

Summary of Oil, Geothermal, and Dissolved Minerals Activity 2021-2022

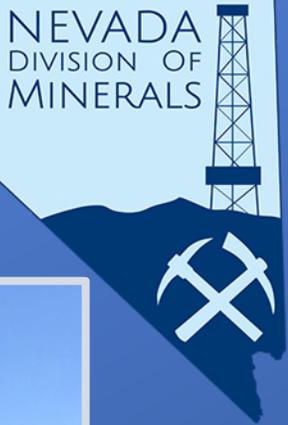
**Nevada Petroleum and Geothermal Society
March 3rd 2022**

**Cortney Luxford
Fluid Minerals Program Manager
Nevada Division of Minerals**



Lowell Price Retired in May 2021

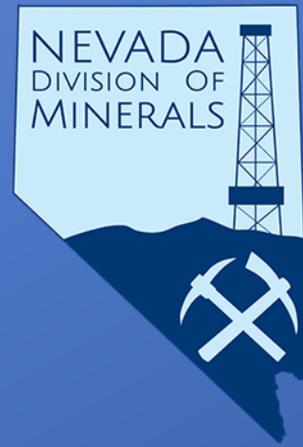
He was with the Division from 2008-2021



Lowell's last well inspection (of many)



Role of the Nevada Division of Minerals



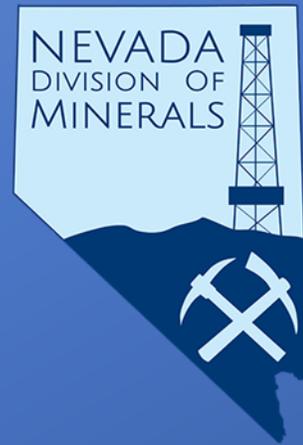
Mission - To encourage and assist in the responsible exploration for and the production of minerals, oil, gas, and geothermal energy which are economically beneficial to the State, to provide for public safety by identifying, ranking and securing dangerous conditions at mines that are no longer operating, and collecting and disseminating information on exploration, production and related topics.

What is included in Fluid Minerals - The Division is responsible for permitting, inspecting, and monitoring all oil, gas, and geothermal drilling activities on both public and private lands in Nevada. Staff also monitors production of oil, gas, and geothermal resources to ensure proper management and conservation. Nevada is a member of the Interstate Oil and Gas Compact Commission. The Division is involved in a wide array of activities relating to mineral development which includes Dissolved Mineral Resource Exploration (primarily lithium brine exploration) permitting.

Source of Funding - Virtually all sources of funds for the Division are from fees and assessments from the mineral industries with which we work, grants, and publication sales. There are no State general funds in the division's budget. Fluid Minerals Program is funded from geothermal annual fees and permit application/sundry fees



Commission on Mineral Resources



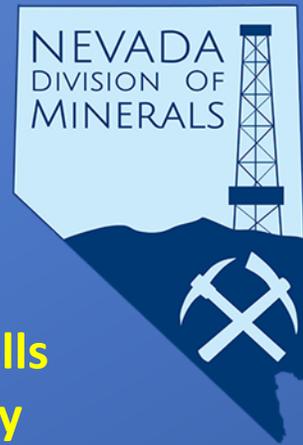
Duties of the Commission

Per NRS 513.063, the duties of the Commission are to:

- 1.Keep itself informed of and interested in the entire field of legislation and administration charged to the Division.**
- 2.Report to the Governor, the Mining Oversight and Accountability Commission created by NRS 514A.040 and the Legislature on all matters which it may deem pertinent to the Division, and concerning any specific matters previously requested by the Governor or the Mining Oversight and Accountability Commission.**
- 3.Advise and make recommendations to the Governor, the Mining Oversight and Accountability Commission and the Legislature concerning the policy of this State relating to minerals.**
- 4.Formulate the administrative policies of the Division.**
- 5.Adopt regulations necessary for carrying out the duties of the Commission and the Division.**



Oil and Gas



The Nevada Division of Minerals is the state's regulatory authority for all oil and gas wells drilled in Nevada. Oil and gas wells drilled within Nevada, on either private or federally managed lands, must be permitted by the Nevada Division of Minerals. The associated drilling and completion programs must be approved by the Division before either program is implemented. The Division oversees the drilling and subsequent completion operations through daily reporting to the Division by the operator, as well as inspect the wells after they are completed. The Division must also approve all maintenance and work-over operations during the life of the well, as well as the final plugging and abandonment of a well at the end of its useful life. Oil and gas production and injection information is submitted to the Division on a monthly basis, where the information is tabulated both monthly and annually.

Last | 12:23 PM EST

110.64 ▲ **+0.04 (+0.0362%)**

Volume

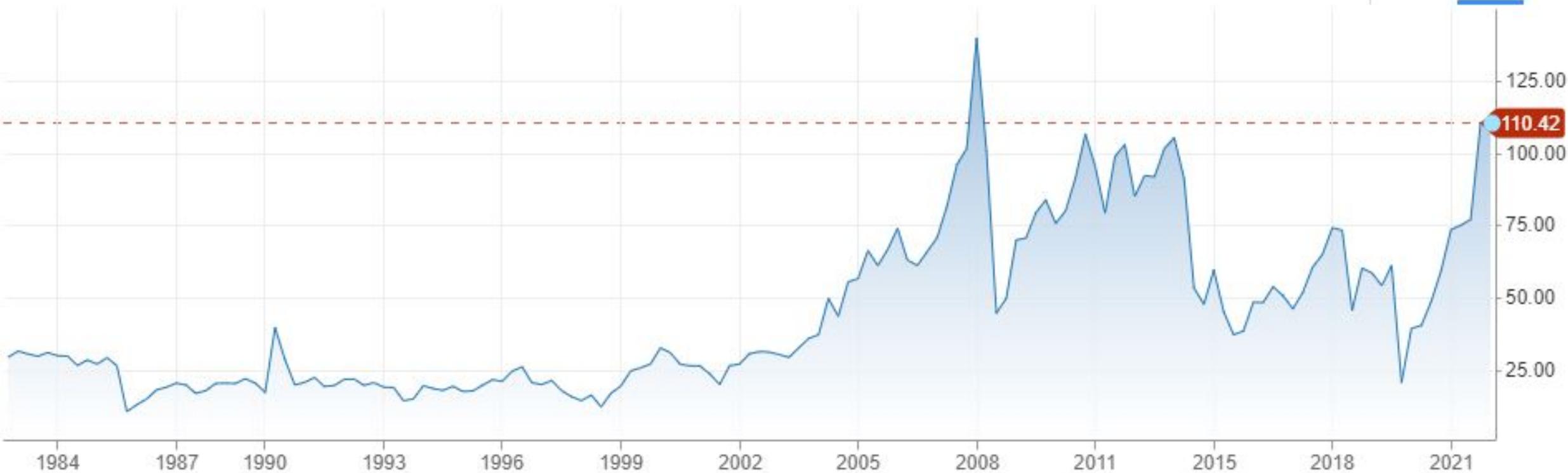
466,847

1D 5D 1M 3M 6M YTD 1Y 5Y **ALL**



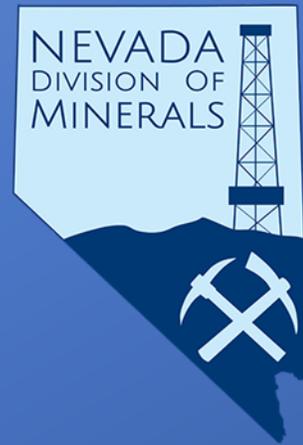
+ Comparison

1M ▾ Display ▾ Studies ▾ ⚙️ | ✎ + 🗨





Oil and Gas Temporary Amendment of Regulations



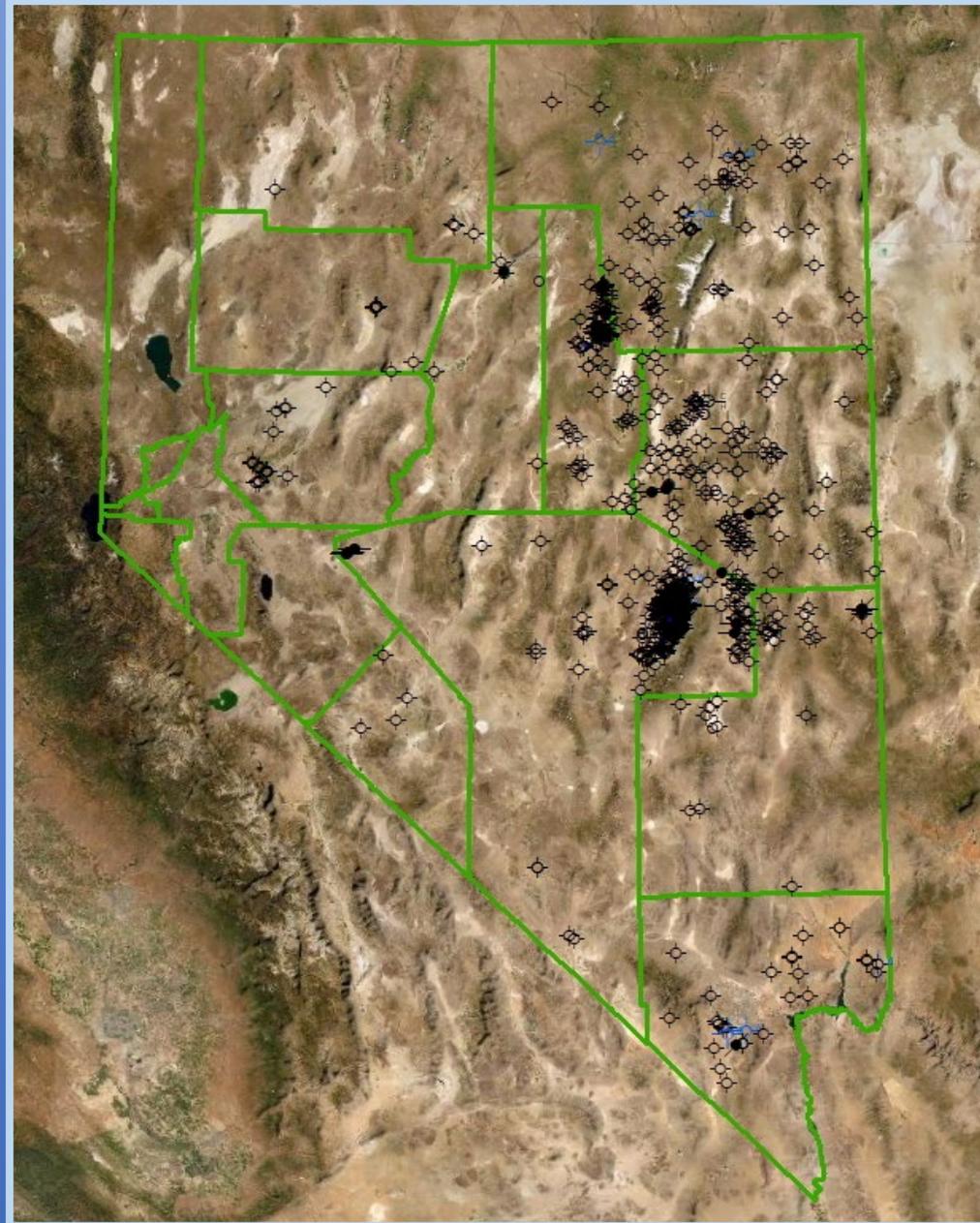
Explanation of the need for the temporarily adopted regulation change to NAC 522

The need for, and the purpose of the temporary amendment of regulation was to provide temporary economic relief to Nevada oil producers by reducing the administrative fee from 15 cents to 5 cents per barrel of oil or per 50,000 cubic feet of natural gas.

This temporary regulation change was in effect from December of 2020 to October of 2021 for a total of 11 months. The reduction from 15 cents to 5 cents a barrel saved Nevada producers a total of \$16,270.32.

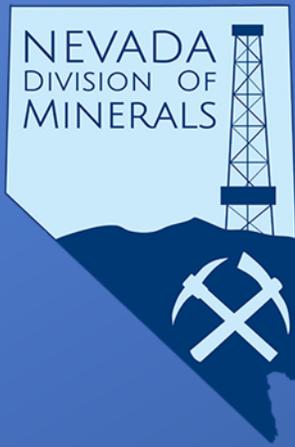


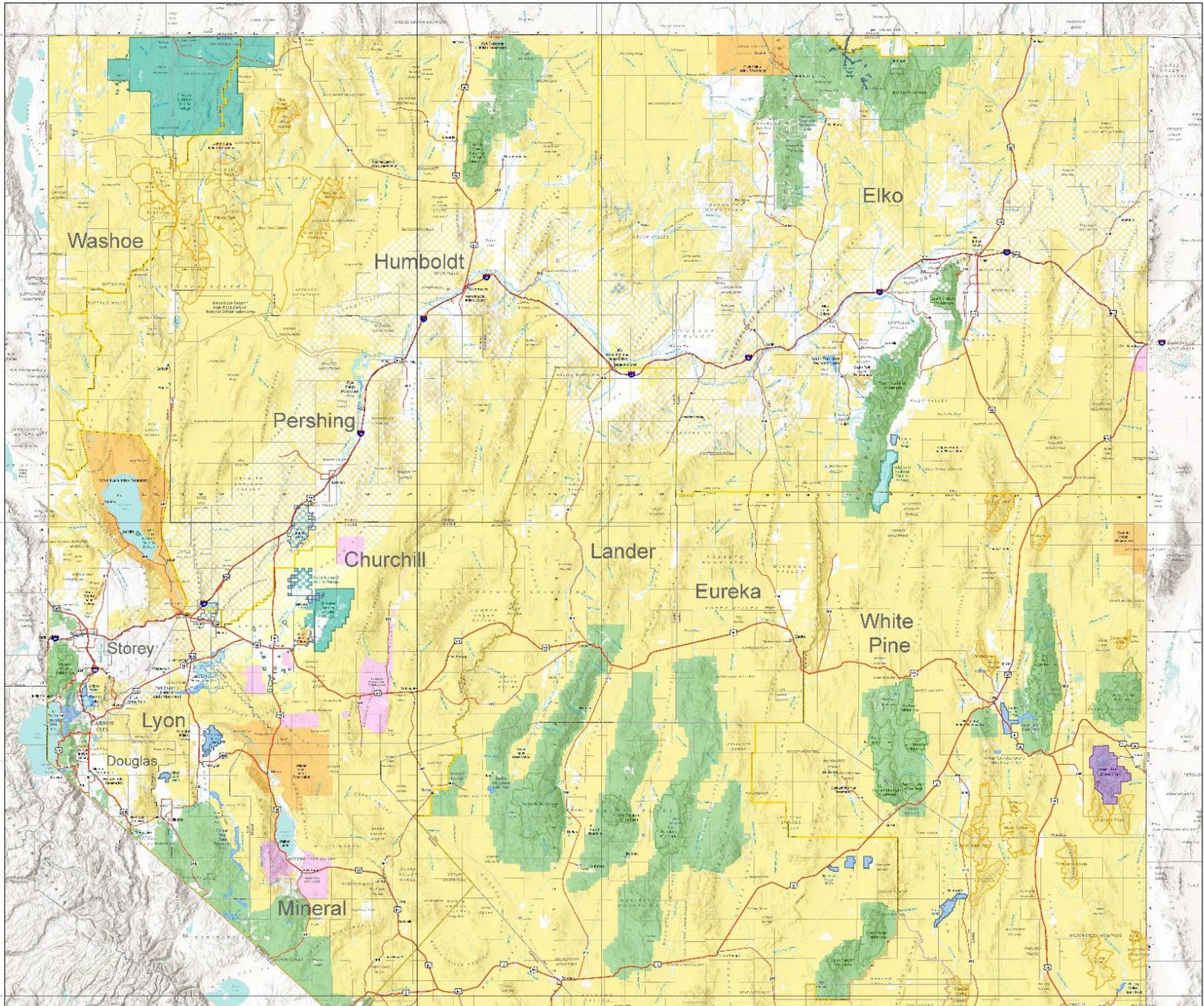
Oil Wells Drilled in Nevada ~742 Total Wells Drilled



121 Open Wells

- 54 Producers Active Wells
- 52 Producers Shut In
- 12 Active Injection Wells
- 3 Shut In Injection Wells
- 6 Orphan Wells(BLM surface)





State of Nevada

Special Management Designation	Surface Management Responsibility
National Conservation Area	Bureau of Indian Affairs
National Monument	Bureau of Land Management
Nevada State Parks	Bureau of Reclamation
NDOW Wildlife Management Areas	County
USFWS Refuges	Department of Defense
USFS Wilderness	Department of Energy
BLM Wilderness	USDA Forest Service
	US Fish and Wildlife Service
	National Park Service
	NV State Lands
	Private

Prepared by
Nevada Natural Heritage Program
March 2020



The federal government owns 81.07 percent of Nevada's total land, 56,961,778 acres out of 70,264,320 total acres.

<https://heritage.nv.gov/documents/nevada-surface-management-wall-map>



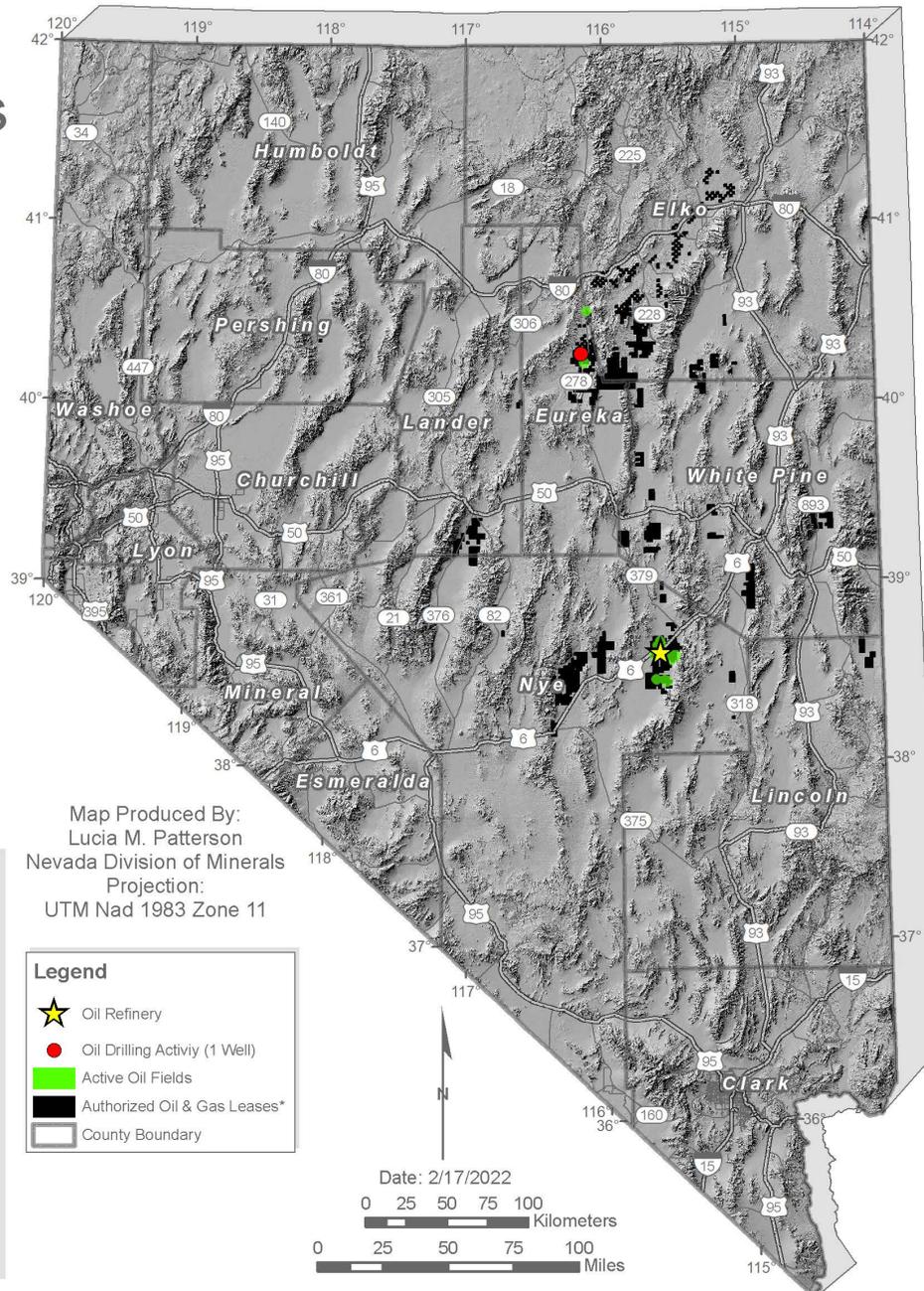
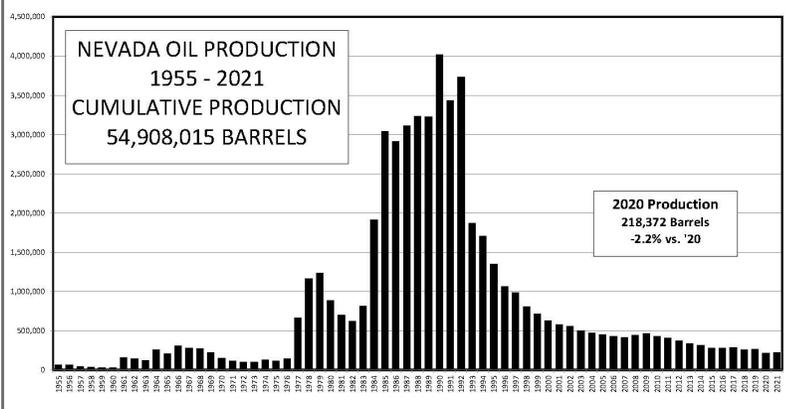
Nevada Oil-Gas Drilling, Production & Federal Leases 2021

As of February 7, 2022 there were 121 permitted oil wells that are active or shut-in.

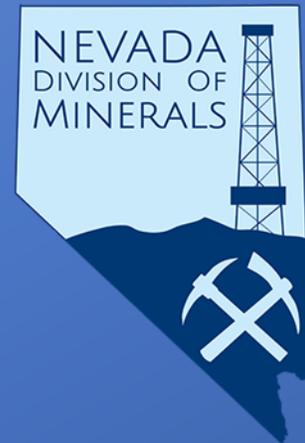
There are currently 10 active oil fields in Nevada

As of January 20, 2022 there were 394 authorized oil leases which total 705,861 acres

There is one oil refinery in Nevada



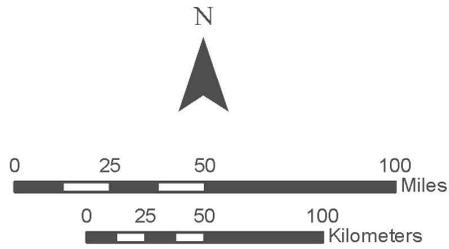
*Authorized leases are plotted by section and do not necessarily depict actual lease boundaries. Lease data as of January 20, 2022



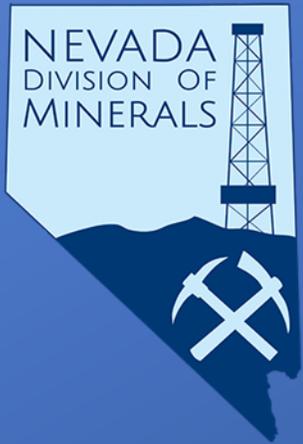
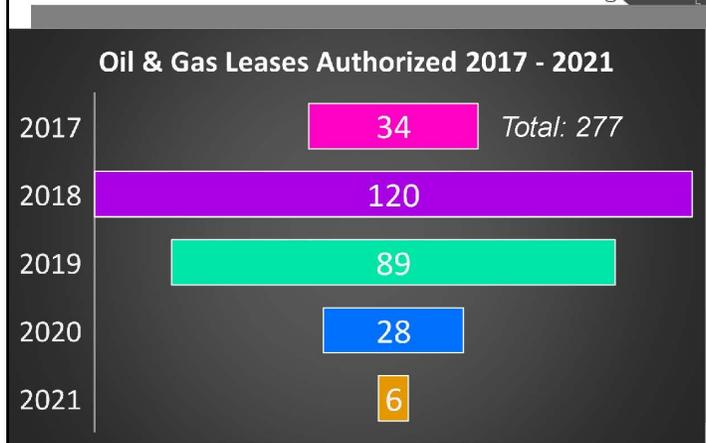
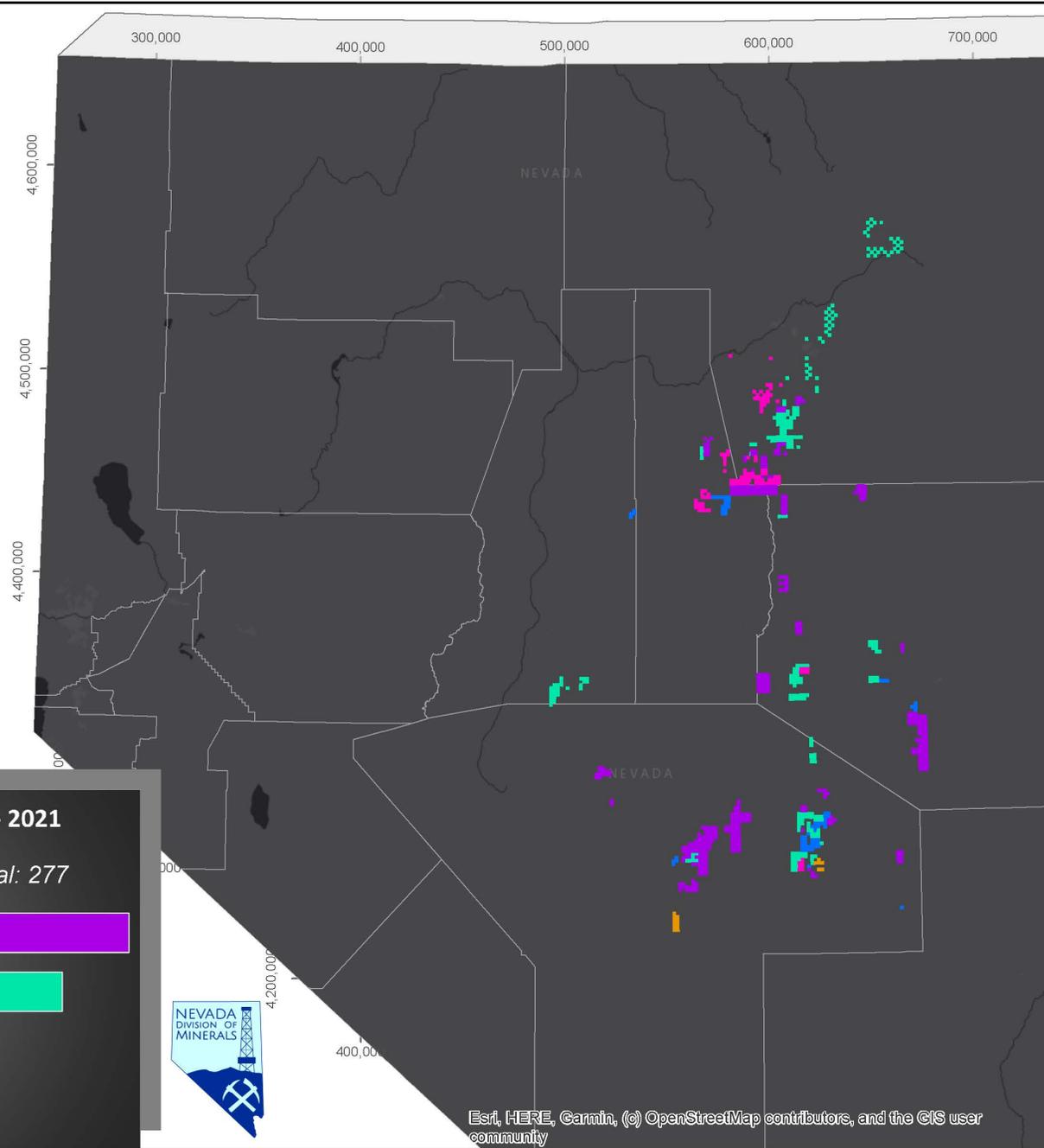


Oil & Gas Leases Issued 2017 - 2021

Map Produced By:
Lucia Patterson, Nevada Division of Minerals
UTM NAD 1983 Zone 11
February 15, 2022



Leases plotted using BLM LR2000 case type codes:
311121, 312021, 311211, & 311111
Action Codes:
237, 209, & 553
Data as of: January 20, 2022

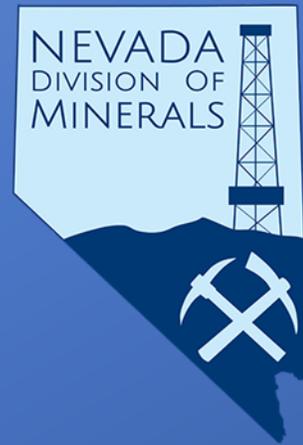




Bureau of Land Management Nevada State Office

Competitive Oil & Gas Lease Sale Results Summary

Tuesday, September 8, 2020

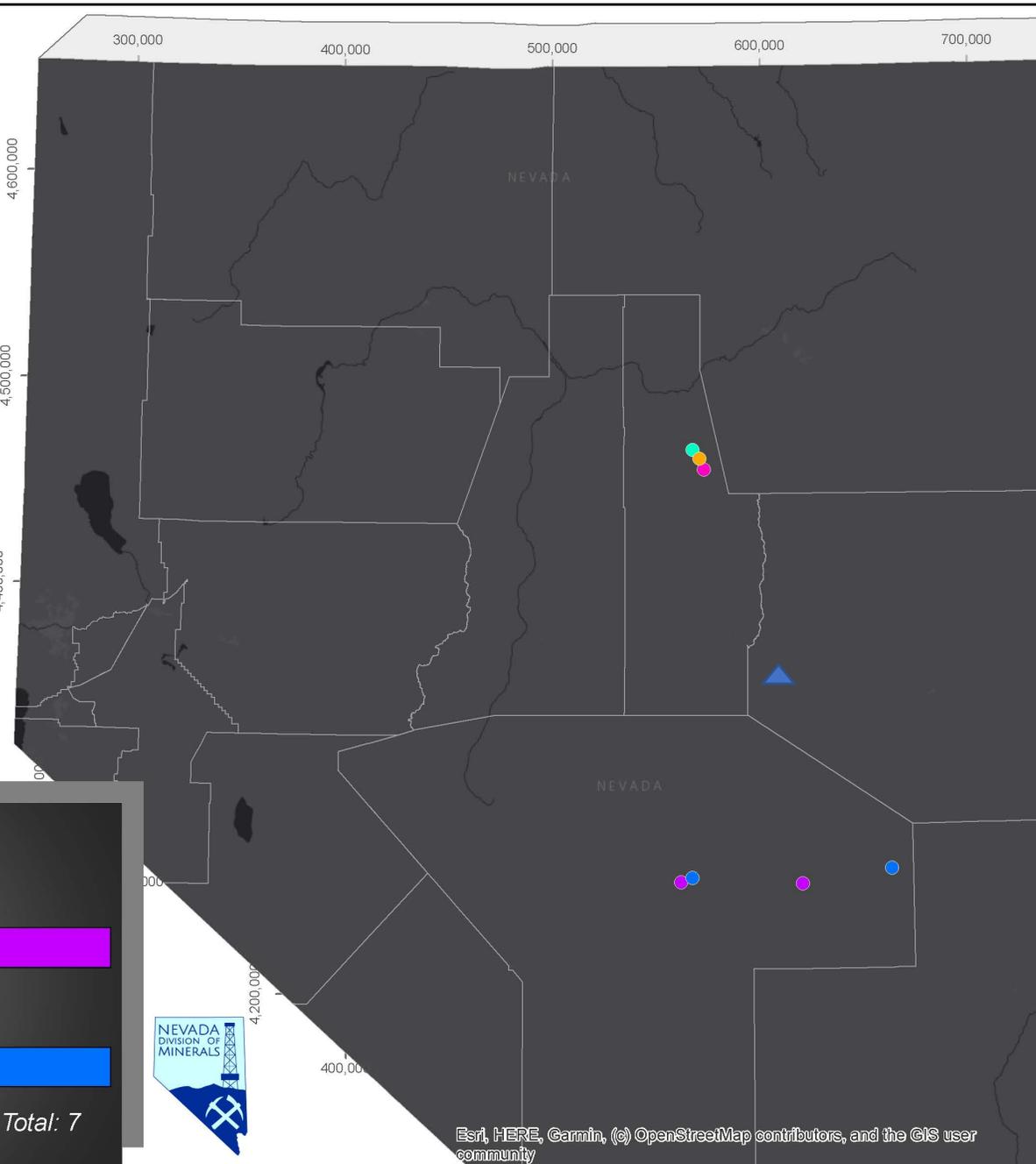


Total Number of Parcels Posted in Original Sale Notice:	14
Total Number of Acres Posted in Original Sale Notice:	16913.611
Total Number of Parcels Protested:	7
Total number of Acres Protested:	10459.141
Total Number of Protests Received on the Sale:	1
Total Number of Parcels Removed as a Result of Protests:	0
Total Number of Parcels Removed for Other Reasons:	0
Total Number of Parcels Offered (Day of Sale):	11
Total Number of Acres Offered (Day of Sale):	15445.201
Total Number of Registered Bidders:	9
Total Number of Parcels Receiving Bids:	11
Total Number of Acres Receiving Bids:	15445.201
Total Sum of High Bids:	\$63,382.00
High Bid Per Parcel:	\$21,150.00
High Bid Per Acre:	\$9.00
Total Receipts:	\$88,422.50



Oil Wells Drilled 2017 - 2021

Map Produced By:
Lucia Patterson, Nevada Division of Minerals
UTM NAD 1983 Zone 11
February 15, 2022

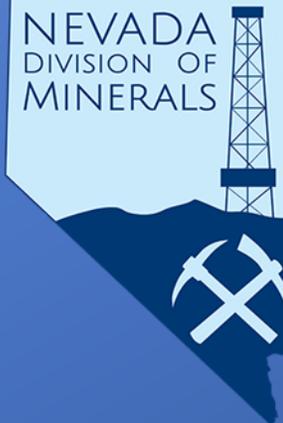


Oil Wells Completed 2017-2021

2017	1	
2018	2	
2019	1	
2020	2	
2021	1	Total: 7

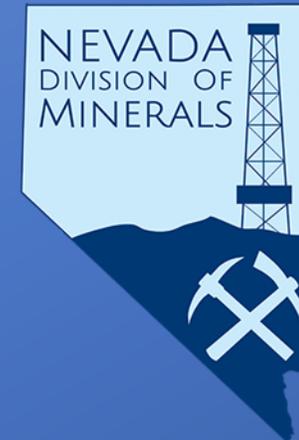


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Oil Exploration Permitting 2017- Present



Envy Energy, Railroad Valley(Northern Part of Valley, White Pine County)

- Permitted Black Point East #1, approved February 2018, expired February 2020

West Grant Canyon Development, LLC, Railroad Valley, Nye County

- Permitted Butterfield Federal 1, approved June 2019, expired June 2021

Western Oil Exploration, Newark Valley, White Pine County

- Permitted Scott Federal 25-1, approved May 2020, expires May 2022

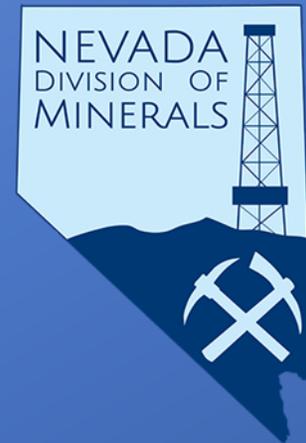
Kebo Oil and Gas, Inc., Railroad Valley, Nye County

- Permitted Ragged Ridge 1, approved November 2020, expires November 2022

Permit Type	Issued	Drilled										
Year	2017	2017	2018	2018	2019	2019	2020	2020	2021	2021	2022	2022
Oil & Gas	0	1	3	1	3	1	4	3	1	2	0	0



Oil Exploration Drilling 2017- Present



True Oil, Railroad Valley, Nye County (1 well)

- Spudded DY Federal 13-31 in December 2017, P&A January 2018

Major Oil International, Hot Creek Valley, Nye County (2 wells)

- Spudded Eblana 3 in April 2018, completed drilling in May 2018, P&A in May 2019
- Spudded Eblana 9 in November 2020, completed in December 2020, P&A April 2021

Grant Canyon Oil and Gas, Three Bar, Pine Valley, Eureka County (2 wells)

- Spudded Three Bar Federal 25-2 in May of 2019, completed well in August of 2019, well is averaging 944 bbls of oil and 807 bbls water per month during the 28 months of production.
- Spudded Three Bar Federal 6R July 2021, re-entry of existing well, completed October 2021, well is averaging 87 bbls oil and 574 bbls water per month in 3 months of production.

Sam Oil, LLC, White River Valley, Nye County (1well)

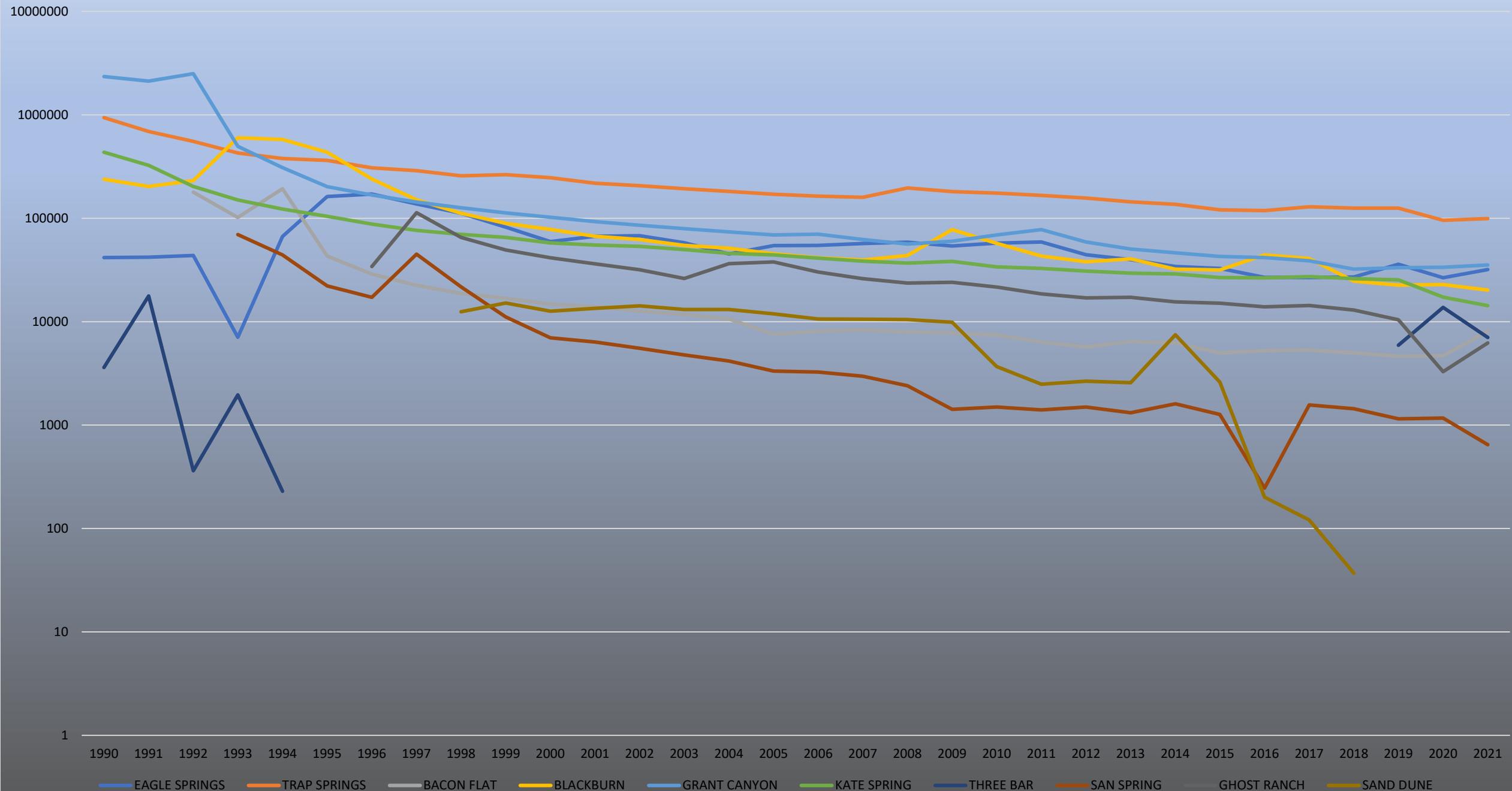
- Spudded White River Valley 1-9 May 2018, well is shut in and waiting on re-entry.

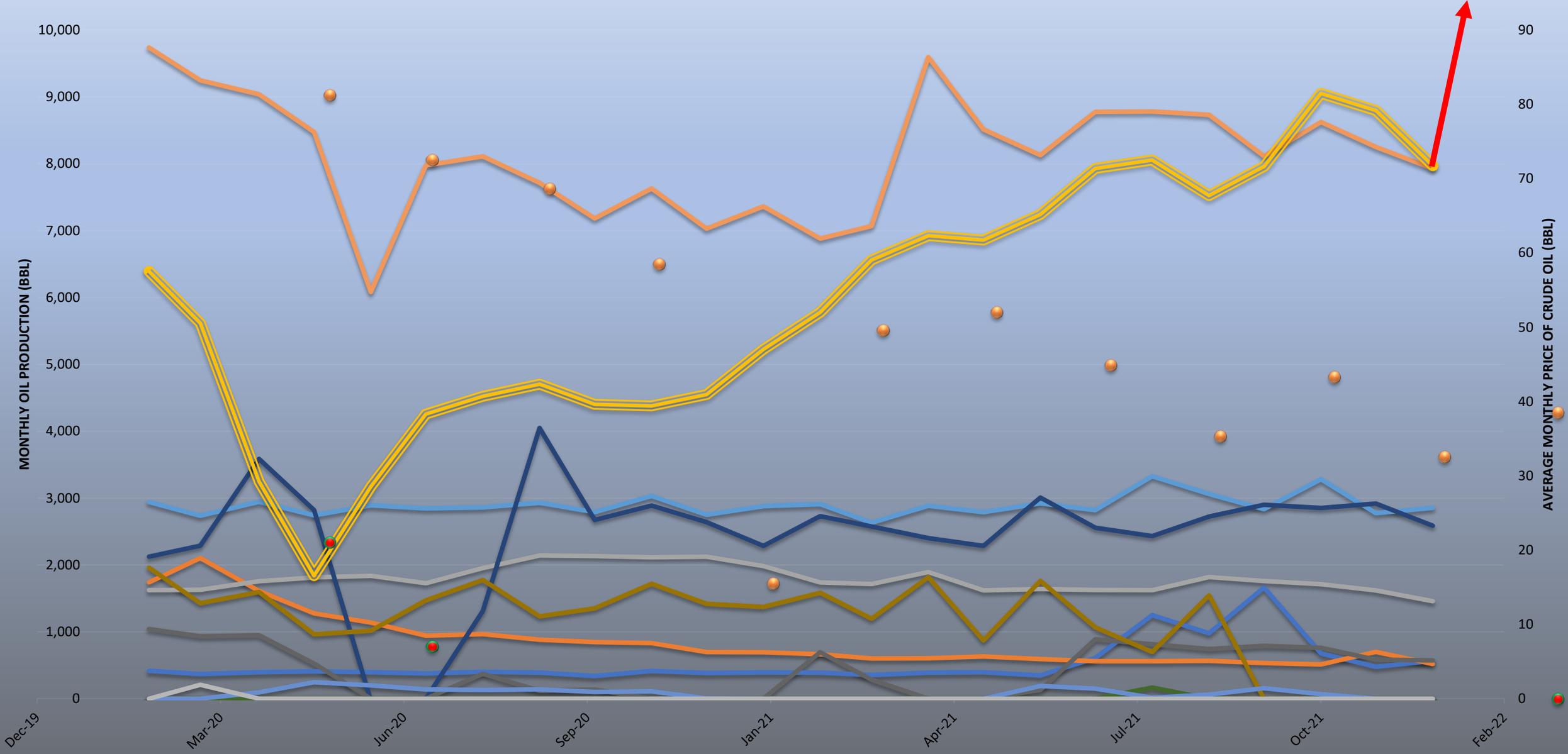
Western Oil Exploration, Newark Valley, White Pine County (1 well)

- Spudded Scott Federal 35-1 in July 2020, BLM shut down operations due to violations, re-entry in September of 2021 and shut down again due to Sage Grouse restrictions. Plan to re-enter in July 2022

YEAR	EAGLE SPRINGS	TRAP SPRINGS	CURRANT	BACON FLAT	BLACKBURN	GRANT CANYON	KATE SPRING	TOMERA RANCH	N WILLOW CREEK	THREE BAR	DUCK-WATER	SANS SPRING	GHOST RANCH	DEAD-MAN CREEK	SAND DUNE	TOANA DRAW	HUMBOLDT	HUNTINGTON	TOTAL PROD.
1954-1989	3,945,917	7,901,672	641	314,660	1,905,504	11,838,587	271,148	6,478	13,493										26,198,100
1990	41,609	939,910	0	0	238,240	2,345,858	434,349	2,605	3,169	3,601	3,095								4,012,436
1991	42,043	690,697	0	0	203,023	2,124,021	324,207	3,067	2,365	17,684	4,190								3,411,297
1992	43,691	554,410	0	178,845	231,719	2,499,831	203,274	2,295	4,491	362	2,764								3,721,682
1993	7,075	427,150	0	102,030	599,857	495,934	150,309	2,140	3,928	1,961	2,256	69,478							1,862,118
1994	66,565	378,829	0	192,601	576,853	308,709	122,544	1,970	3,737	229	1,269	44,279							1,697,585
1995	162,296	362,985	278	43,057	435,975	202,129	104,574	1,405	6,419	0	655	22,174							1,341,947
1996	171,638	306,858	0	28,891	239,934	168,163	87,789	387	3,619	0	433	17,228	34,166						1,059,106
1997	137,278	288,686	202	22,465	151,151	143,707	76,280	659	1,478	0	168	45,001	113,016	109					980,200
1998	111,562	257,921	230	18,757	112,008	126,128	69,768	574	1,502	0	491	21,759	65,370	258	12,465				798,793
1999	82,067	263,566	28	16,849	89,400	112,715	65,315	398	123	0	93	11,127	49,348	0	15,122				706,151
2000	59,394	246,725	55	14,766	78,136	102,113	57,644	488	146	0	116	6,990	41,454	0	12,624				620,651
2001	67,024	218,198	33	13,898	66,899	92,899	55,198	0	144	0	968	6,356	36,173	0	13,461				571,251
2002	67,908	206,424	21	12,647	62,412	85,722	53,408	11,901	573	0	869	5,532	31,814	0	14,211				553,442
2003	57,946	193,191	23	11,763	54,623	79,293	49,698	1,981	349	0	436	4,775	26,129	0	13,123				493,330
2004	45,176	181,937	9	10,612	51,372	73,879	45,656	124	377	0	200	4,169	36,423	0	13,124				463,058
2005	54,362	170,896	3	7,556	45,369	68,944	44,288	0	2,064	0	185	3,324	37,874	0	11,878				446,743
2006	54,708	163,299	0	8,112	41,491	70,158	41,124	0	2,552	0	122	3,265	30,255	0	10,618				425,704
2007	56,992	159,821	81	8,301	39,477	62,236	38,411	0	1,256	0	150	2,971	26,070	0	10,562	1,916			408,244
2008	58,683	196,089	108	7,968	43,600	56,247	36,863	0	56	0	120	2,407	23,615	0	10,467	48			436,271
2009	53,851	181,320	111	7,764	77,730	60,036	38,347	0	0	0	120	1,419	24,011	0	9,883	0			454,592
2010	57,394	175,352	109	7,427	57,260	68,927	33,825	0	0	0	118	1,493	21,630	0	3,687	0			427,222
2011	58,900	166,415	119	6,358	43,198	77,683	32,719	0	0	0	115	1,404	18,605	0	2,483	0			407,999
2012	44,422	156,991	159	5,690	38,004	58,897	30,833	11,705	0	0	117	1,498	17,022	0	2,656	0			367,994
2013	39,818	143,909	194	6,447	40,392	50,517	29,402	3,757	0	0	119	1,318	17,231	0	2,567	0			335,671
2014	34,217	136,651	143	6,223	32,217	46,263	28,934	2,016	0	0	124	1,604	15,564	0	7,467	0	2,756	2,248	316,426
2015	32,675	120,762	25	5,000	31,605	42,810	26,672	1,224	0	0	45	1,268	15,106	0	2,606	0	0	1,584	281,382
2016	26,872	118,847	0	5,261	44,180	41,631	26,486	961	0	0	0	246	13,914	0	201	0	0	854	279,453
2017	26,716	129,104	0	5,325	40,767	38,861	27,287	854	0	0	0	1,567	14,345	0	121	0	0	9	284,956
2018	27,035	125,262	0	5,000	24,625	32,126	26,102	385	0	0	0	1,437	12,959	0	37	0	0	0	254,968
2019	35,979	125,540	0	4,623	22,559	33,314	25,428	372	0	5,910	0	1,148	10,450	0	0	0	0	0	265,323
2020	26,648	95,587	0	4,692	22,838	33,591	17,307	208	0	13,737	0	1,170	3,290	0	0	0	0	0	219,068
2021	31,971	99,400	0	8,103	20,235	35,389	14,304	0	0	7,054	0	646	6,224	0	167	0	0	0	223,493
TOTAL	5,830,432	15,884,405	2,572	1,091,691	5,762,653	21,677,318	2,689,492	57,954	51,841	50,538	19,338	287,053	742,059	367	169,530	1,964	2,756	4,694	54,326,657

Nevada Major Fields Production 1990-2021

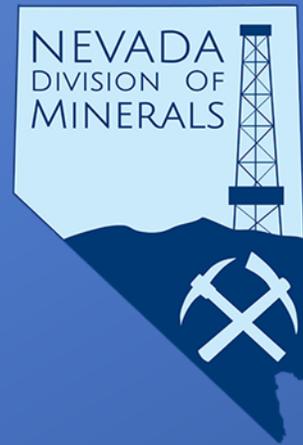




- Bacon Flat
- Grant Canyon
- Ghost Ranch
- Sans Spring
- Three Bar
- Duckwater
- Kate Springs
- Trap Springs
- Blackburn
- Eagle Springs
- Tomera Ranch
- Currant
- EXP
- Sand Dune
- Average Monthly Commodity Price



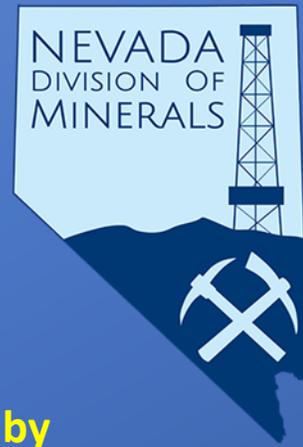
Three Bar Fed. #6R Eureka County, NV Project Overview



- **Why the shallow Tertiary was targeted?**
 - The Tertiary was proven in 2019 in Well #25-2
 - High oil cut
 - Large, Thick oil resource (>700 ft vertical in Upper Tertiary)
 - Shallow depth target
 - 26,850 bbls oil produced thru Dec.2021 from Well #25-2
- **Why the plan for horizontal wellbore?**
 - More exposure in target pay improves initial oil rate, economics, and long-term recovery
 - Higher oil prices in 2021 (deferred from 2020)



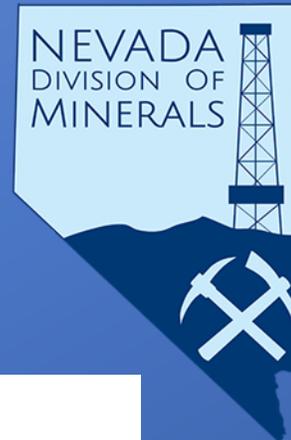
Three Bar Fed. #6R Eureka County, NV Project Overview



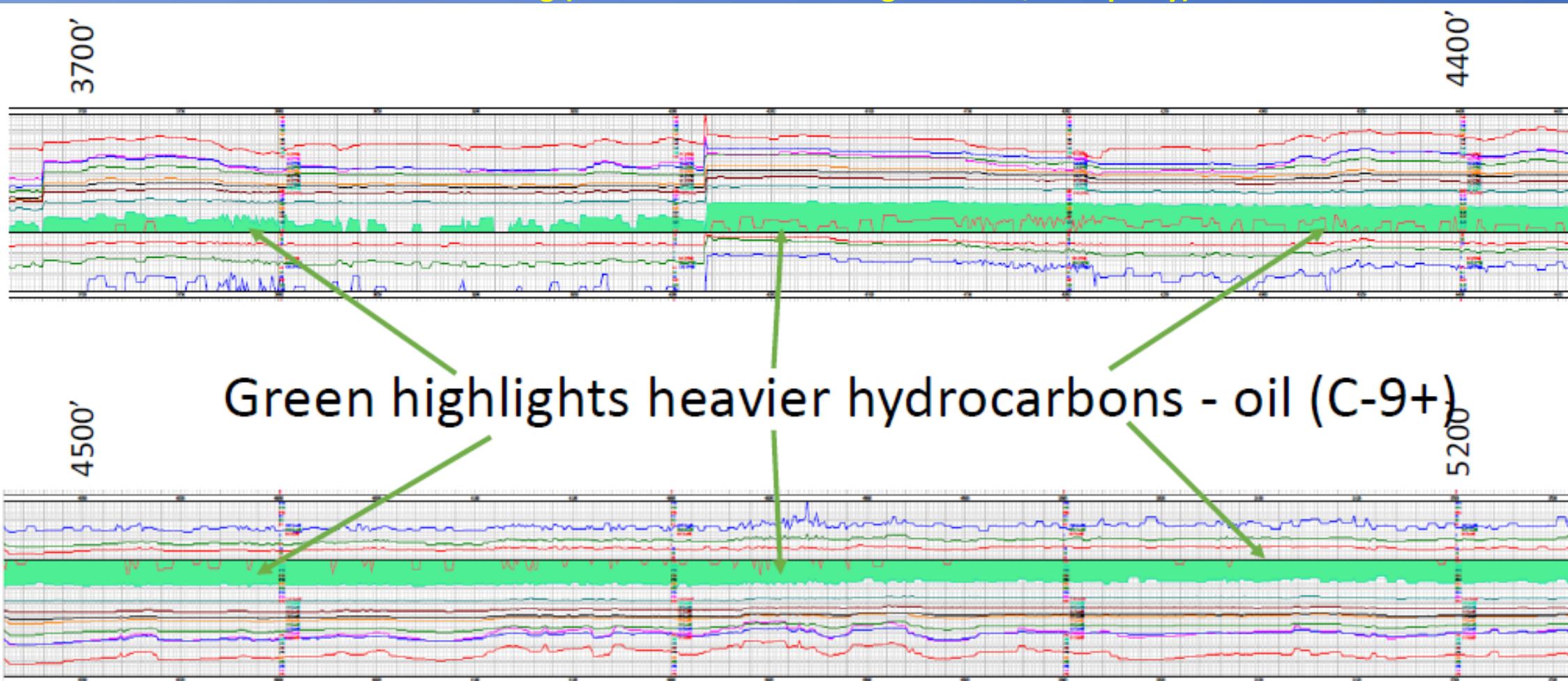
- **Upper Tertiary Proven –**
 - Initially in #25-2 –current Producer.
 - Drilling Well #6R encountered nearly 2,000 ft lateral of oil bearing reservoir as exhibited by surface samples and mass spectrometer shows
- **Lower Tertiary Proven –**
 - Discovered and produced in well #25A during 1991
 - Oil cut peaked at 50% and cum'd 18,250 BO, non-stimulated (Andesite section)
 - Deeper #25A pump test produced 50%-90% oil cut, non-stimulated (U.IW Oligocene)
 - Well #25-2 confirmed two oil show intervals by cuttings and mass spec'
- **Westward extension from previous offset wells proven –essentially drilled 3-4 vertical wells with single horizontal cutting multiple horizons**
- **Well #6R drilled to base of Tertiary and proved structure of both Upper and Lower Tertiary zones to the west**



Three Bar Fed. #6R
Eureka County, NV
Project Overview



Well #6R Upper Tertiary: Example of mass spectrometer log while drilling (continuous zone-strong behavior, not spotty)



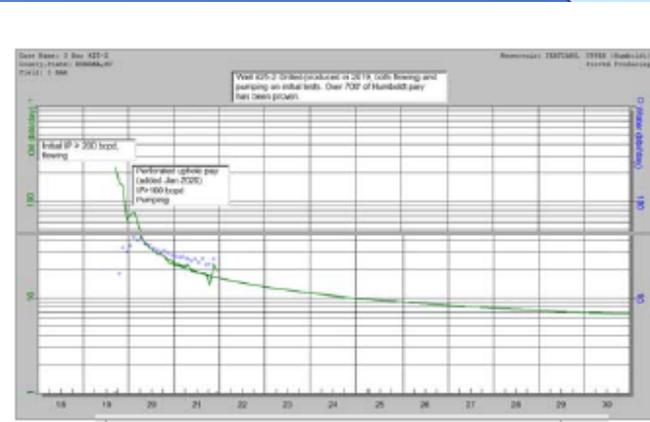
Courtesy Grant Canyon Oil And Gas



Three Bar Fed. #6R Eureka County, NV Project Overview



Well #6R Upper Tertiary



Upper Tertiary : Well #25-2
Vertical wellbore
26,850 bo to date

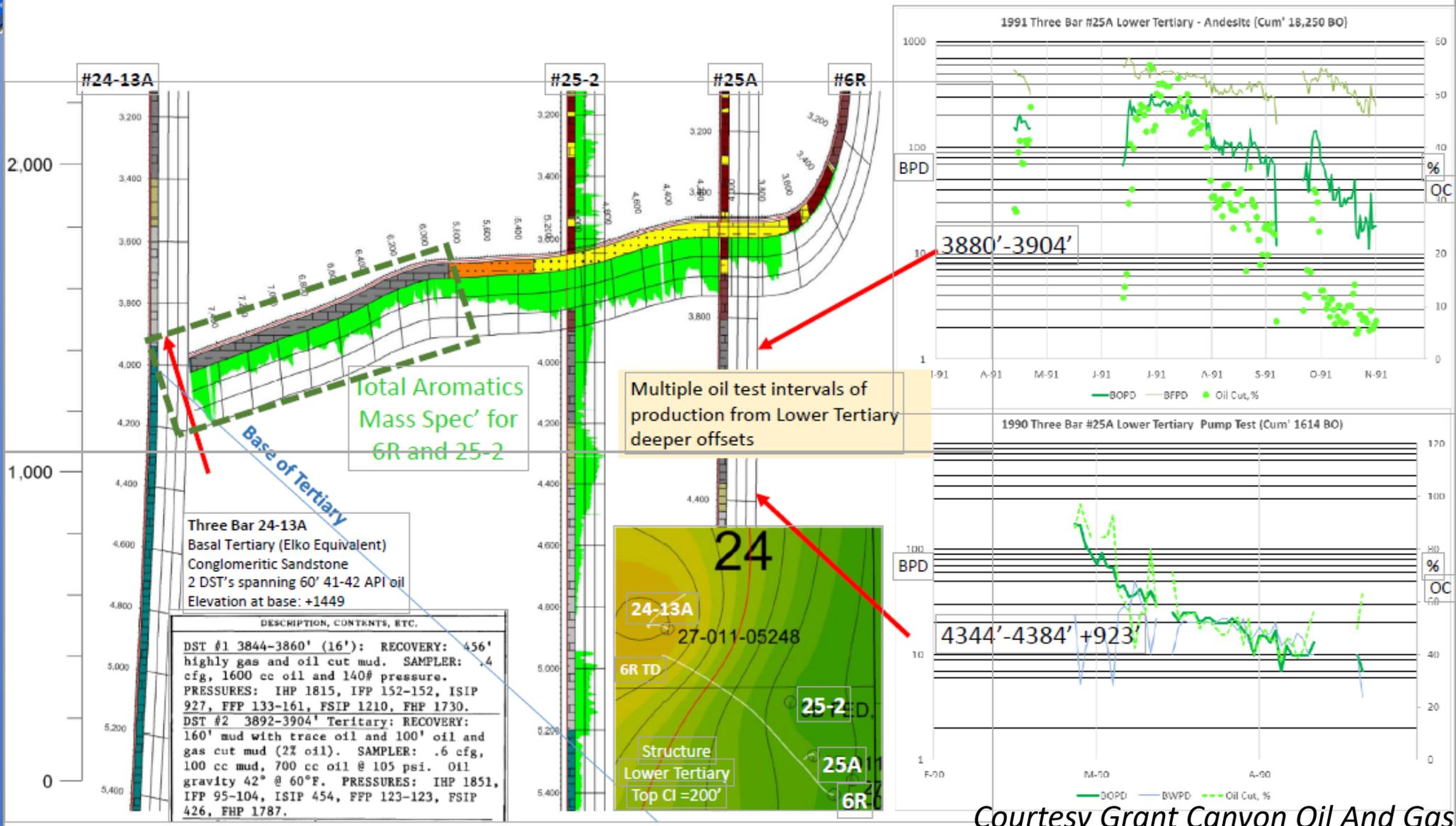
Upper Tertiary : Well #6R
Successful cut in lateral pay
nearly 2,000 ft in strong oil
shows/presence

Courtesy Grant Canyon Oil And Gas

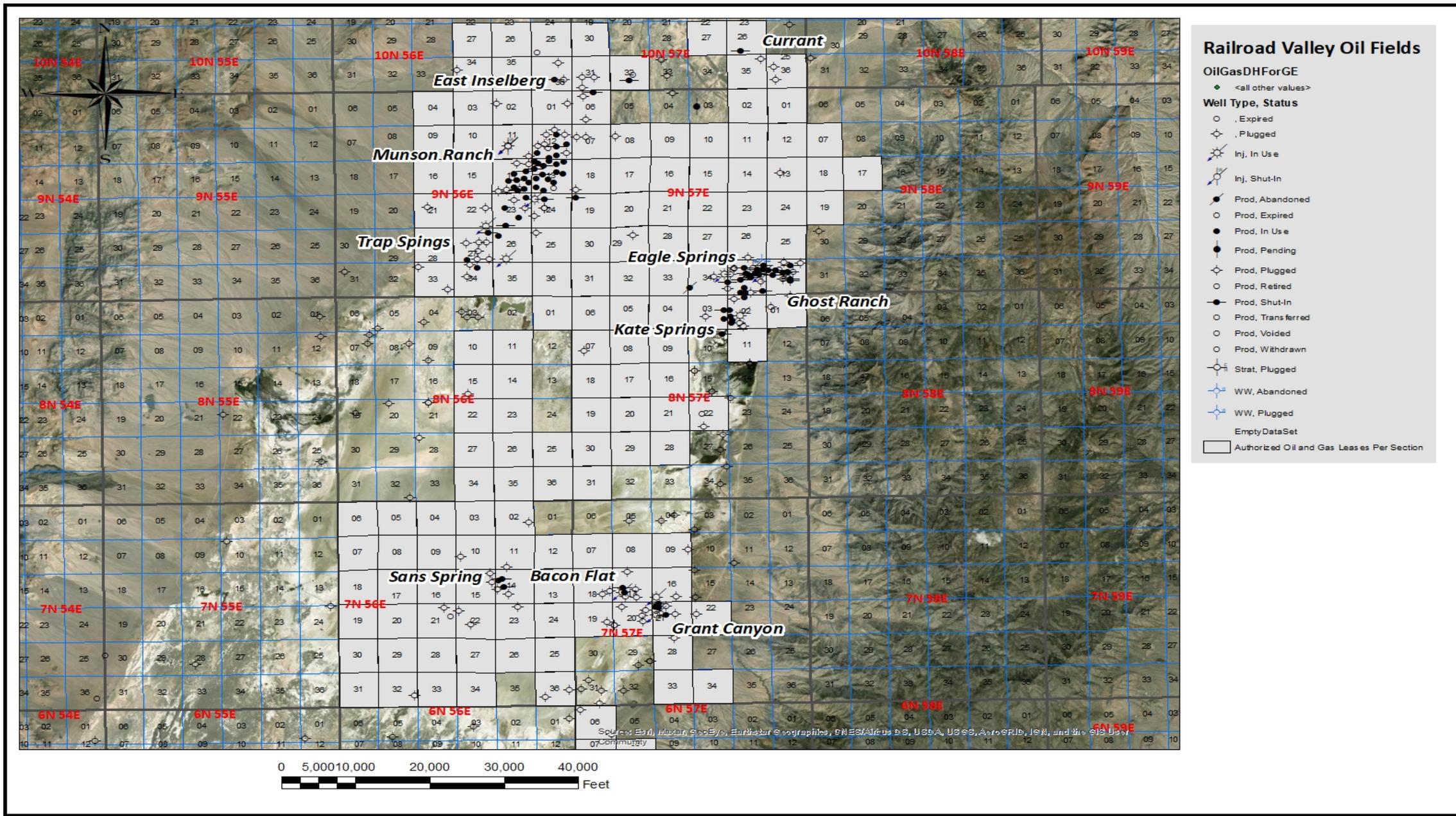


Well #6R Lower Tertiary

Three Bar Fed. #6R Eureka County, NV Project Overview

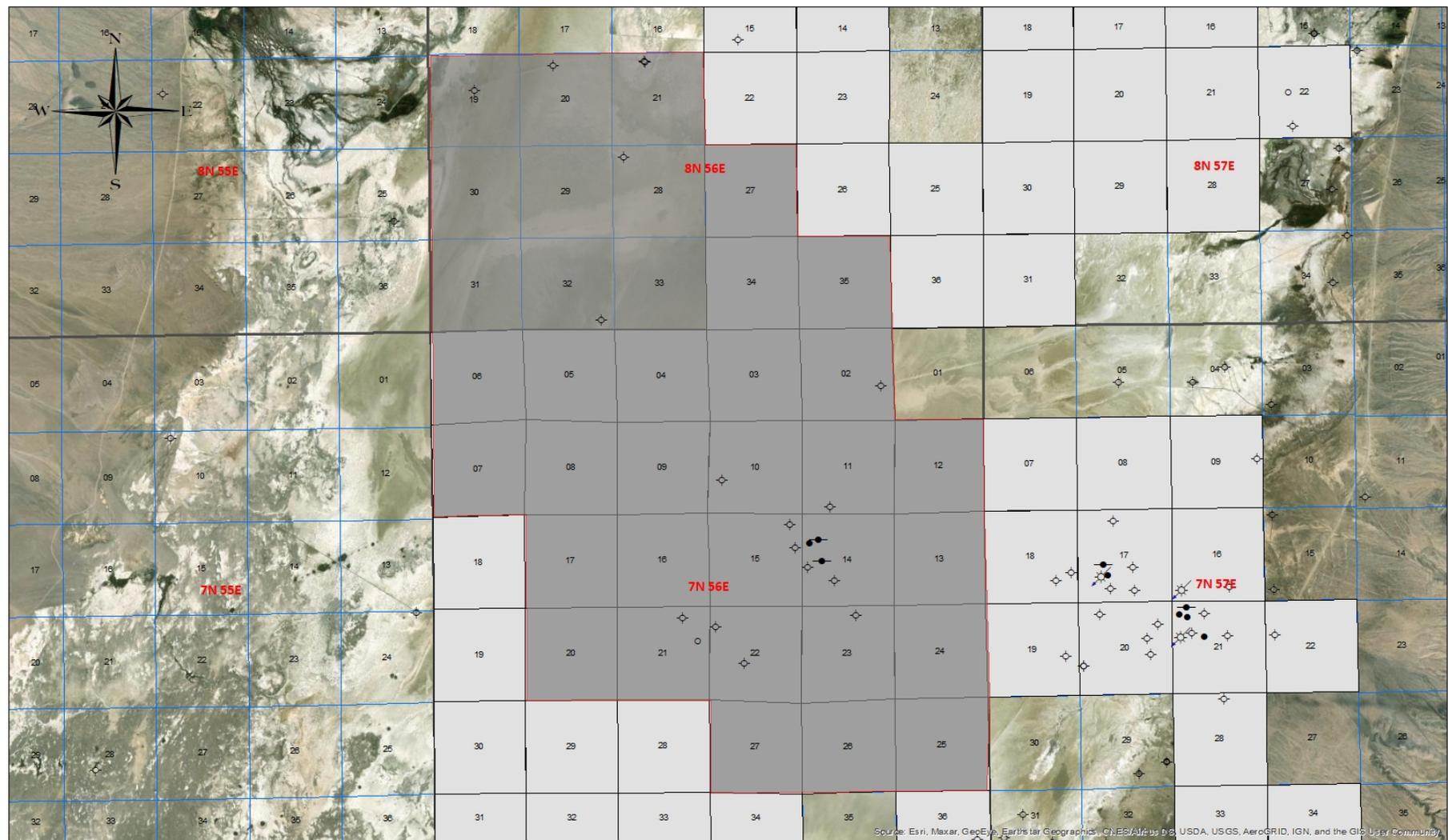
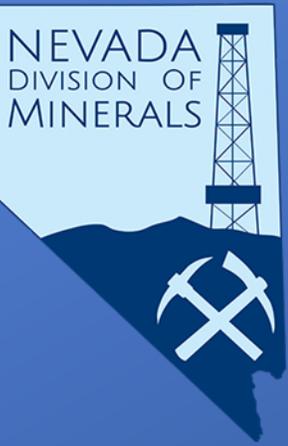


Oil Fields Railroad Valley





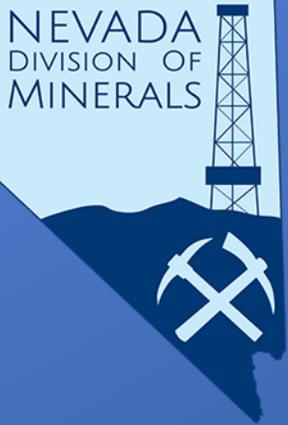
Nasa Proposed Withdrawal Railroad Valley



0 2,200 4,400 8,800 13,200 17,600
Feet



The Ongoing Battle for Railroad Valley



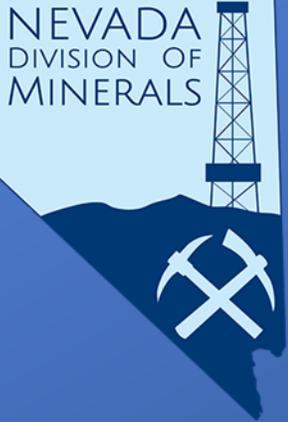
- **Relevance:** Earth Science Missions use the large, homogeneous Railroad Valley playa (RRV) for vicarious radiometric calibration of passive optical instruments
 - RRV is well characterized and instrumented and its surface is ideal for quantitative calibration traceable to international standards
 - Railroad Valley, NV, is the only site in the U.S. that is homogeneous over a large enough area to accommodate large-footprint sensors, such as OCO-2, OCO-3, GOSAT, GOSAT-2, Sentinel 5p, and GeoCarb and for cross-calibration of these instruments with reference instruments, such as MODIS
- **Problem:** Mining claims threaten to disrupt the playa floor, rendering this critical asset useless for large footprint instruments
 - Railroad Valley is under the jurisdiction of the Bureau of Land Management and currently available for multiple uses
- **Objective:** Submit a “Withdrawal” application to preserve RRV
 - To preserve Railroad Valley in its natural state, the OCO-2 team is working with NASA HQ to prepare a “withdrawal application” to preclude the mining and other activities that will disturb the playa floor

Source: http://www.3ploperating.com/3PL%20Website/NASA_JPL%20Ongoing%20Battle%20for%20Railroad%20Valley.pdf





GOSAT/OCO Experiments



- The OCO/GOSAT programs are examples of large footprint sensors that have been using RRV since 2009
- NASA Orbiting Carbon Observatory (OCO) and Japanese Greenhouse gases Observing SATellite (GOSAT) teams formed a close partnership to cross-calibrate their measurements and cross-validate their products
 - Missions include OCO-2 (2014), OCO-3 (Feb. 2019), GOSAT (2009) and GOSAT-2 (Oct. 2018)
 - All four missions require unprecedented calibration accuracy to meet their demanding (0.3%) data product accuracy requirements
 - Many of their science goals can only be addressed by combining data from all four missions, to produce a harmonized, continuous climate data record that spans the lifetimes of both missions
- Cross-calibration methods pioneered by the OCO/GOSAT collaboration have been adopted as best practice for cross-calibrating atmospheric composition sensors by the CEOS Atmospheric Composition-Virtual Constellation (AC-VC)

Source: http://www.3ploperating.com/3PL%20Website/NASA_JPL%20Ongoing%20Battle%20for%20Railroad%20Valley.pdf



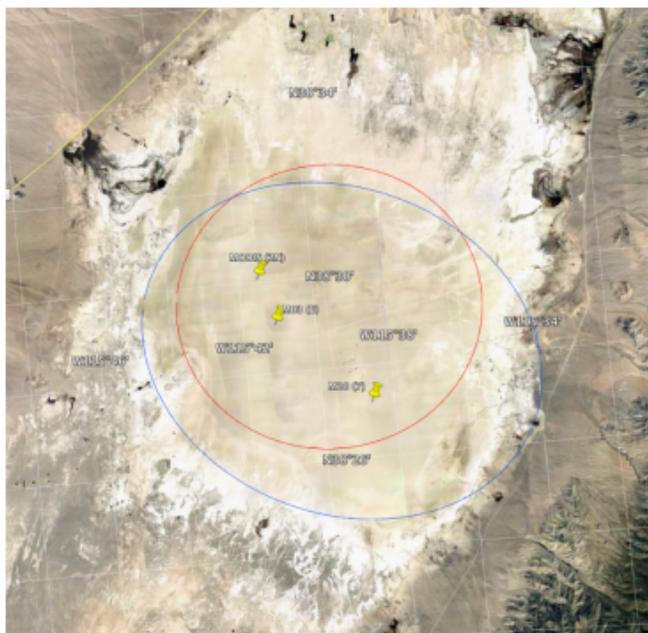


Withdrawal request suitable for AC-VC needs

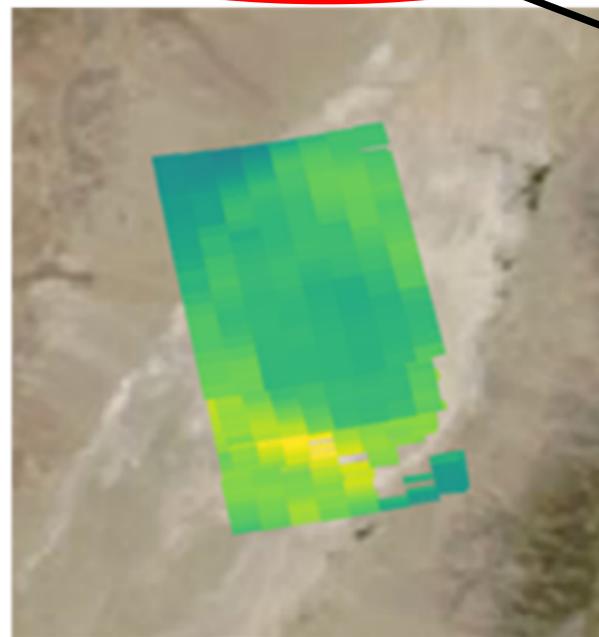
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MINERALS



NASA will request that the dry lakebed playa at Railroad Valley (RRV), NV be withdrawn and preserved in its current state so that it can continue to be used for the routine calibration and validation of Earth observation instruments flown by NASA and its partners. The subject area of NASA's withdrawal request is an approximately 43,000-acre flat playa.



GOSAT footprints on the RRV Playa



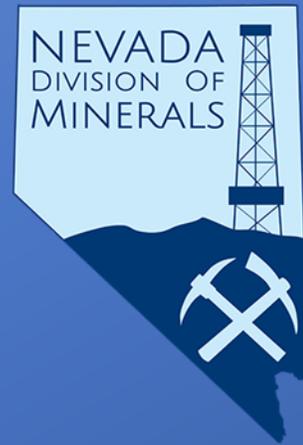
OCO-2 Target Observations over RRV

23,000 acres





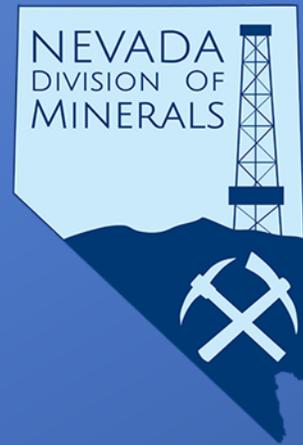
Future of Oil in Nevada



- Reserves continue to decline-new discoveries could reverse this trend.
- Geology of Nevada makes large new field discoveries difficult because of highly faulted and complex stratigraphy, plus volcanics can interfere with seismic interpretation.
- Higher prices due to global instability could entice out of state operators to explore Nevada.
- New techniques to extract from existing fields could increase production.
- Federal leases and permitting could become more difficult depending on the political environment.



Geothermal



The Nevada Division of Minerals is the state's regulatory authority for all geothermal wells drilled in Nevada. Geothermal wells drilled within Nevada, on either private or federally managed lands, must be permitted by the Nevada Division of Minerals. The associated drilling and completion programs must be approved by the Division before either program is implemented. The Division oversees the drilling and subsequent completion operations through daily reporting to the Division by the operator, as well as inspect the wells after they are completed. The Division must also approve all maintenance and work-over operations during the life of the well, as well as the final plugging and abandonment of a well at the end of its useful life. Geothermal production and injection information is submitted to the Division on a monthly basis, where the information is tabulated both monthly and annually.



Geothermal Development 2021

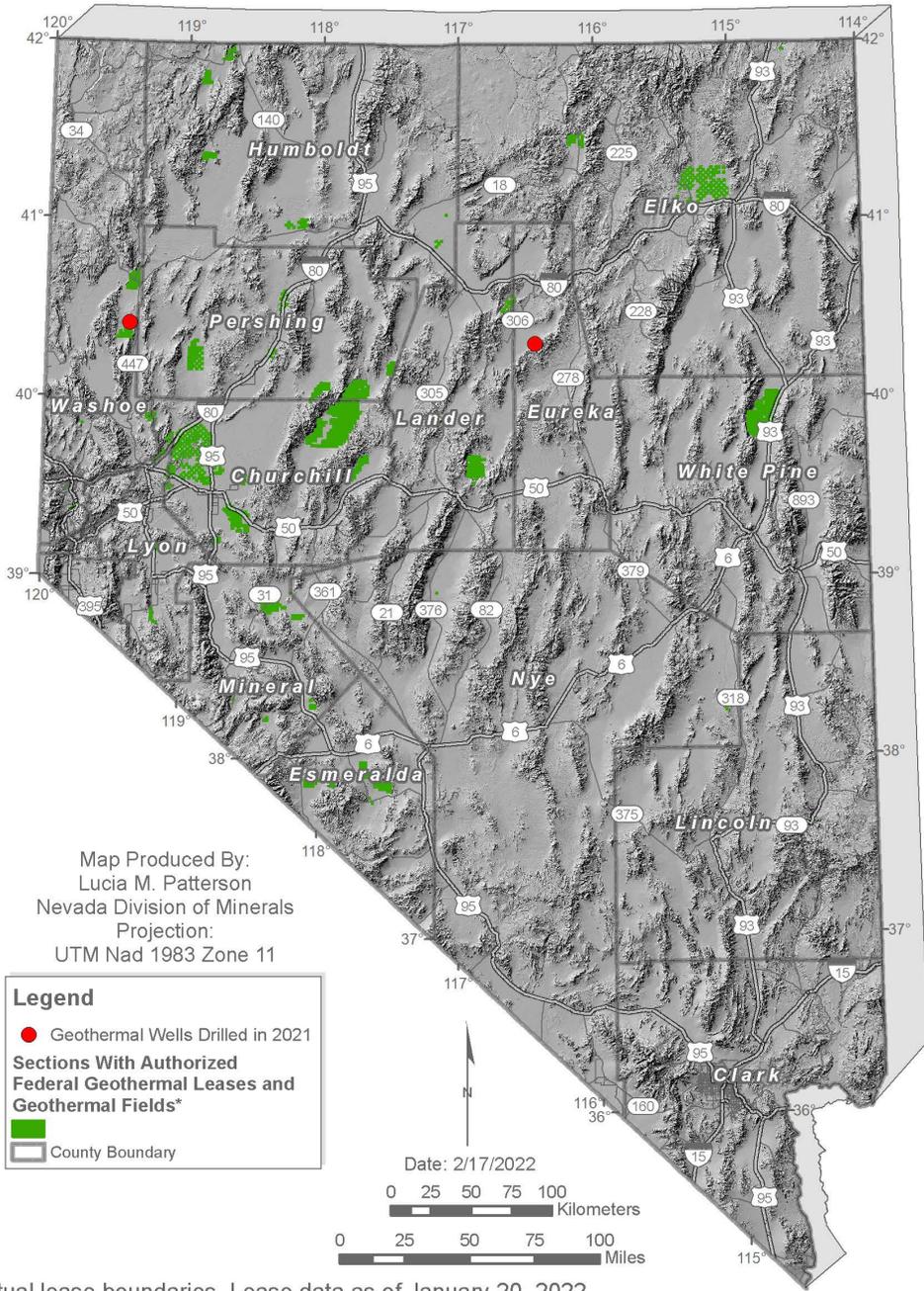
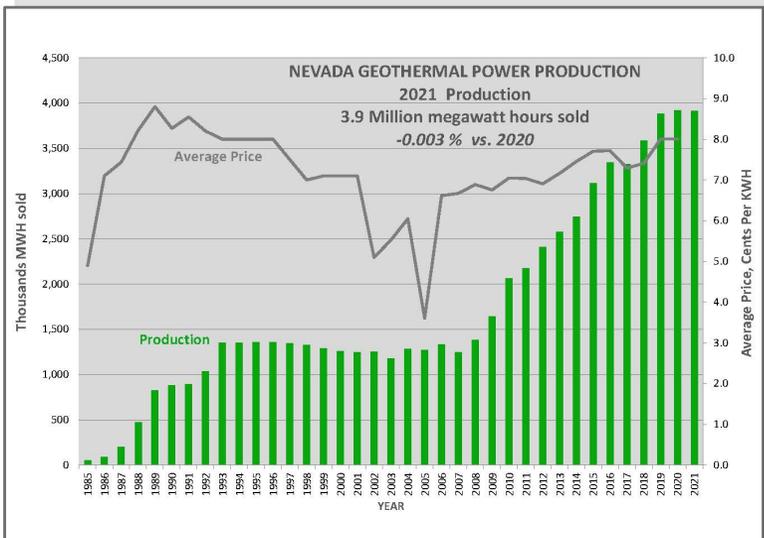


Wells Completed
 1 Industrial Injection
 1 Industrial Production

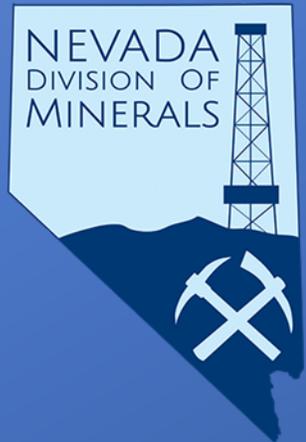
As of January 20, 2022 there were 463 permitted commercial and industrial geothermal wells.
 (Injection, production or observation wells that are ; active or shut-in)

There are 25 active geothermal plants in Nevada

There are 319 authorized geothermal leases as of January 20, 2022 which total 676,434 acres



*Authorized leases are plotted by section and do not necessarily depict actual lease boundaries. Lease data as of January 20, 2022





Geothermal Leases Authorized 2017 - 2021

Map Produced By:
Lucia Patterson, Nevada Division of Minerals
UTM NAD 1983 Zone 11
February 15, 2022



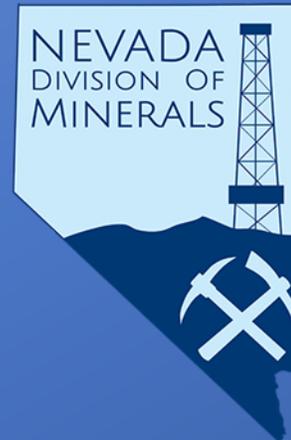
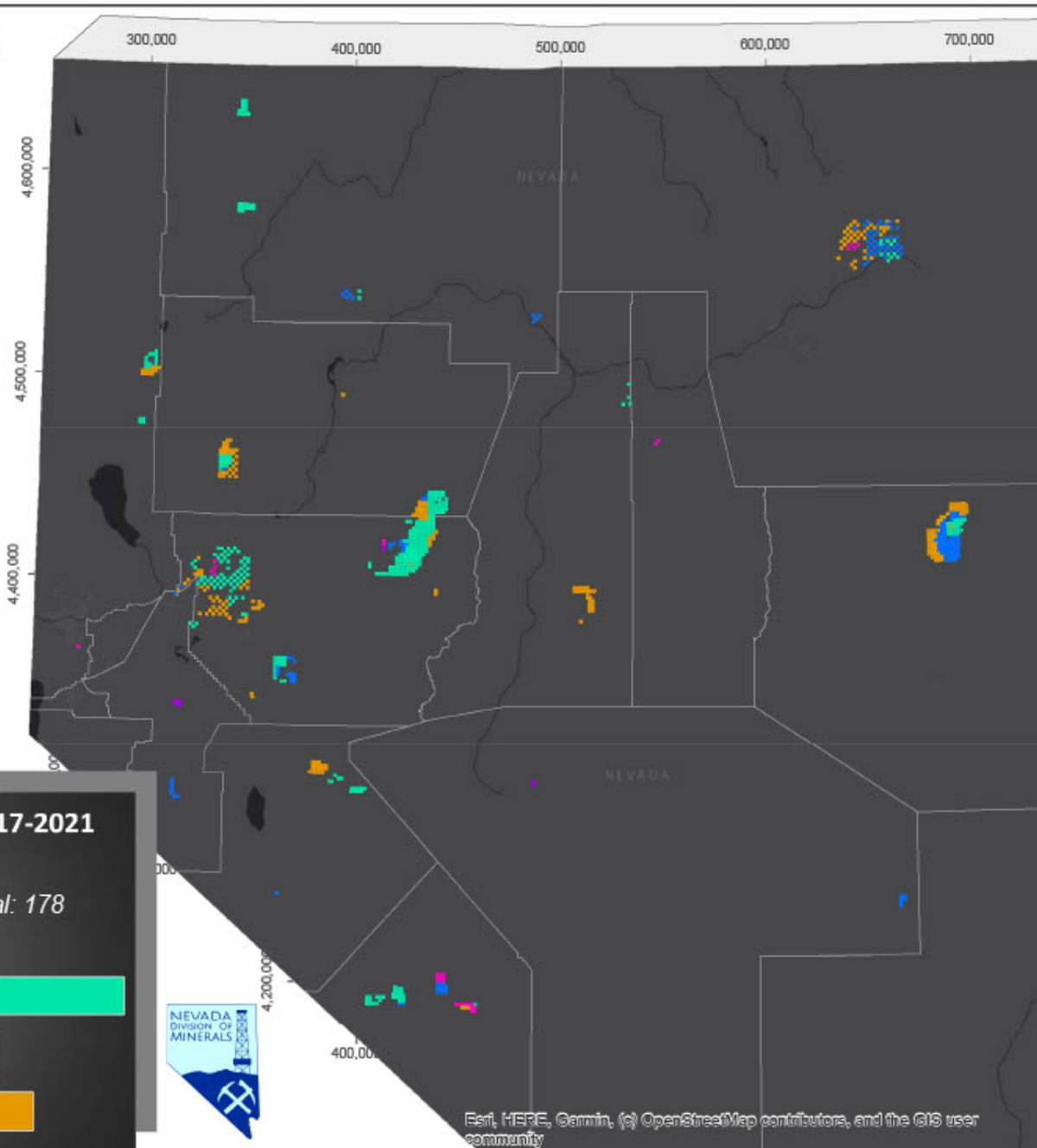
0 25 50 100 Miles

0 25 50 100 Kilometers

Authorized leases plotted using BLM case type codes:
321200, 321000, 321300, 322000, & 322300

Action Codes:
237, 209, & 553

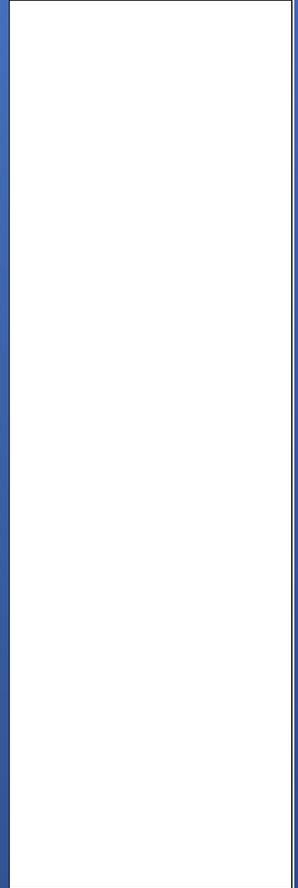
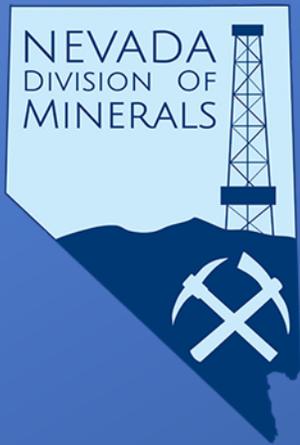
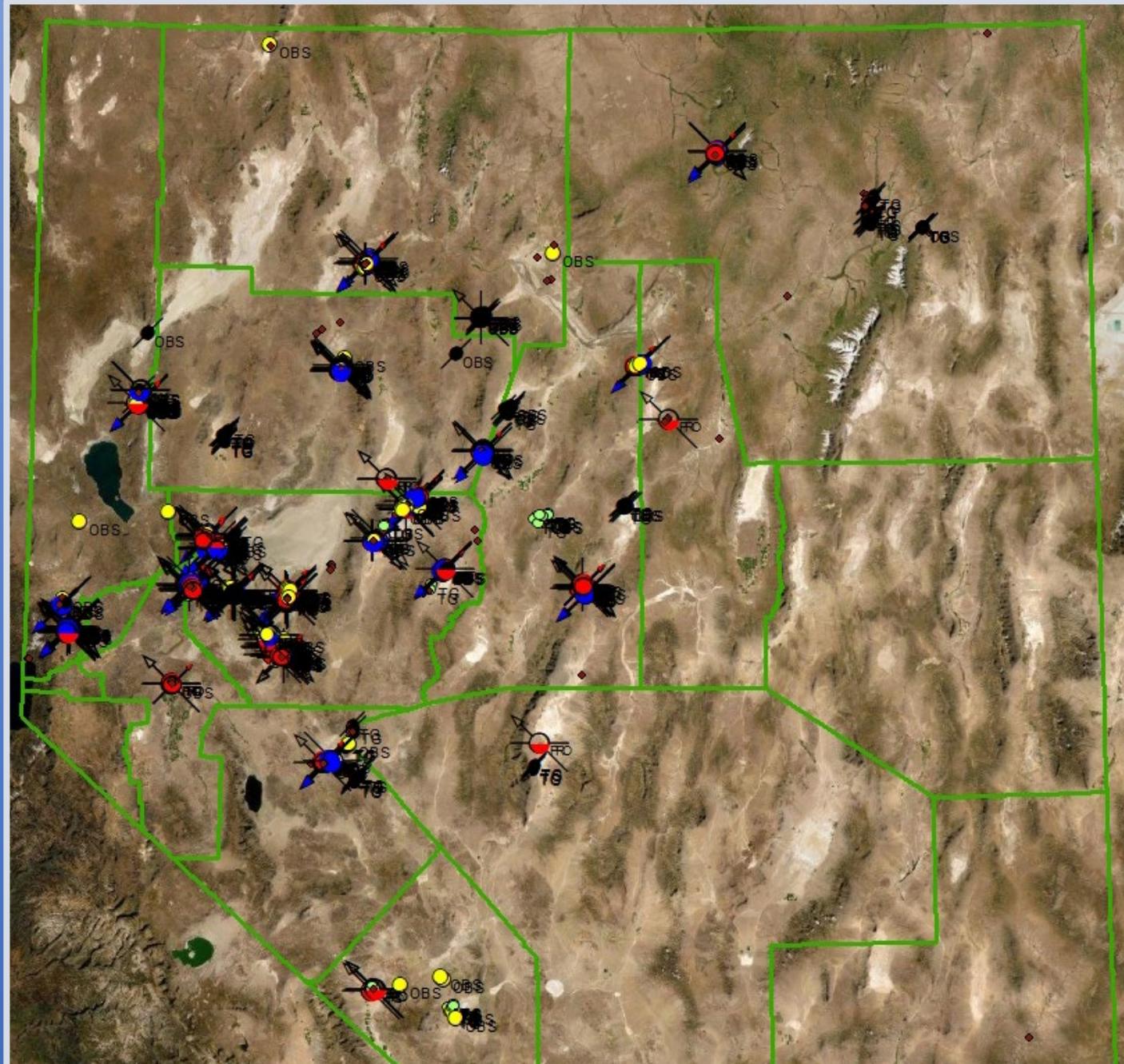
Data as of: January 20, 2022



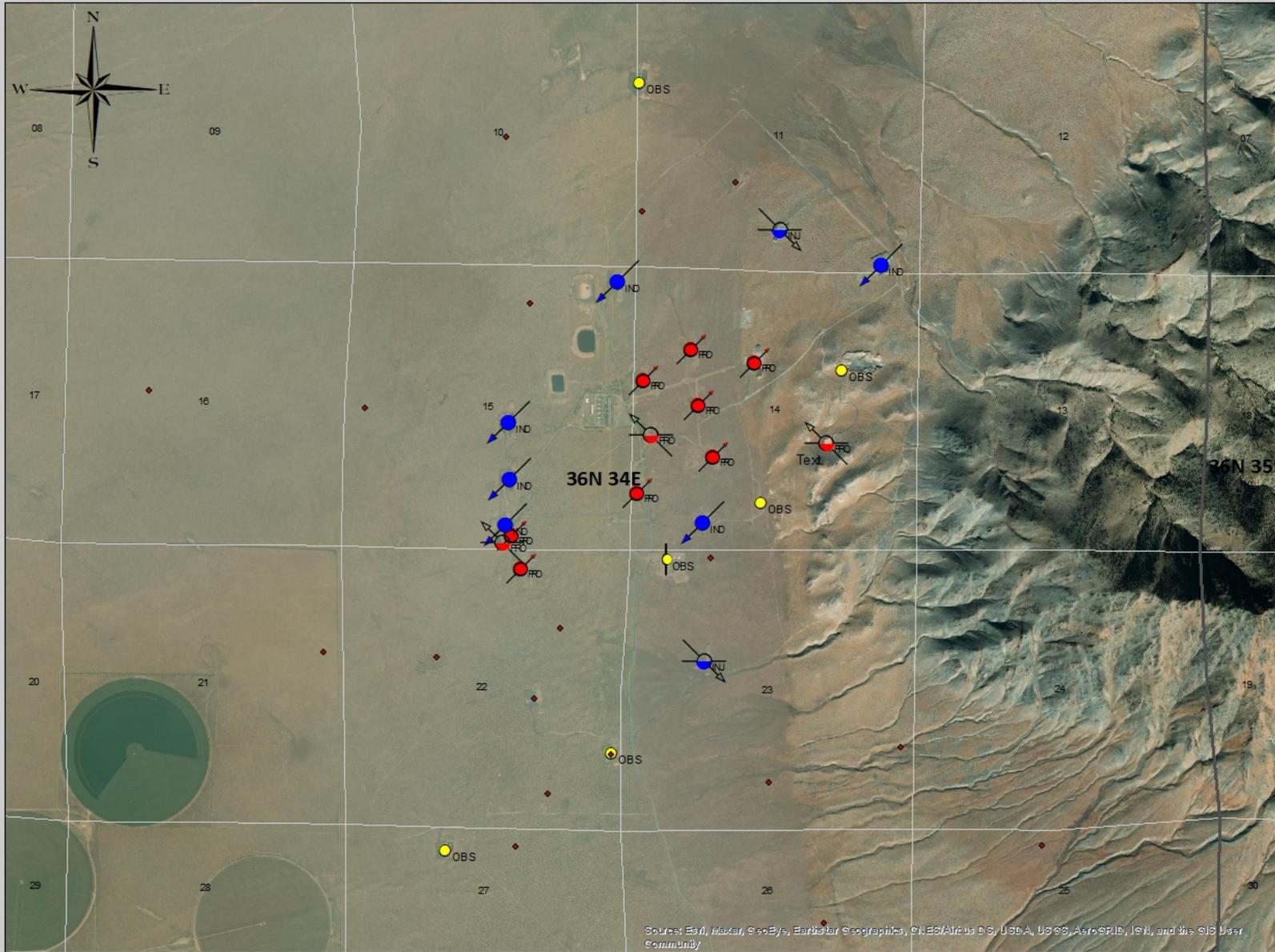
637 Open Wells

- 121 Active Industrial Production Wells
- 72 Shut In Industrial Production Wells
- 79 Active Industrial Injection Wells
- 36 Shut In Industrial Injection Wells
- 3 Active Commercial Production Wells
- 7 Shut In Commercial Production Wells
- 4 Active Commercial Injection Wells
- 5 Shut In Commercial Injection Wells
- 136 Observation Wells
- 85 Thermal Gradient Wells
- 89 Domestic Wells

Nevada Geothermal Wells 881 ~Wells Drilled



Blue Mountain Geothermal Field



Blue Mountain Geothermal Field

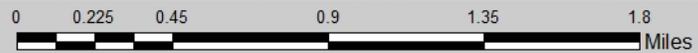
GeoDHForGE

• <all other values>

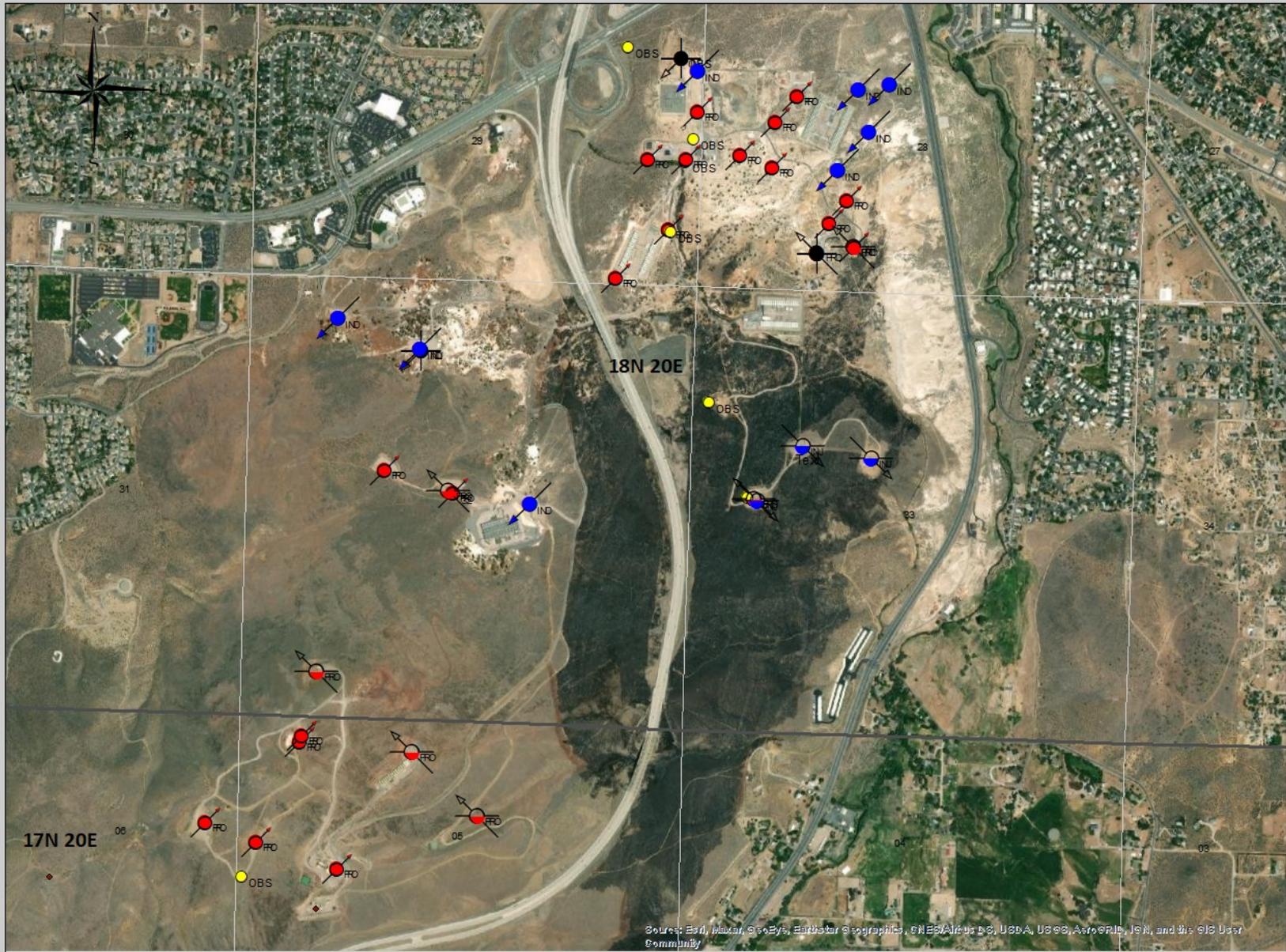
Well Type, Status

-  Ind-Inj, In Use
-  Ind-Inj, P&A
-  Ind-Inj, Shut-In
-  Ind-Prod, In Use
-  Ind-Prod, P&A
-  Ind-Prod, Shut-In
-  Obs, In Use
-  Obs, P&A
-  Obs, Shut-In
-  TG, In Use
-  TG, P&A

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



Steamboat Geothermal Field



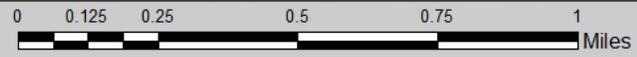
Steamboat Geothermal Field

GeoDHForGE

• <all other values>

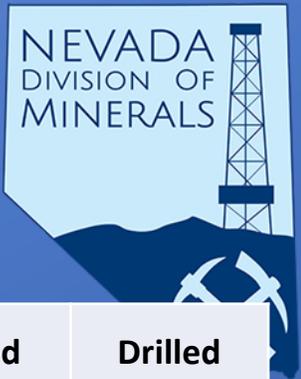
Well Type, Status

-  Ind-Inj, In Use
-  Ind-Inj, P&A
-  Ind-Inj, Shut-In
-  Ind-Prod, In Use
-  Ind-Prod, P&A
-  Ind-Prod, Shut-In
-  Obs, In Use
-  Obs, P&A
-  Obs, Shut-In
-  TG, In Use
-  TG, P&A





Nevada Geothermal Wells Permitted and Drilled 2017-2022

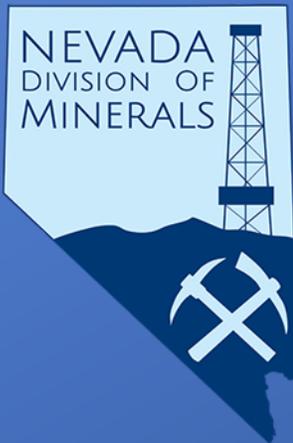
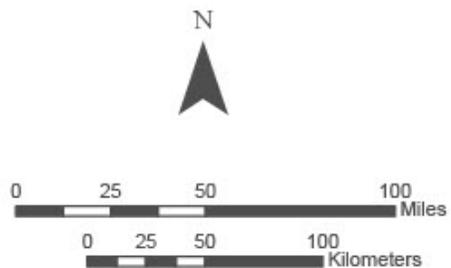


Permit Type	Issued	Drilled								
	2017	2017	2018	2018	2019	2019	2020	2020	2021	2021
Geothermal - Ind Production	6	4	3	4	1	1	2	1	14	1
Geothermal - Ind Inj	4	4	1	1	3	2	1	1	10	---
Geothermal - Observation	3	1	3	3	1	1	4	---	2	1
Geothermal - TG	19	15	18	19	2	2	1	1	---	---
Geothermal - Com	---	---	---	---	---	---	---	---	---	---
Geothermal - Dom	2	2	---	---	---	---	---	---	---	---
Geothermal - Project Area	1	---	---	---	---	---	---	---	1	---
Geothermal - Total	35	26	25	27	7	6	8	3	27	2
Oil & Gas	0	1	3	1	3	1	2	1	2	2



Geothermal Wells Completed 2017 - 2021

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February 15, 2022

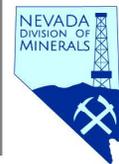
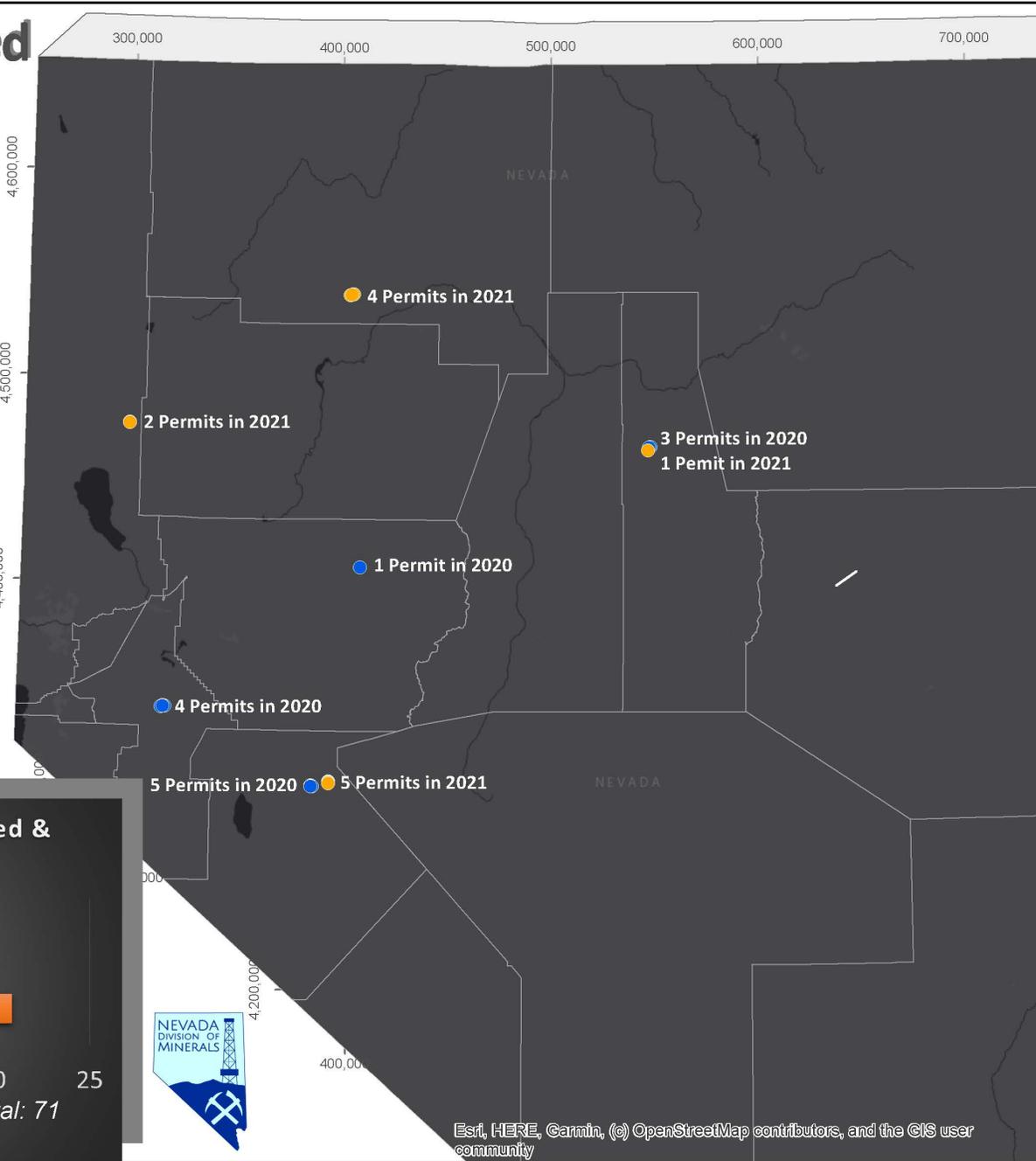
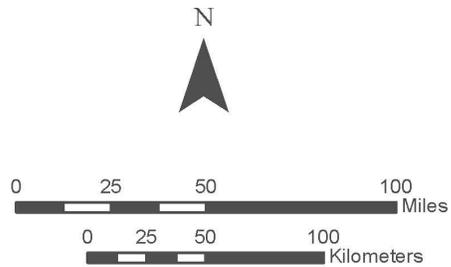


Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community

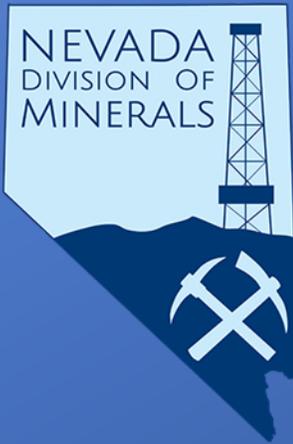


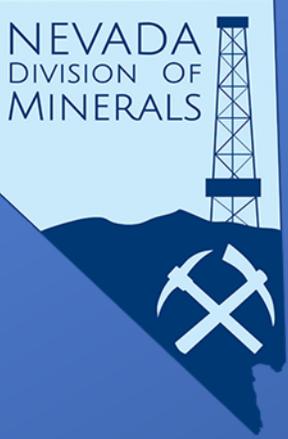
Geothermal Undrilled Permits Issued 2020 - 2021

Map Produced By:
 Lucia Patterson, Nevada Division of Minerals
 UTM NAD 1983 Zone 11
 February 15, 2022

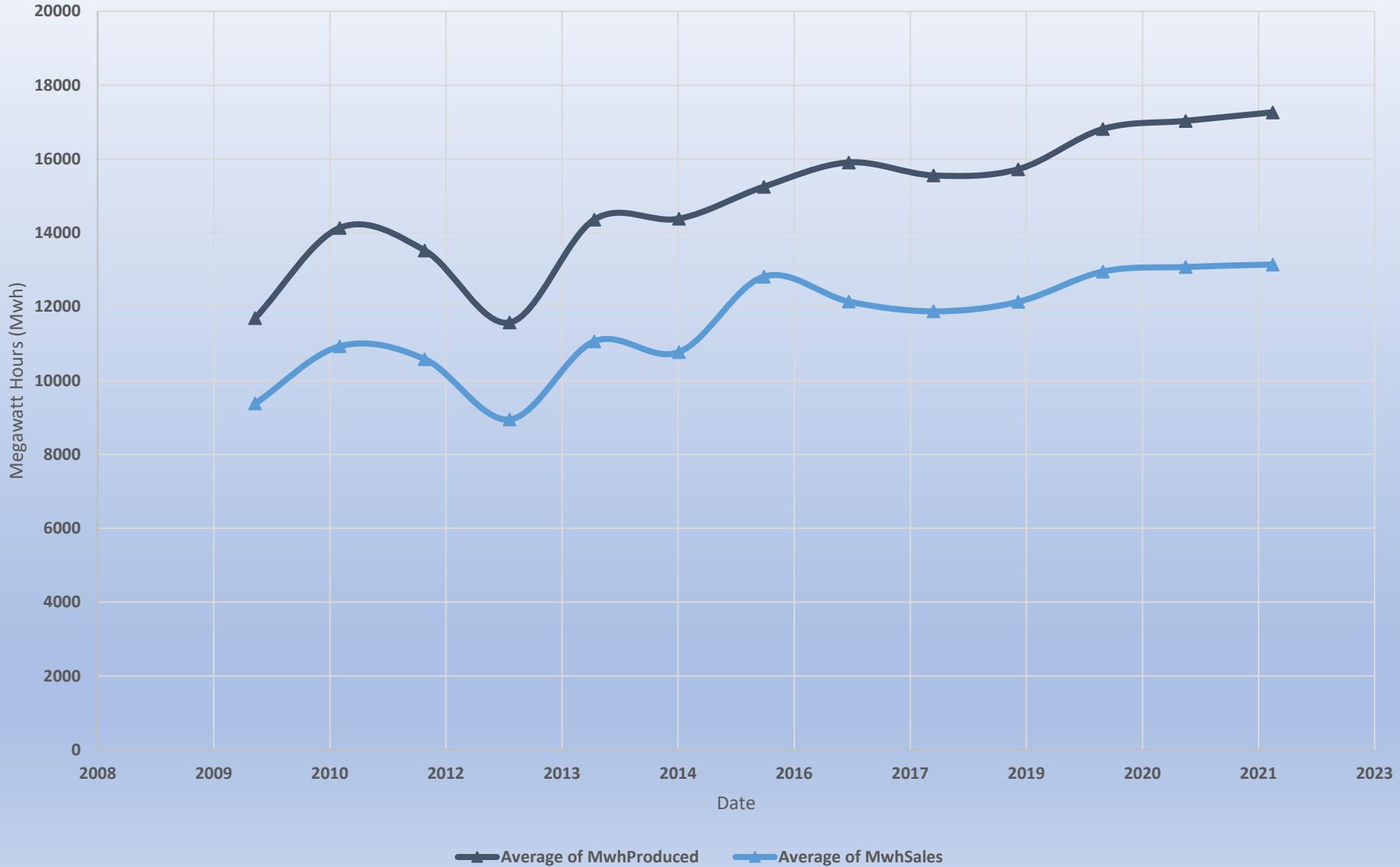


Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community





Average Geothermal Mwh Produced and Sold in Nevada



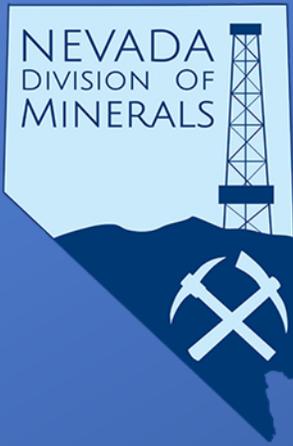
**Average=77.8%
Sold to market**



NV Energy Greenlink Nevada

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The transmission initiative will be made up of:

- Greenlink West will be a 525 kV line that spans approximately 350 miles from Las Vegas, NV to Yerington, NV.
- Greenlink North will be a 525 kV line that spans approximately 235 miles from Ely, NV to Yerington, NV.
- Greenlink Nevada will also include three 345 kV lines from Yerington, NV to the Reno, NV area.

Environmental Benefits

Greenlink Nevada is essential to helping Nevada achieve its climate action and de-carbonization goals and increased renewable portfolio standard, moving Nevada closer to a future powered by 100% renewable energy and reducing Nevada's carbon footprint.

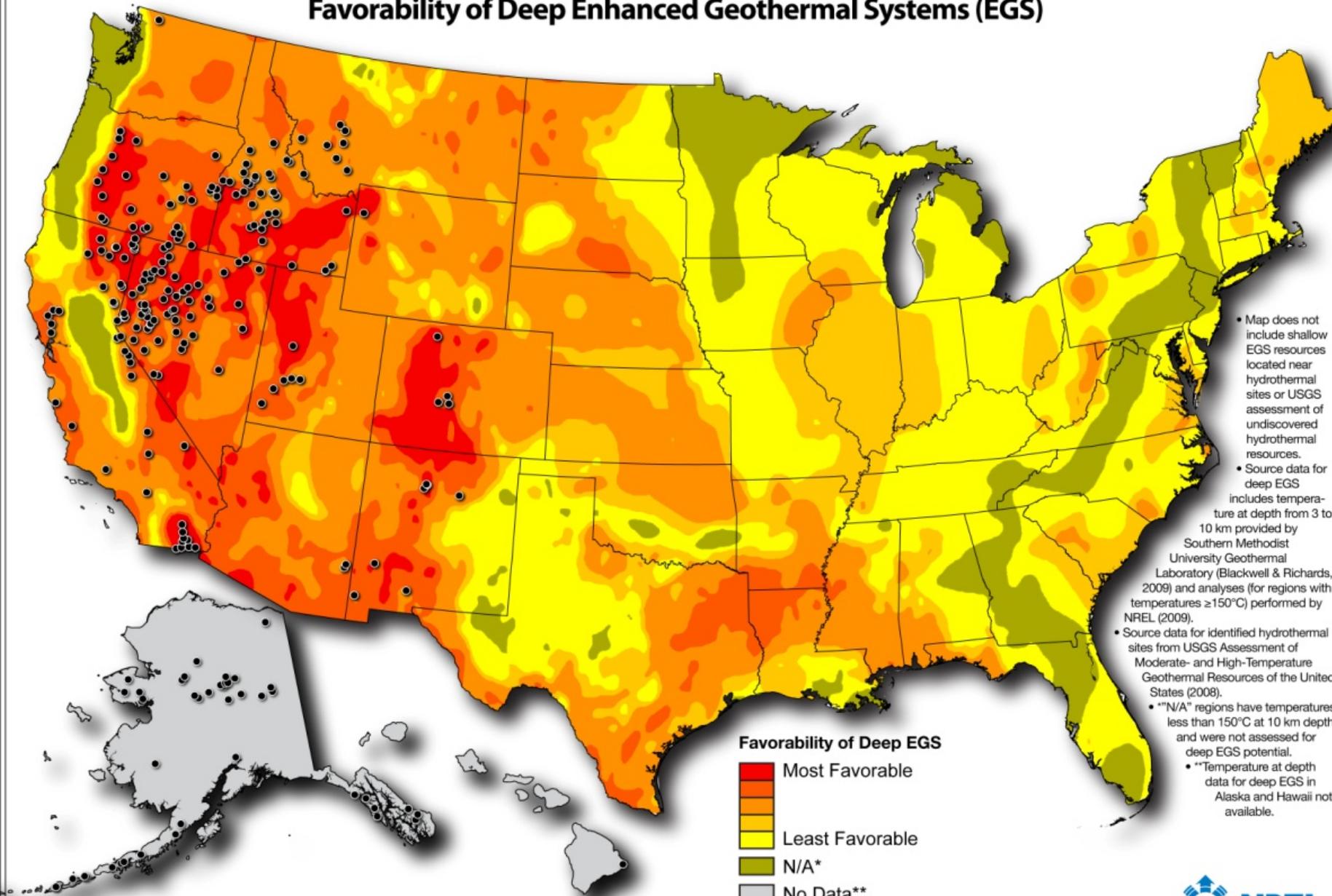
- Creates a renewable energy highway that allows access to Nevada's resource-rich renewable energy zones, containing about 4,000 megawatts of undeveloped renewable resources, that could not previously be developed due to the lack of necessary transmission infrastructure
- Diversifies Nevada's renewable portfolio by creating access to affordable wind and hydro energy across the Western United States



Geothermal Resource of the United States

Locations of Identified Hydrothermal Sites and Favorability of Deep Enhanced Geothermal Systems (EGS)

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- Map does not include shallow EGS resources located near hydrothermal sites or USGS assessment of undiscovered hydrothermal resources.
- Source data for deep EGS includes temperature at depth from 3 to 10 km provided by Southern Methodist University Geothermal Laboratory (Blackwell & Richards, 2009) and analyses (for regions with temperatures $\geq 150^{\circ}\text{C}$) performed by NREL (2009).
- Source data for identified hydrothermal sites from USGS Assessment of Moderate- and High-Temperature Geothermal Resources of the United States (2008).
- **N/A* regions have temperatures less than 150°C at 10 km depth and were not assessed for deep EGS potential.
- **Temperature at depth data for deep EGS in Alaska and Hawaii not available.

Favorability of Deep EGS

- Most Favorable
- Favorable
- Least Favorable
- N/A*
- No Data**

- Identified Hydrothermal Site ($\geq 90^{\circ}\text{C}$)

This map was produced by the National Renewable Energy Laboratory for the US Department of Energy.
October 13, 2009 Author: Billy J. Roberts



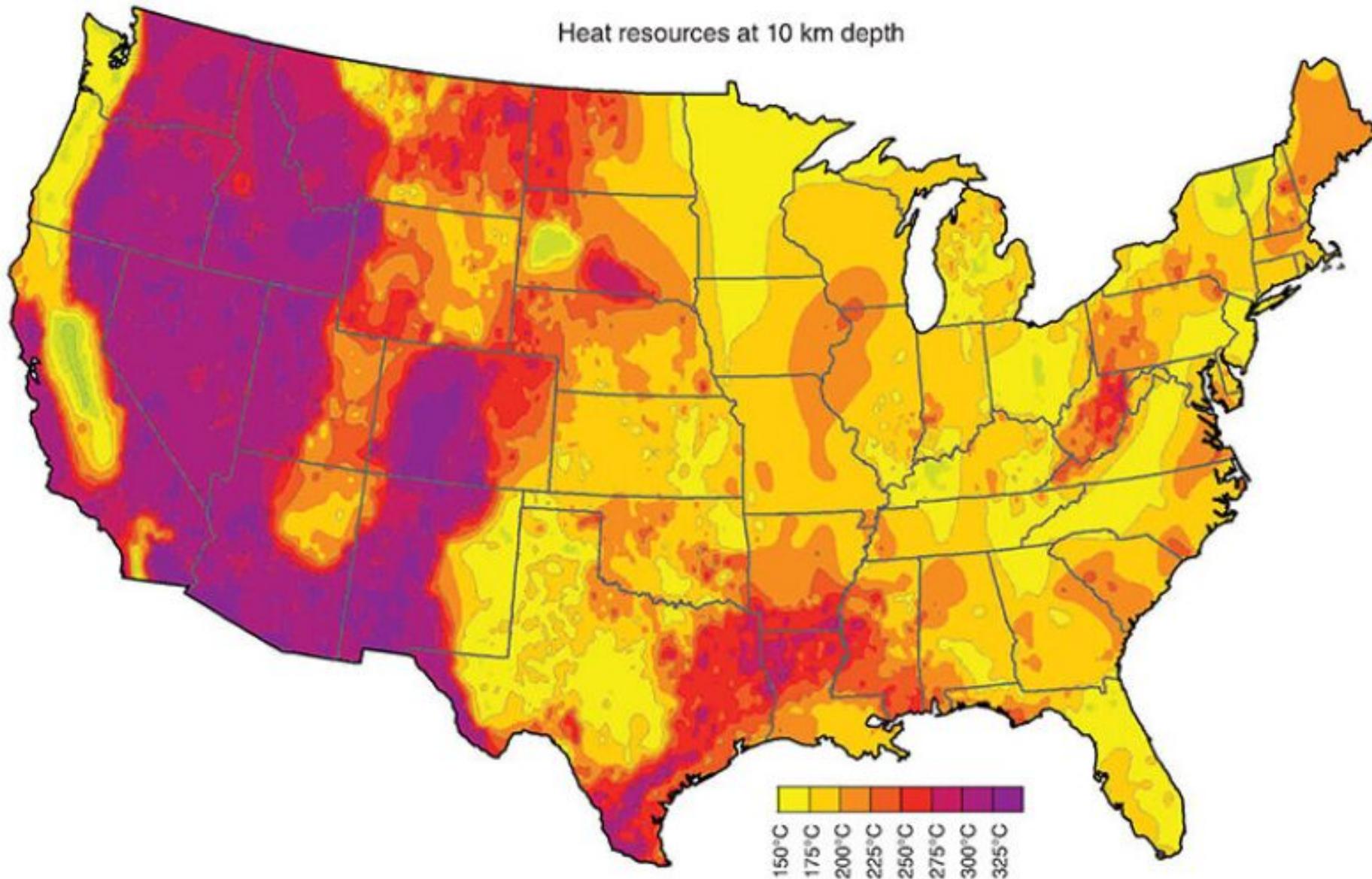
https://www.api.org/news-policy-and-issues/blog/2012/08/07/~media/EnergyTomorrow/blog/geothermal_map.jpg.ashx



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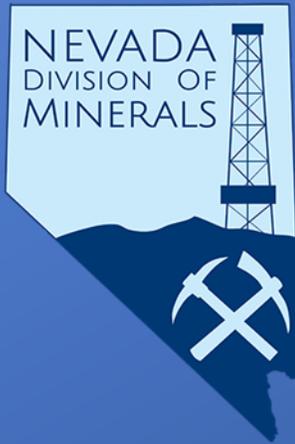
Heat resources at 10 km depth



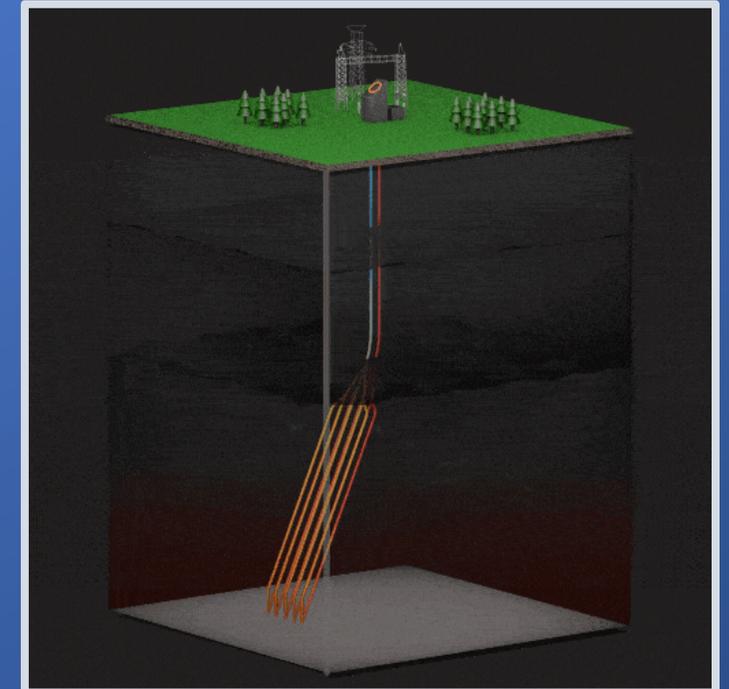
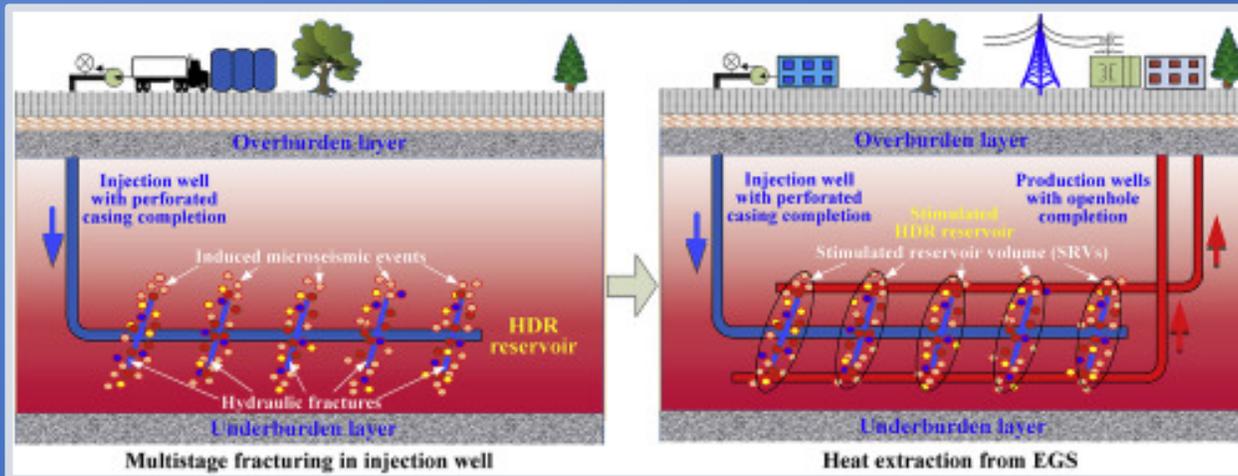
<https://jpt.spe.org/google-taps-ferro-energy-to-develop-enhanced-geothermal-systems-in-nevada>



Future of Geothermal in Nevada



- Continued exploration of traditional geothermal systems.
- EGS- Enhanced Geothermal System, closed loop and hydraulically stimulated systems, combination of solar and geothermal systems.
- Improved power plant efficiency.
- More remote areas available due to increased infrastructure(NV Energy Greenlink).
- Government funded projects in existing oilfields.
- Lithium extraction from brine water.



<https://www.eavor.com/>

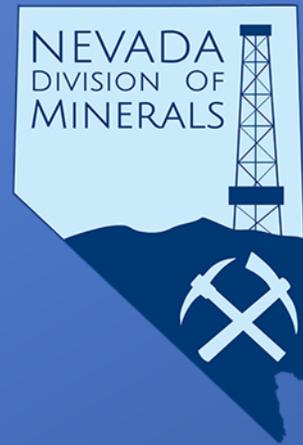
<https://www.sciencedirect.com/science/article/abs/pii/S0960148119316118>



Dissolved Mineral Resource Exploration (DMRE)

Assembly Bill 52 of the 2017 session was signed into law in June, 2017. The purpose of this legislation is to define a permitting path for dissolved mineral exploration, including lithium brines, and to develop regulations to ensure exploration drilling for dissolved minerals is protective of groundwater, as well as oil and geothermal resources. The legislation authorizes regulation by the Division beginning on January 1, 2018. The Division of Minerals is now accepting applications for Dissolved Mineral Resource Exploration (DMRE) wells and notices of intent for DMRE exploration boreholes. All forms for the program are located below, can be picked up at the Division office, or mailed to the public upon request.

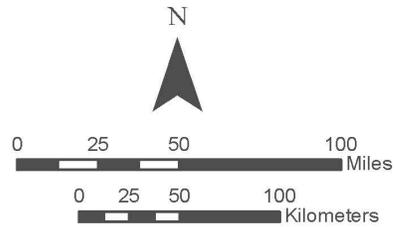
<https://minerals.nv.gov/Programs/DMRE/DMRE/>



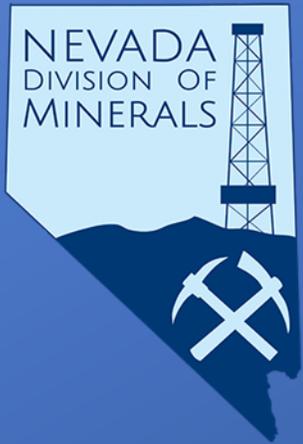
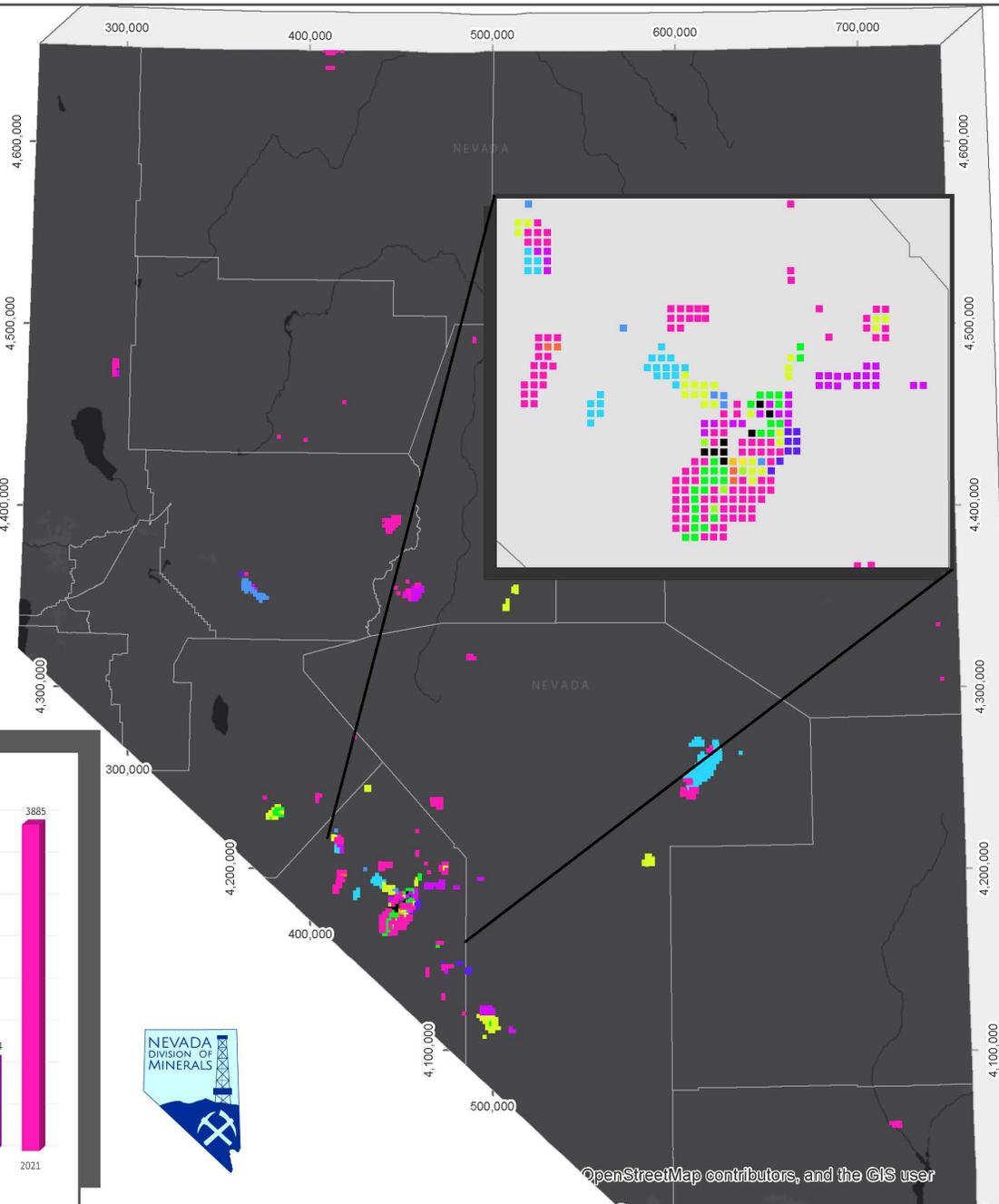
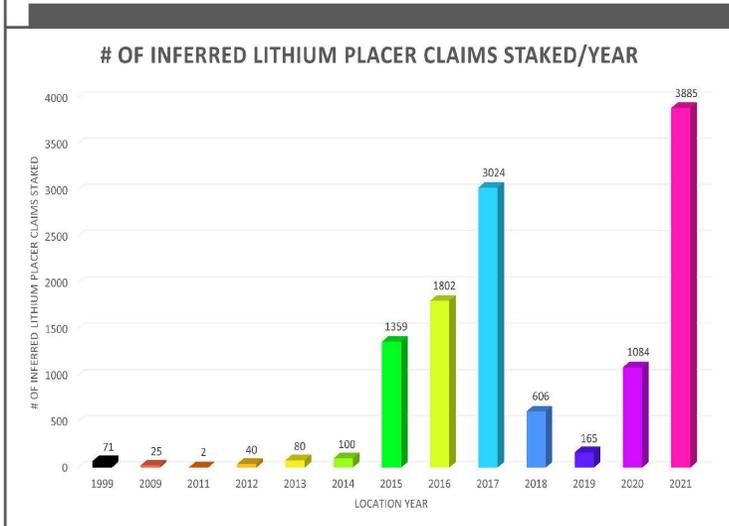


Inferred Lithium Placer Claims Location 2017 - 2021

Map Produced By:
Lucia Patterson, Nevada Division of Minerals
UTM NAD 1983 Zone 11
February 23, 2022



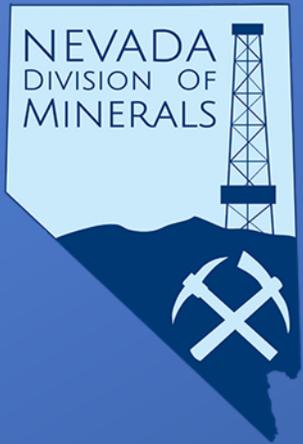
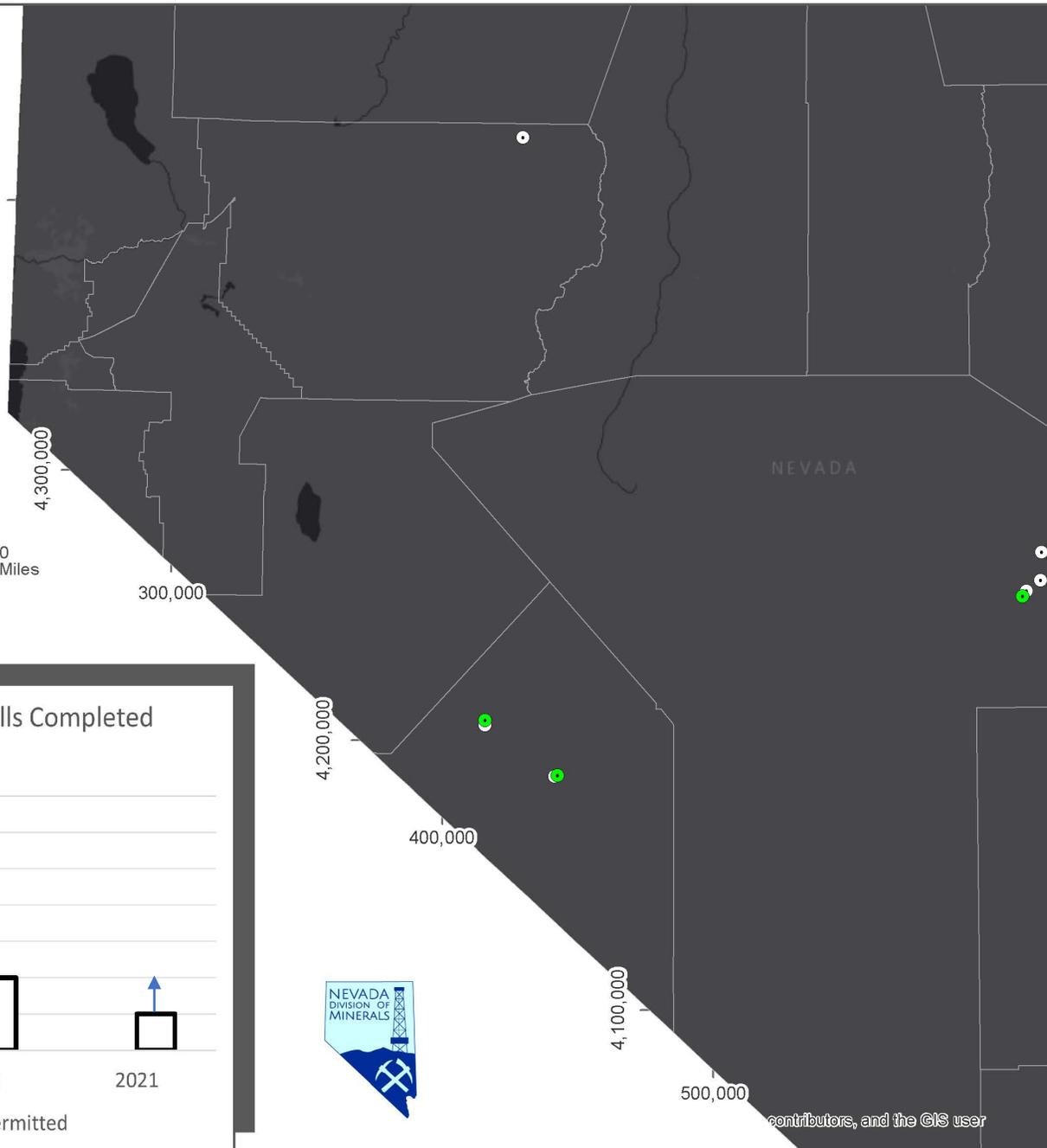
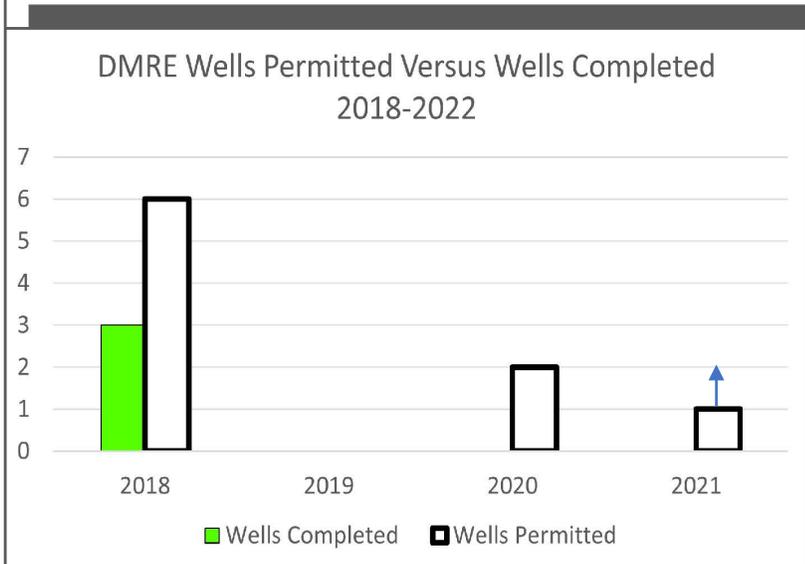
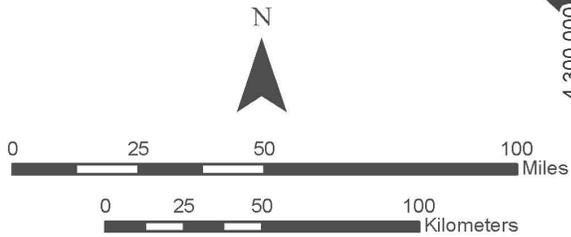
There is an estimated 12,291 active, filed, and submitted placer claims in the BLM's MLRS database, presumably for lithium brine, as of January 24, 2022.





DMRE Wells Permitted & Completed 2018 - 2021

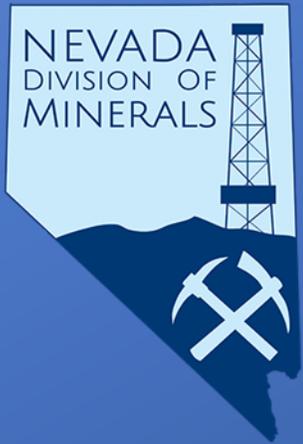
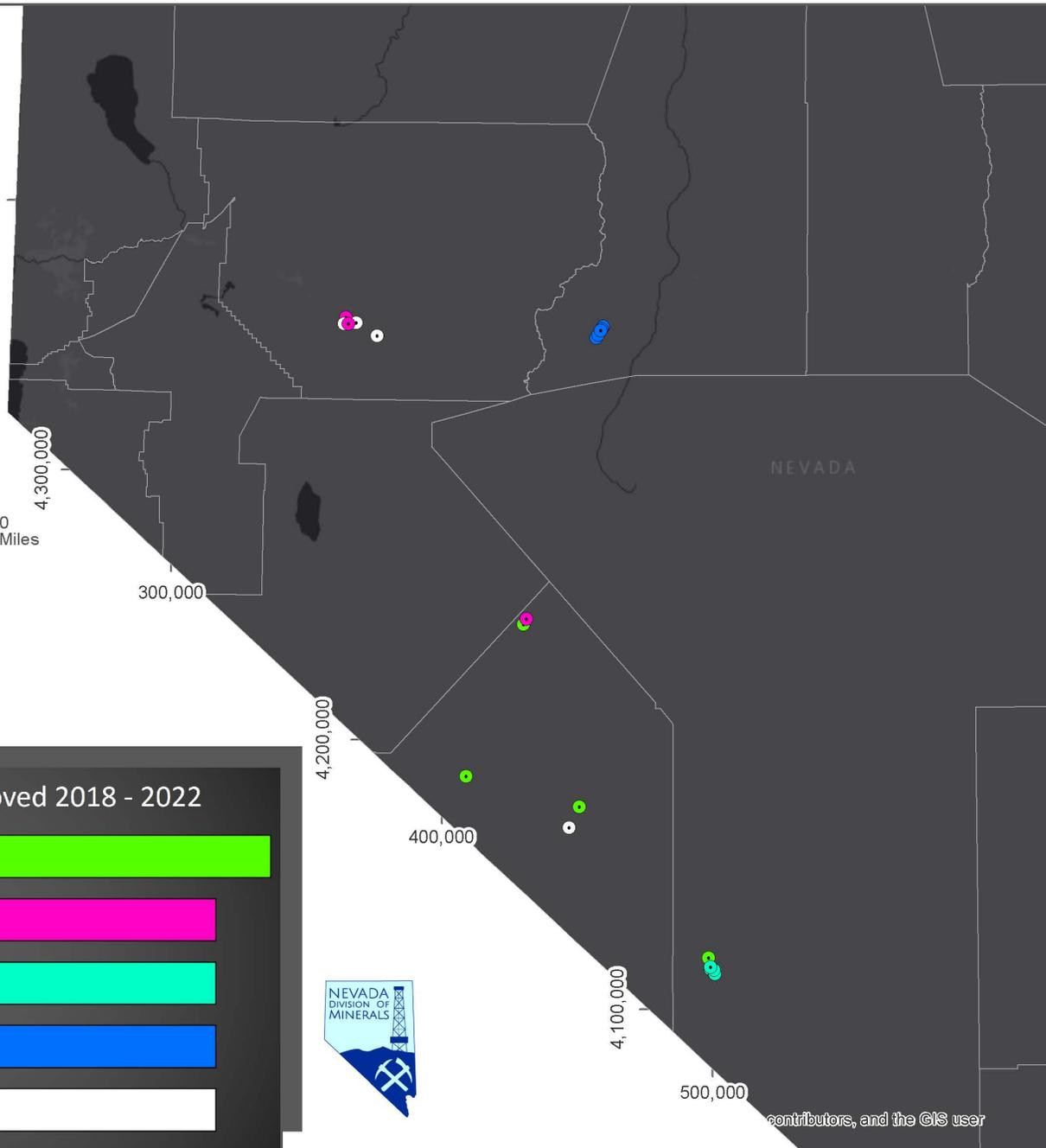
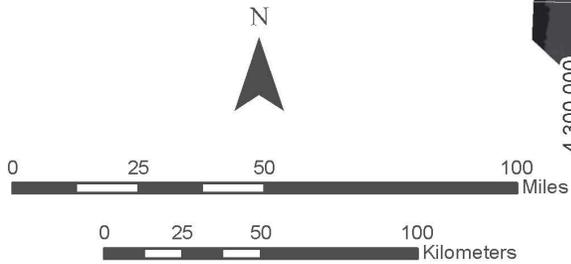
Map Produced By:
Lucia Patterson, Nevada Division of Minerals
UTM NAD 1983 Zone 11
February 23, 2022





DMRE Borehole Notices Approved 2018 - 2021

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UTM NAD 1983 Zone 11
February 23, 2022



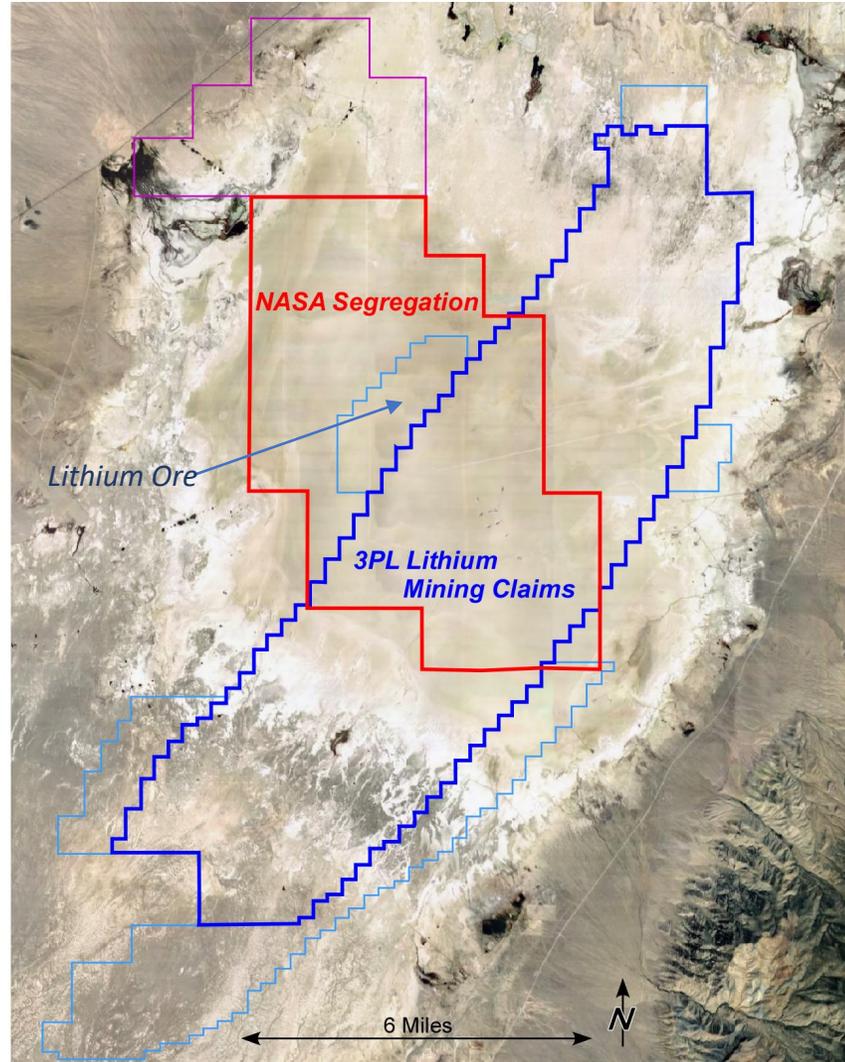
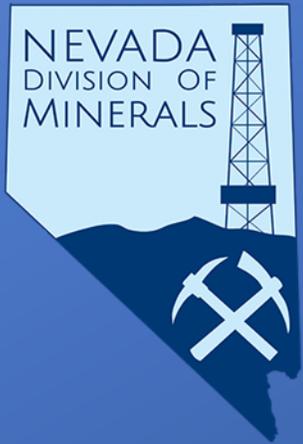
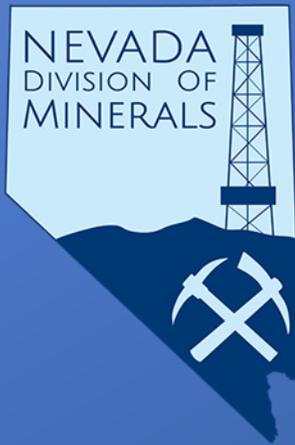


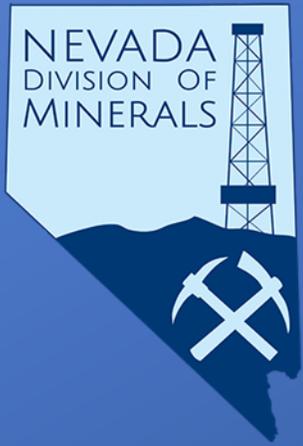
Figure 1. The NASA Segregation area in Railroad Valley is 23,000 acres. 3PL lithium mining claims (dark blue) and other mining claim blocks are shown in light blue and purple. NASA intends to use 5,000 acres, but requests to stop public use in the Segregated area. They currently use 6 acres.



Future of Dissolved Mineral Resource Exploration in Nevada



- Increase in demand and price of lithium.
- Direct lithium extraction, removes need for evaporation ponds and provides timely production of high-grade lithium.
- Exploration of new claims.
- Government support to become more dependent on domestic lithium resources.



Acknowledgments and Special Thanks



State of Nevada Commission on Mineral Resources Division of Minerals



NV ^{gov} Agencies Jobs

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Programs

- Abandoned Mine Lands (AML)
- Bond Pool (Reclamation)
- Dissolved Mineral Resource Exploration (DMRE)
- Education and Outreach
- Geothermal
- Mining

Oil & Gas

- Forms and Reports
- Permits
- For Public
- For Operators
- Hydraulic Fracturing Links

Oil and Gas

The Nevada Division of Minerals is the state's regulatory authority for all oil and gas wells drilled in Nevada. Oil and gas wells drilled within Nevada, on either private or federally managed lands, must be permitted by the Nevada Division of Minerals. The associated drilling and completion programs must be approved by the Division before either program is implemented. The Division oversees the drilling and subsequent completion operations through daily reporting to the Division by the operator, as well as inspect the wells after they are completed. The Division must also approve all maintenance and work-over operations during the life of the well, as well as the final plugging and abandonment of a well at the end of its useful life. Oil and gas production and injection information is submitted to the Division on a monthly basis, where the information is tabulated both monthly and annually.

Data Resources

- NDOM Open Data Site
- Oil, Gas, and Geothermal Open Data Page Demo

Nevada Oil Producers

- Nevada Oil Producers List 2020

Production Information

- Nevada Oil-Gas Drilling, Production & Federal Leases 2018-2019
- Oil Production in Nevada 2019 graphic
- Oil Production in Nevada by Producing Field 2019 spreadsheet

Oil and Gas Maps

- Nevada Active Mines and Energy Producers 2019
- Active and Permitted Oil Wells in Nevada, June 2017

Hydraulic Fracturing in Nevada

- Facts on the use of hydraulic fracturing in Nevada, April 2017

Oil and Gas Contact

Cortney Luxford
Fluid Minerals Program Manager
cluxford@minerals.nv.gov

Statute & Regulations

NRS 522

NAC 522

Oil and Gas Links

NBMG Oil and Gas Well Information

EPA - Region 9

Spill Prevention Control and Countermeasure

BLM LR 2000

Oil and Gas Links Page

Oil and Gas Frequently Asked Questions (FAQ)

Presentations

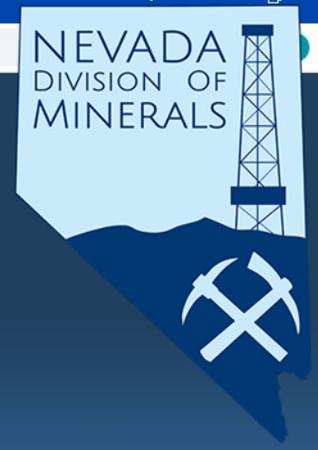
(none)

Educational Materials (K-12)

Oil and Gas in Nevada Activity Book

Drilling For Energy 09-12 FullPacket.pdf

Other Education Materials





State of Nevada Commission on Mineral Resources Division of Minerals



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Data

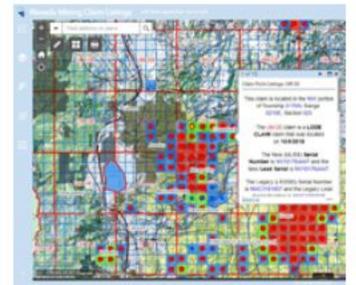
Data Resources

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- [Active Mining Claims in Nevada](#)
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- [Oil, Gas, & Geothermal Drilling Production and Leases](#)
- [Education and Outreach \(Educational Videos and Maps\)](#)
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Contact Information

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Request ADA document remediation for individuals using assistive technology devices

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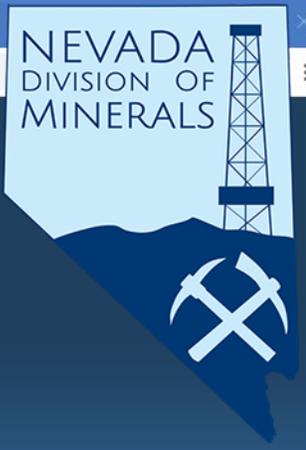
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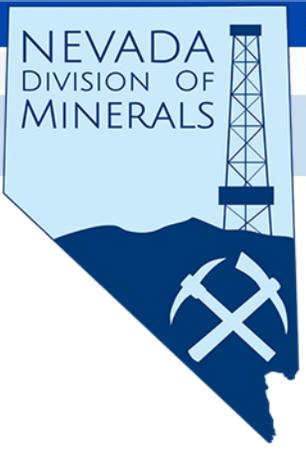
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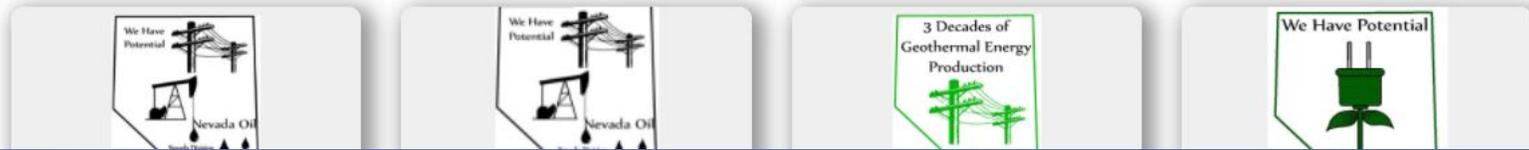
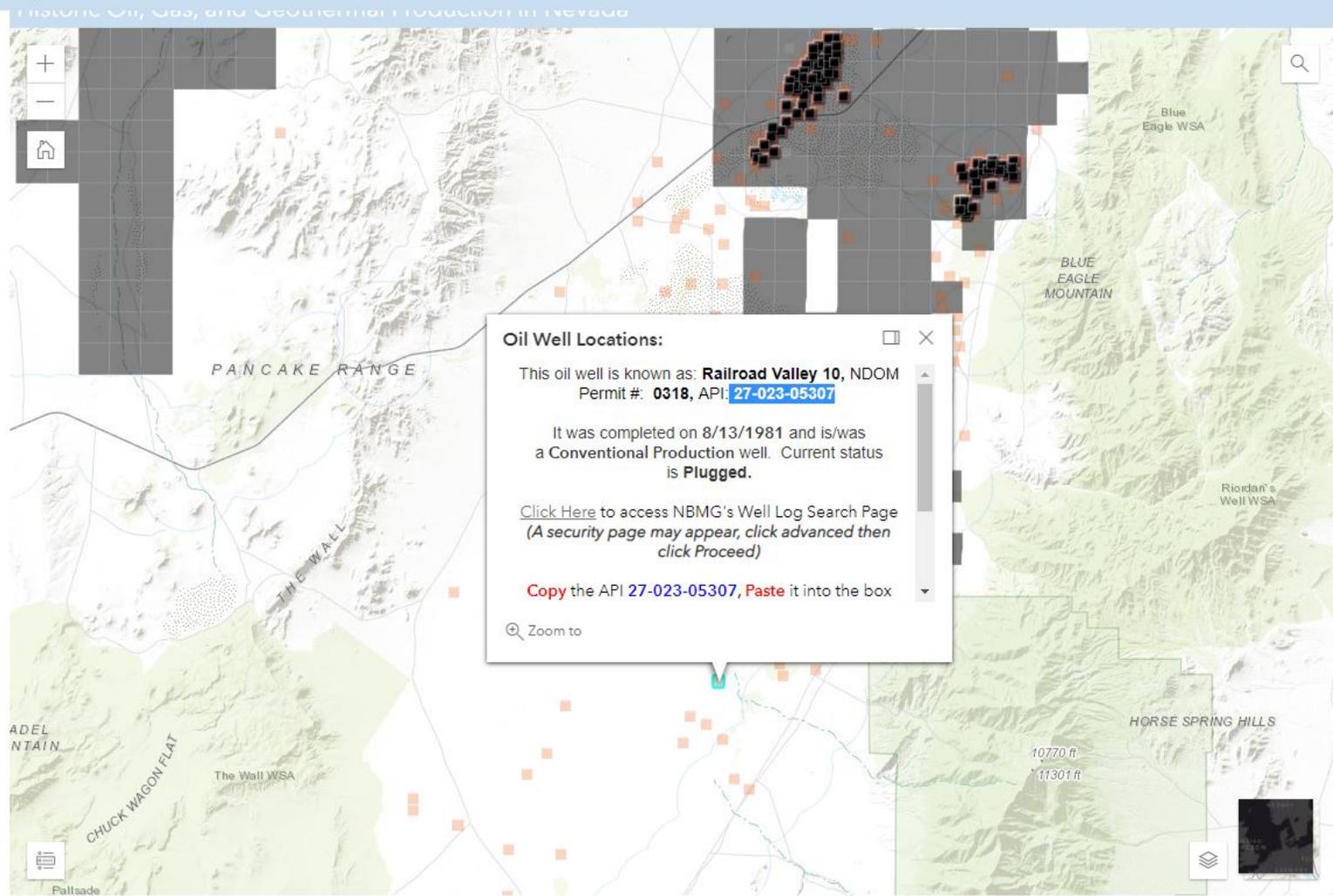
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WCAG 2.0
ADA
Compliance
In Progress**





Nevada Division of Minerals Open Data Site



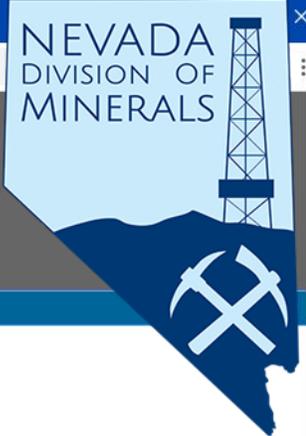


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Oil and Gas Well Search

This page may be used to search the Oil and Gas Well Log files. Files include permits, electric logs, mud logs, completion reports, sundry reports, and production data housed at NBMG. See [excel spreadsheet](#) to identify the correct API number. Additionally, see [description of information and abbreviations](#) from OF2011-06 for help reading logs.

API Number:

County:

Permit:

Operator:

Well:

Township:

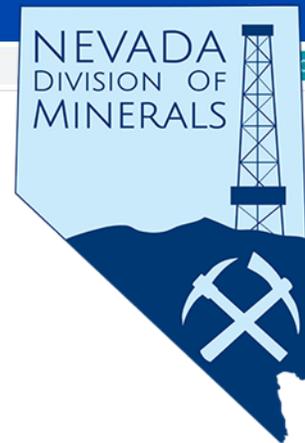
Range:

Search All Fields:

Once search fields have been set, click the "submit" button below, or click "reset" to clear the form.

>
[Oil well log additions since 2011](#)

Oil and Gas logs are in a variety of formats such as PDF, TIFF, JPEG, and software-specific formats and are provided in the format which they were scanned. Some files are duplicated in different formats. Many of these files, especially the log files, are very large. For example, some of the full-color log files in TIFF format are several hundred megabytes in size. You may need special viewing software for some of these files.



Search Results

API	File Name	County	Permit	Operator	Well	Section	Township	Range
27-023-05307	27-023-05307.pdf	Nye	0318	Northwest Exploration Co.	Railroad Valley No. 10	21	06N	56E
27-023-05307	27-023-05307_ACBL.tif	Nye	0318	Northwest Exploration Co.	Railroad Valley No. 10	21	06N	56E
27-023-05307	27-023-05307_AFC.tif	Nye	0318	Northwest Exploration Co.	Railroad Valley No. 10	21	06N	56E
27-023-05307	27-023-05307_CD-CN.tif	Nye	0318	Northwest Exploration Co.	Railroad Valley No. 10	21	06N	56E
27-023-05307	27-023-05307_DP4.tif	Nye	0318	Northwest Exploration Co.	Railroad Valley No. 10	21	06N	56E
27-023-05307	27-023-05307_LACA.tif	Nye	0318	Northwest Exploration Co.	Railroad Valley No. 10	21	06N	56E
27-023-05307	2702305307-DIL.tif	Nye	0318	Northwest Exploration Co.	Railroad Valley No. 10	21	06N	56E
27-023-05307	2702305307-NEUTRON-DENSITY.tif	Nye	0318	Northwest Exploration Co.	Railroad Valley No. 10	21	06N	56E
27-023-05307	2702305307-SONIC.tif	Nye	0318	Northwest Exploration Co.	Railroad Valley No. 10	21	06N	56E
27-023-05307	2702305307-WCR.tif	Nye	0318	Northwest Exploration Co.	Railroad Valley No. 10	21	06N	56E

10 Records Found

[New Search](#)



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Sage Grouse Habitat Management Areas

Find address or place

Layer List

Layers

- Nevada Active, Pending, Submitted, and Filed Mining Claims Listings Points January 24, 2022
- Nevada Active, Pending, Submitted, and Filed Mining Claims Listings Per Section January 24, 2022
- Nevada Active Mining Claim Listings Points as of December 29, 2021
- Nevada Active Mining Claim Listings Per Section as of December 29, 2021
- SFA - ADPP USFSData
- SFA - NVCA ARMPA Locatables Recommended Withdrawal
- MiningDistrictsLinkToNVLR
- Management Categories for Greater Sage-Grouse in Nevada (December 2015)
- SectionReference
- NVPLSSTiles
- Nevada Surface Management Tiles

A map of Nevada showing Sage Grouse Habitat Management Areas. The map is overlaid with a color-coded grid of red and yellow areas, indicating different management zones. The map is powered by Esri and includes a scale bar (60mi) and coordinates (-116.072 36.967 Degrees).

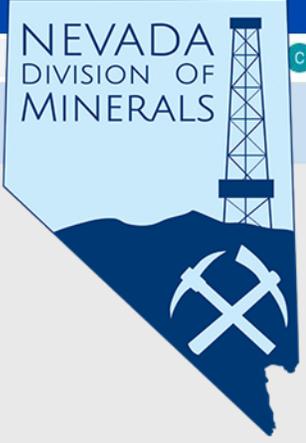
60mi

-116.072 36.967 Degrees

POWERED BY esri

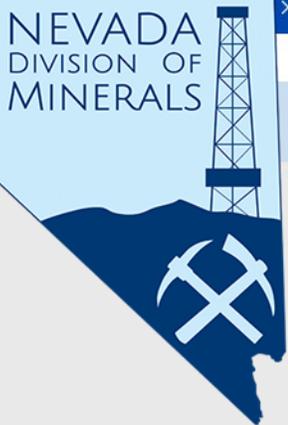
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To download the habitat management boundary data used for this map click here (data directly from the Sagebrush Ecosystem Program) [Click Here](#)





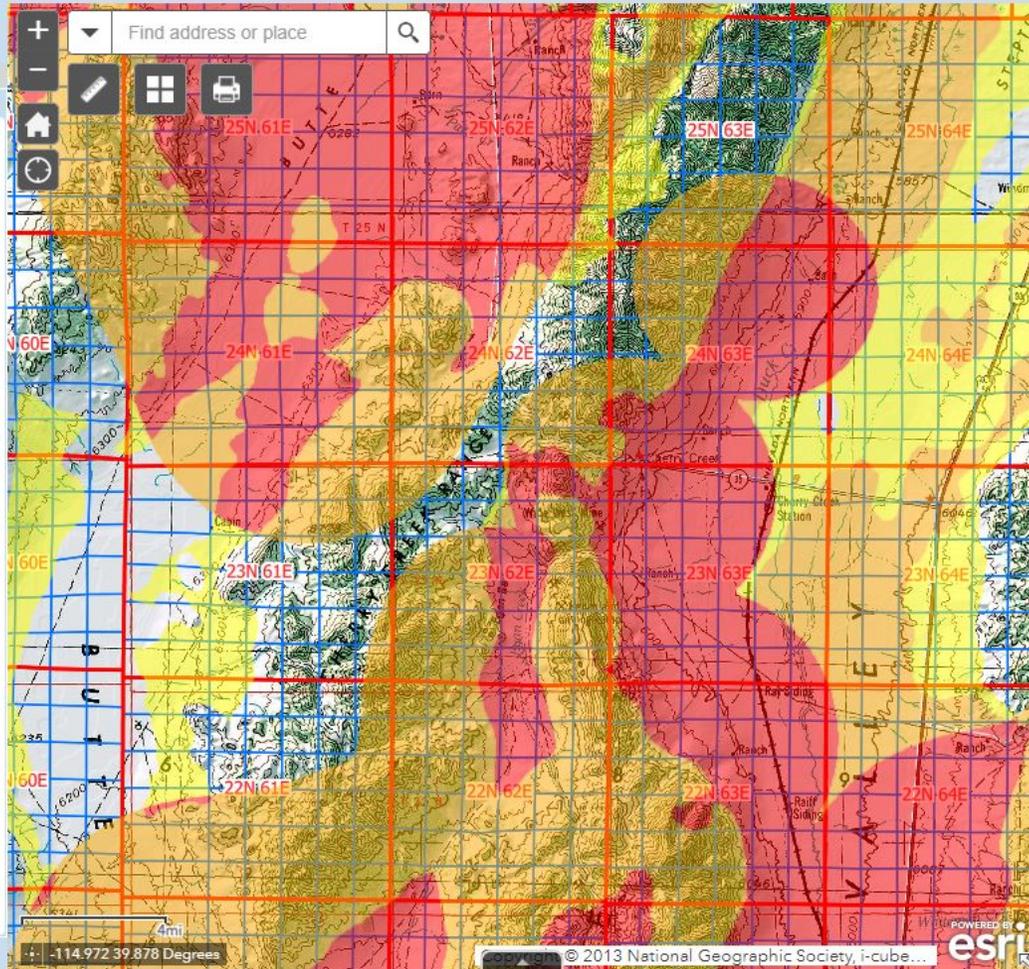
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Sage Grouse Habitat Management Areas

Layer List

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