

Division of  
WATER RESOURCES

# Conjunctive Management

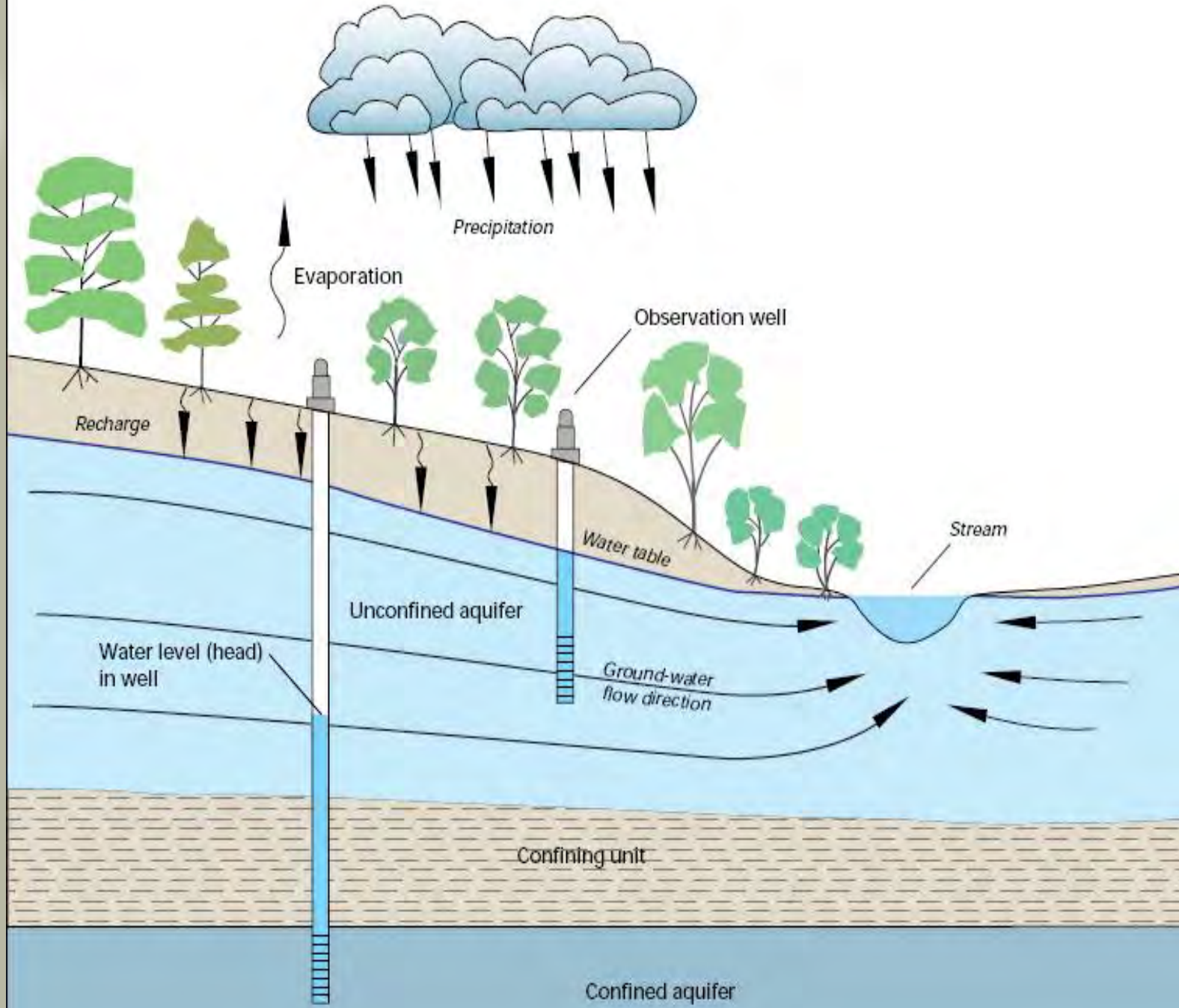
Churchill &  
Lyon Counties

February 12, 2018

Jason King  
State Engineer

Kelvin  
Hickenbottom  
Deputy  
Administrator

DEPARTMENT OF  
**CONSERVATION &  
NATURAL RESOURCES**





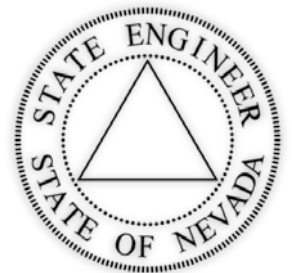
# 2017 Legislation

## SB 47

### **NRS 533.024(1)(e)**

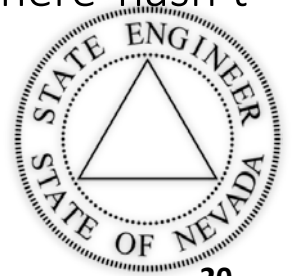
The Legislature declares that:

It is the policy of this State to manage conjunctively the appropriation, use and administration of all waters of this State, regardless of the source of the water.



# Nevada's Water Law

- Surface water law – NRS Chapter 533
- Groundwater law – NRS Chapter 534
  
- 1000's of decisions and dozens of court affirmations have molded water policy in Nevada
  
- The water law and science have not always been harmonized
  - There have been numerous State Engineer decisions that dealt with groundwater/surface water connectivity over time but there hasn't been enough momentum to further the effort.



# Some History

## IV.

The State Engineer concludes that Nevada water law provides for the management of surface water and ground water as distinct sources. The State Engineer concludes that to change that scheme of water management at this point in time would conflict with existing rights and threaten to prove detrimental to the public interest. The State Engineer also concludes that since he has

Ruling 5079, 2001



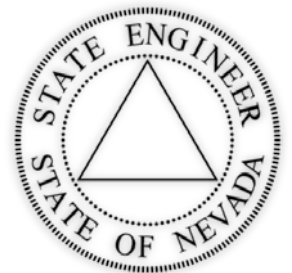
# The Problem

- Surface water used first, typically most senior priority
- Groundwater, generally, used after surface water fully appropriated, therefore junior to surface water rights
- In hydrologically connected systems, groundwater pumping either captures water that would ordinarily flow to the river OR pulls water from the river into the groundwater resource.
- Nevada's water law, based on the prior appropriation doctrine, must protect existing rights from subsequent use.



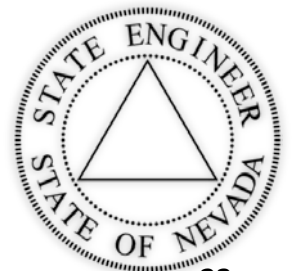
# Humboldt River Basin Modeling and Conjunctive Use Management

- Brief History of the Humboldt Region
- Water use and overview of modeling effort
- Ongoing modeling and hydrologic studies
- Q & A



# Humboldt River

- Fully decreed
  - Priorities are 1860's to early 1900's
  - 285,000 acres irrigated under the decree, rights total ~700,000 af
  - Flows through 34 groundwater basins.
- Current groundwater appropriations of 716,000 af
  - 2016 pumpage ~323,000 af
  - 43,000 af above Palisade
  - 280,000 af below Palisade
- All Decree rights senior to all groundwater rights
- Groundwater pumping depletions of river flow supported by existing studies



# Humboldt River

- USGS and DRI building a capture model of the entire drainage
  - Best available science
  - Completion by the end of 2019
  - Better defined surface water – groundwater connectivity
- Humboldt River Working Group (HRWG) created
  - Members represent agriculture, mining, municipal interest from upper, middle and lower Humboldt River
- Goal is to adopt regulations to address mitigation (augmentation) by the time the capture model results are finalized.





# NEVADA



Winnemucca

Humboldt

Battle Mountain

Lovelock

Fernley

Reno

Carson City

Fallon

Austin

Carlin

Elko

Wells

Ely

Chimney Res.

Little Humboldt

South Fork

Rock Cr.

Maggie Cr.

Pine Cr.

Reese

North Fork

Marys

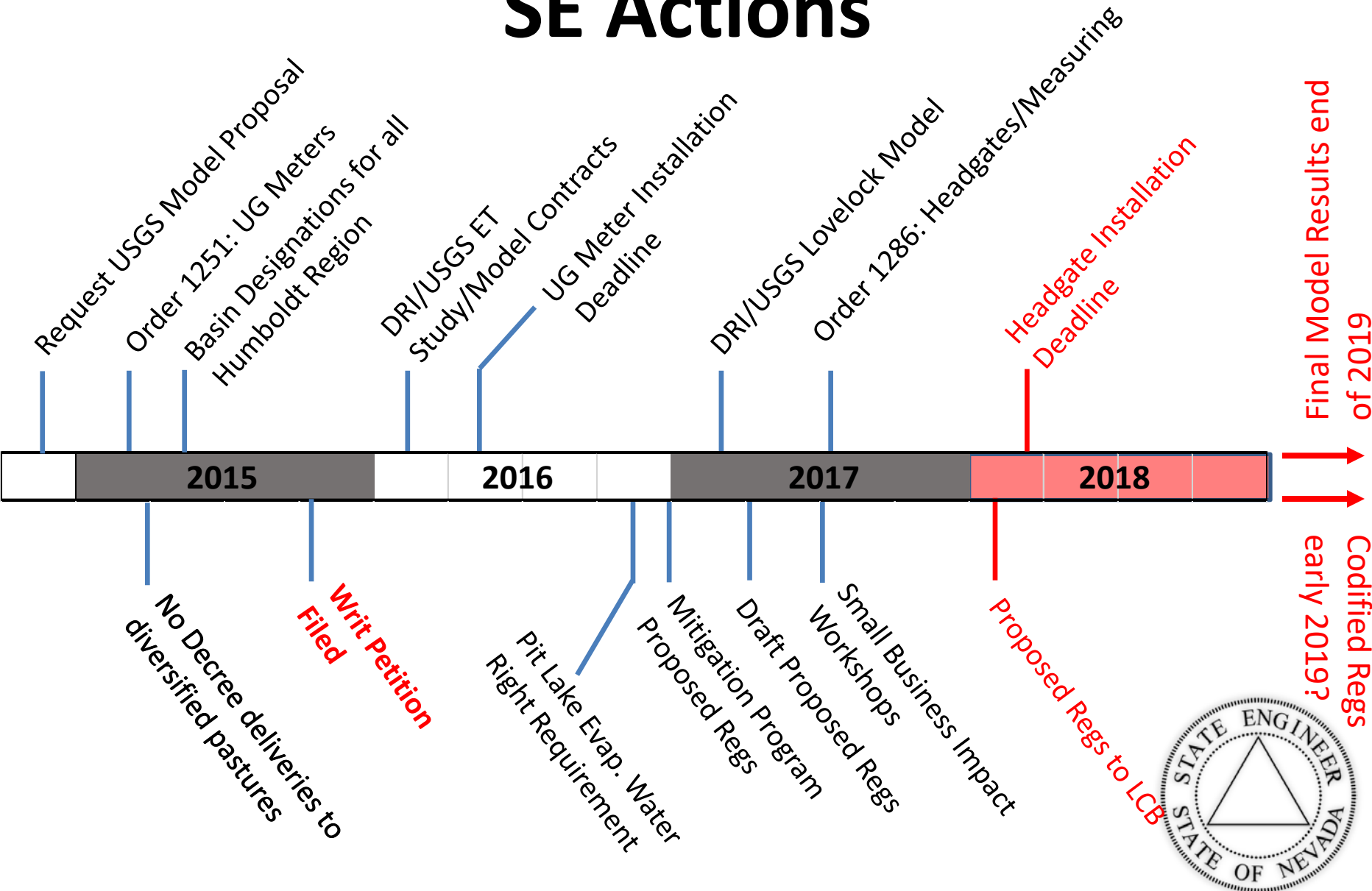
South Fork Res.

South Fork

Humboldt Sink  
Lower Humboldt Drain

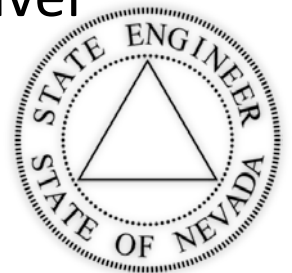
Carson Sink

# SE Actions



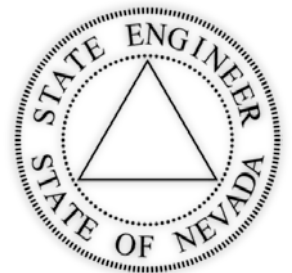
# PCWCD Writ Petition

- 40,000-acre PCWCD holds 140,000 af Decree rights
- Received little to no water from 2013 to 2015
- Argue that groundwater pumping is depleting Humboldt River and conflicting with their senior water rights
- PCWCD filed writ petition in District Court August 2015
  - Curtailment in overappropriated basins
  - Eliminate cones of depression by groundwater pumping causing interference with flows of the Humboldt River
  - Treat mine water rights as permanent; consider dewatering effects and pit lakes.



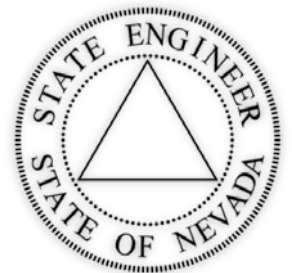
# State Engineer's Management Regulations as an Alternative to Curtailment

- NRS 533.030(1) and 534.020(1) – all water appropriated subject to existing rights
- Maximize beneficial use of the limited water resource
- Allow for continued, uninterrupted groundwater use
- Provide mitigation to senior Decree rights for conflicts
- Involve stakeholders throughout process



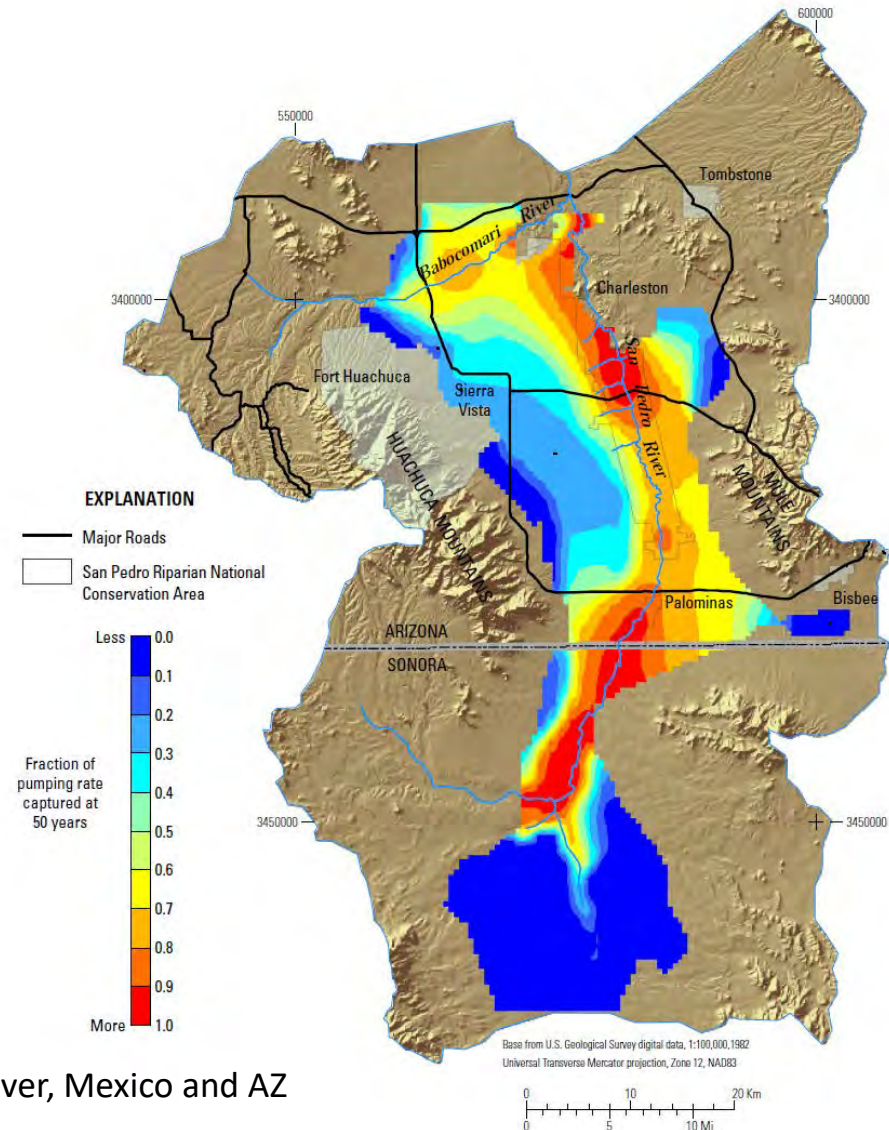
# Water Model Needed to Determine Extent of Conflict

- Ongoing studies by USGS and Desert Research Institute
- Use existing models and geologic data
- Simulate the natural system
- Calibrate to historic conditions, flow records, water levels and pumpage
- Quantify how much surface water is actually captured by groundwater pumping



# Develop Capture Maps

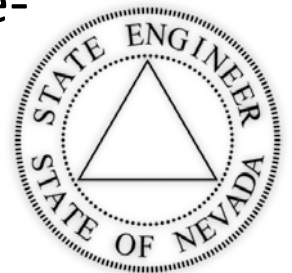
- Evaluate stream depletion as result of pumping
- Publicly available models
- Interactive capture maps
- Peer-reviewed professional publications



Ref: USGS Circular 1376; San Pedro River, Mexico and AZ

# Review

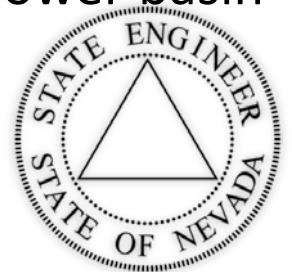
- Groundwater flow model being developed to understand capture of Humboldt River by pumping.
- Major tasks:
  - Assemble datasets: Pumping, water-levels, mine-water management, hydrogeology, stream network, etc.
  - Develop method for understanding limitations of capture maps. (Capture Map Bias)
  - Estimate recharge distribution.
  - Develop and calibrate model.
  - Use model to estimate capture and impact of mine-dewatering.



# Humboldt River Basin Proposed Regulations

## Approach:

- Allow for replacement of injurious depletions – to the extent that surface water is available
  - No reservoirs exist, replacement must be from direct diversions while in priority
  - Groundwater cannot be used for replacement
- If replacement water is not made available, then groundwater users are required to participate in a basin-wide mitigation plan
  - Includes all groundwater use that depletes river
  - Mitigation by financial compensation
  - Mitigation fund compensates surface water users based on conflict
  - Need independent value of water in upper, middle and lower basin
  - Determine conflict: based on pre-pumping estimate of supply, scheduled deliveries minus actual deliveries

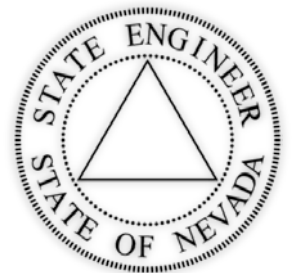




# Humboldt River Basin Conjunctive Management Regulations

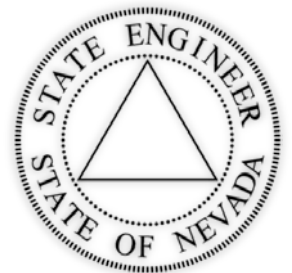
Problems and issues:

- Regulations do not address basic problem
- Lower basin water users want water, not money
- For surface water flows to return to pre-groundwater pumping rates would require decades with no pumping
- Population centers are close to river and would be significantly impacted by curtailment
- Priority issues: GW-GW vs GW-SW
- Groundwater assessments may prove too costly for some users
- Domestic wells
- Forfeiture issue



# Advantage of Proposed Regulations vs Writ Petition

- Addresses same groundwater rights as writ petition
- Regulations allow for continued, uninterrupted diversions
- Senior surface water rights compensated to the extent of conflict
- Use 10-year average conflict for surety, planning
- Better outcome for both surface water and groundwater users than curtailment



Questions?

