



Nevada Division of Minerals

Division activities report

Mineral production and mining activities

Geothermal production and activities

Hydraulic fracturing regulations and oil activity



Senate Natural Resources Committee

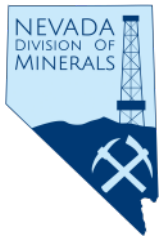
February 10, 2015

Richard Perry, Administrator



WHO WE ARE

- **State Agency and part of the Commission on Mineral Resources NRS 513**
- **CMR is 7 members appointed by the Governor from minerals, OGG industries**
- **Offices in Carson City (9 employees) and Las Vegas (2 employees)**
- **Revenues from fees, no general fund monies (mining claim fees, oil/gas fees, geothermal fees, etc.)**



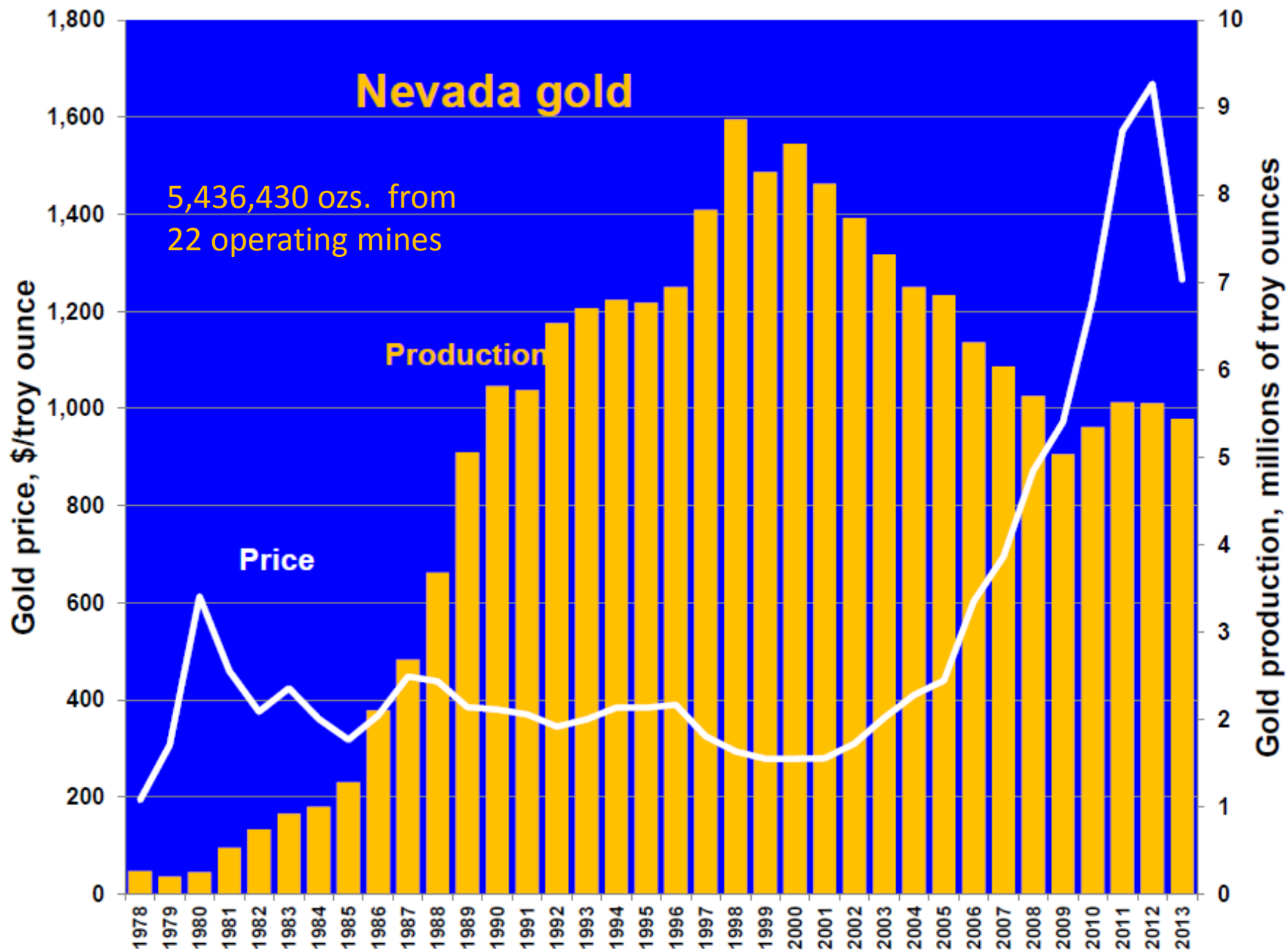
WHAT WE DO

- **“Encourage and assist in the exploration for and production of oil, gas, geothermal energy and minerals within this state”
– NRS 513**
 - **Minerals Education to public, schools, organizations**
 - **Supply information on the minerals industry**
 - **Abandoned Mine Lands Program – public safety**
 - **Record annual production of mines, oil & gas, and geothermal energy.**
- **Permit Oil and Gas drilling & production NRS 522**
- **Permit Geothermal drilling & production NRS 534A**
- **State Reclamation Bond Pool NRS 519A.290**
- **Mining Claims, Mill Sites and Tunnel Rights NRS 517**



PERFORMANCE MEASURES

Activity	Description		FY-14 Actuals	FY-16	FY-17
General Administration	Number of abandoned mine land (AML) and minerals education presentations		196 /11 FTE's = 17.8	12	12
Abandoned Mines	Number of hazardous abandoned mine openings secured, expressed as a percentage of the total number inventoried		14,492 secured/18,331 inventoried = 79.1%	70%	70%
Oil, Gas, and Geothermal	Monitoring of Oil, Gas, and Geothermal Wells		556 Wells Inspected in FY14)/ 558 Permitted Wells = 99.6%	33%	33%
Oil, Gas, and Geothermal	% of Permits Processed in Ten Working Days		42 permits processed / 42 total permits processed = 100%	N/A	N/A



Nevada copper

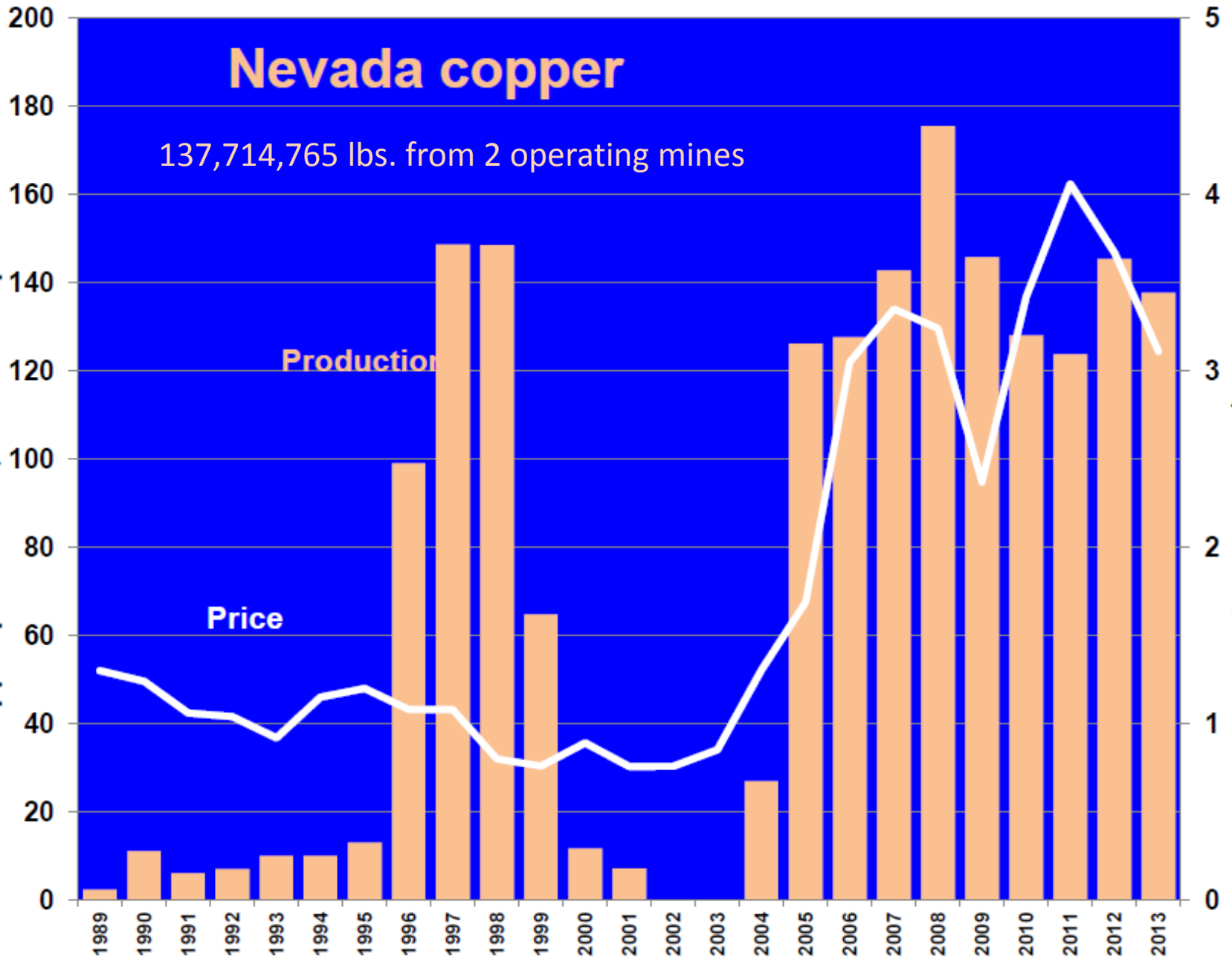
137,714,765 lbs. from 2 operating mines

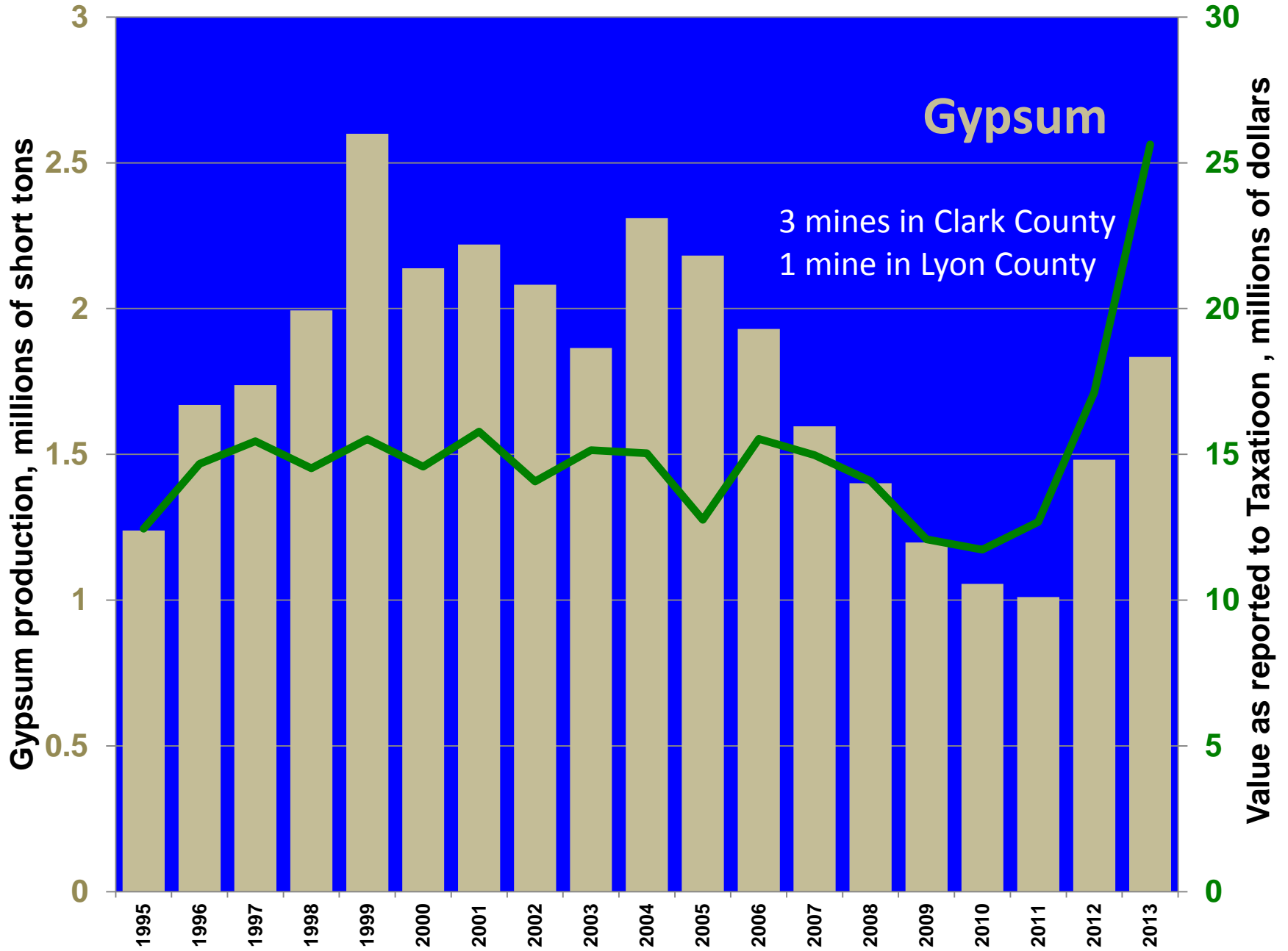
Copper production, millions of pounds

Production

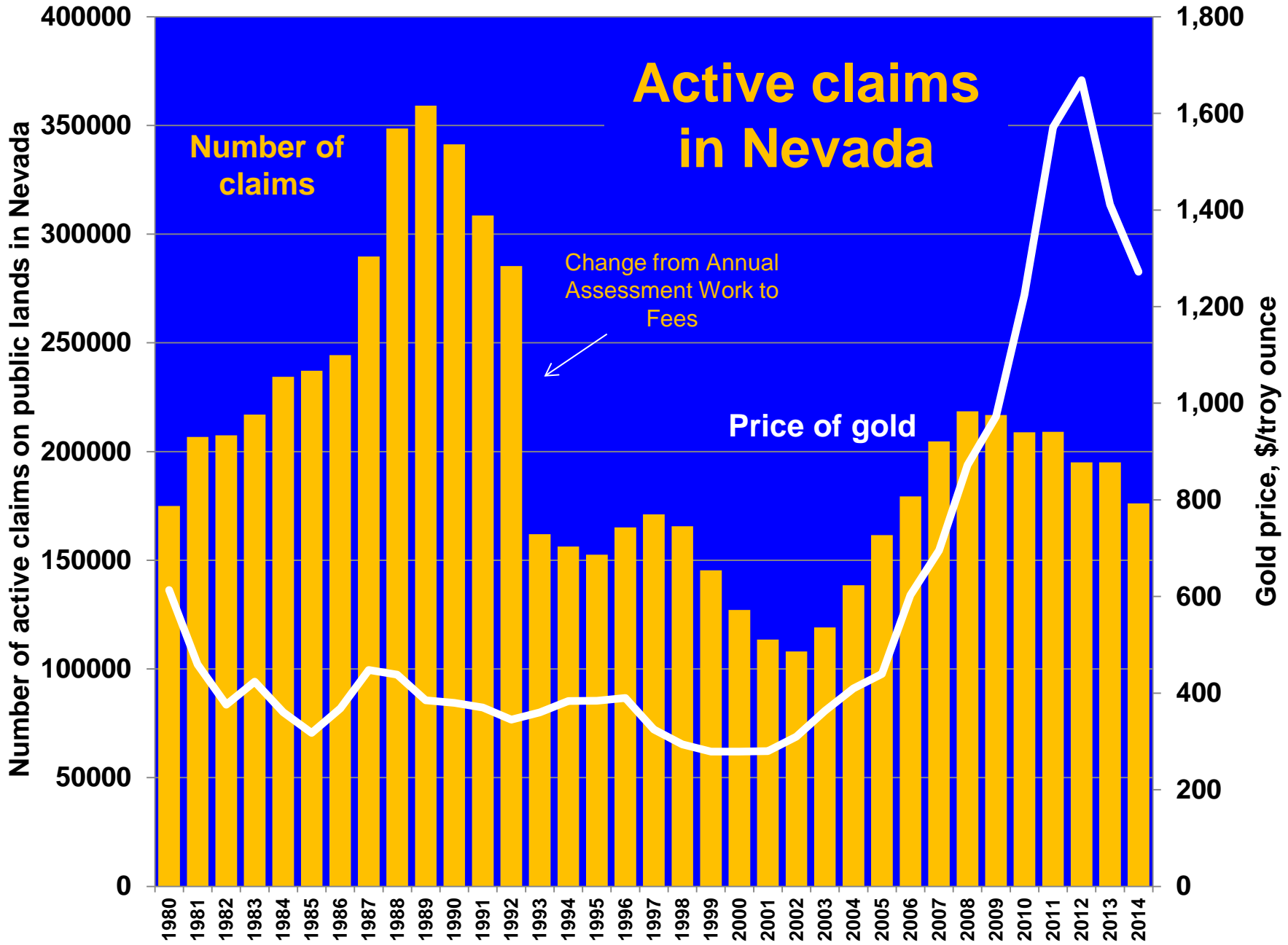
Price

Copper price, \$/pound





Active claims in Nevada



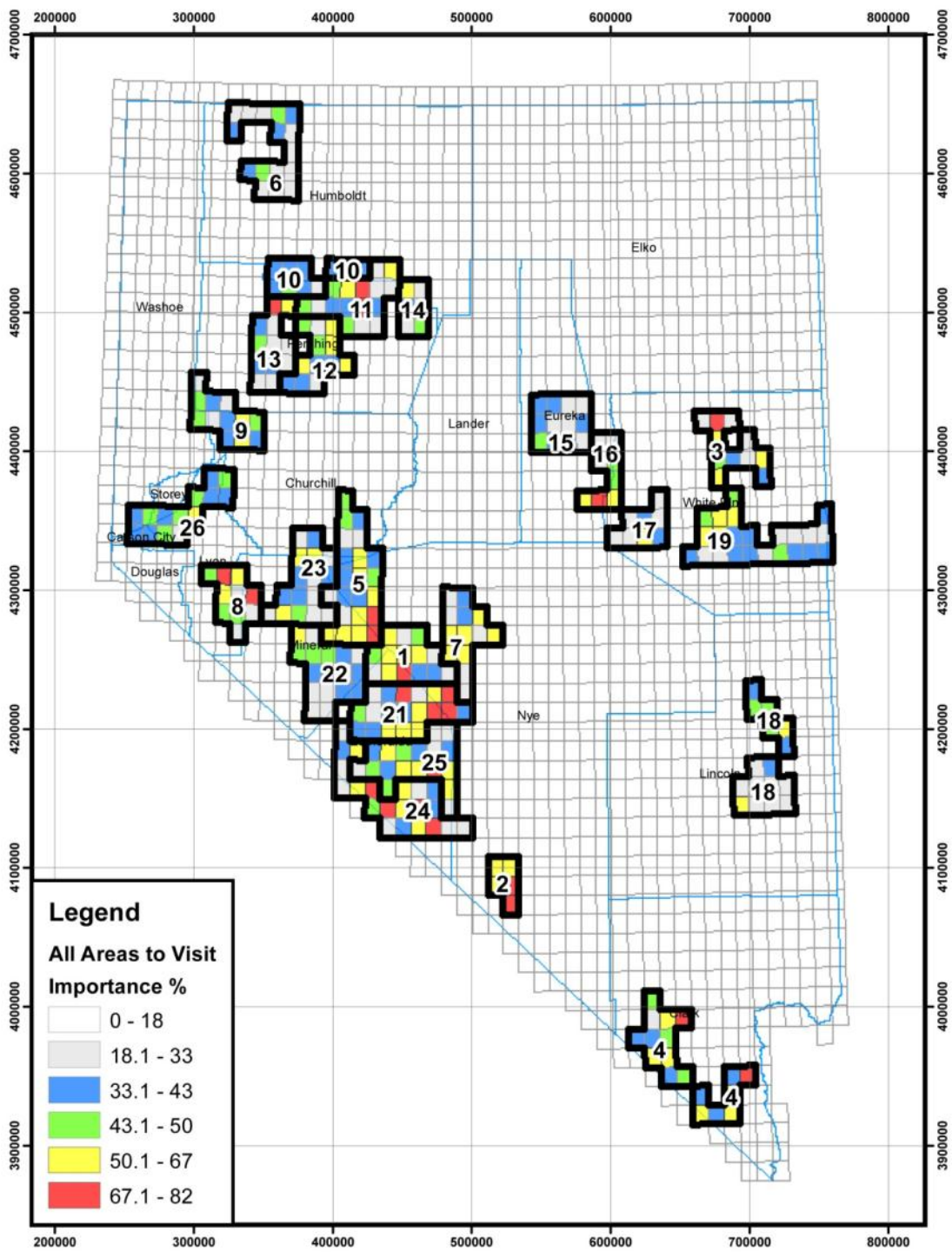


AML Activities by County

COUNTY	SITES DISCOVERED	SITES SECURED	% SECURED	TOTAL UNSECURED	% UNSECURED STATEWIDE
Carson	76	76	100%	0	0.00%
Churchill	707	570	81%	137	3.74%
Clark	2,151	1,686	78%	465	12.68%
Douglas	204	201	99%	3	0.08%
Elko	783	579	74%	204	5.56%
Esmeralda	2,793	2,376	85%	417	11.37%
Eureka	774	709	92%	65	1.77%
Humboldt	797	700	88%	97	2.65%
Lander	591	508	86%	83	2.26%
Lincoln	722	576	80%	146	3.98%
Lyon	1,035	962	93%	73	1.99%
Mineral	1,620	1,355	84%	265	7.23%
Nye	2,614	1,958	75%	656	17.89%
Pershing	1,593	1,141	72%	452	12.33%
Storey	197	186	94%	11	0.30%
Washoe	445	402	90%	43	1.17%
White Pine	1,554	1005	65%	549	14.98%
TOTAL (Since 1987)	18,656	14,990	80%	3666	100.00%



SECURING
ACTIVITIES
PRIORITIZED
ANNUALLY
USING A RISK
EQUATION
2015 >>>>>>>



2014 SUMMER INTERN PROGRAM

Eight UNR-UNLV students investigated 4,012 abandoned mine features in 13 counties, logged 451 hazards and secured 284

NEVADA DIVISION OF MINERALS ABANDONED MINE LANDS 2014 SUMMER INTERN PROGRAM



Many Thanks to These
Hard Working Students:
Sean Diggins
Alain Nowakowski
Ralston Pedersen
Vince Ugalde
Sarah Ullrich
Nolan Weintz
Alex Wheatley
Gunnar Young



Flat tire...the impossible is happening



AML BAT GATE PROJECTS

789 bat compatible closures thru Feb 2014

BEFORE

AFTER

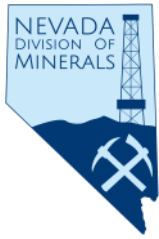




AML BACKFILL PROJECTS

3,125 Backfills thru January 2015





EAGLE SCOUT SECURING PROJECTS



154 projects since 1992 resulting in 696 securings
(through 12/31/2014)

MINERALS EDUCATION



2014 ACTIVITIES:

- 167 educational presentations by staff that reached 6,702 Nevadans
 - 113 classroom presentations
 - 28 to civic groups, clubs and trade orgs.
 - 21 to Boy Scout and youth organizations
 - 88 in Northern Nevada
 - 72 in Southern Nevada





Midway Gold: Pan Project

Located 22 miles southeast of Eureka, NV & 50 miles west of Ely, NV

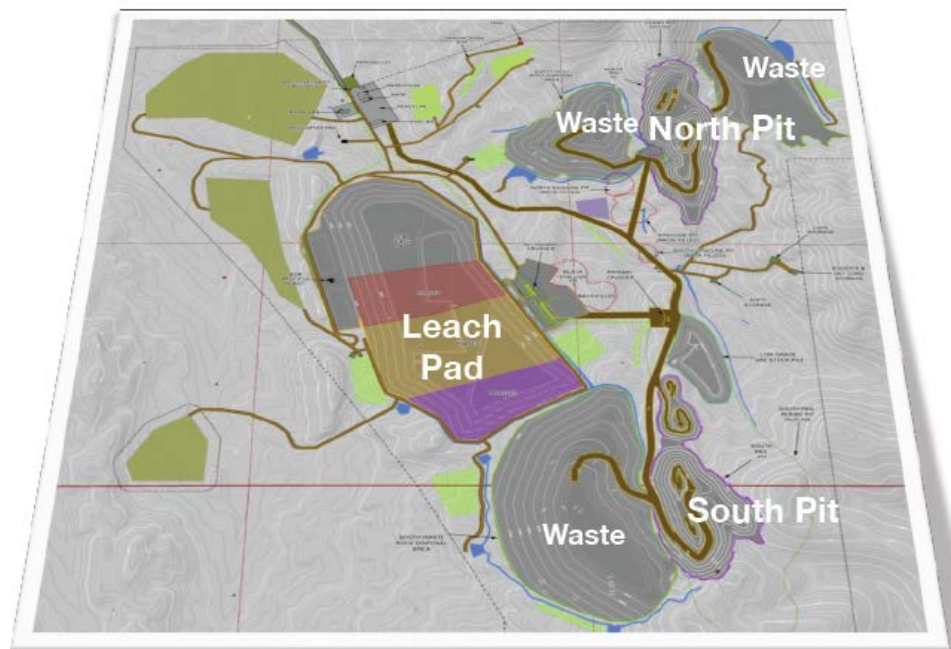
Carlin-type, disseminated, sediment hosted gold deposit

Open-pit mining, processing by heap leaching

- NEPA completed with full EIS in 25 months.
- Construction began early 2014
- First ore on pads in September, 2014
- First Gold shipment expected Q1, 2015
- 150 new jobs, employees from Eureka and Ely



Reserves	Tonnes	Grade	Contained
	('000s)	(g/t)	('000s oz)
Proven	25,245	0.6	487
Probable	23,067	0.51	377
P & P	48,311	0.56	864





Newmont Long Canyon Project

Located 60 mi southeast of Wells NV & 10 mi south of I80 in the Pequop Mountains

Carlin-Type Gold Deposit

Current Activities

- Elko County
- Completing 75' infill drilling
- Waiting on record of decision for Long Canyon EIS (1st Quarter 2015)
- Production expected to begin in the 3rd quarter of 2016
- Average Annual grades will be roughly 0.05 opt with 2.5 to 3 million ore tones/year
- Total annual tons will begin at 20 million and ramp up to roughly 35 million tons
- 250 new employees



Cortez Camp / Goldrush

Cortez Camp

18 Moz production to date

11 Moz reserves⁽¹⁾

4.9 Moz M&I resources⁽¹⁾

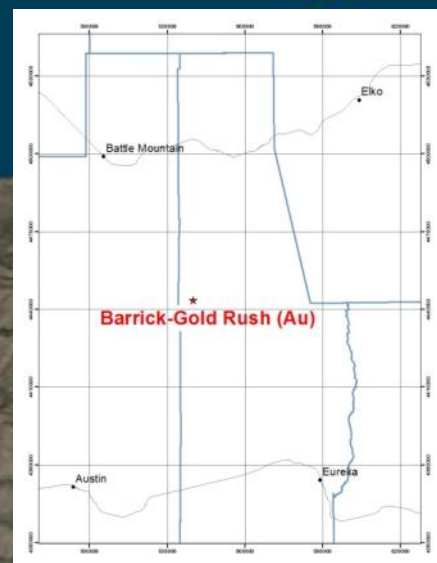
0.9 Moz inferred resources⁽¹⁾

Cortez Hills

Goldrush

10 Moz M&I resources⁽¹⁾

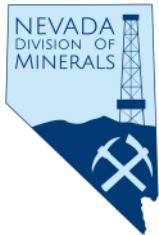
5.6 Moz inferred resources⁽¹⁾



Portal
Conceptual
Exploration
Decline

Open and
untested

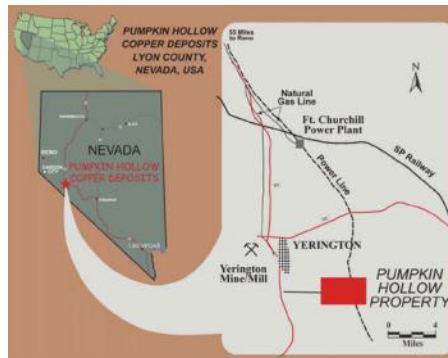
(1) See final slide #4.



Nevada Copper: Pumpkin Hollow

Located 8 miles southeast of Yerington, Nevada (Yerington Copper Porphyry District)
Hybrid IOCG Chalcopyrite-Magnetite Skarn, Underground Mine with on-site Concentrator

- Proven and Probable reserves of 5.22 billion lbs copper, 989,000 ounces of gold and 32.9 million ounces of silver
- Plan for 6,500 ton/day milling rate
- Currently sinking shaft to 2,160'
- Concentrator (mill) to be built
- Commercial underground mining in 2016
- 200+ employees when fully operational
- Smelting and refining off-site
- Have transferred 10,400 acres of federal land to the City of Yerington allowing for Nevada Copper to proceed with plans to develop a large open-pit copper mine on 3,800 of these acres



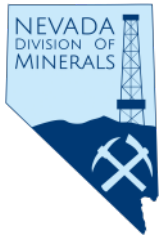


Western Lithium: Kings Valley/Hectorite Clay

100 km north-northwest of Winnemucca, NV and 40 km west-northwest of Orovada, NV
Lithium/Organoclay Drilling Additive Supplier

- Hectorite is an effective additive to drilling muds and has emerged as the enabling mineral with thermal stability superior to bentonite clays to perform in challenging environments i.e. High Pressure & High Temperature
- Western Lithium's Hectatone Plant located in Fernley, NV began production in the 4th quarter of 2014
- The first shipment of Hectatone product was sent out on January 2, 2015
- The facility will continue to ramp up production to meet "nameplate" capacity.
- 15 People currently employed





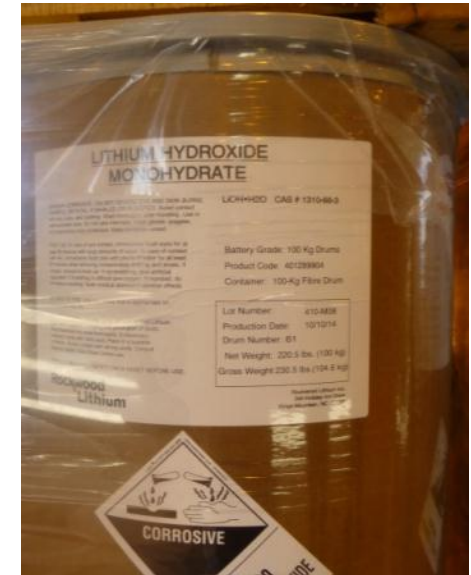
Rockwood Lithium: Silver Peak

Located in Silver Peak, NV

Lithium Brine Deposit

Overview:

- First lithium Carbonate was produced in 1967
- Brine is pumped from 4 aquifers which are bound in the Clayton Valley by high angle faults
- Only commercial lithium mine in North America
- Employs 75 directly + 10 contractors

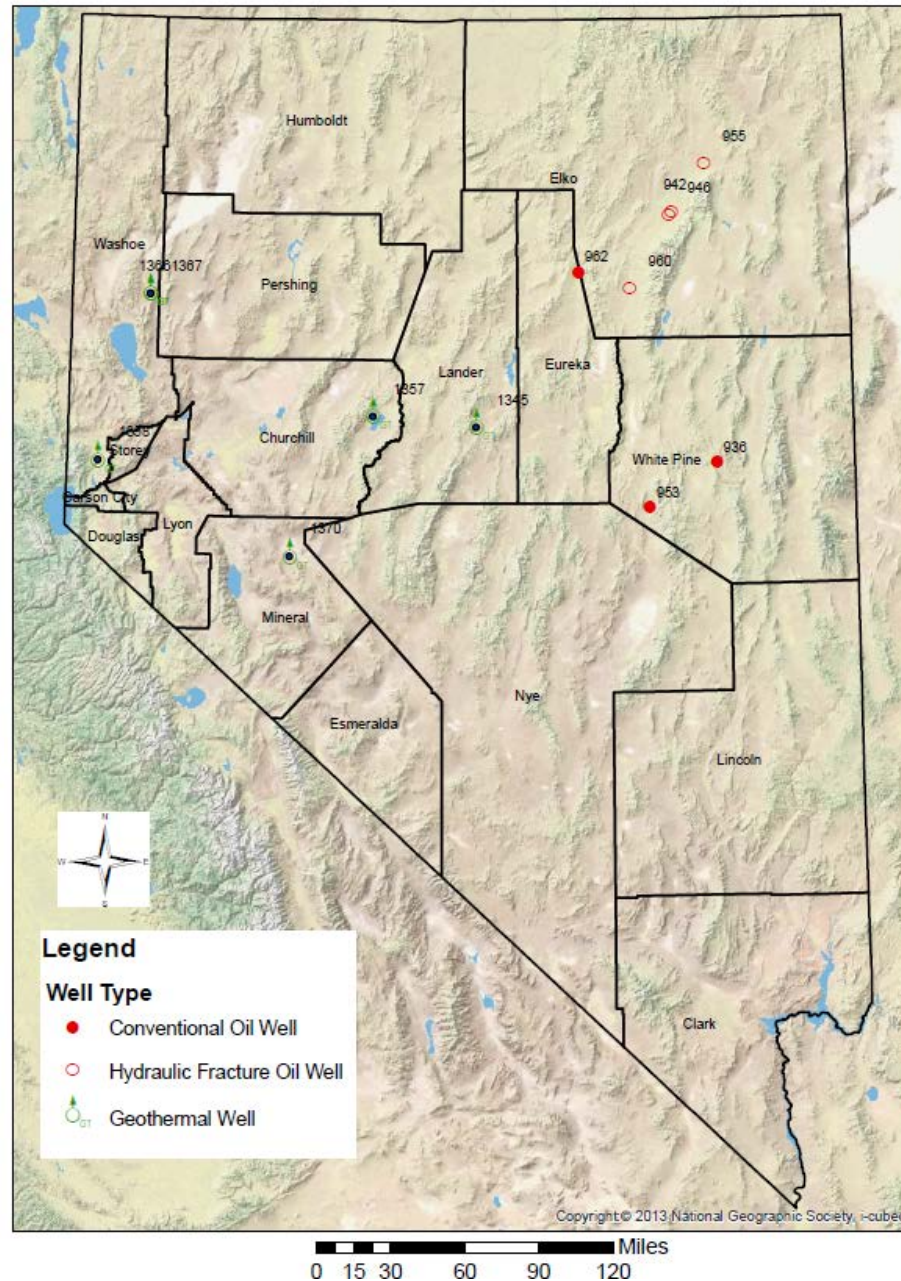




Oil and Geothermal Wells Drilled Since 9/1/2013 to 12/31/2014

7 OIL EXPLORATION
WELLS DRILLED

5 GEOTHERMAL
EXPLORATION OR
PRODUCTION
WELLS DRILLED



Nevada Geothermal Energy

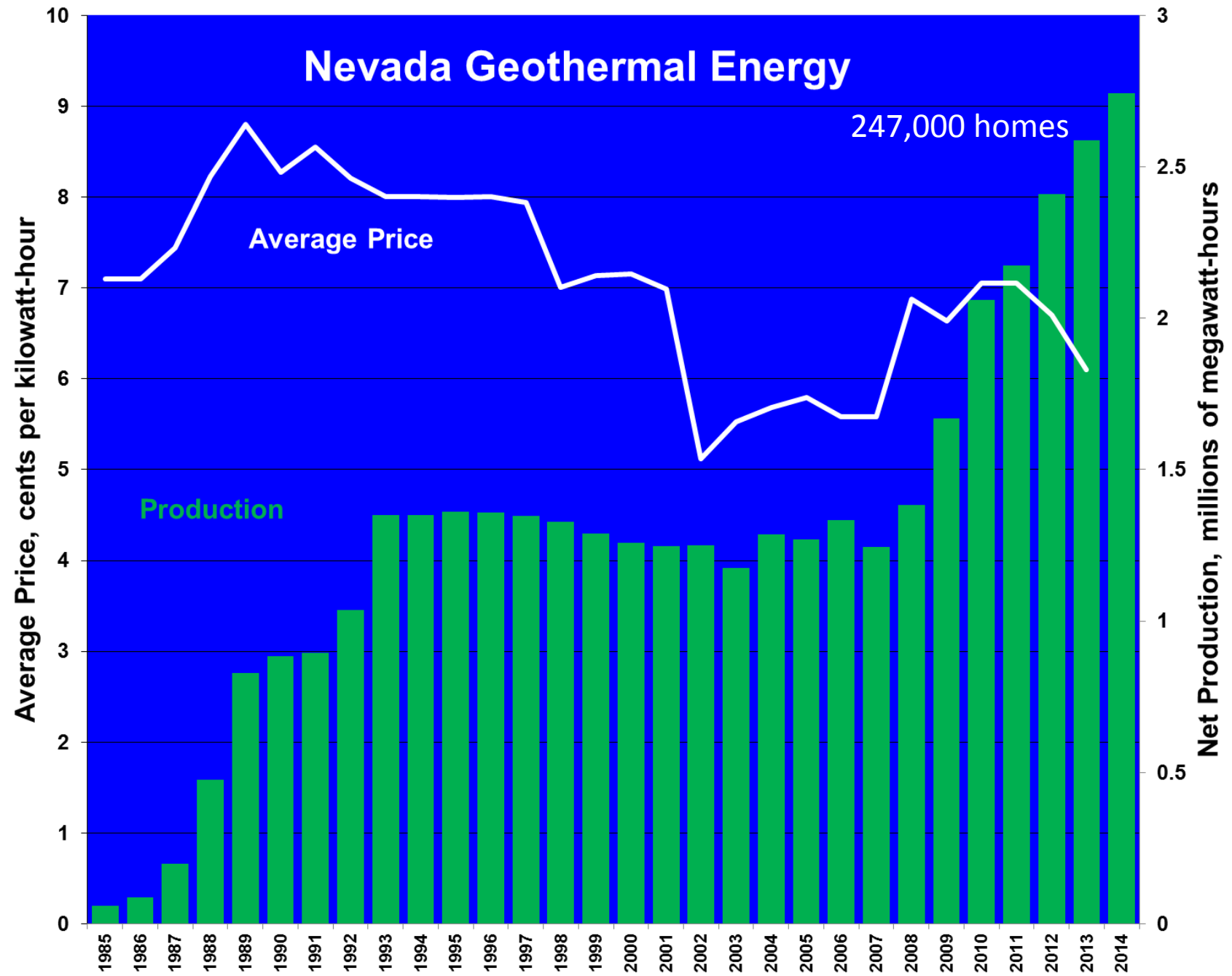
247,000 homes

Average Price, cents per kilowatt-hour

Average Price

Production

Net Production, millions of megawatt-hours





Ormat Technologies Inc: McGinness Hills

Located in Lander County northeast of Austin
Geothermal Power Plant

General

- **First explored for gold in the 1980's due to exposure of high-sulfidation and low-sulfidation hydrothermal alteration products**
- **In 2004 Newcrest Resources encountered hot water during exploration drilling**
- **Each 300 meter exploration hole punctured the sinter cap and intercepted near-boiling waters**
- **Geysering action was observed in one hole**
- **Ormat leased the McGinness Hills Property in 2009**
- **Phase I at 30 MW began operations on June 15, 2012**
- **Phase 2 of commercial operation began February 4, 2015. Total = 72 MW**



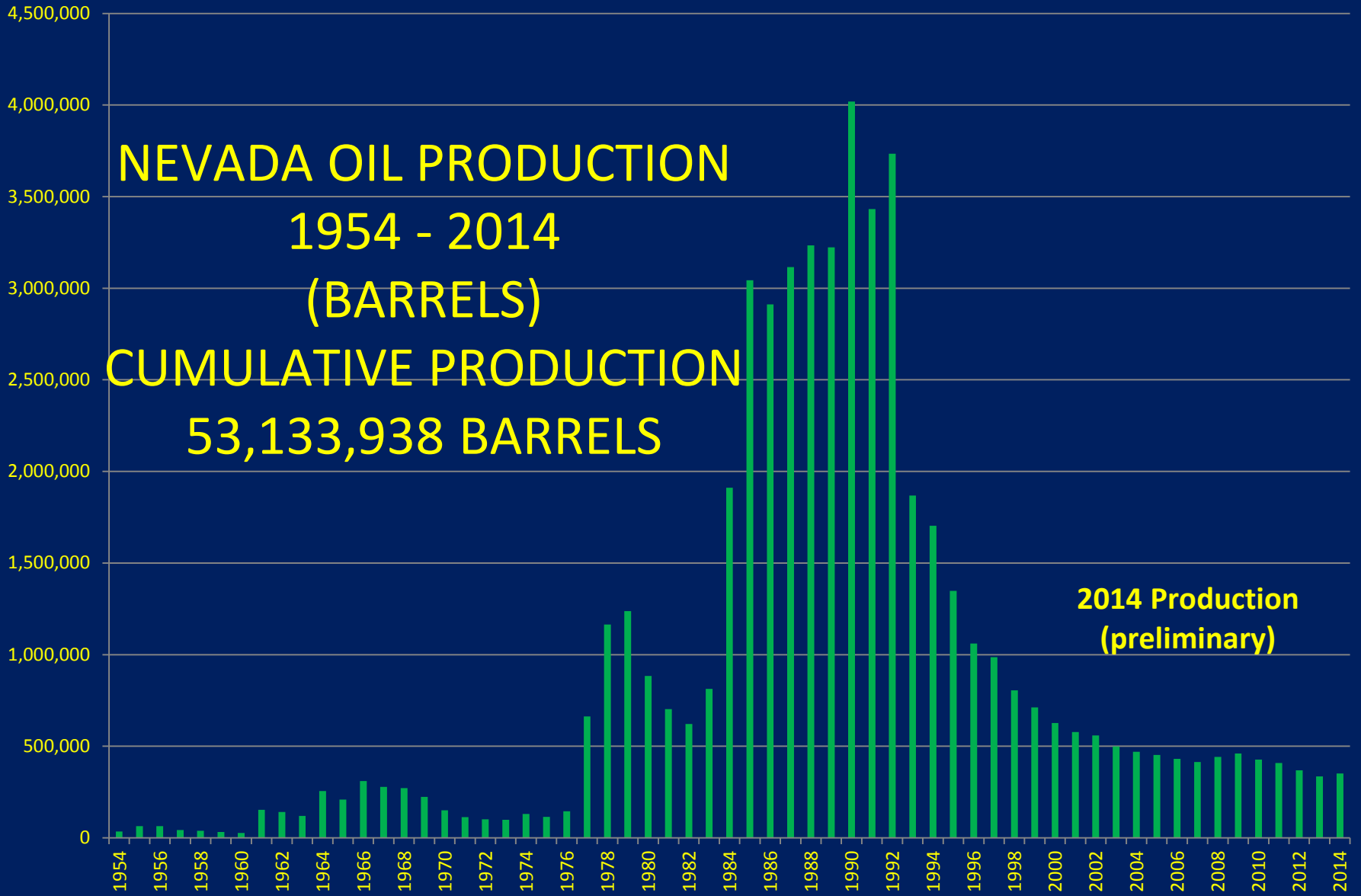
NEVADA OIL PRODUCTION

1954 - 2014

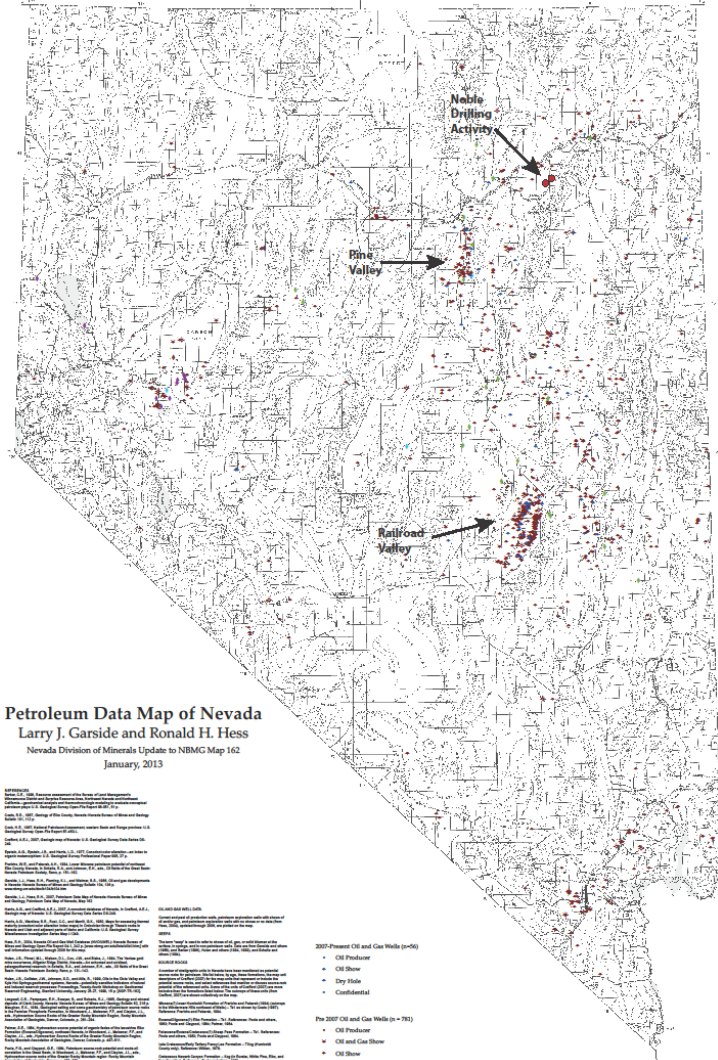
(BARRELS)

CUMULATIVE PRODUCTION

53,133,938 BARRELS



2014 Production
(preliminary)



Petroleum Data Map of Nevada
 Larry J. Garside and Ronald H. Hess
 Nevada Division of Minerals Update to NDMC Map 162
 January, 2013

SYMBOLS: Symbols represent the location of oil and gas wells. Symbols are color-coded by completion date and status. Symbols for oil and gas wells are defined in the legend. Symbols for gas seeps and water wells are defined in the legend. Symbols for oil and gas wells are defined in the legend. Symbols for gas seeps and water wells are defined in the legend.

2007 Present Oil and Gas Wells (n=76)

- Oil Producer
- Oil Show
- Dry Hole
- Combustible

Pre 2007 Oil and Gas Wells (n=782)

- Oil Producer
- Oil and Gas Show
- Oil Show
- Gas Show
- Dry Hole

Seeps and Other Shows

- Gas seep
- Gas above in water well or spring
- Oil seep or hydrocarbon occurrence
- Oil above in water well or spring

Scale: 1 inch equals 12.5 miles
 Base Map Modified from NDMC Map 41, 1995 & NDMC Shaded Relief Map
 Datum: NAD 83
 Map Created by: R. Chappin

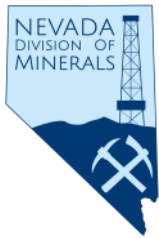
PETROLEUM EXPLORATION WELLS AND PRODUCTION FIELDS IN NEVADA

Field: **bbls oil**

Eagle Springs	39,819
Trap Spring	143,909
Bacon Flat	6,447
Currant	194
Grant Canyon	50,517
Kate Spring	29,401
Duckwater	119
Sans Spring	1,318
Ghost Ranch	17,231
Sand Dune	<u>2,567</u>
Total RR Valley	291,522

Blackburn	40,392
Tomera Ranch	<u>3,757</u>
Total Pine Valley	44,149

Total Nevada **335,672** **-8.8% from 2012**



NRS 522.119 (SB 390)

- **NRS 522.119 Development of program; regulations.**
 1. **The Division of Minerals and the Division of Environmental Protection shall, jointly, develop a hydraulic fracturing program to:**
 - (a) **Assess the effects of hydraulic fracturing on the waters of the State of Nevada**
 - (b) **Require a person who engages in hydraulic fracturing to disclose each chemical used to engage in hydraulic fracturing; and**
 - (c) **Provide for notice to members of the general public concerning activities relating to hydraulic fracturing in this state.**



DEVELOPMENT OF NEVADA'S HF REGULATIONS – UPDATE OF NAC 522

- 1. 7 Member team developed regulations**
- 2. IOGCC - Reviewed regulations of oil-producing states**
- 3. Reviewed BLM proposed rule on hydraulic fracturing**
- 4. Staff discussed what works and what does not with regulators in Arkansas, California, Colorado, Kansas, North Dakota, Ohio, Pennsylvania, Texas and Utah.**
- 5. Benchmarked regulations against other states.**
- 6. LCB review**
- 7. Held public workshops in CC, LV, Elko in March**
- 8. Addressed all comments, modified first draft**
- 9. 2nd LCB review**
- 10. New regulations approved by CMR in August, 2014**
- 11. Recommended for approval by MOAC**
- 12. Approved by Legislative Commission on 10/24/14**



NEVADA HF REGULATIONS SUMMARY

(Update to NAC 522)

APPLICATION:

- application to include minimum 1-mile radius Area of Review
- Groundwater baseline sampling and monitoring of up to 4 existing water wells by operator before and 2X after HF.
- Approved applications with COA's on NDOM web site.

DRILLING

- Cement bond logs and pressure testing to ensure casing integrity
- Intermediate casing required
- Minimum 500' cement for surface, intermediate, production casing

HYDRAULIC FRACTURING

- Pre-approval sundry process for chemicals to be used in HF
- 14 day notification to county commissioners and neighbors

POST-DRILLING

- Operators post HF list on Fracfocus.org within 60 days.



Water-Quality Data, Hydraulic Fracturing in the Upper Humboldt River Basin, Aquifer Quality Assessment Program, Report 2

Ronald L. Hershey
Susan Rybarski
James M. Thomas
Greg Pohll

December 2014

Publication No. 41259

Prepared by
Desert Research Institute, Reno, NV

Prepared for
Noble Energy

AQUA study
By Noble,
NDOM
NDEP, DRI.

Reports 1
and 2 show
no
degradation
of surface or
groundwater

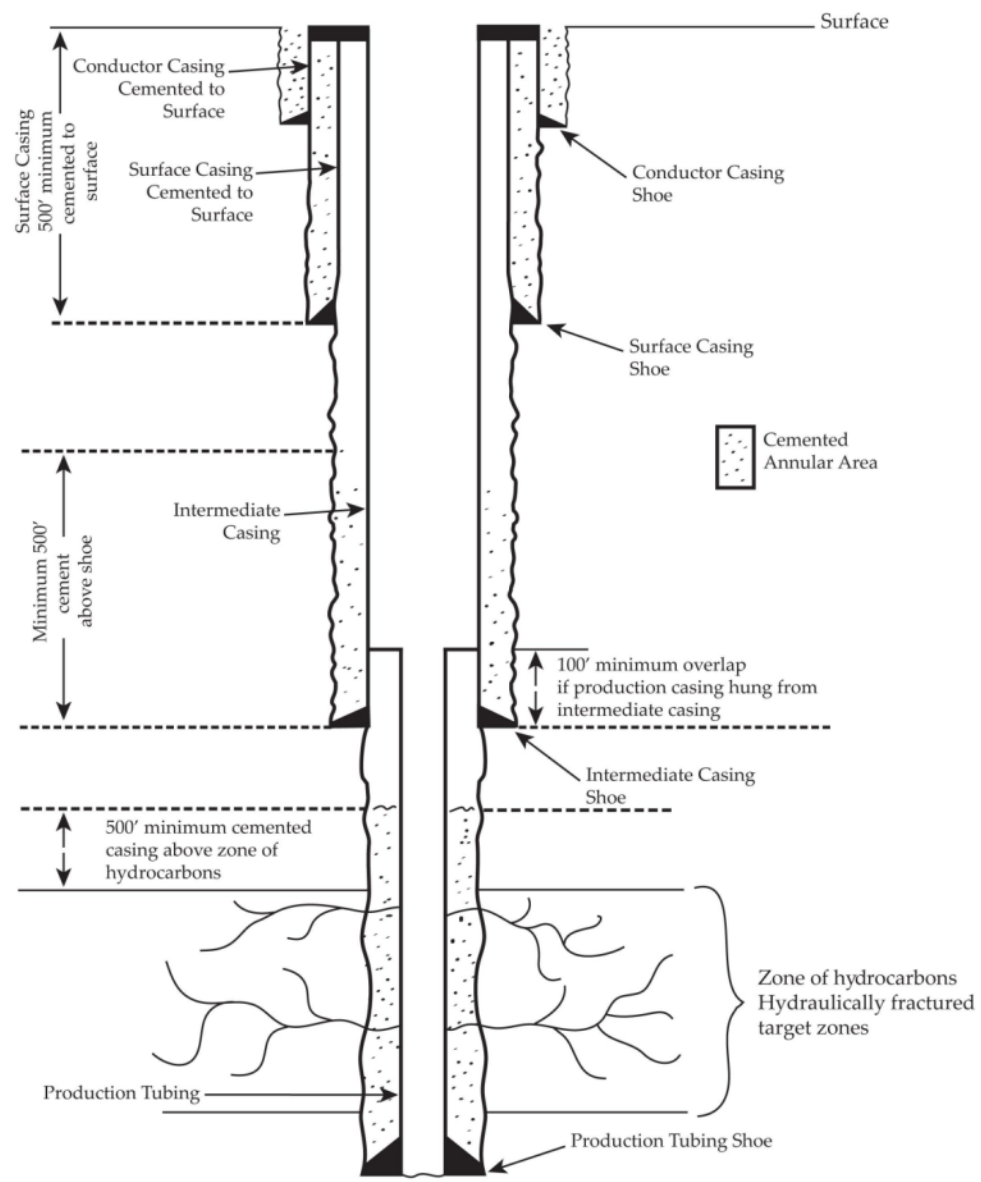


FOUR AGENCIES CAN BE INVOLVED WITH DRILLING AN OIL WELL IN NEVADA

- BLM – drilling on Federal lands, leasing process, NEPA process
- NDEP – Air permits for surface area disturbance, UIC permits if water is to be re-injected, water pollution control permits if water is to be discharged outside of containment.
- NDOM – Permits to drill on private/state lands, coordinates w/ BLM for drill permits on Federal lands.
- NDWR – For any water used in drilling, dust control or hydraulic fracturing



Oil & Gas Resource Well Proposed for Hydraulic Fracturing Vertical





Noble Energy: NE Nevada Oil Play

Unconventional Oil Prospect/Wilson Project

Exploration Stage Unconventional Oil Prospects

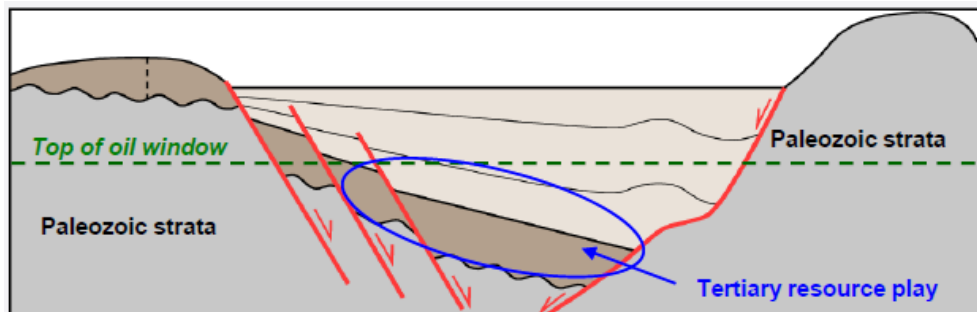
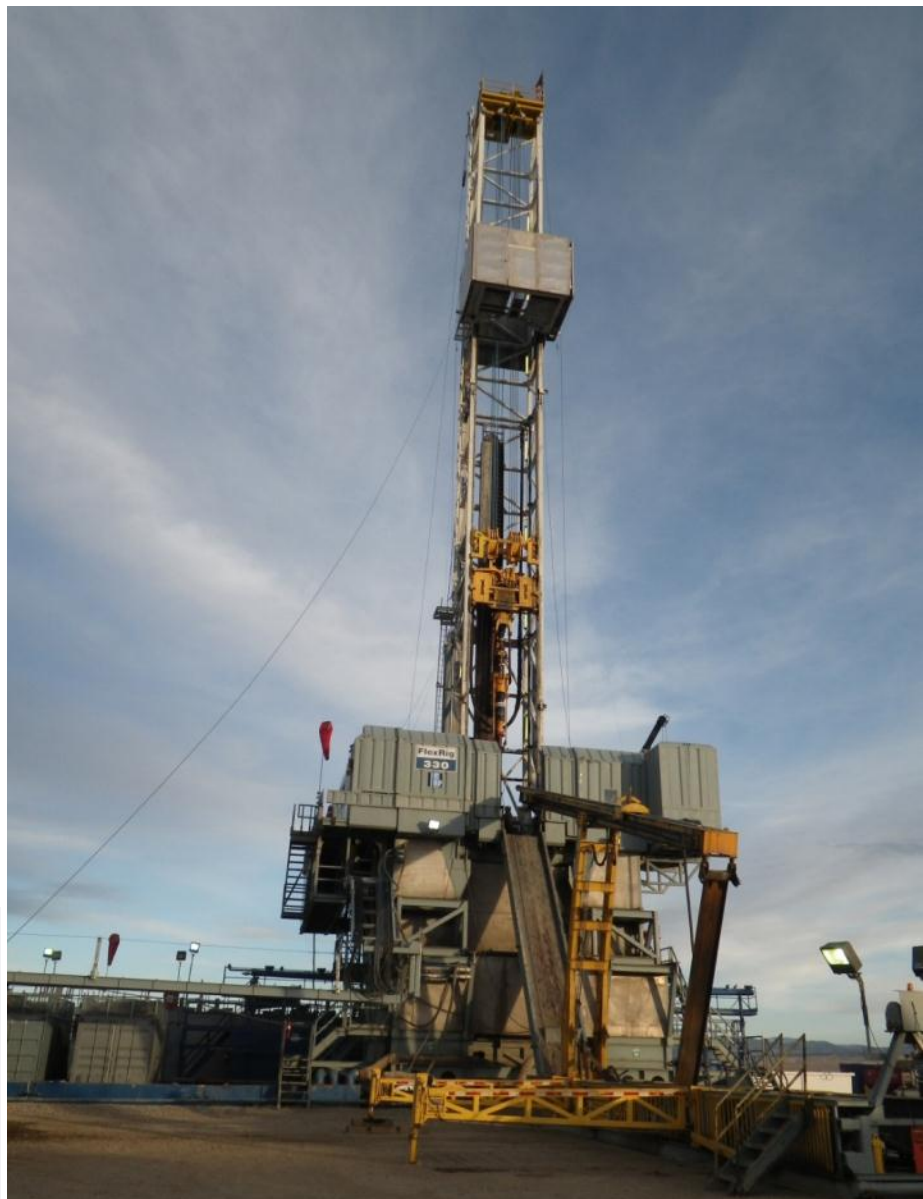
- Targeting Tertiary age lacustrine shale (Elko Formation) with play at depths between 6,000 – 12,000 ft
- Unconventional tight oil prospect
- 4 Wells drilled to date, 3 hydraulically fractured

Encouraging results:

- Hydrocarbon saturation up to 70%
- Thermal maturity in peak oil generation window
- Total organic content 1-24%
- 2 wells recorded oil production

Looking Forward:

- Complete Analysis of data from wells
- Design Completion and conduct production tests





State of Nevada
Commission on Mineral Resources
Division of Minerals



NV gov

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Noble Energy oil exploration well in Elko County



Important Links

- [Nevada Excellence in Mine Reclamation Award Winners Named](#)
- [Final Approved Regulations for Hydraulic Fracturing](#)
- [Nevada Mineral, Oil and Geothermal Energy Production and Selected Projects – Presentation to MOAC December 2, 2014](#)
- [NDOM YouTube Channel](#)
- [Nevada Bureau of Mines and Geology](#)

Employment Announcement(s)

- [Recruitment Announcement for Public Service Intern 2015](#)

Programs

