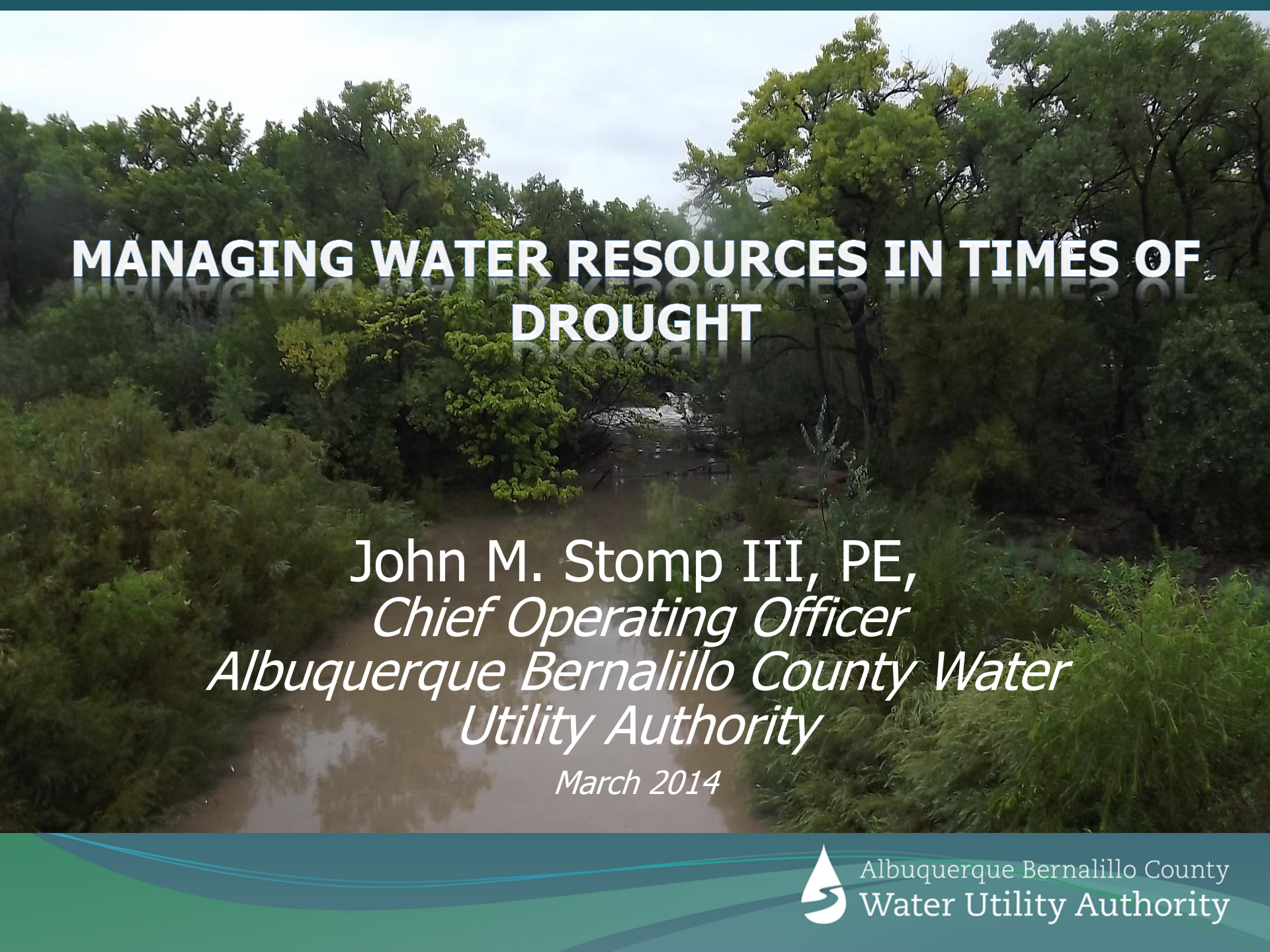


MANAGING WATER RESOURCES IN TIMES OF DROUGHT

John M. Stomp III, PE,
Chief Operating Officer
Albuquerque Bernalillo County Water Utility Authority

March 2014

Albuquerque Bernalillo County
Water Utility Authority

Water Authority's 2007 Water Resources Management Strategy

- Conservation
- Reuse for industry and irrigation
- Use of surface water (Colorado San Juan-Chama trans-basin diversion to Rio Grande)
- Aquifer storage and recovery (related to surface water treatment)
- New Supplies

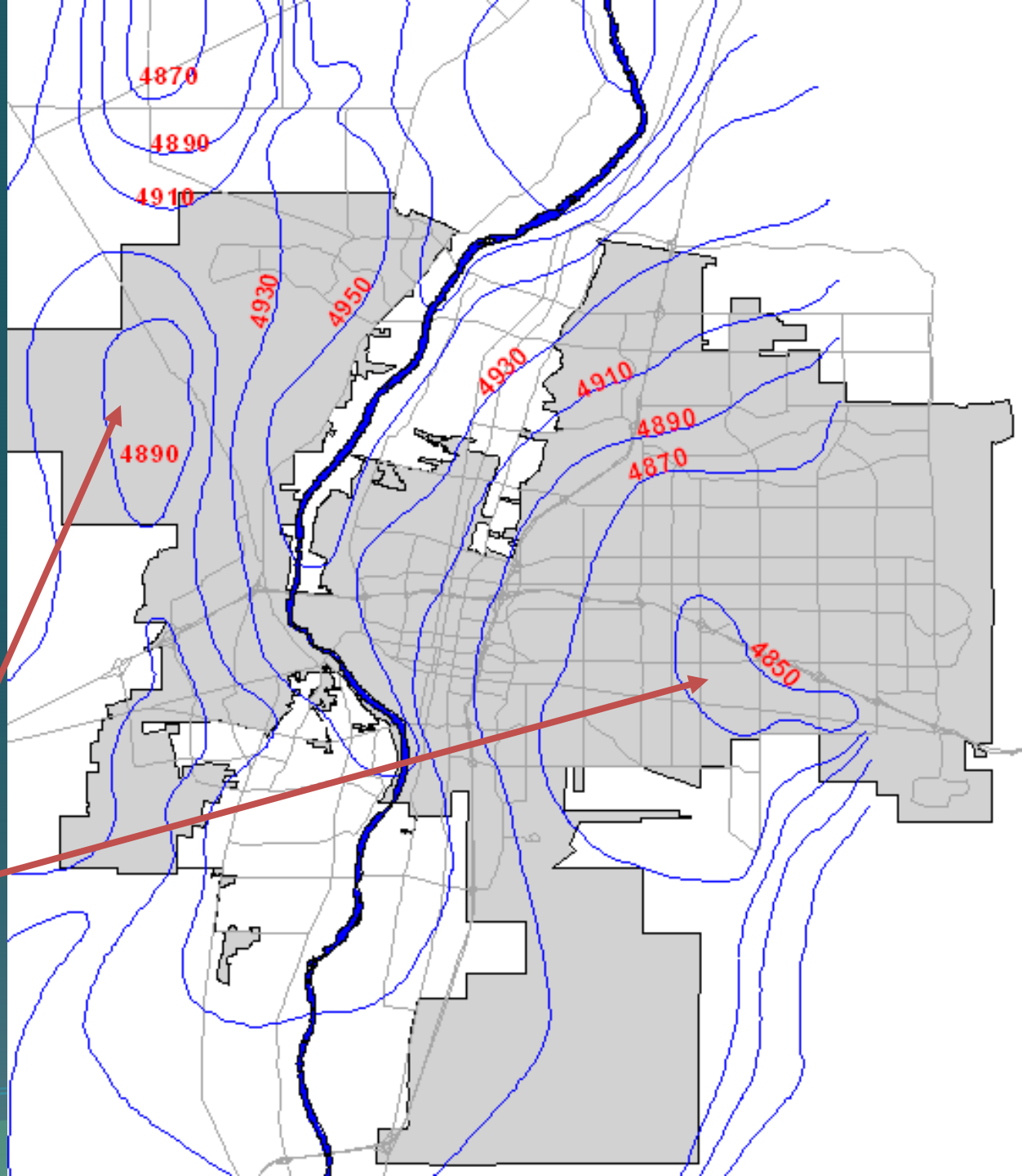
Water Management Strategies in Times of Drought

- Maximize and Protect Storage
- Transition to Renewable Supplies – Water Resources Management Strategy
- Optimize use of Existing Water System
- Conservation – Demand Reduction

Water Management Strategies in Times of Drought

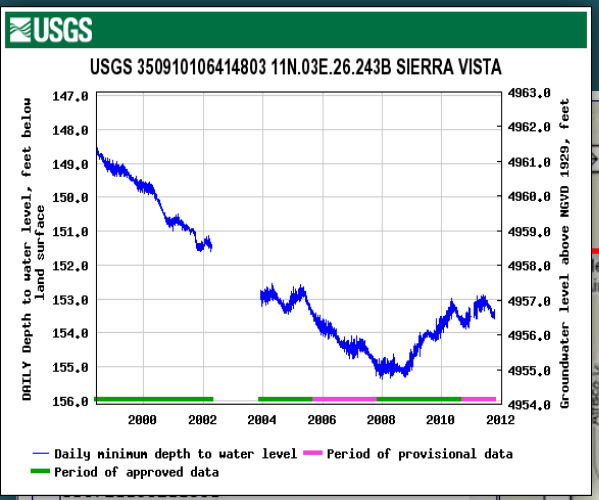
- Maximize and Protect Storage
  - Ground Water in Storage – aquifer
  - Surface Water Storage – Heron and Abiquiu Reservoirs
  - Aquifer Storage and Recovery

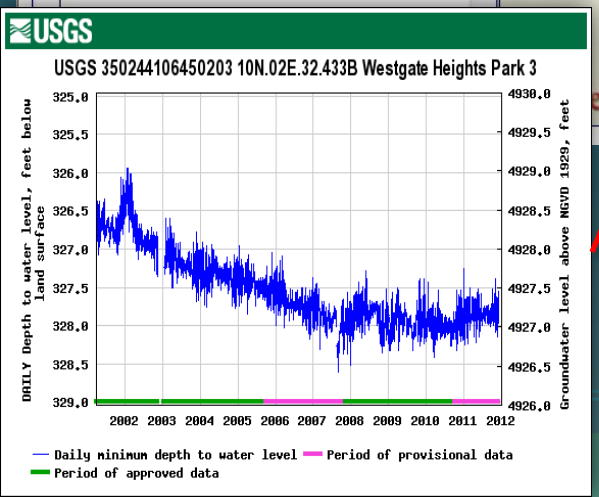
Albuquerque Ground-Water Levels Show Huge Declines

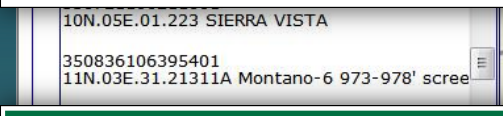


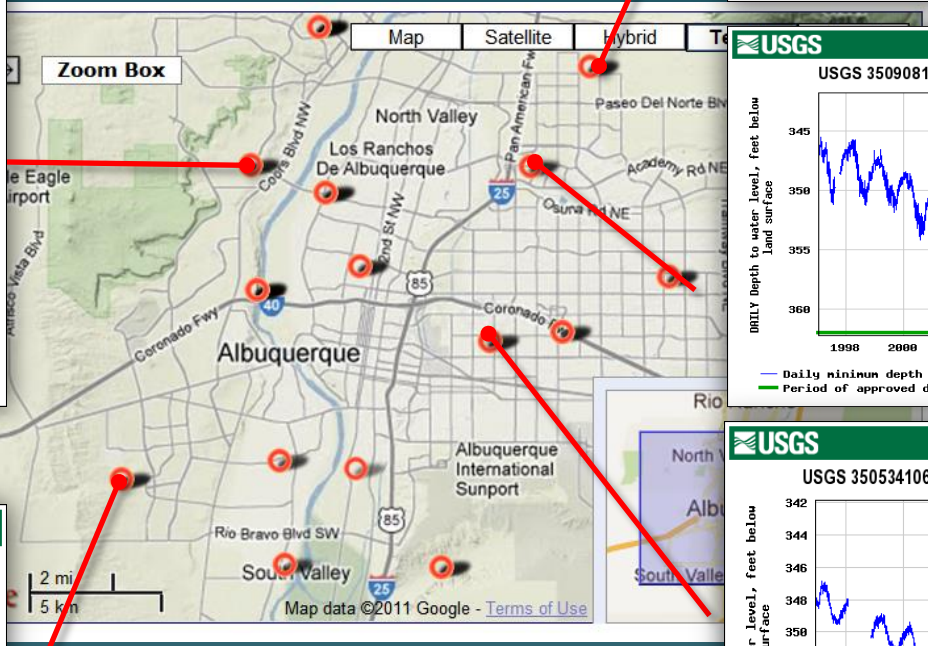
Pumping Cone of Depression in 2002

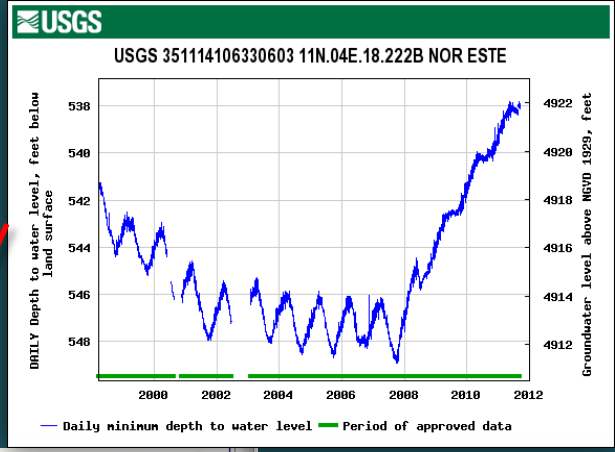
Groundwater Storage and Water Levels - Recent trends with DWP

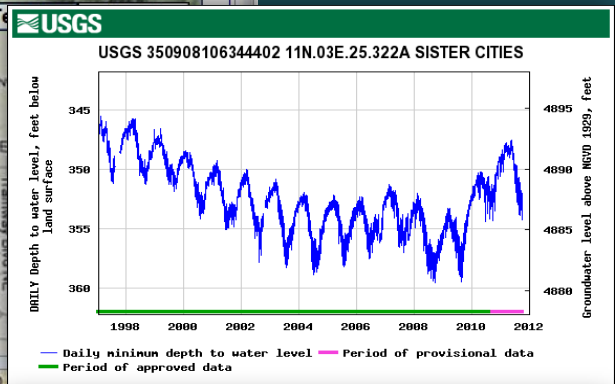


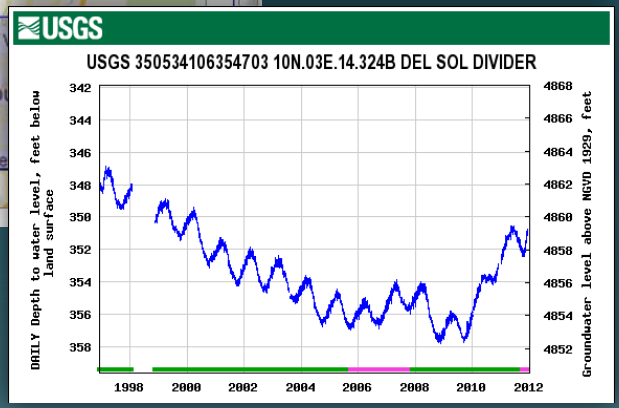












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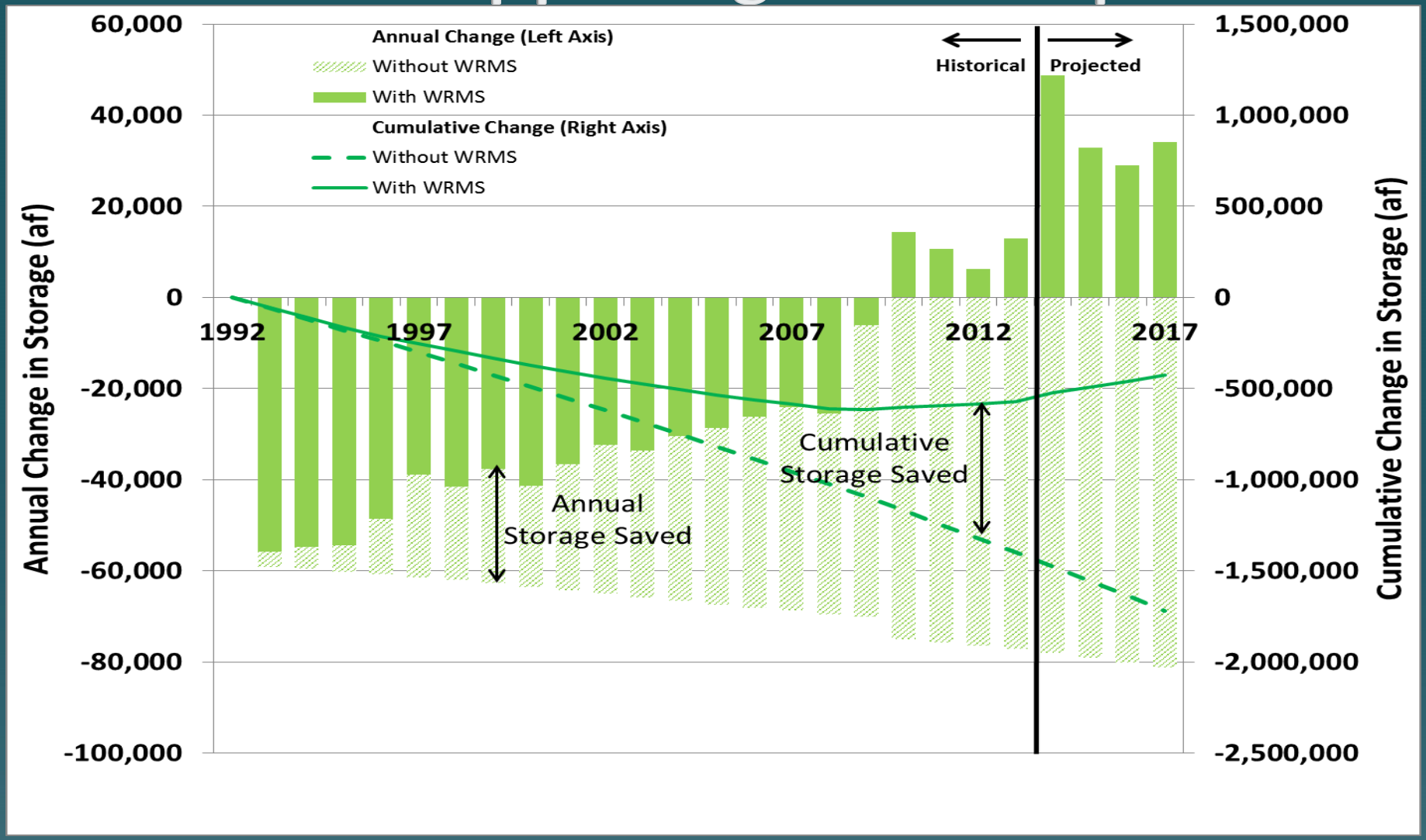
What is happening to the aquifer?



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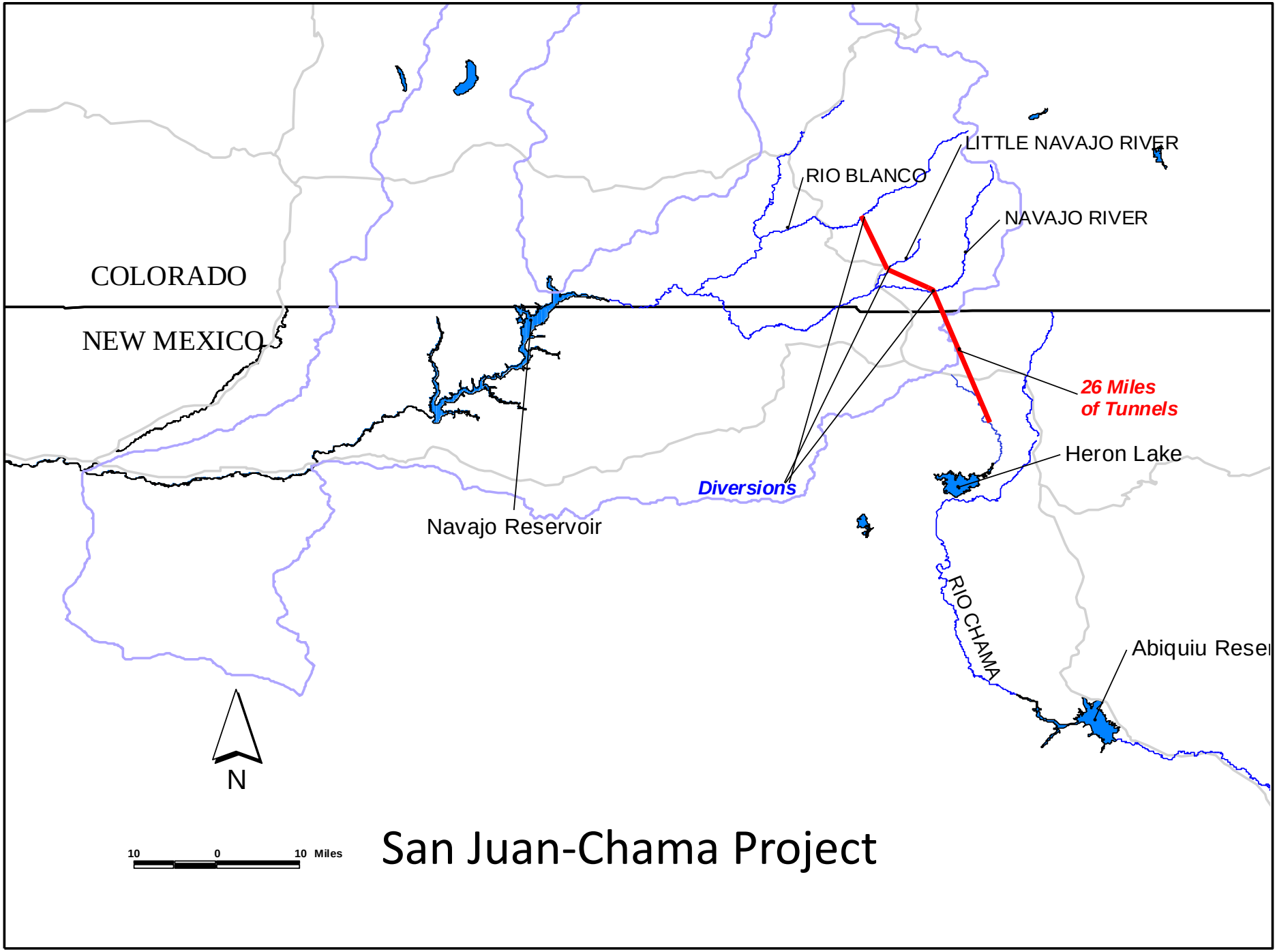
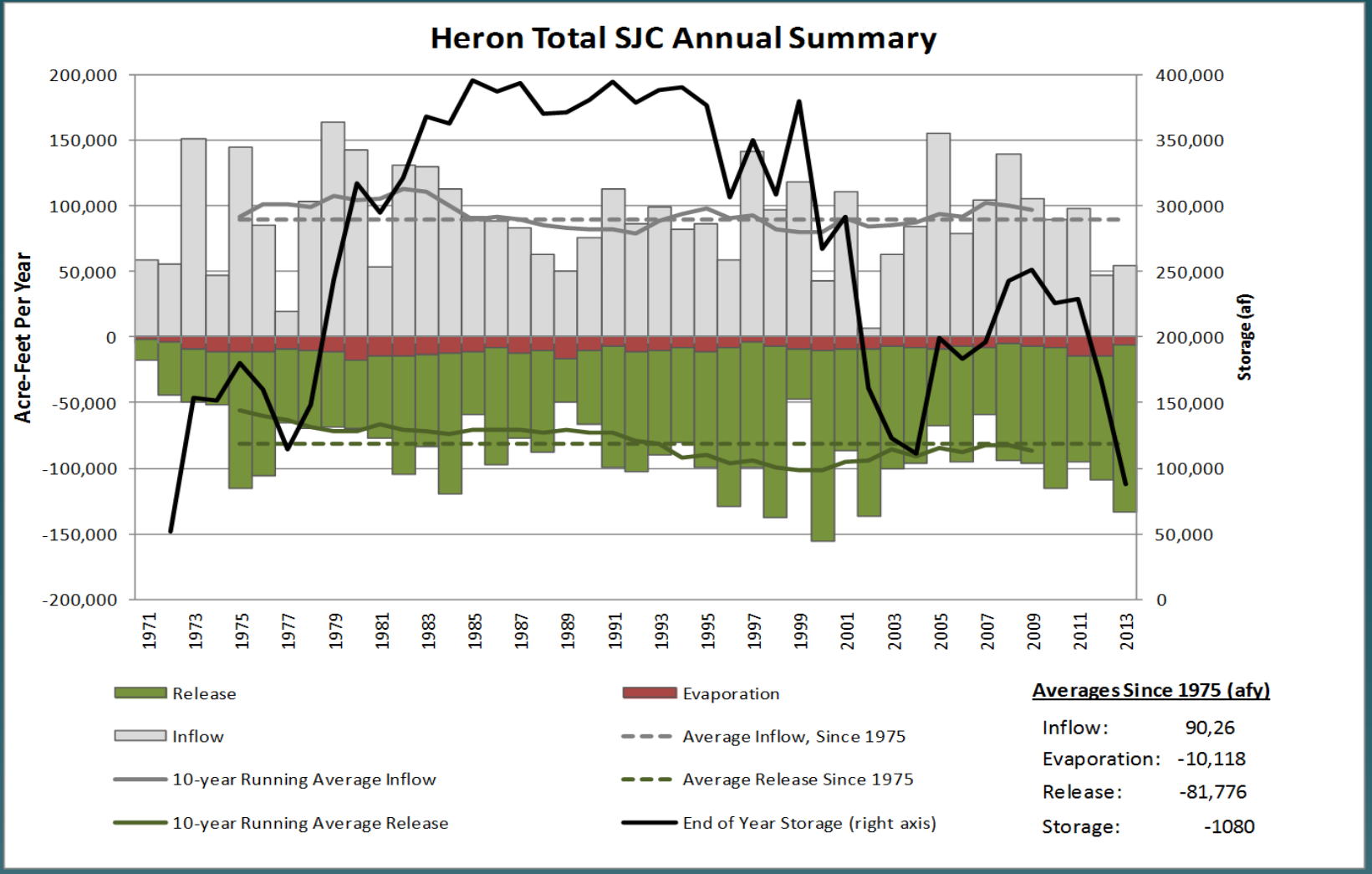

LITTLE NAVAJO RIVER
RIO BLANCO
NAVAJO RIVER
COLORADO
NEW MEXICO
26 Miles
of Tunnels
Heron Lake
Diversions
Navajo Reservoir
RIO CHAMA
Abiquiu Reser
N
10 0 10 Miles
San Juan-Chama Project

Reservoir Operations



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SJC Project: Heron Reservoir

2013

- 163,164 acre-feet as of 1/13/13
- Elevation at 7135.67’
- Actual inflow
- Projected sharing of shortages – full supply with inflow

2014

- 86,529 acre-feet as of 1/13/2014
- Elevation at 7108.14’
- Project sharing of shortages – awaiting actual inflow
- Projected inflow of 81,000 acre-feet
- Reservoir may be at low flow storage at end of year

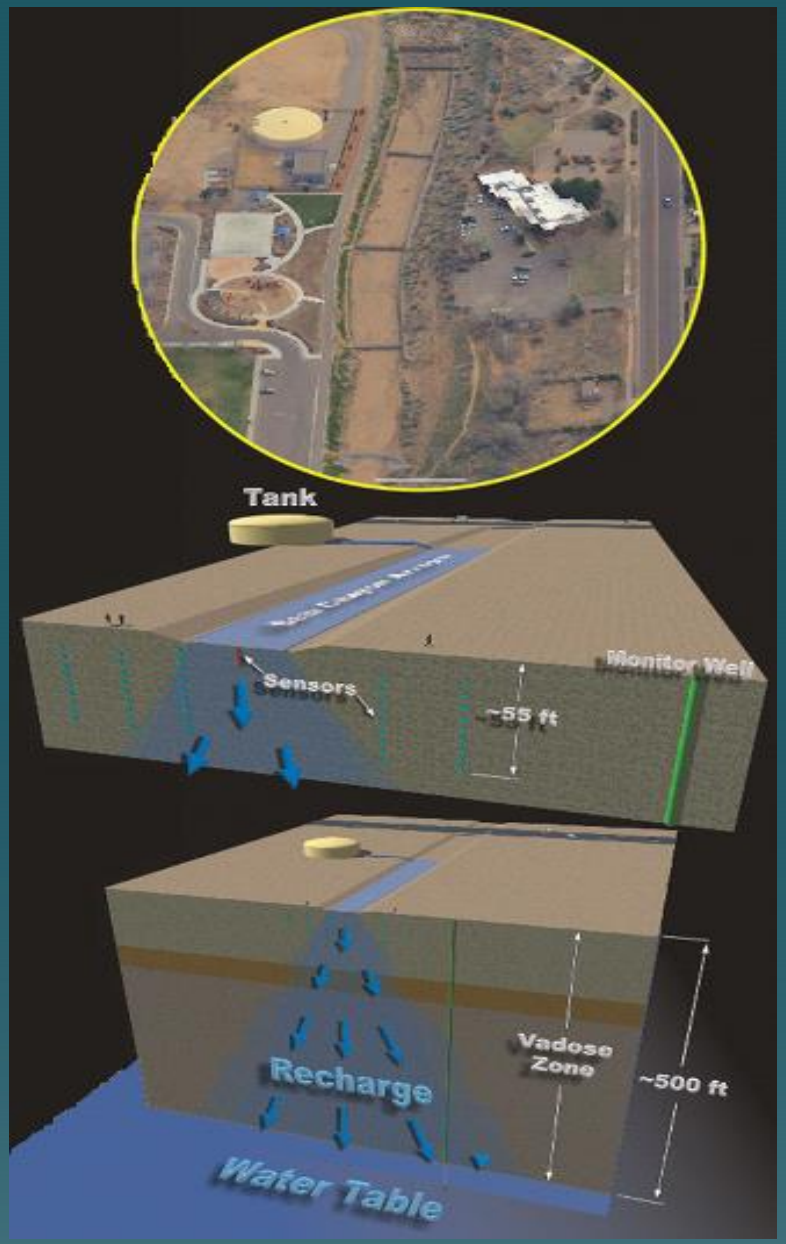
Courtesy of BOR

Surface Water Supplies - Storage Projections

Storage Reservoir	SJC Water in Storage as of 1/23/2014 (AF)	To be Borrowed by MRGCD	Remaining of 2013 Lease to USBR	Evaporation Losses Based on 2013 Amounts	Remaining Storage after Deductions
Heron	63,587				63,587
El Vado	2,707				2,707
Abiquiu	145,190	-20,000	-19,907	-10,393	94,890
E. Butte	4,662			-782	3,880
Total	216,146				165,064

ASR Projects

- Bear Canyon Arroyo ASR Project
  - Completed two seasons of pilot testing
  - Application for full scale permit to be submitted in March 2014
- Large Scale ASR
  - Direct injection
  - Existing Wells – high arsenic
  - In design and testing phase



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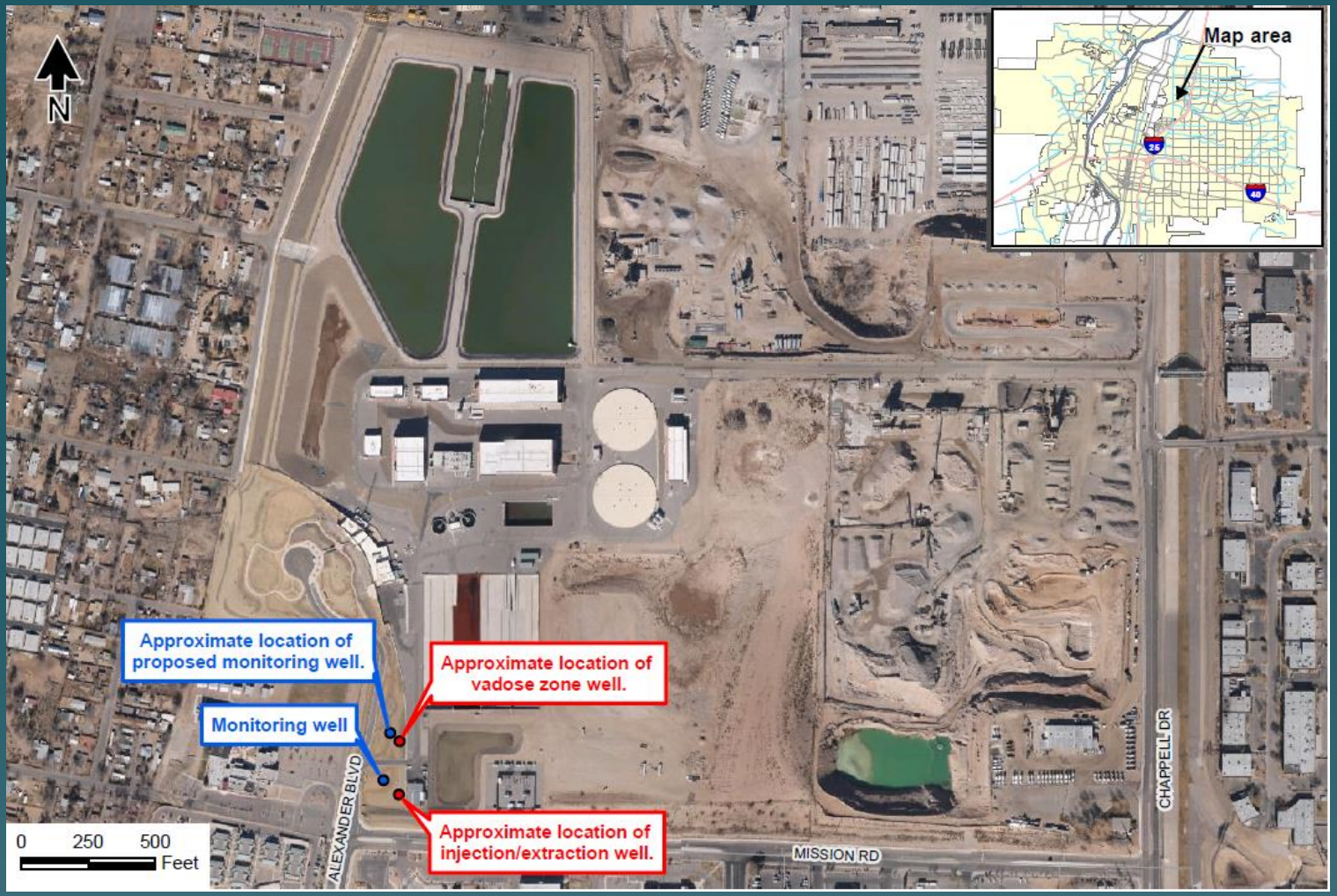
Large Scale ASR – Water Treatment Plant



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Water Management Strategies in Times of Drought

- Transition to Renewable Supplies
  - San Juan-Chama Drinking Water Project
  - Reuse and Recycling
    - Industrial wastewater
    - San Juan-Chama
    - Municipal wastewater
    - Contaminated ground water
    - Storm water
  - New Supplies

Transition to Renewable Supplies – SJC DWP

Surface Water
Distribution System

Legend

- Raw Water Pipeline
- Surface Water Transmission Line
- Existing Reservoir

N

0.9 0.45 0 0.9 1.8 2.7 Miles

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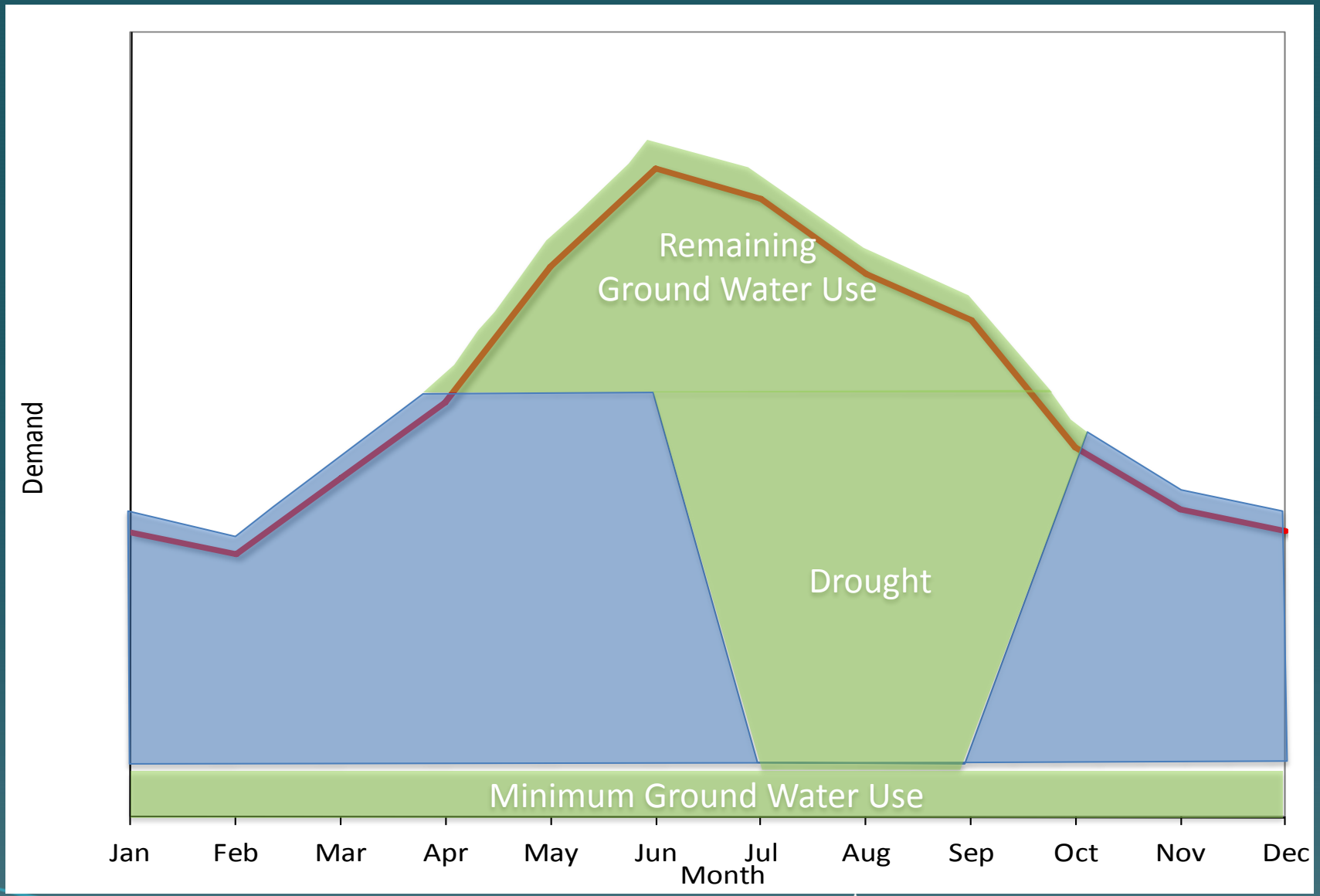
SJC DWP Restricted Diversions During Drought



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Drinking Water Project Operations

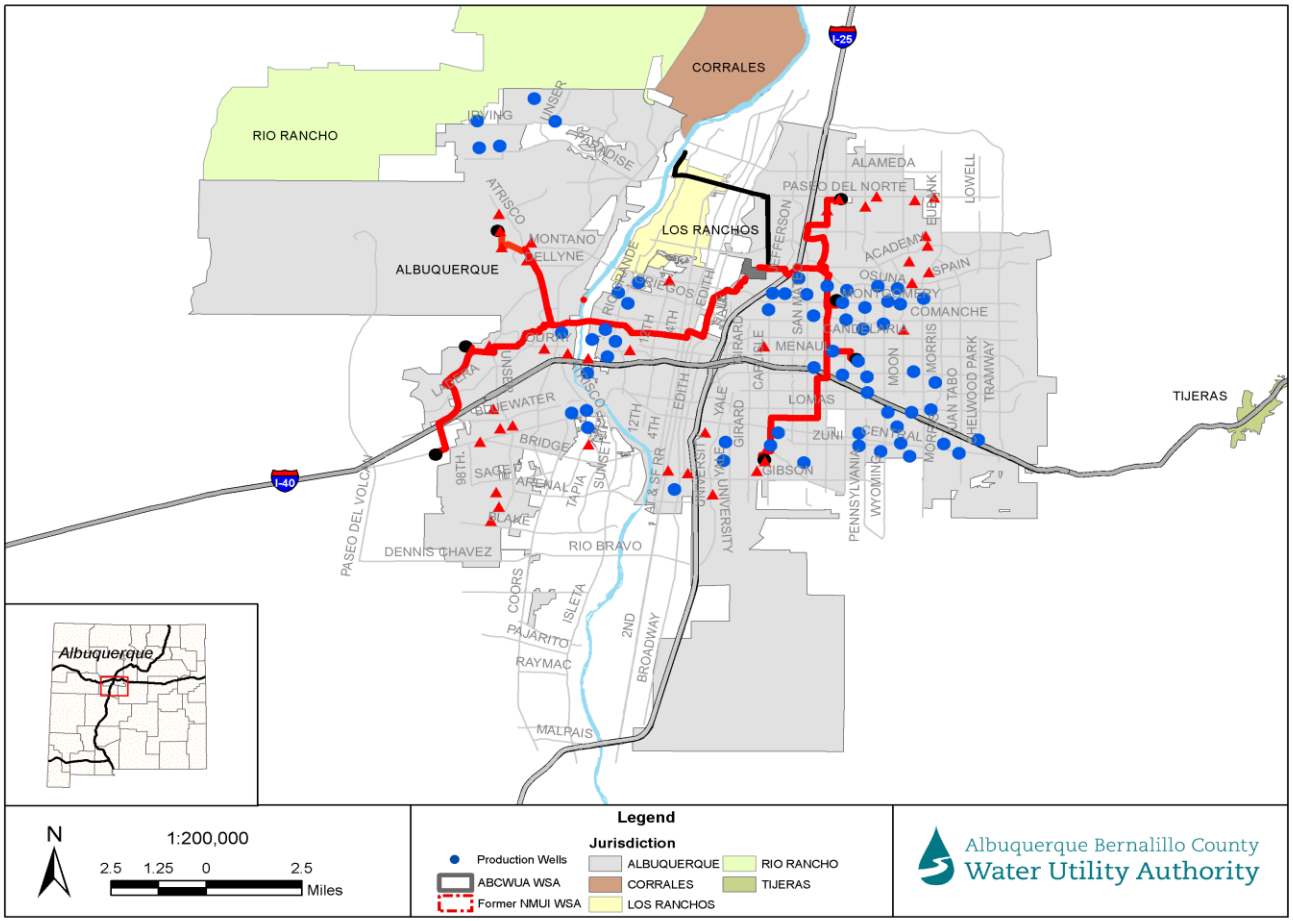
- 2008 – 367 (1%)
- 2009 – 21,357 (21%)
- 2010 – 42,803 (40%)
- 2011 – 41,281 (40%)
- 2012 – 43,208 (41%)
- 2013 – 39,929 (42%)
- 2014 – 40,000 (?)

Water Management Strategies in Times of Drought

- Optimize use of Existing Water System
  - Move ground or surface water throughout service area
  - Maximize use of existing ground water assets (wells)
  - Aquifer Storage and Recovery – Webster project

Maximize Use of Existing Water System - Conveyance

- Reduce impact on arsenic implementation – fully utilize existing assets
- One arsenic treatment plant constructed initially instead of 10 plants – saved over $200 million
- College Arsenic Treatment Plant – able to use 10 MGD from Gonzales wells



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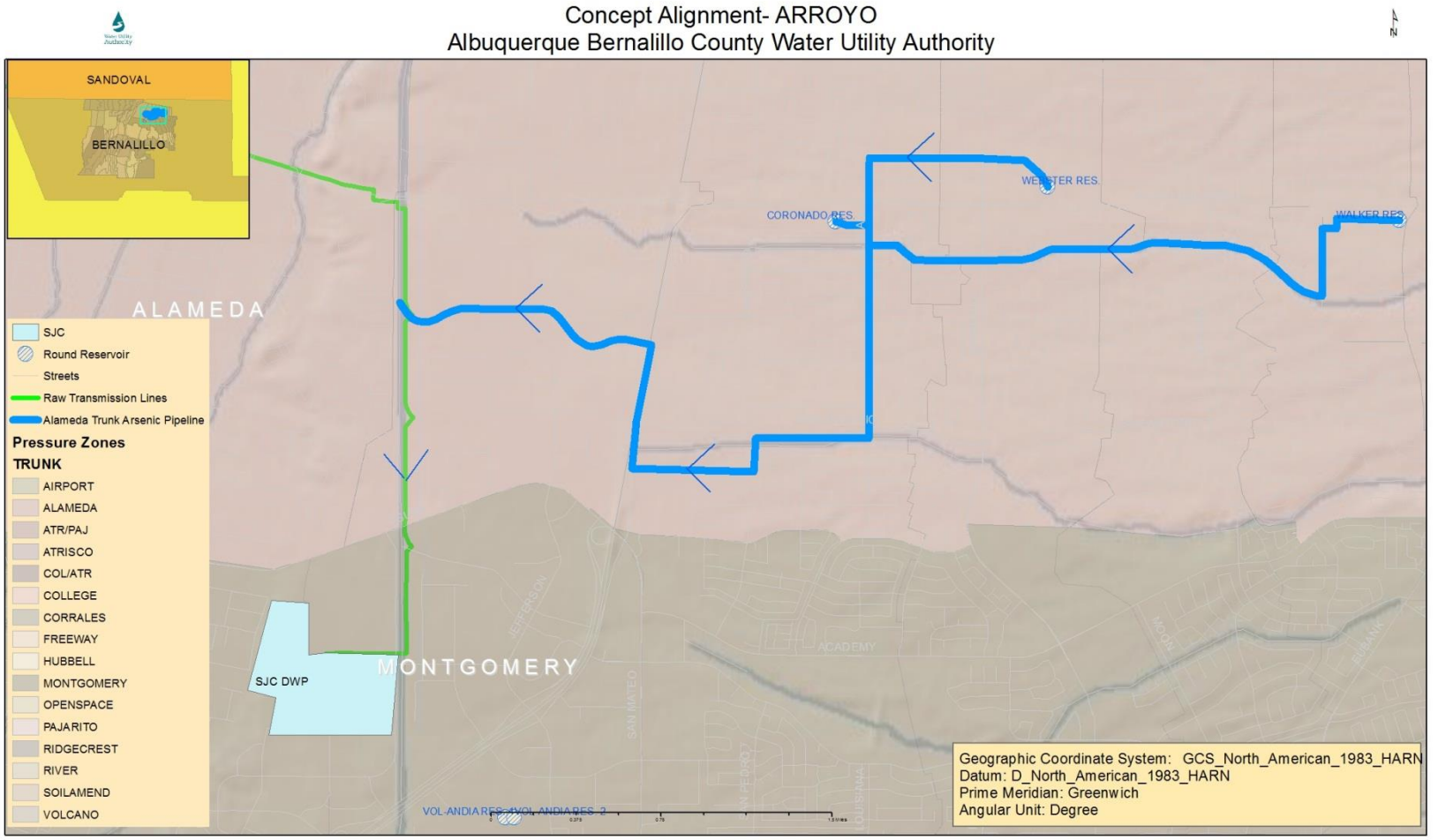
Alameda Trunk Arsenic Pipeline



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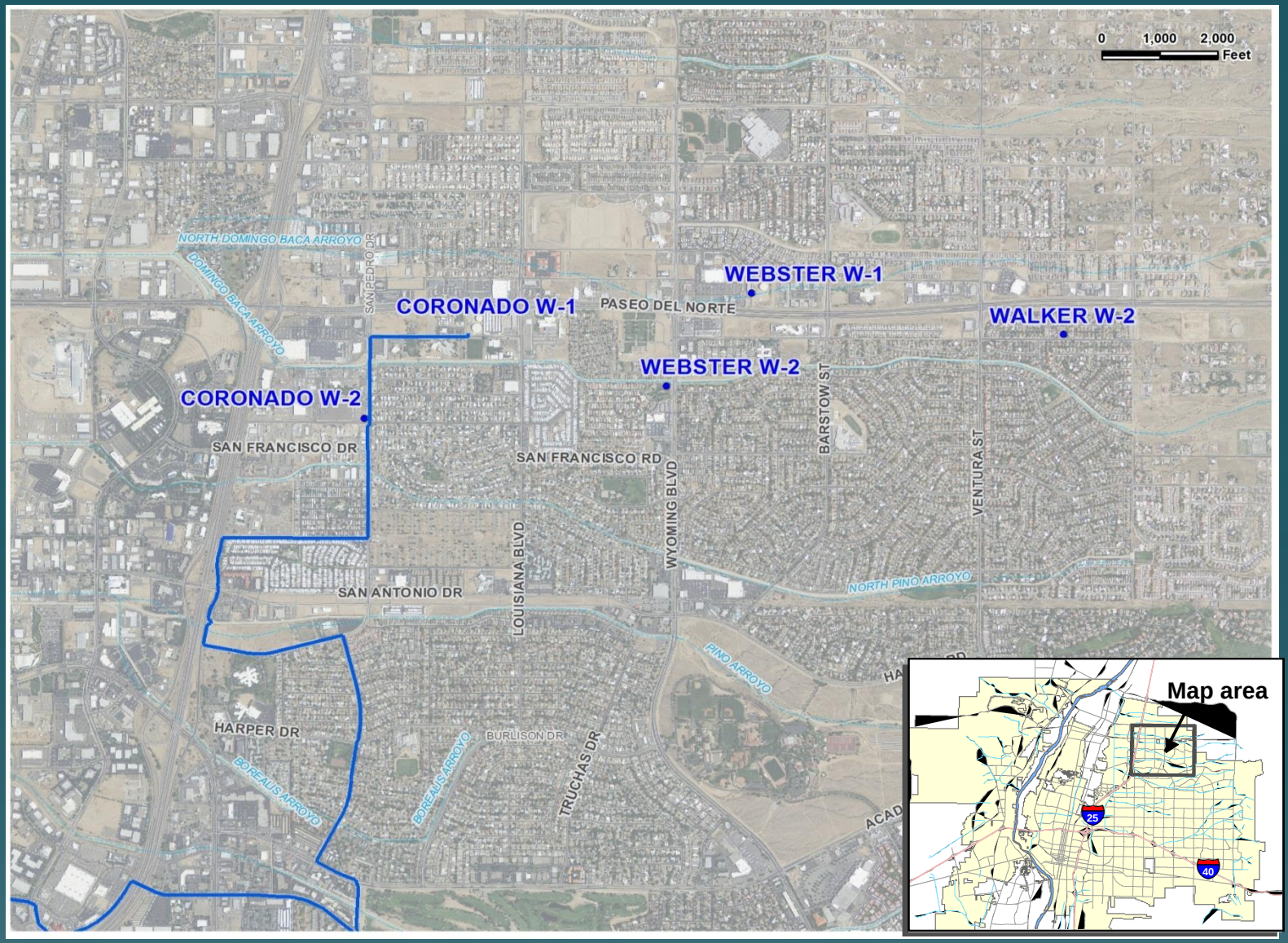

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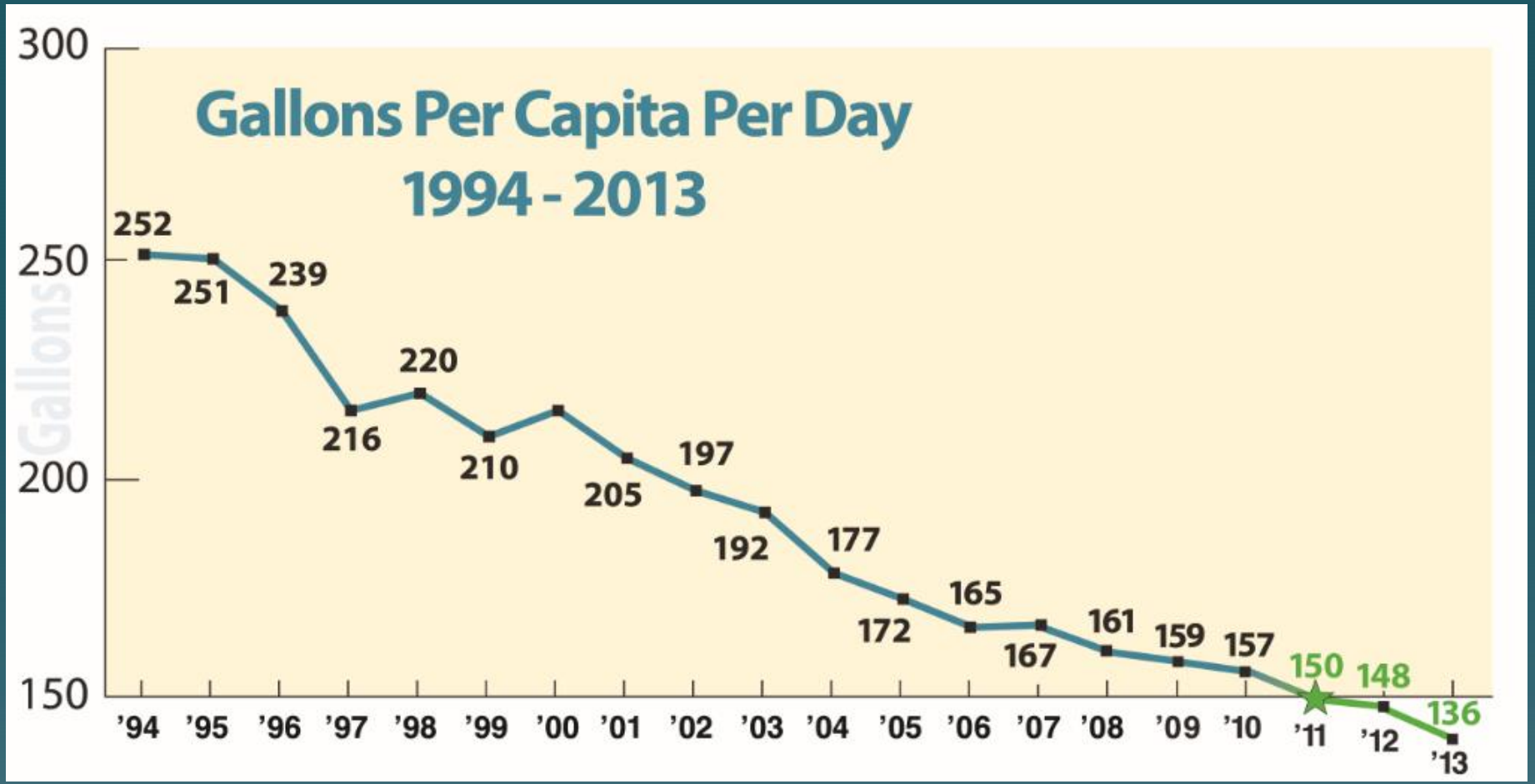
Water Management Strategies in Times of Drought

- Conservation
  - Water Conservation Plan – new 135 gpcd goal
  - Drought Management Strategy
    - Various measures – both voluntary and mandatory for different levels of drought

ABCWUA GPCD 1994 - 2013



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Upper Colorado River Basin

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Colorado River Users Basin Study

- Water Authority part of NM's team on Municipal and Industrial Users
- Goal to save 1,000,000 acre-feet from M&I Group
- Same goal for reuse and agriculture

Comparison of Water Conservation Programs – Colorado River Users

- Water Authority – 136 gpcd

- Salt Lake City – 244 gpcd
- Tucson – 131 gpcd
- Phoenix – 251 gpcd
- Las Vegas – 251 gpcd
- Los Angeles – 152 gpcd

Colorado River Users Next Steps

- Continue meeting to determine opportunities to meet goal – premise being that water conservation (reuse/reduction of agricultural) reduces diversions and leaves additional water in the Colorado River

- San Juan-Chama Project is part of NM's Colorado river share but water conservation by M&I Users on San Juan-Chama project will likely not result in more water in Colorado river

- Work with NM Interstate Stream Commission to provide critical data to group and continue to develop long-term plan working with other Colorado M&I users