

STATUS OF BRACKISH WATER DEVELOPMENTS IN NEW MEXICO:  
*Current Uses, Development and Availability, and Regulatory Challenges*

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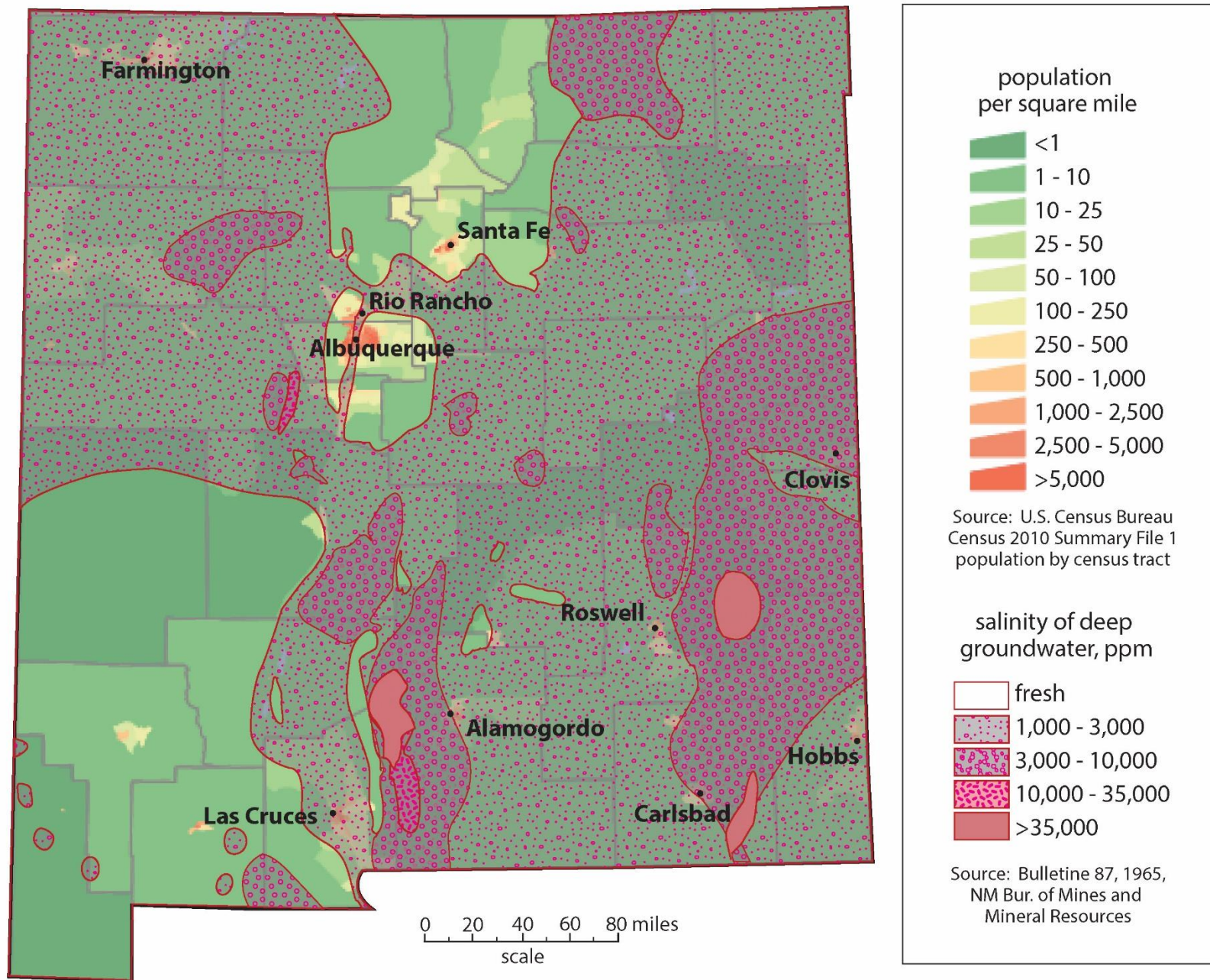


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2016 WATER-STATUS DEVELOPMENTS AND REGULATORY CHALLENGES  
DEVELOPMENTS SUMMARY

# Brackish Groundwater in New Mexico

- ▣ New Mexico has an abundance of brackish (>1,000 to <3,000 mg/L TDS) groundwater in all four quadrants of the state.
- ▣ Sources of elevated salinity in New Mexico groundwater primarily come from dissolution of salts in sedimentary rocks and evapo-concentration of TDS where the water table is near the land surface.



# Current Uses of Brackish Groundwater

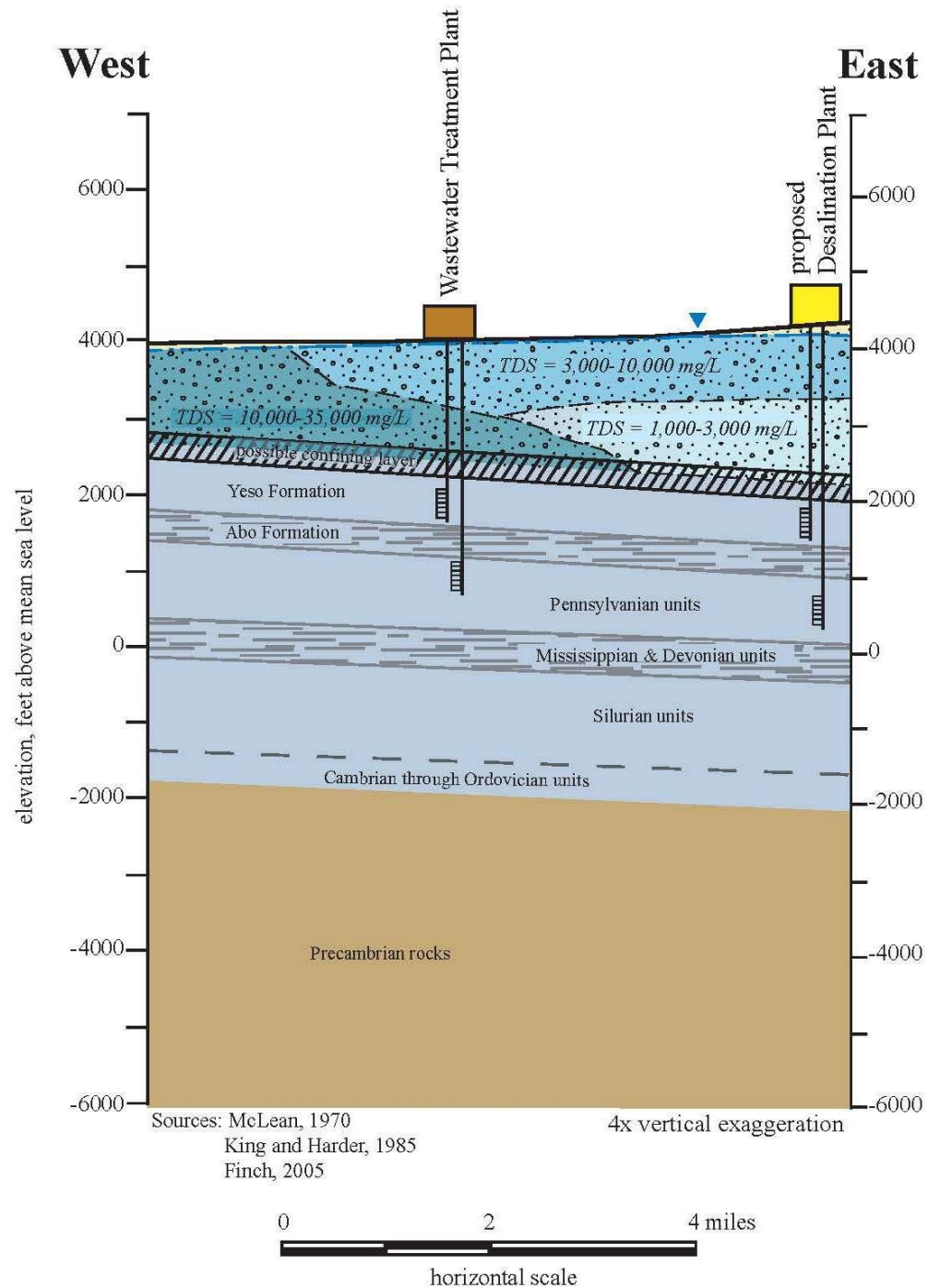
- ▣ About 20% of communities rely on untreated brackish (TDS 1,000 to 1,500 mg/L) groundwater for all or part of their supply.
- ▣ In 2005, over 400,000 acre-feet of brackish groundwater was used for irrigation, an amount equal to approximately 32 percent of all irrigation by groundwater.
  - **Irrigated agriculture is the largest user of brackish groundwater**

# Alamogordo, New Mexico

- ▣ The City of Alamogordo will be the first city in New Mexico to develop a brackish well field for municipal use where the water will be treated to reduce TDS prior to distribution.
- ▣ The project has taken over 15 years to develop due to regulatory issues and funding.
- ▣ Location of the Brackish Groundwater National Desalination Research Facility
  - **And proof that groundwater doesn't always degrade with depth**

Salinity does not always increase with respect to depth, particularly at the Brackish Groundwater National Desalination Research Facility!








This is also the same location proposed for Alamogordo's injection disposal wells.

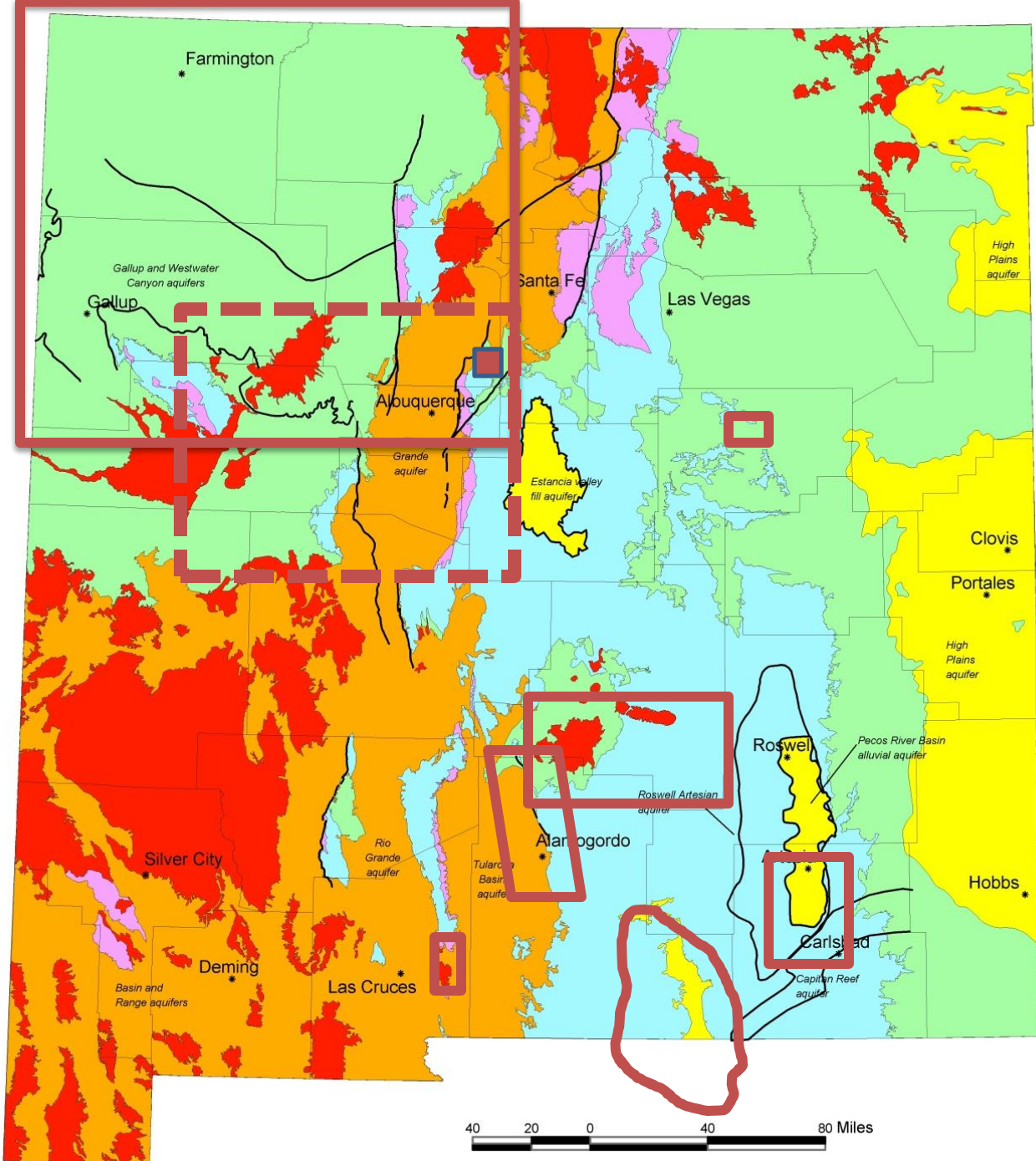


# GEOLOGY OF NEW MEXICO'S AQUIFERS



## Explanation

-  major fault
-  thin alluvial-fan and river-laid deposits
-  basin fill in deep, down-faulted basins
-  volcanic rocks
-  sandstone and shale aquifers
-  limestone, sandstone, and shale aquifers
-  granite and similar crystalline rocks



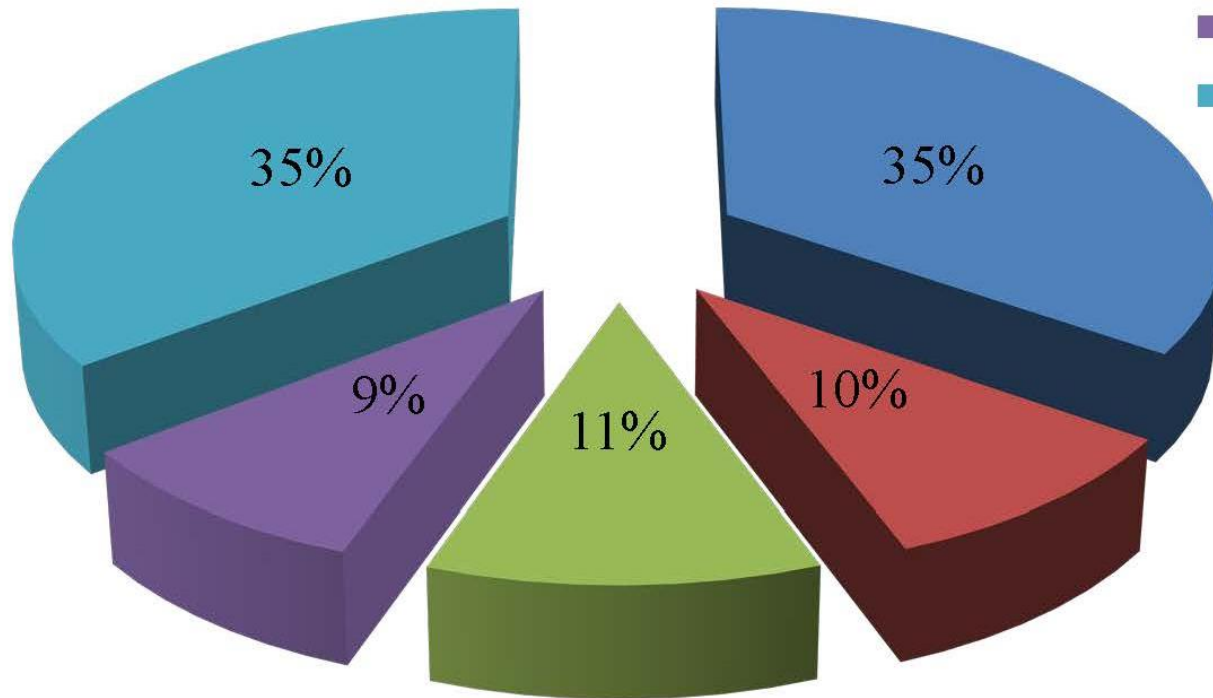
# Permitting Challenges

- ▣ New Mexico Office of the State Engineer (NMOSE)
- ▣ New Mexico Environment Department (NMED)
  - **Drinking Water Bureau**
  - **Groundwater Protection Bureau**
  - **Surface Water Bureau**
- ▣ NM State Land Office (depending on project location)
- ▣ Federal Agencies (depending on project location)
  - **Bureau of Land Management (BLM)**
  - **U.S. Forest Service (USFS)**
  - **U.S. Environmental Protection Agency (EPA)**
- ▣ Permits for projects located on Federal Lands must be renewed, and renewals are not guaranteed.

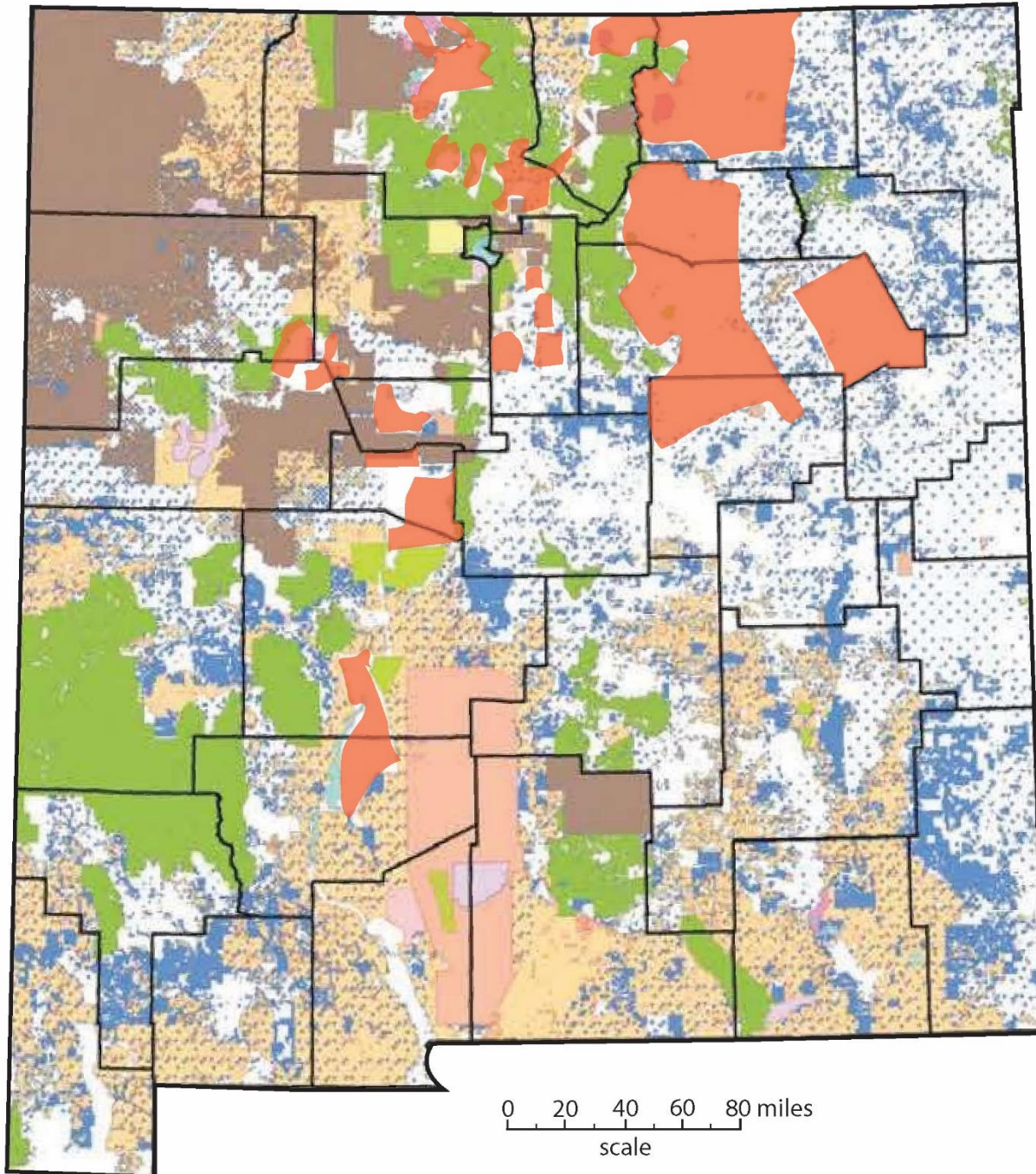


# Land Ownership

- Federal
- Tribal
- State
- Land Grant
- Private



## Land Ownership Distribution



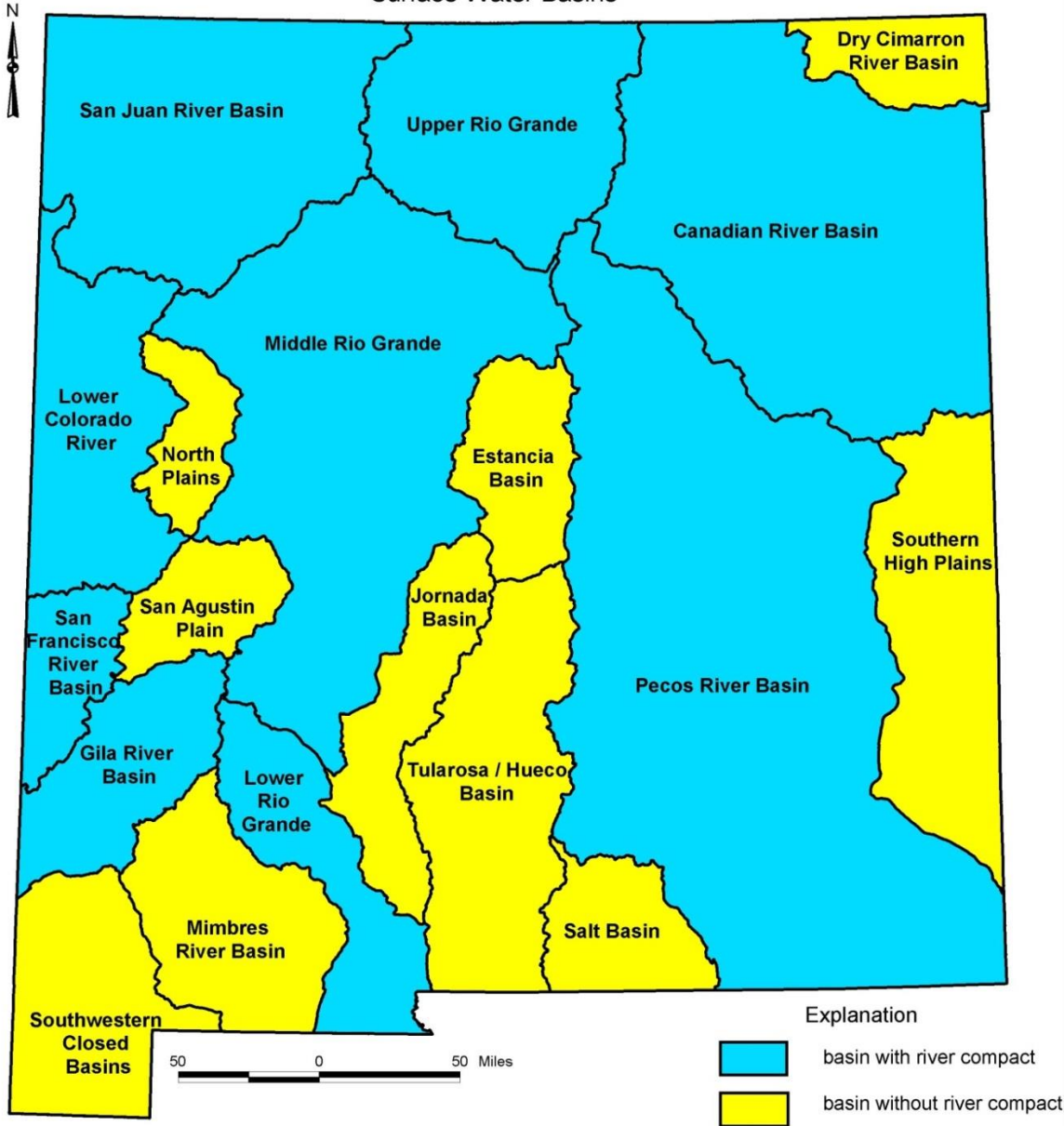
0 20 40 60 80 miles  
scale

# New Mexico Office of the State Engineer

- ▣ Administers all water resources except “non-potable deep aquifer” (>10,000 TDS, top of aquifer >2,500 ft)
- ▣ Water rights presumably administered by prior appropriation
  - **Earliest (senior) user can have a full allotment before others**
- ▣ Any water rights owner, even owners of wells without water rights (domestic and livestock wells), Federal Government, and Tribes can protest any water rights transfer
- ▣ Hearing process is slow and takes years (3 - 10 years)
- ▣ Water rights process (except on Tribal Lands) is likely the most time consuming process

# MANAGEMENT OF NEW MEXICO'S GROUNDWATER

Surface Water Basins



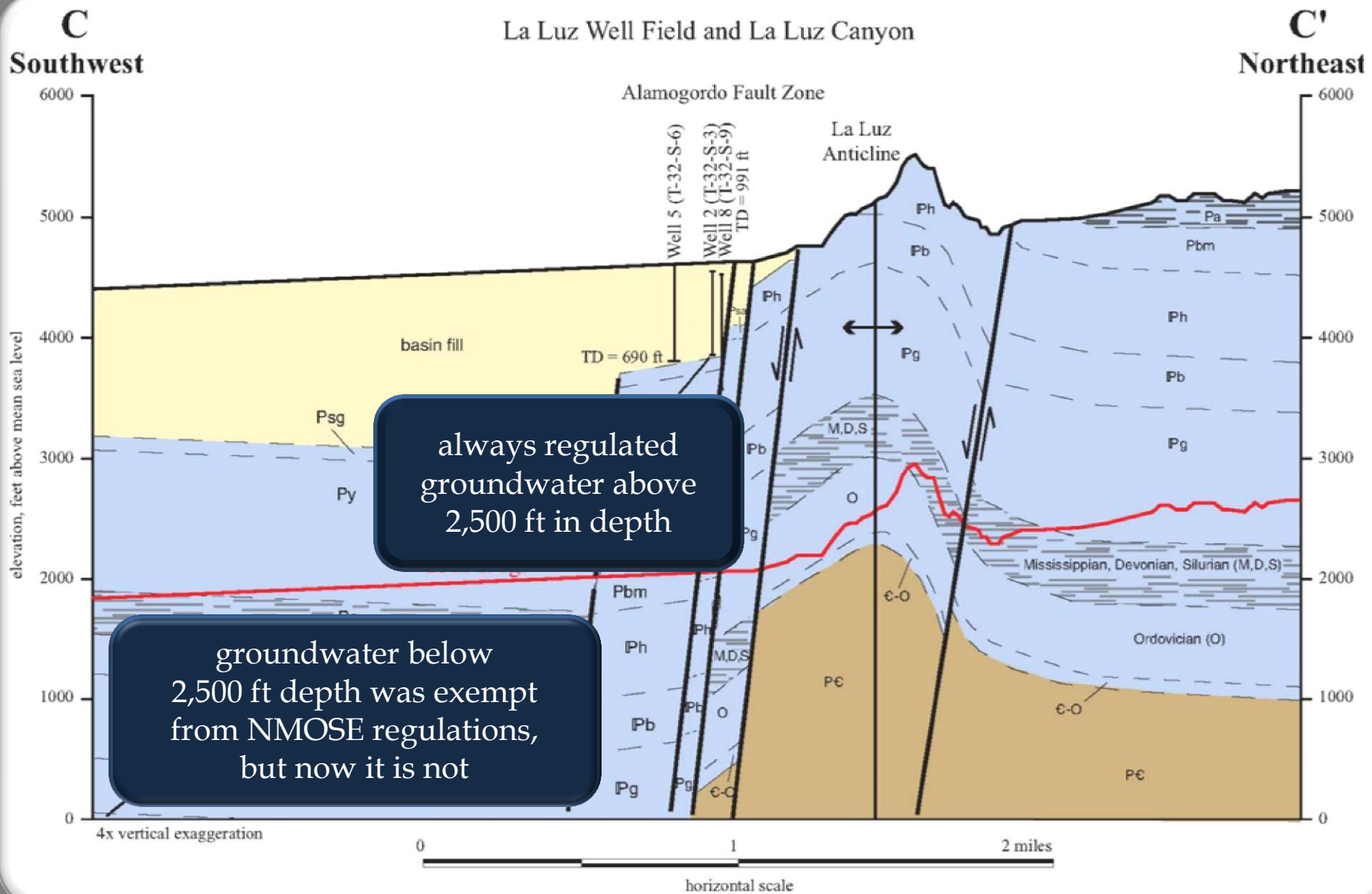
Basins with river compacts are administered by availability of streamflow (blue)

- *water rights limited to allowable stream depletion*

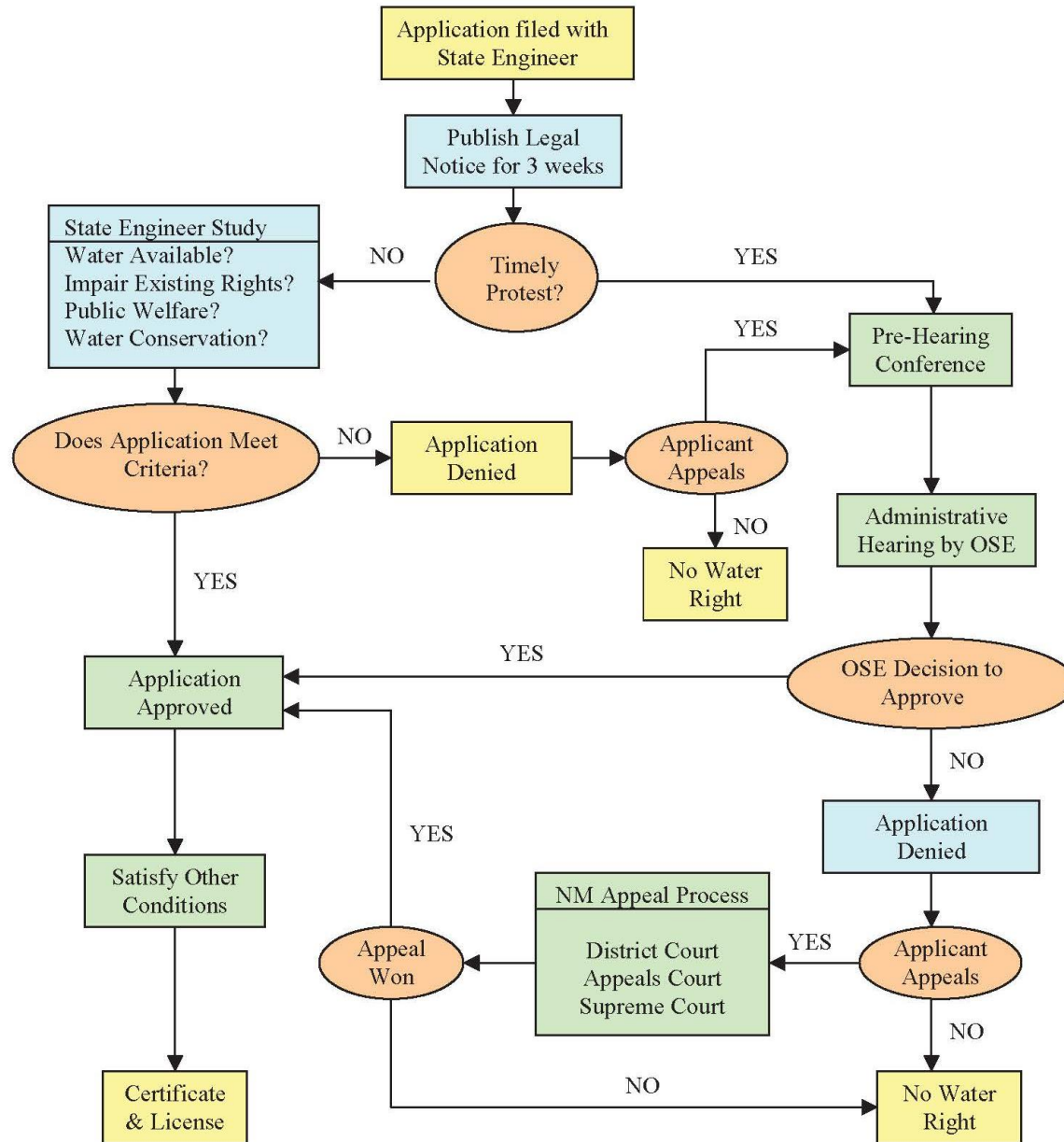
Basins without river compacts are administered by limits of ground-water mining (yellow)

- *typically a maximum of 2.5 ft/yr over*

# NMOSE JURISDICTION HAS CHANGED



# WATER RIGHT APPLICATION FLOW CHART



## CONCLUSIONS

- **New Mexico has abundant brackish groundwater supplies, and a significant amount is already used without treatment.**
- **Land ownership challenges and distance of brackish groundwater source to area of demand limit development.**
- **New Mexico Office of the State Engineer permitting process provides no incentive to develop brackish groundwater – it is treated the same as fresh groundwater.**
- **It is likely that brackish groundwater supplies will not be primary targets for development until the permitting process becomes easier and fresh water sources become more scarce.**