

Overview of Agency Activities and Current Mineral Production and Development in Nevada

Mining Oversight & Accountability Commission

September 6, 2022

Mike Visher, Administrator

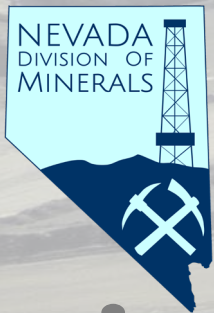
Division of Minerals



Isabella Pearl Mine, Mineral County

Nevada Division of Minerals (NDOM)

- **Executive Non-Cabinet State Agency and part of the Commission on Mineral Resources (Seven members appointed by Governor)**
- **Offices in Carson City (8 FTE) and Las Vegas (3 FTE)**
- **No general fund monies, all revenue from mining claim fees, fluid mineral permit/production fees, and BLM, USFS, and NPS AML assistance agreements**
- **What we do by statute:**
 - **NRS 513**
 - **Abandoned Mine Lands (AML) Program**
 - **Public information and minerals education**
 - **Annual mineral, geothermal and oil production reporting**
 - **Advise and recommend mineral policy to Governor and Legislature (*act as cooperating State agency on Federal Land NEPA actions when requested*)**



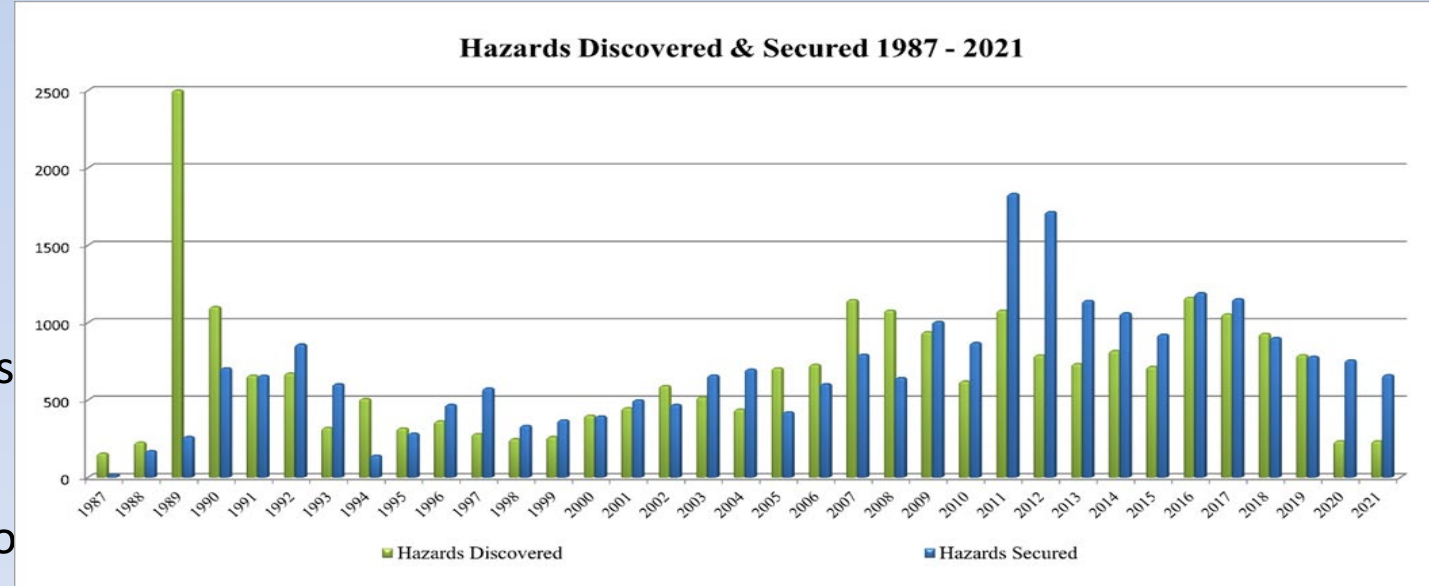
ABANDONED MINE LANDS PUBLIC SAFETY PROGRAM

- **Abandoned Mine Lands (AML) Program created in 1987 to address physical safety hazards**
- **Three program activities mandated:**
 - **Statewide Inventory of Sites, with annual reporting to counties**
 - **Securing of Orphan Hazardous Mines**
 - **Public Awareness Campaign (“Stay Out, Stay Alive”)**
- **Funded by claim fees (\$4 per claim filing at county) and permitted surface disturbance fee (one-time \$20/acre on public land)**

Abandoned Mine Land Hazard Physical Safety Program

Legacy hazards created before reclamation laws were enacted

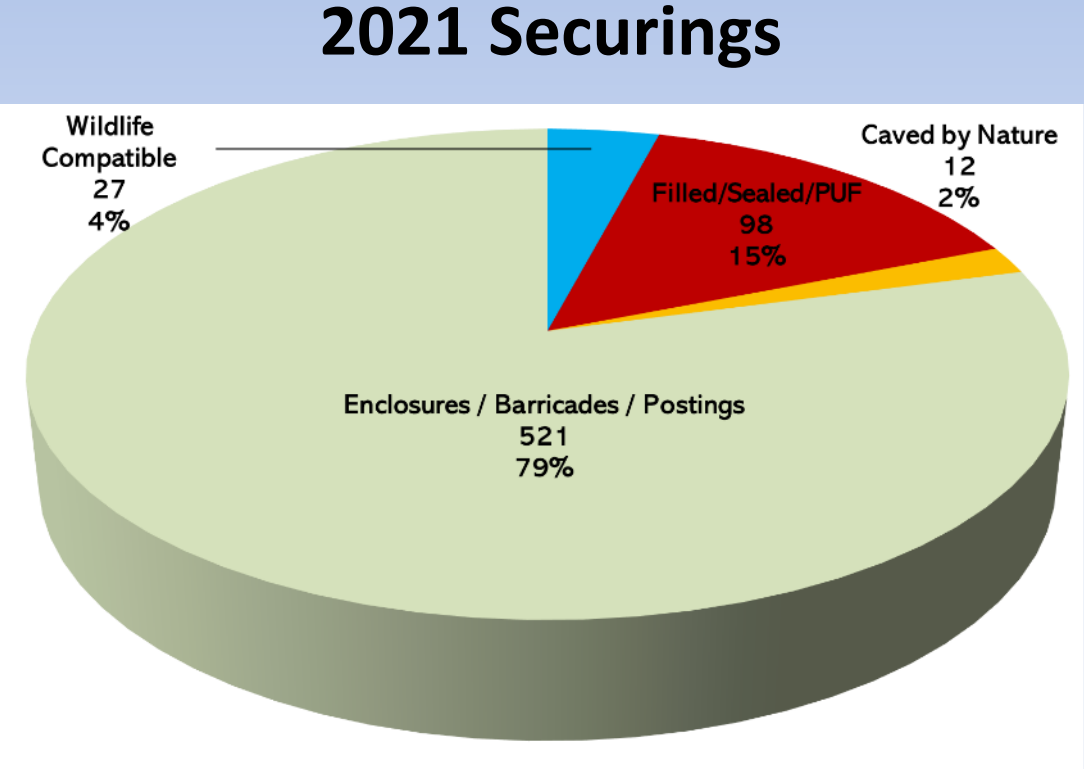
- Historic shafts, adits, tunnels, and pits (est. ~300,000 features)
- Most are on Federal Land
- Division seeks program partners to leverage dollars – BLM, USFS, NPS, USACE, NDOW, and counties.
- Conduct research to determine ownership (private, active mining claimant, or orphan)
- Twice yearly notifications to owners/claimants
- Annual notification of unsecured sites to counties
- NRS 455 authorizes counties to serve notice to owners/claimants, and seek judgement, penalties and fines
- As of July 31, 82% of 24,236 identified hazards are documented as secured



Abatement of Dangerous Conditions at Non-Operating Mines



Poly-Urethane Foam



Wildlife Compatible



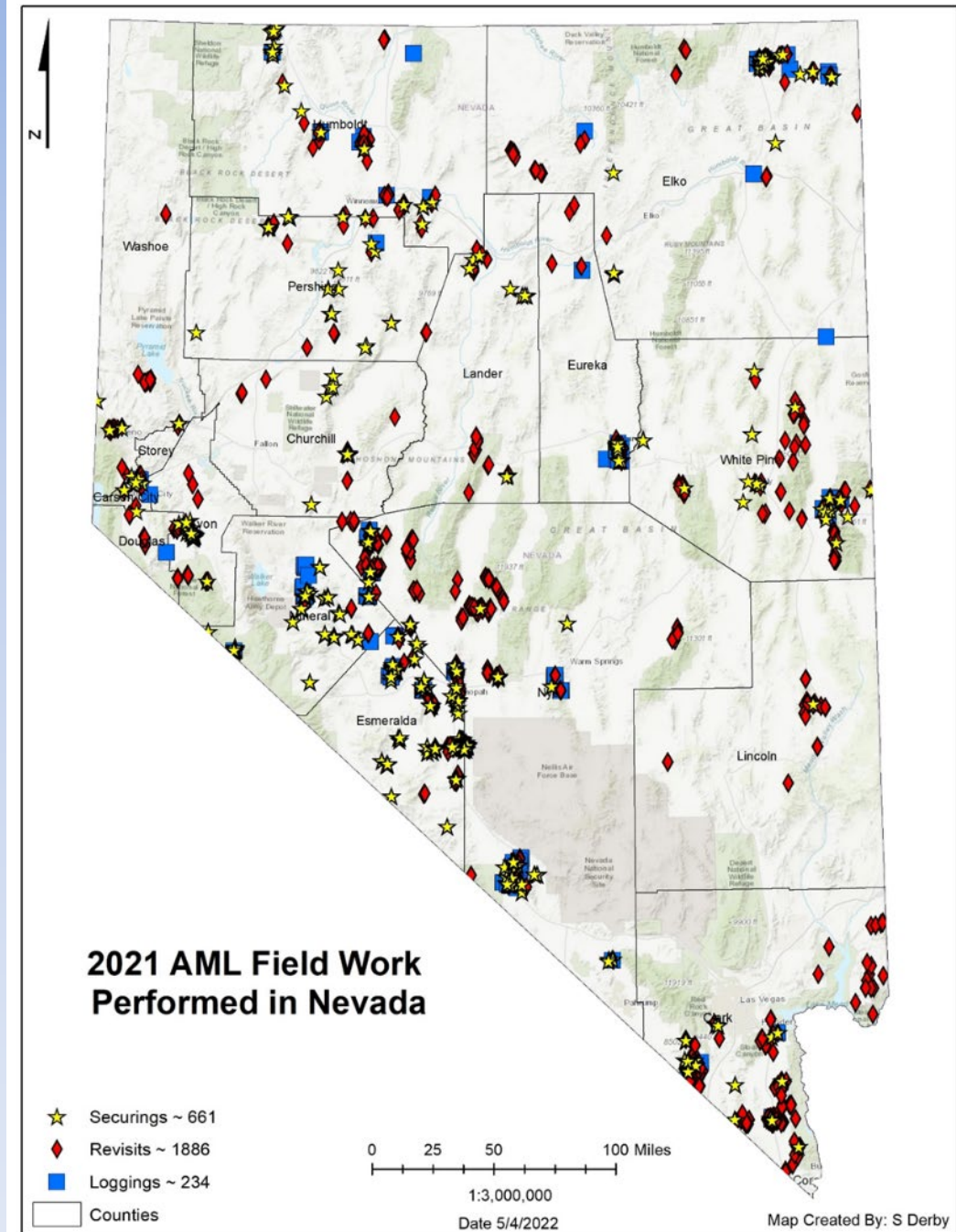
Temporary Securings



Backfills

2021 AML FIELD WORK

- 234 New hazards inventoried
- 1,886 Revisits/Repairs
- 661 Securings
 - 271 by Property Owner or Claimant
 - 173 by NDOM Staff and Interns
 - 170 by NDOM Contractor
 - 47 by BLM
- Seven interns from UNR and UNLV worked 13 weeks in summer.
- All field data collected on digital tablets.
- Imagery and data imported to/from secure database.



2021 Permanent Closures

- Completed Hard Closure Projects
 - 9 - Copper Butte (CL)
 - 4 – Poinsettia Mine (MI)
 - 2- Potosi Mine (CL)
 - 6 - Linka Mine (LA)
 - 16 - Aurora (MI)
 - 47 – Repairs to vandalized closures (CC, CH, CL, DO, LY, WA)
- Hard closures require NEPA process and close coordination with NDOW, SHPO, and BLM/FS.
- All hard closures were completed by state contractor: Environmental Protection Services

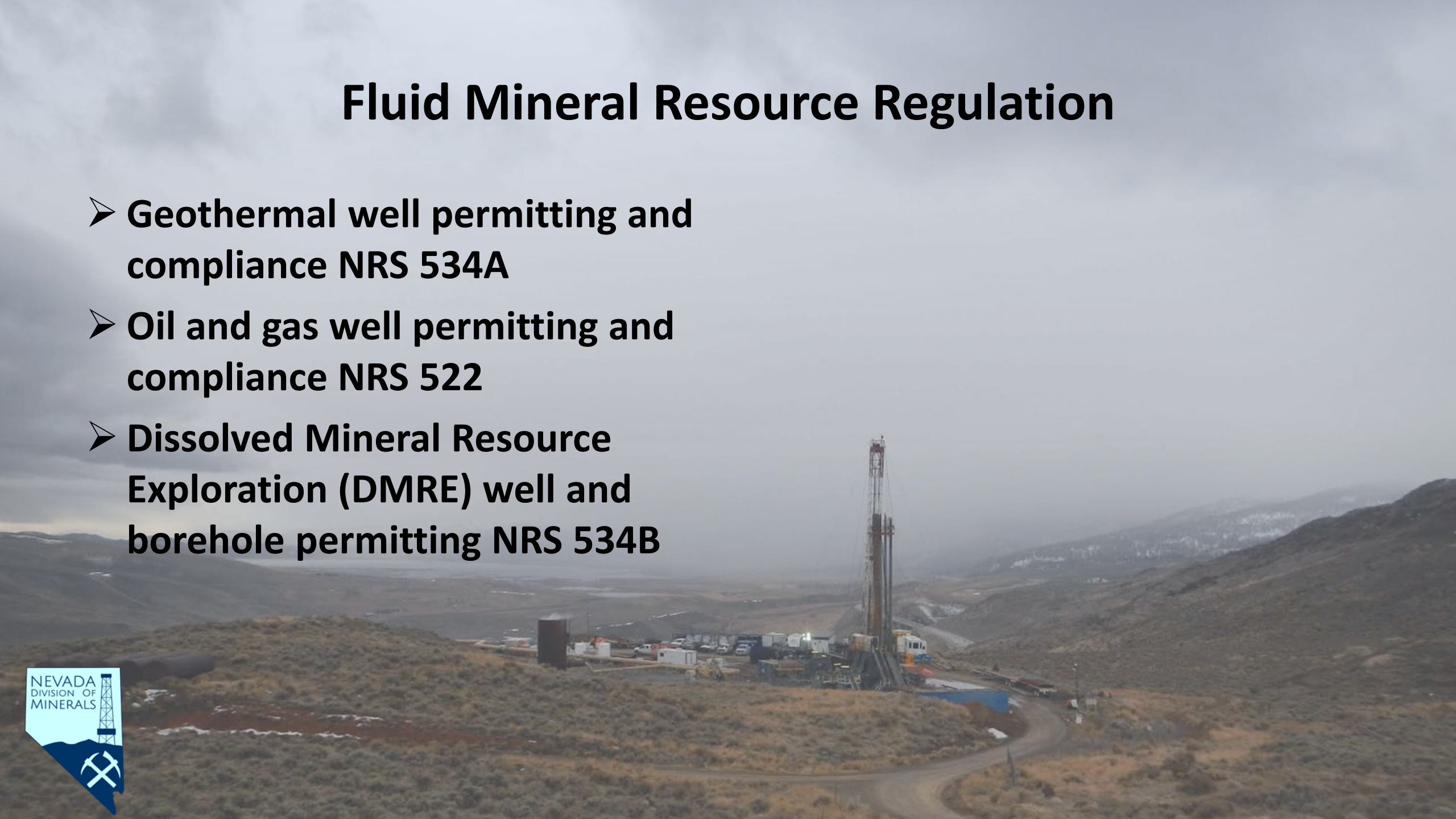


NRS/NAC 519A – Reclamation Bond Pool

- Created to assist small exploration and mine operators with compliance with State and Federal bonding requirements.
- Agency acts as insurance company/bank only, not involved in determining bond amounts or authorizing refunds.
- Six current plan-level participants, 47 notice-level bonds
- \$2.5M statewide bond established with BLM for notice-level participants allows for expeditious bonding.
- Bond Pool works with NDEP and/or BLM to pay or perform when participant fails to fulfill obligations.
- ~\$3M in bond pool account with ~\$2M obligated

Fluid Mineral Resource Regulation

- **Geothermal well permitting and compliance NRS 534A**
- **Oil and gas well permitting and compliance NRS 522**
- **Dissolved Mineral Resource Exploration (DMRE) well and borehole permitting NRS 534B**

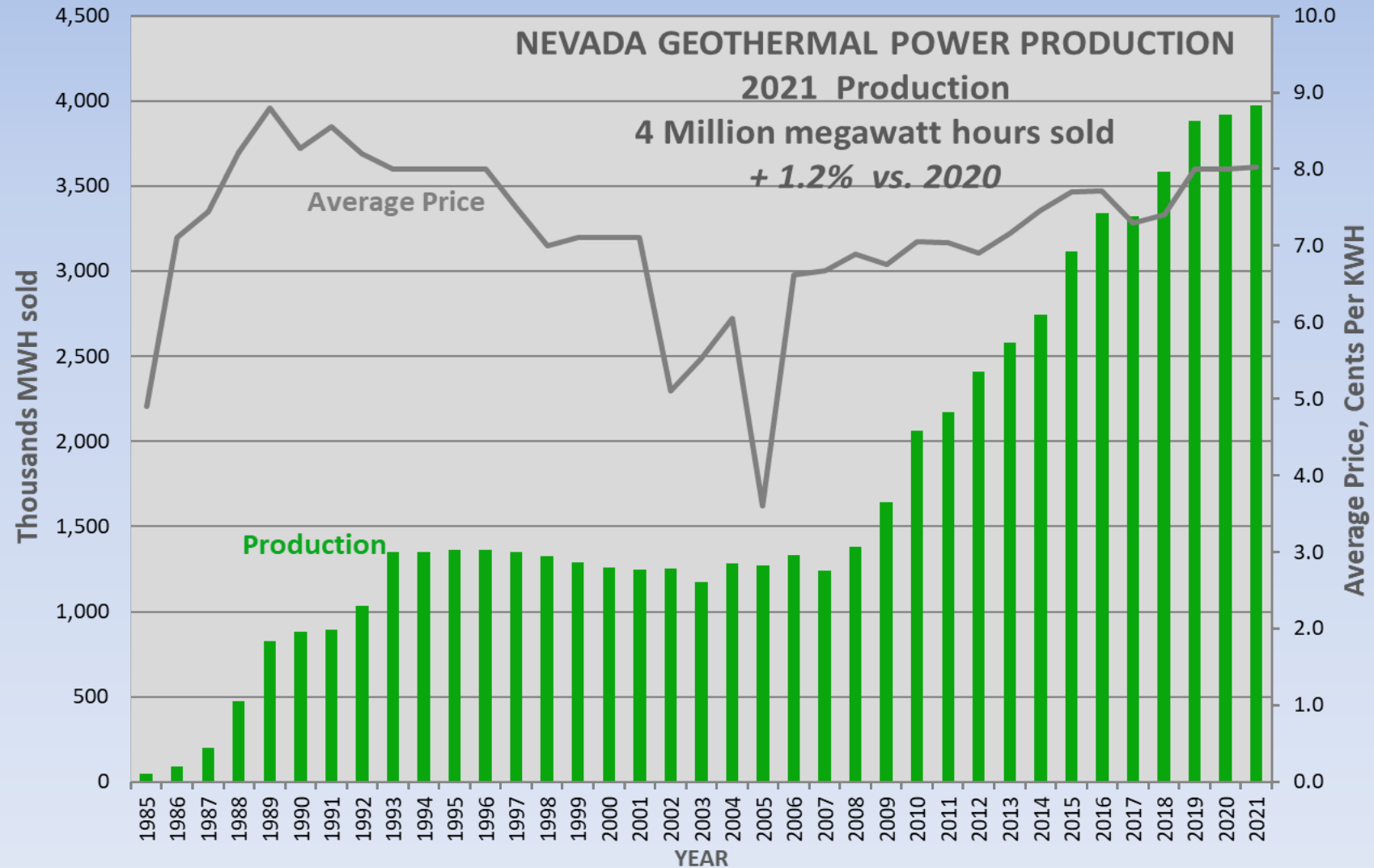


Geothermal Activity in 2021

- 26 well permits issued
- 2 wells completed
- 463 total active or shut-in industrial/commercial wells
- 60% on private land/40% on public land
- 295 wells inspected
- One letter of non-compliance issued for water in cellar at 6 wells and 4 wells needing signage; all issues addressed
- No fines issued in 2021
- Permit, Completion, Annual Fees - \$136,900

Geothermal Power Production

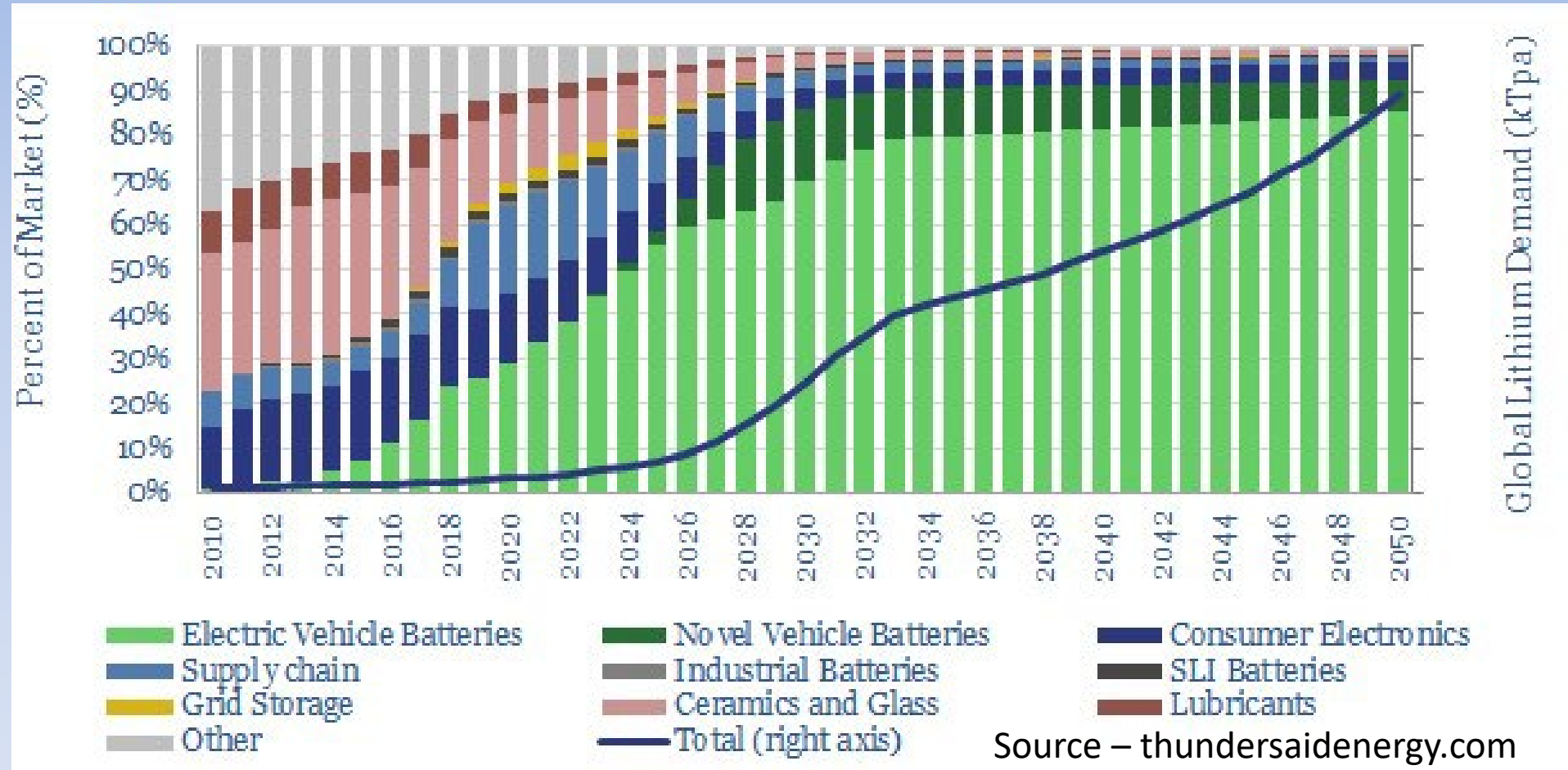
- 25 electricity generating plants
- 319 authorized BLM leases totaling 676,434 acres



Oil and Gas Activity in 2021

- 1 oil well permit issued; 2 oil wells completed
- 121 total active or shut-in wells, 108 oil wells, 13 gas wells (no gas sales, all gas is used for infield operations)
- 117 wells on federal land, 4 on private;
- All 121 wells inspected in 2021
- One letter of non-compliance issued for leaking pump gasket; follow-up inspection 1 week later found issue addressed. No fines issued in 2021.
- Permit, Sundry, Production Fees - \$16,172
- Oil production 223,233 barrels; +2.2% vs. 2020
- Nevada ranks 26th in nation for oil production

Global Demand For Lithium



- The Tesla/Panasonic battery factory alone needs 5X the amount of lithium mined annually in Nevada.

Lithium Prices: January 2016 - April 2022





NEVADA

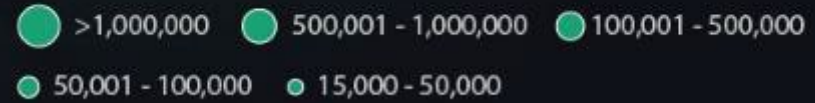
THE LITHIUM STATE

Lithium Deposits* in the U.S.

Source: USGS

*Map shows deposits containing >15,000 tonnes of lithium.

Deposit tonnage, tonnes of lithium



Thacker Pass, a highly prospective, pre-feasibility study stage open-pit lithium mining project, is located in **Kings Valley**.

Albemarle, the world's third-largest lithium mining company, operates America's only lithium-producing mine in **Clayton Valley**.

Kings Valley
Great Salt Lake

US Magnesium began producing lithium in 2020

Clayton Valley

Salton Sea

Smackover Formation

Kings Mountain

500
Kilometers

Lithium in Brine vs. Lithium in Clay/Rock

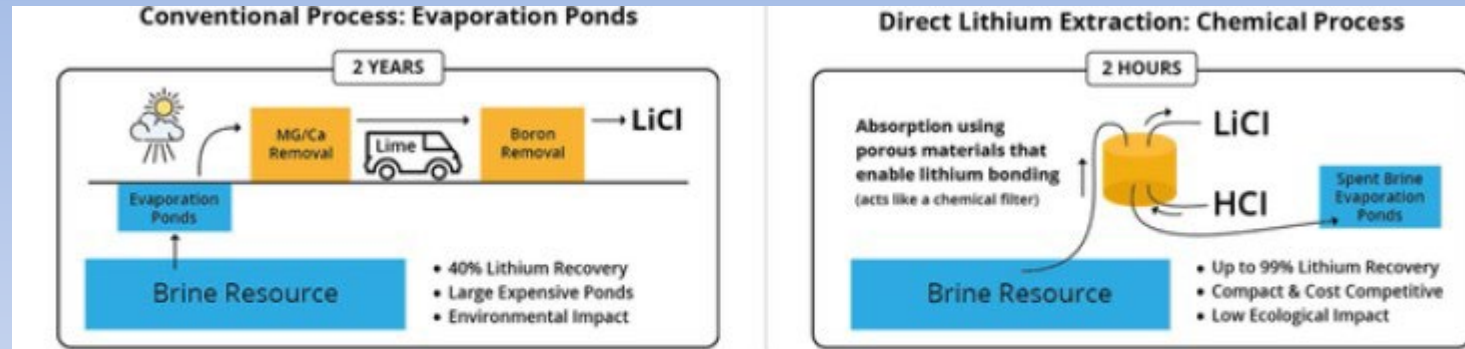
Lithium Brine

- Albemarle's Silver Peak mine, until 2020, was the only active lithium mine in US, operating since 1966.
- Solar evaporation in ponds over 18-24 months increases concentration of lithium chloride (100X, ~0.54%) prior to processing into lithium carbonate.
- Cheaper processing costs but lower recovery %s (~50%).
- Requires significant water rights
- Newer technologies may not require same timeframe nor large consumptive water use
- 17 other playa basins in Nevada being explored (>21 projects)

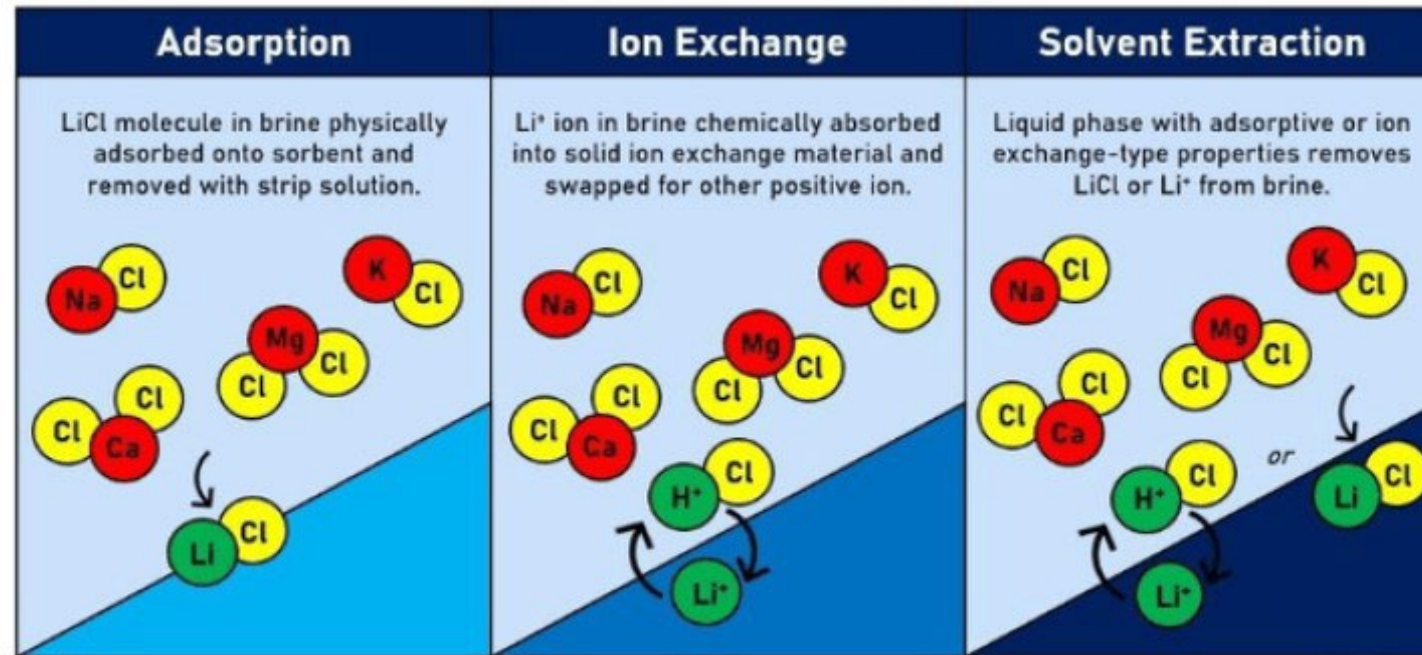
Lithium in Clay/Hard Rock

- No current mines, but 3 projects are in various stages of permitting:
 - Thacker Pass, Humboldt Cty
 - Rhyolite Ridge, Esmeralda Cty
 - TLC Project, Nye Cty
- Resources typically very large with long mine-life
- Processing is more expensive but yields higher recovery %s (~85%)
- Much less water consumption but high acid consumption
- At least five additional exploration projects in Nevada

New Tech - Direct Lithium Extraction



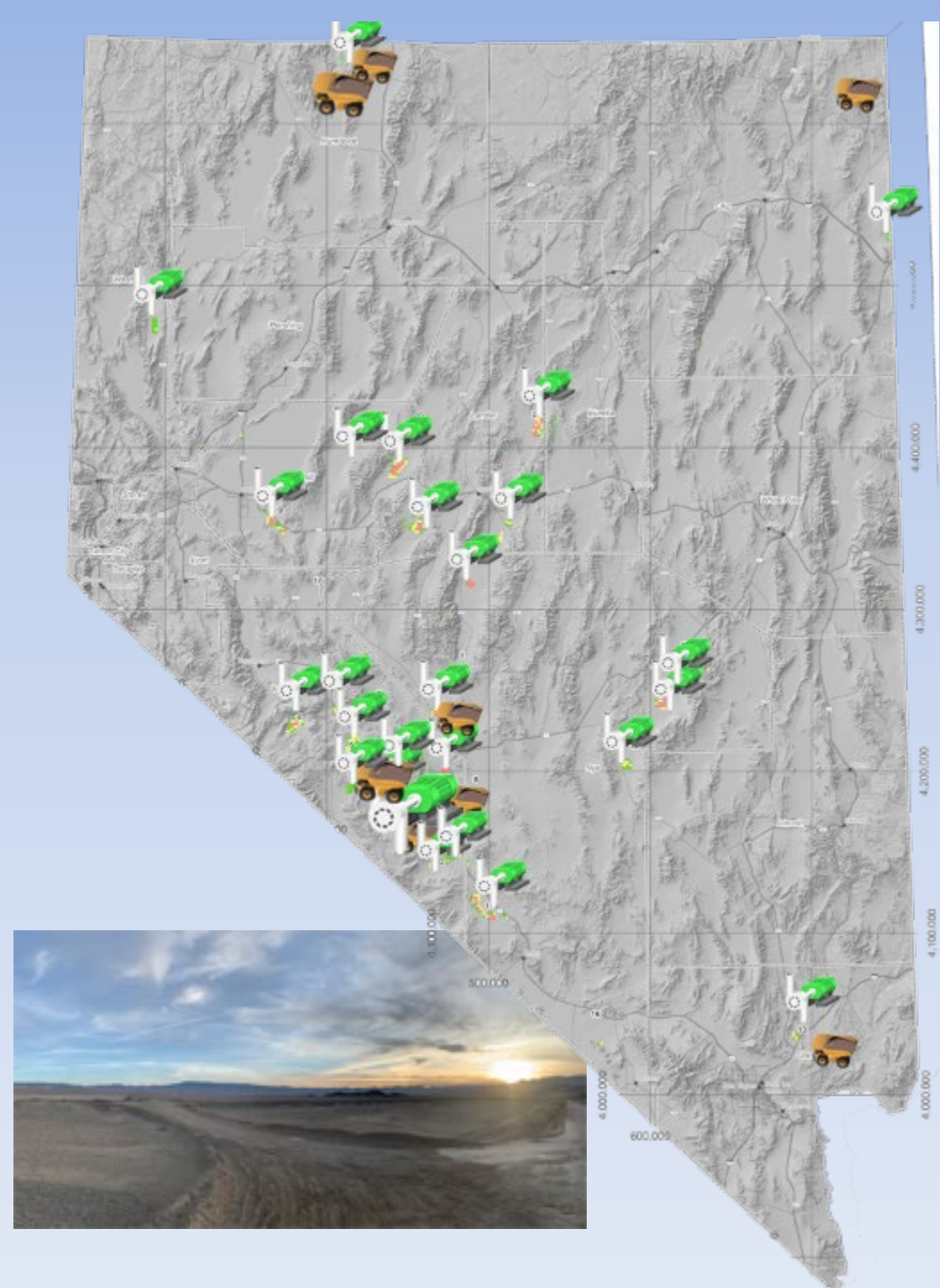
Source: Lithium South Development Corp. website



Source: E3 Metals company presentation courtesy of Jade Cove partners

Lithium Exploration Activity

- > 40 companies in various stages of exploration; ~30,000 mining claims (~13% of total mining claims in NV)
- ~30 companies involved in Clayton Valley alone, with numerous joint ventures/agreements
- ~12 lithium in clay projects (open pit)
- >30 lithium brine projects (DLE), none are considering solar evaporation concentration process
- NeoLith Energy (Schlumberger Energy) has permitted the Clayton Valley Pilot Plant to evaluate their DLE technology (\$15M invested to date) and has a collaboration agreement with Panasonic Energy to optimize process for battery-grade feed
- Advancements in DLE are critical to future of lithium brine production
- Pursuant to NRS 534B, the Division only regulates Dissolved Mineral Resource Exploration (DMRE)
- 35 approved DMRE Notices; 0 in 2021, but 14 in 2022
- 14 Approved DMRE well Permits; 0 in 2021, 6 in 2022



Nevada Mining Summary

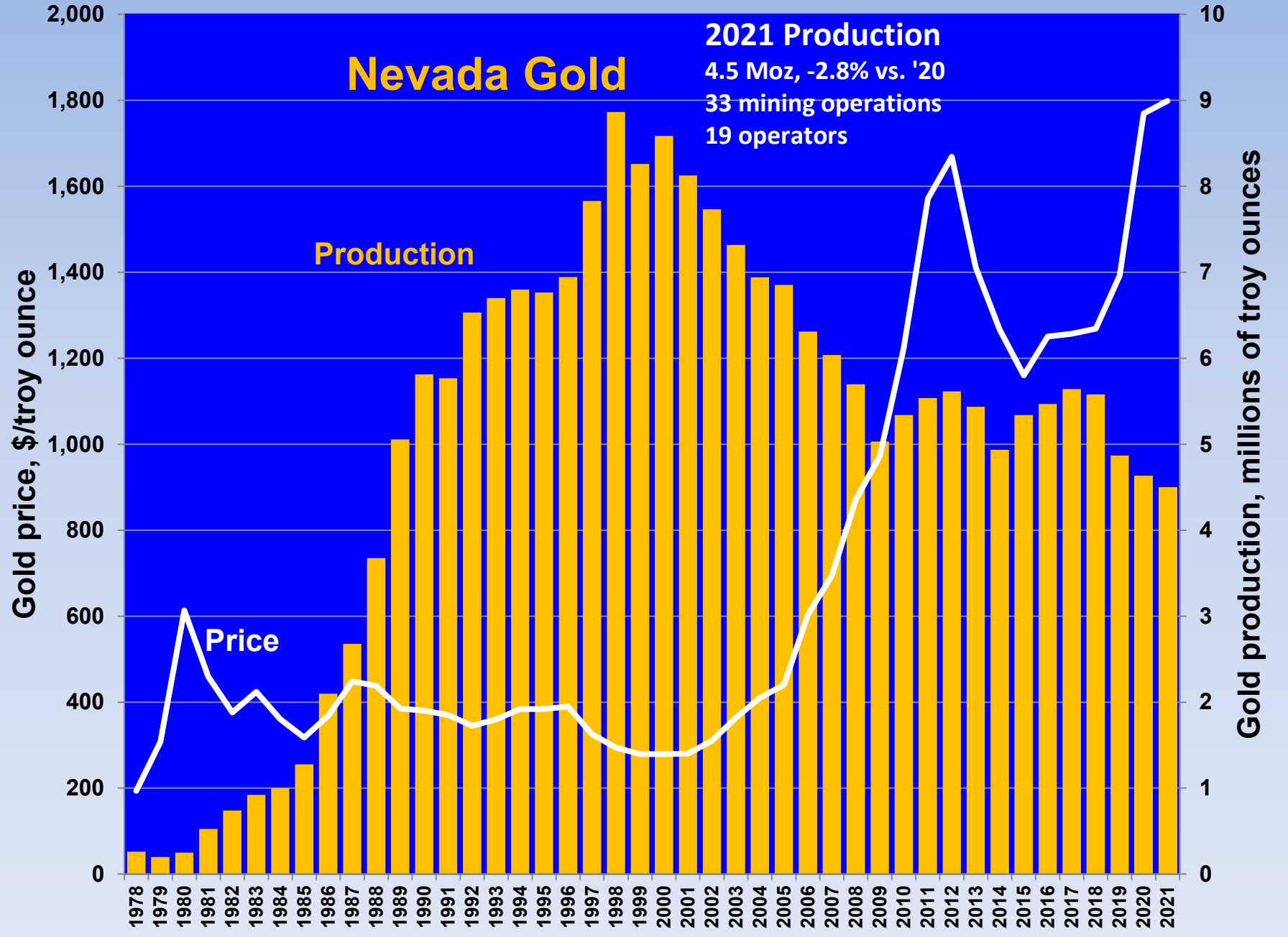
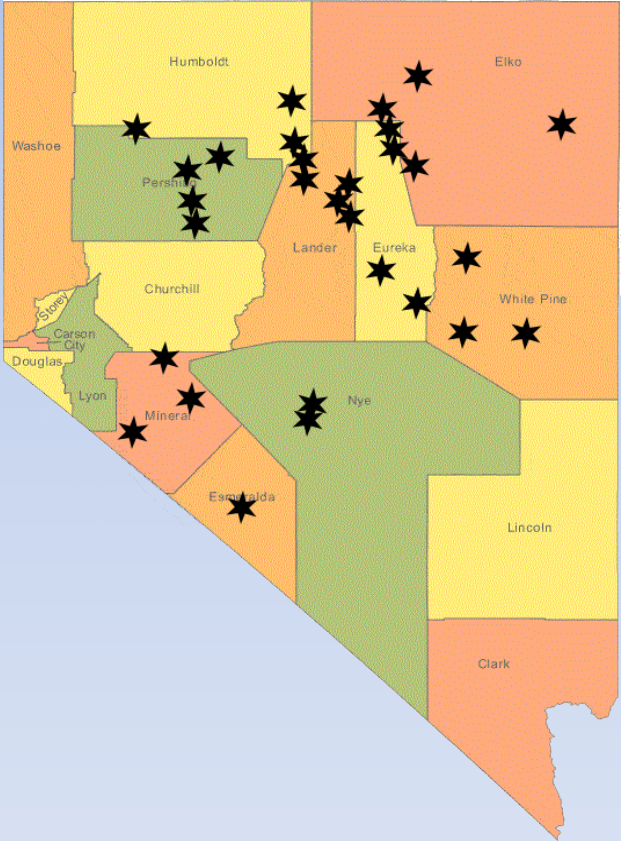
In 2021, Nevada mining employed >15,000 workers at an average salary of \$103,000 (\$49.52/hr)

Nevada produced 10% of all U.S. mineral production

Mines operate on less than ¼ of 1% of Nevada's 70,722,119 acres



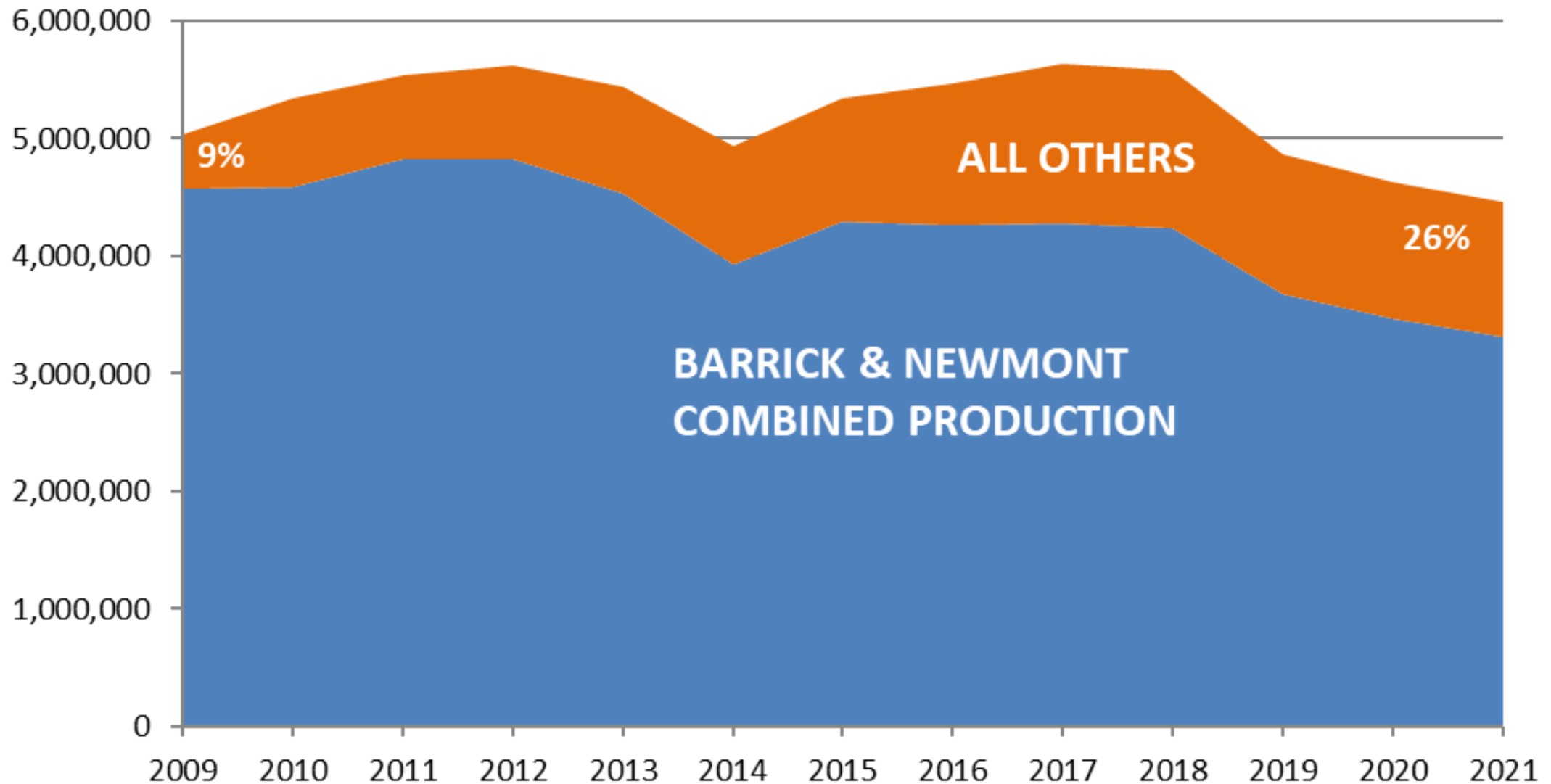
- **NRS 513.073** requires the Division to maintain a mining register and annually record production of mining, oil/gas, and geothermal operations and distribute this information to the public
- In 2021, NV produced 77% of all US gold and ranked 5th in global production (behind China, Australia, Russia, and Canada)
- 20+ commodities are produced from ~150 mines in Nevada
- \$14B impact to Nevada's economy
- Nevada is ranked 3rd best mining jurisdiction based on Investment Attractiveness Index (Fraser Institute, 2021)
- Lots of interest in exploration for, and production of, critical minerals
- Total permitted acreage of surface disturbance, of exploration and mining, is smaller than Storey County



2021 NEVADA METAL PRODUCTION, BY PRODUCER				
Ranked by gold production				
Operator	Gold (ozs)	Silver (ozs)	Copper (lbs)	Moly (lbs)
Nevada Gold Mines	3,354,029	1,600,225	36,736,179	
Kinross	450,567	808,072		
SSR Mining	235,282	4,285		
First Majestic Silver	98,303	1,809		
Hycroft Mining	56,045	397,546		
Florida Canyon Mining (Argonaut Gold)	51,175	27,681		
Walker Lane Minerals	46,459	44,551		
Calibre Gold	45,783	NR		
McEwen Mining	43,881	NR		
KGHM International	41,050	NR	123,700,000	240,000
Coeur	27,985	3,158,017		
Rawhide Mining	23,209	126,510		
i-80 Gold	17,442	3,500		
Gold Acquisition Corp.	5,388	12,773		
Borealis Mining	3,936	6,473		
Mineral Ridge Gold	1,827	1,154		
Nevada Copper	0	NR	3,296,515	
Geo-Nevada	3	4		
Hecla (Klondex)	0	26,214		
Totals	4,502,364	6,218,814	163,732,694	240,000

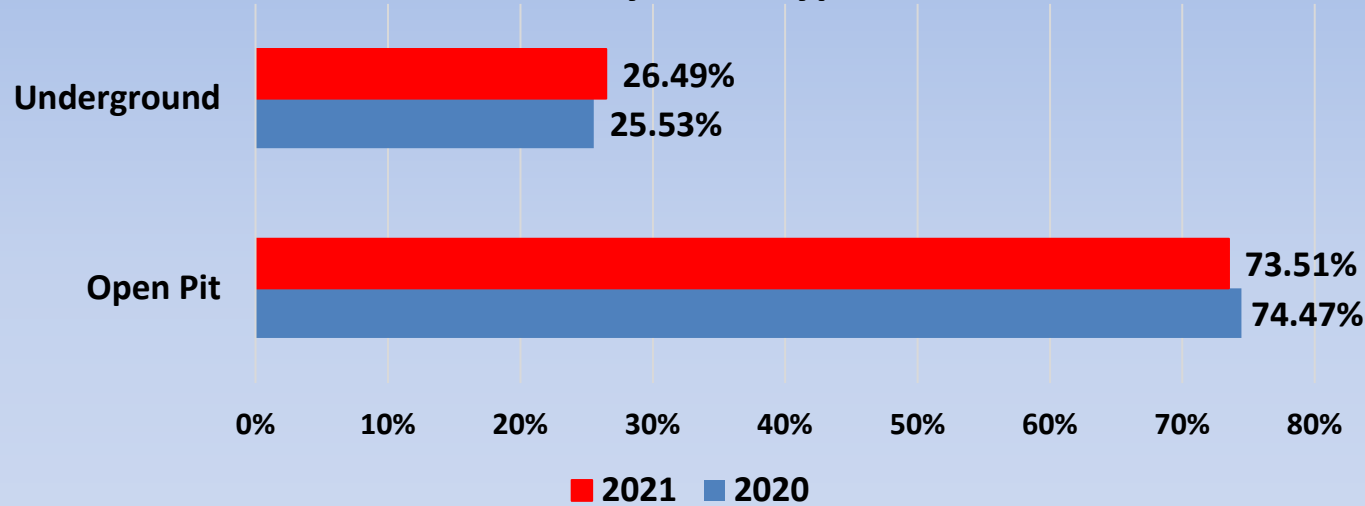
Nevada Gold Mines Production Comparison

2009 - 2021 Annual Gold Production in Nevada

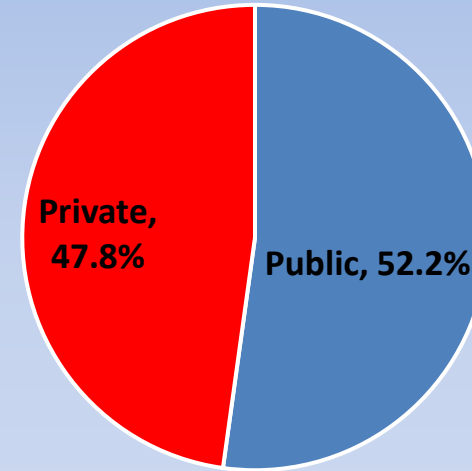


Nevada Gold Production Statistics

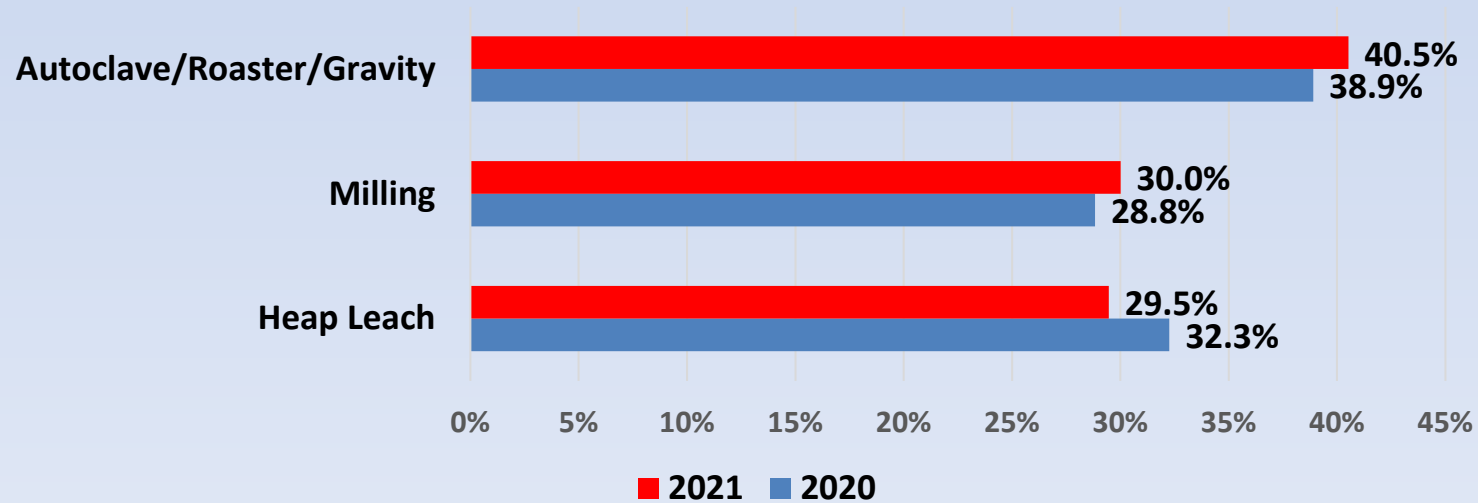
Au % by Mine Type

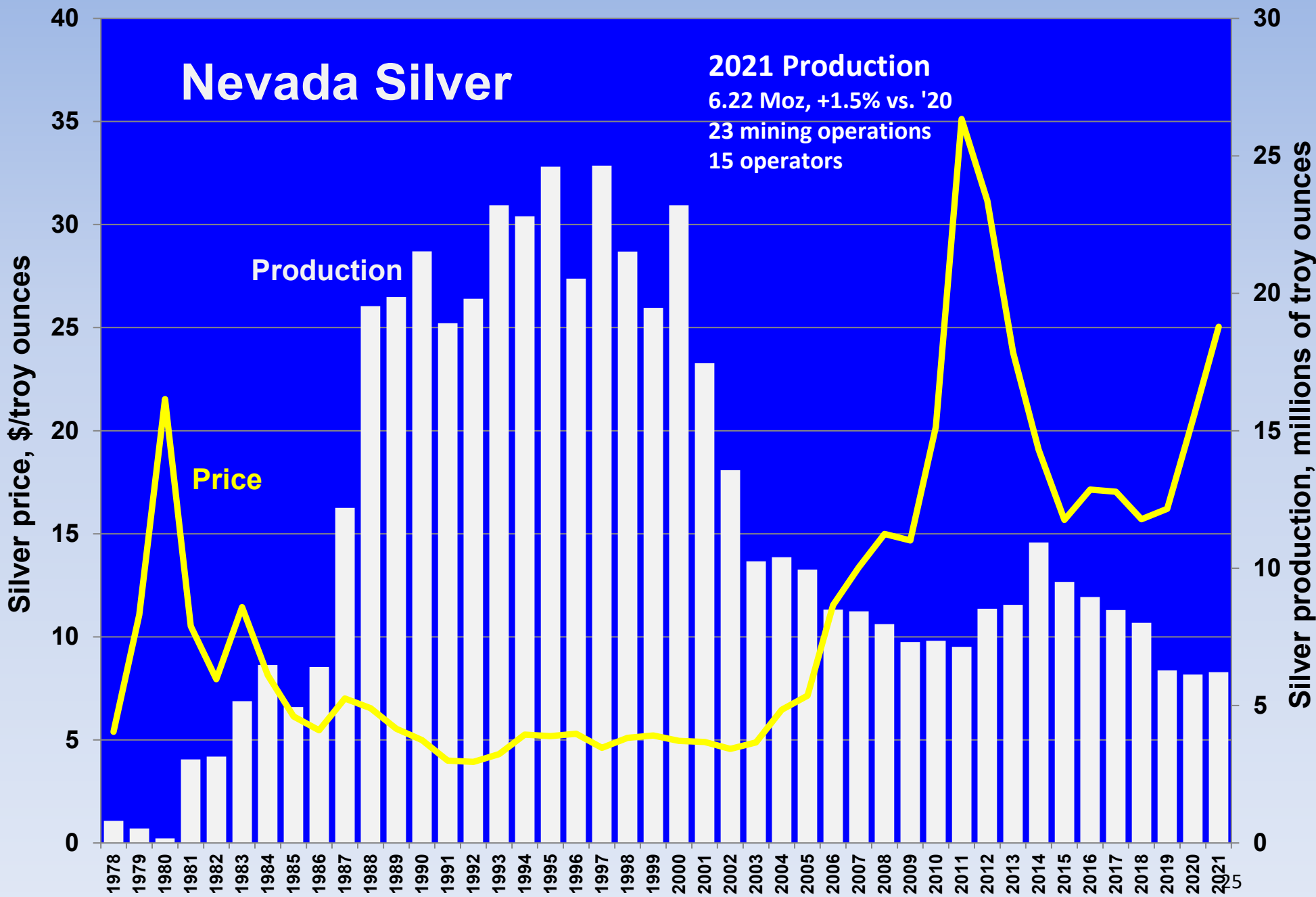


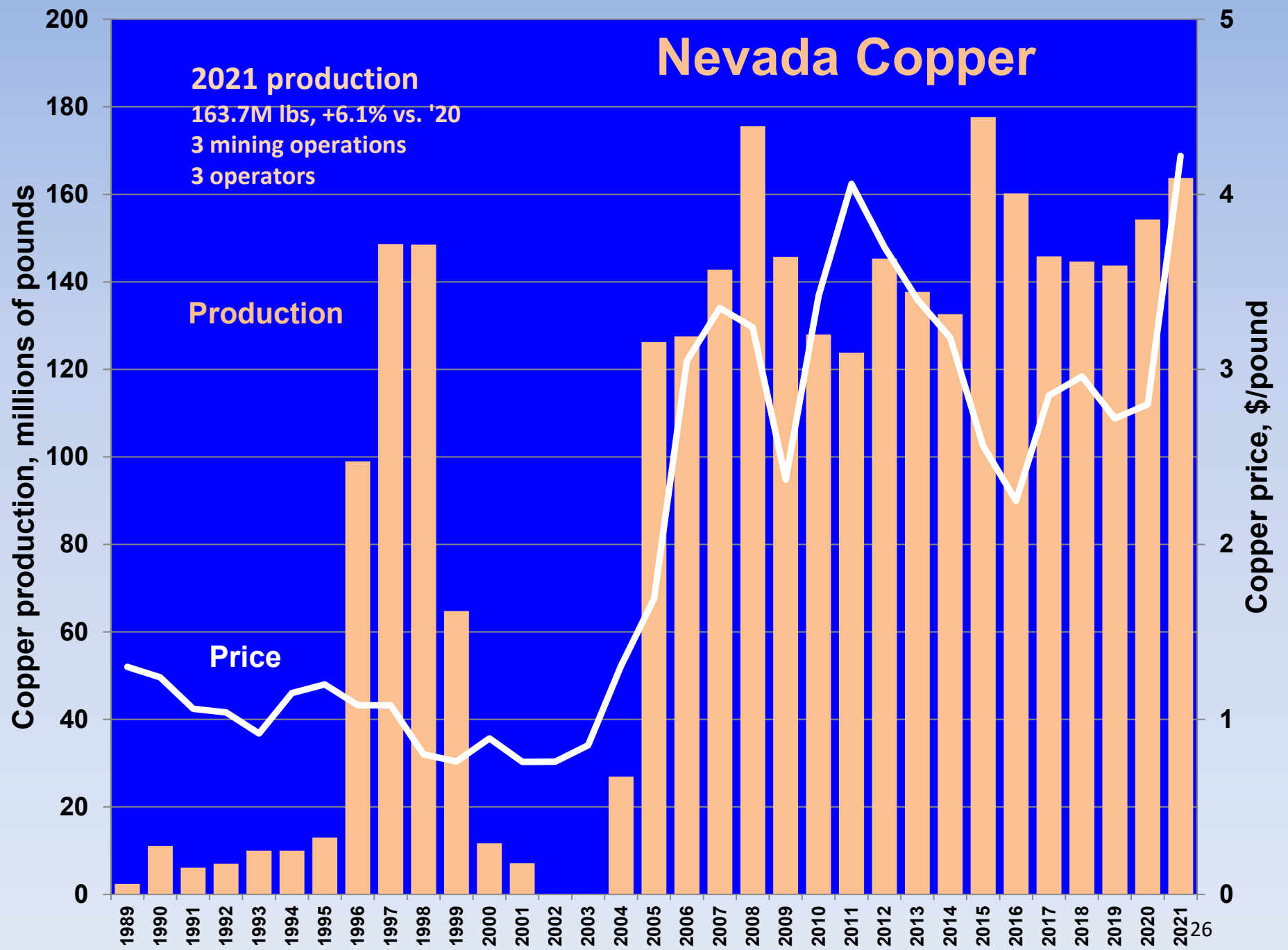
2021 Au % By Land Ownership

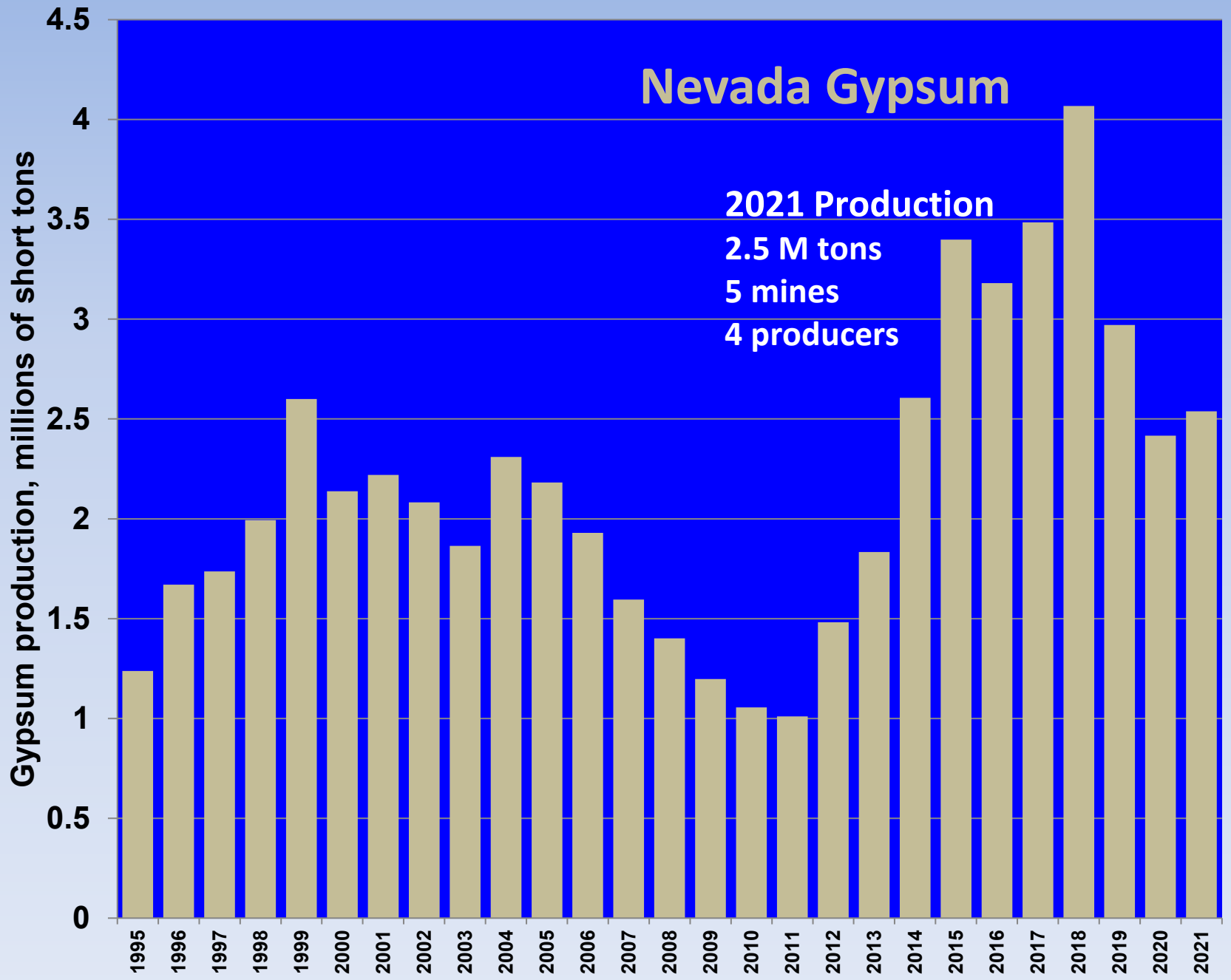


% Au by Process (2020 vs. 2021)



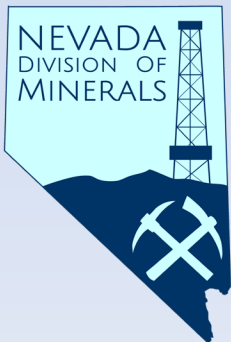
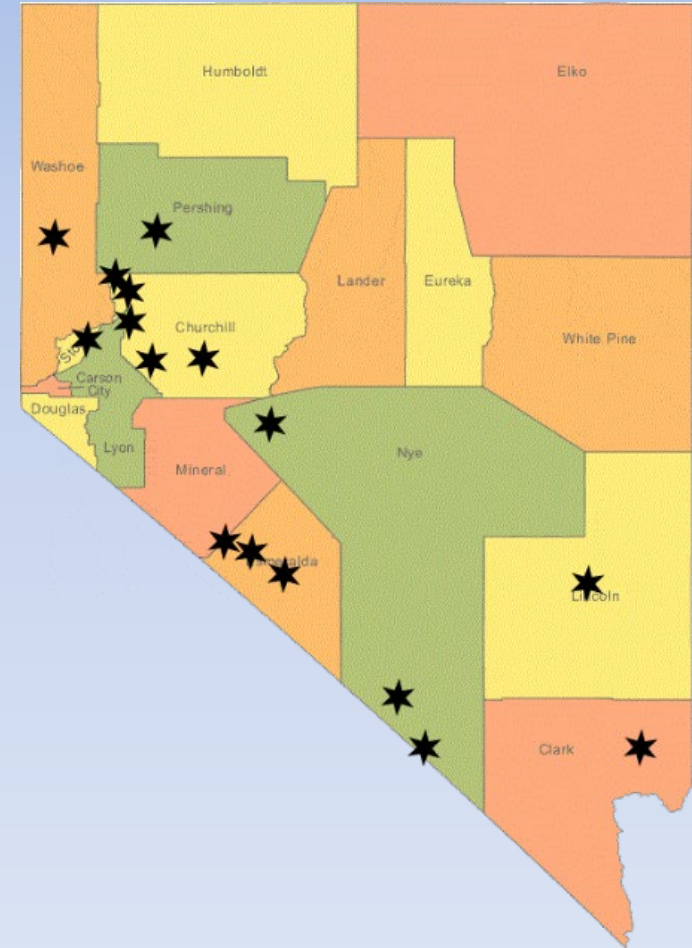






Other Industrial Minerals Produced in 2021

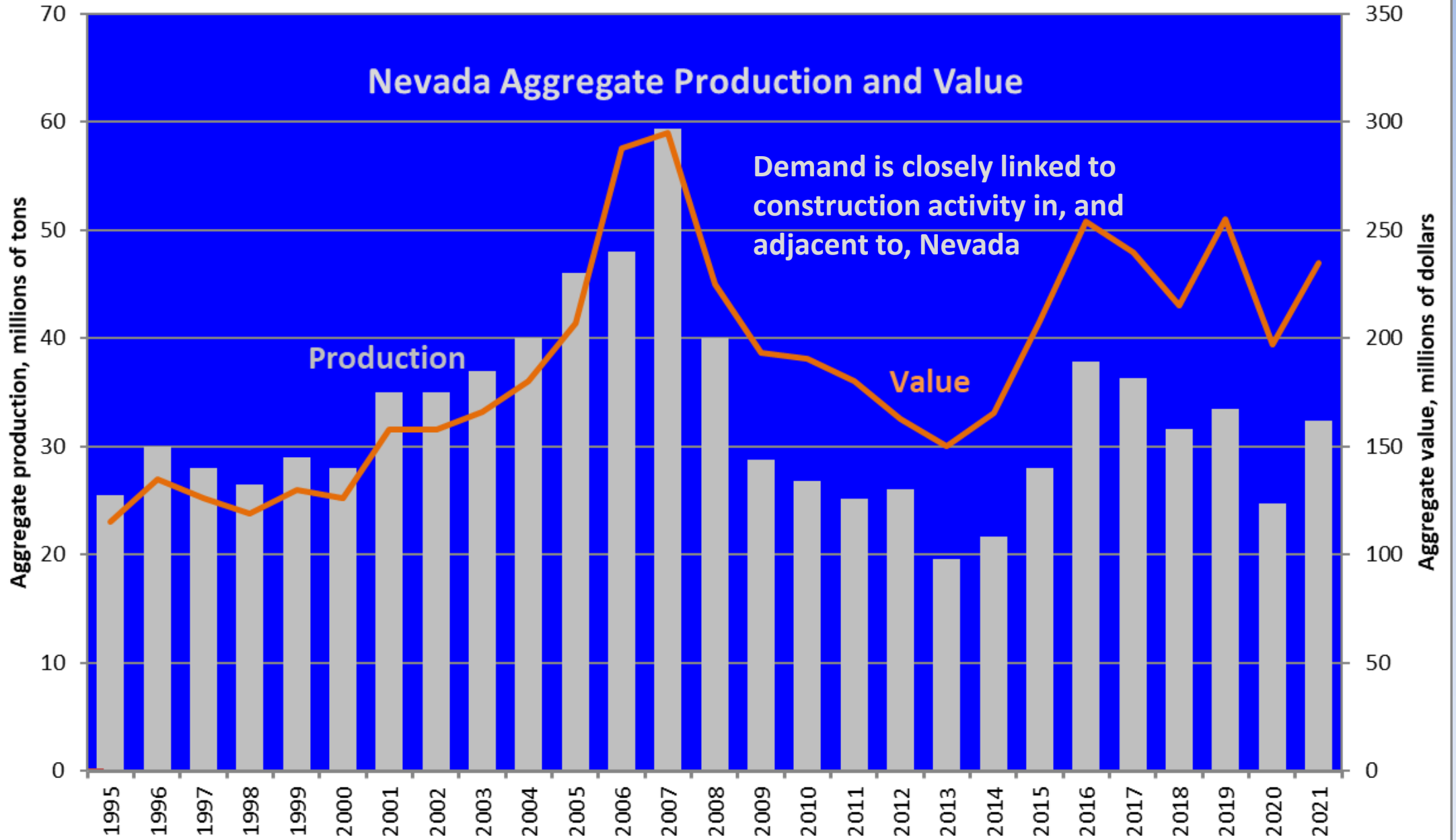
- 12,700,000 lbs of lithium compounds
- 658,000 tons of silica sand
- 129,000 tons of magnesium compounds
- 306,000 tons of diatomite
- 240,000 pounds of molybdenite
- 16,000 tons of salt
- 3,700 tons of perlite
- ~200,000 tons of specialty clays



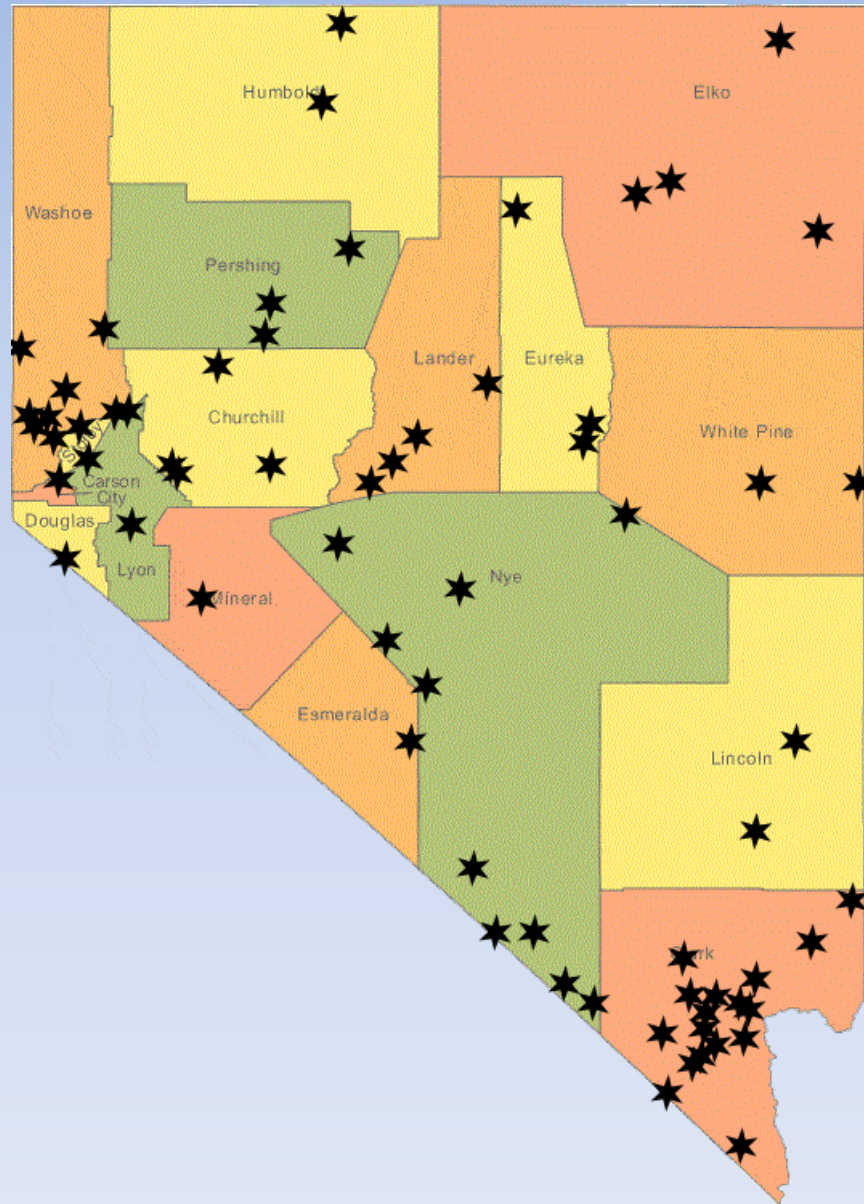
Nevada Aggregate



Nevada Aggregate Production and Value



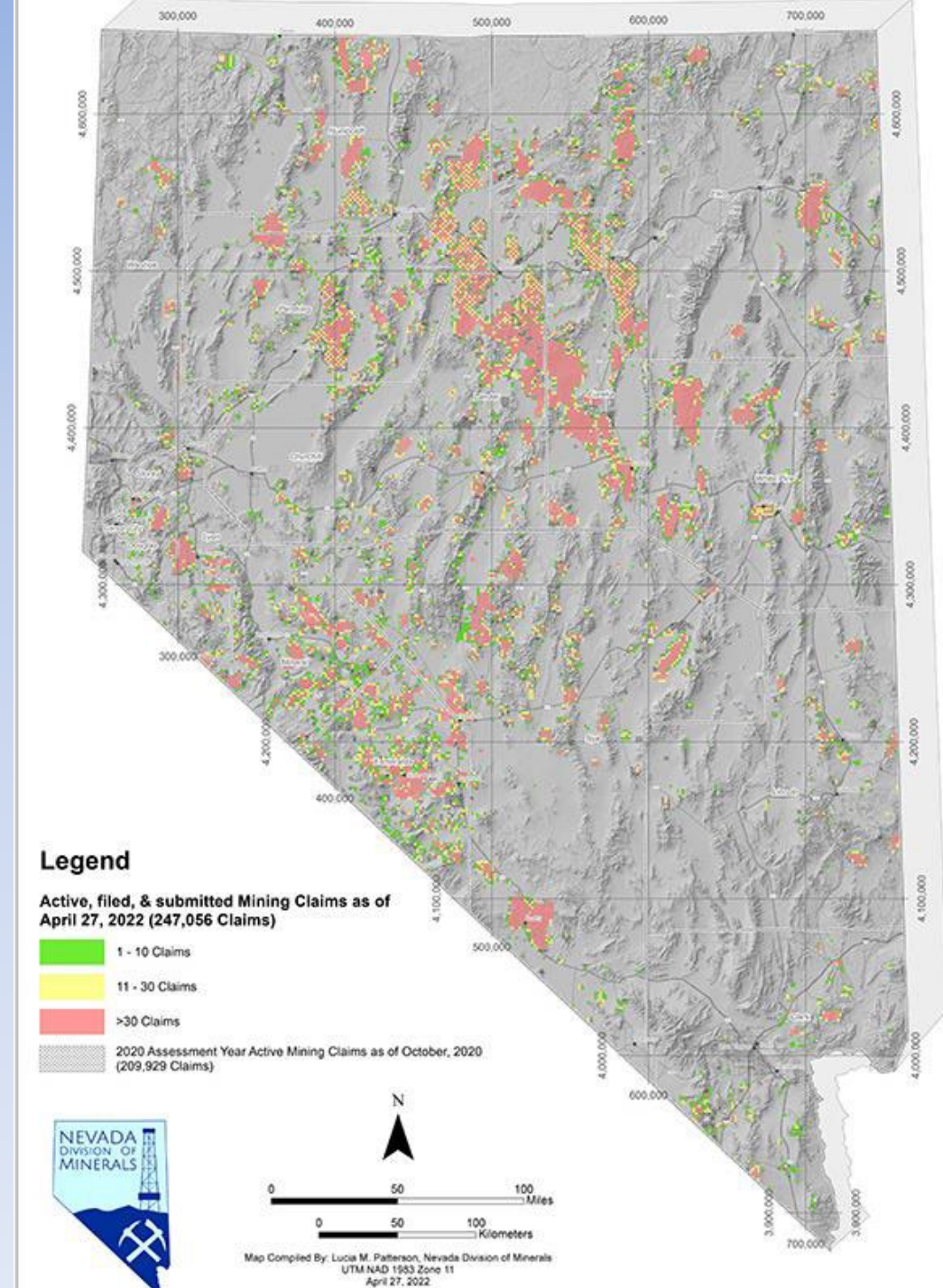
Nevada Aggregates



- 4th highest valued commodity in NV
- Includes:
 - Crushed rock
 - Sand and gravel
- Used primarily for construction but also for landscaping material and products
- 100s of former and current borrow pits
 - NDOT and county road maintenance
- BLM Mineral Materials sales of \$13.7M in FY21
- Unlike most commodities, cost is determined largely by distance needed to transport
- Creates NIMBY challenges in urban areas

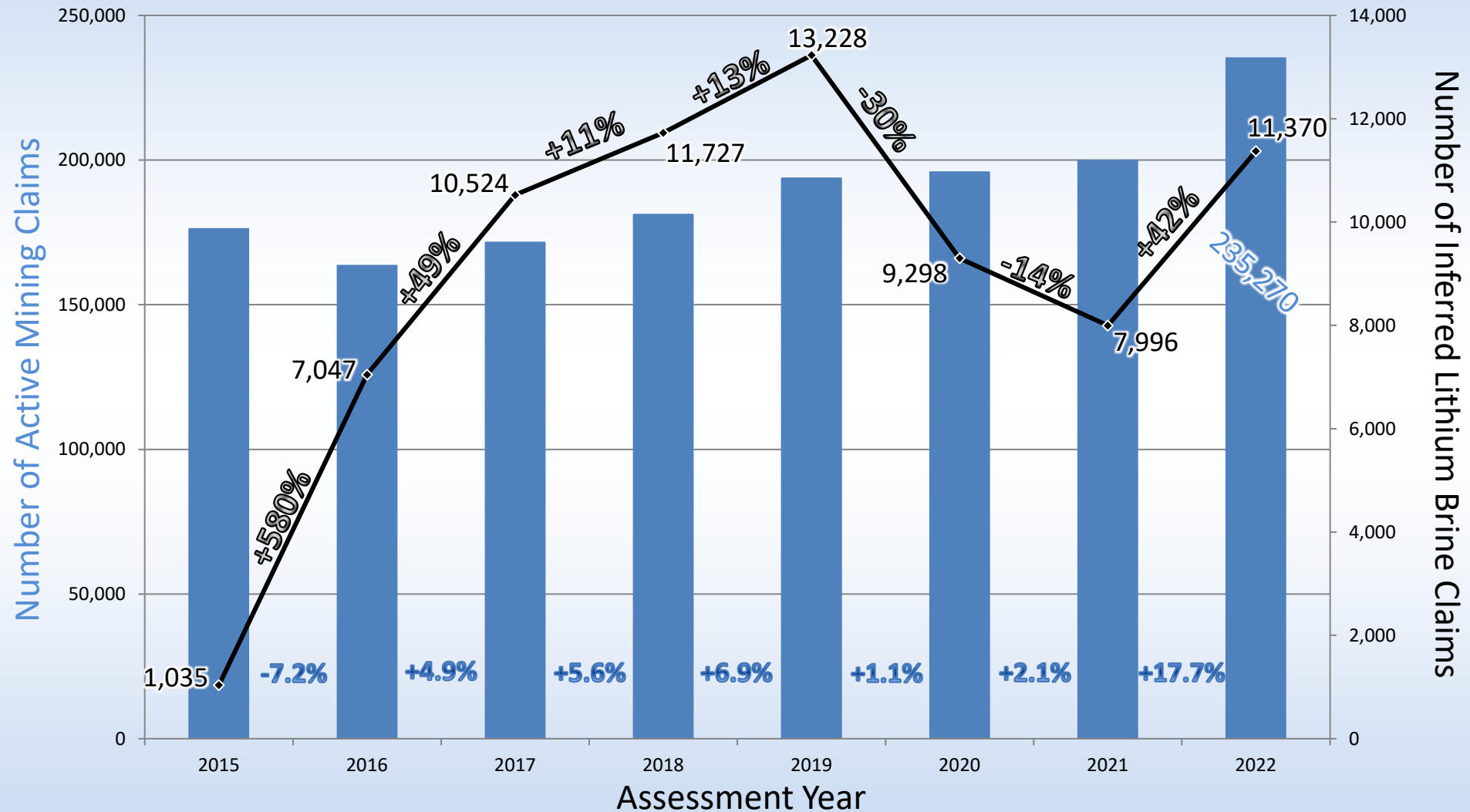
NRS 517 - NEVADA MINING CLAIMS

- Requirements for claim monumenting, filing, deadlines, fees
- Fee of \$10/claim filing collected by county recorder and remitted to NDOM
- 260,039 Active Mining Claims in Nevada as of 9/1/2022
- Increase of 12% from Sep. 2021
- >50% of all US mining claims
- Annual maintenance payments of \$165/claim to BLM and \$12/claim to county recorder
 - ~\$39M to BLM (2021 AY)
 - ~\$2.8M to Nevada counties
- The trend in claims is an indicator for exploration interest and largely the price of gold
- >\$643M spent on exploration in NV in 2019 and 2020
- 71% increase in number of placer claims for lithium brine YOY





Unpatented Mining Claims By Year



NDOM has been gathering active claim data from LR2000/MLRS at the end of October for the last eight years. The purpose of this graph is to show claims data and statistics from the same snapshot in time.

Critical Minerals

A “critical mineral,” as defined by the E.O. 13817, is a mineral:

1. identified to be a nonfuel mineral or mineral material essential to the economic and national security of the United States
2. from a supply chain that is vulnerable to disruption
3. that serves an essential function in the manufacturing of a product, the absence of which would have substantial consequences for the U.S. economy or national security.



<u>Aluminum</u>	<u>Fluorspar*</u>	<u>Manganese*</u>	<u>Tellurium</u>
<u>Antimony*</u>	Gadolinium	<u>Neodymium</u>	Terbium
<u>Arsenic*</u>	<u>Gallium</u>	<u>Nickel</u>	Thulium
<u>Barite*</u>	Germanium	Niobium	<u>Tin</u>
<u>Beryllium*</u>	<u>Graphite</u>	<u>Palladium</u>	<u>Titanium</u>
<u>Bismuth</u>	Hafnium	<u>Platinum</u>	<u>Tungsten*</u>
Cerium	Holmium	Praseodymium	<u>Vanadium</u>
Cesium	<u>Indium</u>	<u>Rhodium</u>	Ytterbium
<u>Chromium</u>	<u>Iridium</u>	Rubidium	<u>Yttrium</u>
<u>Cobalt</u>	<u>Lanthanum</u>	Ruthenium	<u>Zinc*</u>
Dysprosium	<u>Lithium*</u>	Samarium	<u>Zirconium</u>
Erbium	Lutetium	<u>Scandium</u>	
<u>Europium**</u>	<u>Magnesium*</u>	<u>Tantalum</u>	

- An updated list was published as final by USGS in Feb. 2022
- 33 of the 50 occur in Nevada

Bold indicates known occurrences

* indicates past or present production in Nevada

MINERALS ESSENTIAL TO ADVANCED ENERGY TECHNOLOGY



INFRASTRUCTURE
Copper, Iron Ore,
Molybdenum



PUBLIC TRANSIT
Aluminum, Titanium,
Magnesium



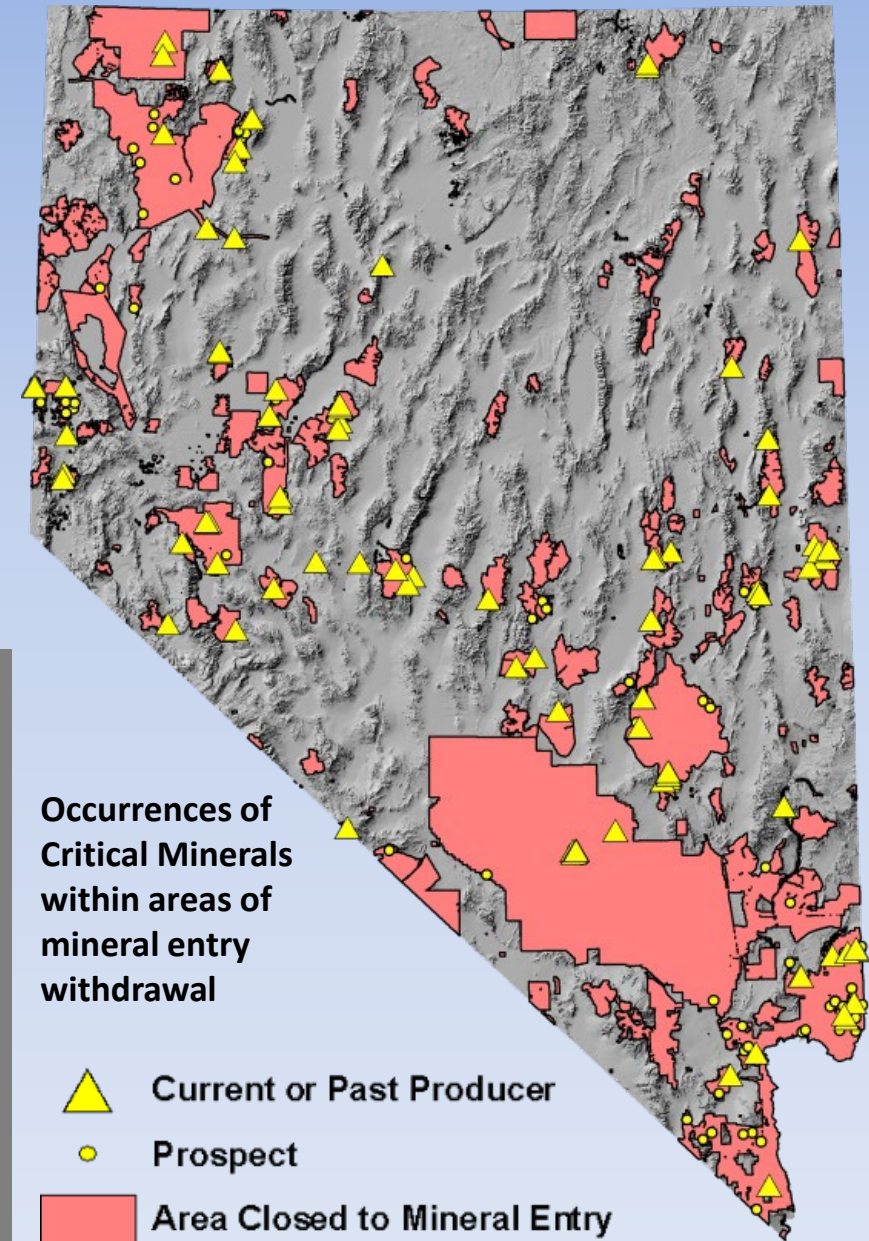
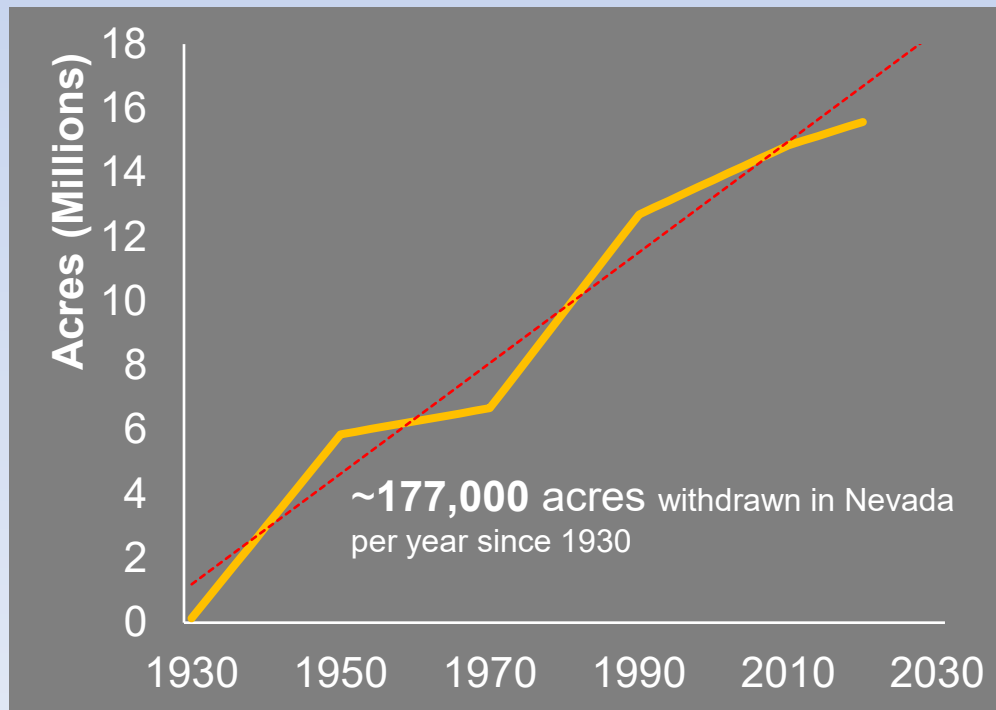
**AUTOMOBILES/
ELECTRIC VEHICLES**
Copper, Nickel, Lithium,
Cobalt



RENEWABLE ENERGY
Gold, Silver, Zinc

➤ Renewed exploration in NV for cobalt, copper, graphite, lithium, nickel, REE, tungsten, vanadium, and zinc while conservation efforts continue to remove land from development.

➤ Nevada is uniquely positioned to lead the US in transitioning away from fossil fuels *so long as* federal land is available for the environmentally responsible extraction of the commodities needed to electrify the nation.



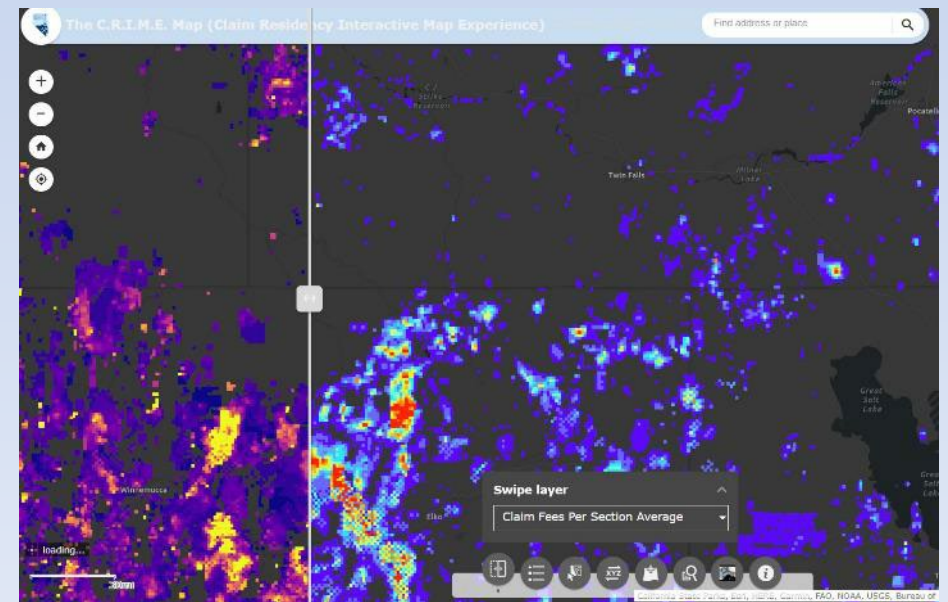
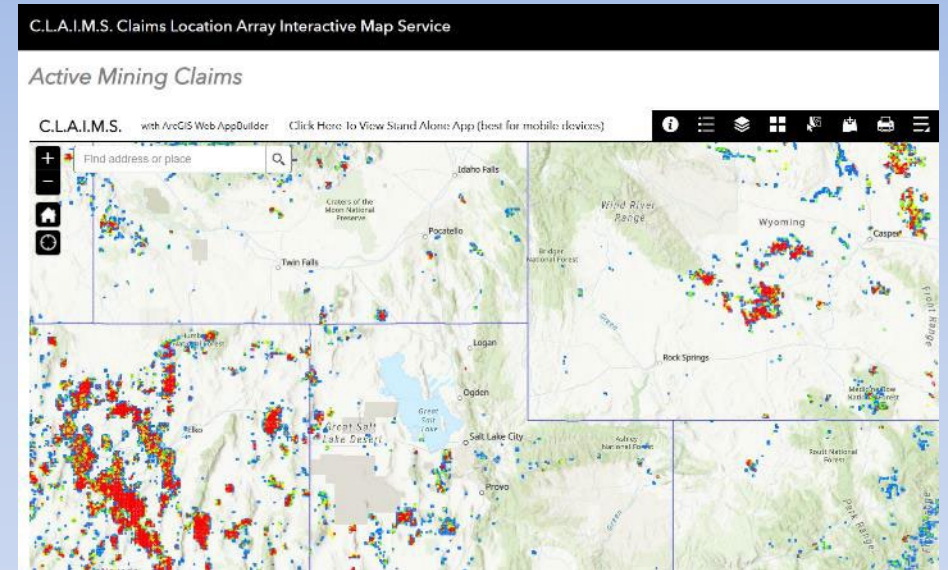
New NDOM Open Data Services

➤ Claims Location Array Interactive Map Service (C.L.A.I.M.S.)

- A platform for exploring and downloading mining claims, BLM Plan and Notice GIS data
- Includes both historic and current data for: AZ, CA, CO, ID, MT, NV, NM, OR, UT, WA and WY
- <https://claims-nvdataminer.hub.arcgis.com/>

➤ Claim Habitation Interactive Map Experience (C.H.I.M.E.)

- For viewing of mining claim density and annual federal fees paid through time per section
- View sum and average of fees per section
- Includes same 11 western states, notice and plan data, and USGS MRDS and USMIN datasets
- <https://data-ndom.opendata.arcgis.com/>



For More Info:

- Agency Homepage: <https://minerals.nv.gov/>
- “Mining” program page
 - Production summaries and stats
 - Numerous free publications and maps
- “Current Information”
 - Links to 17 Distance Learning Educational Videos
 - Recent Presentations
- “Important Links - Open Data Site”
 - Interactive web mapping application to display and download information related to the minerals industry.
 - Location of mining claims, current and historical exploration activity and mineral production.
 - New C.H.I.M.E. page - For viewing of mining claim density and annual federal fees paid through time per section
 - <https://data-ndom.opendata.arcgis.com/>

The screenshot shows the official website of the Nevada Division of Minerals. At the top, there is a navigation bar with links for HOME, ABOUT US, COMMISSION, PROGRAMS, NEWS, FAQs, and CONTACT US. The main content area features a large image of a desert landscape with a mining site, accompanied by a caption about visual effects staging. To the right, there is a 'Current Information' section with a list of recent news items, including a video release, a BLM replacement, and an awards presentation. Below this, there is a section for 'Emergency Measures Relating to COVID-19' with detailed text about office closures and operational changes. Further down, there are sections for 'Employment Announcement(s)', 'Education Workshop(s)', 'Request for Information and Public Records', 'Important Links, Nevada Division of Minerals', and 'Other Important Links'. At the bottom, there is a 'Programs' section with icons for DISCOVERED MINERAL RESOURCES EXPLORATION, EDUCATION & OUTREACH, GEOTHERMAL, MINING, OIL AND GAS, and ABANDONED MINELANDS.