

Managing Water Resources for a Metropolitan Area in the Desert Southwest



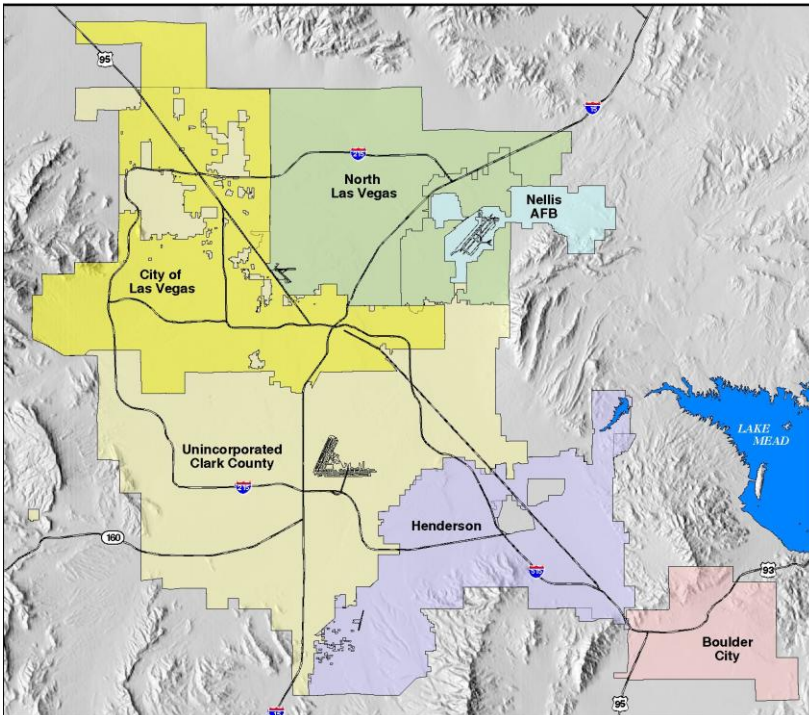
Zane L. Marshall
Director, Water & Environmental Resources
Southern Nevada Water Authority

NWRA – February 6, 2014

Southern Nevada Water Authority

The SNWA is a cooperative agency formed in 1991.

SNWA's mission is to manage the region's water resources and develop solutions that will ensure adequate future water supplies for the Las Vegas Valley.



Member Agencies

- Big Bend Water District
- City of Boulder City
- City of Henderson
- City of Las Vegas
- City of North Las Vegas
- Clark County Water Reclamation District
- Las Vegas Valley Water District

SNWA Responsibilities



Wholesale water treatment and delivery



Manage existing and secure future water resources

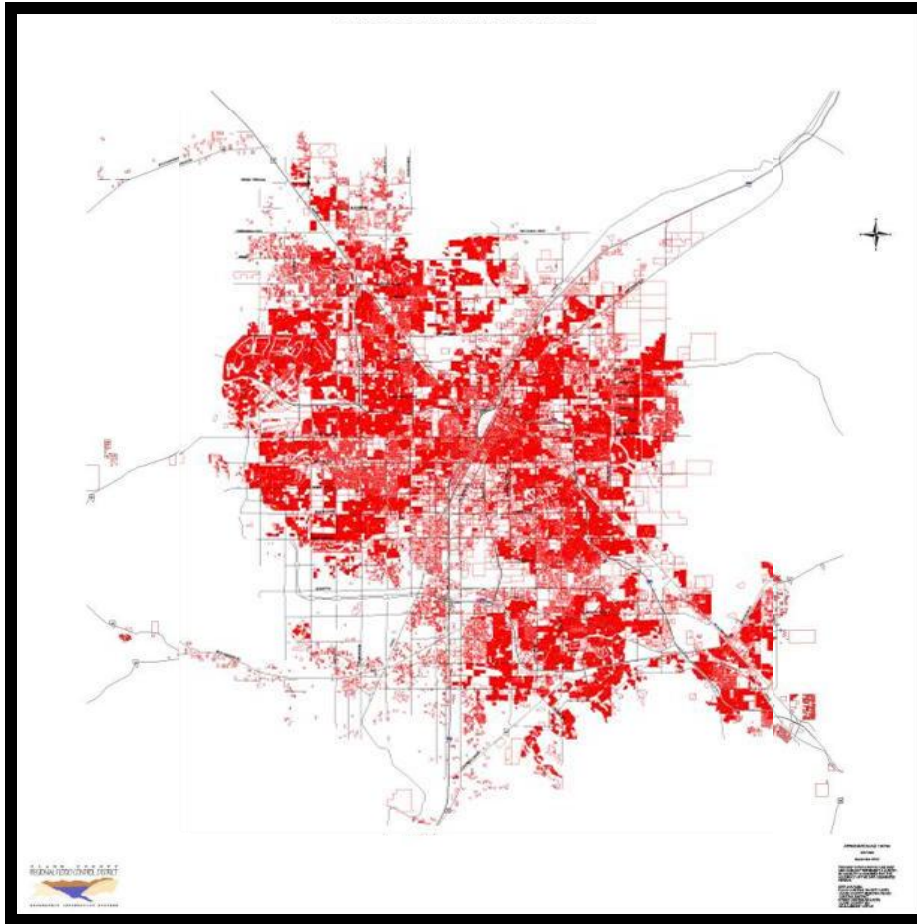


Construct and operate facilities



Promote conservation

Clark County Population Growth



Population

1950 – 48,000

1960 – 127,000

1970 – 273,000

1980 – 463,000

1990 – 800,000

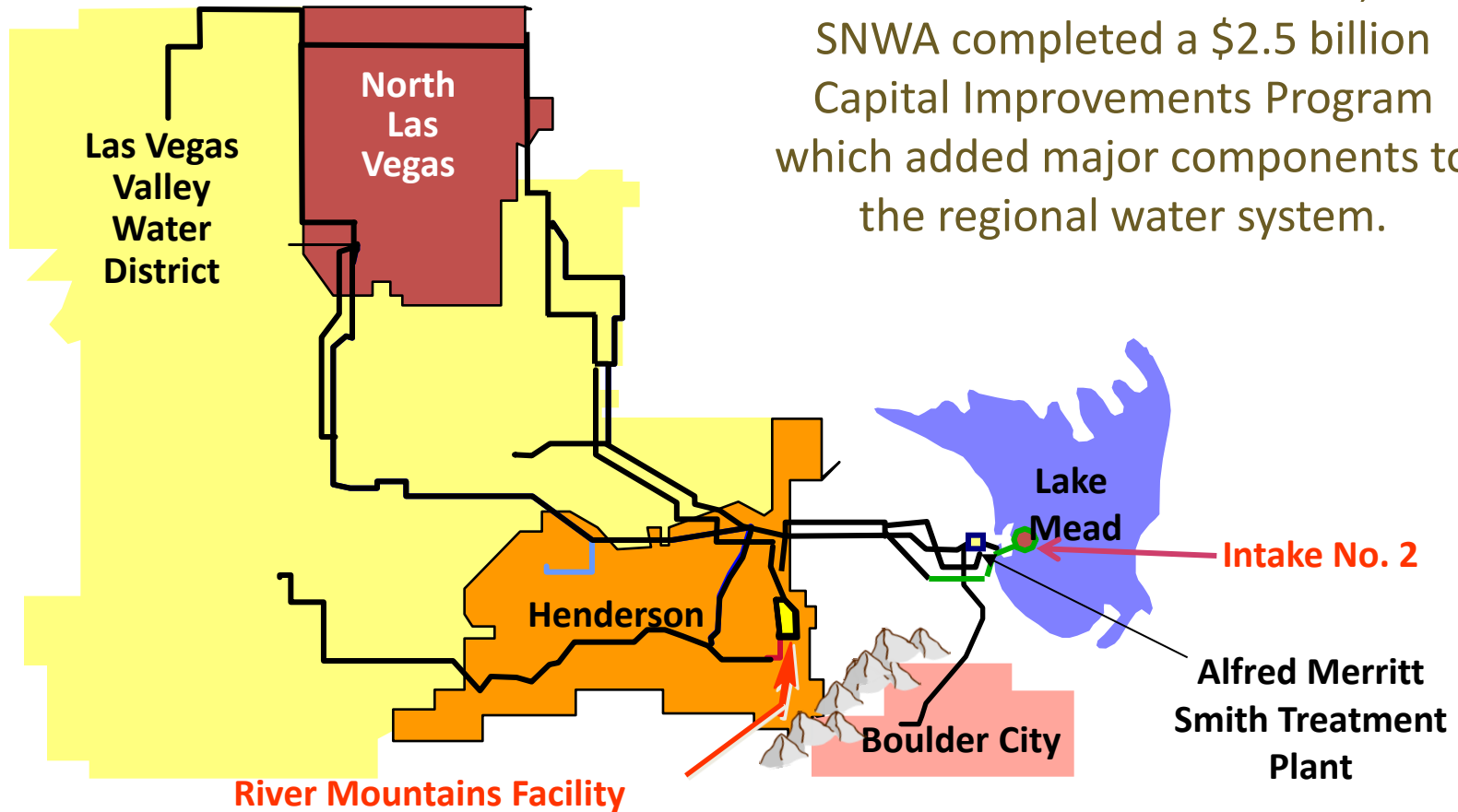
2000 – 1,400,000

2010 – 2,000,000

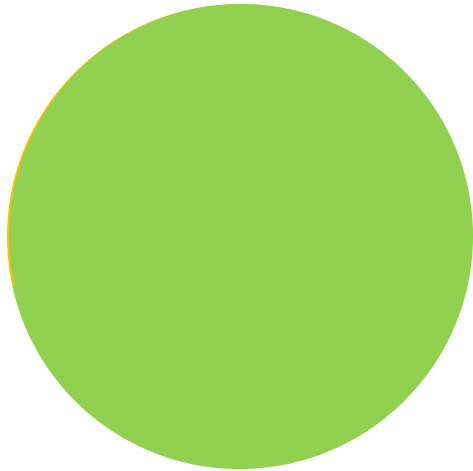
2020 + – ?

Regional Water System

Between 1995 and 2008, SNWA completed a \$2.5 billion Capital Improvements Program which added major components to the regional water system.

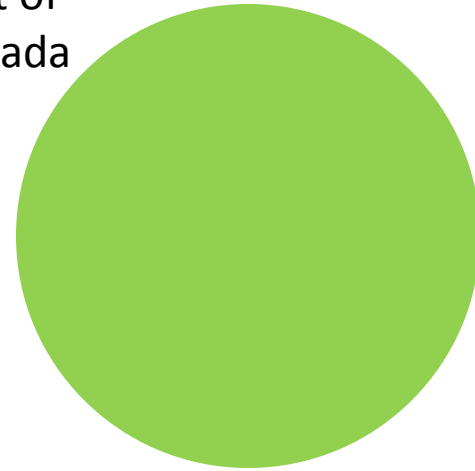


Nevada Statistics

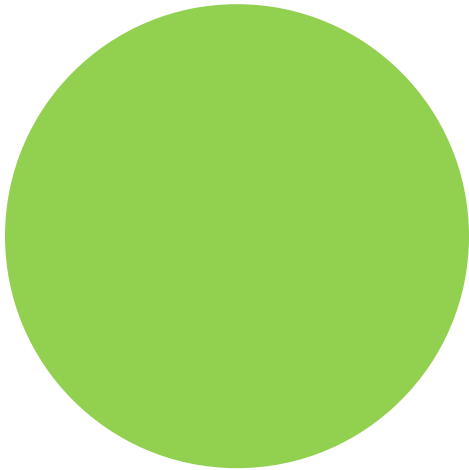


Nevada Gross Domestic Product \$133.6 Billions

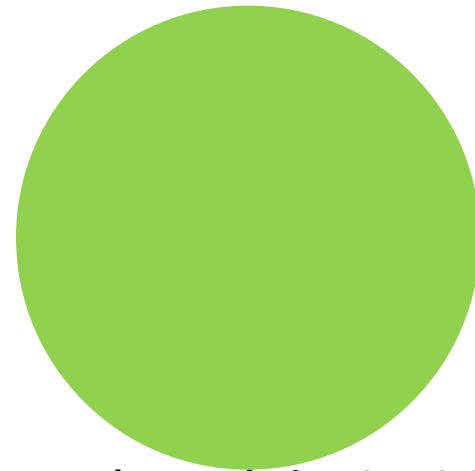
Rest of
Nevada



Nevada Taxable Gaming Revenue \$10.2 Billion



Nevada Total Employment 1,142,700



Nevada Population 2,750,000

Source: U.S. Bureau of Economic Analysis. Data are for the year 2012

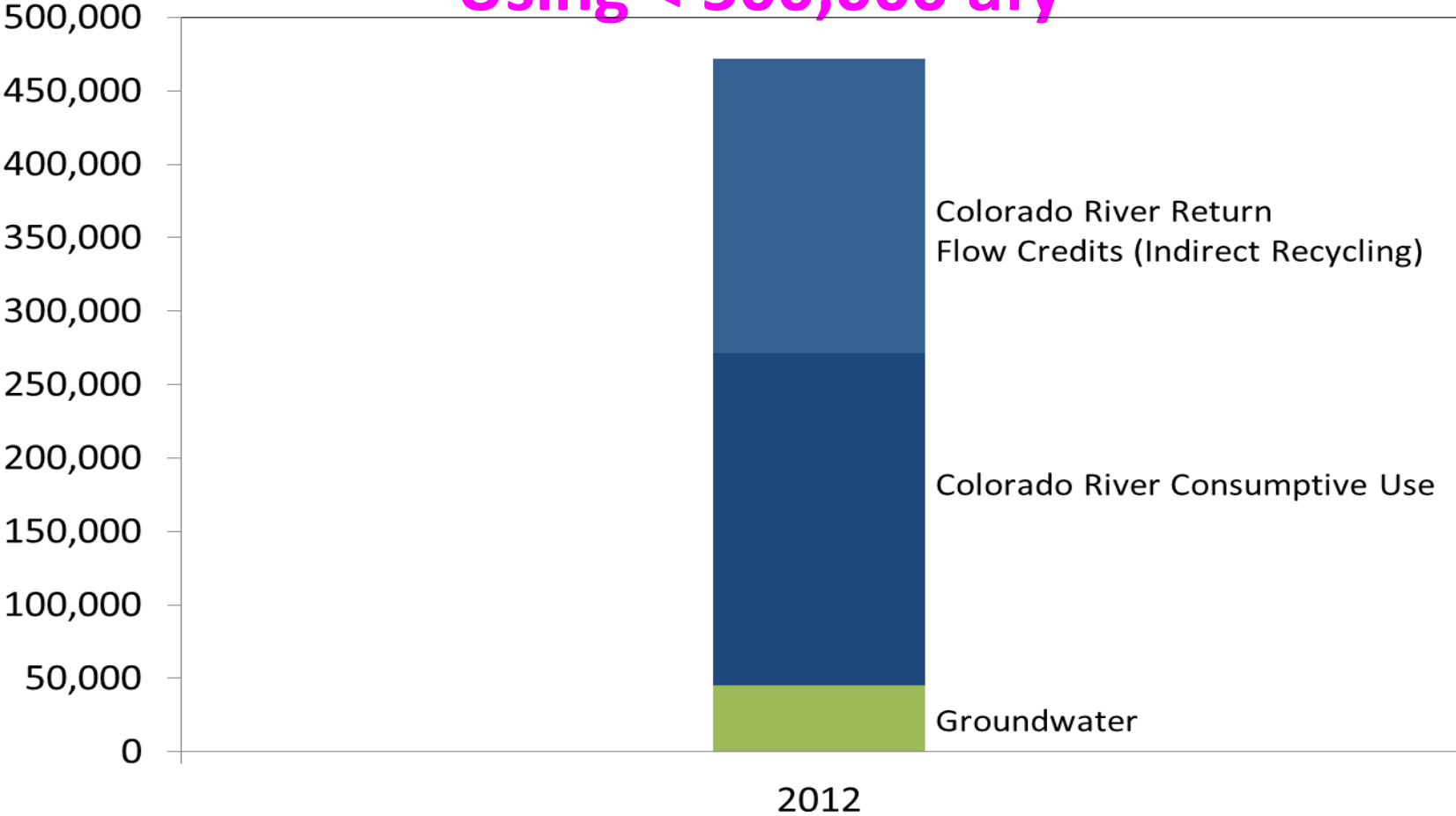
Source: State of Nevada Gaming Control Board. Data based on 12-month period: December 1, 2012 thru November 30, 2013

Source: Nevada State Demographer, 2012 Population Estimates

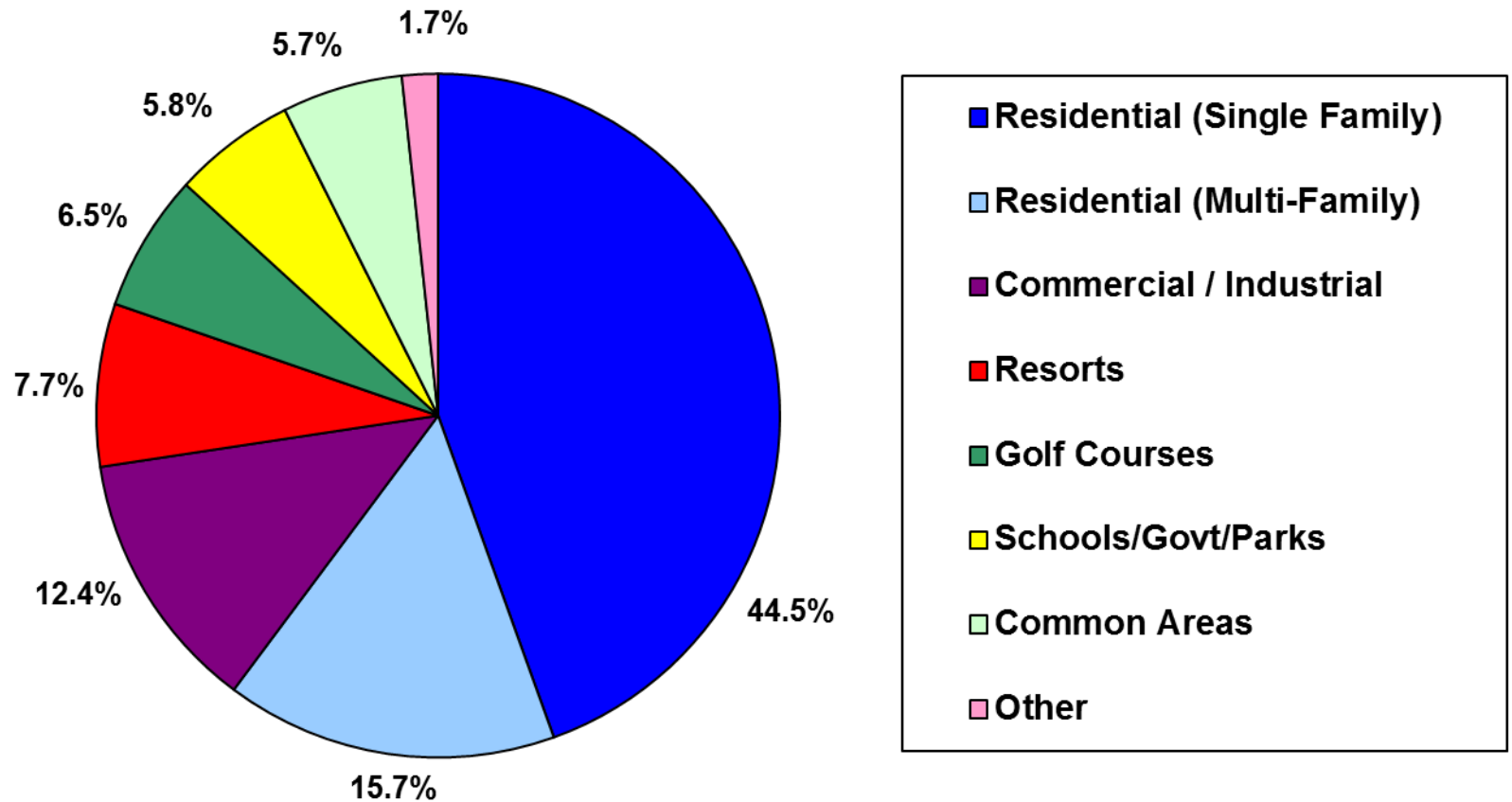
Source: Nevada Department of Employment, Training and Rehabilitation Number employed as of November 2013

SNWA Water Use

Using < 500,000 afy

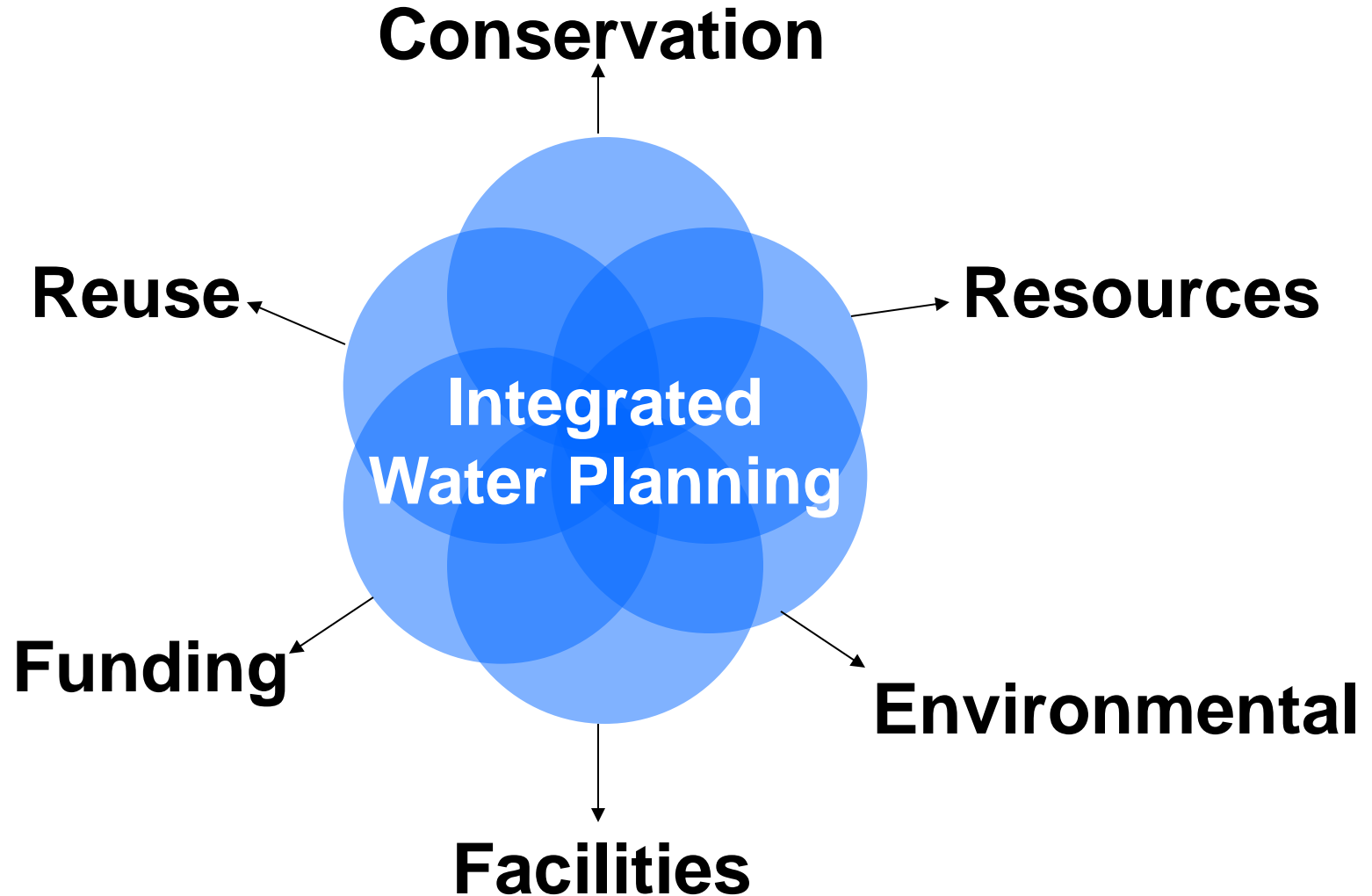


Southern Nevada Metered Water Use



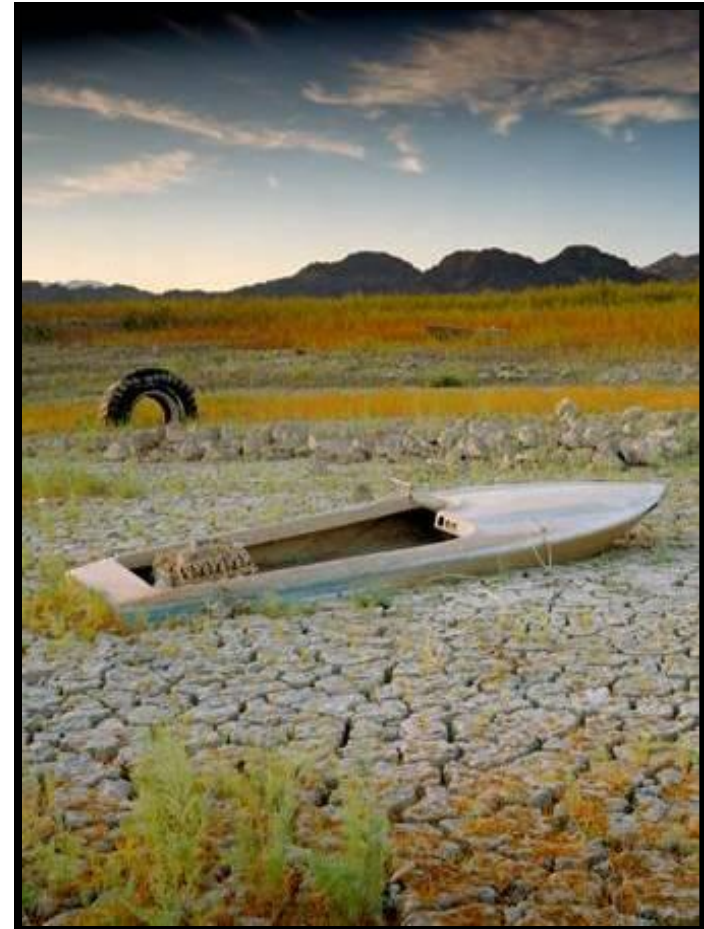
Based upon 2012 metered usage for all SNWA entities

Assured Water Supply



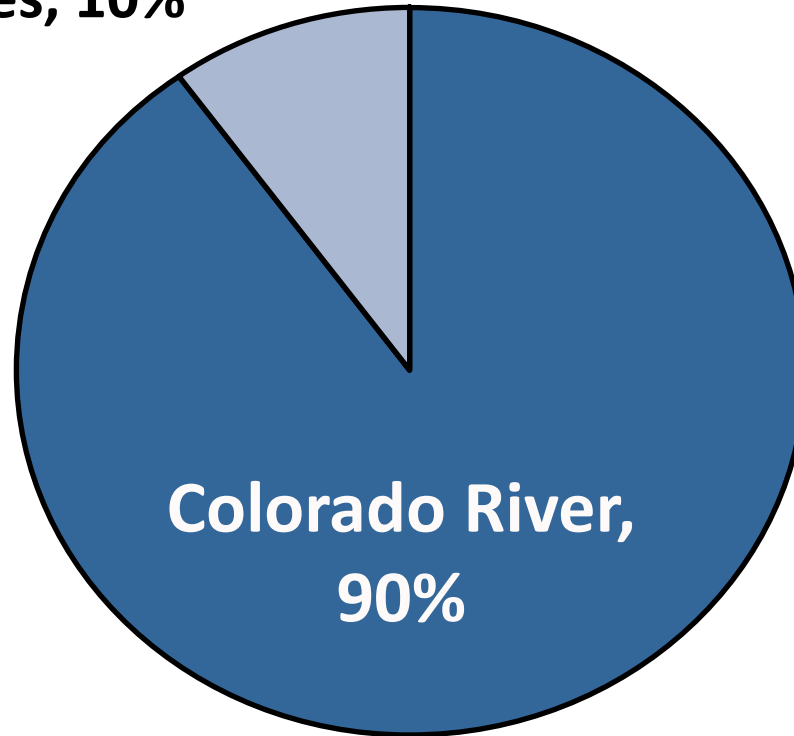
Address Challenges to Assure Water Supplies

- **Population Growth**
- **Economic Viability**
- **Strategic Resource Management and Acquisitions**
- **Environmental Stewardship**
- **Drought & Climate Change**



Southern Nevada's Water Resources

**Other Water
Resources, 10%**

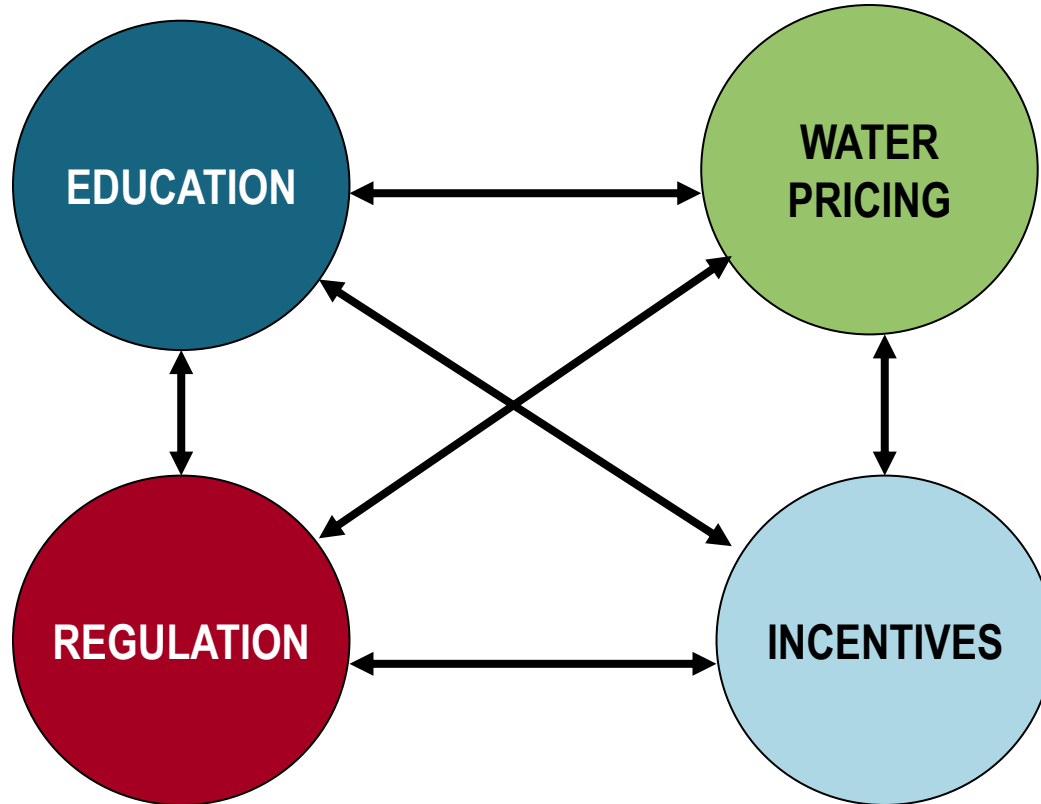


**Nevada receives 90 percent of its water supply
from the Colorado River.**

Conservation



Conservation



SNWA and its member agencies utilize a variety of tools to promote conservation and reduce overall water use

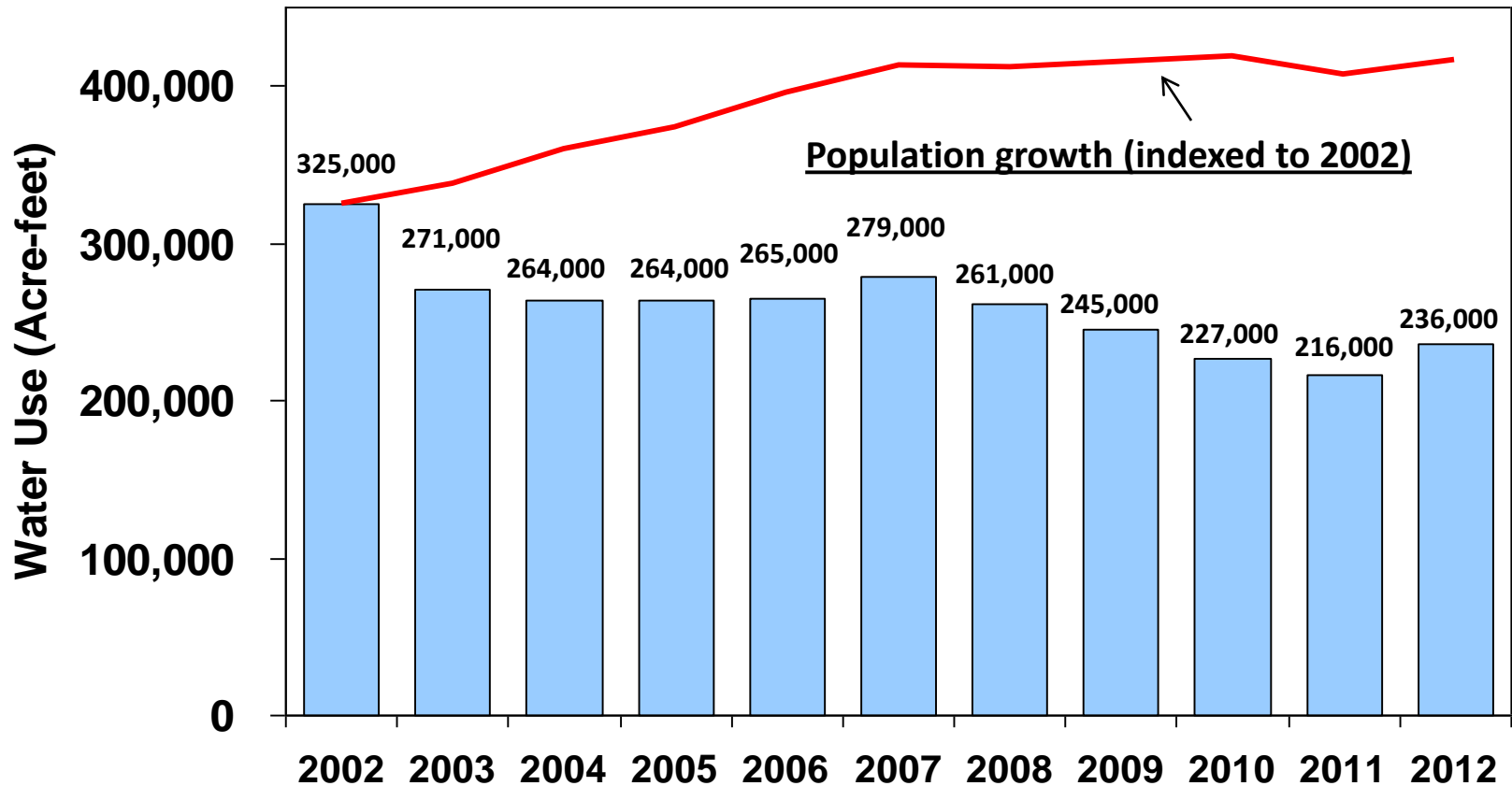
Conservation

Southern Nevada has embraced a culture of efficient watering practices.

- **\$190 million** spent to date on landscape rebates
- **168 million square feet of turf** converted to water efficient landscaping
- More than **9 billion gallons** of water saved annually
- Nearly **69 billion cumulative gallons** of water saved



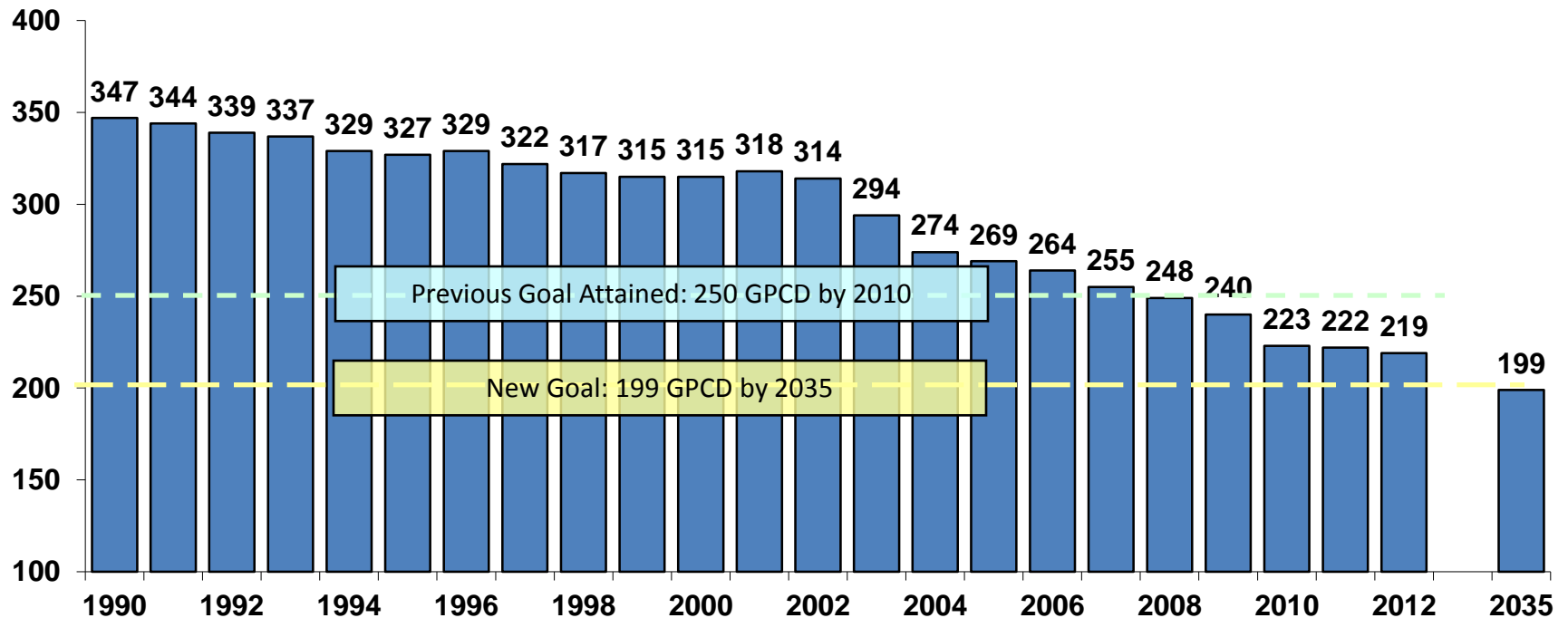
Conservation



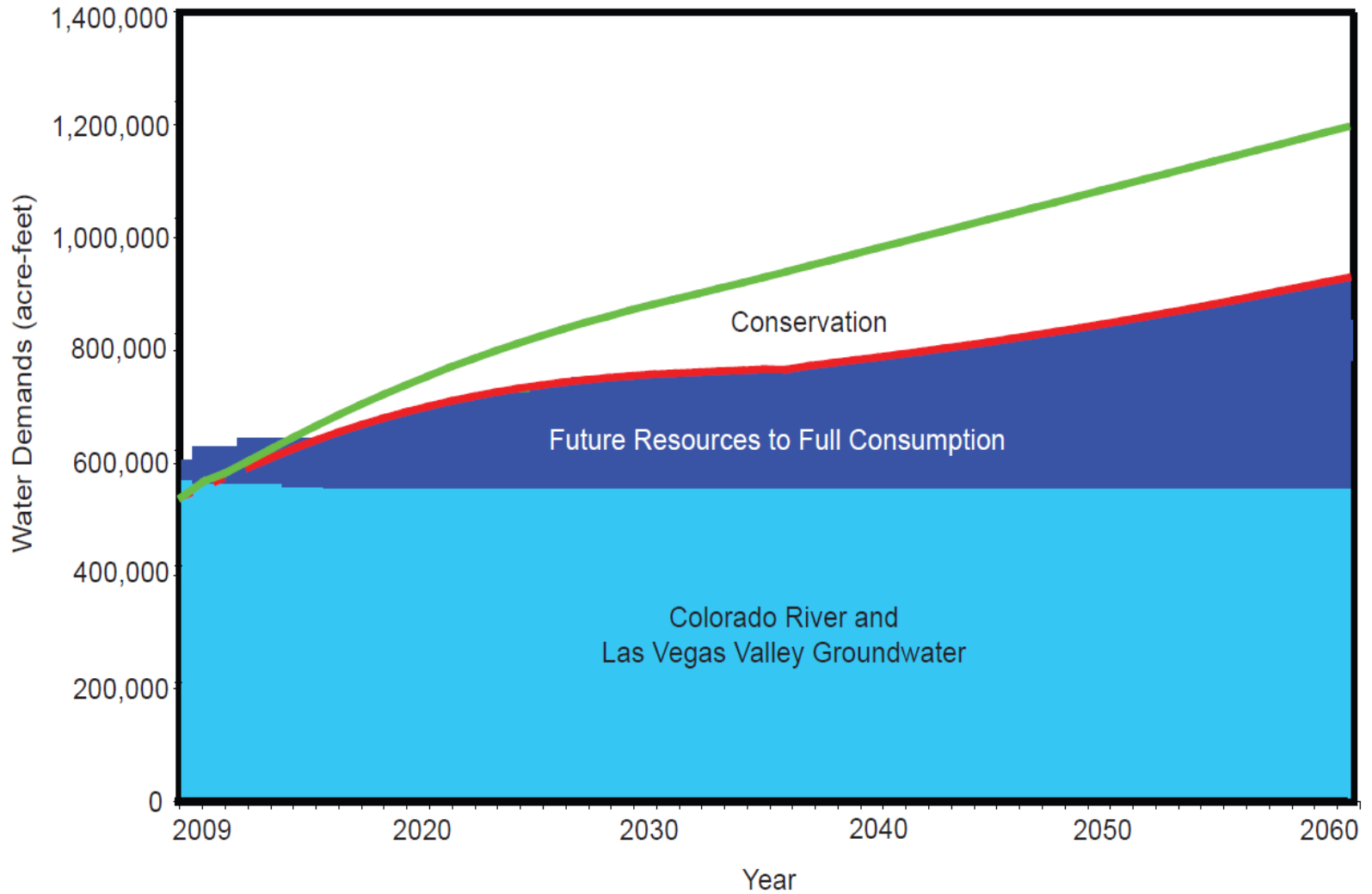
Southern Nevada's annual water consumption decreased by approximately 29 billion gallons between 2002 and 2012, despite a population increase of about 400,000 new residents

Conservation

1990 - 2012 Gallons Per Capita Per Day (GPCD) Water Usage



SNWA Water Resource Plan



Banked Resources

Las Vegas Valley

- 341,198 af recoverable
- Began in 1987
- In state bridge resource
- Banking/recovery long-term commitment
- Groundwater Management Program



Arizona

- 600,000 af banked
- Currently pay-as-you-go program
- Recoverable during CR shortage

California

- 111,000 af banked since 2004 to 2012
- Recoverable during CR shortage

Diversification

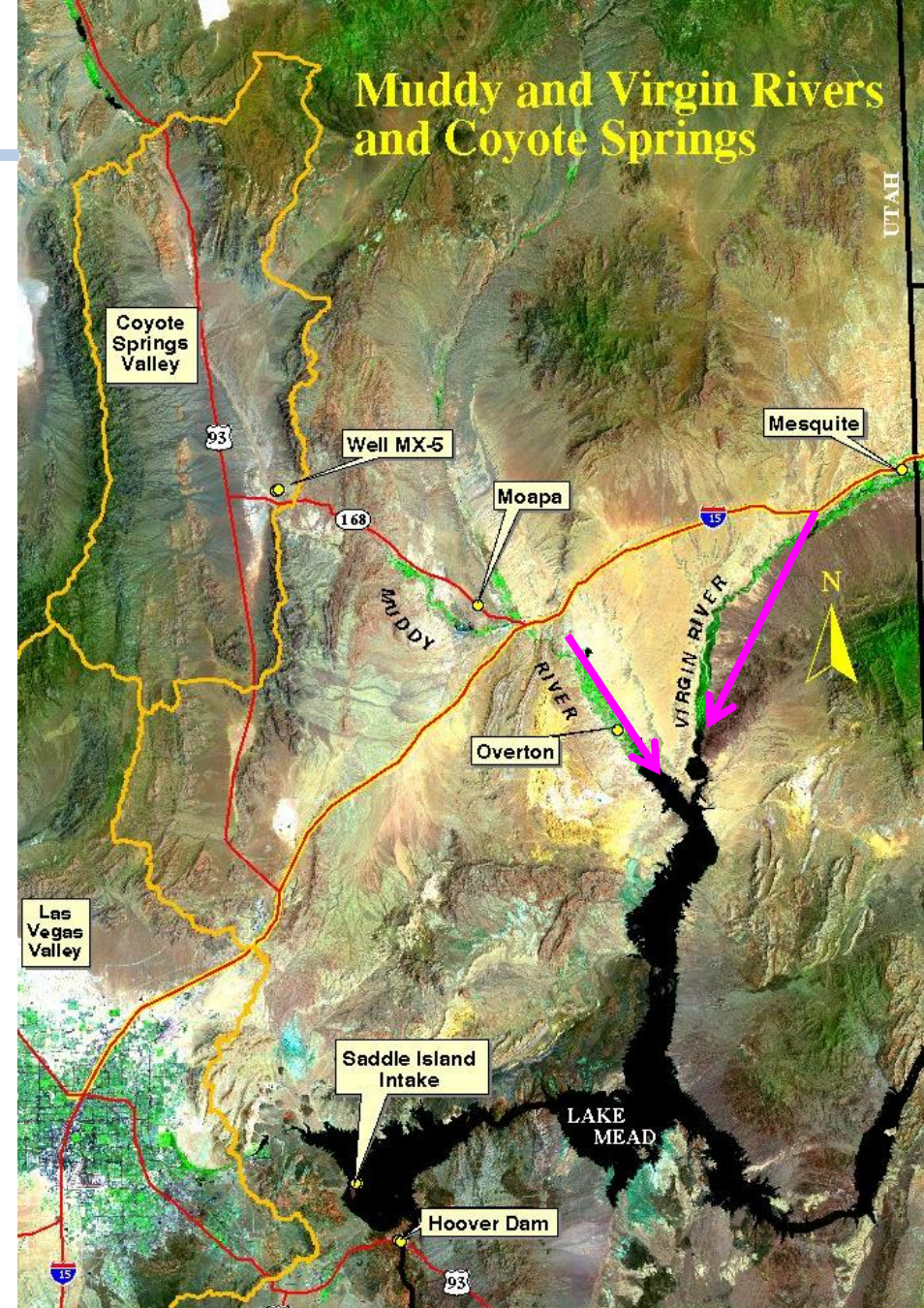
First Importation of water since Colorado River water

Tributary Conservation:

- Muddy and Virgin Rivers
- Acquisition and retirement of pre-1929 agricultural rights
- Conveyance of water to Lake Mead for Colorado River credits

Imported Groundwater:

- Coyote Spring Valley
- Facilities convey groundwater to Lake Mead for Colorado River credits
- Began in 2010

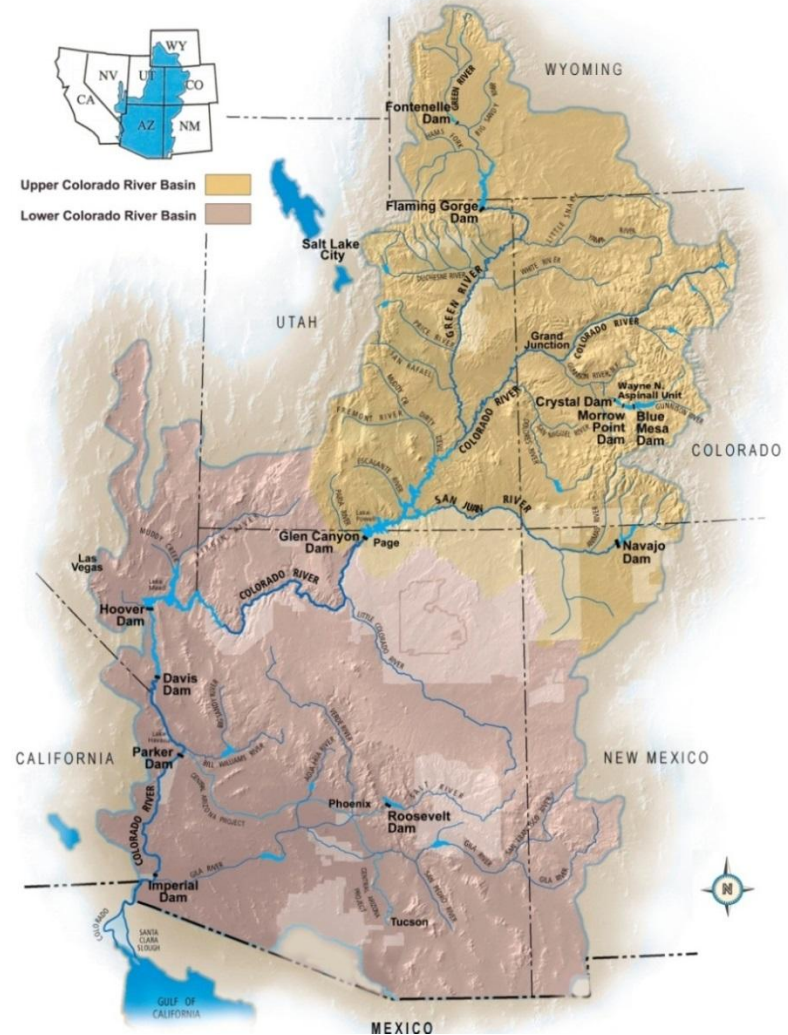


5 0 5 Miles

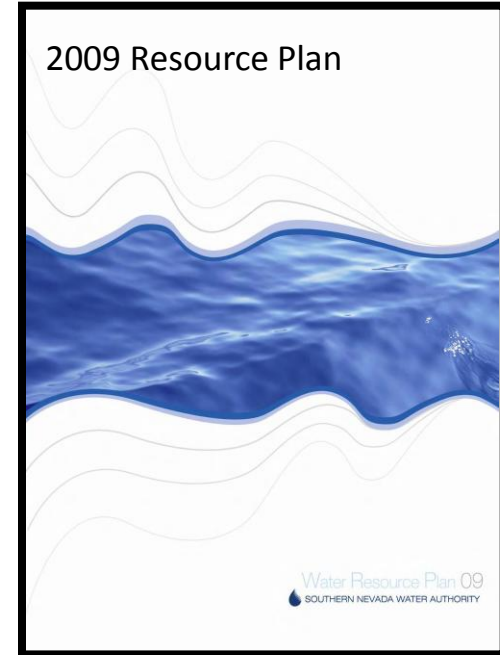
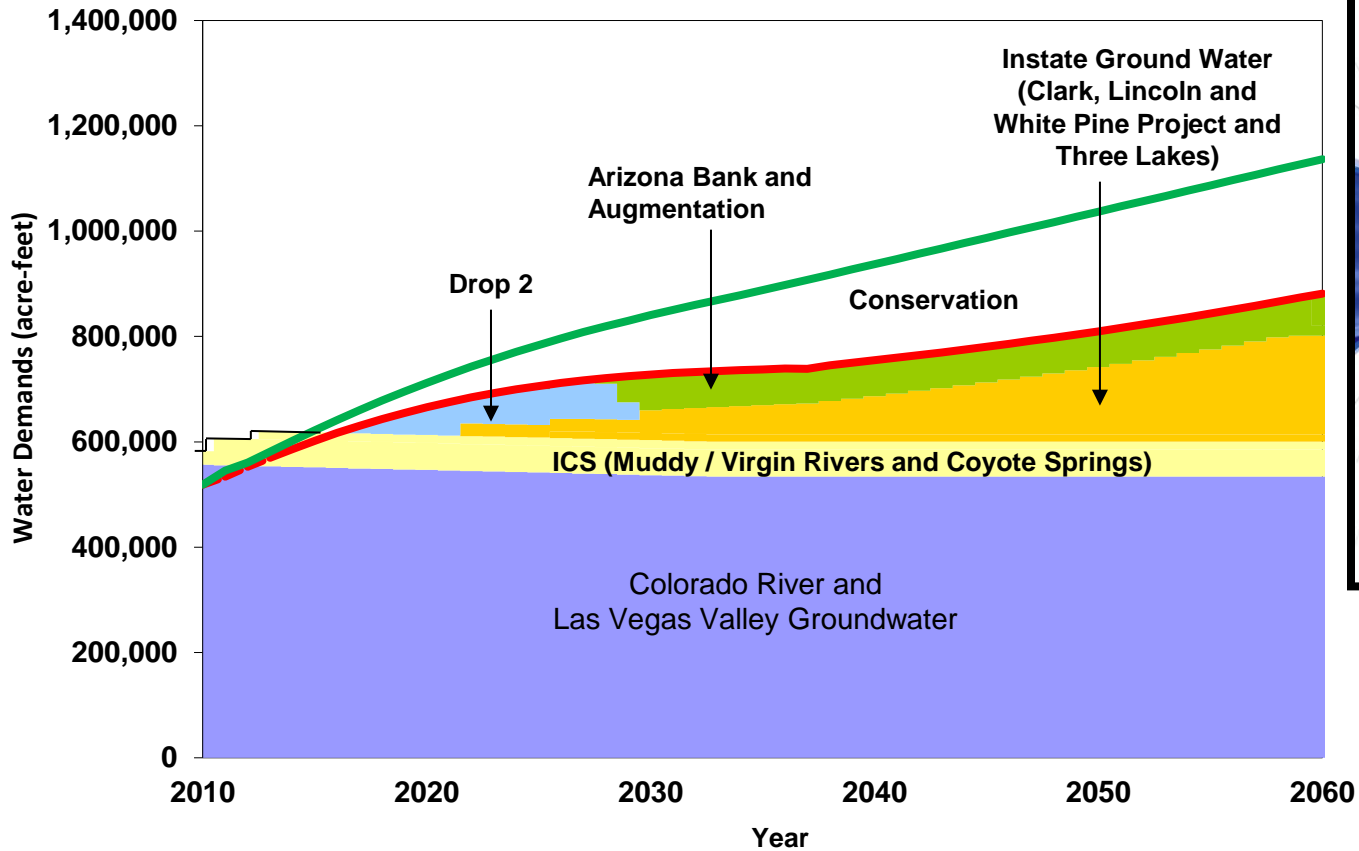
Maximizing Colorado River Supplies

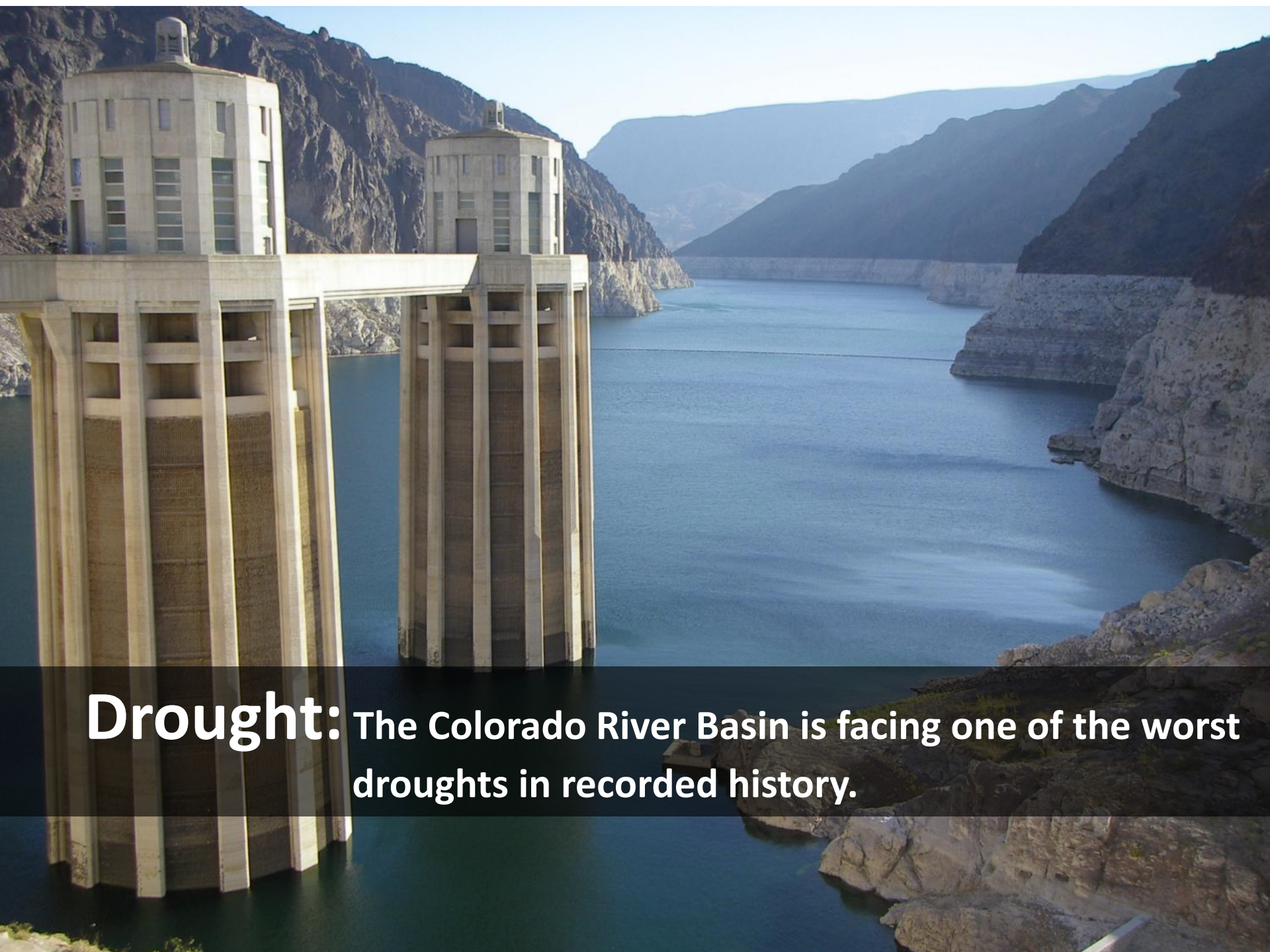
- Brock Reservoir (Drop 2)
- Minute 319 – International Boundary and Water Commission
- Yuma Desalting Plant

Colorado River Basin



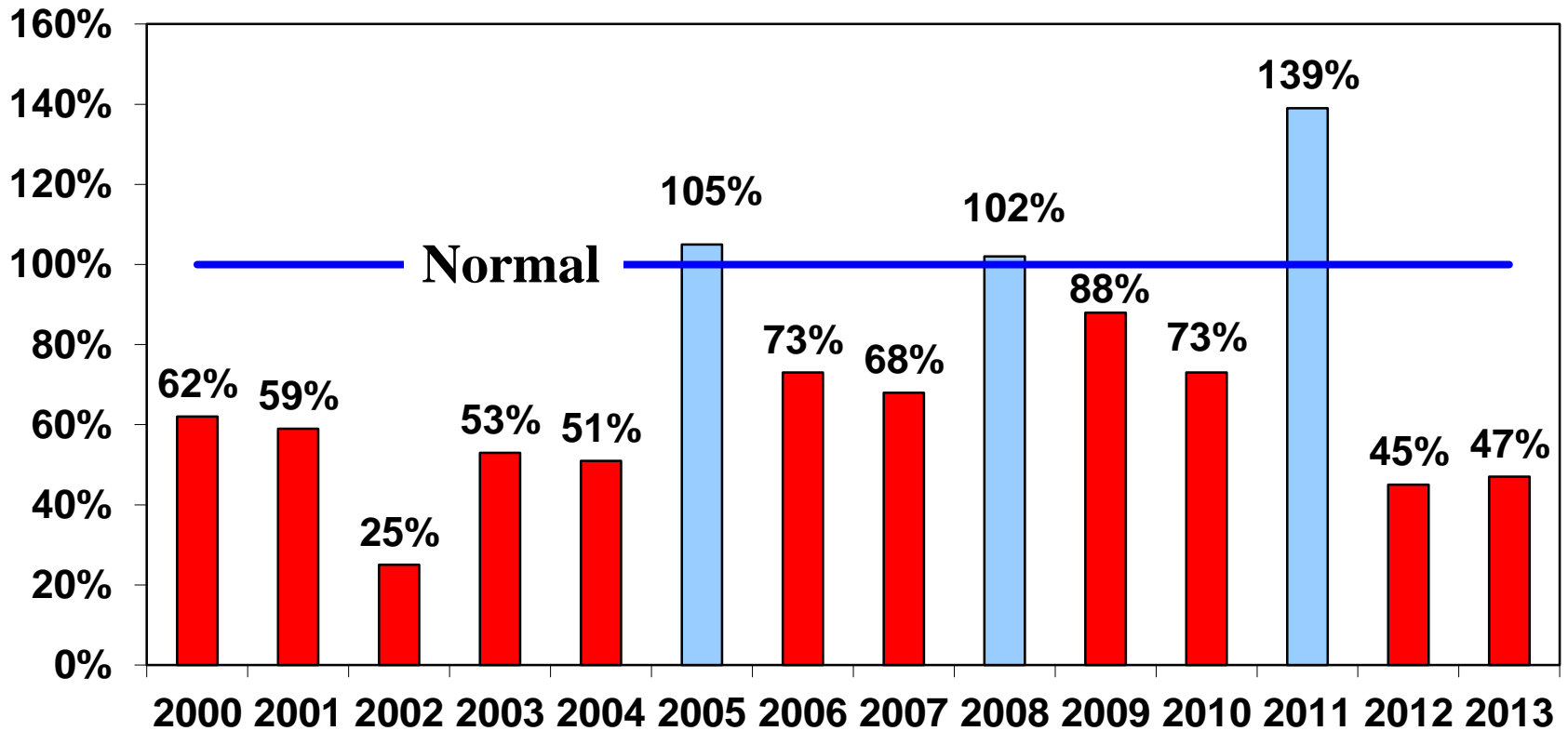
SNWA Water Resource Plan





Drought: The Colorado River Basin is facing one of the worst droughts in recorded history.

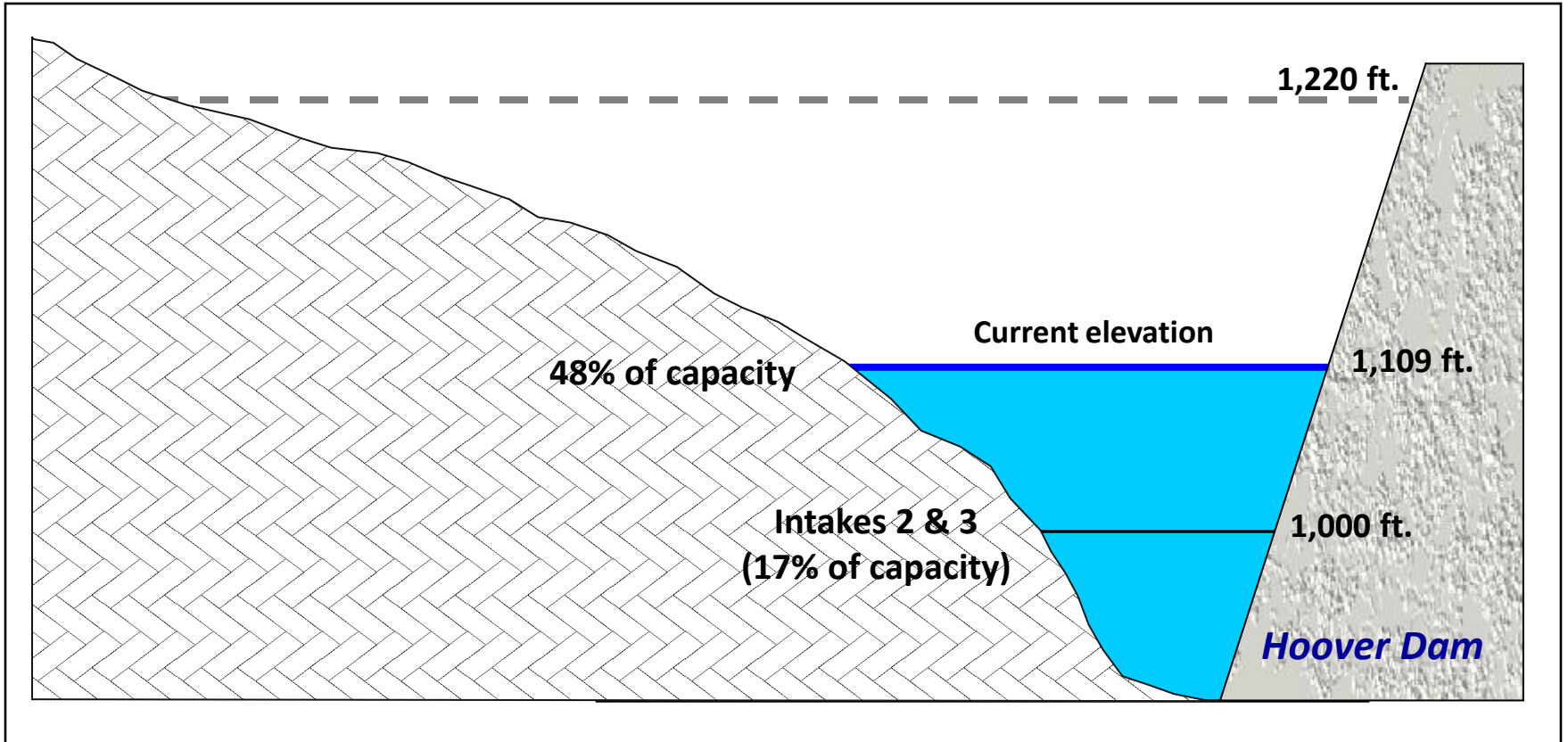
Historical and Projected Lake Powell Annual Inflows



Historical 14-Year Average Inflow: 71% of normal

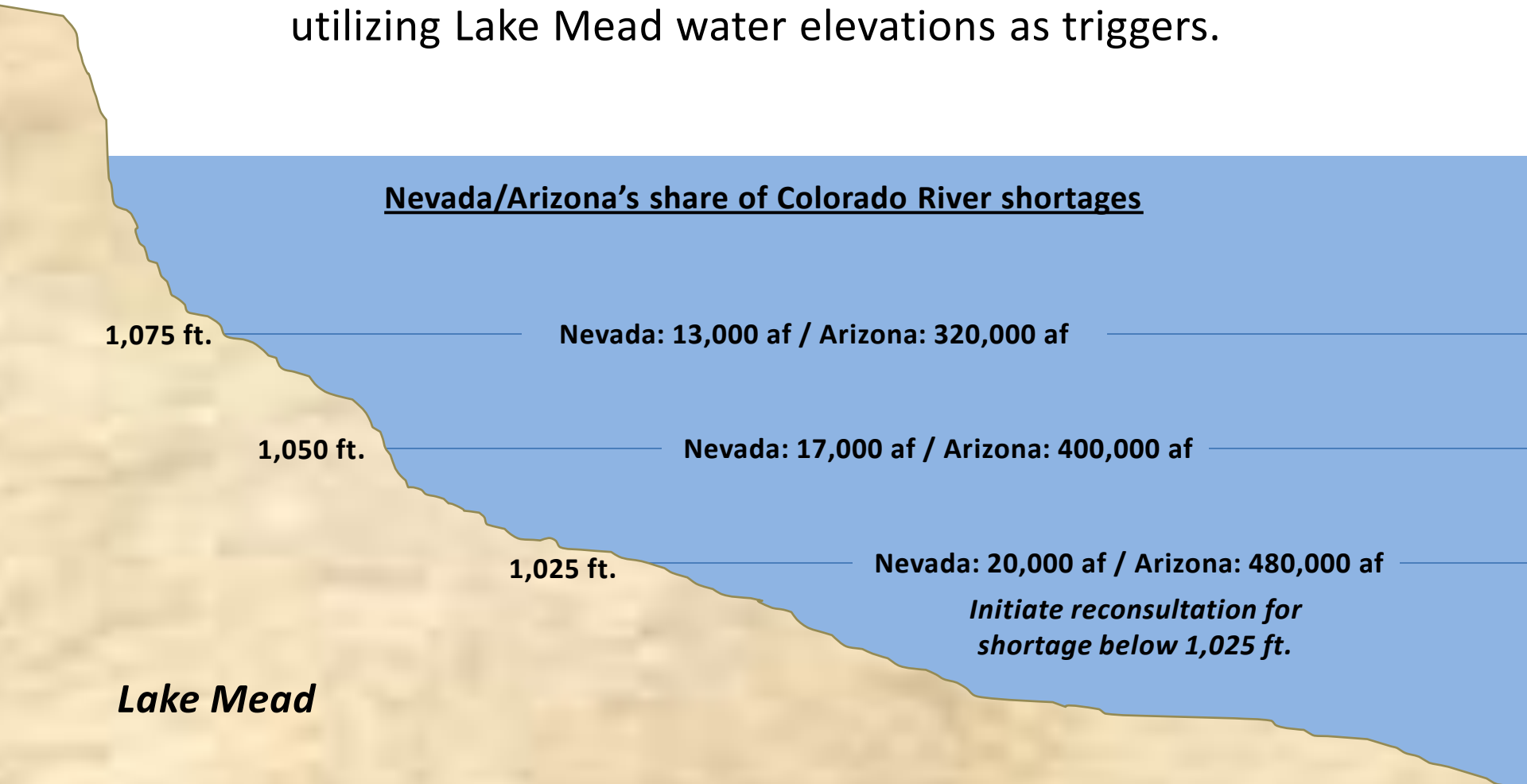
Drought Update

Lake Mead Elevation

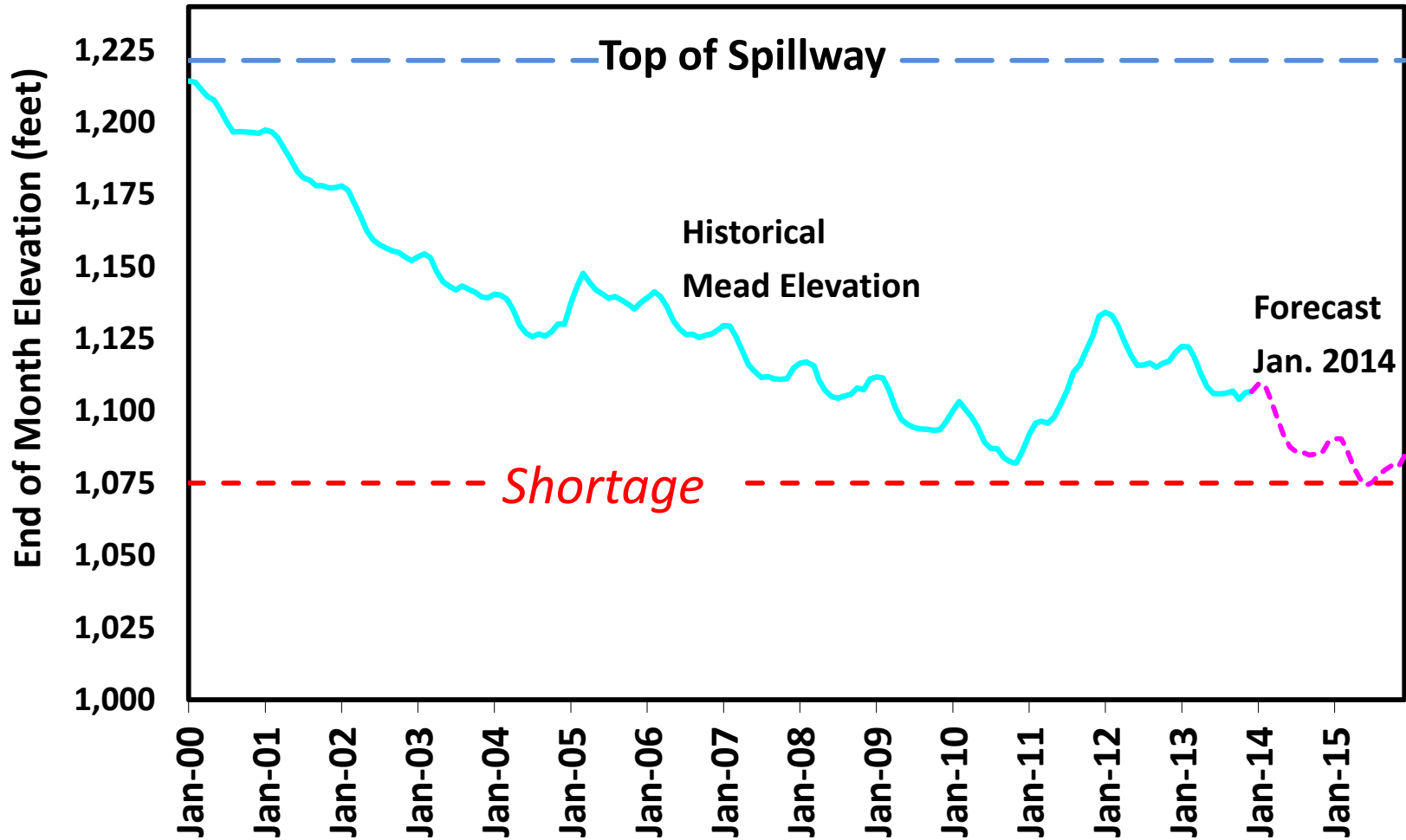


Drought Response: Shortage Sharing

The Basin States developed a framework to manage shortages, utilizing Lake Mead water elevations as triggers.



Lake Mead Elevations



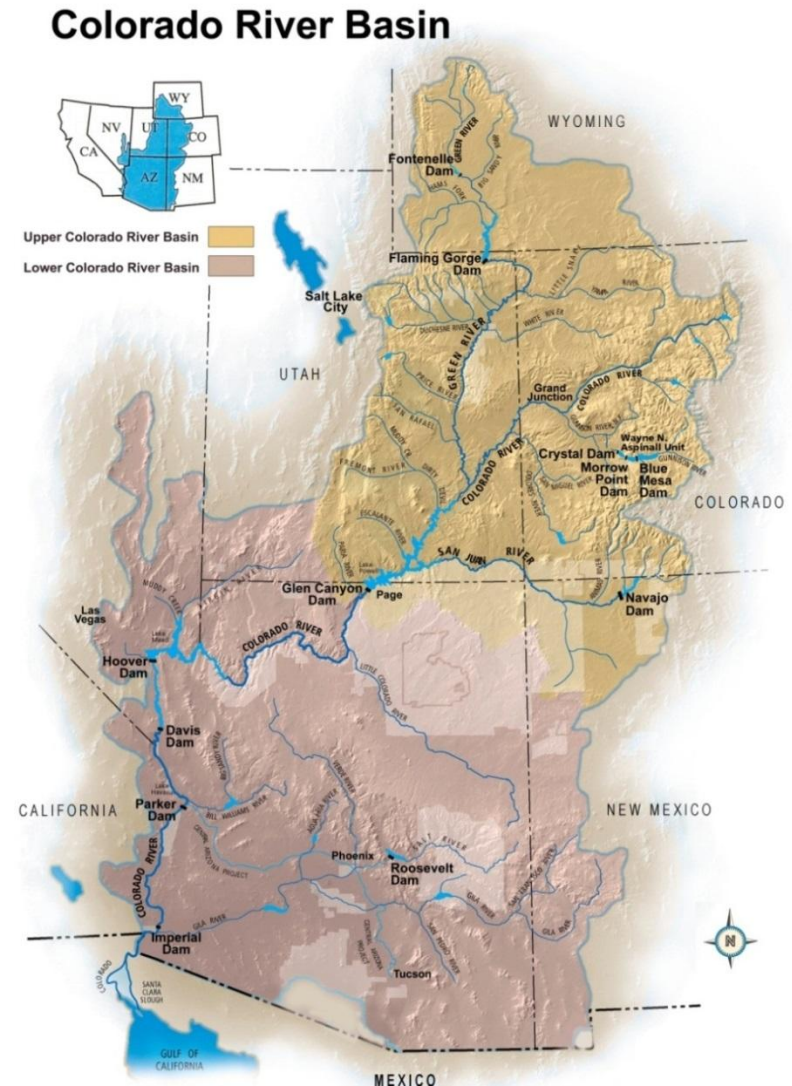
Building Resilience

A CLIMATE CHANGE ADAPTATION STRATEGY

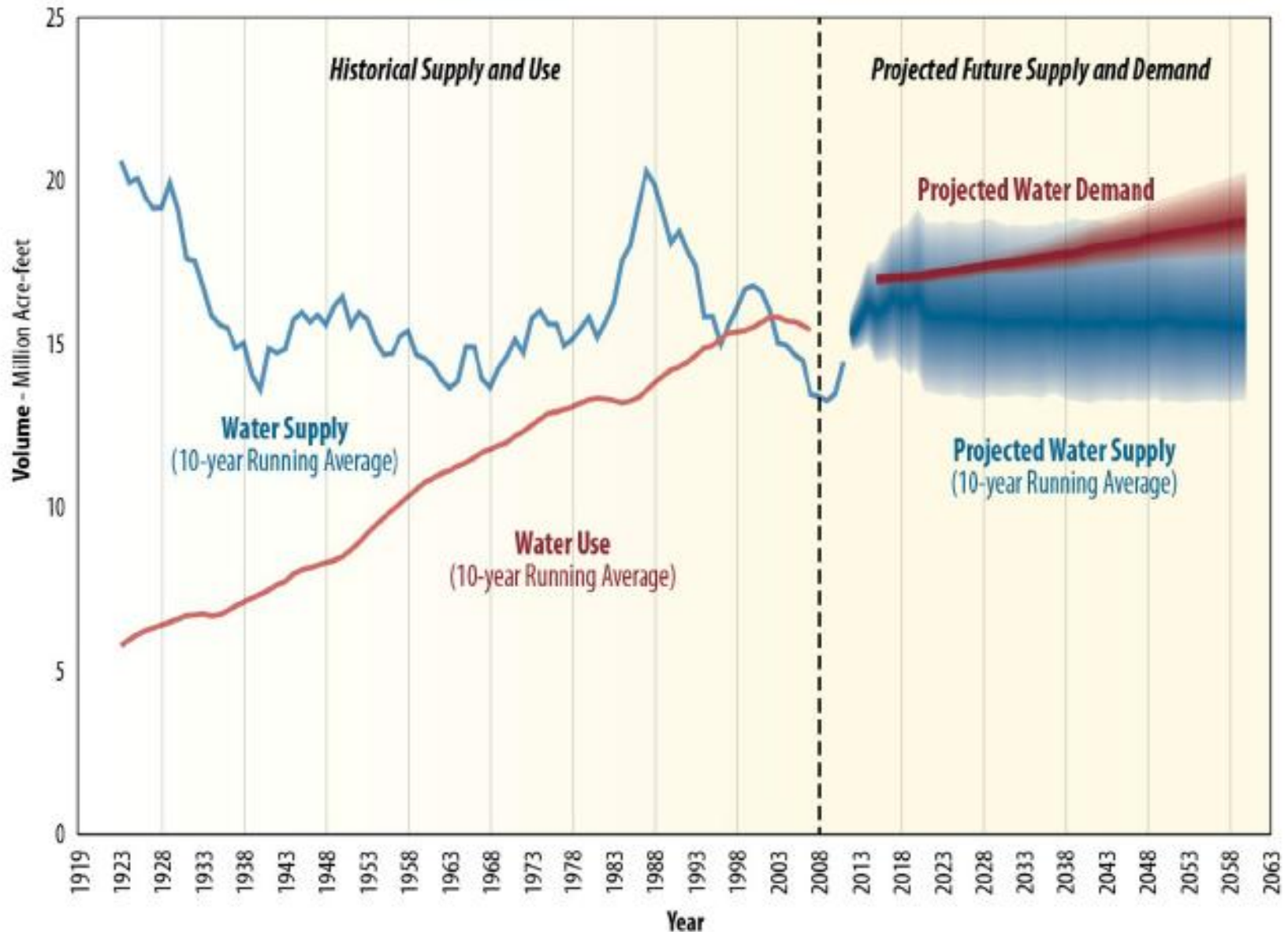
- **Understand**
Climate science and model projections
- **Assess**
Water system vulnerabilities
- **Plan**
Incorporate knowledge into water utility planning
- **Implement**
Adaptation and mitigation strategies
- **Monitor**
Measure performance and environmental conditions

Colorado River Basin Water Supply and Demand Study

- Assess future (50 yr) water supply and demand imbalances
- Assess risks to Basin resources
- Develop and evaluate opportunities for resolving imbalances
- Federal/State/Stakeholder Collaboration & Cost Share



Colorado River Basin Water Supply and Demand Study



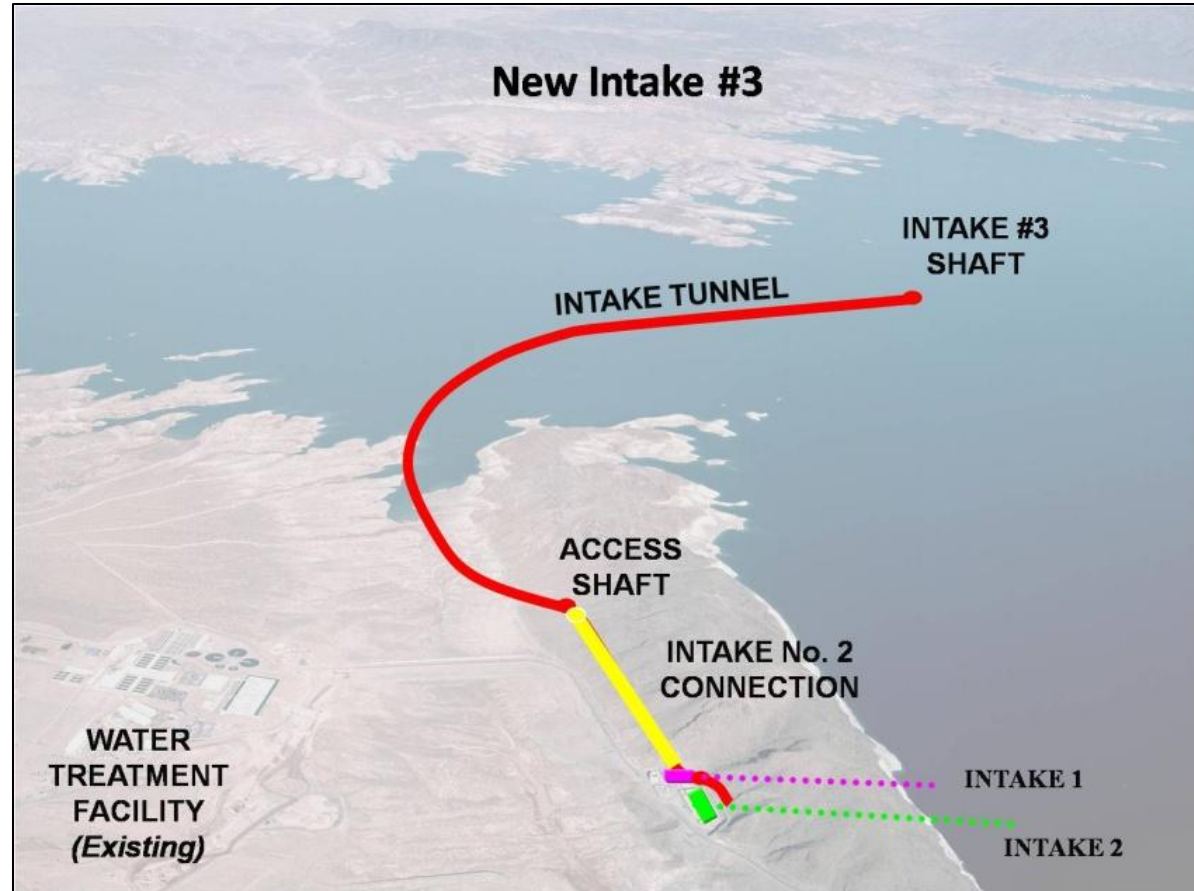
Long-term Reliability

Despite achievements in conservation and water resources, additional infrastructure and resources are needed to provide a long-term, reliable water supply for Southern Nevada.

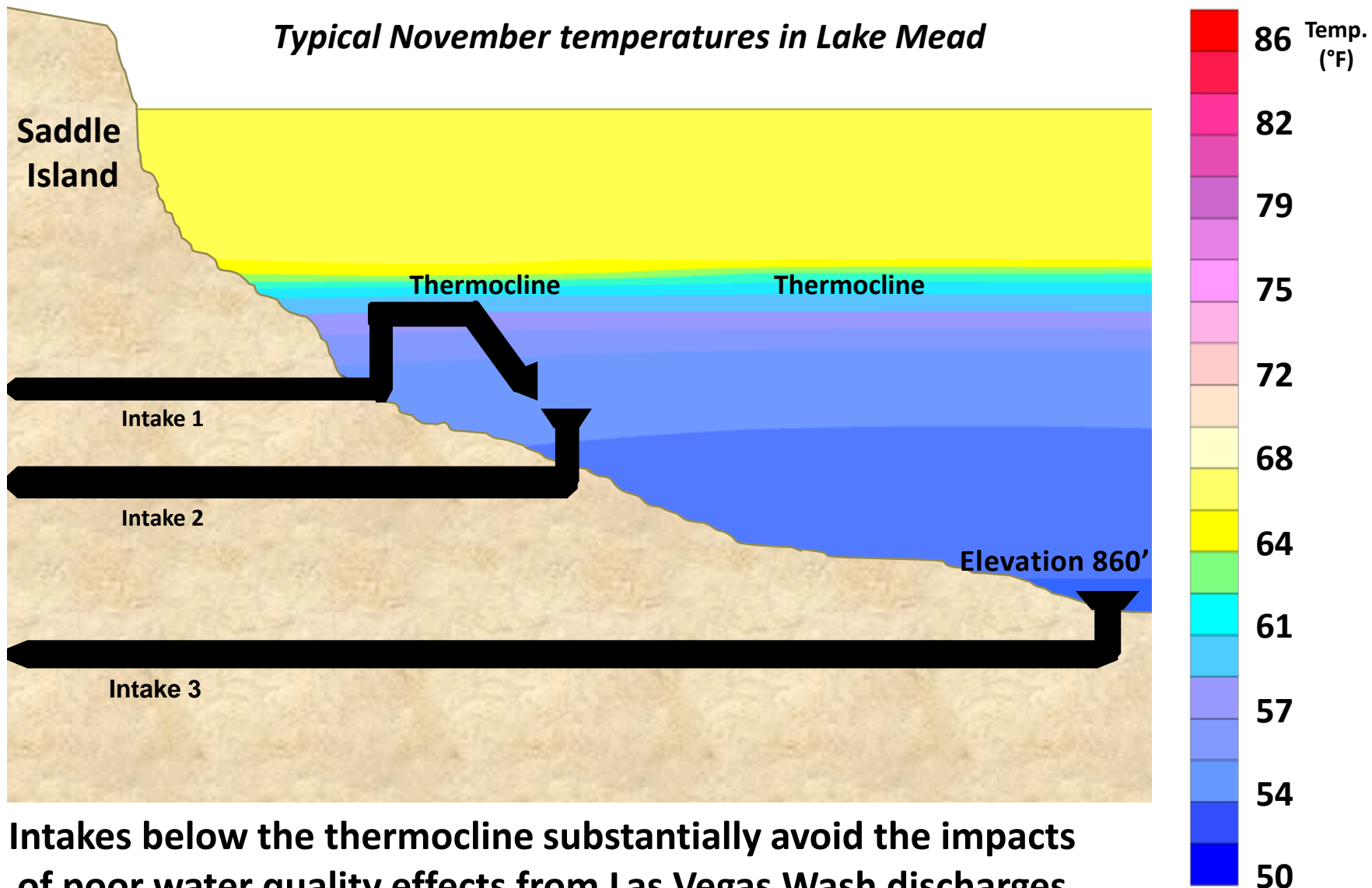


Lake Mead Intake No. 3

- Existing Drinking Water Intakes at elevations 1,050 ft and 1,000 ft
- Loss of Intake #1 between elevation 1,065 – 1,050 ft
- Completion of Intake No. 3 at elevation 860 ft



Intake No. 3: Lake Mead Water Quality



Intakes below the thermocline substantially avoid the impacts of poor water quality effects from Las Vegas Wash discharges

In-State Groundwater Resources



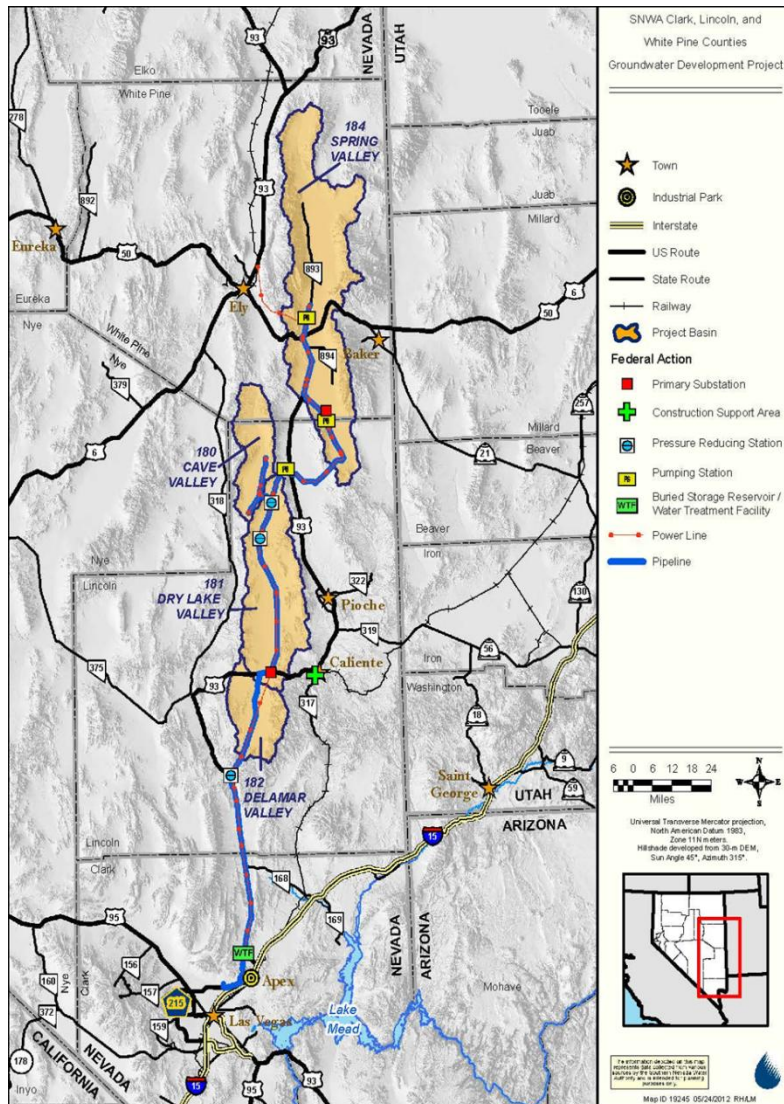
New, permanent resources are needed to meet demands and protect the community from extreme drought and climate change.

In-State Groundwater Resources



In 2012, the Nevada State Engineer granted nearly 84,000 acre-feet per year of permitted groundwater rights from four groundwater basins located in eastern Nevada.

Groundwater Development



- 120,000 afy of groundwater from 5 basins
- 8-year public environmental analysis process
- 500 environmental measures, including over 35 separate environmental plans
- Additional data collection and environmental analysis will be required



Summary

- **Additional conservation is necessary to reduce demands.**
- **A diversified water resource portfolio is essential to provide a reliable water supply for Southern Nevada.**
- **Additional, non-Colorado River water resources must be pursued to protect Southern Nevada from drought.**
- **The future of water development requires that our actions are responsible to the environment and that we consider the long-term sustainability of all our resources.**

