# Nevada Division of Minerals

## *LITHIUM EXPLORATION IN NEVADA*

**SAGEBRUSH ECOSYSTEM COUNCIL**

**August 3, 2017**

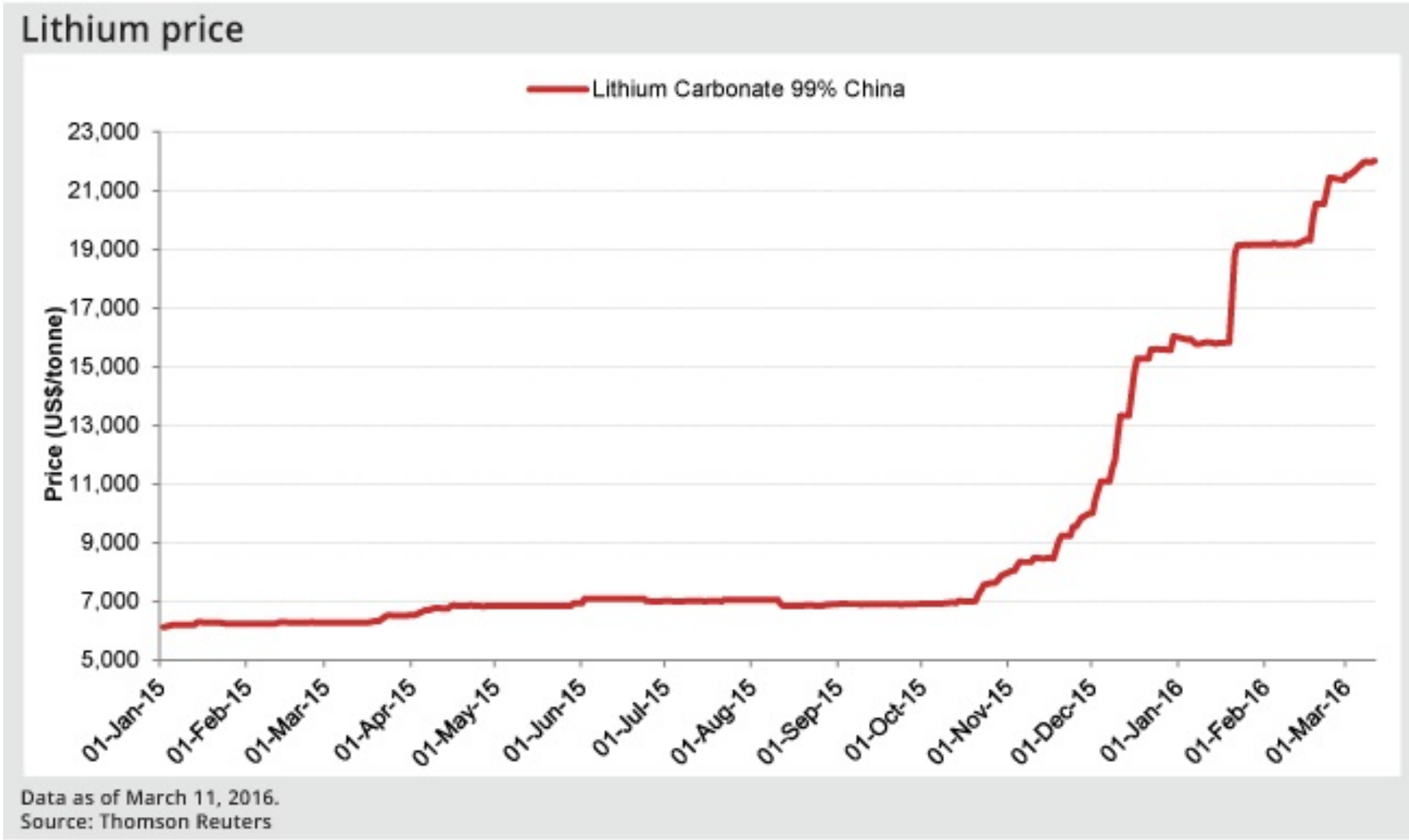
**Rich Perry, Administrator**

# Why the interest in Lithium ?

- Uses in energy storage are expanding
  - 3rd element on periodic table “the lightest metal”
  - 12 % world-wide increase in production in 2016 to 37,800 tons
  - Batteries 39%, ceramics and glass 30%, casting and polymers 5%, air treatment 3%, other including pharma 10 *(USGS Commodity Summaries, 2016)*
  - 4 major suppliers world-wide that sell lithium carbonate and hydroxide compounds to users under contracts. Chile, Argentina, US, Australia production
  - A critical high-tech mineral
  - U. S. is a net importer, Tesla (Panasonic) factory will require increased imports

## WHY THE STAKING BOOM ?

## Answer: SPOT LITHIUM PRICES IN CHINA INCREASED 300% IN 2016



# Lithium Brine Exploration in NV

- **Nevada has the only operating lithium mine in the U.S. – located in Clayton Valley, Esmeralda County**
  - **Operated since 1967, employs 85 people**
  - **Produces lithium carbonate**
  - **Uses surface evaporation ponds to concentrate lithium after treating brines pumped from 4 aquifers**
- **Geologic Model for a lithium brine deposit:**
  - **Salar deposits – a salt flat that may represent the basin of a salt lake**
  - **Accumulations of saline groundwater that are enriched in dissolved lithium.**
  - **Exploration by drilling and sampling of brine aquifers**

Albemarle Lithium Operation, Esmeralda County

# Lithium

- Is a locatable mineral on Federal land under the general Mining law
- Placer claims are used to locate potential lithium brine deposits
- Lode claims are used to locate potential lithium clay deposits

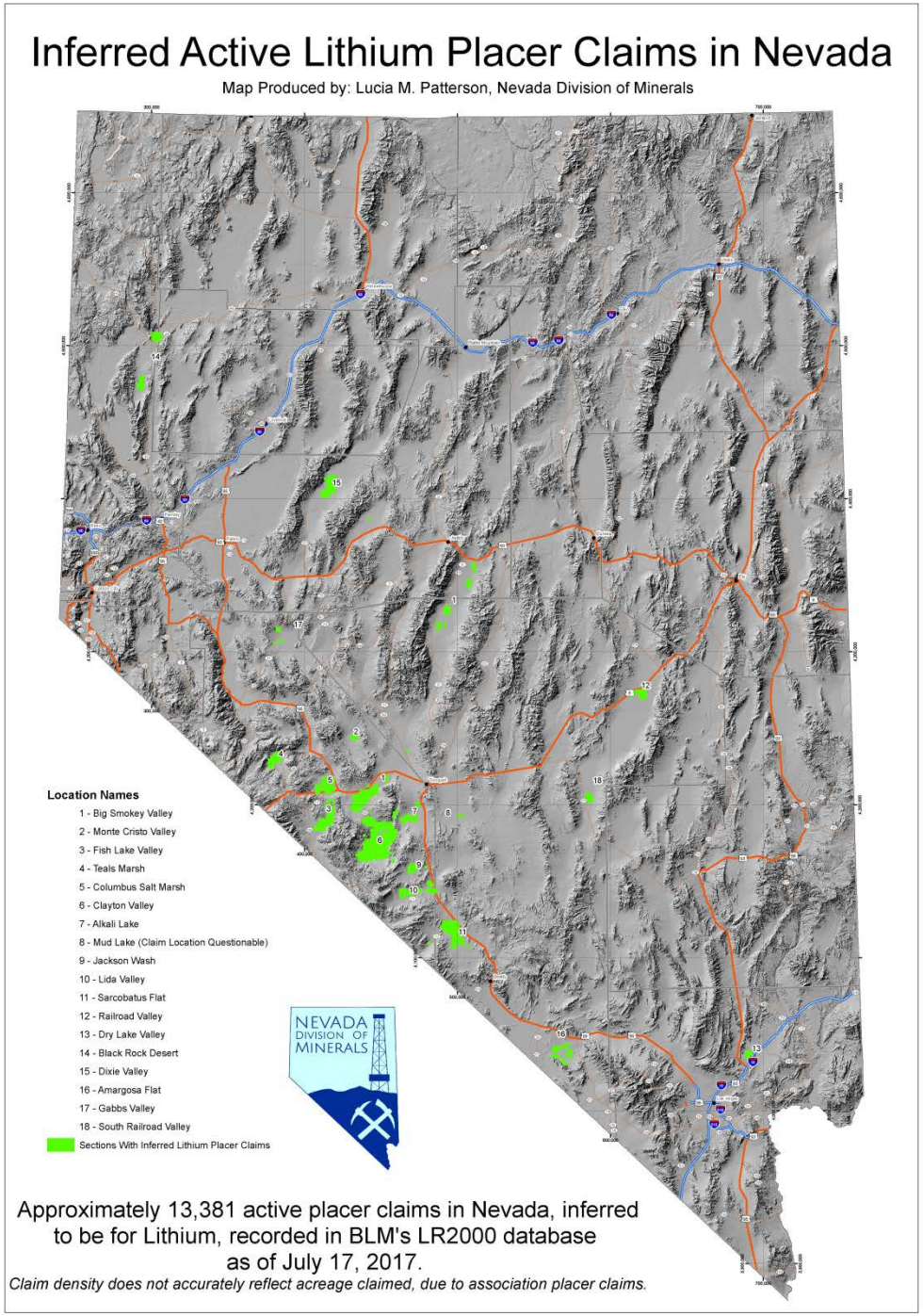
# NEVADA'S LITHIUM EXPLORATION ACTIVITY

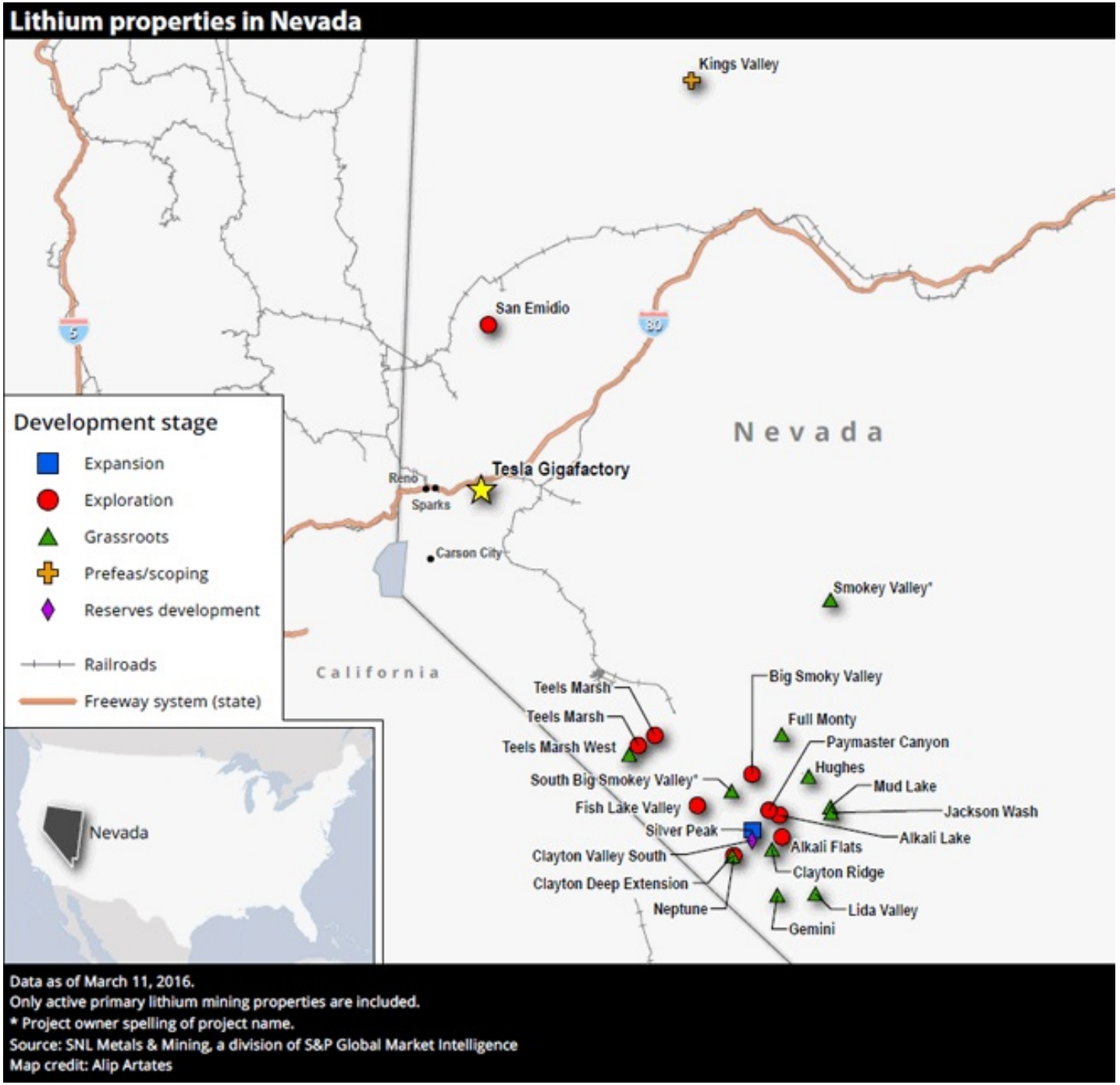
>13,381 claims staked in playas

- 18 different hydrographic basins

-25 different exploration entities and one producer

*Current to 7-17-2017*




Lithium properties in Nevada
Kings Valley
San Emidio
Nevada
Development stage
Expansion
Exploration
Grassroots
Prefeas/scoping
Reserves development
Railroads
Freeway system (state)
Tesla Gigafactory
Reno
Sparks
Carson City
Smokey Valley*
California
Teels Marsh
Teels Marsh
Teels Marsh West
Big Smoky Valley
Full Monty
Paymaster Canyon
Hughes
Mud Lake
Jackson Wash
Alkali Lake
Alkali Flats
Clayton Ridge
Lida Valley
Gemini
South Big Smokey Valley*
Fish Lake Valley
Silver Peak
Clayton Valley South
Clayton Deep Extension
Neptune
Nevada
Data as of March 11, 2016.
Only active primary lithium mining properties are included.
* Project owner spelling of project name.
Source: SNL Metals & Mining, a division of S&P Global Market Intelligence
Map credit: Alip Artates

# Lithium brine exploration

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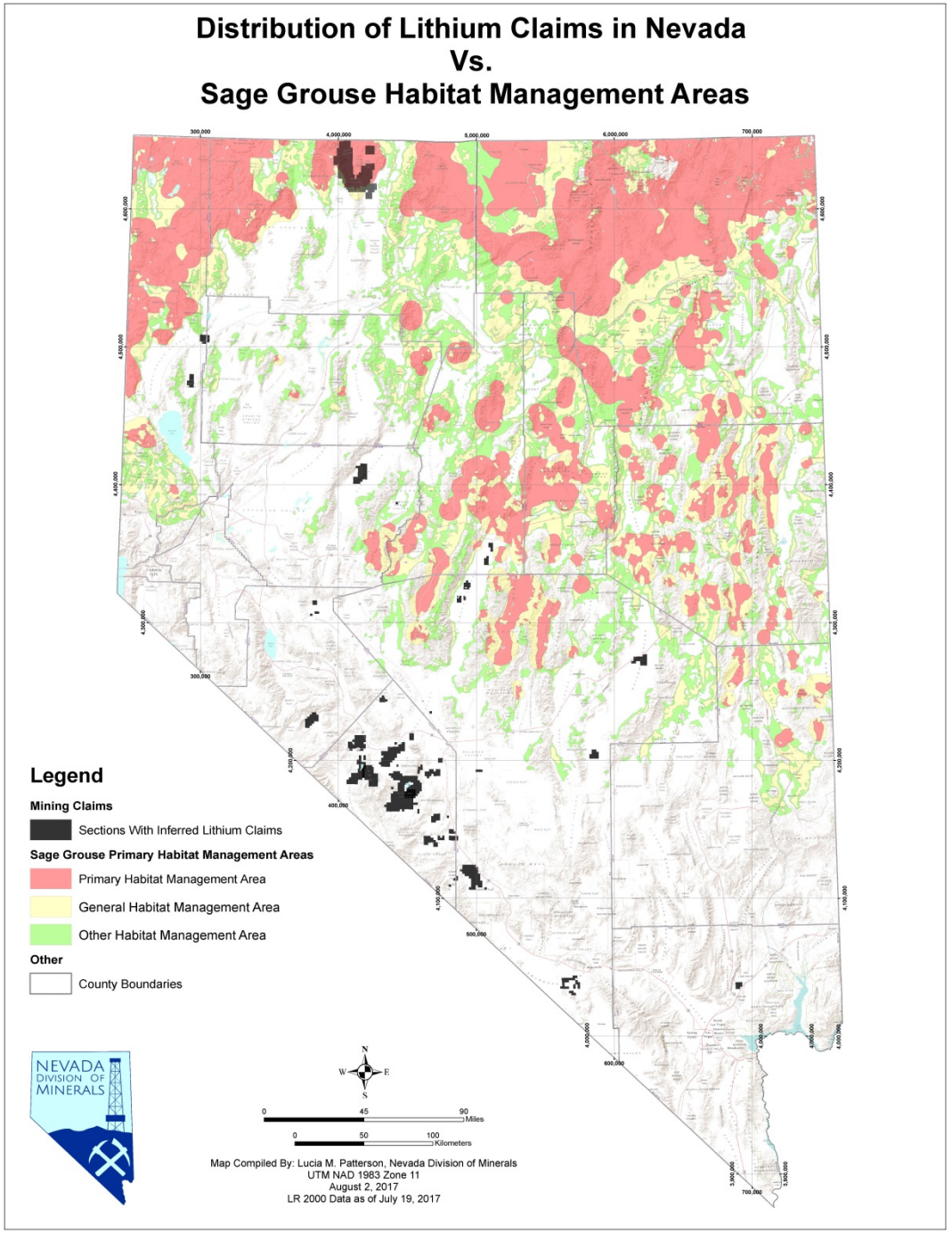
## Lithium Exploration and Sage Grouse habitat

- Lithium brine targets
- Exploration notices to BLM
  - Allow for < 5 acres surface
  - Requires bonding
  - Exploration boreholes
  - Brine sampling of boreholes
- Currently <10 notice-level projects
- Minimal surface disturbance in playas

**No lithium brine exploration projects in any existing Sage Grouse habitat management Areas – see map.**

## Lithium-bearing clay targets

- One in Montana Mtns w/ operating lithium clay quarry
- One project in Esmeralda Cty.



# Development of Regulations for Dissolved Mineral Resources

- A.B. 52 from 2017 legislative session directed NDOM, NDEP and NDWR to jointly develop regulations for dissolved mineral resources
  - Allows for sampling of brines from boreholes
  - Requires a permit to drill a dissolved mineral resource exploration well; one-time 5 acre-foot test is allowed per project
  - Requires a licensed water well driller for boreholes and wells to ensure protection of fresh water and geothermal resources
  - Restrictions on drilling in active geothermal areas being developed in regulations
  - Regulation development in progress, required to be in place by 1-1-2018