Division of
WATER RESOURCES

Pahrump Valley Water Use and Management

Presentation to the Legislative Commission's Subcommittee to Study Water

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Pahrump, NV
July 11, 2016

DEPARTMENT OF
CONSERVATION &
NATURAL RESOURCES

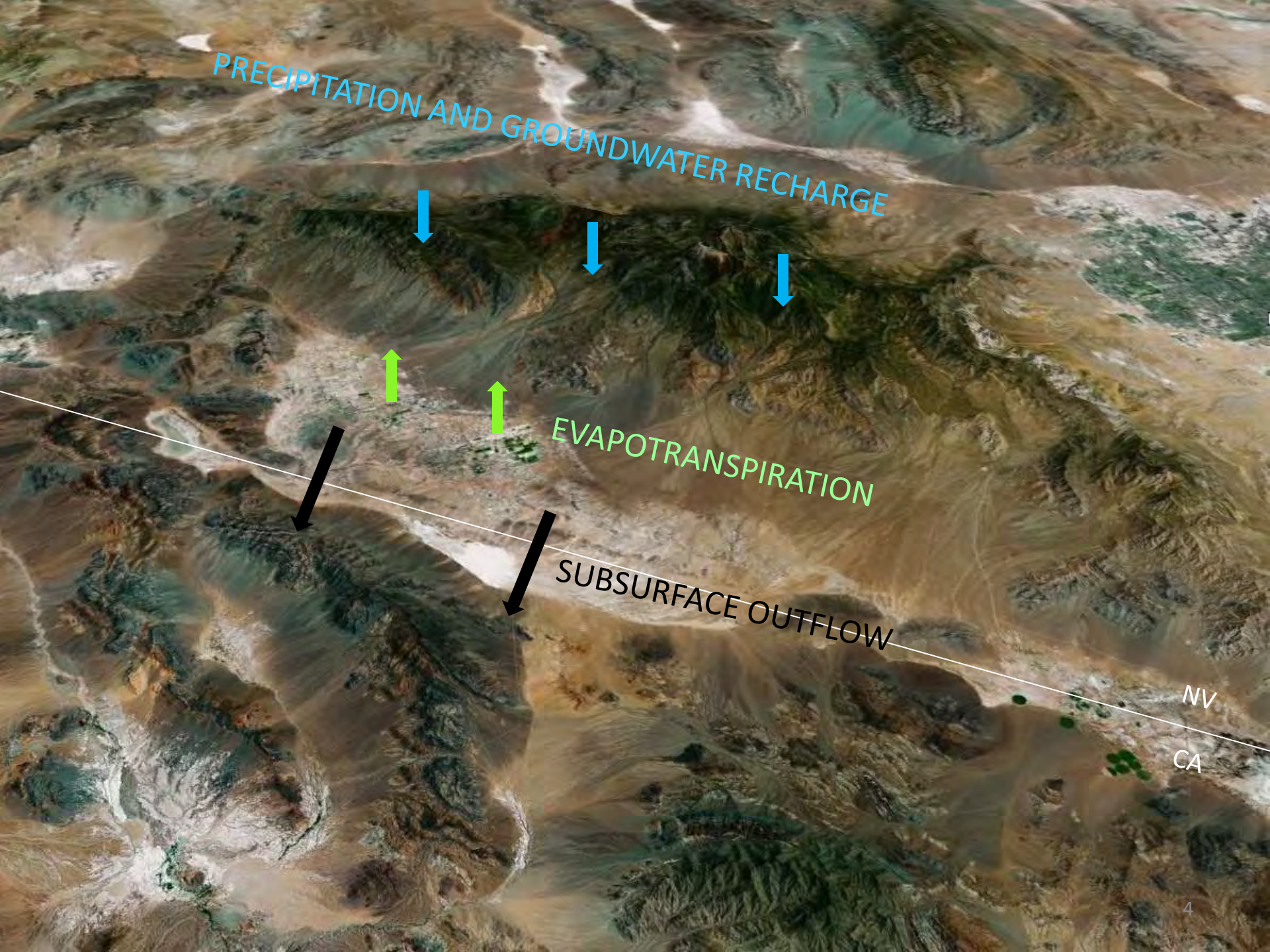
Agenda Item IV (WATER)
Meeting Date: 07-11-16

Abbreviated History

- Settled in late 1800's on Pahrump and Manse springs
  - Springs flow 9,600 acre-feet per year
- Tens of thousands of acres of private lands under State Select sales
- Several thousand acres privatized under Carey Act, Homestead Act and Desert Land Entry
- Currently over 80,000 acres of private land in Pahrump
- By 1960's, up to 10,000 acres of agriculture, mostly cotton and alfalfa
  - Irrigation by groundwater wells
  - Springs dry by 1970
- Pahrump Ranch sold in 1970, cotton gin closes

Abbreviated History

- **Transition to suburban community**
  - **Subdivision developments start in 1960's**
  - **Currently about 60,000 parcels in valley**
  - **Change irrigation water rights to municipal use**
  - **Many new domestic wells drilled**
  - **Reduced pumping during transition from agricultural to municipal water use**
- **Little growth 2008 to present**
- **State and local efforts begun to address declining water levels and over appropriation**


PRECIPITATION AND GROUNDWATER RECHARGE
EVAPOTRANSPIRATION
SUBSURFACE OUTFLOW
NV
CA

Conceptual View of Groundwater Flow

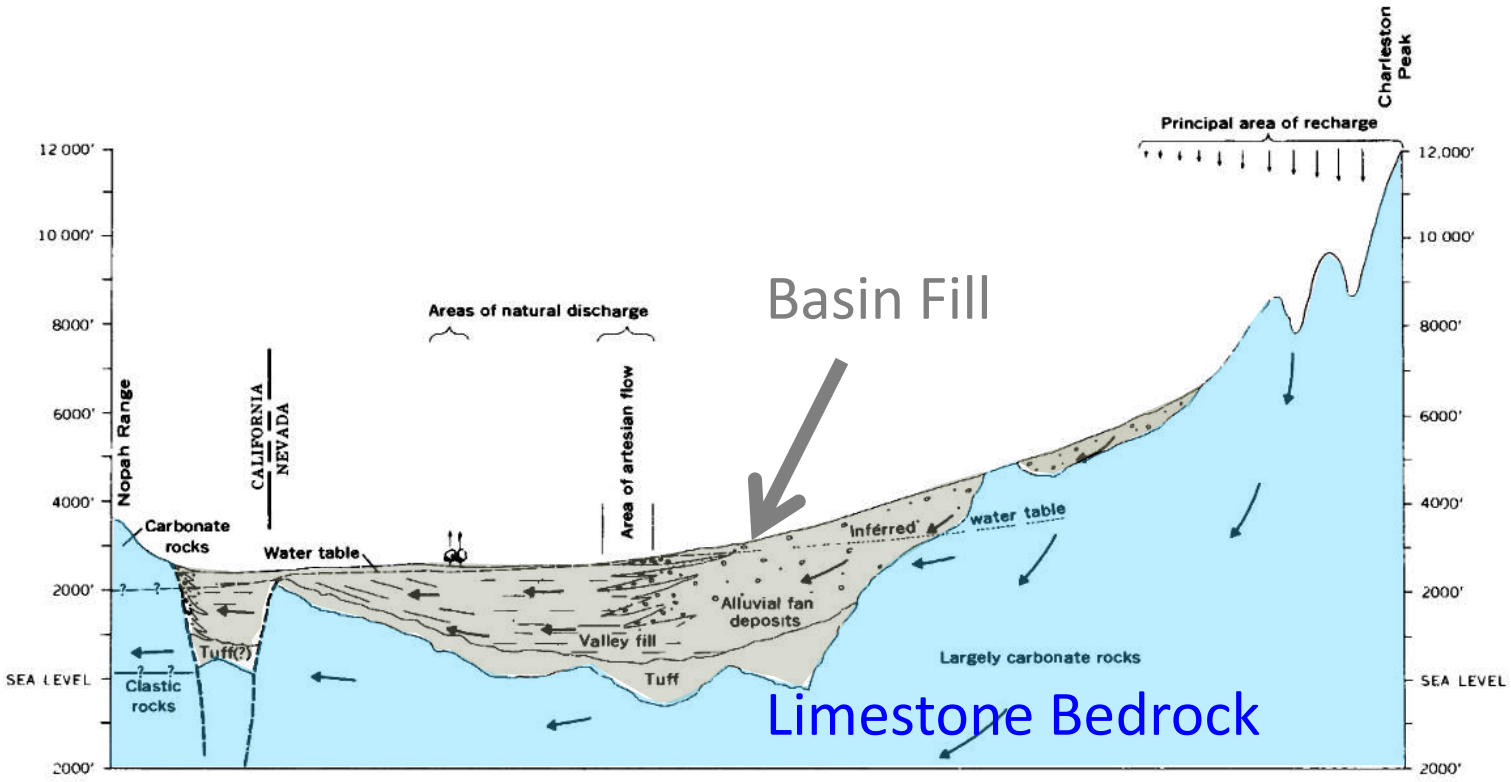


FIGURE 5.—Principal topographic, geologic, and hydrologic features of Pahrump Valley, as shown in section from Charleston Peak to the Nopah Range.

Malmburg, 1967

Groundwater Resource

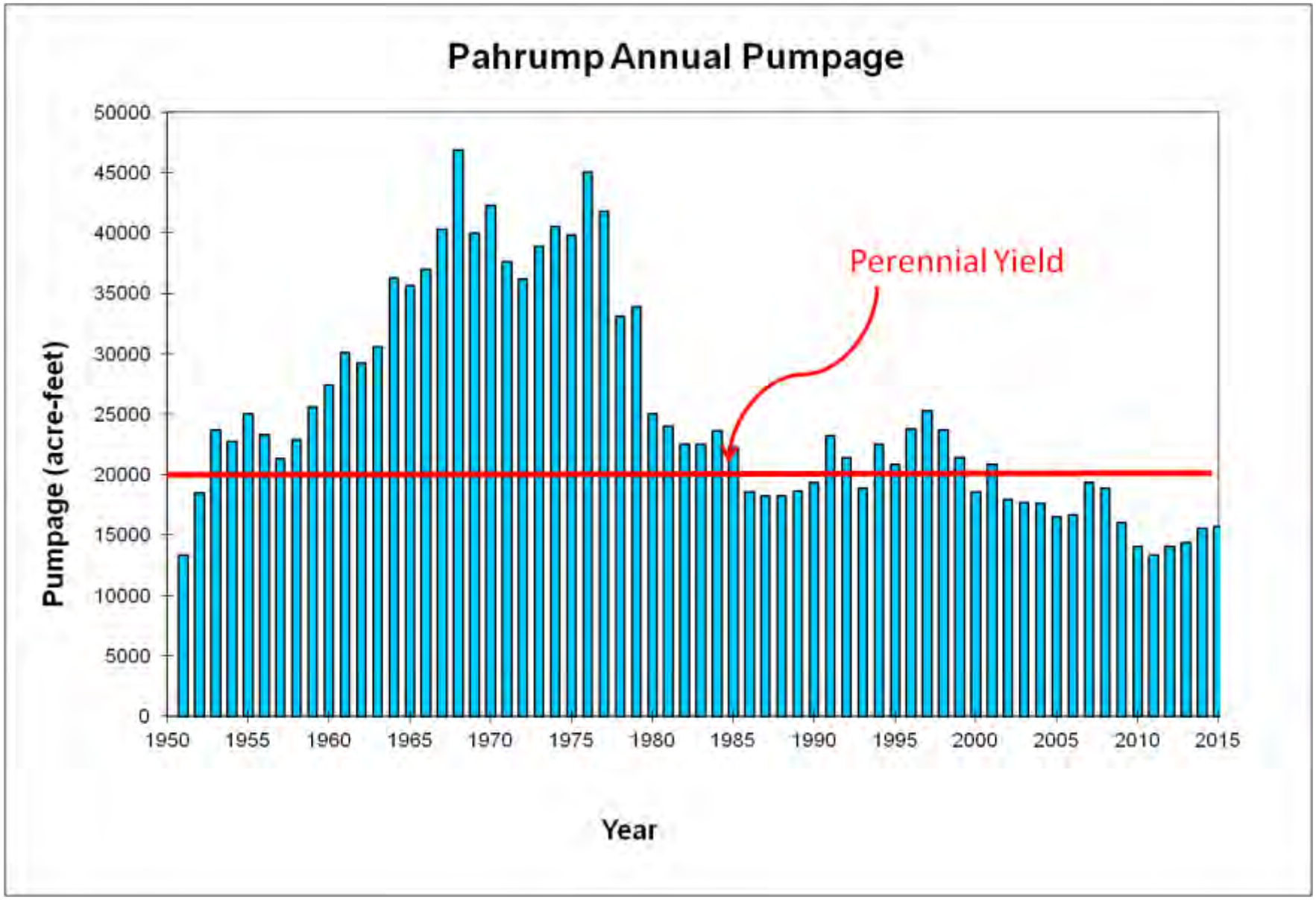
- Numerous water studies, water budget estimates not consistent
- Recharge in the basin is ~ 20,000 to 30,000 AFA
- (Predevelopment) ET ~ 12,000 to 19,000 AFA
- The remainder is lost by subsurface flow in limestone bedrock to southwest
- Perennial yield of the basin is 20,000 AFA

Existing Groundwater Rights

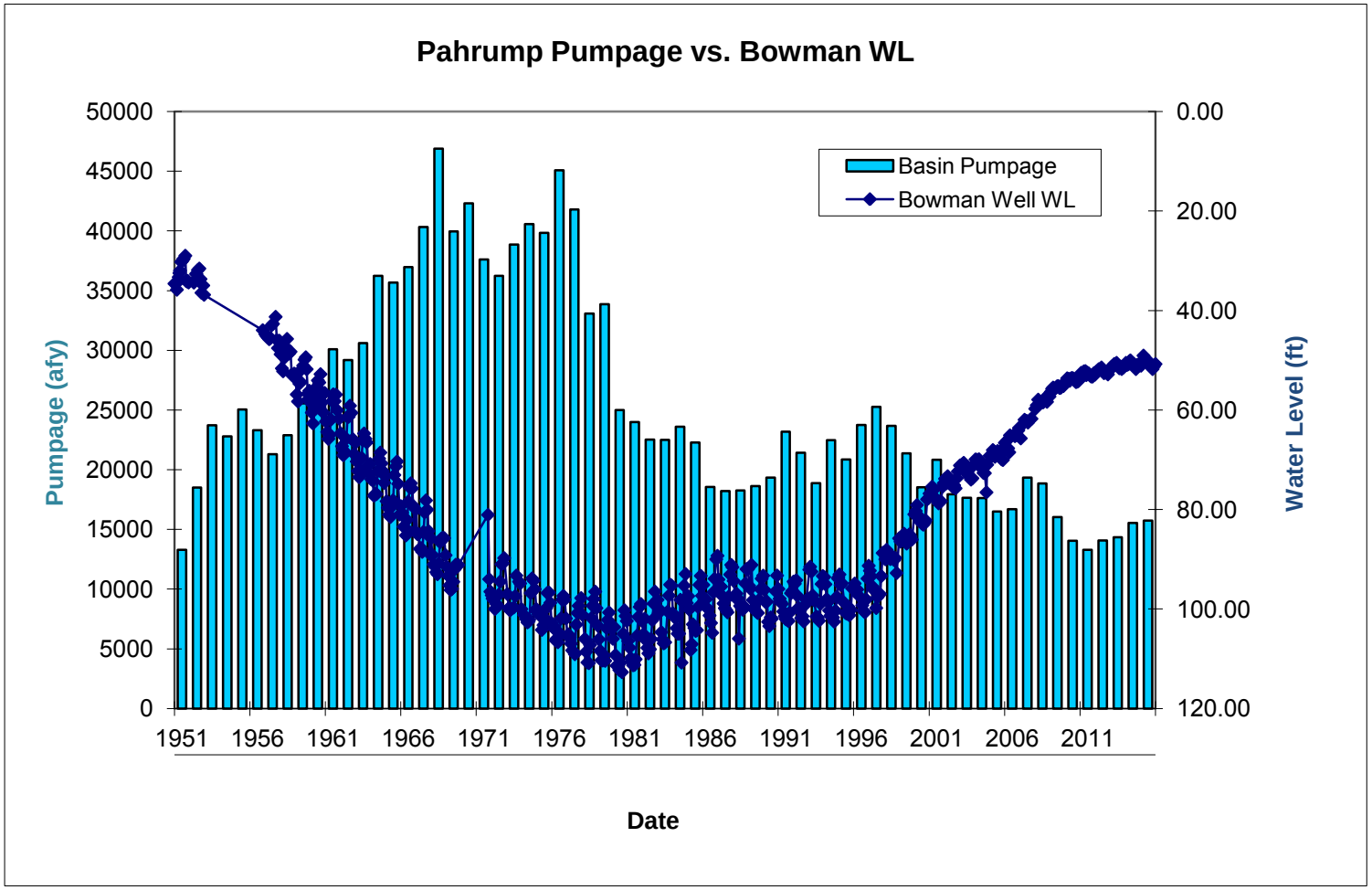
Manner of Use	Acre-Feet
Commercial	1,097
Domestic	7,291
Irrigation	10,520
Municipal and QM	38,762
Other	775
Total Water Rights	58,445
Existing domestic Wells = 11,040	5,520
Potential New Domestic Wells = 8,500	4,250
Total Potential Pumpage	**68,215**

Pahrump Well History

- First well drilled in 1910
- In 1916 there were 28 wells existing, 15 of which were flowing
- Currently there are over 11,000 wells
- Current pumping of 15,000 acre-feet annually is near 60-year low
- Pumping again increasing as economy improves

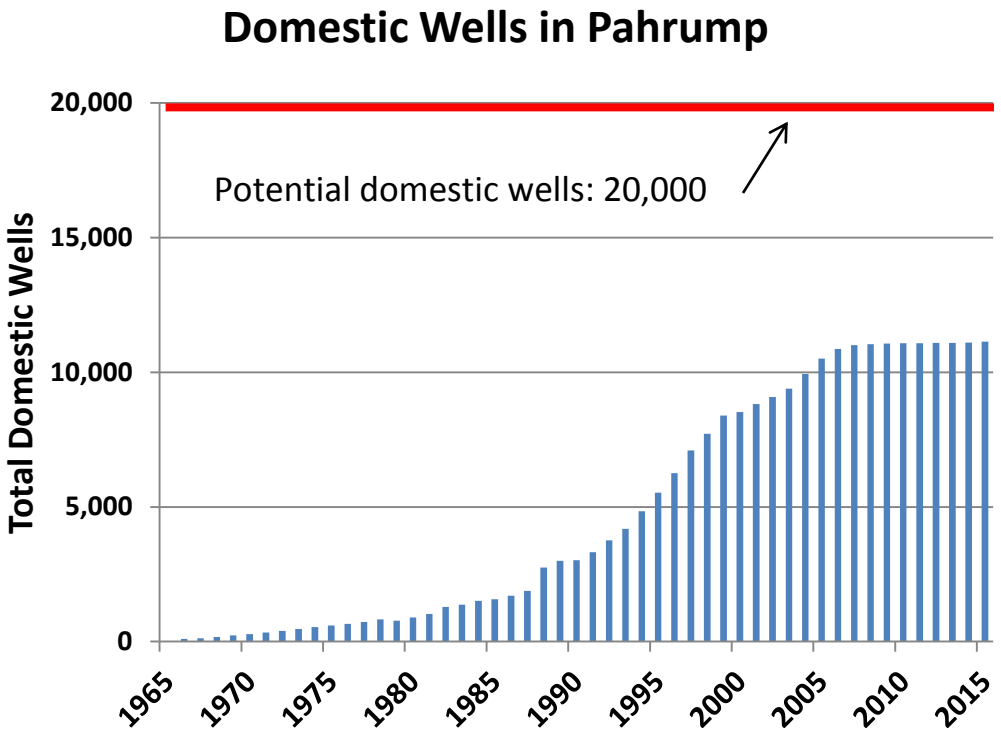

Pahrump Annual Pumpage
Pumpage (acre-feet)
50000
45000
40000
35000
30000
25000
20000
15000
10000
5000
0
1950
1955
1960
1965
1970
1975
1980
1985
1990
1995
2000
2005
2010
2015
Perennial Yield
Year

Pumping

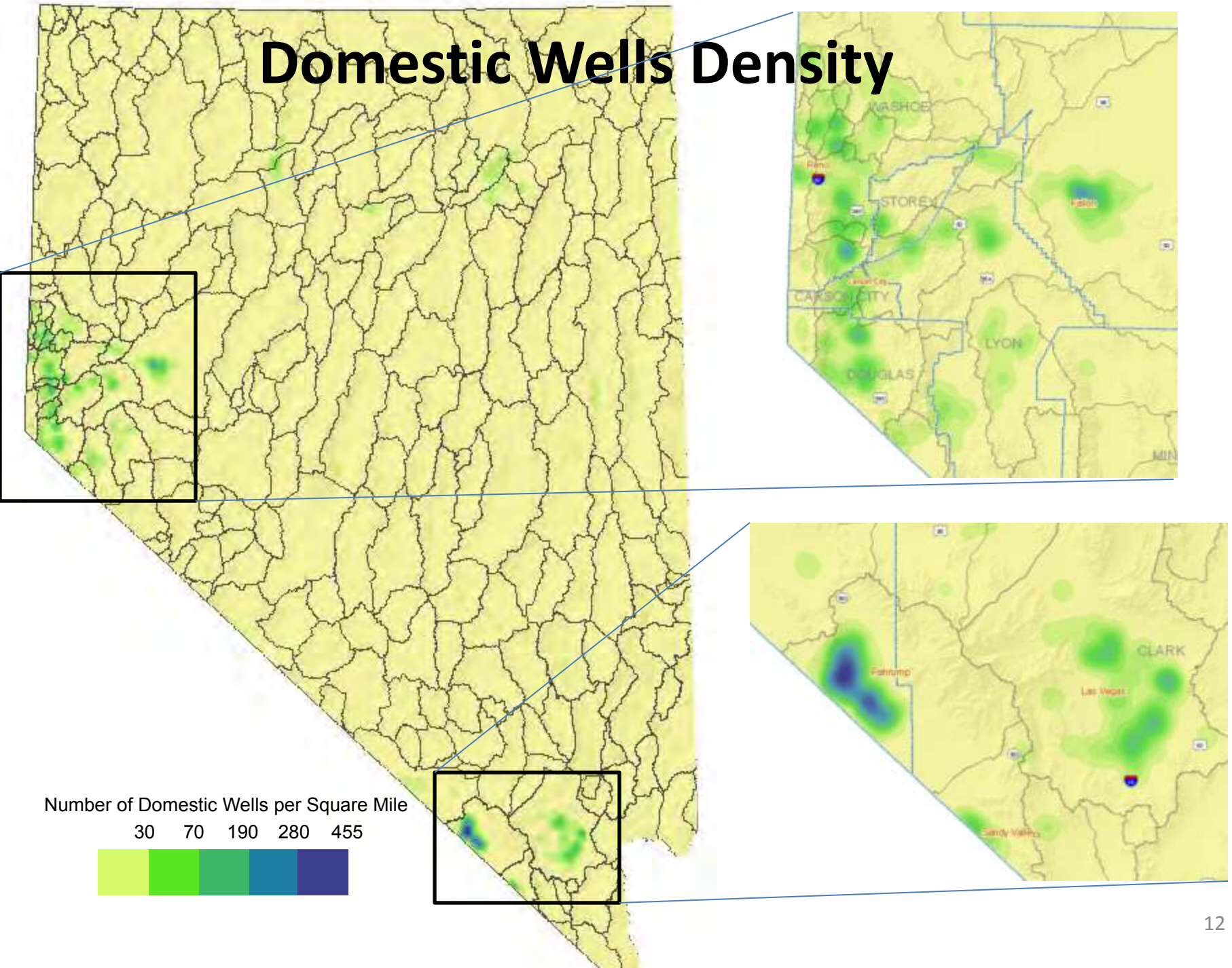

Pahrump Pumpage vs. Bowman WL
Basin Pumpage
Bowman Well WL
Pumpage (afy)
Water Level (ft)
Date
50000
45000
40000
35000
30000
25000
20000
15000
10000
5000
0
0.00
20.00
40.00
60.00
80.00
100.00
120.00
1951
1956
1961
1966
1971
1976
1981
1986
1991
1996
2001
2006
2011

Domestic Wells

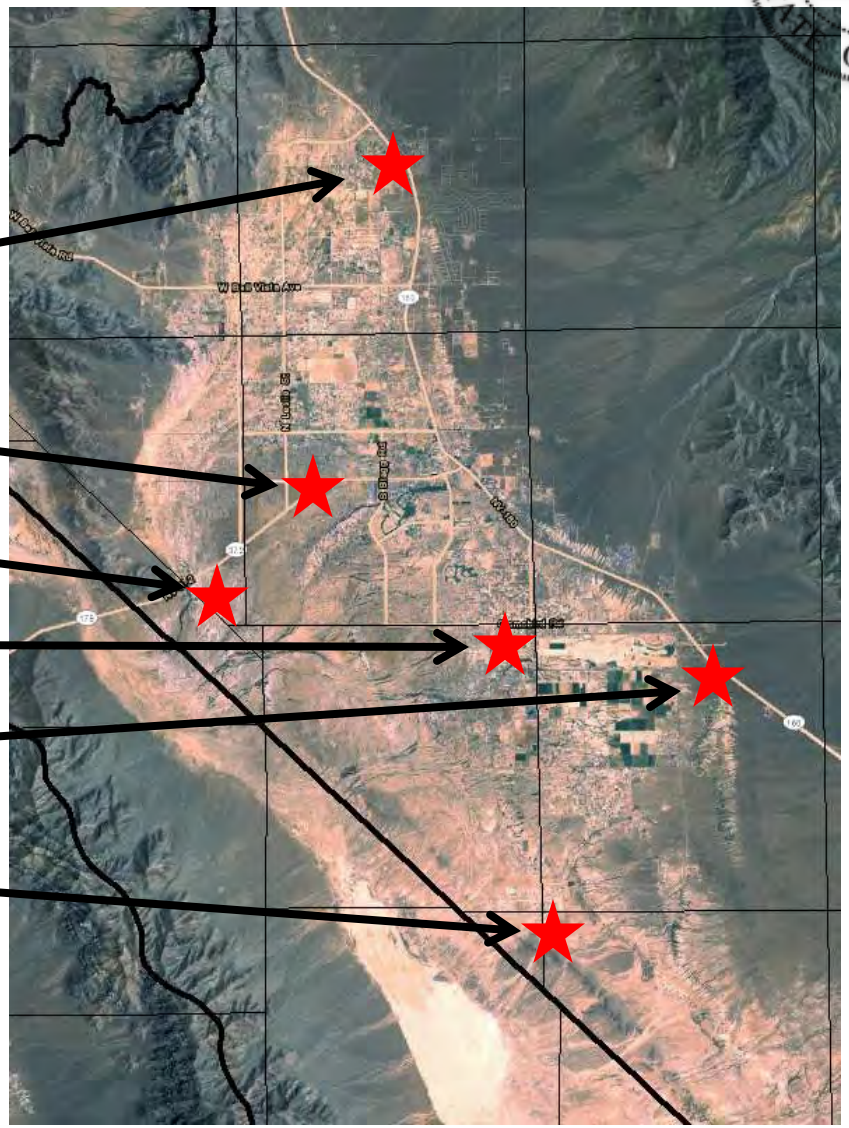
- **Number of domestic wells increased dramatically from late 1980's to 2005**
- **More drawdown expected in areas of highest well density**



Domestic Wells Density



Water Level Trends



162 S19 E53 15DB 1

T20S, R53E, S20 Comp

162S20 E52 36BD 1

T21S, R53E, S12 Comp

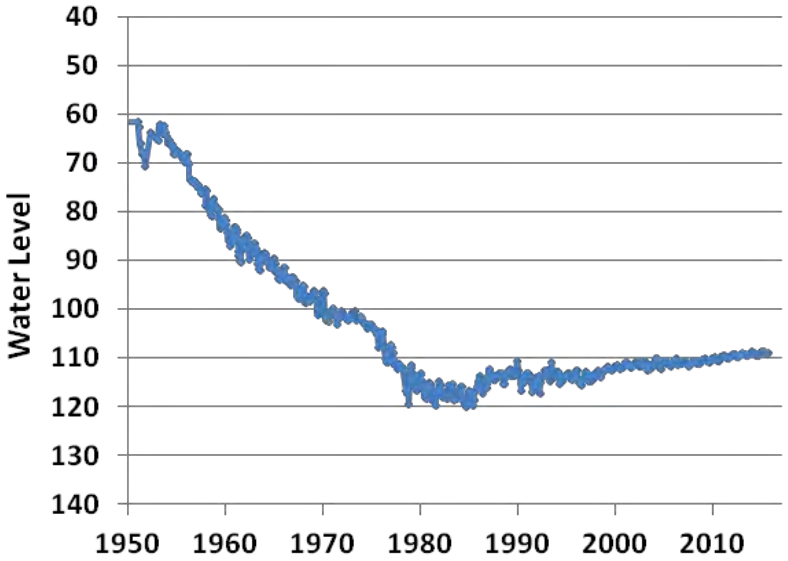
162 S21 E54 10AAC 1

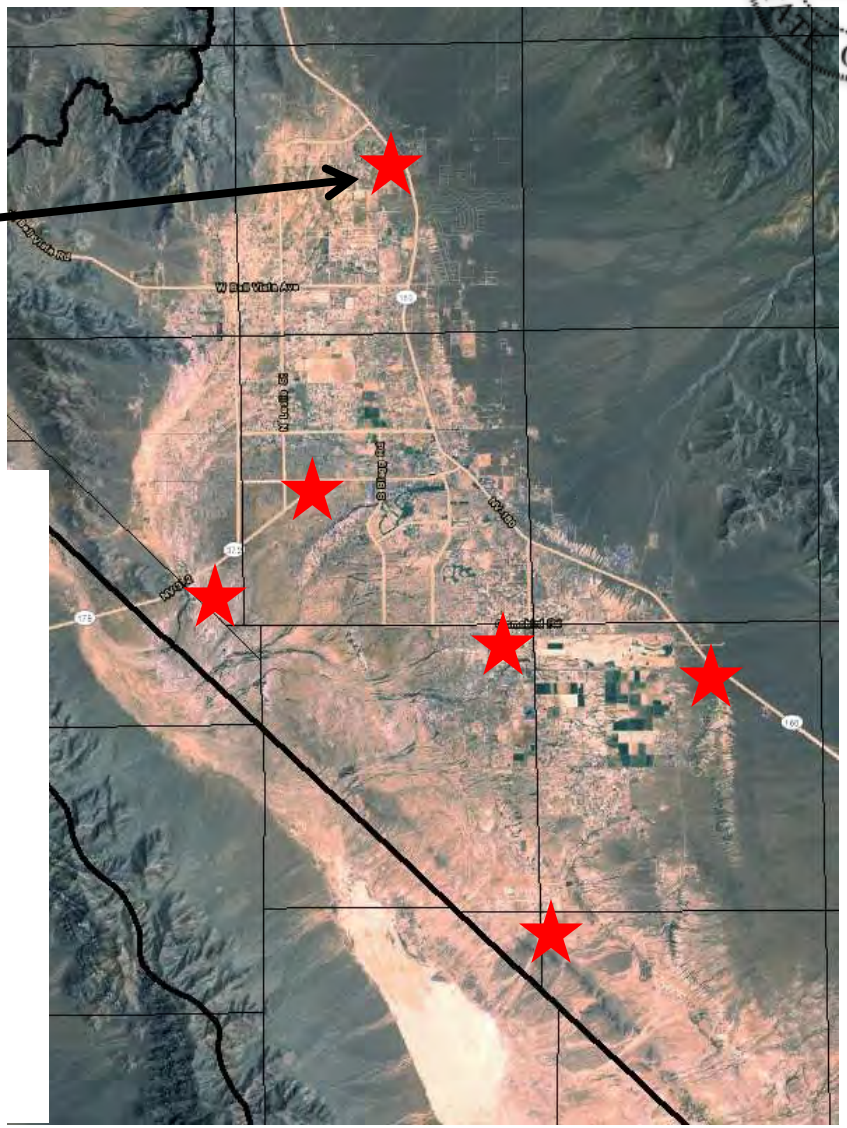
162 S22 E53 01DA 1

Water Level Trends

162S19 E53 15DB 1

Recovery since 1985

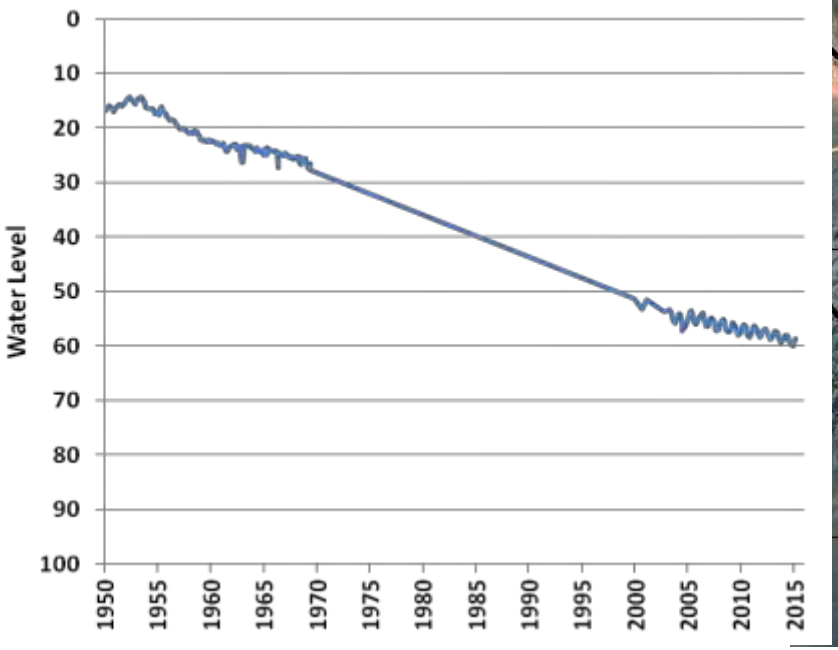


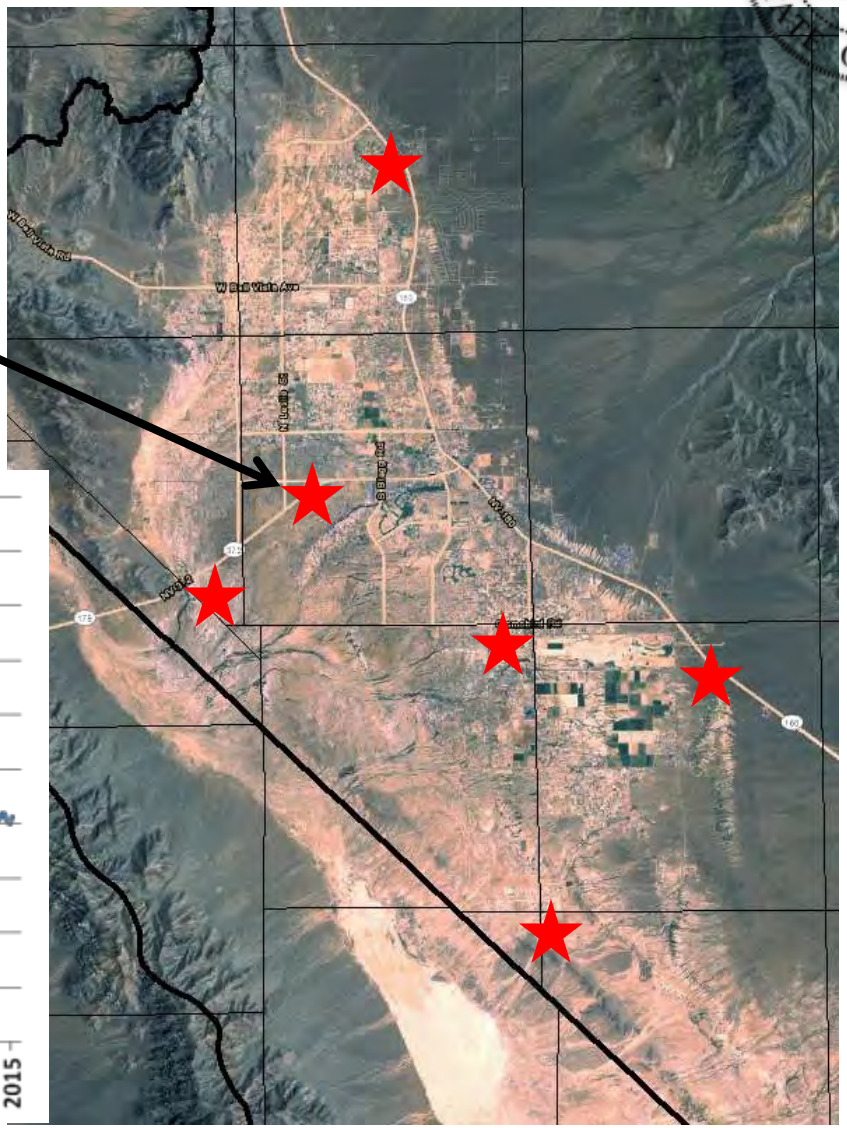


Water Level Trends

T20S, R53E, S20 Comp

0.7 ft/yr decline

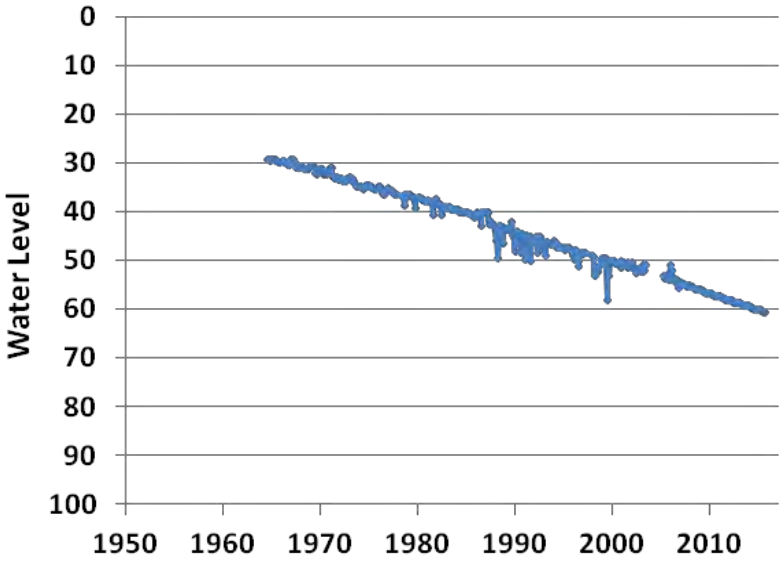


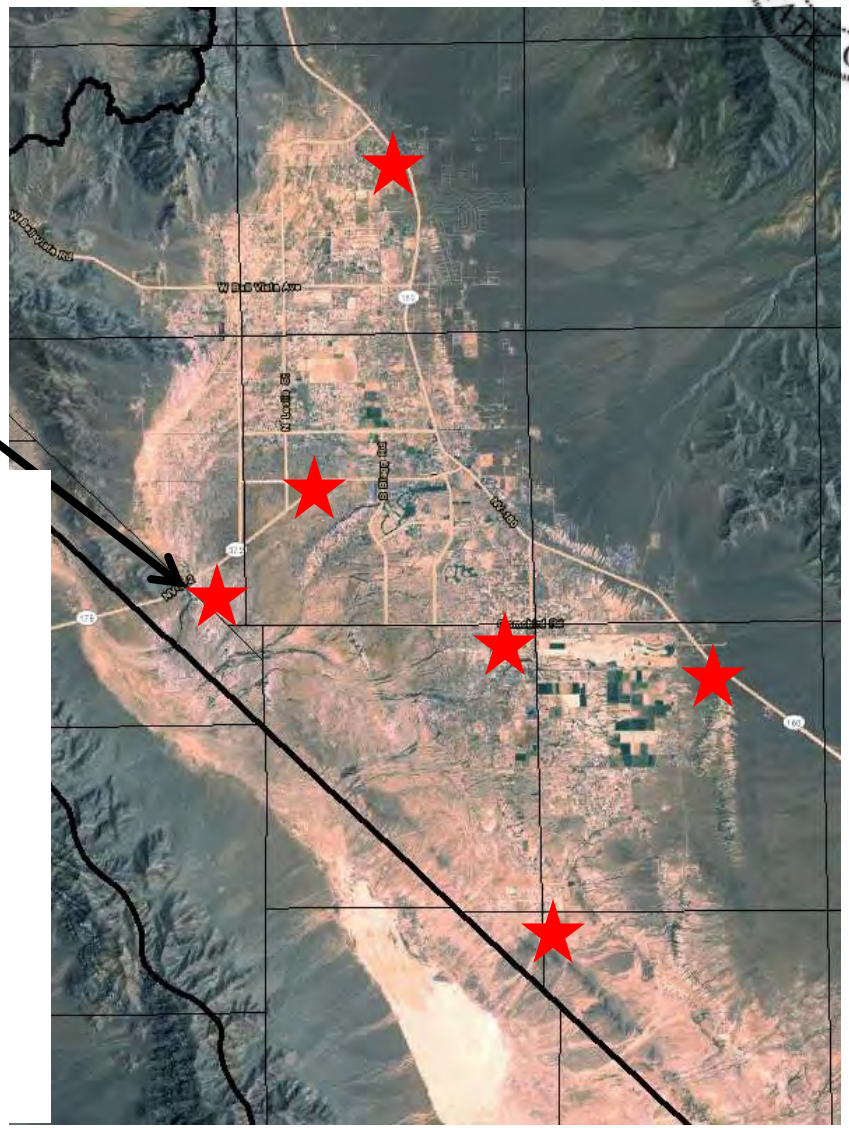


Water Level Trends

162S20 E52 36BD 1

0.6 ft/yr decline

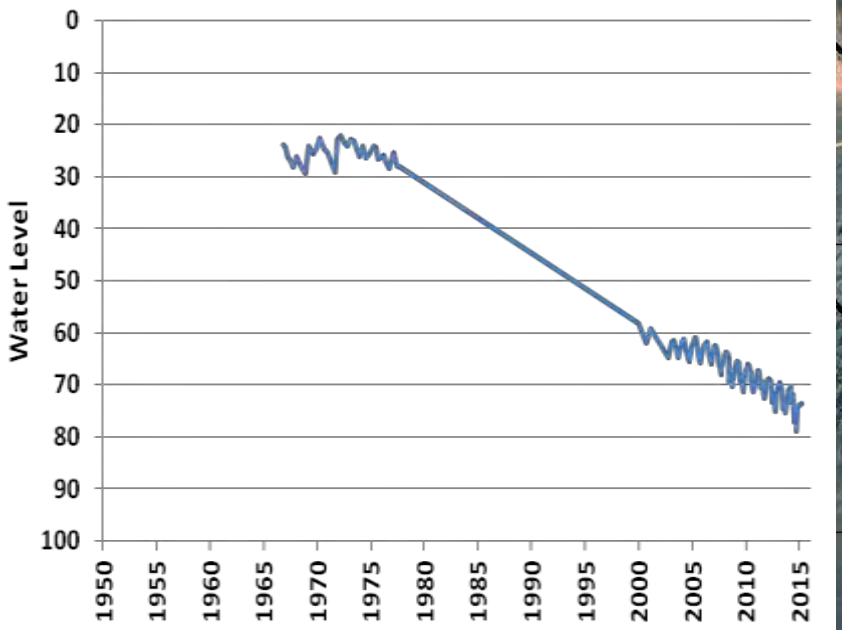


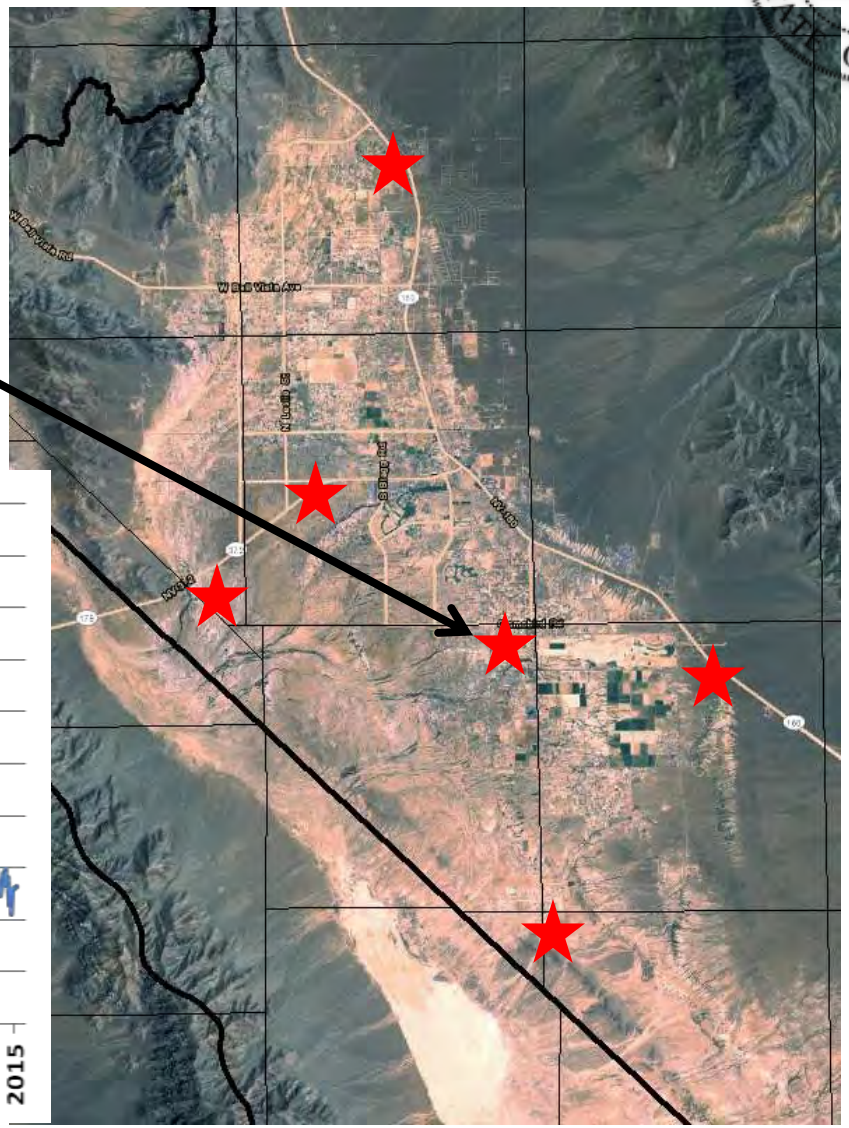


Water Level Trends

T21S, R53E, S12 Comp

1.2 ft/yr decline

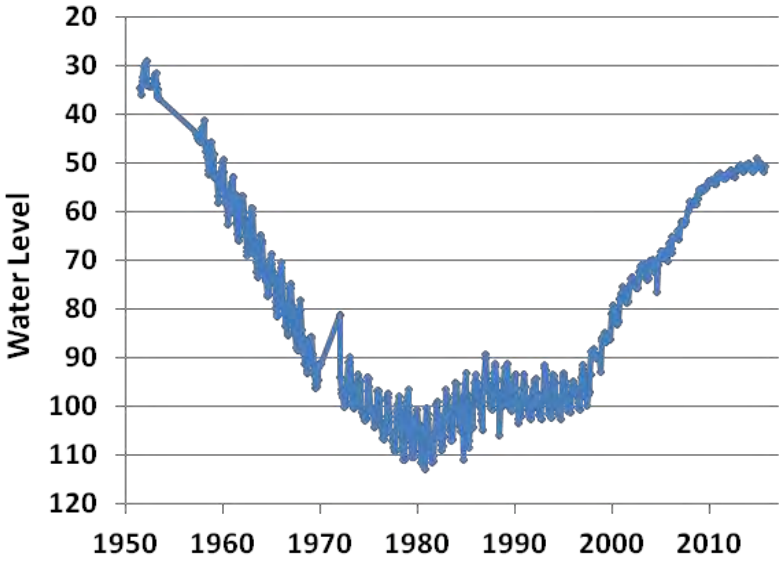


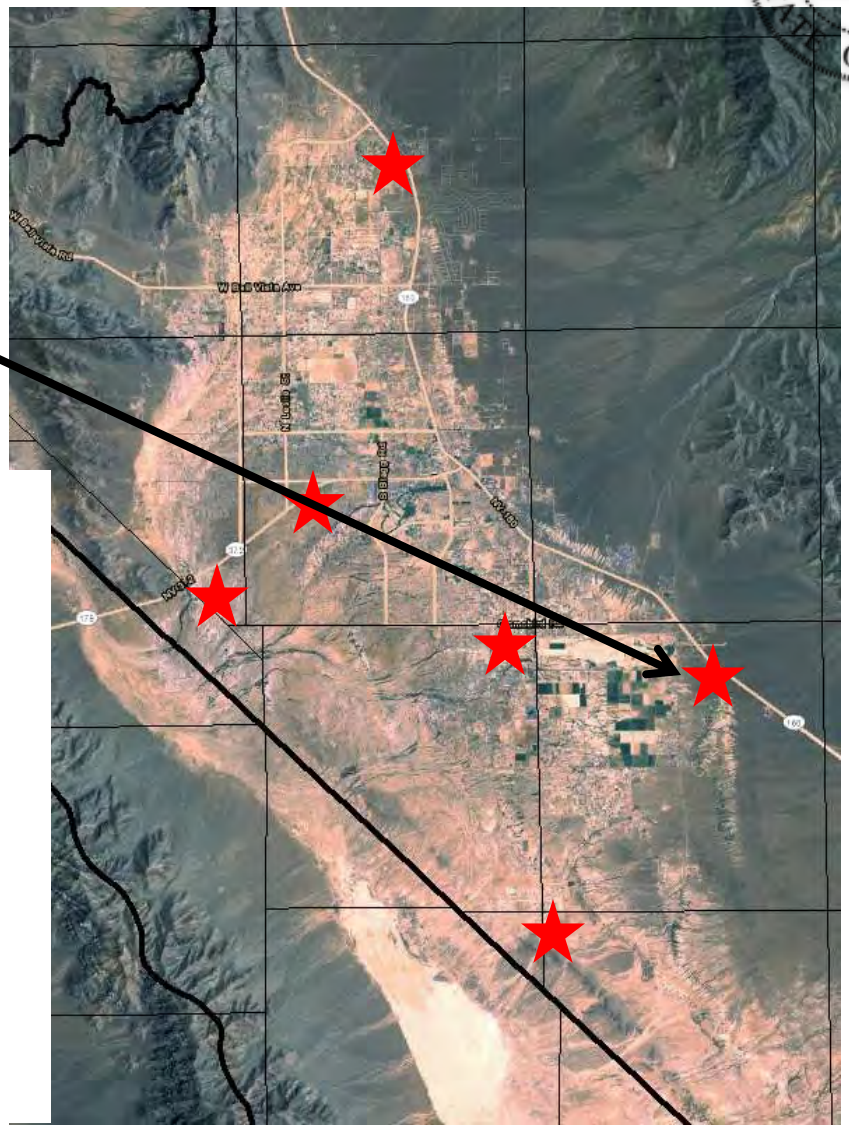


From Buqo, 2007

Water Level Trends

162 S21 E54 10AAC 1

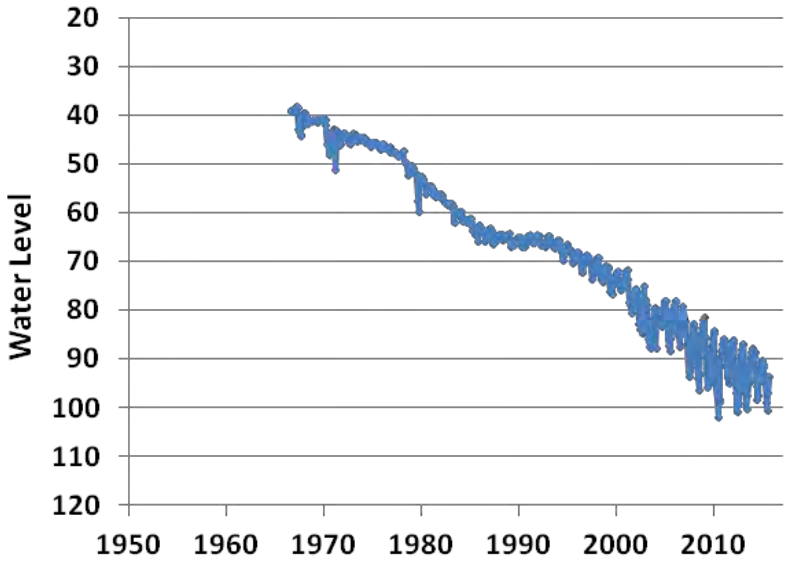


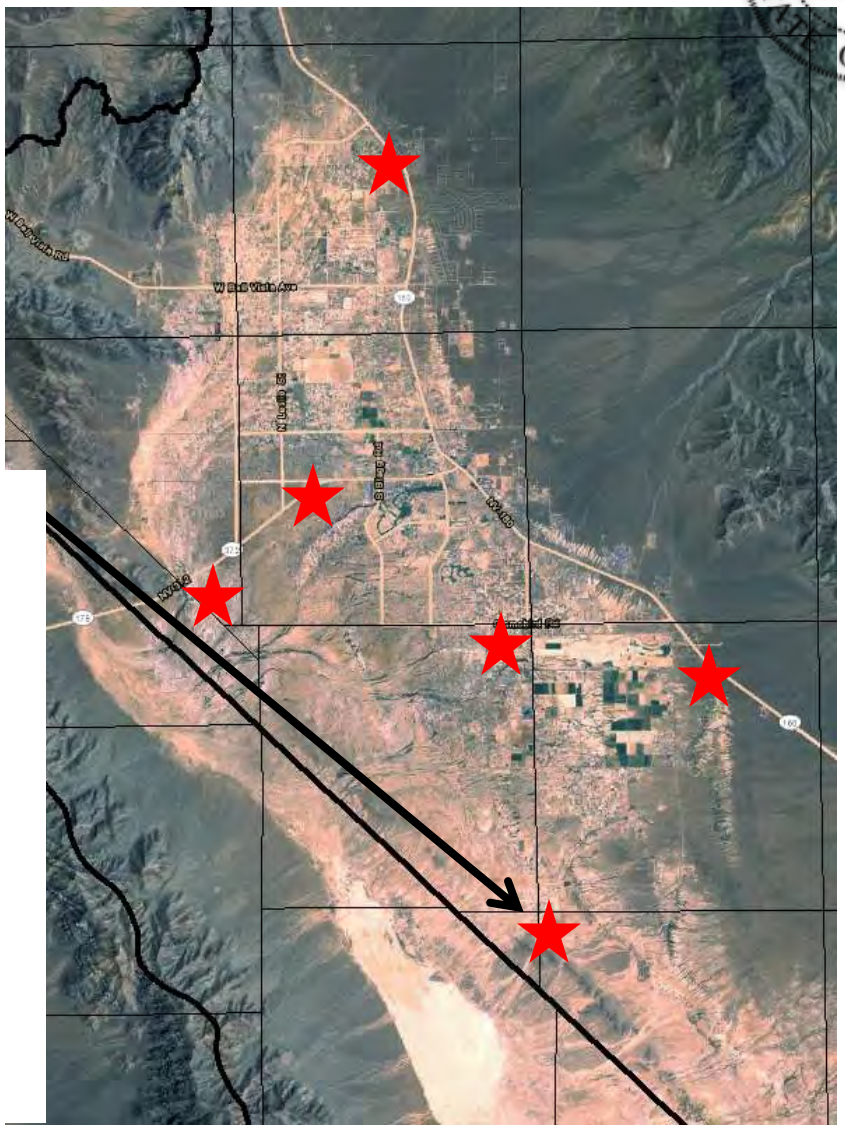


Water Level Trends

162S22 E53 01DA 1

1 ft/yr decline



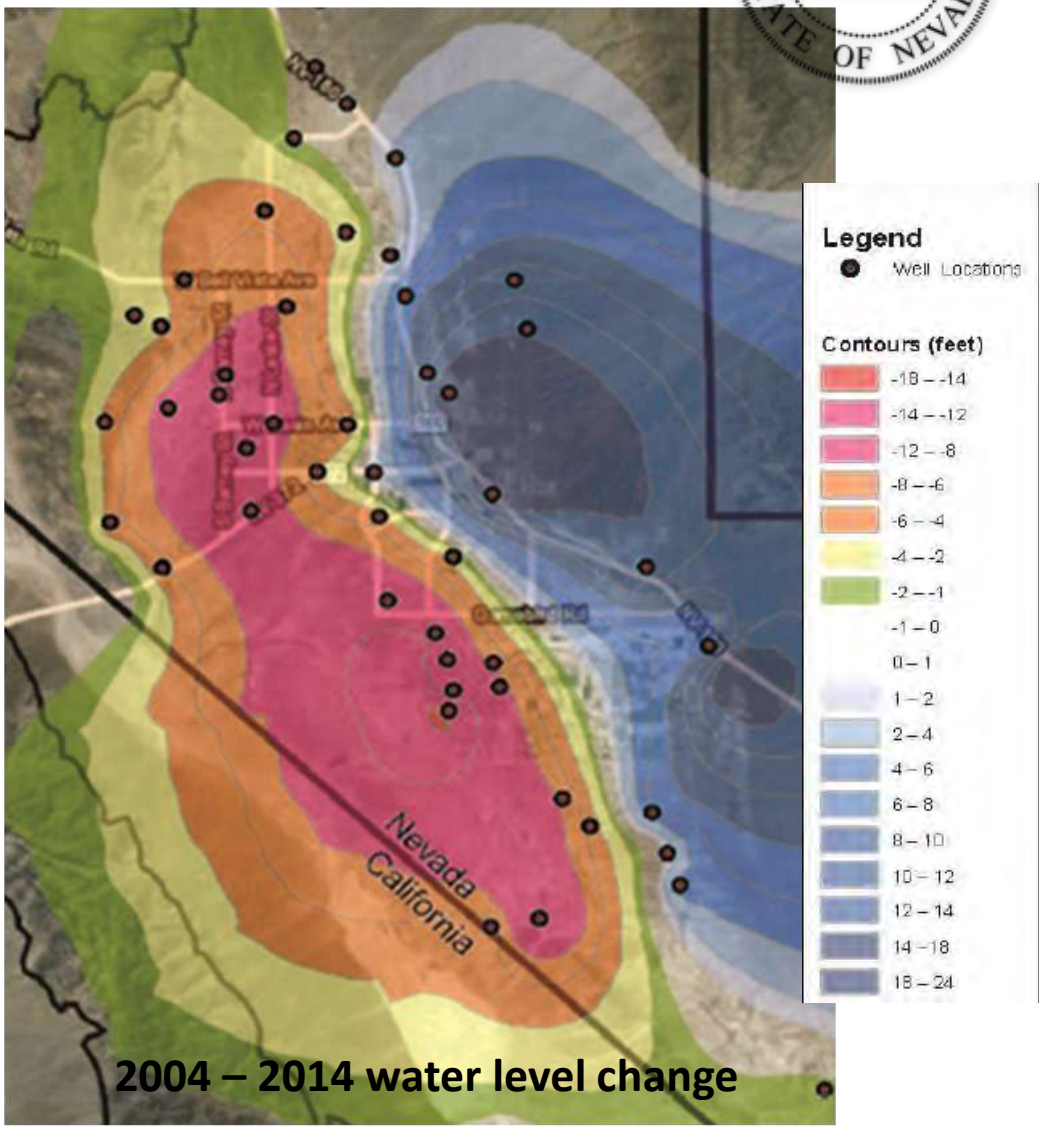


Water Level Trends

- 30 to 60 feet of water level decline across the valley
- Reduced pumpage having positive effects in some areas
- Water level rising in wells closer to the fans
- Steady decline to the west and south on valley floor

Water Level Trends

- Current overall equilibrium
- Declines continue in areas with high density of domestic wells
- Recovery on fans where municipal wells located
- No recovery on valley floor



2004 – 2014 water level change

Source: Nye Co. DWR

State Engineer Actions and Orders

- Designated the basin
- Restricted new permits
- Required relinquishment or transfer of existing water rights for subdivision approval
- Recommended against further parceling w/o water right relinquishment
- Required utilities to acquire water rights in excess of dedication rate
- Forfeited water rights for non-use

State Engineer Actions and Orders

- **NRS 534.120 allows the State Engineer to make additional rules and regulations:**
  - **Order No. 206 (1953) required measuring devices on wells**
  - **Order No. 381 (1970) no new appropriations for irrigation**
  - **Order No. 955 (1987) restricted new appropriation to valley floor and 5,000 gpd**
  - **Order No. 1107 (1994) further limited appropriations to small commercial and industrial (non-living) to 1,800 gpd**
  - **Order No. 1183 (2007) domestic well credit**
  - **Order No. 1252 (2015) closed basin to new appropriations**

Groundwater Management Options

- Heavily dependent on future growth
- Reduce and/or redistribute pumping
- Limits on new domestic wells
- Conservation
- Enhanced recharge and ASR
- Increase secondary uses
- Interconnection of systems
- Consolidation of utilities
- Call for Proofs of Beneficial Use
- Continue over dedication for subdivisions
- Wait until pumping exceeds 20,000 afa then declare CMA

Summary

- **The problem isn't going away.**
- **Stakeholders (Pahrump, Nye County and State Engineer's Office) need to act now.**
- **Best interest of stakeholders to be an integral part of the solution - not wait for State Engineer's office to take action.**
- **Domestic wells need to be addressed – city, county and state statutory changes?**
- **Critical Management Area designation likely inevitable unless comprehensive groundwater management plan implemented.**