Nevada Bureau of Mines and Geology

Metals

Industrial Minerals

Oil and Gas

Geothermal

Special Publication MI-2017

The Nevada Mineral Industry 2017

Exploration
Development
Mining
Processing

University of Nevada, Reno

Starting in 1979, NBMG has issued annual reports that describe the mineral (precious and base metals and industrial minerals including aggregate), oil and gas, and geothermal activities and accomplishments. This report describes those accomplishments in Nevada for 2017, which includes production, reserve, and resource 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; and a directory of mines and mills.

Nevada System of Higher Education 2018

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Cover Photos:
Steamboat Hills geothermal field (left), Washoe County, Nevada (*photographer, Jack Hursh)*. Steam discharging from the wellhead separator for the 63-7 well at the Dixie Valley geothermal plant (right), Churchill County, Nevada (*photographer, Bridget Ayling).*

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The Nevada Mineral Industry 2017

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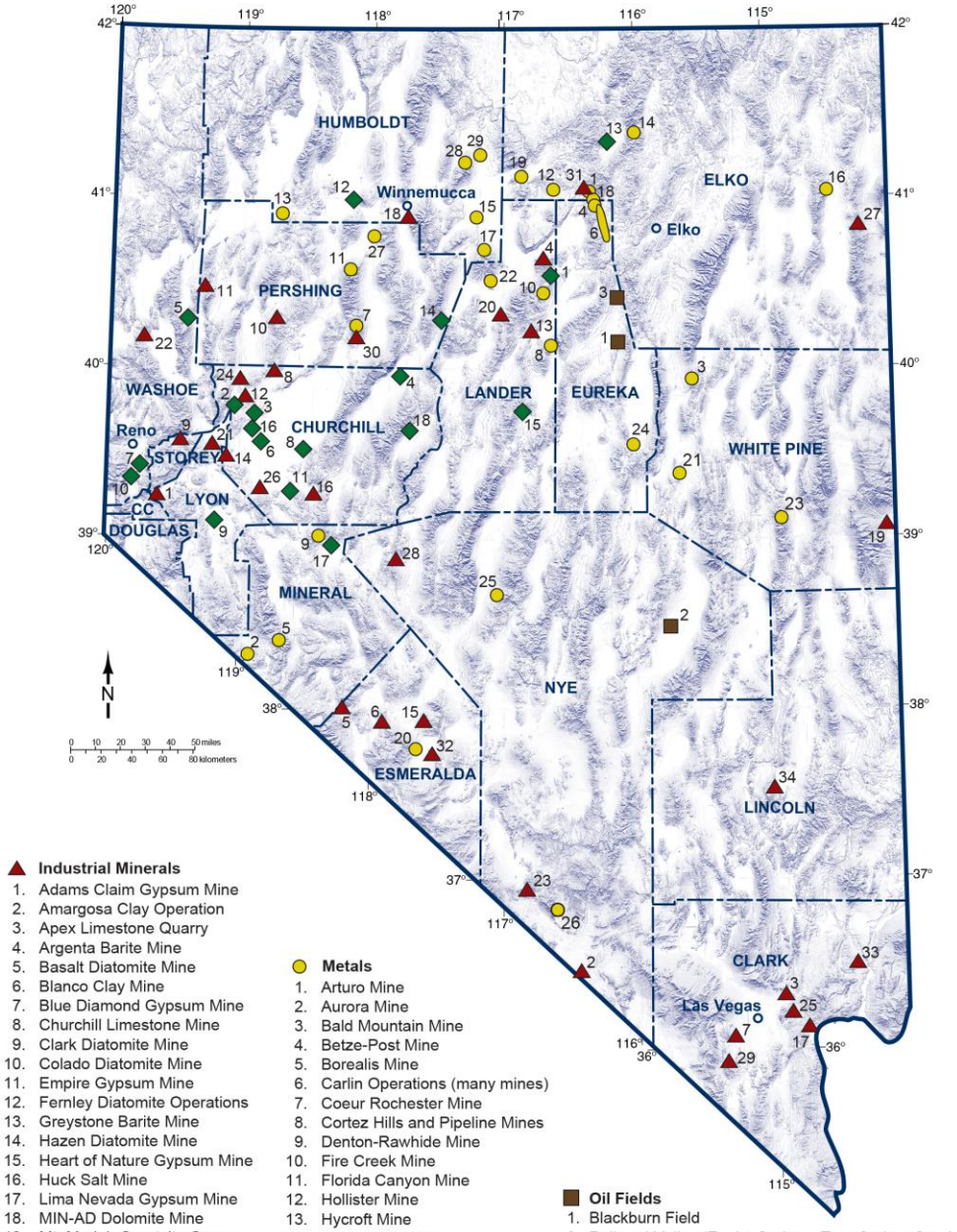

Industrial Minerals

1. Adams Claim Gypsum Mine
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5. San Emidio
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7. Steamboat I, IA, II, and III, Galena
8. Stillwater 1 and 2
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11. Salt Wells
12. Blue Mountain
13. Tuscarora
14. Jersey Valley
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16. Patua
17. Wild Rose
18. Tungsten Mountain

Major mines, oil fields, and geothermal plants, 2017.

OVERVIEW

by John L. Muntean

This report highlights activities through 2017 in metals, industrial minerals, geothermal energy, and petroleum. The value of overall mineral and energy production in Nevada in 2017 was $8.49 billion, a 4.7% increase from 2016 (table 1, fig. 1). Gold production in 2017 was just over 5.64 million ounces (175 tonnes), a 3.2% increase from 2016. The average gold price in 2017 was $1257.12/ounce (fig. 2). The share of gold in the value of Nevada mineral and energy production decreased slightly from 85.8% in 2016 to 83.8% in 2017. Nevada led the nation in the production of both gold and barite ($19.9 million). It was also the only state that produced lithium ($39.62 million), magnesite ($7.9 million), and the specialty clays, sepiolite and saponite ($11.2 million). Other commodities mined and produced in Nevada in 2017, in order of value, included copper ($415.5 million), aggregate (sand, gravel, and crushed stone) ($315 million), geothermal energy ($259.8 million), silver ($144.5 million), diatomite ($48.4 million), gypsum ($42.7 million), limestone and dolomite (mainly for cement, $39.6 million), silica ($20.4 million), dimension stone and landscape rock $19.8 million), and petroleum ($12.9 million). Additional mined materials with production values less than $10,000,000 in 2017 were molybdenum, perlite, other clays, iron oxides, salt, and semiprecious gemstones (opal). Locations of many of the sites mentioned in the text of this report are shown on NBMG Open-File Report 2017-01, *Nevada Active Mines and Energy Producers*, which is available at http://pubs.nbmg.unr.edu/NV-active-mines-and-energy-2017-p/of2017-01.htm.

For the third year in a row, Nevada led the United States in terms of value of overall nonfuel (excluding oil, gas, coal, uranium, and geothermal) mineral production in 2017 (according to the U.S. Geological Survey, Mineral Commodity Summaries 2018, http://minerals.usgs.gov/minerals/pubs/mcs/2018/mcs2018.pdf). Nevada accounted for just over 10% of the value of domestic nonfuel mineral production. Nevada has led the nation eight of the last nine years. Arizona was second and is the country's major copper producer. Texas rose to third, mainly due to its booming construction industry and demand for aggregate and cement. Alaska rose to fourth, mainly due to zinc, gold, lead, and silver production, and California dropped to fifth, with its production dominated by aggregate. 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.

Nevada's production of 5.64 million ounces (175 tonnes) of gold was valued at $7.09 billion. Nevada accounted for 71% of total U.S. gold production in 2017, down from 81% in 2016. This decrease was mainly due to increased production from the Cresson Mine (Cripple Creek) in Colorado and the Haile Mine in South Carolina. The U.S. was the fourth leading gold producer in the world in 2017. Nevada alone accounted for 5.6% of world production of gold, which was approximately 101.3 million ounces (3,150 tonnes) in 2017. Only China, Russia, and Australia produced more gold than the state of Nevada.

The section on **Metals** and the tables in **Major Precious-Metal Deposits** and **Other Metallic Deposits** provide details on exploration, new deposit discoveries, new mine openings, mine closures, additions to reserves, and mine expansions. As has been the case for many years, gold continues to be the leading commodity produced in Nevada. Production of gold in 2017 came mainly from 15 major mining operations that each produced greater than 100,000 ounces (3 tonnes). The share of production from the Carlin trend decreased from 38% in 2016 to 33% in 2017.

Nevada and the U.S. have produced a significant portion of the world's gold. The U.S. Geological Survey estimates that total world gold production, since the beginning of civilization, has been approximately 5.824 billion ounces (181 thousand tonnes). Total gold production in Nevada through 2017 was 229.9 million ounces (7,116.5 tonnes). Remarkably, 89% of Nevada's gold production has been produced since the Carlin Mine began production in 1965; 87% has been produced during the current boom from 1981 to the present; and 24% has been produced in the last ten years. Cumulative U.S. production, primarily since 1835, is approximately 602 million ounces (18.7 thousand tonnes) or about 10.3% of total world gold production, and total Nevada production is 3.9% of cumulative world production. The Carlin trend alone accounts for 1.5% of all the gold ever mined in the world. By the end of 2017, cumulative production from the Carlin trend was 90.1 million ounces (2,802 tonnes), assuring its place as one of the most productive gold-mining districts in the world.

Nevada continues to be in the midst of the biggest gold boom in U.S. history, as the graph of historical U.S. gold production illustrates (fig. 3). 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 too small to be visible to the naked eye. These deposits are mostly in Nevada. The U.S. production so far in the current boom, the period since 1981, has been 282.6 million ounces (8,790 tonnes). This is significantly greater than the total U.S. production during several past eras, including 1) the California gold rush (1849 to 1859, with 29 million ounces or 900 tonnes), although some estimates of unreported production may bring that figure up to 70

million ounces (2,200 tonnes); 2) the Comstock (Nevada) era from 1860 to 1875 with 34 million ounces (1,060 tonnes); and 3) the period from 1897 to 1920, when Goldfield (Nevada), the Black Hills (South Dakota), Cripple Creek (Colorado), and byproduct gold production from copper mines in Arizona and Utah contributed to cumulative production of 95 million ounces (3,000 tonnes). U.S. production in the last decade from 2008 through 2017 alone was 72.4 million ounces (2,252 tonnes). The current boom is bigger than previous booms not only in terms of cumulative production but also in terms of peak annual production and duration. In 1998, 11.6 million ounces (360 tonnes) were produced versus 4.8 million ounces (150 tonnes) in 1909, 2.6 million ounces (80 tonnes) in 1866, and 3.1 million ounces (96 tonnes) in 1853. The current boom has lasted at least 36 years versus no more than 24 years for any of the earlier booms.

Table 1. Mineral, geothermal power, and petroleum production in Nevada[1]

	2017		2016		% Change (2016 to 2017)	
Commodity	**Quantity**	**Value**	**Quantity**	**Value**	**Quantity**	**Value**
Gold	**5,641,538 oz** (175,572 kg)	**$7,092,090,251**	**5,467,646 oz** (170,062 kg)	**$6,838,603,558**	**3.1%**	**3.7%**
Silver	**8,477,388 oz** (263,677 kg)	**$144,492,840**	**8,885,873 oz** (276,382 kg)	**$152,334,964**	**-4.6%**	**-5.1%**
Copper	**145,811,951 lbs** (66,139 tonnes)	**$415,564,060**	**160,218,049 lbs** (72,674 tonnes)	**$352,479,708**	**-9.0%**	**12.1%**
Molybdenum	**391,658 lbs** (178 tonnes)	**$3,197,888**	**493,010 lbs** (224 tonnes)	**$3,244,006**	**-20.5%**	**-1.4%**
Aggregate	**44,210,000 tons** (40,100,000 tonnes)	**$315,000,000**	**36,820,000 tons** (33,400,000 tonnes)	**$254,000,000**	**20.0%**	**24.0%**
Barite	**391,402 tons** (355,074 tonnes)	**$31,302,754**	**230,114 tons** (208,759 tonnes)	**$19,981,158**	**70.1%**	**56.7%**
Gypsum	**3,530,520 tons** (3,202,867 tonnes)	**$40,879,177**	**3,250,872 tons** (2,949,172 tonnes)	**$37,247,488**	**8.6%**	**9.8%**
Geothermal Energy	**3,323,882 MWh net**	**$259,981,916**	**3,344,233 MWh net**	**$258,187,349**	**-6.1%**	**7.0%**
Petroleum	**285,530 barrels**	**$12,889,724**	**278,599 barrels**	**$10,333,936**	**2.5%**	**24.7%**
Other Minerals[2]		**$151,629,268**		**$125,346,022**		**21.0%**
Totals		**$8,506,649,804**		**$8,093,335,658**		**0.1%**

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

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

The value of minerals and energy were calculated as follows:

Gold and silver: production reported by NDOM using average annual prices for gold ($1257.12/oz in 2017 and $1250.74/oz in 2016) and silver ($17.04/oz in 2017 and $17.14/oz in 2016), as reported by http://www.kitco.com.

Copper and molybdenum: production reported by NDOM using average annual prices for copper ($2.85/lb for 2017 and $2.20/lb for 2016) and molybdenum ($8.165/lb for 2017 and $6.58/lb for 2016), as reported by USGS.

The values of all the other commodities were the gross proceeds reported by the Nevada Department of Taxation (NDT). The total values, as calculated, will not necessarily equal the total gross proceeds reported by NDT.

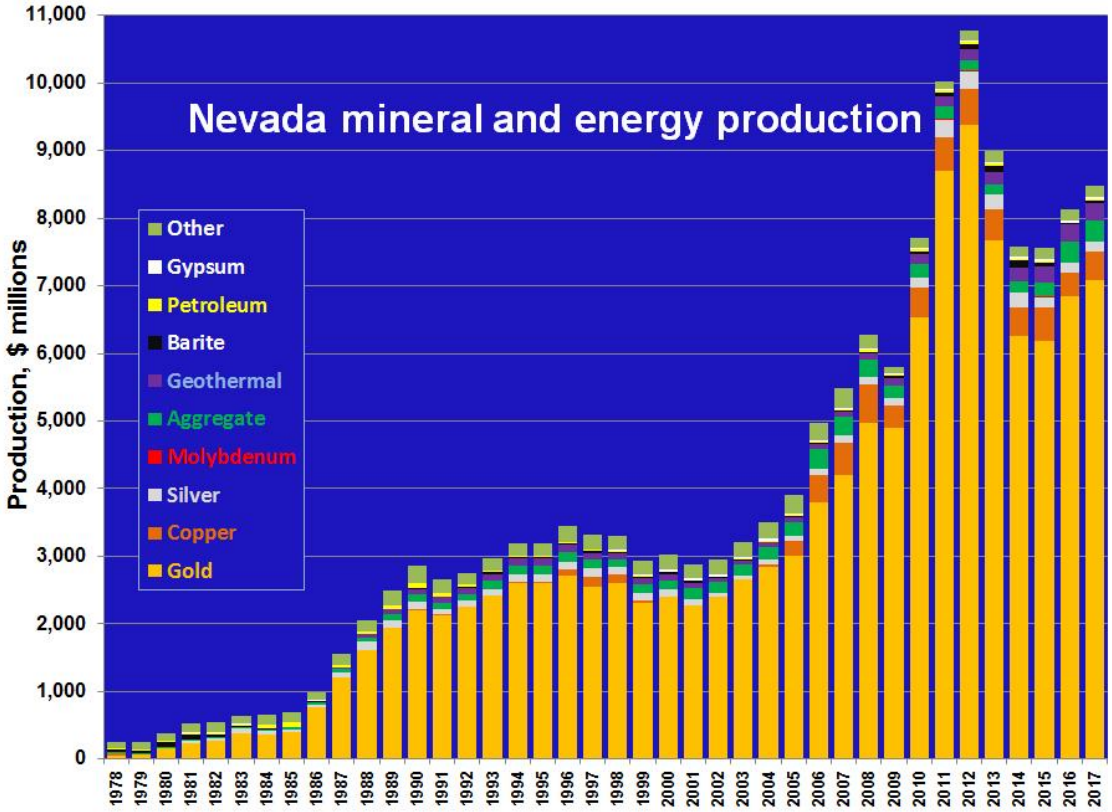


Figure 1. Chart showing relative values of Nevada production of gold, copper, silver, molybdenum, aggregate, geothermal energy, barite, petroleum, gypsum and other minerals from 1978 to 2017. Molybdenum production is only shown for 2011 to 2017.

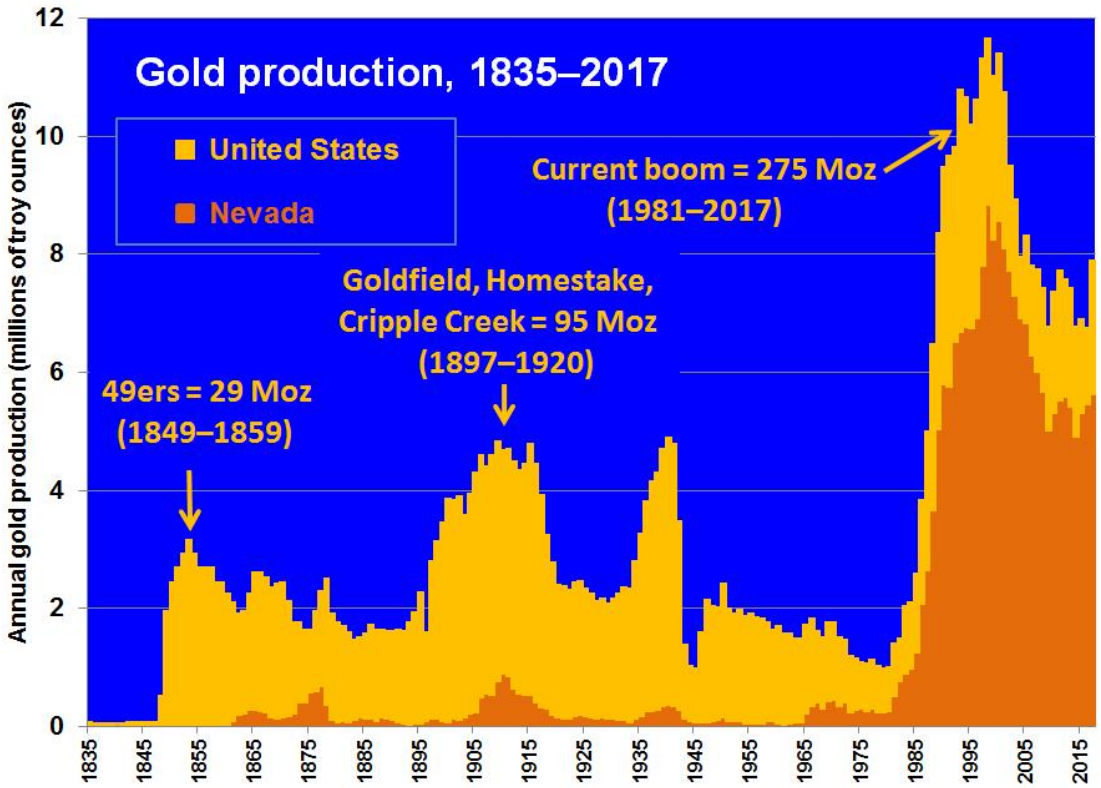


Figure 2. Chart comparing U.S. and Nevada gold production from 1835 to 2017.

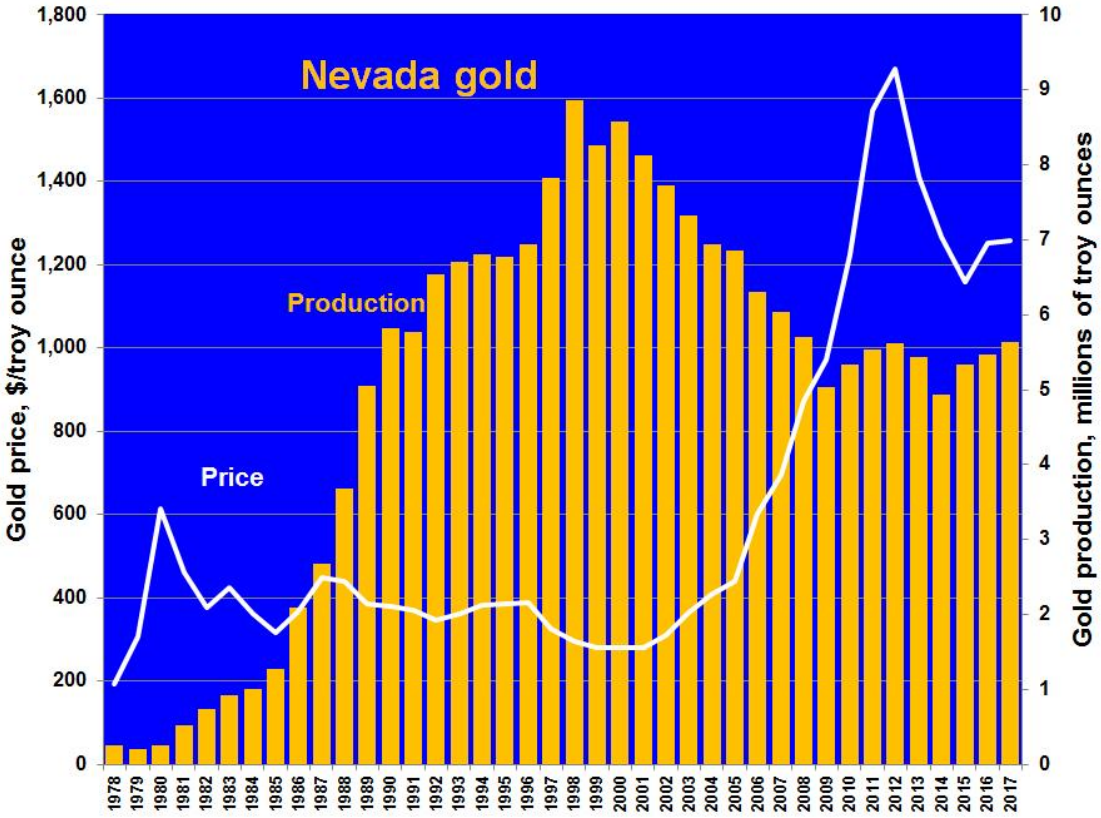


Figure 3. Chart showing Nevada gold production compared to the price of gold from 1978 to 2017.

Barrick Gold Corp. and Newmont Mining Corp. accounted for 76% of Nevada gold production in 2017, mostly from mines in northeastern Nevada. Barrick produced 2.42 million ounces (75.4 tonnes) of gold mainly from its Cortez operation southeast of Battle Mountain and Goldstrike operations on the Carlin trend, which both produced just under one million ounces. Other large gold operations were Newmont's mines on the Carlin trend (971,613 ounces), Kinross Gold Corp.'s Round Mountain Mine (435,324 ounces) in Nye County, and Newmont's mines at Twin Creeks (374,740 ounces), and the nearby Turquoise Ridge (369,000 ounces, 75% Barrick, 25% Newmont), both in Humboldt County. Newmont's new Long Canyon Mine in the Pequop Mountains had its first full year of production, producing 174,462 ounces (5,426 kg) of gold in 2017.

Nevada silver production in 2017 totaled 8.5 million ounces (276 tonnes), a 4.6% decrease from 2016 (fig. 4). About 44% of the silver production was a byproduct of gold mining. With a ratio of value (average price of gold to average price of silver) of 74:1 in 2017, only those deposits with more than 74 times as much silver as gold can be considered primary silver deposits. Only one such mine operated in Nevada in 2017—Coeur Mining Inc.'s Rochester Mine in Pershing County, which had a silver-to-gold production ratio of 92:1 and total silver production of 4.71 million ounces (146.5 tonnes) in 2017. It produced about 56% of Nevada's silver in 2017. Nevada silver production in 2017 accounted for 14% of the U.S. total, which was second in the U.S. behind Alaska.

Nevada copper production in 2017 was dominated by the Robinson copper-gold-molybdenum mine, operated by KGHM International Ltd. near Ely in White Pine County. It produced 112.6 million pounds (51,090 tonnes) of copper (fig 5). Copper was also produced at Newmont's Phoenix Mine near Battle Mountain in Lander County, where the value of 33.2 million pounds (15,050 tonnes) of produced copper was about 38% of the value of the mine's gold production. At Phoenix, Newmont produces copper on site with a solvent extraction-electrowinning (SX-EW) plant, as well as producing concentrates that are shipped to smelters outside Nevada, similar to KGHM's Robinson Mine. KGHM also produced 391,658 pounds (178 tonnes) of by-product molybdenum from Robinson, the only reported molybdenum production in Nevada in 2017.

Mineral exploration activity in 2017 is summarized in the chapters on **Metals and Industrial Minerals**. Most exploration focused on gold; however, some companies explored for lithium, copper, silver, zinc, barite, diatomite, and graphite.

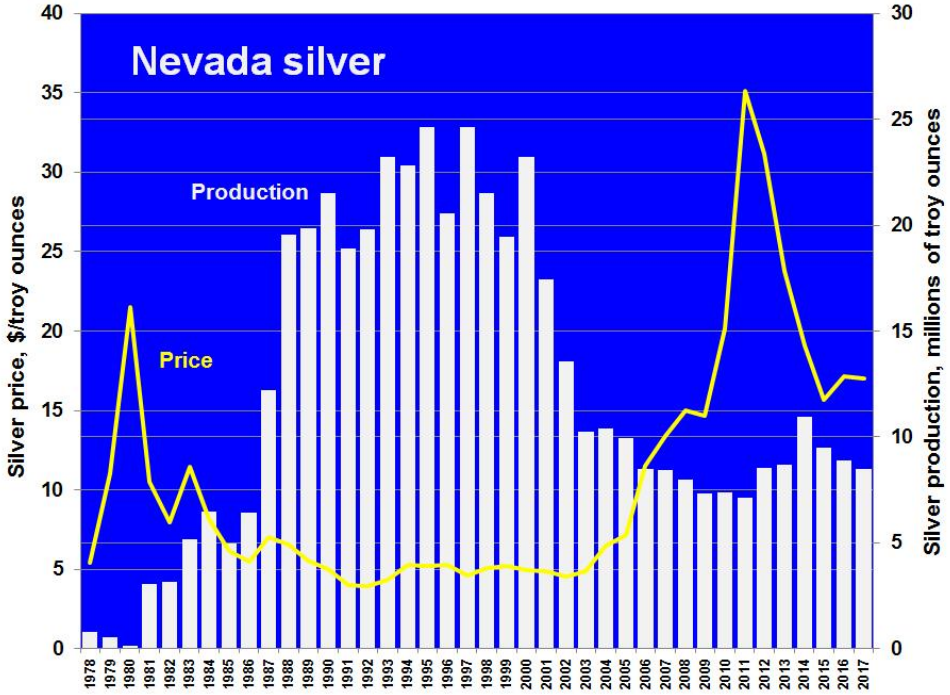


Figure 4. Chart showing Nevada silver production compared to the price of silver from 1978 to 2017.

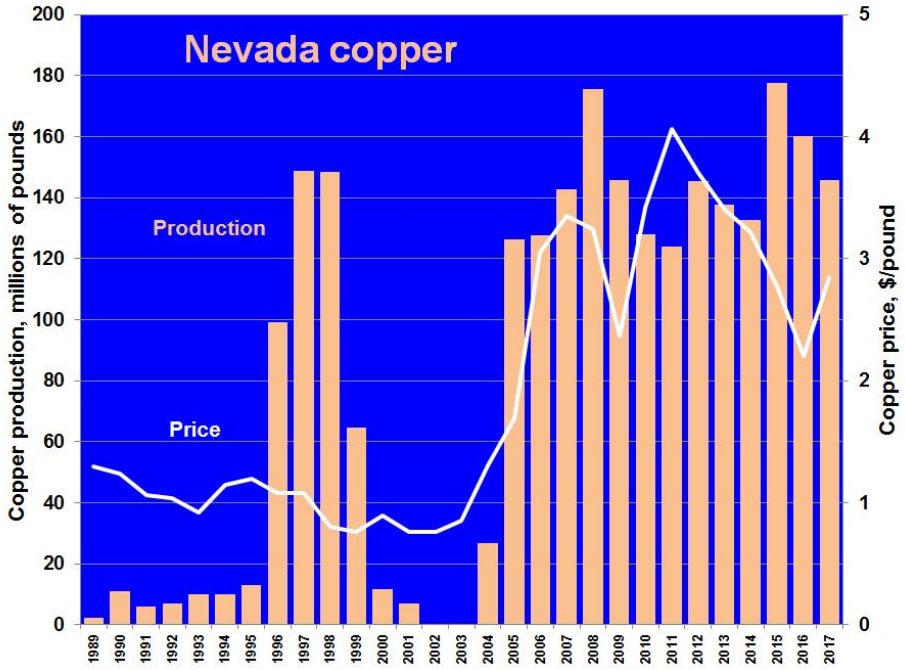


Figure 5. Chart showing Nevada copper production compared to the price of copper from 1989 to 2017.

Exploration activity for metals in Nevada, similar to worldwide exploration, rebounded nicely after five years of decline, as reflected by increases in mining claims and drill projects. According to S&P Global Market Intelligence, total worldwide exploration for non-ferrous metals increased from ~$7.2 billion in 2016 to $7.95 billion in 2017, still well below the recent peak of $22 billion in 2012. Budgets for exploration in the United States increased 19% in 2017, accounting for 8% of worldwide exploration budgets in 2017.

Exploration activity, including new claims staked, was reported in most of Nevada's 17 counties. The Bureau of Land Management's LR2000 database indicated 203,298 claims at the end of 2017, an increase of 4.6% from the end of 2016 (fig. 6). A total of 24,873 new claims were staked and filed in 2017.

The increase in exploration activity for metals, mainly for gold, was also reflected by a sharp increase in projects that were drilled. The number of drill projects increased from 56 projects in 2016 to 90 projects in 2017 (fig. 7). Advanced exploration projects show promise for major developments, particularly for gold along the Carlin and Battle Mountain-Eureka (Cortez) trends in Eureka, Elko, and Lander counties, such as Barrick's large Goldrush deposit and its new high-grade Fourmile discovery near its Cortez mine. Drill programs by junior companies that drew attention in 2017 included Gold Standard Ventures Corp.'s Railroad-Pinion project near the town of Carlin, Premier Gold Mines Ltd.'s Cove project, Corvus Gold Inc.'s Motherlode project near the town of Beatty, and NuLegacy Gold's Red hill project located just south of Barrick's Cortez property.

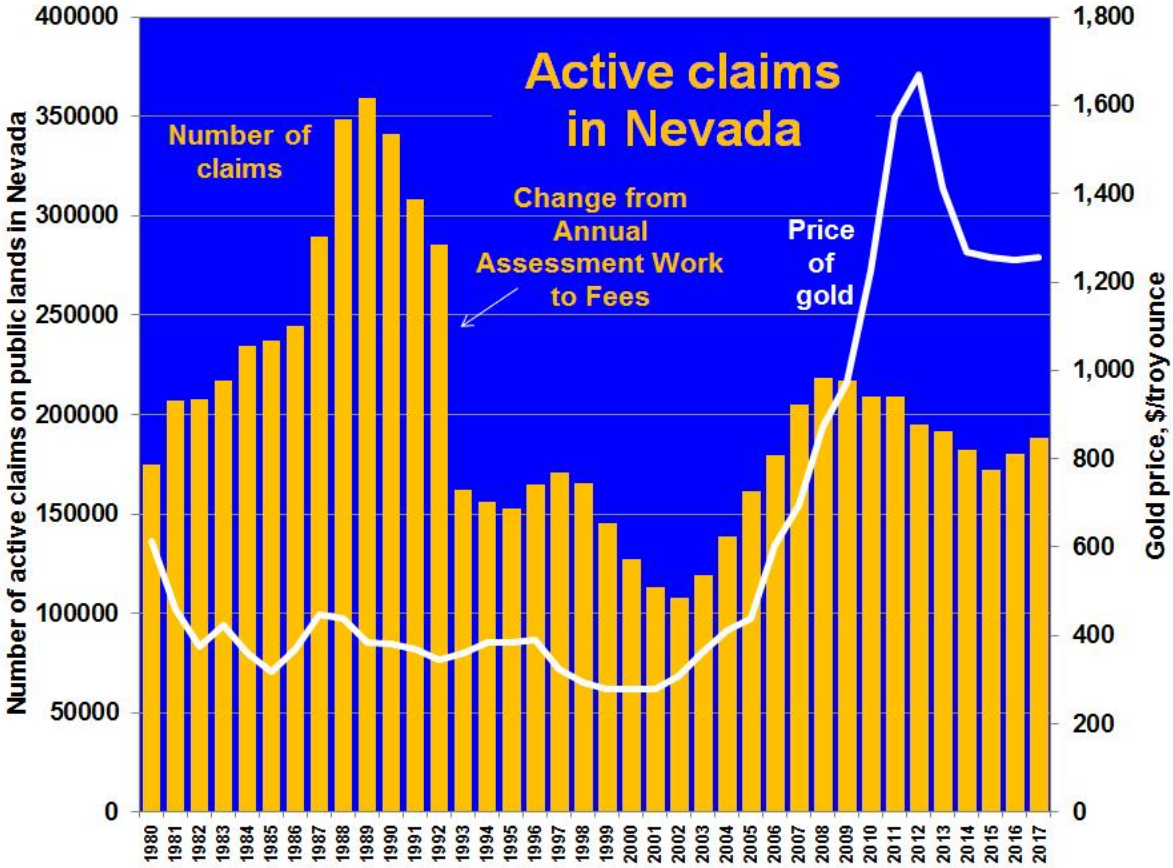


Figure 6. Chart showing number of active mining claims at the end of the year from 1980 to 2017. For comparison, chart also shows the price of gold during that period.

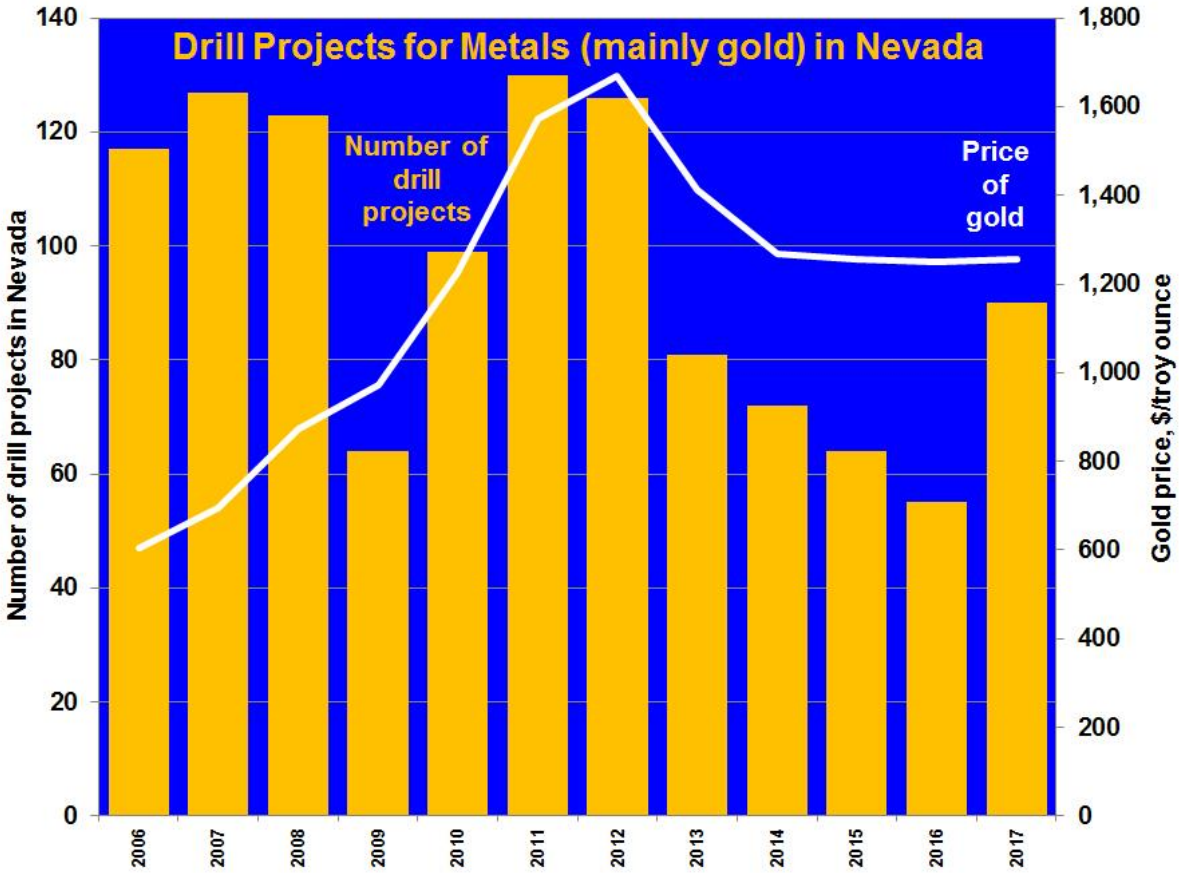


Figure 7. Chart showing number of drill projects targeting metals, mainly gold, from 2006 to 2017. For comparison, chart also shows the price of gold during that period. The number of drill projects shown are minimal, given major mining companies and privately held companies are not required to report whether they drilled or not.

The section on **Industrial Minerals** covers developments during 2017 and gives details on important commodities produced from or processed in Nevada, including aggregate, barite, cement, clays, diatomite, dimension stone, dolomite, gypsum, lime, limestone, lithium, magnesium, perlite, potassium alum (kalinite), pozzolan, salt, semiprecious gemstones (opal), silica, and zeolites. Demand for raw materials for construction will likely grow in the future because of Nevada's increasing population and need for additional highways and housing. Nevada's estimated population in 2017 was 2.994 million, up 10.8% from 2.701 million in 2010 (http://www.census.gov).

Albemarle Corp.'s Silver Peak operation in Clayton Valley in Esmeralda County, where subsurface brines are evaporated on a playa, is the only producer of lithium in the United States. Most exploration for industrial minerals in Nevada was focused on lithium, both in brines and in clay deposits, mainly near Clayton Valley. Most of this exploration is in southwestern Nevada, mainly Clayton Valley and other nearby playas. Companies that did exploration drilling in 2017 included American Lithium Corp., Cypress Development Corp., Dajin Resources Corp., Geoscience Global, Green Energy Resources Inc., Iconic Minerals Ltd., MacArthur Minerals/3PL Operating Inc., Nevada Sunrise Gold Corp., and Pure Energy Minerals Ltd. In addition, Lithium Americas Corp. (formerly Western Lithium USA Corp.) continued testing, and evaluation of the lithium-bearing clay resources on its Kings River Valley project in northern Humboldt County.

Nevada was once again the leading domestic producer of barite, of which 95% is used for drilling muds in oil wells. Production rebounded sharply in 2017, increasing 70% from 2016 (table 1, fig. 9). The barite price is directly tied to the price of oil and gas.

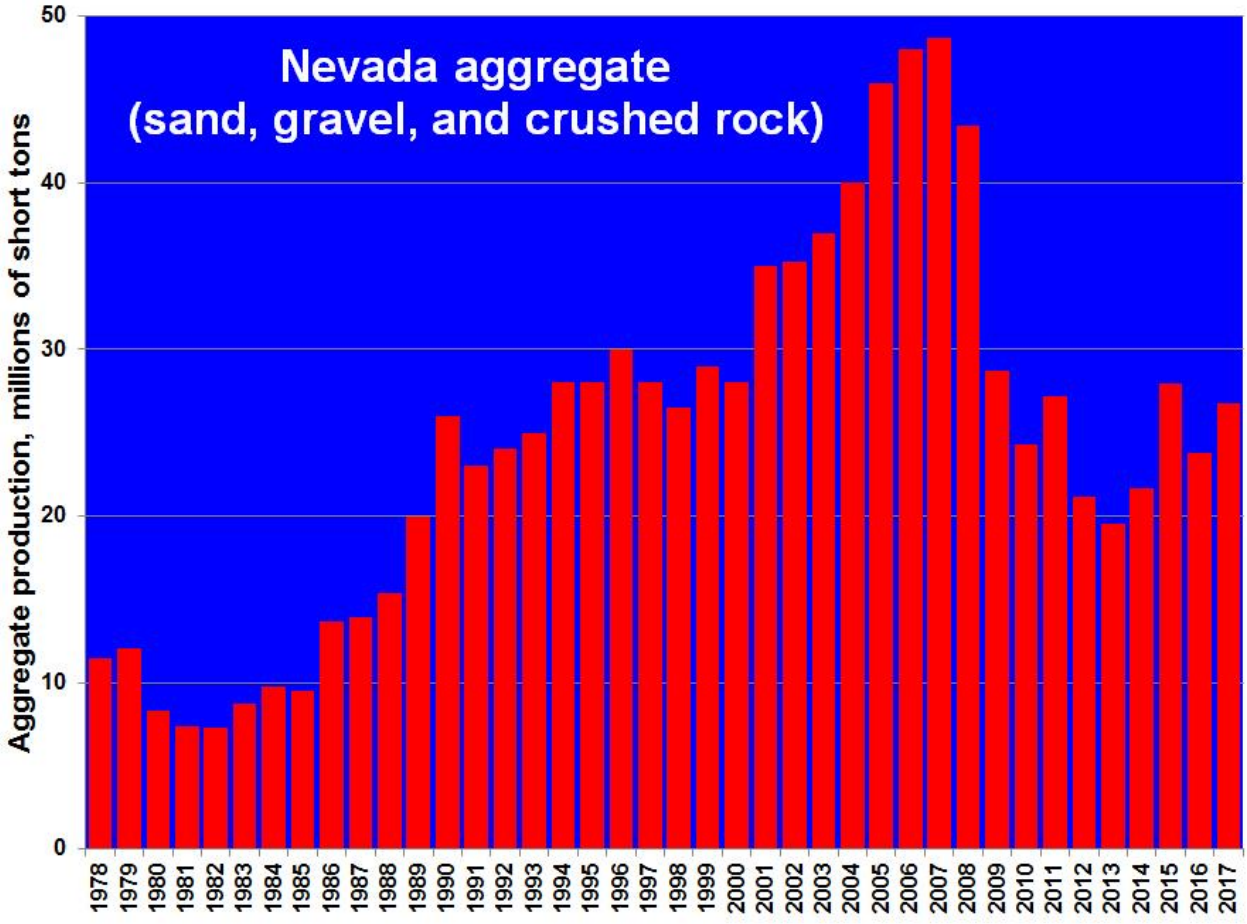


Figure 8. Chart showing Nevada aggregate production from 1978 to 2017.

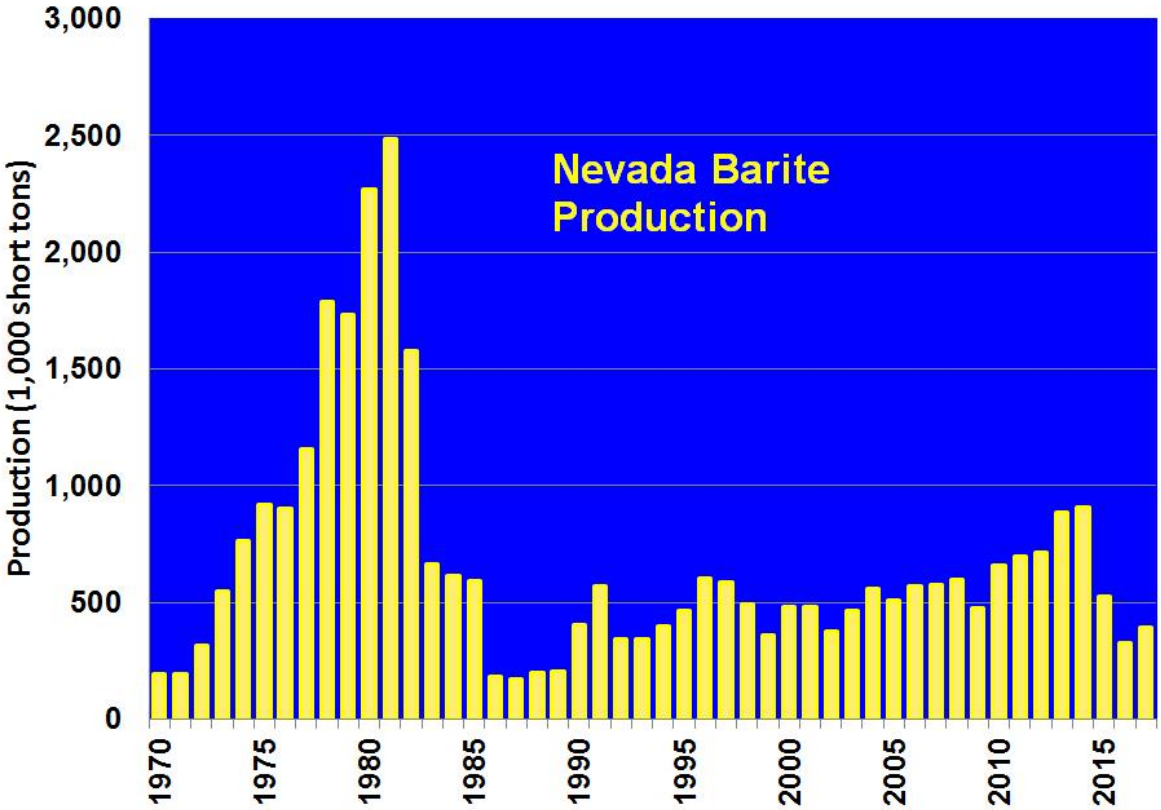


Figure 9. Chart showing Nevada barite production from 1970 to 2017.

One of the reasons for the lithium rush in Nevada is the Tesla Motors, Inc., Gigafactory 1 in Storey County. Construction began in June 2014 with full production expected in 2018. Once in full production, the Gigafactory 1 will more than double the present world production of lithium-ion batteries and also produce batteries for significantly less cost using the economies of scale, innovative manufacturing, reduction of waste, and vertical integration by having most manufacturing processes under one roof. Tesla Motors, Inc., originally projected producing 500,000 electric cars annually by 2020. This rate will require an annual production of 27,000 tons (24,500 tonnes) of lithium compounds on top of the present annual world production of almost 40,000 tons (36,000 tonnes). The company stated that it prefers to have lithium sourced as close as possible to its Gigafactory, preferably North America, but has had to go abroad for a supply. Nevada is well placed as a potential supplier, but only the Albemarle Silver Peak operation is presently producing. Tesla Motors, Inc., has a conditional supply agreement with Pure Energy Minerals, which has a lithium brine property in Clayton Valley, but that company has yet to produce any lithium. Tesla Motors, Inc., most recently signed an offtake agreement for lithium supplies from Mount Holland, Australia, under a joint venture between Kidman Resources Ltd. and SQM, and was in negotiations with SQM for supplies from Chile.

Nevada was also a leader in the production of several other industrial minerals. Nevada production of diatomite, which is mainly used in filtration, was second only to California in the U.S. Nevada ranked second in the list of six states that produce 66% of the country's crude gypsum. The state's gypsum production increased 7% in 2017. Premier Magnesia's Gabbs Mine in Nye County is currently the nation's only hard-rock producer of magnesite.

Developments in the geothermal industry are covered in the section on **Geothermal Energy**. The total geothermal power generation in Nevada in 2017 was 4,324,889 megawatt-hours (MWh) gross and 3,323,882 MWh net, representing small declines from 2016 (fig. 10). Data obtained from the Nevada Department of Taxation indicate that the total gross 2017 proceeds from geothermal operators in Nevada (including the direct use projects) were $259,981,916 (approximately $1.8 million greater than in 2016). The total installed geothermal energy capacity in Nevada increased to ~720 MWe (megawatts electric) in 2017, with the new Tungsten Mountain project coming online in late 2017

In 2017, the Nevada Division of Minerals (NDOM) permitted 35 geothermal wells, and 31 new geothermal wells were drilled (including the deepening of three

existing thermal-gradient holes) (tables 4 and 5). This represents almost a doubling of both the number of permits issued and geothermal wells drilled compared to 2016. Additionally, five industry production wells and four industry injection wells were drilled. Most of these were drilled by Ormat Nevada Inc. in the McGinness Hills, Carson Lake, Dixie Meadows, Dixie Comstock, New York Canyon, and Tungsten Mountain geothermal fields/prospects.

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 constitutes only a slight fraction of U.S. production. In 2017, 280,970 barrels or oil were produced, a 0.9% increase from 2016 (table 1, fig. 11). Small amounts of co-produced natural gas are used to fuel equipment used for oil production. No wells were permitted for oil and gas in 2017.

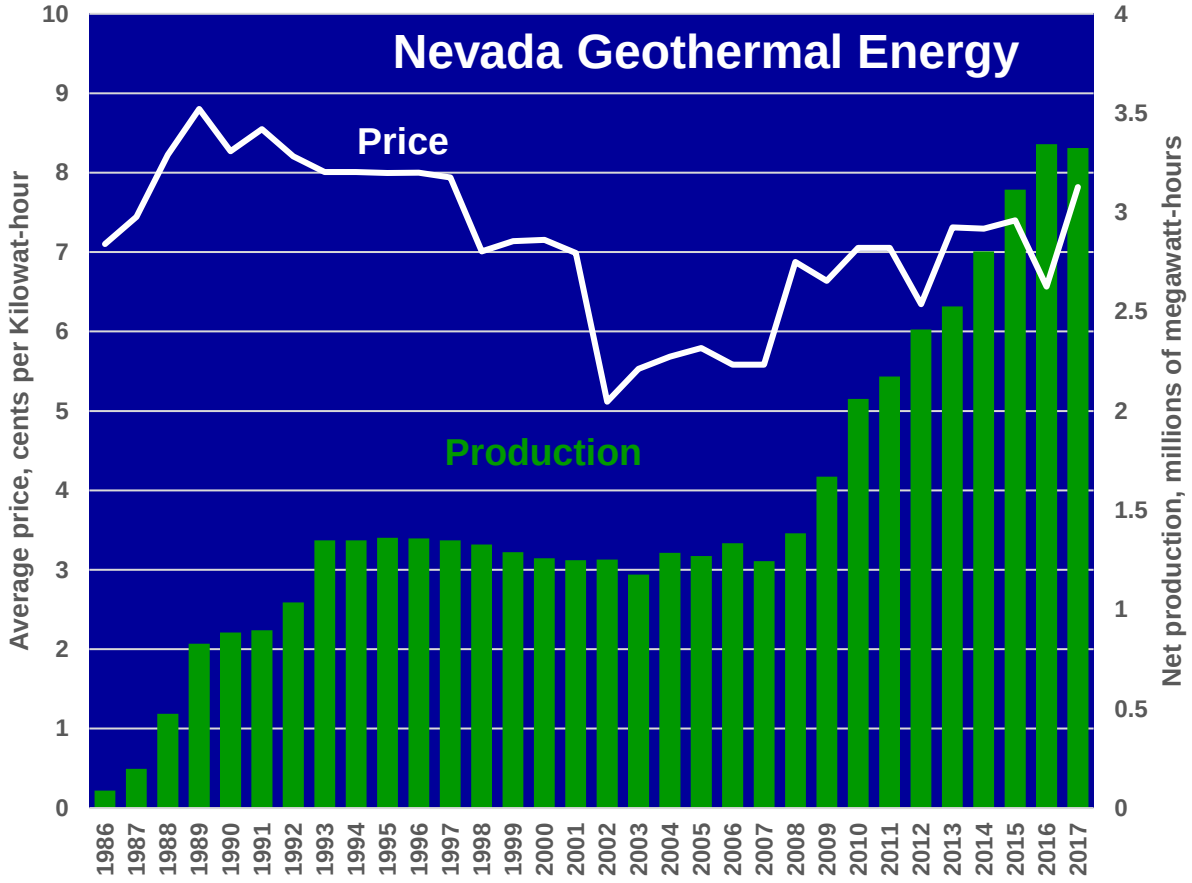


Figure 10. Chart showing net geothermal production in megawatt-hours in comparison to the average price of geothermal power in cents per kilowatt-hour for the period from 1986 to 2017. Note that average price is based on the total MWh produced and total receipts. Actual price for any individual power plant may vary and is held confidential by the state Energy Office.

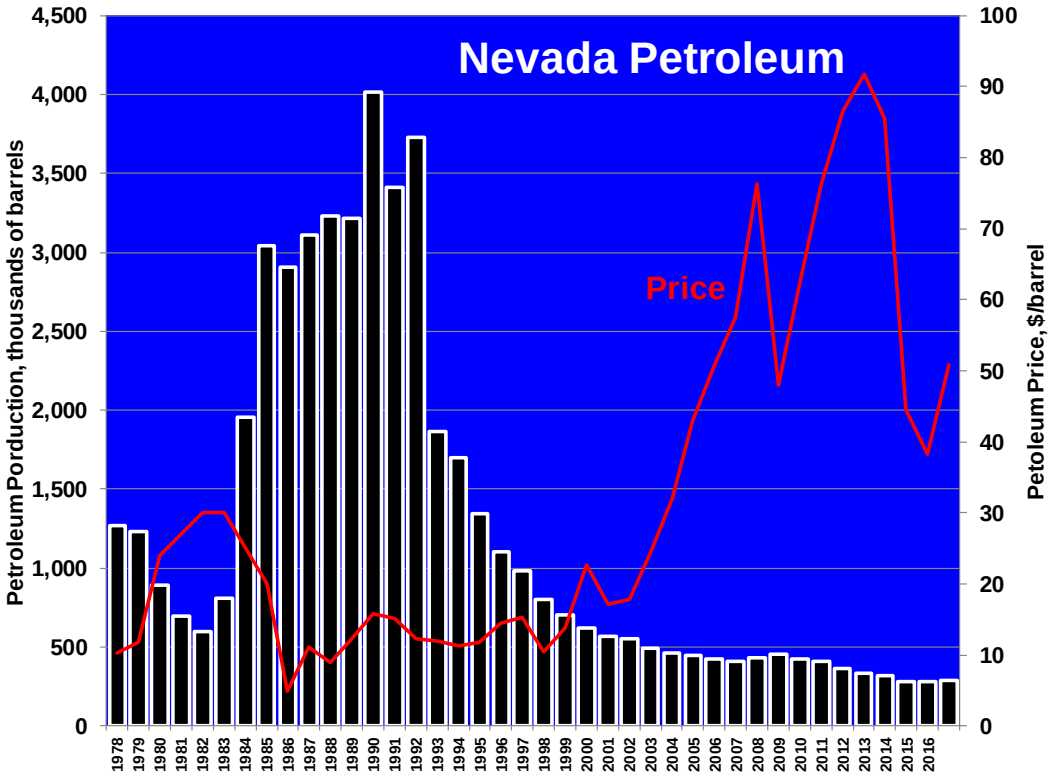


Figure 11. Chart showing Nevada petroleum production and price of petroleum from 1978 to 2017.

Local economies benefit from mining in Nevada. Construction of new homes, hotels, 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. According to the Nevada Department of Employment, Training, and Rehabilitation, the Nevada mining and natural resources industry employed an average of 16,682 employees in 2017, about a 27% increase from 2016. The average pay for mineral industry employees during this time was $83,740 per year, about a 12% decrease from 2016, but still the highest average of any employment sector in the state. Mining employment has remained an important factor in Nevada (*Major mines of Nevada 2016*, Perry and Visher, 2017).

Additional information about the Nevada mineral industry and the U.S. gold industry, including the contents of selected publications, is readily available on line from the Nevada Bureau of Mines and Geology (http://www.nbmg.unr.edu) and 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 (https://minerals.usgs.gov/minerals), and the U.S. Energy Information Administration (https://www.eia.doe.gov) provides data on oil and gas, geothermal, solar, wind, hydroelectric, and other energy sources. The Nevada Bureau of Mines and Geology supports several interactive maps on the web that are backed by periodically updated databases on mineral and energy resources and potential exploration activity, land ownership and restrictions, and other geographic information (https://data-nbmg.opendata.arcgis.com/pages/web-applications).

CONVERSION FACTORS

1 metric ton = 1.1023113 short ton = 1,000 kilograms = 2,204.6226 pounds = 32,150.7 troy ounces.

31.1035 metric tons = 1 million troy ounces (31.1035 grams = 1 troy ounce).

453.592 grams = 1 pound (avoirdupois) = 16 ounces (avoirdupois) = 14.5833 troy ounces.

34.2857 grams per metric ton = 34.2857 parts per million by weight = 1 troy ounce per short ton.

METALS

by David A. Davis and John L. Muntean

PRODUCTION

Nevada produced 5,641,538 ounces (175,471 kg) of gold, 8,477,388 ounces (263,676 kg) of silver, 145,811,951 pounds (66,139 tonnes) of copper, and 391,658 pounds (178 tonnes) of molybdenum from 24 active mines, as well as minor production from residual leaching from 5 inactive mines and very minor production from 3 placer operations. Tables 1 and 2 show the production of gold, silver, copper, and molybdenum in 2017 that was reported to the Nevada Division of Minerals. Remaining mine reserves at the end of 2017 are shown in table 3.

Gold production increased 3.2% in 2017. Barrick Gold Corp. and Newmont Mining Corp. accounted for 76% of Nevada's gold production, down from 78% in 2016. The Carlin trend produced 1,880,160 (58,480 kg) of gold, a decrease of 11.7% from 2016. The Carlin trend's share of Nevada's gold production decreased from 38% in 2016 to 33% in 2017. Through 2017, the Carlin trend had produced 90,123,883 ounces (2,803,167 kg) of gold since the original Carlin Mine went into production in 1965.

Barrick remained the leading producer of gold in 2017, producing 43% of Nevada's gold. It produced 2,424,247 ounces (75,403 kg) from its mines in Nevada, a decrease of 11.4% from 2016. Much of that decrease was a result of significant production decreases at its Goldstrike Mine on the Carlin, both in open pit underground operations. Nevertheless, Nevada production still accounted for 45.5% of Barrick's 5.32 million ounces (0.165 million kg) of worldwide production, down from 48% in 2016. The fact that nearly half of the production of the world's leading gold miner comes from Nevada, underscores yet again the importance of Nevada to the global gold mining industry. Production came from its Cortez, Goldstrike, and Turquoise Ridge (75% share) mines. Importantly, Barrick's Nevada's mines are low-cost producers. Barrick's all in cash cost per ounce for all its mines worldwide averaged $526/oz, whereas cash costs for Goldstrike and Cortez were $455/oz, and $589/oz for Turquoise Ridge. At the end of 2017, Barrick reported 26,229,100 ounces (815,816 kg) of proven and probable reserves in Nevada, an increase of 17.4% from 2016.

Newmont produced 1,851,875 ounces (57,600 kg) of gold in 2017, a 13.5% increase from 2016. Newmont's production came from four open pits (Gold Quarry, Emigrant, Silverstar [formerly known as Genesis], and Goldstar) and four underground mines (Leeville/Turf, Chukar, Pete Bajo, and Exodus) on the Carlin trend and from its open pit mines at the Phoenix and Twin Creeks mines, plus its 25% share of the Turquoise Ridge. Carlin trend operations produced 971,613 ounces (30,220 kg) of gold, 374,740 ounces (11,659 kg) from Twin Creeks, 197,026 ounces (6,128 kg) from Phoenix, and 41,784 ounces (2,233 kg) from open pit mining of the Brooks open pit and residual leaching of pads at its Lone Tree Mine. Newmont's new Long Canyon open pit mine had it first full year of production in 2017, producing 174,462 ounces (5,426 kg) of gold in 2017. The consolidated costs applicable to sales for all its mines worldwide averaged $691 per ounce. The consolidated costs applicable to sales for the Carlin trend operations were $823/oz, $854/oz at Phoenix, $611/oz at Twin Creeks, and $338/oz at Long Canyon. Newmont reported 25,320,000 ounces (787,540 kg) of gold reserves in Nevada for year-end 2017, essentially the same as at the end of 2016. Other gold mines reporting production are listed in table 1. At least 23% of Nevada's gold production in 2016 was from underground mining. However, Newmont does not break out its production into open pit versus underground. The percentage of Nevada gold production from underground mining was likely at least 35%, given Newmont's numerous underground operations on the Carlin trend. The total reserves at the end of 2017 for all the mines that operated in 2017 was 60,364,000 ounces (1,877,309 kg).

Coeur Mining was the leading silver producer at 4,713,574 (146,609 kg), a 3.3% increase from 2016. All of its production came from its low-grade open pit Rochester Mine, the only primary silver mine in Nevada. Newmont was the second largest silver producer at 1,448,264 ounces (46,793 kg), 83.5% of which came from its Phoenix Mine. Kinross climbed to third, producing 959,673 ounces (44,372 kg) of silver in 2017, over 90% of which came from its Round Mountain Mine. Klondex dropped to fourth producing 904,758 ounces (28,141 kg). Reported silver reserves from five mines at the end of 2017 totaled 122,313,000 ounces (3,804,360 kg).

KGHM International's Robinson Mine produced 83% of Nevada's copper. Production in 2017 amounted to 112,633,428 (51,090 tonnes), a decrease of 3.9% from 2016. Newmont's Phoenix Mine made up the balance of the copper production, producing 33,178,523 pounds (15,050 tonnes), a 20.6% decrease from 2016. KGHM International also produced 391,658 pounds (178 tonnes) of molybdenum from Robinson in 2017, a 20.5% decrease from 2016. Total copper reserves at the Phoenix and Robinson mines were 1,895,540,000 pounds (58,954 tonnes) at the end of 2017.

Table 1. 2017 Nevada Metallic Metal Production by Producer.

Operator	Gold ounces (kg)	Silver ounces (kg)	Copper pounds (tonnes)	Molybdenum pounds (tonnes)
Barrick	2,424,247 (75,403)	201,147 (6,256)		
Newmont	1,851,875 (57,600)	1,448,264 (45,046)	33,178,523 (15,050)	
Kinross	706,921 (21,988)	950,673 (29,569)		
SSR Mining	202,239 (6,290)	3,216 (100)		
Klondex	149,159 (4,639)	904,758 (28,141)		
Jerritt Canyon Gold	129,439 (4,026)			
Coeur Rochester	51,051 (1,588)	4,713,574 (146,609)		
KGHM International	37,897 (1,179)		112,633,428 (51,090)	391,658 (178)
Florida Canyon Mining	28,157 (876)	21,128 (657)		
Mineral Ridge Gold	19,045 (592)	10,203 (317)		
Rawhide Mining	18,379 (572)	213,481 (6,640)		
GRP Pan	15,652 (487)	NR		
Ruby Hill Mining	4,463 (139)	4,263 (133)		
Hycroft	1,866 (58)	6,067 (189)		
Sunrise Minerals	546 (17)	91 (2.8)		
Borealis Mining	300 (9.3)	508 (16)		
Sterling Gold Mining	265 (8.2)	NR		
New Gold Nevada	23 (0.7)	2 (0.06)		
Geo-Nevada	14 (0.4)	13 (0.4)		
Totals	**5,641,538 (175,471)**	**8,477,388 (263,676)**	**145,811,951 (66,139)**	**391,658 (178)**

EXPLORATION

Most indicators of exploration activity in Nevada increased in 2017, despite the average gold price being $1,257 per ounce, essentially the same as the average price in 2016. The gold price rose steadily from $1,150 per ounce through the first 9 months of 2016, peaking at $1,347 per ounce in September, before tailing off to $1,290 per ounce at the end of the year. The price of silver averaged $17.04 per ounce, essentially the same as the average price in 2016.

The number of active mining claims increased in 2017. Nevada county recorders registered 203,298 claims in fiscal year 2017 (which ended June 30, 2017), a 3.2% increase from fiscal year 2016. These included new claims and annual maintenance of existing claims. Similarly, the number of active claims at the end of 2016, as derived from U.S. Bureau of Land Management's (BLM) LR2000 database, was 188,338, an increase of 4.6% from the end of 2016. The distribution of active claims at the end of 2017 is shown in figure 1. The BLM listed 24,873 new claims that were staked and filed in 2017, a 31% increase in the amount of new claims compared to new claims staked in calendar year 2016. The distribution of new claims is shown in figure 2. Unlike in 2016, when 54% of new claims staked were placer claims, only 24% of the new claims were staked as placer claims in 2017. The vast majority of placer claims are for lithium exploration, which is summarized in the chapter on industrial minerals. Table 4 shows the top ten companies that staked the most new claims in calendar year 2016, including large claim blocks targeting lithium. Newmont staked the most claims in 2017—3,065 claims. Most of its claim staking focused on areas from south of the Cortez area to the town of Austin, including the Ravenswood mining district and Carico Lake, and Hall Creek areas. Newmont also continued to stake claims in northeast Nevada, in eastern Elko County, including the Delano mining district and Delker mining district in the Butte Valley area. Silver One Resources staked large claim blocks in the Silverthorn and Viola mining districts in Lincoln County, as well as around the inactive Candelaria Mine in Mineral County. Kinross Gold staked large claim blocks in the Diamond Hills north of the Diamond Range and Garcia Flat in Eureka County, as well as the north end of the Bottle Creek mining district in Humboldt County. Renaissance Gold Inc. staked claim blocks in the Beatty Wash area at in the Bare Mountain mining district, in the Tybo mining district in the Hot Creek Range in eastern Nye County, and the west side of Spruce Mountain in Elko County. Another indicator of increased exploration activity was a marked increase in the number of notices of intent that were authorized in 2017. In 2017, 115 notices of intent were authorized, compared to 83 in 2016.

At least 90 projects were drilled in 2017, up from 56 in 2016. This was the first increase in drilling after five consecutive years of decreases, following a high of 130 drilled projects in 2011 (fig. 3). Table 5 shows the breakdown of the drill projects by size of company and drill program. Four "major" companies (Barrick, Newmont, Kinross, and KGHM) and two "mid-tier" companies (Coeur Mining Inc. and Silver Standard Resources) drilled at least 23 projects in 2017, up from 21 in 2016. The remaining 67 projects were drilled by 46 "junior" companies.[1] Figure 4 shows the location of projects across the state that were drilled in 2017. Possibly, more than the 90 projects reported here were drilled in 2017, especially small drill programs carried out by major or mid-tier companies and privately held companies. Large companies are not required to release much of their exploration results, because exploration commonly does not have a material impact on their businesses.

The main exploration target in Nevada continued to be gold. Of the 90 projects that were known to have been drilled in 2017, gold was the main target for 80 of the projects. Only 10 drill projects targeted metals other than gold. Copper exploration continued to be focused on the Yerington district in Lyon County, though the amount of drilling and money spent on exploiration was minor. The MacArthur deposit and the old Yerington open pit were drilled by Quaterra Resources Inc. with funds provided by Freeport-McMoRan Nevada LLC. Three other copper projects were drilled by junior companies, including Majuba Hill in Pershing County, Bonita in Humboldt County, and Victoria in Elko County. Coeur Mining was the only company drilling primarily for silver, focusing on higher grade mineralization east of its Rochester open pit silver deposit in Pershing County. The other silver project that was drilled was Candelaria in Mineral County. Nevada Zinc Corp. continued to drill high-grade, non-sulfide zinc mineralization on the north flank of Lone Mountain in Eureka County. A tungsten project, Pilot Mountain in Mineral County, was drilled by a junior company.

Most of the gold expenditures on exploration by the major mid-sized companies, Barrick Gold Corp., Newmont Mining Corp. Kinross Gold Corp., Coeur Mining Inc. and SSR Inc., was spent on drilling near their active mines. On its Cortez property, Barrick's exploration drilling focused on the Cortez Hills and Goldrush deposits, along with the high-grade Fourmile target north along strike from Goldrush. At Cortez Hills Barrick continued to expand the underground Deep South deposit, which is largely oxidized and remains open to the south. At the end of 2017 Barrick released its first reserve estimate for Goldrush, a probable reserve of (5,671,000 tonnes) grading (8.12 g/t) for a total of 1,481,000 ounces of gold. The best intercept at Fourmile, released by Barrick in 2017, was 47 ft (14.3

m) grading 0.92 opt (31.7 g/t) gold. Newmont spent $40 million on exploration in North America out of the $145 million it spent worldwide in 2017, according to its 2017 annual report. The vast majority of its North American expenditures were in Nevada, namely on Carlin, Twin Creeks, Phoenix, and generative exploration. Newmont continued to advance its underground projects on the Carlin trend at Exodus and Leeville. Newmont continued to drill ore-grade intercepts along a 3 mile-long (5 km) northwest-trending zone of gold mineralization from Leeville to the Pete Bajo deposit to the southeast. Kinross focused its Nevada exploration expenditures at its Bald Mountain and Round Mountain mines. At Round Mountain, it competed 33,554 feet (10,230 m) of in-fill drilling focused on Phase W in 2017. Phase W is a large mineralized zone extending westward underneath alluvial gravel from the main Round Mountain pit. The company spent $2,600,000 on exploration, largely looking for targets to the south and west of the Round Mountain deposit. At Bald Mountain, Kinross spent almost $10,000,000 on exploration, completing 319 holes totaling 171,528 feet (52,295 m). The exploration focused on near term opportunities that may have a direct impact on operational planning and growing the existing mineral resource estimates. Drilling was completed at the Redbird, Winrock, Top, Saga, Poker Flat, Duke, Rat and White Pine deposits in the North Area, and at the Luxe and Yankee deposits in the South Area. Silver Standard Resources drilled 188 holes totaling 179,790 feet (54,814 m) on its Marigold Mine property, focusing on the mineral reserve and resource growth within and adjacent to existing pits especially at the Mackay pit and the East Basalt and North Red Dot, Red Dot, and Valmy deposits.

Junior companies carried out at least 64 drill projects that targeted gold in 2017. Drill programs in 2017 that drew attention included Gold Standard Ventures Corp.'s Railroad-Pinion project in Elko county, Premier Gold Mines Ltd.'s Cove project, Corvus Gold Inc.'s Mother Lode project near Beatty in Nye County, and NuLegacy Gold Corp.'s Red Hill property, located just south of Barrick's Cortez property in Eureka County. Gold Standard Ventures had particularly good results at Pinion, Dark Star, North Dark Star, North Bullion, and its newly acquired Jasperoid Wash deposit. At Cove, Premier Gold Mines continued to drill high grade intercepts between the CSD zone below the Cove open pit and the Helen zone located west of the pit. Drilling by Corvus Gold confirmed and expanded the previously known resource at the Mother Lode deposit. NuLegacy gold drilled some of the highest grades intercepts at its Red Hills project, mainly in Serena and North zones.

Not counting operating mines, several new reserve and/or resource estimates were released by junior companies in 2017. The properties with new reserve or resource estimates included North Bullfrog (Corvus Gold Inc., gold), multiple deposits on Gold Standard Ventures Corp.'s Railroad-Pinion project, including North Bullion, Sweet Hollow, Pod, Dark Star, and Pinion deposits (gold), Gold Resource Corp.'s Isabella Pearl deposit (gold), Northern Empires's Sterling deposit (gold), Thor Mining LLC's Desert scheelite and Garnet deposits at its Pilot Mountain project (tungsten), and Prophecy Development Corp.'s Gibellini and Louie Hill projects (vanadium). Not all of the estimates included new drilling. Some simply used different modeling parameters.

Exploration activity is summarized below by county and district. Projects that were drilled in 2017 are emphasized. Production, reserves, and resources of gold and silver are updated in the sections **Major Precious-Metal Deposits**. Recent production, reserves, and resources from projects producing or targeting other metals are listed in the section **Other Metallic Deposits**.

[1] 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/or have market capitalizations less than $3 billion but more than $500 million, and 3) junior companies produce less than 50,000 ounces of gold and/or have market capitalizations less than $500 million.

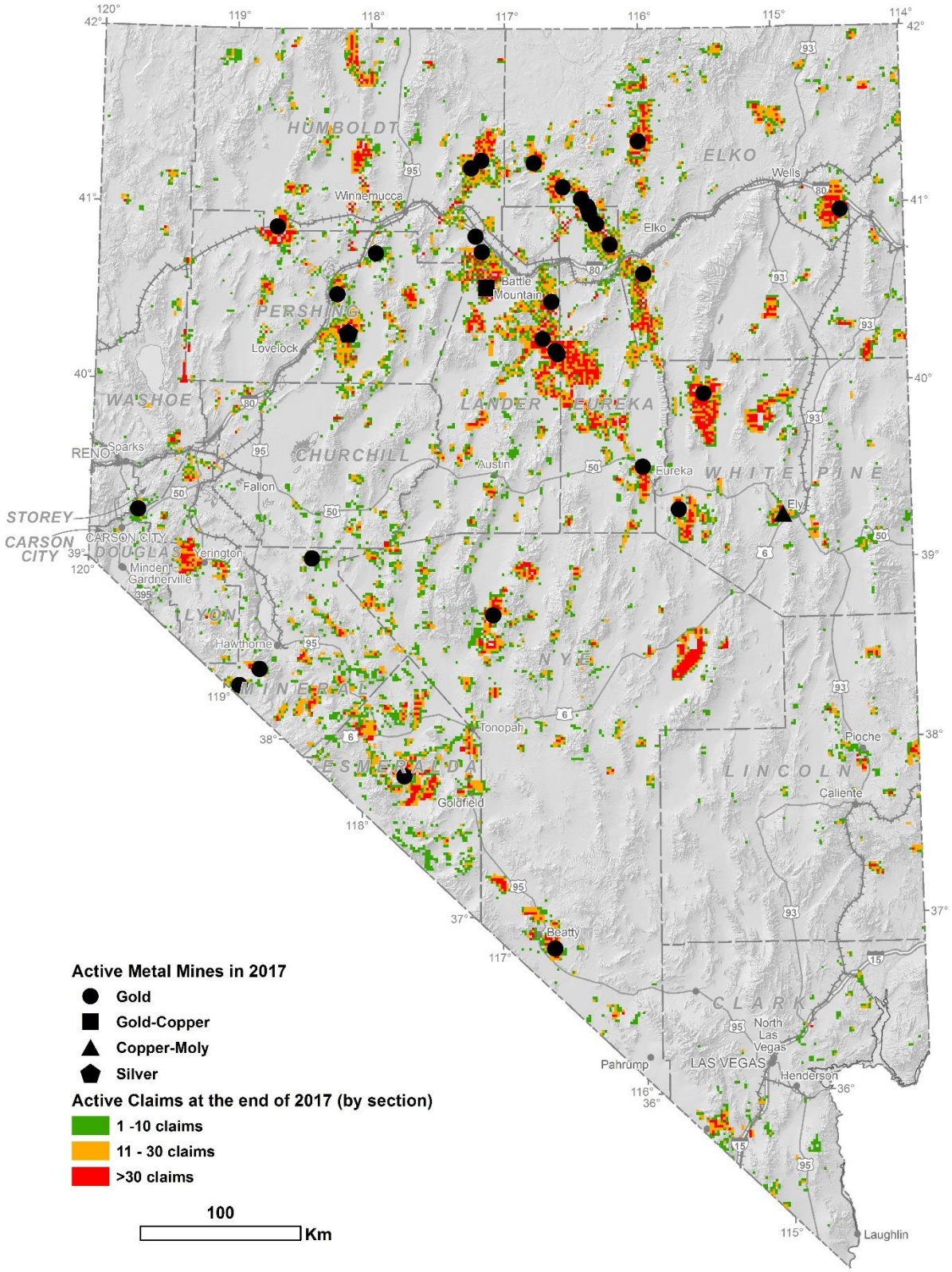


Figure 1. Map showing distribution of active mining claims by section at the end of 2017. Source of data is the U.S. Bureau of Land Management's LR2000 database.

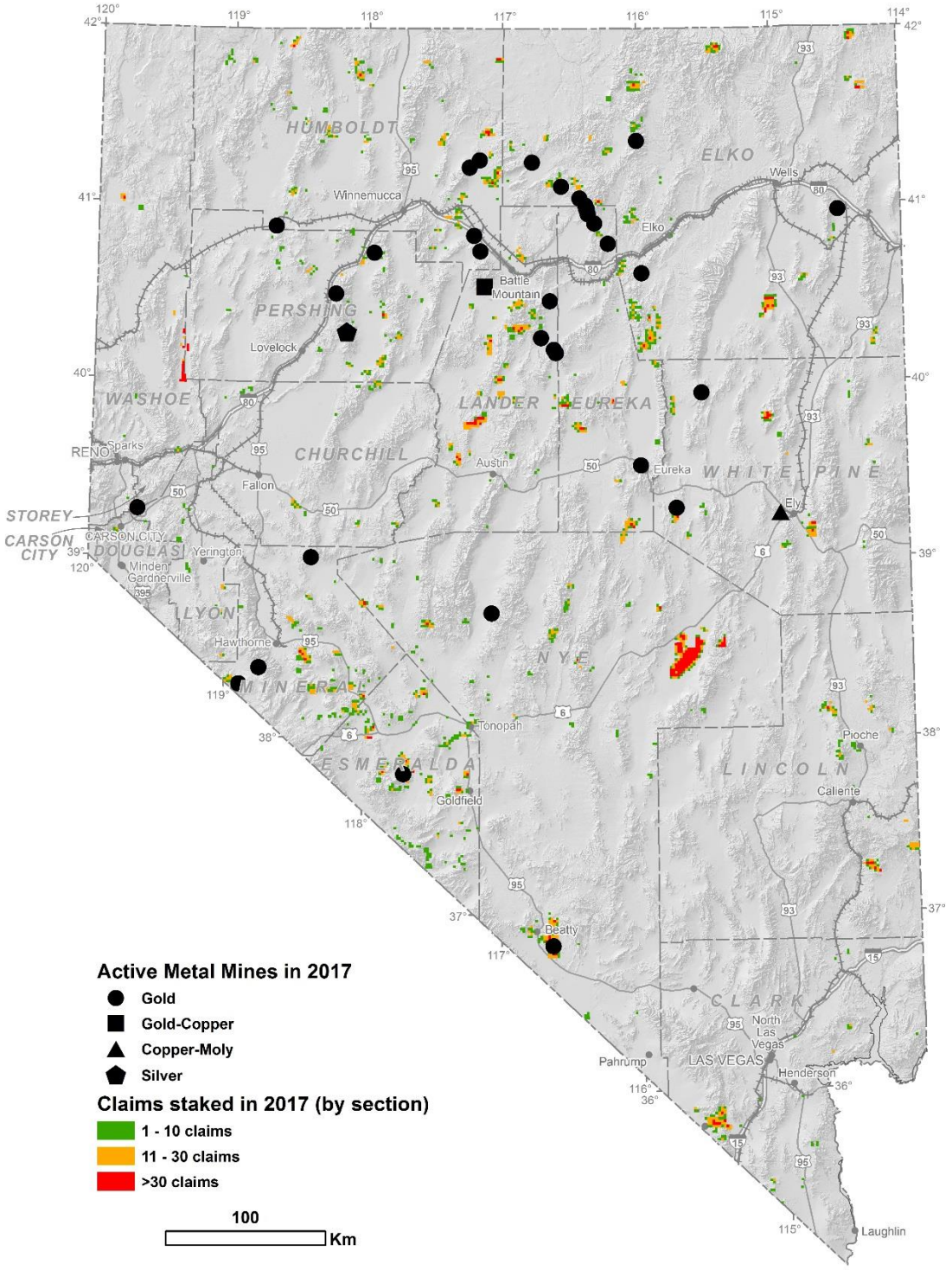


Figure 2. Map showing distribution of active mining claims by section that were staked in 2017. Source of data is the U.S. Bureau of Land Management's LR2000 database.

Table 2. 2017 Metallic Mine Production for Nevada.

Mine	Operator	Gold ounces (kg)	Silver ounces (kg)	Copper pounds (tonnes)	Molybdenum pounds (tonnes)
Carlin Trend Operations (op, ug)	Newmont Mining	971,613 (30,220)	74,594 (2,320)		
Cortez Hills OP/Pipeline (op)	Barrick Cortez	902,887 (28,083)	28,690 (892)		
Betze Post (op)	Barrick Goldstrike Mines	433,422 (13,481)	96,541 (3,003)		
Round Mountain (op)	Kinross Gold	425,324 (13,229)	868,402 (27,010)		
Twin Creeks (op, ug)	Newmont Mining	374,740 (11,656)	181,104 (5,633)		
Turquoise Ridge JV (ug)	Barrick Gold	369,000 (11,477)			
Cortez Hills UG (ug)	Barrick Cortez	336,063 (10,453)	55,284 (1,720)		
Meikle (ug)	Barrick Goldstrike Mines	332,315 (10,336)	20,632 (642)		
Bald Mountain (op)	Kinross Gold	281,597 (8,759)	82,271 (2,559)		
Marigold Mine (op)	SSR Mining	202,239 (6,290)	3,216 (100)		
Phoenix (op)	Newmont Mining	197,026 (6,128)	1,191,630 (37,064)	33,178,523 (15,050)	
Long Canyon (op)	Newmont Mining	174,462 (5,426)			
Arturo (ug)	Barrick Goldstrike Mines	142,810 (4,443)			
Jerritt Canyon (ug)	Jerritt Canyon Gold LLC	129,439 (4,026)			
Fire Creek (ug)	Klondex (ug)	107,143 (3,333)	72,283 (2,248)		
Rochester (op)	Coeur Rochester	51,051 (1,588)	4,713,574 (146,609)		
Lone Tree Complex (op, lp)	Newmont Mining	41,784 (2,233)	936 (29)		
Robinson (op)	KGHM International	37,897 (1,179)		112,633,428 (51,090)	391,658 (178)
Midas (ug)	Klondex	34,343 (1,068)	780,316 (24,271)		
Florida Canyon (op)	Florida Canyon Mining	28,157 (876)	21,128 (657)		
Mineral Ridge (op)	Mineral Ridge Gold	19,045 (592)	10,203 (317)		
Denton-Rawhide (op)	Rawhide Mining	18,379 (572)	213,481 (6,640)		
Pan (op)	GRP Pan	15,652 (487)			
Hollister (ug)	Klondex	6,751 (210)	47,305 (1,471)		
Ruby Hill (lp)	Ruby Hill Mining	4,463 (139)	4,263 (133)		
Hycroft (lp)	Hycroft Mining	1,866 (58)	6,067 (189)		
Aurora (lp)	Klondex	922 (29)	4,854 (151)		
Sunrise Placer (p)	Sunrise Minerals	546 (17)	91 (2.8)		
Borealis (lp)	Borealis Mining	300 (9.3)	508 (16)		
Sterling Mine (lp)	Northern Empire Resources/Sterling Gold Mining	265 (8.2)			
Black Rock Canyon (p)	New Gold Nevada	23 (0.7)	2 (0.06)		
Spring Valley (p)	Geo-Nevada	14 (0.4)	13 (0.4)		
2017 Totals		**5,641,538 (175,471)**	**8,477,388 (263,676)**	**145,811,951 (66,139)**	**391,658 (178)**
2016 Totals (revised)		5,467,646 (170,063)	8,946,737 (278,275)	160,218,049 (72,674)	493,010 (224)
Percentage Change		3.2%	-5.2%	-9.0%	-20.5%

Table 3. Nevada Mine Reserves (Proven and Probable) Reported for End of Year 2017.

Company	Mine	Gold ounces	Silver ounces	Copper pounds
Newmont	Carlin Operations	14,830,000		
Newmont	Phoenix	4,030,000		1,330,000,000
Newmont	Twin Creeks	3,410,000		
Newmont	Turquoise Ridge (25%)	1,980,000		
Newmont	Long Canyon	1,070,000		
Barrick	Goldstrike (OP and UG)	8,419,000		
Barrick	Cortez	10,086,000		
Barrick	Goldrush	1,481,000		
Barrick	Turquoise Ridge (75%)	5,878,000		
Barrick	South Arturo (60%)	365,000		
Coeur	Rochester	757,000	117,623,000	
Kinross	Round Mountain	2,884,000	1,371,000	
Kinross	Bald Mountain	1,698,000		
SSR	Marigold	3,000,000		
Klondex	Midas	140,000	2,475,000	
Klondex	Fire Creek	226,000	220,000	
Klondex	Hollister	110,000	624,000	
KGHM	Robinson			565,400,000
	Totals	**60,364,000**	**122,313,000**	**1,895,400,000**

* All numbers from 2017 annual reports or other regulatory financial filings

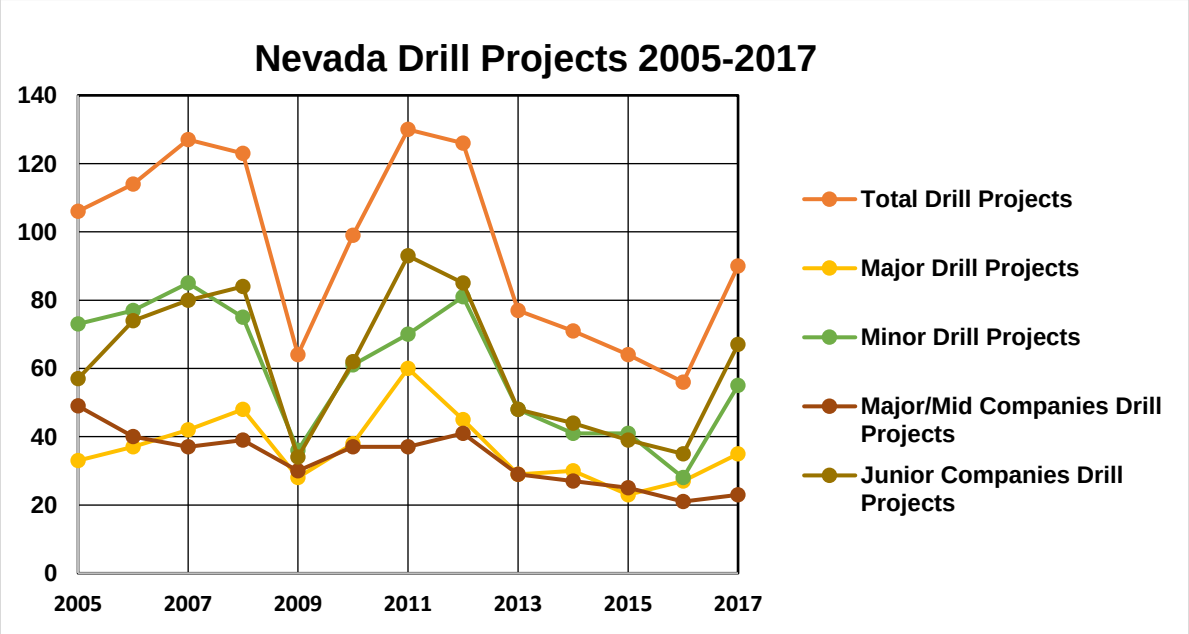


Figure 3. Number of drill projects in Nevada from 2005 to 2017.

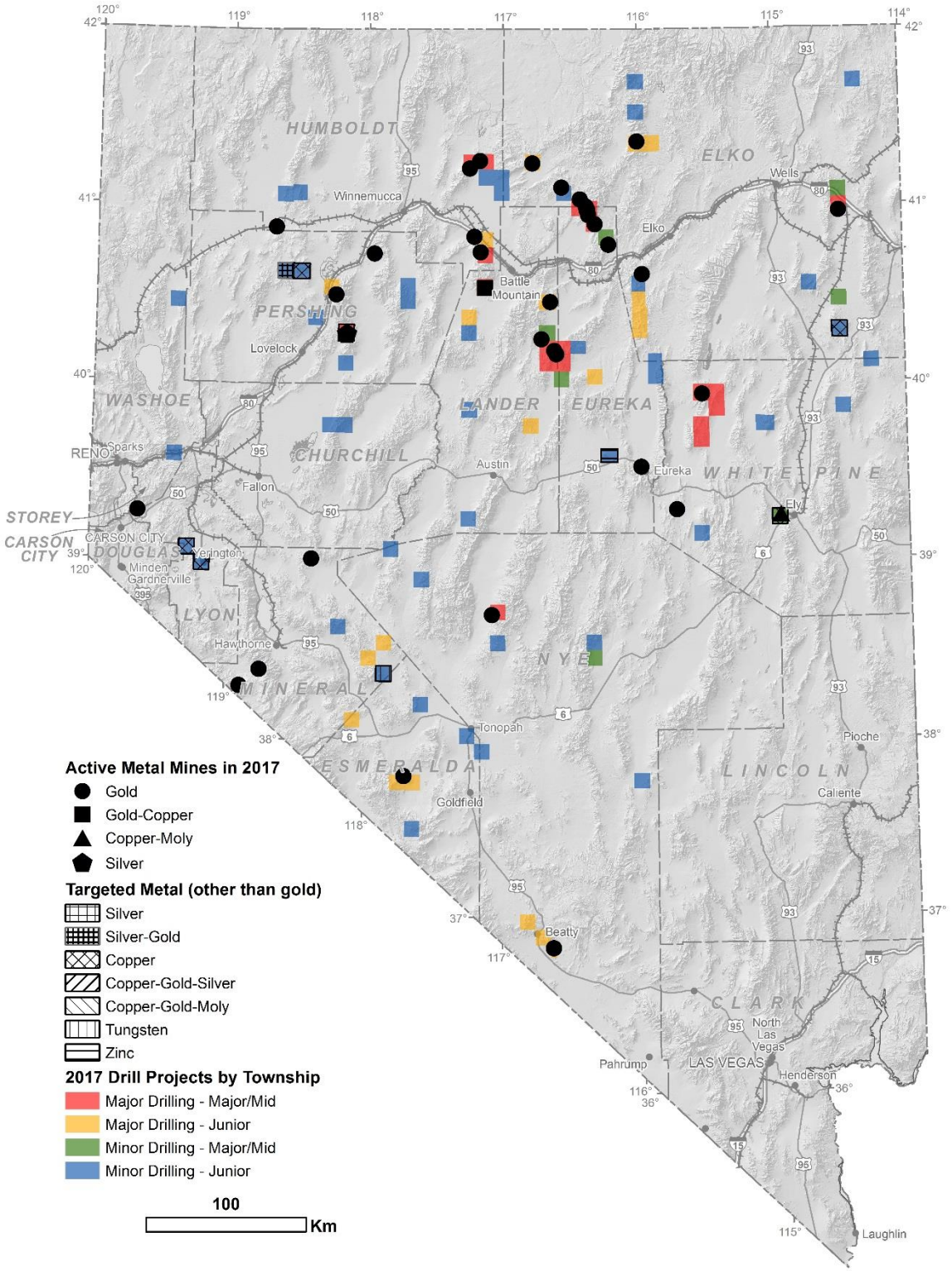


Figure 4. Map summarizing 2017 drill projects by township.

Table 4. Companies that staked the most new claims in 2017.

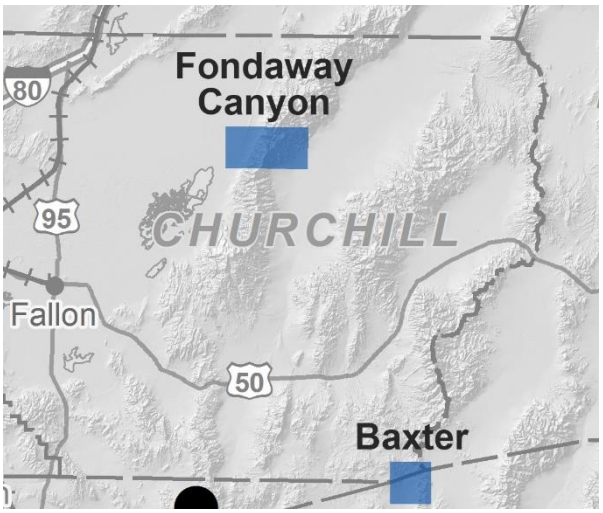
Claimant	Number of Claims	Main Areas of Staking
NEWMONT MINING CORP.	3,065	1) Ravenswood mining district, Lander County (1,027 claims) 2) Delker mining district (Butte Valley, Delcer Buttes, West Buttes), Elko County (707 claims) 3) Carico Lake area, Lander County (439 claims) 4) Reese River Valley southeast of Cove-McCoy (262 claims) 5) Delano mining district, Elko County (200 claims) 6) Pediment west of Deadline Ridge, Elko County (200 claims) 7) Hall Creek area, Toiyabe Range, Lander County, (81 claims) 8) South end of the Osgood Mountains, Humboldt County (72 claims) 9) Kelly Creek area east of Twin Creeks Mine, Humboldt County (50 claims) 10) Near Gold Quarry Mine, Eureka County (27 claims)
3PL OPERATING INC.	2,843	1) Butterfield Marsh area of Railroad Valley, Nye County – lithium (placer claims)
ROCKFORD MINING U.S. CORP.	861	1) South end of Bare Mountain mining district, Nye County
SILVER ONE RESOURCES USA INC.	763	1) Silverthorn district, Lincoln County 2) North of old Candelaria Mine, Mineral County 3) North and northwest of Viola mining district, Lincoln County
QUANTUM BIT LLC	762	1) Winnemucca Lake playa, Washoe County – lithium (placer claims) 2) Duck Flat area, Washoe County – lithium (placer claims)
BASIN & RANGE RESOURCES LLC	712	1) Near old Elder Creek Mine northwest of Gold Acres and Pipeline mines, Lander County 2) Butte Valley mining district, at south end of cherry Creek Range, White Pine County
KINROSS GOLD CORP.	613	1) Garcia Flat and Diamond Hills at north end of Diamond Mountains, Elko County 2) North end of Bottle Creek mining district, Humboldt County
BROWNSTONE VENTURES INC.	523	1) Old Elder Creek Mine to Lewis and Hilltop mining districts northwest of Gold Acres and Pipeline mines, Lander County
LITHIUM HOLDINGS NEVADA LLC	522	1) Butterfield Marsh area of Railroad Valley, Nye County – lithium (placer claims)
RENAISSANCE GOLD INC.	504	1) Beatty Wash area at north end of Bare Mountain mining district, Nye County 2) Tybo mining district, Hot Creek Range, Nye County 3) West side of Spruce Mountain, Elko County

Table 5. Breakdown of 2017 drill programs for metals in Nevada.

2017 Drill Projects	Major/Mid-Tier Companies	Junior Companies	Total
Major Drill Program	**17** (16)	**18** (12)	**35** (28)
Minor Drill Program	**6** (5)	**49** (23)	**55** (28)
Total	**23** (21)	**67** (35)	**90** (56)

For comparison, the number of drill programs in 2016 is shown in parentheses
Major programs are arbitrarily defined as >25 drill holes.

CHURCHILL COUNTY



Aspen District

Baxter. Kinross Gold Corp. completed 13 reverse holes totaling 8,029 feet (2,448 m) on five targets on the Baxter property, which it optioned from Bravada Gold Corp. The geochemistry and geology suggest low sulfidation gold and silver mineralization. Intercepts from a hole drilled in the Sinter zone included 30 feet (9.1 m) grading 0.009 opt (0.31 g/t) gold, 40 feet (12.2 m) grading 0.002 opt (0.22 g/t) gold, 5 feet (1.5 m) grading 0.07 opt (0.59 g/t) gold, and 5 feet (1.5 m) grading 0.027 opt (0.93 g/t) gold. Seven of the holes intercepted gold values above 0.03 opt (1 g/t). Significant intercepts in one hole drilled over 1,600 feet (500 m) northwest of the Sinter zone included 10 feet (3.1 m) grading 1.08 opt (3.7 g/t) gold, and 30 feet (9.14 m) grading 0.04 opt (1.38 g/t) gold. In November, Kinross Gold Corp. notified Bravada Gold Corp. that the company was dropping its option agreement to earn up to a 75 percent interest in the property. (Bravada Gold Corp., Management Discussion and Analysis, 11/28/2017, 6/28/2018; Bravada Gold Corp., news releases, 5/15/2017, 10/23/2017; Bravada Gold Corp., website, http://www.bravadagold.com; Kinross Gold Corp. website, https://www.kinross.com)

Shady Run District

Fondaway Canyon. In March, Canarc Resource Corp. acquired the Fondaway Canyon property from American Innovative Minerals, LLC, for $2,000,000. Canarc issued an NI 43-101 technical report with updated resources for 2017.

Canarc completed seven core holes totaling 8,200 feet (2,500 m). Significant intercepts included 1) 214.5 feet (65.4 m) averaging 0.083 opt (2.83 g/t) gold, including 4.6 feet (1.4 m) grading 0.3 opt (10.20 g/t) gold; 2) 32 feet (9.8 m) grading 0.22 opt (7.69 g/t) gold; 3) 206.3 feet (62.9 m) averaging 0.052 opt (1.77 g/t) gold, including 11.5 feet (3.5 m) grading 0.13 opt (4.39 g/t) gold; 4) 98.7 feet (30.1 m) grading 0.042 opt (1.45 g/t) gold; 5) 80 feet (24.4 m) averaging 0.052 opt (1.8 g/t) gold, including 3 feet grading 0.19 opt (6.35 g/t) gold; 6) 42 feet (12.8 m) averaging 0.1 opt (3.48 g/t) gold, including 20 feet (6.1 m) grading 0.17 opt (5.97 g/t), and 7) 13 feet (4 m) averaging 0.12 opt (4.19 g/t) gold, including 3 feet (0.9 m) grading 0.39 opt (13.40 g/t).

A newly developed structural model tied the mineralized zones to one main, east-west trending shear zone and related northeast-trending dilational splays covering an area 2.2 miles (3.5 km) along strike and up to 2,600 feet (800 m) wide. Late-stage, extensional quartz veins also occur within the shear zone and as isolated northeast-trending veins within the dilation zone. High-grade gold mineralization of greater than 0.09 opt (3 g/t) occurs both within multiple, steep veins along the main shear zone and within the linking structures in the dilation zone. Grades are higher at the intersection between east-west shear veins and northeast extensional veins, especially in the corners of the dilation zone. Geochemically, the gold occurs with elevated arsenic (arsenopyrite) and antimony (stibnite) levels, but with extremely low silver, copper, lead and zinc levels. The host rocks are mainly Mesozoic carbonaceous siltstones and shales that are locally calcareous, which host lower-grade disseminated mineralization where veins are lacking. A swarm of mafic dikes occurs along the trend. The mineral system appears to be transitional between shallow epithermal and deeper mesothermal vein environments. (Canarc Resource Corp. news releases, 3/21/2017, 7/31/2017, 9/7/2017, 11/15/2017, 12/5/2017, 1/16/2018; Canarc Resource Corp. Annual Information Form, 3/28/2018; Canarc Resource Corp. NI 43-101 Technical report, 4/3/2017; Canarc Resource Corp. website: https://www.canarc.net)

Table Mountain District

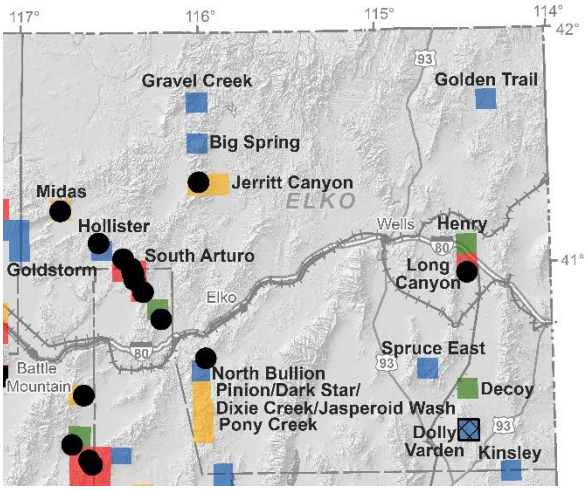
Lovelock Cobalt Mine. In November, Nevada Sunrise Gold Corp. signed a definitive agreement to acquire the Lovelock Cobalt Mine for $18,000 in cash and 200,000 shares of common stock upon signing, and another $75,000 in cash and 750,000 shares of common stock over a three-year period. Before year's end, the company conducted an initial geological sampling program and 2.6 line miles (4.2 km) of DC induced polarization/resistivity surveys. Sampling of mine dumps and outcrops was carried out. An adit sample assayed 1.81% cobalt, 3.05% nickel, 0.65% copper, 0.03% zinc, 0.93 opt (31.9 g/t) silver, and 0.003 opt (0.1 g/t) gold. Significant dump sample assays included 1)

0.41% cobalt, 0.22% nickel, 4.91% copper, 0.1% zinc, 1.4 opt (48 g/t) silver, and trace gold; 2) 0.21% cobalt, 1.64% nickel, 5.99% copper, 0.04% zinc, 2 opt (68.6 g/t) silver, and 0.015 opt (0.51 g/t) gold; and 3) 0.12% cobalt, 0.32% nickel, 1.46% copper, 0.22% zinc, 11.1 opt (380.6 g/t) silver, and 0.029 opt (1 g/t) gold.

An old shaft was sunk into Jurassic mafic volcanic rocks adjacent to Jurassic quartz arenite and gabbro. Cobalt and nickel minerals occur in stringers cutting highly altered greenstone. The minerals reported include cobaltite, tetrahedrite, erythrite (cobalt bloom), azurite, and green crusts that contain copper and nickel arsenates and sulphates. The mine operated from 1883 to 1890 to the 100-foot (30-meter) level and shipped 500 tons (450 tonnes) of concentrated cobalt and nickel mineralized material to Great Britain for processing. A British company attempted smelting on site in 1898 but the smelter equipment failed and production ceased. Cobalt is in demand as one of the components in the production of lithium batteries.

In early 2018, the company also executed an option to buy the nearby Boyer Mine property, which was mined for copper and includes 11 patented claims. In the recent past, the Boyer Mine was also part of the 2Bar project. (Nevada Sunrise Gold Corp. news releases, 11/21/2017, 12/14/2017, 12/29/2017, 1/18/2018, 3/5/2018; Nevada Sunrise Gold Corp. website, http://www.nevadasunrise.ca)

ELKO COUNTY



Bootstrap District

South Arturo. Barrick Gold Corp. produced 142,810 ounces (4,442 kg) of gold from the South Arturo Mine located at the north end of the Carlin trend, a 36% decrease from 2016. The operation is a joint venture between Barrick Gold Corp. (60%) and Premier Gold Mines, Ltd, (40%). The South Arturo Mine includes development of an open pit mine and underground mine in the vicinity of the past producing Dee open pit and Storm underground mine. Mining occurred mainly from the Phase 2 (West Button Hill) pit. Mining was completed in 2017 with enough ore stockpiled for processing into 2018. The ore was trucked to the Goldstrike processing facilities three miles (five km) to the south.

The South Arturo Mine gold-silver deposits are divided into five mineralized zones: Dee Deep North, Hinge, South Arturo, Southwest Dee pit, and West Button Hill. Most are classified as "Meikle-type" breccia-hosted Carlin-type deposits. Dee Deep North is a north-northeast trending pod of mineralization about 590 feet (180 m) long by 150 feet (45 m) wide and 150 feet (45 m) thick that plunges slightly to the north. It is mainly high-grade refractory mineralization in silica-sulfide breccia within a flat to west-dipping silicified, multi-lithic breccia body above the Silurian-Devonian Bootstrap limestone. The mineralization is manly controlled by the north-northeast-trending high angle EB fault and southwest-dipping low angle structures.

The Hinge zone is a north-south striking zone of mineralization lying between the South Arturo Mine zone to the southwest, West Button Hill zone to the northeast, and existing Dee pit to the east. It covers an area 1,400 feet (425 m) long and up to 300 feet (90 m) wide and is up to 500 feet (150 m) thick at depths between 330 feet (100 m) to 890 feet (270 m). The mineralization is hosted in the lower part of the Devonian Rodeo Creek formation and silicified breccias of the Basal Rodeo Creek and Devonian Popovich Upper Muds units. The Hinge zone mineralization is controlled by the Hinge fault, a steeply east-dipping north-south trending structure that may be a northerly extension of faults in the Bootstrap pit to the south. Much of the mineralization is partially to completely oxidized, even in the more deeply buried zones.

The northern extent of the South Arturo Mine mineralization lies approximately 200 feet (60 m) southeast of the Dee pit and under 590 feet (180 m) of waste rock. The mineralization covers an area of 1,700 feet (520 m) in a north-south direction by 330 feet to 380 feet (100 meters to 115 m) in an east-west direction. The mineralization dips 15º to 20º to the south. The rocks are oxidized to a depth of up to 2,000 feet (600 m). Paleozoic carbonate rocks host the mineralization, mainly in multi-stage, heterolithic breccias that are weakly to strongly silicified with local argillization. Gold ranges from 0.006 opt (0.2 g/t) to more than 1.02 opt (35 g/t) with an average grade of 0.058 opt (2.0 g/t). Silver to gold ratios are usually 1:1 at grades of greater than 0.066 opt (2.06 g/t) gold but increase to 5:1 at lower gold grades.

The Southwest Dee pit mineralization lies along the north-northeast-trending, west-dipping Dee fault zone.

The mineralization consists of carbonaceous, partially oxidized, variably silicified mudstone and siltstone breccia covering an area of about 330 feet (100 m) long north-south length by 100 feet (30 m) wide and 150 feet (45 m) thick.

The West Button Hill mineralization trends north-northeast for over 2,000 feet (600 m) in pods that vary up to 390 feet (120 m) wide and 50 feet (15 ms thick). Most of it is high-grade refractory mineralization hosted in the lower part of the Devonian Rodeo Creek formation and heterolithic breccias above the Silurian/Devonian Bootstrap limestone. The mineralization is mainly controlled by north-northeast and north-south-trending high-angle faults and favorable host rocks. The mineralization extends 1,230 feet (375 m) below pre-mining surface because offset along the northeast-striking Tara West fault that down drops the mineralization to the east.

Barrick Gold Corp. conducted two target delineation sampling programs and completed 124,591 feet (37,985 m) of drilling on five exploration programs. The drilling was conducted on key structural intersections controlling gold distribution to expand the gold resources at the pits and to add additional gold resources adjacent to the existing mineralization. The surface sampling tested for continuation of geochemical anomalies along faults.

Though mining ended at the Phase 2 pit, definition drilling was conducted for the potential to continue mining the pit. Upon completion of mining, drilling commenced from within the pit to further define the El Niño underground deposit located down plunge of the Phase 2 pit. More than 3,900 feet (1,200 m) of core and 9,800 feet (3,000 m) of reverse circulation drilling commenced in the Upper Zone to increase confidence in the geological model and to support additional metallurgical work. Also, more than 6,500 feet (2,000 m) of Cubex drilling was also conducted from the elevation of proposed underground portals to infill gaps in the Upper Zone, delineate potential voids, and condemn areas around planned underground development. No drilling results were released.

Drilling to support metallurgical and geotechnical test work for mining potential at Phase 1 (Dee) pit and a proposed Phase 3 pit also started in 2017. Exploration drilling was conducted at several other targets on the property, including the South Hinge structure located between the proposed Phase 2 and Phase 3 pits, and the recently identified Ardent structure. No drilling results were released. Premier Gold Mines, Ltd, was preparing an NI 43-101 technical report with reserves for release in 2018. (Barrick Gold Corp. Annual Information Form, 3/23/2018; Barrick Gold Corp. website, http://www.barrick.com; Premier Gold Mines, Ltd, NI 43-101 Technical Report, 3/26/2018; Premier Gold Mines, Ltd, Annual Information Form, 4/2/2018; Premier Gold Mines, Ltd, news releases, 6/21/2017, 7/11/2017, 10/16/2017; Premier Gold Mines, Ltd, website, http://www.premiergoldmines.com).

Carlin District

Carlin Vanadium. In December, Cornerstone Metals, Inc., commenced a 20 vertical core hole program on its Carlin Vanadium project designed to in-fill the previously drilled area defining the deposit. Three holes were completed by year's end with the rest completed by February 2018. The company had signed an option agreement with Americas Gold Exploration, Inc., and Golden Predator US Holding Corp. whereby the former acquires the Carlin Vanadium/Black Kettle project. The agreement includes paying $2,020,000 cash and issuing 2,000,000 shares of common stock in installments over a four-year period plus conducting about $800,000 in exploration and other work commitments over six years. The Carlin Vanadium project is one of the largest known primary vanadium resources in the country. The property is located on the northwestern flank of the Piñon Range about ten miles west of the Emigrant open pit mine operated by Newmont Mining Corp. (Cornerstone Metals, Inc., news releases, 9/22/2017, 11/9/2017, 12/12/2017, 12/18/2017, 2/18/2018; Cornerstone Metals, Inc., website, https://www.cornerstonemetals.ca)

Emigrant/Rain/Saddle. Newmont Mining Corp. continued to mine at its Emigrant open pit mine. The production from the Emigrant Mine is included in Newmont's production totals for the Carlin trend. The company drilled a few holes in the Rain and Saddle areas, but no details were released. The drilling program extended into 2018. The company submitted an amendment to the Rain Mine Plan of Operations for Final Closure and Alternatives. The Rain Mine ceased operations in 2004 and has been undergoing closure and reclamation activities ever since. The company conducted extensive analyses of numerous alternatives to remediate acid rock drainage from the north waste rock disposal facility. The disposal facility and heap leach pad were reclaimed; however, the final closure may require some reworking of the reclaimed areas, depending upon which alternative is chosen. The proposed amendment recommended the building of a pipeline from the disposal facility to the Emigrant Mine water treatment plant where acid drainage would be treated and used at the Emigrant Mine. (Mike Ressell, oral communication, 2018; Elko Free Press, BLM Seeks Comments for Newmont's Rain Mine Closure, 1/12/2017; Newmont Mining Corp. website, http://www.newmont.com)

Delano District

Golden Trail. Peloton Minerals, Inc., conducted a core drilling program on its Golden Trail property, which was started in late October 2016 and extended into 2017. No details were released, except several zones with anomalous values in gold, silver, arsenic, antimony, and thallium were encountered, consistent with Carlin-type mineralization. The rock types are strongly hydrothermally altered breccia, limestone, and calcareous siliciclastic sedimentary rocks. The program was designed to establish structural controls on mineralization along northwest-striking trends of mineralization and alteration. The Golden Trail vein is the largest of these zones and is over 3,900 feet (1,200 m) long with an associated alteration zone averaging 100 feet (30 m) wide. It cuts across calcsilicate hornfels, marble, and hydrothermally altered limestone central to, and contiguous with, a strong northwest-striking gravity high. Samples commonly contain gold concentrations above 20 ppb with several samples assaying above 0.25 opt (9 g/t) gold. (Peloton Minerals, Inc., Management Discussion and Analysis, 4/28/2017, 5/30/2017; Peloton Minerals, Inc., news release, 1/25/2017; Peloton Minerals, Inc., website, http://www.pelotonminerals.com)

Gold Circle District

Midas. Klondex Mines Ltd. produced 34,343 ounces (1.068 kg) of gold and 780,316 ounces (24,271 kg) of silver from its Midas Mine, a 16% increase in gold and a 42% decrease in silver from 2016. A Merrill Crow processing facility processed ore combined from both Midas and Fire Creek. The mill, which has a design capacity of 1,200 tons (1,089 tonnes) per day, processed 156,927 tons (142,363 tonnes) of ore from Midas, an 18% decrease from 2016, with average mill head grades of 0.24 opt (8.2 g/t) for gold and 6.05 opt (207 g/t) for silver, a 4% increase for gold and a 26% decrease for silver from 2016. The average recovery rates were 90.8% for gold and 81.9% for silver. The production cash cost was $1008 per gold equivalent ounce, a 3% increase from 2016. Capital expenditures were $16,300,000. On June 20, 2018, Hecla Mining Company acquired Klondex Mines Ltd. and all of its assets.

Midas is a low sulfidation epithermal gold-silver system, in the Miocene Northern Nevada Rift. Klondex completed 84 surface and underground drill holes totaling 39,705 feet (12,105 m). The drilling was conducted for exploration and production and focused on converting mineralized material to reserves, increasing mineralized material, and discovering new mineralization. The drilling included ten surface core holes totaling 10,105 feet (3,080 m) in the Trinity zone which included significant intercepts of 1.5 feet (0.5 m) grading 7.83 opt (268 g/t) gold equivalent, 6.6 foot (2 m) grading 0.65 opt (22.2 g/t) gold equivalent including 1.1 feet (0.3 m) grading 3.14 opt (107.6 g/t) gold equivalent, 3.8 feet grading 0.51 opt (17.39 g/t) gold equivalent including 1.5 feet (0.5 m) grading 1.12 opt (38.5 g/t) gold equivalent, and 1.5 feet (0.5 m) grading 1.04 opt (35.7 g/t) gold equivalent. (Klondex Mines Ltd. news release, 9/13/2017, 7/23/2018; Klondex Mines Ltd. Annual Report, 3/14/2018; Hecla Mining Co. website, http://www.hecla-mining.com)

Independence Mountains District

Big Springs. At its Big Springs property, Anova Metals Ltd. of West Perth, Australia, completed seven drill holes totaling 4,034 feet (1,230 m) at Beadles Creek followed by three holes totaling 2,017 feet (615 m) at South Sammy. The drilling at Beadles Creek tested for shallow up-dip extensions east of the high grade zone intercepted by drilling in 2016. The drilling at South Sammy tested for a southern extension of high grade ore and for additional stacked mineralized zones accessible through proposed 601 underground operations. All seven holes drilled at Beadles Creek intercepted the Beadles Creek mineralization up-dip to the east. The mineralization is hosted in the Mississippian-Pennsylvanian Schoonover sequence and remains open in all directions. Significant intercepts at Beadles Creek included 1) 30 feet (9.1 m) averaging 0.14 opt (4.7 g/t) gold ,including 15 feet (4.6 m) grading 0.24 opt (8.1 g/t) gold, 2) 30 feet (9 m) grading 0.13 opt (4.3 g/t) gold, and 3) 15 feet (4.6 m) averaging 0.12 opt (4.1 g/t) gold, including 5 feet (1.5 m) grading 0.19 opt (6.6 g/t) gold. In 2018, the company decided to divest itself of the Big Springs project to concentrate on its Australian assets. (Anova Minerals, Ltd, news release, 11/3/2017, 7/18/2018; Anova Metals, Ltd., quarterly report, 10/31/2017; Anova Metals, Ltd., half-year report, 12/31/2017; Anova Metals, Ltd., website, http://anovametals.com.au)

Jerritt Canyon. Jerritt Canyon Gold, LLC, (Sprott Mining Inc., 80%; Whitebox Asset Management, 20%) produced 129,439 ounces of gold, an 8% decrease from 2016. Most recently, ore has been produced from the Smith, SSX/Steer, Starvation Canyon, and Saval underground mines with SSX/Steer being the main producer. Sprott has not reported drilling results since acquiring the property in 2015. Goldspot Discoveries Inc. was hired by Sprott to assess the company's large amount of data in order to assist with continued exploration. Goldspot Discoveries used artificial intelligence to consolidate over 30 years of historical remote sensing, mining, and exploration data into one high quality comprehensive and functional three-dimensional geologic model of the district. This

geological model was used to identify correlations in the data layers of existing and historically mined deposits. From this a proof-of-concept 16,000-foot (5,000-meter) drill program was developed with the first 3,300 feet (1,000 m) of drilling to commence as soon "as logistically possible." (Globe Newswire, ThreeD Capital Announces Its Artificial Intelligence Investment, Goldspot Discoveries, Reports Major Milestone At Sprott Mining Majority Owned Jerritt Canyon Project, 9/6/2017; Elko Daily Free Press Mining Quarterly, Spring 2016; Jerritt Canyon Gold website, http://www.jerrittcanyon.com)

Ivanhoe District

Hollister. Klondex Mines, Ltd., resumed production at the Hollister Mine in 2017 with an output of 6,751 oz (210 kg) of gold and 47,305 oz (1,471 kg) of silver. Production last occurred from stockpiles in 2014. Production was from the Gloria vein, which is the western extension of the deposit. The ore was mined and stockpiled and later sent for processing at the mill at its Midas Mine. The mine produced 66,543 tons (60,367 tonnes) of ore with average mill head grades of 0.33 opt (11.3 g/t) for gold and 2.95 opt (101 g/t) for silver. The average recovery rates were 71% for gold and 55.5% for silver. The production cash cost was $2,386 per gold equivalent ounce. Capital expenditures for development and projects for the year were $6,700,000 and $10,600,000, respectively. The company issued a revised and restated NI 43-101 technical report with updated underground reserves. The property consisted of 1,005 unpatented lode claims and 11 unpatented mill sites covering 18,000 acres (7,285 hectares). On June 20, 2018, Hecla Mining Company acquired Klondex Mines Ltd. and all of its assets.

Klondex Mines, Ltd., completed 65 surface and underground holes totaling 46,375 feet (14,139 m) at Hollister. The drilling supported exploration and production and was focused on converting mineralized material to reserves, expanding the resource, and discovering new mineralization largely on the Hollister Main and Gloria zones. The program included ten core holes totaling 26,714.5 feet (8,142.6 m) in the Hatter Graben about 3,000 feet (915 m) east of the Hollister Main zone. Significant intercepts from the Hatter Graben included: 1.2 feet (0.4 m) grading 4.12 opt (141 g/t) gold equivalent; 1.1 feet (0.3 m) grading 2.63 opt (90.1 g/t) gold equivalent; 2.4 feet (0.7 m) grading 0.89 opt (30.5 g/t) gold equivalent; 2.9 feet (0.9 m) grading 0.79 opt (27 g/t) gold equivalent; and 6.5 feet (2 m) grading 0.74 opt (24.4 g/t) gold equivalent including 2.9 feet (0.9 m) grading 1.25 opt (42.9 g/t) gold equivalent. (Klondex Mines Ltd. news releases, 7/13/2017, 11/20/2017, 1/18/2018, 7/23/2018; Klondex Mines Ltd. 10-K Report, 3/14/2018; Klondex Mines Ltd. Management Discussion and Analysis, 8/9/2017; Klondex Mines Ltd. NI 43-101 Technical Report, 8/8/2017; Hecla Mining Co. website, http://www.hecla-mining.com)

Kinsley District

Kinsley Mountain. Liberty Gold Corp., (named changed from Pilot Gold, Inc. in May 2017) completed five reverse circulation drill holes totaling about 4,254 feet (1,297 m) on the Western Flank East Extension Target at its Kinsley Mountain project (Liberty Gold Corp., 79%; Nevada Sunrise Gold Corp., 21%). Four holes tested the eastern extension of the Western Flank gold deposit, and one hole tested a geochemical anomaly in the southeastern part of the project area on the eastern flank of the Kinsley Range. The mineralization is contained in the Cambrian Secret Canyon Shale zone (lower host) and the overlying Cambrian Dunderberg Shale zone (upper host). Significant intercepts from the Western Flank East Extension included 1) 95 feet (29 m) averaging 0.15 opt (5.3 g/t) gold, including 55 feet (16.8 m) grading 0.23 opt (7.8 g/t) gold in the Secret Canyon Shale, 2) 15 feet (4.6 m) averaging 0.36 opt (12.4 g/t) gold, including 5 feet (1.5 m) grading 1.02 opt (35.1 g/t) gold in the Dunderberg Shale, and 3) 25 feet (7.6 m) averaging 0.2 opt (6.8 g/t) gold, including 10 feet (3 m) grading 0.37 opt (12.8 g/t) in the Dunderberg Shale. The mineralization of the Western Flank deposit remains open in all directions. The hole that tested the geochemical anomaly on the southeastern flank did not encounter any significant intercepts. (Liberty Gold Corp., Annual Information Form, 3/27/2018; Liberty Gold Corp. news releases 7/13/2017; Liberty Gold Corp, website, https://libertygold.ca; Nevada Sunrise Gold Corp. news releases, 4/12/2017, 7/13/2017; Nevada Sunrise Gold Corp. website, http://www.nevadasunrise.ca)

Pequop District

Long Canyon. Newmont Mining Co. produced 174,462 ounces (5,426 kg) of gold from its Long Canyon Mine. The cost applicable to sales was $338 per ounce. Newmont spent $23,000,000 on "Advanced Projects, Research and Development and Exploration" and Capital Expenditures were $10,000,000 on capital expenditures. Over 4,400,000 tons (4,000,000 tonnes) of ore was placed on the leach pad from November 2016 through 2017. The pad will be expanded in 2018.

Two drill rigs focused on in-fill drilling for Phase 2 of mining and two rigs focused on exploration drilling. Phase 2 will involve expanding and deepening the open pit, going underground, and adding an oxide mill. The ore is all oxide, so there will be no acid generation or the need for complex milling or autoclaving. Exploration

drilling extended mineralization to 3 miles (5 km) along a north-northeast-trending strike, and mineralization is still open in all directions. Drilling encountered significant intercepts down-plunge and southeast of the known reserves. Intercepts down plunge to the northeast of the ore body included 127 feet (38.6m) grading 0.38 opt (11.9 g/t), and intercepts to the southeast included 134.5 feet (41 m) grading 0.36 opt (11.2 g/t). (Streetwise Reports, 9/28/2017; Elko Free Press, 1/19/2018, 7/22/2018; Elko Free Press Mining Quarterly, Spring 2018; Newmont Mining Corp. Investor Presentation, 9/2018; Newmont Mining Corp. Management Information Circular 3/3/2017; Newmont Mining Corp. Audited Annual Financial Statements, 2/22/2018; Newmont Mining Corp. Form 10-K, 2/22/2018; Newmont Mining Corp. website, http://www.newmont.com).

Railroad District

North Bullion. Gold Standard Ventures Corp. conducted a $15,500,000 drilling program on its large Railroad-Pinion property. Drilling was done at North Bullion, Dark Star, Dixie Creek, Jasperoid Wash, and Pinion. The company completed eight reverse circulation/core combination scout drill holes totaling 15,504 feet (4,727 m) north and west-northwest of the North Bullion deposit. The drilling tested for extensions of the Lower Breccia Gold zone. Holes were reverse-circulation drilled to just above the targets and then core tails were drilled to test the targets.

Hole 17-06 intercepted 137 feet (41.7 m) grading 0.56 opt (1.9 g/t) gold including 25 feet (7.6 m) grading 0.18 opt (6.3 g/t) gold. The intercept was mixed oxide and sulfide mineralization hosted in decalcified and variably silicified heterolithic collapse breccia and underlying dolomitic breccia. The breccia is developed at the top of the Devonian Devils Gate Limestone, which also hosts the North Bullion lower gold zone mineralization. Hole 17-06 is 1,230 feet (375 m) west-northwest of the closest previously drilled mineralized drill and 3,700 feet (1,125 m) west-northwest of North Bullion. Other significant intercepts included 1) 4 feet (1.2 m) grading 0.063 opt (2.16 g/t) gold, 2) 8 feet (2.4 m) grading 0.018 opt (0.62 g/t) gold, and 3) 10 feet (3.1 m) grading 0.018 opt (0.6 g/t) gold.

The company issued two NI 43-101 technical reports with oxide and sulfide resources for combined North Bullion, Sweet Hollow, and POD deposits. (Gold Standard Ventures Corp. NI 43-101 Technical Reports, 11/3/2017, 2/16/2018; Gold Standard Ventures Corp. news releases, 2/2/2017, 5/9/2017, 11/15/2017; Gold Standard Ventures Corp. Annual Information Form, 3/29/2018; Gold Standard Ventures website, https://goldstandardv.com)

Robinson Mountain District

Dark Star/North Dark Star. Gold Standard Ventures Corp. completed 47 core and reverse circulation holes totaling 50,263 feet (15,324 m) on its Dark Star deposit, which is part of its greater Railroad-Pinion project. The drilling covered the Dark Star Main and North zones and the Dark Star corridor. The results of the 2016 drilling program showed that Main Dark Star and North Dark Star were connected and formed one deposit with a 4,260-foot (1,300-meter) strike now just called Dark Star. The 2017 drilling program was designed to expand areas of known shallow oxide gold mineralization to the north, west and south and to begin infilling the deposit. Significant intercepts at Dark Star included 12 feet (3.6 m) grading 0.099 opt (3.39 g/t) gold; 2.6 feet (0.8 m) grading 0.068 opt (2.34 g/t) gold; 85 feet (25.9 m) grading 0.044 opt (1.51 g/t) gold including 30 feet (9.1 m) grading 0.084 opt (2.89 g/t) gold; 156 feet (47.6 m) grading 0.02 opt (0.67 g/t) gold including 10 feet (3.1 m) grading 0.089 opt (3.04 g/t) gold; 70 feet (21.3 m) grading 0.029 opt (1.01 g/t) gold including 10 feet (3.1 m) grading 0.072 opt (2.48 g/t) gold and 10 feet (3.1 m) grading 0.083 opt (2.85 g/t) gold; and 446 feet (136 m) grading 0.078 opt (2.67 g/t) gold including 51 feet (15.7 m) grading 0.088 opt (3.02 g/t) gold and 72 feet (22.1 m) grading 0.2 opt (6.89 g/t) gold.

The results confirmed the grade of the existing resource model and expanded the gold zone 148 feet (45 m) deeper and 460 feet (140 m) to the east and 230 feet (70 m) to the west beyond the resource model. The mineralization appeared to be open to the west. The results also confirmed the lateral continuity of a greater than 0.058 opt (2 g/t) gold zone in the immediate hanging wall of the Ridgeline fault. The company issued an NI 43-101 technical report with updated resources.

Dark Star is hosted in Pennsylvanian siliciclastic and carbonate rocks of the Tomera and Moleen Formations and occurs in a linear, north-northeast-striking horst block in the footwall of two major faults that bound the east and west flanks of the deposit. Dark Star lies along the Dark Star corridor, which consists of a five-mile (8-km) long system of prominent north-south to northeast-trending folds; steep en echelon normal faults; and extensive hydrothermal alteration. (Gold Standard Ventures Corp. news releases, 1/19/2017, 2/2/2017, 5/9/2017, 6/29/2017, 10/5/2017, 11/7/2017; Gold Standard Ventures Corp. Annual Information Form, 3/29/2017; Gold Standard Ventures Corp. NI 43-101 Technical Report, 8/11/2017; Gold Standard Ventures website, https://goldstandardv.com).

Dixie Creek. Gold Standard Ventures Corp. completed one core and five reverse circulation holes totaling 8,231 feet (2,509 m) on its Dixie Creek deposit about 2.2 miles (3.5 km) south of the Dark Star deposit. Significant

intercepts included 1) 85 feet (25.9 m) averaging 0.022 opt (0.76 g/t) gold, including 16 feet (4.9 m) grading 0.039 opt (1.32 g/t) gold and 2) 150 feet (45.7 m) grading 0.022 opt (0.75 g/t) gold, including 25 feet (7.6 m) grading 0.039 opt (1.32 g/t) gold. The mineralization is in altered Pennsylvanian-Permian calc-arenite and debris flow conglomerate and lies within the Dark Star corridor. (Gold Standard Ventures Corp. news releases 10/5/2017; Gold Standard Ventures Corp. Annual Information Form, 3/29/2017; Gold Standard Ventures website, https://goldstandardv.com)

Jasperoid Wash. In March of 2017, Gold Standard Ventures Corp. acquired 20,941 acres (8,475 hectares) adjacent to the south boundary of its Railroad-Pinion project. The acquisition included the Jasperoid Wash deposit about 4 miles (6 km) south of the Pinion deposit. The acquisition involved lease agreements with private mineral interest owners and the staking of new claims. The company completed one core to 1,303 feet (397 m) and 11 reverse circulation holes on the Jasperoid Wash deposit. Significant intercepts from the core hole included 1) 340 feet (54.9 m) averaging 0.016 opt (0.56 g/t) gold, including 25 feet (7.6 m) grading 0.039 opt (1.32 g/t) gold and 2) 100 feet (30.5 m) grading 0.027 opt (0.93 g/t) gold. Significant intercepts from the reverse circulation holes included 1) 180 feet (103.7 m) averaging 0.026 opt (0.89 g/t) gold, including 30 feet (9.1 m) grading 0.037 opt (1.25 g/t) gold and 2) 40 feet (12.2 m) grading 0.048 opt (1.66 g/t) gold. The mineralization is in a pervasively oxidized Pennsylvanian-Permian debris flow conglomerate. (Gold Standard Ventures Corp. news releases, 3/23/2017, 5/9/2017, 10/5/2017, 1/11/2018; Gold Standard Ventures Corp. Annual Information Form, 3/29/2017; Gold Standard Ventures website, https://goldstandardv.com)

Pinion. Gold Standard Ventures Corp. completed three core and 16 reverse circulation holes totaling 7,665 feet (2,337 m) on its Pinion deposit, which is part of its greater Railroad-Pinion project. The gold mineralization at Pinion is very continuous and widespread within a highly permeable, silicified, and oxidized collapse breccia. The breccia is sandwiched between relatively impermeable silty micrite of the overlying Mississippian Tripon Pass formation and thickly-bedded calc-arenite of the underlying Devonian Devils Gate Formation. The drilling was designed to upgrade and add to the resources and to expand drill coverage near the margins of the current pit design.

Four reverse circulation holes were drilled into the Pinion North zone, three reverse circulation holes were drilled into the new Sentinel deposit, and the rest were drilled into the Pinion Main zone. Significant intercepts from Pinion North zone included 1) 185 feet (56.4 m) averaging 0.049 opt (1.68 g/t) gold, including 125 feet (38.1 m) grading 0.068 opt (2.32 g/t) gold; 2) 50 feet (15.2 m) averaging 0.048 opt (1.66 g/t) gold, including 35 feet (10.6 m) grading 0.063 opt (2.17 g/t) gold; and 3) 75 feet (22.8 m) grading 0.023 opt (0.8 g/t) gold. Significant intercepts from Pinion Main zone included 1) 40 feet (12.2 m) averaging 0.048 opt (1.66 g/t) gold; 2) 140 feet (42.7 m) averaging 0.036 opt (1.23 g/t) gold, including 75 feet (22.8 m) grading 0.056 opt (1.92 g/t) gold; 3) 50 feet (15.2 m) averaging 0.048 opt (1.66 g/t) gold, including 35 feet (10.6 m) grading 0.063 opt (2.17 g/t) gold; and 4) 65 feet (19.8 m) averaging 0.022 opt (0.75 g/t) gold, including 15 feet (4.6 m) grading 0.062 opt (2.13 g/t) gold. The Sentinel results had not been released by year's end. (Gold Standard Ventures Corp. news releases, 2/2/2017, 2/9/2017, 11/21/2017; Gold Standard Ventures Corp. Annual Information Form, 3/29/2017; Gold Standard Ventures Corp. NI 43-101 Technical Report, 3/30/2017; Gold Standard Ventures website, https://goldstandardv.com)

Pony Creek. Contact Gold Corp. was formed through the merger of Winwell Venture Inc. and Carlin Opportunities, Inc. in June 2017. In the second half of 2017, the Contact Gold Corp. completed 42 reverse circulation and core holes totaling 34,079 feet (10,390 m) at Pony Creek and Pony Creek North. The drilling was concentrated on the historical Pony Creek resource area, known as the Bowl zone, and to test mineralization at Pony Creek North, also known as the North zone, about 2 miles (3 km) north of the Bowl zone.

Thirty-one holes totaling 25,938 feet (7,908 m) were completed in the Bowl zone. Significant intercepts included 1) 150 feet (45.7 m) averaging 0.82 opt (2.82 g/t) gold, including 70 feet (21.3 m) grading 0.16 opt (5.45 g/t) gold and 20 feet (6.1 m) grading 0.31 opt (10.53 g/t) gold; 2) 260 feet (79.3 m) averaging 0.023 opt (0.78 g/t) gold, including 50 feet (15.2 m) grading 0.037 opt (1.26 g/t) gold; 3) 30 feet (9.1 m) grading 0.05 opt (1.72 g/t) gold; 4) 15 feet (4.57 m) 0.051 opt (1.76 g/t) gold; 5) 143 feet (43.7 m) averaging 0.04 opt (1.36 g/t) gold, including 51 feet (15.5 m) grading 0.098 opt (3.35 g/t) gold; and 6) 65 feet (19.8 m) avergaing 0.024 opt (0.82 g/t) gold, including 15 feet (4.6 m) grading 0.061 opt (2.1 g/t) gold. The results of 15 holes were still pending in early 2018. The drilling validated the historical resource area in the Bowl zone and extended the mineralization along strike and down dip. So far, the mineralization is open in all directions and at depth. It is mainly hosted in clastic rocks of the Pennsylvanian Moleen Formation. Alteration is characterized by decarbonatization and silicification.

Eleven holes totaling 8,141 feet (2,482 m) were completed in the North zone. Significant intercepts included 1) 15 feet (4.57 m) grading 0.021 opt (0.72 g/t) gold; 2) 145 feet (44.2 m) grading 0.0099 opt (0.34 g/t)

gold; and 3) 50 feet (15.24 m) grading 0.0096 opt (0.33 g/t) gold. Drilling showed the North zone contains a considerable thicknesses of near-surface, oxidized gold mineralization covering an area 0.6 miles (1 km) along strike by 650 feet (200 m) wide, that is open in most directions.

Before their merger, Winwell Venture Inc. and Carlin Opportunities Inc. issued an NI 43-101 technical report describing the Pony Creek project with historical but no new resource estimates. (Winwell Venture, Inc., and Carlin Opportunities, Inc., NI 43-101 Technical Report, 4/18/2017; Contact Gold Corp. news releases, 5/2/2017, 6/7/2017, 7/20/2017, 10/4/2017, 11/2/2017, 1/16/2018; Contact Gold Corp. website, http://www.contactgold.com)

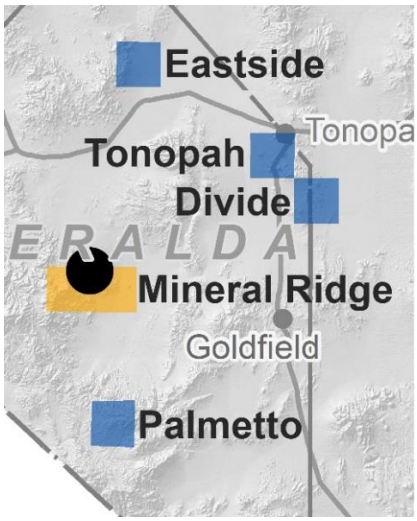
Snowstorm Mountains District

Goldstorm. In December, Stakeholder Gold Corp. commenced a three core hole drilling program on the Goldstorm project. The holes were completed in early 2018. The drilling tested the Clayton and Prochnau zones for Midas-style, epithermal, low sulfidation gold-silver mineralization. The rocks underlying the property consist of basalt, rhyolite, and rhyodacite flows and intrusive dikes with locally interbedded sedimentary rocks. Most of the altered area consists of silicic pyroclastic and tuffaceous sedimentary rocks. The gold and silver mineralization is present mainly in silicified vein-like zones and in white quartz veins, carrying up to 1.14 opt (39 g/t) gold at the surface. These zones and veins are all high angle and strike variably between east-west to north-northwest. The mineralization is typically hosted in quartz-sericite-pyrite alteration, which is widespread on much of the surface, and also within silicified veins. Stakeholder Gold Corp. signed an option agreement with Mountain View Gold Corp. whereby the former can earn up to a 100% interest in the property through required exploration work and issuance of common stock over time. The company issued an NI 43-101 technical report giving an overview of the property but contained no resource estimate. (Stakeholder Gold Corp. news release, 3/8/2017, 5/9/2017, 9/14/2017, 11/7/2017, 12/5/2017, 1/16/2018; Stakeholder Gold Corp. NI 43-101 Technical Report, 4/30/2017; Stakeholder Gold Corp., Management Discussion and Analysis, 3/12/2018; Stakeholder Gold Corp., website, http://stakeholdergold.com).

Spruce Mountain District

Spruce East. Renaissance Gold Corp. completed five reverse circulation holes totaling 3,985 feet (1,215 m) on the Cicada and the Scorpion zones on the company's Spruce East project in T31N, R64E. Two holes tested the Scorpion fault zone and cut quartz and calcite vein swarms but returned no significant gold mineralization. Three holes tested the Cicada fault zone, and significant intercepts included 30 feet (9 m) grading 0.009 opt (0.31 g/t) gold (the hole ended in 0.015 opt (0.52 g/t) gold); 10 feet (3 m) grading 0.018 opt (0.61 g/t) gold; and 10 feet (3 m) grading 0.022 opt (0.76 g/t) gold. The gold in one hole is associated with a 100-foot (30-m) thick zone of anomalous geochemistry, which averages 0.19 ppm gold and 0.9 ppm silver, 668 ppm arsenic, 0.4 ppm mercury, 56 ppm antimony, and 3.6 ppm thallium. This geochemical signature coupled with the low base metal values in all holes suggests a Carlin-like geochemical cell on the project which remains open and minimally tested. In May, Kinross Gold, U.S.A., Inc., signed an exploration agreement with Renaissance Gold Corp. to acquire a 70% interest over a 10-year period in the Buffalo Canyon, Diamond Point, and Spruce East projects. As part of the agreement for the first year, Kinross Gold, U.S.A., Inc., advanced Renaissance Gold Corp. $500,000 to conduct exploration on all three projects. (Renaissance Gold Corp. news release, 1/11/2017, 2/20/2017, 5/15/2017, 10/26/2017; Renaissance Gold Corp., Management Discussion and Analysis, 10/25/2017; Renaissance Gold Corp., website, http://www.rengold.com).

ESMERALDA COUNTY



Divide District

Hill of Gold. West Kirkland Mining, Inc., completed one hole on the Hill of Gold Property about 2.3 miles (3.7 km) north-northeast of the Hasbrouck Mountain deposit. The hole intercepted 240 feet (103.6 m) grading 0.15 opt (0.5 g/t) gold and 0.23 opt (8 g/t) silver. The property was being explored for a possible source of ore for the Three Hills heap leach facility, and the drill results expanded the known gold zone. (West Kirkland

Mining, Inc., Management Discussion and Analysis, 4/26/2018, 5/29/2018; West Kirkland Mining, Inc., news releases 1/3/2017, 1/12/2017, 3/16/2017; West Kirkland Mining, Inc., website, http://www.wkmining.com)

Gilbert District

Eastside/Castle. In March, Columbus Gold Corp., completed 10 holes totaling 9,539 feet (2,938 m) at its Eastside project. Most of the drilling centered on an outcrop yielding surface samples of up to 0.32 opt (1.08 g/t) gold in the Target 5 zone. All holes encountered zones of anomalous gold mineralization exceeding 115 feet (35 m) thick. The results were mostly low-grade. Intercepts included 1) 80 feet (24.4 m) grading 0.009 opt (0.30 g/t), 2) 15 feet (4.6 m) grading 0.015 opt (0.50 g/t) gold, 3) 80 feet (24.4 m) grading 0.008 opt (0.26 g/t) gold, and 4) 35 feet (10.7 m) grading 0.013 opt (0.43 g/t) gold. Silver mineralization was present within the gold intercepts in several holes with better intercepts including 15 feet (4.5 m) grading 0.58 opt (19.7 g/t) silver, 25 feet (7.6 m) grading 0.45 opt (15.4 g/t) silver, and 35 feet (10.7 m) grading 0.29 opt (9.9 g/t) silver.

Target 5 is about five miles (8 km) south of the Original zone at Eastside and about half way between it and the Castle zone and Boss Mine to the south. The drilling results suggest that Target 5 is a large system with mineralization open in all directions and below the depth of the initial drilling. Gold mineralization and supergene oxidation extends from the surface to nearly 1,000 feet (300 m) in depth. Mineralizaiton and alteration is characterized by quartz veins and stockwork within zones of adularia and illite alteration.

In November of 2017, Columbus Gold Corp. spun off its U.S. assets into a new company called Allegiant Gold, Ltd. In December, Allegiant Gold, Ltd., commenced a drilling program which focused on expansion of the Original zone, inside the pit to the west and to the south, where little to no drilling has previously taken place. (Columbus Gold Corp., news releases, 1/20/2017, 2/22/2017, 3/7/2017, 7/21/2017; Columbus Gold Corp., NI 43-101 Technical Report, 9/1/2017; Allegiant Gold, Ltd., news releases, 11/7/2017, 11/28/2017, 12/4/2017, 12/5/2017; Allegiant Gold, Ltd., website, http://www.allegiantgold.com).

Palmetto District

Palmetto. ML Gold Corp. completed 13 reverse circulation holes totaling 10,303 feet (3,141 m) and three core holes totaling 2,908 feet (887 m) on its Palmetto project. Intercepts included 1) 100 feet (30.5 m) averaging 0.02 opt (0.7 g/t) gold and 0.15 opt (5.21 g/t) silver, including 70 feet (21.3 m) grading 0.027 opt (0.93 g/t) gold and 0.21 opt (7.06 g/t) silver and 25 feet (7.6 m) grading 0.066 opt (2.26 g/t) gold and 0.43 opt (14.7 g/t) silver; and 3) 140 feet (42.7 m) averaging 0.009 opt (0.3 g/t) gold and 0.23 opt (7.88 g/t) silver, including 65 feet (19.8 m) grading 0.013 opt (0.45 g/t) gold and 0.42 opt (14.64 g/t) silver and 10 feet (3 m) grading 0.037 opt (1.26 g/t) gold and 0.17 opt (5.88 g/t) silver.

The Palmetto project is characterized quartz veins, stockworks, and breccias. It consists of two main zones —the Discovery and the Northwest. The bedrock exposures is largely obscured by a layer of alluvium with the geology being largely interpreted from drill hole data. The 2017 drilling in the Northwest zone indicated a thick consistently mineralized horizon which remains open to the east and west and stepped out the mineralization an additional 160 feet (50 m) from the company's previously reported holes. This gold mineralization is disseminated within the sedimentary rocks and is likely related to a high grade feeder/breccia zone. Drilling in the Discovery zone ended in high grade gold mineralization in one hole at its total depth of 777 feet (237 m) indicating the zone is open at depth. The drilling also confirmed consistent gold mineralization surrounding the intense breccia and stockwork zones that form the higher grade cores of mineralization. Mineralization in the Northwest and Discovery zones remains open along strike, west and east, and at depth. Placer gold is also present. (ML Gold Corp. news releases, 5/18/2017, 6/1/2017, 6/15/2017, 6/27/2017, 6/29/2017, 10/2/2017; ML Gold Corp. Management Discussion and Analysis, 12/20/2017; ML Gold Corp. NI 43-101 Technical Report, 4/26/2018; ML Gold Corp. website, http://www.mlgoldcorp.com).

Silver Peak District

Mineral Ridge. Mineral Ridge Gold LLC, a subsidiary of Scorpio Gold Corp., produced 19,045 ounces (8,907 kg) of gold and 10,203 ounces of silver, decreases of 48% and 40% respectively from 2016, from its Mineral Ridge Mine (Scorpio Gold Corp. 70%; Elevon, LLC, an affiliate of Waterton Global Value L.P., 30%). The drop in production was due to the decreasing size of the pits, particularly the Mary LC and Brodie pits; slower production rates; and mining being temporarily shut down in early November to better evaluate the remaining resources. The total amount of material mined was 3,433,000 tons (3,114,397 tonnes) of which 435,263 tons (394,868 tonnes) was ore. 439,705 tons (398,898 tonnes) of ore were processed with a head grade of 0.046 opt (1.57 g/t) gold at a cash cost of $1,026 per ounce, a 16% increase from 2016. The recovery rates were 89.4% for gold and 59% for silver. Production came from the Mary LC pit, Bluelite South, Brodie SE, and Brodie North pits. The Mary LC pit accounted for 79.8% of the ore.

The company completed 14 reverse circulation holes totaling 6,450 feet (1,966 m) as infill drilling in the Drinkwater pit. The company also completed 40 sonic holes, mainly on the leach pad, totaling 3,976 feet (1,212 m). Six of the sonic holes totaling 305 feet (93 m) were completed in conjunction with geologic mapping and trenching at the Eagle Canyon target down dip and east of the Drinkwater and Mary pits. Eagle Canyon mainly contains placer material, which the exploration work showed not to be economically viable at current gold prices. The remaining sonic holes were drilled on the leach pad to determine if the residual mineralization is amenable to further gold recovery through milling processes. The results of the drilling activity over the last several years were incorporated into two feasibility studies release as an NI 43-101 technical reports. The reports contained updated reserves and resources including those separately for Brodie, Custer, Drinkwater HW, Mary LC and Bunkhouse, and Oromonte. (Scorpio Gold Corp. news releases, 3/30/2017, 10/10/2017, 10/27/2017, 11/6/2017, 1/4/2018, 1/10/2018; Scorpio Gold Corp. Management Discussion and Analysis, 4/24/2018; Scorpio Gold Corp. NI 43-101 Technical Report, 10/10/2017, 1/2/2018; Scorpio Gold Corp. website, http://www.scorpiogold.com)

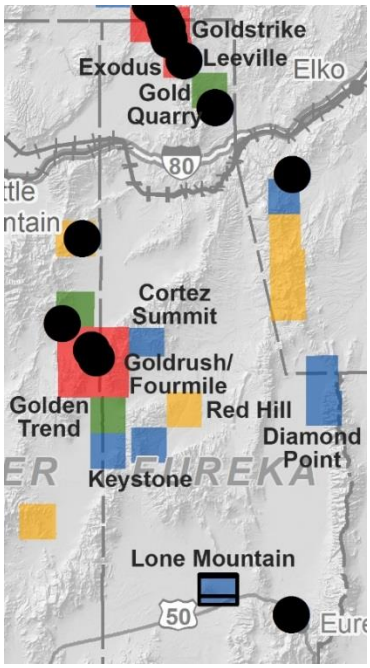
Tonopah District

Three Hills. West Kirkland Mining, Inc., completed seven reverse circulation holes totaling about 4,300 feet (1,300 m). Intercepts included 1) 7 feet (2 m) grading 0.032 opt (1.1 g/t) gold and 0.029 opt silver; 2) 150 feet (46 m) grading 0.018 opt (0.6 g/t) gold and 0.055 opt (1.9 g/t) silver; and 3) 40 feet (12 m) grading 0.015 opt (0.5 g/t) gold and 0.11 opt (3.7 g/t) silver. The drilling was within the planned pit outline for its Three Hills Mine but outside of the reserve boundary. The results were evaluated for resource or reserve expansion, but did not did not yield any further recoverable ore.

Three Hills and Hasbrouck Mountain, which is located in the Divide district about five miles to the south, and the intervening leased Hill of Gold property make up the Hasbrouck Gold project. West Kirkland Mining, Inc., owns a 75% interest in the Three Hills and Hasbrouck Mountain, and Clover Nevada LLC, a subsidiary of Waterton Precious Metals Fund II Cayman LP, owns the remaining 25%. In May, the two companies agreed that West Kirkland Mining, Inc., would be the project operator, and Waterton Precious Metals Fund II Cayman, LP, would fund their 25% share of the expenditures or have their interest diluted.

Three Hills is a low-sulfidation, epithermal gold deposit occurring in a zone of pervasive silicification within the outcropping Siebert formation immediately above and along the contact with the underlying Fraction Tuff. Mineralization is oxidized and occurs as discontinuous, irregular thin veinlets, vein stockworks, and erratic breccia veins of chalcedony and quartz. Due to its stronger economics, Three Hills will be mined before Hasbrouck. Both deposits will have their own heap leach facility, but the adsorption-desorption-recovery (ADR) plant for stripping loaded carbon, which will take care of both deposits, will be located at Three Hills. The run-of-mine recovery for Three Hills is predicted to be 81.5% for gold and 11% for silver. (West Kirkland Mining, Inc., Management Discussion and Analysis, 4/26/2018, 5/29/2018; West Kirkland Mining, Inc., NI 43-101 technical report, 9/14/2016; West Kirkland Mining, Inc., news releases 3/16/2017, 5/1/2017; West Kirkland Mining, Inc., website, http://www.wkmining.com)

EUREKA COUNTY



Antelope District

Gold Bar/Gold Canyon. In September of 2017, Fremont Gold Ltd. signed an option agreement with Ely Gold and Minerals Inc., whereby the former can acquire the Gold Bar Mine property by making a series of cash payments totaling $1,000,000 over a five-year period. The property consists of 96 unpatented and 12 patented claims covering 5,520 acres (2,235 hectares) centered around the Gold Bar open pit mine. The pit produced 286,354 ounces of gold from 3,986,000 tons (3,616,075 tonnes) of ore between 1986 and 1994. The property is adjacent to the Gold Bar property of McEwen Mining, Inc., and was also part of old Gold Bar property formerly

owned by Atlas Precious Metals, Inc. At year's end, Fremont Gold, Ltd., was considering an option agreement (signed in January 2018) with Ely Gold Royalties, Inc., whereby the former can acquire the Gold Canyon Property consisting of 26 unpatented lode mining claims covering 460 acres (170 hectares). Gold Canyon is about seven miles (11 km) northeast of the Gold Bar Mine and was also formerly a part of the Gold Bar property of Atlas Precious Metals, Inc. It produced 41,000 ounces of gold between 1986 and 1994. The company commenced drilling projects on both properties in 2018. (Fremont Gold, Ltd., news releases, 9/12/2017, 1/16/2018, 5/5/2018, 5/9/2018; Fremont Gold, Ltd., website, https://fremontgold.net).

Gold Bar North. U.S. Gold Corp. completed one reverse circulation hole to a depth of 1,810 feet (552 m) on its Gold Bar North project in N22-23N, R49E. The property consists of the Gold Bar and Mill Site deposits, which were part of the Atlas Precious Metals, Inc., property mined between 1986 and 1994. This should not confused with the adjacent Gold Bar North property of McEwen Mining, Inc. The hole was an outlier of the scout drill program U.S. Gold Corp. conducted mainly on its Keystone project about 3 miles (5 km) to the northwest. Assays were not released but the hole intercepted two reduced mineralization zones containing anomalous gold—115 feet (35 m) thick starting at a depth of 460 feet (140 m) and 150 feet (45.7 m) thick starting a depth of 900 feet (274 m). The mineralization was in the Devonian Wenban Limestone. (U.S. Gold Corp. news release, 12/12/2017, 2/13/2018; U.S. Gold Corp., website, https://www.usgoldcorp.gold).

Buckhorn District

Cortez Summit. Barrick Gold Exploration, Inc., completed one core hole to 5,171 feet (1,577 m) on the Cortez Summit property controlled by Carlin Gold Corp. The hole was located in the north-northwest trending Fourmile Structural zone in the southwestern part of the property near a cluster of reverse circulation holes drilled in 2012. The hole was collared in a post-mineral Miocene basalt and gravel sequence and drilled vertically. Drilling encountered altered and mineralized upper plate Ordovician Vinini strata at 283 feet (86 m) and then continued in upper plate rocks to the base of the Roberts Mountain thrust at 4,234 feet (1,291 m). Below this, drilling encountered a complete section of lower plate carbonate rocks.

At 328 feet (100 m), the drilling encountered a 592-foot (180-meter) thick section of highly anomalous arsenic averaging 480 ppm, with strongly anomalous Carlin-style pathfinder elements including mercury up to 17 ppm, antimony up to 173 ppm, and thallium up to 6.3 ppm. Gold intercepts included 10 feet (3 m) at 694 feet (211 m) grading 0.076 opt (2.6 g/t). This thick anomalous section is entirely within upper plate rocks and consists of variably clay-altered, iron-oxide stained, brecciated hornfels with lesser amounts of mudstone and siltstone. The most intense clay alteration and iron-oxide development occurs between 652 and 798 feet (199 and 243 m). Minor, local zones of brecciation, carbon enrichment, and minor decalcification as well as more modest zones of anomalous arsenic and thallium were encountered further down the hole, including a 415-foot (127-meter) thick interval of anomalous thallium straddling the base of the Roberts Mountain thrust. No significant gold mineralization was encountered in the lower plate carbonate section.

The property consists of 142 claims in the southern Cortez Mountains between the old Buckhorn and Horse Canyon mines. It is surrounded on all four sides by Barrick's claim blocks and is adjoined on the west by the claim block containing the recently discovered and drilled Fourmile target. In November 2016, Carlin Gold Corp. and Barrick Gold Exploration, Inc., entered into an Exploration and Earned-in agreement whereby Barrick can earn a 70% interest in the former's Cortez Summit Project by spending $5,000,000 through the end of 2020 and $500,000 by September 1, 2017. Barrick Gold Exploration, Inc., terminated the agreement in early 2018. (Carlin Gold Corp. news releases, 6/6/2017, 10/25/2017, 11/24/2017, 2/20/2018; Carlin Gold Corp. Management Discussion and Analysis, 4/20/2018; Carlin Gold Corp. website, https://carlingold.com)

Carlin Trend

Newmont Carlin Operations Summary. Newmont Mining Corp. reported 971,613 ounces (30,220 kg) of gold and 74,594 ounces (2,320 kg) of silver from its Carlin trend operations, a 3% increase for gold and 26% decrease for silver from 2016. Production came from four open pits and four underground operations. The open pits were the Goldstar pit and Silverstar (formerly Genesis) pit in the Lynn District (Northern Carlin trend) and the Gold Quarry pit in the Maggie Creek District and the Emigrant pit in the Carlin District (Southern Carlin trend). The underground operations were the Leeville, a shaft mine, and the Exodus and Pete Bajo, both portal mines and the Chukar, a portal mine accessed from the bottom of the Gold Quarry pit. The increase in production was due to more ore with higher grades mined at Leeville, partially offset by halted activity at the Silverstar Mine due to geotechnical issues in the fourth quarter. The bulk of the ore from the underground mines and higher grade refractory ore from the open pits are processed through the Mill 6 roaster. Mill 6 consists of a grinding circuit, roasting circuit and a conventional carbon-in leach circuit and processed about 3,600,000 tons (3,300,000 tonnes), a 6% increase from 2016.

Higher grade oxide ore from the open pits is processed by conventional milling and cyanide leaching at Mill 5. Mill 5 also contains a flotation mill for treating lower grade, non-carbonaceous, sulfidic refractory ore to produce a gold/pyrite concentrate. Mill 5 processed about 4,900,000 tons (4,400,000 tonnes), a 2% decrease from 2016. Lower-grade material with suitable cyanide solubility from the open pits is treated on one of four heap leach pads. The all-in sustaining cost was $1,030 per ounce, a 2% decrease from 2017 due to lower costs applicable to sales. Costs applicable to sales per ounce decreased 5% from 2016 because of more ounces sold. (Newmont Mining Corp. Form 10-K, 2/22/2018; Newmont Mining Corp. website, http://www.newmont.com)

Cortez District

Fourmile. Barrick Nevada completed at least 15 holes on its Fourmile Project, 0.6 to 2 miles (1 to 3 km) north of Goldrush. Significant intercepts included 1) 110.5 feet (33.7 m) grading 0.39 opt (13.3 g/t) gold; 2) 27.6 feet (8.4 m) grading 0.98 opt (30.6 g/t) gold; 3) 19 feet (5.8 m) grading 1.59 opt (49.6 g/t) gold; 4) 47 feet (14.3 m) grading 1.0 opt (31.7 g/t) gold; and 5) 15.1 feet (4.6 m) grading 0.64 opt (19.9 g/t) gold. Fourmile and Goldrush combined may be part of a 4.4-mile (7-km) long mineralized system. (Barrick Gold Corp. news release, 4/23/2018; Barrick Gold Corp. Investor Day Presentation, 2018; Annual Information Form, 3/23/2018; Barrick Gold Corp. website, http://www.barrick.com).

Goldrush. Barrick Nevada conducted a drilling program at Goldrush. No details were released. The drilling improved confidence in the resource above the water table (Red Hill zone). The drilling converted 1.48 million ounces (46,033 kg) of gold to probable reserves. The company also commenced construction of twin exploration declines to provide access better access to drill the ore body. The declines will also better support both the conversion of existing measured and indicated resources into proven and probable reserves and additional exploration drilling for new resources. The declines are located next to the existing Horse Canyon Haul Road in the northern part of Grass Valley and will provide access to the Goldrush ore body in Horse Canyon from the west. The exploration declines can be converted to production declines in the future. A feasibility study was completed in 2017, which showed positive economic results at an average annual production of ~500,000 ounces (15,551 kg) for 16 years. Production could commence in 2021. (Barrick Gold Corp. Management Discussion and Analysis, 2/15/2018; Barrick Gold Corp. Annual Information Form, 3/23/2018; Barrick Gold Corp. website, http://www.barrick.com)

Eureka District

Ruby Hill. Ruby Hill Mining Co., LLC, a subsidiary of Waterton Precious Metals Fund II Cayman, LP, produced 4,463 ounces (139 kg) of gold and 4,263 ounces (133 kg) of silver from its Ruby Hill. Mining was never resumed by the company or its predecessor, Barrick Mining Corp., after the high wall failure in November 2013. The 2017 production was from the leach pads, and no drilling has been reported since 2013. Ruby Hill Mining Co., LLC, was formed in 2015 and is managed by Elko Mining Group, LLC. (Nevada Business Search; Waterton Global Resource Management news release, 12/17/2015; Waterton Global Resource Management website, http://www.watertonglobal.com).

Gibellini District

Gibellini. In June, Prophecy Development Corp. acquired the Gibellini Project through a 10-year mineral lease (Dietrich Lease) from Janelle Dietrich, which included data from American Vanadium Corp., now Monitor Ventures, Inc. The lease consisted of 40 claims, and the company staked an extra 198 claims covering 4,091 acres (1,656 hectares) by December. The Gibellini deposit is hosted in organic-rich siliceous mudstone, siltstone, and chert of the Gibellini facies of the Devonian Woodruff Formation. The beds strike north-northwest and dip from 15º to 50º to the west. The black shale unit which hosts the vanadium resource varies from 175 feet (53 m) to over 300 feet (1,000 m) thick and overlies gray mudstone of the Bisoni facies. The shale has been oxidized to various hues of yellow and orange to a depth of 100 feet (30 m). No drilling was reported for 2017, but the company issued an NI 43-101 technical report with new resources and was preparing a preliminary economic assessment. (Prophecy Development Corp. news releases, 5/8/2017, 5/17/2017, 6/23/2017, 11/20/2017, 12/5/2017; Prophecy Development Corp. NI 43-101 Technical Reports, 11/10/2017, 5/29/2018; Prophecy Development Corp. website, https://www.prophecydev.com)

Louie Hill. In July, Prophecy Development Corp. acquired the Louie Hill project through a 10-year mineral lease (McKay Lease) from Richard A. McKay, Nancy M. Minoletti, and Pamela S. Scutt. The Louie Hill Project consists of 10 claims and is located about 1,600 feet (500 m) south of the Gibellini Project. The Louie Hill deposit is hosted in organic-rich siliceous mudstone, siltstone, and chert of the Gibellini facies of the Devonian Woodruff Formation and probably

represents a dissected piece of the same allochthonous fault wedge containing the Gibellini deposit. The beds are commonly contorted and shattered but generally strike north to south and dip from 0 to 40º to the west. Underlying the Louie Hill deposit are mudstone, siltstone and fine-grained sandstone probably of the Mississippian Webb and/or Chainman Formations. Oxidation of the mineralized rocks has produced light-colored material with local red and yellow bands of concentrated vanadium minerals. No drilling was reported for 2017, but the company issued an NI 43-101 technical report with an inferred resource and was preparing another one as a preliminary economic assessment. (Prophecy Development Corp. news releases, 7/13/2017, 11/20/2017; Prophecy Development Corp. NI 43-101 Technical Reports, 11/10/2017, 5/29/2018; Prophecy Development Corp. website, https://www.prophecydev.com)

Huntington Creek District

Diamond Point. Renaissance Gold Corp. completed six reverse circulation holes totaling 3,940 feet (1,200 m) on the company's Diamond Point project in T25-26N, R54E. Four of the holes were spaced about 0.6 miles (1 km) apart to test geophysical targets in shallow pediment. Two holes tested The West fault 1,300 feet (400 m) north of the northernmost gold anomalies in the soil where the system goes under the alluvium. The depth to Paleozoic rocks ranges between 5 feet to 70 feet (1.5 meters and 21 m). All of the holes bottomed in the Chainman Shale, and none reached the targeted Webb Formation. Gold values in 5-foot (1.5-meter) sample intervals ranged from below detection limits to 0.008 opt (0.29 g/t) gold. No significant multi-sample gold intervals were intercepted.

In May, Kinross Gold, U.S.A., Inc., signed an exploration agreement with Renaissance Gold Corp. to acquire a 70% interest over a 10-year period in the Buffalo Canyon, Diamond Point, and Spruce East projects. As part of the agreement for the first year, Kinross Gold, U.S.A., Inc., advanced Renaissance Gold Corp. $500,000 to conduct exploration on all three projects. After the poor values were posted, Kinross Gold, U.S.A., Inc., dropped its option on the Diamond Point project. (Renaissance Gold Corp. news release, 2/20/2017, 5/15/2017, 10/26/2017, 12/6/2017, 2/13/2018; Renaissance Gold Corp., Management Discussion and Analysis, 10/25/2017; Renaissance Gold Corp., website, http://www.rengold.com).

Lone Mountain District

Lone Mountain. In early January, Nevada Zinc Corp. completed its Phase 5 drilling program on its Lone Mountain project (also known as North Lone Mountain). A hole drilled just southwest of the Mountain View Mine property intercepted 120 feet (36.58 m) of near surface mineralization grading 4.39% zinc and 0.04% lead. A hole in the Discovery zone intercepted a broad zone of zinc mineralization 175 feet (53.3 m) thick grading 3.99% zinc and 0.21% lead including a 100 feet (30.5 m) grading 5.99% zinc.

In September, the company completed its Phase 6 drilling program consisting of 13 core holes totaling 6,831 feet (2,083 m). The program was designed to corroborate assays from earlier reverse circulation drilling and to provide geological information on the mineralized zones as well as to expand the extent of the mineralization. Three of the holes were drilled in the north half of the Mountain View Mine claim, and the rest were drilled among a cluster of 2014–2016 reverse circulation holes just northwest of the Mountain View Mine claim. Significant intercepts included 1) 300 feet (91.5 m) averaging 7.67% zinc and 1.91% lead, including 55 feet (16.6 m) grading 12.79% zinc and 8.84% lead; and 2) 81 feet (24.7 m) grading 23.15% zinc and 0.29% lead.

The company's claim block surrounds the one lode claim containing the Mountain View Mine. Between 1943 and 1964, the district production, mostly from the Mountain View Mine, was 4,952,627 pounds (2,247 tonnes) of zinc, 649,579 pounds (295 tonnes) of lead, 600 pounds (0.27 tonnes) of copper, and 4,040 ounces (126 kg) of silver. The mined mineralization reportedly consisted mainly of smithsonite, zincite, and hydrozincite with minor cerussite, malachite and azurite along with local sulfides, including sphalerite, galena, chalcopyrite, and pyrite. The ore was hosted in highly brecciated hydrothermal dolomite cut by calcite veins in the Devonian Devils Gate Limestone at the intersections of northeast-striking, southeast-dipping and northwest-striking, southwest-dipping faults. (NBMG Bulletin 64; Nevada Zinc Corp., news releases, 2/16/2017, 6/22/2017, 11/21/2017, 3/1/2018; Nevada Zinc Corp., Annual Information Form, 4/30/2018; Nevada Zinc Corp., NI 43-101 Technical Report, 7/22/2018; Nevada Zinc Corp., website, http://www.nevadazinc.com)

Lynn District

Exodus/Northwest Exodus. Underground drilling by Newmont Mining Corp. continued to grow its Exodus and Northwest Exodus deposits. Growth at Exodus was in the footwall of the Castle Reef fault, where intercepts included 1) 120 feet (36.5 m) grading 4.4 g/t and 80 feet (24.4 m) grading 5.2 g/t. The spatial extent of the reserve/resource in plan view has a diameter of about 2,000 feet (600 m). The first footwall stopes at the Exodus were successfully mined. At Northwest Exodus, drilling extended the deposit northwest along the strike and southwest into the footwall of the Castle Reef fault.

Significant intercepts along strike included and 81 feet (24.7 m) grading 0.5 opt (16 g/t) gold. Significant intercepts in the footwall incoluded1) 369 feet (112.5 m) grading 0.17 opt (5.3 g/t) gold and 81 feet (24.7 m) grading 0.5 opt (16 g/t) gold. Combined reserves at Exodus and Northwest Exodus, as of September 2017, were 800,000 ounces (24,833 kg) of gold (1.1 tons (1 tonne) @ 0.31 opt (9.6 g/t)). (Newmont Mining Corp. website, http://www.newmont.com)

Fence/Full House/Rita K/Leeville/Pete Bajo. In 2017 Newmont Mining Corp. continued to drill the 3.7 mile (6 km) northwest-striking corridor between its underground Leeville Mine and its Pete Bajo underground mine to the southeast. The drilling between Leeville and Pete Bajo continued to enlarge the Rita K, Full House, and Fence zones. At Rita K the best intercepts were 22 feet (6.6 m) grading 0.76 opt (23.8 g/t) gold and 200 feet (61 m) grading 0.21 opt (6.7 g/t) gold. At Full House, to the southeast of Rita K., the best intercept was 70.5 feet (21.5 m) grading 1.14 opt (35 g/t) gold. At Fence, further to the southeast, the best intercepts were 54 feet (16.5 m) grading 0.77 opt (24.2 g/t) and 29.5 feet (9.5 m) grading 1.16 opt (36.4 g/t) gold. Most of the high grade intercepts in the corridor occur at depths of about 2,000 feet (600 m). (Newmont Mining Corp. website, http://www.newmont.com)

Goldstrike. During the first quarter of 2017, the management and operations of Goldstrike, Arturo, and Cortez were integrated under the name Barrick Nevada. At its Goldstrike operation, Barrick Nevada produced 433,422 ounces of gold and 96,541 ounces of silver from the Betze-Post open pit, decreases of 20% and 28%, respectively, from 2016. The company produced 332,315 ounces of gold and 20,632 ounces of silver from the Meikle and Rodeo underground mines, decreases of 20% and 45%, respectively, from 2016. For the open pit and underground operations combined, 86,007,000 tons (76,587,000 tonnes) of material mined including 8,864,000 tons (8,041,000 tonnes) of ore with an average grade of 0.125 opt (4.28 g/t) gold was processed. These represent a 13% and 9% increases respectively for material mined and ore but a 26% decrease in grade from 2016. Metallurgical recoveries were between 67.3% and 83.8% for the open pit ore and 89.2% for the underground ores. The company issued a NI 43-101 technical report on the Goldstrike Mine. Open pit production shows that 13.51 million tons (12.26 million tonnes) of ore grading 0.112 opt (3.84 g/t) gold will be mined and rehandled from stockpiles through 2031. Underground reserves are projected to sustain the mine operations until 2023.

Surface drilling programs were conducted northwest of the Betze-Post pit. The company did conduct nine underground exploration projects including initial drill testing, infill drilling, reserve definition drilling and geotechnical drilling. The drilling totaled 414,622 feet (126,409 m) of both reverse circulation and diamond core drilling, of which 250,681 feet (76,427 m) was for exploration. Exploration drilling focused on extending known mineralization ahead of mining and testing new targets. Significant intercepts included 1) 160 feet (49 m) grading 0.4 opt (12.5 g/t) gold; 2) 79 feet (24 m) grading 0.46 opt (14.6 g/t) gold; and 3) 104 feet (31.6 m) grading 0.29 opt (9.1 g/t) gold.

The gold mineralization at the Betze-Post open pit is 6,000 feet (1,829 m) long, trends northwest, and averages between 600 feet to 800 feet (183 m to 244 m) wide and 400 feet to 600 feet (122 m to 183 m) thick. Production was largely from the North Betze layback and the third and fourth northwest laybacks, which were being stripped in 2017 and into 2018. The underground mineralization consists of the Meikle and Rodeo deposits, which are hosted in carbonate breccias and limestones of the Silurian-Devonian Bootstrap limestone and the Devonian Popovich Formation and various intrusive rocks. Meikle also includes the Meikle Extension, South Meikle, East Griffin, and West Griffin zones, and adjoins the Banshee deposit to the north-northwest. Rodeo also includes West Rodeo and Barrel and adjoins East and West Griffin to the north-north west and the North Post deposit and JV Post (Barrick Nevada 70%; Newmont Mining Corp. 30%) to the south-southeast. The mineralization of the combined ore zones is about 12,000 feet (3,660 m) long by about 1,950 feet (595 m) wide. It starts about 590 feet (180 m) below surface and continues to more than 1,920 feet (586 m) below surface.

The property has two processing facilities—an autoclave installation, which was originally designed to treat non-carbonaceous sulfide ore, and a roaster, which was used to treat carbonaceous ore that responds poorly to cyanidization. The recovery rate was 61.5% for the autoclave and 88.9% for the roaster. These facilities process the ore from both the Goldstrike and Cortez properties where both ores are refractory. The combined capacity of the two facilities is between 29,000 and 30,000 tons (26,000 to 27,000 tonnes) per day. The autoclave was recently retrofitted and upgraded with the construction of the Total Carbonaceous Material (TCM) project which allows for the use of calcium thiosulphate instead of cyanide to process double refractory ore. Resin is used to collect the dissolved gold rather than activated carbon. The new TCM circuit will allow the autoclaves to operate throughout the life of the mine and speed up the processing of stockpiled carbonaceous material. (Barrick Gold Corp., NI 43-101 Technical Report, 4/25/2017; Barrick Gold Corp., Management Discussion and Analysis, 2/15/2018; Barrick Gold Corp. Annual Information Form, 3/23/2018; Barrick Gold Corp. website, http://www.barrick.com)

Northern Simpson Park Mountains

Red Hill. NuLegacy completed 45 reverse circulation and core holes totaling 42,353 feet (12,909 m) at its Red Hill project. The drill program was designed to expand the Avocado deposit; to confirm the Deep Iceberg induced polarization geophysical anomaly as the third gold deposit identified to date; and to determine if the VIO and Jasperoid Basin anomalies could be developed into gold deposits.

The Iceberg gold deposit consists of four zones of gold mineralization: South, Central, North, and Serena. Seven reverse circulation and two core holes totaling 6,105 feet (1,860 m) were drilled between the Central and South zones of the Iceberg deposit. Most of these were step-outs from the defined mineralized zones. Three of the reverse circulation holes were drilled to the west of the South zone with one encountering modest mineralization, which opens a very large, as of yet undrilled area, to the west and northwest of the South zone. This was followed up with additional soil sampling to the west and south of the South zone, which ties into the pre-existing soil grids. Four reverse circulation and two core holes drilled in the Central zone were significant step-outs to the west and north of the defined mineralization. The most significant hole encountered multiple gold values and opened a corridor that may be a connection to the North zone. Another hole extended Central zone mineralization to the south and started closing the gap with the South zone. One core and five reverse circulation holes totaling 4,196 feet (1,280 m) were drilled in to North zone, which extended its area of known mineralization.

A step-out hole discovered the new Serena zone, 1,200 feet (375 m) west of the North zone of the Iceberg deposit. The mineralization is in a 405-foot (125-meter) thick section starting at 435 feet (133 m) consisting of highly brecciated jasperoid hosted in the Devonian Horse Canyon unit. The hole intercepted 280 feet (85.4 m) averaging 0.019 opt (0.64 g/t) gold, including 165 feet (50.5 m) grading 0.029 opt (1 g/t) gold and a separate zone of 45 feet (13.7 m) averaging 0.066 opt (2.27 g/t) gold. A step-out hole drilled 330 feet (100 m) from the North zone of the Iceberg deposit in the direction of the Serena zone intercepted 70 feet (21.3 m) grading 0.083 opt (2.85 g/t) gold including 15 feet (4.6 m) grading 0.28 opt (9.76 g/t) gold. The gold is contained in a unit of moderately brecciated grey jasperoid with fine-grained silt and sands encapsulated in a microcrystalline silica containing about 2% fine-grained pyrite. Two follow-up core holes connected the Serena and North zones. One core hole intercepted 107 feet (32.7 m) averaging 0.06 opt (2.07 g/t) gold, including 10.7 feet (3.3 m) grading 0.43 opt (14.68 g/t) gold. The other core hole intercepted 135 feet (41.1 m) averaging 0.022 opt (0.76 g/t) gold, including 35 feet (10.7 m) grading 0.069 opt (2.37 g/t) gold. A hole was drilled into a target similar to Serena at the northern extension of the West Iceberg fault near the range front 1,700 feet (500 m) north of the Serena zone. The hole encountered 328 feet (100 m) of jasperoid and breccia that included 75 feet (22.9 m) grading 0.0035 opt (0.12 g/t) gold.

Two reverse circulation holes totaling 3,280 feet (1,000 m) tested the Iceberg Deep induced polarization geophysical anomaly in the area between the North and Central zones of the Iceberg deposit. Both holes encountered carbonaceous Devonian Wenban limestone with fine-grain disseminated pyrite, and near the bottom of each hole anomalous Carlin-type gold deposit trace elements were intersected. Also, one hole intercepted 80 feet (24.3 m) grading 0.01 opt (0.35 g/t) gold at the Devonian Horse Canyon/Wenban contact. This represents a southern extension of the North zone toward the Central zone.

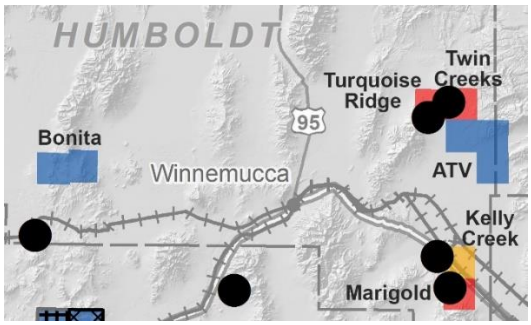
Two reverse circulation holes totaling 1,400 feet (427 m) were drilled into the VIO zone, which is over 2.5 miles (4 km) west of the Iceberg gold deposit, resulting in a new gold zone discovery. The gold mineralization is hosted in mafic to intermediate volcanic flows of probable Miocene age with geologic and geochemical characteristics typical of an epithermal gold system. The discovery hole intercepted 110 feet (33.5 m) averaging 0.019 opt (0.65 g/t) gold and 0.16 opt (5.5 g/t) silver, including 30 feet (9.1 m) grading 0.053 opt (1.8 g/t) gold and 0.51 opt (17.6 g/t) silver. This was followed up with two core holes that were drilled from a single drill pad to the east of the discovery hole. One hole was angled to the south to test the VIO fault and intercepted multiple thin zones of gold mineralization that assayed up to 0.022 opt (0.75 g/t) gold and 0.099 opt (3.4 g/t) silver. The other hole intercepted four feet (1.2 m) grading 0.013 opt (0.46 g/t) gold. The entire volcanic section above the fault, which was at a depth of 450 feet (138 m), assayed over 0.029 opt (1 g/t) silver. Two reverse circulation holes with core holes were drilled in the West Avocado zone. One hole intercepted 107 feet (32.5 m) grading 0.018 opt (0.61 g/t) gold. At Jasperoid Basin, three reverse circulation holes totaling 2,050 feet (625 m) were drilled to test the extensive jasperoids in the area, and the hanging wall of the Long fault. Significant hydrothermal alteration and favorable geochemistry were encountered, which was followed up with additional geological mapping and rock chip geochemical sampling to further define drill targets. (NuLegacy Gold Corp. news releases, 4/6/2017, 4/25/2017, 5/16/2017, 6/20/2017, 7/25/2017, 8/8/2017, 9/6/2017, 9/13/2017, 1/9/2018, 1/18/2018; NuLegacy Gold Corp. Management Discussion and Analysis 7/26/2018; NuLegacy Gold Corp. website, http://www.nulegacygold.com)

Roberts District

Keystone. U.S. Gold Corp. completed two scout drilling programs on its Keystone project in T23-24N, R48E, the first being a completion of a program started in 2016 and the second conducted in the fall of 2017. The first scout drilling program was commenced in the fall of 2016, but was stalled due to bad weather in the winter. The last four holes were completed in the summer of 2017. These included one core hole drilled to 1,605 feet (489 m) and three reverse circulation holes totaling 5,570 feet (1,698 m). All of the holes intercepted anomalous gold (> 10 ppb) with high assays of 0.181 ppm, 0.32 ppm, 0.731 ppm, and 1.05 ppm gold. The host rocks are largely calcareous sediments of the Silurian to Devonian Roberts Mountains Formation, Devonian Wenban Limestone, and Devonian Horse Canyon unit. Dacitic dikes and sills and granodiorite of Tertiary age are present, and the host rocks have been locally metamorphosed to hornfels or silicified. The Wenban Limestone has also been locally altered to a pyrrhotite-pyrite-magnetite skarn. Weakly anomalous zones of copper, lead and zinc were scattered through the skarn and hornfels zones.

The Fall drilling program included seven reverse circulation holes totaling 10,740 feet (3,274 m). The program included an eighth hole drilled on the company's Gold Bar North property about 3 miles (5 km) to the southeast. The drilling was designed to gather more information on the host rock characteristics including the distribution, depth, and alteration effects as well as the presence of the hydrothermal system. All of the holes intercepted mineralization with anomalous gold values. Significant intercepts included 1) 30 feet (9.1 m) grading 0.032 opt (1.11 g/t) gold; 2) 20 feet (6.1 m) grading 0.02 opt (0.69 g/t) gold; 3) 35 feet (10.7 m) grading 0.013 opt (0.46 g/t) gold; and 4) 35 feet (7.6 m) grading 0.012 opt (0.4 g/t) gold. (U.S. Gold Corp. news release, 8/25/2017, 8/28/2017, 10/11/2017, 12/12/2107, 2/13/2018; U.S. Gold Corp., website, https://www.usgoldcorp.gold).

HUMBOLDT COUNTY



Battle Mountain District

Marigold. SSR Mining, Inc., (formerly Silver Standard Resources, Inc.) produced 202,239 ounces of gold and 3,216 ounces of silver from its Marigold Mine in 2017, a 1% decrease for gold and a 37% increase for silver from 2016. The company mined 76,071,000 tons (69,011,000 tonnes) of material of which 47,864,000 tons (43,422,000 tonnes) was waste removed and 28,207,000 tons (23,613,000 tonnes) was ore stacked with strip ratio of 1.7:1 and an average grade of 0.01 opt (0.35 g/t) gold. The gold recovery was 73%, and the all in sustaining cost was $896 per ounce, a 7% decrease from 2016.

Marigold is a Carlin-style deposit, with both structural and stratigraphic controls to ore. The ore is oxidized and hosted in argillite, quartzite, sandstone, limestone, chert and meta-volcanic rocks (in upward stratigraphic order) of the Ordovician Valmy Formation, Pennsylvanian-Permian Antler sequence, and Mississippian-Permian Havallah sequence. These rocks are cut by Cretaceous granodiorite dikes and sills trending northwestward. The mineralized zones are generally tabular and shallow-dipping, becoming steeper near normal faults, which trend N10°E to N20°W. Eight deposits of interest were noted for 2017. The Antler deposit is hosted by quartzite and argillite of the Pennsylvanian-Permian Antler sequence and is 2,370 feet (722 m) long, by 580 feet (177 m) wide by 130 feet (40 m) thick. The Basalt deposit is hosted in Ordovician Valmy Formation quartzite and argillite and is 3,300 feet (1,000 m) long, by 1,070 feet (325 m) wide by 80 feet (25 m) thick. The Target II deposit is hosted in Ordovician Valmy Formation quartzite and rocks of the Pennsylvanian-Permian Edna Mountain Formation, Antler sequence, and Battle Formation and is 2,300 feet (700 m) long, by 330 feet (100 m) wide by 100 feet (30 m) thick. The Mackay deposit is hosted in Ordovician Valmy Formation quartzite and is 11,800 feet (3,600 m) long, by 2,300 to 3,000 feet (700 to 900 m) wide in a number of zones that are up to 100 feet (30 m) thick. The 8 South deposit, which is included in the Mackay North deposit, is hosted in the Pennsylvanian-Permian Edna

Mountain Formation and Antler Peak Limestone and is 1,000 feet (300 m) long, by 330 feet (100 m) wide by up to 115 feet (35 m) thick. The 5 North Phase 1 deposit is hosted in the Permian Edna Mountain Formation and is 850 feet (260 m) long, by 300 feet (90 m) wide by 33 feet (10 m) thick. The 5 North Phase 2 deposit is hosted in the Pennsylvanian-Permian Edna Mountain Formation and Antler Peak Limestone and is 820 feet (250 m) long, by 160 feet (50 m) wide by 65 feet (20 m) thick. The Valmy deposit is hosted in Ordovician Valmy Formation quartzite and is 11,800 feet (3,600 m) long, by 2,300 to 3,000 feet (700 to 900 m) wide and up to 200 feet (60 m) thick. All of these deposits trend north-south except for 5 North Phase 2, which trends north-northwest.

Silver Standard completed 188 reverse circulation holes totaling 179,790 feet (54,814 m) and one diamond core hole totaling 3,700 feet (1,128 m). Significant intercepts included: East Basalt, 1) 260 feet (79.2 m) grading 0.04 opt (1.37 g/t) gold and 2) 180 feet (54.9 m) grading 0.02 opt (0.69 g/t) gold; Mackay pit, 1) 110 feet (33.5 m) grading 0.073 opt (2.50 g/t) gold and 2) 350 feet (106.7 m) grading 0.032 opt (1.09 g/t) gold; Red Dot, 155 feet (47.2 m) grading 0.023 opt (0.79 g/t) gold; and Red Dot North, 165 feet (50.3 m) averaging 0.028 opt (0.95 g/t) gold, including 25 feet (7.6 m) at grading 0.11 opt (3.63 g/t) gold.

Exploration activities mainly focused on mineral reserve and resource growth within and adjacent to existing pits especially at the Mackay pit and the East Basalt and North Red Dot, Red Dot, and Valmy deposits. Structural and compilation work at the North Red Dot target tested and confirmed the continuity of mineral controlling fault systems. Positive drilling results within the resource portions of the Red Dot deposit and in the Mackay pit expansion phases 4 and 5 confirmed the working geologic understanding of the Mackay and Red Dot deposits. Exploration of the Showdown target area indicated several intervals of shallow low grade gold mineralization between the East Basalt deposit and the Valmy deposits. Drilling results extended the mineralization zone eastward from the Basalt deposit to below and east of the current resource of the East Basalt deposit. Drilling results of the Hollow Point target area indicated a shallower level of oxidation as work progressed southward towards the Oyarbide fault.

Construction of an additional leach pad and pumping upgrades were underway with plans for completion in 2018. In August, the company changed its name from Standard Silver Resources, Inc., to SSR Mining, Inc. The company was preparing an NI 43-101 technical report with updated resources. (SSR Mining, Inc., Technical Report, 7/31/2018; SSR Mining, Inc., Management Discussion and Analysis, 2/22/2018; SSR Mining, Inc., new releases 3/27/2017, 5/1/2017, 7/31/2018, 9/5/2017, 11/7/2017; SSR Mining, Inc., Annual Information Form, 3/21/2018; SSR Mining, Inc., website, http://www.ssrmining.com)

Buffalo Mountain District

Lone Tree/Brooks. Newmont Mining Corp. produced 41,784 ounces of gold and 936 ounces of silver from its Lone Tree Complex, a 26% increase for gold from 2016. Most of the production came from the Brooks pit located about three miles (5 km) to the southwest of the Lone Tree pit. Mining of the Brooks pit commenced in 2015 with the ore being hauled to the Lone Tree heap leach pad for processing. The Lone Tree pit has been in closure since 2007 and the company is conducting on-going reclamation activities. What Lone Tree production persists comes from the residual heap leaching operation with four haul trucks ranging between 150 and 190 tons (136 to 172 tonnes) moving leach material around for the leaching operation. The Lone Tree autoclave and flotation mill are on care and maintenance. The company is monitoring the pit lake, which at times has a low pH due to sulfide minerals. No drilling or other exploration activity was released. (Newmont Mining Corp. Management Discussion and Analysis, 10/26/2017; Newmont Mining Corp. Form 10-K, 2/22/2018; Newmont Mining Corp. website, http://www.newmont.com)

East of Potosi District

ATV (Across-the-Valley). In December, NV Gold Corp. completed 13 vertical reverse circulation holes and one diamond core hole with a reverse circulation pre-collar totaling 13,835 feet (4,218 m) on its Across-the-Valley project, commonly referred to as the ATV project. The project is located east of Newmont's Twin Creeks Mine. The drilling was designed to test a number of targets including those associated with gravity highs that may be areas underlain by prospective Paleozoic sedimentary rocks covered by recent valley-fill gravel and/or Miocene volcanic rocks; structural targets along the margins of gravity highs; a large north-south oriented BLEG (Bulk Leach Extractable Gold) geochemical anomaly straddling a gravity high potentially resulting from shallowly buried favorable host-rocks; and mineralization along the unconformity between Tertiary volcanic rocks and Paleozoic sedimentary rocks.

The results were reported as "geochemically anomalous intervals" of which four holes had none. Intervals reporting gold and silver included 30 feet (9.2 m) grading 1.7 ppm silver with up to 28 ppm arsenic and up to 4 ppm antimony; 340 feet (103.6 m) grading 1.2 ppm silver with up to 17 ppm arsenic and 5 ppm antimony; 120 feet (36.5 m) grading 1.6 ppm silver with

up to 15 ppm arsenic, 4 ppm antimony; 22 feet (6.7 m) grading 0.14 ppm gold; 22 feet (6.7 m) grading 2.7 ppm silver with up to 15 ppm arsenic and 4 ppm antimony; and 10 feet (3.1 m) grading 3.6 ppm silver with up to 28 ppm arsenic, 11 ppm antimony, 1.5 ppm mercury, 41 ppm molybdenum, and 34 ppm selenium. This 10 foot interval was interpreted to occur in decalcified silty limestone probably in the lower plate of the Roberts Mountain thrust. Three holes never penetrated through the overlying volcanic rocks. Eleven holes encountered siliciclastic sedimentary rocks of the upper plate of the Roberts Mountain thrust and nine of these holes intercepted intervals anomalous gold, silver, and Carlin-style pathfinder elements. (NV Gold Corp. Management Discussion and Analysis, 4/18/2018; NV Gold Corp. news release, 6/5/2017, 6/19/2017, 8/1/2017, 2/13/2018; NV Gold Corp. website, http://www.nvgoldcorp.com).

North of Marigold

Kelly Creek. Nevada Exploration, Inc., completed 53 holes totaling 15,000 feet (4,560 m) on its Kelly Creek property using a Scorpion drill rig. The holes ranged from 75 to 480 feet (23 to 146 m) deep. The drilling was centered about 4.5 miles (7.2 km) east of the Lone Tree Mine. The company reported the drilling encountered significant gold enrichment at the bedrock-alluvium contact. One drill hole intercepted 35 feet (11 m) grading 0.0027 opt (0.095 ppm) gold at the bedrock-alluvium contact from 365 to 400 feet (111 to 120 m) included two 10-foot (3-m) intervals averaging 0.0029 (0.149 ppm) gold and 0.0035 opt (0.120 ppm) gold respectively, as well as shorter intervals at the bedrock-alluvium contact containing from 0.0029 opt (0.100 ppm) gold to 0.0045 opt (0.153 ppm) gold in six other drill holes.

In addition to sampling alluvium and bedrock at 5 foot (1.5 m) intervals, Nevada Exploration collected approximately 490 groundwater samples, generally at 30 foot (9 m) down-hole intervals. The Scorpion holes were focused along four fences across NGE's primary targets defined by earlier, wider-spaced groundwater sampling on a regional structure known to control mineralization at the Marigold gold mine, as well as along four additional fences across parallel target areas. Hole spacing varied from 160 to 1,312 ft (50 to 400 m) along the fences, which were spaced between 490 to 3,280 ft (150 to 1,000 m) apart.

The results of Scorpion sampling at Kelly Creek confirm that the enriched gold in groundwater seen in earlier programs is now supported by elevated gold and related geochemistry in both alluvium and bedrock at depth, as well as increasing concentrations of gold in groundwater at depth. Together, the groundwater results define a hydrogeochemical plume of elevated gold and related elements measuring 2.2 km (1.4 mi) in strike length and 1.6 km (1 mi) in width, beneath 45–245 m (150–800 ft) of alluvial cover, which has now been closed off in one direction. The bedrock and alluvium sampling results within the hydrogeochemical plume have defined areas of significant enrichment of gold and related trace elements, including most significantly one drill hole containing 11 m (35 ft) averaging 0.095 ppm Au at the bedrock-alluvium contact from 111–120 m (365–400 ft), which included two 3 m (10 ft) intervals averaging 0.149 ppm Au and 0.120 ppm Au respectively, as well as shorter intervals at the bedrock-alluvium contact containing from 0.100 ppm Au to 0.153 ppm Au in six other drill holes.

The company combined its former Hot Pot project with its Kelly Creek project, which together are now referred to as the Kelly Creek project. The Kelly Creek project consists of 333 unpatented mining claims held directly by the company, covering approximately 9.3 square miles (23.9 square km); 209 unpatented mining claims leased by the company from Genesis Gold Corporation through a Mining Lease and Option to Purchase Agreement covering 5.8 square miles (15.1 square km); and about 5.5 square miles (14.2 square km) of private land leased by the company under a Mining Lease Agreement called the Hot Pot Lease. (Nevada Exploration, Inc., Management Discussion and Analysis, 8/27/2018; Nevada Exploration, Inc., news releases, 2/6/2017, 4/20/2017, 7/21/2017; Nevada Exploration, Inc., website, http://www.nevadaexploration.com)

Potosi District

Turquoise Ridge. The Turquoise Ridge underground mine (75% Barrick Gold Corp., 25% Newmont Mining Corp.) operated by Barrick Gold Corp. produced 369,000 ounces, a 4% increase from 2016. The all-in sustaining costs were $733 per ounce, a 17% increase from 2016. Production was from 659,000 tons (643,000 tonnes) of material mined grading 0.55 opt (15.45 g/t) gold including 577,000 tons (472,000 tonnes) of ore processed grading 0.44 opt (15.01 g/t) gold. This represents 7.5% increase in material mined with an 8% decrease in grade. The increase in cost was due to higher processing costs associated with processing lower grade ore with a higher organic carbon content. Overall capital expenditures increased 13% to $36,000,000 due to commencement of the construction of a third shaft.

Underground mining is presently focused on the gold mineralization hosted in the laminated to thinly bedded silty limestone units of Cambrian to Ordovician age in the hanging wall of the Getchell fault. The mineralization is controlled by stratigraphy, complex faulting, margins of igneous dikes, and broad ponding beneath a thick basalt flow. The underground mineralized zone in the hanging wall starts about 1,300

feet (400 m) below the surface and extends northward from the shafts for 1.125 miles (1.8 km) and continues to more than 3,300 feet (1 km) below the surface.

Barrick Gold Corp., completed 17 diamond core holes totaling 26,043 feet (7,940 m) on three mine exploration programs. The North East Turquoise Ridge Corridor program was drilled on the eastern side of the underground resource. The drilling targeted mineralization extending northeast out on the Turquoise Ridge Corridor fault structures and followed up on the 2016 Lower Main Bullion Decline program that targeted the proximal portions of Turquoise Ridge Corridor fault structures. The second underground program tested targets at the intersections of high-angle, north-east striking faults and the low-angle Getchell fault. The third program tested for down-dip mineralization of the Footwall Pond. Two 5,575-foot (1,700-meter) holes were drilled from the surface and intercepted mineralization below the North Pillow basalt, about 1,150 feet (350 m) from the existing infrastructure. Two wedge holes were then drilled to follow up this intercept. A hole drilled at the North zone extension/footwall pond intercepted 49 feet (14.9 m) grading 0.28 opt (8.7 g/t) gold, extending mineralization 250 m further northward.

Refractory ore from Turquoise Ridge was processed at the Twin Creeks autoclave owned by Newmont Mining Corp. The toll milling contract between the two companies was for up 2,000 tons (1,800 tonnes) of milling capacity per day to be available for Turquoise Ridge ore. The contract expired in December. A new seven-year toll milling contract was agreed to whereby the milling capacity available will be 850,000 tons (771,000 tonnes) per year in 2018 and 2019 and 1,200,000 tons (1,088,000 tonnes) per year from 2020 through 2024. The underground mine is accessed by two shafts—1,770 feet (540 m) and 1,800 feet (550 m) in depth. In August, surface preparations commenced for the third shaft project, which will be a new production shafeet located closer to the current mining areas. The shaft will be sunk conventionally to a total depth of about 3,300 feet (1,000 m) and will have the ability to load skips at two levels. (Elko Free Press Mining Quarterly, Spring 2017; Barrick Gold Corp., Management Discussion and Analysis, 2/15/2018; Barrick Gold Corp. Annual Information Form, 3/23/2018; Barrick Gold Corp. website, www.barrick.com; Newmont Mining Corp. Form 10-K, 2/22/2018; Newmont Mining Corp. website, http://www.newmont.com)

Twin Creeks. Newmont Mining Corp. produced 374,740 ounces of gold and 181,104 ounces of silver at its Twin Creeks Mine, a 2% increase for gold and a 21% decrease for silver from 2016. The all-in sustaining cost was $756 per ounce, a 23% increase from 2016 due to lower sales and higher stockpile and leach pad inventory adjustments. Ore from the Vista pit is mainly oxide and goes to the Juniper mill. The Juniper mill processes higher-grade oxide ores by conventional milling for cyanide leaching and processed 805,000 tons (730,000 tonnes) of ore, a 27% decrease from 2016. The ore from the Mega pit is mainly refractory and goes to the Sage mill. The autoclaves at the Sage mill process higher-grade refractory ores and lower-grade material with suitable cyanide solubility for treatment on heap leach pads. The Sage mill processed 3,900,000 tons (3,540,000 tonnes) of ore, the same as in 2016. A new contract was implemented for refractory ore from the Turquoise Ridge Mine to be processed the Sage mill (see Turquoise Ridge). Brownfield exploration and development for new reserves is ongoing for both the open pits and underground mine. The company budgeted $12,000,000 for drilling in 2016 and 2017, but no details or results were released.

Mining commenced in August 2017 at the Twin Creeks Underground Mine with commercial production planned by July 2018. The mine is accessed from the inactive Vista open pit. The mine is expected to average between 30,000 and 40,000 ounces of gold annually between 2018 and 2022. Development capital costs since approval were $13,000,000, of which $9,000,000 was spent in the fourth quarter of 2017. Small Mine Development was contracted to build the mine, and the total cost of the mine was $42,000,000. The mine is located below and just north of the Vista pit. The portal is below two existing portals. The mineralization commonly occurs with older Cretaceous base metal veins and extends 1.4 miles (2.3 km) along a northeast-southwest-trending strike. It is also open along strike and at depth. The deposit varies between two feet (0.6 m) and 20 feet (6 m) wide and dips 65º to 70º. Significant intercepts of the Twin Creeks drilled in 2017 included 30 feet (9 m) grading 0.72 opt (22.4 g/t) gold and 53.5 feet (16.3 m) grading 0.68 opt (21.4 g/t) gold. (Elko Free Press Mining Quarterly, Winter 2017; Elko Daily Free Press 12/8/2017; Newmont Mining Corp. Investor Presentation, 9/2017, 9/2018; Newmont Mining Corp. news release, 7/3/2018; Newmont Mining Corp. Form 10-K, 2/22/2018; Newmont Mining Corp. website, http://www.newmont.com)

Red Butte District

Bonita. VR Resources, Ltd., completed four diamond drill holes totaling 6,136 feet (1,871 m) on its Bonita property on the east flank of the Jackson Mountains. The property contains a mafic alkaline, polyphase middle Jurassic pluton and minor early 20th century copper, gold, and iron workings. The company also conducted a rock chip sampling program and had induced polarization geophysical and ZTEM (Z-Tipper Axis Electromagnetic) surveys done prior to the drilling.

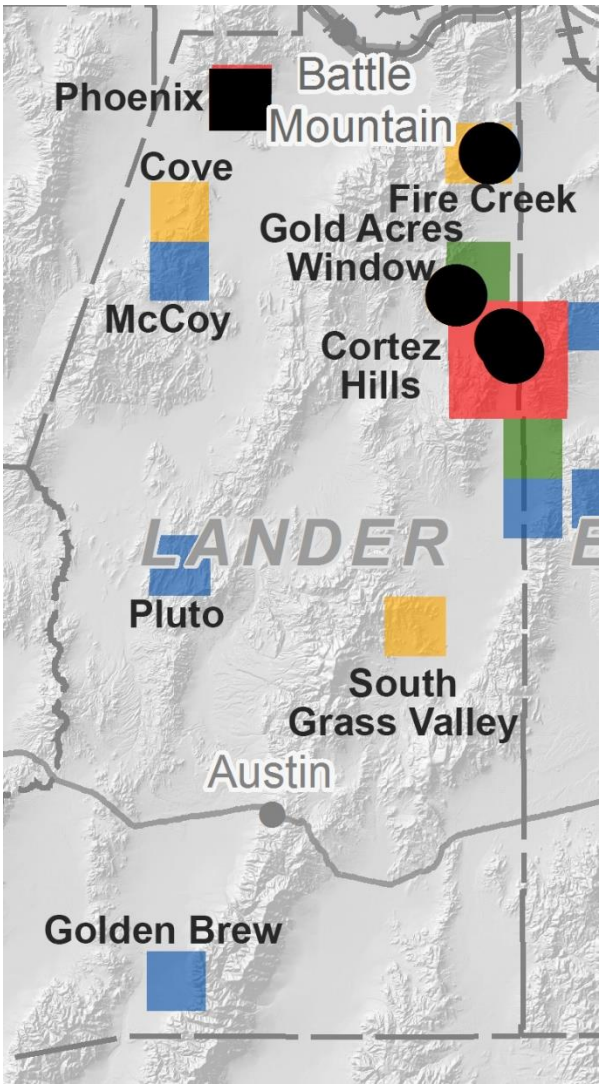
Two holes were drilled on the Copper Queen target and one on the Hemco target. One hole had to be abandoned but did end in mineralized alteration. The holes at Copper Queen drilled through propylitic, phyllic and, potassic alteration in gabbro, sodic diorite, and porphyritic monzodiorite dykes. One hole intercepted 672 feet (205 m) of hydrothermal breccia, quartz-sulfide veins with local chalcopyrite and anomalous copper and gold geochemistry. The other hole intercepted 1,112 feet (339 m) of iron carbonate-silica-specularite and silica-sulfide hydrothermal breccia with local copper and gold geochemical anomalies throughout. The Hemco hole drilled through a continuous, pervasive sodic and phyllic alteration in sodic diorite and monzodiorite dykes with specularite vein breccia and disseminated iron oxide throughout and copper veins occurring locally both near the surface and at depth. No assays were released.

The drilling program confirmed that the Jurassic porphyry hydrothermal system is delineated by sodic, phyllic, inner propyllitic and calc-potassic alteration; sheeted quartz-pyrite veins and quartz-pyrite vein stockworks in hydrothermal breccia zones; and porphyritic dykes within gabbro and sodic diorite. It also confirmed that the alteration and hydrothermal breccia zones with anomalous gold and copper mapped over a surface area of 4.5 by 4.5 miles (7 by 7 km) extend at least as deep as the holes were drilled, to 1,640 feet to 2,300 feet (500 to 700 m). (VR Resources, Ltd., Management Analysis and Discussions, 2/15/2018; VR Resources, Ltd., news releases, 4/26/2017, 5/11/2017, 5/24/2017, 6/21/2017, 6/27/2018, 7/13/2017, 8/24/2017, 1/9/2018; VR Resources, Ltd., website, https://vrr.ca)

Sulphur District

Hycroft. Hycroft Mining Corp., produced 1,866 ounces of gold and 6,067 ounces of silver, decreases of 92% and 97%, respectively from 2016. No drilling or other exploration activity was reported for 2017. The company focused on proving the viability of a heap leach oxidation process for the large transition and sulfide gold and silver deposits at the Hycroft. Two 5,000-ton (4,500-tonne) test heap leach pads on the two main ore domains from the Central and Brimstone deposits were conducted with successful results. The company completed feasibility studies for a mill processing plant that could handle the transition and sulfide ore at the Hycroft Mine and then successfully operated a 10-ton-per-day mill demonstration plant to measure its effectiveness in a continuous operating environment. It then commenced a new feasibility study for the sulfide heap leach oxidation process, which is expected to be completed by mid-2018. (Hycroft Mining Corp. news releases: 1/10/2018; Hycroft Mining Corp. website, http://www.alliednevada.com)

LANDER COUNTY



Battle Mountain District

Lewis. On June 14, 2017, Gold Standard Ventures Corp. bought out Battle Mountain Gold, Inc., and acquired its Lewis project. Battle Mountain Gold, Inc., had drilled the property in 2016. In September, Gold Standard Ventures Corp. announced a $1,500,000 drilling program, proposing 11 drill holes totaling 15,000 feet (4,600 m) on the property. However, the program had not started by year's end. The property covers 5,340 acres (2,161 hectares). (Battle Mountain Gold, Inc., news release, 2/21/2017, 6/15/2017; Gold Standard Ventures Corp., news release, 6/14/2017, 9/28/2017; Gold Standard Ventures Corp., website, https://goldstandardv.com).

Phoenix. Newmont Mining Corp. produced 197,026 ounces of gold, 1,191,630 ounces of silver, and

33,178,523 pounds of copper from its Phoenix Mine, 11% and 1% increases respectively for gold and silver and a 21% decrease for copper from 2016. The lower copper production was due to lower mill grade and throughput and lower copper leach placement. The all-in sustaining cost was $1,027 per ounce for gold, an 11% increase from 2016, and $2.09 per pound for copper, a 27% decrease from 2016. Phoenix is a skarn-hosted polymetallic deposit. The mine contains a mill that produces a gravity gold concentrate and a copper/gold flotation concentrate and recovers additional gold from cyanide leaching of the flotation tails. The mill processed 11,700,000 tons (10,600,000 tonnes) of ore, a 2.5% decrease from 2016. The mine also contains a copper leaching facility and a solvent extraction electrowinning facility to produce copper cathode. The mine has a surface fleet of three shovels and 16 240-ton (218-tonne) haul trucks. The BLM issued a draft environmental impact statement for the company's proposal to expand the pit and upgrade some of the related infrastructure. A final environmental impact was in preparation for release in July 2018. The proposal is to deepen the pit and to expand it to the east and west, which will extend the life of the mine from 2040 out to 2063. The mine's two main pits, the Fortitude and Bonanza Pits, will grow together into one big one to be called the Phoenix pit. The proposal is also to expand the copper leach facility, waste rock facilities, and tailings storage. The company spent $4,000,000 on advanced research and development projects and brownfield exploration to replace depleting reserves and/or enhance the recovery and processing of current reserves, though drilling details and results were not released. (BLM, Draft Environmental Impact Statement, DOI-BLM-NV-B010-2016-0009-EIS, 9/2017; BLM, Final Environmental Impact Statement, DOI-BLM-NV-B010-2016-0009-EIS, 7/2018; Newmont Mining Corp. Form 10-K, 2/22/2018; Newmont Mining Corp. website, http://www.newmont.com)

Bullion District

Fire Creek. Klondex Mines Ltd. produced 107,143 ounces of gold and 72,283 ounces of silver from its Fire Creek Mine, a 6% increase for gold and a 10% decrease for silver from 2016. The ore was shipped to its Midas mill, which processed 123,754 tons (112,269 tonnes) from Fire Creek, a 3% increase from 2016. The average mill head grades were 0.87 opt (29.8 g/t) for gold and 0.66 opt (22.6 g/t) for silver, 3% and 14% decreases respectively from 2016. The average recovery rates were 91.6% for gold and 82.1% for silver. The production cash cost was $479 per gold equivalent ounce, a 3% increase from 2016. The company spent $26,000,000 on capital and $2,800,000 on exploration. Development is planned to the northwest. The company issued two NI 43-101 technical reports with new resource and reserve estimates. On June 20, 2018, Hecla Mining Company acquired Klondex Mines Ltd. and all of its assets.

Fire Creek is a high grade, epithermal vein deposit vertically-zoned within high-angle northwest striking structures and consisting of low sulfidation mineralization hosted in a package of mid-Miocene basalts in the western half of the Northern Nevada Rift. The company completed 262 holes totaling 180,129 feet (54,917 m). On the surface, 29 core holes totaling 17,800 feet (5,427 m) and six reverse circulation holes totaling 5,835 feet (1,778 m) fitted with vibrating wire piezometers were completed. The surface drilling tested up-dip extensions of veins and structures above the present mine workings and extensions in all directions of the Zeus structural zone to the northwest. The remaining 227 holes totaling 156,494 feet were underground core holes drilled to test the up-dip extensions of veins and structures above the present mine workings for open pit analysis; veins west of the decline; and extensions of the Karen, Joyce, Vonnie, Hui Wu, and Honeyrunner veins in all directions.

Drilling of the northern and down dip extensions of the Vein 31, Honeyrunner and Karen veins from the northern most portion of the mine workings returned high grades and extended continuous mineralization on multiple veins northward along strike by about 750 feet (228.6 m) and 500 feet (152.4 m) down dip. The up-dip drilling along Vein 21, Joyce, Joyce Splay, Karen, and Honeyrunner veins returned significant assays along a cumulative strike of approximately 1,000 feet (304.8 m). Mineralization was extended up-dip above the existing mine workings by 50 to 200 feet (15.2 to 61.0 m). The drilling to the southwest returned a cluster of significant assays on previously known and unknown veins about 200 feet (61.0 m) from the present mine workings.

Significant intercepts from the underground drilling included: 6.3 feet (1.9 m) grading 0.91 opt (31.21 g/t) gold (Honeyrunner vein/Vein 59); 1.3 feet (0.4 m) grading 1.12 opt (38.50 g/t) gold (Karen vein); 17.3 feet (5.2 m) grading 0.77 opt (26.25 g/t) gold (Honeyrunner vein/Vein 55); 32.5 feet (9.9 m) grading 0.32 opt (10.95 g/t) gold (Honeyrunner vein); 5 feet (1.5 m) grading 1.61 opt (55.13 g/t) gold (Joyce vein); 1.5 feet (0.5 m) grading 2.68 opt (91.81 g/t) gold (Vein 31); 1.3 feet (0.4 m) grading 1.32 opt (45.33 g/t) gold (Honeyrunner vein); 31.2 feet (9.5 m) grading 0.45 opt (15.48 g/t) gold (Vein 21); 1.5 feet (0.5 m) grading 3.56 opt (122.01 g/t) gold (Vein 39); 1.3 feet (0.4 m) grading 1.70 opt (58.22 g/t) gold (Vein 39); 1.0 feet (0.3 m) grading 1.60 opt (55.01 g/t) gold (Vein 45); and 11.8 feet (3.6 m) grading 0.84 opt (28.69 g/t) gold including 2.2 feet (0.7 m) grading 1.66 opt (56.81 g/t) gold and 1.3 feet (0.4 m) grading 3.33 opt (114.01 g/t) gold (Vein 39/Joyce vein).

Significant surface drilling intercepts in the Zeus (formerly West) zone included: 1) 14 feet (4.3 m) averaging 1.27 opt (43.69 g/t) gold, including 1.7 feet (0.5 m) grading 8.25 opt (282.93 g/t) gold and 1.9 feet (0.6 m) grading 0.58 opt (19.71 g/t) gold; 2) 2 feet (0.6 m) grading 2.03 opt (69.43 g/t) gold; and 3) 15.7 feet (4.8 m) grading 0.18 opt (6.08 g/t) gold. (Klondex Mines Ltd. news release, 9/14/2017, 11/15/2017, 7/23/2018; Klondex Mines Ltd. NI 43-101 Technical Reports, 11/30/2017, 2/5/2018; 7/23/2018; Klondex Mines Ltd. Annual Report, 3/14/2018; Hecla Mining Co. website, http://www.hecla-mining.com)

Pipeline Complex/Gold Acres. Production figures for Barrick Nevada's Pipeline complex open are combined with those for the Cortez Hills open pit reported below. The company included Pipeline and Gold Acres in its Cortez drilling program, but no details were released. Pipeline is hosted in silty carbonates associated with the Silurian to Devonian Roberts Mountains Formation, the Devonian Wenban Limestone, and Devonian Horse Canyon unit. The mineralization in the Pipeline deposit extends up to about 5,250 feet along strike with a maximum width of about 3,900 feet (1,200 m). The mineralized zone starts about 200 feet (60 m) below surface and continues down to a depth of more than 2,000 feet (600 m). Capital expenditures included stripping and dewatering at the Crossroads open pit. Open pit mining at the Pipeline Complex is expected to last through 2027. (Elko Daily Free Press Mining Quarterly, Spring 2018; Barrick Gold Corp. Management Discussion and Analysis, 2/15/2018; Barrick Gold Corp. Annual Information Form, 3/23/2018; Barrick Gold Corp. website, https://www.barrick.com)

Robertson. Barrick Cortez, Inc., a subsidiary of Barrick Gold Corp., bought the Robertson Property from Coral Gold Resources Ltd. for $15,750,000, a return of Coral Gold Resources stock, and a sliding scale 1% to 2.25% net smelter return. The property consists of 415 unpatented claims and nine patented claims covering 8,480 acres (3,432 hectares). The property includes the Core, Gold Ridge, Excluded, and the RUF mining claims, but not the Norma, Sass, Eagle, and JDN mining claims. The known gold deposits at Robertson are hosted by upper plate rocks of the Roberts Mountain allochthon. Barrick did complete a drill program at Robertson, but no results were released. (Coral Gold Resources, Ltd., news release, 6/8/2017, 9/27/2017; Barrick Gold Corp. Annual Information Form, 3/23/2018; Barrick Gold Corp. website, https://www.barrick.com)

Callaghan Ranch District

South Grass Valley. Between November 2017 and early January 2018, Nevada Exploration, Inc., using a Scorpion drill rig, completed 61 infill holes totaling 19,234 feet (5,864 m) on its South Grass Valley property. The holes averaged 315 feet (96 m) deep. Both groundwater and bedrock were sampled. The program's objectives were to establish the extent, size, and magnitude of the gold-in-groundwater footprint at South Grass Valley and its relationship to the larger geologic setting. Forty-one holes penetrated bedrock at an average depth of 275 feet (84 m). The combined bedrock and groundwater sampling programs defined two clusters of greater than 0.0029 opt (0.1 g/t) gold in bedrock. The clusters cover 2,300 by 1,000 feet (700 by 300 m) and 3,300 by 2,000 feet (1,000 by 600 m). The property consists of 491 unpatented mining claims covering 8.6 square miles (22.1 square km). (Nevada Exploration, Inc., Management Discussion and Analysis, 8/27/2018; Nevada Exploration, Inc., news releases, 10/16/2017, 1/16/2018, 1/22/2018; Nevada Exploration, Inc., website, http://www.nevadaexploration.com)

Cortez District

Cortez Hills. Barrick Gold Corp. produced 902,887 ounces of gold and 28,690 ounces of silver from its Pipeline and Cortez Hills open mines, increases of 74% and 27% respectively from 2016. Barrick also produced 336,063 ounces of gold and 55,284 ounces of silver from its Cortez Hills underground mine, a 0.7% decrease for gold and a 778% increase for silver from 2016. For all of the production at Barrick's Cortez Mine (Cortez Hill and Pipeline, open pit and underground), 148,263,000 tons (134,503,000 tonnes) of material were mined and 17,475,000 tons (15,853,000 tonnes) of ore with an average grade of 0.091 opt (3.1 g/t) gold were processed, an 8% increase in material mined, a 37% decrease in ore processed, and a 89% increase in grade from 2016. Mining at the Cortez Hills complex is scheduled through 2019 at the open pit and through 2029 underground.

The company completed 155 drill holes totaling 141,102 feet (43,019 m) at Cortez, which included both Cortez Hills, Gold Acres, Pipeline, and Robertson. No details were released. Spacing ranged from 300 feet to 1,000 feet (100 meters to 300 m) for earlier stage projects to 50 feet to 150 feet (15 meters to 45 m) for resource and reserve delineation programs. Drilling in the Cortez Hills area is conducted from surface and underground platforms. Mineralization remains open at depth. In the Renegade zone, exploration continued to further define the limits of mineralization to the northwest and southeast. Cortez Hills consists of the Breccia, Middle, Lower, Renegade, and Deep South

zones, and the Pediment deposit. The mineralization extends up to about 4,250 feet (1,300 m) along strike with a maximum width of about 1,380 feet (420 m). The mineralized zone starts about 390 feet (120 m) below surface and continues down to a depth of more than 2,000 feet (600 m), where it remains open at depth in the Renegade zone.

The grade and metallurgical character of the ore determine the type of processing. Lower grade run-of-mine oxide ore is heap leached at the existing facilities. Higher-grade non-refractory ore is treated in a conventional mill using cyanidation and the CIL process. Refractory ore is stockpiled on site in designated areas and trucked to Goldstrike for processing. The mill throughput varies between 11,500 to 15,000 tons (10,430 and 13,600 tonnes) per day depending on the hardness of the ore being processed.

Capital expenditures included the underground development of the Cortez Hills Lower zone and construction of the range front declines. The twin range front declines are part of the Deep South project. The Deep South zone contains 1,900,000 ounces of proven and probable reserves of which about 60% is oxide. However, it is currently beneath permitted areas of the Lower zone in the underground mine, which necessitated a submission of an amendment to the mine plan of operation to the BLM in 2016. The preparation of an environmental impact statement and permitting are underway with an anticipated initial production date of 2022 or 2023. The twin range front declines will access the Deep South zone and are being cut with a continuous tunnel boring machine referred to as a roadheader. (Barrick Gold Corp. Management Discussion and Analysis, 2/15/2018; Barrick Gold Corp. Annual Information Form, 3/23/2018; Barrick Gold Corp. website, http://www.barrick.com)

Golden Trend. Kinross Gold Corp. carried out a minor deep drilling program ~4.5 miles (~7.3 km) south of Barrick Gold's Goldrush deposit. No results were released. The underlying claimant is Rubicon Resources LLC) (BLM LR2000 database).

McCoy District

Cove. Premier Gold Mines Ltd. completed 26 reverse circulation and core holes totaling about 55,760 feet (over 17,000 m) at the Cove portion of its McCoy-Cove project. The drilling focused on defining and expanding mineralization in the existing gold horizons and testing additional targets on the property. Significant intercepts in the Helen zone included: 1) 19.5 feet (5.9 m) grading 0.86 opt (29.52 g/t) gold and 0.25 opt (8.48 g/t) silver; 2) 47 feet (14.3 m) grading 0.58 opt (19.72 g/t) gold and 0.21 opt (7.29 g/t) silver; 3) 23.5 feet (7.2 m) grading 0.38 opt (13.13 g/t) gold and 0.03 opt (0.93 g/t) silver; and 4) 18 feet (5.5 m) grading 0.27 opt (9.31 g/t) gold and 0.35opt (12.11 g/t) silver. Significant intercepts in the CSD Gap zone included: 1) 8 feet (2.4 m) grading 0.56 opt (19.37 g/t) gold and 0.33 opt (11.28 g/t) silver; 2) 9.7 feet (3 m) grading 0.52 opt (17.73 g/t) gold and 3.06 opt (104.9 g/t) silver; 3) 11 feet (3.4 m) grading 0.49 opt (16.75 g/t) gold and 0.1 opt (3.55 g/t) silver; and 4) 9.5 feet (2.9 m) grading 0.25 opt (8.69 g/t) gold and 0.04 opt (1.53 g/t) silver. The most significant intercepts in the Windy Hill zone to the north of Cove included: 657 feet (200.3 m) averaging 0.019 opt (0.65 g/t) gold and 0.009 opt (0.31 g/t) silver, including 6 feet (1.8 m) grading 0.21 opt (7.11 g/t) gold and 0.007 opt (0.25 g/t) silver. A hole drilled on a target 0.6 miles (1 km) south of Cove intercepted 8 feet (2.4 m) grading 0.18 opt (6.07 g/t) gold and 0.11 opt (3.7 g/t) silver. The company issued an NI 43-101 technical report with updated resources.

The mineralization is hosted in Triassic rocks consisting mainly of limestone with lesser amounts of conglomerate, sandstone, and dolomite and with most of the historic production coming from the Augusta Mountain Formation. The Cove deposit consists of the Helen, CSD Gap, CSD, and 2201-VG zones. The Carlin-type mineralization within the first three zones makes up about 85% of the existing resource with high grade gold and silver contained in both stratabound and structurally controlled mineralization at the intersection of the Cove anticline and favorable lithologic beds, structures, dikes, and sills. The polymetallic 2201-VG zone is a separate deposit from the shallower Carlin-style mineralization and may be a structurally controlled sheeted vein system. Veining trends southeast-northwest and is controlled by a northwest striking reverse fault.

The mineralization occurs in four distinct types as follows: 1). Carlin-style (gold-silver), where gold and silver are mainly sub-micron in size and generally occurs in pyrite and arsenical pyrite. An envelope characterized by decalcification, silicification, and argillization accompanied by anomalous amounts of silver, arsenic, antimony, thallium, and mercury commonly accompanies mineralization. This type of mineralization at Cove is relatively rich in silver compared to similar deposits elsewhere in northern Nevada; 2). Polymetallic Sheeted veins (gold-silver+/-lead-zinc) mineralization, charactierized by polymetallic veins with electrum and silver-bearing, along with base metals sulfides occurring in the 2201-VG zone are enveloped by a zone of illitization of the conglomerate matrix. Minor silicification is relatively common, especially in the conglomerate; however, it is not present everywhere and not always directly associated with mineralization; 3). Carbonate replacement (silver-lead-zinc+/-gold), characterized by manto-style replacement mineralization characterized

by massive sulfide (pyrite-sphalerite-galena) replacing basal limestone at the Dixie Valley/Favret contact. Mineralization is discontinuous and generally defined by high-grade silver-zinc-lead+/-gold; and 4). Skarn (gold-silver+/-copper) mineralization at the McCoy pit occurs as both endoskarn and exoskarn mineralization characterized by a predominantly garnet-diopside-magnetite mineral assemblage. (Premier Gold Mines, Ltd., news releases, 3/21/2017, 4/12/2017, 7/26/2018; Premier Gold Mines, Ltd., NI 43-101 Technical Report, 4/15/2017; Premier Gold Mines, Ltd., Annual Information Form, 4/2/2018; Premier Gold Mines, Ltd., website, http://www.premiergoldmines.com)

Ravenswood District

Pluto. S2 Resources, Ltd., headquartered in Scarborough, Australia, completed four reverse circulation holes totaling 4,600 feet (1,402 m) on the Pluto project at the north end of the Ravenswood District. At the project site, the Mississippian-Pennsylvanian Havallah sequence is thrusted over the Permian Antler sequence along the Golconda Thrust. Gravity survey data suggested a potential horst of Antler sequence limestones at relatively shallow depths. Surface chip samples from siltstone in the Havallah sequence assayed up to 0.38 opt (13.1 g/t) gold. The underlying Antler sequence is considered to be more favorable for gold mineralization. The drilling program tested the horst for Antler sequence rocks at shallow depths. Unfortunately, all four holes bottomed in Havallah sequence rocks and returned no significant gold values.

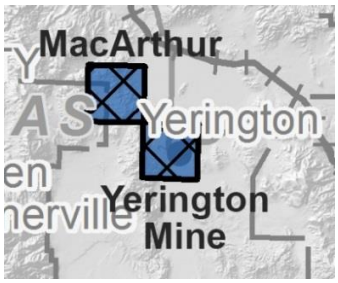
In July, Star Exploration, LLC, a subsidiary of S2 Resources, Ltd., signed an agreement with Renaissance Gold, Inc., whereby the former may earn up to 70% interest on the Pluto, South Roberts, and Ecru projects by spending $3,000,000 within 5 years with $200,000 being spent on each project by the second anniversary of the agreement. After receiving the disappointing drill data, S2 Resources, Ltd., dropped the part of the option concerning the Pluto project. (S2 Resources, Ltd., Quarterly Reports, 1/22/2108, 4/26/2018; S2 Resources, Ltd., website, http://www.s2resources.com.au; Renaissance Gold Corp., news release, 10/26/2018; Renaissance Gold Corp., Management Discussion and Analysis, 2/22/2018; Renaissance Gold Corp., website, http://www.rengold.com).

West of Kingston District

Golden Brew. Regulus Resources, Inc. completed five reverse circulation holes totaling 9,640 feet (2,939 m). Detailed results were not released. The widely-spaced drilling tested zones of structural complication, gravity lows, and magnetic lows in what is interpreted to be a Carlin type arsenic-antimony-gold system located within an uplifted horst block on the western edge of a shallowly buried lower plate window. The area of interest is outboard of a large zone of gold mineralization of up to 0.12 opt (4 g/t) gold in jasperoid exposed on the lower slopes of the Toiyabe Range. The jasperoid covers an area of 2,500 feet (760 m) by 200 feet (60 m). All holes intersected bedrock beneath 680 feet (207 m) and 1,539 feet (466 m) of post-mineral valley fill. All holes intersected deeply oxidized sections of thinly bedded silty limestone with oxidation consisting of pervasive limonite/hematite staining that was accompanied locally by weak to moderate decalcification. This alteration contains some areas of highly elevated arsenic (up to 828 ppm) and antimony (up to 812 ppm) with anomalous gold (up to 67 ppb).

Regulus Resources, Inc. has an option agreement with Highway 50 Gold Corp. whereby the former can earn a 50% interest in the Golden Brew project by expending $5,000,000 on exploration over a five-year period. The property consist of 153 claims. Once the 50% earn-in is satisfied, the parties will form a joint venture on a 50/50 basis. The minimum $500,000 for the first year was delayed when the permitting process was slowed due to a sage grouse lek near the site. The two companies eventually received drilling permits with some restrictions from the U.S. Forest Service. (Regulus Resources, Inc., news releases, 8/16/2017, 1/4/2018; Regulus Resources, Inc., Management Discussion and Analysis, 1/25/2018, 3/1/2018; Regulus Resources, Inc., website, http:www.regulusresources.com; Highway 50 Gold Corp., website, http://www.highway50gold.com).

LYON COUNTY



Yerington District

Yerington. Quaterra Resources Inc. and its subsidiary Singatse Peak Services LLC completed 13 reverse circulation and core holes totaling 26,056 feet (7,944 m) at its Yerington copper project, which covers 51 square miles (131 square km) and includes the Yerington Mine, the MacArthur Mine, and the Bear deposit. Drilling in 2017 discovered additional sulfide copper mineralization in, around, and at least 800 feet (245 m)

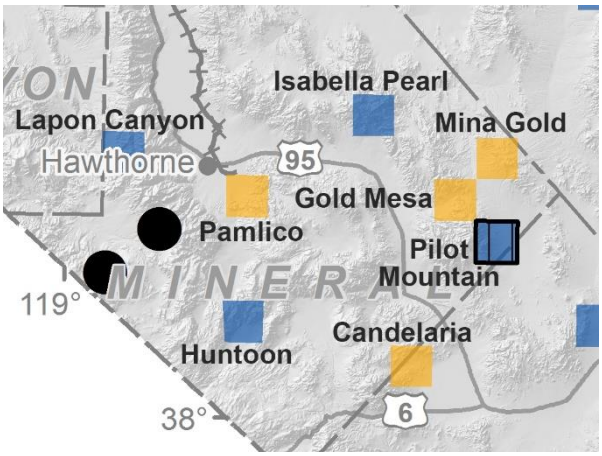
below the Yerington pit, and explored for primary sulfide mineralization below the MacArthur oxide deposit.

Four reverse circulation holes were drilled in the greater MacArthur area. At a depth of 850 feet (260 m), one hole intercepted 30 feet (10 m) of endoskarn averaging 0.27% copper. None of the other holes contained significant mineralization, including two additional wildcat holes drilled on the far northern and eastern parts of the property. Five reverse circulation and core holes tested the depth extension of mineralization in and around the historic Yerington pit. Significant intercepts included 1) 15.8 feet (4.8 m) grading 0.55% copper; 2) 1,297 feet (395 m) averaging 0.15% copper, including 74 feet (22.6 m) grading 0.23% copper and 64 feet (19.5 m) averaging 0.26% copper; 3) 231.6 feet (70.6 m) averaging 0.15% copper, including 85.5 feet (26 m) grading 0.23% copper and 17.8 feet (5.4 m) grading 0.28% copper; and 4) 561.7 feet (171.3 m) averaging 0.2% copper, including 34.5 feet (10.5 m) grading 0.31% copper and 61.3 feet (18.7 m) grading 0.33% copper.

Freeport-McMoRan Nevada, LLC, a subsidiary of Freeport-McMoRan Inc. spent $14,540,000 on the exploration and drilling project carried out by Quaterra as part of an option agreement to earn a 55% interest in the project. However, Freeport-McMoRan Nevada, LLC, terminated the agreement in September. (Quaterra Resources, Inc., news releases, 1/19/2017, 3/29/2017, 8/2/2017, 9/13/2017, 10/26/2017; Quaterra Resources, Inc., Management Discussion and Analysis, 3/28/2017; Quaterra Resources, Inc., website, http://www.quaterra.com)

Pumpkin Hollow. Nevada Copper Corp. maintained its Pumpkin Hollow project's "construction ready" status and spent $4,755,000 on engineering and feasibility studies, underground development, "site costs", water rights, and permits on the property. No exploration activities were reported. No drilling was conducted during 2016 or 2017, but a 33,000-foot (10,000-meter) drilling program commenced in early 2018. The project will involve both open pit and underground mining with production planned to start in 2019. In December, the company received a $378,000,000 construction financing and recapitalization package to move ahead with the project. The company issued an NI 43-101 technical report and a second amended one containing feasibility studies for two development options but with no new resource estimates. (Nevada Copper Corp. news releases, 11/30/2017, 11/28/2017, 12/22/2017, 2/26/2018; 5/15/2018; Nevada Copper Corp. Annual Information Form, 3/28/2018; Nevada Copper Corp. NI 43-101 Technical Reports, 9/15/2017, 1/3/2018; Nevada Copper Corp. website, http://www.nevadacopper.com)

MINERAL COUNTY



Aurora District

Aurora. Klondex Mines, Ltd., resumed production at the Aurora Mine in 2017 with an output of 922 oz of gold and 4,854 oz of silver. The property was formerly known as the Esmeralda property and contains the Esmeralda mill. Production last occurred in 2009. No ore was mined in 2017, but the mill reprocessed 9,563 tons (8,848 tonnes) of tailings. The average mill head grades were 0.15 opt (5.1 g/t) for gold and 1.59 opt (54.5 g/t) for silver. The average recovery rates were 63.5% for gold and 31.0% for silver. The mill is rated at 350 tons (318 tonne) per day. The company conducted rehabilitation work on the carbon stripping and carbon regeneration circuits and the mill, throughout the year. This allowed for commencement of production from tailings in the fourth quarter of the year, and for considering using the mill for ore tolling. On June 20, 2018, Hecla Mining Company acquired Klondex Mines Ltd. and all of its assets. (Klondex Mines Ltd. news release, 7/23/2018; Klondex Mines Ltd. 10-K Report, 3/14/2018; Hecla Mining Co. website, http://www.hecla-mining.com)

Bell District

Mina Gold. Gold Resource Corp. completed 28 reverse circulation holes totaling 13,002 feet (3,964 m) on its Mina Gold property. The drilling targeted expansion to depth of known high-grade gold mineralization at the surface on the patented claims and included five condemnation holes for a proposed heap leach site. No results were released. (Gold Resource Corp. news release, 7/16/2017; Gold Resource Corp. Form 10-K, 3/8/2018; Gold Resource Corp. website http://www.goldresourcecorp.com)

Candelaria District

Candelaria. In December, Silver One Resources Inc. completed 27 sonic holes totaling 3,641 feet (1,110 m) on the historic heap leach pads and stockpiles on its Candelaria Silver project. Seventeen holes were drilled on a 660-foot (200-meter) spaced rectangular grid on Leach Pad No. 1. Ten holes were drilled on a 330-foot (100-meter) spaced rectangular grid on Leach Pad No. 2. Sixteen holes were drilled on a 160-foot (50-meter) to 250-foot (75-meter) spaced rectangular grid on the stockpiles. Silver assays from the drill holes ranged from 0.47 opt to 3.2 opt (16 g/t to 111 g/t) (1.25 opt (43 g/t) average). Furthermore, the cyanide soluble silver from the drill holes ranged from 35% to 77% (56% average). The results are encouraging, considering the heaps were partially leached by Kinross and others during past operations. In January of 2017, Silver One Resources, Inc., entered into an option agreement with a subsidiary of Silver Standard Resources, Inc., whereby Silver One Resources can acquire a 100% interest in the Candelaria Silver project. (Silver One Resources, Inc., news releases, 6/6/2017, 10/31/2017, 11/28/2017, 1/3/2018, 3/5/2018, 6/18/2018; Silver One Resources, Inc., Management Discussion and Analysis, 4/24/2018; Silver One Resources, Inc., website, https://www.silverone.com)

Borealis District

Borealis. Borealis Mining Co., LLC, produced 300 ounces of gold and 508 ounces of silver from its Borealis oxide heap leach mine, declines of 51% and 66% respectively from 2016. Borealis Mining Co. LLC was a subsidiary of Gryphon Gold Corp. but is now managed by Elko Mining Group, LLC, a subsidiary of Water Global L.P. The operation leached material from existing heap leach pads. No drilling or other exploration work was reported.

Huntoon District

Huntoon. Great Western Mining Corp., PLC, completed two core holes on the M1 deposit on the Huntoon property. Significant intercepts included 9 feet (2.7 m) grading 0.045 opt (1.528 g/t) gold; 10 feet (3.1 m) grading 0.035 opt (1.187 g/t) gold; and 5.2 feet (1.6 m) grading 0.62% copper. A resource estimate for the M2 prospect was released in February. The copper and gold occurs with hematite and magnetite, and the resource was modelled as an iron oxide-copper-gold (IOCG) stringer zone projecting up dip from a thicker, more consistent, diorite-hosted core hosted underneath Sharktooth Peak on Boss Mountain. The IOCG mineralization under Boss Mountain is estimated to be 2.5 miles by 0.6 miles (4 km by 1 km) and open to the southwest.

In August 2016, Great Western Mining Corp., PLC, and Crown Point Gold and Silver Mining Co. signed the Huntoon Mine Area Cooperation Agreement. The companies own adjoining claim blocks, and the agreement provides for the sharing of operational resources, giving Great Western Mining Corp. enhanced ground facilities, and allowing Crown Point Gold and Silver Mining Co. to follow any commercially exploitable veins originating on its own claim area into Great Western's area, with any consequent profits shared between the two companies. (Great Western Mining Corp., news releases, 2/22/2017, 7/4/2017, 9/14/2017, 11/23/2017; Great Western Mining Corp., Annual Report, 12/31/2017; Great Western Mining Corp., Half-Year Report, 6/30/2017; Great Western Mining Corp., website, http://www.greatwesternmining.com)

Marietta District

M2/M4. Great Western Mining Corp PLC commenced a 42-hole in-fill drilling program at M2 on the Black Mountain group of claims. The area drilled included the inferred resource and the Sharktooth discovery. The program was designed to upgrade the inferred resource to a measured and indicated resource and increase the overall tonnage of ore suitable for open pit mining. No results were released. The company also commenced a six-hole drilling program at M4 on the Golconda fault Line group of claims, which are adjacent to and south of the Black Mountain group. The program tested the thickness of surface copper oxide mineralization, and to test induced polarization geophysical anomalies. Three holes were completed, but no results were released. (Great Western Mining news releases, 6/12/2017, 9/14/2017, 10/10/2017, 4/6/2018, 5/23/2018; Great Western Mining website, http://www.greatwesternmining.com)

Mount Grant District

Lapon Canyon. Walker River Resources Corp. drilled nine reverse circulation holes totaling 5,609 feet (1,710 m) at its Lapon Canyon gold project, located on the western flank of the Wassuk Range. The drilling program was designed to expand existing gold mineralization zones and to find and delineate new ones. Significant intercepts included 1) 30 feet (9.2 m) averaging 0.38 opt (12.85 g/t) gold, including 5 feet (1.5 m) grading 0.95 opt (32.6 g/t) gold and 5 feet (1.5 m) grading 0.77 opt (26.2 g/t) gold; 2) 10 feet (3 m) averaging 0.61 opt (21.03 g/t) gold, including 5 feet (1.5 m) grading 1.17 opt (40 g/t) gold; 3) 30 feet (6.1 m) averaging 0.54 opt (18.6 g/t), including 5 feet (1.5 m)

grading 1.56 opt (53.4 g/t) gold; and 5) 45 feet (13.7 m) averaging 0.54 opt (18.4 g/t), including 5 feet (1.5 m) grading 3.88 opt (133 g/t) gold.

The mineralization is contained in a broad, altered, fractured, and brecciated northeast-trending structural zone called the Lapon Rose zone. This zone contains many areas of anomalous gold with the higher grades located in sub-vertical en echelon zones of intense alteration. (Walker River Resources Corp. news releases, 7/19/2017, 10/4/2017, 11/8/2017, 11/27/2017; Walker River Resources Corp. Management Discussion and Analysis, 4/3/2018, 4/26/2018; Walker River Resources website, http://www.wrrgold.com).

Pamlico District

Pamlico. In July 2016, Newrange Gold Corp., then called Columbian Mines Corp., entered into an option agreement to acquire the Pamlico project for $4,000,000 payable over four years. In 2017, Newrange Gold completed 47 reverse circulation holes totaling 18,567 feet (5,661 m) in two phases on the Pamlico property. Phase I was drilled in the Merritt decline area. Significant intercepts included 1) 40 feet (12.2 m) grading 1.45 opt (49.5 g/t) gold; 2) 5 feet (1.5 m) grading 9.95 opt (340.9 g/t) gold; 3) 232 feet (71 m) averaging 0.1 opt (3.57 g/t) gold, including 15 feet (4.6 m) grading 1.28 opt (43.8.6 g/t) gold and 2.5 feet (0.76 meter) grading 7.13opt (244.3 g/t) gold; and 4) 70 feet (13.7 m) averaging 0.4 opt (13. 7 g/t) gold, including 30 feet (9.15 m) grading 0.81 opt (27.8 g/t) gold, 15 feet (4.6 m) grading 1.31 opt (44.9 g/t), and 5 feet (1.5 m) grading 2.48 opt (84.9 g/t) gold.

Phase II was drilled in the Merritt area. Significant intercepts in the N zone included 1) 70 feet (21.3 m) averaging 0.12 opt (4.2 g/t) gold, including 5 feet (1.5 m) grading 1.34 opt (45.9 g/t) gold; and 2) 10 feet (3 m) grading 0.37 opt (12.6 g/t) gold. Significant intercepts in the J zone included 1) 120 feet (36.6 m) averaging 0.11 opt (3.7 g/t) gold, including 5 feet (1.5 m) grading 1.89 opt (64.9 g/t) gold; and 2) 50 feet (15.2 m) averaging 0.24 opt (8.3 g/t) gold, including 5 feet (1.5 m) grading 1.3 opt (44.4 g/t) gold; Significant intercepts in the K zone included 1) 175 feet (53.4 m) averaging 0.069 opt (2.4 g/t) gold ,including 15 feet (4.6 m) grading 0.24 opt (8.3 g/t) gold; and 3) 15 feet (4.6 m) grading 0.49 opt (16.9 g/t) gold.

The company also conducted 248 feet (75.5 m) of channel sampling in the Merritt decline. The sampling cut four high grade ore zones. The highest results for the Right Rib were: 1) Zone 1, 45 feet (13.8 m) grading 0.503 opt (17.25 g/t) gold; 2) Zone 2, 15 feet (4.6 m) grading 0.316 opt (10.8 g/t) gold; and 3) Zone 3, 15 feet (44.2 m) grading 0.027opt (0.9 g/t) gold. The highest result for the Right Rib was Zone 1, 5 feet (1.5 m) grading 3.055 opt (104.75 g/t) gold. The average for the whole channel was 0.085 opt (2.9 g/t) gold.

The geology consists of a complex structural setting with volcanic rocks juxtaposed against sedimentary rocks by numerous high and low angle faults. A series of high-angle northwesterly to northeasterly trending faults host most of the gold mineralization. The most recent exploration discovered six high-grade gold zones, designated J, K, L, M, N and O, which make up a northwest-oriented gold corridor. The corridor is at least 220 feet (65 m) wide, and historic mining and recent mapping indicate it may be in a wider corridor up to 800 feet (245 m) wide. The mineralization is deeply oxidized and is dominated by coarse, free gold. The oxidized mineralization extends to at least 800 feet (245 m) below the surface. (Newrange Gold Corp. news releases, 5/10/2017, 6/19/2017; Newrange Gold Corp. Management Discussion and Analysis, 12/28/2018, 4/3/2017; Newrange Gold Corp. website, http://www.newrangegold.com).

Pilot Mountains District

Pilot Mountain. Thor Mining LLC completed three reverse circulation and diamond core holes on the Desert Scheelite deposit totaling 1,653 feet (504 meter), six reverse circulation holes on the Garnet deposit, and one reverse circulation hole to 144 feet (44 m) on the Good Hope deposit, all part of its Pilot Mountain Tungsten project. The drilling tested for extensions of the deposit. The objective of drilling the Garnet and Good Hope deposits was to validate select intercepts in holes drilled by Union Carbide in the late 1970s.

The best intercept at the Desert Scheelite deposit was 46 feet (13.9 m) grading 0.89% WO_3, 1.8% copper, and 2.2% zinc. The best intercept at the Garnet deposit included 1) 17 feet (5.3 m) grading 1.0% WO_3 and 0.9% zinc. The best intercept at the Good Hope deposit was 90 feet (27.4 m) averaging 0.19% WO_3, 1.1% copper, and 1.3% zinc, including 33 feet (10 m) grading 0.32% WO_3.

The Pilot Mountain project contains four tungsten deposits: Desert Scheelite, Garnet, Good Hope, and Gunmetal. The deposits are scheelite-bearing garnet-epidote skarns with some quartz formed by quartz monzonite intruding limestone beds. The skarns also commonly contain sulfides including pyrite, chalcopyrite, and sphalerite along with some powellite and molybdenite. About 500 units of WO_3 were produced from 1,620 tons of ore mined from the Desert Scheelite Mine between 1941–1943 and 1952–1957. About 215 units of WO_3 were produced from 1,125 tons of ore mined from the Garnet Mine between 1941–1943 and in 1953. About 23,000 units of WO_3 were produced from 1,125 tons of ore mined from the Gunmetal Mine in 1925, 1929, 1933, and between 1940–1943 and 1951–1956. The Good Hope deposit consists of a small inlier or window of mineralized skarn exposed within an area

overlain by younger volcanic rocks and contains some minor workings. The drilling resulted in an upgrade of the Desert Scheelite resource estimate and a resource estimate for the Garnet deposit. (NBMG Bulletin 105, 1988; Thor Mining, LLC, news releases, 12/16/2016, 3/16/2017, 5/22/2017, 8/18/2017; Thor Mining, LLC, website, http://www.thormining.com).

Rawhide District

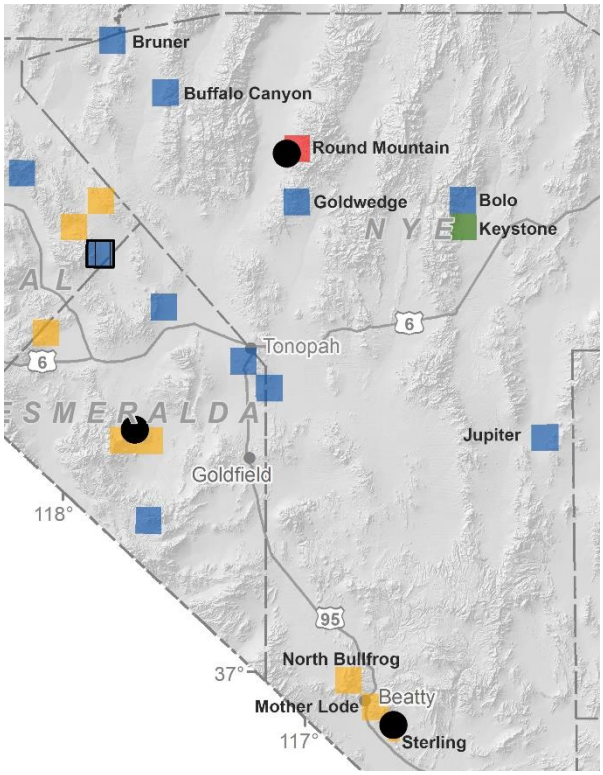
Denton-Rawhide. Rawhide Mining LLC produced 18,379 ounces (572 kg) of gold and 213,481 ounces (6,640 kg) of silver from its wholly owned Denton-Rawhide Mine, increases of 2% and 103% respectively from 2016. The company has been leasing the Buckskin Rawhide East Property from Emgold Mining Corp. since 2012. Rawhide Mining LLC proposed to amend its plan of operation to expand its mining operation onto Regent property. The proposed plan of operation amendment also calls for allowing near future exploration at four proposed exploration targets located west of current operations. The targets are collectively referred to as the Western Exploration Target area and are individually called the North Buckskin project, the Toiyabe project, the Black Eagle project, and the Chicago Gulch project. Eleven holes were drilled on the Chicago Gulch project in 2013. (Rawhide Mining, LLC, Amended Plan of Operation, 9/28/2016, 6/2017, 10/2017; U.S. Bureau of Land Management, Environmental Assessment, DOI-BLM-NV-C010-2018-0015-EA 7/2018; Emgold Mining Corp., Emgold Mining Corp. Management Discussion and Analysis, 4/23/2018; Emgold Mining Corp. website, http://www.emgold.com).

Santa Fe District

Gold Mesa (Clay Peters). Gold Resource Corp. completed 68 shallow reverse circulation holes totaling 6,347 feet (1,935 m) on its Gold Mesa property. The property includes the old Clay Peters project site. The drilling tested for extensions of areas of surface and near surface high-grade gold mineralization discovered during previous drilling programs. Significant intercepts included 1) 15 feet (4.6 m) averaging 0.28 opt (1.0 g/t) gold and 5.4 opt (185 g/t) silver, including 10 feet (3.05 m) grading 0.039 opt (1.3 g/t) gold and 7.07 opt (242 g/t) silver; and 2) 30 feet (9.14 m) averaging 0.046 opt (1.59 g/t) gold, including 15 feet (4.57 m) grading 0.083 opt (2.85 g/t gold). The gold intercepts were at depths of less than 100 feet (30 m). (Gold Resource Corp. news releases, 3/21/2017, 6/22/2017, 8/30/2017; Gold Resource Corp. Form 10-K, 3/8/2018; Gold Resource Corp. website http://www.goldresourcecorp.com)

Isabella Pearl. Gold Resource Corp. completed five reverse circulation holes totaling 4,447 feet (1,356 m) as a condemnation drilling program in the proposed heap leach area on its Isabella Pearl property. Also, a reconnaissance geological mapping and rock chip sampling delineated a new, high-grade gold target area on the surface located along strike to the northwest of the deposit. No results from the drilling or sampling programs were released. An updated proven and probable reserve was released. (Gold Resource Corp. news release, 4/19/2018; Gold Resource Corp. Form 10-K, 3/8/2018; Gold Resource Corp. website http://www.goldresourcecorp.com)

NYE COUNTY



Bare Mountain District

Mother Lode. Corvus Gold, Inc., completed a Phase I drilling program consisting of 42 holes totaling 42,079 feet (12,829 m) on its Mother Lode property, near Beatty. The drilling program was designed to confirm and expand an early resource estimate, acquire representative material for metallurgical testing, and define the key ore controls on high-grade mineralization. The four targets were the Main, Northern Extension, Western Extension, and FCF zone.

Significant intercepts in the Main target included 1) 196 feet (59.8 m) averaging 0.057 opt (1.95 g/t) gold and 0.039 opt (1.32 g/t) silver, including 81 feet (24.7 m) grading 0.11 opt (3.67 g/t) gold and 0.11 opt (3.67 g/t) silver and 36 feet (11 m) grading 0.17 opt (5.78 g/t) gold

and 0.09 opt (3.09 g/t) silver; 2) 180 feet (54.8 m) averaging 0.081 opt (2.77 g/t) gold and 0.038 opt (1.3 g/t) silver, including 9 feet (2.8 m) grading 0.3 opt (10.25 g/t) gold and 0.11 opt (3.64 g/t) silver and 27 feet (8.4 m) grading 0.19 opt (6.48 g/t) gold and 0.064 opt (2.18 g/t) silver; 3) 180 feet (54.8 m) averaging 0.079 opt (2.7 g/t) gold and 0.072 opt (2.48 g/t) silver, including 30 feet (9.1 m) grading 0.2 opt (6.96 g/t) gold and 0.13 opt (4.48 g/t) silver; 4) 140 feet (42.7 m) grading 0.058 opt (1.97 g/t) gold and 0.041 opt (1.4 g/t) silver, including 95 feet (29 m) grading 0.075 opt (2.57 g/t) gold and 0.053 opt (1.83 g/t) silver and 25 feet (7.6 m) grading 0.14 opt (4.86 g/t) gold and 0.091 opt (3.1 g/t) silver.

Significant intercepts in the Northern target included 1) 115 feet (35.1 m) averaging 0.058 opt (1.97 g/t) gold and 0.061 opt (2.09 g/t) silver, including 105 feet (32 m) grading 0.061 opt (2.1 g/t) gold and 0.063 opt (2.17 g/t) silver; 2) 217 feet (66.3 m) averaging 0.036 opt (1.24 g/t) gold and 0.078 opt (2.66 g/t) silver; 3) 110 feet (33.5 m) averaging 0.047 opt (1.6 g/t) gold and 0.091 opt (3.13 g/t) silver, including 40 feet (18.3 m) grading 0.072 opt (2.47 g/t) gold and 0.12 opt (4.12 g/t) silver; and 4) 40 feet (12.2 m) grading 0.067 opt (2.31 g/t) gold and 0.06 opt (2.05 g/t) silver, including 25 feet (7.6 m) grading 0.099 opt (3.39 g/t) gold and 0.075 opt (2.58 g/t) silver.

Significant intercepts in the Western target included 1) 310 feet (94.5 m) averaging 0.035 opt (1.2 g/t) gold and 0.054 opt (1.86 g/t) silver, including 40 feet (12.2 m) grading 0.058 opt (2 g/t) gold and 0.058 opt (1.97 g/t) silver; 2) 100 feet (30.5 m) grading 0.047 opt (1.62 g/t) gold and 0.081 opt (2.78 g/t) silver; and 3) 80 feet (24.4 m) grading 0.049 opt (1.69 g/t) gold and 0.069 opt (2.37 g/t) silver. Significant intercepts in the FCF zone included 25 feet (7.6 m) averaging 0.033 opt (1.12 g/t) gold and 0.062 opt (2.11 g/t) silver, including 15 feet (4.6 m) grading 0.045 opt (1.55 g/t) gold and 0.091 opt (3.13 g/t) silver.

The drilling results confirmed the existence of a thick central zone of mineralization which is continuous along strike. Step out drilling indicated potential extensions of the mineralization to the east and west of the central zone. It also identified a new target, called Flatiron, in the western part of the original Mother Lode claims.

Corvus Gold, Inc., acquired the Mother Lode property from Goldcorp USA, Inc., in June 2017 for 1,000,000 shares of common stock valued at $0.81 per share. The Mother Lode property partly adjoins the company's North Bullfrog property on the southeast. The property originally consisted of 13 lode claims, and the company then staked another 398 claims to the northwest and 22 claims to east to cover areas for potential exploration and development. The Mother Lode property, which included the Sunday Night Anomaly, last produced between 1989 and 1991, with N.A. Degerstrom, Inc., as the operator. (Nevada Mineral Industry MI-1990; Corvus Gold Inc., news releases, 6/6/2017, 6/9/2017, 10/11/2017, 10/25/2017, 11/7/2017, 12/12/2017, 1/10/2018, 1/18/2018, 2/1/2018; Corvus Gold Inc., Form 10-K, 8/28/2017, 8/31/2018; Corvus Gold Inc., http://www.corvusgold.com)

Silicon. In May, AngloGold Ashanti, North America, Inc., a subsidiary of Anglo Gold Ashanti, signed an option agreement with Renaissance Gold Corp., whereby the former can acquire the Silicon project for a series of payments totaling $3,000,000 over 3 years with $100,000 paid in May 2017, $200,000 due in May 2018, $300,000 due in May 2019, and $2,400,000 due in May 2020. The project area contains extensive steam-heated alteration, characteristic of the upper portions of a low-sulfidation, epithermal gold system. AngloGold Ashanti, North America, Inc., commenced a 10,000-foot (3,000-meter) diamond drilling program in January 2018. (Renaissance Gold Corp., news release, 2/13/2018; Renaissance Gold Corp., Management Discussion and Analysis, 2/22/2018; Renaissance Gold Corp., website, http://www.rengold.com).

Sterling. Sterling Gold Mining Corp., a subsidiary of Imperial Metals Corp., had produced 350 ounces of gold from the Sterling Mine in 2016, but no production was reported for 2017. In May of 2017, Northern Empire Resources Corp. acquired the Sterling Mine from Sterling Gold Mining Corp. for $10,100,000 in cash plus common shares of stock in Northern Empire Resources Corp. Northern Empire Resources Corp. completed 49 drill holes of reverse circulation and core holes totaling about 17,000 feet (5,200 m). The program was designed to confirm and expand the property's inferred gold resources, starting with the Daisy and Secret Pass deposits followed by infill, resource expansion, and exploration drilling at the Sterling Mine proper. Significant intercepts at the Daisy deposit included 155 feet (47.2 m) averaging 0.043 opt (1.47 g/t) gold, including 60 feet (18.3 m) grading 0.076 opt (2.61 g/t) gold. Significant intercepts at the Secret Pass deposit included 270 feet (82.3 m) averaging 0.036 opt (1.25 g/t) gold, including 150 feet (45.7 m) grading 0.028 opt (0.95 g/t) gold and 3) 120 feet (36.6 m) grading 0.047 opt (1.63 g/t) gold. Significant intercepts at the Sterling Mine included 40 feet (12.2 m) grading 0.24 opt (8.37 g/t) gold, and 25 feet (7.6 m) grading 0.1 (3.41 g/t) gold.

Part of the drilling identified a zone of potential shallow mineralization now referred to as the Sterling Connector. This new zone is associated with a mapped structure that exits at the Ambrose pit and was intercepted by drilling on Water Tank Hill. The Daisy and Secret Pass deposits along with the SNA deposit are along the east-trending Fluorspar Canyon fault, the same

detachment fault as at the nearby Bullfrog Mine, and collectively make up the Fluorspar Canyon trend. The company issued two NI 43-101 technical report with updated resources. (Northern Empire Resources news releases, 5/30/2017, 6/22/2017, 8/1/2017, 8/22/2017, 9/6/2017, 9/18/2017, 10/4/2017, 10/23/2017, 11/2/2017, 12/4/2017; Northern Empire Resources NI 43-101 Technical Report, 5/1/2017, 7/12/2017; Northern Empire Resources website, http://www.northernemp.com)

Bruner District

Bruner. Canamex Gold Corp. completed 17 reverse circulation holes totaling 12,270 feet (3,740 m) on its Bruner property. Nine holes totaling 8,270 feet (2,521 m) were drilled in the Penelas area to test for extensions to deep higher grade intercepts encountered previous drilling. The drilling focused mainly on breccias at depths between 600 feet (180 m) to 800 feet (245 m) and tested a gap between the higher grade deeper Penelas zone and mineralization to the northwest of the higher grade Deep zone. Drilling of the gap successfully connected the two zones. Eight holes totaling 4,000 feet (1,219 m) were drilled in the Historic Resource Area (HRA), to test beneath a large silica-adularia alteration spire at the north end of the area.

Significant intercepts in the Penelas Resource Area included: 1) 145 feet (44.2 m) averaging 0.024 opt (0.837 g/t) gold and 0.17 opt (5.99 g/t) silver; and 215 feet (65.5 m) averaging 0.034 opt (1.18 g/t) gold and 0.23 opt (7.97 g/t) silver. Significant intercepts in the HRA Resource Area included 1) 75 feet (22.9 m) averaging 0.068 opt (2.32 g/t) gold and 2.67 opt (91.6 g/t) silver, including 55 feet (16.8 m) grading 0.088 opt (3.02 g/t) gold and 3.64 opt (124.5 g/t) silver, and 2) 25 feet (7.6 m) averaging 0.03 opt (1.035 g/t) gold and 0.77 opt (26.3 g/t) silver.

The company issued an NI 43-101 technical report as a preliminary economic assessment with updated resources. In November of 2017, the company changed its name from Canamex Resource Corp. to Canamex Gold Corp. (Canamex Gold Corp. news releases, 8/22/2017, 9/21/2017, 10/25/2017, 11/8/2017; Canamex Gold Corp. Management Discussion and Analysis, 4/30/2018; Canamex Gold Corp., NI 43-101 Technical Report, 12/26/2017; Canamex Gold Corp. website, https://canamexgold.com)

Bullfrog District

North Bullfrog. Corvus Gold Inc. completed 28 reverse circulation holes on its North Bullfrog property. Four of the holes were drilled on the Cat Hill target. Intercepts included: 25 feet (7.6 m) grading 0.012 opt (0.41 g/t) gold and 0.012 opt (0.41 g/t) silver; and 35 feet (10.7 m) grading 0.007 opt (0.24 g/t) gold and 0.039 opt (1.33 g/t) silver. Two of the holes were drilled on the Jim Dandy target with best intercept being 15 feet (4.57 m) grading 0.007 opt (0.23 g/t) gold and 0.005 opt (0.16 g/t) silver. A hole drilled on the Jolly Jane target intercepted 65 feet (19.8 m) grading 0.011 opt (0.38 g/t) gold and 0.028 opt (0.97 g/t) silver. Four of the holes were drilled on the North Jolly Jane target. Intercepts included 1) 725 feet (221 m) grading 0.006 opt (0.21 g/t) gold and 0.027 opt (0.94 g/t) silver; 2) 95 feet (29 m) averaging 0.012 opt (0.4 g/t) gold and 0.015 opt (0.53 g/t) silver. Twelve holes were drilled on the Northwest Sierra Blanca target. Intercepts included 1) 335 feet (102 m) averaging 0.011 opt (0.38 g/t) gold and 0.027 opt (0.93 g/t) silver, including 65 feet (19.8 m) grading 0.031 opt (1.05 g/t) gold and 0.054 opt (1.85 g/t) silver; 2) 25 feet (7.6 m) grading 0.029 opt (1.01 g/t) gold and 0.02 opt (0.69 g/t) silver; and 3) 450 feet (137.2 m) averaging 0.013 opt (0.45 g/t) gold 0.34 opt (1.15 g/t) silver, including 50 feet (15.2 m) grading 0.024 opt (0.82 g/t) gold and 0.046 opt (1.59 g/t) silver and 80 feet (42.7 m) grading 0.023 opt (0.78 g/t) gold 0.04 opt (1.38 g/t) silver. Three holes were drilled on the Savage East and Deep targets with an intercept of 405 feet (123.4 m) grading 0.001 opt (0.14 g/t) gold and 0.037 opt (1.27 g/t) silver. Two holes were drilled in the Western zone, with the best intercept being 165 feet (50.3 m) averaging 0.01 opt (0.35 g/t) gold and 0.032 opt (1.08 g/t) silver, including 50 feet (15.24 m) grading 0.02 opt (0.69 g/t) gold and 0.034 opt (1.18 g/t) silver.

The North Jolly Jane target is a large zone of low-grade mineralization with higher gold grades associated with large fault zones. The higher grade mineralization intercepted by the drilling is associated with stockwork veins along the West Jolly Jane fault zone. The Cat Hill target is also a large zone of low-grade mineralization that is deeply oxidized. The overall results of the drilling show the gold mineralization is widespread on the western side of the district and covers about 10 square miles (25 square km) containing three deposits. The company issued an NI 43-101 technical report as a preliminary economic assessment for combined mill and heap leach processing. (Corvus Gold Inc., news releases, 6/8/2017; Corvus Gold Inc., NI 43-101 Technical Report, 12/15/2017; Corvus Gold Inc., Form 10-K, 8/28/2017, 8/31/2018; Corvus Gold Inc., website, http://www.corvusgold.com)

Manhattan District

Goldwedge. Scorpio Gold Corp. completed a Phase I drilling program consisting of seven reverse circulation holes totaling 7,530 feet (2,295 m) on its Goldwedge property. The drilling tested the down dip continuation of mineralization in the favorable host Ordovician Zanzibar limestone within the Reliance fault zone near

existing underground workings. Three holes encountered significant mineralization, but three holes deviated and missed the mineralization. Significant intercepts included: 5 feet (1.5 m) grading 0.274 opt (9.39 g/t) gold, 10 feet (3 m) grading 0.324 opt (11.11 g/t) gold, 15 feet (4.6 m) grading 0.325 opt (11.12 g/t) gold, and 5 feet (1.5 m) grading 0.157 opt (5.38 g/t) gold.

The mill on the property had been placed on care and maintenance in July 2015, but in February, the company signed a letter of intent with Lode-Star Mining for a custom toll milling agreement. The mill has a gravity circuit and a 400-ton (360-tonne) per day capacity. (Scorpio Gold Corp. news releases, 2/27/2017, 7/27/2017; Scorpio Gold Corp. Management Discussion and Analysis, 4/24/2018; Scorpio Gold Corp. website, http://www.scorpiogold.com)

Queen City District

Jupiter. Ramelius Resources Ltd. completed seven reverse circulation holes totaling 3,920 feet (1,195 m) on the Jupiter project. Significant intercepts included 35 feet (9.1 m) averaging 0.032 opt (1.1 g/t) gold, including 25 feet (7.6 m) grading 0.037 opt (1.28 g/t) gold and 5 feet (1.5 m) grading 0.058 opt (2 g/t) gold. The geology is characterized by Cambrian limestone and chert thrust over Ordovician limestone, chert, and shale that are overlain by Tertiary felsic tuffs and flows dated at 21.1–21.9 Ma and 24.9–25.3 Ma. The carbonate rocks are cut by a west-northwest-trending intermediate intrusion dated at 24.2–24.7 Ma that has associated small skarns. The rocks are cut by west-northwest and east-west trending faults, which in turn are cut by north, northeast and northwest trending transtensional faults. The Cambrian limestone and chert contain jasperoid bodies associated in part with altered felsic dikes. The gold mineralization is hosted throughout the carbonate rocks and is associated with the faults, jasperoid bodies, felsic dikes, and subtle anticlines. The mineralization is open in all directions. Ramelius Resources, Ltd., executed a binding agreement with Kinetic Gold (U.S.), Inc., a wholly owned subsidiary of Renaissance Gold, Inc., whereby the former may earn up to 75% interest in the Jupiter project by spending $3,000,000 within 5 years. (Ramelius Resources, Ltd., 2017 Annual Report, 10/26/2017; Ramelius Resources, Ltd., 2017 December Quarterly Report, 1/30/2018; Renaissance Gold Corp. news release, 6/21/2017, 10/26/2017, 1/29/2018; Renaissance Gold Corp., Management Discussion and Analysis, 2/22/2018; Renaissance Gold Corp., website, http://www.rengold.com).

Round Mountain District

Round Mountain. The Round Mountain Gold Corp., a subsidiary of Kinross Gold Corp., produced 425,324 ounces of gold and 868,402 ounces of silver from its Round Mountain Mine, increases of 14% and 20% respectively from 2016. Mining was conducted at the main Round Mountain pit and the Gold Hill pit north of the main pit. 29,121,000 tons (26,418,000 tonnes) of ore grading 0.041 opt (1.41 g/t) were mined, increases 12% and 44% respectively from 2016. 25,651,000 tons (23,270,000 tonnes) of ore were processed with a recover rate of 81.2%. Grade and recovery numbers are for the mill, not the heap leach. The cost of sales was $691 per ounce, an 11% decrease from 2016. The increase production was due to increases in the amount of ore mined and the mill grade, which resulted from mining a deeper, higher grade ore. The increase in gold production was due to higher mill grade. The company spent $95,800,000 on capital expenditures, a 33% increase form 2016.

After the company acquired the 50% share of Barrick Gold Corp. in January 2016, it conducted about 115,000 feet (35,060 m) of in-fill, geotechnical, and metallurgical drilling. Of the total, 33,554 feet (10,230 m) was conducted as in-fill drilling focused on Phase W in 2017. Phase W is a large mineralized zone extending westward from the main Round Mountain pit. The company spent $2,600,000 on exploration largely looking for targets to the south and west of the Round Mountain deposit, but no drilling details or results were released. Round Mountain pit is presently 10,700 feet (3,260 m) long in a northwest-southeast direction and 8,800 feet (2,680 m) wide. Many areas of the pit are being mined below the oxide zone. Gold Hill is presently 3,000 feet (915 m) long in an east-west direction and 2,600 feet (790 m) wide in a north-south direction. The ore is oxide material that presently requires no crushing due to proper blasting. With the current mineral reserves, mining at Gold Hill is expected to continue through 2019 and heap leaching through 2027.

An environmental assessment was issued concerning the Phase W expansion project. The expansion will include a layback of the current pit, construction of a new carbon in column plant and heap leach pad, additions to the mining fleet and equipment, and relocation of some existing infrastructure. Stripping of Phase W ore is expected to begin in early 2018. The initial plant and infrastructure is projected to cost $230,000,000, and capitalized stripping between 2018–2020 is projected to cost $215,000,000. The expansion will add five years (2020–2024) to the life of the mine with leaching continuing out to 2027 and with an extra 1,500,000 more ounces of gold to be produced. (BLM, Environmental Assessment, DOI-BLM-NV-B020-2017-0013-EA 10/2017; Kinross Gold Corp. news release, 9/18/2017, 2/14/2018; Kinross Gold Corp. Management Discussion and Analysis, 2/14/2018; Kinross Gold Corp. Annual Information Form,

3/28/2018; Kinross Gold Corp. Annual Report, 4/4/2018; Kinross Gold Corp. website, http://www.kinross.com)

Tybo District

Bolo. In August, Columbus Gold Corp., completed 14 reverse circulation holes totaling 9,204 feet (2,806 m) on its Bolo project in Hot Creek Range. Bolo is a Carlin-style gold and silver project with widespread gold mineralization associated with jasperoid and iron-stained structures occurring along two parallel north-south trending faults known as the Mine and East faults. Alteration along the Mine fault has been traced for 9,000 feet (2,750 m) along strike with assays ranging up to 0.25 opt (8.6 g/t) gold. The East fault extends for 7,200 feet (2,200 m) of strike with assays ranging up to 0.14 opt (4.7 g/t) gold. The gold mineralization in the South zone of the Mine fault, where the below noted drilling was conducted, is oxide associated with weak silicification and decalcification of Paleozoic sedimentary rocks. The alteration varies between 100 feet (30 m) and 330 feet (100 m) thick and occurs in the Cambrian Windfall Formation in the hanging wall of the fault, and the Ordovician Hanson Creek Formation and Silurian Roberts Mountains Formation in the footwall. The drilling focused on and around the recently acquired Uncle Sam patented claim. The Uncle Sam covers a 1,600-foot (500-meter) strike extension of a fault zone immediately south of an area that Columbus previously drilled. Three holes were drilled approximately 330 feet (100 m) north of the Uncle Sam claim, and three holes were drilled in the fault zone to test extensions to the west and north.

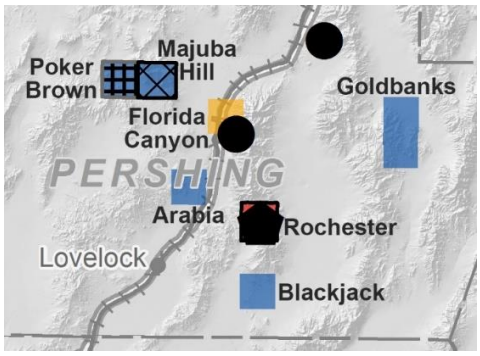
Twelve of the holes encountered strong alteration, including decalcification, quartz veining and stockworks, strong iron oxide staining, and intense silicification (jasperoid) replacement. Significant intercepts included 1) 436 feet (133 m) averaging 0.037 opt (1.28 g/t) gold, including 100 feet (30.5 m) grading 0.095 opt (3.24 g/t) gold); 2) 295 feet (89.9 m) averaging 0.029 opt (1 g/t) gold, including 134 feet (40.9 m) grading 0.06 opt (2.05 g/t) gold; and 3) 170 feet (51.8 m) grading 0.037 opt (1.27 g/t) gold from surface. The last hole was angled and drilled along the fault, 650 feet (200 m) north of where the main drilling was conducted and near an area where a surface sample in jasperoid returned 0.095 opt (3.24 g/t) gold. The drill hole encountered 330 feet (100 m) of strong alteration, including jasperoid and strong iron oxides, from the surface to depth of 330 feet (100 m).

In November Columbus Gold Corp. spun off its U.S. assets into a new company called Allegiant Gold, Ltd. (Columbus Gold Corp., news releases, 8/31/2017; Allegiant Gold, Ltd., news releases, 11/7/2017, 11/28/2017, 12/4/2017, 12/5/2017; Allegiant Gold, Ltd., website, http://www.allegiantgold.com).

Union District

Buffalo Canyon. Renaissance Gold Corp. completed five reverse circulation holes totaling 5,600 feet (1,707 m) on the company's Buffalo Canyon project in T12N, R39E. Three holes intercepted thick zones of altered biotite hornfels cut by abundant quartz-tourmaline veining. This is typical of the gold mineralization encountered in previous drilling and surface sampling. Two holes intercepted a hydrothermally altered multi-phase intrusive complex. Two holes also validated the presence of long runs of low grade gold mineralization in gravel north and west of where the deposit outcrops. This suggest that part of the deposit has been eroded off. Significant intercepts included 1) 25 feet (7.6 m) grading 0.043 opt (1.46 g/t) gold; 2) 45 feet (13.7 m) averaging 0.013 opt (0.43 g/t) gold, including 25 feet (7.6 m) grading 0.018 opt (0.6 g/t) gold; and 2) 239 feet (72.9 m) averaging 0.01 opt (0.35 g/t) gold, including 45 feet (13.7 m) grading 0.015 opt (0.5 g/t) gold and 15 feet (4.6 m) grading 0.016 opt (0.55 g/t) gold. The work was funded by Kinross Gold, which signed an exploration agreement with Renaissance Gold to acquire a 70% interest over a 10-year period in the Buffalo Canyon, Diamond Point, and Spruce East projects. As part of the agreement for the first year, Kinross Gold advanced Renaissance Gold Corp. $500,000 to conduct exploration on all three projects. (Renaissance Gold Corp. news release, 2/20/2017, 5/15/2017, 10/26/2017, 12/6/2017; Renaissance Gold Corp., Management Discussion and Analysis, 10/25/2017; Renaissance Gold Corp., website, http://www.rengold.com).

PERSHING COUNTY



Antelope Springs District

Blackjack. In April, Pershing Gold Corp. entered into a Mining Sublease with Newmont Mining for an area that was the last of seven parcels the company needed to consolidate the Blackjack project area and consisted of seven historic mercury and antimony mines and Blackjack Hill. The project is about nine miles (14 km) south of the company's Relief Canyon project. The sublease gives the Pershing Gold Corp. the exclusive right to prospect, explore for, develop, and mine minerals on these areas for an initial term of ten years. The company must make minimum work expenditures for the first four years of the Sublease, followed by annual Advanced Minimum Royalty Payments to maintain the Sublease in good standing.

The geology of Blackjack Hill consists of a stacked sequence of southwest verging thrust slices. The gold mineralization is hosted in dolomitic conglomerate and calcareous sandstone and is associated with steep northwest- and northeast-trending faults, their zones of intersection, and where they cut the dolomitic conglomerate/sandstone contact and the thrust faults. The dolomitic conglomerate/sandstone package is repeated many times along thrust ramps. The General's fault is a major regional north-south fault that passes along the east margin of Blackjack Hill, which is also intersected by the steep faults. Surface rock samples assayed up to 0.38 opt (12.89 g/t) gold.

Pershing Gold Corp. completed 15 holes totaling 5,800 feet on the Blackjack project. Significant intercepts included 2.8 feet (0.85 m) grading 0.066 opt (2.26 g/t) gold and 0.044 opt (1.52 g/t) silver; 13.6 feet (4.15 m) grading 0.022 opt (0.74 g/t) gold and 0.014 opt (0.47 g/t) silver; 20.7 feet (6.3 m) grading 0.016 opt (0.545 g/t) gold and 0.018 opt (0.63 g/t) silver; and 42.8 feet (13 m) grading 0.012 opt (0.42 g/t) gold and 0.035 opt (1.21 g/t) silver. (Pershing Gold Corp., 10-K Form, 4/2/2018; Pershing Gold Corp. news releases, 4/4/2017, 5/8/2017; Pershing Gold Corp. http://www.pershinggold.com)

Arabia District

Arabia. Renaissance Gold Corp. completed eight reverse circulation holes totaling 7,380 feet (2,250 m) on the company's Arabia project in T29N, R32E. Several exploration targets were tested for extensions of mesothermal quartz veins and stockworks, including those beneath the historic Electric and Montezuma Mine workings. These and other exploration targets were confirmed but were found to contain lower than expected values. Individual drill samples assayed only up to 0.017 opt (0.574 g/t) gold and 1.07 opt (36.7 g/t) silver. Other anomalous metals in the drilling included copper (up to 598 ppm), lead (up to 5,319 ppm), zinc (up to 2,563 ppm), and antimony (up to 1,251 ppm). The work was funded by Coeur Mining, Inc. In March of 2016, Coeur signed a non-binding letter of intent with Renaissance Gold, Inc., wherein the former will provide latter with $250,000 per year for two years to conduct grass roots exploration in select areas of Nevada. The letter of intent provided that Coeur Mining, Inc. will have a "right of first refusal" on all projects generated within defined exploration target areas. It also allows Coeur Mining, Inc., the option to earn a 70% interest in a project of interest. Coeur Mining, terminated the agreement involving the Arabia project because of the poor drilling results. (Renaissance Gold Corp. news release, 2/9/2017, 2/27/2017, 5/19/2017; Renaissance Gold Corp., website, http://www.rengold.com).

Goldbanks District

Goldbanks. Premier Gold Mines, Ltd., completed at least 13 reverse circulation and core holes totaling about 24,082 feet (7,342 m) on the Goldbanks project. The drilling was designed to expand the Golden Devil target area as well as test any projection of main zone to the south of the Golden Devil. Two intercepts that were reported were 11 feet (3.4 m) grading 7.15 opt (245 g/t) gold and 7 opt silver (251 g/t Ag) and a 2-foot (60-cm) thick breccia grading 0.006 opt (0.2 g/t) gold. No other results were released.

In the second half of 2016, Premier Gold Mines, Ltd., had entered into an option agreement with Kinross Gold USA, Inc., whereby the former can earn a 50% interest in the Goldbanks project by spending $20,000,000 in exploration on the property over five years, including a guaranteed commitment of $3,500,000 during the first 18 months. Premier Gold Mines, Ltd., is the operator of the exploration programs, but Kinross Gold can elect to become the operator after Premier has earned its 50% interest. (Premier Gold Mines, Ltd., news release, 3/26/2018; Premier Gold Mines, Ltd., Management Discussion and Analysis, 8/8/2017, 11/7/2017, 3/26/2018; Premier Gold Mines, Ltd., Annual Information Form, 4/2/2018; Premier Gold Mines, Ltd., website, http://www.premiergoldmines.com).

Imlay District

Florida Canyon. Rye Patch Gold Corp. operated the Florida Canyon Mine and produced 28,157 ounces of gold, a 159% increase from 2016, and 21,128 ounces of silver, a 3.5% decrease from 2016. Of the rock mined, ore accounted for 6,988,290 tons (6,339,735 tonnes) with an average grade of 0.011 opt (0.38 g/t) gold and waste accounted for 6,294,109 tons (5,709,978 tonnes) for a strip ratio of 0.9. The amount of ore crushed and placed on the pads was 6,574,130 tons (5,964,011 tonnes).

In August 2016, Rye Patch Gold Corp. commenced its Florida Canyon Mine restart program. Mining commenced November 1, 2016, with blasting on the 5620 bench in the Jasperoid Hill pit, which was followed by the stockpiling of ore. The crusher, which had been moved up from the Standard Mine, was fully operational by December 24. In January 2017, the company issued an amended preliminary economic report for the Florida Canyon Mine with updated oxide minerals resources. The new South Heap Leach Pad was completed by March 2017 and irrigation commenced in April. The first gold pour occurred April 25, 2017. Earlier production had been residual gold from the older leach pads.

The company spent $308,006 on exploration, down from $779,582 spent in 2016. In October, the company completed 18 reverse circulation holes totaling around 10,000 feet (3,050 m). The drilling tested the distribution of the sulfide body and was to validate the current geologic model and ore controls. Holes drilled in the untested sulfide body between the Main and Central pits had significant intercepts of 1) 230 feet (70.1 m) grading 0.086 opt (2.94 g/t) gold; 2) 185 feet (56.4 m) grading 0.076 opt (2.60 g/t) gold; and 3) 115 feet (35.1 m) grading 0.061 opt (2.08 g/t) gold. An area previously noted as waste rock in the Central pit was found through mining to contain gold above the cut-off grade. Sixteen holes were drilled at the site which resulted in the designation being changed from waste to oxide resource and the area was later mined.

In May 2018, Alio Gold, Inc., acquired Rye Patch Gold Corp. As a subsidiary of Alio Gold, Inc., Rye Patch Gold Corp. will continue under the name of Alio Gold (US), Inc., and ceased to be a reporting issuer in Canada. (Alio Gold, Inc., news releases, 3/29/2018; Alio Gold (US), Inc., notice, 7/25/2018; Rye Patch Gold Corp., news releases, 3/30/2017, 5/1/2017, 10/16/2017, 11/29/2017; Rye Patch Gold Corp., NI 43-101 Amended Technical Report–Preliminary Feasibility Report, 1/27/2017; Rye Patch Gold Corp. Management Discussion and Analysis, 11/27/2017, 4/30/2018; Alio Gold, Inc., https://www.aliogold.com; Rye Patch Gold Corp., http://www.ryepatchgold.com)

Rochester District

Rochester. Coeur Rochester Inc., a subsidiary of Coeur Mining Inc., produced 4,713,574 ounces of silver and 51,051 ounces of gold from its Rochester Mine, increases of 3% and 0.6% respectively from 2016. 16,440,270 (14,914,515 tonnes) of ore was milled. Mined ore averaged 0.53 opt (18.15 g/t) silver and 0.003 opt (0.102 g/t) gold. Ultimate recovery from crushed ore on the heap leaches was estimated to be 61.5% for silver and 92.5% for gold. The total cost applicable to sales per ounce of silver was $13.15, an 11% increase of from 2016.

The company spent $1,400,000 on exploration and $1,300,000 on capitalized drilling. The company completed 47 reverse circulation holes totaling 46,740 feet (14,250 m) and two core holes totaling 2,118 feet (646 feet). Exploration drilling was conducted which consisted of 25,620 feet (7,809 m) for testing areas near the Packard pit and on the South Charlie target and the new East Rochester resource area. The core holes were drilled at East Rochester. Conversion drilling was conducted, which mainly consisted of 23,238 feet (7,083 m) within the main Rochester pit resource. No results were released. The company released an NI 43-101 technical report as a preliminary economic report with updated the reserves and resources for both Rochester and Nevada Packard as wells as various stockpiles around the Rochester Mine. (Coeur Mining Inc., news releases, 4/26/2017, 7/26/2017, 10/25/2017, 1/8/2018; Coeur Mining Inc. 10-K Report, 2/9/2018; Coeur Mining Inc., NI 43-101 Technical Report, 12/31/2017; Coeur Mining Inc. website, http://www.coeur.com)

STOREY COUNTY

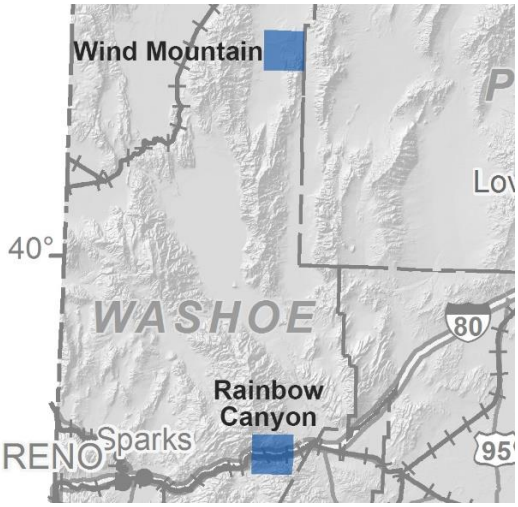
Comstock/Silver City Districts

Comstock. Comstock Mining, Inc., ceased mining the Lucerne pit near Virginia City in 2015 and ceased processing ore in 2016. The company spent $1,130,567 on exploration and mine development, a 75% decrease from 2016. Due to a lack of mining revenue, the company concentrated on cost reduction. No drilling was conducted, though the company reviewed targets particularly in the Dayton Valley Resource Area, Spring Valley group, and Occidental group.

On October 5, Tonogold Resources Inc. signed an option agreement with Comstock Mining Inc., whereby the Tonogold can acquire up to a 51% interest in 1,162 acres (470 hectares) of mining claims including the Lucerne Mine. Tonogold Resources, Inc., paid $200,000 for an initial 6-month option, which can be extended for a further payment of $2,000,000 prior to the expiration of the initial option period. To earn the 51% interest, the

company is required to invest $20,000,000 over the next 42-months on work programs developed and managed by the company on the Lucerne properties. (Comstock Mining, Inc., press release, 10/5/2017; Comstock Mining, Inc. Form 10-K, 2/20/2018; Comstock Mining, Inc., website, http://www.comstockmining.com; Tonogold Resources, Inc., press releases, 10/5/2017, 4/9/2018; Tonogold Resources, Inc., website, http://tonogold.com)

WASHOE COUNTY



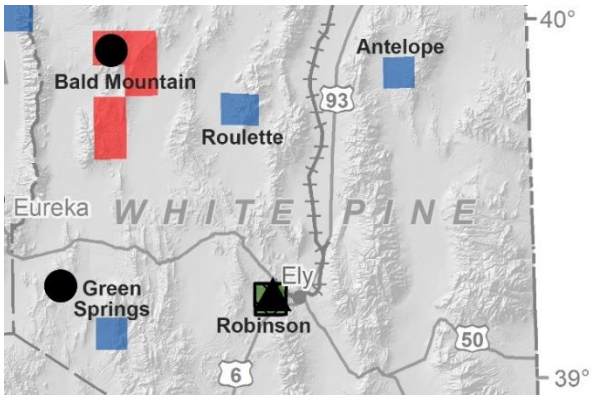
Olinghouse District

Rainbow Canyon. Alba Minerals Ltd. carried out a small drill program in the Rainbow Canyon area of the Olinghouse district. No results were released. (BLM LR2000 database; Alba Minerals Ltd. website, http://www.albamineralsltd.com)

San Emidio District

Wind Mountain. In December, Bravada Gold Corp. commenced drilling 2 reverse circulation holes on its Wind Mountain property. One hole had a planned depth of 1,476 feet (450 m) and the other 2,460 feet (750 m). The holes were drilled on two fault intersections 4,900 feet (1,500 m) apart. These intersections may represent upwelling or feeder zones for the previously mined mineralization. The holes were also intended to intersect the unconformity between Mesozoic metasedimentary and Tertiary volcanic rocks. Wind Mountain is a low-sulfidation epithermal deposit, which was previously mined as an open pit. The drilling appears to have outlined a potential upwelling zone. Hole WM17-097 intercepted anomalous gold (50–699 ppb) and mercury (>1ppm) in Tertiary volcanic rocks before passing into Mesozoic basement rocks at 915 feet (279 m). Hole WM19-098 was drilled from the bottom of the Wind Mountain open pit and drilled though a portion of the previously defined resource, where it intercepted 131 feet (40 m) of 0.01 opt (0.343 g/t) gold. Unaltered Mesozoic basement was intersected at 2,024 feet (617 m). No assays were released. (Bravada Gold Corp., Management Discussion and Analysis, 6/28/2018; Bravada Gold Corp., news releases, 11/22/2017, 12/6/2017, 1/17/2018; Bravada Gold Corp., website, http://www.bravadagold.com)

WHITE PINE COUNTY



Bald Mountain District

Bald Mountain. Kinross Gold Corp. produced 281,597 ounces (8,759 k) of gold and 61,728 ounces (1,920 kg) of silver from its Bald Mountain Mine, a 118% increase for gold from 2016. Silver was up greatly from only 864 ounce in 2016. 23,826,000 tons (21,615,000 tonnes) of ore grading 0.023 opt (0.8 g/t) were mined and processed, increases 102% and 25%, respectively, from 2016. The cost of sales was $642 per ounce, 46% decrease from 2016. The company spent $9,500,000 on exploration and business development and $90,500,000 on capital expenditures, increases of 6% and 123%, respectively, from 2016.

The company spent almost $10,000,000 on exploration and completed 319 holes totaling 171,528 feet (52,295 m). The exploration focused on near term opportunities that may have a direct impact on operational planning and grow the existing mineral resource estimates. Drilling was completed at the Redbird, Winrock, Top, Saga, Poker Flat, Duke, Rat and White Pine deposits in the North Area, and at the Luxe and Yankee deposits in the South Area. Drill testing was also completed on early stage targets within the Joint Venture and the North Area.

Drilling of the Redbird deposit tested the south extent of mineralization, and included infill drilling as well. The drilling expanded the mineralization potential of the current estimated mineral resource up to 1,000

feet (300 m) southeast of the current pit design. Significant intercepts included 150 feet (45.7 m) grading 0.13 opt (4.15 g/t) gold; 215 feet (65.5 m) grading 0.079 opt (2.74 g/t) gold; and 255 feet (77.7 m) grading 0.074 opt (2.54 g/t) gold.

Drilling of the Winrock deposit added resource ounces in the shallow oxide zones. Significant intercepts included 365 feet (111.3 m) grading 0.022 opt (0.77 g/t) gold; 140 feet (42.7 m) grading 0.04 opt (1.37 g/t) gold; and 105 feet (32 m) grading 0.066 opt (2.25 g/t) gold.

Drilling of the Saga deposit extended the mineralization and also confirmed both gaps in mineralization within the designed pits and moderate step outs with significant grades to the east and at depth of the current mineral resource. Significant intercepts included 340 feet (103.6 m) grading 0.022 opt (0.75 g/t) gold; 145 feet (44.2 m) grading 0.056 opt (1.92 g/t) gold; and 370 feet (112.8 m) grading 0.022 opt (0.76 g/t) gold.

Infill drilling at the south wall of the Top 2 pit (Top Gap deposit) indicated continuity of mineralization along the Skarn fault. Drilling of the Top Hat deposit in the northwest area of the Top 2 pit intersected mineralization outside of the current resource model. Significant intercepts included 45 feet (13.7 m) grading 0.29 opt (9.91 g/t) gold; 95 feet (29 m) grading 0.093 opt (3.2 g/t) gold; and 289 feet (88.2 m) grading 0.12 opt (7.06 g/t) gold including 25 feet (7.6 m) grading 1.02 opt (34.78 g/t) gold and 85 feet (25.9 m) grading 0.3 opt (10.16 g/t) gold. Drilling of the Rattlesnake target in the Bald Mountain Joint Venture area confirmed a large mineralized system hosted in limestone of the Devonian Guilmette Formation.

At the Bald Mountain Vantage Complex project, permitting and engineering commenced on a new heap leach pad and associated processing facilities and infrastructure with a total capacity of 75,000,000 tons (68,000,000 tonnes) of ore. Overall engineering was 80% complete and initial construction commenced by year's end. The main construction got underway in early 2018 with commissioning expected in the first quarter of 2019. (Kinross Gold Corp. news releases, 11/8/2017, 2/14/2018, 8/1/2018; Kinross Gold Corp. Management Discussion and Analysis, 2/14/2018; Kinross Gold Corp. Annual Information Form, 3/28/2018; Kinross Gold Corp. Annual Report, 4/4/2018; Kinross Gold Corp. website, http://www.kinross.com)

Butte Valley District

Roulette: Nevada Sunrise Gold Corp. completed four reverse circulation holes totaling 3,480 feet (1,060 m) on the Roulette (formerly Grulla) property. The geology consists of a sequence of Devonian through Mississippian limestone and shale including the Guilmette Limestone, Pilot Shale, Joana Limestone and Chainman Shale. Two jasperoid bodies containing gold and arsenic are hosted in the Joana Limestone near its contact with the Chainman Shale. One hole tested the possible depth extent of the Parlay mineralized jasperoid, where outcrop sampling in 2014 assayed 0.13 opt (4.44 g/t) gold over 11 feet (3.3 m). However, none of the holes returned significant mineralization. The company had an option agreement to earn up to 100% interest in the property. The company terminated the option after drilling. (Nevada Sunrise Gold Corp. news releases, 3/6/2017, 4/12/2017, 6/23/2017; Nevada Sunrise Gold Corp., http://www.nevadasunrise.ca)

Eagle District

Antelope: In July 2016, the Logan Resources Ltd. signed a lease option to earn up to 80% interest on the Antelope and other properties from Pilot Gold Inc. (named changed to Liberty Gold Corp. in May 2017). Significant concentrations of gold occur in two jasperoid zones which are part of a gently west-dipping sequence of limestone, siltstone and dolomite. Elevated gold values are also concentrated along the contacts between the sedimentary rocks and narrow, northwest trending Tertiary quartz monzonite dikes as well as in proximity to steep, northwest-striking faults. Exploration in the 1980s defined an anomalous gold zone covering an area of 6,600 feet (2,000 m) by 3,000 feet (900 m) with mineralization open to the west and at depth. The jasperoid bodies project down-dip westward under shallow cover, where gravity data indicate the cover remains shallow for at least 0.6 miles (1 km).

By August, 2017, the Logan Resources completed four reverse circulation holes totaling about 2,000 feet (610 m) on the Antelope property. The drilling program was designed to confirm results from selected historic drill holes and to test the northwest extension of near-surface mineralization. Significant intercepts included 1) 35 feet (10.7 m) grading 0.047 opt (1.6 g/t) gold; and 2) 60 feet (18.3 m) grading 0.008 opt (0.29 g/t) gold. (Liberty Gold Corp., Annual Information Form, 3/28/2017; Pilot Gold, Liberty Gold Corp., https://libertygold.ca; Logan Resources, Ltd. news release, 5/4/2017, 6/20/2017, 8/24/2017; Logan Resources, Ltd. Management Discussion and Analysis, 7/11/2018; Logan Resources, Ltd., http://loganresources.ca)

Pancake District

Pan. GRP Pan, LLC, produced 15,652 ounces of gold from its Pan Mine, an 80% increase from 2016. Mining was conducted from both the North Pan zone and the South Pan zone. Pan is a Carlin-type gold system. The mineralization is entirely oxide and crops out at the surface. It is hosted in the Devonian-Mississippian Pilot Shale and limestone of Devonian Devils Gate Formation

and occurs in elongate dissolution/collapse breccias along the Pan fault and along bedding planes near the Pilot Shale-Devils Gate contact. No drilling was done 2017. During 2017, the Phase I leach pad was rehabilitated, and a carefully-controlled ore blending program was implemented. The mining rate from both the North and South pits reached a sustained 14,000 tons (12,700 tonnes) per day in September. Construction of the Phase II heap leach pad was completed December of 2017, adding an additional 2,200,000 square feet (204,500 square m) of leach pad space. On September 25, 2017, GRP Minerals, LLC, and Fiore Exploration, Ltd, combined to form Fiore Gold, Ltd. (Fiore Gold, Ltd, news release, 6/15/2017, 1/25/2018, 1/30/20118; Fiore Gold, Ltd, Management Discussion and Analysis, 1/24/2018; Fiore Gold, Ltd, website, http://fioregold.com)

Robinson District

Robinson. The Robinson Nevada Mining Co. produced 112,633,428 pounds of copper (51,090 tonnes) and 652,763 pounds (296 tonnes) of molybdenum, a decreases of 5% and 21%, respectively, from 2016. The mine also produced 37,897 ounces of gold as a by-product, a 23% decrease from 2016. No silver production was reported. Material containing molybdenite is stockpiled, and molybdenum is produced when the stockpiles are large enough to process it in the mill. Concentrates from the mill are trucked to the Wendover Bulk Transhipment Co. rail yard at Wendover, Utah, and loaded into Union Pacific train cars headed for the Port of Vancouver. They are shipped mainly to China, India, and Japan. All mining at Robinson is on 21,000 acres of private land. The Robinson Nevada Mining Co. and the Wendover Bulk Transhipment Co. are subsidiaries of Robinson Holdings (USA), Ltd., which in turn is a subsidiary of KGHM International, Ltd., headquartered in Lubin, Poland.

The decrease in copper production was mainly due to 6% decrease in recovery rates and mining of lower grade ore (averaging 0.4% copper) from the higher parts of the Ruth West pit. During much of the previous year, most of the mining had been from the lower levels of the Ruth West and Ruth East pits with copper grades of 0.47% and 0.53% respectively. Almost 80% of $147,000,000 capital expenditures of KGHM International Ltd. went to the Robinson Mine. Most of it was for pre-stripping at the Ruth pit and drainage of the Robinson Mine. Assuming no more increases in reserves, the remaining life of the mine was about seven years. However, in 2016, the company issued preliminary and final environmental assessments concerning proposals to expand the mine dumps and related infrastructure. Also, the company was proposing to expand the Ruth pit, which may require another environmental assessment. While no details or results were reported, the company has an on-going exploration drilling program to provide information for the geologic model, better define the ore body, and provide metallurgical samples. (BLM, Preliminary Environmental Assessment, Robinson Mine Expansion project, DOI-BLM-NV-L010-2016-0005-EA, 10/2016; BLM, Final Environmental Assessment, Robinson Mine Expansion project, DOI-BLM-NV-L010-2016-0005-EA, 12/2016; Ely Times, BLM Seeks Public Input on Robinson Mine Expansion Proposal, 7/6/2018, KGHM International, Annual Report, 2017, 12/31/2018; KGHM International, 3rd quarter 2017 consolidated report, 11/14/2017, http://kghm.com)

White Pine District

Green Springs. Colorado Resources Ltd. completed 12 reverse circulation holes totaling 4,895 feet (1,492 m) on its Green Springs project. Four holes tested the gold mineralization at the lower Chainman Shale–Joana Limestone contact in the "E" zone south of the old mine workings and along the trend of a north-south-striking mineralized structural corridor. Six holes tested the gold mineralization at the lower Devonian-Mississippian Pilot Shale–Guilmette Limestone contact in the "A" zone. This contact is well exposed north and east of the mine workings and is associated with well developed, thick jasperoid bodies that are spatially related with the gold mineralization. Two holes tested the newly discovered "G" zone, which lies at the crest of a regional antiform and is associated with a gold anomaly in the soil. Significant intercepts in the "E" zone included 135 feet (41 m) averaging 0.09 opt (3.23 g/t) gold, including 25 feet (7.6 m) grading 0.28 opt (9.75 g/t) gold and 15 feet (4.6 m) grading 0.35 opt (12 g/t) gold. Significant intercepts in the "A" zone included 80 feet (24 m) averaging 0.05 opt (1.75 g/t) gold, including 35 feet (10.7 m) grading 0.08 opt (2.89 g/t) gold. Significant intercepts in the "G" zone included 20 feet (6.1 m) grading 0.03 opt (1.12 g/t) gold and 30 feet (9.1 m) grading 0.02 opt (0.68 g/t) gold.

The company also collected 1,067 soil samples, completed 3.9 line miles (6.3 line-km) of induced polarization (IP) geophysical surveys, and conducted 5.9 square miles (15 square km) of geological mapping. The IP survey was conducted over the "E" zone where the known mineralization appears to correlate with a north-northwest trending greater than 1000-foot (300-meter) long resistivity break and greater than 1,600-foot (500-meter) long silver anomaly in the soil. Geologic mapping and soil sampling were conducted in the "A" zone and "A" zone north. Drill holes there targeted the Devonian-Mississippian Pilot Shale rather than the Chainman Shale, which had been mined in the past.

Twelve bulk leachable extractable gold samples were collected from the Devonian-Mississippian Pilot Shale, but they produced variable gold recoveries. The "A" zone also contained a 650-foot by 2,600-foot (200-meter by 800-meter) area of Chainman Shale associated with jasperoid bodies and soil geochemical anomalies. The "A" zone north area contains a 1,100-foot by 1,600-foot (350-meter by 500-meter) area of Devonian-Mississippian Pilot Shale which was outlined by geologic mapping and gold and silver anomalies in the soil.

Colorado Resources Ltd. had an option agreement with Ely Gold and Minerals, Inc., whereby the Colorado Resources can acquire 100% interest in the Green Springs project, Cox Claims, and Cathedral Well project for $3,000,000 and 2,250,000 in common shares of stock. The Cathedral Well project bounds the Green Springs project area to the east and the west. Colorado Resources, Ltd., dropped the option in May 2018. (Ely Gold and Minerals, Inc., Management Discussion and Analysis, 5/1/2017; Ely Gold and Minerals, Inc., news release, 12/7/2016; Ely Gold and Minerals, Inc., http://elygoldinc.com; Colorado Resources, Ltd., Management Discussion and Analysis, 11/29/2017, 7/30/2018; Colorado Resources, Ltd., news releases, 2/13/2017, 2/24/2017, 4/4/2017; Colorado Resources, Ltd., http://www.coloradoresources.com)

MAJOR PRECIOUS-METAL DEPOSITS

by David A. Davis and 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 websites, 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
CHURCHILL COUNTY				
Bell Mountain (Bell Mountain district)	1982: 1,000,000 tons, 0.055 opt Au, 1.4 opt Ag 1989: reserves-30,000 oz Au, 125,000 oz Ag 1997: 2,500,000 tons, 0.059 opt Au equiv. oz 2011: 10,760,000 tons, 0.015 opt Au, 0.514 opt Ag (measured and indicated resource); 2,255,000 tons, 0.013 opt Au, 0.387 opt Ag (inferred resource) 2017: East Ridge Pit Shell: 36,100 tons, 0.028 opt Au, 1,016 oz Au, 0.85 opt Ag, 30,598 oz Ag (measured and indicated resource); 268,400 tons, 0.023 opt Au, 6,150 oz Au, 0.77 opt Ag, 205,928 oz Ag (Inferred resource); Sphinx Pit Shell: 29,100 tons, 0.025 opt Au, 723 oz Au, 0.74 opt Ag, 21,705 oz Ag 254,400 tons, 0.019 opt Au, 4,892 oz Au, 0.53 opt Ag, 134,915 oz Ag (inferred resource); Spurr Pit Shell: 856,900 tons, 0.021 opt Au, 18,266 oz Au, 0.79 opt Ag, 676,421 oz Ag (measured and indicated resource) 395,900 tons, 0.008 opt Au, 3,131 oz Au, 0.4 opt Ag, 158,100 oz Ag (inferred resource); Varga Pit Shell: 2,143,000 tons, 0.016 opt Au, 33,740 oz Au, 0.32 opt Ag, 689,423 oz Ag (measured and indicated resource,); 1,140,700 tons, 0.013 opt Au, 14,711 oz Au, 0.31 opt Ag, 355,618 oz Ag (inferred resource)	1914: 35 tons, 0.51 opt Au, 16 opt Ag	rhyolitic tuff	Miocene
Buffalo Valley gold property (Eastgate district)	1996: 96,000 oz Au		rhyolitic ash-flow tuff	Tertiary
Dixie Comstock (Dixie Valley district)	1991: 2,400,000 tons, 0.049 opt Au 1995: 100,000 oz Au		Tertiary rhyolite	Miocene?
Fireball Ridge (Truckee district)	1988: 258,000 tons, 0.032 opt Au		sedimentary	
Fondaway Canyon (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) 2017: underground sulfide: 2,260,000 tons, 0.18 opt Au, 409,000 oz Au (indicated resource); 3,530,000 tons, 0.19 opt Au, 660,000 oz Au (inferred resource)	1989: 1,065 oz Au, 87 oz Ag 1990: 12,000 oz Au	Triassic slate and phyllite	
Jessup (Jessup district)	1998: 8,376,564 tons, 0.024 opt Au, 0.25 opt Ag (global resource) 2007: 5,432,000 tons, 0.022 opt Au, 0.31 opt Ag (indicated resource); 1,265,000 tons, 0.017 opt Au, 0.23 opt Ag (inferred resource) 2009: 8,571,000 tons, 0.015 opt Au, 0.255 opt Ag (measured resource); 13,936,000 tons, 0.012 opt Au 0.209 opt Ag (indicated resource); 4,954,000 tons, 0.016 opt Au, 0.231 opt Ag (inferred resource)			

MAJOR PRECIOUS-METAL DEPOSITS, CHURCHILL COUNTY (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
New Pass property (New Pass district)	1994: 3,400,000 tons, 0.042 opt Au 1997: 3,100,000 tons, 0.055 opt Au 2006: 11,500,000 tons, 0.0226 opt Au, 0.0041 opt Ag (inferred resource) 2009: 11,142,000 tons, 0.028 opt Au, 0.24 opt Ag (measured and indicated resource); 15,515,488 tons, 0.022 opt gold, 341,750 oz Au 0.202 opt Ag, 3,134,129 opt Ag (inferred resource)		Triassic siltstone	
Pyramid (Holy Cross district)	1998: 62,000 oz Au, 3.5 million oz Ag (drill indicated resource) 2003: 4,000 tons 0.516 opt Au, 74.99 opt Ag, 5.95% Pb, 7.08% Zn (Inferred mineral resource)	1910-1956: ~80,000 oz Au 1977-1987: 17 tons concentrates, 3.302 opt Au, 477.8 opt Ag, 17.5% Pb	welded tuff	

CLARK COUNTY

Crescent property (Crescent district)	1992: 390,000 tons, 0.05 opt Au; 3,300,000 tons, 0.022 opt Au			
Keystone (Goodsprings district)	1990: 64,000,000 tons, 0.05 opt Au (estimated geologic resource) 1992: 110,000 tons, 0.11 opt Au	1990: ~1,000 oz Au 1993: idle	lower Paleozoic carbonate rocks	Triassic

DOUGLAS COUNTY

Buckskin (Buckskin district)	1973: 678,400 tons, averaging 0.15 opt Au, 0.45 opt Ag, 1.3% Cu 1978: 561,500 tons, 0.18 opt Au, 0.5 opt Ag, 1.3% Cu	1918-50 intermittent: est. 10,000 tons Au, Cu ore	Triassic andesite and rhyodacite flows	

ELKO COUNTY

Banshee (Bootstrap district)	2002: 44,000,000 tons, 0.44 opt Au, 1,400,000 oz Au (preliminary resource) 2011 underground: 1,679,000, tons, 0.327 opt Au, 548,000 oz contained Au		Popovich Fm.	
Big Springs (Independence Mountains district)	1987: 3,760,000 tons, 0.148 opt Au 1989: 1,550,000 tons, 0.172 opt Au 2005 (inferred resource): 15,145,000 tons, 0.078 opt Au 2005 (inferred resource): 468,000 tons, 0.45 opt Au 2013: North Sammy: 1,430,000, 0.12 opt Au, 167,000 oz Au; North Sammy Contact: 1,430,000 tons, 0.05 Au, 70,000 oz Au; South Sammy: 8,000,000 tons, 0.06 opt Au, 438,000 oz Au; Beadle Creek: 2,310,000 tons, 0.07 opt Au, 70,000 oz Au; Mac Ridge: 1,870,000 tons, 0.04 opt Au, 74,000 oz Au; Dorsey Creek: 330,000 tons, 0.04 opt Au, 12,000 oz Au; Briens Fault: 880,000 tons, 0.05 opt Au, 43,000 oz Au; Big Springs Total: 16,300,000 tons, 0.06 opt Au, 968,000 oz Au (inferred resource) 2014: North Sammy: 1,607,000, 0.13 opt Au, 184,100 oz Au; North Sammy Contact: 1,441,000 tons, 0.06 Au, 71,800 oz Au; South Sammy: 8,380,000 tons, 0.06 opt Au, 437,200 oz Au; Beadle Creek: 2,978,000 tons, 0.08 opt Au, 201,700 oz Au; Mac Ridge: 2,080,000 tons, 0.04 opt Au, 81,100 oz Au; Dorsey Creek: 306,000 tons, 0.05 opt Au, 12,900 oz Au; Briens Fault: 881000 tons, 0.05 opt Au, 40,500 oz Au; Big Springs Total: 17,672,000 tons, 0.07 opt Au, 1,029,900 oz Au (combined measured, indicated and inferred resource)	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

MAJOR PRECIOUS-METAL DEPOSITS, ELKO COUNTY (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
Bootstrap/Capstone/ Tara (Bootstrap district)	1989: 25,100,000 tons, 0.039 opt Au (geologic resource) 1996: 20,200,000 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 at the end of this section 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 2006: 2,019 oz Au, 436 oz Ag	dacitic dikes, Paleozoic siltstone and laminated limestone/chert	Eocene
Burns Basin (Jerritt Canyon, Independence Mountains district)	2005-2007: 29,700 tons, 0.134 opt Au (open pit indicated resource) 30,700 tons, 0.194 opt Au (underground indicated resource), 50,600 tons, 0.23 opt Au (underground inferred resource) 2011: 348,800 tons, 0.078 opt Au, 27,200 oz Au (proven and probable reserves, open pit) 344,500 tons, 0.096 opt Au, 33,200 oz Au (measured and indicated resource, includes reserves) 14,000 tons, 0.079 opt Au, 1,100 oz Au (inferred resource) 2012: 423,800 tons, 0.101 opt Au, 42,800 oz Au (proven and probable reserves, open pit) 476,500 tons, 0.097 opt Au, 46,300 oz Au (measured and indicated resource, includes reserves) 5,000 tons, 0.061 opt Au, 300 oz Au (inferred resource)		Hanson Creek and Roberts Mountains Formations	
California Mountain (Jerritt Canyon, Independence Mountains district)	2005-2007: 8,000 tons, 0.11 opt Au (open pit indicated resource) 32,100 tons, 0.38 opt Au (underground indicated resource), 9,400 tons, 0.33 opt Au (underground inferred resource) 2011: 4,500 tons, 0.184 opt Au, 800 oz Au (indicated resource, underground) 29,500 tons, 0.192 opt Au, 5,700 oz Au (inferred resource)		Hanson Creek and Roberts Mountains Formations	
Coyote Zone (Jerritt Canyon, Independence Mountains district)	2005-2007: 45,200 tons, 0.21 opt Au (underground indicated resource) 2,700 tons, 0.18 opt Au (underground inferred resource) 2006-2007: 20,100 tons, 0.104 opt Au (open pit inferred resource)		Hanson Creek and Roberts Mountains Formations	
Cobb Creek (Mountain City district)	1988: 3,200,000 tons, 0.045 opt Au (geologic resource)			
Cord Ranch (Robinson Mountain district)	1991: 3,500,000 tons, 0.037 opt Au 1994: 350,000 oz Au in 3 deposits (see Piñon)		Webb Formation Devils Gate Formation Tomera Formation	
Dark Star (Robinson Mountain district)	2015: 25,470,000 tons, 0.017 opt Au, 374,000 oz Au (inferred resource), 2017: oxide: 16,950,000 tons, 0.016 opt Au, 265,100 oz Au (indicated resource); 18,790,000 tons, 0.038 opt Au, 715,800 oz Au (inferred resource))		Tomera Formation Moleen Formation	

MAJOR PRECIOUS-METAL DEPOSITS, ELKO COUNTY (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
Dee (Bootstrap district)	1982: 2,500,000 tons, 0.12 opt Au 1990: 4,500,000 tons, 0.059 opt Au 1999: 1,400,000 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 carbonate rocks, dacitic dikes	Eocene
Doby George (Aura district)	1995: 3,700,000 tons, 0.060 opt Au 1997: 250,000 oz Au		Schoonover	
Emigrant (Carlin district)	1989 (Emigrant Springs): 30,300,000 tons 0.021 opt Au 2005 (Emigrant Springs): 1,531,165 oz Au (proven and probable reserves) 2011 low grade oxide: 1,600,000 oz Au (reserves) 2012: 1,240,000 oz Au (reserves)	2012: 20,738 oz Au, 2,376 oz Ag 2014-2017: included in Newmont Gold production at the end of this section	Webb Formation	Eocene
Hollister (Ivanhoe district)	1989: oxide-18,400,000 tons, 0.035 opt Au; estimated mineral inventory 83,500,000 tons, 0.034 opt Au, with 52,800,000 tons of oxide and 30.7 million tons of sulfide 1995: 1,300,000 oz Au; 42 million tons of 0.031 opt Au (geologic resource, combined oxide and sulfide) 2001: 719,000 tons, 1.29 opt Au, 7 opt Ag 2007: (May, 0.25 opt Au cut-off grade): 903,000 tons, 1.03 opt Au, 5.71 opt Ag (measured and indicated resource) 805,000, tons, 1.08 opt Au, 3.94 opt Ag (inferred resource) 2008: 1,615,000 tons, 0.87 opt Au, 4.57 opt Ag (measured and indicated resource) 1,252,000 tons, 0.51 opt Au, 1.43 opt Ag (inferred resource) 2009: 1,111,200 tons, 1.167 opt Au, 8.59 opt Ag (measured and indicated resource, includes reserves) 2010: 1,121,000 tons, 1.305 opt Au, 10.35 opt Ag (measured and indicated resource, includes reserves); 1,487,000 tons, 0.690 opt Au, 11.1 opt Ag (inferred resource) 2012: 516,000 tons, 0.882 opt Au, 455,000 oz Au, 2.9 opt Ag, 1,470,000 oz Ag (proven and probable reserves, Au cut-off grade: 0.25 opt epithermal, 0.15 opt Tertiary mineralization); 1,260,000 tons, 0.595 opt Au, 750,000 oz Au, 2.5 opt Ag, 3,106,000 oz Ag (measured and indicated resource, includes reserves, cut-off 0.1 opt Au); 1,416,000 tons, 0.224 opt Au, 317,000 oz Au, 0.6 opt Ag, 872,000 oz Ag (inferred resource, cut-off 0.1 opt Au) 2016: Oxide: 20,807,000 tons, 0.026 opt Au, 549,000 oz Au, 0.036 opt Ag, 740,000 oz Ag; Mixed: 2,093,000 tons, 0.031 opt Au, 64,000 oz Au, 0.035 opt Ag, 73,000 oz Ag (indicated resource); Oxide: 36,445,000 tons, 0.012 opt Au, 449,000 oz Au 0.018 opt Ag, 642,000 oz Ag; Mixed: 1,487,000 tons, 0.022 opt Au, 33,000 oz Au, 0.035 opt Ag, 52,000 oz Ag (inferred resource) 2017: Underground: 199,457 tons, 0.553 opt Au, 110,300 oz Au, 3.125 opt Ag, 623,700 oz Ag (proven and probable reserves)	1990: 6,000 oz Au 1991: 60,000 oz Au 2007: 4,066 oz Au, 38,885 oz Ag 2008: 41,890 oz Au, 192,000 oz Ag 2009: 31,174 oz Au, 243,148 oz Ag 2010: 105,144 oz Au 578,855 oz Ag 2011: 86,518 oz Au 711,493 oz Ag 2012: 62,423 oz Au 301,526 oz Ag 2013: 12,359 oz Au 55,648 oz Ag 2014: 2,342 oz Au 9,433 oz Ag 2017: 6,751 oz Au	rhyolitic tuff, flows	Miocene

MAJOR PRECIOUS-METAL DEPOSITS, ELKO COUNTY (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
Island Mountain (Island Mountain district)	2012: 32,000 oz Au (indicated resource); 385,000 oz Au (inferred resource)			
Jerritt Canyon Property (Independence Mountains district)	1981: 12,500,000 tons 0.231 opt Au 1989: 21,600,000 tons, 0.143 opt Au mill ore; 6,500,000 tons, 0.043 opt Au leachable 1999: 1,500,000 oz Au, (proven and probable reserve); 3,800,000 oz Au (other minlzd material) 2000: 1,300,000 oz Au (proven and probable resv); 3,700,000 oz Au (other mineralized material) 2001: 2,058,000 oz Au (proven and probable; reserve), 893,000 oz Au (other mineralized mat.) 2002: 580,913 oz Au, proven and probable reserves; 1,296,000 oz Au (measured and indicated resource); 1,035,000 oz Au (inferred resource) 2003: 820,104 oz Au, (proven and probable reserves); 2,295,000 oz Au (measured and indicated resource); 1,034,000 oz Au (inferred resource) 2004: 9,988,000 tons, 0.241 opt Au (measured and indicated resource); 4,100,000 tons, 0.219 opt Au (inferred resource) 2005: 3,723,000 tons, 0.24 opt Au (proven and probable reserves); 8,812,000 tons, 0.24 opt Au (measured and indicated resource, includes proven and probable reserves), 2.646,500 tons, 0.23 opt Au (inferred resource) 2006: 1,984,900 tons, 0.245 opt Au (proven and probable reserves); 8,203,200 tons, 0.232 opt Au (measured and indicated resource, includes proven and probable reserves), 2,414,800 tons, 0.226 opt Au (inferred resource) 2007: 3,155,200 tons, 0.227 opt Au (proven and probable reserves); 8,196,900 tons, 0.239 opt Au (measured and indicated resource, includes proven and probable reserves); 2,319,700 tons, 0.224 opt Au (inferred resource) 2010: 4,365,800 tons, 0.164 opt Au (proven and probable reserves); 11,692,300 tons, 0.217 opt Au (measured and indicated resource, includes proven and probable reserves); 4,490,100 tons, 0.198 opt Au 2011: 6,056,900 tons, 0.175 opt Au, 1,060,800 oz Au (proven and probable reserves); 12,289,500 tons, 0.189 opt Au, 2,319,200 oz Au (measured and indicated resource, includes reserves); 4,115,700 tons, 0.182 opt Au, 748,400 oz Au (inferred resource) 2012: 7,287,000 tons, 0.157 opt Au, 1,145,000 oz Au (proven and probable reserves); 12,443,000 tons, 0.181 opt Au, 2,251,100 oz Au (measured and indicated resource, includes reserves); 3.845,000 tons, 0.17 opt Au, 653,200 oz Au (inferred resource)	1981: ~2.600,000 oz Au 1991: 1,380,000 oz Au, 25,000 oz Ag 1995: 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 Au, 6,322 oz Ag 2006: 169,862 oz Au, 7,154 oz Ag 2007: 121,700 oz Au, 17,560 oz Ag 2008: 35,936 oz Au, 4,620 oz Ag 2009: 9,770 oz Au 2010: 65,104 oz Au 2011: 67,453 oz Au 2012: 105,627 oz Au 4,580 oz Ag 2013: 165,000 oz Au (all deposits combined) 2014: 179,329 oz Au (all deposits combined) 2015: 167,683 0z Au, 4,000 oz Ag (all deposits combined) 2016: 140,990 oz Au, (all deposits combined) 2017: 129,439 oz Au, (all deposits combined)	Hanson Creek and Roberts Mountains Formations	Eocene

MAJOR PRECIOUS-METAL DEPOSITS, ELKO COUNTY (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
Kinsley Mountain (Kinsley district)	1988: 2,100,000 tons, 0.048 opt Au 1996: 3,400,000 tons, 0.032 opt Au 1999: (Main NW-trend oxidized): 785,808 tons, 0.037 opt Au, 28,799 oz Au; (SW "off-trend" oxidized): 590,022 tons, 0.024 opt Au, 14,227 oz Au; (Main trend, (Unoxidized/refractory): 994,162 tons, 0.072 opt Au, 71, 904 oz Au (drill indicated Resources) 2015: Secret Canyon Shale sulfide: 1,619,000 tons, 0.17 opt Au, 284,000 oz Au (indicated resource); 560,000 tons, 0.07 opt Au, 39,000 oz Au (inferred resource) Dunderberg Shale sulfide and transitional: 573,000 tons, 0.078 opt Au, 45,000 oz Au (indicated resource) 518,000 tons, 0.071 opt Au, 37,000 oz Au (inferred resource) Oxide: 3,910,000 tons, 0.019 opt Au, 76,000 oz Au (indicated resource); 2,628,000 tons, 0.017 opt Au, 46,000 oz Au (inferred resource); Total: 6.095,000 tons, 0.066 opt Au, 405,000 oz Au (indicated resource); 3,706,000 tons, 0.028 opt Au, 122,000 oz Au (inferred resource)	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?
Long Canyon (Pequop district)	2009 (March, 0.012 opt Au cut-off grade): 5,300,000 tons, 0.069 opt Au (indicated resource); 9,678,000 tons, 0.048 opt Au 9,678,000 tons, 0.048 opt Au (inferred resource) 2010 (May, 0.006 opt Au cut-off grade): 13,492,000 tons, 0.050 opt Au (measured and indicated resource) 11,457,000 tons, 0.048 opt Au (inferred resource) 2010 (year-end, 0.006 opt Au cut-off grade): 20,250,000 tons, 0.069 opt Au (measured and indicated resource) 12,313,000 tons, 0.056 opt au (inferred resource) 2012: 27,900,000 tons, 0.094 opt Au 2,630,000 oz Au (inferred resource) 2013: 15,700,000 tons, 0.065 opt Au, 1,010,000 oz Au (probable reserves); 3,700,000 tons, 0.097 opt Au (mineralized material) 2014: 18,400,000 tons, 0.067 opt Au, 1,230,000 oz Au (probable reserves); 4,900,000 tons, 0.101 opt Au (mineralized material) 2015: 18,000,000 tons, 0.067 opt Au, 1,200,000 oz Au (probable reserves); 9,400,000 tons, 0.093 opt Au (mineralized material) 2016: 19,200,000 tons, 0.061 opt Au, 1,170,000 oz Au (probable reserves); 16,000,000 tons, 0.103 opt Au (mineralized material) 2017: 21,600,000 tons, 0.049 opt Au, 1,070,000 oz Au (prove and probable reserves); 16,000,000 tons, 0.103 opt Au (mineralized material)	2016: 22,500 oz Au 2017: 174,462 oz Au	limestone and dolomite	
Maverick Springs (Maverick Springs area)	2002: 350,000 oz Au, 32,300,000 oz Ag (indicated resource); 747,000 oz Au, 68,800,000 oz Ag (inferred resource) 2004: 69,630,000 tons, 0.01 opt Au (indicated resource); 85,550,000 tons, 0.008 opt Au (inferred resource)			

MAJOR PRECIOUS-METAL DEPOSITS, ELKO COUNTY (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
Meikle (Lynn district)	1992: 7,900,000 tons, 0.613 opt Au (geologic resource) 1999: 5,900,000 tons, 0.647 opt Au (proven and probable reserves); 3,300,000 tons, 0.457 opt Au mineralized material 2000: 4,900,000 tons, 0.540 opt Au (proven and probable reserves); 2,900,000 tons, 0.450 opt Au (mineral resource) 2001: 9,000,000 tons, 0.439 opt Au (proven and probable reserves); 13,500,000 tons, 0.433 opt Au (mineral resource) 2002: 9,800,000 tons, 0.398 opt Au (proven and probable reserves); 12,900,000 tons, 0.396 opt Au (mineral resource) 2003: 3,316,000 tons, 0.467 opt Au (proven Reserves0; 5,862,000 tons, 0.326 opt Au (probable reserves); 1,580,000 tons, 0.435 opt Au (measured resource); 4,261,000 tons, 0.423 opt Au (indicated resource); 7,725,000 tons, 0.366 opt Au (inferred resource) 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): 7,319,000 tons, 0.379 opt Au (proven and probable reserves); 3,234,000 tons, 0.386 opt Au (measured and indicated resource); 3,034,000 tons, 0.386 opt Au (inferred resource) 2006 (includes all underground resources at Goldstrike): 7,662,000 tons, 0.370 opt Au (proven and probable reserves); 4,143,000 tons, 0.338 opt Au (measured and indicated resource); 2,159,000 tons, 0.301 opt Au (inferred resource) 2007 (includes all underground resources at Goldstrike): 7,423,000 tons, 0.364 opt Au (proven and probable reserves); 4,129,000 tons, 0.329 opt Au (measured and indicated resource); 2,747,000 tons, 0.371 opt Au (inferred resource) 2008 (includes all underground resources at Goldstrike): 6,923,000 tons, 0.368 opt Au proven and probable reserves; 4,467,000 tons, 0.323 opt Au measured and indicated resource; 3,424,000 tons, 0.393 opt Au inferred resource 2009 (includes all underground resources at Goldstrike): 8,998,000 tons, 0.318 opt Au proven and probable reserves; 4,436,000 tons, 0.334 opt Au measured and indicated resource; 1,858,000 tons, 0.341 opt Au inferred resource 2010 (includes all underground resources at Goldstrike): 10,872,000 tons, 0.272 opt Au (proven and probable reserves); 6,771,000 tons, 0.298 opt Au (measured and indicated resource) 3,047,000 tons, 0.298 opt Au (inferred resource) 2011 (includes all underground resources at Goldstrike): 11,895,000 tons, 0.255 opt Au, 3,055,000 oz Au (proven and probable reserves); 6,077,000 tons, 0.325 opt Au, 1,828,000 oz Au (measured and indicated resource); 2,698,000 tons, 0.298 opt Au, 805,000 oz Au (inferred resource) 2012 (includes all underground resources at Goldstrike): 14,632,000 tons, 0.233 opt Au, 3,405,000 oz Au (proven and probable reserves); 6,144,000 tons, 0.303 opt Au, 1,864,000 oz Au (measured and indicated resource); 2,387,000 tons, 0.265 opt Au, 633,000 oz Au (inferred resource) 2013 (includes all underground resources at Goldstrike): 10,474,000 tons, 0.247 opt Au, 2,585,000 oz Au (proven and probable reserves); 5,985,000 tons, 0.302 opt Au, 1,810,000 oz Au (measured and indicated resource); 1,302,000 tons, 0.311 opt Au, 405,000 oz 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 oz Au, 133,979 oz Ag 2006 (includes all underground production at Goldstrike): 477,035 oz Au, 58,345 oz Ag 2007 (includes all underground production at Goldstrike): 413,186 oz Au, 74,000 oz Ag 2008 (includes all underground production at Goldstrike): 424,687 oz Au, 51,434 oz Ag 2009 (includes all underground production at Goldstrike): 388,548 oz Au, 30,198 oz Ag 2010 (includes all underground production at Goldstrike): 281,308 oz Au, 22,628 oz Ag 2011 (includes all underground production at Goldstrike): 279,348 oz Au, 16,345 oz Ag 2012: 327,203 oz Au, 41,775 oz Ag 2013: 360,578 oz Au, 58,352 oz Ag 2014: 386,679 oz Au, 15,707 oz Ag 2015: 411,003 oz Au, 17,749 oz Ag 2016: 417,438 oz Au, 37,615 oz Ag 2017: 332,315 oz Au, 20,632 oz Ag	Popovich and Roberts Mountains Formations	Eocene

MAJOR PRECIOUS-METAL DEPOSITS, ELKO COUNTY (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
Meikle (cont.)	2014 (includes all underground resources at Goldstrike): 7,342,000 tons, 0.3 opt Au, 1,890,000 oz Au (proven and probable reserves,); 4,123,000 tons, 0.338 opt Au, 1,395,000 oz Au (measured and indicated resource); 1,827,000 tons, 0.351 opt Au, 405,000 oz Au (inferred resource) 2015 (includes all underground resources at Goldstrike): 5,459,000 tons, 0.3 opt Au, 1,628,000 oz Au (proven and probable reserves); 4,527,000 tons, 0.31 opt Au, 1,382,000 oz Au (measured and indicated resource); 1,362,000 tons, 0.3 opt Au, 409,000 oz Au (inferred resource) 2016 (includes all underground resources at Goldstrike): 6,267,000 tons, 0.29 opt Au, 1,806,000 contained oz Au (proven and probable reserves); 3,314,000 tons, 0.3 opt Au 1,009,000 oz Au (measured and indicated resource); 1,173,000 tons, 0.29 opt Au, 344,000 oz Au (inferred resource) 2017 (includes all underground resources at Goldstrike): 9,459,000 tons, 0.29 opt Au, 2,765,000 oz Au (proven and probable reserves); 4,297,000 tons, 0.25 opt Au, 1,077,000 oz Au (measured and indicated resource); 1,314,000 tons, 0.27 opt Au, 359,000 oz Au (inferred resource)			
MCE (Jerritt Canyon, Independence Mountains district)	2005-2007: 4,400 tons, 0.20 opt Au (underground measured and indicated resource) 7,800 tons, 0.19 opt Au (underground inferred resource)		Hanson Creek and Roberts Mountains Formations	
Midas (Ken Snyder) Mine (Gold Circle district)	1995: 13,000,000 tons, 0.16 opt Au, 2.7 opt Ag, announced resource, proven Au reserves<500,000 oz 1996: 1,100,000 tons, 1.324 opt Au, 14.95 opt Ag 1999: 3,000,000 tons, 0.816 opt Au, 9.835 opt Ag (proven and probable reserves) 2000: 3,400,000 tons, 0.63 opt Au, 7.77 opt Ag (proven and probable reserves) 2002: 3,400,000 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: 2,900,000 tons, 0.510 opt Au (proven and probable reserves); 200,000 tons, 0.58 opt Au (indicated resource); 700,000 tons, 0.31 opt Au (inferred resource) 2005: 1,500,000 tons, 0.58 opt Au (proven and probable reserves); 600,000 tons, 0.42 opt Au, (inferred resource) 2006: 1,200,000 tons, 0.47 opt Au (proven and probable reserves which includes 6,800,000 oz Ag); 800,000 tons, 0.33 opt Au, (inferred resource) 2007: 1,000,000 tons, 0.493 opt Au, (proven and probable reserves which includes 7,500,000 oz Ag); 200,000 tons, 0.345 opt Au (measured and indicated resource); 100,000 tons, 0.3013 opt Au (inferred resource) 2008: 900,000 tons, 0.436 opt Au, (proven and probable reserves); 200,000 tons, 0.186 opt Au, (measured and indicated resource); 100,000 tons, 0.321 opt Au (inferred resource) 2009: 700,000 tons, 0.425 opt Au, (proven and probable reserves, also includes 4,600,000 oz Ag); 100,000 tons, 0.193 opt Au, measured	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, 2,166,396 oz Ag 2006: 140,884 oz Au, 1,694,060 oz Ag 2007: 79,133 oz Au, 1,040,059 oz Ag 2008: 150,608 oz Au 1,872,883 oz Ag 2009: 123,621 oz Au, 1,634,601 oz Ag 2010: 127,196 oz Au, 1,710,318 oz Ag 2011: 111,476 oz Au, 1,512,287 oz Ag 2012: 82,922 oz Au, 1,247,994 oz Ag 2013: 52,195 oz Au, 1,368,896 oz Ag 2014: 21,984 oz Au, 1,489,149 oz Ag 2015: 28,838 oz Au, 1,513,112 oz Ag 2016: 29,577 oz Au, 1,345,990 oz Ag 2017: 34,343 oz Au	Tertiary volcanic rocks	Miocene

MAJOR PRECIOUS-METAL DEPOSITS, ELKO COUNTY (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
Midas (con't)	and indicated resource); 100,000 tons, 0.248 opt Au (inferred resource); 2010: 500,000 tons, 0.319 opt Au (proven and probable reserves, also includes 2,800,000 oz Ag); 120,000 tons, 0.167 opt Au (measured and indicated resource) 2011: 800,000 tons, 0.226 opt Au, 7.201 opt Ag, 160,000 Au, 5,250,000 oz Ag (proven and probable reserves); 110,000 tons, 0.070 opt Au; 100,000 tons 4.352 opt Ag (measured and indicated resource); 100,000 tons, 0.049 opt Au, 9.56 opt Ag (inferred resource) 2012: 600,000 tons, 0.095 opt Au, 7.791 opt Ag, 50,000 oz Au, 4,410,000 oz Ag (proven and probable reserves); 100,000 tons, 0.056 opt Au, 6.879 opt Ag, (measured and indicated resource); 300,000 tons, 0.07 opt Au, 7.156 opt, Ag, 20,000 oz Au, 2,500,000 oz Ag (inferred resource) 2013: 250,000 tons, 0.093 opt Au, 30,000 oz Au, 11.48 opt Ag, 2,820,000 oz Ag (proven and probable reserve); 100,000 tons, 0.04 opt Au, 7.25 opt Ag (mineralized material) 2014: 242,100 tons, 0.378 opt Au, 91,600 oz Au, 10.93 opt Ag, 2,646,000 oz Ag (proven and probable reserve); 1,117,000 tons, 0.377 opt Au, 421,000 oz Au, 6.085 opt Ag, 6,765,000 oz Ag (measure and indicated resource); 858,000 tons, 0.28 opt Au, 241,000 oz Au, 3.48 opt Ag, 2,988,000 oz Ag (inferred resource) 2015: 309,000 tons, 0.233 opt Au, 72,000 oz Au, 10.686 opt Ag, 3,304,700 oz Ag (proven and probable reserve); 1,154,900 tons, 0.356 opt Au, 411,300 oz Au; 8.4 opt Ag, 9,700,900 oz Ag (measured and indicated resource); 856,800 tons, 0.238 opt gold, 203,500 oz Au; 4.814 opt Ag, 4,124,900 oz Ag (inferred resource) 2016: 449,000 tons, 0.311 opt Au, 139,639 oz Au, 5.52 opt Ag, 2,475,000 oz Ag (proven and probable reserve) reserve, $1,000/oz Au, $15.83/oz Ag); 1,114,000 tons, 0.376 opt Au, 419,000 oz Au; 5.54 opt Ag, 6.620,000 oz Ag (measured and indicated resource) 671,800 tons, 0.303 opt gold, 203,000 oz Au; 2.93 opt Ag, 1,966,000 oz Ag (inferred resource)	780,316 oz Ag		
Mill Creek (Jerritt Canyon, Independence Mountains district)	2005-2007: 78,400 tons, 0.12 opt Au (measured and indicated resource) 2011: 186,000 tons, 0.09 opt Au, 16,800 oz Au (proven and probable reserves, open pit) 276,200 tons, 0.094 opt Au, 26,100 oz Au (measured and indicated resource, includes reserves) 3,400 tons, 0.154 opt Au, 500 oz Au (inferred resource) 2012: 197,000 tons, 0.09 opt Au, 17,700 oz Au (proven and probable reserves, open pit) 302,000 tons, 0.094 opt Au, 28,300 oz Au (measured and indicated resource, includes reserves) 4,000 tons, 0.153 opt Au, 600 oz Au (inferred resource)		Hanson Creek and Roberts Mountains Formations	
Murray (Jerritt Canyon, Independence Mountains district)	2005: 243,300 tons, 0.26 opt Au (proven and probable reserves) 789,200 tons, 0.29 opt Au (measured and indicated resource, includes reserves) 2006: 18,400 tons, 0.266 opt Au (proven and probable reserves); 393,300 tons, 0.290 opt Au (measured and indicated resource, includes reserves); 152,000 tons, 0.220 opt Au (inferred resource) 2007: 393,300 tons, 0.290 opt Au (measured and indicated resource); 152,000 tons, 0.220 opt Au (inferred resource) 2011: 412,400 tons, 0.221 opt Au, 91,100 oz Au (proven and probable reserves) 590,200 tons, 0.213 opt Au, 125,900 oz Au (measured and indicated resource, includes reserves) 86,000 tons, 0.215 opt Au, 18,500 oz Au (inferred resource) 2012: 495,400 tons, 0.165 opt Au, 81,700 oz Au (proven and probable reserves); 545,000 tons, 0.165 opt Au, 89,900 oz Au (measured and indicated resource, includes reserves); 61,000 tons, 0.162 opt Au, 10,000 oz Au (inferred resource)			

MAJOR PRECIOUS-METAL DEPOSITS, ELKO COUNTY (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
Pie Creek (Jerritt Canyon, Independence Mountains district)	2005-2007: 190,200 tons, 0.16 opt Au (measured and indicated resource) 28,300 tons, 0.14 opt Au (inferred resource) 2011: 205,400 tons, 0.087 opt Au, 17,900 oz Au (indicated resource, open pit); 4,900 tons, 0.09 opt Au, 400 oz Au (inferred resource) 2012: 225,000 tons, 0.086 opt Au, 19,200 oz Au (indicated resource, open pit); 5,000 tons, 0.089 opt Au, 500 oz Au (inferred resource)		Hanson Creek and Roberts Mountains Formations	
Pinion (Piñon; South Bullion) (Robinson Mountain district)	1996: 38,300,000 tons, 0.026 opt Au geologic mineral inventory 2002: 30,600,000 tons, 0.026 opt Au, measured, indicated, and inferred resource 2014: Piñon: 22,970,000 tons, 0.018 opt Au, 423,000 oz Au (indicated resource) 61,650,000 tons, 0.017 opt Au, 1,022,000 oz Au, 84,620,000 tons, 0.13 opt Ag, 9,430,000 oz Ag (inferred resource) 2016: Piñon: 34,840,000 tons, 0.018 opt Au, 630,300 oz Au (indicated resource) 67,330,000 tons, 0.016 opt Au, 1,081,300 oz Au, 102,170,000 tons, 0.12 opt Ag, 12,401,600 oz Ag (inferred resource)		Webb Formation siltstone Devils Gate Limestone	
Pony Creek (Robinson Mountain district)	1994:1,100,000 tons, 0.057 opt Au (geologic resource) 2004: 32,410,000 tons, 0.044 opt Au (inferred resource)			
Railroad Property (Railroad district)	1997: POD Zone: 1,500,000 tons, 0.085 opt Au drill-indicated resource 2017: Oxide (Sweet Hollow and POD): 3,220,000 tons, 0.028 opt Au, 90,100 oz Au (indicated resource); 3,700,000 tons, 0.013 opt Au, 46,600 oz Au (inferred resource); Sulfide (North Bullion, Sweet Hollow, and POD): 2,260,000 tons, 0.076 opt Au, 171,400 oz Au (inferred near surface resource); 6,120,000 tons, 0.096 opt Au, 46,600 oz Au (inferred underground resource)			
Rain Property (Carlin district)	1982: 3,400,000 tons, 0.147 opt Au and 8,300,000 tons, 0.083 opt Au			
Gnome	1988: 2,700,000 tons, 0.048 opt Au		Webb Formation	Eocene
Rain	1989: 22,600,000 tons, 0.052 opt Au (geologic resource) 1996 (Rain/Emigrant Springs): 16,000,000 tons, 0.028 opt Au (proven and probable reserves); 10,400,000 tons, 0.021 opt Au (mineralized material) 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	1988: 29,000 oz Au 1991: 135,000 oz Au 1994: 79,000 oz Au 1995: 32,100 oz Au 1996: 48,900 oz Au 1997-1998: included in Newmont Gold production at the end of this section 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		
Saddle	2000: 2,000,000 tons, 0.5 opt Au			
SMZ	1989: 1,600,000 tons, 0.019 opt Au (geologic resource)			

MAJOR PRECIOUS-METAL DEPOSITS, ELKO COUNTY (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
Rain Property (cont.) (Carlin district)	1982: 3,400,000 tons, 0.147 opt Au and 8,300,000 tons, 0.083 opt Au			
Rain district	2000: 13,500,000 tons, 0.026 opt Au proven and probable open-pit ore; 308,000 tons, 0.267 opt Au (proven and probable underground ore) 2001: 13,500,000 tons, 0.026 opt Au (proven and probable open-pit ore); 21,000 tons, 0.024 opt Au (proven and probable underground ore); 1,300,000 tons, 0.048 opt Au (mineralized material)			
REN (Bootstrap district)	2003: 2,100,000 tons, 0.43 opt Au (inferred resource) 2005: 2,100,000 tons, 0.38 opt Au (indicated resource); 1,400,000 tons, 0.37 opt Au (inferred resource) 2006: 2,713,000 tons, 0.37 opt Au (indicated resource); 758,000 tons, 0.47 opt Au (inferred resource) 2007: 2,991,000 tons, 0.37 opt Au (indicated resource); 835,000 tons, 0.47 opt Au (inferred resource)			
Road Canyon (Jerritt Canyon, Independence Mountains district)	2005-2007: 148,600 tons, 0.14 opt Au (measured and indicated resource); 74,300 tons, 0.13 opt Au (inferred resource) 2011: 17,500 tons, 0.069 opt Au, 1,200 oz Au (indicated resource, open pit) 185,100 tons, 0.082 opt Au, 15,100 oz Au (inferred resource) 2012: 17,000 tons, 0.07 opt Au, 1,200 oz Au (indicated resource, open pit) 187,000 tons, 0.081 opt Au, 15,200 oz Au (inferred resource)		Hanson Creek and Roberts Mountains Formations	
Saval (Jerritt Canyon, Independence Mountains district)	2005: 104,400 tons, 0.23 opt Au (proven and probable reserves); 460,500 tons, 0.25 opt Au (measured and indicated resource, includes reserves); 270,000 tons, 0.25 opt Au (inferred resource) 2006: 120,200 tons, 0.246 opt Au (proven and probable reserves); 369,300 tons, 0.254 opt Au (measured and indicated resource, includes reserves); 191,200 tons, 0.238 opt Au (inferred resource) 2007: 120,200 tons, 0.246 opt Au (proven and probable reserves); 379,800 tons, 0.252 opt Au (measured and indicated resource, includes reserves); 107,400 tons, 0.206 opt Au (inferred resource) 2010: 169,100 tons, 0.210 opt Au (proven and probable reserves, underground) 656,000 tons, 0.227 opt Au (measured and indicated resource, includes reserves); 201,700 tons, 0.209 opt Au (inferred resource) 2011 underground: 169,100 tons, 0.210 opt Au, 35,500 oz Au (proven and probable reserves) 333,600 tons, 0.224 opt Au, 74,800 oz Au (measured and indicated resource, includes reserves); 95,400 tons, 0.2 opt Au, 19,100 oz Au (inferred resource); open pit: 144,900 tons, 0.092 opt Au, 13,400 oz Au (proven and probable reserves) 654,300 tons, 0.074 opt Au, 48,600 oz Au (measured and indicated resource, includes reserves); 222,200 tons, 0.142 opt Au, 31,600 oz Au (inferred resource) 2012 underground: 168,000 tons, 0.207 opt Au, 34,800 oz Au (proven and probable reserves) 177,600 tons, 0.25 opt Au, 44,200 oz Au (measured and indicated resource, includes reserves); 51,000 tons, 0.238 opt Au, 12,200 oz Au (inferred resource); open pit: 83,000 tons, 0.129 opt Au, 10,800 oz Au	2014: 2,732 oz Au	Hanson Creek and Roberts Mountains Formations	

MAJOR PRECIOUS-METAL DEPOSITS, ELKO COUNTY (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
Saval (cont.) (Jerritt Canyon, Independence	(proven and probable reserves); 367,000 tons, 0.093 opt Au, 34,300 oz Au (measured and indicated resource, includes reserves);10,000 tons 0.083 opt Au, 800 oz Au (inferred resource)			
Smith (Jerritt Canyon, Independence Mountains district)	2005: 949,300 tons, 0.29 opt Au (proven and probable reserves) 1,863,300 tons, 0.28 opt Au (measured and indicated resource, includes reserves) 677,000 tons, 0.24 opt Au (inferred resource) 2006: 269,000 tons, 0.332 opt Au (proven and probable reserves); 1,064,400 tons, 0.290 opt Au (measured and indicated resource, includes reserves); 541,600 tons, 0.231 opt Au (inferred resource) 2007: 954,100 tons, 0.282 opt Au (proven and probable reserves); 1,236,900 tons, 0.278 opt Au (measured and indicated resource, includes reserves); 534,000 tons, 0.221 opt Au (inferred resource) 2010: 1,631,700 tons, 0.172 opt Au (proven and probable reserves, underground) 4,186,200 tons, 0.235 opt Au (measured and indicated resource, includes reserves) 1,157,300 tons, 0.195 opt Au (inferred resource) 2011: 2,056,600 tons, 0.212 opt Au, 435,700 oz Au (proven and probable reserves, underground) 4,231,500 tons, 0.22 opt Au, 928,800 oz Au (measured and indicated resource, includes reserves) 979,500 tons, 0.196 opt Au, 191,800 oz Au (inferred resource) 2012: 3,012,000 tons, 0.164 opt Au, 495,300 oz Au (proven and probable reserves); 5,193,000 tons, 0.202 opt Au, 1,049,400 oz Au (measured and indicated resource, includes reserves); 977,000 tons, 0.179 opt Au, 174,600 oz Au (inferred resource)	<2013: Jerritt Canyon combined 2013: 82,309 oz Au 2014: 80,198 oz Au	Hanson Creek and Roberts Mountains Formations	
Smith East (Jerritt Canyon, Independence Mountains district)	2006: 997,400 tons, 0.281 opt Au (measured and indicated resource, includes reserves) 120,400 tons, 0.264 opt Au (inferred resource) 2007: 1,065,500 tons, 0.287 opt Au (measured and indicated resource); 125,200 tons, 0.280 opt Au (inferred resource)		Hanson Creek and Roberts Mountains Formations	
South Arturo (Bootstrap district)	2006: 21,073,000 tons, 0.060 opt Au (indicated resource); 1,310,000 tons, 0.053 opt Au (inferred resource) 2007: 29,880,000 tons, 0.070 opt Au (indicated resource); 1,020,000 tons, 0.022 opt Au (inferred resource) 2008: 36,857,000 tons, 0.045 opt Au (indicated resource); 3,253,000 tons, 0.013 opt Au (inferred resource) 2009: 43,857,000 tons, 0.051 opt Au (proven and probable reserve) 5,628,000 tons, 0.048 opt Au (indicated resource); 4,232,000 tons, 0.018 opt Au (inferred resource) 2010: 45,597,000 tons, 0.051 opt Au (proven and probable reserve) 26,735,000 tons, 0.043 opt Au (indicated resource); 11,623,000 tons, 0.018 opt Au (inferred resource) 2011: 47,062,000 tons, 0.05 opt Au 2,330,000 oz Au (probable reserve); 35,803,000 tons, 0.039 opt Au,1,380,000 contained oz Au (indicated resource) 7,430,000 tons, 0.023 opt Au, 472,000 oz Au (inferred resource) 2012: 56,280,000 tons, 0.042 opt Au, 0.227 opt Ag, 2,368,000 oz Au 11,600,000	2016: 223,145 oz Au 2017: 142,810 oz Au	Popovich Formation Bootstrap Limestone Rodeo Creek Formation	

MAJOR PRECIOUS-METAL DEPOSITS, ELKO COUNTY (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
South Arturo (cont.) (Bootstrap district)	oz Ag (probable reserve); 27,295,000 tons, 0.045 opt Au, 0.339 opt Ag, 731,000 oz Au, 5,900,000 oz Ag (indicated resource); 28,123,000 tons, 0.015 opt Au, 0.077 opt Ag, 422,000 oz Au, 3,250,000 oz Ag (inferred resource) 2013: 34,208,000 tons, 0.049 opt Au, 1,678,000 oz Au (proven and probable reserve); 54,378,000 tons, 0.044 opt Au, 2,400,000 oz Au (measured and indicated resource); 25,802,000 tons, 0.014 opt Au, 367,000 oz Au, (inferred resource) 2014: 3,143,000 tons, 0.15 opt Au, 403,000 oz Au (probable reserve); 39,552,000 tons, 0.049 opt Au, 2,542,000 oz Au (measured and indicated resource); 9,665,000 tons, 0.023 opt Au, 210,000 oz Au, (inferred resource cut-off grade 0.005-0.065 opt Au)] 2015: 2,368,000 tons, 0.16 opt Au, 388,000 contained oz Au (probable reserve); 290,000 tons, 0.04 opt Au, 11,600 oz Au (measured and indicated resource); 13,000 tons, 0.07 opt Au, 1,000 oz Au, (inferred resource) 2016: 1,800,000 tons, 0.11 opt Au, 203,000 oz Au (probable reserve); 53,000 tons, 0.034 opt Au, 1,800 oz Au (measured and indicated resource); various cut-off grades); 11,000 tons, 0.15 opt Au, 1,800 oz Au, (inferred resource, 2017: 7,262,000 tons, 0.093 opt Au, 674,500 oz Au, 6,009,600 tons, 0.46 opt Ag, 2,787,700 oz Ag (proven and probable reserve); 20,849,500 tons, 0.0434 opt Au, 77,700 oz Au, 20,575,900 tons, 0.19 opt Ag, 3,841,500 oz Ag (measured and indicated resource); 1,593,200 tons, 0.048 opt Au, 77,700 oz Au, 1,376,800 tons, 0.11 opt Ag, 153,700 oz Ag (inferred resource)			
SSX-Steer (Jerritt Canyon, Independence Mountains district)	2005: 1,333,300 tons, 0.25 opt Au (proven and probable reserves); 2,597,500 tons, 0.28 opt Au (measured and indicated resource, includes reserves); 1,052,200 tons, 0.23 opt Au (inferred resource) 2006: 739,400 tons, 0.266 opt Au (proven and probable reserves); 2,332,500 tons, 0.266 opt Au (measured and indicated resource, includes reserves); 929,700 tons, 0.23 opt Au (inferred resource) 2007: 900,000 tons, 0.226 opt Au (proven and probable reserves); 2,561,400 tons, 0.259 opt Au (measured and indicated resource, includes reserves); 959,200 tons, 0.236 opt Au (inferred resource) 2010: 1,215,400 tons, 0.189 opt Au (proven and probable reserves, underground) 4,012,200 tons, 0.224 opt Au (measured and indicated resource, includes reserves); 479,100 tons, 0.194 opt Au (inferred resource) 2011: 1,280,900 tons, 0.191 opt Au, 244,400 oz Au (proven and probable reserves, underground) 3,699,200 tons, 0.209 opt Au, 772,200 oz Au (measured and indicated resource, includes reserves) 371,700 tons, 0.198 opt Au, 73,700 oz Au (inferred resource) 2012 (including West Mahala): 1,621,000 tons, 0.163 opt Au, 272,000 oz Au (proven and probable reserves); 3,643,000 tons, 0.199 opt Au, 724,300 oz Au (measured and indicated resource, includes reserves); 2,508,000 tons, 0.173 opt Au, 433,600 oz Au (inferred resource)	<2013: Jerritt Canyon combined 2013: 48,930oz Au 2014: 34,486 oz Au	Hanson Creek and Roberts Mountains Formations	
Starvation Canyon (Jerritt Canyon, Independence Mountains district)	2005: 400,500 tons, 0.30 opt Au (probable reserves); 676,400 tons, 0.28 opt Au (measured and indicated resource, includes reserves); 51,400 tons, 0.31 opt Au (inferred resource) 2006: 369,600 tons, 0.305 opt Au (probable reserves); 636,500 tons, 0.290 opt Au (measured	2013: 15,750 oz Au 2014: 61,913 oz Au	Hanson Creek and Roberts Mountains Formations	

MAJOR PRECIOUS-METAL DEPOSITS, ELKO COUNTY (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
Starvation Canyon (con't)	and indicated resource, includes reserves); 51,200 tons, 0.278 opt Au (inferred resource) 2007: 571,600 tons, 0.282 opt Au (probable reserves); 697,300 tons, 0.287 opt Au (measured and indicated resource, includes reserves) 25,500 tons, 0.252 opt Au (inferred resource) 2010: 363,000 tons, 0.264 opt Au (proven and probable reserves, underground) 502,400 tons, 0.285 opt Au (measured and indicated resource, includes reserves) 256,300 tons, 0.276 opt Au (inferred resource) 2011: 343,400 tons, 0.265 opt Au, 90,900 oz Au (proven and probable reserves, underground) 525,200 tons, 0.251 opt Au, 131,800 oz Au (measured and indicated resource, includes reserves) 244,400 tons, 0.253 opt Au, 64,600 oz Au (inferred resource) 2012: 970,000 tons, 0.178 opt Au, 172,600 oz Au (proven and probable reserves); 970,000 tons, 0.178 opt Au, 172,600 oz Au; (measured and indicated resource, includes reserves); 21,000 tons, 0.17 opt Au, 3,600 oz Au (inferred resource)			
Storm Mine (Rossi) (Bootstrap district)	1998: 3,100,000 tons, 0.371 opt Au (resource) 2000: 2,700,000 tons, 0.345 opt Au (resource) 2002: 1,900,000 tons, 0.335 opt Au (measured and indicated resource); 1,000,000 tons, 0.335 opt Au (inferred resource) 2005 and 2006: 500,000 tons, 0.449 opt Au (measured and indicated resource) 800,000 tons, 0.376 opt Au, (inferred resource)	2008: 52,000 oz Au 2009: 64,558 oz Au, 50,069 oz Ag 2010: 74,429 oz Au, 63,309 oz Ag 2011: 86,508 oz Au, 73,588 oz Ag 2012: 33,802 oz Au, 18,875 oz Ag 2013: 9,503 oz Au, 15,575 oz Ag	Popovich Formation Bootstrap Limestone Rodeo Creek Formation	
Trout Creek (Contact district)	1988: 1,500,000 tons, 0.04 opt Au	1988: exploration	Miocene sedimentary rocks	
Tuscarora (Dexter) (Tuscarora district)	1987: 2,000,000 tons, 0.039 opt Au, 1.9 opt Ag 1988: 1,800,000 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	Eocene
Twelvemile Ranch (Tecoma district)	1986: 4,000,000 tons, 0.01 opt Au, (resource)		volcanic and sedimentary rocks	
Waterpipe II (Jerritt Canyon, Independence Mountains district)	2005-2007: 37,400 tons, 0.21 opt Au (underground inferred resource)		Roberts Mountains Formation	
West Mahala (Jerritt Canyon, Independence Mountains district)	2005 and 2006: 368,100 tons, 0.22 opt Au (underground measured and indicated resource); 141,900 tons, 0.21 opt Au (underground inferred resource) 2007: 197,500 tons, 0.218 opt Au (underground indicated resource); 129,600 tons, 0.206 opt Au (inferred resource) 2010: 225,800 tons, 0.189 opt Au(measured and indicated resource, underground); 1,956,900 tons, 0.191 opt Au (inferred resource) 2011: 199,300 tons, 0.188 opt Au, 37,500 oz Au (proven and probable reserves, underground) 388,700 tons, 0.19 opt Au, 73,900 oz Au (measured and indicated resource, includes reserves) 1,854,600 tons, 0.175 opt Au, 324,000 oz Au (inferred resource) 2012: Included with SSX		Hanson Creek and Roberts Mountains Formations	
West Pequop (Pequop district)	2010: 1,349,700 tons, 0.0.0475 opt Au (measured and indicated resource); 6,055,500 tons, 0.0411 opt Au (inferred resource)			

MAJOR PRECIOUS-METAL DEPOSITS, ELKO COUNTY (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
Winters Creek (Jerritt Canyon, Independence Mountains district) **Winters Creek**	1986: 1,400,000 tons, 0.146 opt Au 2005-2007: 148,900 tons, 0.22 opt Au (measured and indicated resource); underground 37,200 tons, 0.2 opt Au, (underground inferred resource) 2011: 90,300 tons, 0.162 opt Au, 14,600 oz Au (indicated resource, underground); 9,200 tons, 0.186 opt Au, 1,700 oz Au (inferred resource) 2012: 117,000 tons, 0.112 opt Au, 13,100 oz Au (indicated resource); 10,000 tons, 0.145 opt Au, 1,500 oz Au (inferred resource)		lower Paleozoic carbonate rocks	Eocene
Wright Window (Jerritt Canyon, Independence Mountains district)	1986: 1,300,000 tons, 0.095 opt Au 2005-2007: 32,600 tons, 0.226 opt Au, (probable reserves); 97,800 tons, 0.16 opt Au, (measured and indicated resource, includes reserves); 19,000 tons, 0.23 opt Au (inferred resource) 2010: 84,500 tons, 0.127 opt Au (probable reserve, open pit); 97,800 tons, 0.156 opt Au (measured and indicated resource, includes reserves); 19,000 tons, 0.229 opt Au (inferred resource) 2011: 112,900 tons, 0.096 opt Au, 10,900 oz Au (proven and probable reserves, open pit); 125,800 tons, 0.094 opt Au, 11,800 oz Au (measured and indicated resource, includes reserves) 4,800 tons, 0.093 opt Au, 400 oz Au (inferred resource) 2012: 114,000 tons, 0.096 opt Au, 11,000 oz Au (proven and probable reserves, open pit); 120,000 tons, 0.094 opt Au, 11,200 oz Au (measured and indicated resource, includes reserves) 5,000 tons, 0.089 opt Au, 500 oz Au (inferred resource)	1992: 3,500 oz Au	lower Paleozoic carbonate rocks	Eocene

ESMERALDA COUNTY

Boss (Gilbert district)	1987: 500,000 tons, 0.07 opt Au 1990: 637,500 tons, 0.023 opt Au (reserves); 31,000 oz Au (geologic resource) 1996: see Castle		Ordovician sedimentary rocks	Miocene?
Castle Black Rock (includes Castle and Boss) (Gilbert district)	1996: 3.7 million tons, 0.03 opt Au 1997: 10 million tons, 0.03 opt Au resource 2000: 215,000 oz Au indicated resource and 93,000 oz Au inferred resource 2012: Castle Zone: 16,185,000 tons, 0.013 opt Au (inferred resource, 0.007 opt Au cut-off grade). 2016: 13,646,000 tons, 0.015 opt Au, 93,000 oz Au (measured and indicated); 8,763,000 tons, 0.011 opt Au, 93,000 oz Au (inferred resource)		Ordovician Palmetto Formation	
Eastside (Gilbert district) complexes	2016: 39,440,000 tons, 0.017 opt Au, 654,000 oz Au, 0.1 opt Ag, 3,999,000 oz Ag (inferred resource)		Miocene rhyolite	dome
Gemfield (Goldfield district)	1996: 9,500,000 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 resource); 1,001,000 tons, 0.022 opt Au (inferred resource) 2006: 12,459,000 tons, 0.031 opt Au (measured and indicated resource); 88,000 tons, 0.116 opt Au (inferred resource) 2011: 15,748,000 tons, 0.0325 opt Au, 511,000 oz Au; (proven and probable reserves); 18,772,000 tons, 0.031 opt Au, 438,000 oz Au, 0.098 opt Ag, 1,846,000 oz Ag (measured and indicated resource); 4,596,000 tons, 0.016 opt Au, 74,000 oz Au, 0.059 opt Ag, 272,000 oz Ag (inferred resource)		Sandstorm Rhyolite	21 Ma?

MAJOR PRECIOUS-METAL DEPOSITS, ESMERALDA COUNTY (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
Gemfield (con't)	2013: 19,7026,000 tons, 0.0298 opt Au, 567,000 oz Au; (proven and probable reserves); 27,070,000 tons, 0.025 opt Au, 681,000 oz (measured and indicated resource, 0.007 opt Au cut-off grade); 1,190,000 tons, 0.015 opt Au, 18,000 oz Au (inferred resource)			
Goldfield Project (Goldfield district)	1983: 1,750,000 tons, 0.087 opt Au 1994: 3,480,000 tons, 0.071 opt Au 2003: 23,410,200 tons, 0.031 opt Au (measured and indicated resource); 10,239,100 tons 0.024 opt Au inferred resource (includes Goldfield Main, McMahon Ridge, and Gemfield) 2006: 16,856,000 tons, 0.034 opt Au (measured, indicated, and inferred resource, includes McMahon Ridge and Gemfield) 2013: 42,615,000 tons, 0.032 opt Au 1,340,000 oz Au (measured and indicated resource); 8,756,000 tons, 0.044 opt Au, 382,000 oz Au (inferred resource) (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
Goldfield Main (Goldfield district)	2004: 6,651,000 tons, 0.036 opt Au (measured and indicated resource(; 2,129,000 tons, 0.038 opt Au (inferred resource) 2010: 9,424,000 tons, 0.044 opt Au (indicated resource) 7,267,000 tons, 0.050 opt Au (inferred resource) 2011: 9,425,000 tons, 0.045 opt Au, 421,000 oz Au, (indicated resource): 7,264,000 tons, 0.05 opt Au, 360,000 oz Au (inferred resource)			
Goldfield West (Goldfield district)	2011: 5,042,444 tons, 0.015 opt Au, 76,080 oz Au, 0.12 opt Ag, 589,078 oz Ag (inferred resource)		rhyolite tuff	
Hasbrouck (Divide district)	1982: 5,000,000 tons 0.06 opt Au, 1.5 opt Ag 1986: 12,900,000 tons, 0.0291 opt Au, 0.59 opt Ag 1998: 7,700,000 tons, 0.036 opt Au, 0.7 opt Ag 2003: 26,036,00 tons, 0.023 opt Au (indicated resource); 8,200,000 tons, 0.021 opt Au (inferred resource) 2011: 128,608,197 tons, 0.009 opt Au, 0.228 Ag, 1,157,474 oz Au, 29,322,699 oz Ag (inferred resource) 2014: 14,686,000 tons, 0.014 opt Au, 0.307 opt Ag, 206,000 oz, 4,509,000 oz Ag Au (measured resource); 55,002,000 tons, 0.011 opt Au, 0.248 opt Ag, 605,000 oz Au, 13,640,000 oz Ag (indicated resource) 2015: 35,617,000 tons, 0.017 opt Au, 588,000 oz Au, 0.297 opt Ag, 10,569,000 oz Ag (proven and probable reserve); 54,185,000 tons, 0.014 opt Au, 738,000 oz Au, 0.26 opt Ag, 14,096,000 oz Ag (measured and indicated resource); 11,772,000 tons, 0.009 opt Au, 104,000 oz Au, 0.191 opt Ag, 2,249,000 oz Ag (inferred resource)		Siebert Formation tuff and volcaniclastic rocks	16 Ma
Hill of Gold (Divide district)	1988: 500,000 tons, 0.04 opt Au, 0.40 opt Ag 1996: 1,600,000 tons, 0.026 opt Au		Miocene silicic tuff	16 Ma
Imperial (Railroad Springs district)	1985: 769,000 tons, 0.029 opt Au (probable geologic inventory); 2,091,000 tons 0.029 opt Au (possible geologic inventory)	1930s: 2,000-3,000 oz Au, 1934-39: 3,241 tons ore valued at $15,926	Cambrian Campito Formation	

MAJOR PRECIOUS-METAL DEPOSITS, ESMERALDA COUNTY (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
Mary-Drinkwater (Silver Peak district)	1991: 531,300 tons, 0.124 opt Au 2010 (May): 4,697,000 tons, 0.047 opt Au (measured and indicated resource, Drinkwater and Mary deposits); 3,793,000 tons, 0.036 opt Au (inferred resource, Drinkwater and Mary deposits) 2014: Mary/LC: 1,502,560 tons, 0.061 opt Au, 91,510 oz contained Au (probable reserves, 0.02 opt Au cut-off grade); 1,534,500 tons, 0.063 opt Au, 96,670 oz contained Au (indicated resources); 50,900 tons, 0.061 opt Au, 3,100 oz contained Au (inferred resources); Drinkwater: 170,680 tons, 0.056 opt Au, 9,630 Au (probable reserves); 537,900 tons, 0.047 opt Au, 25,280 Au (indicated resources); 11,100 tons, 0.035 opt Au, 390 oz contained Au (inferred resource)	1991: 25,000 oz Au, 8,000 oz Ag See Mineral Ridge	Wyman Formation	Mesozoic?
McMahon Ridge (Goldfield district)	2004: 8,200,000 tons, 0.035 opt Au (measured and indicated resource); 171,000 tons, 0.019 opt Au (inferred resource) 2006: 4,138,000 tons, 0.042 opt Au (measured and indicated resource); 172,000 tons, 0.038 opt Au (inferred resource) 2011: 6,074,000 tons, 0.039 opt Au, 238,000 oz Au (indicated resource); 121,000 tons, oz, 0.032 opt Au, 4,000 oz Au (inferred resource)			
Mineral Ridge (Silver Peak district)	1995: 5,200,000 tons, 0.068 opt Au (proven and probable reserves, includes Mary-Drinkwater) 1998: 4,000,000 tons, 0.06 opt Au; 241,000 oz Au 2000: 2,840,000 tons, 0.074 opt Au (minable reserves) 2002: 2,660,000 tons, 0.079 opt Au (total Reserves) 2003: 8,300,000 tons, 0.061 opt Au resource (includes 2,660,000 tons, 0.079 opt Au reserves) 2010: 4,697,000 tons, 0.047 opt Au (measured and indicated resource, Drinkwater and Mary deposits); 3,793,000 tons, 0.036 opt Au (inferred resource, Drinkwater and Mary deposits) 2012: 3,231,000 tons, 0.059 opt Au, 190,800 oz Au (indicated resource, Drinkwater, Mary, and Last Chance deposits); 89,000 tons, 0.043 opt Au, 3,800 oz (inferred resource, Drinkwater, Mary, and Last Chance deposits) 2014 (incudes Mary/LC and Drinkwater): 2,137,120 tons, 0.061 opt Au, 131,190 oz Au (probable reserves); 2,697,500 tons, 0.050 opt Au, 160,300 oz Au (indicated resource); 72,730 tons, 0.055 opt Au, 3,970 oz, Au (inferred resource) [See Mary-Drinkwater] 2017 (incudes Mary/LC and Drinkwater): 3,713,020 tons, 0.042 opt Au, 156,3000 oz Au (probable reserve); 3,182,800 tons, 0.072 opt Au, 227,800 oz Au (indicated resources); 182,900 tons, 0.059 opt Au, 10,730 oz Au (inferred resources)	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 2011: 11,932 oz Au, 6,918 oz Ag 2012: 32,871 oz Au, 13,871 oz Ag 2013: 39,160 oz Au, 14,975 oz Au 2014: 40,814 oz Au, 18,182 oz Ag 2015: 39,690 oz Au, 19,742 oz Ag 2016: 36,879 oz Au, 16,950 oz Ag 2017: 19.045 oz Au, 10,203 oz Ag	Wyman Formation	Mesozoic?
Monte Cristo (Gilbert district)	2006: 363,760 tons, 0.190 opt Au, 0.583 opt Ag (inferred resource) 2010: 2,545,980 tons, 0.11 opt Au (inferred resource, McLean Lode, 0.02 opt cut-off grade) 888,685 tons, 0.04 opt Au (inferred resource, Upper Zone) 999,966 tons, 1.27 opt Ag (inferred silver resource, McLean Lode) 123,948 tons, 0.78 opt Ag (inferred silver resource, Upper Zone) 2015: 913,000 tons, 0.014 opt Au, 131,000 oz Au, 0.3 opt Ag, 271,000 oz Ag (inferred resource) 2006: 363,760 tons, 0.190 opt Au, 0.583 opt Ag (inferred resource) 2010: 2,545,980 tons, 0.11 opt Au (inferred resource, McLean Lode); 888,685 tons, 0.04 opt Au (inferred resource, Upper Zone) 999,966 tons 1.27 opt Ag (inferred silver resource, McLean Lode) 123,948 tons, 0.78 opt Ag (inferred silver resource, Upper Zone, 0.36 opt cut-off grade)	late 1980s: 300,000 tons, 0.072 opt Au	Tertiary andesite, lithic tuff	Tertiary

MAJOR PRECIOUS-METAL DEPOSITS, ESMERALDA COUNTY (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
Monte Cristo (con't) (Gilbert district)	2015: 913,000 tons, 0.014 opt Au, 131,000 oz Au, 0.3 opt Ag, 271,000 oz Ag (inferred resource)			
Palmetto (Palmetto district)	2017: Open pit: 11,171,000 tons, 0.028 opt Au, 310,360 oz Au, 0.21 opt Ag, 2,374,120 oz Ag (inferred resource) Underground: 108,000 tons, 0.11 opt Au, 11,310 oz Au, 0.32 opt Ag, 33,910 oz Ag (inferred resource)			
Nivloc (Red Mtn. district)	2011: 1,807,000 tons, 0.023 opt Au, 41,000 oz Au, 3.11 opt Ag, 5,633,000 oz Ag (inferred resource)	1937-43: 4,675,408 oz Ag, 18,794 oz Au	Alaskite Complex, rhyolite, and metasediments	Late Cenozoic
Three Hills (Tonopah district)	1996: 3,200,000 tons, 0.036 opt Au 1997: 6,300,000 tons, 0.023 opt Au 2003: 5,736,000 tons, 0.023 opt Au (indicated resource) 2014: 1,091,000 tons, 0.023 opt Au, 25,000 oz Au (measured resource); 7,413,000 tons, 0.017 opt Au, 126,000 oz Au (indicated resource) 2015: 9,653,000 tons, 0.018 opt Au, 176,000 oz Au (probable; 0.005 opt Au cut-off grade); 10,897,000 tons, 0.017 opt Au, 189,000 oz Au (indicated resource); 2,568,000 tons, 0.013 opt Au, 32,000 oz Au (inferred resource)		Miocene Siebert Formation and Oddie Rhyolite	
Tip Top (Fish Lake Valley district)	1997: 109,000 tons, 0.103 opt Au, 0.88 opt Ag (indicated resource) 1998: 168,000 tons, 0.088 opt Au inferred geologic resource) 2009: 388,920 tons, 0.096 opt Au (indicated resource) 323,230 tons, 0.072 opt Au (inferred resource)		Tertiary quartz latite	
Tonopah Divide (Divide district)	1988: 500,000 tons, 0.04 opt Au, 0.4 opt Ag 1997: 1,800,000 tons, 0.55 opt Au 2005: 400,000 tons, 0.348 opt Au (open pit "reserve")	1912-40: 113,794 tons ore 1982-86: 429,876 oz Au 1983-84: 3,759 oz Ag	Siebert Formation	16 ma
Weepah (Weepah district)	1986: 200,000 tons, 0.1 opt Au, 0.4 opt Ag	1930s: N/A 1986-87: 58,000 oz Au	Wyman Formation	Cretaceous

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Afgan (Antelope district)	1996: 80,000 oz Au drill-indicated resource 1999: 2,800,000 tons, 0.037 opt Au oxide resource 2004: 1,850,000 tons, 0.027 opt Au (indicated resource) 1,290,000 tons, 0.026 opt Au (inferred resource) 2011 (oxide): 3,206,000 tons, 0.021 opt Au, 66,000 oz Au (indicated resource); 3,972,000 tons, 0.014 opt Au, 55,000 oz Au (inferred resource)		Webb Formation	
Antimony Hill (Lynn district)	2002: 20,000 oz at 0.05 opt Au ("pre-mine resource")		Vinini Formation	
Barrel (Lynn district)	1998 (Barrel and Goldbug): 2,917,000 tons, 0.391 oz Au, 1,140,000 oz Au (proven and probable reserve); 1,170,000 tons, 0.337 opt Au (material not in reserve) 2002: 200,000 oz at 0.2 opt Au ("pre-mine resource") 2011 underground: 383,000 tons, 0.217 opt Au, 83,000 oz contained Au		Popovich Fm. Rodeo Creek Fm.	
Beast (Lynn district)	2002: 50,000 oz at 0.02 opt Au (pre-mine resource)	1994-1999: 8,000,000 tons, 0.02 opt Au	Roberts Mountains Fm., Eocene rhyolite dikes	Eocene

MAJOR PRECIOUS-METAL DEPOSITS, EUREKA COUNTY (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
Betze-Post (Lynn district)	1988: 128,400,000 tons, 0.095 opt Au 1999: 135,600,000 tons, 0.153 opt Au (proven and probable reserves); 23,300,000 tons, 0.099 opt Au (mineralized material) 2000: 116,400,000 tons, 0.155 opt Au (proven and probable); 55,900,000 tons, 0.063 opt Au (mineral resource) 2001: 108,900,000 tons, 0.151 opt Au (proven and probable); 49,900,000 tons, 0.069 opt Au (mineral resource) 2002: 107,100,000 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 resource); 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 reserves); 21,115,000 tons, 0.050 opt Au (measured and indicated resource); 417,000 tons, 0.089 opt Au (inferred resource) 2006: 105,206,000 tons, 0.125 opt Au (proven and probable reserves); 20,184,000 tons, 0.050 opt Au (measured and indicated resource); 489,000 tons, 0.078 opt Au (inferred resource) 2007: 94,914,000 tons, 0.128 opt Au (proven and probable reserves); 34,532,000 tons, 0.052 opt Au (measured and indicated resource); 5,014,000 tons, 0.064 opt Au (inferred resource) 2008: 86,254,000 tons, 0.119 opt Au (proven and probable reserves); 15,751,000 tons, 0.055 opt Au (measured and indicated resource); 479,000 tons, 0.092 opt Au (inferred resource) 2009: 82,902,000 tons, 0.112 opt Au (proven and probable reserves); 16,687,000 tons, 0.052 opt Au (measured and indicated resource); 3,568,000 tons, 0.116 opt Au (inferred resource) 2010: 95,865,000 tons, 0.101 opt Au (proven and probable reserves); 4,694,000 tons, 0.037 opt Au (measured and indicated resource) 1,344,000 tons, 0.065 opt Au (inferred resource) 2011: 97,325,000 tons, 0.096 opt Au, 9,342,000 oz Au (proven and probable reserves); 4,612,000 tons, 0.032 opt Au, 147,000 oz Au (measured and indicated resource); 564,000 tons, 0.055 opt Au, 31,000 oz Au (inferred resource) 2012 (includes all open pit resources at Goldstrike): 94,541,000 tons, 0.094 opt Au, 8,933,000 oz Au (proven and probable reserves); 3,621,000 tons, 0.033 opt Au, 103,000 oz Au (measured and indicated resource); 3,049,000 tons, 0.066 opt Au, 201,000 oz Au (inferred resource) 2013 (includes all open pit resources at Goldstrike): 84,255,000 tons, 0.096 opt Au, 8,122,000 oz Au (proven and probable reserves); 5,909,000 tons, 0.07 opt Au, 413,000 oz Au (measured and indicated resource); 1,081,000 tons, 0.071 opt Au, 77,000 oz Au (inferred resource) 2014 (includes all open pit resources at Goldstrike): 81,782,000 tons, 0.11 opt Au, 7,724,000 oz Au (proven and probable reserves); 4,956,000 tons, 0.055 opt Au, 274,000 oz Au (measured and indicated resource); 516,000 tons, 0.09 opt Au, 40,000 oz 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 2006: 1,432,698 oz Au, 121,032 oz Ag 2007: 1,215,447 oz Au, 140,923 oz Ag 2008: 1,281,450 oz Au, 152,886 oz Ag 2009: 901,002 oz Au, 120,736 oz Ag 2010: 884,200 oz Au, 138,931 oz Ag 2011: 721,534 oz Au, 94,572 oz Ag 2012: 812,707 oz Au, 102,700 oz Ag 2013: 521,489 oz Au, 86,124 oz Ag 2014: 515,641 oz Au, 17,993 oz Ag 2015: 642,493 oz Au, 67,223 oz Ag 2016: 544,736 oz Au, 134,283 oz Ag 2017: 433,422 oz Au, 96,541 oz Ag	Popovich Fm. Rodeo Creek Fm.	Eocene

MAJOR PRECIOUS-METAL DEPOSITS, EUREKA COUNTY (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
Betze-Post (cont.)	2015 (includes all open pit resources at Goldstrike): 76,139,000 tons, 0.091 opt Au, 6,911,000 oz Au (proven and probable reserves); 5,639,000 tons, 0.072 opt Au, 404,000 oz Au (measured and indicated resource)); 505,000 tons, 0.081 opt Au, 41,000 oz Au (inferred resource, various cut-off grades) [NI43-101 compliant] 2016 Goldstrike Open Pit: 71,650,000 tons, 0.088 opt Au, 6,271,000 oz Au (proven and probable reserve) 5,760,000 tons, 0.078 opt Au, 447,000 oz Au (measured and indicated resource); 89,300 tons, 0.056 opt Au, 5,000 oz Au (inferred resource) 2017 Goldstrike Open Pit: 65,268,000 tons, 0.087 opt Au, 5,654,000 oz Au (proven and probable reserves); 6,177,000 tons, 0.082 opt Au, 505,000 oz Au (measured and indicated resource,); 304,000 tons, 0.082 opt Au, 24,000 oz Au (inferred resource)			
Buckhorn property (Buckhorn district)	1984: 5,000,000 tons, 0.044 opt Au, 0.585 opt Ag 1990: 700,000 tons, 0.05 opt Au, 200,350 oz Au ("geologic resource" 1993: 1,100,000 tons, 0.11 opt Au ("geologic resource")	1988-93: 109,422 oz Au, 409,887 oz Ag	basaltic andesite, sinter, silicified sedimentary rocks	14.6 Ma
Buckhorn South/ Zeke deposit (Buckhorn district)	1989: 2,000,000 tons, 0.056 opt Au, 0.224 opt Ag 1998: 2,400,000 tons, 0.046 opt Au		lower Paleozoic rocks	
Cabin Creek (Antelope district)	2009-2010 (Feb., 0.012 opt Au cut-off grade) 3,200,000 tons, 0.024 opt Au (indicated resource); 100,000 tons, 0.015 opt Au (inferred resource) 2011: 2,348,000 tons, 0.026 opt Au, 60,005 oz Au (measured and indicated resource, 0.009 opt Au cut-off grade), 1,117,000 tons, 0.023 opt Au, 25,391 oz Au (inferred resource) 2015: 1,651,000 tons, 0.025 opt Au, 41,000 oz Au (proven and probable reserve); 2,616,000 tons, 0.025 opt Au, 66,000 oz Au (measured and indicated resource grade); 754,000 tons, 0.019 opt Au, 14,000 oz Au (inferred resource) 2017: 2,473,000 tons, 0.028 opt Au, 64,000 oz Au (measured and indicated resource); 695,000 tons, 0.019 opt Au, 13,000 oz Au (inferred resource)		Devonian McColley Canyon Formation	
Carlin North, Newmont (Lynn district)				
Blue Star	1987: 1,950,000 tons, 0.066 opt Au 1989: 22,200,000 tons, 0.030 opt Au (geologic resource)	1974-84: intermittent 1988-2010: included in Newmont Gold production at the end of this section	lower Paleozoic sandy siltstone and carbonate rocks, granodiorite	Eocene
Bobcat (Bobstar)	1988: 17,700,000 tons, 0.029 opt Au (geologic resource)		lower Paleozoic rocks	Eocene
Bullion Monarch	1987: 1,000,000 tons, 0.10 opt Au	1977-84: 17,779 oz Au	lower Paleozoic sedimentary rocks	Eocene
Deep Star	1996: 1,400,000 tons, 0.8765 opt Au (proven and probable reserves)	1995: 2,800 oz Au 1996: 93,400 oz Au 1997-2011: included in Newmont Gold production at the end of this section	Popovich Formation	Eocene
Fence	2002: 200,000 oz, 0.2 opt Au ("pre-mine Resource")		Roberts Mountain Formation	

MAJOR PRECIOUS-METAL DEPOSITS, EUREKA COUNTY (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
Carlin North, Newmont (Lynn district) (con't.)				
Fence/Full House/ Rita K/Pete Bajo	2015: 992,000 tons, 0.26 opt Au, 300,000 oz Au (reserve); 1,650,000 tons, 0.27 opt Au, 400,000 oz Au (resource) 2016: 2,200,000 tons, 0.23 opt Au, 400,000 oz Au (reserve); 2,200,000, 0.22 opt Au, 500,000 oz Au (resource)		Roberts Mountain Formation	
Genesis (Silverstar)	1989: 35,800,000 tons, 0.044 opt Au (geologic resource) 1990: 32,000,000 tons, 0.047 opt (includes Blue Star) 2004: 1,065,000 oz Au (proven and probable reserve) 2012: 3,000,000 oz Au (reserve)	1986: production commenced 1988-2010: included in Newmont Gold production at the end of this section	Ordovician-Devonian limestone, argillite, chert	Eocene
Genesis Complex	2000:14,100,000 tons, 0.026 opt Au (proven and and probable open-pit reserve) 2004: 1,065,000 oz Au (proven and probable reserve)			
Leeville	2004: 2,612,000 oz Au (proven and probable reserve) 2005: 2,433,000 oz Au (proven and probable reserve)	2005-2014: included in Newmont Gold production at the end of this section	Roberts Mountains Formation	Eocene
North Lantern	2004: 199,940 oz Au			
North Star	1989: 6,900,000 tons, 0.052 opt Au (geologic resource) 1990: 3,900,000 tons, 0.052 opt Au	1988: 4,250 oz Au 1989-2010: included in Newmont Gold production at the end of this section	lower Paleozoic sedimentary rocks	Eocene
Post/Goldbug	1996: 25,600,000 tons, 0.190 opt Au (proven and probable reserve); 43,600,000 tons, 0.079 opt Au (mineralized material)	1999-2010: included in Newmont Gold production at the end of this section	lower Paleozoic sedimentary rocks	Eocene
Deep Post	2000: 3,100,000 tons, 0.814 opt Au (proven and probable underground reserves) 2004 (includes Deep Star) 1,462,000 oz Au (proven and probable reserves) 2005 (includes Deep Star) 942,000 oz Au (proven and probable reserves)	included in Newmont Gold production at the end of this section		
Turf	1996: 2,500,000 tons, 0.367 opt Au (mineralized material)	included in Newmont Gold production at the end of this section	Roberts Mountains Formation	Eocene
West Leeville (Newmont)	1996: 2,000,000 tons, 0.377 opt Au (proven and probable reserves; 581,000 tons, 0.354 opt Au (mineralized material)	1995-96: 272,000 oz Au 1997-2010: included in Newmont Gold production at the end of this section	Roberts Mountains Formation	Eocene
West Leeville (Newmont-Barrick)	1996: 7,100,000 tons, 0.425 opt Au (proven and probable reserves); 500,000 tons, 0.328 opt Au (mineralized material)		Roberts Mountains Formation	Eocene
Carlin Mine	1965: 11,000,000 tons, 0.32 opt Au	1965-86: 3,800,000 oz Au		
Carlin/Pete/Lantern	1995: 14,800,000 tons, 0.031 opt Au 1996: 13,700,000 tons, 0.046 opt Au (proven and probable reserves); 14,700,000 tons, 0.046 opt Au (mineralized material) 2004: 940,040 oz Au (proven and probable reserves) 2005: 1,044,841 oz Au (proven and probable reserves)	1994-96: 68,700 oz Au 1997-2014: included in Newmont Gold production at the end of this section	Roberts Mountains Formation	Eocene
Carlin Underground	2004: 163,000 oz Au 2005: 123,000 oz Au (proven and probable reserves)			
Carlin North-other	2000: 19,800,000 tons, 0.052 opt Au, proven and probable open-pit reserves			
Carlin North area total	2000: 8,200,000 tons, 0.495 opt Au (proven and probable underground reserves)			

MAJOR PRECIOUS-METAL DEPOSITS, EUREKA COUNTY (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
Carlin North area, total open-pit	2001: 32,600,000 tons, 0.044 opt Au, (proven and probable reserves); 13,000,000 tons, 0.039 opt Au (mineralized material)			
Carlin North area, total underground	2001: 10,900,000 tons, 0.56 opt Au, (proven and probable reserves); 2,100,000 tons, 0.55 opt Au (mineralized material)			
Carlin South, Newmont (Maggie Creek district)				
Chukar Footwall underground	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) 2005: 256,000 oz Au (proven and probable reserves)	2002-2014: included in Newmont Gold production at the end of this section		
Gold Quarry/Mac/ Tusc	1982: 25,100,000 tons, 0.106 opt Au and 150,000,000 tons, 0.036 opt Au 1987: 197,800,000 tons, 0.042 opt Au 1990: 212,600,000 tons, 0.042 opt Au, *geologic resource*-534,300,000 tons, 0.037 opt Au 1996: 174,800,000 tons, 0.046 opt Au (proven and probable reserves); 51,900,000 tons, 0.058 opt Au (mineralized material) 2004: 5,984,000 oz (proven and probable reserves) 2005: 6,554,297 oz (proven and probable reserves)	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 1994-96: 2,978,000 oz Au 1997-2016: included in Newmont Gold production at the end of this section	See below Ordovician to Devonian chert, shale, siltstone, and impure carbonate rocks; in part, *Vinini Formation*	Eocene Eocene
Mike	1999: 408,000,00 tons, 0.006 opt Au, 151,000,000 tons, 0.10 % Cu 19,000,000 tons, 1.00 % Zn (drill-indicated mineral inventory)			
Tusc	1988: *geologic resource*-15.8 million tons, 0.059 opt Au 1990: 13,300,000 tons, 0.062 opt Au	included in Newmont Gold production at the end of this section	lower Paleozoic sedimentary rocks	Eocene
Carlin South area	2000: 75,200,000 tons, 0.059 opt Au (proven and probable open-pit reserves)			
Carlin South open-pit	2001: 61,300,000 tons, 0.062 opt Au proven and probable reserves; 24,600,000 tons, 0.028 opt Au (mineralized material)			
Carlin North and South combined (includes all Newmont's Carlin properties)				
Carlin open pit	2002: 181,800,000 tons, 0.042 opt Au (proven and probable reserves); 9,500,000 tons, 0.028 opt Au (measured and indicated mineralized) material; 9,300,000 tons, 0.035 opt Au (inferred mineralized material) 2003: 17,500,000 tons, 0.052 opt Au (proven reserves); 203,300,000 tons, 0.044 (probable reserves); 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: 238,300,000 tons, 0.043 opt Au (proven and probable reserves); 28,100,000 tons, 0.04 opt Au (measured and indicated resource); 4,200,000 tons, 0.024 opt Au (inferred resource) 2006: 271,600,000 tons, 0.042 opt Au (proven and probable reserves); 35,100,000 tons, 0.035 opt Au (measured and indicated resource); 6,300,000 tons, 0.022 opt Au (inferred resource) 2007: 213,500,000 tons, 0.045 opt Au (proven and probable reserves); 14,600,000 tons, 0.020 opt Au (measured and indicated resource); 3,700,000 tons, 0.037 opt Au (inferred resource)	2004-2017: included in Newmont Gold production at the end of this section		Eocene

MAJOR PRECIOUS-METAL DEPOSITS, EUREKA COUNTY (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
Carlin open pit (con't.)	2008: 202,400,000 tons, 0.045 opt Au (proven and probable reserves); 88,400,000 tons, 0.040 opt Au (measured and indicated resource); 21,100,000 tons, 0.023 opt Au (inferred resource) 2009: 259,300,000 tons, 0.044 opt Au (proven and probable reserves); 28,800,000 tons, 0.021 opt Au (measured and indicated resource); 10,400,000 tons, 0.034 opt Au (inferred resource) 2010: 263,500,000 tons, 0.043 opt Au (proven and probable reserve); 91,800,000 tons, 0.020 opt Au (measured and indicated resource) 22,100,000 tons, 0.034 opt Au (inferred resource) 2011: 331,700,000 tons, 0.038 opt Au (proven and probable reserve); 112,600,000 tons, 0.026 opt Au (measured and indicated resource) 15,300,000 tons, 0.02 opt Au (inferred resource) 2012: 313,200,000 tons, 0.037 opt Au, 11,650,000 oz Au (proven and probable reserve); 88,900,000 tons, 0.027 opt Au, 2,370,000 oz Au (measured and indicated resource); 18,900,000 tons, 0.018 opt Au, 350,000 oz Au (inferred resource) 2013: 271,600,000 tons, 0.036 opt Au, 9,730,000 oz Au (proven and probable reserve); 83,800,000 tons, 0.019 opt Au (mineralized material) 2014: 244,300,000 tons, 0.037 opt Au, 9,090,000 oz Au (proven and probable reserve); 81,900,000 tons, 0.027 opt Au (mineralized material) 2015: 226,100,000 tons, 0.039 opt Au, 8,860,000 oz Au (proven and probable reserve); 89,100,000 tons, 0.028 opt Au (mineralized material); stockpiles: 22,800,000 tons, 0.059 opt Au, 1,330,000 oz Au (proven reserves) 2016: 255,300,000 tons, 0.033 opt Au, 8,500,000 oz Au (proven and probable reserve)); 100,300,000 tons, 0.036 opt Au (mineralized material); stockpiles: 21,200,000 tons, 0.063 opt Au, 1,330,000 oz Au (proven reserves) 2017: 258,000,000 tons, 0.032 opt Au, 8,340,000 oz Au (proven and probable reserve); 91,400,000 tons, 0.041 opt Au (mineralized material); stockpiles: 18,900,000 tons, 0.062 opt Au, 1,180,000 oz Au (proven reserves)			
Carlin underground	2002: 10,000,000 tons, 0.57 opt Au (proven and probable reserves); 2,600,000 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); reserves); 6,100,000 tons, 0.500 opt Au (probable 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: 7,700,000 tons, 0.49 opt Au (proven and probable reserves); 300,000 tons, 0.33 opt Au (measured and indicated resource); 3,700,000 tons, 0.46 opt Au (inferred resource) 2006: 7,400,000 tons, 0.44 opt Au (proven and probable reserves); 1,100,000 tons, 0.28 opt Au (measured and indicated resource); 3,000,000 tons, 0.47 opt Au (inferred resource) 2007: 7,200,000 tons, 0.388 opt Au (proven and probable reserves); 110,000 tons, 0.482 opt Au (measured and indicated resource); 2,600,000 tons, 0.480 opt Au (inferred resource) 2008: 11,700,000 tons, 0.313 opt Au (proven and probable reserves); 340,000 tons, 0.330 opt Au (measured and indicated resource); 3,100,000 tons, 0.327 opt Au (inferred resource) 2009: 9,700,000 tons, 0.311 opt Au (proven and probable reserves); 810,000 tons, 0.180 opt Au (measured and indicated resource); 7,400,000 tons, 0.289 opt Au (inferred resource)	2004-2016: included in Newmont Gold gold production at the end of this section		Eocene

MAJOR PRECIOUS-METAL DEPOSITS, EUREKA COUNTY (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
Carlin underground (con't.)	2010: 14,600,000 tons, 0.307 opt Au, 12,620,000 oz Au (proven and probable reserve, 88% recovery) 4,200,000 tons, 0.290 opt Au (measured and indicated resource); 1,300,000 tons, 0.345 opt Au (inferred resource) 2011: 18,000,000 tons, 0.282 opt Au, 5,090,000 oz Au (proven and probable reserve, 88% recovery) 7,600,000 tons, 0.241 opt Au (measured and indicated resource); 1,300,000 tons, 0.264 opt Au (inferred resource) 2012: 23,500,000 tons, 0.265 opt Au, 6,230,000 oz Au (proven and probable reserve); 1,300,000 tons, 0.18 opt Au, 240,000 oz Au (measured and indicated resource); 4,000,000 tons, 0.26 opt Au, 1,020,000 oz Au (inferred resource) 2013: 23,900,000 tons, 0.252 opt Au, 6,010,000 oz Au (proven and probable reserve); 2,900,000 tons, 0.235 opt Au (mineralized material) 2014: 23,300,000 tons, 0.258 opt Au, 6,030,000 oz Au (proven and probable reserve); 1,900,000 tons, 0.195 opt Au (mineralized material) 2015: 23,000,000 tons, 0.266 opt Au, 6,100,000 oz Au (proven and probable reserve) 1,800,000 tons, 0.192 opt Au (mineralized material) 2016: 18,600,000 tons, 0.278 opt Au, 5,170,000 oz Au (proven and probable reserve); 3,200,000 tons, 0.223 opt Au (mineralized material) 2017: 18,400,000 tons, 0.291 opt Au, 5,310,000 oz Au (proven and probable reserve); 2,600,000 tons, 0.214 opt Au (mineralized material)			
Gold Bar (Antelope district) (includes multilple deposits after 2009)	1984: 2,800,000 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: 3,600,00 tons, 0.100 opt Au (resource) 2009: 21,500,000 tons, 0.032 opt Au (measured and indicated resource, 0.012 opt Au cut-off grade, Gold Pick and Gold Ridge deposits); 8,700,000 tons, 0.021 opt Au (inferred resources, 0.012 opt Au cut-off grade, Gold Pick and Gold Ridge deposits) 2010: 33,300,000 tons, 0.027 opt Au (measured and indicated and resource, 0.012 opt Au cut-off grade, Gold Pick and Gold Ridge deposits); 1,200,000 tons, 0.016 opt Au (inferred resource,Gold Pick and Gold Ridge deposits) 2011: 21,486,000 tons, 0.028 opt Au, 592,928 oz Au (measured and indicated resource, 0.009 opt Au cut-off grade, Cabin Creek, Gold Pick, and Gold Ridge deposits); 7,758,000 tons, 0.027 opt Au, 212,168 oz Au (inferred resources, 0.009 opt Au cut-off grade, Cabin Creek, Gold Pick, and Gold Ridge deposits) 2015: 13,099,000 tons, 0.032 opt Au, 419,000 oz Au (proven and probable reserve, 0.009 opt Au cut-off grade, , Cabin Creek, Gold Pick, and Gold Ridge deposits); 22,112,000 tons, 0.028 opt Au, 611,000 oz Au (measured and indicated resource, Cabin Creek, Gold Pick, and Gold Ridge deposits); 4,792,000 tons, 0.024 opt Au, 111,000 oz Au (inferred resource, Cabin Creek, Gold Pick, and Gold Ridge deposits) 2017: (Cabin Creek, Gold Bar South, Gold Pick, and Gold Ridge combined): 16,497,000 tons, 0.029 opt Au, 485,000 oz Au (proven and probable reserve); 23,527,000 tons, 0.028 opt Au, 730,000 oz Au (measured and indicated resource); 4,900,000 tons, 0.025 opt Au, 111,000 oz Au (inferred 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?

MAJOR PRECIOUS-METAL DEPOSITS, EUREKA COUNTY (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
Gold Bar South (Antelope district)	2017: Gold Bar portion of combined Gold Bar: deposits: 3,488,000 tons, 0.029 opt Au, 101,000 contained oz Au (measured and indicated resource,); 123,000 tons, 0.042 opt Au, 5,000 oz Au (inferred resource)		Mississippian Webb Formation Devonian Devils Gate Limestone	Eocene?
Gold Canyon (Antelope district)	1992: reserves-86,500 oz Au, *geologic resource*-131,000 oz Au 1993: 770,000 tons, 0.080 opt Au 2001: *see* Gold Bar 2002: 2,500,000 tons, 0.056 opt Au resource	reported with Gold Bar	Devonian Upper Denay Limestone Formation	Eocene?
Gold Pick (Antelope district)	1988: 10,000,000 tons, 0.06 opt Au 1993: 1,400,000 tons, 0.079 opt Au 2001: *see* Gold Bar 2002: 5,000,000 tons, 0.057 opt Au measured mineral resource 2005: 7,874,000 tons, 0.041 opt Au (indicated resource) 2011: 16,553,000 tons, 0.028 opt Au, 459,165 oz Au (measured and indicated resource); 5,649,000 tons, 0.029 opt Au, 161,761 oz Au (inferred resource, 0.009 opt Au cut-off grade) 2015: 10,145,000 tons, 0.033 opt Au, 335,000 oz Au (proven and probable reserve); 17,069,000 tons, 0.028 opt Au, 479,000 oz Au (measured and indicated resource); 3,046,000 tons, 0.025 opt Au, 77,000 oz Au (inferred resource) 2017: Gold Pick portion of Gold Bar combined; 17,603,000 tons, 0.028 opt Au, 489,000 oz Au (measured and indicated resource); ,227,000 tons, 0.025 opt Au, 80,000 oz Au (inferred resource)	reported with Gold Bar	Devonian McColley Canyon Formation	Eocene?
Gold Ridge (Antelope district)	1988: 400,000 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 2011: 2,585,000 tons, 0.028 opt Au, 73,100 oz Au (measured and indicated resource, 0.009 opt Au cut-off grade) 992,000 tons, 0.025 opt Au 25,016 oz Au (inferred resource) 2015: 1,303,000 tons, 0.033 opt Au, 43,000 oz Au (proven and probable reserve) 2,427,000 tons, 0.028 opt Au, 67,000 oz Au (measured and indicated resource, 0.008 opt Au cut-off grade); 824,000 tons, 0.024 opt Au, 20,000 oz Au (inferred resource) 2017: Gold Ridge portion of overall Gold Bar; 2,726,000 tons, 0.028 opt Au, 76,000 oz Au (measured and indicated resource); 854,000 tons, 0.025 opt Au, 22,000 contained oz Au (inferred resource)	reported with Gold Bar	Devonian McColley Canyon Formation	Eocene?
Goldrush (Cortez district)	2011 (Red Hill/Goldrush): 11,221,000 tons, 0.113 opt Au, 1,273,000 oz Au (indicated resource); 41,290,000 tons 0.139 opt Au, 5,748,000 oz Au (inferred resource) 2012: 65,914,000 tons, 0.127 opt Au, 8,367,000 oz Au (measured and indicated resource); 43,183,000 tons, 0.132 opt Au, 5,679,000 oz Au (inferred resource) 2013: 75,540,000 tons, 0.132 opt Au, 9,960,000 oz Au (measured and indicated resource); 39,472,000 tons, 0.134 opt Au, 5,555,000 oz Au (inferred resource)			

MAJOR PRECIOUS-METAL DEPOSITS, EUREKA COUNTY (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
Goldrush (con't)	2014: 75,091,000 tons, 0.141 opt Au, 10,574,000 oz Au (measured and indicated resource); 30,776,000 tons, 0.184 opt Au, 4,868,000 oz Au (inferred resource) 2015: 146,000 tons, 0.33 opt Au, 48,000 oz Au (measured resource); 25,595,000 tons, 0.31 opt Au, 8,509,000 oz Au (indicated resource); 6,278,000 tons, 0.26 opt Au, 1,647,000 oz Au (inferred resource) 2016: 34,169,000 tons, 0.28 opt Au, 9,522,000 oz Au (measured and indicated resource); 8,094,000 tons, 0.24 opt Au, 1,931,000 oz Au (inferred resource) 2017: 6,251,000 tons, 0.24 opt Au, 1,481,000 contained oz Au (probable reserve); 34,743,000 tons, 0.27 opt Au, 9,398,000 oz Au (measured and indicated resource); 9,719,000 tons, 0.24 opt Au, 2,335,000 oz Au (inferred resource)			
Goldstone (Antelope district)	1988: 1,700,000 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?
Horse Canyon (Cortez district)	1984: 3,940,000 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?
Hunter (Antelope district)	2009: 500,000 tons, 0.031 opt Au (indicated resource) 100,000 tons, 0.015 opt Au (inferred resource)			
Lookout Mountain (Eureka district)	2011: 20,745,000 tons, 0.019 opt Au 390,000 oz Au (measured and indicated resource); 18,385,000, 0.012 opt Au, 221,000 oz Au (inferred resource) 2013: 28,940,000 tons, 0.018 opt Au 508,000 oz Au (measured and indicated Resource); 11,790,000, 0.012 opt Au, 141,000 oz Au (inferred resource)	1987: 180,000 tons,	Hamburg Dolomite	
Mineral Ridge (Eureka district)	1988: 3,000,000 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
North Post (Lynn district)	2011 underground: 3,348,000 tons, 0.244 opt Au, 816,000 contained oz Au			
Northwest Exodus (Lynn district)	2015: 770,000 tons, 0.18 opt Au, 100,000 oz Au (reserves); 2,800,000 tons, 2,800,000 tons, 0.27 opt Au, 700,000 oz Au (resources) 2016: 3,300,000 tons, 0.24 opt Au, 800,000 oz Au (reserves); 2,200,000 tons, 0.18 opt Au, 300,000 oz Au (resource)			
Ratto Canyon (Lookout Mountain) (Eureka district)	1984: ~200,000 oz Au (entire Ratto Ridge area): 2006: 836,000 tons, 0.24 opt Au (measured and indicated resource) 2010: 13,640,000 tons, 0.021 opt Au (measured and indicated resource) 16,420,000 tons, 0.012 opt Au (inferred resource)	1987-88: 17,000 oz Au	Dunderberg Shale, Hamburg Dolomite	Eocene
Rock Creek (Eureka-Lander Co. line)	1997: 800,000 tons, 0.045 opt Au		Tertiary latite tuff	

MAJOR PRECIOUS-METAL DEPOSITS, EUREKA COUNTY (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
Rodeo Projects (Rodeo, Griffin, Goldbug, North Betze) (Lynn district)	1998: 2,900,000 tons, 0.487 opt Au proven and probable reserves; 5,800,000 tons, 0.302 opt Au (mineralized material) 1999: 5,800,000 tons, 0.466 opt Au, (proven and probable reserves); 13,000,000 tons, 0.270 opt Au (mineralized material) 2000: 9,200,000 tons, 0.414 opt Au (proven and Probable); 7,400,000 tons, 0.333 opt Au (mineral resource) 2005-2014: reserves are combined with Meikle reserves	included with Meikle production, Elko County		Eocene
Ruby Hill (Eureka district)	1994: 20,000,000 tons, 0.08 opt Au (geologic resource 1995: 7,620,000 tons, 0.099 opt Au 1999: 3,770,000 tons, 0.110 opt Au (proven and probable); 7,330,000 tons, 0.072 opt Au (mineralized material) 2000: 2,700,000 tons, 0.105 opt Au (proven and probable reserves); 7,300,000 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 2006: (East Archimedes) 19,479,000 tons, 0.055 opt Au (proven and probable reserves); 601,000 tons, 0.088 opt Au (measured and indicated resource) 2007: (East Archimedes) 18,763,000 tons, 0.055 opt Au (proven and probable reserves); 3,202,000 tons, 0.076 opt Au (measured and indicated resource); 6,000 tons, 0.333 opt Au (inferred resource) 2008: (East Archimedes) 18,844,000 tons, 0.044 opt Au (proven and probable reserves); 111,919,000 tons, 0.04 opt Au measured and (indicated resource); 3,495,000 tons, 0.037 opt Au (inferred resource) 2009: 13,933,000 tons, 0.050 opt Au (proven and probable reserves); 8,960,000 tons, 0.057 opt Au (measured and indicated resource); 2,928,000 tons, 0.051 opt Au, (inferred resource) 2010: 17,182,000 tons, 0.065 opt Au (proven and probable reserves); 61,530,000 tons, 0.023 opt Au (measured and indicated resource); 12,885,000 tons, 0.024 opt Au (inferred resource) 2011: 16,778,000 tons, 0.058 opt Au, 978,000 contained oz Au (proven and probable reserves); 107,626,000 tons, 0.021 opt Au, 2,245,000 oz Au (measured and indicated resource); 5,779,000 tons, 0.034 opt Au 196,000 oz Au (inferred resource) 2012: 7,823,000 tons, 0.042 opt Au, 326,000 oz Au (proven and probable reserves); 172,646,000 tons, 0.02 opt Au, 3,463,000 oz Au (measured and indicated resource); 5,152,000 tons, 0.043 opt Au, 220,000 oz Au (inferred resource) 2013: 4,963,000 tons, 0.028 opt Au, 140,000 oz Au (proven and probable reserves); 178,428,000 tons, 0.02 opt Au 3,612,000 oz Au (measured and indicated resource); 8,343,000 tons, 0.04 opt Au, 220,000 oz Au (inferred resource) 2014: 1,762,000 tons, 0.016 opt Au, 24,000 oz Au (proven and probable reserves) 2017,1,726,000 tons, 0.014 opt Au 24,164 oz Au (proven and probable reserve)	1997-98: 133,100 oz Au, 8,686 oz Ag 2000: 125,193 oz Au, 7,984 oz Ag 1999: 123,841 oz Au, 7,688 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 2007:142,856 oz Au, 8,368 oz Ag 2008: 102,553 oz Au, 7,572 oz Ag 2009: 103,523 oz Au, 39,110 oz Ag 2010: 81,382 oz Au, 43,276 oz Ag 2011: 127,089 oz Au, 42,754 oz Ag 2012: 41,242 oz Au, 32,124 oz Ag 2013: 91,074 oz Au, 76,283 oz Ag 2014: 33,124 oz Au, 65,020 oz Ag 2015: 10,673 oz Au, 24,842 oz Ag 2016: 6,471.6 oz Au 7,791.4 oz Ag 2017: 4,463 oz Au 4,263 oz Ag	Goodwin Limestone	

MAJOR PRECIOUS-METAL DEPOSITS, EUREKA COUNTY (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
Tonkin Springs (Antelope district)	1983: 1,840,000 tons, 0.089 opt Au, 0.204 opt Ag 1987: Oxide:1,500,000 tons, 0.05 opt Au; Sulfide: 2,500,000 tons, 0.09 opt Au 1991: 9,000,000, 0.05 opt Au 1999: 30,700,000 tons, 0.045 opt Au (resource) 2006: 29,672,000 tons, 0.043 opt Au (measured and indicated resource); 3,466,000 tons, 0.044 opt Au, (inferred resource) 2008 (May): 35,584,000 tons, 0.041 opt Au (measured and indicated resource) 9,290,000 tons, 0.033 opt Au, (inferred resource)	1987-88: 10,265 oz Au 1989-90: 3,821 oz Au, 1,872 oz Ag	Vinini Formation	Eocene?

HUMBOLDT COUNTY

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
Adelaide Crown (Gold Run district)	1989: south pit-585,000 tons, 1.313 opt Ag, 0.043 opt Au; additional area: 165,000 tons, 0.015 opt Au, 1.10 opt Ag	1990-91: 4,917 oz Au, 53,474 oz Ag	Preble Formation	Tertiary
Ashdown (Vicksburg district)	1987: 1,160,000 tons, 0.125 opt Au 1992: 1,100,000 tons, 0.12 opt Au 2002: 100,000 oz Au	See Other Metallic Deposits	Mesozoic granite	Mesozoic
Buckskin (National district)	1997: 50,221 oz Au, 466,243 oz Ag estimated resource		Miocene rhyolite flows and flow breccias	16 Ma
Chimney Creek (Potosi district)	1988: proven, probable-26,900,000 tons, 0.068 opt Au; inferred in south pit-2,100,000 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	
Converse/Redline (Buffalo Valley district)	2003: 77,459,000 tons, 0.020 opt Au (measured and indicated resource) 2004: 263,000,000 tons, 0.0150 opt Au, 0.0582 opt Ag (measured and indicated resource) 35,000,000 tons, 0.0143 opt Au, 0.0524 opt Ag 2011: 352,990,000 tons, 0.015 opt Au, 0.108 opt Ag, 5,170,000 oz Au, 37,950,000 oz Ag (measured and indicated resource); 34,440,000 tons, 0.015 opt Au, 510,000 oz Au, 0.087 opt Ag, 3,010,000 oz Ag (inferred resource) 2014: 400,000,000 tons, 0.017 opt Au, 6,120,000 oz Au; 0.11 opt Ag, 38,100,000 oz Ag (measured and indicated resource); 40,800,000 tons, 0.017 opt Au, 600,000 oz Au; 0.099 opt Ag, 3,500,000 oz Ag (inferred resource)		Havallah Formation, granodiorite	Tertiary
Getchell/Turquoise Ridge (Potosi district)	1989: 8,100,000 tons, 0.154 opt Au mill grade and 1,430,000 tons, 0.049 opt Au heap-leach ore; additional geologic resource: 5,700,000 tons, 0.092 opt Au sulfide and 2,600,000 tons, 0.055 opt Au oxide 1999: 18,100,000 tons, 0.359 opt Au 2000: 2,800,000 oz Au (measured resource); 5,500,000 oz Au (indicated resource); 6,700,000 oz (inferred resource) 2002: 2,690,000 oz Au (proven and probable reserves); 1,510,000 oz Au (measured and indicated mineral 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	Comus and Preble Formations, dikes, granodiorite	37-41 Ma

MAJOR PRECIOUS-METAL DEPOSITS, HUMBOLDT COUNTY (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
Getchell/Turquoise Ridge (cont.)	2003: (Turquoise Ridge) 6,000,000 tons, 0.57 opt Au (proven reserves); 2,400,000 tons, 0.62 opt Au (probable reserves); 4,400,000 tons, 0.3 opt Au (indicated material); 2,800,000 tons, Au 0.4 opt Au (indicated material); 4,800,000 tons, 0.49 opt Au (inferred material) 2005: (Turquoise Ridge and Getchell Footwall deposits) 7,600,000 tons, 0.56 opt Au (proven and probable reserves); 5.600,000 tons, 0.42 opt Au (measured and indicated resource); 400,000 tons, 0.54 opt (inferred resource) 2006: (Turquoise Ridge and Getchell Footwall deposits) 8,436,000 tons, 0.544 opt Au (proven and probable reserves); 4,801,000 tons, 0.432 opt Au (measured and indicated resource); 1,961,000 tons, 0.493 opt (inferred resource) 2007: (Turquoise Ridge and Getchell Footwall deposits) 11,239,000 tons, 0.458 opt Au (proven and probable reserves); 3,291,000 tons, 0.409 opt Au (measured and indicated resource); 2,000,000 tons, 0.444 opt (inferred resource) 2008: (Turquoise Ridge) 10,614,000 tons, 0.501 opt Au (proven and probable reserves); 3,289,000 tons, 0.435 opt Au (measured and indicated resource); 4,440,000 tons, 0.505 opt (inferred resource) 2009: (Turquoise Ridge) 10,680,000 tons, 0.507 opt Au (proven and probable reserves); 2,307,000 tons, 0.431 opt Au (measured and indicated resource); 5,033,000 tons, 0.456 opt (inferred resource) 2010 (Turquoise Ridge): 12,339,000 tons, 0.456 opt Au (proven and probable reserve); 85,625,000 tons, 0.131 opt Au (measured and indicated resource); 43,427,000 tons, 0.160 opt Au (inferred resource) 2011 (Turquoise Ridge): 15,981,000 tons, 0.442 opt Au, 7,054,000 oz Au, (proven and probable reserve, 92% recovery); 83,192,000 tons t0.122 opt Au, 10,188,000 oz Au (measured and indicated resource); 33,992,000 tons, 0.13 opt Au, 4,404,000 oz Au (inferred resource) 2012 (Turquoise Ridge) 20,358,000 tons, 0.381 opt Au, 7,755,000 oz Au, (proven and probable reserve); 80,690,000 tons, 0.123 opt Au, 9,912,000 oz Au (measured and indicated resource); 39,014,000 tons, 0.131 opt Au, 5,089,000 oz Au (inferred resource) 2013 (Turquoise Ridge): 13,337,000 tons, 0.51 opt Au, 6,760,000 oz Au, (proven and probable reserve); 120,695,000 tons, 0.127 opt Au, 15,317,000 oz Au (measured and indicated resource); 49,508,000 tons, 0.15 opt Au, 7,421,000 oz Au (inferred resource) 2014 (Turquoise Ridge): 12,050,000 tons, 0.57 opt Au, 5,944,000 oz Au, (proven and probable reserve); 119,351,000 tons, 0.135 opt Au, 16,148,000 oz Au (measured and indicated resource); 43,170,000 tons, 0.184 opt Au, 6,931,000 oz Au (inferred resource) 2015 (Turquoise Ridge): 12,587,000 tons, 0.45 opt Au, 5,619,000 oz Au, (proven and probable reserve); 110,214,000 tons, 0.138 opt Au, 15,235,000 oz Au (measured and indicated resource); 26,417,000 tons, 0.147 opt Au, 5,163,000 oz Au (inferred resource) 2016 (Turquoise Ridge): 22,210,000 tons, 0.44 opt Au, 5,372,000 oz Au, (proven and probable reserve); 74,648,000 tons, 0.169 opt Au, 12,647,000 oz Au (measured and indicated resource); 23,485,000 tons, 0.185 opt Au, 3,257,000 oz Au (inferred resource)	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 2006: 233,127 oz Au, 30,473 oz Ag 2007: 251,133 oz Au 2008: 168,808 oz Au 2009: 177,333 oz Au 2010: 161,579 oz Au 2011: 178,283 oz Au 2012: 191,754 oz Au 2013: 223,189 oz Au 2014: 259,345 oz Au 2015: 289,421 oz Au 2016: 354,580.16 oz Au 2017: 369,000 oz Au		

MAJOR PRECIOUS-METAL DEPOSITS, HUMBOLDT COUNTY (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
Getchell/Turquoise Ridge (con't.)	2017 (Turquoise Ridge): 17,375,000 tons, 0.454 opt Au, 7,858,000 oz Au, (proven and probable reserve); 7,504,000 tons, 0.27 opt Au, 2,008,000 oz Au (measured and indicated resource)); 2,262,000 tons, 0.38 opt Au, 948,000 oz Au (inferred resource)			
Hycroft (Sulphur district)	1988: 25,000,000 tons, 0.025 opt Au 1999: 23,800,000 tons, 0.0204 opt Au (proven and probable reserves); 2,300,000 tons, 0.0177 opt Au (indicated reserves) 2000: 41,900,000 tons, 0.0196 opt Au (measured and indicated resource); 14,100,000 tons, 0.0152 opt Au (inferred resource) 2004: 47,479,000 tons, 0.016 opt Au (measured and indicated); 12,029,000 tons, 0.011 opt Au (inferred resource) 2005: 33,320,000 tons, 0.02 opt Au (proven and probable reserves); 52,700,000 tons 0.019 opt Au (measured and indicated resource); 8.700,000 tons, 0.015 opt Au (inferred resource) 2007: 33,320,000 tons, 0.020 opt Au (proven and probable reserves); 19,780,000 tons, 0.018 opt Au (measured and indicated resource); 283,392,000 tons, 0.019 opt Au (inferred resource) 2008: 73,159,508 tons, 0.016 opt Au (proven and probable reserves); 141,300,000 tons, 0.014 opt Au (measured and indicated resource); 180,200,000 tons, 0.012 opt Au (oxide inferred resource); 199,400,000 tons, 0.20 opt Au, (sulfide inferred resource); 2010: 196,000,000 tons, 0.013 opt Au, 0.25 opt Ag (proven and probable oxide heap leach reserves); 720,000,000 tons, 0.007 opt Au, 0.15 opt Ag (measured and indicated oxide and transitional heap leach resource); 620,000,000 tons, 0.014 opt Au, 0.71 opt Ag (measured and indicated oxide, transitional and sulfide mill resource); 181,000,000 tons, 0.015 opt Au, 0.56 opt Ag (inferred oxide, transitional and sulfide resource) 2011: 1,134,669,000 tons, 0.011 opt Au, 12,651,000 oz Au, 0.42 opt Ag, 481,881,000 oz Ag (proven and probable reserves); 939,619,000 tons, 0.009 opt Au, 8,170,000 oz Au, 0.25 opt Ag, 236,851,000 oz Ag (measured and indicated resource); 534,938,000 tons, 0.01 opt Au, 0.253 opt Ag (inferred resource) 2012: 1,108,078,000 tons, 0.011 opt Au, 11,875,000 oz Au, 0.46 opt Ag, 509,559,000 oz Ag (proven and probable reserves); 1,596,780,000 tons, 0.008 opt Au, 12,429,000 oz Au, 0.23 opt Ag, 360,148,000 oz Ag (measured and indicated resource); 628,251,000 tons, 0.01 opt Au, 0.26 opt Ag (inferred resource) 2013: 951,001,000 tons, 0.011 opt Au, 10,556,000 oz Au, 0.49 opt Ag, 467,146,000 oz Ag (proven and probable reserves); 1,587,969,000 tons, 0.008 opt Au, 12,375,000 oz Au, 0.23 opt Ag, 369,911,000 oz Ag (measured and indicated resource); 627,093,000 tons, 0.01 opt Au, 0.26 opt Ag (inferred resource) 2014: 949,201,000 tons, 0.011 opt Au, 10,550,000 oz Au, 0.49 opt Ag, 465,275,000 oz Ag (proven and probable reserves); 1,357,064,000 tons, 0.008 opt Au, 11,057,000 oz Au, 0.24 opt Ag, 324,251,000 oz Ag (measured and indicated resource); 620,059,000 tons, 0.01 opt Au, 0.26 opt Ag (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 oz Ag 2002: 1,771 oz Au, 217 oz Ag 2003: 644 oz Au, 100 oz Ag 2004: 61 oz Au 2008: 1,000 oz Au, 3,000 oz Ag 2009: 53,189 oz Au, 65,753 oz Ag 2010: 102,483 oz Au, 233,974 oz Ag 2011: 104,002 oz Au, 479,440 oz Ag 2012: 114,705 oz Au, 696,114 oz Ag 2013: 181,941 oz Au, 858,073 oz Ag 2014: 214,345 oz Au, 1,818,637 oz Ag 2015: 107,998 oz Au, 621,788 oz Ag 2016: 32,265 oz Au, 235,934 oz Ag 2017: 1,866 oz Au, 6,067 oz Ag	Camel conglomerate, rhyolite dikes	1-2 Ma

MAJOR PRECIOUS-METAL DEPOSITS, HUMBOLDT COUNTY (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
Lone Tree (Buffalo Mountain district)	1990: 5,400,000 tons oxide mill ore, 0.159 opt Au, 5,700,000 tons heap-leach ore, 0.025 opt Au and 1,200,000 oz Au in sulfide ore 1994: 4,000,000 oz Au 2000: 40,800,000 tons, 0.060 opt Au proven and probable reserves (Lone Tree Complex) 2001: 29,200,000 tons, 0.065 opt Au (proven and probable reserves); 7,900,000 tons, 0.032 opt Au (mineralized material) 2002: 21,000,000 tons, 0.069 opt Au (proven and probable reserves); 2,000,000 tons, 0.057 opt Au (measured and indicated mineralized material); 1,000,000 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: 4,000,000 tons, 0.080 opt Au (proven and probable reserves); 3,000,000 tons, 0.032 opt Au (measured and indicated resource) 2007: 4,200,000 tons, 0.022 opt Au (measured and indicated resource) 2012: 2,200,000 tons, 0.023 opt Au, 50,000 oz Au (indicated resource); 5,000,000 tons, 0.032 opt Au, 80,000 oz Au (inferred resource) 2013: 2,500,000 tons, 0.023 opt Au (mineralized material); stockpiles: 4,20,000 tons, 0.017 opt Au, 70,000 oz Au (proven reserve) [2014: 2,200,000 tons, 0.023 opt Au (mineralized material); leach pad: 1,600,000 tons, 0.005 opt 0.017 opt Au, 10,000 oz Au (proven reserve) 2015: 2,200,000 tons, 0.023 opt Au (mineralized material); leach pad: 1,100,000 tons, 0.007 opt Au, 10,000 oz Au; stockpiles: 2,700,000 tons, 0.007 opt Au, 20,000 oz Au (proven reserve) 2016: 3,800,000 tons, 0.011 opt Au, 40,000 oz Au (proven and probable reserves) 2017: 3,700,000 tons, 0.007 opt Au, 20,000 oz Au (proven reserves)	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 2006: 357,787 oz Au, 26,601 oz Ag 2007: 182,768 oz Au, 37,172 oz Ag 2008: 16,775 oz Au, 1,897 oz Ag 2009: 12,011 oz Au 2,309 oz Ag 2010: 1,313 oz Au, 2011: 19,619 oz Au, 28 oz Ag 2012: 29,738 oz Au, 5,789 oz Ag 2013: 22,931 oz Au, 4,970 oz Ag 2014: 21,702 oz Au, 920 oz Ag 2015: 21,349 oz Au 2016: 31,854 oz Au 2017: 41,784 oz Au, 936 oz Ag	Havallah Formation, Antler sequence, and dacite porphyry	38 Ma
Marigold (Battle Mountain district)	1987: 8,000,000 tons, 0.0935 opt Au 1990: 4,300,000 tons, 0.105 opt Au mill ore, 7,600,000 tons, 0.026 opt Au heap-leach ore 1999: 19,090,000 tons, 0.032 opt Au 2000: 30,200,000 tons, 0.035 opt Au (proven and probable reserves); 20,700,000 tons, 0.029 opt Au measured and (indicated resource) 2001: 75,500,000 tons, 0.027 opt Au (proven and probable reserves); 109,900,000 tons, 0.014 opt Au (measured and indicated resource) 2002: 79,100,000 tons, 0.026 opt Au (proven and probable reserves); 129,700,000 tons, 0.014 opt Au (mineral resource) 2003: 9,366,000 tons, 0.031 opt Au (proven reserves); 83,909,000 tons, 0.023 opt Au (probable reserves); 19,937,000 tons, 0.020 opt Au (measured reserves); 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 resource); 21,000,000 tons, 0.014 opt Au (inferred resource)	1989-93: 322,219 oz Au, 9,784 oz Ag 1994-98: 363,771 oz Au 1999: 74,000 oz Au 2000: 68,000 oz Au 2001: 84,784 oz Au, 401 oz Ag 2002: 83,321 oz Au, 1,281 oz Ag 2003: 142,100 oz Au, 2,080 oz Ag 2004: 141,304 oz Au, 2,354 oz Ag 2005: 205,663 oz Au, 1,723 oz Ag 2006: 149,805 oz Au, 1,986 oz Ag 2007: 140,840 oz Au, 2,233 oz Ag 2008: 144,106 oz Au, 5,037 oz Ag 2009: 146,842 oz Au, 4,239 oz Ag 2010: 136,754 oz Au, 3,729 oz Ag	Paleozoic chert, argillite, and carbonate rocks	

MAJOR PRECIOUS-METAL DEPOSITS, HUMBOLDT COUNTY (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
Marigold (Battle Mountain district) (cont.)	2005: 98,210,000 tons, 0.021 opt Au (proven and probable reserves); 157,480,000 tons, 0.020 opt Au (measured and indicated resource, includes reserves); 163,230,000 tons, 0.013 opt Au (inferred resource) 2006: 102,870,000 tons, 0.021 opt Au (proven and probable reserves); 94,587,000 tons, 0.018 opt Au (measured and indicated resource); 88,212,000 tons, 0.011 opt Au (inferred resource) 2007: 84,660,000 tons, 0.020 opt Au (proven and probable reserves); 46,410,000 tons, 0.020 opt Au (measured and indicated resource); 122,530,000 tons, 0.013 opt Au (inferred resource) 2008: 69,600,000 tons, 0.020 opt Au (proven and probable reserves); 42,660,000 tons, 0.016 opt Au (measured and indicated resource); 44,810,000 tons, 0.013 opt Au (inferred resource) 2009: 150,000,000 tons, 0.016 opt Au (proven and probable reserves) 42,190,000 tons, 0.015 opt Au (indicated resource); 75,000,000 tons, 0.015 opt Au (inferred resource) 2010: 143,529,000 tons, 0.016 opt Au (proven and probable reserves); 80,526,000 tons, 0.014 opt Au (indicated resource); 46,638,000 tons, 0.014 opt Au (inferred resource) 2011: 226,889,000 tons, 0.015 opt Au (proven and probable reserves); 32,935,000 tons, 0.012 opt Au (measured and indicated resource); 11,037,000 tons, 0.013 opt Au (inferred resource) 2012: 324,770,000 tons, 0.015 opt Au 4,920,000 contained oz Au (proven and probable reserves); 50,130,000 tons, 0.012 opt Au, 621,000 contained oz Au (measured and indicated resource); 89,559,000 tons, 0.012 opt Au, 1,113,000 contained oz Au (inferred resource) 2013: 264,585,000 tons, 0.016 opt Au 4,167,000 oz Au (proven and probable reserves); 37,000,000 tons, 0.013 opt Au, 474,000 contained oz Au (measured and indicated resource); 25,014,000 tons, 0.013 opt Au, 324,000 contained oz Au (inferred resource) [NI43-101 compliant] 2014: 143,970,000 tons, 0.017 opt Au 2,120,000 oz Au (probable reserves); 268,630,000 tons, 0.017 opt Au, 4,000,000 oz Au (indicated resource); 14,770,000 tons, 0.016 opt Au, 200,000 oz Au (inferred resource) 2015: 154,650,000 tons, 0.013 opt Au 2,040,000 oz Au (probable reserves); 332,560,000 tons, 0.013 opt Au, 4,450,000 oz Au (indicated resource inclusive of probable reserves); 42,770,000 tons, 0.013 opt Au, 550,000 oz Au (inferred resource); Leach pad inventory: 130,000 oz Au 2016: 204,000,000 tons, 0.013 opt Au 2,670,000 oz Au (probable reserves, 0.0019 opt Au cut-off grade); 383,900,000 tons, 0.013 opt Au, 4,450,000 oz Au (indicated resource inclusive of probable reserves, 0.0019 opt Au cut-off grade); 65,400,000 tons, 0.012 opt Au, 700,000 oz Au (inferred resource); Leach pad inventory: 170,000 oz Au 2017: 226,100,000 tons, 0.013 opt Au 3,000,000 oz Au (probable reserves); 408,100,000 tons, 0.013 opt Au, 5,470,000 oz Au (indicated resource inclusive of probable reserves); 54,800,000 tons, 0.012 opt Au, 630,000 oz Au (inferred resource); Leach pad inventory: 190,000 oz Au	2011: 153,741 oz Au, 4,162 oz Ag 2012: 144,382 oz Au, 2,729 oz Ag 2013: 161,062 oz Au, 3,394 oz Ag 2014: 162,382 oz Au, 3,085 oz Ag 2015: 207,005 oz Au, 2,841 oz Ag 2016: 205,116 oz Au, 2,349 oz Ag 2017: 202,230 oz Au 3,216 oz Ag		
North Stonehouse (Buffalo Mountain district)	1991: 2,500,000 tons, 0.103 oz Au mill ore		Havallah Formation and porphyry dikes	39 Ma

MAJOR PRECIOUS-METAL DEPOSITS, HUMBOLDT COUNTY (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
Pinson (Potosi district)	1980: 3,245,000 tons, 0.119 opt Au 1989: 480,000 oz Au 1996: 2,600,000 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) 2006: (includes Range Front, Ogee and CX-West zones); 2,505,000 tons, 0.454 opt Au (measured and indicated resource); 3,374,500 tons, 0.340 opt Au (inferred resource) 2012: 1,738,738 tons, 0.369 opt Au, 642,236 oz Au (proven and probable reseve); Open pit: 25,466,300 tons, 0.039 opt Au, 981,700 oz Au (measured and indicated resource, Mag Pit and South Zone deposits); 824,000 tons, 0.034 opt Au, 28,300 oz Au (inferred resource, Mag Pit and South Zone deposits); Underground: 2,919,800 tons 0.368 opt Au, 1,078,000 oz Au (measured and indicated resource,); 2,236,200 tons, 0.378 opt Au, 845,000 oz Au (inferred resource) 2014: Underground: 389,000 tons, 0.402 opt Au, 156,000 oz Au (proven and probable reserves); 798,000 tons, 0.43 opt Au, 343,000 oz Au (measured and indicated resource); 1,672,000 tons, 0.419 opt Au, 700,000 oz Au (inferred resource), Mag Pit: 7,170,000 tons, 0.0451 opt Au, 322,644 oz 0.006 opt Au heap leach recoverable); 25,466,000 tons. 0.039 opt Au, 982,000 oz Au (measured and indicated resource); 824,000 tons. 0.034 opt Au, 25,000 oz Au (measured and indicated resource) 2015: Mag pit: 7,160,000 tons, 0.0451 opt Au, 322,644 Au (proven and probable reserves, 0.006 opt Au); 23,335,000 tons, 0.039 opt Au, 912,000 oz Au (measured and indicated resource); 533,000 tons 0.038 opt Au, 20,000 oz Au (inferred resource); South Zone: 2,131,000 tons, 0.033 opt Au, 70,000 oz (measured and indicated resource); 291,000 tons. 0.028 opt Au, 8,000 oz 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 2012: 1,378 oz Au 2013: 5,183 oz Au 2014: 3,780 oz Au 2015: 16,898 oz Au	Comus Formation	Eocene?
Preble (Potosi district)	1985: 1,800,000 tons, 0.062 opt Au 1986: 3,160,000 tons, 0.093 opt Au heap leach, 80,000 tons, 0.242 opt Au mill grade 1989: 15,110 oz Au	1985: 17,000 oz Au 1987: 28,000 oz Au 1988: 18,828 oz Au 1989: included with Pinson 1990: 1,161 oz Au	Preble Formation	Eocene?
Rabbit Creek (Potosi district)	1989: 4,100,000 oz Au (additional geologic resource of 100,000 Au in refractory material) 1992: reserves-3,260,000 oz Au 1993: *see* Twin Creeks	1990-92: 296,000 oz Au 1993: *see* Twin Creeks	Ordovician	Eocene?
Sandman (Tenmile district)	2007: 8,033,000 tons, 0.034 opt Au (measured and indicated resource); 1,418,000 tons, 0.027 opt Au (inferred resource) 2012: 1,300,000 tons, 0.036 opt Au, 0.199 opt Ag, 50,000 oz Au, 300,000 oz Ag (indicated resource) 1,100,000 tons, 0.063 opt Au, 0.167 opt Ag, 70,000 oz Au, 200,000 oz Ag (inferred resource) 2013: 1,300,000 tons, 0.036 opt Au, 0.2 opt Ag (mineralized material)			
Sleeper (Awakening district)	1985: 4,200,000 tons, 0.13 opt Au, 0.73 opt Ag 1989: 1,975,000 oz Au 1990: 44,100,000 tons, 0.038 opt Au, 0.152 opt Ag 1999: 2,100,000 oz Au at average grade of 0.025 opt Au; 18,100,000 oz Ag at average grade of 0.208 opt Ag 2008: 29,718,000 tons, 0.025 opt Au (indicated resource); 22,046,000 tons, 0.017 opt Au (inferred resource)	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

MAJOR PRECIOUS-METAL DEPOSITS, HUMBOLDT COUNTY (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
Sleeper (Awakening district) (con't.)	2011(oxide): 47,167,350 tons, 0.011 opt Au, 511,872 oz Au, 0.12 opt Ag, 5,781,121 oz Ag (measured and indicated resource) 14,541,139 tons, 0.009 opt Au, 136,145 oz Au, 0.1 opt Ag, 1,450,516 oz Ag (inferred resource) 2011 (sulfide): 143,269,803 tons, 0.015 opt Au, 2,113,527 oz Au, 0.14 opt Ag, 19,556,454 oz Ag (measured and indicated resource 75,409,000 tons, 0.013 opt Au,0.09 opt Ag (inferred resource) 2012 (oxide): 79,798,000 tons, 0.008 opt Au, 659,000 oz Au, 0.11 opt Ag, 8,588,000 oz Ag (measured and indicated resource) 32,667,000 tons, 0.007 opt Au, 214,000 oz Au, 0.093 opt Ag, 3,030,000 oz Ag (inferred resource) 2012 (sulfide): 280,614,000 tons, 0.01 opt Au, 2,820,000 oz Au, 0.11 opt Ag, 32,018,000 oz Ag (measured and indicated resource) 188,960,000 tons, 0.008 opt Au 1,532,000 oz Au, 0.083 opt Ag, 15,708,000 oz Ag (inferred resource, 0.003 opt Au cut-off grade) 2012 (alluvial): 168,000 tons, 0.059 opt Au 10,000 oz Au; (mine dumps): 24,707,000 tons, 0.009 opt Au, 216,000 oz Au, 0.07 opt Ag, 1,712,000 oz Ag (inferred resource, 0.003 opt Au cut-off grade) 2015: Global: 324,517,000 tons, 0.011 opt Au, 3,421,000 oz Au, 0.096 opt Ag, 30,794,000 oz Ag (measured and indicated resource) 266,540,000 tons, 0.0093 opt Au, 2,472,000 oz Au, 0.055 opt Ag, 15,004,000 oz Ag (inferred resource); In-pit and mineralized dumps: 47,052,000 tons, 0.011 opt Au, 511,000 oz Au, 0.095 opt Ag, 4,458,000 oz Ag (measured and indicated resource); 38,500,000 tons, 0.013 opt Au,511,000 oz Au, 0.017 opt Ag, 640,000 oz Ag (inferred resource);			
Trenton Canyon (includes Valmy and North Peak) (Buffalo Valley district)	1994 oxide resource: 14,600,000 tons, 0.035 opt Au, (517,000 oz Au) 1999: 995,000 tons, 0.021 opt Au (North Peak); 10,800,000 tons, 0.022 opt Au (Valmy) 2015: Valmy: 350,000 oz Au (inferred mineral resource)	2000: included with Lone Tree 2001: 24,228 oz Au, 2,996 oz Ag 2002: 3,685 oz Au, 742 oz Ag 2006: 1,937 oz Au, 38 oz Ag 2007: 1,768 oz Au, 360 oz Ag		
Trout Creek (Battle Mountain district)	1989: 50,000 oz Au			
Twin Creeks (Chimney and Rabbit Creeks) (Potosi district)	1993: 5,700,000 oz Au 1999: 87,100,000 tons, 0.079 opt Au (proven and probable) 2000: 75,200,000 tons, 0.086 opt Au (proven and probable) 2002: 47,600,000 tons, 0.081 opt Au (proven and probable reserves); 55,000,000 tons, 0.057 opt Au (measured and indicated mineralized material); 1,800,000 tons, 0.046 opt Au (inferred mineralized material) 2003: 14,000,000 tons, 0.085 opt Au (proven reserves); 48,200,000 tons, 0.074 opt Au (probable reserves); 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: 61,200,000 tons, 0.074 opt Au (proven and probable reserves); 19,900,000 tons, 0.049 opt Au (measured and indicated resource); 3,100,000 tons, 0.033 opt Au (inferred resource) 2006: 64,800,000 tons, 0.077 opt Au (proven and	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 2006: 354,484 oz Au, 43,467 oz Ag 2007: 488,457 oz Au, 99,344 oz Ag 2008: 512,190 oz Au, 57,913 oz Ag 2009: 437,830 oz Au, 84,159 oz Ag 2010: 452,744 oz Au,	Paleozoic	41-43 Ma

MAJOR PRECIOUS-METAL DEPOSITS, HUMBOLDT COUNTY (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
Twin Creeks (cont.)	probable reserves); 25,000,000 tons, 0.058 opt Au (measured and indicated resource); 3,100,000 tons, 0.033 opt Au (inferred resource) 2007: 52,100,000 tons, 0.078 opt Au (proven and probable reserves); 21,000,000 tons, 0.063 opt Au (measured and indicated resource); 2,600,000 tons, 0.030 opt Au (inferred resource) 2008: 51,700,000 tons, 0.077 opt Au (proven and probable reserves); 31,100,000 tons, 0.051 opt Au (measured and indicated resource); 10,800,000 tons, 0.018 opt Au (inferred resource) 2009: 50,200,000 tons, 0.077 opt Au (proven and probable reserves); 35,000,000 tons, 0.050 opt Au (measured and indicated resource); 11,300,000 tons, 0.018 opt Au (inferred resource) 2010: 57,800,000 tons, 0.076 opt Au (proven and probable reserve); 37,900,000 tons, 0.039 opt Au (measured and indicated resource); 12,000,000 tons, 0.0194 opt Au (inferred resource 2011: 48,700,000 tons, 0.078 opt Au (proven and probable reserve); 46,000,000 tons, 0.045 opt Au (measured and indicated resource); 13,500,000 tons, 0.026 opt Au (inferred resource) 2012: 58,300,000 tons, 0.058 opt Au, 3,400,000 oz Au (proven and probable reserve); 41,900,000 tons, 0.059 opt Au, 2,470,000 oz Au (measured and indicated resource); 3,900,000 tons, 0.061 opt Au 240,000 oz Au (inferred resource) 2013: 39,400,000 tons, 0.06 opt Au, 2,360,000 oz Au (proven and probable reserve); 32,000,000 tons, 0.069 opt Au (mineralized material; stockpiles: 33,900,000 tons, 0.067 opt Au, 2,280,000 oz Au (proven reserve) 2014: 33,600,000 tons, 0.064 opt Au, 2,150,000 oz Au (proven and probable reserve); 38,500,000 tons, 0.059 opt Au (mineralized material); stockpiles: 36,100,000 tons, 0.065 opt Au, 2,340,000 oz Au (proven reserve) 2015: 29,200,000 tons, 0.058 opt Au, 1,710,000 oz Au (proven and probable reserve); 39,400,000 tons, 0.057 opt Au (mineralized material); stockpiles: 35,600,000 tons, 0.064 opt Au, 2,280,000 oz Au (proven reserve) 2016: 29,900,000 tons, 0.053 opt Au, 1,590,000 oz Au (proven and probable reserve); 31,600,000 tons, 0.062 opt Au (mineralized material); stockpiles: 32,000,000 tons, 0.063 opt Au, 2,000,000 oz Au (proven reserve); 7,700,000 tons, 0.059 opt Au (mineralized material) 2017: 31,900,000 tons, 0.044 opt Au, 1,400,000 oz Au (proven and probable reserve); 36,600,000 tons, 0.059 opt Au (mineralized material); Stockpiles: 31,900,000 tons, 0.063 opt Au, 2,010,000 oz Au (proven reserve); 8,500,000 tons, 0.059 opt Au (mineralized material); Underground: 880,000 tons, 0.2 opt Au, 200,000 oz Au (proven reserve); 330,000 tons, 0.16 opt Au (mineralized material)	211,935 oz Ag 2011: 484,449 oz Au, 290,802 oz Ag 2012: 408,751 oz Au, 79,574 oz Ag 2013: 406,847 oz Au, 88,184 oz Ag 2014: 385,169 oz Au, 252,836 oz Ag 2015: 470,759 oz Au, 143,631 oz Ag 2016: 367,528 oz Au, 227,814 oz Ag 2017: 374,740 oz Au. 181,104 oz Ag		
Winnemucca Mountain (Winnemucca district)	1998: 130,000 to 140,000 oz Au proven, 300,000 oz Au indicated			

LANDER COUNTY

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
Austin Gold Venture (Birch Creek district)	1986: 1,750,000 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

MAJOR PRECIOUS-METAL DEPOSITS, LANDER COUNTY (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
Battle Mountain Complex (Battle Mountain district)	1992: 500,000 oz Au 1995: resource (overall Battle Mountain complex)-60,200,000 tons, 0.036 opt Au, including reserves-46,600,000 tons, 0.040 opt Au 1999 (Phoenix): 5,680,000 oz Au (proven and probable); 1.500,000 oz Au (additional mineralization) 2000: 175.200,000 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
Battle Mountain Ridge (Battle Mountain district)	<2011: 2,900,000 tons, 0.023 opt Au (resource)			
Buffalo Valley Gold Project (Buffalo Valley district)	1988: 1,500,000 tons, 0.05 opt Au 1994: 4,800,000 tons, 0.07 opt Au 1997: 600,106 oz Au resource; 100,797 oz Au, other mineralized material 2010: 18,300,000 tons, 0.020 opt Au (indicated resource); 900,000 tons, 0.017 opt Au (inferred resource) 2011: 16,500,000 tons, 0.019 opt Au (indicated resource); 2,900,000 tons, 0.014 opt Au (inferred resource) 2012: 23,100,000 tons, 0.063 opt Au 470,000 oz Au (indicated resource); 715,000 tons, 0.035 opt Au 14,300 oz Au (inferred resource) 2013: 22,100,000 tons, 0.019 opt Au (mineralized material)	1988-90: 39,668 oz Au		Eocene?
Chem (Iowa Canyon district)	2004: 2,500,000 tons, 0.013 opt Au, 32,500 oz Au (resource)		Tertiary rhyolite tuff	
Colorback (Bullion district)	1996: 297,000 tons, 0.038 opt Au (geologic resource)		Sedimentary	
Copper Basin (Battle Mountain district)	1996: 638,000 oz Au, 1,228,000 oz Ag, 164,000,000 lbs Cu (estimated endowment) 2012: 1,200,000 oz Au, 2,300,000 oz Ag, 164,000,000 lbs Cu (resource)	1870-1987: Intermittent N/A		
Cortez Joint Venture (Bullion and Cortez districts) CJV includes original Cortez Mine, Pipeline, South Pipeline, Gold Acres (2007 and on includes Cortez Hills)	1968: 3,600,000 tons, 0.279 opt Au (Cortez deposit) 1987: 4,800,000 tons, 0.105 opt Au 1999: 189,400,000 tons, 0.050 opt Au (proven and probable); 119,100,000 tons, 0.035 opt Au mineralized material 2000: 151,300,000 tons, 0.047 opt Au **(**proven and probable); 60,000,000 tons, 0.047 opt Au (mineralized material) 2001: 191,100,000 tons, 0.044 opt Au (proven and probable); 76,600,000 tons, 0.040 opt Au (resource) 2002: 229,300,000 tons, 0.034 opt Au (proven and probable reserves); 281,700,000 tons, 0.025 opt Au (measured and indicated mineral resource) 2003: 88,131,000 tons, 0.061 opt Au (proven reserves); 49,623,000 tons, 0.045 opt Au (probable reserves); 44,617,000 tons, 0.046 opt (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	1942-84: 2.400,000 tons, 0.13 opt Au; 2,000,000 tons, 0.041opt Au leached. Little Gold Acres: 800,000 tons, 0.124 opt Au 1988: 42,322 oz Au (includes Horse Canyon) 1989: 39,993 oz Au, 12,234 oz Ag (includes Horse Canyon) 1990-91: 107,445 oz Au, 16,750 oz Ag 1992-93: 141,850 oz Au 1995-98: 1,817,273 oz Au 31,332 oz Ag 1999: 1,328,525 oz Au 2000: 1,009,992 oz Au 2001: 1,184,732 oz Au 2002: 1,081,677 oz Au 2003: 1,065,402 oz Au 2004: 1,051,197 oz Au 2005: 915,889 oz Au, 52,160 oz Ag 2006: 408,255 oz Au, 25,065 oz Ag 2007: 534,173 oz Au, 47,240 oz Ag	Roberts Mountains Formation, Wenban Limestone, Valmy Formation, quartz porphyry dikes	

MAJOR PRECIOUS-METAL DEPOSITS, LANDER COUNTY (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
Cortez Joint Venture (con't.)	2005: 275,800,000 tons, 0.040 opt Au (proven and probable reserves); 309,000,000 tons, 0.033 opt Au (measured and indicated resource); 39,200,000 tons, 0.058 opt Au (inferred resource) 2006: 184,000,000 tons, 0.061 opt Au (proven and probable reserves); 44,470,000 tons, 0.041 opt Au (measured and indicated resource); 6,540,000 tons, 0.131 opt Au (inferred resource) 2007: 144,090,000 tons, 0.080 opt Au (proven and probable reserves); 76,240,000 tons, 0.045 opt Au (measured and indicated resource); 19,340,000 tons, 0.153 opt Au (inferred resource) 2008: 222,125,000 tons, 0.060 opt Au (proven and probable reserves); 81,088,000 tons, 0.046 opt Au (measured and indicated resource); 29,912,000 tons, 0.129 opt Au (inferred resource) 2009: 243,669,000 tons, 0.058 opt Au (proven and probable reserves); 46,622,000 tons, 0.074 opt Au (measured and indicated resource); 30,128,000 tons, 0.144 opt Au (inferred resource) 2010: 317,081,000 tons, 0.046 opt Au (proven and probable reserves); 60.463,000 tons, 0.072 opt Au (measured and indicated resource); 50,337,000 tons, 0.103 opt Au (inferred resource) 2010: 317,081,000 tons, 0.046 opt Au (proven and probable reserves); 60.463,000 tons, 0.072 opt Au (measured and indicated resource); 50,337,000 tons, 0.103 opt Au (inferred resource) 2010: 317,081,000 tons, 0.046 opt Au (proven and probable reserves); 60.463,000 tons, 0.072 opt Au (measured and indicated resource); 50,337,000 tons, 0.103 opt Au (inferred resource) 2011: 306,879,000 tons, 0.047 opt Au, 14,488,000 oz Au (proven and probable reserves); 54,391,000,000 tons, 0.069 opt Au, 3,757,000 oz Au (measured and indicated resource); 21,881,00000,000 tons, 0.074 opt Au, 1,615,000 oz Au (inferred resource) 2012: 306,190,000 tons, 0.049 opt Au 15,058,000 oz Au (proven and probable reserves); 50,943,000 tons, 0.053 opt Au, 2,701,000 oz Au (measured and indicated resource); 25,174,000 tons, 0.065 opt Au, 1,633,000 oz Au (inferred resource) 2013: 207,710,000 tons, 0.053 opt Au 11,024,000 oz Au (proven and probable reserves); 100,465,000 tons, 0.049 opt Au, 4,914,000 oz Au (measured and indicated resource); 17,344,000 tons, 0.054 opt Au, 939,000 oz Au (inferred resource) 2014: 169,557,000 tons, 0.068 opt Au 9,851,000 oz Au (proven and probable reserves,); 42,907,000 tons, 0.082 opt Au, 3,513,000 contained oz Au (measured and indicated resource); 26,047,000 tons, 0.052 opt Au, 1,156,000 oz Au (inferred resource), 2015: 168,908,000 tons, 0.067 opt Au 11,169,000 contained oz Au (proven and probable reserves); 48,180,000 tons, 0.045 opt Au, 2,150,000 contained oz Au (measured and indicated resource); 20,700,000 tons, 0.042 opt Au, 861,000 contained oz Au (inferred resource); Stockpiles: 3,814,000 tons, 0.115 opt Au, 438,000 oz Au (proven reserves) 2016: 166,450,000 tons, 0.062 opt Au, 10,220,000 contained oz Au (proven and probable reserves); 34,542,000 tons, 0.062 opt Au, 2,143,000 oz Au (measured and indicated resource); 15,990,000 tons, 0.048 opt Au, 763,000 oz Au (inferred resource)	2008: 464,253 oz Au (6,804 oz Au from Cortez Hills), 69,278 oz Ag 2009: 517,512 oz Au, 74,080 oz Ag 2010 (open pit): 791,978 oz Au, 45,477 oz Ag 2010 (underground): 47,988 oz Au 2011 (open pit): 1,119,910 oz Au, 19,721 oz Ag 2011 (underground): 301,129 oz Au, 4,775 oz Ag 2012 (open pit): 939,004 oz Au, 25,155 oz Ag 2012 (underground): 430,962 oz Au, 9,986 oz Ag 2013 (open pit, includes Pipeline): 825,196 oz Au, 22,187 oz Ag 2013 (underground): 545,852 oz Au, 13,666 oz Ag 2014 (Cortez Hills and Pipeline open pit): 506,274 oz Au, 17,739 oz Ag 2014 (Cortez Hills underground): 395,093 oz Au, 13,464 oz Ag 2015: (Cortez Hills and Pipeline open pit): 520,060 oz Au, 17,602 oz Ag 2015 (Cortez Hills underground): 478,940 oz Au, 16,210 oz Ag 2016: (Cortez Hills and Pipeline open pit): 850,312 oz Au, 22,565 oz Ag 2016 (Cortez Hills underground): 338,275 oz Au, 6,294 oz Ag 2017: (Cortez Hills and Pipeline open pit): 902,887 oz Au, 28,690 oz Ag 2017: (Cortez Hills underground): 336,063 oz Au, 55,284 oz Ag		

MAJOR PRECIOUS-METAL DEPOSITS, LANDER COUNTY (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
Cortez Joint Venture (con't)	2017: 185,098,000 tons, 0.055 opt Au, 10,086,000 oz Au (proven and probable reserves), metallurgical recovery); 34,638,000 tons, 0.054 opt Au, 1,712,000 oz Au (measured and indicated resource); 10,884,000 tons, 0.059 opt Au, 638,000 oz Au (inferred resource)			
Cortez Hills (Cortez district)	2005 (Sept 1): 71,300,000 tons, 0.079 opt Au 5,545,000 oz Au (proven and probable reserves); 5.7500,000 tons, 0.42 opt Au, 2,421,667 oz Au (measured and indicated resource, underground); 13,800,000 tons, 0.13 opt Au, 1,856,667 oz Au (inferred resource, open pit and underground) 2006: 8.500,000 oz Au (proven and probable reserves) 2008: 15,620,000 tons, 0.127 opt Au, 1,983,740 oz Au (proven reserve); 128,150,000 tons, 0.074 opt Au, 9,483,000 oz Au (probable reserve) 2010 (open pit): 31,531,000 tons, 0.139 opt Au (proven and probable reserve) 2010 (underground, breccia zone): 2,251,000 tons, 0.595 opt Au (proven and probable reserve) 2010 (underground, middle zone): 3,173,000 tons, 0.370 opt Au (proven and probable reserve) 2011(open pit): 32,591,000 tons, 0.131 opt Au, 4,275,000 oz Au (proven and probable reserve); 237,000 tons, 0.08 opt Au, 19,000 oz Au (measured and indicated resource); 1,351,000 tons, 0.025 opt gold, 33,000 oz Au (inferred resource) 2011 (underground): 6,516,000 tons, 0.446 opt Au, 2,908,000 oz Au (proven and probable reserve); 6,476,000 tons, 0.379 opt Au, 2,456,000 oz Au (measured and indicated resource); 3,197,000 tons, 0.337 opt gold, 1,078,000 oz Au (inferred resource) 2015 (open pit): 18,702,000 tons, 0.117 opt Au, 2,182,000 oz Au (proven and probable reserve) 3,440,000 tons, 0.04 opt gold, 122,000 oz Au (Breccia Zone inferred resource); 2015 (underground): 12,912,000 tons, 0.347 opt Au, 4,476,000 oz Au (proven and probable reserve); 3,172,000 tons, 0.297 opt Au, 943,000 oz Au (measured and indicated resource)1,341,000 tons, 0.035 opt gold, 466,000 oz Au (inferred resource)	2010-2016: Production combined with Cortez Joint Venture	Roberts Mountains Formation, Wenban Limestone	
Cortez NW Deeps (Cortez district)	2011: 4,689,000 tons, 0.047 opt Au, 218,000 oz Au (measured and indicated resource); 3,951,000 tons, 0.065 opt gold, 259,000 oz Au (inferred resource)		Roberts Mountains Formation, Hanson Creek Formation	
Cortez Pits (Cortez district)	Pre-2015: See Cortez Joint Venture 2015: 4,083,000 tons, 0.056 opt Au, 227,000 oz Au (measured and indicated resource): 1,283,000 tons, 0.02 opt Au, 27,000 oz Au (inferred resource)	1968-1993: See Cortez Joint Venture		
Crescent Pit (Bullion district)	1994: 1,970,000 tons mill grade, 0.125 opt Au, 2.200,000 tons heap-leach, 0.029 opt Au 1997: included in Cortez Joint Venture			
Crescent Valley (Bullion district)	1994: placer reserves-8,000,000 cu yd, 0.031 oz Au/cu yd 1995: placer resource-6,000,000 cu yd, 0.03 oz Au/cu yd			
Crossroads (Bullion district)	2010: 125,842,000 tons, 0.027 opt Au (proven and probable reserve)			

MAJOR PRECIOUS-METAL DEPOSITS, LANDER COUNTY (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
Crossroads (con't)	2011:129,391,000 tons, 0.03 opt Au, 3,937,000 oz Au (proven and probable reserve); 23,895,000 tons, 0.015 opt Au, 370,000 oz Au (measured and indicated resource); 7,273,000 tons, 0.015 opt gold, 112,000 oz Au (inferred resource) 2015: 94,749,000 tons, 0.033 opt Au, 3,167,000 oz Au (proven and probable reserve); 19,030,000 tons, 0.014 opt Au, 259,000 oz Au (measured and indicated resource); See Pipeline for inferred resource			
Dean (Lewis district)	1995: proven reserves-11,000 oz Au possible to probable resource-240,000 oz Au			
Elder Creek Project/Shoshone (Lewis district)	1989: 91,500 oz Au 1990: 1,500,000 tons, 0.041 opt Au	1990-91: 20,102 oz Au	Valmy Formation	Cretaceous or Eocene
Fire Creek (northeast of Bullion district)	1982: 350,000 tons, 0.06 opt Au 2005 (May): 1,779,196 tons, 0.328 opt Au (indicated resource) 2006: 1,961,195 tons, 0.576 opt Au (indicated resource) 2008 (April): 2,654,650 tons, 0.479 opt Au (indicated resource, 0.233 opt Au cut-off grade); 1,184,202 tons, 0.396 opt Au (inferred resource, 2011: 2,364,745 tons, 0.513 opt Au, 1,215,019 oz Au (indicated resource); 611,824 tons, 0.366 opt Au, 223,794 oz Au (inferred resource) 2011: 5,705,560 tons, 0.289 opt Au, 1,647,052 oz Au (indicated resource); 1,910,008 tons, 0.240 opt Au, 458,084 oz Au (inferred resource) 2014 (Joyce, Karen, Vonnie Veins): 158,800 tons, 1.285 opt Au, 138,700 oz Au; 0.927 opt Ag, 172,200 oz Ag (proven and probable reserve); (Far North, Main, North, South, West Zones): 377,400 tons, 1.1 opt Au, 415,500 oz Au; 0.86 opt Ag, 324,200 oz Ag (measured and indicated resource) 840,000 tons, 0.43 opt gold, 358,300 oz Au; 0.38 opt Ag, 320,800 oz Ag (inferred resource); 2015: 240,000 tons, 1.311 opt Au, 314,600 oz Au, 0.972 opt Ag, 233,300 oz Ag (proven and probable reserve,); 462,500 tons, 1.011 opt Au, 467,700 oz Au; 0.783 opt Ag, 362,400 oz Ag (measured and indicated resource); 1,064,900 tons, 0.41 opt gold, 436,200 oz Au; 0.319 opt Ag, 339,500 oz Ag (inferred resource) 2016: 240,000 tons, 1.213 opt Au, 291,000 oz Au, 0.94 opt Ag, 224,000 oz Ag (proven and probable reserve); 526,000 tons, 0.948 opt Au, 499,000 oz Au; 0.78 opt Ag, 411,000 oz Ag (measured and indicated resource); 931,000 tons, 0.538 opt gold, 501,000 oz Au; 0.48 opt Ag, 446,000 oz Ag (inferred resource) 2017: 319,000 tons, 0.708 opt Au, 226,000 oz Au, 0.69 opt Ag, 220,200 oz Ag (proven and probable reserve, $1,200/oz Au, $17/oz Ag); 42,877,000 tons, 0.025 opt Au, 1,093,000 oz Au; 0.055 opt Ag, 2,330,400 oz Ag (indicated resource, 0.01 opt Au equivalent cut-off); 31,707,900 tons, 0.034 opt Au, 1,085,000 oz Au; 0.091 opt Ag, 2,882,000 oz Ag (inferred resource	1983-84: 767 oz Au 2012: 191 oz Au, 286 oz Ag 2014: 65,655 oz Au, 62,911 oz Ag 2015: 77,055 oz Au, 92,114 oz Ag 2016: 101,284 oz Au; 80,593 oz Ag 2017: 107,143 oz Au 72,283 oz Ag	basaltic andesite	Miocene

MAJOR PRECIOUS-METAL DEPOSITS, LANDER COUNTY (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
Fortitude Complex (Battle Mountain district)	1984: 16,000,000 tons, 0.15 opt Au, 0.57 opt Ag	1986: 253,000 oz Au, 902,000 oz Ag 1987: 255,000 oz Au 1988-93: 985,616 oz Au, 1,707,992 oz Ag (includes Surprise) 1994: 50,000 oz Au, 95,000 Ag (Reona Mine) 1995: *see* Battle Mountain Complex 2001: *see* Phoenix	Battle Formation, Antler Peak Limestone Pumpernickel Formation	37 Ma
Fortitude Extension (Battle Mountain district)	1992: 500,000 oz Au 1993: *geologic resource*-900,000 oz Au 1996: included in Battle Mountain Complex			
Gap (Bullion district)	2010: 53,571,000 tons, 0.015 opt Au (proven and probable reserve) 2011: 48,151,000 tons, 0.016 opt Au, 772,000 oz Au (proven and probable reserve); 9,259,000 tons, 0.013 opt Au, 124,000 oz Au (measured and indicated resource); 2,504,000 tons, 0.013 opt gold, 32,000 oz Au (inferred resource) 2015: 2,569,000 tons, 0.02 opt Au, 51,000 oz Au (measured and indicated resource, See Pipeline for inferred resource	2011: Production combined with Cortez Joint Venture	Wenban Limestone	
Gold Acres (Bullion district)	2011: 5,032,000 tons, 0.097 opt Au, 487,000 oz Au (measured and indicated resource); 778,000 tons, 0.092 opt Au, 72,000 oz Au (inferred resource) 2015: 3,479,000 tons, 0.105 opt Au, 367,000 oz Au (measured and indicate refractory resource); 305,000 tons, 0.103 opt Au, 32,000 oz Au (inferred refractory resource)	1942-1993: Production included with Cortez Joint Venture	Roberts Mountains Formation, Wenban Limestone, Valmy Formation	
Hilltop (Hilltop district)	1984: 10,300,000 tons, 0.073 opt Au 1989: 10,000,000 tons, 0.049 opt Au 2005: 121,000,000 tons, 0.019 opt Au (measured and indicated resource)		Valmy Formation	Oligocene?
Independence (Battle Mountain district)	2010: 14,802,000 tons, 0.014 opt Au, 0.27 opt Ag (measured and indicated oxide resource) 5,997,000 tons, 0.011 opt Au, 0.066 opt Ag (inferred oxide resource); 4,182,000 tons, 0.19 opt Au (inferred sulfide resource) 2011 Shallow Deposit: 16,056,000 tons, 0.014 opt Au, 223,300 oz Au; 0.236 opt Ag, 3,784,000 oz Ag (proven and probable reserve,); 4,592,000 tons, 0.01 opt Au, 46,400 oz Au, 0.046 opt Ag, 211, 200 oz Ag (inferred resource); Deep Skarn Deposit: 4,182,000 tons, 0.19 opt gold, 796,200 oz Au (inferred resource)			
Iron Butte (South of Warm Springs district)	2009: 21,180,858 tons, 0.014 opt Au, 326,780 oz Au, 0.26 opt Ag, 6,173,156 oz Ag (resource) 2010 Red Ridge Zone: Oxide: 14,072,175 tons, 0.019 opt Au, 300, 376 oz Au; Sulfide: 9,661,356 tons, 0.015 opt Au, 160,410 oz Au; Total: 23,733,531 tons, 0.018 opt Au, 460,786 oz Au; North Zone: Oxide: 641,179 tons, 0.019 opt Au, 13,523 oz Au; Sulfide: 6,182,878 tons, 0.019 opt Au, 131,877 oz Au; Total: 6,824,057 tons, 0.019 opt Au, 145,000 oz Au; Total Resource: Oxide: 14,713,354 tons 0.019 opt Au, 313, 899 oz Au; Sulfide: 15,844,234 tons, 0.017 opt Au, 292,287 oz Au; Total: 30,557,588 tons, 0.018 opt Au, 606,186 oz Au (resource)			

MAJOR PRECIOUS-METAL DEPOSITS, LANDER COUNTY (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
Klondike (Kingston District)	1989: 100,000 oz Au equivalent			
McCoy/Cove (McCoy district)	1981: 2,500,000 tons, 0.08 opt Au, 1 opt Ag (McCoy) 1987: 14,000,000 tons, 0.05 opt Au (McCoy); 4,000,000 oz Au, 25000,000 oz Ag (Cove) 1989: proven and probable reserves 2,900,000 oz Au, 128,000,000 oz Ag *geologic resource*-3,500,000 oz Au, 1,500,000 oz Ag 1999: 11,800,000 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: 4,700,000 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 2010 (Helen Zone): 684,855 tons, 0.77 opt Au (inferred resource) 2011 (Helen Zone): 391,600 tons, 0.59 opt Au (inferred resource) 2013 (Helen Zone): 468,600 tons, 0.31 opt Au, 143,100 oz Au (indicated resource); 973,600 tons, 0.29 opt Au, 278,700 oz Au (inferred resource) 2017: 676,800 tons, 0.338 opt Au, 228,000 oz Au (indicated mineral resource)); 3,723,600 tons, 0.355 opt Au (inferred mineral resource)	1986: 50,000 oz Au 1987-98: 3,046,660 oz Au, 85,790,000 oz Ag 1999: 124,500 oz Au, 8,430,000 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 2006: 2,939 oz Au, 596 oz Ag	Panther Canyon Formation (conglomerate, sandstone), Augusta Mountain Formation (limestone), granodiorite	39.5 Ma
Mud Springs (Bald Mtn. Zone) (Bullion district)	1993: 42,000 oz Au (geologic resource)			
Mule Canyon (Argenta district)	1992: 8,500,000 tons, 0.136 opt Au 1996: 9,000,000 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 2006: 30,732 oz Au, 3,248 oz Ag 2007: 22,466 oz Au, 4,565 oz Ag	basalt and basaltic andesite	15-16 Ma
Pediment (Cortez district)	2010: 47,316,000 tons, 0.024 opt Au (proven and probable reserve) 2011: 49,469,000 tons, 0.024 opt Au, 1,163,000 oz Au (proven and probable reserve, 0.004-0.075 opt Au cut-off grade); 805,000 tons, 0.008 opt Au, 6,000 oz Au (inferred resource) 2015: 21,268,000 tons, 0.027 opt Au, 571,000 oz Au (proven and probable reserve, 0.004-0.205 opt Au cut-off grade); 3,851,000 tons, 0.03 opt Au, 125,000 oz Au (inferred resource, 0.004-0.075 opt Au cut-off grade) [NI43-101 compliant]			

MAJOR PRECIOUS-METAL DEPOSITS, LANDER COUNTY (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
Phoenix (Battle Mountain district)	2001: 174,200,000 tons, 0.034 opt Au (proven and probable reserves); 156.300,000 tons, 0.17% Cu (proven and probable reserves); 73,800,000 tons, 0.026 opt Au mineralized material; 99,600,000 tons, 0.14% Cu (mineralized material) 2002: 174,200,000 tons, 0.034 opt Au (probable reserves); 156,300,000 tons, 0.16 % Cu (probable reserves); 1,.500,000 tons, 0.033 opt Au (measured and indicated mineralized material); 72,300,000 tons, 0.026 opt Au (inferred mineralized material); 63.500,000 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,.400,000 tons, 0.029 opt Au (proven and probable reserves); 22,200,000 tons, 0.023 opt Au (measured and indicated resource); 16.500,000 tons, 0.026 opt Au (inferred resource) 2006: 295,200,000 tons, 0.027 opt Au (proven and probable reserves); 92,800,000 tons, 0.017 opt Au (measured and indicated resource) 23,200,000 tons, 0.022 opt Au (inferred resource) 2007: 278,100,000 tons, 0.027 opt Au (proven and probable reserves); 92,800,000 tons, 0.017 opt Au (measured and indicated resource); 22,900,000 tons, 0.022 opt Au (inferred resource) 2008: 299,800,000 tons, 0.021 opt Au (proven and probable reserves); 61,600,000 tons, 0.015 opt Au (indicated resource); 34,000,000 tons, 0.019 opt Au (inferred resource) 2009: 285,000,000 tons, 0.020 opt Au (probable reserves); 158,400,000 tons, 0.013 opt Au (indicated resource); 35,400,000 tons, 0.015 opt Au (inferred resource) 2010: 329,800,000 tons, 0.018 opt Au (probable reserve); 150,900,000 tons, 0.013 opt Au (indicated resource); 54,300,000 tons, 0.015 opt Au (inferred resource) 2011: 447,100,000 tons, 0.016 opt Au, 7,250,000 oz Au; 450,300,000 tons, 0.244 opt Ag, 109,980,000 oz Ag (proven and probable reserve) 216,400,000 tons, 0.012 opt Au, 0.173 opt Ag (indicated resource); 132,300,000 tons, 0.012 opt Au, 0.197 opt Ag (inferred resource) 2012: 439,900,000 tons, 0.017 opt Au, 7,430,000 oz Au, 443,200,000 tons, 0.254 opt Ag, 112,580,000 oz Ag (proven and probable reserve); 198,100,000 tons, 0.013 opt Au, 0.186 opt Ag, 2,520,000 oz Au, 36,900,000 oz Ag (measured and indicated resource); 117,200,000 tons, 0.012 opt, Au, 0.202 opt Ag, 1,390,000 oz Au, 23,700,000 oz Ag (inferred resource); stockpiles: 2,300,000 tons, 0.089 opt Ag, 200,000 oz Ag (inferred resource) 2013: 335,800,000 tons, 0.017 opt Au, 5,660,000 oz Au, 339,100,000 tons, 0.24 opt Ag, 80,280,000 oz Ag (proven and probable reserve); 174,800,000 tons, 0.011 opt Au, 0.21 opt Ag (mineralized material) 2014: 322,700,000 tons, 0.017 opt Au, 5,510,000 oz Au, 324,900,000 tons, 0.24 opt Ag, 78,680,000 oz Ag (proven and probable reserve); 49,500,000 tons, 0.019 opt Au, 0.22 opt Ag (mineralized material); stockpiles:	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 2006: 67,394 oz Au, 38,112 oz Ag, 6,235,096 lbs Cu 2007: 181,313 oz Au, 664,787 oz Ag, 10,808,206 lbs Cu 2008: 175,259 oz Au, 1,040,563 oz Ag 15,853,706 lbs Cu 2009: 218,732 oz Au 1,212,153 oz Ag 23,733,389 lbs Cu 2010: 214,142 oz Au 921,350 oz Ag 19,008,818 lbs Cu 2011: 205,658 oz Au 1,152,312 oz Ag 23,897,865 ibs Cu. 2012: 158,843 oz Au 1,325,200 oz Au 27,809,189 lbs Cu 2013: 202,055 oz Au 1,550,346 oz Ag 29,815,908 lbs Cu 2014: 189,474 oz Au 1,653,459 oz Ag 46,014,331 lbs Cu 2015: 183,371 oz Au 986,159 oz Ag 46,330,821 lbs Cu 2016: 176,758 oz Au; 1,175,126 oz Ag, 41,806,950 lbs Cu 2017: 197,026 oz Au, 1,191,630 oz Ag, 33,178,523 lbs Cu		Eocene

MAJOR PRECIOUS-METAL DEPOSITS, LANDER COUNTY (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
Phoenix (cont.)	3,300,000 tons, 0.027 opt Au, 90,000 oz Au (probable reserve); 2015: 288,300,000 tons, 0.017 opt Au, 5,010,000 oz Au, 289,500,000 tons, 0.25 opt Ag, 73,510,000 oz Ag (proven and probable reserve); 153,700,000 tons, 0.012 opt Au, 0.21 opt Ag (mineralized material); stockpiles: 3,200,000 tons, 0.028 opt Au, 90,000 oz Au (proven reserve) 2016: 256,600,000 tons, 0.017 opt Au, 4,340,000 oz Au, 0.24 opt Ag, 60,910,000 oz Ag (proven and probable reserve); 178,100,000 tons, 0.021 opt Au, 0.21 opt Ag (mineralized material) 2017: 249,900,000 tons, 0.016 opt Au, 4,030,000 oz Au, 0.24 opt Ag, 60,880,000 oz Ag (proven and probable reserve); 213,100,000 tons, 0.013 opt Au, 0.21 opt Ag (mineralized material)			
Pipeline (Bullion district)	1991: *geologic resource*-11,300,000 tons, 0.237 opt Au 1996: 136,700,000 tons, 8,700,000 oz Au (measured resource, includes South Pipeline) 1997: included in Cortez Joint Venture 2010: 41,453,000 tons, 0.017 opt Au (proven and probable reserve) 2011: 35,704,000 tons, 0.02 opt Au, 707,000 oz Au (proven and probable reserve, 0.004-0.075 opt Au cut-off grade, Pipeline/South Pipeline); 4,803,000 tons, 0.018 opt Au, 84,000 oz Au (measured and indicated resource); 2,022,000 tons, 0.012 opt gold, 24,000 oz Au (inferred resource) 2015: 17,455,000 tons, 0.017 opt Au, 294,000 oz Au (proven and probable reserve); 15,848,000 tons, 0.019 opt Au, 302,000 oz Au (measured and indicated resource); Combined Pipeline, Crossroads, Gap: 13,918,000 tons, 0.02 opt Au, 211,000 oz (inferred resource)	1996-2009, 2013-15: included in Cortez Joint Venture		Eocene?
Robertson (Bullion district)	1988: 11,000,000 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) 2005-2006: 22,900,000 tons, 0.031 opt Au (measured and indicated resource) 9,408,000 tons, 0.046 opt Au (inferred resource) 2007: 91,300,000 tons, 0.025 opt Au (inferred resource) 2009: 178,924,188 tons, 0.0189 opt Au (inferred resource) 2011: 191,725,418 tons, 0.0143 opt Au, 2,741,673 oz Au (inferred resource)	1989: 3,700 oz Au	Valmy Formation	early Oligocene
Slaven Canyon property (Bateman Canyon district)	1994: 50,000 oz Au 2002: 1,600,000 tons, 0.043 opt Au			
South Pipeline (Bullion district)	1992: 900,000 tons, 0.082 opt Au 1994: *geologic resource*-76.500,000 tons, 0.048 opt Au 1996: *see* Pipeline 1997: included in Cortez Joint Venture 2011: see Pipeline		Roberts Mountains Formation	Eocene?
Surprise (Battle Mountain district)	1987: 225,000 oz Au 1988-91: production and reserves included in Fortitude figures 1994: mined out	1987: 2,000 oz Au	skarn	37 Ma

MAJOR PRECIOUS-METAL DEPOSITS, LANDER COUNTY (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
Toiyabe	1988: 813,400 tons, 0.066 opt Au 2009: 4,975,000 tons, 0.035 opt Au (indicated resource)	1988: 32,000 oz Au, 10,300 oz Ag 1990-91: 20,480 oz Au, 15,125 oz Ag	lower Paleozoic calcareous siltstone	Eocene?
Victorine (Kingston) (Kingston district)	1987: 1,480,000 tons, 0.208 opt Au (ore reserves) 1992: 915,000 tons, 0.304 opt Au 1995: 256,000 tons, 0.36 opt Au (proven and probable reserves); 31,160 oz Au (geologic resource) 2000: 120,000 oz Au (proven and probable reserves); 200,000 oz Au (possible reserves)	1987-88: 39,247 oz Au, 88,207 oz Ag 1988-89: 25,131 oz Au	Cambrian to Ordovician Broad Canyon sequence	

LINCOLN COUNTY

Atlanta (Atlanta district)	1980: 1,100,000 tons, 0.08 opt Au, 1.6 opt Ag 1996: 300,000 oz Au, 3,000,000 oz Ag 2011 Main Zone: 6,391,000 tons, 0.047 opt Au, 302,797 oz Au, 0.25 opt Ag, 1,569,689 oz Ag (indicated resource) 4,330,227 tons, 0.031 opt Au, 133,662 oz Au, 0.56 opt Ag, 2,404,717 oz Ag (inferred resource) East-West Zones: 1,610,800 tons, 0.046 opt Au, 73,072 oz Au, 0.13 opt Ag, 212,154 oz Ag (indicated resource) 830,783 tons, 0.039 opt Au, 32,479 oz Au, 0.23 opt Ag, 190,083 oz Ag (inferred resource) 2012: 15,503,000 tons, 0.035 opt Au, 572,100 oz, Au, 0.38 opt Ag, 5,893,500 oz Ag (measured and indicated resource)) 18,538,000 tons, 0.029 opt Au, 544,300 oz,Au, 0.213 opt Ag, 3,955,400 oz Ag (inferred resources) 2018: Global Resoure: 13,867,000 tons, 0.038 opt Au, 525,100 oz Au, 0.34 opt Ag, 4,690,000 oz Ag (measured and indicated resources); 15,112,000 tons, 0.027 opt Au, 401,000 oz Au, 0.22 opt Ag, 3,240,000 oz Ag (inferred resources) Open pit Resource: 6,007,000 tons, 0.041 opt Au, 243,100 oz Au, 0.37 opt Ag, 2,180,000 oz Ag (measured and indicated resources); 1,389,000 tons, 0.022 opt Au, 31,000 oz Au, 0.17 opt Ag, 240,000 oz Ag (inferred resources)	1954: 22,000 tons ore 1960s: 27,000 tons ore 1975-1985: 1,500,000 tons, 0.09 opt Au, 1.25 opt Ag 1980: 88,000 oz Au, 1,710,000 oz Ag	Pogonip Group, Ely Springs and Laketown Dolomites, Oligocene silicic tuff, dacite dikes	early Miocene
Caliente (Pennsylvania district)	1997: 50,000 tons, 0.03 opt Au, 0.80 opt Ag; (geologic reserves); 700,000 tons, 0.039 opt Au (geologic resource)		Tertiary diorite Tertiary andesite	
Easter and Delamar Project (Delamar district)	1994: 3,360,000 tons, 0.069 opt Au (geologic resource) 1995: 1,500,000 tons, 0.069 opt Au 2010 (Easter project): 2,640,000 tons, 0.0386 opt Au, 0.408 opt Ag (indicated resource) 200,000 tons, 0.0333 opt Au, 0.350 opt Ag (inferred resource)		Cambrian quartzite	Miocene
Gold Springs (Eagle Valley district)	2012: (Grey Eagle Zone): 3,196,276 tons, 0.02 opt Au 62,482 Au, 0.02 opt Ag, 632,617 oz Ag (inferred resource, 0.009 opt Au equivalent cut-off grade) 2014: (Grey Eagle Zone): 8,450,000 tons, 0.018 opt Au, 150,000 oz Au, 0.2 opt Ag, 1,695,000 oz Ag (measured and indicated resource); 3,557,000 tons, 0.017 opt Au 65,000 Au, 0.198 opt Ag, 78,000 oz Ag (inferred resource)		Miocene latite to andesite	

MAJOR PRECIOUS-METAL DEPOSITS, LINCOLN COUNTY (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
Gold Springs (con't.)	2015: (Grey Eagle Zone): 10,052,000 tons, 0.016 opt Au, 159,000 oz Au, 0.19 opt Ag, 1,901,000 oz Ag (measured and indicated resource); 2,417,000 tons, 0.01 opt Au, 25,000 oz Au, 0.14 opt Ag, 339,000 oz Ag (inferred resource) 2017: (Grey Eagle): 7,909,000 tons, 0.018 opt Au, 142,000 oz Au, 0.21 opt Ag, 1,654,000 oz Ag (measured and indicated resource, 0.007 opt Au cut-off grade); 965,000 tons, 0.013 opt Au, 12,000 oz Au, 0.19 opt Ag, 179,000 oz Ag (inferred resource); (Thor): 391,000 tons, 0.028 opt Au, 11,000 oz Au, 0.53 opt Ag, 207,000 oz Ag (measured and indicated resource); 25,000 tons, 0.018 opt Au, 400 oz Au, 0.32 opt Ag, 8,000 oz Ag (inferred resource)			
Groom Mine (Groom district)	1963: Reserve: 30,000 tons, 0.5 opt Ag, 4-5% Pb (reserve)	1915-26: Concentrates: 6,145 tons, 100,341 oz Ag, 5,926,371 lbs. Pb 1915-37: 5,737 tons ore valued at $367,325	Sedimentary	

LYON COUNTY

Dayton Resource Area (Comstock Mine Project) (Silver City District)	2010: 4,970,000 tons, 0.034 opt Au, 0.244 opt Ag (measured and indicated resource) 1,210,000 tons, 0.026 opt Au, 0.298 opt Ag (inferred resource) 2011 (Alhambra, Dayton, and Kossuth Mines): 8,330,000 tons, 0.029 opt Au, 0.213 opt Ag (measured and indicated resource); 8,590,000 tons, 0.024 opt Au, 0.131 opt Ag (inferred resource)		Santiago Canyon tuff; Alta Formation	
Fire Angel (Como district)	1989: 5,600 oz Au, *geologic resource*– 148,500 oz Au			
Hercules (Como district)	1997 (Hydra-Hercules): 259,329 oz Au, 1,956,511 oz Ag 2012: 7,703,522 tons, 0.0125 opt Au, 96,525 oz Au, 0.107 opt Ag, 821,581 oz Ag (indicated resource) 31,121,649 tons, 0.0121 opt Au, 377,506 oz Au, 0.135 opt Ag, 4,211,693 oz Ag (inferred resource)		Tertiary andesite	
Pine Grove (Wilson district)	1994: 2,500,000 tons, 0.061 opt Au 2008:2,738,000 tons, 0.25 opt Au (inferred resource, Wilson deposit) 3,321,000 tons, 0.075 opt Au) (inferred resource, Wheeler deposit) 2011 Wilson and Wheeler deposits: 5,316,000 tons, 0.033 opt Au (indicated resource); 4,136,000 tons, 0.028 opt Au (inferred resource) 2012 Wheeler: 2,867,000 tons, 0.038 opt Au, 109,900 oz Au (measured and indicated resource); 96,000 tons, 0.027 opt Au, 7,500 oz Au (inferred resource) Wilson: 3,189,000 tons, 0.03 opt Au, 96,100 oz Au (measured and indicated resource) 732,000 tons, 0.026 opt Au, 34,300 oz Au (inferred resource) 2015 Wheeler: 1,268,000 tons, 0.06 opt Au, 75,700 oz Au (measured and indicated resource); 3,000 tons, 0.032 opt Au, 100 oz Au (inferred resource); Wilson: 959,000 tons, 0.05 opt Au, 47,600 oz Au (measured and indicated resource); 85,000 tons, 0.068 opt Au, 5,800 oz Au (inferred resource)			

MAJOR PRECIOUS-METAL DEPOSITS, LYON COUNTY (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
Rockland Mine (Wilson district)	1965: 100,000 tons, $40 per ton (proven and indicated reserves)	1870-1934 intermittently: 45,787 tons at $380,611	Rhyolite and diorite	
South Comstock Joint Venture (Silver City district)	1994: 3,000,000 tons, 0.05 opt Au 1995: 100,000 oz Au			
Talapoosa (Talapoosa district)	1988 oxide: 2,500,000 tons, 0.041 opt Au, 0.53 opt Ag; sulfide: 14,900,000 tons, 0.03 opt Au, 0.49 opt Ag sulfide 1995 geologic resource: 45,000,000 tons, 0.025 opt Au and 0.33 opt Ag, including proven and probable reserves of 29,900,000 tons, 0.026 opt Au and 0.4 opt Ag 2010 Bear Creek Zone (sulfide): 20,130,000 tons, 0.027 opt Au, 549,000 oz Au, 0.35 opt Ag, 7,053,000 oz Ag (measured and indicated resource, 0.015 opt Au cut-off grade); 10,401,000 tons, 0.027 opt Au, 277,000 oz Au, 0.326 opt Ag, 3,391,000 oz Ag (inferred resource); Main Zone (oxide): 2,921,000 tons, 0.028 opt Au, 83,000 oz Au, 0.4 opt Ag, 1,169,000 oz Ag (measured and indicated resource); 2,194,000 tons, 0.03 opt Au, 49,000 oz Au, 0.391 opt Ag, 858,000 oz Ag (inferred resource) 2013: 31,264,470 tons, 0.032 opt Au, 1,012,802 oz Au, 0.437 opt Ag, 13,649,358 oz Ag (measured and indicated resource); 11,198,000 tons, 0.021 opt Au, 233,532 oz Au, 0.194 opt Ag, 10,158,000 2015 oxide: 4,538,050 tons, 0.036 opt Au, 162,581 oz Au, 0.51 opt Ag, 2,315,322 oz Ag; sulfide: 26,726,420 tons, 0.032 opt Au, 850,220 oz Au, 0.31 opt Ag, 11,332,037 oz Ag (measured and indicated resource); oxide:1,762,000 tons, 0.027 opt Au, 47,745 oz Au, 0.065 opt Ag, 115,115 oz Ag; sulfide; 9,436,000 tons, 0.02 opt Au, 85,787 oz Au, 0.218 opt Ag, 2,057,651 oz Ag (inferred resource)		Kate Peak Formation	Miocene

MINERAL COUNTY

Aurora Mine (Aurora district)	1989: 347,000 tons, 0.253 opt Au 1996: 900,000 tons, 0.1 opt Au 2003: *see* Esmeralda	1989-90: 25,656 oz Au, 34,562 oz Ag 1991: 15,000 oz Au 1992-93: 23,600 oz Au, 52,200 oz Ag 1995: 15,000 oz Au, 35,000 oz Ag 1996: 10,374 oz Au 1997-98: 15,414 oz Au, 7,287 oz Ag 2017: 922 oz Au 4,854 oz Ag	andesite, rhyolite	10 Ma
Aurora Partnership (Aurora district)	1983: 1,500,000 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

MAJOR PRECIOUS-METAL DEPOSITS, MINERAL COUNTY (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
Borealis (Borealis district)	1981: 2,100,000 tons, 0.08 opt Au, 0.5 opt Ag 1988: 1,792,000 tons, 0.046 oz Au/ton 2000: 33,400,000 tons, 0.044 opt Au, 0.22 opt Ag cumulative resource 2005 (May): 44,700,000 tons, 0.03 opt Au (measured and indicated resource) 34,800,000 tons, 0.02 opt Au (inferred resource) 2006: 8,235,000 tons, 0.022 opt Au, 0.158 opt Ag (measured and indicated resource, oxide) 35,157,000 tons, 0.032 opt Au, 0.164 opt Ag (measured and indicated resource, oxide, partially oxidized, sulfides) 16,909,000 tons, 0.028 opt Au, 0.106 opt Ag (inferred resource, oxide, partially oxidized, and sulfides) 2008: 29,560,000 tons, 0.045 opt Au, 0.273 opt Ag (measured and indicated resource, combined sulfide, partially oxidized and oxide); 36,161,000 tons, 0.027 opt Au, 0.196 opt Ag (inferred resource, combined sulfide, partially oxidized and oxide); 8,546,000, 0.028 opt Au, 0.222 opt Ag (measured and indicated resource, oxide and partially oxidized); 13,706,000 tons, 0.018 opt Au, 0.096 opt Ag (inferred resource, oxide and partially oxidized) 2009: 16,650,000 tons, 0.023 opt Au, 0.19 opt Ag (measured and indicated resource, oxide, partially oxidized) 2010: 14,294,000 tons, 0.023 Au (proven and probable reserve, in situ, oxide, partially oxidized); 16,650,000 tons, 0.023 Au (proven and probable reserve, in situ leach pads and dumps, oxide, partially oxidized); 35,643,000 tons, 0.040 opt Au (measured and indicated resource, in situ leach pads and dumps, oxide, partially oxidized, and sulfide); 50,225,000 tons, 0.022 opt Au (inferred resource, in situ leach pads and dumps, oxide, partially oxidized, and sulfide)	1981-84: 170,000 oz Au 1986-88: 116,256 oz Au 1989-90: 107,495 oz Au 52,401 oz Ag 2011: 3,171 oz Au 1,992 oz Ag 2012: 32,066 oz Au 13,871 oz Ag 2013: 10,556 oz Au 21,187 oz Ag 2014: 10,589 oz Au, 35,133 oz Ag 2015: 7,998 oz Au, 29,321 oz Ag 2016: 617.9 oz Au, 1,510.54 oz Ag 2017: 299.7 oz Au, 508.3 oz Ag	rhyolite flow dome, andesite flows, breccias, volcaniclastic rocks	5 Ma
Candelaria Mine (Candelaria district)	1982: 18,500,000 tons, 1.09 opt Ag, 0.009 opt Au 1988: 24,000,000 tons, 1.267 opt Ag, 0.011 opt Au 1999: 27,300,000 tons, 3.4 opt Ag unmined resource; additional 800,000 oz Ag in low-grade stockpile 2000: 48,000 oz Au and 45.400,000 oz Ag indicated reserves 2001: 13,623,000 tons, 0.003 Au, 3.23 opt Ag, 44,060,000 oz Ag (measured and indicated resource); Northern Belle, leach pads, stockpiles combined: 55,681,000 tons, 0.002 opt Au, 1.49 opt Ag, 82,829,000 oz Ag (inferred resource)	1982: 1,700,000 oz Ag, 9,000 oz Au 1987: total production was 1000,000 oz Ag as of June 1987 1988-98: 30,670,000 oz Ag, 95,218 oz Au 1999: 96,896 oz Ag, 237 oz Au	Candelaria Formation serpentinite, granitic dikes	Cretaceous
Denton-Rawhide (Rawhide district)	1986: 24,100,000 tons 0.045 opt Au, 0.47 opt Ag 1989: reserves-29,400,000 tons, 0.040 oz Au and 0.368 opt Ag; *geologic resource*-59,300,000 tons, 0.0274 opt Au, 0.298 opt Ag 1997: 447,000 oz Au, 3,900,000 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 2006: 26,334 oz Au, 235,870 oz Ag 2007: 19,597 oz Au, 160,964 oz Ag 2008: 17,731 oz Au, 150,493 oz Ag 2009: 19,370 oz Au, 209,528 oz Ag 2010: 20,159 oz Au, 342,382 oz Ag 2011: 24,828 oz Au, 438,023 oz Ag 2012: 24,052 oz Au, 339,044 oz Ag 2013: 23,900 oz Au, 305,000 oz Ag	rhyolite plugs, flows, tuffs, breccias	16 Ma

MAJOR PRECIOUS-METAL DEPOSITS, MINERAL COUNTY (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
Denton-Rawhide (Rawhide district) (cont.)		2014: 28,446 oz Au, 256,138 oz Ag 2015: 23,334 oz Au, 147,316 oz Ag 2016: 17,972 oz Au, 105,413 oz Ag 2017: 18,379 oz Au, 213,481 oz Ag		
Esmeralda (Aurora district)	2003: 30,710,500 tons, 0.031 opt Au (bulk-minable measured and indicated resource), 9,206,300 tons, 0.025 opt Au (bulk-minable inferred resource); 192,152 tons, 0.50 opt Au (underground-minable resource)	2009: 5,212 oz Au, 24,980 oz Ag	andesite rhyolite	10 Ma
Golden Mile (Bell district)	2007: 2,409,805 tons, 0.064 opt Au, 154,227 contained oz Au (resource)		Luning Formation	
Isabella Pearl (Santa Fe District)	2013: 3,013,100 tons, 0.064 opt Au, 191,400 oz Au (probable and probable reserves) 2017: 2,970,000 tons, 0.065 opt Au, 192,600 oz Au; 0.38 opt Ag, 1,129,100 oz Ag (proven and probable reserve)			
Marietta (Marietta district)	1990s Silver Glance: 853,000 tons, 0.036 opt Au, 1.07 opt Ag; Sultana Zone: 176,000 tons, 0.02 opt Au, 3.0 opt Ag; Endowment Mine: 45,000 tons, 0.15 opt Au, 20 opt Ag (estimated resources)			
Mina Gold (Bell district)	1997: Monster Zone: 1,770,000 tons, 0.055 opt Au (mineralized material; geologic resource)		Tertiary feldspar porphyry	
Mindora (Garfield district)	1988: 1,000,000 tons, 0.037 opt Au and 1.78 opt Ag	1988: exploration		
Pamlico (Pamlico district)	1996: 900,000 tons, 0.05 opt Au, 45,000 oz Ag (resource)	1886-89: 324 tons valued at $167,542	Sedimentary	
Santa Fe (Santa Fe district)	1984: 8,000,000 tons, 0.032 opt Au, 0.26 opt Ag 1990: 6,800,000 tons, 0.035 opt Au, 0.241 opt Ag	1989-95: 345,499 oz Au, 710,629 oz Ag	Luning Formation	Miocene
Silver Gulch (Marietta district)	2006: 853,000 tons, 0.036 opt Au, 1.09 opt Ag (calculated resource)		Dunlap Formation	Tertiary
Sultan Group (Marietta district)	1990: 176,000 tons, 0.02 opt Au, 3 opt Ag (resource)			

NYE COUNTY

Baxter Springs (Manhattan district)	1988: 1,000,000 tons, 0.05 opt Au 1990: 5,000,000 tons, 0.05 opt Au (geologic resource)			
Bruner (Bruner district)	1992: Duluth Zone: 15,000,000 tons, 0.026 opt Au (geologic resource) 2015: Total: 11,350,000 tons, 0.024 opt Au, 239,000 oz Au, 0.2 opt Ag, 1,950,000 oz Ag (indicated resource, cut-off grade 0.212 opt Au); 2,700,000 tons, 0.026 opt Au, 61,000 oz Au, 0.12 opt Ag, 270,000 oz Ag (inferred resource); Historic Resource Area: 3,860,000 tons, 0.026 opt Au, 86,000 oz Au, 0.28 opt Ag, 920,000 oz Ag (indicated resource); 385,000 tons, 0.012 opt Au, 4,000 oz Au, 0.11 opt Ag, 40,000 oz Ag (inferred resource); Penalas Zone: 7,500,000 tons, 0.024 opt Au, 153,000 oz Au, 0.16 opt Ag, 1,030,000 oz Ag (indicated resource, cut-off grade 0.212 opt Au); 1,540,000 tons, 0.024 opt Au, 32,000 oz Au, 0.092 opt Ag, 120,000 oz Ag (inferred	1931-1942 (Penalas): 80,100 tons ore, 26,000 1993: exploration	Tertiary volcanic rocks	Miocene

MAJOR PRECIOUS-METAL DEPOSITS, NYE COUNTY (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
Bruner (con't)	resource); Paymaster Zone: 770,000 tons, 0.037 opt Au, 125,000 oz Au, 0.16 opt Ag, 110,000 oz Ag (inferred resource) 2016: Total: 13,120,000 tons, 0.019 opt Au, 249,000 oz Au, 0.17 opt Ag, 2,264,000 oz Ag (indicated resource); 2,870,000 tons, 0.021 opt Au, 61,000 oz Au, 0.087 opt Ag, 249,000 oz Ag (inferred resource); Historic Resource Area: 4,460,000 tons, 0.02 opt Au, 87,000 oz Au, 0.23 opt Ag, 1,017,000 oz Ag (indicated resource); 441,000 tons, 0.01 opt Au, 4,000 oz Au, 0.1 opt Ag, 46,000 oz Ag (inferred resource); Penalas Zone: 8,650,000 tons, 0.019 opt Au, 162,000 oz Au, 0.14 opt Ag, 1,247,000 oz Ag (indicated resource); 1,710,000 tons, 0.02 opt Au, 34,000 oz Au, 0.071 opt Ag, 138,000 oz Ag (inferred resource); Paymaster Zone: 716,500 tons, 0.032 opt Au, 23,000 oz Au, 0.086 opt Ag, 249,000 oz Ag (inferred resource) 2017: Total: 21,550,000 tons, 0.016 opt Au, 353,000 oz Au, 0.24 opt Ag, 3,342,000 oz Ag (indicated resource); 2,480,000 tons, 0.015 opt Au, 38,000 oz Au, 0.12 opt Ag, 299,000 oz Ag (inferred resource); Historic Resource Area: 5,015,000 tons, 0.018 opt Au, 89,000 oz Au, 0.23 opt Ag, 1,135,000 oz Ag (indicated resource); 276,000 tons, 0.011 opt Au, 3,000 oz Au, 0.16 opt Ag, 43,000 oz Ag (inferred resource); Penalas Zone: 13,613,000 tons, 0.017 opt Au, 234,000 oz Au, 0.14 opt Ag, 1,866,000 oz Ag (indicated resource); 1,819,000 tons, 0.017 opt Au, 31,000 oz Au, 0.13 opt Ag, 235,000 oz Ag (inferred resource); Paymaster Zone: 661,000 tons, 0.029 opt Au, 19,000 oz Au, 0.13 opt Ag, 85,000 oz Ag (indicated resource); 220,000 tons, 0.016 opt Au, 3,000 oz Au, 0.033 opt Ag, 7,000 oz Ag (inferred resource)			
Bullfrog (Bullfrog district)	1989: 18,600,000 tons, 0.097 opt Au 1996: 10,200,000 tons, 0.062 opt Au (proven and probable reserves); 3,700,000 tons, 0.040 opt Au (mineralized material) 2016: Bullfrog North: 14,700,000 tons, 0.026 opt Au, 375,051 oz Au; Bullfrog Northeast/ Mystery Hill: 990,000 tons, 0.023 opt Au, 26,813 oz Au (mineral inventory) 2017: 29,100,000 tons, 0.02 opt Au, 585,000 oz Au; 0.054 opt Ag, 1,569,000 oz Ag (measured and indicated resource, Montgomery-Shoshone and Bullfrog combined); 6,200,000 tons, 0.023 opt Au, 129,000 oz Au; 0.057 opt Ag, 285,000 oz Ag (inferred resource)	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
Cimmaron (San Antone district)	2004: 1,730,600 tons, 0.035 opt Au inferred material			
Corcoran Canyon (Barcelona district)	2004: 1,774,700 tons, 0.025 opt Au, 5.11 opt Ag indicated and inferred material		rhyolitic ash-flow tuff	
Daisy (Bare Mountain district)	1993: 4,700,000 tons, 0.024 opt Au *geologic resource*-430,000 oz Au 1998: 4,200,000 tons, 0.033 opt Au proven and probable reserves	1997-98: 64,504 oz Au 1999: 30,660 oz Au 2000: 8,740 oz Au 2001: 347 oz Au	Cambrian Bonanza King, Nopah, and Carrara Formations	11-13 Ma(?)
Gold Bar (Bullfrog district)	1987: 1,230,000 tons Au ore 1993: idle	1989-1991: Withheld	silicic volcanic rocks	Miocene

MAJOR PRECIOUS-METAL DEPOSITS, NYE COUNTY (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
Golden Arrow (Golden Arrow district)	1997: 12,400,000 tons, 0.039 opt Au resource 2009: 12,172,000 tons, 0.024 opt oz Au, 296,500 oz Au, 0.33 opt Ag, 4,008,000 oz Ag (measured and indicated resource); 3,790,000 tons, 0.013 opt Au, 50,500 oz Au, 0.33 opt Ag, 1,249,000 oz Ag (inferred resource)		Tertiary rhyolite tuff	
Gold Hill property (Round Mt. district)	1998: 306,620 oz Au, 4,871,890 oz Ag (potential resource) 2003: (included in Round Mt.)	2012-17: included with Round Mountain	rhyolite ash-flow tuff	26 Ma(?)
Gold Wedge property (Manhattan district)	2002: 104,706 oz Au, 0.494 opt Au measured resource; 47,052 oz Au, 0.583 opt Au indicated resource; 394,626 oz Au, 0.494 opt Au inferred resource 2005: 333,000 tons, 0.310 opt Au (measured and indicated resource)	2008: 406 oz dore		
Longstreet property (Longstreet district)	1989: 400,000 tons, 0.024 opt Au, *geologic resource*-9.600,000 tons, 0.024 opt Au 2011: 4,369,836 tons, 0.024 opt Au, 103,969 oz Au, 0.66 opt Ag, 2,879,683 oz Ag (indicated resource, 0.01 opt AuEq cut-off grade); 867,050 tons, 0.024 opt Au, 20,809 oz Au, 0.66 opt Ag, 606,935 oz Ag (inferred resource) 2013: 4,844,000 tons, 0.019 opt Au, 90,900 oz Au, 0.456 opt Ag, 2,210,000 oz Ag (in-pit indicated resource); 336,000 tons, 0.014 opt Au, 4,750 oz Au, 0.425 opt Ag, 142,700 oz Ag (in-pit inferred resource)		rhyolitic volcanic rocks	Oligocene
Manhattan property (Manhattan district)	1989: 100,000 tons, 0.50 opt Au (geologic resource) 1997: 1,700,000 tons, 0.13 opt Au (proven and probable “reserve”)		Cambrian Gold Hill Formation	
Midway (Rye Patch district)	1997: 270,000 oz Au (preliminary resource) 2005: 5,526,000 tons, 0.039 opt Au (inferred resource) 2011: 114,000 tons, 0.3017 opt Au, 34,394 oz Au (inferred resource) 2018: 7,385,000 tons, 0.028 opt Au, 186,000 oz Au (measured and indicated resource); 10,580,000 tons, 0.022 opt Au, 238,000 oz Au (inferred resource)		Ordovician Palmetto Formation Tertiary volcanic rocks	
Montgomery Shoshone (Bullfrog district)	1988: 3,100,000 tons, 0.072 opt Au, 0.240 opt Ag 2015: 1,590,000 tons, 0.028 opt Au, 41,000 oz Au (resource, 0.009 opt Au cut-off grade) 2016: Shallow: 1,130,000 tons, 0.031 opt Au, 38,612 oz Au; Deeoer: 990,000 tons, 0.027 opt Au, 26,813 oz Au (mineral inventory) 2017: 1,500,000 tons, 0.025 opt Au, 39,000 oz Au; 0.1 opt Ag, 162,000 oz Ag (measured and indicated resource);	Early 1900s: 70,000 oz Au Late 1990s: 220,000 oz Au	rhyolitic ash-flow tuff	9.5 Ma
Mother Lode (Bare Mountain district)	1989: 4,900,000 tons, 0.054 opt Au, of which 1,800,000 tons, 0.048 opt Au are in the Sunday Night Anomaly (reserves, proven and probable) 1990: Sunday Night Anomaly oxide reserves: 927,372 tons, 0.047 opt Au; sulfide ore reserves: 65,217 tons, 0.042 opt Au 1992: Mined out 1996: 8,500,000 tons, 1.6 g/t, 430,000 oz Au	1989: 1,000 oz Au, 150 oz Ag 1990: 30,000 oz Au, 3,100 oz Ag 1991: W 1992: idle	Lower Paleozoic rocks, Tertiary dacite porphyry	14 Ma

MAJOR PRECIOUS-METAL DEPOSITS, NYE COUNTY (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
Nevada Mercury (Bare Mountain district)	1994: 50,000 oz Au (geologic resource)			
North Bullfrog (Bullfrog district)	2008: 2,226,600 tons, 0.026 opt Au (indicated resource); 1,047,200 tons, 0.023 opt Au (inferred resource) 2011: 26,268,000 tons, 0.0085 opt Au, 223,880 oz Au, 0.011 opt Ag, 300,460 oz Ag (Jolly Jane and Mayflower oxide indicated resource, 0.003 opt Au cut-off grade) 515,380,000 tons, 0.0055 opt Au, 2,834,566 oz Au, 0.023 opt Ag, 12,007,678 oz Ag (Connection oxide and Mayflower and Sierra Blanca oxide and unoxidized inferred resource) 2012: 40,465,000 tons, 0.008 opt Au, 307,860 oz Au, 0.011 opt Ag, 443,230 oz Ag (Jolly Jane and Mayflower oxide indicated resource) 243,230,000 tons, 0.0053 opt Au, 1,288,970 oz Au, 0.023 opt Ag, 5,760,000 oz Ag (Connection Jolly Jane, Mayflower, and Sierra Blanca oxide inferred resource); 2014: Total: 28,352,000 tons, 0.008 opt Au, 240,000 oz Au, 0.013 opt Ag, 372,000 oz Ag (indicated resource); 205,011,000 tons, 0.006 opt Au,1,120,000 oz Au, 0.019 opt Ag, 4,092,000 oz Ag (inferred resource); Yellowjacket: 4,070,000 tons, 0.03 opt Au, 123,000 oz Au, 0.16 opt Ag, 655,000 oz Ag (indicated resource); 20,287,000 tons, 0.027 opt Au, 555,000 oz Au, 0.18 opt 3,648,000 oz Ag (inferred resource); Sierra Blanca: 1,019,000 tons, 0.006 opt Au, 6,000 oz Au, 0.038 opt Ag, 39,000 oz Ag, (indicated resource, 0.004 opt Au); 195,904,000 tons, 0.006 opt Au,1,066,000 oz Au, 0.02 opt Ag, 3,943,000 oz Ag (inferred resource); Mayflower: 6,024,000 tons, 0.013 opt Au, 81,000 oz Au, 0.012 opt Ag, 71,000 oz Ag (indicated resource); 34,000 tons, 0.006 opt Au, 0.007 opt Ag (inferred resource); Jolly Jane: 21,310,000 tons, 0.007 opt Au, 150,000 oz Au, 0.012 opt Ag, 262,000 oz Ag (indicated resource); 9,073,000 tons, 0.006 opt Au, 54,000 oz Au, 0.016 opt Ag, 149,000 oz Ag (inferred resource) 2015: Total Mill: 6,250,000 tons, 0.075 opt Au, 0.57 opt Ag, (measured and indicated resource resource); 1,630,000 tons, 0.028 opt Au, 0.14 opt Ag, (inferred resource); Total Heap Leach: 25,518,000 tons, 0.01 opt Au, 0.16 opt Ag, (measured and indicated resource); 194,400,000 tons, 0.0065 opt Au, 0.023 opt Ag, (inferred resource); Yellowjacket Mill: 4,250,000 tons, 0.087 opt Au, 316,510 oz Au, 0.67 opt Ag, 2,445,230 oz Ag (measured resource); 2,000,000 tons, 0.052 opt Au, 89,090 oz Au, 0.35 opt Ag, 593,250 oz Ag (indicated resource); 1,630,000 tons, 0.028 opt Au, 39,360 oz Au, 0.14 opt Ag, 203,350 oz Ag, (inferred resource); Sierra Blanca and Yellowjacket Heap Leach: 340,000 tons, 0.0085 opt Au, 2,340 oz Au, 0.093 opt Ag, 26,280 oz Ag (measured resource); 14,000 tons, 0.0085 opt Au, 1,070 oz Au, 0.068 opt Ag, 8,560 oz Ag (indicated resource); 185,600,000 tons , 0.0064 opt Au, 1,041,800 oz Au, 0.023 opt Ag, 3,664,420 oz Ag (inferred resource); Jolly Jane Heap Leach: 19,400,000 tons, 0.0085 opt Au, 141,440 oz Au, 0.015 opt Ag, 240,990 oz Ag (indicated resource); 8,760,000 tons, 0.007 opt Au, 51,000 oz Au, 0.018 opt Ag, 137,330 oz Ag (inferred resource); Mayflower Heap Leach: 5,650,000 tons, 0.016 opt Au,77,260 oz Au, 0.014 opt Ag, 68,270 oz Ag (inferred resource)		Miocene Crater Flat Tuff	

MAJOR PRECIOUS-METAL DEPOSITS, NYE COUNTY (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
North Bullfrog (con't)	2017: Total: 135,735,000 tons, 0.006 opt Au, 855,000 oz Au, 0.019 opt Ag, 2,565,000 oz Ag (measured and indicated resource); 64,900,000 tons, 0.006 opt Au, 367,000 oz Au, 0.014 opt Ag, 902,000 oz Ag (inferred resource); Mill Mineral Resource (oxide and sulfide): 3,531,000 tons, 0.03 opt Au, 117,000 oz Au, 0.088 opt Ag, 344,000 oz Ag (measured and indicated resource); 73,800 tons, 0.041 opt Au, 3,000 oz Au, 0.068 opt Ag, (inferred resource); Mill Mineral Resource (oxide): 1,987,000 tons, 0.035 opt Au, 69,000 oz Au, 0.058 opt Ag, 114,000 oz Ag (measured and indicated resource); Heap Leach Mineral Resource: 131,842,000 tons, 0.006 opt Au, 738,000 oz Au, 0.017 opt Ag, 2,221,00 oz Ag (measured and indicated resource); 64,827,000 tons, 0.006 opt Au, 364,000 oz Au, 0.14 opt Ag, 897,000 oz Ag, (inferred resource)			
Northumberland (Northumberland district)	1988: 12,000,000 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) 2008 (June): 36,518,000 tons, 0.06 opt Au (measured and indicated resource); 7,418,000 tons, 0.10 opt Au (inferred resource)	1939-42: 32,700 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	
Paradise Peak/ Ketchup Flats pit (Fairplay district)	1984: 10,000,000 tons, 0.1 opt Au, 3 opt Ag 1989: 5,220,000 tons, 0.09 opt Au, 3.62 opt Ag, mill ore; 11.5200,000 tons, 0.036 opt Au, 0.445 opt Ag, leachable 1996: 5,000,000 tons, 0.022 opt Au, 0.2 opt Ag (Ketchup Flats)	1986-88: 560,000 oz Au, 8,500,000 oz Ag 1989-94: 1,054,084 oz Au, 15,600,000 oz Ag	rhyolite and andesite flows, ash-flow and air-fall tuffs	Miocene
Reward property (Bare Mountain district)	1998: 77,500 oz Au 2007: 5,181,340 tons, 0.0266 opt Au (proven and probable reserves); 6,423,571 tons, 0.0245 opt Au (measured and indicated resource) 2009: 7,147,721 tons, 0.0243 opt Au (proven and probable reserves) 2010: 7,709,000 tons, 0.023 opt Au (proven and probable reserves) 2011: 11,856,200 tons, 0.0224 opt Au, 265,800 oz Au (proven and probable reserves) 18,055,000 tons, 0.0201 opt Au, 362,000 oz Au (measured and indicated resource, 0.006 opt Au cut-off grade) 4,757,000 tons, 0.0138 opt Au, 65,600 oz Au (inferred resource) 2012: 12,347,000 tons, 0.022 opt Au, 269,248 oz Au (proven and probable reserves) 18,055,000 tons, 0.02 opt Au, 362,600 oz Au (measured and indicated resource) 4,757,000 tons, 0.014 opt Au, 65,600 oz Au (inferred resource) 2013: 10,731,000 tons, 0.023 opt Au, 249,516 oz Au (proven and probable reserves) 20,294,000 tons, 0.019 opt Au, 387,900 oz Au (measured and indicated resource) 7,071,000 tons, 0.015 opt Au, 106,400 oz Au (inferred resource)		Cambrian Wood Canyon Formation	
Round Mountain (Smoky Valley) (Round Mountain district)	1977: 12,000,000 tons, 0.061 opt Au, 0.07 opt Ag 1989: *geologic resource*-27100,000 tons, 0.032 opt Au 1999: 320,000,000 tons, 0.018 opt Au (proven and probable reserves); 126,000,000 tons, 0.016 opt Au (mineralized material) 2000: 273,200,000 tons, 0.019 opt Au (proven and probable reserves); 18,700,000 tons, 0.022 opt Au (mineralized material)	1977-84: 313,480 oz Ag, 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,	rhyolite ash-flow tuff	26 Ma

MAJOR PRECIOUS-METAL DEPOSITS, NYE COUNTY (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
Round Mountain (cont.)	2002: 192,100,000 tons, 0.020 opt Au (proven and probable reserves); 54.600,000 tons, 0.012 opt Au (mineral resource) 2003: 129,866,000 tons, 0.017 opt Au (proven reserves); 49,838,000 tons, 0.020 opt Au (probable reserves); 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 reserves); 35,412,000 tons, 0.017 opt Au (measured and indicated resource); 35,374,000 tons, 0.013 opt Au (inferred resource) 2006: 226,084,000 tons, 0.017 opt Au (proven and probable reserves); 26,134,000 tons, 0.019 opt Au (measured and indicated resource); 32,898,000 tons, 0.013 opt Au (inferred resource) 2007: 141,736,000 tons, 0.018 opt Au (proven and probable reserves); 30,632,000 tons, 0.022 opt Au (measured and indicated resource); no released inferred resource 2008: 185,162,000 tons, 0.018 opt Au (proven and probable reserves); 57,140,000 tons, 0.019 opt Au (measured and indicated resource); 12,982,000 tons, 0.012 opt Au (inferred resource) 2009: 157,614,000 tons, 0.019 opt Au (proven and probable reserves); 87,824,000 tons, 0.021 opt Au (measured and indicated resource); 57,208,000 tons, 0.017 opt Au (inferred resource) 2010: 146,034,000 tons, 0.018 opt Au (proven and probable reserves); 101,736,000 tons, 0.022 opt Au (measured and indicated resource); 49,740,000 tons, 0.018 opt Au (inferred resource) 2011: 165,376,000 tons, 0.017 opt Au, 2,822,000 contained oz Au (proven and probable reserves); 166,840,000 tons, 0.016 opt Au 2,672,000 contained oz Au (measured and indicated resource); 77,694,000 tons, 0.012 opt Au 928,000 contained oz Au (inferred resource) 2012: 141,356,000 tons, 0.018 opt Au, 2,485,000 contained oz Au (proven and probable reserves); 88,586,000 tons, 0.021 opt Au, 1,850,000 contained oz Au (measured and indicated resource); 56,246,000 tons, 0.015 opt Au 310,000 contained oz Au (inferred resource) 2013: 92,917,000 tons, 0.02 opt Au, 1,838,000 oz Au; 13,481,000 tons, 0.25 opt Ag, 3,412,000 oz Ag (proven and probable reserves); 84,028,000 tons, 0.022 opt Au, 1,806,000 oz Au; 6,433,000 tons, 0.2 opt Ag, 1,258,000 oz Ag (measured and indicated resource); 54,048,000 tons, 0.016 opt Au, 866,000 oz Au; 278,000 tons, 0.09 opt Ag, 24,000 oz Ag (inferred resource) 2014: 60,186,000 tons, 0.027 opt Au, 1,378,000 oz Au; 6,892,000 tons, 0.32 opt Ag, 1,870,000 oz Ag (proven and probable reserves); 52,399,000 tons, 0.02 opt Au, 880,000 oz Au; 2,414,000 tons, 0.29 opt Ag, 598,000 oz Ag (measured and indicated resource); 17,330,000 tons, 0.017 opt Au, 260,000 oz Au; 1,426,000 tons, 0.2 opt Ag, 242,000 oz Ag (inferred resource) 2015: 72,910,000 tons, 0.02 opt Au, 1,472,000 oz Au; 2,612,000 tons, 0.33 opt Ag, 870,000 oz Ag (proven and probable reserves); 44,975,000 tons, 0.015 opt Au, 684,000 oz Au; 12,389,000 tons, 0.22 opt Ag, 2,687,000 oz Ag (measured and indicated resource); 17,864,000 tons, 0.013 opt Au, 234,000 oz Au; 2,620,000 tons, 0.17 opt Ag, 454,000 oz	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 2006: 657,911 oz Au, 644,017 oz Ag 2007: 587,445 oz Au, 955,681 oz Ag 2008: 477,499 oz Au, 931,368 oz Ag 2009: 414,941 oz Au, 850,878 oz Ag 2010: 358,614 oz Au, 651,457 oz Ag 2011: 360,020 oz Au, 644,329 oz Ag 2012: 367,595 oz Au, 926,284 oz Ag 2013: 314,886 oz Au, 636,564 oz Ag 2014: 330,071 oz Au, 580,685 oz Ag 2015: 385,159 oz Au, 775,025 oz Ag 2016: 371,484 oz Au, 721,465 oz Ag 2017:425,324 oz Au, 868,402 oz Ag		

MAJOR PRECIOUS-METAL DEPOSITS, NYE COUNTY (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
Round Mountain (cont.)	Ag (inferred resource) 2016: 62,947,000 tons, 0.02 opt Au, 1,267,000 oz Au; 4,904,000 tons, 0.25 opt Ag, 1,232,000 oz Ag (proven and probable reserves); 83,812,000 tons, 0.023 opt Au, 1,932,000 oz Au; 7,173,000 tons, 0.2 opt Ag, 1,424,000 oz Ag (measured and indicated resource); 109,992,000 tons, 0.018 opt Au, 1,863,000 oz Au; 2,536,000 tons, 0.17 opt Ag, 428,000 oz Ag (inferred resource) 2017: 37,106,000 tons, 0.02 opt Au, 2,884,000 oz Au; 8,039,000 tons, 0.17 opt Ag, 1,371,000 oz Ag (proven and probable reserves) 115,809,000 tons, 0.02 opt Au, 2,393,000 oz Au; 8,473,000 tons, 0.22 opt Ag, 1,827,000 oz Ag (measured and indicated resource); 98,191,000 tons, 0.02 opt Au, 2,115,000 oz Au; 1,058,000 tons, 0.05 opt Ag, 54,000 oz Ag (inferred resource); 28,388,000 tons, 0.015 opt Au, 378,000 oz Au (proven stockpile)			
Sterling (Bare Mountain district)	1983: 200,000 tons, 0.20 opt Au 1989: 469,000 tons, 0.21 opt Au 1996: 129,000 tons, 0.245 opt Au 2006: 214,554 tons, 0.216 opt Au 2012: 144 undeground zone: 509,712 tons, 0.133 opt Au, 67,792 oz Au (measured and indicated resource), Panama underground zone: 103,040 tons, 0.082 opt Au, 8,449 oz Au (measured and Indicated resource) 2017: Surface Total: 10,536,000 tons, 0.064 opt Au, 671,000 oz Au; Sterling open pit: 2,158,000 tons, 0.107 opt Au, 231,000 Au; 2,818,000 tons, 0.062 opt Au; Secret Pass: 3,896,000 tons, 0.048 opt Au, 188,000 oz Au; SNA: 1,664,000 tons, 0.047 opt Au, 78,000 oz Au (surface open pit inferred resources)	1983-88: 75,900 oz Au 1990-91: 24,841 oz Au 1995-98: 36,811 oz Au 1999: 3,093 oz Au 2012: 12,000 oz Au 2013: 7,500 oz Au 2014: 5,721 oz Au 2015: 1,740 oz Au 2016: 350 oz Au	Wood Canyon and Bonanza King Formations	14 Ma
South Monitor (west of Ellendale district)	1996: 250,000 oz Au 1997: 14,000,000 tons, 0.026 opt Au, 0.12 opt Ag		Tertiary volcanic rock	
Sullivan (Fairplay district)	1987: 10,200,000 tons, 0.039 opt Au, 0.086 opt Ag and 0.37% Cu 1995: proven and possible-17,000,000 tons of 0.34% Cu, 0.0255 opt Au, + 8,500,000 tons of 0.32% Cu		Mesozoic granodiorite and metavolcanic rocks	Mesozoic
Summit (Union district)	1996: 100,000 tons, 0.07 opt Au, 2012: 200,000 tons, 0.035 opt Au (open pit resource)	1990: 8,800 oz Au	Triassic dolomite and limestone	

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Bunce (Velvet district)	1989: 600,000 tons, 0.04 opt Au (geologic reserves) 1990: 500,000 tons, 0.04 opt Au		rhyolite	Miocene?
Colado Gold (Willard district)	1997: 15,000,000 tons, 0.022 opt Au resource 2007: 22,707,000 tons, 0.012 opt Au (oxide, measured and indicated resource); 594,000 tons, 0.070 opt Au (sulfide, measured and indicated resource); 79,129,000 tons, 0.015 opt Au (inferred resource)		Triassic-Jurassic metasedimentary rocks	
Florida Canyon (Imlay district)	1987: 22,000,000 tons, 0.023 opt Au 1988: 37,000,000 tons, 0.023 opt Au 1997: reserves-45,500,000 tons, 0.024 opt Au	1987-88: 109,300 oz Au 1989-98: 1,146,148 oz Au, 610,326 oz Ag	Grass Valley Formation	2 Ma

MAJOR PRECIOUS-METAL DEPOSITS, PERSHING COUNTY (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
Florida Canyon (cont.)	proven and probable mineralized material-122,800,000 tons, 0.022 opt Au 2002: 20,000,000 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) 2010 reserve: 832,000 oz Au; resource: 746,700 oz Au 746,700 oz Au ("resource") 2012: 1,124,800 oz Au (reserves) 761,000 oz Au (resources) 2016: 84,202,100 tons, 0.013 opt, 1,126,600 oz Au (measured and indicated resource); 350,800 tons, 0.015 opt Au 5,300 oz Au (inferred material)	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, 7,571 oz Ag 2005: (Standard): 21,522 oz Au, 51,751 oz Ag 2006: (Florida Canyon): 16,061 oz Au, 12,423 oz Ag 2006: (Standard): 46,070 oz Au, 64,497 oz Ag 2007: (Standard): 11,814 oz Au, 24,735 oz Ag 2008: (Standard): 2,625 oz Au, 3,644 oz Ag 2009: (Florida Canyon): 44,814 oz Au, 39,760 oz Ag 2009: (Standard): 1,510 oz Au, 3,270 oz Ag 2010: (Florida Canyon): 54,975 oz Au, 39,903 oz Ag 2016: (Florida Canyon and Standard): 10,873.28 oz Au; 21,898.26 oz Ag 2017: 28,157 oz Au, 21,128 oz Ag		
Goldbanks (Goldbanks district)	1994: 900,000 oz Au 1996: 80,800,000 tons, 0.019 opt Au (proven and probable reserves); 7.400,000 tons, 0.014 opt Au (possible reserves); 106.800,000 tons, 0.028 opt (Au drill indicated resource) 2000: 569,000 oz Au and 1,700,000 oz Ag indicated reserves 2006: 28,310,000 tons, 0.02 opt Au (inferred resource, Main and KW zones)			
Lincoln Hill (Rochester district)	2010: 17,215,000 tons, 0.02 opt Au, 0.5 opt Ag 2012: Oxide: 3,846,000 tons, 0.012 opt Au, 47,000 oz Au, 0.34 opt Ag, 1,292,000 oz Ag (measured resource, 0.003 opt Au cut-off grade); 19,985,000 tons, 0.011 opt Au, 221,000 oz Au, 0.29 opt Ag, 5,648,000 oz Ag (indicated resource); Sulfide: 395,000 tons, 0.015 opt Au 6,000 oz Au, 0.56 opt Ag, 219,000 oz Ag (measured resource); 4,878,000 tons, 0.012 opt Au, 60,000 oz Au, 0.5 opt Ag, 2,457,000 oz Ag (indicated Resource); Oxide: 8,412,000 tons, 0.008 opt Au, 66,000 oz Au, 0.24 opt Ag, 2,017,000 oz Ag (inferred resource); Sulfide: 7,227,000 tons, 0.014 opt Au, 99,000 oz Au, 0.57 opt Ag, 4,138,000 oz Ag (inferred resource) 2014: Oxide: 4,194,000 tons, 0.014 opt Au, 51,000 oz Au, 0.37 opt Ag, 1,347,000 oz Ag (measured resource); 21,686,000 tons, 0.013 opt Au, 234,000 oz Au, 0.32 opt Ag, 5,914,000 oz Ag (indicated resource); Sulfide: 448,000 tons, 0.017 opt Au 7,000 oz Au, 0.64 opt Ag, 246,000 oz Ag (measured resource); 5,982,000 tons, 0.014 opt Au, 72,000 oz Au, 0.53 opt Ag, 2,741,000 oz Ag (indicated resource); Oxide: 9,702,000 tons, 0.009 opt Au, 74,000 oz Au, 0.27 opt Ag, 2,227,000 oz Ag (inferred resource); Sulfide: 13,250,000 tons, 0.016 opt Au, 182,000 oz Au, 0.52 opt Ag, 5,936,000 oz Ag (inferred resource)			
Nevada Packard (Rochester district)	2000: 9,500,000 equivalent oz Ag (reserve) 2013: 35,372,000 tons, 0.56 opt Ag, 19,633,000 oz Ag, 0.002 opt Au, 88,000 oz Au (measured and indicated resource); 6,806,000 tons, 0.47 opt Ag, 3,228,000 oz Ag, 0.003 opt Au, 20,000 oz Au (inferred resource) 2017: 36,879,000 tons, 0.53 opt Ag, 19,499,000 oz Ag, 0.003 opt Au, 93,000 oz Au (measured and indicated resource); 9,744,000 tons, 0.46 opt Ag, 4,451,000 oz Ag, 0.003 opt Au, 26,000 oz Au (inferred resource)	1913-23: 241,266 tons ore valued at $1,559,319 1981-83: 100,000 oz Ag 2002-2007: 9,400,000 oz Ag 28,700 oz Au	Weaver Rhyolite	

MAJOR PRECIOUS-METAL DEPOSITS, PERSHING COUNTY (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
Relief Canyon (Antelope Springs district)	1983: 9,000,000 tons, 0.032 opt Au 1988: ~ 1,300,000 tons, 0.03 opt Au 1996: 8,600,000 tons, 0.022 opt Au 2013: 32,541,000 tons, 0.017 opt Au (mineralized material) 2014 oxide: 26,698,000 tons, 0.022 opt Au, 534,000 oz Au (measured and indicated resources); 10,124,000 tons, 0.015 opt Au, 157,000 oz Au (inferred resource); Sulfide: 250,000 tons, 0.071 opt Au, 18,000 oz Au (indicated resource); 163,000 tons, 0.048 opt Au, 8,000 oz Au (inferred resource) 2015 Oxide: 36,918,000 tons, 0.02 opt Au, 716,000 oz Au (measured and indicated resources); 6,928,000 tons, 0.01 opt Au,70,000 oz Au (inferred resource); Sulfide: 417,000 tons, 0.054 opt Au, 23,000 oz Au (indicated resource); 2,000 tons, 0.025 opt Au, 40 oz Au (inferred resource) 2016 Oxide: 37,855,000 tons, 0.02 opt Au, 743,000 oz Au (measured and indicated resources, 0.005 opt Au cut-off grade); 5,267,000 tons, 0.009 opt Au, 47,000 oz Au (inferred resource, 0.005 opt Au cut-off grade); Sulfide: 613,000 tons, 0.057 opt Au, 35,000 oz Au (indicated resource, 0.02 opt Au cut-off grade); 16,000 tons, 0.029 opt Au, 500 oz Au (inferred resource, 0.02 opt Au cut-off grade) [NI43-101 compliant] 2017: 30,529,700 tons, 0.021 opt Au, 634,900 oz Au; 14,392,500 tons, 0.113 opt Ag, 1,632,600 oz Ag (proven and probably reserves, 0.005 opt Au cut-off grade; Oxide: 41,086,000 tons, 0.018 opt Au, 751,000 oz Au; 16,786,000 tons, 0.11 opt Ag, ,844,000 oz Ag; (measured and indicated resources, 0.005 opt Au cut-off grade); 5,238,000 tons, 0.009 opt Au, 25,000 oz Au; 781,000 tons, 0.066 opt Ag, 52,000 oz Ag (inferred resource, 0.005 opt Au cut-off grade); Mixed: 421,000 tons, 0.048 opt Au, 20,000 oz Au; 421,000 tons, 0.234 opt Ag, 98,000 oz Ag (measured and indicated resources, 0.01 opt Au cut-off grade); 4,000 tons, 0.018 opt Au, 100 oz Au; 4,000 tons, 0.125 opt Ag, 1,000 oz Ag (inferred resource, 0.01 opt Au cut-off grade); Sulfide: 369,000 tons, 0.02 opt Au, 18,000 oz Au; 369,000 tons, 0.313 opt Ag, 115,000 oz Ag (indicated resource, 0.02 opt Au cut-off grade); 4,000 tons, 0.028 opt Au, 100 oz Au; 4,000 tons, 0.164 opt Ag, 1,000 oz Ag (inferred resource, 0.02 opt Au cut-off grade) [NI43-101 compliant]	1984: 24,500 oz Au 1987-88: 82,000 oz Au 1989-90: 34,266 oz Au, 39,235 oz Ag 2009: 92 oz Au, 342 oz Ag	Natchez Pass Limestone, Grass Valley Formation	Tertiary
Rochester (Rochester district)	1981: 75,000,000 tons, 1.5 opt Ag 1989: *geologic resource*-94,500,000 tons, 0.012 opt Au, 1.40 opt Ag 1997: 74,200,000 oz Ag, 603,000 oz Au 2000: 50,000,000 oz Ag, 410,000 oz Au (includes Nevada Packard) 2001: 51,400,000 tons, 0.85 opt Ag, 0.007 opt Au (proven and probable reserves); 61,800,000 tons, 0.75 opt Ag, 0.005 opt Au (mineralized material) 2002: 46,900,000 tons, 0.008 opt Au, 0.85 opt Ag (proven and probable reserves); 33,800,000 tons, 0.009 opt Au, 0.77 opt Ag (mineralized material) (includes Nevada Packard) 2003: 32,700,000 tons, 0.01 opt Au, 0.91 opt Ag proven and probable reserves; 40,300,000 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 resource; 8,551,000 tons, 0.010 opt Au, 0.96 opt Ag	1986-98: 810,329 oz Au, 59.300,000 oz Ag 1999: 70,396 oz Au, 6.200,000 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 2006: 71,891 oz Au, 5,113,504 oz Ag 2007: 50,408 oz Au, 4,614,779 oz Ag 2008: 21,041 oz Au, 3,033,720 oz Ag 2009: 12,633 oz Au,	Koipato Group, Weaver Rhyolite, Rochester Rhyolite	Late Cretaceous

MAJOR PRECIOUS-METAL DEPOSITS, PERSHING COUNTY (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
Rochester (cont.)	indicated resource; 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 reserves); 15,646,000 tons, 0.010 opt Au, 1.03 opt Ag (measured and indicated resource) 2006: 3,720,000 tons, 0.007 opt Au, 0.66 opt Ag (proven reserves); 15,235,000 tons, 0.010 opt Au, 0.94 opt Ag (measured and indicated resource) 2007: 32,664,000 tons, 0.010 opt Au, 0.86 opt Ag (measured and indicated resource) 2008: 114,058,000 tons, 0.005 opt Au, 0.54 opt Ag (measured and indicated resource) 2010: 48,271,000 tons, 0.005 opt Au, 0.57 opt Ag (proven and probable reserve); 215,602,900 tons, 0.003 opt Au, 0.44 opt Ag (measured and Indicated resource); 21,984,300 tons, 0.003 opt Au, 0.65 opt Ag (inferred resource) 2012: 79,923,000 tons, 0.56 opt Ag, 44,896,000 oz Ag, 0.004 opt Au, 308,000 oz Au (proven and probable reserve); 264,283,000 tons, 0.46 opt Ag, 120,717,000 oz Ag, 0.003 opt Au, 865,000 oz Au (measured and indicated resource) 45,643,300 tons, 0.6 opt Ag, 27,201,000 oz Ag, 0.003 opt Au, 123,000 oz Au (inferred resource) 2013: 187,234,000 tons, 0.54 opt Ag, 101,368,000 oz Ag, 0.004 opt Au, 681,000 oz Au (proven and probable reserve); 141,722,000 tons, 0.44 opt Ag, 61,753, 000 oz Ag, 0.003 opt Au 454,000 oz Au (measured and indicated resource, includes Nevada Packard); 37,365,300 tons, 0.62 opt Ag, 23,295,000 oz Ag,0.003 opt Au, 101,000 oz Au (inferred resource, includes Nevada Packard) 2014: 145,235,000 tons, 0.55 opt Ag, 80,204,000 oz Ag, 0.004 opt Au, 518,000 oz Au (proven and probable reserve); 173,201,000 tons, 0.44 opt Ag, 0.003 opt Au (mineralized material) 2015: 150,691,000 tons, 0.53 opt Ag, 79,342,000 oz Ag, 0.003 opt Au, 477,000 oz Au (proven and probable reserve); 140,951,000 tons, 0.48 opt Ag, 0.003 opt Au (mineralized material) 2016: 244,804,000 tons, 0.46 opt Ag, 112,405,000 oz Ag, 0.003 opt Au, 803,000 oz Au (proven and probable reserve); 69,461,000 tons, 0.56 opt Ag, 0.003 opt Au (mineralized material) 2017: 273,427,000 tons, 0.43 opt Ag, 117,623,000 oz Ag, 0.003 opt Au, 757,000 oz Au (proven and probable reserve); 311,455,000 tons, 0.39 opt Ag, 0.002 opt Au (mineralized material)	2,181,788 oz Ag 2010: 9,641 oz Au, 2,023,423 oz Ag 2011: 6,276 oz Au, 1,392,433 oz Ag 2012: 38,071 oz Au, 2,801,501 oz Ag 2013: 30,860 oz Au, 2,798,937 oz Ag 2014: 44,887 oz Au, 4,189,071 oz Ag 2015: 52,588 oz Au, 4,630,739 oz Ag 2016: 50,750 oz Au, 4,564,139 oz Ag 2017: 51,051 oz Au, 4,713,574 oz Ag		
Rosebud Project (Rosebud district)	1992: 570,000 oz Au (0.362 opt), 5.500,000 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
Spring Valley (Spring Valley district)	2005-2006: 10,030,000 tons, 0.024 opt Au (measured and indicated resource) 7,753,000 tons, 0.025 opt Au (inferred resource) 2007: 50,600,000 tons, 0.0196 opt Au (inferred resource) 2008: 87,750,000 tons, 0.021 opt Au (inferred resource) 2011: 159,641,000 tons, 0.013 opt Au (measured and indicated resource) 114,567,000 tons, 0.017 opt Au (inferred resource) 2014: 222,600,000 tons, 0.019 opt Au, 4,120,000 oz Au (measured and indicated resource), 62,100,000 tons, 0.016 opt Au, 990,000 oz Au (inferred resource)		Permo-Triassic Koipato Group	

MAJOR PRECIOUS-METAL DEPOSITS, PERSHING COUNTY (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
Standard (Imlay district)	2002: 17,200,000 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) 2010 reserve: 292,000 oz Au; resource: 14,300 oz Au	1939-42, 1946-49: 45,743 oz Au, 127,451 oz Ag 2004-2010: included with Florida Canyon 2011: 41,161 oz Au, 46,896 oz Ag 2012: 43,575 oz Au, 50,983 oz Ag 2013: 46,152 oz Au, 58,333 oz Ag 2014: 40,311 oz Au, 79,231 oz Ag 2015: 21,716 oz Au, 67,687 oz Ag 2016: combined with Florida Canyon	Natchez Pass Limestone, Grass Valley Formation argillite	
Tag-Wildcat (Farrel district)	1989: 416,000 tons, 0.076 opt Au opt Au (reserves); 1,500,000 tons, 0.043 opt Au (geologic resource) 2003: see Wildcat		Tertiary volcanic rocks	Miocene
Trinity (Trinity district)	1987: 1,000,000 tons, 5.25 opt Ag Sulfide resource: ~4,000,000 tons, 2.5 opt Ag 2012: 19,790,000 tons, 1.07 opt Ag, 21,265,000 oz Ag, 0.217% Pb, 85,987,000 lbs, Pb, 0.354% Zn, 140,253,000 lbs. Zn (inferred resource)	1987-89: ~5-600,000 oz Ag	rhyolite porphyry, rhyolite tuff	26 Ma
Wildcat (Farrel district)	2003: 38,108,000 tons, 0.018 opt Au (indicated resource); 28,355,000 tons, 0.015 opt Au (inferred resource)		Tertiary volcanic	Miocene
Wilco –Colado (Willard district)	2012: Oxide: 6,399,000 tons, 0.009 opt Au 58,000 oz Au, 0.047 opt Ag, 300,000 oz Ag (measured resource, 0.003 opt Au cut-off grade); 37,571,000 tons, 0.008 opt Au, 285,000 oz Au, 0.047 opt Ag, 1,753,000 oz Ag (indicated resource); Sulfide: 3,449,000 tons, 0.014 opt Au 49,000 oz Au, 0.195 opt Ag, 672,000 oz Ag (measured resource); 16,864,000 tons, 0.012 opt Au, 197,000 oz Au, 0.162 opt Ag, 2,735,000 oz Ag (indicated resource); 39,032,000 tons, 0.007 opt gold, 541,000 oz Au, 0.082 opt Ag, 6,100,000 oz Ag (inferred resources)		Jurassic-Triassic Auld Lang Syne Group	
Wilco –Section Line (Willard district)	2012: Oxide: 12,279,000 tons, 0.011 opt Au 140,000 oz Au, 0.113 opt Ag, 1,393,000 oz Ag (measured resource); 23,676,000 tons, 0.008 opt Au, 193,000 oz Au, 0.081 opt Ag, 1,906,000 oz Ag (indicated resource); Sulfide: 5,558,000 tons, 0.015 opt Au 81,000 oz Au, 0.128 opt Ag, 710,000 oz Ag (measured resource); 20,024,000 tons, 0.014 opt Au, 274,000 oz Au, 0.126 opt Ag, 2,517,000 oz Ag (indicated resource); 18,947,000 tons, 0.014 opt gold, 258,000 oz Au, 0.154 opt Ag, 2,917,000 oz Ag (inferred resources)		Jurassic-Triassic Auld Lang Syne Group	
Willard (Willard district)	2007: 17,295,000 tons, 0.016 opt Au (oxide, measured and indicated resource) 448,000 tons, 0.070 opt Au (sulfide, measured and indicated resource) 20,849,000 tons, 0.015 opt Au (inferred resource)	Late 1980s to early 1990s: ~90,000 oz Au	Jurassic-Triassic Grass Valley Formation	6 Ma

STOREY COUNTY

Comstock heap leach project (Comstock district)	1992: 475,000 tons, 0.072 opt Au, 0.60 opt Ag 1996: 100,000 oz Au, 1.200,000 oz Ag 1980: 10,000,000 tons, 0.08 opt Au, 3.1 opt Ag			

MAJOR PRECIOUS-METAL DEPOSITS, STOREY COUNTY (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
Comstock Mine Project (Comstock/Silver City districts)	2011 (Lucerne and Dayton Resource Areas): 51,260,000 tons, 0.029 opt Au, 1,508,000 oz Au, 0.28 opt Ag, 14,360,000 oz Ag (measured and indicated resource); 33,580,000 tons, 0.026 opt Au, 881,000 oz Au, 0.179 opt Ag, 6,030,000 oz Ag (inferred resource) 2013: 61,880,000 tons, 0.029 opt Au, 1,824,000 oz Au, 0.276 opt Ag, 17,100,000 oz Ag (measured and indicated resource); 34,890,000 tons, 0.022 opt Au 758,000 oz Au, 0.166 opt Ag, 5,790,000 oz Ag (inferred resource)	2004-2016: Production under Lucerne Resource	Santiago Canyon tuff; Alta Formation	
Flowery (Golden Eagle) (Comstock district)	1989: 100,000 tons, 0.037 opt Au 1993: 362,000 tons, 0.064 opt Au, 0.97 opt Ag, *geologic resource*-88,128 oz Au and 100,000 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
Gooseberry (Ramsey district)	1985: 216,505 tons, 0.209 opt Au, 8.08 opt Ag	1978-81: Ore: 235,000 tons, 0.14 opt Au, 7.18 opt Ag 1985: 5,000 oz Au, 225,000 oz Ag	Kate Peak Formation	
Lucerne Resource Area (Comstock Mine Project/Hartford Hill Complex) (Comstock district)	2010 (Billy the Kid and Lucerne Mines: 26,540,000 tons, 0.028 opt Au, 0.354 opt Ag (measured and indicated resource) 12,660,000 tons, 0.023 opt Au, 0.252 opt Ag (inferred resource) 2011 (Billy the Kid, Hartford, and Lucerne Mines): 42,930,000 tons, 0.03 opt Au, 0.293 opt Ag (measured and indicated resource); 26,990,000 tons, 0.027 opt Au, 0.196 opt Ag (inferred resource)	2004: 2,836 oz Au, 12,695 oz Ag 2005: 5,715 oz Au, 26,488 oz Ag 2006: 5,000 oz Au, 20,000 oz Ag (estimated) 2012: 2,588 oz Au, 26,738 oz Ag 2013: 17,739 oz Au, 186,482 oz Ag 2014: 19,601 oz Au, 222,416 oz Ag 2015: 15,451 oz Au, 221,723 oz Ag 2016: 4,086 oz Au, 75,657 oz Ag	Santiago Canyon tuff; Alta Formation	
Oliver Hills (Comstock district)	1990: 3,370,000 tons, 0.054 opt Au, 1.2 opt Ag 1993: 400,000 tons, 0.05 opt Au, 225,000 oz Au, 0.5 opt Ag, 2.2500,000 oz Ag (geologic resource)	1991: 573 oz Au, 6,947 oz Ag		

WASHOE COUNTY

Mountain View Gold Project (Deephole district)	1995: 19,500,000 tons, 0.027 opt Au 1998: 10,700,000 tons, 0.055 opt Au 2002: 23,219,000 tons, 0.013 opt Au indicated resource; 4,6600,000 tons, 0.039 opt Au inferred resource		rhyolite	Miocene
Olinghouse (Olinghouse district)	1994: *geologic resource*-500,000 opt Au, 0.057 opt Au 1997: 512,800 oz Au proven and probable reserves, 0.042 opt Au	1998: 2,912 oz Au, 1,879 oz Ag 1999: 28,655 oz Au, 17,598 oz Ag	Miocene andesite	Miocene
Hog Ranch (Leadville district)	1984: 2,500,000 tons, 0.085 opt Au 1988: 5,500,000 tons, 0.064 opt Au (proven and probable reserves); 20,100,000 tons, 0.029 opt Au (geologic resource) 2003: 1,598,350 tons, 0.033 opt Au (indicated resource); 440,924 tons, 0.054 opt Au (inferred resource)	1986-87: 80,000 oz Au 1988-95: 118,045 oz Au, 25,400 oz Ag	rhyolite, explosion breccia sinter	15-16 Ma

MAJOR PRECIOUS-METAL DEPOSITS, WASHOE COUNTY (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
Wind Mountain (San Emidio)	1988: 15,000,000 tons, 0.021 opt Au, 0.42 opt Ag 2007: 33,657,553 tons, 0.012 opt Au (measured and indicated resource) 9,758,547 tons, 0.009 opt Au (inferred resource) 2011 Oxide: 58,816,000 tons, 0.1 opt Au, 564,000 oz Au, 0.25 opt Ag, 14,539,000 oz Ag (indicated resource); 19,866,000 tons, 0.006 opt Au, 125,200 oz Au, 0.17 opt Ag, 3,443,000 oz Ag (inferred resource); Mixed and unoxidized: 498,000 tons, 0.12 opt Au, 5,900 oz Au, 0.4 opt Ag, 197,000 oz Ag (indicated resource); 14,595,000 tons, 0.016 opt Au, 229,100 oz Au, 0.16 opt Ag, 6,672,000 oz Ag (inferred resource)	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

WHITE PINE COUNTY

Alligator Ridge (Bald Mountain district)	1983: 500,000 tons, 0.09 opt Au 1989: 100,000 tons, 0.064 opt Au 1992: (includes Casino/Winrock) 11.500,000 tons, 0.046 opt Au; 661,888 oz Au (geologic resource)	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 1996-2017: included with Bald Mountain	Pilot Shale	Mesozoic or early Tertiary
Bald Mountain (Bald Mountain district)	1989: 6,700,000 tons, 0.069 opt Au 1999: 32,600,000 tons, 0.041 opt Au, (proven and probable reserves); 31,700,000 tons, 0.044 opt Au, (mineralized material) 2000: 509,000 oz Au (proven and probable); 2,030,000 oz Au (measured and indicated resource) 2002: 508,000 oz Au (proven and probable reserves); 2.0300,000 oz Au (measured mineral resource) 2003: 10,143,000 tons, 0.033 opt Au (proven reserves; 8,549,000 tons, 0.040 opt Au (probable reserves; 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 (includes Alligator Ridge): 105,050,700 tons 0.032 opt Au (proven and probable reserves) 35,000,000 tons 0.023 opt Au (measured and indicated resource); 14,868,000 tons, 0.026 opt Au (inferred resource) 2006 (includes Alligator Ridge): 109,922,000 tons, 0.031 opt Au (proven and probable reserves); 23,289,000 tons, 0.035 opt Au (measured and and indicated resource); 17,290,000 tons, 0.023 opt Au (inferred resource) 2007 (includes Alligator Ridge): 128,093,000 tons, 0.024 opt Au (proven and probable reserves); 36,493,000 tons, 0.024 opt Au (measured and indicated resource); 24,648,000 tons, 0.017 opt Au (inferred resource) 2008 (includes Alligator Ridge): 57,675,000 tons, 0.018 opt Au (proven and probable reserves) 90,374,000 tons, 0.019 opt Au (measured and indicated resource); 71,004,000 tons, 0.021 opt Au (inferred resource) 2009 (includes Alligator Ridge): 227,346,000 tons, 0.020 opt Au (proven and probable reserves); 99,338,000 tons, 0.012 opt Au (measured and	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 2006: 277,615 oz Au, 32,121 oz Ag 2007: 125,998 oz Au, 21,702 oz Ag 2008: 103,610 oz Au,15,352 oz Ag 2009: 75,037 oz Au, 12,389 oz Ag 2010: 60,333 oz Au, 15,000 oz Ag 2011: 92,818 oz Au, 14,615 oz Ag 2012: 171,154 oz Au, 40,954 oz Ag 2013: 95,497 oz Au, 29,479 oz Ag 2014: 161,036 oz Au, 48,240 oz Ag 2015: 191,088 oz Au, 26,164 oz Ag 2016: 129,282 oz Au, 864 oz Ag 2017: 281,597 oz Au, 61,728 oz Ag	quartz porphyry, Cambrian shale and limestone	Jurassic?

MAJOR PRECIOUS-METAL DEPOSITS, WHITE PINE COUNTY (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
Bald Mountain (cont.)	indicated resource); 40,184,000 tons, 0.012 opt Au (inferred resource) 2010 (includes Alligator Ridge): 246,711,000 tons, 0.019 opt Au (proven and probable reserves); 151,944,000 tons, 0.011 opt Au (measured and indicated resource); 60,636,000 tons, 0.011 opt Au (inferred resource) 2011 (includes Alligator Ridge): 307,162,000 tons, 0.017 opt Au, 5,102,000 oz Au (proven and probable reserves); 123,191,000 tons, 0.013 opt Au 1,623,000 oz Au (measured and indicated resource); 72,491,000 tons, 0.011 opt Au, 787,000 oz Au (inferred resource) 2012: 295,559,000 tons, 0.017 opt Au, 5,815,000 oz Au (proven and probable reserves); 125,190,000 tons, 0.012 opt Au, 1,472,000 oz Au (measured and indicated resource); 88,864,000 tons, 0.009 opt Au, 762,000 oz Au (inferred resource) 2013: 135,051,000 tons, 0.018 opt Au, 2,460,000 oz Au (proven and probable reserves); 206,436,000 tons, 0.018 opt Au, 3,579,000 contained oz Au (measured and indicated resource); 57,515,000 tons, 0.013 opt Au, 758,000 oz Au (inferred resource) 2014: 66,664,000 tons, 0.024opt Au, 1,361,000 oz Au (proven and probable reserves); 224,118,000 tons, 0.019 opt Au, 4,160,000 oz Au (measured and indicated resource); 32,724,000 tons, 0.016 opt Au, 461,000 oz Au (inferred resource) 2015: 54,104,000 tons, 0.021opt Au, 1,142,000 contained oz Au (proven and probable reserves); 190,116,000 tons, 0.019 opt Au, 3,698,000 oz Au (measured and indicated resource); 23,532,000 tons, 0.015 opt Au, 345,000 oz Au (inferred resource) 2016: 121,789,000 tons, 0.018opt Au, 2,133,000 oz Au (proven and probable reserves); 221,493,000 tons, 0.015 opt Au, 3,548,000 oz Au (measured and indicated resource); 54,533,000 tons, 0.012 opt Au, 648,000 oz Au (inferred resource) 2017: 104,957,000 tons, 0.018 opt Au, 1,698,000 oz Au (proven and probable reserves); 198,787,000 tons, 0.018 opt Au, 3,349,000 oz Au (measured and indicated resource); 47,735,000 tons, 0.012 opt Au, 597,000 oz Au (inferred resource)			
Bellview (White Pine district)	1988: 277,000 tons, 0.04 opt Au, *geologic resource*-1,000,000 tons, 0.036 opt Au			
Casino/Winrock (Bald Mountain district)	1989: **Casino**-804,000 tons, 0.054 opt Au; **Winrock** 1,300,000 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
Golden Butte (Cherry Creek district)	1989: 4,230,000 tons, 0.031 opt Au	1989-91: 43,519 oz Au, 16,911 oz Ag	Chainman Shale	Cretaceous or Eocene
Gold Rock (Easy Junior/ Nighthawk Ridge) (White Pine district)	1989: 5,680,000 tons, 0.031 opt Au 1991: 137,000 oz Au 1997: 510 oz Au, 76 oz Ag 2011: 14,294,000 tons, 0.022 opt Au, 310,000 oz Au (indicated resource); 19,724,000 tons, 0.017 opt Au, 331,000 oz, Au (inferred resource) 2014: 26,241,000 tons, 0.021 opt Au, 540,000 oz Au (measured and indicated resource); 35,416,000 tons, 0.017 opt Au, 596,000 oz Au (inferred resource)	1990: 11,500 oz Au, 900 oz Ag	Devonian and Mississippian rocks	Eocene
Green Springs (White Pine district)	1988: 1,250,000 tons, 0.06 opt Au (“resource”); 500,000 tons, 0.039 opt Au, (“additional resource”)	1988-91: 63,000 oz Au, 1989-90: 9,000 oz Ag	Upper Joana Limestone	

MAJOR PRECIOUS-METAL DEPOSITS, WHITE PINE COUNTY (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
Griffon (White Pine district)	1993: 60,000 oz Au (geologic resource) 1994: 50,454 oz Au, 0.039 opt Au (geologic resource) 1995: 2,737,000 tons, 0.025 opt Au (proven and probable reserves) 1997: 100,000 oz Au	1998: 37,921 oz Au, 269 oz Ag 1999: 24,740 oz Au	Mississippian Chainman Shale	
Horseshoe (Bald Mountain district)	1991: 1,500,000 tons, 0.039 opt Au		Pilot Shale and intrusive quartz porphyry	36-38 Ma
Illipah (Illipah district)	1987: 57,000 oz Au	1987: ~25,000 oz Au 1988: 25,324 oz Au, mining ended 1989: 3,874 oz Au, heap-leached	Paleozoic sedimentary rocks	Eocene?
Limousine Butte (Butte Valley district)	2009 (0.012 opt Au cut-off grade): 10,600,000 tons, 0.023 opt Au (measured and indicated resources) 2,500,000 tons, 0.020 opt Au (inferred resource)	1987-1989: ~91,000oz Au	Paleozoic sedimentary rocks	Eocene?
Little Bald Mtn. (Bald Mountain district)	1986: 1,000,000 tons, 0.10 opt Au 1989: 200,000 tons, 0.13 opt Au; 1993: 140,000 tons, 0.13 opt Au, 21,800 oz Au (geologic resource)	1985-88: 21,700 oz Au 1989: 5,500 oz Au, 1,500 oz Ag	Antelope Valley Formation	35-38 Ma
Mt. Hamilton (White Pine district)	1988: 7,700,000 tons, 0.05 opt Au, 0.5 opt Ag 1994: 9,040,000 tons, 0.052 opt Au, 0.38 opt Ag (“reserve”) 1996: 10,800,000 tons, 0.038 opt Au, 0.24 opt Ag 1997: 7,720,000 tons, 0.035 opt Au 2009: 12,617,000 tons, 0.031 opt Au, 0.144 opt Ag (measured and indicated resource); 1,491,000 tons, 0.012 opt Au, 0.122 opt Ag (inferred resource) 2011 (Centennial deposit): 22,527,000 tons, 0.022 opt Au, 487,100 oz Au, 0.134 opt Ag, 3,028,200 oz Ag (proven and probable reserves); 23,650,000 tons, 0.022 opt Au, 526,854 oz Au, 0.133 opt Ag, 3,152,624 oz Ag (measured and resource), 3,454,000 tons, 0.018 opt Au, 60,859 oz Au, 0.079 opt Ag, 273,457 oz Ag (inferred resource) 2012 (Seligman deposit): 6,960,000 tons, 0.022 opt Au, 154,388 oz Au, 0.097 opt Ag, 676,665 oz Ag (indicated resource); 3,770,000 tons, 0.021 opt Au, 78,044 oz Au, 0.144 opt Ag, 543,671 oz Ag (inferred resource) 2013: 31,880,000 tons, 0.022 opt Au, 687,700 oz Au, 0.19 opt Ag, 6,187,900 oz Ag (measured and indicated resource); 10,330,000 tons, 0.017 opt Au, 178,800 oz Au, 0.16 opt Ag, 1,685,900 oz Ag (inferred resource) 2014: 22,500,000 tons, 0.024 opt Au, 545,400 oz Au, 0.198 opt Ag, 4,459,600 oz Ag (proven and probable reserves); 33,710,000 tons, 0.022 opt Au, 727,000 oz Au, 0.195 opt Ag, 6,569,000 oz Ag (measured and indicated resource); 6,721,000 tons, 0.018 opt Au, 119,000 oz Au, 0.171 opt Ag, 1,153,000 oz Ag (inferred resource)	1995-97: 99,500 oz Au, 207,500 oz Ag	Dunderberg Shale	Cretaceous
Pan (Pancake district)	1989: 241,000 oz Au 1998: 10,860,000 tons, 0.022 opt Au (Drill-indicated and inferred resource) 2003: 17,890,000 tons, 0.019 opt Au (indicated resource (; 7,986,000 tons, 0.016 opt Au (inferred resource) 2009: 34,650,000 tons, 0.018 opt Au (measured and indicated resource); 1,600,000 tons, 0.017 opt Au (inferred resource)	2015: 21,216 oz Au, 680 oz Ag 2016: 27,400 tons ore 8,713,814 oz fine Au 2017: 15,652 oz Au	Mississippian rocks	

MAJOR PRECIOUS-METAL DEPOSITS, WHITE PINE COUNTY (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
Pan (cont.)	2010: 42,750,352 tons, 0.016 opt Au (measured and indicated resource); 1,600,000 tons, 0.017 opt Au (inferred resource) 2011: 53,253,000 tons, 0.016 opt gold, 864,220 oz Au (proven and probable reserve); 88,226,224 tons, 0.128 opt Au 1,129,809 oz Au (measured and indicated resource); 4,330,080 tons, 0.105 opt Au, 45, 261 oz Au (inferred resource) 2015: Total: 21,196,000 tons, 0.0143 opt gold, 302,400 oz Au (proven and probable reserves); North Pan: 10,685,000 tons, 0.0148 opt gold, 158,300 oz Au (proven and probable reserves); Red Hill: 337,000 tons, 0.0337 opt gold, 11,400 oz Au (proven and probable reserves, 0.005 opt Au); Central Pan: 335,000 tons, 0.0132 opt gold, 4,700 oz Au (proven and probable reserves): South Pan: 9,273,000 tons, 0.0131 opt gold, 121,600 oz Au (proven and probable reserves); South Satellite: 546,000 tons, 0.0119 opt gold, 6,500 oz Au (proven and probable reserves); Pan Mine: 34,157,000 tons, 0.014 opt Au, 477,100 oz Au, (measured and indicated resource); 9,517,080 tons, 0.012 opt Au, 112,500 oz Au (inferred resource, 0.006 opt Au cut-off grade) [NI43-101 compliant] Au (proven and probable reserves, 0.005 opt Au cut-off grade); Central Pan: 335,000 tons, 0.0132 opt gold, 4,700 oz Au (proven and probable reserves, 0.005 opt Au cut-off grade); South Pan: 9,273,000 tons, 0.0131 opt gold, 121,600 oz Au (proven and probable reserves, 0.005 opt Au cut-off grade); South Satellite: 546,000 tons, 0.0119 opt gold, 6,500 oz Au (proven and probable reserves, 0.005 opt Au cut-off grade); Pan Mine: 34,157,000 tons, 0.014 opt Au, 477,100 oz Au, (measured and indicated resource); 9,517,080 tons, 0.012 opt Au, 112,500 oz Au (inferred resource)			
Robinson (Robinson district)	1989: 46,000,000 tons, 0.019 opt Au; 100,000 oz Au (geologic resource) 1991: 20,000,000 tons 0.012 opt Au (geologic resource) 1999: 194,000,000 tons, 0.59% Cu, 0.007opt Au, (proven and probable reserves) 2003: 146.300,000 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 reserves); 610,979,000 tons, 0.55% Cu, 0.0064 opt Au (measured resource); 171,858,000 tons, 0.44% Cu, 0.0041 opt Au (indicated resource) 98,166,000 tons, 0.32% Cu, 0.0015 opt Au (inferred resource); 2006: 122,401,000 tons, 0.69% Cu, 0.0076 opt Au 2006: 122.410,000 tons, 0.69% Cu, 0.0076 opt Au (proven and probable reserves) 2007: 103,788,000 tons, 0.68% Cu, 0.0067 opt Au (proven and probable reserves) 2008: 121,693,000 tons, 0.54% Cu, 0.0067 opt Au (proven and probable reserves) 2009: 103,059,000 tons, 0.53% Cu, 0.0062 opt Au (proven and probable reserves) 2010: 121,250,000 tons, 0.50%Cu, 0.0053 opt Au (proven and probable reserves) 716,490,000 tons, 0.33% Cu, 0.0044 opt Au (measured and indicated resource) 154,320,000 tons, 0.29% Cu, 0.0041 opt Au (inferred resource) 2014: 131,586,000 tons, 0.41 % Cu, 1,078,869,000 lbs. Cu, 0.005 opt Au, 579,227 oz Au (proven and probable reserves); 394,750,000 tons, 0.45 % Cu, 3,565,945,000 lbs.	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, 370,000,000 lbs Cu 1999: 26,250 oz Au, 153,104 oz Ag, 6,200,000 lbs Cu 2004: 12,228 oz Au, 27,000,000 lbs Cu (proven and probable reserves) 191,479 oz Ag, 126,000,000 lbs Cu 2006: 75,074 oz Au, 156,839 oz Ag, 121,319,197 lbs Cu, 260,000 lbs Mo 2007: 108,118 oz Au, 179,238 oz Ag, 131,986,134 lbs Cu, 62,033 lbs Mo 2008: 137,628 oz Au, 183,903 oz Ag, 159,684,092 lbs Cu, 78,855 lbs Mo 2009: 99,000 oz Au, 200,819 oz Ag,	Rib Hill Sandstone, Riepe Spring Limestone, intrusions	Cretaceous 2005: 80,941 oz Au,

MAJOR PRECIOUS-METAL DEPOSITS, WHITE PINE COUNTY (continued)

Deposit name	Reserves/resources	Production	Host rock	Mineralization age
Robinson (cont.)	Cu, 0.006 opt Au, 2,050,027 oz Au (measured and indicated resource); 13,164,000 tons, 0.38% Cu, 100,025,000 lbs. Cu, 0.006 opt Au, 389,056 oz Au (inferred resource) 2015: Ruth/Ruth East: 124,000,000 tons, 0.416% Cu, 0.0048 opt Au, 0.0238% Mo (proven and probable reserves)	122,000,000 lbs Cu, 88,711 lbs Mo 2010: 72,998 oz Au, 245,746 oz Ag, 108,967,015 lbs Cu, 226,688 lbs Mo 2011: 31,969 oz Au, 116,774 oz Ag, 88,893,372 lbs Cu, 1,261,309 lbs Mo 2012: 30,948 oz Au, 225,421 oz Ag, 117,509,548 lbs Cu, 449,001 lbs Mo 2013: 47,452 oz Au, 161,638 oz Ag, 107,898,857 lbs Cu, 1,384,649 lbs Mo 2014: 26,303 oz Au, 86,601,987 lbs Cu 741,717 lbs Mo 2015: 60,360 oz Au, 131,307,031 lbs Cu, 905,061 lbs Mo 2016: 49,217 oz Au, 118,411,099 lbs Cu, 823,659 lbs Mo 2017: 37,897 oz Au, 112,633,426 lbs Cu, 652,763 lbs Mo		
Taylor (Taylor district)	1980: 10,000,000 tons, 3 opt Ag 1988: 5,920,000 tons, 2.7 opt Ag (resource) 2007: 6,433,000 tons, 2.31 opt Ag (measured and indicated resource) 757,000 tons, 2.54 opt Ag (inferred resource) 2013: 8,894,000 tons, 1.89 opt Ag, 16,820,000 oz Ag (measured and indicated resource); 1,716,000 tons, 2.3 opt Ag 3,941,000 oz Ag (inferred resource)	1981-1984: 3,800,000 oz Ag, 3,000 oz Au	Guilmette and Joana Limestones, rhyolite dikes	Eocene or Oligocene
White Pine (White Pine district)	1989: 63,000 oz Au, 0.04 opt Au	1989: 20,654 oz Au	Pilot Shale	Oligocene?
Yankee (Bald Mountain district)	1992: 683,000 oz Au 1993: *see* Bald Mountain	1990: ~15,000 oz Au 1992: 10,800 oz Au	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:

Year	Gold (oz)	Silver (oz)
1988	895,500	NA
1989	1,467,800	117,400
1990	1,676,000	NA
1991	1,575,700	NA
1992	1,588,000	98,000
1993	1,666,400	175,000
1994	1,554,000	158,000
1995	1,634,500	188,000
1996	1,700,000	322,000
1997	1,819,000	118,000
1998	1,575,391	150,400
1999	1,536,401	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
2006	1,310,258	169,212
2007	1,322,001	268,875
2008	1,320,019	149,254
2009	1,172,790	225,431
2010	934,282	69,430
2011	917,973	76,938
2012	987,959	192,333
2013	1,020,791	221,256
2014	907,282	76,614
2015	885,242	92,173
2016	943,823	101,475
2017	971,613	74,594

NA= not available

OTHER METALLIC DEPOSITS

by David A. Davis and John L. Muntean

This is a compilation, in progress, of metallic deposits other than gold and silver. Initially, active projects with recently released reserves, resources, and production were included and earlier published data are included as found. The information in this compilation was obtained from the Nevada Division of Minerals and from published reports, articles in mining newsletters, and company websites, annual reports, and press releases. Locations of active mines are shown on page 2, and contact information is listed in the Directory of Mining and Milling Operations.

Deposit name	Metals	Reserves/resources	Production
CHURCHILL COUNTY			
Buena Vista (Mineral Basin district)	Fe	1945: 350,000 tons ore, 54% Fe 2013: 111,200,000 tons, 18.6% Fe 20,700,000 contained tons Fe (probable reserve); 148,700,000 tons, 18.8% Fe (indicated resource); 61,000,000 tons, 19.9% Fe (inferred resource)	1943-52: 563,000 tons ore >57% Fe 1958: 150,000 tons >56% Fe
CLARK COUNTY			
Boulder City (Las Vegas district)	Mn	1949: 1,000,000 tons, 7.5% Mn or 15,000,000 tons, 3% Mn (resource)	
Silver Leaf (Tri-State) (Bunkerville district)	W	1963: 21,000 tons (inferred reserve) 1981: 44,000 tons, 0.35% WO_3, 96,000 tons, 0.3% WO_3 (indicated and inferred resource)	1953-71, 1980: 165 units
DOUGLAS COUNTY			
Buckskin (Buckskin district)	Cu, Au	1973: 678,400 tons, averaging 0.15 opt Au, 0.45 opt Ag, 1.3% Cu 1978: 561,500 tons, 0.18 opt Au, 0.5 opt Ag, 1.3% Cu	1918-50 intermittent: est 10,000 tons Au, Cu ore
Pine Nut (Gardnerville district)	Mo	2007: 82,000,000 tones, 0.06% Mo	
ELKO COUNTY			
Carlin Vanadium (Carlin district)	V	2010: 28,000,000 tones, 0.515% V_2O_5 (inferred resource)	
Contact (Contact district)	Cu	2009: 33,578,000 tons, 0.293% Cu (proven and probable reserve); 89,551,000 tons, 0.268% Cu (measured and indicated resource); 50,520,000 tons, 0.302% Cu (inferred resource) 2012: 215,710,000,000 tons, 0.25% Cu 1,058,998,000 lbs. Cu (measured and indicated resource); 70,921,000,000tons, 0.24% Cu, 340,421,000,000 lbs. Cu (inferred resource) 2013: 141,094,000 tons, 0.22% Cu, 611,748,000 lbs. Cu (proven and probable reserve); 3,340,000 tons, 0.18%, 11,905,000 lbs. Cu (inferred resource); 2016: 141,094,000 tons, 0.22% Cu, 611,748,000 lbs. Cu (proven and probable reserve); 213,113,000 tons, 0.2% Cu 831,484,000 lbs.Cu (measured and indicated resource), 12,982,000 tons, 0.2%, 52,982,000 lbs. Cu (inferred resource)	

OTHER METALLIC DEPOSITS, ELKO COUNTY (continued)

Deposit name	Metals	Reserves/resources	Production
Hot Spot No. 1 (Mountain City district)	U	1956: 13,200 tons, 0.137% U_3O_8 in eight small deposits (“indicated ore”)	
Indian Springs (Delano district)	W	2007: 10,800,000 tons, 0.171% WO_3 (indicated resource); 8.200,000 tons, 0.167% WO_3 (inferred resource)	
Marshall (Contact district)	Cu	1972: 8,128,115 tons, 2.3% Cu equivalent	1917-30: N/A
Montrose (Alder district)	W	1952: 1,050 tons, 0.25% WO_3 (inferred resource)	
Rio Tinto (Mountain City District)	Cu	1976 Footwall deposit: 600,000 tons, 1% copper (one-third mined)	1931-47: 1,109,878 tons, 9.7% Cu, 0.3 opt Ag, 0.006
Spruce Mountain (Spruce Mountain district)	Cu, Mo	1984 two areas: 105,000,000 tons and 80,000,000 tons (low grade porphyry Cu-Mo resource)	
Victoria (Dolly Varden district)	Cu, Ag	1973: 3,500,000 tons, 2.45% Cu (reserves) 1976 underground: 2,068,650 tons, 3% Cu (proven and probable reserves) 1981: 1,375,425 tons, 2.15% Cu, 0.35 opt Ag (proven and probable reserves)	1975-77: 6,000 tons Cu 1980-81: 124,575 tons, 1.56% Cu, 0.32 opt Ag
Vivian Tunnel (Contact district)	Cu	1930: 4,000,000 tons (commercial ore)	

ESMERALDA COUNTY

Black Horse (Black Horse district)	W, Mo	1982: 300,000 tons, 0.05% WO_3, 0.08% Mo	1940-78 (Intermittant): 6,000 units WO_3
Cucomungo (Tule Canyon district)	Mo	2006 Basalt Cap Zone: 30,000,000 tons, 0.11% MoS_2 (0.066% Mo, drill-indicated resource); Roper Tunnel Zone: 9,000,000 tons 0.125% to 0.25% MoS_2 (0.075% to 0.15% Mo, possible resource)	

EUREKA COUNTY

Gibellini (Gibellini district)	V	2011: 19,970,000 tons 0.30% V_2O_5 (proven and probable reserves, Gibellini Hill, part of the measured and indicated resource); 23,050,000 tons, 0.29% V_2O_5 (measured and indicated resource, Gibellini Hill); 14,230,000 tons, 0.17% V_2O_5 (inferred resource, reduced material) 2017: 22,010,000 tons 0.294% V_2O_5, 46,550,000 lbs V_2O_5 (measured and indicated resource); 9,820,000 tons, 0.19% V_2O_5, 37,270,000 lbs V_2O_5 (inferred resource)	
Lone Mountain (North) (Lone Mountain district)	Pb, Zn	2017: 3,257,000 tons 0.7% Pb, 7.57% Zn 543,000,000 lbs Zn (inferred resource, 2% Zn cut-off grade)	

OTHER METALLIC DEPOSITS, EUREKA COUNTY (continued)

Deposit name	Metals	Reserves/resources	Production
Louie Hill (Gibellini district)	V	2017: 7,060,000 tons 0.284% V_2O_5, 40,160,000 lbs V_2O_5 (inferred resource)	
Mount Hope (Mount Hope district)	Mo	2007: 965,926,000 tons 0.068% Mo (proven and probable reserves); 109,641,000 tons, 0.030% Mo (measured and indicated resource); 191,308,000 tons, 0.063% Mo (inferred resource) 2014: 984,602,000 tons 0.07% Sulfide Mo (proven and probable reserves, 0.034% Mo cutoff grade); 65,243,000 tons, 0.033% Sulfide Mo (measured and indicated resource, 0.025% to 0.034% Mo cutoff grade); 111,261,000 tons, 0.056% Sulfide Mo (inferred resource, 0.025% Mo cutoff grade)	

HUMBOLDT COUNTY

Alpine (Porvenir) (Potosi district)	W	1946: 10,000 tons, 0.475% WO_3 (estimated and inferred reserve)	1943: 8,000 tons, 0.5% WO_3 1942-43, 1952-53: est. 24,000 units WO_3
Ashdown (Vicksburg district)	Mo	1983: 10,000 tons molybdenite on dump 2006 (Sylvia Vein): 21,550 tons, 8% Mo	2006: 10,500 lbs Mo 2007: 247,466 lbs Mo 2008: 202,597 lbs Mo 2009: 214,714 lbs Mo 2010: 189,035 lbs Mo 2011: 648,853 lbs Mo 2012: 44,092 lbs Mo
Cordero (Opalite district)	Ga	2007: 1000,000 tons, 47.7 ppm Ga (measured and indicated resource); 6,600,000 tons, 43.7 ppm Ga (inferred resource)	
Granite Creek (Potosi district)	W	1946: 118,000 tons, 0.48% WO_3 (measured, indicated, and inferred reserve)	1942-44: 88,000 tons, 0.5% WO_3 1942-46, 1950-57: 149,100 units WO_3
Kings Valley (Disaster district)	U	2006: 2,978,000 tons, 0.081% U_3O_8 (inferred resource)	
Kirby (Potosi district)	W	1946: 5,500 tons, 0.42% WO_3 (measured, indicated, and inferred reserve)	before 1943: 32,000 tons, 0.43% WO_3 1943, 1950-51: est. 25,000 units WO_3
Knight (Potosi district)	W	1946: 2,100 tons, 0.52% WO_3 (estimated and inferred reserve)	
Markus (Potosi district)	W	1946: 7,650 tons, 0.4% WO_3 (measured, indicated, and inferred reserve)	1956-57: 100,000 units WO_3
McDermitt (Opalite district)	Hg	1982: 1,325,000 tons, 10 lbs per ton Hg (measured reserve)	1974-90: N/A
Pacific (Getchell) (Potosi district)	W	1946: 40,000 tons, 0.5% WO_3 (estimated and inferred reserve)	1951-1956: est. 150,000 units WO_3
Richmond (Potosi district)	W	1946: 20,000 tons, 0.5% WO_3 (estimated and inferred reserve)	1942-43: 30,000 tons, 0.5% WO_3 1942-43, 1954: 15,100 units WO_3
Riley (Dernan) (Potosi district)	W	1946: 578,500 tons, 0.7% WO_3 (estimated and inferred reserve)	1943-45: 88,000 tons 1943-57: est. 337,000 units WO_3
Uranium Lode Star (Virgin Valley district)	U	1984: 15 to 20,000,000 tons low grade uranium-bearing material (“submarginal” resource)	

OTHER METALLIC DEPOSITS, HUMBOLDT COUNTY (continued)

Deposit name	Metals	Reserves/resources	Production
Valley View (Saunders) (Potosi district)	W	1945: 56,000 tons, 0.49% WO_3 (estimated and inferred reserve)	<1945: 1,500 tons 1942-44, 1951-1956: est. 37,680 units WO_3

LANDER COUNTY

Apex (Reese River district)	U	2006: 1,119,928 tons, 0.07% U_3O_8 (inferred resource)	1954-60, 1963-66: 106,000 lbs. U_3O_8
Black Eagle (Jersey district)	Mn	1942: 49,000 tons, 12.27% Mn (assured); 70,000 tons, 11.96% Mn (assured and probable); 83,500 tons, 11.68% Mn (assured, probable, and possible)	
Black Rock (Buffalo Valley district)	Mn	1942: 16,650 tons, 15.1% Mn (assured); 30,000 tons, 14.1% Mn (assured and probable); 42,600 tons, 12.7% Mn (assured, probable, and possible)	1942-47: 11,150 tons, 13.5-39.9% Mn 1950-53: 10,126 tons ore
Buckingham (Battle Mountain district)	Mo	1984: 1.1 billion tons, 0.06% MoS_2 (resource)	
Phoenix (Battle Mountain district)	Cu	2007: 279,600,000 tons, 0.13% Cu (proven and probable reserves); 91,300,000 tons, 0.16% Cu (measured and indicated resource); 23,900,000 tons, 0.16% Cu (inferred resource) 2008: 302,000,000 tons, 0.15% Cu (proven and probable reserves); 91,700,000 tons, 0.20% Cu (measured and indicated resource); 95,953,000 tons, 0.23% Cu (inferred resource) 2009: 287,500,000 tons, 0.16% Cu (proven and probable reserves); 199,687,000 tons, 0.18% Cu (measured and indicated resource); 91,815,000 0.23% Cu (inferred resource) 2010 Non-leach: 332,600,000 tons, 0.15% Cu (probable reserve); 150,900,000 (indicated resource); 56,600,000 tons, 0.13% Cu 0.12% Cu (inferred resource) 2010 (leach): 132,900,000 tons, 0.23% Cu (probable reserve; 25,900,000 tons, 0.19% Cu (indicated resource); 45,900,000 tons, 0.22% Cu (inferred resource) 2011 Non-leach: 450,300,000 tons, 0.15% Cu, 1,300,000,000 lbs. Cu (proven and probable reserve); 216,400,000 tons, 0.09% Cu (indicated resource); 132,300,000 tons, 0.1% Cu (inferred resource) 2011 Leach: 170,200,000 tons, 0.21% Cu, 690,000,000 Cu, (proven and probable reserve); 14,100,000 tons, 0.2% Cu (indicated resource); 54,100,000 tons, 0.2% Cu (inferred resource) 2012 Non-leach: 443,200,000 tons, 0.15% Cu, 1,290,000,000 lbs Cu, (proven and probable reserve); 198,100,000 tons, 0.08% Cu, 310,000,000 lbs Cu (measured and indicated resource); 119,600,000 tons, 0.1% Cu, 230,000,000 lbs Cu (inferred resource); Leach: 177,100,000 tons, 0.24% Cu, 850,000,000 lbs Cu, (probable reserve); 22,300,000 tons, 0.25% Cu 120,000,000 lbs Cu (measured and indicated resource); 16,900,000 tons, 0.2% Cu, 70,000,000 lbs Cu (inferred resource) 2013 Mill: 339,100,000 tons, 0.14% Cu, 940,000,000 lbs Cu, (proven and probable reserve, Leach: 160,800,000 tons, 0.22% Cu, 710,000,000 lbs Cu, (probable reserve), Total: 499,900,000 tons, 0.17% Cu, 1,650,000,000 lbs Cu, (proven and probable reserves)	2006: 6,235,096 lbs Cu 2007: 10,808,206 lbs Cu 2008: 15,853,706 lbs Cu 2009: 23,733,389 lbs Cu 2010: 19,008,818 lbs Cu 2011: 23,897,865 lbs Cu 2012: 27,809,189 lbs Cu 2013: 29,815,908 lbs Cu 2014: 46,014,331 lbs Cu (See Major Precious Metal Deposits also.) 2015: 46,330,821 lbs Cu (See Major Precious Metal Deposits also.) 2016: 41,806,950 lbs Cu (See Major Precious Metal Deposits also.) 2017: 33,178,523 lbs Cu (See Major Precious Metal Deposits also.)

OTHER METALLIC DEPOSITS, LANDER COUNTY (continued)

Deposit name	Metals	Reserves/resources	Production
Phoenix (cont.)		reserve); 220,500,000 tons, 0.14% Cu (mineralized material) 2014 Mill: 324,900,000 tons, 0.14% Cu, 940,000,000 lbs Cu, (proven and probable reserve); Leach: 211,700,000 tons, 0.19% Cu, 790,000,000 lbs Cu, (probable reserve); Total: 536,500,000 tons, 0.16% Cu, 1,730,000,000 lbs Cu (probable reserve); 89,100,000 tons, 0.13% Cu (mineralized material) 2015 Mill: 289,500,000 tons, 0.14% Cu, 840,000,000 lbs Cu, (proven and probable reserve); Leach: 237,900,000 tons, 0.19% Cu, 910,000,000 lbs Cu, (proven and probable reserve) Total: 527,400,000 tons, 0.17% Cu, 1,750,000,000 lbs Cu (proven and probable reserve); 199,400,000 tons, 0.12% Cu (mineralized material) 2016: 395,500,000 tons, 0.16% Cu, 1,260,000,000 lbs Cu, (proven and probable reserve); 257,000,000 tons, 0.13% Cu (mineralized material) 2017: 394,700,000 tons, 0.17% Cu, 1,330,000,000 lbs Cu, (proven and probable reserve); 289,200,000 tons, 0.13% Cu (mineralized material)	

LINCOLN COUNTY

Andies Mine (Tem Piute district)	Hg	1964: 64,000 tons, 2.13 lbs. per ton (indicated)	
Groom Mine (Groom district)	Pb, Zn	1963: Reserve: 30,000 tons, 0.5 opt Ag, 4-5% Pb (reserve)	1915-26: Concentrates: 6,145 tons, 100,341 oz Ag, 5,926,371 lbs. Pb 1915-37: 5,737 tons ore valued at $367,325
Pan American (Comet district)	Pb, Zn	1982: 2,196,000 tons, 1.17% Pb, 2.45% Zn, (proven reserve)	1947-78: N/A

LYON COUNTY

Ann Mason (Yerington district)	Cu	2010: 1,409,960,000 tons, 0.336% Cu, (inferred resource, (0.2% Cu cut-off grade) 315,220,000 tons, 0.485% Cu, (inferred resource, 0.4% Cu cut-off grade)	
	Cu, Mo	2012: 1,253,000,000 tons, 0.33% Cu, 8,150,000,000 lbs. Cu, 0.006% Mo, 150,000,000 lbs. Mo; 0.0006 opt Au, 0.017 opt Ag (indicated resource, 0.2% Cu cut-off grade); 962,000,000 tons, 0.29% Cu, 5,590,000,000 lbs. Cu, 0.004% Mo, 80,000,000 lbs. Mo; 0.0009 opt Au, 0.019 opt Ag (inferred resource, 0.2% Cu cut-off grade)	
	Cu, Mo	2015: 1,540,000,000 tons, 0.32% Cu, 9,890,900,000 lbs. Cu, 0.006% Mo, 186,600,000 lbs. Mo; 0.0009 opt Au, 1,130,000 oz Au, 0.019 opt Ag 29,460,000 oz Ag (indicated resource); 699,600,000 tons, 0.29% Cu, 3,987,200,000 lbs. Cu, 0.007% Mo, 96,200,000 lbs. Mo; 0.0009 opt Au, 580,000 oz Au, 0.019 opt Ag 13,160,000 oz Ag (inferred resource)	

OTHER METALLIC DEPOSITS, LYON COUNTY (continued)

Deposit name	Metals	Reserves/resources	Production
Blue Hill (Yerington district)	Cu, Mo	2012: Oxide zone: 52,290,000 tons, 0.17% Cu, 179,370,000 lbs. Cu; Mixed zone: 27,220,000 tons, 0.18% Cu, 98,120,000 lbs. Cu (inferred resource); Sulfide zone: 54,960,000 tons, 0.23% Cu, 253,460,000 lbs. Cu, 0.005% Mo, 0.0003 opt Au, 0.009 opt Ag (inferred resource)	
MacArthur (Yerington district)	Cu	2008: 57,365,000 tons, 0.239% Cu, (measured and indicated resource, oxide and chalcocite material) 75,832,000 tons, 0.283% Cu, (inferred resource, oxide and chalcocite material) 2010: 143,721,000 tons, 0.192% Cu (measured and indicated resource, oxide and chalcocite material) 215,043,000 tons, 0.197% Cu (inferred resource, oxide and chalcocite material) 74,090,000 tons, 0.256% Cu (inferred resource, primary sulfide material) 2011: 159,094,000 tons, 0.212% Cu, 675,513,000 lbs. Cu (measured and indicated resource, oxide and chalcocite material) 243,417,000 tons, 0.201% Cu, 979,510,000 lbs. Cu (inferred resource, oxide and chalcocite material) 1,098,000 tons, 0.292% Cu, 6,408,000 lbs. Cu (measured and indicated resource, primary sulfide material); 134,900,000 tons, 0.283% Cu 764,074,000 lbs. Cu (inferred resource, primary sulfide material)	1995-97: N/A
Pumpkin Hollow (Yerington district)	Cu, Fe,	2007: 342,735,000 tons, 0.579% Cu, 0.0019 opt Au, 0.0700 opt Ag, 15.67% Fe (measured and indicated resource); 438,164,000 tons, 0.446% Cu, 0.0015 opt Au, 0.0700 opt Ag, 10.23% Fe (inferred resource)	
	Cu	2009: 488,228,000 tons, 0.58% Cu, 0.002 opt Au, 0.069 opt Ag (measured and indicated resource); 440,826,000 tons, 0.42% Cu, 0.001 opt Au, 0.048 opt Ag (inferred resource)	
	Fe	2009: 306,420,000 tons, 30.04% Fe (measured and indicated resource); 440,138,000 tons, 20.67% Fe (inferred resource)	
	Cu	2010: 531,042,000 tons, 0.55% Cu, 0.003 opt Au, 0.079 opt Ag (total measured and indicated resource) 495,129,000 tons, 0.37% Cu, 0.001 opt Au, 0.044 opt Ag (total inferred resource) 33,544,000 tons, 1.74% Cu, 0.010 opt Au, 0.244 opt Ag (measured and indicated resource, eastern underground deposits,) 249,155,000 tons, 0.6% copper, 0.002 opt gold, 0.067opt Ag (measured and indicated resource, western open pittable deposits)	
	Fe	2010: 340,898,000 tons, 32.59% Fe (measured and indicated resource, western open pittable deposits); 29,769,000 tons, 25.6% Fe (inferred resource, western open pittable deposits)	
	Cu, Au, Ag	2011 Western open pit deposits: 560,599,000 tons, 0.39% Cu, 4,311,274,000 lbs. Cu, 0.002 opt Au, 1,061,000 oz Au, 0.053 opt Ag, 29,689,000 oz Ag (measured and indicated resource) 387,757,000 tons, 0.3% Cu, 12,288,414,000 lbs. Cu, 0.001opt Au, 385,000 oz Au, 0.039 opt Ag, 14,960,000 oz Ag (inferred resource) Eastern underground deposits: 50,589,000 tons, 1.45% Cu, 1,459,824,000 lbs. Cu, 0.009 opt Au, 449,000 oz Au, 0.213 opt Ag, 10,817,000 oz Ag (measured and indicated resource) 12,098,000 tons, 1.11% Cu,267,533,000 lbs. Cu, 0.002 opt Au, 24,000 oz Au 0.065 opt Ag, 792,000 oz Ag (inferred resource)	
	Fe	2011: Western open pit deposits: 340,898,000 tons, 32.59% Fe, 71,162,000 tons Fe (measured and indicated resource, western open pits, 20% Fe cut-off grade)	

OTHER METALLIC DEPOSITS, LYON COUNTY (continued)

Deposit name	Metals	Reserves/resources	Production
Pumpkin Hollow (con't.)	Cu, Au, Ag	2012: Western open pit deposits: 732,056,000 tons, 0.37% Cu, 5,448,225,000 lbs. Cu, 0.001 opt Au, 981,000 oz Au, 0.046 opt Ag, 34,034,000 oz Ag (measured and indicated resource) 225,073,000 tons, 0.31% Cu, 1,388,107,000 lbs. Cu, 0.001 opt Au, 219,000 oz Au 0.041 opt Ag, 9,296,000 oz Ag (inferred resource) East underground deposits: 27,645,000 tons, 1.49% Cu, 820,000,000 lbs. Cu, 0.008 opt Au, 220,765 oz Au, 0.17 opt Ag, 4,710,391 oz Ag (proven and probable reserve) E2 underground deposits: 8,132,000 tons, 1.65% Cu, 269,000,000 lbs. Cu, 0.006 opt Au, 50,920 oz Au, 0.186 opt Ag, 1,512,862 oz Ag proven and probable reserve)	
	Fe	2012: Western open pit deposits: 400,226,000 tons, 32.2% Fe, 128,899,000 tons Fe (measured and indicated resource, western open pits)	
	Cu, Au,	2013: Western open pit deposits: 732,056,000 tons, 0.37% Cu, 5,448,225,000 lbs. Cu, 0.001 opt Au, 937,000 oz Au, 0.047 opt Ag, 34,666,000 oz Ag (measured and indicated resource); 225,073,000 tons, 0.31% Cu, 1,392,266,000 lbs. Cu, 0.001 opt Au, 198,000 oz Au, 0.039 opt Ag, 8,755,000 oz Ag (inferred resource),	
	Fe	2013: Western open pit deposits: 242,957,000 tons, 32.8% Fe, 79,738,000 tons Fe (measured resource) 152,265,000 tons, 31% Fe, 47,2126,000 tons Fe (indicated resource); 118,334,000 tons, 29% Fe, 34,270,000 tons Fe (inferred resource)	
	Cu, Au, Ag, Fe	2015: Western open-pit depsoits: 539,285,000 tons, 0.39% Cu, 4,210,511,000 lbs. Cu, 0.001 opt Au, 591,590 oz Au, 0.044 opt Ag, 23,939,204 oz Ag (proven and probable reserves); 566,400,000 tons, 0.43% Cu, 4,840,000,000 lbs. Cu, 0.001 opt Au, 750,000 oz Au, 0.042 opt Ag, 26,621,000 oz Ag, 13.6% Fe, 76,800,000 tons Fe (measured and indicated resource); 8,000,000 tons, 0.52% Cu, 83,000,000 lbs. Cu, 0.001 opt Au, 6,000 oz Au 0.052 opt Ag, 414,000 oz Ag, 6.1% Fe, 500,000 tons Fe (inferred resource); Eastern Underground Area: 32,603,000 tons 1.287% Cu, 839,158,000 lbs. Cu, 0.005 opt Au, 168,995 oz Au, 0.113 opt Ag, 3,697,769 oz Ag (proven and probable reserves); 54,100,000 tons, 1.39% Cu, 1,503,000,000 lbs. Cu, 0.005 opt Au, 291,000 oz Au, 0.116 opt Ag, 6,257,000 oz Ag, 17.8% Fe, 9,600,000 tons Fe (measured and indicated resource); 29,200,000 tons, 1.09% Cu, 636,000,000 lbs. Cu, 0.003 opt Au, 87,000 oz Au, 0.064 opt Ag, 1,875,000 oz Ag, 12.8% Fe, 3.700,000 tons Fe (inferred resource)	
Yerington (Yerington District)	Cu	2011: 18,391,000 tons, 0.23% Cu, 85,886,000 lbs. (measured and indicated resource, oxide and chalcocite zone); 24,703,000 tons, 0.2% Cu, 97,873,000 lbs. Cu (inferred resource, oxide and chalcocite zone); 102,526,000 tons, 0.26% Cu, 531,495,000 lbs. Cu (measured and indicated resource, primary sulfide material) 160,104,000 tons, 0.2% Cu 629,209,000 lbs. Cu (inferred resource, primary sulfide material)	1952-79: 1,744,000,000 lbs. Cu
	Cu	2013: Oxide and chalcocite zone 30: 23,500,000 tons, 0.25% Cu, 118,000,000 lbs. Cu (measured and indicated resource); 25,900,000 tons, 0.23% Cu, 118,000,000 lbs. Cu (inferred resource), Primary sulfide zone 40:105,000,000 tons, 0.3% Cu, 633,000,000 lbs. Cu (measured and indicated resource); 128,000,000 tons, 0.23% Cu 600,000,000 lbs.Cu (inferred resource)	

OTHER METALLIC DEPOSITS, MINERAL COUNTY

Deposit name	Metals	Reserves/resources	Production
MINERAL COUNTY			
Desert Scheelite (Pilot Mtns. District)	W, Cu, Ag	2012: 6,710,000 tons, 0.31% WO_3, 0.71 opt Ag, 0.16% Cu (indicated resource) 770,000 tons, 0.3% WO_3, 0.28 opt Ag, 0.24% Cu (inferred resource) 2017: 9,270,000 tons, 0.27% WO_3, 24,802 tons W, 0.62 opt Ag, 5,747,400 oz Ag, 0.14% Cu, 13,000 tons Cu (indicated resource); 1,642,000 tons, 0.33% WO_3, 3,780 tons W, 0.26 opt Ag, 426,920 oz Ag, 0.17% Cu, 2,756 tons Cu (inferred resource)	
Dunlap (Pilot Mtns. District)	Cu	1941: 175,000 tons, low grade ore	
Garnet (Pilot Mtns. District)	W	2017: 2,017,000 tons, 0.36% WO_3, 0.36% WO_3, 7,264 tons contained W (inferred resource)	
M2 (Huntoon District)	Cu	2017: North Zone: 4,315,218 tons, 0.525% Cu 45,308,940 lbs. Cu (indicated resource); 14,412,385 tons, 0.525% Cu, 151,330,360 lbs. Cu (inferred resource)	
New York Canyon (Santa Fe District)	Cu	2010: 26,250,000 tons, 0.43% Cu (indicated resource), 2,900.000 tons, 0.31% Cu (inferred resource)	
Pine Tree (Pilot Mtns. District)	Mo, Cu, Ag	2011: 240,840,000 tons, 0.04% MoS_2, 173,300,000 lbs. MoS_2, 0.09% Cu, 428,700,000 lbs. Cu, 0.044 opt Ag, 10.680,000 oz Ag (indicated resource) 196,760,000 tons, 0.3% MoS_2, 106,200,000 lbs. MoS_2, 0.09% Cu, 324,400,000 lbs. Cu, 0.039 opt Ag, 7.7800,000 oz Ag (inferred resource)	
B and C Springs (Paradise Peak district)	Mo, Cu	1983: 131,000,000 tons, 0.12% Mo 2007 Open pit: 105,902,046 tons, 0.048% Mo, 101,126,000 lbs. Mo., 0.068% Cu, 144,282,000 lbs Cu (indicated resource) Underground: 2,846,524 tons, 0.234% Mo, 0.334% Cu (indicated resource)	
Bisoni McKay (Gibellini District)	V	2008: Area A North: 8,073,844 tons, 0.43% V_2O_5 (indicated resource); 4,744,214 tons, 0.48% V_2O_5 (inferred resource) Area A South: 5,490,356 tons, 0.48% V_2O_5 (inferred resource) 2015: Area A North Oxide: 5,623,556 tons, 0.347% V_2O_5; Reduced: 7,447,730 tons, 0.429% V_2O_5 (indicated resource); Oxide: 773,522 tons, 0.374% V_2O_5; Reduced: 521,468 tons, 0.378% V_2O_5 (inferred resource) Area A North and South combined: Oxide: 4,579,268 tons, 0.347% V_2O_5; Reduced: 7,300,322 tons, 0.429% V_2O_5 (indicated resource); Oxide: 2,893,104 tons, 0.324% V_2O_5; Reduced: 4,154,952 tons, 0.498% V_2O_5 (inferred resource)	
Liberty (formerly known as Hall-Tonopah) (San Antone district)	Mo	2007 (April 2008): 432,951,000 tons, 0.071% Mo, 0.07% Cu (proven and probable reserves); 109,336,000 tons, 0.052% Mo, 0.11% Cu (measured and indicated resource); 127,200,000 tons, 0.051% Mo, 0.08% Cu (inferred resource)	1982-91: 50,000,000 tons Mo (avg ore grade ~0.11%)
	Mo, Cu	2011: 541,420,000 tons, 0.068% Mo, 0.08% Cu (proven and probable reserves, 0.02% Mo cut-off grade) 105,194,000 tons, 0.052% Mo, 0.05% Cu	

OTHER METALLIC DEPOSITS, MINERAL COUNTY (continued)

Deposit name	Metals	Reserves/resources	Production
Liberty (cont.)	Mo, Cu	(measured and indicated resource, 0.02% Mo cut-off grade) 252,647,000 tons, 0.04% Mo, 0.13% Cu (inferred resource, 0.02% Mo cut-off grade) 2014: 309,216,000 tons, 0.078% Mo, 482,000,000 lbs Mo, 0.098% Cu, 606,000,000 lbs. Cu (proven and probable reserves); 566,159,000 tons, 0.067% Mo, 762,200,000 lbs. Mo; 0.084% Cu, 956,400,000 lbs. Cu (measured and indicated resource); 148,598,000 tons, 0.052% Mo, 154,500,000 lbs. Mo, 0.115% Cu, 341,800,000 lbs.Cu (inferred resource)	
Tonopah (San Antone district)	Cu	1999: 98,000,000 tons, 0.343% Cu (proven reserve); 137,800,000 tons, 0.314% Cu (resource)	1999-2001: N/A

PERSHING COUNTY

Black Diablo (Black Diablo district)	Mn	1942: 75,000 tons, 30% Mn; 75,000 tons, 5-8% Mn	1929-54: 5,497 long tons, 36.3% Mn; 54,485 long tons, 28.5% Mn
Buena Vista (Mineral Basin district)	Fe	1958: 45,517,153 tons, 29.24% Fe, 1,331,035,114 units (assured ore); 21,557,550 tons, 26,57% Fe, 572,930,865 units (possible ore); 55,934,000 tons, 24.95% Fe, 1,396,056,000 units (prospective ore); 123,008,703 tons, 26.83% Fe, 3,300,008,703 units (total)	
Fencemaker (Table Mountain district)	Sb	1981: 100,000 tons (probable reserve) 400,000 tons (possible reserve) 2012: 34,125 tons, 2.92% Sb (inferred resource)	1880s: 1 ton Sb metal 1940: 2 tons ore, 50% Sb 1966-81: N/A 2013-2014: 500 tons ore
Gold Banks (Goldbanks district)	Hg	1965: 71,000 tons, 5.87 lbs. per ton (probable); 24,000 tons, 8.07 lbs. per ton (possible)	
Humboldt (Mill City district)	W	1958: est. 50,000-70,000 units WO_3	1917-18: 8,075 tons, 2% WO_3, milled 1918-19: 15,220 tons, 0.68% WO_3, milled
Majuba Hill (Antelope district)	Cu, Ag, Sn	1965: 30,000 tons, 3% Cu, 2 opt Ag, 0.18% Sn (resource)	1915-19: 5,000 tons, 12% Cu, 5 opt Ag 1942-45: 12,000 tons 3.9% Cu, 1.4 opt Ag; 350 tons, 3.4% Sn
Rose Creek (Rose Creek district)	W	1940: 6,000 tons, 15% WO_3 (reserve)	1943-45: 1,898 tons, 1% 1943-44, 1952-56: 3,690 units WO_3
Springer (Mill City district)	W	1983: 3.590,000 tons, 0.446% WO_3 (historical General Electric resource) 2009 (Sutton beds): 274,000 tons, 0.619% WO_3 (indicated resource) 1,097,000 tons, 0.562% WO_3 (inferred resource) 2013 Sutton I and II: 355,000 tons, 0.537% WO_3 190,635 STU (indicated resource, 0.2% WO_3 cut-off grade), 1,616,000 tons, 0.459% WO_3, 741,744 STU (inferred resource); Springer West) 318,600 tons, 0.663% WO_3, 211,232 STU (inferred resource); George: 143,950 tons, 0.423% WO_3, 60,863 STU (inferred resource); O'Byrne): 173,670 tons, 0.862% WO_3, 149,719 STU (inferred resource,)	1917-19: 1,356 tons, 1.32% WO3

OTHER METALLIC DEPOSITS, PERSHING COUNTY (continued)

Deposit name	Metals	Reserves/resources	Production
Springer (cont.)		2016 Sutton I and II: 246,117 tons, 0.43% WO_3 106,113 STU (indicated resource), 1,450,368 tons, 0.44% WO_3, 583,261 STU (inferred resource) Springer West: 318,600 tons, 0.663% WO_3, 211,232 STU (inferred resource) STU: standard ton unit = 20 lbs.]	
Trinity (Trinity district)	Pb, Zn, Ag	2012: 19,790,000 tons, 1.07 opt Ag, 21,265,000 oz Ag, 0.217% Pb, 85,987,000 lbs, Pb, 0.354% Zn, 140,253,000 lbs. Zn (inferred resource),	1987-1989: 1,100,000 tons ore 6 opt Ag
WASHOE COUNTY			
Red Bluff (Pyramid district)	U	1991: 200,000 tons, 0.13% U_3O_8 (resource, 0.05% U_3O_8 cut-off grade); 100,000 tons, 0.24% U_3O_8 (resource, 0.1% U_3O_8 cut-off grade)	
WHITE PINE COUNTY			
Bald Mountain (Bald Mountain District)	W	1942: 6,500 tons, 0.95% WO_3, 4,600 tons, 0.45% WO_3 (reserves)	1942: N/A 1954-55: 1,000 tons ore 1979: 5,000 tons ore
Delsa (Bald Mountain District)	Hg	1967: 21,000 tons, 4.38 lbs. per ton	
Lage (Butte Valley District)	Sb	1951: 200,000 tons, low grade ore 1954: 500 tons, 5% Sb; 270,000 tons, 0.22% Sb	
Monte Cristo (White Pine District)	W, Mo	1980: 5,500,000 tons, 0.3% WO_3, 0.2% Mo (estimated reserve)	
Mt. Wheeler (Lincoln District)	Be, W, Fluorspar	1959:100,000 tons, 0.75% BeO 1969: 200,000 tons, 0.75% BeO, 0.3% WO_3, 22% CaF_2 (ore reserves) 1972: 59,625 tons (proven ore), 30,200 tons (probable ore), 191,900 tons (possible ore)	
Robinson (Robinson district)	Cu, Mo	2006: 122,401,000 tons, 0.69% Cu (proven and probable reserves) 2007: 103,788,000 tons, 0.68% Cu (proven and probable reserves) 2008: 121,693,000 tons, 0.54% Cu (proven and probable reserves) 2009: 103,059,000 tons, 0.53% Cu (proven and probable reserves) 2010: 121,250,000 tons, 0.50% Cu (proven and probable reserves) 716,490,000 tons, 0.33% Cu (measured and indicated resource); 154,320,000 tons, 0.29% Cu (inferred resource) 2014: 131,586,000 tons, 0.41% Cu, 1,078,869,000 contained lbs. Cu (proven and probable reserves); 394,750,000 tons, 0.45% Cu, 3,565,945,000 contained lbs. Cu (measured and indicated resource); 13,164,000 tons, 0.38% Cu, 100,025,000 contained lbs. Cu (inferred resource) 2015: Ruth/Ruth East: 124,000,000 tons, 0.416% Cu, 0.0048 opt Au, 0.0238% Mo	2006: 121,319,197 lbs Cu, 260,000 lbs Mo 2007: 131,986,134 lbs Cu, 62,033 lbs Mo 2008: 159,684,092 lbs Cu, 78,855 lbs Mo 2009: 122,000,000 lbs Cu, 88,711 lbs Mo 2010: 108,967,015 lbs Cu, 226,688 lbs Mo 2011: 88,893,372 lbs Cu, 1,261,309 lbs Mo 2012: 117,509,548 lbs Cu, 440,001 lbs Mo 2013: 107,898,858 lbs Cu, 1,384,649 lbs Mo 2014: 86,601,987 lbs Cu, 741,717 lbs Mo 2015: 131,307,031 lbs Cu, 905,061 lbs Mo (See Major Precious Metal Deposits also.) 2016: 118,411,099 lbs Cu, 823,659 lbs Mo (See Major Precious Metal Deposits also.) 2017: 112,633,428 lbs Cu, 652,763 lbs Mo (See Major Precious Metal Deposits also.)

INDUSTRIAL MINERALS

by David A. Davis

The total value of industrial minerals produced in Nevada in 2017 was estimated to be at least $578,000,000, a 21% increase from 2016. Minus the value of aggregate, the total value was about $263,000,000, a 17% increase from 2016. The commodities in decreasing order of estimated value, were aggregate diatomite, gypsum, lithium, lime and limestone, barite, dimension stone/landscape rock, silica, and clay. Industrial mineral commodities with production values of less than $10,000,000 were magnesia, dolomite, alunite, salt, perlite, iron ore, gems, and pozzolan. Data used for these estimates were from the Nevada Division of Minerals (NDOM), the Nevada Department of Taxation (NDT), the U.S. Bureau of Land Management (BLM), the U.S. Geological Survey (USGS), or directly from companies that produced the commodities. Unless otherwise noted, individual and compiled state production data are from NDOM. The gross proceeds are from NDT. USGS data (mostly domestic production, consumption, prices, and trends) cited are from commodity reports on the agency's website at http://minerals.usgs.gov/minerals/pubs/commodity.

Aggregate (Sand and Gravel, Crushed Stone)

The estimated domestic production of construction sand and gravel in 2017 was 981,000,000 tons (890,000,000 tonnes) valued at $7,700,000,000, decreases of 0.2% and 12%, respectively, from 2016. The estimated domestic production of crushed stone was 1,470,000,000 tons (1,330,000,000 tonnes) valued at $15,000,000,000, decreases of 2% and 7%, respectively. 2017 marked the first annual decrease since 2011, and was 25% below the 2006 peak. The estimated apparent consumption of construction sand and gravel remained unchanged at 992,000,000 tons (900,000,000 tonnes). The estimated apparent consumption of crushed stone decreased 1.5% to 1,532,000,000 tons (1,390,000,000 tonnes). The average price of construction sand and gravel increased 1.5% to $7.89 per ton ($8.70 per tonne) from $7.77 per ton ($8.57 per tonne) in 2016. The average price of crushed stone increased 3% to $10.39 per ton ($11.45 per tonne) from $10.11 per ton ($11.14 per tonne) in 2016.

Nevada produced an estimated 26,790,000 tons (24,300,000 tonnes) of construction sand and gravel valued at $154,000,000 and 17,420,000 tons (15,800,000 tonnes) of crushed stone valued at $161,000,000. The total estimated production value of $315,000,000, an increase of 24% from 2016, made construction aggregate the third most valuable commodity produced in the state. The production and value of construction sand and gravel increased 17% and 20%, respectively, and crushed stone increased 24% and 26%, respectively, from 2016. Production from sand and gravel deposits accounted for about 61% of aggregate production statewide, with crushed stone and lightweight aggregate making up the balance.

An estimated 25,940,000 tons (23,530,000 tonnes) of construction aggregate were produced in the Las Vegas area with sand and gravel operations accounting for over 55% of the aggregate production. The Lone Mountain area in northwest Las Vegas accounted for about one-fifth of the production and continued to be the area's most important source of sand and gravel. Significant production also came from sand and gravel pits and stone quarries south and northeast of Las Vegas and in Ivanpah Valley south-southwest of Las Vegas. Portable crushers at construction sites were also important producers of base aggregate in Las Vegas.

The major producers in the Las Vegas area in descending order of production were as follows: Las Vegas Paving, a major producer of asphalt concrete, produced sand and gravel from their Blue Diamond and Lone Mountain pits and some crushed stone from the Apex Landfill pit. The company did not mine its Primm pit in 2017. Aggregate Industries, through its subsidiary Frehner Inc., mined and crushed limestone from its Sloan property a few miles south of Las Vegas. Nevada Ready Mix, a subsidiary of the Mitsubishi Corp., mined most of its aggregate from a complex of pits in alluvium in the Lone Mountain area, with minor production coming from quarries in adjacent bedrock. Impact Sand and Gravel, Inc., under CTC Crushing LLC, mined sand and gravel from its Boulder Ranch and Jericho pits at the north end of Eldorado Valley. Their other pits, such as Cactus and Inspirada, which the company has mined in the past, have not been mined since 2014. Wells Cargo mined mostly sand and gravel from its mining operations at Lone Mountain and from its Spring Mountain pit, which straddles Spring Mountain Road between South Buffalo Way and South Tenaya Way and is now surrounded by residential housing and some businesses. Mel Clark, Inc., mined sand and gravel from Lone Mountain. Boulder Sand and Gravel, Inc., mined sand and gravel from its Pole Line pit. These operations alone accounted for almost half of the aggregate production in the Las Vegas area. Community pits and other aggregate mining facilities administered by the BLM and operated by a number of companies, including some of those already mentioned, annually account for between 10% and 20% of the total production of the Las Vegas and adjacent southern Nevada area. The Lone Mountain Community pit covers 4,053 acres, of which 1,620 acres are in the current mine plan, and 620 acres have currently been disturbed. With the recent rise in

construction activity, annual production has increased to around 6,000,000 tons.

The Cind-R-Lite Block Company shipped lightweight aggregate to the Las Vegas market from their cinder operation in a Quaternary basaltic cinder cone near Amargosa Valley in Nye County. Most of the material shipped was minus 3/8-inch aggregate for the manufacture of cinder blocks and pavers. Cind-R-Lite has two manufacturing sites in the Las Vegas Valley and one in Amargosa Valley.

An estimated 10,700,000 tons (9,710,000 tonnes) of construction aggregate were produced in the Reno-Sparks-Carson City area with crushed rock accounting for almost 60% of the aggregate production, which is at the low end of the 60%-80% range over for the last 15 years. The Lockwood pit operated by Granite Construction was the largest producer, producing over 1,200,000 tons (1,090,000 tonnes) in 2017, a record high. The company also produced sand gravel from the Wade pit near Wadsworth. At over 950,000 tons (862,000 tonnes) each, CEMEX was the second producer and Martin Marietta Materials Inc. was third largest producer. CEMEX produced crushed rhyolite from the Sierra Stone Quarry near Lockwood and sand and gravel from the Paiute pit, which is currently leased from the Pyramid Lake Paiute Tribe near Wadsworth. Martin Marietta Materials, Inc., operated the Spanish Springs (Rocky Ridge) Quarry north of Sparks, which produced crushed granitic rock and some decomposed granite.

Of the smaller producers, Basalite Concrete Products mined lightweight aggregate, which is an important component of crushed rock production in the area. Sierra Nevada Construction, Inc., produced aggregate from its Mustang pit, and Gopher Construction, Inc., produced aggregate from its Trico pit in Storey County. A small amount of decorative rock and sand and cinder for deicing was mined from the Black and Red Cinder pits northeast of Carson City. Over 460,000 tons (417,000 tonnes) of decomposed granite was produced from the Donovan pit and Spanish Springs Quarry in Washoe County and the Goni pit in Carson City.

About 7,570,000 tons (6,870,000 tonnes) of aggregate were produced outside of the major metropolitan areas, much of it from BLM administered pits on public lands. Over 95% of the aggregate was sand and gravel. Nye County produced at least 1,000,000 tons (910,000 tonnes), making the county the largest rural producer. At least half of this production came from the Pahrump area, which in part supplied the demand of the Las Vegas area. Lyon County produced over 920,000 tons (835,000 tonnes), which in part supplied the Reno-Carson City area. Eureka County produced at least 650,000 tons, and Douglas County produced over 550,000 tons. The remaining counties produced less than 400,000 tons (360,000 tonnes) each.

USA Parkway/State Route 439 was completed and opened in August 2017. Ames Construction, Inc., commenced construction in early 2016 and extended the road 13 miles (21 km) over the Virginia Range from a point about six miles (10 km) southeast of Patrick to Opal Avenue in Silver Springs. An estimated 2,000,000 cubic yards (1,530,000 cubic meters) of earth was excavated of which 500,000 tons (450,000 tonnes) of aggregate was used for the roadway base. Half the project was done by February, and the rest was completed three months ahead of schedule. (Environmental Assessment, USA Parkway SR 439 project, FHWA-NV-EA 13.02, 9/2014; Nevada Department of Transportation project update, 12/14/2015; NDOT Begins Paving of USA Parkway, State Route 439 extension, CarsonNOW.org, 10/11/2016; NDOT: USA Parkway extension construction reaches 50 percent completion, CarsonNOW.org, 2/3/2017; The Nevada Department of Transportation opened the USA Parkway extension at noon, KOLO NewsNow, 9/8/2017).

In northern Nevada, USA Parkway/State Route 439, located between Reno and Fernley, was completed in August 2017. Ames Construction, Inc., commenced construction in early 2016 and extended the road 13 miles (21 km) over the Virginia Range from a point about six miles (10 km) southeast of Patrick to Opal Avenue in Silver Springs. An estimated 2,000,000 cubic yards (1,530,000 cubic meters) of earth was excavated of which 500,000 tons (450,000 tonnes) of aggregate was used for the roadway base. Half the project was done by the February, and the rest was completed three months ahead of schedule. (Environmental Assessment, USA Parkway SR 439 project, FHWA-NV-EA 13.02, 9/2014; Nevada Department of Transportation project update, 12/14/2015; NDOT Begins Paving of USA Parkway, State Route 439 extension, CarsonNOW.org, 10/11/2016; NDOT: USA Parkway extension construction reaches 50 percent completion, CarsonNOW.org, 2/3/2017; The Nevada Department of Transportation opened the USA Parkway extension at noon, KOLO NewsNow, 9/8/2017).

In southern Nevada, Fisher Sand and Gravel Co. continued construction on two concurrent phases of the Boulder City by-pass section of Interstate 11. Crushing equipment was used for producing aggregate on site with none expected to needed from off site. Phase I involved upgrading U.S. 93 and building 2.5 miles (4 km) of freeway on the west end of the by-pass at a cost of $83,000,000. About 2,300,000 cubic yards (1,750,000 cubic meters) of earth was expected to be moved for Phase I. Phase II involves construction of 12.5 miles (20 km) of Interstate 11 from U.S. 93 west of Hoover Dam, bending south around Boulder City, and

to the east end of Phase I at a cost of $235,000,000. About 8,000,000 cubic yards (6,100,000 cubic meters) of earth was expected to be moved for Phase II. Phase I was more than 50% complete by the start of 2017 but was not completed until well into 2018. Phase II was completed August 9, 2018. Interstate 11 is planned to eventually link Las Vegas to Reno. (ConstructionEquipmentGuide.com, Crews Work to Fill Interstate Gap between Vegas, Phoenix, 2/23/2016; Las Vegas Review-Journal, First phase of I-11 opens next week near Las Vegas, 5/17/2018; Stantec, Phase 2 of I-11 Boulder City Bypass Expansion project opens August 2018, 7/31/2018; http://i-11nv.com).

A Record of Decision was under review at year's end for an environmental assessment issued in 2015 by the BLM to designate eight new free use and community pits in northern Washoe County. The Record of Decision and Finding of No Significant Impact were issued in 2018. Most of the sites had operated under free use permits (FUP) in the past. The new pits would benefit the Washoe County Road Department general public. The community pit sites are: 1) Clear Creek pit, T34N R22E, 40 acres (16 ha) old FUP, 12.5 acres (5 ha) new FUP; 2) Empire pit, T31N R23E, 15 acres (6 ha) new FUP; 3) Gerlach DG pit, T32N R23E; 4) Leadville Canyon South pit, T36N R23E, 80 acres (32 ha) old FUP, 48 acres (19 ha) new FUP; 5) Red Mountain Creek pit, T35N R23E, 160 acres (65 ha) old FUP, 14 acres (6 ha) new FUP; 6) Rodeo Creek pit, T30N R22E, 10 acres (4 ha) old FUP, 10 acres (4 ha) new FUP; 7) Wall Canyon pit, T33N R21E, 40 acres (16 ha) old FUP, 12.5 acres (5 ha) new FUP. The remaining site is the Smoke Creek Blue pit, T32N R21E, 22.5 acres (9 ha) old FUP, 24 acres (10 ha) new FUP. The Gerlach DG pit did not have a previous free use permit, and the Empire pit had been closed since 1988. (U.S. Bureau of Land Management, Preliminary Environmental Assessment, DOI-BLM-NV-W030-2015-0022-EA; U.S. Bureau of Land Management, Record of Decision and Finding of No Significant Impact, 6/19/2018).

Alunite

Heart of Nature, LLC, a subsidiary of Advanced Bio-Minerals Technologies, LLC, of Henderson, Nevada, processed material from its Alum/Sulfur pit (formerly the Rulco Potassium Sulfate project) in the Alum mining district in Esmeralda County. In 2017 15,039 tons (13,643 tonnes) of material were produced and the gross proceeds were $1,819,760, declines of 39% and 11%, respectively, from 2016. The mineral assemblage mined includes alunite, potassium alum (kalinite), jarosite, gypsum, native sulfur, and potassium feldspar. The alunite occurs with kalinite and sulfur as veins, stringers, and fracture fillings in either a dike or neck of rhyolite intruded into folded rhyolitic tuffs of the Tertiary Esperanza formation. Reddish, iron-stained jarosite occurs locally in the pit. The material is mined, crushed, and stockpiled with the stockpiled material being processed as necessary. Alunite and sulfur are the main essential minerals with thiobacillis bacteria added. The final product is sold as an agricultural soil amendment, as an odor control for manure, and as an odor and algae control for ponds under the trade name SK Microsource™. (Heart of Nature, LLC, website, http://www.heartofnature.biz)

Barite

The USGS did not publish domestic production and consumption data for 2017 to avoid disclosing company proprietary data. The USGS did note that domestic production decreased, although consumption appeared to increase. Almost all the production came from Nevada, with the remainder from a mine in Georgia. The mine production from Nevada decreased 23% from 2016. Production for 2016 was adjusted from 264,000 tons (240,000 tonnes) to an estimated 348,000 tons (316,000 tonnes) (crude), valued at approximately $37,700,000 (for grinding). Estimated apparent consumption decreased 26% to 1,600,000 tons (1,450,000 tonnes). Imported barite, mostly from China and some from India, Mexico, and Morocco, was 2,450,000 tons (2,220,000 tonnes) in 2017, an increase of 72%. China, India, and Morocco combined accounted for 68% of the world's production and Kazakhstan, China, Turkey, India, and Iran combined accounted for 73% of the world's reserves. The estimated average price of barite was $154 per ton ($170 per tonne) free on board from the mine, a 9% decline from 2016. From mid-2014 onward, an oil glut with prices down to and at times below $40 per barrel, resulted in a major drop in drilling and demand for barite.

More than 90% of the barite sold in the United States is used as a weighting agent for drilling. Barite mined in Nevada was sold mainly to customers drilling in the central and western United States. Imported barite came through Louisiana and Texas ports mostly for use in oil and gas drilling offshore in the Gulf of Mexico and onshore drilling in Louisiana, Oklahoma, and Texas. Demand for barite is tied to oil and gas drilling, and the drill rig count has traditionally acted as a barometer of where expected barite production. The average combined weekly rig count for the five main states making up the market for barite produced in Nevada averaged 168, a 93% increase from 87 in 2016. (Baker Hughes Oilfield Operations, Inc., website: https://www.bhge.com)

Nevada's barite production comes from four operations, though one operation only sold from stockpiles. The four operations shipped 391,402 tons (355,078 tonnes) with gross proceeds of $31,302,754,

increases of 70% and 57%, respectively, from 2016. The most recent production peak of 811,334 tons (736,042 tonnes) shipped came in 2012 during high demand for oil and gas drilling and a fracking boom. Over the years, production reported by the NDOM has differed from that reported by the USGS. The difference is because the USGS reports run-of-mine, flotation, or other beneficiated material that is sold or used by the producer, while the NDOM reports only shipped barite, which may include some material from stockpiles.

M-I SWACO, a subsidiary of Schlumberger, Ltd., was the largest Nevada barite producer. The company shipped 133,000 tons (121,000 tonnes) of crude and ground barite from the Greystone Mine and Battle Mountain plant, both in Lander County, a 16% increase from 2016. Conventional open pit mining with front-end loaders is used to remove the barite ore with concurrent reclamation. The ore is either stockpiled at an adjacent mill site or trucked to the Battle Mountain Grinding Plant for concentration. The mill consists of a three-stage crushing and screening circuit and a jig circuit for gravity separation to do the concentrating. Barite concentrates intended for use as a drilling mud must contain between 65% and 75% $BaSO_4$ with a specific gravity greater than 4.1. Barite at the Greystone Mine is hosted in the Middle to Late Devonian Slaven Chert, which consists of black chert with minor argillite and shale.

M-I SWACO, also mined barite from the nearby Mountain Springs Mine in 2017. The company mined from January through April before temporarily shutting down the mine. The company shipped 146,900 tons (133,300 tonnes) from both mined and stockpiled barite, an increase of 130% from 2016. Prior to 2016, barite was only taken from stockpiles for blending at the plant. The mine had last produced from 1952 through 1986. Like at the Greystone Mine, the barite and Mountain Springs is also hosted in the Devonian Slaven Chert. (M-I SWACO, website, https://www.slb.com)

National Oilwell Varco shipped 80,946 tons (73,434 tonnes) of concentrates and ground barite from its Dry Creek jig plant and Osino grinding plant, a 320% increase from 2016. The company's Big Ledge Mine was shut down in 2014 with production coming from stockpiles. The Dry Creek jig plant was idle in 2016 but produced concentrates in 2017. At the jig plant, barite is crushed, washed, sorted, and concentrated, and then is stockpiled for later hauling to Osino. The barite is shipped to warehouses across the country with the product from Osino supplying operations as far away as Ohio and Pennsylvania. The barite at the Big Ledge Mine occurs in argillite and chert of the Ordovician Valmy Formation. (National Oilwell Varco, website, https://www.nov.com).

Baker Hughes Oilfield Operations, Inc., formerly Baker Hughes Drilling Fluids, shipped 62,263 tons (56,485 tonnes) of barite from its Argenta plant near Battle Mountain in Lander County, an 85% increase from 2016. The mine was shut down from December 2014 through 2015 due to market conditions. The barite is hosted in the Devonian Slaven Chert. (Baker Hughes Oilfield Operations, Inc., website, https://www.bhge.com).

Baroid Drilling Fluids, a subsidiary of Halliburton Co., is the operator of the Rossi Mine and jig and the Dunphy mill facility. Due to the decreased demand, the mine was temporarily closed at the end of 2015, and the mill facility was temporarily closed on April 14, 2016. The mill facility consists of two grinding plants, one built in 1964 and the other in 2014. The latter one is the largest barite grinding plant in North America. The barite at the Rossi Mine occurs in structurally complex chert and argillite of Ordovician Vinini Formation and Silurian to Devonian Elder Sandstone. (Halliburton Co. website, http://www.halliburton.com).

Though no work was reported for 2017, Baker Hughes, Inc., submitted a Plan of Operation to the BLM for the company's Scruffy Oz project covering 2,180 acres (882 ha) mostly in portions of the eastern part of T31N, R46E and the western part of T31N, R47E in the Argenta mining district. The project also includes the rights to barite on the adjacent Shoshone Pediment property owned by Bravada Gold Corp. Baker Hughes, Inc. The barite occurs in beds at least 10 feet (3 meters) thick hosted in black chert, limestone, and argillite of the Devonian Slaven Chert. (LR-2000 BLM Database; Mine Permit Submitte for Bravada's Shoshone Pediment Barite-Royalty Property in Nevada; Provides Corporate Update, http://finance.yahoo.com/news/mine-permit-submitted-bravadas-shoshone-220303848.html, 6/1/2016; NBMG Bulletin 98; Bravada Gold Corp., news release, 6/1/2016; Bravada Gold Corp., website, http://www.bravadagold.com)

The U.S. Forest Service is working with the BLM on permitting the Ann Barite Mine project for Halliburton Energy Services, Inc. The project covers about 2,500 acres (1,000 ha) in T12-13N, R46E in the Northumberland district, Nye County. The company proposes the construction of open pits, waste rock dumps, a jig plant for the production of barite concentrate, access roadways, and support facilities. The barite will initially be stockpiled at a staging area along U.S. 50 and then transported to the Dunphy mill for processing. The barite is hosted in Devonian dark gray chert that is likely correlative with the Slaven Chert. (Eureka County Natural Resources Advisory Commission, public meeting minutes, 6/20/2017; Elko Free Press, 6/10/2017; NBMG Bulletin 98)

The descriptions of 181 Nevada barite deposits are compiled in NBMG Bulletin 98, *Barite in Nevada*, 1984, by Keith Papke. A collection of Nevada barite samples

acquired by Keith Papke is also available at the NBMG Great Basin Science Sample and Records Library.

Cement

Domestic cement production increased 2% in 2017 to an estimated 94,700,000 tons (85,900,000 tonnes) that was valued at $12,400,000,000. Estimated apparent consumption increased 3% to 106,700,000 tons (96,800,000 tonnes) with the difference between production and consumption made up by imports from Canada, Greece, South Korea, and China. Imports (hydraulic cement and clinker) decreased 20% to 13,200,000 tons (12,000,000 tonnes) from 2016. Production, consumption, and prices are driven by the housing market and followed the construction boom up through 2005 and the crash down afterwards. The estimated average mill price increased 2% to $102.51 per ton ($113.00 per tonne) from 2016. Domestic production remained well below capacity. It had grown at a slower rate in 2015 and 2016 due to 1) an increase in imports partly in response to the technical, economic, and environmental problems in restarting long idled kilns at some plants, and 2) a decrease in oil prices and slowdown in drilling requiring well cements. A rise in oil prices and increased domestic production that cut into imports in 2017 in part negated these issues; however, hurricanes disrupted construction activities in the southern states.

The only cement producer in Nevada is Nevada Cement Co. (a subsidiary of Eagle Material, Inc. of Dallas, Texas), which has a plant in Fernley in Lyon County. The plant's annual capacity is 500,000 tons (450,000 tonnes) of cement and 560,000 tons (510,000 tonnes) of clinker. The plant produces Type I/II, low alkali, moderate sulfate-resistant cement; Type II/V, low alkali, high sulfate-resistant cement; IP portland-pozzolan moderate sulfate-resistant cement; and Class N pozzolan. The cement is manufactured from limestone mined from three areas, pozzolan from the nearby Mustache pit, iron oxide from the Barth Mine in northern Eureka County, and clay from the Terraced Hills north of Pyramid Lake. A small amount of gypsum from an undisclosed source is also added during the clinker stage of production. Over 70% of the limestone comes from the Churchill quarry in the Trinity Range about 40 miles (64 km) east of the plant. The remainder comes from the Fernley quarry, a few miles south of Fernley, and from the Relief Canyon quarry near the inactive Relief Canyon gold mine near the south end of Humboldt Range about 70 miles (110 km) northeast of the plant. The company has at least 50 years of limestone reserves.

Nevada Cement serves markets in northern Nevada and California, and the company has a rail terminal in Sacramento. Starting in February, one kiln was down for about six months and the second kiln was down for about three months for the installation of pollution control equipment to mainly reduce nitrogen oxides and sulfur dioxide emissions. This decreased the efficiency of the plant and led to higher fuel costs and $3,500,000 in increased operating costs.

The gross proceeds were $8,734,349 for the combined clay, pozzolan, iron ore, and limestone mines and the cement plant, a 7% decrease from 2016. Overall, for their fiscal year ending March 31, 2018, Eagle Materials reported their total cement sales volume and overall cement sales revenue were up 10% and 15%, respectively, from the previous year. Their average price was $107.20 per ton ($92.25 per tonne), a 6% increase from the previous year (United States District Court of Nevada, United States of America vs. Nevada Cement Co., Case 3:17-cv-00302 Document 2-1 Filed 05/12/17; Eagle Materials Inc., 10-K Report, 5/23/2018; Eagle Materials Inc., http://www.eaglematerials.com; Nevada Cement Co., http://www.nevadacement.com).

Clay

Domestic clay production decreased 2% to an estimated 27,270,000 tons (24,700,000 tonnes) with a sales value of $1,570,000,000 from 2016. The USGS divides output into: ball clay, bentonite, common clay, fire clay, fuller's earth, and kaolin. Estimated apparent consumption increased 3% to 23,100,000,000 tons (21,000,000 tonnes) from 2016. The difference between production and consumption was mainly attributable to exports, mainly to Canada, Saudi Arabia, Japan, China, Mexico, and Finland. Nevada has never been a large clay producer, and the state's 2016 clay production only accounts for 0.57% of domestic production. The state's production (not including clay produced from stockpiles) increased 54% to 154,623 tons (140,273 tonnes). The gross proceeds for all Nevada clay production decreased 34% in 2017 to $10,834,232.

IMV Nevada, a subsidiary of Lhoist North America, produced 24,571 tons (22,291 tonnes) of sepiolite, a 49% decrease from 2016. The company also produced saponite clay (essentially bentonite without calcium) in 2017. Both clays were processed from stockpiles that were mined in 2016. In December, IMV Nevada announced an average 3% to 8% price increase on most of its clay products to cover rising energy, personnel, capital, and operating costs.

Bentonite is a white to off-white, calcium-based montmorillonite with an unusually well-developed dioctahedral crystalline structure and an extremely high cation exchange capacity. Saponite is similar to montmorillonite except that magnesium has replaced all or most of the aluminum and exchangeable sodium. It is a swelling clay with a trioctahedral structure and a flat tubular mica-like crystal and a low cation exchange

capacity that imparts thixotropy to aqueous solutions. Saponite has the same uses as bentonite but is more stable due to a much lower cation exchange capacity. Sepiolite is a hydrous magnesium silicate in the same clay family as attapulgite. It is structurally similar to bentonite and saponite, but the crystals are much more highly ordered and contain very few of the imperfections which give rise to enhanced cation exchange capacity. The nearly perfect crystal structure, which forms long "ribbons", contributes to high thermal stability, and helps impart viscosity to aqueous suspensions. Unlike bentonite and saponite, sepiolite is unaffected by electrolytes and can gel salt solutions. While similar to attapulgite, it is more efficient in some applications, such as asbestos replacement and reinforcing systems and is also an excellent binder. The clays occur in shallow, flat-lying deposits in Pliocene lacustrine rocks in the Ash Meadows-Amargosa Flat area of Nye County. It is processed at the company's Amargosa Valley plant, and clay products are exported worldwide for use in drilling mud, construction, and animal feed. The sepiolite and saponite deposits have unusual geology and are considered to have originated in a Pliocene playa with an area of at least 22 square miles (57 square km). The sepiolite, which yields most of the profits for the operation, occurs in an almost continuous bed with an average thickness of about seven feet (2 meters). IMV Nevada is the only commercial producer of sepiolite and saponite in North America. (Lhoist North America, news release, 12/1/2017; Lhoist North America, website, https://www.lhoist.com/us_en/imv-nevada).

Two companies intermittently mine and ship minor amounts of Nevada smectite 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 deposits in Nevada, Arizona, and California. The company mined 2,200 tons (2,000 tonnes) of smectite from the New Discovery Mine just south of Beatty, a 29% increase from 2016. Prior to 2016, the mine had been shut down since November 2011, and was again temporarily shut down on March 31, 2017. However, the company mined 4,243 tons from the Blanco Mine located about 40 miles (64 km) west-southwest of Tonopah in the Coaldale mining district in Esmeralda County. The company did not mine there in 2016, and the mine again was temporarily shut down on May 1, 2017. The Buff and Satin Mines about 10 miles (16 km) northeast of Lovelock in the Willard mining district in Pershing County have been temporarily shut down since December 2012, but the company did process and ship from stockpiles. The company shipped 2,948 3,236 tons (2,674 tonnes) after processing from stockpiles from all of the mines, a 9% decrease from 2016. The clay at the New Discovery Mine is derived from altered perlite and periltic pitchstone interbedded in Tertiary tuff-breccia. The clay at the Blanco Mine is derived from altered tuff and tuffaceous sedimentary rocks of the late Miocene to early Pliocene Esmeralda Formation. The clay at the Satin and Buff Mines is derived from late Miocene to early Pliocene altered welded and non-welded tuffs. (Vanderbilt Minerals Co., website, https://www.vanderbiltminerals.com).

The American Colloid Co. intermittently produces calcium bentonite from its Nassau property in Coal Canyon in the Willard mining district for use in specialty clay products. The company mined the deposit in 2016 but not in 2017. However, the company did ship 900 tons (816 tonnes) in 2017 from stockpiles both onsite and offsite. The clay is hosted in altered rhyolite tuff-breccia of probable Miocene-Pliocene age. (American Colloid Co., website, http://www.colloid.com).

The Nevada Cement Co., mined 13,655 tons (12,388 tonnes) of halloysite, on an as-needed basis, from its company-owned Flanagan pit in the Terraced Hills about 8 miles (13 km) northwest of Pyramid Lake, a 46% decrease from 2016. Because of its high alumina content, halloysite is used in the production of Portland cement at the Nevada Cement Co. plant at Fernley. The halloysite occurs in partly altered, lapilli tuff in a pyroclastic unit separating late Miocene to Pliocene andesitic and basaltic flows. In the past, the Art Wilson Co. was contracted to mine the clay, but Nevada Cement Co. employees have mined the clay since 2014. (Nevada Cement Co., website, http://www.nevadacement.com).

Precious Minerals Mining and Refining Corp. sells a volcanically derived clay-based mineral under the trade name Orykta™ as a soil and animal feed additive. The two main components reported in Orykta™ are natrojarosite and gypsum. The company produced 3,000 tons (2,700 tonnes) of material from East Walker Clay Mine in the Washington mining district in Lyon County in 2014, but no production has been reported since then. The company's 1998 approved plan of operation allowed for annual production of up to 36,500 tons (33,100 tonnes). (Precious Minerals Mining and Refining Corp. website, https://www.oryktamineralgoods.com).

Exploration and processing of lithium-bearing clays are described below in the section on lithium. The descriptions of 31 Nevada clay deposits are compiled in NBMG Bulletin 76, *Montmorillonite, Bentonite, and Fuller's Earth Deposits in Nevada*, 1970, by Keith Papke. A collection of Nevada clay samples acquired by Keith Papke is also available at the Nevada Bureau of Mines and Geology Great Basin Science Sample and Records Library.

Diatomite

The United States is the world's largest producer of diatomite. Domestic production increased 2% to an estimated 772,000 tons (700,000 tonnes) valued at $200,000,000. Estimated apparent consumption decreased 2% to 678,000 tons (615,000 tonnes), and exports increased 44% to 105,000 tons (95,000 tonnes). Production was from six companies with 12 mining areas and nine processing facilities in California, Nevada, Oregon, and Washington. Nevada produced 277,043 tons (251,332 tonnes) of diatomite, a 24% increase from 2016. The gross proceeds increased 4% to $45,988,975. About two-thirds of the diatomite produced in Nevada is used in filtration, and the remainder is largely used in absorbents, fillers, and cement. Emerging small-scale uses include pharmaceutical processing and nontoxic insecticides. The estimated average free on board plant price increased 2% to $242 per ton ($290 per tonne) from 2016.

EP Minerals, LLC, produced most of Nevada's diatomite. Its Colado plant and mine in Pershing County is the company's largest Nevada operation and produced 199,488 tons (180,974 tonnes), a 2% increase from 2016. It consists of a plant at Lovelock that mostly makes filtration products from diatomite mined from a series of pits about 15 miles (24 km) to the northwest in the Velvet mining district. The diatomite occurs as thick beds interbedded with freshwater tuffaceous sedimentary rocks of probable Miocene age. The diatomite has to be dry before processing. Most diatomite is about 3% water, but the diatomite at the Colado Mine is 50% water. It is mined in the summer and laid out in the sun to dry. Despite the wetness of the diatomite, there is no groundwater for at least 2,000 feet (600 meters) below the pit, and water needed for the operation has to be hauled in from Lovelock (Elko Daily Free Press Mining Quarterly, Winter 2016).

EP Minerals LLC processed diatomite used in fillers and absorbents at its Clark plant in the Clark mining district, Storey County, about 20 miles (32 km) east of Reno. The nearby Clark Mine produced 6,249 tons (5,669 tonnes) and shipped 87,112 tons (79,027 tonnes) of diatomite, a 38% increase from 2016. The diatomite at Clark contains about 90% of the diatom *Melosira granulate*, and is interbedded with Neogene diatomaceous shale and thin beds of lacustrine volcanic tuff. The company also produced 31,221 tons (28,323 tonnes) at its Fernley mine and mill, a 0.8% decrease from 2016. The Fernley diatomite was processed into absorbent products, cat litter, and soil conditioner. The mine and mill (acquired from the Moltan Company in 2013) are located about 20 miles (32 km) northeast of Fernley in the Desert mining district. The company also produced 9,363 tons (8,494 tonnes) from its Hazen pit on the Lyon/Churchill County line, a 0.2% increase from 2016. EP Minerals LLC was bought out by U.S. Silica Holdings, Inc., for $750,000,000 in early 2018 (U.S. Silica Holdings, Inc., news release, 3/23/2018).

Imerys Minerals of California, Inc., (formerly Celite Corp. and World Minerals, Inc.) operated a plant in Fernley that produced functional fillers from 28,300 tons (25,674 tonnes) mined from the company's Nightingale deposit north of Fireball Ridge in Churchill County, a 29% increase from 2016. The company's Hazen pit, which had been mined since 1950 and still has reserves, has been on standby since 2009. The diatomite deposits mined at both Nightingale and Fernley are interbedded with Neogene lacustrine tuffaceous shale, sandstone, and limestone, and siliceous tuff.

Grefco Minerals Inc.'s diatomite operation near the Esmeralda/Mineral County line is small relative to other Nevada diatomite companies but has been producing diatomite for many years, mainly for fillers. The company campaign mines and then processes material from the resulting stockpiles. The mine was idle from 2004 through 2011 but mining resumed in 2012. The company mined 2,422 tons (2,197 tonnes), a 50% decrease from 2016. The deposit is in Miocene-Pliocene lacustrine sedimentary rocks consisting of diatomite, argillaceous and calcareous diatomite, clay, sand, and volcanic ash, and the main diatoms are *Melosira granulate*, *Stephanodiscus aslraea*, and *Eunotia robusta*.

Dimension Stone and Landscape Rock

Domestic production of dimension stone was 3,010,000 tons (2,730,000 tonnes) valued at $440,000,000, decreases of 2% and 1% respectively from 2016. Estimated value of apparent consumption was $2,570,000,000. Nevada supplied local and regional markets, and produced 7,271 tons (6,596 tonnes) of dimension stone and at least 233,000 tons (211,000 tonnes) of crushed landscape and decorative rock. The estimated value was at least $20,000,000.

Mt. Moriah Stone Quarries LLC, quarried flaggy quartzite of several colors from the Cambrian Prospect Mountain Quartzite at a quarry about 15 miles (24 km) north of Baker in White Pine County. The company produced 4,966 tons (4,505 tonnes), a 75% increase from 2016. This material, which naturally splits into large slabs, is used for flagstone, ashlar (uncut facing stone), and other types of uncut building stone. The operation commonly shuts down during the last month of the year through the first quarter of the following year.

Las Vegas Rock produced 2,305 tons (2,091 tonnes) of cut decorative slabs, flagstone, ashlar, boulders, and 75,904 (68,860 tonnes) of crushed

landscape rock from its Rainbow quarries near Goodsprings, about 32 miles southwest of Las Vegas at the base of Mount Potosi. The operation consists of a main quarry and a number of satellite quarries located according to the color of the stone. The stone is mined from the Jurassic Aztec Sandstone, and technical data including hardness, strength, and composition are available on the company's website (Las Vegas Rock website http://vegasrock.com).

Kalamazoo Materials Inc. of Tucson, Arizona produced 157,285 tons (142,688 tonnes) of crushed stone for landscaping from the Beatty quarry located about 5 miles (8 km) north of Beatty. The company's Modoc quarry about 16 miles west of Searchlight was mined in 2015 but not in 2016 or 2017. The Modoc quarry is mainly in Precambrian gneiss, schist, and granitic rocks In 2010, D and H Mining leased the pits making up the Beatty quarry to Kalamazoo. These pits produce from Pliocene tuff, which in the past, D and H Mining mined and sold under the name of "Spicerite" (strong, bright white, hydrothermally altered tuff used to make bricks and blocks). (Kalamazoo Materials website, http://www.kalamazoomaterials.com).

The amount of landscape rock produced is likely greater than the estimate given above. Vista Landscape Center, Inc., of Henderson, Nevada, sold decorative stone mined from quarries near Searchlight and Crescent Peak 20 miles (30 km) west of Searchlight. R.T. Donovan Co. and Reno Rock Transport of Reno, Cheyenne Rock of North Las Vegas, and others also sold decorative rock produced in Nevada. (Cheyenne Rock website, https://cheyennerock.com; R.T. Donovan Co. website, http://www.rtdonovan.com; Reno Rock Transport website, http://www.renorock.net; Vista Landscape Center, Inc., website, http://www.vistalandscape.com).

Gemstones

The combined value of the domestic production of natural and synthetic gemstones was $71,000,000, a 6% increase from 2016. Nevada ranked fourth, after Oregon, Arizona, and Idaho, which are among 11 states that accounted for 92% of domestic production of natural gemstones.

Precious opal is produced from several small mines in the Virgin Valley area of northern Humboldt County, a well-known source of gemstones in North America. The best known mines are the Royal Peacock, Rainbow Ridge, and Bonanza Mines, which produce about 500 pounds (225 kg) of precious opal, opal potch, and wood opal annually from pay-to-dig operations. The opal occurs in lacustrine sedimentary rock, volcanic ash and tuff, and bentonite. Lone Mountain Mining, LLC, produced about 1,000 pounds (450 kg) of turquoise from the Lone Mountain Mine in T1N, R41E, sections 7 and 18 in the Lone Mountain district in Esmeralda County. The turquoise is present as nodules associated with silicification and argillization in thinly bedded calcareous shale. The Blueridge Mine operated by the Wintle family produced a few pounds of variscite in 2016, but no production was reported for 2017. The Blueridge Mine is in T28N, R47E, sections 19, 20, 29, 30 in the Bullion district of Lander County. The May Turquoise Mine in T29N, R47E, section 28 produced about 100 pounds of turquoise from a small, hand-mined pit. Gemfield Gem produced chalcedony from a pay-to-dig operation on five claims in T2S, R42E, sections 29 and 39 in the Montezuma district, Esmeralda County. The reported gross proceeds for gemstones increased 21% to $174,663 from 2016. The descriptions of 68 mines and districts are compiled in NBMG Report 17, *Turquoise Deposits of Nevada*, 1968, by Frank R. Morrissey.

Graphite

Natural graphite was not produced in the United States during 2017, though 26,000 tons (24,000 tonnes) valued at $42,900,000 were consumed, a 4% increase from 2016. One use of graphite is as the anode in lithium ion batteries, and the Gigafactory being built by Tesla Motors at Patrick (see Lithium) is expected to need up to 103,000 tons (93,000 tonnes) of flake graphite once full production is reached.

In 2015, Ravenline Explorations, Ltd., a subsidiary of Matica Enterprises, Inc., conducted an extensive mapping and sampling program on the Grumpy Lizard graphite project. The project covered 1,920 acres (777 ha) in T29N, R26-27E in the Bluewing Mining District of Pershing County and T18N, R45E in the Birch Creek mining district of Lander County. In the Bluewing district, the area of interest is a zoned complex covering an area of about six miles by nine miles (10 km by 15km) with the graphite occurring in andalusite schist zones between six feet and 140 feet (2 meters and 42 meters) thick and up to two miles (3 km) along strike. Little work was reported for 2016, and the company dropped the claims in September 2017. (Andalusite var Chiastolite, by James Carr, 2010, https://mineralogicalrecord.com/pdfs/CHIASTOLITE%20ARTICLE.pdf; Matica Enterprises, Inc., news releases, 1/14/2015, 7/20/2015; Matica Enterprises, Inc., Management Analysis and Discussion, 4/30/2018)

In February, Global Li-Ion Graphite Corp. (formerly Thelon Diamonds, Ltd.) entered into an option agreement with GeoXplor Corp. to acquire a 100% interest in the Chedic graphite project in T15N, R19E sections 25 and 26 in the Voltaire district near Carson City. The agreement was for $350,000 and 2,000,000 shares of common stock plus conducting at least $1,200,000 of exploration work over a five-year period.

In December, the U.S. Forest Service approved the company's Plan of Operation, and the company commenced drilling the property in early 2018. The graphite is hosted in Upper Triassic to Lower Jurassic metasedimentary rocks intruded by the Sierra Nevada batholith, and is thought to have been carbonaceous sediments metamorphosed to graphite. The property contains the Chedic graphite mine, also known as the Voltaire mine and Carson Black Lead mine, opened by Walter Chedic in the early 1900s. A graphite body between 10 feet and 35 feet (3 meters and 11 meters) was previously mined from a pit 120 feet (36 meters) wide by 20 feet (6 meters) deep. Graphite was also exposed in small cuts 200 feet (60 meters) and 600 feet (180 meters) east of the pit. (Global Li-Ion Graphite Corp. news releases, 2/20/2017, 7/26/2017, 12/8/2017, 1/15/2018, 2/23/2018; Global Li-Ion Graphite Corp. website, https://globalli-iongraphite.com).

Gypsum

Domestic crude gypsum production was 17,090,000 tons (15,500,000 tonnes) valued at $144,000,000, increases of 3% for both from 2016. Synthetic gypsum produced from scrubbed emissions from coal-fired power plants offset the production of crude gypsum. The production of synthetic gypsum was 17,600,000 tons (16,000,000 tonnes), a 4% decrease from 2016. Estimated apparent consumption of all gypsum increased 5% in 2017 to 42,200,000 tons (38,300,000 tonnes). Overall production and consumption have increased annually since 2009. The difference between production and consumption was mostly made up with imports from Mexico, Canada, and Spain, which increased 11% to 5,290,000 tons (4,800,000 tonnes) in 2017. The estimated price of crude gypsum was $7.44 per ton ($8.20 per tonne) free on board from the mine, a 3% increase from 2016. Interestingly, the U.S. has the largest known gypsum reserves at almost 800,000,000 tons (700,000,000 tonnes), but China accounts half of the world's gypsum production of 287,000,000 tons (260,000,000 tonnes).

Nevada was the leading producer of gypsum in the United States. The state's gypsum production was 3,530,520 tons, (3,202,867 tonnes), a 9% increase from 2016. This was the fifth annual increase in six years surpassing the previous production record of 3,397,974 tons (3,082,622 tonnes) in 2014. The reported gross proceeds was $40,879,177, a 10% increase from 2016.

PABCO Gypsum in Clark County northeast of Las Vegas was the largest Nevada producer with production of 1,461,632 (1,325,984 tonnes), a 6% increase from 2016. PABCO Gypsum processes its gypsum to make wallboard at a plant adjacent to their mining operation. The plant has an annual capacity of 1,260,000,000 square feet (117,000,000 square meters) of wallboard. The gypsum ore occurs in a nearly flat-lying late Miocene gypsite blanket atop a 5-square-mile (13-square-km) mesa. Drilling indicates the gypsum is at least 120 feet (37 meters) thick in the area of current mining (NBMG Bulletin 103; PABCO Gypsum website, http://www.pabcogypsum.com).

Gypsum Resources Materials, LLC, mined 980,520 (889,522 tonnes) of gypsum from the Blue Diamond pit, a 24% decrease from 2016. The operation covers over 3,000 acres (1,200 ha), and the company processes the gypsum at its plant adjacent to the mine. The operation serves Nevada, Arizona, and southern California, and is looking to expand markets into Oregon and Washington. The gypsum is interbedded with limestone, dolomite, and red shale of the Lower Permian Kaibab Formation. The gypsum is used for wallboard and cement with about two-thirds being shipped to California's Central Valley for agricultural use, largely as a soil amendment. Before the collapse of the housing market in the mid-2000s, BPB, PLC, was mining gypsum at Blue Diamond. Because it was in the path of metropolitan growth, the company ended production in 2004. Jim Rhodes then acquired the property and formed Gypsum Resources materials, LLC. His intention was to develop the property into master community and mine the gypsum in the meantime. Concerns of the project's impact in a still rural area and on the nearby Red Rock Canyon Conservation Area, re-zoning of the area for rural housing (maximum of 1,500 homes), and the collapse of the housing market shortly thereafter put the project on hold. Recently, Mr. Rhodes has again proposed to develop the area and this time have the area rezoned to construct 5,025 homes at the site, since scaled back to 3,500 homes, while continuing to mine gypsum as the homes were being built. He again is facing opposition including a lawsuit from the environmental group Save Red Rock. Also, he proposed selling 1,375 acres (556 ha) of mining claims to Denver investment firm Resource Land Holdings. That deal went through in early 2018 for $3,400,000. (Las Vegas Sun, The Battle to Build Near Red Rock Canyon is Coming to a Head Again, 2/20/2017; Las Vegas Review-Journal, Developer Jim Rhodes Ups Mining Investment in Blue Diamond Hill, 3/29/2018; NBMG Bulletin 103; Gypsum Resources, LLC, website, http://www.bdhgypsum.com).

Empire Mining Co. LLC produced 50,000 tons (45,360 tonnes) of gypsum and 600,000 tons (544,300 tonnes) of anhydrite from its Empire Mine. In May 2016, USG Corp. sold its Empire mine and adjacent company town of Empire in Washoe County to Empire Mining Co., LLC, for $11,380,000, and Empire Mining commenced production on September 15, 2016. The gypsum and anhydrite were shipped to companies that make fertilizer and cement and for use in lithium extraction. The company was also seeking a partner to

lease the existing mill and manufacturing plant. The gypsum and anhydrite occur form ten orebodies within an area 2 miles (3.2 km) in diameter. The 4,400-feet by 2,200-foot (1,340-meter by 670-meter) Selenite orebody in the largest. The gypsum is white, fine-grained, and nonfriable. It occurs in beds grading 85% to 95% gypsum in limestone, marble, and metasiltstone (NBMG Bulletin 103; Washoe County Assessor, 2016; Nevada Business Search, 2016; Reno Gazette-Journal, Empire Mining Co. will only restore part of ghost town, 3/19/2016; Empire Mining Co., LLC, website, https://www.empireminingco.com).

The Art Wilson Co., of Carson City produced 388,368 tons (352,325 tonnes) of gypsum from the Adams Mine near the town of Moundhouse in Lyon County, a 7% decrease from 2016. It is mainly used as a soil amendment and livestock feed additive. The Adams deposit is a folded body associated with limestone in Triassic metavolcanic rocks. In 2015, the Art Wilson Co. was acquired by ACG Materials (formerly Harrison Gypsum Co.) of Norman, OK, but retained its name. (ACG Materials, website, http://www.acgmaterials.com/art-wilson-company).

H. Lima Nevada, LLC, produced 50,000 tons (45,360 tonnes) of gypsum from its Lima Nevada Gypsum quarry, a 31% decrease from 2016. The company acquired the Pioneer Mine, located about 10 miles (16 km) east of Las Vegas, from the Pioneer Gypsum Mining Co. in February 2015 and renamed it. The property consisted of 330 acres (133 ha) of claims. In November, the company filed a Plan of Operations with the BLM for new and expanded construction of an open pit mine and supporting facilities. The Lima Nevada Gypsum quarry mines the same late Miocene gypsite deposit as the PABCO operation. The gypsum is used as a soil enhancer and cement retarder (Plan of Operations, H. Lima Nevada, LLC, Lima Nevada Gypsum quarry, 11/2017).

Georgia-Pacific Gypsum LLC operated a plant at Apex using synthetic gypsum and crude gypsum imported from Saint George, Utah, for the production of drywall and related products. The plant has an annual capacity of 270,000,000 square feet (25,000,000 square meters) of wallboard. It also owns the Weiser Ridge quarry about 10 miles (16 km) west of Overton, which has not been mined since 1995. The quarry is in gypsum interbedded with limestone of the Permian Toroweap and Kaibab Formations. The company issued a technical support report for the renewal of its operating permit for the county (Georgia-Pacific Gypsum LLC, Technical Support Document, 11/2015; Georgia-Pacific Gypsum LLC, website, http://www.gp.com).

CertainTeed Gypsum Manufacturing Inc. produced gypsum board, land plaster (soil amendment), and plaster products from its plant at Blue Diamond, Clark County. The plant has an annual capacity of 700,000,000 square feet (65,000,000 square meters) of wallboard. The plant has two sources of gypsum. The company acquires gypsum from the nearby Blue Diamond Hill Mine operated by Gypsum Resources Materials, LLC, and from the Black Rock Mine in Mohave County, Arizona, about 120 miles (190 km) northeast of Blue Diamond, which trucks the gypsum to the plant. (Las Vegas Sun, The Battle to Build Near Red Rock Canyon is Coming to a Head Again, 2/20/2017; Water Conservation Plan, CertainTeed Gypsum Manufacturing, Inc., 6/5/2015; CertainTeed Gypsum Manufacturing, Inc., website, http://www.certainteed.com).

The descriptions of 26 Nevada gypsum deposits are compiled in Nevada Bureau of Mines and Geology Bulletin 103, *Gypsum Deposits in Nevada*, 1987, by Keith Papke. A collection of Nevada gypsum samples acquired by Keith Papke is also available at the Nevada Bureau of Mines and Geology Great Basin Science Sample and Records Library.

Iron Oxide

The USGS reports iron ore that is not used in general iron and steel production as iron oxide pigments (IOP). This includes use in concrete and other construction materials (54%); coatings and paint (20%); foundry uses (9%); and animal food, magnetic tapes, and other uses (17%). The estimated combined amount of sold or used finished natural and synthetic IOP increased 5% in 2017 to 60,600 tons (55,000 tonnes) valued at $85,000,000. Estimated apparent consumption of combined naturally and synthetically produced IOP increased 7% to 256,000 tons (232,000 tonnes). About 82% of IOP consumed was imported. The estimated average price was $1,397 per ton ($1,540 per tonne), a 2% increase from 2016. Nevada's production of IOP was small and not reported. The gross proceeds was $668,663, a 5% decrease from 2016.

Saga Exploration Co. was the only company to produce IOP (reported as iron oxide) in Nevada, and that was shipped from stockpiles at the Nevada Barth Mine in Eureka County. The iron ore consists mostly of hematite and some magnetite, and is used in the manufacturing of cement by the Nevada Cement Company in Fernley. The American Smelting and Refining Company leased the property from the Central Pacific Railroad Company and mined 544,295 tons (439,780 tonnes) of iron ore between 1903 and 1918 for use as flux in their lead smelter in Salt Lake City. Lessees continued to work the property off and on afterwards with some mining in the 1960s and 1970s. Saga Exploration has shipped iron ore from stockpiles since 1993.

Lime, Limestone, and Dolomite

Domestic production of quicklime and hydrate was an estimated 19,800,000 tons (18,000,000 tonnes) increased 2% in 2017 and was valued at $2,300,000,000. Apparent consumption also increased 2% to 19,800,000 tons (18,000,000 tonnes). Peak production of 23,100,000 tons (21,000,000 tonnes) and consumption of 23,400,000 tons (21,200,000 tonnes) occurred in 2006. The average price at the plant was $112 per ton ($123 per tonne) for hydrate and $135 ($149 per tonne) for hydrate, a 2% increase for each from 2016. The USGS rolls its production figures of limestone and dolomite not used in lime production into the figure for crushed stone, and in 2017, 70% of the crushed stone produced nationwide was from limestone and dolomite.

Nevada limestone production was 3,241,447 tons (2,940,621 tonnes), a 0.8% increase from 2016. Nevada dolomite production was 319,146 tons (289,527 tonnes), a 2% decrease from 2016. The gross proceeds were $35,017,798 for limestone (including cement) and $4,412,622 for dolomite, increases of 2% and 5%, respectively, from 2016.

Nevada's largest lime producer, Lhoist North America (formerly Chemical Lime Co.), produced lime at Apex in the Apex Mining District about 20 miles northeast of Las Vegas. The operation produced 1,254,000 tons (1,138,000 tonnes) of limestone and 268,000 tons (258,000 tonnes) of dolomite, decreases of 0.5% and 5%, respectively, from 2016. 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 hydrated dolomitic lime for building and home construction. Production is from the Devonian Sultan Limestone. (Lhoist North America website, https://www.lhoist.com).

Nevada's other lime producer, the Pilot Peak high-calcium lime operation of Graymont Western US, Inc. (formerly Continental Lime, Inc.) is in the Toano Range about 10 miles (16 km) northwest of Wendover in Elko County. In most years, Pilot Peak is the State's largest lime producer. The operation produced 1,465,164 tons (1,329,188 tonnes) of limestone, a 19% increase from 2016. The plant has three kilns with a combined capacity of more than 700,000 tons (635,000 tonnes) of quicklime per year and a hydrated lime plant capable of producing 350 tons (320 tonnes) per day. Pilot Peak mainly markets lime to gold-mining operations for use in cyanide-solution pH control. During 2017, a new baghouse was completed with a second one under construction at year's end. Production is mainly from the Devonian Devils Gate Limestone. (Graymont Western US, Inc. 2017 Sustainability Report, 3/20/2018; Graymont Western US, Inc. website, http://www.graymont.com).

As noted in the Cement section, Nevada Cement Co. mines limestone from three quarries. The company's main production came from its Churchill mine in the Trinity Range about 40 miles east of the plant. There the company mined 376,628 tons (341,675 tonnes) from Mesozoic marble. The company mined 94,687 tons (85,507 tonnes) from Tertiary lacustrine limestone deposits in its main quarry a few miles south of Fernley. The company also mined 46,044 (41,771 tonnes) from massive limestone beds in the Upper Triassic Natchez Pass Formation near Relief Canyon in the southern Humboldt Range about 70 miles (110 km) northeast of the plant. These mark decreases of 31%, 10%, and 23%, respectively, from 2016. The decreases are mainly due the kilns being off line for extended periods in order to add pollution controls.

Aggregate Industries produced over 2,400,000 tons (2,200,000 tonnes) of crushed limestone, a 19% increase from 2016, from its Sloan quarry a few miles south of Las Vegas. The crushed limestone is used as aggregate along with Portland cement, sand, and water to produce ready mixed concrete. As part of its South West Region Concrete Division, Aggregate Industries has a series of ready mix plants in North Las Vegas, Sloan, and Summerlin. Since it is used as aggregate, the Sloan production is included with that for crushed stone in the section on aggregate (Aggregate Industries website: http://www.aggregate-us.com/products-services/Ready-mixed-concrete/las-vegas).

Of Nevada's specialty dolomite and limestone producers, the Nutritional Additives Corp. produces agricultural and nutritional dolomite products along the northwest edge of the Sonoma Range about five miles (8 km) south of Winnemucca. The company processed 1,581 tons (1,434 tonnes) from the Triassic Dun Glen Formation, a 6% decrease from 2016. Min-Ad, Inc., a subsidiary of Inter-Rock Minerals Inc. of Toronto, Canada, produced 49,565 tons (44,965 tonnes), a 22% increase from 2016, also from the Dun Glen Formation, about three miles south of the Nutritional Additives Corp. operation. Their dolomite is mostly sold to Midwestern states and as far as New York and Alberta for use in beef and dairy feed. Art Wilson Co. of Carson City produced 4,924 tons (4,467 tonnes) of pure calcitic limestone from its Adams Mine, a 51% decrease from 2016. The limestone is used for soil pH control and reportedly contains no detectable magnesium.

Lithium

The U.S. Geological Survey keeps production and actual consumption confidential. Domestic consumption has been stable at 2,200 tons (2,000 tonnes). but increased to 3,300 tons (3,000 tonnes) for both 2016 and 2017. Nevada is the only state with domestic production of raw lithium materials. Subsurface brines were the dominant raw material for lithium carbonate production worldwide because of low production costs, as compared with the mining and processing costs for hard-rock ores, largely spodumene. However, with the growth of demand from China over the last few years, hard-rock lithium operations in Australia, Brazil, Canada, and China are estimated to have supplied about half the market since 2014. A spodumene operation in Australia along with two brine operations in Chile dominated world production in 2017. New brine operations under development in Argentina, Bolivia, Chile, and China; new spodumene mines were under development in Canada, China, and Finland; and a jadarite mine was under development in Serbia. Two new spodumene operations ramped up concentrate production in 2017.

Lithium was produced as a by-product from brine in California since 1938, but the Nevada operation, initiated at Silver Peak in Esmeralda County in 1966 by Cyprus Mines, was the first to extract lithium as the sole commercial product from brine. This operation was the world's dominant lithium producer until the late 1980s, when a Chilean lithium brine operation started up, followed by brine operations in Argentina and China. U.S. lithium imports increased 9% to 3,770 tonnes (3,420 tonnes) from 2016. This is the fourth consecutive annual increase and is up 61% from 2,348 tonnes (2,130 tonnes) in 2014. Exports increased 22% to 2,040 tons (1,850 tonnes) from 2016. Global production increased 13% to 47,400 tons (43,000 tonnes). Most of the increase was due to lithium-based rechargeable battery sales, which accounted for 46% of the global lithium market, up from 39% in 2016. Ceramics and glass account for 27% and lubrication grease for 7% of the market. The remainder includes air treatment, metallurgy, polymers, pharmaceuticals, aluminum production, and other uses. Throughout 2017, spot prices for lithium carbonate ranged between $6.68 and $10.89 per pound ($15–$24 per kg) in China. However, the average annual price of lithium carbonate in the United States was $6.30 per pound ($13.90 per kg) a 61% increase from 2016. (*Industrial Minerals*).

One of the reasons for the lithium rush in Nevada described below is the Tesla Motors, Inc., Gigafactory 1 at Patrick in Storey County. Construction began in June 2014 with full production expected at the time to begin in 2018. While a number of factors have pushed back that expectation, and the building was only about 30% completed by the end of 2017, the factory was in operation. It was producing at a sustained rate 3,000 battery packs per week for the company's Model 3 mass-market electric sedan with the amount of time to produce a pack being reduced from seven hours to 70 minutes. It was also producing the Model 3 drive units as well as Powerwalls and Powerpacks. The last two are rechargeable lithium-ion battery stationary energy storage products with Powerwall for home use and Powerpack for commercial or electric utility grid use.

Once in full production, the Gigafactory 1 will more than double the present world production of lithium-ion batteries and also produce batteries for significantly less cost using the economies of scale, innovative manufacturing, reduction of waste, and vertical integration—having most manufacturing processes under one roof. Tesla Motors Inc. originally projected producing 500,000 electric cars annually by 2020. This rate will require an annual production of 27,000 tons (24,500 tonnes) of lithium compounds on top of the present annual world production of almost 40,000 tons (36,000 tonnes). The company stated that it prefers to have lithium sourced as close as possible to its Gigafactory, preferably North America, but has had to go abroad for a supply. While Nevada is well placed as a potential supplier, but only the Albemarle Silver Peak operation is presently producing. Tesla Motors, Inc., has a conditional supply agreement with Pure Energy Minerals, which has a lithium brine property in Clayton Valley, but that company has yet to produce any lithium. Tesla Motors, Inc., most recently signed an offtake agreement for lithiumsupplies from Mount Holland, Australia, under a joint venture between Kidman Resources Ltd. and SQM, and was in negotiations with SQM for supplies from Chile.

Besides lithium, the batteries will also require significant amounts of graphite and cobalt. Panasonic Corp. of Japan presently manufactures the batteries and has not disclosed the exact composition, but it has been estimated that each kilowatt-hour will require 0.23–0.46 lbs. (104–208 g) of cobalt, 1.3–1.8 lbs. (590–820 g) of lithium, and 2.6–3.5 lbs. (1.2–1.6 kg) of graphite. Graphite, which is used on the anode, may also be replaced with lithium titanate, which reduces battery charging times and has the potential of increasing the lithium market even more (Tesla Motors, Inc., website, http://www.teslamotors.com; *Industrial Minerals*; Electrek, 2/12/2018; https://electrek.co/2018/02/12/ tesla-gigafactory-1-building-permits-expansion; Electrek, https://electrek.co/2018/05/17/tesla-secures-dea-lithium-australia; USA TODAY, 5/3/2018, https://www.usatoday.com/story/money/cars/2018/05/03/teslas-battery-gigafactory-hits-new-output-levels/576017002/; Tesla Powerwall, https://en.wikipedia.org/wiki/Tesla_Powerwall;

Lithium-titanate Batteries, https://en.wikipedia.org/wiki/Lithium-titanate_battery).

Albemarle U.S., Inc., shipped 10,233,341 pounds (4,642 tonnes) of lithium compounds, from its Silver Peak operation, a 10% increase from 2016. The gross proceeds increased 70% to $39,621,926 from 2016. The operation produced lithium carbonate and lithium hydroxide anhydrous. The former is used in the production of aluminum and ceramics, and the latter is used carbon dioxide scrubbers. The lithium chemicals are produced by solar evaporation pre-concentration and subsequent refining techniques of lithium chloride brine pumped from beneath the Clayton Valley playa. The brine varies between 100 and 300 ppm lithium. The operation covers 15,301 acres (6,192 ha), and the company estimates that at an annual production rate of 6,600 tons (6,000 tonnes). Approximately, 20 years of reserves remain. The company also extracted a precursor of potash and bischofite as a by-product of the lithium extraction process. Rockwood Lithium, Inc. (formerly Chemetall Foote Mineral Co.) owned and operated the Silver Peak lithium facility through January 2015, when it was bought out by and became a subsidiary of bromine products manufacturer Albemarle U.S., Inc. (Albemarle Corp., 10-K Report, 12/31/2017; Albemarle Corp., website, https://www.albemarle.com; *Industrial Minerals*).

As mentioned in the Metals chapter, a large percentage of the new claims located since 2015 have been placer claims aimed at lithium exploration. Most of those claims are in playas throughout Nevada, which are somewhat similar to Clayton Valley. The exploration involves drilling and sampling of both groundwater and basin clays for lithium. Many of those exploration projects are summarized in the following text.

Alix Resources Corp., which changed its name to Infinite Lithium Corp. near the end of 2017, conducted a sampling program on its newly acquired and recently staked White Basin Property in the Muddy Mountains area in Clark County. Six samples composited from 17 sampling sites of clay-rich altered volcanic units in the Oligocene-Miocene Horse Spring Formation were analyzed and returned values ranging between 310 ppm and 3,762 ppm lithium. The property consists of 25 placer claims covering 500 acres (202 ha). (Infinite Lithium Corp., news release, 4/13/2017, 5/15/2017, 12/4/2017; Infinite Lithium Corp., website, http://www.infinitelithium.com).

In late 2016, American Lithium Corp. assayed 214 brine samples taken from 54 shallow auger holes and three sonic holes drilled on the North Playa of Fish Lake Valley in Esmeralda County. The lithium values ranged from trace to 300 mg/L. The highest 55 concentrations from the center of the playa ranged from 100 mg/L to 300 mg/L and averaged 160 mg/L. (American Lithium Corp. Management Discussion and Analysis, 6/28/2018; American Lithium Corp. news release 4/18/2017; American Lithium Corp. website, http://www.americanlithiumcorp.com).

Belmont Resources Inc. completed two core holes totaling 2,046 feet (624 meters) on its Lithium Brine project in the Kibby Basin in the Monte Cristo Valley in Esmeralda County, Nevada. The first hole targeted a basin-bounding fault defined by a gravity survey and was drilled east of the Kibby Flat playa. It encountered unconsolidated alluvial sand and gravel with minor silt, clay, and aquifers. Three clay rich zones were assayed but only contained between 20 ppm and 40 ppm lithium. The second hole was drilled in the Kibby Flat playa about 5,000 (1,500 meters) southwest of the first hole. It encountered typical playa lake sediments of fine-grained clay-rich silt and mud with thin gravel interbeds and some thicker zones of fine-grained sand. A number of water zones were also encountered. Twenty-five samples of clay were analyzed with values ranging between 70 ppm and 200 ppm. Belmont Resources Inc. acquired the Kibby Basin property in March 2016 from Zimtu Capital Corp. The property originally consisted of 16 association placer claims covering 2,560 acres (1,036 ha) over Kibby Flat mostly in sections 29 through 32, T6N, R37.5E. A NI 43-101 Technical Report without a resource was completed shortly after the acquisition. (Belmont Resources, Inc., NI 43-101 Technical Report, 5/26/2016; Belmont Resources, Inc., Management Discussion and Analyses, 5/31/2018; Belmont Resources, Inc., news releases, 4/18/2017, 5/29/2017; 6/27/2017; Belmont Resources, Inc., website, http://www.belmontresources.com).

Caeneus Minerals Ltd., headquartered in West Perth, Australia, completed two holes on its Lida Valley project in Esmeralda County. The holes targeted basin sediments defined by gravity data and inferred from resistivity data to potentially host lithium rich brines. Thirty-six groundwater samples were collected and analyzed. Lithium in the water samples were below the 20 ppm detection limit. The company subsequently dropped the project. (Caeneus Minerals, Ltd., Annual report, 10/2/2017; Caeneus Minerals, Ltd., news releases, 8/21/2017; Caeneus Minerals, Ltd., website, http://www.caeneus.com.au)

Caeneus Minerals, Ltd. also commenced a Phase I drill project on its Scotty's South-Sarcobatus Flat project, located on a playa lake in Sarcobatus Valley along U.S. 95 in Nye County about 45 miles (72 km) southeast of Clayton Valley. The valley is about 20 miles (30 km) long by about 12 miles (20 km) wide, and is the terminus for streams from an approximately 780-square-mile (2,000-square-km) drainage basin. The area contains highly anomalous concentrations of lithium, with samples from the salt flats within the valley assaying between 50 to 340 ppm lithium. Unfortunately, the drilling project was abandoned due to soft,

collapsing ground, and no samples were taken. The company subsequently relinquished the Scotty's South-Sarcobatus Flat project. (Caeneus Minerals, Ltd., Annual report, 10/2/2017; Caeneus Minerals, Ltd., news releases, 10/31/2017; Caeneus Minerals, Ltd., website, http://www.caeneus.com.au)

Caeneus Minerals Ltd. completed one hole to a depth of 1,320 feet (402 meters) near the center of its Columbus Salt Marsh project. The drilling intersected three separate lithium-bearing (Upper, Middle, and Lower) zones. The Upper zone is between 200 feet and 340 feet (61 and 104 m). Lithium-rich brine is hosted by a complex sequence of clay, salt and carbonate sediments. Lithium analyses of sediments ranged between 310 ppm to 930 ppm and averaged 560 ppm. Brine samples ranged between 21 mg/L and 95.7 mg/L, averaging 61 mg/L. The interval between 259 feet and 338 feet (79 meters to 103 meters) also averaged 3,100 g/L potassium and 851 g/L boron with the highest assays being 3,800 g/L and 1,360 g/L, respectively. The Middle zone is between 340 feet and 830 feet (104 m and 253 m) and consists of porous clay that hosts a lithium-bearing, high-density brine that differs from the Upper zone. Brine samples range between 25.8 mg/L and 42.1 mg/L and average 37mg/L. The water flow in this zone measured up to 55 gallons (208.45 liters) per minute. Lithium analyses from sediments ranged between 296 ppm and 1,000 ppm and averaged 602 ppm. The Lower zone is below 830 feet (255.38 meters) and consists of soft, saturated black clay. The clay hosts saline groundwater containing low but anomalous lithium concentrations. Brine samples collected from between 838 feet and 1,019 feet (255 m and 311 m) contained lithium concentrations ranging between 6 mg/L and 13 mg/L. Lithium analyses of sediments ranged from 480 ppm to 610 ppm and average of 537 ppm. (Caeneus Minerals, Ltd., Annual report, 10/2/2017; Caeneus Minerals, Ltd., news releases, 8/21/2017, 11/3/2017, 1/31/2018, 7/5/2018; Caeneus Minerals, Ltd., website, http://www.caeneus.com.au)

Cypress Development Corp. conducted two phases of drilling on both its Cypress Dean Lithium project and Cypress Glory Lithium project, both of which were acquired in 2016. The Dean property adjoins the east boundary of the Albemarle Corp. Silver Peak operation. The Glory project consisted of 76 lode and placer claims covering 1,520 acres (615 ha) and adjoins the south boundary of the Dean property.

Through two surface sampling programs at its Dean property in 2016, Cypress Development Corp. had identified a 0.8-square-mile (2-km^2) high grade area called the Frontera Verde zone. The area contains mineralization ranging up to 3,700 ppm lithium in uplifted lakebeds of claystone and mudstone. In the first half of 2017, it completed a Phase I drilling program consisting of nine core holes on the Dean property. Significant intercepts of lithium in basin sediments included 103.5 feet (31.6 meters) averaging 1,146 ppm, 210 feet (64 meters) averaging 1,139 ppm, and 236.5 feet (72.1 meters) averaging 1,051 ppm. The first eight holes were clustered in the central southern part of the property. The last hole (DCH-9) was drilled as a 2-mile (1.25-km) step-out in the northeast eastern area of the project area. It intercepted 281 feet (85.7 meters) averaging 1,014 ppm lithium. Starting in October, the company completed a Phase II in-fill drilling program by year's end. Five core holes were drilled in the eastern part of the Dean property. Significant lithium intercepts included 350 feet (106.7 meters) averaging 1,134 ppm including 290 feet (88.4 meters) averaging 1,206 ppm and 106 feet (32.3 meters) averaging 1,051 ppm. The drilling showed the mineralized zone covers at least 1.25 miles by 2.5 miles (2 km by 4 km), appears open on all sides, generally starts near the surface, is continuous and generally over 220 feet (67 meters) thick, thickens and increases in grade towards the east, and tilts about 10^o to the east. A NI 43-101 technical report with a resource estimate and proposal for an open pit mine straddling both properties was being prepared for release in 2018. The 14 holes drilled in the two phases totaled 3,657 feet (1,114 meters). (Cypress Development Corp. NI43-101 Technical Report, 2/3/2018, 6/5/2018; Cypress Development Corp. news releases, 1/12/2017, 2/14/2017, 5/15/2017, 6/6/2017, 6/20/2017, 8/10/2017, 8/23/2017, 9/13/2017, 10/19/2017, 11/27/2017, 12/5/2017, 1/9/2018; Cypress Development Corp., http://www.cypressdevelopmentcorp.com)

As part of the Phase II in-fill drilling program Cypress Development Corp. was conducting on its Dean property, the company also completed four core holes totaling about 1,200 feet (366 meters) on its adjacent Glory property. Significant lithium intercepts included 156 feet (47.5 meters) averaging 927 ppm, 128 feet (39 meters) averaging 702 ppm, and 193 feet (58.8 meters) averaging 659 ppm. The drilling extended lithium mineralization trend 1.25 miles (2 km) south and west from that on the Dean property. The company also continued experimenting with processes for extracting lithium from clay. Solutions of 5% to 10% sulfuric acid heated to 50^{o}C resulted in extraction rates from the low ~60% to up to 74%. (Cypress Development Corp. news releases, 10/19/2017, 11/27/2017, 12/5/2017, 1/9/2018, 2/7/2018; Cypress Development Corp., http://www.cypressdevelopmentcorp.com)

In 2016, Dajin Resources Corp. conducted a 12-mile (19-km) high resolution seismic survey to help define targets for drilling and assist in defining any inferred mineral resource at its Teels Marsh Lithium Brine project in the Teels Marsh mining district (mostly T4N, R32-33E) of Mineral County. In March 2017, the company released its report and interpretation of the survey and a NI 43-101 technical report on the property.

The basin is about 4.3 miles (7 km) long by about 0.6 to 1.4 miles (1 to 2.4 km) wide and trends in a N20E to N30E direction. It is bounded by normal faults and consists of a composite northwest-tilted half-graben. This half-graben is filled with mostly unconsolidated sediments dipping northwesterly to westerly with dips progressively increasing from horizonatal near the surface to as much as 25° at 6,560 feet (2 km) depth. The basin is at least 8,200 feet (2,500 meters) deep. A number of seismic reflectors are present which are variable is strength with depth but can be traced for long distances. The nature of the reflectors cannot be verified until drilled, but they suggest stratification of the basin fill. Some of the reflectors may be due to accumulations of volcanic ash such as the Bishop Tuff from the Long Valley caldera.

The Teels Marsh Lithium Brine project consists of 403 placer claims covering 7,914 acres (3,202 ha). During the year, the company acquired the water rights for the project site. The claims are also overlapped by geothermal leases belonging to Geothermal Development Associates. The northwest end of the valley has subsurface temperatures of up to 206ºF (97ºC) at 131 feet (40 meters). In August, the two companies signed a memorandum of understanding whereby they will share data with the aim of eventually constructing both a lithium extraction facility and a geothermal power plant. (Dajin Resources Corp., Management Discussion and Analysis, 4/2/2018; Dajin Resources Corp. NI 43-101 Technical Report, 3/30/2017, 8/23/2017; Dajin Resources Corp. news releases, 3/16/2017; Dajin Resources Corp., website, http://dajin.ca)

In January, Geoscience Global, headquartered in North Sydney, Australia, completed two drill holes in the North Basin and three in the South Basin totaling 4,087 feet (1,246 meters) on its Rhyolite Ridge lithium-boron property about 16 miles (25 km) west of the Silver Peak Operation. The results were not released. Lithium is present in brine, pegmatite, and sedimentary rocks. The mineralized sedimentary rocks are thick, shallow, and flat lying. The project contains two sedimentary basins—North Basin and South Basin—about 2.5 miles (4 km) apart. The North Basin covers about 3.5 square miles (9 square km) and the South Basin covers about 8 square miles (20 square km). A second 16,400-foot (5,000-m) drilling program was commenced in mid-year to upgrade part of the current resource from the Inferred to the Indicated category and to test for extensions of shallow, high-grade lithium-boron mineralization mainly to the south of the current resource area. Significant intercepts included 1) 131 feet (40 meters) averaging 1,975 ppm lithium and 0.53% boron, including 56 feet (17 meters) grading 1,718 ppm lithium and 1.18% boron; 2) 125 feet (38 meters) averaging 1,706 ppm lithium and 0.92% boron, including 59 feet (18 meters) grading 1,975 ppm lithium and 1.83% boron; 3) 121 feet (37 meters) averaging 1,876 ppm lithium and 0.85% boron, including 56 feet (17 meters) grading 1,856 ppm lithium and 1.74% boron; 4) 125 feet (38 meters) averaging 1,885 ppm lithium and 0.89% boron, including 56 feet (17 meters) grading 1,805 ppm lithium and 1.95% boron; 5) 203 feet (62 meters) grading 2,125 ppm lithium and 0.49% boron, including 69 feet (21 meters) grading 2,147 ppm lithium and 1.25% boron, and 6) 125 feet (38 meters) averaging 1,769 ppm lithium and 1.41% boron, including 95 feet (29 meters) grading 1,695 ppm lithium and 1.85% boron. The new data were used to revise and upgrade the resource of the South Basin. The mineralization was still open to the south, east, and northeast.

The company ran a number of metallurgical tests and experimented with recovery processes. The company discovered the lithium-boron mineralization to be amenable to heap leaching using sulfuric acid (413 kilograms of acid per tonne of ore) with recovery rates of 89%–92% for lithium and 88%–89% for boron. (Geoscience Global, news release, 1/23/2017, 6/30/2017, 8/16/2017, 8/31/2017, 10/5/2017, 10/31/2017, 12/12/2017; Geoscience Global, http://www.globalgeo.com.au)

Green Energy Resources, Inc., a wholly-owned subsidiary of Noram Ventures, Inc., completed a Phase I drilling on its lithium clay property in Clayton Valley. The program consisted of 46 core holes averaging 47 feet (14.3 m) and totaling 2,160 feet (658 m). All but one of the holes were drilled on the main target covering an area 2.5 miles (4.1 km) by 1.5 miles (2.4 km). Analyses were reported for 4-foot (1.2-m) intervals. Lithium analyses for 4-foot (1.2 m) intervals ranged between 162.5 ppm and 2,380 ppm and averaged 908 ppm lithium. The company released a NI 43-101 technical report with an inferred resource calculated from this drill and other data. The rocks hosting the lithium consist mostly of soft and crumbly tuffaceous siltstones, mudstones and claystones, which contain several thin beds of harder, more consolidated sediments. Most of the sediments are also calcareous with some algal mats present and likely represent lakebed deposits. The rocks are considered to be part of the Tertiary Esmeralda Formation. The property contained 888 placer claims covering 17,738 acres (7,178 ha). In February, Noram Ventures, Inc., entered into an option agreement whereby Alba Minerals, Ltd., could earn up to a 50% interest in the Clayton Valley property. (Noram Ventures, Inc., NI-43-101 Technical report, 7/24/2017; Noram Ventures, Inc., news releases: 2/6/2017, 2/22/2017, 3/23/2017, 3/29/2017, 5/25/2017; Noram Ventures, Inc., http://www.noramventures.com; Alba Minerals, Ltd., website, https://albamineralsltd.com)

Iconic Minerals, Ltd. spent $127,027 on exploration and had a magneto-telluric (MT) geophysical survey

conducted over its Smith Creek Valley lithium project following the long axis of the valley. The property consisted of 808 placer claims covering 25.25 square miles (65.4 square km) in southwestern Lander County. Smith Creek Valley extends about 40 miles (64 km) in a north-northeasterly direction and averages about nine miles (14.5 km) wide. The enclosed Smith Creek Valley Basin covers about 582 square miles (1,507 square km) and consists of alluvium surrounding the remnant of a paleo-lake, which is now a mud flat. A series of normal faults bound the basin. Fluids moving up along some of these faults fed hot springs along the edge of the mud flat where some brine evaporates are also present. An earlier gravity study showed a large gravity low under the southern part of the basin, and the basin sediments were estimated to be over 4,000 feet (1,220 meters) thick. Brine evaporate samples taken from the mud flat downslope of hot springs just northwest of the flat had lithium concentrations up to 470 ppm. The MT survey showed a 4.5-mile-long (7.6-km-long) resistivity low that is interpreted to be two possible brine zones. The upper one is a thin surface anomaly. The lower one is interpreted to average 1,300 feet (400 meters) thick. It extends north beyond to limit of the survey and dips gently to the south, occurring 650 to 1,600 feet (200 to 500 meters) below the surface. Two major faults were interpreted as well. (Iconic Minerals, Ltd., Management Discussion and Analysis, 12/28/2017, 4/30/2018; Iconic Minerals, Ltd., news releases, 1/17/2017, 3/1/2017; Iconic Minerals, Ltd., website, http://www.iconicminerals.com)

Iconic Minerals Ltd. also spent $632,000 on exploration and completed a shallow reverse circulation hole to 300 feet (91 meters) at its Bonnie Claire lithium project. Sediment samples taken every 20 feet (6 m) had lithium concentrations up to 460 ppm near the surface, rising to over 1,000 ppm at 200 feet (61 m), and remaining above 1,000 ppm to the bottom of the hole. A high density brine was found below a clay layer at 160 feet (49 m), which continued to the bottom of the hole. The project consists of 23,100 acres of contiguous placer claims covering 28.75 square miles (75 square km) in Sarcobatus Valley. The valley is over 20 miles (30 km) long by 12 miles (20 km) wide and contains a drainage basin covering over 800 square miles (2,070 square km). The drainage basin and the adjacent areas contain quartz-rich volcanic rocks with anomalous amounts of lithium. Samples from the salt flats within the basin had up 340 ppm lithium. The valley also contains a 12-mile-long (20-km-long) gravity low, and the current estimates to the depth to bedrock ranges from 1,500 to 2,000 feet (460-610 m) within the gravity low. The claim block covers the gravity low and associated mud flats. (Iconic Minerals, Ltd., Management Discussion and Analysis, 12/28/2017; Iconic Minerals, Ltd., news releases, 4/3/2017, 5/10/2017, 5/23/2017, 6/5/2017, 6/28/2017, 8/10/2017, 1/9/2018; Iconic Minerals, Ltd., website, http://www.iconicminerals.com)

Lithium Americas Corp. (formerly Western Lithium USA Corp.) conducted a drilling program and seismic survey on its Nevada Lithium project (formerly Kings River Valley project). The Nevada Lithium project consists of the Lith, Beta, BPE, Neutron, Neutron Plus 1 and Neutron R claims that cover 37,641 acres (15,233 ha) mainly in the Disaster mining district in northern Humboldt County. The property is within the McDermitt caldera, and covers several areas containing inferred uranium resources and broader zones of uranium, molybdenum, and lithium mineralization. The lithium largely occurs in high-lithium clays, including hectorite, with significant amounts of clay formed from the hydrothermal alteration of the volcaniclastic sedimentary rocks making up the moat deposits in the western part of the caldera. These moat deposits extend north through the western Montana Mountains and Disaster Peak into Oregon. Significant lithium mineralization has been defined in five areas referred to as: PCD, South Lens, South Central Lens, North Central Lens, and North Lens by Chevron (who drilled the area in 1985) and Stages I through V respectively by Lithium Americas Corp. In each area, the high lithium clay occurs in thick, apparently continuous accumulations with the zones of mineralization varying between about 3 and 300 feet (0.9 meters and 91 meters) thick. The Thacker Pass project portion covers 8,320 acres (3,367 ha) in much of the northern half of T44N, R35E.

The company drilled 77 HQ core holes in 2017, which were analyzed for lithium. Another eight were drilled to target industrial clay deposits for RheoMinerals, Inc., and not analyzed for lithium. The drilling project details and data were not released, but the data were used to update the resource in a new NI 43-101 technical report for the Thacker Pass deposit (formerly Stage I Lens and now designated the Thacker Pass project).

The clay that is mined is processed in Fernley by RheoMinerals, Inc. (formerly Hectatone, Inc.), a subsidiary of Lithium Americas Corp., operated its 24,000-ton (22,000-tonne) annual capacity organoclay plant at the company-owned industrial complex in Fernley adjacent to rail and freeway access. Production had commenced in December 2014, but the plant was not fully operational until April 1, 2016. 2017 was the first year of full operation, and sales for the year were $4,300,000 as compared to about $1,900,000 for 2015 and 2016. The company had developed methods to process hectorite into a drilling mud additive and entered the specialty drilling mud business. Hectorite was processed using an extruder combined with several additives to produce an organoclay initially under the trade name Hectatone™. The company eventually developed six drilling related products under several

trade names including RheoMinerals™ and Hectagel™. The decline in drilling for oil and gas hampered demand at first, but the company redirected product development and successfully entered the environmental, animal feed, and industrial coatings markets. (Elko Daily Free Press Mining Quarterly, Summer 2017; Lithium Americas Corp. Annual Information Form, 3/29/2018; Lithium Americas Corp. news releases, 10/23/2017, 5/8/2018; Lithium Americas Corp. NI43-101 Technical Report, 2/15/2018; Lithium Americas Corp. website, http://lithiumamericas.com)

Lithium Consolidated Minerals Exploration Ltd. conducted a gravity infill data survey over its South Tonopah Lithium project in northwestern Clayton Valley. The new data were merged with existing gravity data sets and remodeled to produce a 3D inversion model of the basin. The model showed that northeast-trending depth gradients were caused by normal faults defining sub-basin boundaries; which could serve as potential traps for the concentration of lithium brine from groundwater flowing from the northwest towards the Silver Peak Operation. Basement depths in the northwestern Clayton Valley were interpreted to be greater than 9,800 feet (3,000 m). The model also identified three potential brine traps. (Lithium Consolidated Mineral Exploration, Ltd, Annual Report, 6/30/2017; Lithium Consolidated Mineral Exploration, Ltd, news release, 9/4/2017; Lithium Consolidated Mineral Exploration, Ltd, website, https://li3limited.com)

Lithium Energy Products Inc. conducted a gravity survey over their Jackpot Lake project. The results indicated a large, closed sedimentary basin that overlies basement rock beneath the property. The company also conducted a geophysical controlled source audio magnetotellurics/magnetotellurics (CSAMT) survey. The results suggest large quantities of highly concentrated brines are present throughout the property, particularly across an area of 3 miles by 1.25 miles (5 km by 2 km) at depth of over 1,250 feet (380 m). The Jackpot Lake project occurs in a flat, arid drainage basin in Dry Lake Valley east of the Arrow Canyon Range. (Lithium Energy Products, Inc., Management Discussion and Analyses, 1/29/2018; Lithium Energy Products, Inc., news releases, 5/29/2017, 6/19/2017; Lithium Energy Products, Inc., website, http://www.lithiumenergyproducts.com)

Macarthur Minerals conducted a near surface sampling program on its Stonewall Lithium project, whereby 380 samples were collected on a grid at a depth of about 1.5 feet (45 cm). The sediment assays ranged between 14.6 ppm and 187 ppm lithium, with 19 samples over 100 ppm lithium. The property covers parts of eastern Lida Valley and northwestern Stonewall Flat basins in Esmeralda and Nye counties. Two holes drilled 1.25 miles (2 km) to the south on the adjacent property returned only freshwater instead of brine. The company did not renew the Stonewall project claims. (Macarthur Minerals Annual Report, 7/25/2018; Macarthur Minerals news releases, 5/24/2018; Macarthur Minerals, http://www.macarthurminerals.com)

Macarthur Minerals staked 210 new unpatented placer mining claims covering 4,200 acres (1,300 ha) at its new Reynolds Springs Lithium Brine project in the Railroad Valley, Nevada. The company conducted a near surface sampling program in which 206 soil samples were collected from a depth of about 1.5 feet (0.45 m) every 660 feet (201 m) from 12 lines spaced 1,320 feet (402 m) apart. The sediment assays ranged between 39.3 ppm and 405 ppm lithium, with 39 samples over 200 ppm lithium. The company conducted an assessment of downhole geophysical logs for a dozen abandoned oil and gas wells in the near vicinity of the project, five of which were on the property. Several zones of high conductivity were identified which indicate potential brine aquifers. The company also entered into a strategic alliance with 3PL Operating, Inc., which has an adjacent property. 3PL Operating, Inc. has experience in the drilling, development, and production of oil and gas. The alliance will have 3PL Operating Inc. drill or re-enter existing oil wells on the Railroad Valley playa for the purpose of obtaining brine samples and evaluating lithium concentrations. (Macarthur Minerals Annual Report, 7/25/2018; Macarthur Minerals news releases, 6/16/2017, 7/25/2017, 7/26/2017, 12/6/2017; Macarthur Minerals, website, http://www.macarthurminerals.com)

Nevada Sunrise Gold Corp. and Advantage Lithium Corp. completed three reverse circulation holes totaling 4,560 feet (1,390 meters) on its Clayton Northeast (Clayton NE) project in Clayton Valley. Hole CNE-17-04 intersected the base of the Clayton Valley salar sedimentary basin at 1,885 feet (579 meters). The strata consisted of alternating layers of gravel, volcanic ash and clay interbedded with some units of carbonate deposits and other evaporites. Eighty groundwater samples were collected from six brine-bearing beds. These units occurred over a 1,540-foot (469-m) section starting down hole at 460 feet (140 m) and included the Salt Aquifer, Main Ash Aquifer, Tufa Aquifer, Lower Aquifer System, Lower Gravel Aquifer, and a possible fractured bedrock aquifer. The average concentration was 243 mg/L. Hole CNE-17-05 drilled to a depth of 1,380 feet (420 m) bottomed in Paleozoic bedrock. Brine samples from 840 feet (256 m) to the bottom of the hole averaged 72.5 mg/L lithium. A 300-foot (91-m) zone starting at 1,000 feet (304 m) averaged 101.5 mg/L lithium, with the first 20 feet (6 m) of that zone averaging 238 mg/L. Hole CNE-17-06 intersected the Angel Island fault zone at 560 feet (171 m). Below the fault, the drill was in the Lower Gravel Aquifer, and

below 1,075 feet (328 m) the drill penetrated Paleozoic bedrock. With the exception of a 20-foot (6-m) zone starting at 860 feet (262 m) averaging 214 mg/L lithium, the hole only encountered weakly anomalous brines.

The Clayton Northeast project consisted of 55 placer claims covering about 1,080 acres (437 ha) in the Clayton Valley sedimentary salar and is contiguous to the eastern boundary of the Silver Peak operation. Several of the Silver Peak operation's lithium brine production wells are situated within approximately 330 feet (100 meters) west of the Clayton NE claim boundary. In June, Nevada Sunrise Gold Corp. and Advantage Lithium Corp. also acquired the Triton lithium property, which consisted of 19 unpatented claims covering 380 acres (154 ha) about 3 miles (5 km) southwest of the Clayton Northeast project. In December, Nevada Sunrise Gold Corp. and Advantage Lithium Corp. sold the Clayton Northeast project and the Triton property to Pure Energy Minerals Ltd. Pure Energy Minerals Ltd. issued 2,100,000 shares of common stock to Nevada Sunrise Gold Corp. and 4,900,000 shares to Advantage Lithium Corp. (Advantage Lithium Corp. news releases, 11/8/2017, 12/8/2017; Advantage Lithium Corp. Annual Information Form, 3/16/2018; Advantage Lithium Corp. website, http://www.advantagelithium.com; Nevada Sunrise Gold Corp., Management Discussion and Analyses, 1/25/2018; Nevada Sunrise Gold Corp., news release, 6/7/2017, 11/8/2017, 12/8/2017; Nevada Sunrise Gold Corp., website, http://www.nevadasunrise.ca)

Nevada Sunrise Gold Corp. and Advantage Lithium Corp. drilled one borehole to 1,500 feet (457 m) on the Neptune property. Due to unstable ground conditions, the hole was lost and no brine was encountered. Nevada Sunrise Gold Corp. acquired the Neptune Property from Nevada Alaska Mining Co., Inc., for 1,000,000 shares of stock. The Neptune Property is located near the common corners of T3-4S, R38-39E. The Neptune Property contained 93 20-acre placer claims totaling 1,860 acres (753 ha). In 2016, Resolve Ventures, Inc. signed a couple of options with Nevada Sunrise Gold Corp. to earn up to a 50% interest in the property by making cash and share payments and funding exploration expenditures. However Resolve Ventures, Inc. dropped the options in December 2017. In September 2016, Advantage Lithium Corp. signed an agreement to earn a 50% interest in the property by spending at least $700,000 on exploration through 2019 and making annual common share payments to Nevada Alaska Mining Co., Inc. However in August 2017, Advantage Lithium Corp. dropped its option. (Advantage Lithium Corp. news releases, 4/6/2017; Advantage Lithium Corp. website, http://www.advantagelithium.com; Nevada Sunrise Gold Corp. news releases, 4/6/2017, 8/23/2017; Nevada Sunrise Gold Corp. Management Discussion and Analysis, 1/25/2018; Nevada Sunrise Gold Corp. website, http://www.nevadasunrise.ca).

Nevada Sunrise Gold Corp. drilled one borehole to 2,710 feet (826 m) on its Jackson Wash claim block on the east side of the Montezuma Range 20 miles (30 km) southeast of the Silver Peak operation. The sediments that were intercepted consisted of interbedded sand, gravel, and clay. Hot fresh water at 106ºF (41ºC) was encountered, but no brines were encountered. The Jackson Wash property contained 92 unpatented placer claims totaling 1,840 acres (744.6 ha) (Nevada Sunrise Gold Corp. Management Discussion and Analysis, 1/25/2018; Nevada Sunrise Gold Corp. website, http://www.nevadasunrise.ca).

Pure Energy Minerals, Ltd., of Vancouver, British Columbia, completed two core holes (CV-7 and CV-8) totaling 5,194 feet (1,584 m), on its Nevada Lithium Brine project also known as the Clayton Valley South Lithium Brine project. Thirteen samples sampled from 400 to 1,800 feet (122 and 549 m) in CV-7 averaged between 53 and 109 mg/L lithium. Thirty-one samples collected during a pumping test from 600 and 1,940 feet (183 and 591 m) averaged between 45 and 60 mg/L lithium. Ten samples collected from 700 to 2,700 feet (213 and 823 m) in CV-8 averaged between 52 and 229 mg/L lithium. Thirty-four samples collected during a pumping test from 1,190 and 2,845 feet (363 and 867 m) averaged between 83 and 101 mg/L lithium. The company also conducted Hybrid Source Audio-Magnetotellurics (HSAMT) surveys on its Clayton Valley South and its newly acquired Clayton Valley North property, which has had little exploration. The purpose of the survey was to define the extent of conductors that may represent lithium-bearing units and to map the continuity, thickness, dip, and extent of these units. The data from the survey showed zones of low electrical resistivity from near surface to depths up to 3,300 feet (1,000 m) that may indicate the presence of lithium bearing brine in new target areas.

In addition to occurring in a brine, lithium occurs in clay and silt and ash/tuff interbeds in the basin infill deposits within grabens. It is hypothesized, though not confirmed, that strong exchange reactions occur between the solid matrix materials in the sediments and the brines releasing the lithium from the solid phase into the aqueous phase, which supplements the resource. In the northern half of Clayton Valley, where the main Silver Peak operation is, the zone of lithium bearing sediments and aquifers is about 7.5 miles (12 km) long by two (3.2 km) miles wide, and 300 feet to 1,000 feet (90 m to 300 m) deep. In the southern half of the valley, which contains the Clayton Valley South project, the zone is about 10 miles (16 km) long by 1.8 miles to 2.2 miles (2.9 km by 3.5 km) wide and at least 820 feet (250 m) thick.

The Clayton Valley South Lithium Brine project is mostly in T3S, R39E, just south of the Silver Peak Operation of Rockwood Lithium, Inc. The project consists of placer claims leased from GeoXplor Corp. (the company's operator) and Nevada Alaska Mining Company, Inc., plus claims staked by Pure Energy Minerals. In May, the company acquired Lithium X Energy Corp.'s interest in its Clayton Valley North project and its Clayton Valley South Expansion property. Together they consist of 756 unpatented claims covering 15,000 acres in Clayton Valley. The Clayton Valley South Expansion property adjoins the west side of Pure Energy Minerals' property. Lithium X Energy Corp. sold its interests for 19.99% of Pure Energy Minerals' common stock and warrants. (Lithium X Energy Corp., Management Analysis and Discussion, 11/23/2017; Pure Energy Minerals, Ltd., Management Analysis and Discussion, 2/28/2018; Pure Energy Minerals, Ltd., Amended and Restated Annual Information Form 4/5/2018; Pure Energy Minerals, Ltd., NI 43-101 Technical Report, 8/15/2017, 3/23/2018; Pure Energy Minerals, Ltd., news releases, 1/5/2017, 2/7/2017, 5/9/2017, 10/31/2017; Pure Energy Minerals, Ltd., website, http://www.pureenergyminerals.com).

In early 2017, Reedy Lagoon Corp., Ltd., headquartered in Richmond, Australia, acquired three lithium properties in Esmeralda County—Alkali Lake North, Big Smoky Valley South, and Columbus Salt Marsh. Shortly after acquisition, the company conducted MT geophysical surveys over the three properties. Encouraging survey results caused the company to stake claims to enlarge the Big Smoky Valley South, and Columbus Salt Marsh properties. Drilling commenced on the Big Smoky Valley South, and Columbus Salt Marsh properties in early 2018.

The Alkali Lake North property consisted of 128 claims covering 2,560 acres (1,036 ha) about six miles (10 km) northeast of Alkali Lake. The geophysical survey indicated a potential 2,600 foot (800 m) wide brine target with a 1,300 foot (400 m) vertical extent and about 2,300 feet (700 m) to the top of the formation. The target is within an up to 3,800 foot (1,200 m) wide sub-basin in the center of the property. The sub-basin is defined by a series of steep faults which may have been geothermally active and introduced brine solutions into the graben. A shallow near surface aquifer containing saline water deepens towards the center of the basin.

The Big Smoky Valley South property consisted of 273 claims covering 5,460 acres (2,209 ha) where the southern end of Big Smoky Valley meets the western side of Clayton Valley about six miles northwest of Albemarle's Silver Peak operation. Big Smoky Valley trends northwestward and is defined by a series of major northwestward and northeastward striking faults. The center of the valley contains a discrete sub-basin with more than 1.5 miles (2.4 km) of subsidence. The area contains extensive Tertiary volcanic deposits with deposits of volcanic ash to 100 feet (30 m) thick in the valley. The ash deposits are capped by very recent basalt lava flows and cinder cones. Recent volcanism is considered to be an important heat source for driving geothermal activity which can dissolve lithium from the tuff beds and circulate it in ground water convection cells. The geophysical survey indicated a 2,600 foot (800 m) wide brine target with a 1,300-foot (400 m) vertical thickness, and the top of which was at a depth of 2,100 feet (650 m). This target is spatially associated with a number of steep graben faults which may have acted as feeder faults for brine enriched fluids to be introduced into the basin. A second shallower 1,150 foot (350 m) wide target with a 1,000 foot (300 m) thickness, starting at a depth of 1,150 feet (350 m). This target is associated with a possible major bounding fault structure. A shallow aquifer system at a depth of 500 feet (150 m) may also be present and which could represent a buried playa lake surface.

The Columbus Salt Marsh property consists of 165 claims covering 3,300 acres (1,335 ha) just south of U.S. 6, along the southern edge of Columbus Marsh structural depression. The valley is fault-bounded with several geothermal springs discharging alkali salts onto the lake surface. These alkali deposits have been mined for borax in the past. The center of the valley has subsided up to 2.2 miles (3.5 km). The margins of the basin are thought to contain shallow sub-basins. Geophysical surveys have indicated two relatively shallow brine targets and a deeper 2,600 foot (800 m) wide central sub-basin. The top of the sub-basin top is at a depth of 2,000 feet (600 m) and the bottom is about 4,900 feet (1,500 m). The spatial association of this deeper target with steep graben faults could result from geothermal activity along the faults at the time of deposition of the basin sediments. (Reedy Lagoon Corp., Ltd., news releases, 2/28/2017, 4/3/2017, 4/10/2017, 5/5/2017, 5/26/2017, 5/29/2017, 5/30/2017, 2/2/2018, 4/16/2018; Reedy Lagoon Corp., Ltd., website, http://www.reedylagoon.com.au)

Spearmint Resources Inc. received the results from 91 5-foot (1.5-m) channel samples collected during field work conducted in late 2016 on its Clayton Valley Lithium project. The samples were all taken from lithium-bearing light green volcanic clay with a 250-foot (76-m) thick mineralized section. The samples ranged between 285 ppm and 1,630 ppm lithium and averaged 843 ppm lithium with 23 samples over 1,000 ppm. The company commenced a drilling program on the property in early 2018. The project consists of 880 claims making up the McGee Claim Block about five miles (8 km) southeast of Silver Peak. (Matica Enterprises, news release, 7/26/2016; Spearmint Resources, Inc., Management Discussion and Analysis, 5/30/2018; Spearmint Resources, Inc., news releases, 7/13/2016,

11/16/2016, 12/1/2016, 3/6/2017, 2/21/2018; Spearmint Resources, Inc., website, https://www.spearmintresources.ca)

In May 2017, United Lithium Corp. entered into an option agreement with Ultra Lithium Inc. to acquire a 100% interest in certain claims of Ultra Lithium's company's South Big Smoky Valley property. The property consists of 100 20-acre placer claims covering about 2,000 acres (809 ha) in T1N, R38E in Esmeralda County. The agreement included Ultra Lithium Inc. issuing, upon signing of the agreement, 300,000 common shares of company stock subject to a 16-month trading restriction from the first day of trading on a stock exchange, and agreeing to incur $115,000 in qualified exploration expenditures on the project within the first year of trading on a stock exchange. A NI 43-101 technical report was issued summarizing work done previously on the property. United Lithium Corp. conducted two rounds of sampling as part of a Phase I exploration program. Seventy-two soil and sediment samples were collected and analyzed. Lithium ranged between 8.6 ppm and 38 ppm. Boron was also analyzed, but was below the detection limit. The groundwater samples from both rounds of sampling showed lithium ranging up to 0.16 mg/L and boron ranging up to 0.84 mg/L. (Ultra Lithium, Inc., Management Discussion and Analysis, 2/27/2018; United Lithium Corp., Management Discussion and Analysis, 3/28/2018; United Lithium Corp., NI 43-101 Technical Report, 7/30/2017; Ultra Lithium, Inc., website, http://www.ultralithium.com; United Lithium Corp. website, http://unitedlithium.com).

In August 2017, Uranium Resources Inc. changed its name to Westwater Resources Inc. It conducted a Phase I drilling program to test the lithium content in the local brine aquifer at its Columbus Basin project in and around the Columbus Salt Marsh. Three core holes were completed totaling 3,870 feet (1,180 m). The deepest hole was drilled 1,680 feet (512 m), and lithium concentrations up to 43 ppm and boron concentrations up to 173 ppm were reported. The company's subsidiary Lithium Holdings Nevada LLC optioned a 3,040-acre (1,230-hectare) block of unpatented claims adjoining the south end of the Columbus Basin project for $75,000 and 200,000 shares of common stock upon closing. The company conducted a geochemical sampling program on a grid on the new acquisition and collected 54 samples within six inches (15 centimeters) of the surface. The samples averaged 144 ppm lithium with the highest sample having 348 ppm. In August, the company acquired water rights in the Columbus Basin for its lithium project. (Uranium Resources, Inc., news releases, 2/22/2017, 3/27/2017, 7/12/2017, 7/31/2017, 8/21/2017, 8/22/2017, 10/31/2017; Uranium Resources, Inc., website, http://www.uraniumresources.com).

Magnesia

Domestic production of magnesium compounds was an estimated 364,000 tons (330,000 tonnes), a 3% increase from 2016. The production was valued at $250,000,000. Until 2016, the USGS reported volume as magnesium content. Starting in 2016, the USGS reported the volume as magnesium oxide content. About 70% of domestic magnesia production came from seawater and natural brines, and the rest was produced from mining magnesite and minor brucite in Nevada and olivine in Washington. Estimated apparent consumption increased 4% to 696,000 tons (620,000 tonnes), with most of the difference between consumption and production being made up by imports, mostly from China, Canada, Australia, and Brazil. About 60% of the magnesium compounds are used in agricultural, chemical, construction, environmental, and industrial operations in the form of caustic-calcined magnesia, magnesium chloride, magnesium hydroxide, and magnesium sulfates. The remainder is used for refractories in the form of dead-burned magnesia, fused magnesia, and olivine.

Prices through 2016 in this section have generally been for 92% MgO calcined magnesia. In the literature, prices are usually reported for several types and grades of magnesia, but they all trend about the same. The prices are given for Chinese magnesia, since China accounts for 67% of the world production of magnesia and provides about half the imports into the U.S. Prices decreased from $177 per ton ($195.10 per tonne) at the end of 2016 to between $122 and $145 per ton ($135 and $160 per tonne) at the end of 2017. (Roskill website, https://roskill.com/market-report/magnesium-compounds/; ANFRE website, http://www.anfre.com/magnesia-prices-continue-to-rise-in-china)

Magnesite and some brucite (<5%) have been mined at Gabbs since 1935, and in the 1940s were processed in Henderson, Nevada, to make magnesium metal. Premier Chemicals LLC of Cleveland, Ohio, currently operates the Gabbs magnesia operation in Nye County, which was and still is the only place in the country to mine magnesite. During the 1990s, the availability of cheap foreign refractory magnesia caused production at Gabbs to be switched to light-burned (caustic calcined) magnesia that is mainly marketed for wastewater treatment and agricultural uses. Premier Chemicals LLC shipped 112,139 tons (101,732 tonnes) of magnesium compounds, a 2% increase from 2016. The plant capacity is rated at 150,000 tons (136,000 tonnes) per year. The gross proceeds increased 17% to $7,900,419 from 2016. The magnesite and brucite occur as complex replacement bodies in Triassic dolomite in an area of about 1,300 acres (530 ha) in the Paradise Range just east of the town of Gabbs. The resource is

thought to be sufficient for more than 50 years of production at present mining.

Nevada Clean Magnesium, Inc., owns the Tami-Mosi deposit in the Nevada district of White Pine County. In April, the company had a bench test furnace built. In November, magnesium metal was successfully produced by the furnace from a charge of dolomite from the Tami-Mosi property combined with ferro silicon as a case base reductant material. Gateway Analytical of Gibsonia, Pennsylvania, determined this unrefined magnesium metal had a very good metal purity capable of producing ASTM B92 grade metal with minimal treatment and also found no impurities which would impact food grade. (Nevada Clean Magnesium, Inc., Management Discussion and Analysis, 3/28/2018; Nevada Clean Magnesium, Inc., news release, 1/23/2018; Nevada Clean Magnesium, Inc., website, http://www.nevadacmi.com).

Perlite

Domestic production of perlite was 573,000 tons (520,000 tonnes) and was valued at $29,100,000, increases of 1% and 2%, respectively, from 2016. Until 2003, the U.S. was the world's largest producer of perlite, but was surpassed by Greece in 2004, Turkey in 2014, and China in 2015. Estimated apparent consumption decreased 2% to 650,000 tons (590,000 tonnes) from 2016, the difference between production and consumption being made up by imports mostly from Greece. The estimated average price remained the same as in 2016 at $58 per ton ($64 per tonne). About 53% of perlite production is used in building construction products. About 15% is used for horticultural aggregate and most of the rest is used in fillers, filters, and specialty insulation.

Nevada has large perlite resources, and several deposits in central Pershing, northern Lincoln, and southern Clark counties were mined extensively in the past. 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 produced less than 2% of the total domestic production. 11,977 tons (10,865 tonnes) were processed and shipped in 2017, a 38% decrease from 2016. The gross proceeds decreased 39% to $829,568 in 2017.

Wilkin Mining and Trucking Inc. produced 2,530 tons (2,295 tonnes), a 5% increase from 2016, from the Tenacity Perlite Mine in the South Pahroc Range mining district about 25 miles (40 km) west of Caliente, Lincoln County. The company has mined perlite in the area for more than 25 years. The company has a small popping plant in Caliente, and sales were almost exclusively of expanded perlite used for horticultural purposes. Most years, the company ships between 1,500 and 2,000 tons. The deposit consists of a large, flat-lying, 20-foot (6-m) thick perlite flow with obsidian pellets in Tertiary rhyolitic volcanic rocks.

EP Minerals processed and shipped 9,447 tons (8,570 tonnes) of expanded perlite, a 45% decrease from 2016, from its Colado diatomite plant in Pershing County. The product is marketed as a filter aid. The crude perlite comes from the Popcorn Mine about 15 miles (24 km) south of Fallon, Churchill County. Perlite is usually mined a week or two per year, but none was mined in 2017. The perlite occurs as glassy flows associated with rhyolitic flows (NBMG Bulletin 83).

Pozzolan

The NDT includes pozzolan with clay. The only pozzolan producer is the Mustache quarry near Fernley owned by the Nevada Cement Co. Shale within the Pliocene Chloropagus Formation is the source of the pozzolan. No production was reported for 2014 through 2017, but the NDT reported gross proceeds of $22,058, a 3% increase from 2016.

Sunrise Resources PLC conducted sampling, mapping, trenching, and drilling activities its CS Pozzolan-Perlite project, which during 2017 was enlarged to 54 claims mainly in T4N, R39E, sections 4 and 5, and T5N, R39E, sections 29 and 32 in the Crow Springs district, Esmeralda County. The company excavated 11 trenches within an area over 4,300 feet by 2,300 feet (1,300 meters by 700 meters) to expose and sample bedrock in areas covered by colluvium. Nine trenches were excavated in the periphery of the Main zone and two trenches in the southern part of the newly defined 2,100-foot by 2,100-foot (650 by 650 m) Northeast zone. All but one trench reached bedrock, and most of the bedrock appeared to have perlitic and/or pozzolanic properties. Reconnaissance sampling and follow-up mapping conducted about 1.1 miles (1.7 km) southwest of the Main zone defined a new 3,900-foot by 650-foot (1,200-m by 200-m) area testing positive for pozzolan called the Tuff zone. The company also completed seven holes spaced between 500 feet and 820 feet (150 m and 250 m) apart to test the core of the Main zone for both pozzolan and perlite. Two holes were also drilled into the Tuff zone mainly for pozzolan. A second phase of drilling was conducted in early 2018.

These deposits were developed in and around a rhyolitic volcano with its crystalline core located the west of the Main zone. Thick deposits of perlite formed on the margins of crystalline rhyolite lava flows in the inner parts of the volcanic complex just east of the crystalline core. This perlite is well represented on the surface and in drill holes in the Main zone. Farther out from the core, to the east and northeast of the Main zone, tephra zones formed as air fall deposits with the Northeast zone being an extensive zone of tephra. Some

of the tephra was contaminated by silty material in drainages and marginal lakes forming a silty tuff. Perlitic flows in the eastern part of the Main zone are interbedded with the tephra deposits. Still further away from the crystalline core, finer grained pyroclastic material fell to the ground to form volcanic tuffs such as in the Tuff zone. The more distal tephra, tuffs, and silty tuffs are glassy and silica- and aluminum-rich and contain a significant water content, which makes them good pozzolans. However, their perlitic properties are compromised by being finer grained and having a higher content of non-expandable material, especially where contaminated by non-glassy silty material.

Pozzolan was tested using 7-day and 28-day SAI (Strength Against Index, a measure of pozzolanic reactivity) for drill samples from Main and Tuff zones and surface samples from the Northeast zone. All results exceeded the ASTM C618 strength requirements and were consistent with the performance of a high quality natural pozzolan. Tests also showed the pozzolan can significantly reduce the Alkali-Silica Reaction (a.k.a. concrete cancer). This occurs when alkalis in Portland cement react with common aggregates containing reactive silica and crack and weaken the concrete. (Sunrise Resources, PLC, news releases, 3/13/2017, 6/14/2017, 6/27/2017, 7/13/2017, 8/3/2017, 9/4/2017, 10/16/2017. 1/22/2018, 2/16/2018; Sunrise Resources, PLC, website, http://www.sunriseresourcesplc.com).

Salt

Domestic production of salt increased 2% to 47,400,000 tons (43,000,000 tonnes) valued at $1,900,000,000. Nevada's only producer, the Huck Salt Co., produced 24,000 tons (21,800 tonnes) of salt, a 50% increase from 2016. The gross proceeds were $845,054, a 38% increase from 2016. The salt is mainly used for de-icing roads, the production levels of which are dependent on weather, and for water softeners. The salt is mined from the playa on Fourmile Flat about 25 miles southeast of Fallon, Churchill County, where it has been harvested almost continuously since the 1860s, when it was hauled to the mills that processed Comstock silver and gold ore. The descriptions of brine and evaporite deposits are compiled in Nevada Bureau of Mines and Geology Bulletin 87, *Evaporites and Brines in Nevada Playas*, 1976, by Keith Papke.

Silica

The USGS includes silica under *Industrial Sand and Gravel*. The U.S. is by far the world's largest silica sand producer, and the estimated domestic production was 116,000,000 tons (105,000,000 tonnes), a 35% increase from 2016, valued at $3,500,000,000. About 5% of the production is exported. The estimated average price decreased 2% to $29.90 per ton ($33.00 per tonne) from 2016. The uses of silica are: hydraulic fracturing sand and well-packing and cement sand, 67%; other whole grain silica, 10%, manufacturing glass, 10%; foundry sand, 6%; and fillers and building products, golf course sand, and other uses, 7%. Nevada shipped 1,046,242 tons (949,145 tonnes) of silica, a 16% increase from 2016 but less than 1% of the national total. The gross proceeds (excluding Southern Nevada Liteweight) decreased 3% to $19,788,707 from 2016. No Nevada sand was used for hydraulic fracturing in 2017.

Nevada's main silica producer, Simplot Silica Products at Overton, Clark County, shipped 727,088 tons (659,610 tonnes), a 4% decrease from 2016. 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. The facility produces four grades of sand based on coarseness, AFS 55, 60, 70, and 100. AFS 70, which is used mainly in manufacturing glass and foundry castings.

Southern Nevada Liteweight produced and shipped 319,154 tons (289,535 tonnes) of silica sand, a 112% increase from 2016, from the Hidden Valley South (former Money pit) quarry about 20 miles (32 km) south of Las Vegas. The quarry produced mostly plaster and concrete sand for stucco and masonry block.

Zeolites

Domestic production and apparent consumption of zeolite increased 7% and 10% in 2017, respectively, to an estimated 87,100 tons (79,000 tonnes) and 84,900 tons (77,000 tonnes). Prices varied between $91 and $363 per ton ($100 and $400 per tonne) in 2017, depending upon the zeolite. Seven companies mined chabazite in Arizona and clinoptilolite in five other states. About 75% of the zeolites sold is used in animal feed, pet litter, odor control, drill hole cement, and water treatment.

Nevada contains large known resources of zeolite; however, zeolite production has been small, and no zeolite is currently mined in Nevada. KMI Zeolite, Inc. shipped 10,400 tons (9,400 tonnes) of clinoptilolite from its new plant near Ash Meadows in Amargosa Valley about 60 miles (100 km) west of Las Vegas. The source is a large deposit of mainly clinoptilolite eight miles (13 km) west of Death Valley Junction in California about 18 miles (29 km) from the plant. The company completed the new mill, which is closer to the mine to cut down transportation costs. The old Shenandoah mill in Sandy Valley was about 85 miles (136 km) from the mine. Also, the new mill is larger and more efficient than old mill, which was capable of producing 55,000 tons (50,000 tonnes) per year (KMI Zeolite, Inc., website, http://www.kmizeolite.com).

Zeolite minerals (most of which are rare) reportedly found in Nevada include analcime, chabazite, clinoptilolite, epistilbite, erionite, ferrierite, heulandite, mordenite, natrolite, offretite, phillipsite, scolecite, and stilbite, and reported locations of these minerals are given in Nevada Bureau of Mines and Geology Special Publication 31, *Minerals of Nevada*, 2004, by Stephen B. Castor and Gregory C. Ferdock. The descriptions of a few Nevada zeolite deposits are also compiled in Nevada Bureau of Mines and Geology Bulletin 79, *Erionite and Other Associated Zeolites in Nevada*, 1972, by Keith Papke. A collection of Lovelock, Nevada, zeolite samples acquired by Keith Papke is also available at the Nevada Bureau of Mines and Geology Great Basin Science Sample and Records Library.

INDUSTRIAL MINERAL DEPOSITS

by David A. Davis

This is a compilation, in progress, of industrial mineral deposits. The information in this compilation was obtained from the Nevada Division of Minerals and from published reports, articles in mining newsletters, and company websites, annual reports, and press releases. Locations of active mines and contact information are listed in the Directory of Mining and Milling Operations.

Deposit name	Minerals	Reserves/resources	Production
CHURCHILL COUNTY			
Baxter Silica (Sand Springs district)	Silica	1961: 68,000 tons **(**resource within 50 feet of surface)	
Carson Sink Salt Project (Carson Sink district)	NaCl	1978: 3,600,000 tons **(**recoverable NaCl)	
Fallon Bentonite Project (Sand Springs Marsh district)	Bentonite	2012: 34,000,000 tons, Na-Bentonite (proven reserves)	2012: 7,000 tons stockpiled
Hot Springs Mtn. (Desert district)	Limestone	1964: 2,500,000 tons, 91.4-97% $CaCO_3$, 0.84-2.11% $MgCO_3$, 1.46-4.75% SiO_2 (estimated reserves)	
Salt Wells	Bentonite	1984: 1,700,000 tons (reserve) 2,700,000 tons (probable reserve)	
CLARK COUNTY			
Anderson (January) (Moapa district)	Gypsum	1936: 1,500,000 tons, (estimated reserve)	
Anniversary (Muddy Mountains district)	Colemanite	1936: 400,000 tons, (estimated reserve)	1921-1928: 25,000 tons B_2O_2
Blue Diamond (Arden district)	Gypsum	2014: >25,000,000 tons, (proven and probable reserves)	1909-1988: N/A 1962: >300,000 tons annually 1989-2004: 8,287,349 tons 2012: 43,120 tons 2013: 314,141 tons 2014: 1,116,784 tons 2015: 1,602,431 tons 2016: 1,290,640 tons 2017: 980,520 tons
Chapparal (Moapa district)	Limestone	2012: 182,000,000-200,000,000 tons, 80-95% $CaCO_3$ (resource, <2.5% MgO)	
Lone Mountain	Aggregate	2008: Public Lands: 177,000,000 cubic yards; Private Property: 63,000,000 cubic yards (proposed for extraction)	1980-2016: N/A
Mica Peak (Gold Butte district)	Vermiculite	2007: 2,000,000-3,000,000 tons, (estimated recoverable reserve)	
Mount Vista (Arden) (Arden district)	Gypsum	2014: 200,000,000 tons, (resource)	1909-1931: N/A
Overton (Moapa district)	Magnesite	1936: 850,000 tons 38% MgO; 3,700,000 tons 34% MgO; 5,100,000 tons 30% MgO (resource)	1920s: small

INDUSTRIAL MINERAL DEPOSITS, CLARK COUNTY (continued)

Deposit name	Minerals	Reserves/resources	Production
Pabco (Apex) **(Muddy Mountains district)**	Gypsum	1958: 750,000,000 tons (estimated reserves)	1940s: N/A 1959-1988: N/A 1989-2005: 12,712,287 tons 2006: 1,438,886 tons 2007: 1,148,624 tons 2008: 829,801 tons 2009: 715,701 tons 2010: 682,000 tons 2011: 710,033 tons 2012: 1,033,681 tons 2013: 1,177,633 tons 2014: 1,137,216 tons 2015: 1,249,931 tons 2016: 1,375,612 tons 2017: 1,461,632 tons
Searchlight Insulation **(Searchlight district)**	Perlite	1951: 10,581,000 tons (indicated reserves)	1940s-1955: N/A
Sloan **(Sloan district)**	Dolomite	1952: 48,000,000 tons (indicated ore) 22,000,000 tons (inferred ore)	1928-2012: N/A 2013: 1,287,000 tons 2014: 1,500,000 tons 2015: 2,200,000 tons 2016: 2,016,753 tons 2017: 2,400,000 tons
Sloan Hills **(Sloan district)**	Dolomite Limestone	2011: 126,000,000 tons (material proposed to be mined)	
ELKO COUNTY			
Camp Creek	Barite	1974: 90,000 tons, 90% $BaSO_4$ (resource)	
Ivanhoe Creek **(Ivanhoe district)**	Bentonite	2007: 2,200,000 tons, Ca-Bentonite (inferred resource)	
Lakes **(Beaver district)**	Barite	1982: 8,000,000 tons, 4.1 sp. gr. (resource)	1959-1965; 1973-1981: <1,000,000 tons
Southern Pequop Mtns. **(Pequop district)**	Phosphate	1987: 250,000 tons, 16.4% P_2O_5 (resource)	
ESMERALDA COUNTY			
Clayton Valley (Noram) **(Silver Peak Marsh district)**	Li	2017: 18,847,650 tons. 0.106% (1,060 ppm) Li, 19,978 tons Li. 106, 345 tons Li_2CO_3 (inferred resource, 400 ppm Li cut-off) (NI 43-101 compliant)	
Clayton Valley Lithium **(Dean and Glory) Project** **(Silver Peak Marsh district)**	Li	2018: Preliminary Resource Estimate: 767,800,000 tons, 886 ppm Li, 1,444,000,000 lbs Li (indicated resource, 300 ppm Li cut-off); 708,600,000 tons, 852 ppm Li, 1,312,000,000 lbs Li (inferred resource, 300 ppm Li cut-off); Classified Mineral Resource in Initial Pit: 211,000,000 tons, 988 ppm Li, 415,600,000 lbs Li (indicated resource, 300 ppm Li cut-off); 28,000,000 tons, 1,047 ppm Li, 58,600,000 lbs Li (inferred resource, 300 ppm Li cut-off) (NI 43-101 compliant)	
Clayton Valley South	Li	2015: Northern Zone, upper part of Main Ash Aquifer saturation thickness: 118 feet, 11,350 Tons Li, 102 mg/L; Northern Zone, Main Ash	

INDUSTRIAL MINERAL DEPOSITS, ESMERALDA COUNTY (continued)

Deposit name	Minerals	Reserves/resources	Production
Clayton Valley South (cont.)		Aquifer saturation thickness: 102 feet, 34,940 tons Li, 370 mg/L; Northern Zone, Lower Aquifer System saturation thickness: 981 feet, 179,700 tons Li, 194 mg/L; Southern Zone, Main Ash Aquifer saturation thickness: 141 feet, 270,100 tons Li, 102 mg/L; Southern Zone, Lower Ash Aquifer saturation thickness: 581 feet, 403,400 tons Li, 37 mg/L; Total; 899,500 tons Li (Lithium Carbonate Equivalent inferred resource) 2017: 272,000 tons Li [Lithium Hydroxide Monohydrate (240,000 tons Lithium Carbonate Equivalent inferred resource)	
Diatom Hill	Diatomite	2014: 192,000,000 tons (proven indicated); 232,000,000 tons (probable indicated)	
Monte Cristo (Gilbert district)	Diatomite, Silica	2014: >220,000,000 tons (reserve)	
Potash-alum (Alum district)	Potash, Sulfur	1925: 110,000 tons, 15% potash-alum, 10% sulfur (proved ore)	
Rhyolite Ridge (Red Mountain district)	Li, B, K	2016: South Basin: 177,400,000 tons 1,550 ppm Li, 1.2% LCE, 2,180,000 tons Cont. LCE, 0.8% Li_2CO_3, 1,470,000 tons Cont. LC, 3.3% H_2BO_3, 5,876,000 tons Cont. Boric, 1.7% K_2SO_4, 2,990,000 tons Cont. Pot. (measured resources, 0.6% LCE cut-off grade); 71,200,000 tons 1,700 ppm Li, 1.2% LCE, 3,160,000 tons Cont. LCE, 0.9% Li_2CO_3, 2,314,000 tons Cont. LC, 2.6% H_2BO_3, 6,636,000 tons Cont. Boric, 1.7% K_2SO_4, 4,442,000 tons Cont. Pot. (inferred resources, 0.6% LCE cut-off grade); Searlesite Zone: 26,800,000 tons 1,820 ppm Li, 2% LCE, 529,000 tons Cont. LCE, 1% Li_2CO_3, 265,000 tons Cont. LC, 9.4% H_2BO_3, 2,513,000 tons Cont. Boric, 2% K_2SO_4, 551,000 tons Cont. Pot. (measured resources, 1.8% LCE cut-off grade); 44,400,000 tons 1,960 ppm Li, 2% LCE, 904,000 tons Cont. LCE, 1% Li_2CO_3, 462,000 tons Cont. LC, 9% H_2BO_3, 3,990,000 tons Cont. Boric, 2.3% K_2SO_4, 1,014,000 tons Cont. Pot. (inferred resources, 1.8% LCE cut-off grade)	
	Li, B, K	2017: South Basin (Upper and Lower Zones): 301,700,000 tons 0.9% Li_2CO_3 2,670,000 tons contained Li_2CO_3, 3.3% H_2BO_3, 9,870,000 tons contained boric acid, 1.7% K_2SO_4, 5,100,000 tons contained K (indicated resource, 1,050 ppm Li cut-off); 204,800,000 tons 0.9% Li_2CO_3 1,790,000 tons contained Li_2CO_3, 1.6% H_2BO_3, 3,320,000 tons contained boric acid, 1.6% K_2SO_4, 3,330,000 tons contained K (inferred resource, 1,050 ppm Li cut-off) (JORC compliant)	
Silver Peak (Silver Peak Marsh district)	Li	1975: 775,000 tons Li to 1,200 feet (brine reserves) 44,500 tons Li (recoverable) 2008: 44,000 tons (economic reserves)	1966-1997: N/A 1998: 1,200,000 lbs $LiCO_3$, 500,000 lbs LiOH 1999-2014: N/A 2015-2017: 31,284,457 lbs Li compounds

EUREKA COUNTY

Bisoni (Fish Creek) (Fish Creek district)	Fluorspar	1970s: “many 100,000s” tons, 10% CaF_2 1987: >120,000,000 tons, 10% CaF_2 2014: 9,800,000 tons, 10.3% CaF_2 (indicated mineral resource, 8% CaF_2 cut-off); 32,500,000 tons, 10.4% CaF_2 (inferred	

INDUSTRIAL MINERAL DEPOSITS, EUREKA COUNTY (continued)

Deposit name	Minerals	Reserves/resources	Production
Bisoni (cont.)		mineral resource, 8% CaF_2 cut-off) [JORC compliant] 2015: MB: 6,700,000 tons, 10.8% CaF_2 (indicated mineral resource, 9% CaF_2 cut-off); 88,500,000 tons, 0.7% CaF_2 (inferred mineral resource, 9% CaF_2 cut-off) [JORC compliant]	
Unnamed (29N, 46E, S7) (Lewis district)	Silica	1964: 1,000,000 cu. yds. quartzite	
Unnamed (29N, 46E, S25) (Bullion district)	Silica	1964: 150,000,000 cu. yds. chert	
Unnamed (30N, 46E, S7) (Lewis district)	Silica	1964: 4,000,000 cu. yds. quartzite 99.2% SiO_2, 0.3% Fe_2O_3, 0.1% Al_2O_3	
HUMBOLDT COUNTY			
Kings Valley (Disaster district)	Li, K, Na	2011: 16,465,000 tons, 0.4% Li, 3.85% K, 3.7% Na (proven reserves); 13, 445,000 tons, 0.388% Li, 3.93% K, 3.93% Na (probable reserves, 0.327% Li cut-off grade)	
	Li, K, Na	2012: 13,396,000 tons, 0.405% Li, 3.83% K, 1.46% Na (proven reserves); 1, 980,000 tons, 0.396% Li, 3.77% K, 1.45% Na (probable reserves, 0.32% Li cut-off grade)	
Thacker Pass (Disaster district)	Li, K, Na	2016: Stage I Lens (Kings Valley): 55,945,000 tons, 0.312% Li, 929,000 tons Li, 3.27% K, 1,830,000 tons K, 1.13% Na, 633,000 tons Na (measured resource, 0.2% Li cut-off grade); 184,224,000 tons, 0.285% Li, 2,744,000 tons Li, 3.07% K, 5,551,000 tons K, 1.04% Na, 1,881,000 tons Na (indicated resource, 0.2% Li cut-off grade); 137,666,000 tons, 0.294% Li, 2,154,000 tons Li, 3.04% K, 4,180,000 tons K, 1.1% Na, 1,515,000 tons Na (inferred resource, 0.2% Li cut-off grade)	
	Li	2017: 432,650,000 tons, 2,917 ppm Li, 6,718,000 tons lithium carbonate equivalent (measured and indicated resource, 2,000 ppm Li cut-off grade); 162,520,000 tons, 2,832 ppm Li, 2,536,000 tons lithium carbonate equivalent (inferred resource, 2,000 ppm Li cut-off grade)	
Lone Tree Hill (Potosi district)	Silica	1964: 60,000,000 cu. yds. quartzite	
Unnamed (36N, 41E, S17) (Potosi district)	Marble	1964: 10,000,000 tons, 93.39% $CaCO_3$, 1% $MgCO_3$, 4.24% SiO_2, 1% Al_2O_3, 0.43% Fe_2O_3, 0.33% P_2O_5 (reserves)	
LANDER COUNTY			
Blazer (Iowa Canyon district)	Fluorspar	1970s: 300,000 tons, 30% CaF_2 1974: 437,500 tons, 25.8% CaF_2	
Bradshaw (Bullion district)	Barite	1975: 78,760 tons (reserve, shipping grade 4.22 sp. gr.); 5,100 tons (low grade resource)	1975-1982: N/A
Nevada Fluorspar (Iowa Canyon district)	Fluorspar	1974: 924,000 tons, 26% CaF_2	1945-1975: N/A

INDUSTRIAL MINERAL DEPOSITS, LANDER COUNTY (continued)

Deposit name	Minerals	Reserves/resources	Production
Unnamed (32N, 42E, S23) (Buffalo Valley district)	Silica	1964: 50,000,000 cu. yds. chert	

LINCOLN COUNTY

Acoma (Acoma district)	Perlite	1951: 38,700,000 tons (indicated reserves) 21,850,000 tons (inferred reserves)	
Blue Nose (Viola district)	Limestone	2011: 227,725,000 tons (indicated resource; low, <5%, MgO); 30,595,000 tons (inferred resource, low; <5%, MgO); 16,649,000 tons (indicated resource, high MgO); 2,086,000 tons (inferred resource, high MgO)	
Boyd (Boyd district)	Kaolinite, Alum	1936: 800,000 cubic feet 1945: 3,500 tons (measurable and indicated ore); 30,000 tons (inferred ore)	1920-1930: 18,000 tons
Eccles and Minto (Acoma district)	Perlite	1951: 15,281,000 tons (indicated reserves) 9,640,000 tons (inferred reserves)	
Fairview (Silverhorn district)	Perlite	1951: 4,038,000 tons (indicated reserves) 2,000,000 (inferred reserves)	Bef. 1951: 5,000 tons
Free (Wilson Creek Range district)	Perlite	1951: 450,000 tons (indicated reserves) 1,000,000 (inferred reserves)	
Hollinger (Wilson Creek Range district)	Perlite	1951: 1,150,000 tons (indicated reserves) 3,000,000 (inferred reserves)	1940s-1968: over 250,000 tons
Johnson-Fitchett	Perlite	1951: 2,680,000 tons (indicated reserves) 1,000,000 tons (inferred reserves)	
Kopenite (South Pahroc Range district)	Perlite	1951: 10,460,000 tons (indicated reserves) 5,000,000 tons (inferred reserves)	Bef. 1951: several 1,000 tons
Leech (Wilson Creek Range district)	Perlite	1951: 1,150,000 tons (indicated reserves) 3,000,000 (inferred reserves)	
Panaca (Panaca district)	Diatomite	1936: 2,000,000 cubic feet (estimated reserves)	
Robb (South Pahroc Range district)	Perlite	1951: 16,000,000 tons (indicated reserves) 8,000,000 (inferred reserves)	
Snow (Eagle Valley district)	Perlite	1951: 29,615,000 tons (indicated reserves)	
Tenacity (South Pahroc Range district)	Perlite	1950s: 15,000,000 tons (reserves)	1950-2009: N/A 2010: 1,417 tons 2011: 1,699 tons 2012: 2,120 tons 2013: 2,199 tons 2014: 1,784 tons 2015: 2,184 tons 2016: 2,408 tons 2017: 2,530 tons

INDUSTRIAL MINERAL DEPOSITS, LYON COUNTY

Deposit name	Minerals	Reserves/resources	Production
Adams Claim (Mound House district)	Gypsum	2016: 6,000,000 tons gypsum and anhydrite; 300,000 tons limestone (reserves)	1996-2009: 2,312,342 tons 2010: 148,000 tons 2011: 238,802 tons 2012: 342,985 tons 2013: 441,129 tons 2014: N/A 2015: 520,530 tons 2016: 416,898 tons 2017: 388,368 tons
East Walker Clay Mine (Washington district)	Clay	2000: 938,522,358 cu. yds. (resource)	1998-2012: 5,000 tons 2014: 3,000 tons
Nevada Cement	Limestone	2014: Company land: 13,700,000 tons; Leased land: 71,700,000 tons (combined reserves in Churchill, Lyon, and Pershing Counties) 2015: Company land: 14,400,000 tons; Leased land: 70,600,000 tons (combined reserves in Churchill, Lyon, and Pershing Counties) 2017: Company land: 14,200,000 tons; Leased land: 69,600,000 tons (combined reserves in Churchill, Lyon, and Pershing Counties)	1964-2009: N/A 2010: 659,373 tons 2011: 661,243 tons 2012: 609421 tons 2013: 649,747 tons 2014: 723,789 tons 2015: 636,587 tons 2016: 709,211 tons 2017: 517,359 tons
North of Rosetta Mine (Red Mountain district)	Limestone	1959: 1,000,000 tons (estimated)	
South of Rosetta Mine (Red Mountain district)	Limestone	1959: 400,000 tons (estimated)	
Unnamed (20N, 24E, S7) (Olinghouse district)	Gravel	1964: 3,700,000 cubic yards	
Unnamed (20N, 24E, S11)	Sand	1964: 200,000,000 tons	
MINERAL COUNTY			
Baxter (Broken Hills district)	Fluorspar	1944: 177,000 tons (measurable reserve); 93,000 (indicated reserve); 186,000 tons (inferred reserve) 45%-70% CaF_2 1951: 247,163 tons 45.5% CaF_2 (indicated ore); 107,100 tons 45.5% CaF_2 (inferred ore)	1928-1957: 181,897 tons
Fluftrok (Aurora district)	Perlite	1950s: 300,000 tons (resource)	
Fluorspar King and Blue Bell (Buena Vista district)	Fluorspar	1945: 25,000-37,500 tons, 65% CaF_2	1929: 200 tons
NYE COUNTY			
Carrara (Bare Mountain district)	Marble	2003: 60,000,000 tons	1914-1934: ~10,000 tons
Horseshoe (Quinn Canyon district)	Fluorspar	1956: 410,000 tons, abt. 40% CaF_2 (estimated reserves)	
Mammoth (Quinn Canyon district)	Fluorspar	1956: 3,125,000 tons, 30-35% CaF_2 (estimated reserves)	

INDUSTRIAL MINERAL DEPOSITS, NYE COUNTY (continued)

Deposit name	Minerals	Reserves/resources	Production
Premier (Gabbs district)	Mg	2010: 64,000,000 tons (resource)	1935-2009: N/A 2010: 422,261 tons 2011: 421,969 tons 2012: 344,552 tons 2013: 435,072 tons 2014: 430,385 tons 2015: 360,612 tons 2016: 1,000,000 tons 2017: 326,522 tons
Railroad Valley (Butterfield Marsh district)	Sodium Carbonate	1967: 196,000,000 tons, 17.3% sodium carbonate (reserve)	
Shannon Queen (Quinn Canyon district)	Fluorspar	1956: 12,000 tons, abt. 51% CaF_2 (estimated reserves)	
Spar (Quinn Canyon district)	Fluorspar	1956: 33,000 tons, abt. 80% CaF_2 (estimated reserves)	
Union Canyon (Sea Bee) (Union district)	Fluorspar	1974: 433,000 tons, 18.5% CaF_2 (estimated open pit mineable) 20,000 tons, 16% CaF_2 (stockpiled)	1953-1954: 360 tons Early 1970s: mined and stockpiled: 20,000 tons
PERSHING COUNTY			
Lovelock (Muttlebury district)	Gypsum	1964: 3,000 tons gypsite	1890s: N/A
Nassau (Nevada district)	Bentonite	2012: 535,000 tons, Ca-Bentonite (wet tons of reserves)	1981-2009: <2,000 tons annually 2010: 2,000 tons 2011: 2,000 tons 2012: <2,000 tons 2013: <2,000 tons 2014-2015: 0 tons 2016: 4,486 tons 2017: 0 tons
Unnamed (31N, 30E, S11) (Nevada district)	Perlite	1964: >1,000,000 tons (source of commercial quality)	
Unnamed (31N, 30E, S35) (Nevada district)	Perlite	1964: 250,000 tons (source of commercial quality)	
Unnamed (31N, 36E, S11) (Willow Creek district)	Marble	1964: 30,000,000 tons, 89.22% $CaCO_3$, 8.21% $MgCO_3$, 24% SiO_2, 0.17% Al_2O_3, 0.004% P_2O_5	
Valery (Imlay district)	Fluorspar	1965: 800,000 tons, 25% CaF_2	1953-1955: 1,932 tons
STOREY COUNTY			
Washington Hill (Castle Peak district)	Aggregate	1989: >500,000,000 tons (light weight aggregate)	
WASHOE COUNTY			
Marble Bluff	Limestone	1965: 200,000,000 tons, >95% $CaCO_3$ (reserve)	

INDUSTRIAL MINERAL DEPOSITS, WASHOE COUNTY (continued)

Deposit name	Minerals	Reserves/resources	Production
Spanish Springs Quarry (McClellan district)	Aggregate	2012: 139,849,000 tons, hard rock (reserve) 2013: 139,342,000 tons, hard rock (reserve)	1984-2012: N/A 2013: 618,233 tons 2014: 663,749 tons 2015: 543,848 tons 2016: 618,233 tons 2017: 817,374 tons
Terraced Hills (Sand Pass district)	Halloysite	1965: >50,000,000 tons (reserve)	1968-2014: N/A 2010: 18,856 tons 2011: 19,232 tons 2012: 10,031 tons 2013: 27,569 tons 2014: 17,534 tons 2015: 43,232 tons 2016: 25,391 tons 2017: 13,655 tons
Winnemucca Lake Silica (Nightingale district)	Quartz	1964: 1,000,000 tons	

WHITE PINE COUNTY

Hampton Creek Garnet (Mount Moriah district)	Garnet	1990: 12,000 to 60,000 tons (1-5% alluvial resource)	Early 1960s: test lots
Mount Wheeler (Lincoln district)	Be, W, Fluorspar	1969: 200,000 tons, 0.75% BeO, 0.3% WO_3, 22% CaF_2 (ore reserves)	
Tami-Mosi (Nevada district)	Mg	2011: 454,000,000 tons, 12.3% Mg, 111,000,000,000 lbs. Mg metal content (inferred resource, 12% cut-off grade)	

GEOTHERMAL ENERGY

By Bridget Ayling

OVERVIEW

The total installed geothermal energy capacity in Nevada increased to ~720 MWe (megawatts electric) in 2017 with the new Tungsten Mountain project coming online in late 2017 (fig. 1; tables 1 and 2). Gross geothermal production remained stable at around 494 MWe and is anticipated to be larger in 2018, as Tungsten Mountain achieves 12 full months of production.

The total geothermal power generation in Nevada in 2017 was 4,324,889 megawatt-hours (MWh) gross and 3,323,882 MWh net, representing a small decline from generation in 2016. Data obtained from the Nevada Department of Taxation indicate that the total gross 2017 proceeds from geothermal operators in Nevada (including the direct use projects) were $259,981,916 (approximately $1.8 million greater than in 2016). The reported adjusted gross proceeds for 2017 (taking into account the cost of operating and maintaining plants and transmission lines, depreciation of capital investment in these, amortization of each long-term PPA, and other factors) were $81,697,687 (~$10 million decline compared to 2016).

In October 2017, the BLM offered up 20 parcels for geothermal exploration in Nevada (fig. 2; table 3). Ten of these were sold at a price of $2 an acre for a total of 19,209 acres of land and $38,418 in bonus bids. Total monies received by the BLM were $78,444 (including the bonus bid, administrative fees, and first year lease rental at $2/acre). Ormat Nevada Inc. bought eight of the 10 parcels sold, acquiring ~13,500 acres in Esmeralda County in the northern Clayton Valley and around the Fish Lake geothermal prospect, 2,514 acres in Churchill County adjacent to the Desert Peak and Brady geothermal systems, a small parcel in Washoe county (at the Steamboat geothermal system), and a parcel in Elko County (at the Marys River geothermal prospect) (fig. 2, table 3). U.S. Geothermal bought two parcels near the Dan Ranch hot springs system in Crescent Valley (Eureka County).

In 2017, the Nevada Division of Minerals (NDOM) permitted 35 geothermal wells, and 31 new geothermal wells were drilled (including the deepening of three existing thermal-gradient holes) (tables 4 and 5). This represents almost a doubling of both the number of permits issued and geothermal wells drilled compared to 2016. Fourteen of these wells were drilled in the City of Wells (13 of which were GeoProbe thermal gradient holes drilled with a truck-mounted push probe setup to depths no greater than 46 m (150 ft)). Additionally, five industry production wells and four industry injection wells were drilled. Most of these were drilled by Ormat Nevada Inc. in the McGinness Hills, Carson Lake, Dixie Meadows, Dixie Comstock, New York Canyon, and Tungsten Mountain geothermal fields/prospects, with permitted depths varying between 701 and 1,939 m (2,300–6,367 ft). Figure 3 illustrates these trends more clearly and highlights the boom in geothermal leasing and associated number of drilling permits issued in the late 2000s, as well as the decline in exploration activity since 2012. The number of production wells drilled has not varied as much between 2007 and 2017.

Trends

In 2017, average wellhead fluid production temperatures ranged from 86–187°C (187–369°F) for electricity generation, and three reported direct-use applications utilized geothermal fluids ranging between 78–95°C (172–203°F) (fig. 4). Production flow rates for an individual well averaged 130 liters/second (l/s; ~2,060 gallons/minute (gpm)) for electricity generation, with the highest production flowrates measured at the Don A. Campbell geothermal field (315 l/s; 4,993 gpm). Reviewing trends in production over time, it is apparent that some fields have experienced periods of production decline, such as San Emidio, Brady Hot Springs, Stillwater, and Salt Wells, whereas others demonstrate relatively stable production, including Dixie Valley, Wabuska, Steamboat Hills, Soda Lake, and Beowawe (figs. 5 a,b,c).

Since around 2007, geothermal generation capacity has been increasing at a near constant rate (fig. 6) to the current installed capacity of 720 MWe. This is almost a tripling of installed capacity since the mid 2000s, although the net power to market has only doubled in this time. The estimated price for geothermal electricity has remained relatively stable in recent years and is estimated to be around 7.82 cents(c)/kilowatt-hour (kWh) in 2017 (calculated by dividing the total gross proceeds by the annual net electricity production) — almost the same as the estimated price in 2016 (7.72 c/kWh) (fig. 7). The share of geothermal electricity generation in the state has increased since the mid-2000s to around 8% in 2016, coincident with a decrease in coal-fired electricity generation and variable hydroelectric generation (fig. 8). Natural gas generation has remained somewhat constant since mid-2005. It should be noted that these proportions reflect generation of electricity in Nevada, not consumption. Some geothermal power from Nevada is sold to Californian utilities under various Power Purchase Agreements (PPAs).

Table 1. Nevada geothermal power plants, and production figures, 2017.

Plant name	Nameplate Capacity (MWe)[1]	Flash or Binary	Commission Year	2017 Production (MWhr)		2017 Production (MWe)[2]		Operator
				Gross	Net	Gross	Net MWe	
Beowawe	18.5	F/B	1985	117,972	98,166	13.5	11.2	Terra-Gen Power
Blue Mountain	49.5	B	2009	323,481	229,622	36.9	26.2	AltaRock Energy
Brady Hot Springs	26.1	F/B	1992	90,460	48,417	10.3	5.5	Ormat Nevada Inc.
Desert Peak II	23.0	B	2006	125,973	96,409	14.4	11.0	Ormat Nevada Inc.
Dixie Valley	64.7	F	1988	531,212	475,833	60.6	54.3	TerraGen Power
Dixie Valley Binary Unit	6.2	B	2012			0.0	0.0	TerraGen Power
Don A. Campbell	22.5	B	2013	212,769	171,486	24.3	19.6	Ormat Nevada Inc.
Don A. Campbell II	25.0	B	2015	213,073	168,499	24.3	19.2	Ormat Nevada Inc.
Jersey Valley	23.5	B	2011	109,319	73,217	12.5	8.4	Ormat Nevada Inc.
McGinness Hills	48.0	B	2012	454,535	380,804	51.9	43.5	Ormat Nevada Inc.
McGinness Hills II	48.0	B	2015	462,333	388,523	52.8	44.4	Ormat Nevada Inc.
Patua	48.0	B	2012	203,996	111,135	23.3	12.7	Cyrq Energy
Salt Wells	23.6	B	2009	132,258	95,732	15.1	10.9	Enel North America
San Emidio	11.75	B	2012	89,949	66,591	10.27	7.60	U.S. Geothermal Inc.
Soda Lake No. 1	5.1	B	1987	28,435	22,028	3.2	2.5	Cyrq Energy
Soda Lake No. 2	21.0	B	1991	76,483	42,072	8.7	4.8	Cyrq Energy
Steamboat II	23.9	B	1992	95,718	59,572	10.9	6.8	Ormat Nevada Inc.
Steamboat III	23.9	B	1992	101,057	64,849	11.5	7.4	Ormat Nevada Inc.
Galena 1	30.0	B	2005	175,556	144,403	20.0	16.5	Ormat Nevada Inc.
Galena 2	13.5	B	2007	62,182	36,656	7.1	4.2	Ormat Nevada Inc.
Burdette (Galena 3)	30.0	B	2008	179,214	136,524	20.5	15.6	Ormat Nevada Inc.
Steamboat Hills	13.2	F	1988	102,112	85,071	11.7	9.7	Ormat Nevada Inc.
Total MW at Steamboat	***134.5***							
Stillwater 2	47.2	B	2009	203,347	129,035	23.2	14.7	Enel Stillwater
Tungsten Mountain	37.0	B	2017	34,469	28,306	3.9	3.2	Ormat Nevada Inc.
Tuscarora	32.0	B	2012	181,575	130,295	20.7	14.9	Ormat Nevada Inc.
Wabuska	5.6	B	1984	17,411	9,303	2.0	1.1	Open Mountain Energy
Total:	**720.8**			**4,324,889**	**3,292,548**	**493.7**	**375.9**	

[1] Nameplate capacity is the manufacturer's rating of equipment output capacity, as reported to the Nevada Division of Minerals by the plant operators, and does not necessarily reflect the capability of the currently developed resource. These nameplate capacities are estimates, and several different values can be found in the literature. Generator nameplate capacity actually refers to the size of the actual generator, but not to the turbine size or the actual capacity of the power plant. There are no public documents breaking down nameplate capacity of the turbines or gross power, so these numbers may not adequately reflect actual generation.

[2] Production values were calculated by dividing annual megawatt hours (MWh) produced by the number of hours in a year.

Table 2. Geothermal power plant operator contact information.

Company Address	Local Contact	Project	MWe
AltaRock Energy 4010 Stone Way North, Suite 400 Seattle, WA 98103 (206) 729-2400 http://altarockenergy.com/	NGP Blue Mountain 1 15250 Blue Mountain Road Winnemucca, NV 89445 (775) 786-4322	Blue Mountain	49.5
Cyrq Energy 136 S. Main Street, Suite 600 Salt Lake City UT 84101 (801) 875 4200 http://www.cyrqenergy.com/	Patua Geothermal Power Plant 17388 Patua Road Hazen, NV 89408 (775) 217-2650 Soda Lake Power Plant 5500 Soda Lake Road Fallon, NV, 89406, USA (775) 867-5093	Patua Soda Lake No. 1 Soda Lake No. 2	48 5.1 21
Enel North America 1755 East Plumb Lane, Suite 155 Reno, NV 89502 (775) 329 0700 https://www.enelgreenpower.com/country-north-america	(775) 423-5374 (775) 423-0322	Salt Wells Stillwater	23.6 47.2
Open Mountain Energy 3451 N. Triumph Blvd, Suite 201 Lehi, UT 84043 (801) 376 9417 http://openmountainenergy.com/	Wabuska 15 Julian Lane Yerington, NV 89447 (775) 463-4633	Wabuska[1]	5.6
Ormat Technologies, Inc. 6140 Plumas St Reno, NV 89519 (775) 356-9029 http://www.ormat.com/	(775) 322-7782 (775) 423-5800 (775) 852-1444 (775) 384-7807 (775) 557-2015 (775) 852-1444 (775) 852-1444 (775) 852-1444 (775) 384-7807	Brady Hot Springs Desert Peak Jersey Valley McGinness Hills (1 & 2) San Emidio (Empire)[2] Steamboat Tungsten Mountain Tuscarora Don Campbell (Wild Rose)	26.1 23 23.5 96 11.75 134.5 37 32 47.5
Terra-Gen Power, LLC 9590 Prototype Ct., #220 Reno, NV 89521 (775) 850-1125 http://www.terra-gen.com/	(775) 635-2130 (775) 423-6535	Beowawe Dixie Valley	18.5 70.9
	Total Installed MWe (nameplate capacity)		**720.75**

[1] Homestretch Geothermal 2010 LLC was bought by Open Mountain Energy in April 2017.
[2] US Geothermal was purchased by Ormat Nevada Inc. in 2018, and thus contact details for San Emidio are included under Ormat.

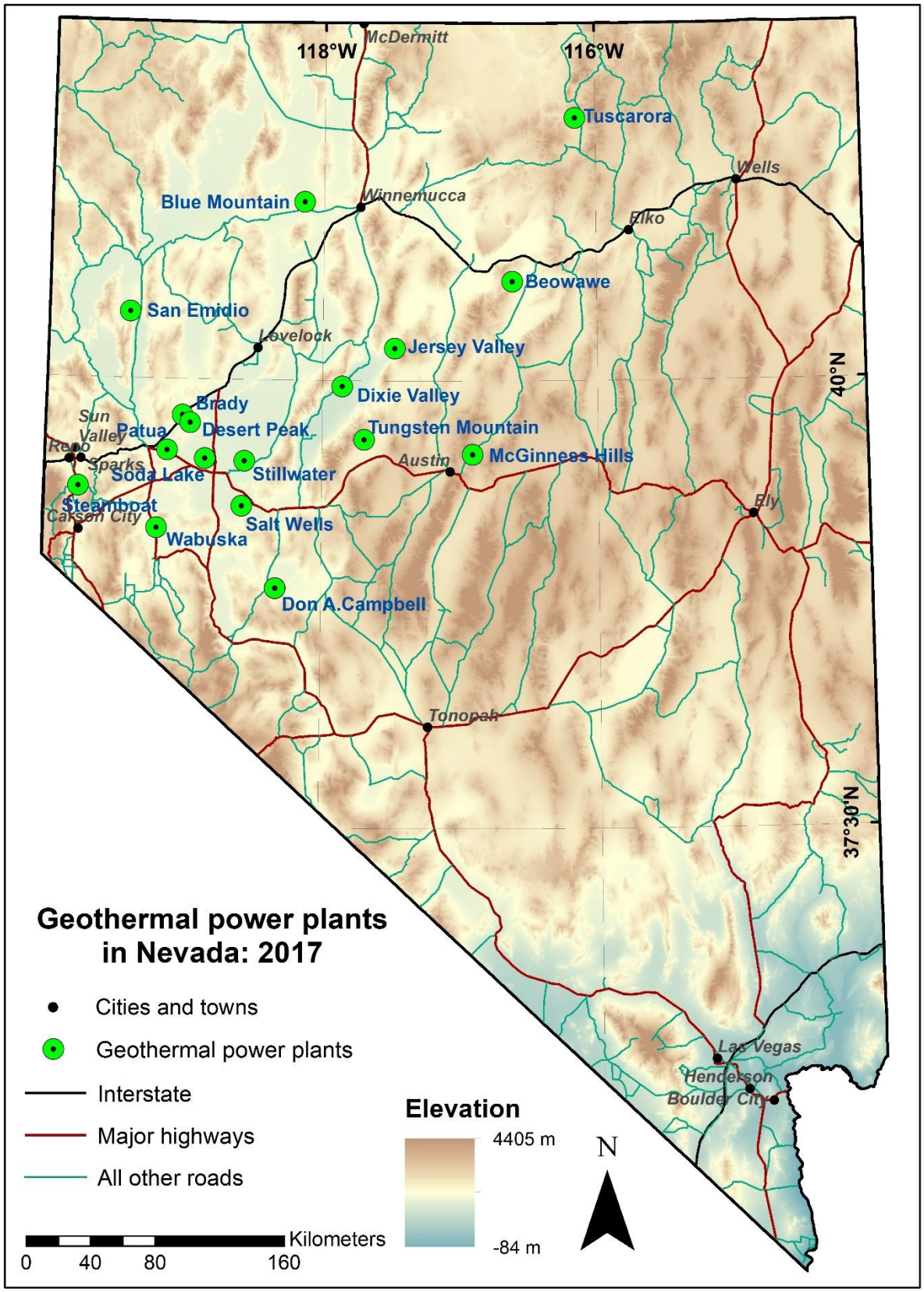

Figure 1. Location of geothermal power plants in Nevada in 2017.

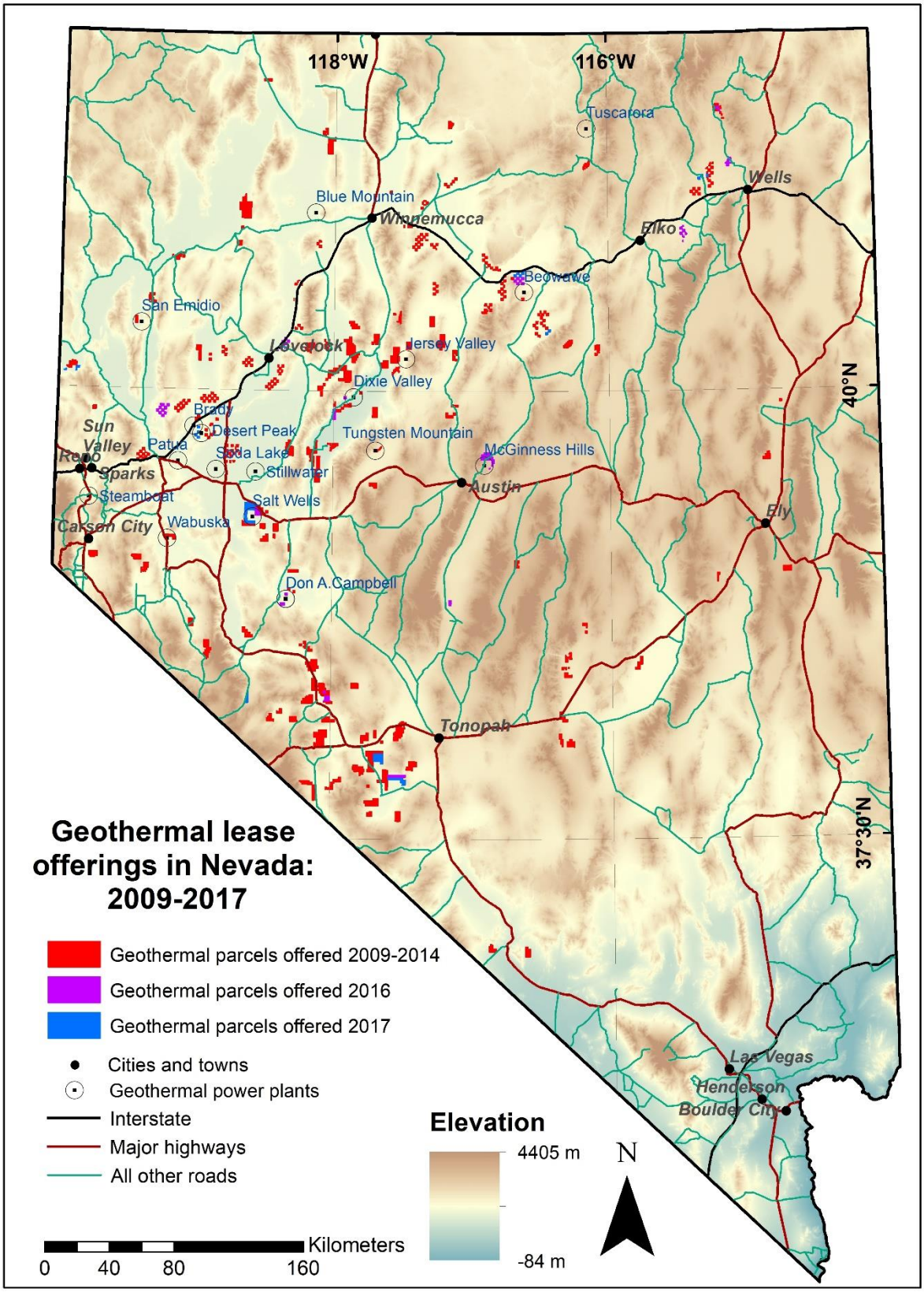

Figure 2. Geothermal leases offered by the BLM between 2009 and 2017.

Table 3. Geothermal competitive leasing activity in Nevada, 2007–2017.

Year	Parcels Offered	Acres Offered	Parcels Sold	Acres Sold	Total receipts[1]	Highest bid per acre	Avg. bid per acre	% Acres Sold	% Parcels Sold
2007	43	122,849	43	122,849	$11,669,821	$95	$92.90	100%	100%
2008	35	105,212	35	105,212	$28,207,806	$268	$266	100%	100%
2009	108	323,222	82	243,727	$8,909,445	$3,800	$34.50	75%	76%
2010	114	328,020	75	212,370	$2,762,292	$1,000	$10.95	65%	66%
2011	51	151,119	17	42,627	$456,353	$60	$8.65	28%	33%
2012	33	94,829	8	27,834	$112,540	$2	$2	29%	24%
2013	13	16284	9	10373	$42,870	$2	$2	64%	69%
2014	2	3,438	1	40	$315	$2	$2	1%	50%
2015	0	0	-	-	-	-	-	-	-
2016	22	46976	14	32075	$30,552	$2	$2	68%	64%
2017	20	38208	10	19209	$78,444	$2	$2	50%	50%
Totals:	**441**	**1,230,157**	**294**	**816,316**	**$52,370,438**	**$3,800**	**$42.30**	**66%**	**67%**

[1] Includes first year lease rental at a price of $2 per acre and administration fees ($160 per parcel).

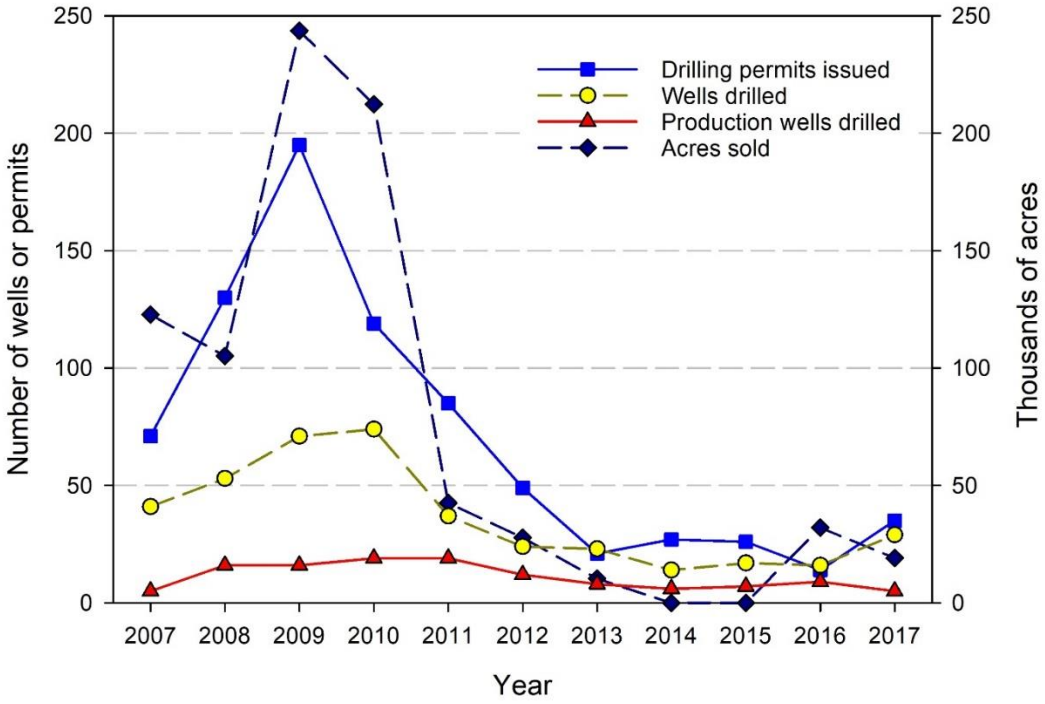

Figure 3. Trends in geothermal leasing and drilling activities in Nevada from 2007 to 2017.

Table 4. Geothermal wells reported as drilled, re-drilled or completed in 2017.

County	Area	Permit #	Operator Name	Well Number	Well Type[1]	UTM_ Easting[2]	UTM_ Northing[2]	Land Type	Permitted depth (m)[3]
Washoe	Reno	1380	Bob and Rose Maynard trust	PW-1	Dom	258174	4374900	Private	61
Washoe	San Emidio	1382	USG Nevada	18-21	Obs	295037	4470642	BLM / USFS	663
Washoe	San Emidio	1383	USG Nevada	28-21	Obs	295373	4470706	BLM / USFS	305
Washoe	San Emidio	1385	USG Nevada	78-20	Obs	294798	4470736	BLM / USFS	727
Churchill	Tungsten Mountain	1410	ORNI 43	75B-22	Ind-Prod	441019	4391356	BLM / USFS	1523
Churchill	Dixie Meadows	1412	ORNI 32	75(53)-4	Ind-Inj	410590	4406373	BLM / USFS	1939
Pershing	New York Canyon	1413	ORMAT NEVADA	68(72-11)-2	Ind-Prod	413959	4434801	BLM / USFS	1371
Churchill	Tungsten Mountain	1414	ORNI 43	24(34)-22	Ind-Inj	440318	4391787	BLM / USFS	1218
Washoe	Reno	1415	DODD, JEFFREY	#1	Dom-Prod	258206	4374385	Private	91
Washoe	Reno	1416	DODD, JEFFREY	#1	Dom-Inj	258212	4374412	Private	91
Elko	Wells	1417	CITY OF WELLS	WGP1	TG - GP	669122	4555144	Private	46
Elko	Wells	1418	CITY OF WELLS	WGP2	TG - GP	669028	4555260	Private	46
Elko	Wells	1419	CITY OF WELLS	WGP3	TG - GP	668746	4555424	Private	46
Elko	Wells	1420	CITY OF WELLS	WGP4	TG - GP	668957	4555274	Private	46
Elko	Wells	1421	CITY OF WELLS	WGP5	TG - GP	668998	4555245	Private	46
Elko	Wells	1422	CITY OF WELLS	WGP6	TG - GP	669071	4555176	Private	46
Elko	Wells	1423	CITY OF WELLS	WGP7	TG - GP	669079	4555196	Private	46
Elko	Wells	1424	CITY OF WELLS	WGP8	TG - GP	669059	4555219	Private	46
Churchill	Dixie Comstock	1428	ORMAT NEVADA	35(24)-14	TG	413144	4412933	BLM / USFS	609
Churchill	Dixie Comstock	1431	ORMAT NEVADA	37(27)-14	TG	413213	4412421	BLM / USFS	609
Lander	McGinness Hills	1435	ORNI 41	57D(67)-22	Ind-Inj	508377	4380932	Private	701
Elko	Wells	1436	CITY OF WELLS	WGP-09	TG - GP	668767	4555156	Private	46
Elko	Wells	1437	CITY OF WELLS	WGP-10	TG - GP	668825	4555140	Private	46
Elko	Wells	1438	CITY OF WELLS	WGP-11	TG - GP	668863	4555115	Private	46
Elko	Wells	1439	CITY OF WELLS	WGP-12	TG - GP	668931	4555095	Private	46
Elko	Wells	1440	CITY OF WELLS	WGP-13	TG - GP	669211	4554769	Private	46
Lyon	Wabuska	1441	Open Mountain Energy	PW-5	Ind-Prod	311706	4337215	Private	213
Churchill	Carson Lake	1442	ORNI 16	84A-31	Ind-Inj	357852	4360307	BLM / USFS	762
Lander	McGinness Hills	1443	ORNI 41	28C-10	Ind-Prod	507729	4383999	BLM / USFS	1218
Lander	McGinness Hills	1445	ORNI 41	36B-10	Ind-Prod	507762	4383987	BLM / USFS	1218
Elko	Wells	1447	CITY OF WELLS	WELL 1	Obs	668999	4555249	Private	152

[1] Abbreviations as follows: Ind-Production = Industry Production well, Ind-Inj = Industry Injection well, Obs = Observation well, Dom = Domestic well, TG-GP = GeoProbe Thermal Gradient hole, TG = Thermal Gradient hole.

[2] North American 1983 Datum UTM 11N (in meters).

[3] Permitted depth for each well obtained from the Nevada Division of Minerals (http://minerals.nv.gov/Programs/Geo/GeoPermits/).

Table 5. Geothermal drilling activity in Nevada, 2007–2017.

Year	Number of permits issued	Number of wells drilled	Number of production wells drilled
2007	71	41	5
2008	130	53	16
2009	195	71	16
2010	119	74	19
2011	85	37	19
2012	49	24	12
2013	21	23	8
2014	27	14	6
2015	26	17	7
2016	14	16	9
2017	35	31	5

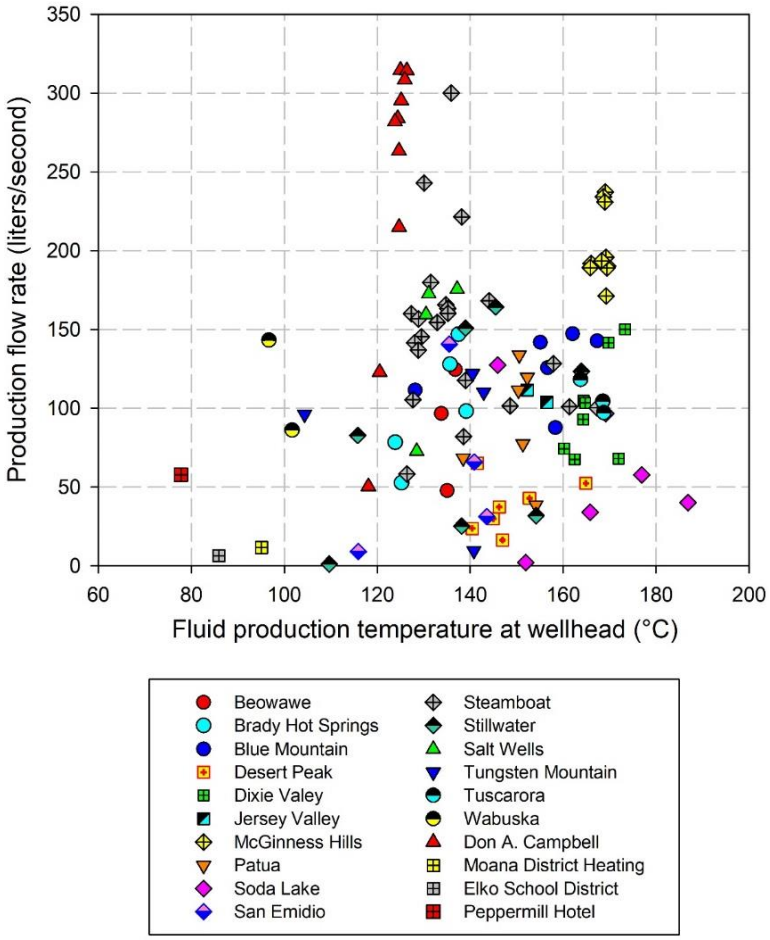

Figure 4. Average production flow rates of geothermal wells in Nevada in 2017 and their associated temperatures as measured at the wellhead. Data based on information provided to the Nevada Division of Minerals, 2017.

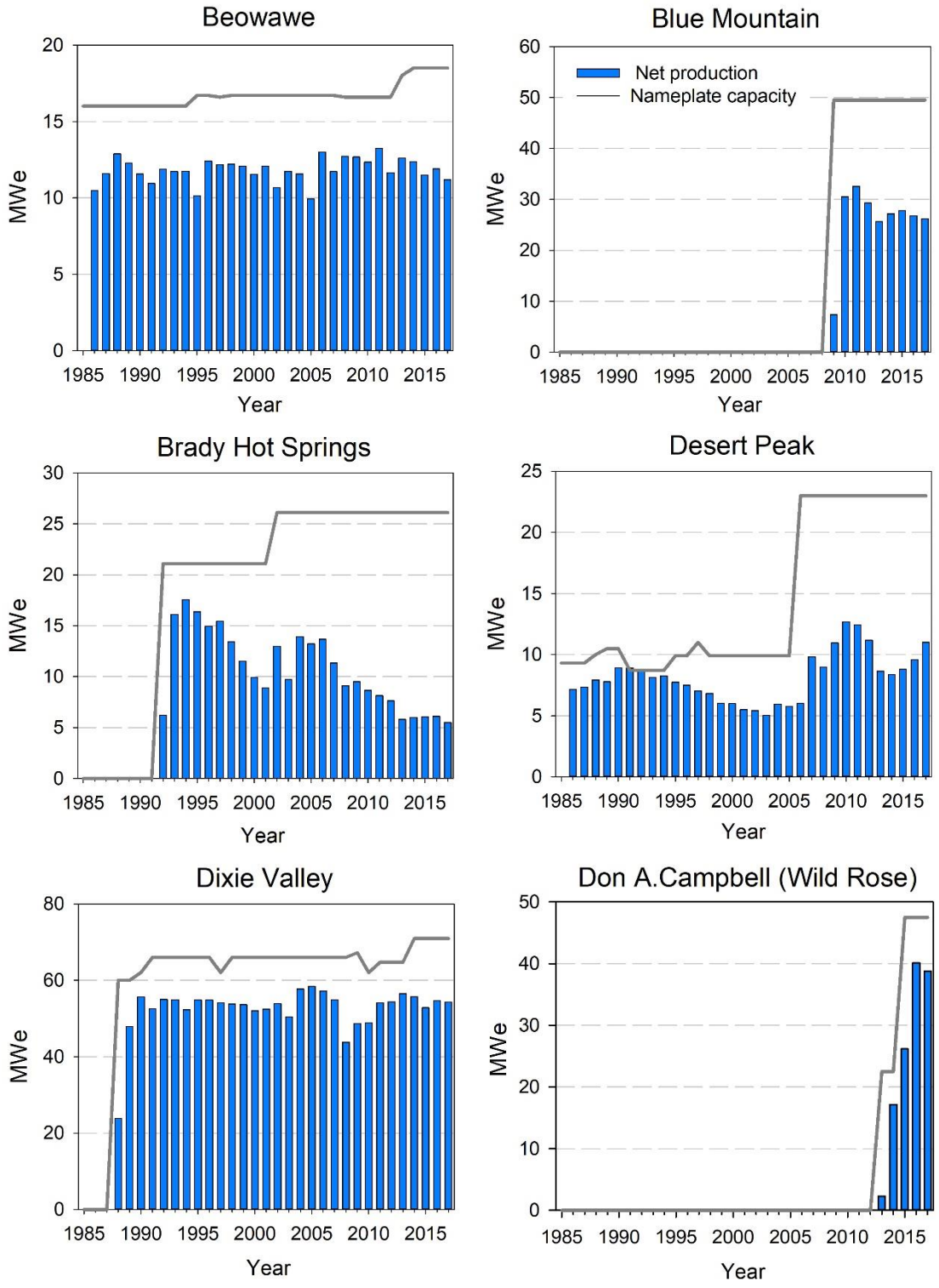

Figure 5a. Evolution of nameplate capacity (MWe) and net power generation (MWe) for geothermal power plants in Nevada (legend is the same for all plots).

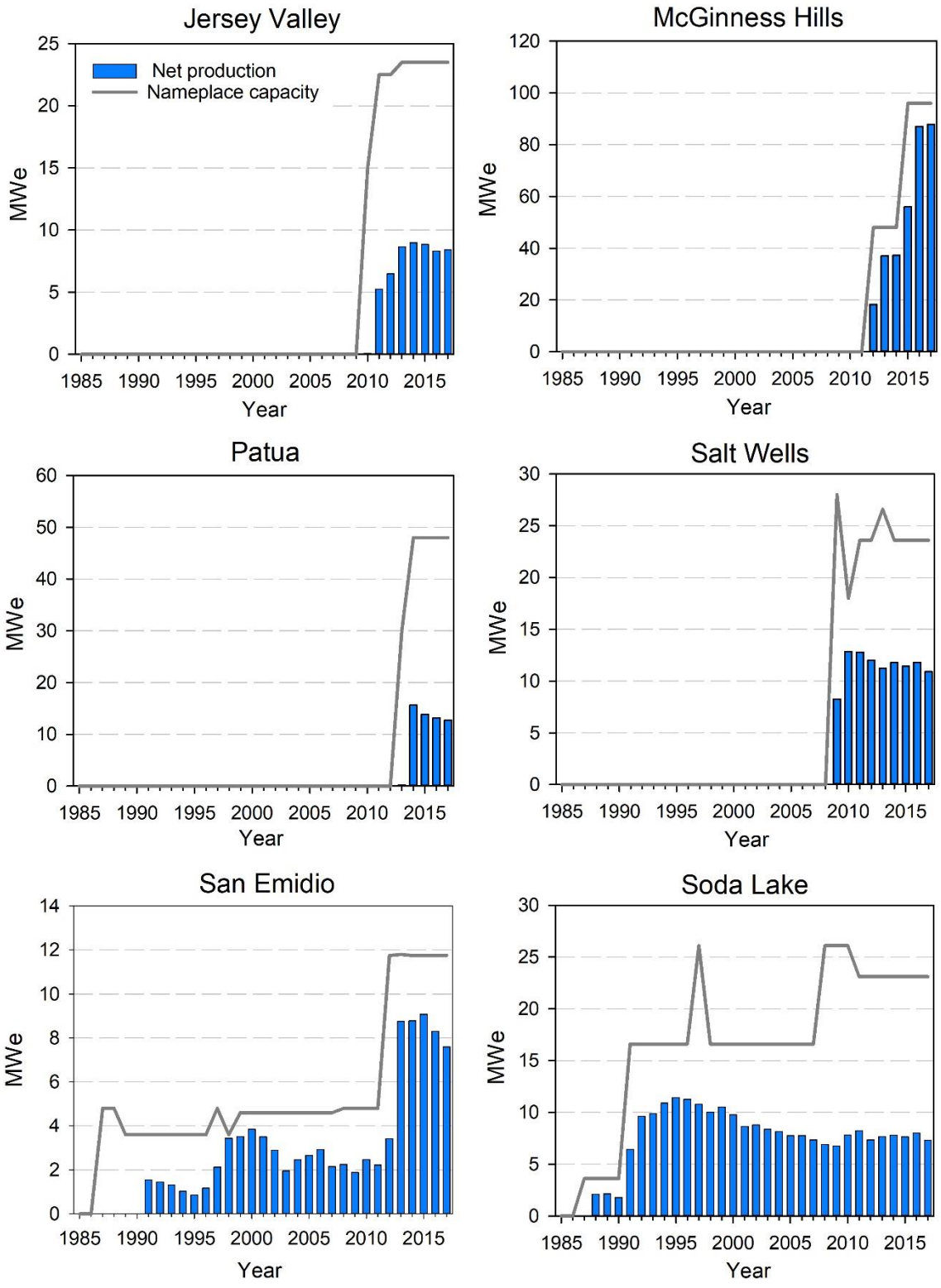

Figure 5b. Evolution of nameplate capacity (MWe) and net power generation (MWe) for geothermal power plants in Nevada (legend is the same for all plots).

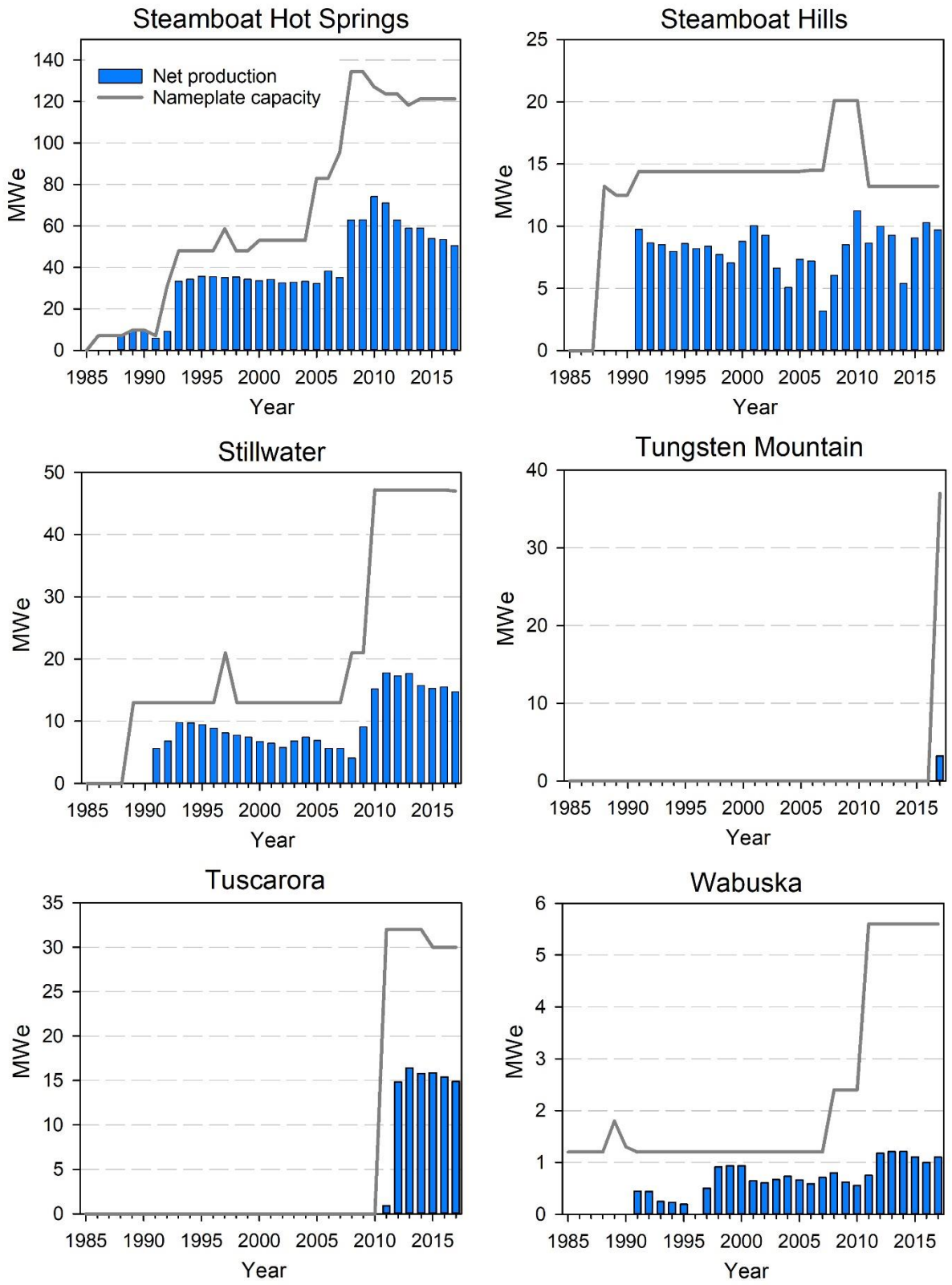

Figure 5c. Evolution of nameplate capacity (MWe) and net power generation (MWe) for geothermal power plants in Nevada (legend is the same for all plots).

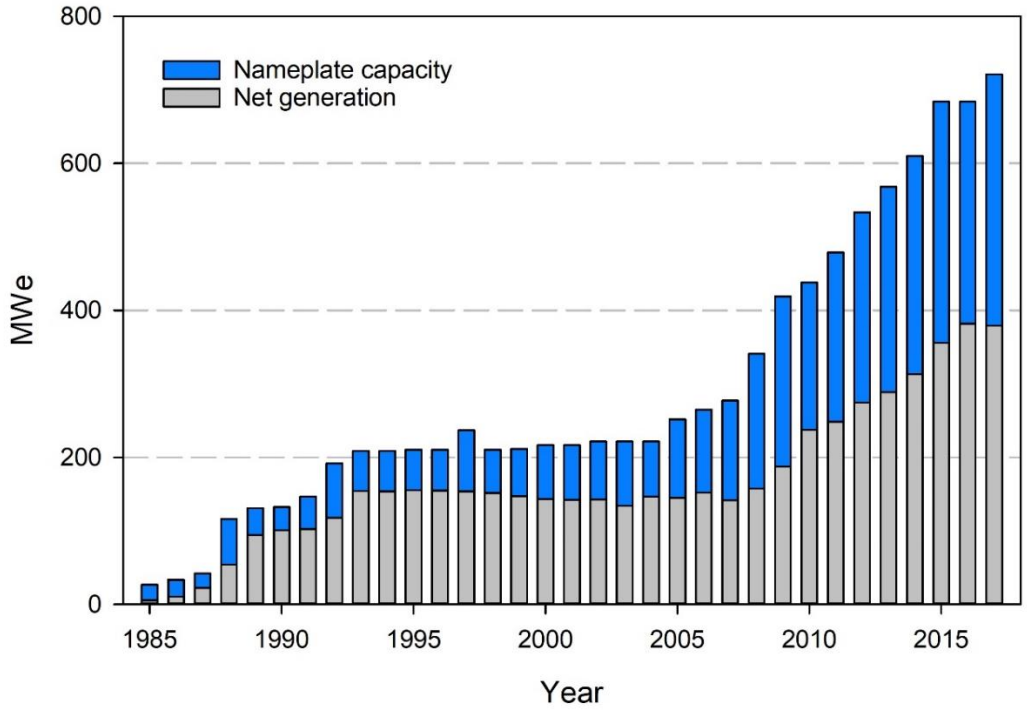

Figure 6. Cumulative nameplate generating capacity and net geothermal power production in Nevada between 1985 and 2017, as reported to the Nevada Division of Minerals. Net generation is calculated by dividing annual net generation in megawatt-hours by the number of hours in a year.

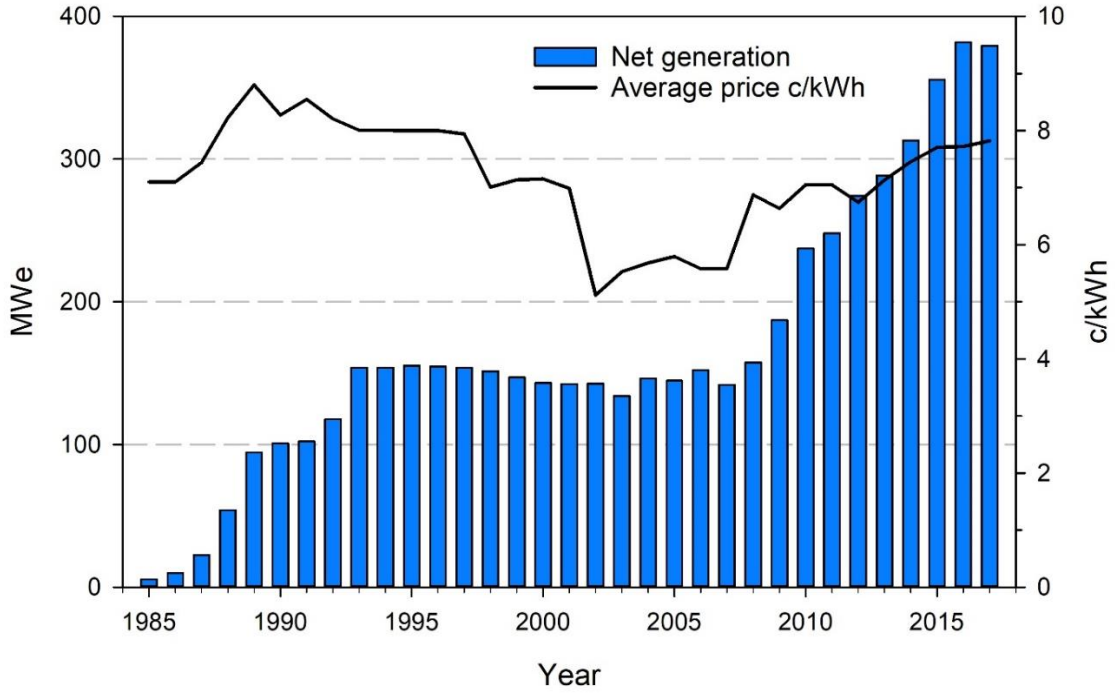

Figure 7. Trends in annual, net geothermal electricity generation and the estimated average price of geothermal electricity (calculated from gross proceeds and reported net production through 2017) in cents per kilowatt hour (c/kWh). The actual price for any individual power plant may be different and is held confidential by the State Energy Office.

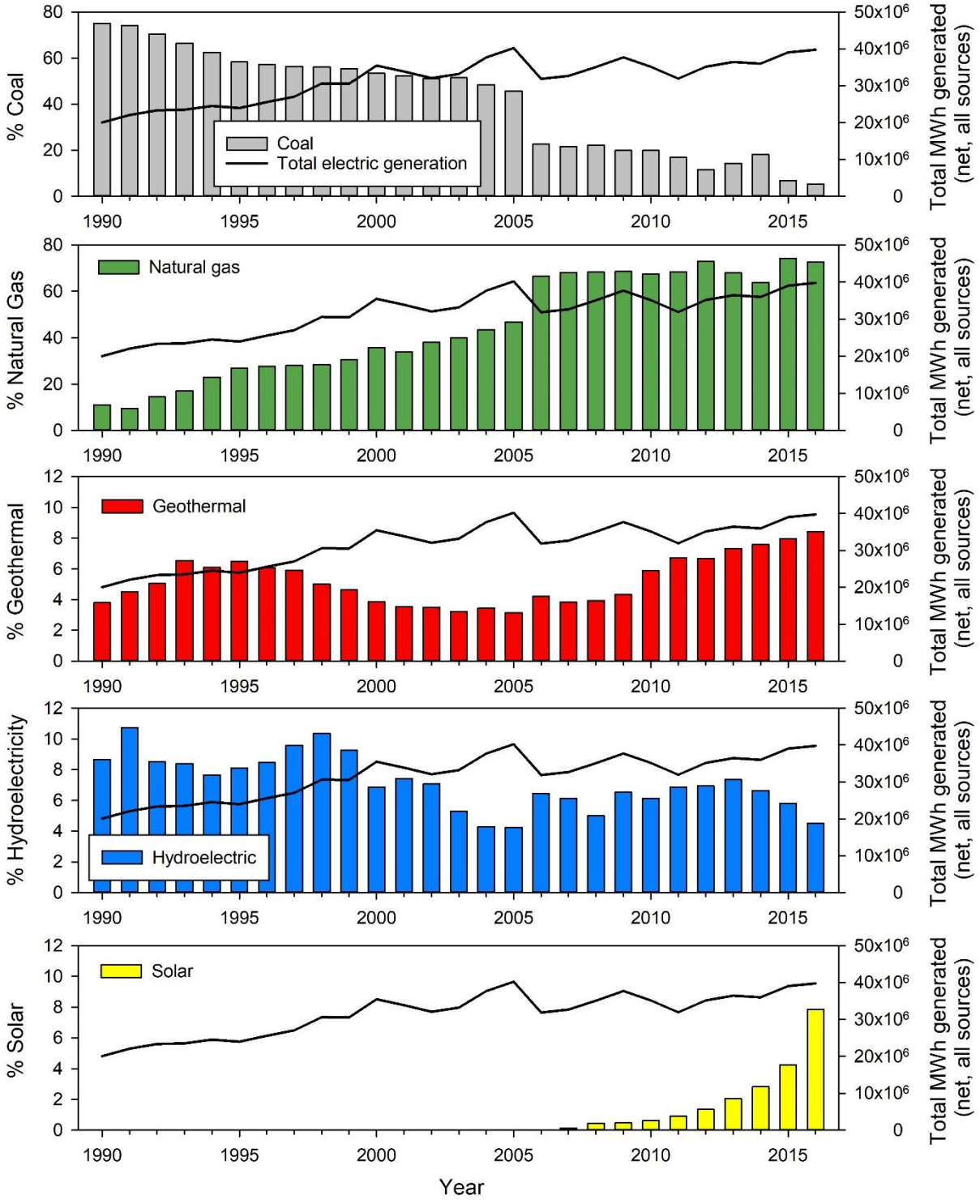

Figure 8. Changes in the major contributors to electricity generation in Nevada between 1990 and 2016. Data sourced from the U.S. Energy Information Administration (EIA)[3].

[3] https://www.eia.gov/electricity/state/nevada/

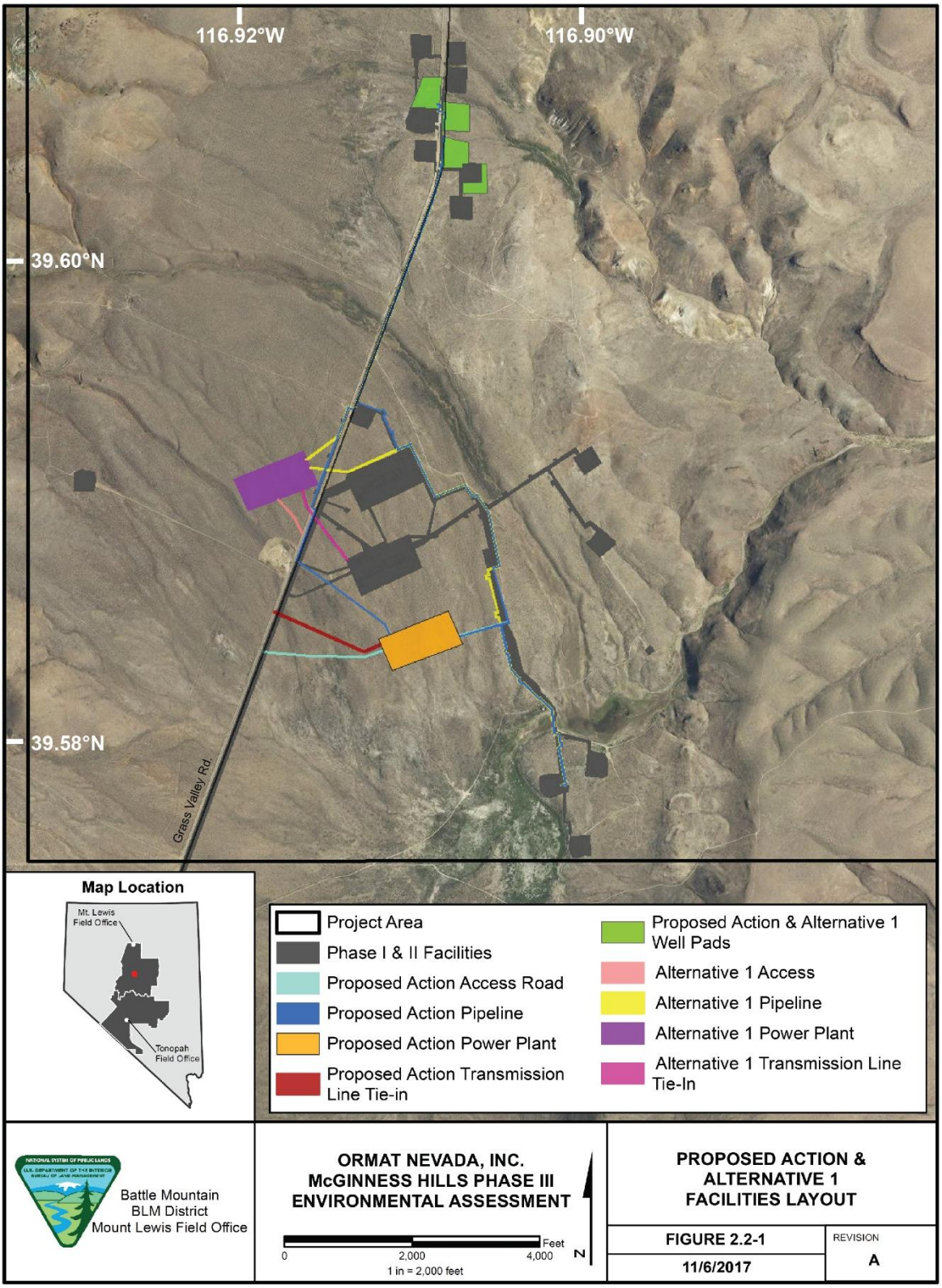

Figure 9. Proposed locations of the Phase 3 expansion at the McGinness Hills geothermal plant (extracted from the Environmental Assessment document: http://clearinghouse.nv.gov/public/Notice/2018/E2018-065.pdf)

In 2017, Ormat Nevada Inc. secured a new PPA with the Southern California Public Power Authority (SCPPA) for a term of 26 years beginning December 31, 2017[4], with a fixed price of $75.50/MWh. SCPPA will in turn sell this power to the Los Angeles Department of Water and Power (LADWP). Energy deliveries will begin in December 2017, and the entire portfolio is expected to be online in 2022. The portfolio PPA contract is for 150 MWe but has an upper capacity limit of 185 MWe net and lower limit of 135 MWe net. This additional capacity will be met by a combination of generation from new geothermal plants (e.g. Tungsten Mountain, Dixie Meadows, Baltazor Hot Springs, McGinness Hills Phase 3 expansion), as well as re-contracting of existing plants (e.g. Steamboat Hills, Brady, Steamboat 2 and 3, and Desert Peak).

Significant federally funded geothermal research projects in Nevada in 2017

In 2017, the U.S. Department of Energy (DOE) provided funding for several geothermal research projects in Nevada. Six projects are briefly reviewed as follows:

1. Nevada Play Fairway project: Phase 2

- Project PI: Dr. James Faulds, University of Nevada, Reno
- Project duration: 18 months: 1 April 2016–30 September 2017.
- Total project funding: Phase 2: $825,000
- Project goal: Develop a methodology that will predict the locations of potential blind hydrothermal geothermal systems (i.e. systems with no surface hot springs or steam vents) and distinguish the most promising systems for development (whether blind or not). In Phase 1 of the Nevada play fairway project, an extensive suite of existing geological, geophysical and geochemical data were compiled and evaluated, in support of locating new areas with geothermal potential and developing a workflow to reduce geothermal exploration risk (Faulds et al., 2015; Faulds et al., 2016). A geothermal potential map was produced for 96,000 km^2 of Nevada, extending from the west-central to eastern part of the state. In Phase 2, 5 sites were selected for more detailed characterization: southeastern Gabbs Valley, Sou Hills, Granite Springs Valley, Crescent Valley, and Steptoe Valley (Faulds et al., 2017). Key activities included additional data collection, such as shallow temperature surveys, more detailed structural mapping, interpretation of existing seismic reflection profiles, gravity surveys, 3D geological modeling, and water sampling for geochemical analysis.

2. Nevada Play Fairway project: Phase 3

- Project PI: Dr. James Faulds, University of Nevada, Reno
- Project duration: 18 months: 1 October 2017–30 March 2019.
- Total project funding: Phase 3: $1,500,000
- Project goal: Validate the geothermal play fairway workflow developed in Phases 1 and 2 via confirmation (thermal gradient) drilling and more detailed geophysical surveys. Two locations were prioritized for Phase 3 work: southeastern Gabbs Valley (in Mineral County, about 16 km southeast of the Don A. Campbell geothermal power plant), and northern Granite Springs Valley in Pershing County.

3. Fallon Frontier Observatory for Research in Geothermal Energy (FORGE): Phase 2a,b

- Project PI: Sandia National Laboratories
- Project duration: Phase 2a, b: 18 months, October 2016 to March 2018.
- Total project funding: Phase 2a, b: $9,500,000
- Project goal: Select and demonstrate site viability to host the FORGE field research laboratory, where the scientific and engineering communities can conduct research and test technologies to make Engineered Geothermal Systems (EGS) commercially viable. In Phase 1, the Fallon FORGE site was selected as a potential candidate for experiments related to developing deep, engineered geothermal reservoirs. Phase 1 activities included substantial compilation and review of the existing geological, geochemical, geophysical, environmental, logistical, and hydrological data from the Fallon site to determine the suitability of the site to host FORGE. In Phase 2, key activities included securing additional environmental permits and initiating an EA (Environmental Assessment), extensive outreach with key local, regional, and state stakeholders, preparing an induced seismicity mitigation plan (ISMP), acquisition of seismologic and geodetic baseline datasets (MEQ, GPS and InSAR), reprocessing and reinterpretation of preexisting seismic reflection profiles, acquisition of new, detailed gravity and magnetic data, refining the detailed 3D model of the site (originally constructed

[4]https://investor.ormat.com/file/Index?KeyFile=2000842054

in Phase 1) based on the new geophysical data and reinterpreted seismic reflection profiles, geomechanical and reservoir modelling, and siting and drilling a deep well to provide additional certainty that the target reservoir has low permeability (Ayling and Blankenship, 2018).

4. A Novel Approach to Map Geothermal Permeability Using Passive Seismic Emission Tomography and Joint Inversion of Active Seismic and EM Data: Subsurface Technology and Engineering Crosscut Initiative (SubTer)

- Project PI: U.S. Geothermal Inc.
- Project duration: 2 years: October 2016–September 2018.
- Project funding: $1,500,000 (DOE); $400,000 (U.S. Geothermal cost share)
- Project goal: Develop new subsurface technologies at both San Emidio and Crescent Valley geothermal fields in Nevada to identify fluid flow paths in the geothermal resources. Multiple geophysical techniques (passive seismic emission tomography, and joint inversion of active seismic and electro-magnetic (EM) data) were used to map sub-surface fluids and associated permeability in these two geothermal prospects. Preliminary results indicate that a robust 3D permeability map can be generated using electromagnetic and dense passive seismic datasets if combined with complementary drilling and potential field data (Warren et al., 2018).

5. Quantifying EGS Reservoir Complexity with an Integrated Geophysical Approach - Improved Resolution Ambient Seismic Noise Interferometry

- Project PI: Dr. John Louie, University of Nevada, Reno.
- Project duration: 3 years, 9 months: October 2014–June 2018.
- Total project funding: $408,195
- Project goal: Improve the resolution (from 2 km to 0.1 km, to 3 km depth) of seismic interferometry-estimated parameters, such as seismic attenuation, temperature, and lithology, relative to prior work on the Dixie Valley geothermal system. Also, assess the possibility of using seismic interferometric analysis in combination with other geophysical techniques for EGS target identification to characterize the subsurface.

6. Hawthorne Deep-Direct Use Assessment

- Project PI: Sandia National Laboratories
- Project duration: 2 years: October 2017 to September 2019.
- Total project funding: $560,000
- Project goal: Develop a multi-disciplinary, three-tiered analysis approach to assess the geothermal resource and determine the feasibility of implementing a direct-use facility for the Hawthorne Army Depot (HAD) and the various town and county facilities in Hawthorne, Nevada (e.g. library, town hall and other public buildings). A three-tiered analysis approach will link a production side analysis (PSA) and a demand side analysis (DSA) into a whole-system analysis (WSA) to provide an integrated assessment of the resource and the probability of delivering economically viable direct-use energy to the Hawthorne area. The output from this project will be a comprehensive techno-economic feasibility assessment that presents Pareto-optimal results for a set of direct-use district heating and cooling configurations that show their respective tradeoffs amongst a set of decision metrics.

ACTIVITY DURING 2017

The following section outlines new activity at geothermal power plants and major exploration sites in 2017. For historical information about geothermal sites in Nevada, refer to previous Mineral Industry reports published annually by NBMG (e.g. Muntean et al., 2017).

Carson Lake (Ormat Nevada Inc.)

In 2017, Ormat drilled an injection well 84A-31 with a permitted depth of 762 m (2,500 ft). This well was twinned beside production well 84-31 that was drilled in 2008. Well 84-31 has a measured bottom hole temperature of 170°C (338°F) at 1811 m (5,941 ft) depth but also has a shallow outflow zone with a measured temperature of 125°C (264°F) at ~200 m (~656 ft) depth (Fallon FORGE well-log dataset, 2018). Ormat reported that well 84-31 did not meet their commercial criteria, but 84A-31 tested favorably. Planning is underway for a flow test to estimate reservoir volume[5].

[5]https://investor.ormat.com/interactive/newlookandfeel/4087066/2017_AR_Ormat.pdf

Dixie Meadows (Ormat Nevada Inc.)

Ormat continued work at the Dixie Meadows geothermal prospect in central Nevada, which is located approximately 28 km southwest of the Dixie Valley geothermal system. In 2017, Ormat drilled an injection well (75(53)-4) with a permitted depth of almost 1,939 m (6,361 ft) (table 4). This follows the drilling of five wells in 2015 and 2016, which included drilling three production wells. The Dixie Meadows project has run into some opposition due to the rare Dixie Valley toad that was recently identified in the area[6],[7].

A draft EA was completed by the BLM in May 2017 and was open for public comment until July 2017[8]. The EA stated that up to two 30 MWe binary geothermal power plants will be constructed, up to 15 geothermal production and injection wells will be drilled, tested, and operated, up to 8 core holes will be drilled, and supporting surface pipelines and transmission line infrastructure will be installed[9]. However, in their 2017 annual report, Ormat stated that they are developing a 15–20 MWe geothermal plant at Dixie Meadows; this is somewhat less than the two 30 MWe power plants that are proposed in the EA. Ormat also stated that based on the drilling results to date, the geothermal injection wells would be best placed in an area that is currently designated as protected land. They are evaluating options regarding changing this designation, and until this is completed, the project has been put on hold[10].

Dixie Comstock (Ormat Nevada Inc.)

A thermal gradient well was drilled at the Dixie Comstock geothermal prospect in 2017, with a permitted depth of ~600 m (1968 ft). No other activity is reported at Dixie Comstock for 2017.

McGinness Hills (Ormat Nevada Inc.)

Work towards the Phase 3 expansion of the McGinness Hills plant continued in 2017. For this expansion, Ormat is proposing to build a third 48 MWe (net), 60 MWe (gross) binary, air-cooled geothermal power generation facility, approximately 180 m (650 ft) south of the existing Phase 2 power plant. This will require drilling of 5 new production wells, an additional 1,121 m (3,680 ft) of production pipeline, ~950 m (3,100 ft) of access roads, and a new power generation tie-in consisting of 564 m (1,850 ft) of new transmission line connecting to the existing transmission line[11] (fig. 9). In 2017, Ormat drilled two new production wells and an injection well to support the Phase 3 expansion, with permitted depths of ~1,200 m (3,937 ft) and ~700 m (2297 ft), respectively.

Moana district heating (Avalon Geothermal, LLC)

Nevada Geothermal Utility Company operated the geothermal district heating system at the Warren and Manzanita estates in Reno from 1983 through to 2017. In August 2017, Avalon Geothermal, LLC, a wholly owned subsidiary of Cyrq Energy, Inc. purchased Nevada Geothermal Utility Company, and continues to operate the district heating system, which includes both space heating and water heating[12]. The system uses ~95°C (203°F) geothermal fluids that are produced at ~12 l/s (~184 gpm) from a single production well (fig. 4), and provides space and water heating for 104 homes.

New York Canyon (Ormat Nevada Inc.)

Ormat drilled a production well (68(72-11)-2) at their New York Canyon project in Pershing County, with a permitted depth of 1,371 m (4,498 ft). Additionally, two observation wells were permitted in 2017 with permitted depths of 609 m (2000 ft). No results are reported from the new production well, and no other activity is reported for this prospect for 2017.

Rye Patch (Open Mountain Energy)

In July 2017, Open Mountain Energy (OME) acquired the Rye Patch-Humboldt House geothermal project from Presco Energy, LLC. This included ~9,165 acres of federal and private geothermal leases, nine drilled geothermal production and injection wells, multiple thermal gradient holes, some geothermal power plant equipment, and associated permits and rights associated with the wells and future power plant operation[13]. OME reported that they plan to utilize existing infrastructure (possibly including drilling two

[6] https://www.unr.edu/nevada-today/news/2017/new-toad-species-discovered
[7] http://www.mapress.com/j/zt/article/view/zootaxa.4290.1.7
[8] https://www.blm.gov/press-release/blm-completes-environmental-assessment-dixie-meadows-geothermal-development-project
[9] https://eplanning.blm.gov/epl-front-office/projects/nepa/75996/106090/129658/Dixie_Meadows_DraftEA.pdf
[10] https://investor.ormat.com/interactive/newlookandfeel/4087066/2017_AR_Ormat.pdf
[11] http://clearinghouse.nv.gov/public/Notice/2018/E2018-065.pdf
[12] http://nvgeothermal.com/updates.shtml
[13] http://openmountainenergy.com/2017/08/24/open-mountain-energy-acquires-wabuska-geothermal-project-2/

additional injection wells) and complete the first phase of development by the end of 2018 to produce between 10–15 MWe net generation.

San Emidio (U.S. Geothermal Inc.)

In 2017, U.S. Geothermal Inc. deepened the remaining three thermal gradient holes that were originally drilled at the San Emidio project in 2015. All wells were completed with a 6 ¼" bottom hole diameter, with a 4 ½" perforated casing liner[14]. Well 78-20 was drilled to 727 m (2,387 ft) depth and intersected the geothermal resource at 705 m (2,314 ft) depth. It had a measured flowing temperature of 160°C (321°F). Well 18-21 was drilled to 664 m (2,177 ft) depth, intersected the geothermal resource at 571 m (1,874 ft), and had a measured flowing temperature of 163°C (325°F). Well 28-21 was drilled to 853 m (2799 ft) and intersected a geothermal resource at 579 m (1,900 ft). This well was reported to be less permeable than the other two wells that were deepened, but it had a measured flowing temperature of 160°C (321°F).

U.S. Geothermal reported that these three wells have extended the proven portion of the Southwest zone of the resource ~305 m (~1000 ft) farther south. They are anticipating an increase of the P90 (90% probability level) resource estimate previously provided (18.7 MWe net). The next steps include conducting a long-term flow test to provide more detailed information about the reservoir and inform an updated reservoir model.

In late June 2017, U.S. Geothermal also filed a Large Generator Interconnection agreement with NV Energy for 45 MWe for the San Emidio Phase 2 project.

Tungsten Mountain (Ormat Nevada Inc.)

Ormat drilled two more wells at the Tungsten Mountain geothermal project in 2017: 1) production well 75B-22 with a permitted drilling depth of 1523 m (4997 ft), and 2) injection well 24(35)-22 with a permitted depth of 1218 m (3996 ft). This brings the total number of commercial-scale wells to eight for the field. On the 1st of December 2017, the 26 MWe (net) Tungsten Mountain geothermal plant in Churchill County began commercial operations. Electricity generated from the Tungsten Mountain geothermal power plant is sold to the Southern California Public Power Authority (SCPPA), which in turn resells the entire output of the plant to Los Angeles Department of Water and Power (LADWP). The power plant is expected to generate approximately $15 million in average annual revenue. Additionally, the power plant utilizes the newest Ormat turbine design and also contains the largest OEC (Ormat Energy Converter) ever installed[15].

Ormat report that a 7 MWe (alternating current)/8.5 MWe (direct current) solar PV (photovoltaic) plant will also be built at the Tungsten Mountain site to reduce the parasitic load of the geothermal plant. Projected completion for this addition is the end of 2018[11].

Wells (City of Wells)

As part of the Department of Energy's Small Business Vouchers (SBV) Pilot Program, researchers from Lawrence Berkeley National Laboratory (LBNL), National Energy Technology Laboratory (NETL), and the University of Nevada, Reno (UNR), worked closely with the Elko Heat Company and the City of Wells to improve the current understanding of the geothermal system(s) around Wells, Nevada, and identify a geothermal resource that could support direct-use applications for the Wells community.

As part of this project, multiple push-probe (GeoProbe) holes were completed (table 4), in addition to new water sampling for geochemistry analysis, shallow 2 m temperature surveys, shallow geophysical surveys (electromagnetic induction and direct-current resistivity), and more detailed geological mapping. These results were incorporated into a 3D conceptual geological model. Key findings are that geothermal upwelling is occurring along parts of the north-northeast-striking fault system on the west side of the Snake Mountains (5–10 km from the City of Wells) (Spycher et al., 2018). Thermal springs and shallow temperature anomalies seem to coincide with the intersection of these faults with west-northwest-striking faults and fractures. The deep reservoir temperatures of the geothermal system(s) were estimated to be ~160°C (~320°F), sufficient not only for district heating but also for electricity generation. However measured temperatures closer to the City of Wells (and thus more likely to be accessible for direct-use applications) were much lower (40–45°C; 104–113°F)) and may reflect cooling of an outflow plume (fluids pathways and potential source of the fluids are still to be resolved). Further work is warranted to resolve the location, temperature, and potential productivity of the geothermal resource near the City of Wells.

[14] http://www.usgeothermal.com/news-releases/news-release-details/us-geothermal-inc-announces-successful-results-three-wells

[15] https://investor.ormat.com/interactive/newlookandfeel/4087066/2017_AR_Ormat.pdf

Wabuska (Open Mountain Energy)

In early 2017, Open Mountain Energy (OME) acquired the Wabuska Geothermal Project from Homestretch Geothermal LLC. This acquisition included ~5000 acres of private and Federal geothermal leases, in addition to four geothermal production wells, wellfield piping and surface equipment, and permits and other rights associated with the operation of the power plant[16].

Open Mountain Energy plans to replace the existing power generation units with Kaishan power generation equipment, with an anticipated lower loss per kWe and anticipated generation of 4 MWe net. In 2017, OME drilled a new production well at the field (well PW-5) with a permitted depth of 213 m (700 ft).

ACKNOWLEDGMENTS

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[16] http://openmountainenergy.com/2017/08/24/open-mountain-energy-acquires-wabuska-geothermal-project/

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WEB LINKS TO OTHER GEOTHERMAL INFORMATION

For further information on geothermal resources in Nevada check the following websites or contact David Davis at (775) 682-8766 or via e-mail at ddavis@unr.edu

The Nevada Bureau of Mines and Geology ARC-GIS Open Data site: https://data-nbmg.opendata.arcgis.com/

Map of geothermal resources in Nevada, NBMG Map 161, available online in PDF format: http://www.nbmg.unr.edu/Geothermal/PublishedMaps.html (includes zipped file of GIS layers)

Nevada Bureau of Mines and Geology Geothermal Resources of Nevada website at http://www.nbmg.unr.edu/Geothermal/index.html. This site contains geothermal exploration data, interactive maps, lease and information, and numerous geothermal digital data sets. These data are increasingly being made available through the National Geothermal Data System (www.geothermaldata.org) and the Department of Energy's Geothermal Data Repository (https://gdr.openei.org/).

Nevada Commission on Minerals, Nevada Division of Minerals at http://minerals.state.nv.us/ and http://minerals.nv.gov/Programs/Geo/Geo/.

GEO-HEAT CENTER, at https://www.oit.edu/orec/geo-heat-center, Oregon Institute of Technology, Klamath Falls, Oregon. This site focuses on direct-use applications of geothermal energy.

Southern Methodist University Geothermal Lab, specializing in geothermal gradient data and maps of the entire country, posts information at http://www.smu.edu/geothermal/.

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/.

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The Bureau of Land Management Land and Mineral Records-LR2000 system website address at http://www.blm.gov/lr2000/. Provides reports on BLM land and mineral use authorizations for oil, gas, and geothermal leasing, rights-of-ways, coal and other mineral development, land and mineral title, mining claims, withdrawals, classifications, and more on federal lands or on federal mineral estate.

The U.S. Department of Energy (DOE) Geothermal Technologies Program's (https://energy.gov/eere/geothermal/geothermal-energy-us-department-energy) 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 http://www.osti.gov/scitech/ and https://www.osti.gov/home/collections.

OIL AND GAS

by David A. Davis

PRODUCTION

According to the Nevada Division of Minerals, Nevada's net oil production in 2017 was 285,530 barrels, which accounted for 0.008% of total domestic production. Production increased 2% in 2017 from 278,599 barrels in 2016, the first increase since 2009. Production in 2016 was the lowest since 143,101 barrels were produced in 1976 (NBMG Bulletin 104). Production came from 51 actively producing wells in eight fields in Railroad Valley, Nye County, which accounted for over 85% of the state's production, and eight wells in two field in Pine Valley, Eureka County, which accounted for about 15% of the state's production. Nine barrels were also produced over a few days in a minor field in Elko County. Five other minor fields were shut-in throughout 2017 and three other minor fields are plugged and abandoned. The Spencer Lease is not counted as a field. Nevada ranked 28 out of the 34 oil-producing states (http://www.eia.gov). The average per barrel net wellhead price for Nevada crude oil for 2017 was $45.14, a 22% increase from $37.09 in 2016. The sales volume (or gross proceeds) increased 25% to $12,889,724.47 in 2017 from $10,333,936.11 in 2016 (2017–2018 Net Proceeds of Minerals Bulletin).

Production from Nevada's 61 actively producing wells (a decrease of 4 wells from 2016) ranged up to 78 barrels of oil per day and up to 3,201 barrels of water per day. The daily averages in 2017 were 13 barrels of oil, up from 12 barrels per day in 2016, and 304 barrels of water per day for the 58 water producers, up from 257 barrels per day in 2016 for the 61 water producers. Twenty-six wells produced less than ten barrels of oil per day, and eight produced more than 30 barrels of oil per day. Twenty-two wells produced less than 300 days and 13 produced less than 100 days during 2017. Forty-one other wells listed as producers were shut-in for the entire year.

At 77.8 barrels of oil and 1,320 barrels of water per day, Trap Spring 9 surpassed Grant Canyon No. 10 as Nevada's most productive well. Grant Canyon No. 10 had been Nevada's largest producer the previous six years, but fell to number two at 77.3 barrels of oil and 59 barrels of water per day. Nevada's third highest continuous volume producer for the third year in a row was Kate No. 1A. It produced for 304 days and averaged 48 barrels of oil and 686 barrel of water per day. Kate No. 1 actually produced 58 barrels of oil per day, but was in production for only 60 days. Also, several other wells also had higher production, but only produced for several days during the year.

The Bacon Flat Field produces from dolomite in the Devonian Guilmette Formation between about 4,960–5,350 feet (1,512 and 1,634 m). The field averaged 15 barrels of oil and 154 barrels of water per day and accounted for less than 2% of Nevada's total oil production. Oil and water production increased 1%, and 1,256% respectively from 2016. Only one well has been active in the field since 1993, and it produced for 365 days, up slightly from 320 days in 2016. The field also had two inactive producers.

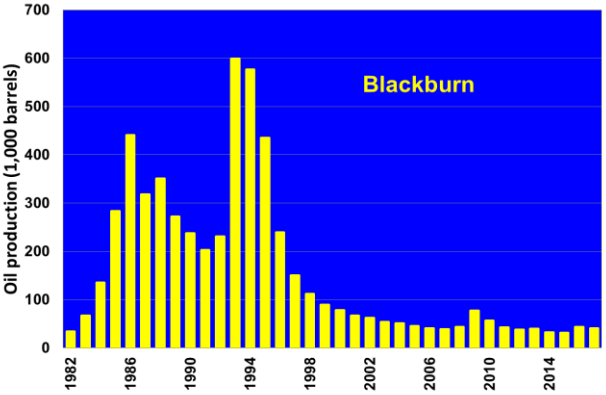

Figure 1. Chart showing oil production from the Blackburn Field in Pine Valley, Eureka County, from 1983 to 2017.

The Blackburn Field produces from the Oligocene Indian Well Formation (tuff and tuffaceous sandstone), Mississippian Chainman Shale (sandstone), and Devonian Nevada Formation (dolomite) between about 6,700 and 6,750 feet (2,043 and 2,058 m). The field had five active wells, which averaged 351 days of production each. A sixth producer came on line in March and produced for 142 days before being shut-in for December. Spread over the year, production for the field averaged 112 barrels of oil and 5,542 barrels of water per day, and accounted for 14% of Nevada's total oil production. Oil production decreased 8% and water production increased 26% from 2016. Daily per well oil production ranged between nine and 35 barrels and averaged 21 barrels. Daily per well water production ranged between 11 and 3,010 barrels and averaged 932 barrels. Not counting the new producer, oil production increased in one well and decreased in four wells. The field also had two inactive producers.

The Eagle Springs Field produces from Oligocene ignimbrites, the Eocene Sheep Pass Formation (lacustrine carbonates) and the Pennsylvanian Ely Limestone between about 5,780 and 7,360 feet (1,762 and 2,244 m). The field had 10 active producers. One of these wells had been shut-in since 2012 but was brought back on line in August. Two wells shut-in during 2016, remained shut-in throughout 2017. An eleventh well,

which had been shut-in since 2015, produced for one day in May. Not counting that one, the other 10 producers averaged 179 days of production each. Spread over the year, production for the field averaged 73 barrels of oil and 1,299 barrels of water per day and

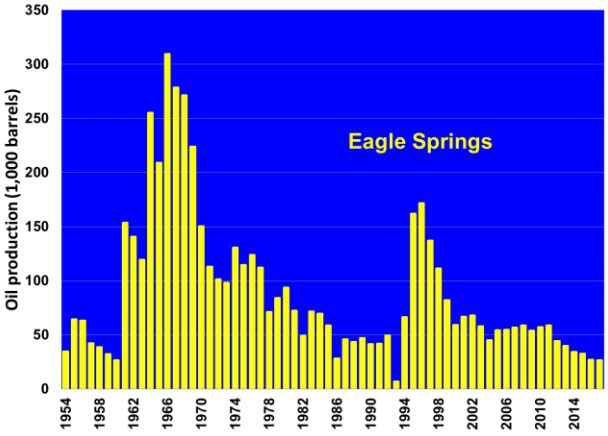

Figure 2. Chart showing oil production from the Eagle Springs Field in Railroad Valley, Nye County, from 1954 to 2017.

accounted for about 9% of Nevada's total oil production. Oil production decreased 0.6% and water production increased 26% from 2016. Daily per well oil production ranged between less than 1 and 32 barrels and averaged 14 barrels. Daily per well water production ranged between 5 and 804 barrels and averaged 241 barrels. Of the nine wells with production from 2016, production increased in four wells in 2017 and decreased in the rest. The one well that was briefly returned to production was NDOM Permit No. 80, Kirkwood Oil and Gas, LLC, Eagle Springs Unit 2-36, which was completed in 1965 and shut-in from 2015 onwards.

The Ghost Ranch Field produces from dolomites of the Devonian Guilmette Formation between about 4,350 and 4,620 feet (1,326 and 1,409 m). The field had four active producers which averaged 363 days of production each. Spread over the year, production for the field averaged 39 barrels of oil and 1,421 barrels of water per day and accounted for 5% of Nevada's total oil production. Oil and water production increased 3% and 15% respectively from 2016. Daily per well oil production ranged between six and 14 barrels and averaged slightly less than 10 barrels. Daily per well water production ranged between 23 and 412 barrels and averaged 355 barrels. Oil production increased in all four wells.

The Grant Canyon Field also produces from dolomites of the Devonian Guilmette Formation between about 2,160 and 4,300 feet (659 and 1,333 meters). The field had three active producers that each averaged 364 days of production. Spread over the year, production for the field averaged 106 barrels of oil and 1,465 barrels of water per day and accounted for 14% of Nevada's total oil production. Both oil and water production decreased 7% in 2017. Daily per well oil production ranged between 14 and 77 barrels and averaged 35 barrels. Daily per well water production ranged between 3 and 791 barrels and averaged 488 barrels. Oil production increased in one and decreased in two of the active producers. The field also had two inactive producers.

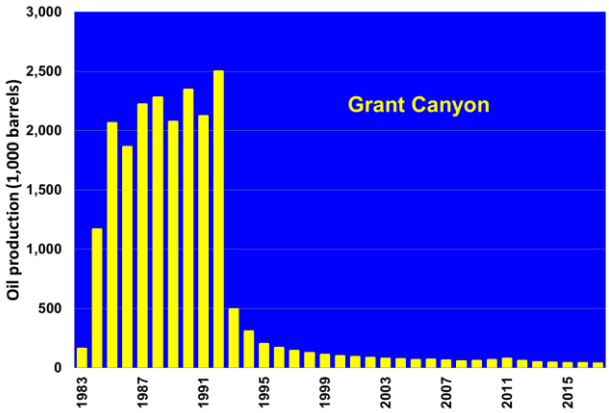

Figure 3. Chart showing oil production from the Grant Canyon Field in Railroad Valley, Nye County, from 1983 to 2017.

The Kate Spring Field produces from the Tertiary Horse Camp Formation (breccia) and the Devonian Guilmette Formation between about 4,450 and 4,820 feet (1,357 and 1,470 m). The field had five active producers. A sixth well had been shut-in for years only produced for one day in June. Not counting that one, the remaining four wells averaged 225 days of production each. Spread over the year, production for the field averaged 76 barrels of oil and 1,233 barrels of water per day, and accounted for slightly less than 10% of Nevada's total oil production. Oil production and water production increased 5% and 31%, respectively, from 2016. Oil production increased in three wells and decreased in two wells. Western General, Inc., Kate Spring No. 1C, which was shut-in from 1997 and briefly produced in 2016, also produced for a few days in February, July, and December 2017. The one well that was briefly returned to production was NDOM Permit No. 536, Western General, Inc., Taylor No. 2, which was completed in 1989 and shut-in from 1993 onwards. It produced for one day in June in 2017. Except for Taylor No. 2, all five active wells also produced natural gas. A total of 2,982,000 cubic feet of gas was produced, a 6% decrease from 2016. The gas is used to operate production and related equipment at the lease sites of Makoil, Inc., and Western General, Inc.

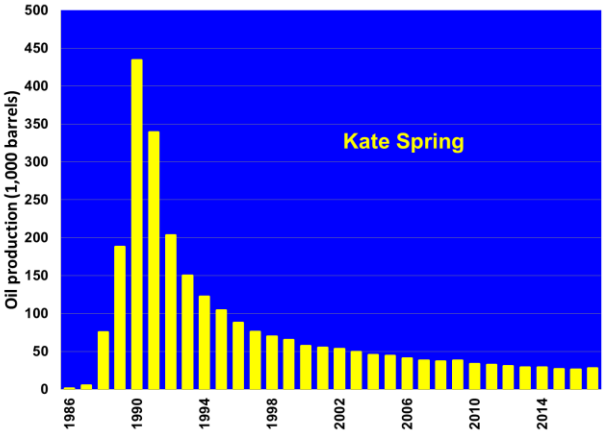

Figure 4. Chart showing oil production from the Kate Spring Field in Railroad Valley, Nye County, from 1986 to 2017.

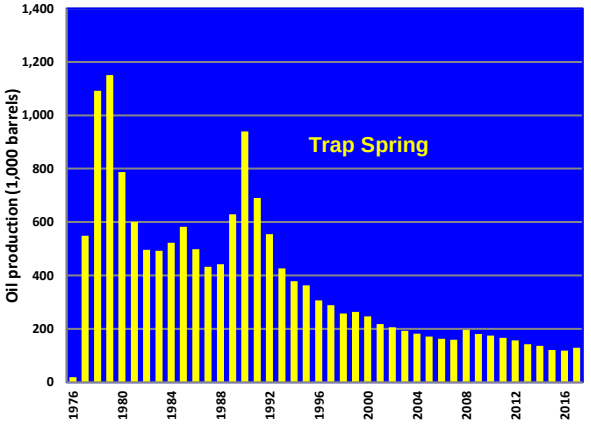

Figure 5. Chart showing oil production from the Trap Spring Field in Railroad Valley, Nye County, from 1976 to 2017.

The Sand Dune Field produces from Permian and Pennsylvanian limestone between about 5,970 and 6,200 feet (1,820 and 1,890 m). Its only well was active for 6 days and averaged 20 barrels of oil and 23 barrels of water per day and accounted for less than 0.05% of Nevada's total oil production. Oil and water production decreased 40% and 63%, respectively, in 2017. The well produced one day per month scattered through the year.

The Sans Spring Field produces from the Oligocene Garrett Ranch Group (volcaniclastic rocks and ignimbrites) between about 5,640 and 5,770 feet (1,720 and 1,759 m), It's only active well produced all the month of March and then for a few days per month during the last half of the year. It averaged 23 barrels of oil per day with no water over 69 days of production. It accounted for about 0.5% of Nevada's total oil production. The field also contains two inactive producers.

In the Tomera Ranch Field, the latest production was from an unnamed conglomerate unit. Past production from three now plugged and abandoned wells was from the Oligocene Indian Well Formation (tuffaceous sandstone) between about 1,150 and 1,950 feet (351 and 595 meters). The field had two active producers that averaged 117 days of production each. During that time, the field averaged 4 barrels per day of oil and totaled 7 barrels of water. Oil production declined 11% from 2016, and the field accounted for about 0.3% of Nevada's total oil production.

The Trap Spring Field produces from the Oligocene tuff of Pritchards Station between about 3,210 and 4,950 feet (979 and 1,509 meters). The field had 25 active producers which each averaged 319 days of production. Spread over the year, production for the field averaged 354 barrels of oil and 6,538 barrels of water per day and accounted for 45% of Nevada's total oil production. Daily per well oil production ranged between three and 78 barrels and averaged 16 barrels. Daily per well water production ranged between less than one and 3,021 barrels and averaged 299 barrels. Oil production increased almost 9% and water production decreased 0.4% in 2017. Seven wells shut-in during early 2016 remained shut-in during 2017. Not counting them, oil production increased in 14 wells and decreased in 11. Including those seven wells, the field contains 18 inactive producers.

Only one minor field produced in 2017. The one well in the Huntington Field produced a small amount of oil and gas but no water during April from the Eocene Sheep Pass Formation between 8,924 and 9,290 feet (2,721 and 2,832 m). Four other minor fields, each with one well, have been shut-in since 2015. The Currant Field produced from the Eocene Sheep Pass Formation between about 6,850 and 7,080 feet (2,088 and 2,159 m). The Duckwater Creek Field produced from the tuffs of the Oligocene Garrett Ranch Group between about 5,680 and 5,830 feet (1,732 and 1,777 m). The East Inselberg Field, produced from the Devonian Guilmette Formation between about 1,046 and 1,171 feet (319 and 357 m). The Humboldt Field, produced from the Elko Formation between 7,906 feet and 8,210 feet (2,410 and 2,503 m).

The following four minor fields produced in the past but are all now plugged and abandoned. Three Bar contained three wells which produced from the Miocene Humboldt Formation, the Oligocene Indian Well Formation, and the Cretaceous Newark Formation between 5,720 and 7,070 feet (1,744 and 2,155 m). Deadman Creek had only one well that produced briefly from the Humboldt Formation between 8,165 and 8,850 feet (2,489 and 2,698 m). Toano Draw had only one well that produced from the Humboldt Formation between 8,250 and 8,950 feet (2,515 and 2,729 m).

Most of Nevada's oil is used to make such products as No. 1 and No. 2 diesel fuel, kerosene, stove oil, and

Production from Nevada's oil fields (barrels of oil)

Compiled from producers' reports filed with the Nevada Division of Minerals

Field (year discovered)	1954-2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total
Eagle Springs (1954) (Railroad Valley)	5,275,251	58,683	53,851	57,394	58,900	44,422	39,818	34,217	32,675	26,872	26,716	5,708,799
Trap Spring (1976) (Railroad Valley)	13,912,820	196,089	181,320	175,273	166,383	156,962	143,876	136,627	120,748	118,847	129,104	15,438,049
Currant (1979) (Railroad Valley)	1,604	108	111	109	119	159	194	143	25	0	0	2,572
Bacon Flat (1981) (Railroad Valley)	1,005,810	7,968	7,764	7,427	6,358	5,690	6,447	6,223	5,000	5,261	5,325	1,069,273
Blackburn (1982) (Pine Valley)	5,223,443	43,600	77,730	57,260	43,198	38,004	40,392	32,217	31,605	44,180	40,767	5,672,396
Grant Canyon (1983) (Railroad Valley)	21,001,026	56,247	60,036	68,927	77,683	58,897	50,517	46,263	42,810	41,631	38,861	21,542,898
Kate Spring (1986) (Railroad Valley)	2,294,984	36,863	38,347	33,825	32,719	30,833	29,402	28,934	26,672	26,486	27,861	2,606,925
Spencer Lease (1986) (Railroad Valley)	86	0	0	0	0	0	0	0	0	0	0	86
Tomera Ranch (1987) (Pine Valley)	36,472	0	0	0	0	11,705	3,757	2,016	1,224	961	854	56,989
North Willow Creek (1988) (Pine Valley)	51,785	56	0	0	0	0	0	0	0	0	0	51,841
Three Bar (1990) (Pine Valley)	23,837	0	0	0	0	0	0	0	0	0	0	23,837
Duckwater Creek (1990) (Railroad Valley)	18,460	120	120	118	115	117	119	124	45	0	0	19,338
Sans Spring (1993) (Railroad Valley)	268,428	2,407	1,419	1,493	1,404	1,498	1,318	1,604	1,268	246	1,567	282,652
Ghost Ranch (1996) (Railroad Valley)	528,092	23,615	24,011	21,630	18,605	17,022	17,232	15,564	15,106	13,914	14,345	709,136
Deadman Creek (1996) (Elko County)	367	0	0	0	0	0	0	0	0	0	0	367
Sand Dune (1998) (Railroad Valley)	127,188	10,467	9,883	3,687	2,483	2,656	2,567	7,467	2,606	201	121	169,326
East Inselberg (2005) (Railroad Valley)	355	0	0	79	32	29	33	24	14	0	0	567
Toano Draw (2007) (Elko County)	1,916	48	0	0	0	0	0	0	0	0	0	1,964
Humboldt (2014) (Elko County)								2,756	0	0	0	2,756
Huntington (2014) (Elko County)								2,248	1,584	0	9	3,840
Total	49,771,924	436,271	454,592	427,222	407,999	367,994	335,672	316,426	281,382	278,599	285,530	53,363,611
Change from previous year		7%	4%	-6%	-4%	-10%	-9%	-6%	-11%	-1%	2%	

Production of water from Nevada's oil fields (barrels of water)

Compiled from producers' reports filed with the Nevada Division of Minerals

Field (year discovered)	1994-2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total
Eagle Springs (1954) (Railroad Valley)	5,856,314	842,435	699,950	699,147	644,703	361,101	375,711	429,749	557,326	377,316	474,199	11,317,951
Trap Spring (1976) (Railroad Valley)	32,172,579	2,356,016	2,307,911	2,288,649	2,450,044	2,460,099	2,429,108	2,382,353	2,325,601	2,394,821	2,386,266	55,953,447
Currant (1979) (Railroad Valley)	0	0	0	2	0	0	0	0	0	0	0	2
Bacon Flat (1981) (Railroad Valley)	378,624	10,204	33,664	5,331	1,810	1,765	1,685	1,825	1,625	4,152	56,319	497,004
Blackburn (1982) (Pine Valley)	25,774,251	1,558,039	1,588,194	1,623,338	1,334,105	1,418,780	1,284,774	1,117,893	1,373,509	1,601,484	2,022,722	40,697,089
Grant Canyon (1983) (Railroad Valley)	5,193,640	638,822	624,493	709,918	644,303	640,311	637,840	621,172	547,166	572,710	534,650	11,365,025
Kate Spring (1986) (Railroad Valley)	6,611,293	416,983	520,099	494,605	450,155	426,896	337,981	368,722	398,138	343,883	449,919	10,818,674
Spencer Lease (1986) (Railroad Valley)	0	0	0	0	0	0	0	0	0	0	0	0
Tomera Ranch (1987) (Pine Valley)	505,881	0	0	0	0	0	0	0	0	0	7	505,888
North Willow Creek (1988) (Pine Valley)	3,983	0	0	0	0	773	360	0	0	0	0	5,116
Three Bar (1990) (Pine Valley)	5,958	0	0	0	0	0	0	0	0	0	0	5,958
Duckwater Creek (1990) (Railroad Valley)	68,841	1,080	1,080	1,080	1,080	1,080	1,080	990	0	0	0	76,311
Sans Spring (1993) (Railroad Valley)	3,988,235	217,288	0	0	0	0	0	0	0	0	0	4,205,523
Ghost Ranch (1996) (Railroad Valley)	3,243,956	711,865	496,553	529,423	514,379	479,013	600,429	537,388	561,107	452,521	518,688	8,645,322
Deadman Creek (1996) (Elko County)	0	0	0	0	0	0	0	0	0	0	0	0
Sand Dune (1998) (Railroad Valley)	320,746	32,684	29,998	37,399	50,857	55,225	49,525	14,308	5,211	365	135	596,453
East Inselberg (2005) (Railroad Valley)	3,344	0	0	856	698	0	0	0	0	0	0	4,898
Toano Draw (2007) (Elko County)	25,614	3,507	0	0	0	0	0	0	0	0	0	29,121
Humboldt (2014) (Elko County)								0	0	0	0	0
Huntington (2014) (Elko County)								0	4,589	0	0	4,589
Total	84,153,259	6,788,923	6,301,942	6,389,748	6,092,134	5,845,043	5,718,493	5,474,400	5,774,272	5,747,252	6,442,905	144,728,371
Change from previous year		2%	-7%	1%	-4%	-4%	-2%	-4%	5%	-1%	12%	

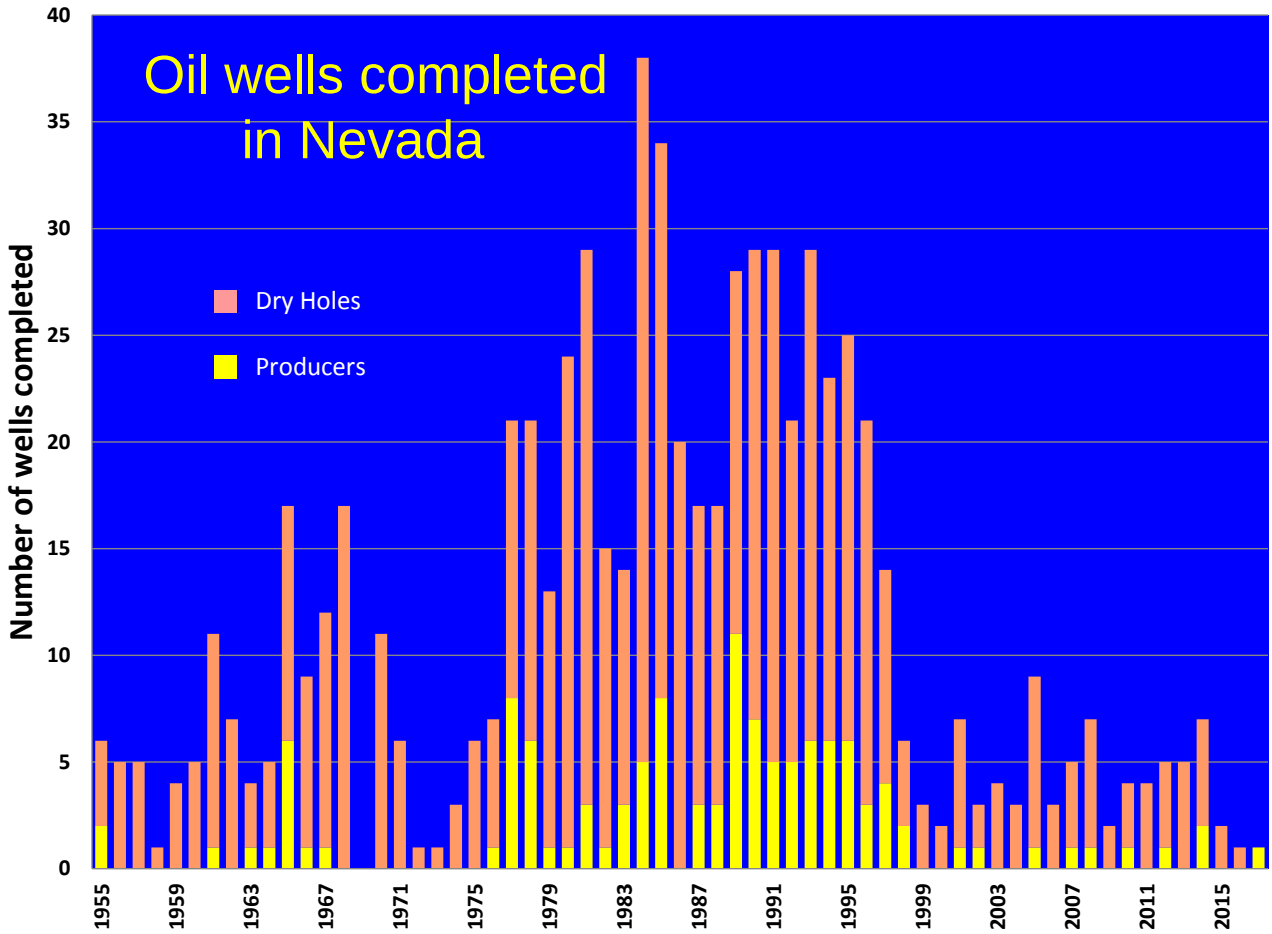

Figure 6. Chart showing number of wells completed and how many were producers in Nevada from 1955 to 2017.

Oil well activity in 2017

Company	Well	Permit No.	Location	Permit Date	Spud Date	Completion Date	Depth (Ft.)	Status
CHURCHILL COUNTY								
Gary Borgna	MB No. 1	937	SE/4, SE/4, S36, T18N, R30E	JAN 13			*5,000	Expired
ELKO COUNTY								
Noble Energy, Inc.	MR S25G-S25-33A	955	NW/4, SE/4, S25, T38N, R60E	JUN 14	OCT 14	NOV 14	11,136	P&A
EUREKA COUNTY								
Andromeda Oil, LLC	Tomera Ranch No. 6X	934	SE/4, SW/4, S33, T31N, R52E	SEP 12	NOV 12	NOV 13	1,550	P&A
Grant Canyon Oil and Gas, LLC	Blackburn Unit No. 22	971	NW/4, SW/4, S8, T27N, R52E	MAY 16	JUL 16	MAR 17	7,355	Producer
LINCOLN COUNTY								
Makoil, Inc.	Murphy Gap 14-23	970	SW/4, SE/4, S14, T1S, R59E	MAR 16			*7,500	Not Drilled
NYE COUNTY								
Grant Canyon Oil and Gas, LLC	Federal No. 12-14	673	NW/4, SW/4, S14, T7N, R56E	APR 93	MAY 93	JUN 93	6,106	TA
Wester Oil Co.	Gigante No. 1-4	837	NW/4, NE/4, S4, T12N, R35E	MAY 01	AUG 01	DEC 03	7,707	TA
Tri Valley Oil and Gas	Midland Trail No. 1-32	861	SW/4, SW/4, S32, T6N, R56E	SEP 04	JUN 05	JAN 06	7,063	Shut in
Makoil, Inc.	Radio No. 6-31	865	NE/4, NW/4, S6, T9N, R57E	SEP 04	MAY 05	MAY 05	3,433	Shut in
Makoil Inc.	Trap Spring No. 27-41	899	NE/4, NE/4, S27, T9N, R56E	APR 08	DEC 08	JAN 09	7,294	Shut in
Desert Discoveries, LLC	Paradise Unit No. 2-12	916	SE/4, NE/4, S12, T12N, R34E	APR 10	JUL 10	NOV 10	4,250	Shut in
HBF Exploration, Inc.	Well No. 2	920	SW/4, NW/4, S33, T7N, R61E	APR 11	JUL 11	AUG 11	1,020	Shut in
Major Oil International	Eblana No. 1	925	NE/4, NE/4, S25, T7N, R50E	MAY 12	MAY 12	JUN 12	8,550	Shut in
Bestoso Oil and Gas, Inc.	Well No. 1	940	NW/4, SE/4, S20, T5N, R61E	APR 13			*14,000	Not Drilled
True Oil, LLC	DY Federal 13-31	954	NW/4, SW/4, S31, T7N, R57E	JAN 14	DEC 17	JAN 18	11,136	P&A
Makoil Inc.	Munson Ranch No. 12-23X	968	NE/4, SW/4, S12, T9N, R56E	JUN 15			*5,000	Expired
Makoil Inc.	Munson Ranch No. 13-34	969	SW/4, SE/4, S13, T9N, R56E	JUN 15			*5,200	Expired
Makoil Inc.	Soda Spring 1-22	972	NE/4, SW/4, S22, T8N, R57E	OCT 16			*8,000	Lost Lease
WHITE PINE COUNTY								
Geyser Petroleum	Pipeline Canyon No. 1	870	NE/4, SW/4, S28, T15N, R62E	JAN 05	MAR 05	AUG 05	5,280	Shut in
Grant Alliance, LLC	FLT-1	918	NE/4, NW/4, S11, T16N, R55E	OCT 10	JAN 11	MAY 11	4,875	Shut in

P&A: Plugged and abandoned; TA: Temporarily abandoned; *: Permitted depth given when the actual depth is not available

asphalt. Nevada crude oil was transported in batches by trucks to the 8,000-barrel-per-day capacity refinery near Currant in Railroad Valley, which is owned by Foreland Refining Corporation.

NEW PRODUCERS

One well was completed as a producer in 2017. Grant Canyon Oil and Gas, LLC, Blackburn Unit 22, was spudded in 2016, drilled to 7,355 feet (2,242 meters) and completed as a producer in March 2017.

EXPLORATION

No wells were permitted for oil and gas in 2017, down from three permitted in 2016, and four permitted in 2015. True Oil, LLC, DY Federal 13-31 (permitted in 2014) was the only well spudded in 2017. While still being drilled at year's end, it was completed to 6,500 feet (1,982 m) and plugged and abandoned in mid-January 2018.

Two wells that had been shut in were plugged and abandoned in 2017. Andromeda Oil, LLC, Tomera Ranch No. 6X, was completed in 2013. A water sand was noted between 1,200 feet and 1,550 feet (366 and 473 m). The well had been cased and perforated between 1,192 feet and 1,198 feet (363 and 365 m) and between 1,342 feet and 1,380 feet (409 and 421 m) in dolomite. Swabbed water and tar balls were noted. Noble Energy, Inc., MR S25G-S25-33A, was completed in 2014. A series of oil shows were reported clustered between depths of 2,350 and 5,350 feet (716 and 1,631 m), 6,680 and 9,550 feet (2,037 and 2,912 m), and 10,460 and 10,700 feet (3,189 and 3,262 m). Rocks above 8,112 feet (2,473 m) are in the Tertiary Indian Wells Formation, and those below are in the Tertiary Elko Formation. While the well was cased, no perforations were reported.

Of ten wells completed between 1993 and 2012, eight were shut-in and two were temporarily abandoned. One shut-in well has been waiting for a plugging and abandoning plan since 2005. In this section, the shut-in wells were never listed as producers. The lease (N81152) owned by FX Nevada LLC was lost before Makoil, Inc., which held the permit, could drill it.

Based on reports filed with the state, no drill rigs operated in the state during 2017. No wells were hydraulically fractured in Nevada in 2017, but a table of wells hydraulically fractured in the past is provided below.

In 2016, 1,276 oil leases covering 2,540,114 acres (1,027,970 hectares) were in effect on public lands in Nevada. This represents decreases of 25% and 31%, respectively, in the number of leases and acreage. The acreage covers 5.3% of the 47,300,000 acres (19,242,000 hectares) of public lands managed by the U.S. Bureau of Land Management (BLM) in Nevada. Unfortunately, the data for 2017 were not readily accessible at the time of this writing.

On March 14, 2017, the Nevada State Office of the Bureau of Land Management (NSO-BLM) held a competitive oil and gas lease sale for 67 parcels covering 115,970 acres (46,932 hectares) mostly in Elko County and a little in Eureka County. None of the acres had been deferred from the preliminary sage grouse list. Ten bidders registered. Twenty parcels covering 35,503 acres (14,368 hectares) received bids totaling $74,780. The high bid was $4 per acre by Stephen Smith of Stephen Smith, Inc., of Grand Junction, CO, for parcel NV-17-03-041 in Elko County covering 1,880 acres (761 hectares) in all of sections 14 and 15 and portions of sections 13 and 16 in T26N, R54E. The other parcels went for the minimum $2 per acre. Forty-seven parcels covering 80,467 acres (32,565 hectares), which received no bids, were then put up for non-competitive offers. Seventeen parcels covering 31,646 acres (12,807 hectares) received offers, and $62,523 in rental fees were collected (https://www.blm.gov/programs/energy-and-minerals/oil-and-gas/leasing/regional-lease-sales/Nevada; Lease Sale: March 14, 2017).

On June 13-14, 2017, the NSO-BLM held a competitive oil and gas lease sale for 106 parcels covering 195,614 acres (79,164 hectares) in Eureka, Lander, and Nye Counties. None of the acres had been deferred from the preliminary sage grouse list. Seven bidders registered. Three parcels covering 5,760 acres (2,331 hectares) received bids totaling $29,440. The high bid was $8 per acre by Debra Bohac of Antelope Energy Co. LLC of Midland, Texas, for parcel NV-17-06-036 in Eureka County covering 2,560 acres (1,036 hectares) in all of sections 16, 17, 20 and 21 in T25N, R51E. The second highest bid was $6 per acre by Robert Dunbar of Proper, Texas, for parcel NV-17-06-106 in Nye County covering 640 acres (259 hectares) in all of section 21 in T7N, R56E. The remaining parcel went for the minimum $2 per acre. One hundred three parcels covering 189,354 acres (76,631 hectares) which received no bids were then put up for non-competitive offers. Four parcels covering 9,164 acres (3,709 hectares) received offers, and $21,735 in rental fees were collected (https://www.blm.gov/programs/energy-and-minerals/oil-and-gas/leasing/regional-lease-sales/Nevada; Lease Sale: June 13–14, 2017).

On September 12, 2017, the NSO-BLM held a competitive oil and gas lease sale for 3 parcels covering 3,680 acres (1,489 hectares) in T7N, R56E, in Nye County. None of the acres had been deferred from the preliminary sage grouse list. Six bidders registered. All three parcels went for $9 per acre totaling $33,120. All bids were by Ronald Miles of Federal Abstract Co. of Santa Fe, NM (https://www.blm.gov/programs/energy-and-minerals/oil-and-gas/leasing/regional-lease-sales/Nevada; Lease Sale: September 12, 2017).

On December 12, 2017, the NSO-BLM held a competitive oil and gas lease sale for 208 parcels covering 388,959 acres (157,410 hectares) in Lincoln, Nye, and White Pine Counties. None of the acres had been deferred from the preliminary sage grouse list. Thirteen bidders registered. Seventeen parcels covering 33,484 acres (13,551 hectares) received bids totaling $66,978. All bids were for the minimum $2 per acre. Larry Moyer of Grand Junction, Colorado, spent the most, which was $34,248 for parcels NV-17-12-230 through 236 covering 17,163 acres (6,946 hectares) in T14N, R62E in White Pine County. One hundred ninety-one parcels covering 355,476 acres (143,859 hectares), which received no bids, were then put up for non-competitive offers. Twenty-one parcels covering 36,472 acres (14,760 hectares) received offers, and $51,231 in rental fees were collected (https://www.blm.gov/programs/energy-and-minerals/oil-and-gas/leasing/regional-lease-sales/Nevada; Lease Sale: December 12, 2017).

TRANSFERS

Tomera Oil Fields, LLC, was formed in Nevada on April 26, 2017, and by September had taken over the producers Tomera Ranch No. 3 and Tomera Ranch No. 33-1B from Andromeda Oil, LLC. Andromeda Oil, LLC, was subsequently dissolved.

OTHER DEVELOPMENTS

In 2015, the BLM under Secretary of the Interior Sally Jewell released new rules covering hydraulic fracturing (fracking) on public and tribal lands. The rules included 1) the protection of groundwater supplies by requiring a validation of well integrity and strong cement barriers between the wellbore and intercepted water zones; 2) requiring companies to publicly disclose chemicals used in hydraulic fracturing to the BLM through the website FracFocus; 3) higher standards for interim storage of recovered waste fluids; 4) lowering the risk of cross-well contamination with chemicals and fluids used in the fracturing operation, and 5) requiring companies to submit more detailed information on the geology, depth, and location of preexisting wells so the BLM can better evaluate and manage site characteristics. The rules also allow states and tribes to request variances from the provisions if they equal or exceed the regulations in place. The American Petroleum Institute stated that they would impose new costs and delays on energy development without improving state and federal regulations. Also, the rules would not affect private and state lands where 90% of the fracking is conducted. After several delays, the rules were struck down in June 2016 by the District Court of Wyoming on the grounds that Congress had not given the Department of the Interior the authority to regulate fracking. However, in September 2017, the United States 10th Circuit Court of Appeals disagreed and reinstated the rules. Reinstatement of the rules became a moot point when the BLM rescinded the rules in December 2017. (BLM Press Releases, 3/20/2015; HIS Drilling Wire, Four Corners Edition, Section 1, 3/25/2015; Obama Administration's Fracking Rules Struck Down by Federal Judge, The Washington Times, 6/21/2016; https://www.ca10.uscourts.gov/opinions/16/16-8068.pdf;

Partial list of Nevada oil wells that were stimulated in the past

Modified and compiled from well records and data from consultant Jerry Walker

Permit	Company	Well Name	Year Completed	Perfs (gross)	Fluid	Proppant	Date Fracked	Present Status	Formation
203	Northwest Exploration Co.	Trap Spring No. 13	1977	4976'-5078'	10,122 gal lease oil	55,000 lbs. 8/12 sand	6/21/1977	WD	Garrett Ranch Volcanics
189	Northwest Exploration Co.	Trap Spring No. 4	1977	4018'-4389'	53,000 gal. oil	37,000 lbs. 8/12 sand	8/19/1977	P&A	Garrett Ranch Volcanics
196	Northwest Exploration Co.	Trap Spring No. 8	1977	4408'-4575'	72,300 gal. lease oil	100,000 lbs. 10/20 sand	9/11/1977	Producer	Tertiary volcanic rock
233	Northwest Exploration Co.	Trap Spring No. 20	1978	3932'-3987'	62,000 gal. lease oil	75,000 lbs. 10/20 sand	8/4/1978	WD	Pritchards Station Volcanics
196	Northwest Exploration Co.	Trap Spring No. 8	1979	4408'-4575'	1,795 gal. lease oil	100,000 lbs. 10/20, 8/12, 4/8 sand	6/23/1979	Producer	Tertiary volcanic rock
263	Wexpro Co.	Jiggs 10-1	1980	10,060'-10,080'	Hy-gel	1.5 ppg 100 mesh sand	3/6/1980	P&A	Paleozoic rock
324	Amoco Production Co.	Blackburn No. 3	1982	6274'-6345'	Jellied lease crude	30,000 lbs. 20/40 sand	1982	Shut in	Indian Well Formation
342	Sun Exploration and Production Co.	Southern Pacific No. 3-13	1983	8386'-8432'	53,090 gal. diesel; 1500 SCF CO_2	53,620 lbs. 20/40 sand	1/28/1983	P&A	Humboldt Formation
350	Amoco Production Co.	Blackburn No. 10	1983	5660'-5870'	87,500 gallons foamed oil	120,000 lbs. 20/40 sand	9/22/1983	Producer	Indian Well Formation
210	MAPCO Oil and Gas Co.	Trap Spring No. 17	1985	3570'-3610'	10,000 gal. foam	12/20 sand	1985	P&A	Horse Camp Volcanics
856	DY Exploration	Toano Draw 15-19	2005	8800'-8950'	75,000 gal. gel; 6,400 gal. slickwater	115,000 lbs. 20/40 PR6000 sand	8/30/2005	P&A	Humboldt Formation
856	DY Exploration	Toano Draw 15-19	2006	8800'-8950'	61,967 gal. water, solvents, gels, and other additives	30,900 lbs. 20/40 PR6000 sand	6/1/2006	P&A	Humboldt Formation
942	Noble Energy, Inc.	M2C-M2-21B	2014	7906'-8210'	250,057 gal. water; 2% by mass solvents, gels, and other additives	9% by mass PRC Sand; 0.7% by mass Premium white sand	3/17-24/2014	Shut in	Elko Formation
946	Noble Energy, Inc.	M10C-M10-11B	2014	8620'-8889'	343,919 gal. water; 2.5% by mass solvents, gels, and other additives	10% by mass PRC Sand; 0.6% by mass Premium white sand	6/3-4/2014	Shut in	Elko Formation
458	Grant Canyon Oil and Gas	Blackburn No. 16	1985	6959'-7012'	209,600 gal. water; 2.4% by mass solvents, gels, and other additives	12% by mass Premium white sand; 2.4% by mass PRC Sand	6/5/2014	Producer	Nevada Formation
928	Makoil, Inc.	Portuguese Mtn. 14A-2	2014	N/A	29,949 gal. water; 14% by mass solvents, gels, and other additives	32% by mass Premium white sand	11/23/2014	P&A	N/A
960	Noble Energy, Inc.	K1L-1V	2014	N/A	300,537 gal. water; 0.3% by mass solvents, gels, and other additives	7% by mass Premium white sand; 1.5% by mass SSA-2	12/5/2014	Producer	N/A

Abbreviations: Perf (gross) - larger interval containing one or more smaller perforated intervals; P&A - plugged and abandoned; gal. - gallons; WD - water disposal

https://www.federalregister.gov/documents/2017/12/29/2017-28211/oil-and-gas-hydraulic-fracturing-on-federal-and-indian-lands-rescission-of-a-2015-rule).

On November 18, 2016, the BLM published its final Methane and Waste Reduction Rule, which is an attempt to reduce the perceived waste of natural gas from mineral leases administered by the BLM. The rationale is that much gas is lost during oil and gas production activities through venting or flaring and through equipment leaks. As well as not being regulated, the venting, flaring, and leaking of natural gas also contributes to regional and global air pollution problems of smog, particulate matter, and toxics (such as benzene, a carcinogen) and the loss of royalty revenues. The rule requires the operator to capture as much gas as is practical, and except in an emergency or certain other circumstances, must flare any gas that would otherwise be vented. The rule will only affect production on public lands, which includes 5% of the oil and 11% of the natural gas production nationally. The rule may have limited effect. Gas lost through flaring, venting, and leakage ranges between 1.2% and 1.6% and has been decreasing through the years. Gas is a valuable commodity, which companies prefer to sell, but the infrastructure to transport it is lacking in many cases. New equipment is expensive, and marginal wells will likely be capped instead of upgraded. This will result in a loss of production, revenue, and royalties. Also, far from being unregulated, the states have been regulating gas and other field emissions for decades. In the case of Nevada, most production is from public lands, but gas production is small and only from the Kate Spring field where it is used to run equipment. The rule and delays in implementation spawned a series of lawsuits, and Congress was reviewing the rule under the Congressional Review Act. In December 2017, the BLM suspended 2018 compliance dates until 2019. In early 2018, the BLM proposed to return to the rules in place prior to 2016. (https://www.regulations.gov/document?D=BLM-2016-0001-9126; https://energyindepth.org/mtn-states/myth-vs-fact-on-the-blm-methane-venting-and-flaring-rule; https://www.blm.gov/press-release/blm-offers-revision-methane-waste-prevention-rule)

On December 1, 2016, the BLM released its final land use planning rule also known as Planning Rule 2.0. The rules were updated in 1983 and 2005, but since then, pressures have increased on the BLM land managers to better balance often competing and increasingly conflicting uses of the public lands. Planning Rule 2.0 was intended to allow the BLM to more effectively address these issues in a timely manner and increase engagement. Highlights of the rule include the following. Public involvement will be enhanced through earlier solicitation of public comments and lengthening the comment period. Earlier public feedback should reduce the need for supplemental analysis and litigation by identifying and addressing concerns and conflicts earlier. Cooperation between the BLM and other Federal agencies and state, local, and tribal governments will be enhanced. If these entities choose not to cooperate with the BLM, the BLM will still consider their plans, policies, and management programs and assist in resolving any inconsistencies between their plans and BLM plans. The BLM will become more versatile and adaptable to change. The decision maker will generally remain the State Director, but provisions allow for a different arrangement if necessary. The oil industry and other entities opposed the rule, which they said allows the BLM to pick and choose what projects to concentrate on and to centralize control. Congress reviewed the rule under the Congressional Review Act, and both the House of Representatives and Senate voted to overturn the rule. On May 27, 2017, President Trump signed the measure repealing the rule. http://www.ogj.com/articles/2017/02/us-house-passes-cra-resolution-to-revoke-blm-land-use-planning-changes.html;

U.S. OIL PRODUCTION AND CONSUMPTION

According to the Energy Information Agency of the U.S. Department of Energy (http://www.eia.gov), the total petroleum products supplied to the U.S. averaged 19,877,000 barrels per day in 2017, a 1% increase from 19,631,000 barrels per day in 2016, but still 4% below the all-time high of 20,788,000 barrels per day in 2005. Domestic crude oil production averaged 9,355,000 barrels per day, a 5% increase from 8,875,000 barrels per day in 2016. Production has increased in seven of the last eight years. The most recent high production of 9,415,000 barrels per day was in 2015, which had been the highest since 1972, when it peaked at 9,441,000 barrels per day. Imported crude oil averaged 7,912,000 barrels per day, an 0.4% increase from 7,877,000 barrels per day in 2016, and but still down 22% from the all-time high of 10,126,000 barrels per day in 2005. Imported crude oil accounted for 46% of the total, down from 47% in 2016. The average price of domestic oil increased 25% to $48.05 per barrel from an average of $38.29 per barrel in 2016.

Status of Nevada oil and gas production wells in 2017

This table gives the amount of oil and water produced and the number of production days in 2017. The sources of information include well records and statistics from the Nevada Division of Minerals.
Status abbreviations with dates of the action where applicable: BBL-barrels; ex-except; MCF-thousand cubic feet; PA-plugged and abandoned; Prod-production; SI-shut-in; WD-water disposal

FIELD/OPERATOR/WELL	NEVADA PERMIT	DATE COMPLETED	STATUS	LOCATION	PRODUCTION OIL (BBL)	PRODUCTION WATER (BBL)	PRODUCTION GAS (MCF)	PRODUCTION DAYS
EAGLE SPRINGS (Nye Co., 1954)								
Kirkwood Oil and Gas, LLC								
Eagle Springs Federal No. 44-35	813	05/98	SI 08/04-06/11; SI 02/12	SE, NW, S35, T9N, R57E	0	0		0
Eagle Springs Federal No. 54-35	726	10/94	Prod	SW, NE, S35, T9N, R57E	3,619	64,336		363
Eagle Springs Unit No. 1-34	107	07/67	SI 07/86	SE, NE, S34, T9N, R57E	0	0		0
Eagle Springs Unit No. 1-35	4	05/54	WD 1978	NE, NW, S35, T9N, R57E	0	0		0
Eagle Springs Unit No. 1-36	76	02/65	SI 05/08	SW, NE, S36, T9N, R57E	0	0		0
Eagle Springs Unit No. 2-36	80	07/65	SI 11/96-12/06; SI 12/15 ex 5/17	NW, SE, S36, T9N, R57E	10	128		1
Eagle Springs Unit No. 4-36	86	10/65	SI 06/97	NW, SE, S36, T9N, R57E	0	0		0
Eagle Springs Unit No. 5-36	94	04/66	Prod	NW, NE, S36, T9N, R57E	10,883	7,097		342
Eagle Springs Unit No. 15-35	21	07/55	SI 09/95-08/02	NW, SW, S35, T9N, R57E	37	470		10
Eagle Springs Unit No. 35-35	17	03/55	Prod	NE, SW, S35, T9N, R57E	159	3,303		37
Eagle Springs Unit No. 43-36	83	08/65	Prod	NE, SE, S36, T9N, R57E	2	9		2
Eagle Springs Unit No. 62-35	46	01/60	SI 01/12	NW, NE, S35, T9N, R57E	0	0		0
Eagle Springs Unit No. 73-35	69	10/63	Prod	SE, NE, S35, T9N, R57E	2,222	75,323		288
Eagle Springs Unit No. 74-35	71	04/64	SI 01/98-01/01; SI 10/16	SE, NE, S35, T9N, R57E	0	0		0
Eagle Springs Unit No. 84-35	77	01/65	SI 10/97	SE, NE, S35, T9N, R57E	0	0		0
Eagle Springs/Plains Petroleum No. 13-36	744	02/96	Prod; SI 01/12-07/17	SW, NW, S36, T9N, R57E	937	34,350		111
Eagle Springs/Plains Petroleum No. 23-36	733	10/95	Prod	SW, NW, S36, T9N, R57E	6,886	11,394		281
Eagle Springs/Plains Petroleum No. 24-36	737	11/94	SI 07/16	SW, NW, S36, T9N, R57E	0	0		0
Eagle Springs/Plains Petroleum No. 55-35	761	11/95	SI 02/97	SW, NE, S35, T9N, R57E	0	0		0
Eagle Springs/Plains Petroleum No. 64-35	755	09/95	SI 01/12	SW, NE, S35, T9N, R57E	0	0		0
Eagle Springs/Plains Petroleum No. 82-35	734	10/94	Prod	NE, NE, S35, T9N, R57E	1,894	273,284		340
Eagle Springs/Plains Petroleum No. 83-35	754	07/95	Prod	SE, NE, S35, T9N, R57E	67	4,505		14
TRAP SPRING (Nye Co., 1976)								
J. N. Oil and Gas Federal No. 1	449	09/85	PA 01/99	NE, NW, S34, T9N, R56E				
Munson Ranch No. 12-42	572	06/90	PA 08/08	SE, NE, S12, T9N, R56E				
Munson Ranch No. 12-44X	445	07/85	PA 08/08	SE, SE, S12, T9N, R56E				
Trap Spring No. 4	189	03/77	PA 07/95	SE, NE, S27, T9N, R56E				
Makoil, Inc.								
Britton No. 13-21	224	04/78	SI 12/91	NE, NW, S13, T9N, R56E	0	0		0
Munson Ranch No. 12-14	688	05/95	Prod	SW, SW, S12, T9N, R56E	64	3		11
Munson Ranch No. 12-23	596	11/90	Prod; SI 04/98	NE, SW, S12, T9N, R56E	0	0		0
Munson Ranch No. 12-24	432	04/85	Prod	SE, SW, S12, T9N, R56E	2,961	12,239		354
Munson Ranch No. 12-32	559	12/89	Prod	SW, NE, S12, T9N, R56E	4,526	21,352		365
Munson Ranch No. 12-33	423	03/85	SI 04/96	NW, SE, S12, T9N, R56E	0	0		0
Munson Ranch No. 12-34	406	10/84	Prod	SW, SE, S12, T9N, R56E	3,950	3,970		365
Munson Ranch No. 12-43	880	03/08	Prod	NE, SE, S12, T9N, R56E	9,936	8,325		365
Munson Ranch No. 13-1	435	08/85	Prod; SI 03/16	SE, NW, S13, T9N, R56E	609	540		91
Munson Ranch No. 13-11	622	11/91	Prod; SI 02/03-03/16	NW, NW, S13, T9N, R56E	2,432	132,356		241
Munson Ranch No. 13-11R	840	11/01	Prod	NW, NW, S13, T9N, R56E	2,329	25,702		301
Munson Ranch No. 13-12	537	07/89	Prod; SI 07/89	SW, NW, S13, T9N, R56E				
Munson Ranch No. 13-14	623	09/91	Prod; SI 01/01-12/06	SW, SW, S13, T9N, R56E	4,692	80,831		350
Munson Ranch No. 13-21X	640	05/92	Prod	NE, NW, S13, T9N, R56E	4,365	17,793		357
Munson Ranch No. 13-24	218	08/79	Prod	SE, SW, S13, T9N, R56E	358	553		66
Munson Ranch No. 13-31	382	07/84	Prod	NW, NE, S13, T9N, R56E	4,348	22,915		365
Munson Ranch No. 13-32	373	08/84	Prod	SW, NE, S13, T9N, R56E	5,542	41,445		365
Munson Ranch No. 13-33	211	11/78	Prod	NW, SE, S13, T9N, R56E	1,081	3,794		364
Munson Ranch No. 13-41X	448	09/85	Prod	NE, NE, S13, T9N, R56E	9,297	71,924		365
Munson Ranch No. 13-42	222	11/78	Prod	SE, NE, S13, T9N, R56E	830	44,298		243
Munson Ranch No. 13-45	547	08/89	SI 03/16	NW, SW, S13, T9N, R56E	0	0		0
Munson Ranch No. 13-46	548	07/89	SI 06/92	NE, SW, S13, T9N, R56E	0	0		0
Munson Ranch No. 14-23	313	08/81	Prod	NE, SW, S14, T9N, R56E	2,316	19,068		362
Munson Ranch No. 14-24	354	10/83	SI 06/96	SE, SW, S14, T9N, R56E	0	0		0
Munson Ranch No. 14-32	455	09/87	Prod	SW, NE, S14, T9N, R56E	4,590	74,918		363
Munson Ranch No. 14-33	513	07/89	SI 03/16	NW, SE, S14, T9N, R56E	0	0		0
Munson Ranch No. 14-34	287	11/80	SI 07/15	SW, SE, S14, T9N, R56E	0	0		0
Munson Ranch No. 14-34X	522	08/88	Prod	SW, SE, S14, T9N, R56E	2,074	6,174		363
Munson Ranch No. 14-41	538	07/89	Prod	NE, NE, S14, T9N, R56E	0	0		0
Munson Ranch No. 14-44	528	08/89	Prod	SE, SE, S14, T9N, R56E	2,954	122,172		362
Munson Ranch No. 14-49	550	08/89	SI 01/11-10/13; SI 03/16	NE, SE, S14, T9N, R56E	0	0		0
Munson Ranch No. 14-49X	562	02/90	SI since 07/15	NE, SE, S14, T9N, R56E	0	0		0
Trap Spring No. 14-42	523	10/88	SI since 02/16	SE, NE, S14, T9N, R56E	0	0		0
Trap Spring No. 2	185	02/77	Prod	SE, SW, S27, T9N, R56E	5,837	803		362
Trap Spring No. 3	188	04/77	Prod	NW, NE, S34, T9N, R56E	10,042	1,099,668		364
Trap Spring No. 8	196	09/77	SI 03/16	SE, SW, S23, T9N, R56E	0	0		0
Trap Spring No. 9	197	09/78	Prod	NW, NW, S26, T9N, R56E	28,364	451,841		365
Trap Spring No. 16	232	09/78	Prod	NW, SE, S23, T9N, R56E	3,414	117,798		364
Trap Spring No. 19	219	12/77	Prod	SE, NW, S23, T9N, R56E	13,529	3,921		336
Trap Spring No. 23-41	574	06/90	Prod	NE, NE, S23, T9N, R56E	864	812		268
Trap Spring No. 27-41	899	01/09	SI 01/09	NE, NE, S27, T9N, R56E	0	0		0
Zuspann No. 24-1	198	06/77	SI 07/86	NW, SW, S24, T9N, R56E	0	0		0
Zuspann No. 24-3	208	09/77	SI 08/15	NE, NW, S24, T9N, R56E	0	0		0
EAST INSELBERG (Nye Co., 2005)								
Makoil, Inc.								
East Inselberg No. 36-33	860	04/05	SI 12/06-06/10; SI 08/15	NW, SE, S36, T10N, R56E	0	0		0
CURRANT (Nye Co., 1979)								
Makoil, Inc.								
Currant No. 1	241	10/78	SI 07/05-05/07; SI 08/15	SE, SW, S26, T10N, R57E	0	0		0
BACON FLAT (Nye Co., 1981)								
Grant Canyon Oil and Gas, LLC								
Bacon Flat No. 1	316	07/81	SI 10/88	C, SW, S17, T7N, R57E	0	0		0
Bacon Flat Federal No. 23-17	657	09/92	SI 12/93	NE, SW, S17, T7N, R57E	0	0		0
Bacon Flat Federal No. 23-17A	710	01/94	Prod	NE, SW, S17, T7N, R57E	5,325	56,319		365

Status of Nevada oil and gas production wells in 2017–continued

FIELD/OPERATOR/WELL	NEVADA PERMIT	DATE COMPLETED	STATUS	LOCATION	PRODUCTION OIL (BBL)	PRODUCTION WATER (BBL)	PRODUCTION GAS (MCF)	PRODUCTION DAYS
BLACKBURN (Eureka Co., 1982)								
Grant Canyon Oil and Gas, LLC								
Blackburn No. 3	324	03/82	SI 12/98 ex 11/05	SW, SW, S8, T27N, R52E	0	0		0
Blackburn No. 10	350	09/83	Prod	SW, NW, S8, T27N, R52E	5,425	21,537		323
Blackburn No. 14	442	07/85	Prod; SI 01/01-10/08	NE, SE, S7, T27N, R52E	11,544	28,607		354
Blackburn No. 16	458	12/85	Prod; SI 08/09-09/13	SE, NE, S7, T27N, R52E	3,638	53,989		351
Blackburn No. 18	660	11/92	Prod	NE, SE, S7, T27N, R52E	6,192	824,209		363
Blackburn No. 19	724	06/94	Prod	NW, SW, S8, T27N, R52E	12,642	1,092,782		363
Blackburn No. 21	802	09/97	SI 08/14	NE, SE, S7, T27N, R52E	0	0		0
Blackburn No. 22	971	05/16	Prod	NW, SW, S8, T27N, R52E	1,326	1,598		142
GRANT CANYON (Nye Co., 1983)								
Grant Canyon No. 4	376	07/84	PA 04/92	NE, NW, S21, T7N, R57E				
Grant Canyon No. 5	400	08/84	PA 07/95	E/2, NE, S20, T7N, R57E				
Grant Canyon Oil and Gas, LLC								
Grant Canyon No. 3	375	08/84	SI 06/92	SW, SW, S16, T7N, R57E	0	0		0
Grant Canyon No. 7	625	08/91	SI 12/93-10/07; SI 12/12	NW, NW, S21, T7N, R57E	0	0		0
Grant Canyon No. 9	642	04/92	Prod	NW, NW, S21, T7N, R57E	4,931	939		365
Grant Canyon No. 10	706	07/11	Prod; PA 11/93-01/10	NW, NW, S21, T7N, R57E	28,216	288,777		365
Grant Canyon No. 22-21	705	01/94	Prod	SE, NW, S21, T7N, R57E	5,714	244,934		363
KATE SPRING (Nye Co., 1986)								
Makoil, Inc.								
Kate Spring No. 12-2	544	08/89	Prod	NW, NW, S2, T8N, R57E	5,815	94,117	1,263	365
Western General, Inc.								
Kate Spring No. 1	436	01/86	Prod	W/2, SW, S2, T8N, R57E	3,500	40,000	196	60
Kate Spring No. 1A	560	12/89	Prod	NW, SW, S2, T8N, R57E	14,643	208,680	1411	304
Kate Spring No. 1C	592	09/91	Prod; SI 06/97-07/2016	SW, SW, S2, T8N, R57E	230	2,301	15	35
Taylor Federal No. 1	497	10/87	Prod	NE, SE, S3, T8N, R57E	3,070	104,821	293	362
Taylor Federal No. 2	536	06/89	SI 09/93 ex 06/17	SE, NE, S3, T8N, R57E	29	0	0	1
SPENCER LEASE (Nye Co., 1986)								
Spencer Federal No. 32-29	446	12/85	PA 06/86	SW, NE, S29, T9N, R57E				
TOMERA RANCH (Eureka Co., 1987)								
Tomera Ranch No. 33-1	591	10/90	PA 09/07	SW, SW, S33, T31N, R52E				
Southern Pacific Land Co. No. 1-5R	647	05/92	PA 06/97	NE, NE, S5, T30N, R52E				
Tomera Ranch No. 33-2RR	841	01/02	PA 09/07	SW, SW, S33, T31N, R52E				
Tomera Oil Fields, LLC								
Tomera Ranch No. 3	923	02/12	Prod	SE, SW, S33, T31N, R52E	334	2		103
Tomera Ranch No. 33-1B	962	11/14	Prod	SW, SW, S33, T31N, R52E	520	5		131
Foreland Corp.								
Southern Pacific Land Co. No. 1-5	492	08/87	WD 1992	NE, NE, S5, T30N, R52E				
NORTH WILLOW CREEK (Eureka Co., 1988)								
North Willow Creek No. 5-27	646	06/93	PA 10/98	SE, NW, S27, T29N, R52E				
Kirkwood Oil and Gas, LLC								
North Willow Creek No. 6-27	648	09/93	SI 04/02	NE, SW, S27, T29N, R52E	0	0		0
Southern Pacific Land Co. No. 1-27	633	01/92	SI 02/97-04/02; SI 06/08	NW, SE, S27, T29N, R52E	0	0		0
THREE BAR (Eureka Co., 1990)								
Three Bar Federal No. 24-13A	566	09/90	PA 01/01	SW, SW, S24, T28N, R51E				
Three Bar Federal No. 5	679	07/93	PA 12/00	SE, NE, S25, T28N, R51E				
Three Bar Federal No. 25-A	556	10/90	PA 01/01	C, NE, S25, T28N, R51E				
DUCKWATER CREEK (Nye Co., 1990)								
Makoil, Inc.								
Duckwater Creek No. 19-11	542	03/90	SI 06/15	NW, NW, S19, T9N, R57E	0	0		0
SANS SPRING (Nye Co., 1993)								
Grant Canyon Oil and Gas, LLC								
Federal No. 5-14	635	02/93	SI 03/98	SW, NW, S14, T7N, R56E				
Sans Springs No. 5-14A	792	05/97	Prod	SW, NW, S14, T7N, R56E	1,567	0		69
Federal No. 12-14	673	06/93	SI 10/93 TA	SW, SW, S14, T7N, R56E				
GHOST RANCH (Nye Co., 1996)								
Makoil, Inc.								
Ghost Ranch Springs No. 2-21X	800	08/97	Prod; SI 08/97-8/04	NE, NW, S2, T8N, R57E	5,247	116,844		365
Kirkwood Oil and Gas, LLC								
Ghost Ranch Springs No. 38-35	793	01/97	Prod	SE, SW, S35, T9N, R57E	2,508	149,076		362
Ghost Ranch Springs No. 47-35	799	03/97	Prod	SE, SW, S35, T9N, R57E	4,298	107,959		363
Ghost Ranch Springs No. 48-35	779	07/96	Prod	SE, SW, S35, T9N, R57E	2,292	144,809		362
DEADMAN CREEK (Elko Co., 1996)								
Deadman Creek No. 44-13	342	01/96	PA 09/98	SE, SE, S13, T39N, R65E				
SAND DUNE (Nye Co., 1998)								
Kirkwood Oil and Gas, LLC								
Sand Dune Federal No. 88-35	816	07/98	Prod	SE, SE, S35, T9N, R57E	135	365		6
TOANO DRAW (Elko Co., 2007)								
Toano Draw No. 15-19	856	12/06	PA 10/08	NW, SW, S19, T39N, R66E				
HUMBOLDT (Elko Co., 2013)								
Noble Energy, Inc.								
M2C-M2-21B	942	10/13	SI 11/14	NE, NW, S2, T34N, R58E	0	0		0
HUNTINGTON (Elko Co., 2014)								
Noble Energy, Inc.								
K1L-1V	960	11/14	SI 10/15 ex 4/17	SW, SW, S1, T29N, R55E	9	0	26	28

DIRECTORY OF MINING AND MILLING OPERATIONS

By David A. Davis

Compiled from information supplied by the Nevada Div. of Minerals, Mine Safety and Training Section of the Div. of Industrial Relations, and companies.
Except for larger BLM community pits, aggregate 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, N/A: not available, OP: open-pit mine, OS: other surface, PL: placer, UG: underground

Mine/Mill Name	Operator	Location	Commodity	Type	Process/ Activity	Company/ Contract Employees	Address
CARSON CITY							
Black and Red Cinder Pits	Cinderlite Trucking, Inc.	S21, 22, T16N, R20E	cinder decorative stone	OP, ML	mining screening	4	1665 South Sutro Terrace Carson City, NV 89706 Phone: 775-882-4483 FAX: 775-882-1671 Web: http://www.cinderlite.com
Goni Pit	Cinderlite Trucking Corp.	S28, T16N, R20E	decomposed granite sand gravel	OP	mining	6 (Mine and plant combined)	1665 South Sutro Terrace Carson City, NV 89706 Phone: 775-882-4483 FAX: 775-882-1671 Web: http://www.cinderlite.com
Goni Plant	Cinderlite Trucking Corp.	S28, T16N, R20E	decomposed granite sand gravel	ML	crushing screening	6 (Mine and plant combined)	1665 South Sutro Terrace Carson City, NV 89706 Phone: 775-882-4483 FAX: 775-882-1671 Web: http://www.cinderlite.com
CHURCHILL COUNTY							
Huck Salt	Huck Salt Co.	S12, T16N, R31E	salt	OS	mining evaporation	9	2900 Phritzie Lane Fallon, NV 89406 Phone: 775-423-2055 FAX: 775-423-0467 Web: http://www.hucksalt.com
Churchill Quarry	Nevada Cement Co.	S31, T25N, R29E	limestone	OP	mining	8 (Nevada Cement pits combined)	P.O. Box 840 Fernley, NV 89408 Phone: 775-575-2281 FAX: 775-575-4387 Web: http://www.nevadacement.com
Fernley Operations Mill	EP Minerals, LLC	S29, T23N, R27E	diatomite	ML	calcining classification drying grinding	25	P.O. Box 860 I-80 Frontage Rd. Fernley, NV 89408-0860 Phone: 775-423-6668 FAX: 775-423-6411 Web: http://www.epminerals.com
Fernley Operations Mine	EP Minerals, LLC	S28, 32, T23N, R27E	diatomite	OP	mining	35 (Mine and mill combined)	P.O. Box 860 I-80 Frontage Rd. Fernley, NV 89408-0860 Phone: 775-423-6668 FAX: 775-423-6411 Web: http://www.epminerals.com
Nightingale Pit	Imerys Filtration Minerals, Inc.	S17, 18, 19, 20, T24N, R26E	diatomite	OP	mining	15/6 (Mine and plant combined)	100 Front St. Fernley, NV 89408 Phone: 775-575-2536 FAX: 775-575-1507 Web: http://imerys-filtration.com/north-america
Popcorn Mine	EP Minerals, LLC	S24, T16N, R28E; S19, T16N, R29E	perlite	OP	processing shipping	4	640 Clark Station Rd. Sparks, NV 89434 Phone: 775-824-7700 FAX: 775-824-7715 Web: http://www.epminerals.com
CLARK COUNTY							
Apex Landfill Pit	Las Vegas Paving Corp.	S19, T18S, R64E	sand gravel	OP, ML	mining crushing screening	25/3	4420 South Decatur Blvd. Las Vegas, NV 89103 Phone: 702-251-5800 FAX: 702-251-1968 Web: http://www.lasvegaspaving.com
Apex Lhoist Quarry	Las Vegas Paving Corp.	S23, T18S, R64E	aggregate sand	OP, ML	stockpile	8	4420 South Decatur Blvd. Las Vegas, NV 89103 Phone: 702-251-5800 FAX: 702-251-1968 Web: http://www.lasvegaspaving.com

Directory of Mining and Milling Operations (continued)

Mine/Mill Name	Operator	Location	Commodity	Type	Process/ Activity	Company/ Contract Employees	Address
CLARK COUNTY (continued)							
Apex Lhoist Plant	Lhoist North America	S26, T18S, R63E	limestone	OP, ML	calcining crushing screening	120/2 (Mine and plant combined)	12101 North Las Vegas Blvd. Las Vegas, NV 89165 Phone: 702-643-7702 Phone: 702-643-9517 Web: http://www.lhoist.us
Apex Lhoist Quarry	Lhoist North America	S26, T18S, R63E	limestone	OP, ML	mining	120/2 (Mine and plant combined)	12101 North Las Vegas Blvd. Las Vegas, NV 89165 Phone: 702-643-7702 Phone: 702-643-9517 Web: http://www.lhoist.us
Blue Diamond Hill Mill	Gypsum Resources Materials, LLC	S32, T21S, R59E	gypsum	OP, ML	mining crushing screening	38	P.O. Box 147 Blue Diamond, NV 89004 Phone: 702-830-3378 FAX: 702-441-7148 Web: http://www.bluediamondhillmine.com
Blue Diamond Hill Mine	Gypsum Resources Materials, LLC	S32, T21S, R59E	gypsum	OP, ML	mining crushing screening	82/4 (Mine and mill combined)	P.O. Box 147 Blue Diamond, NV 89004 Phone: 702-830-3378 FAX: 702-441-7148 Web: http://www.bluediamondhillmine.com
Blue Diamond Pit	Las Vegas Paving Corp.	S26, T22S, R60E	sand gravel	OP, ML	mining crushing screening	12	4420 South Decatur Blvd. Las Vegas, NV 89103 Phone: 702-251-5800 FAX: 702-251-1968 Web: http://www.lasvegaspaving.com
Boulder Ranch Quarry	CTC Crushing LLC	S15, 22, T23S, R63E	sand gravel	OP, ML	mining crushing screening	30	1045 Palms Airport Dr., Suite 110 Las Vegas, NV 89119 Phone: 702-597-1010 FAX: 702-853-9507 Web: http://www.impactsandandgravel.com
El Dorado Quarry	Portable Aggregate Producers, LLC	S14, T23S, R63E	sand gravel	OP, ML	mining crushing screening	12	P.O. Box 62437 Boulder City, NV 89006 Phone: 702-558-9180 FAX: 702-558-9182
Georgia-Pacific Gypsum Plant	Georgia-Pacific Gypsum, LLC	S34, 35, T18S, R63E	gypsum	ML	crushing	110	P.O. Box 337350 11401 U. S. Highway 91 North Las Vegas, NV 89033 Phone: 702-643-8100 FAX: 702-643-2049 Web: http://www.gp.com
Henderson Community Pit	Various (U.S. Bureau of Land Management manages pit) pit)	S14, T21S, R62E	sand gravel	OP	mining		Bureau of Land Management 4701 North Torrey Pines Dr. Las Vegas, NV 89130-2301 Phone: 702-515-5000 Web: https://www.blm.gov/nv/st/en.html
Henderson Plant	Lhoist North America	S12, T22S, R62E	lime	ML	calcining	120/2 (Mine and plant combined)	12101 North Las Vegas Blvd. Las Vegas, NV 89165 Phone: 702-643-7702 Phone: 702-643-9517 Web: http://www.lhoist.us
Las Vegas Plant	CertainTeed Gypsum Manufacturing, Inc.	S5, 8, T22S, 59E	gypsum	ML	processing	N/A	Highway 159 Blue Diamond, NV 89004 Phone: 702-875-4111 FAX: 702-875-4213 Web: http://www.certainteed.com
Lima Nevada Gypsum Mill	H. Lima Nevada LLC	S30, T20S, R64E	gypsum	ML	crushing screening	10 (Mine and mill combined)	704 East Yosemite Manteca, CA 95336 Phone: 209-239-6787 FAX: 209-239-6778
Lima Nevada Gypsum Mine	H. Lima Nevada LLC	S30, T20S, R64E	gypsum	OP	mining	10 (Mine and mill combined)	704 East Yosemite Manteca, CA 95336 Phone: 209-239-6787 FAX: 209-239-6778
Lone Mountain	Las Vegas Paving Corp.	S35, 36, T19S, R59E; S2, T20S, R60E	aggregate	OP, ML	mining crushing screening	6	4420 South Decatur Blvd. Las Vegas, NV 89103 Phone: 702-251-5800 FAX: 702-251-1968 Web: http://www.lasvegaspaving.com

Directory of Mining and Milling Operations (continued)

Mine/Mill Name	Operator	Location	Commodity	Type	Process/ Activity	Company/ Contract Employees	Address
CLARK COUNTY (continued)							
Lone Mountain	Mel Clark, Inc.	S36, T19S, R59E	sand gravel	OP, ML	mining	5	10550 West Lone Mtn Rd. Las Vegas, NV 89129 Phone: 702-643-1914 FAX: 702-643-1954 Web: http://www.melclarkinc.com
Lone Mountain	Nevada Ready Mix Corp.	S36, T19S, R59E	sand gravel	OP, ML	mining crushing screening	15	601 West Bonanza Las Vegas, NV 89106 Phone: 702-457-1115 FAX: 702-932-3992 Web: http://www.nevadareadymix.com
Lone Mountain Pit	Wells Cargo, Inc.	S35; T19S, R60E	sand gravel rock	OP, ML	mining gravity rock	3	9127 West Russell Rd., Suite 210 Las Vegas, NV 891148 Phone: 702-876-5090 FAX: 702-876-3977 Web: http://www.wcilv.com
Lone Mountain Community Pit	Various (U.S. Bureau of Land Management manages pit) pit)	S36, T19S, R59E; S1, T20S, R59E	sand gravel	OP	mining		Bureau of Land Management 4701 North Torrey Pines Dr. Las Vegas, NV 89130-2301 Phone: 702-515-5000 Web: https://www.blm.gov/nv/st/en.html
Mesquite Community Pit	B.J. Rees's Enterprise	S20, T13S, R71E	sand gravel	OP	mining crushing screening	8	P.O. Box 358 Coalville, UT 84017 Phone: 435-336-5345 FAX: 435-336-5351
Mesquite Community Pit	Various (U.S. Bureau of Land Management manages pit) pit)	S20, T13S, R71E	sand gravel	OP	mining		Bureau of Land Management 4701 North Torrey Pines Dr. Las Vegas, NV 89130-2301 Phone: 702-515-5000 Web: https://www.blm.gov/nv/st/en.html
Money Pit	Southern Nevada Liteweight, Inc.	S9, T25S, R61E	silica sand	OP, ML	mining milling	11	4262 Blue Diamond Rd. Las Vegas, NV 89139 Phone: 702-399-8621 FAX: 702-633-4062
PABCO Gypsum-Apex Plant	Pacific Coast Building Products, Inc.	S7, T20S, R64E	gypsum	ML	crushing screening washing	18/1 (Mine and plant combined)	P.O. Box 364329 North Las Vegas, NV 89036 Phone: 702-407-3700 FAX: 702-643-6249 Web: http://www.pabcogypsum.com
PABCO Gypsum-Apex Pit	Pacific Coast Building Products, Inc.	S7, 18, T20S, R64E	gypsum	OP	mining	18/1 (Mine and plant combined)	P.O. Box 364329 North Las Vegas, NV 89036 Phone: 702-407-3700 FAX: 702-643-6249 Web: http://www.pabcogypsum.com
Pole Line Pit and Mill	Boulder Sand and Gravel, Inc.	S14, T20S, 62E	sand gravel	OP, ML	mining crushing	5	4090 West Hacienda Ave., Suite 100 Las Vegas, NV 89118 Phone: 702-294-1156 FAX: 702-367-4727
Rainbow Quarries	Las Vegas Rock, Inc.	S34, T25S, R58E	landscape rock sand stone	OP, ML	mining crushing sawing	20	2 Prison Rd. P.O. Box 19118 Jean, NV 89019 Phone: 702-791-7625 FAX: 702-896-4533 Web: http://www.vegasrock.com
Sierra Ready Mix Quarry	Sierra Ready Mix, LLC	S6, 7, T25S, R60E	sand gravel	OP, ML	mining crushing screening	7	4150 Smiley Rd. North Las Vegas, NV 89081 Phone: 702-664-3000 FAX: 702-664-1736 Web: http://www.sierrareadymix.com
Simplot Silica Products Pit	J. R. Simplot Co.	S11, T17S, R67E	silica sand	OP	mining	37 (Mine and plant combined)	P.O. Box 308 Overton, NV 89040 Phone: 702-397-2667 FAX: 702-397-2798 Web: http://www.simplot.com

Directory of Mining and Milling Operations (continued)

Mine/Mill Name	Operator	Location	Commodity	Type	Process/ Activity	Company/ Contract Employees	Address
CLARK COUNTY (continued)							
Simplot Silica Products Plant	J. R. Simplot Co.	S30, T16S, R68E	silica sand	ML	drying flotation hydrosizing screening	23	P.O. Box 308 Overton, NV 89040 Phone: 702-397-2667 FAX: 702-397-2798 Web: http://www.simplot.com
Sloan Mill	Aggregate Industries	S13, T23S, R60E	sand gravel	ML	crushing screening	52 (Mine and plant combined)	4675 West Teco Ave., Suite 140 Las Vegas, NV 89118 Phone: 702-649-6250 FAX: 702-642-2213 Web: http://www.aggregate-us.com
Sloan Quarry	Aggregate Industries	S13, T23S, R60E	sand gravel	OP, OS	mining	52 (Mine and plant combined)	4675 West Teco Ave., Suite 140 Las Vegas, NV 89118 Phone: 702-649-6250 FAX: 702-642-2213 Web: http://www.aggregate-us.com
South Jean Pit	Service Rock Products	S28, T25S, R60E	sand gravel	OP	mining	8	151 Cassia Way Henderson, NV 89014 Phone: 702-798-0568 Phone: 702-798-0580 Web: http://www.servicerock.com
Spring Mountain Pit and Mill	Wells Cargo, Inc.	S15; T21S, R60E	sand gravel	OP, ML	mining gravity	11	9127 West Russell Rd., Suite 210 Las Vegas, NV 891148 Phone: 702-876-5090 FAX: 702-876-3977 Web: http://www.wcilv.com
DOUGLAS COUNTY							
Bing Materials Pit and Mill	Bing Materials Co.	S16, T12N, R20E	sand gravel	OP, ML	mining crushing	14	P.O. Box 487 Minden, NV 89423 Phone: 775-265-3641
ELKO COUNTY							
Arturo Mine Project	Barrick Goldstrike Mines, Inc.	S3, T36N, R49E S34, 35, T37N, R49E	gold	OP, CIL,	mining	7	P.O. Box 29 Elko, NV 89803 Phone: 775-748-1001 FAX: 775-748-1240 Web: http://www.barrick.com
Boehler Pit	Staker Parson Co.	S12, T34N, R62E	sand gravel	OP, ML	mining crushing	4	2755 Last Chance Rd. Elko, NV 89801 Phone: 775-738-8155 Web: http://www.stakerparson.com
Dry Creek Jig Plant	National Oilwell Varco	S15, T42N, R62E	barite	ML	shipping	1	247 Bluffs Ave. Elko, NV 89801 Phone: 775-738-7171 FAX: 775-738-7196 Web: http://www.nov.com
Elburz Pit	Vega Construction and Trucking Co.	S9, T33N, R52E	sand gravel	OP, ML	mining crushing screening	7	P.O. Box 1630 Elko, NV 89803 Phone: 775-738-5381 FAX: 775-738-6311
Emigrant Mine	Newmont Mining Corp.	S2, T31N, R53E; S26, 35 T32N, R53E	gold	OP	mining	160	1655 Mountain City Hwy. Elko, NV 89803 Phone: 775-778-4000 FAX: 775-778-4751 Web: http://www.newmont.com
Emigrant Plant	Newmont Mining Corp.	S12, T31N, R53E	gold	ML	milling	14	1655 Mountain City Hwy. Elko, NV 89803 Phone: 775-778-4000 FAX: 775-778-4751 Web: http://www.newmont.com
Hollister Mine	Klondex Hollister Mine, Inc	S4, 5, T37N, R48E; S32, T38N, R48E	gold silver	UG	mining	87/28	6110 Plumas St., Suite A Reno, NV 89519 Phone: 775-284-5757 FAX: 775-284-5756 Web: https://www.hecla-mining.com

Directory of Mining and Milling Operations (continued)

Mine/Mill Name	Operator	Location	Commodity	Type	Process/ Activity	Company/ Contract Employees	Address
ELKO COUNTY (continued)							
Jerritt Canyon Mill	Jerritt Canyon Gold, LLC	S33, T41N, R54E	gold silver	ML, CIL	heap leach milling roasting	136	HC31 Box 78 Elko, NV 89801 Phone: 775-738-5600 FAX: 775-758-9233 Web: http://www.jerrittcanyon.com
Jerritt Canyon Mine	Jerritt Canyon Gold, LLC	S7, T39N, R53E; S10, 14, 23, T40N, R53E; S4, 7, 8, 18, T40N, R54E	gold silver	UG	mining	240/210 (Mine and mill combined)	HC31 Box 78 Elko, NV 89801 Phone: 775-738-5600 FAX: 775-758-9233 Web: http://www.jerrittcanyon.com
Long Canyon	Newmont Mining Corp.	S20, 21, 28, 29, 32, 32, T36N, R66E	gold	OP, HL	mining milling	244	1655 Mountain City Hwy. Elko, NV 89803 Phone: 775-778-4000 FAX: 775-778-4751 Web: http://www.newmont.com
Meikle Mine	Barrick Goldstrike Mines, Inc.	S12, 13, T36N, R50E	gold silver	UG	mining	584	P.O. Box 29 Elko, NV 89803 Phone: 775-748-1001 FAX: 775-748-1240 Web: http://www.barrick.com
Midas Mill	Klondex Mines, Ltd.	S22, T39N, R46E	gold silver	ML	milling	32	6110 Plumas St., Suite A Reno, NV 89519 Phone: 775-284-5757 FAX: 775-284-5756 Web: https://www.hecla-mining.com
Midas Mine	Klondex Mines, Ltd.	S21, 22, 27, 28, 33, 34; T39N, R46E	gold silver	UG	mining	121/47 (Mine and mill combined)	6110 Plumas St., Suite A Reno, NV 89519 Phone: 775-284-5757 FAX: 775-284-5756 Web: https://www.hecla-mining.com
Osino Grinding Plant	National Oilwell Varco	S10, T35N, R56E	barite	ML	grinding shipping	11	247 Bluffs Ave. Elko, NV 89801 Phone: 775-738-7171 FAX: 775-738-7196 Web: http://www.nov.com
Pilot Peak Plant	Graymont Western US., Inc.	S14, T34N, R68E	limestone	ML	calcining crushing rotary kiln screening	31	P.O. Box 2520 West Wendover, NV 89883 Phone: 775-483-5463 FAX: 801-262-3942 Web: http://www.graymont.com
Pilot Peak Quarry	Graymont Western US., Inc.	S14, 15, 22, 23, 26, T34N, R68E	limestone	OP	mining	69 (Mine and plant combined)	P.O. Box 2520 West Wendover, NV 89883 Phone: 775-483-5463 FAX: 801-262-3942 Web: http://www.graymont.com
ESMERALDA COUNTY							
Basalt Mill	Grefco Minerals, Inc.	S29, T2N, R34E	diatomite	ML	drying milling	5	P.O. Box 278 Dyer, NV 89010 Phone: 775-573-2422 Web: http://www.dicalite.com
Basalt Mine	Grefco Minerals, Inc.	S29, T2N, R34E	diatomite	OP	mining	15/3 (Mine and mill combined)	P.O. Box 278 Dyer, NV 89010 Phone: 775-573-2422 Web: http://www.dicalite.com
Blanco Mine	Vanderbilt Minerals Corp.	S22, T1N, R37E	clay	OP	mining	4 (Combined Vanderbilt Mines)	3561 East Burgundy Dr. P.O. Box 6660 Pahrump, NV 89048 Phone: 775-537-6976 FAX: 775-537-6879 Web: https://www.vanderbiltminerals.com
Gemfield Gems	Gemfield Gems	S29, 30, T2S, R42E T2S, R42E	chalcedony	OP	mining	1	P.O. Box 5 Goldfield, NV 89013 Phone: 775-485-3789 Web: http://www.gemfieldnv.com

Directory of Mining and Milling Operations (continued)

Mine/Mill Name	Operator	Location	Commodity	Type	Process/ Activity	Company/ Contract Employees	Address
ESMERALDA COUNTY (continued)							
Heart of Nature Alum/Sulfur Mine	Heart of Nature, LLC	S32, T1N, R38.5E	alum sulfur	OP, ML	mining crushing processing screening	1/4	34710 7th Standard Rd. Bakersfield, CA 93314 Phone: 877-324-3278 FAX: 661-399-9758 Web: http://www.heartofnature.biz
Lone Mountain Mine	Lone Mountain Mining, LLC	S18, T1N, R41E	turquoise	OP	mining	0/4	600 Queensridge Ct. Las Vegas, NV 89145 Phone: 719-330-8266 Web: http://www.lonemountainturquoise.com
Mineral Ridge Crusher	Mineral Ridge Gold, LLC	S1, T2S, R38E	gold silver	ML	crushing	53 (Plants combined)	1515 7th St. Elko, NV 89801 Phone: 775-799-9271 FAX: 775-753-4780 Web: http://www.scorpiogold.com
Mineral Ridge Mine	Mineral Ridge Gold, LLC	S1, T2S, R38E	gold silver	ML	milling	53 (Plants combined)	1515 7th St. Elko, NV 89801 Phone: 775-799-9271 FAX: 775-753-4780 Web: http://www.scorpiogold.com
Mineral Ridge Mill	Mineral Ridge Gold, LLC	S1, T2S, R38E	gold silver	OP, HL	mining heap leach	60/20 (Mine and plants combined)	1515 7th St. Elko, NV 89801 Phone: 775-799-9271 FAX: 775-753-4780 Web: http://www.scorpiogold.com
Silver Peak Operations	Albemarle U.S., Inc.	T2S, R39-40E	lithium carbonate	OS, ML	mining evaporation precipitation	70/10	P.O. Box 98 Silver Peak, NV 89047 Phone: 775-937-2222 FAX: 775-937-2317 Web: https://www.albemarle.com
EUREKA COUNTY							
Barrick Goldstrike Mines Autoclave	Barrick Goldstrike Mines, Inc.	S29, T36N, R50E	gold silver	ML	autoclave	229	P.O. Box 29 Elko, NV 89803 Phone: 775-748-1001 FAX: 775-748-1240 Web: http://www.barrick.com
Barrick Goldstrike Mines Roaster	Barrick Goldstrike Mines, Inc.	S13, T36N, R49E	gold silver	ML	roasting	140	P.O. Box 29 Elko, NV 89803 Phone: 775-748-1001 FAX: 775-748-1240 Web: http://www.barrick.com
Betze/Post Mine	Barrick Goldstrike Mines, Inc.	S23-26, T36N, R49E; S12, 20, 29, 30; T36N, R50E	gold silver	OP, HL	mining heap leach	1123 (Mine and plant combined)	P.O. Box 29 Elko, NV 89803 Phone: 775-748-1001 FAX: 775-748-1240 Web: http://www.barrick.com
Carlin Mill 5	Newmont Mining Corp.	S36, T34N, R51E	gold silver	ML	milling	2155/431 (Combined Newmont Carlin Trend Operations)	1655 Mountain City Hwy. Elko, NV 89801 Phone: 775-778-4000 FAX: 775-778-4360 Web: http://www.newmont.com
Carlin Mill 6	Newmont Mining Corp.	S36, T34N, R51E	gold silver	ML	milling	2155/431 (Combined Newmont Carlin Trend Operations)	1655 Mountain City Hwy. Elko, NV 89801 Phone: 775-778-4000 FAX: 775-778-4360 Web: http://www.newmont.com
Carlin North - Genesis Complex	Newmont Mining Corp.	S33, T36N, R50E	gold	OP, HL	mining bioleaching heap leach	2155/431 (Combined Newmont Carlin Trend Operations)	1655 Mountain City Hwy. Elko, NV 89801 Phone: 775-778-4000 FAX: 775-778-4360 Web: http://www.newmont.com
Carlin North - Post and adjacent mines	Newmont Mining Corp.	S19, T36N, R50E	gold	OP, HL	mining bioleaching heap leach	2155/431 (Combined Newmont Carlin Trend Operations)	1655 Mountain City Hwy. Elko, NV 89801 Phone: 775-778-4000 FAX: 775-778-4360 Web: http://www.newmont.com

Directory of Mining and Milling Operations (continued)

Mine/Mill Name	Operator	Location	Commodity	Type	Process/ Activity	Company/ Contract Employees	Address
EUREKA COUNTY (continued)							
Carlin South - Carlin and adjacent mines	Newmont Mining Corp.	S14, T35N, R50E	gold	UG, HL	mining bioleaching heap leach	2155/431 (Combined Newmont Carlin Trend Operations)	1655 Mountain City Hwy. Elko, NV 89801 Phone: 775-778-4000 FAX: 775-778-4360 Web: http://www.newmont.com
Carlin South - Gold Quarry and adjacent mines	Newmont Mining Corp.	S3, T33N, R51E	gold	OP, HL	mining bioleaching heap leach	2155/431 (Combined Newmont Carlin Trend Operations)	1655 Mountain City Hwy. Elko, NV 89801 Phone: 775-778-4000 FAX: 775-778-4360 Web: http://www.newmont.com
Nevada Barth Iron Mine and Mill	Saga Exploration Co.	S7, T31N, R51E	iron	OP, ML	screening	5	2339 Dickerson Rd. Reno, NV 89503 Phone: 775-322-9994
Ruby Hill Mill	Ruby Hill Mining Co., LLC	S10, T19N, R53E	gold silver	ML	milling	10	P.O. Box 676 Eureka, NV 89316 Phone: 775-401-6435
Ruby Hill Mine	Ruby Hill Mining Co., LLC	S9-11, 14, 15, T19N, R53E	gold silver	OP, HL	heap leach	16 (Mine and plant combined)	P.O. Box 676 Eureka, NV 89316 Phone: 775-401-6435
HUMBOLDT COUNTY							
Bonanza Opal Mine	Bonanza Opal Mines, Inc.	S6, 7, T45N, R26E	precious opal	OP	mining	N/A	P.O. Box 127 Denio, NV 89404 Phone: 775-375-5955 Web: http://www.bonanzaopals.net
Hycroft Merrill-Crowe Plant	Hycroft Resources and Development, Inc.	S19, T35N, R29E	gold silver	ML	milling	26/9 (Mine and plant combined)	P.O. Box 3030 Winnemucca, NV 89446 Phone: 775-623-5260 FAX: 775-201-1045 Web: http://www.alliednevada.com
Hycroft Mine	Hycroft Resources and Development, Inc.	S26, T35N, R29E	gold silver	OP, HL	mining heap leach	26/9 (Mine and plant combined)	P.O. Box 3030 Winnemucca, NV 89446 Phone: 775-623-5260 FAX: 775-201-1045 Web: http://www.alliednevada.com
Lone Tree Complex	Newmont Mining Corp.	S1, 11, 13, 15, 23, T34N, R42E	gold silver	OP, HL,	heap leach	51/29 (Mine and plant combined)	1655 Mountain City Hwy. Elko, NV 89801 Phone: 775-778-4000 FAX: 775-778-4360 Web: http://www.newmont.com
Lone Tree Mine (Brooks Pit)	Newmont USA Ltd.	S11, T34N, R42E	gold silver	OP	mining	34	P.O. Box 1657 Battle Mountain, NV 89820 Phone: 775-635-9000 FAX: 775-778-4600 Web: http://www.newmont.com
Lone Tree Plant	Newmont USA Ltd.	S15, T34N, R42E	gold silver	ML	milling	30	P.O. Box 1657 Battle Mountain, NV 89820 Phone: 775-635-9000 FAX: 775-778-4600 Web: http://www.newmont.com
Marigold Mill and Refinery	SSR Mining	S9, T33N, R43E	gold silver	ML	milling	35	P.O. Box 160 Valmy, NV 89438 Phone: 775-635-2317 FAX: 775-635-2551 Web: http://www.ssrmining.com
Marigold Mine	SSR Mining	S8, 9, 18-20; T33N, R43E	gold silver	OP, HL	mining	384/7 (Mine and plant combined)	P.O. Box 160 Valmy, NV 89438 Phone: 775-635-2317 FAX: 775-635-2551 Web: http://www.ssrmining.com
MIN-AD Mine	MIN-AD, Inc.	S28, T35N, R38E	dolomite	OP, ML	mining grinding	15	P.O. Box 39 Winnemucca, NV 89446 Phone: 775-623-5944 FAX: 775-623-9028 Web: http://www.min-ad.com

Directory of Mining and Milling Operations (continued)

Mine/Mill Name	Operator	Location	Commodity	Type	Process/ Activity	Company/ Contract Employees	Address
HUMBOLDT COUNTY (continued)							
Rainbow Ridge Opal Mine	Rainbow Ridge Opal Mines, Inc.	S22, 23, T45N, R26E	opalized wood precious opal	OP	mining	1	P.O. Box 97 Denio, NV 89404 Phone: (Summer) 775-941-0270 Phone: (Winter) 541-312-2679 Web: http://www.nevadaopal.com
Royal Peacock Opal Mine	Walter Wilson	S30, T45N, R26E	precious opal	OP	mining	1	No. 10 Virgin Valley Rd. Denio, NV 89404 Phone: 775-941-0374 FAX: 775-272-3395 Web: http://www.royalpeacock.com
Turquoise Ridge Joint Venture	Barrick Gold Corp.	S33, T39N, R42E	gold silver	UG	mining	480/100	2055 Getchell Mine Rd. Golconda, NV 89414-9702 Phone: 775-529-5001 FAX: 775-748-3125 Web: http://www.barrick.com
Twin Creeks Juniper and Sage Mills	Newmont Mining Corp.	S5, T39N, R43E	gold silver	ML	milling	166 (Plants combined)	1655 Mountain City Hwy. Elko, NV 89801 Phone: 775-778-4000 FAX: 775-778-4360 Web: http://www.newmont.com
Twin Creeks Mine	Newmont Mining Corp.	S3-10, 15-22, 27-32, T39N, R43E	gold silver	OP, HL	mining heap leach	471/133 (Mine and mill combined)	1655 Mountain City Hwy. Elko, NV 89801 Phone: 775-778-4000 FAX: 775-778-4360 Web: http://www.newmont.com
Twin Creeks Pinion Mill	Newmont Mining Corp.	S31, T39N, R43E	gold silver	ML	milling	166 (Plants combined)	1655 Mountain City Hwy. Elko, NV 89801 Phone: 775-778-4000 FAX: 775-778-4360 Web: http://www.newmont.com
LANDER COUNTY							
Argenta Mill	Baker Hughes Oilfield Operations, Inc.	S6, T32N, R47E	barite	ML	gravity grinding	10	P.O. Box 277 Battle Mountain, NV 89820 Phone: 775-635-5441 FAX: 775-635-5455 Web: http://www.bakerhughes.com
Argenta Mine	Baker Hughes Oilfield Operations, Inc.	S13, 14, T32N, R46E; S18, 19, T32N, R47E	barite	OP	mining	15/5 (Mine and plant combined)	P.O. Box 277 Battle Mountain, NV 89820 Phone: 775-635-5441 FAX: 775-635-5455 Web: http://www.bakerhughes.com
Battle Mountain Grinding Plant	M-I Swaco	S18, T32N, R45E	barite	ML	gravity grinding	34	P.O. Box 370 2 North Second Street Battle Mountain, NV 89820 Phone: 775-635-5135 FAX: 775-635-2645 Web: http://www.slb.com/services/miswaco.aspx
Cortez Hills Open Pit Mine	Barrick Cortez, Inc.	S24, T27N, R47E	gold	OP	mining	932/425 (Combined Pipeline and Cortez Hills Mines/Mill)	HC 66 Box 1250 Crescent Valley, NV 89821-1250 Phone: 775-468-4400 FAX: 775-468-4496 Web: http://www.barrick.com
Cortez Hills Underground Mine	Barrick Cortez, Inc.	S24, T27N, R47E	gold	UG	mining	322/130	HC 66 Box 1250 Crescent Valley, NV 89821-1250 Phone: 775-468-4400 FAX: 775-468-4496 Web: http://www.barrick.com
Cortez Pipeline Mill	Barrick Cortez, Inc.	S31, T27N, R48E	gold	ML	milling	932/425 (Combined Pipeline and Cortez Hills Mines/Mill)	HC 66 Box 1250 Crescent Valley, NV 89821-1250 Phone: 775-468-4400 FAX: 775-468-4496 Web: http://www.barrick.com

Directory of Mining and Milling Operations (continued)

Mine/Mill Name	Operator	Location	Commodity	Type	Process/ Activity	Company/ Contract Employees	Address
LANDER COUNTY (continued)							
Cortez Pipeline Mine	Barrick Cortez, Inc.	S31, T27N, R48E	gold	OP, HL	mining	932/425 (Combined Pipeline and Cortez Hills Mines/Mill)	HC 66 Box 1250 Crescent Valley, NV 89821-1250 Phone: 775-468-4400 FAX: 775-468-4496 Web: http://www.barrick.com
Fire Creek	Klondex Mines, Ltd.	S15, 22 T30N, R47E	gold silver	UG	mining	84/39	6110 Plumas St., Suite A Reno, NV 89519 Phone: 775-284-5757 FAX: 775-284-5756 Web: https://www.hecla-mining.com
Greystone Mine	M-I Swaco	S25, 26, T28N, R45E	barite	OP	mining	56 (Mine and plant combined)	P.O. Box 370 2 North Second Street Battle Mountain, NV 89820 Phone: 775-635-5135 FAX: 775-635-2645 Web: http://www.slb.com/services/miswaco.aspx
Greystone Plant	M-I Swaco	S26, T28N, R45E	barite	OP	mining crushing gravity	26	P.O. Box 370 2 North Second Street Battle Mountain, NV 89820 Phone: 775-635-5135 FAX: 775-635-2645 Web: http://www.slb.com/services/miswaco.aspx
May Turquoise Mine	Red Widow Mine Co.	S29, T29N, R47E	turquoise	OP	mining	1	633 6th St. Crescent Valley, NV 89821-1250 Phone: 775-455-7856
Mountain Springs Mine	M-I Swaco	S8, 9, T28N, R44E	barite	OP	mining gravity	4	P.O. Box 370 2 North Second Street Battle Mountain, NV 89820 Phone: 775-635-5135 FAX: 775-635-2645 Web: http://www.slb.com/services/miswaco.aspx
Phoenix Mill	Newmont Mining Corp.	S33, T31N, R43E	gold silver	ML	milling	153	1655 Mountain City Hwy. Elko, NV 89801 Phone: 775-778-4000 FAX: 775-778-4360 Web: http://www.newmont.com
Phoenix Mine	Newmont Mining Corp.	S22, 27, 33, 34, T31N, R43E	gold silver	OP, HL,	mining heap leach	471/133 (Mine and mill combined)	1655 Mountain City Hwy. Elko, NV 89801 Phone: 775-778-4000 FAX: 775-778-4360 Web: http://www.newmont.com
LINCOLN COUNTY							
Tenacity Perlite Mill	Wilkin Mining and Trucking Co., Inc.	S5 T4S, R67E	perlite	OP, ML	mining crushing	5 (Mine and mill combined)	HC 34 Box 199 Caliente, NV 89008 Phone: 775-728-4463
Tenacity Perlite Mine	Wilkin Mining and Trucking Co., Inc.	S34, T4S, R62E	perlite	OP, ML	mining crushing	5 (Mine and mill combined)	HC 34 Box 199 Caliente, NV 89008 Phone: 775-728-4463
LYON COUNTY							
Adams Claim Gypsum Mine	Art Wilson Co.	S25, T16N, R20E	gypsum limestone	OP	mining	46/2 (Mine and mill combined)	P.O. Box 20160 Carson City, NV 89702-1160 Phone: 775-882-0700 FAX: 775-882-0790 Web: http://www.acgmaterials.com
Art Wilson Co. Mill	Art Wilson Co.	S25, T16N, R20E	gypsum limestone	ML	crushing grinding screening pelletizing	21	P.O. Box 20160 Carson City, NV 89702-1160 Phone: 775-882-0700 FAX: 775-882-0790 Web: http://www.acgmaterials.com
Dayton Materials (Mustang Pit)	3D Concrete, Inc.	S23, T16N, R21E	aggregate landscape rock sand	OP, ML	mining crushing screening	10	No. 20 Ricci Rd. Dayton, NV 89403 Phone: 775-246-5440 FAX: 775-346-3911 Web: http://3dconcrete.com

Directory of Mining and Milling Operations (continued)

Mine/Mill Name	Operator	Location	Commodity	Type	Process/ Activity	Company/ Contract Employees	Address
LYON COUNTY (continued)							
Fernley Plant	Imerys Filtration Minerals, Inc.	S11, T20N, R24E	diatomite	ML	classification drying grinding milling	11	100 Front St. Fernley, NV 89408 Phone: 775-575-2536 FAX: 775-575-1570 Web: http://imerys-filtration.com/north-america/
Fernley Quarry	Nevada Cement Co.	S3-6, 9, T19N, R25E; S31-33, T20N, R25E	limestone	OP	mining	8 (Nevada Cement pits combined)	P.O. Box 840 Fernley, NV 89408 Phone: 775-575-2281 FAX: 775-575-4387
Hazen Pit	EP Minerals, LLC	S6, 9, T19N, R26E	diatomite	OP	mining	2/4	640 Clark Station Rd. Sparks, NV 89434 Phone: 775-824-7700 FAX: 775-824-7715 Web: http://www.epminerals.com
Nevada Cement Plant	Nevada Cement Co.	S10, 11, T20N, R24E	limestone clay	ML	crushing dry milling rotary kiln	120/70 (Plant and mines combined)	P.O. Box 840 Fernley, NV 89408 Phone: 775-575-2281 FAX: 775-575-4387 Web: http://www.nevadacement.com
Rocks Road Pit	Desert Engineering	S31, T13N, R26E	sand gravel	OP, ML	mining crushing	4	517 W. Bridge St. Suite E Yerington, NV 89447 Phone: 775-463-3478 FAX: 775-463-9526 Web: http://deserteng.com
MINERAL COUNTY							
Aurora Mine	Klondex Aurora Mining, Inc.	S18, 19, T6N, R29E	gold silver	OP, UG	reprocessing	12/9 (Mine and mill combined)	6110 Plumas St., Suite A Reno, NV 89519 Phone: 775-284-5757 FAX: 775-284-5756 Web: https://www.hecla-mining.com
Borealis Mine	Borealis Mining Co., LLC	S8, 9, 16, 17, T6N, R29E	gold silver	OP, HL	heap leach	6 (Mine and plant combined)	9650 Gateway Dr., Suite 202 Reno, NV 89521 Phone: 775-826-7567
Borealis Processing Plant	Borealis Mining Co., LLC	S17, T6N, R29E	gold silver	ML	milling	5	9650 Gateway Dr., Suite 202 Reno, NV 89521 Phone: 775-826-7567
Denton-Rawhide Mine	Rawhide Mining, LLC	S4, 5, 8, 16, 17, T13N, R32E	gold silver	OP, HL	mining heap leach	56/2 (Mine and plant combined)	P.O. Box 2070 Fallon, NV 89407 Phone: 775-945-1015 FAX: 775-945-1213
Denton-Rawhide Processing Facility	Rawhide Mining, LLC	S9, T13N, R32E	gold silver	ML	milling	48	P.O. Box 2070 Fallon, NV 89407 Phone: 775-945-1015 FAX: 775-945-1213
Esmeralda Mill	Klondex Aurora Mining, Inc.	S19, T6N, R29E	gold silver	ML	reprocessing	12/9 (Mine and mill combined)	6110 Plumas St., Suite A Reno, NV 89519 Phone: 775-284-5757 FAX: 775-284-5756 Web: https://www.hecla-mining.com
NYE COUNTY							
Amargosa Clay Operation	Lhoist North America of Arizona	S21, T17S, R51E	clay	OP, ML	mining crushing screening	31/3	P.O. Box 86 Amargosa Valley, NV 89020 Phone: 775-372-5341 FAX: 775-372-5320 Web: https://www.lhoist.com/us_en/imv-nevada imv-nevada
Amargosa Plant	Lhoist North America of Arizona	S28, T17S, R49E	clay	ML	crushing drying evaporation grinding screening	29/4	P.O. Box 86 Amargosa Valley, NV 89020 Phone: 775-372-5341 FAX: 775-372-5320 Web: https://www.lhoist.com/us_en/imv-nevada imv-nevada

Directory of Mining and Milling Operations (continued)

Mine/Mill Name	Operator	Location	Commodity	Type	Process/ Activity	Company/ Contract Employees	Address
NYE COUNTY (continued)							
Beatty Quarry	Kalamazoo Materials, Inc.	S16, T11S, R47E	landscape rock	OP, ML	mining crushing screening	4	6975 North Oracle Rd. Tucson, AZ 85704 Phone: 520-575-9601 FAX: 520-575-9604 Web: http://wwwkalamazoomaterials.com
Cinder Cone Pit	Allied Building Materials, Inc. and Cind-R-Lite Co.	S36, T14S, R48E; S31, T14S, R49E; S1, T15S, R48E; S6, T15S, R49E	cinder	OP, ML	mining screening	6	4745 Mitchell St. North Las Vegas, NV 89081 Phone: 702-651-1550 FAX: 702-651-1551 Web: http://www.abmnv.com
Gamebird Pit	Wulfenstein Construction	S3, T21S, R54E	sand gravel	OP, ML	mining crushing screening	2	2281 East Postal Dr. P. O. Box 38 Pahrump, NV 89048 Phone: 775-727-5900 FAX: 775-727-6010 Web: http://wulfensteinconstruction.com
Gold Hill Mine (Smoky Valley Common Operation)	Round Mountain Gold Corp.	S11, T10N, R44E	gold silver	OP, HL, ML	mining heap leach milling	764/236 (Gold Hill and Round Mtn. combined)	P.O. Box 480 Smoky Valley Mine Rd. Round Mountain, NV 89405 Phone: 775-377-2366 FAX: 775-377-3224 Web: http://www.kinross.com
New Discovery Mine	Vanderbilt Minerals Corp.	S13, 24, T12S, R46E S18, 19, T12S, R47E	clay	UG	mining	4 (Combined Vanderbilt Mines)	3561 East Burgundy Dr. P.O. Box 6660 Pahrump, NV 89048 Phone: 775-537-6976 FAX: 775-537-6879 Web: https://www.vanderbiltminerals.com
Pahrump Community Pit	Various (U.S. Bureau of Land Management manages pit)	S28, 29, T20S, R54E	sand gravel	OP	mining		Bureau of Land Management 4701 North Torrey Pines Dr. Las Vegas, NV 89130-2301 Phone: 702-515-5000 Web: http://www.blm.gov
Premier Chemicals Mine	Premier Chemicals, LLC	S22, 23, 25-27, 34-36, T12N, R36E	magnesite	OP	mining	104/10 (Mine and plant combined)	P.O. Box 177 Gabbs, NV 89409 Phone: 775-285-2601 FAX: 775-285-4021 Web: http://www.premiermagnesia.com
Premier Chemicals Plant	Premier Chemicals, LLC	S26, T12N, R36E	magnesite	ML	calcining crushing gravity screening sizing	86	P.O. Box 177 Gabbs, NV 89409 Phone: 775-285-2601 FAX: 775-285-4021 Web: http://www.premiermagnesia.com
Round Mountain ADR Plant (Smoky Valley Common Operation)	Round Mountain Gold Corp.	S25 ,T10N, R44E	gold silver	ML	recovery	263 (Plants combined)	P.O. Box 480 Smoky Valley Mine Rd. Round Mountain, NV 89405 Phone: 775-377-2366 FAX: 775-377-3224 Web: http://www.kinross.com
Round Mountain Mill (Smoky Valley Common Operation)	Round Mountain Gold Corp.	S25 ,T10N, R44E	gold silver	ML	milling	263 (Plants combined)	P.O. Box 480 Smoky Valley Mine Rd. Round Mountain, NV 89405 Phone: 775-377-2366 FAX: 775-377-3224 Web: http://www.kinross.com
Round Mountain Mine (Smoky Valley Common Operation)	Round Mountain Gold Corp.	S19, 20, 29, 30, T10N, R44E	gold silver	OP, HL,	mining heap leach	764/236 (Gold Hill and Round Mtn. combined)	P.O. Box 480 Smoky Valley Mine Rd. Round Mountain, NV 89405 Phone: 775-377-2366 FAX: 775-377-3224 Web: http://www.kinross.com
Shenandoah Mill	KMI Zeolite, Inc.	S25, T18S, R50E	zeolite silver	ML	milling processing	19	P.O. Box 5139 2399 Postal Dr. Pahrump, NV 89041 Phone: 855-823-3777 Web: http://www.kmizeolite.com

Directory of Mining and Milling Operations (continued)

Mine/Mill Name	Operator	Location	Commodity	Type	Process/ Activity	Company/ Contract Employees	Address
NYE COUNTY (continued)							
Sterling Mine	Northern Empire Resources	S14, T13S, R47E;	gold	UG	heap leach	5	P.O. Box 549 Beatty, NV 89003 Phone: 866-608-4381 FAX: 775-981-9044 Web: https://www.coeur.com
White Caps Mill	Vanderbilt Minerals Corp.	S19, T12S, R47E	clay	ML	bagging grinding screening	3	3561 East Burgundy Dr. P.O. Box 6660 Pahrump, NV 89048 Phone: 775-537-6976 FAX: 775-537-6879 Web: https://www.vanderbiltminerals.com
Wulfenstein (BLM) Pit	Wulfenstein Construction	S28, T20S, R54E	sand gravel	OP, ML	mining crushing screening	6	2281 East Postal Dr. P. O. Box 38 Pahrump, NV 89048 Phone: 775-727-5900 FAX: 775-727-6010 Web: http://wulfensteinconstruction.com
PERSHING COUNTY							
Buff-Satin Mine	Vanderbilt Minerals Corp.	S2, T27N, R32E	clay	OP	bagging grinding screening	4 (Combined Vanderbilt Mines)	3561 East Burgundy Dr. P.O. Box 6660 Pahrump, NV 89048 Phone: 775-537-6976 FAX: 775-537-6879 Web: https://www.vanderbiltminerals.com
Coeur Rochester Mine	Coeur Rochester, Inc.	S9-11, 15, 16, 21, 27, 28, T28N, R34E	silver gold	OP, HL,	mining heap leach	287/28 (Mine and plant combined)	P.O. Box 1057 Lovelock, NV 89419 Phone: 775-273-7995 FAX: 775-273-7423 Web: http://www.coeur.com
Coeur Rochester Plant	Coeur Rochester, Inc.	S15, T28N, R34E	silver gold	ML	milling	109	P.O. Box 1057 Lovelock, NV 89419 Phone: 775-273-7995 FAX: 775-273-7423 Web: http://www.coeur.com
Colado Mine	EP Minerals, LLC	S6, 7, 16, 18, 21, 25, T28N, R29E	diatomite perlite	OP, OS	mining	35	P.O. Box 959 150 Coal Canyon Rd. Lovelock, NV 89419 Phone: 775-824-7591 FAX: 775-824-7595 Web: http://www.epminerals.com
Colado Plant	EP Minerals, LLC	S33, T28N, R32E	diatomite perlite	ML	calcining classification drying grinding	110	P.O. Box 959 150 Coal Canyon Rd. Lovelock, NV 89419 Phone: 775-824-7591 FAX: 775-824-7595 Web: http://www.epminerals.com
Empire Mine	Empire Mining Co.	S31, T31N, R23E	gypsum anhydrite	OP	mining	50/5 (Mine and mill combined)	Nevada Hwy. 447 M.P. 68 Empire, NV 89405 Phone: 775-800-4569 Web: http://www.empireminingco.com
Florida Canyon Mine	Florida Canyon Mining, Inc.	S3, T31N, R33E	gold silver	OP, HL	mining heap leach	173/24 (Mine and plant combined)	P.O. Box 330 Imlay, NV 89418 Phone: 775-538-7300 FAX: 775-538-7324 Web: http://ryepatchgold.com
Florida Canyon Plant	Florida Canyon Mining, Inc.	S3, T31N, R33E	gold silver	ML	milling	35	P.O. Box 330 Imlay, NV 89418 Phone: 775-538-7300 FAX: 775-538-7324 Web: http://ryepatchgold.com
Gypsum Mountain Mine	Silver State Minerals, LLC Mining, Inc.	S27, T27N, R32E	gypsum	OP	mining crushing screening	N/A	2A Sunshine Lane Reno, NV 89502 Phone: 775-359-9900 FAX: 775-775-359-9904

Directory of Mining and Milling Operations (continued)

Mine/Mill Name	Operator	Location	Commodity	Type	Process/ Activity	Company/ Contract Employees	Address
PERSHING COUNTY (continued)							
Nassau (Section 8) Mine	American Colloid Co.	S8, T27N, R33E	clay	OP	shipping	3	P. O. Box 428 Lovell, WY 82431 Phone: 307-548-5135 FAX: 307-548-6449 Web: http://www.colloid.com
Relief Canyon Quarry	Nevada Cement Co.	S13-16, 21-24, T27N, R34E	limestone	OP, ML	mining crushing	8 (Nevada Cement pits combined)	P.O. Box 840 Fernley, NV 89408 Phone: 775-575-2281 FAX: 775-575-4387 Web: http://www.eaglematerials.com
Sexton Mine	Nutritional Additives Corp.	S5, T34N, R38E	dolomite	OP, ML	mining milling	2	415 Wellington Street Winnemucca, NV 89445 Phone: 775-623-1151 FAX: 775-623-1153 Web: http://www.nutritionaladditives.com
Sunrise Gold Placer Mine	Sunrise Minerals, LLC	S17, T33N, R36E	gold	PL	mining gravity	5	7343 South Alton Way, Suite 100 Centennial, CO 80112 Phone: 303-779-1800 FAX: 303-770-1995
STOREY COUNTY							
Basalite Dayton Mill	Basalite Concrete Products	S16, T17N, R22E	sand gravel	ML	crushing milling	6 (Mine and mill combined)	2500 Boeing Way Carson City, NV 89701 Phone: 775-882-9336 FAX: 775-887-1025 Web: http://www.basalite.com
Basalite Dayton Pit	Basalite Concrete Products	S8, 9, 16, 17, T17N, R22E	sand gravel	OP	mining	6 (Mine and mill combined)	2500 Boeing Way Carson City, NV 89701 Phone: 775-882-9336 FAX: 775-887-1025 Web: http://www.basalite.com
Clark Mill	EP Minerals, LLC	S35, T20N, R22E	diatomite	ML	calcining crushing drying grinding screening	58	640 Clark Station Rd. Sparks, NV 89434 Phone: 775-824-7700 FAX: 775-824-7633 Web: http://www.epminerals.com
Clark Mine	EP Minerals, LLC	S27, 33, 34, T20N, R23E	diatomite	OP	mining	4	640 Clark Station Rd. Sparks, NV 89434 Phone: 775-824-7700 FAX: 775-824-7633 Web: http://www.epminerals.com
River Canyon III	Joy Engineering	S2, T19N, R22E	aggregate	OP	mining	5	81822 Highway 70 Beckworth, CA 96129 Phone: 530-832-5760 Web: http://www.joyengineering.com
Sierra Stone Plant	CEMEX	S27, 34, T19N, R22E	aggregate	ML	crushing	9/3 (Mine and plant combined)	3005 Canyon Way Sparks, NV 89434 Phone: 775-342-0500 FAX: 775-342-0554 Web: http://www.cemex.com
Sierra Stone Quarry	CEMEX	S26, 27, 33, 34, T19N, R22E	aggregate	OP	crushing	9/3 (Mine and plant combined)	3005 Canyon Way Sparks, NV 89434 Phone: 775-342-0500 FAX: 775-342-0554 Web: http://www.cemex.com
Trico Pit	Gopher Construction Co.	S33, T20N, R22E	aggregate	OP, ML	mining crushing	10	1625 East Newlands Dr. P. O. Box 801 Fernley, NV 89408 Phone: 775-575-4333 FAX: 775-575-1137

Directory of Mining and Milling Operations (continued)

Mine/Mill Name	Operator	Location	Commodity	Type	Process/ Activity	Company/ Contract Employees	Address
WASHOE COUNTY							
Bella Vista Pit	A and K Earthmovers	S3, 4, T18N, R20E; S33, 34, T19N, R20E;	aggregate	OP, ML	mining crushing screening	6	515 Windmill Rd. Fallon, NV 89406 Phone: 775-423-6085 FAX: 775-423-8410 Web: http://www.akearthmovers.com
Donovan Pit	R.T. Donovan	S24, T21N, R20E	decomposed granite	OP, ML	mining crushing screening	15	11600 Pyramid Way Sparks, NV 89441 Phone: 775-843-5352 FAX: 775-425-0815 Web: http://www.rtdonovan.com
Empire Mill	Empire Mining Co.	S11, 13, T31N, R23E	gypsum anhydrite	ML	crushing screening	21	Nevada Hwy. 447 M.P. 68 Empire, NV 895405 Phone: 775-800-4569 Web: http://www.empireminingco.com
Golden Valley Pit	A and K Earthmovers	S11, 12, T19N, R20E	aggregate	OP, ML	mining screening	2	515 Windmill Rd. Fallon, NV 89406 Phone: 775-423-6085 FAX: 775-423-8410 Web: http://www.akearthmovers.com
Lockwood Plant	Granite Construction Co.	S17, T19N, R21E	aggregate	ML	crushing screening washing	28 (Mine and plant combined)	1900 Glendale Ave. Sparks, NV 89432 Phone: 775-355-3434 FAX: 775-329-2803 Web: http://www.graniteconstruction.com
Lockwood Quarry	Granite Construction Co.	S17, T19N, R21E	aggregate	OP	mining	28 (Mine and plant combined)	1900 Glendale Ave. Sparks, NV 89432 Phone: 775-355-3434 FAX: 775-329-2803 Web: http://www.graniteconstruction.com
Mustang Plant	Sierra Nevada Construction, Inc.	S4, T19N, R21E	aggregate	ML	crushing screening	14 (Mine and plant combined)	P.O. Box 50760 2055 East Gregg St. Sparks, NV 89435-0760 Phone: 775-355-0420 FAX: 775-355-0535 Web: http://www.snc.biz
Mustang Quarry	Sierra Nevada Construction, Inc.	S4, T19N, R21E	aggregate	OP	mining	14 (Mine and plant combined)	P.O. Box 50760 2055 East Gregg St. Sparks, NV 89435-0760 Phone: 775-355-0420 FAX: 775-355-0535 Web: http://www.snc.biz
Paiute Pit	CEMEX	S2, 27, 34, T21N, R24E	sand gravel	OP	mining	9 (Mine and plant combined)	10 Hill Ranch Rd. Wadsworth, NV 89442 Phone: 775-575-1162 Web: http://www.cemex.com
Paiute Plant	CEMEX	S34, T21N, R24E	sand gravel	ML	crushing screening	9 (Mine and plant combined)	10 Hill Ranch Rd. Wadsworth, NV 89442 Phone: 775-575-1162 Web: http://www.cemex.com
Rilite Aggregate	Rilite Aggregate Co.	S23, T18N, R20E	sand rock	OP, ML	mining crushing	12	3025 Mill St. Reno, NV 89502 Phone: 775-329-8842 FAX: 775-329-3593
Terraced Hill Clay (Flanigan) Mine	Nevada Cement Co.	S13, 14, T27N, R19E	clay	OP, ML	mining milling	8 (Nevada Cement pits combined)	P.O. Box 840 Fernley, NV 89408 Phone: 775-575-2281 FAX: 775-575-4387 Web: http://www.eaglematerials.com
Tracy Pit	BJ Rees's Enterprise	S27, 20N, 22E	sand gravel	OP, ML	mining crushing screening	8	1045 South Hoytsville Road Coalville, UT 84017-9741 Phone: 801-359-9781
Spanish Springs Plant	Martin Marietta Materials, Inc.	S15,T21N, R20E	aggregate	ML	crushing screening	17 (Mine and plant combined)	11059 Pyramid Lake Rd. Sparks, NV 89436 Phone: 775-425-4455 FAX: 775-425-5131 Web: http://www.martinmarietta.com

Directory of Mining and Milling Operations (continued)

Mine/Mill Name	Operator	Location	Commodity	Type	Process/ Activity	Company/ Contract Employees	Address
WASHOE COUNTY (continued)							
Spanish Springs Quarry	Martin Marietta Materials, Inc.	S15, 22, T21N, R20E	aggregate	OP	mining	17 (Mine and plant combined)	11059 Pyramid Lake Rd. Sparks, NV 89436 Phone: 775-425-4455 FAX: 775-425-5131 Web: http://www.martinmarietta.com
Wade Sand Pit	Granite Construction Co.	S3, T20N, R24E	sand	OP	mining screening	2	P.O. Box 2087 1900 Glendale Ave. Sparks, NV 89432 Phone: 775-355-3434 FAX: 775-329-2803 Web: http://www.graniteconstruction.com
WHITE PINE COUNTY							
Bald Mountain Mine	KG Mining (Bald Mountain), Inc.	S14, 15, 19, 20, T24N, R57E	gold silver mercury	OP	mining heap leach	550/200 (Mine and plants combined)	435 Jiggs Hwy., Unit 16 Spring Creek, NV 89815 Phone: 775-237-7100 FAX: 775-237-7101 Web: http://www.kinross.com
Bald Mountain Mooney North Mooney Plant	KG Mining (Bald Mountain), Inc.	S29, T24N, R58E	gold silver mercury	ML	milling	71 (Plants combined)	435 Jiggs Hwy., Unit 16 Spring Creek, NV 89815 Phone: 775-237-7100 FAX: 775-237-7101 Web: http://www.kinross.com
Bald Mountain Mooney South Mooney Plant	KG Mining (Bald Mountain), Inc.	S32, T24N, R58E	gold silver mercury	ML	milling	71 (Plants combined)	435 Jiggs Hwy., Unit 16 Spring Creek, NV 89815 Phone: 775-237-7100 FAX: 775-237-7101 Web: http://www.kinross.com
Bald Mountain Plant No. 2	KG Mining (Bald Mountain), Inc.	S14, T24N, R57E	gold silver mercury	ML	milling	71 (Plants combined)	435 Jiggs Hwy., Unit 16 Spring Creek, NV 89815 Phone: 775-237-7100 FAX: 775-237-7101 Web: http://www.kinross.com
Mount Moriah Quarry	Mount Moriah Stone Quarries, LLC	S22, 23, 26, 27, 33-36, T16N, R70E	building stone landscape rock	OP	mining	40	P.O. Box 70 No. 10 Hatch Rock Rd. Baker, NV 89311 Phone: 435-855-2232 FAX: 435-855-2332 Web: http://mtmoriahstone.com
Pan Mine	Fiore Gold, Ltd.	S36, T17N, R55E	gold silver	OP, HL	mining heap leach	42/63	P.O. Box 150278 Ely, NV 89315 Phone: 775-366-1901 FAX: 303-357-2499 Web: http://fioregold.com
Robinson Mine	KGHM International, Ltd.	S6, 8, 17, 18, T16N, R62E	copper gold molybdenum	OP	mining	579/25 (Mine and mill combined)	P.O. Box 382 Ruth, NV 89319 Phone: 775-289-7000 FAX: 775-289-7349 Web: http://kghm.com
Robinson Sag Mill and Concentrator	KGHM International, Ltd.	S8, T16N, R62E	copper gold molybdenum	ML	milling	151	P.O. Box 382 Ruth, NV 89319 Phone: 775-289-7000 FAX: 775-289-7349 Web: http://kghm.com

For additional information on Nevada's mineral resources and mineral industries, please see the following:

Mining and Exploration Applications on "Open Data" Web Page: https://data-nbmg.opendata.arcgis.com/

Mining District Files: https://gisweb.unr.edu/MiningDistricts/
Reno Mineral Resources: https://gisweb.unr.edu/RenoMinerals/
43-101 Reports: https://gisweb.unr.edu/43-101Reports/

NBMG Publications (selected publications listed below): http://pubs.nbmg.unr.edu/

Statewide Commodity Publications

- Antimony (B61)
- Barite (B98)
- Copper (M100, B65)
- Fluorspar (B93)
- Gypsum (B103)
- Iron (B53)
- Mercury (B41)
- Montmorillonite, bentonite, and fuller's earth (B76)
- Nevada active mines and energy producers (OF17-1)
- Oil and gas (B104, OF01-7, OF04-1, OF11-2, OF11-6, M162)
- Radioactive minerals (B81, OF06-19)
- Talcose minerals (B84)
- Thermal waters (B91, M161, M151)
- Tungsten (B105)
- Zeolites (B79)

County Mineral Resource Bulletins

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

Other Publications

- Index to geothermal well files housed at NBMG (L-5)
- Gold and silver resources in Nevada (M149)
- Geothermal resources (M161, M151, B91)
- Industrial mineral deposits (M142)
- Major mines of Nevada 2016 (P-28)
- Outline of Nevada mining history (SP15)
- Mining districts of Nevada (R47)

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

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

The Nevada Bureau of Mines and Geology (NBMG) is a research and public service unit of the University of Nevada and is the state geological survey. NBMG is part of the Mackay School of Earth Sciences and Engineering within the College of Science at the University of Nevada, Reno. NBMG scientists conduct research and publish reports on mineral resources, engineering geology, environmental geology, hydrogeology, and geologic mapping. Individuals interested in Nevada geology are encouraged to visit, call, or write NBMG or visit our home page at:

www.nbmg.unr.edu

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