Nevada Division of Minerals

2018 NEVADA MINERAL PRODUCTION, EXPLORATION and DEVELOPMENT AND OTHER FUN FACTS

PUBLIC LANDS FOUNDATION
Reno, NV
September 12, 2019
Richard Perry, Administrator
## 2018 NEVADA METAL PRODUCTION

### 2018 NEVADA METAL PRODUCTION, BY PRODUCER - Final

**Ranked by gold production**

<table>
<thead>
<tr>
<th>Operator</th>
<th>Gold (ozs)</th>
<th>Silver (ozs)</th>
<th>Copper (lbs)</th>
<th>Moly (lbs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barrick</td>
<td>2,425,512</td>
<td>105,360</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Newmont</td>
<td>1,808,484</td>
<td>1,107,493</td>
<td>32,102,979</td>
<td></td>
</tr>
<tr>
<td>Kinross</td>
<td>660,100</td>
<td>820,042</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SSR Mining</td>
<td>205,161</td>
<td>4,315</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jerritt Canyon Gold</td>
<td>145,064</td>
<td>NR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hecla (Klondex)</td>
<td>109,614</td>
<td>516,312</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coeur</td>
<td>54,668</td>
<td>5,037,983</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Florida Canyon Mining (Alio Gold)</td>
<td>46,878</td>
<td>31,775</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KGHM International</td>
<td>38,990</td>
<td>171,679</td>
<td>112,552,787</td>
<td>459,959</td>
</tr>
<tr>
<td>Fiore Gold</td>
<td>37,403</td>
<td>NR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Premier Gold (40% of S. Arturo)</td>
<td>20,980</td>
<td>NR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rawhide Mining</td>
<td>15,444</td>
<td>208,875</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mineral Ridge Gold</td>
<td>7,497</td>
<td>3,444</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ruby Hill Mining</td>
<td>4,648</td>
<td>3,584</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Borealis Mining</td>
<td>420</td>
<td>394</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sunrise Minerals</td>
<td>268</td>
<td>150</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Geo-Nevada</td>
<td>14</td>
<td>NR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>New Gold Nevada</td>
<td>14</td>
<td>2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Totals**

|                | 5,581,160  | 8,011,408  | 144,655,766 | 459,959    |
The Biggest Export From Every State in 2017
U.S. Exports by Origin (Values in Millions of Dollars)

[Map showing the biggest exports from each state with values in millions of dollars.]

Article & Sources:
https://howmuch.net/articles/biggest-export-from-each-state
https://www.census.gov/foreign-trade/statistics/state/data/index.html
New Operation for 2019, #1: McEwen Mining – Gold Bar

- Groundbreaking – November 2017
- First gold pour – February 2019
- Full Production achieved May, 2019
- Production target – 60,000 Au oz/yr
- Avg. Au grade - 1.0 g/t
- Current mine life – 7 years
New Operation for 2019, #2: Gold Resource Corp. – Isabella Pearl

- Groundbreaking – June 2018
- First gold pour – April 2019
- Production target – 40,000 Au oz/yr
- Avg. Au grade - 3.7 g/t
- Current mine life – 5 years
Nevada silver

2018 Production
8.02 Moz, -5.4% vs. '17
22 mining operations
14 operators

Production

Price

Silver price, $/troy ounces

Silver production, millions of troy ounces
Nevada copper

144.7M lbs, -0.8% vs. '17
2 mining operations

Copper production, millions of pounds
Copper price, $/pound
2 deposits with 5 billion contained pounds of Cu:
- Higher grade eastern deposit; underground
- Shallower western deposit; open-pit

Currently developing a 5,000 tpd underground mine on the eastern deposit with a concentrator
- Main shaft being extended to 2,147 feet
- First copper production planned for @Q4 2019
- The mine should employ ~300 people
- Nevada’s 3rd copper producer in past 20 years
Nevada Barite Production

2018
405,500 tons shipped
+ 4% vs. '17
4 producers

Average Annual Price per Barrel of Oil

Production (1,000 short tons)

Oil Price
NEVADA’S BARITE PRODUCTION IS FROM STRATIFORM BEDDED DEPOSITS IN THE ORDOVICIAN-DEVONIAN.

- 4 MINES OPERATED IN 2018
- 5 PROCESSING PLANTS
Nevada Diatomaceous Earth Production

Diatomite production (tons)
Other Industrial Minerals Produced in 2018

- 12,900,000 lbs of lithium carbonate
- 716,000 tons of silica sand
- 348,600 tons of magnesite
- 19,900 tons of salt
- 17,087 tons of perlite
Fluid Mineral Resources

• Geothermal well permitting and compliance NRS 534A

• Oil and gas well permitting and compliance NRS 522

• Dissolved Mineral Resource Exploration well and borehole permitting NRS 534B

Ormat Geodrill #1 at Tungsten Mtn, 2018
Geothermal Development 2017-2018

Wells Drilled 2017-2018
- 3 Domestic
- 4 Industrial Injection
- 8 Industrial Production
- 3 Observation
- 31 Temperature Gradient

As of 12/31/2018 there were 459 permitted commercial and industrial wells.

There are 25 active geothermal plants in Nevada.

There are 727 authorized geothermal leases as of 01/07/2019 which total 334,303 acres.

NEVADA GEO Thermal POWER PRODUCTION
2018 Production: 3.5 Million megawatt hours sold
Average Price: 7.08% vs. 2017

Map Produced By:
Lucia M. Patterson
Nevada Division of Minerals
Projection:
UTM Nad 1983 Zone 11

Legend:
- Number of 2017-2018 Wells Drilled
  - 1
  - 2 - 3
  - 4 - 6
  - 7 - 10
  - 11 - 14

Sections With Authorized Federal Geothermal Leases and Geothermal Fields
- County Boundary

Date: 1/28/2019
0 25 50 75 100 Kilometers
0 25 50 75 100 Miles
There are currently 17 geothermal fields in Nevada being operated by 5 operators:

- **Ormat Nevada**: Steamboat, McGinness Hills, Brady, Desert Peak, Wild Rose (Don Campbell), Jersey Valley, Tuscarora, and Tungsten Mountain, San Emidio

- **Terra-Gen**: Dixie Valley and Beowawe

- **Cyrg Energy**: Soda Lake, Patua, Blue Mtn

- **Enel North America**: Stillwater and Salt Wells

- **Star Peak Geothermal**: Wabuska

- 458 permitted wells
- 60% on private property
- >334,000 acres in authorized BLM leases

From: NBMG MI-2017
New Geothermal Plant in 2018: Ormat Technologies McGinness Hills Phase III

General

• Phase III plant went on-line in December, 2018

• 48 MW capacity

• 5 Production wells, 1 injection well drilled 2017-2018

• Phase I at 30 MW (2012)

• Phase 2 increase to 72 MW (2015)

• Phase 3 increase to 138 MW (2018)
2018 Nevada Oil Activity

- 5 oil producers:
  - Makoil
  - Grant Canyon
  - Kirkwood
  - Western General
  - Tomera Ranch
- 60 producing wells in 10 fields
- 119 permitted oil wells
- 99% on Federal land
- 194 authorized oil leases totaling 337,000 acres
- 3 new drilling permits issued in 2018
NEVADA OIL PRODUCTION
1955 - 2018
CUMULATIVE PRODUCTION
54,199,538 BARRELS

2018 Production
254,968 Barrels
-10.5% vs. '17
SOME FACTS ABOUT OIL LEASING IN NEVADA

• 99% of historic production is on Federal leases
• Anyone can file an “expression of interest” (EOI) to BLM for certain lands to be included in a competitive lease sale. There is no fee for this.
• BLM conducts on-line competitive lease sales quarterly, after environmental review.
• A lease allows for exploration, but actual permits to drill are required from both BLM and NDOM.
• In 2018, only 8.7 percent of “nominated” Federal acreage was actually leased
Where do Fluid Mineral Leasing Revenues go? Shared 50% with State

- See the production and revenues by County at: https://www.onrr.gov/

NRS 328.450-.470
Disposition of Revenue Received by State From Lease on Federal Lands
- States do not get revenue From solar or wind

<table>
<thead>
<tr>
<th>State</th>
<th>Disbursement Type</th>
<th>County or Coastal Political Subdivision (CPS)</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nevada</td>
<td>Geothermal</td>
<td>Churchill County</td>
<td>$668,908.66</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Elko County</td>
<td>$8,387.60</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Esmeralda County</td>
<td>$24,369.59</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Eureka County</td>
<td>$14,095.37</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Humboldt County</td>
<td>$46,051.65</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lander County</td>
<td>$283,264.18</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lyon County</td>
<td>$10,805.38</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mineral County</td>
<td>$144,864.87</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Nye County</td>
<td>$375.30</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pershing County</td>
<td>$37,278.68</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Washoe County</td>
<td>$46,923.61</td>
</tr>
<tr>
<td></td>
<td></td>
<td>White Pine County</td>
<td>$937.30</td>
</tr>
<tr>
<td>Nevada</td>
<td>Both Oil and Gas and Geothermal</td>
<td>Total</td>
<td>$4,066,416.81</td>
</tr>
<tr>
<td>Nevada</td>
<td>Both Oil and Gas and Geothermal</td>
<td>Total</td>
<td>$5,352,679.00</td>
</tr>
</tbody>
</table>


Nevada Mineral and Energy Production Values 1978 - 2018

$8.4 Billion in 2018, same as 2017

Production, $ millions

- Other
- Petroleum
- Gypsum
- Barite
- Geothermal
- Copper
- Silver
- Aggregate
- Gold

202,147 Active Mining Claims in Nevada as of 3/15/2019, an increase of 0.4% from 2/22/2018
Minimum Exploration Expenditures
2011 and 2015 through 2018

Nevada Exploration Spend by Year

- Precious metals
- Energy metals
- Base metals
- Industrial minerals
- Geothermal
- Petroleum

2011 spend: $674M
2015 spend: $347M
2016 spend: $324M
2017 spend: $351M
2018 spend: $461M

n=169 companies
n=163 companies
n=163 companies
n=172 companies
n=172 companies
As of 01/22/2019 there were 7 DMRE holes drilled:

- 5 Wells
- 2 Boreholes

As of 01/04/2019 there were 11,772 inferred lithium placer claims.

Lithium Claims Vs. Time:

- Number of 2017-2018 DMRE Holes Drilled
- County Boundary
- Sections with inferred Lithium Placer Claims

Map Produced By:
Lucia M. Patterson
Nevada Division of Minerals
Projection:
UTM Nad 1983 Zone 11

Legend

Date: 1/28/2019
DMRE WELL DRILLED UNDER NEW REGULATIONS IN RAILROAD VALLEY, NYE COUNTY. 3PL Operating, David Gibson Drilling

Photo taken May 13, 2018
Lithium Clay Projects

- Exploration regulations same as hard rock
  - Notice or plan-level under BLM
  - No permitting of boreholes needed as no water pumped

- Mine permitting same as any mining project
  - On Federal lands, BLM or USFS lead agency
  - On Private lands, NDEP-BMRR is lead agency

- Two projects which have done PFS reports, metallurgical studies, and proposed flowsheets:
  - Lithium Americas - Thacker Pass Project in Humboldt County
  - Ioneer Ltd. - Rhyolite Ridge Project in Esmeralda County
Lithium Americas – Thacker Pass Project
Lithium Americas – Thacker Pass Project

- Reserves – 3.1M tonnes LCE at 2,358 ppm Li
- Strip ratio – 1.6:1
- Mine life – 46 years
- Processing time – <24 hours
- Lithium recovery – 83%
- Pilot plant operational in Reno
- Final Mine PoO to be submitted to BLM later this year
Ioneer’s Rhyolite Ridge Project

A searlesite resource that is different to other sedimentary lithium deposits - it is suitable for a simple acid leach process

- Total Resource\(^1\) of 4.1 million tonnes lithium carbonate & 10.9 million tonnes boric acid
- Including 121 million tonnes of lithium-boron ore containing:
  - 1.1 million tonnes lithium carbonate
  - 8.6 million tonnes boric acid
- Lithium only clay mineralisation to be stockpiled
CUMULATIVE MINING PERMITS AND PERMITTED DISTURBANCE IN NEVADA

2017 Permitted Plan-level Exploration Disturbance = 3,752 ac. or 2.6% of Total Exploration Permits = 110 or 41.8% of Total.
Nevada Land Withdrawals as of May, 2018
Nevada
Land Withdrawals
as of May, 2018

Line graph displaying the trend in the amount of land (in acres) withdrawn per year.

~177,000 acres withdrawn per year since 1930
Available Federal Lands Open to Mineral Entry

The chart to the left depicts the decrease in federal lands open to locatable mineral entry by decade. Since 1930, approximately 1,770,000 acres of land are withdrawn each decade.
Critical Minerals Affected by Mineral Entry Withdrawals

- Minerals selected are deemed “vital to the Nation's security and economic prosperity.”
- Nevada contains known occurrences or deposits of 20 of the 35 critical minerals
- More than 330 historic mining districts contain occurrences of one or more critical minerals

Figure 1: Historic Mining Districts Containing Critical Minerals

Critical Minerals Affected by Mineral Entry Withdrawals

- Aluminum
- Antimony*
- Arsenic*
- Barite*
- Beryllium*
- Bismuth
- Cesium & Rubidium
- Chromium
- Cobalt
- Fluorspar*
- Gallium
- Germanium
- Graphite
- Helium
- Indium
- Lithium*
- Magnesium*
- Manganese*
- Niobium
- PGM
- Potash
- REE
- Rhenium
- Scandium
- Strontium
- Tantalum
- Tellurium
- Tin
- Titanium
- Tungsten*
- Uranium*
- Vanadium
- Zirconium & Hafnium

**Bold** indicates known occurrences  
* indicates past or present production

---

Publications

- Major Mines of Nevada 2017
- Nevada Abandoned Mine Lands Report 2017
- Opportunities for Precious Metals Toll Processing and Copper Concentrate Processing in Nevada
- The Nevada Mineral Industry 2017
Questions?