



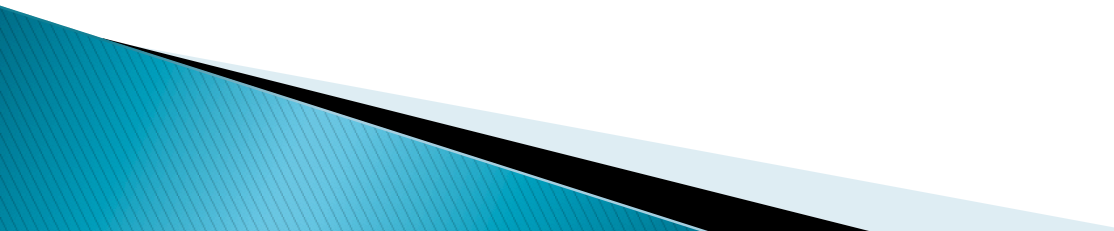
# City of Phoenix

## WATER SERVICES DEPARTMENT

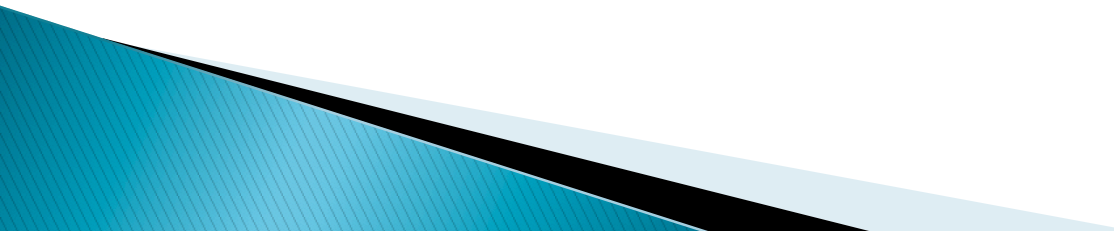
Quality Reliability Value




# Phoenix Water Services

- ▶ 8 treatment plants
  - ▶ 100 billion gallons of water produced
  - ▶ 12,000 miles of water and sewer mains
  - ▶ 63 billion gallons of wastewater treated
  - ▶ More than five million tests and measurements each year to meet or surpass regulatory requirements
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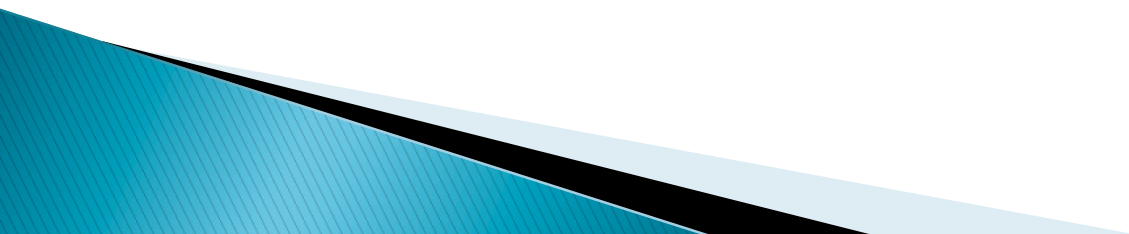
# Phoenix Water Services

- ▶ **Operating budget \$250M**
  - ▶ **1,470 employees**
  - ▶ **5-Year Water and Wastewater Capital Improvement Program around \$1.1B**
  - ▶ **406,000 accounts in billing system**
  - ▶ **Serves 1.5 million water and 2.5 million wastewater customers**
  - ▶ **Revenues around \$600M**
  - ▶ **AAA rating**
- 

# Water System Components

- ▶ 5 water treatment plants (660 MGD capacity)
  - ▶ 20 groundwater wells
  - ▶ 7,000 miles of water mains
  - ▶ 109 booster pump stations
  - ▶ 153 pressure reducing valve stations
  - ▶ 69 reservoirs and storage tanks
  - ▶ 125,000 water line valves
  - ▶ 54,000 fire hydrants
  - ▶ 90,000 manholes
  - ▶ 29 lift stations
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# Water Resources



# Typical Water Supplies



## Central Arizona Project (CAP)

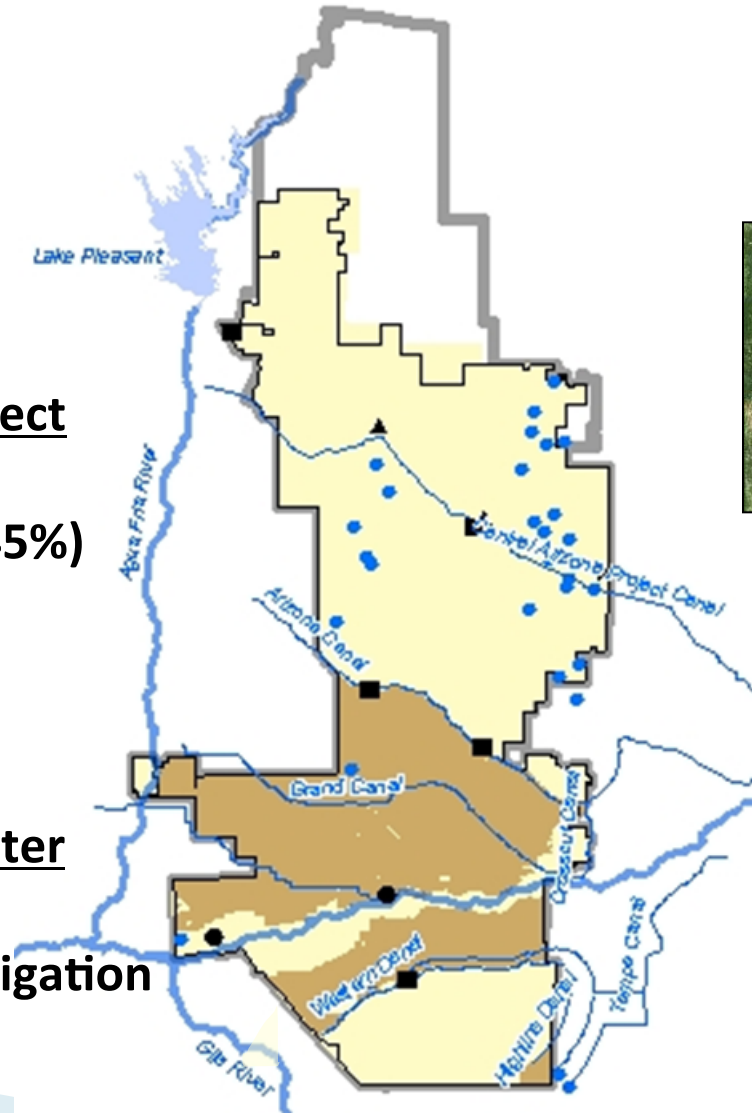
Colorado River (43-45%)



## Reclaimed Wastewater

• Palo Verde NGS

• Turf and Agriculture Irrigation



## Salt River Project (SRP) Salt/Verde River (49-51%)



Groundwater (2-3%)

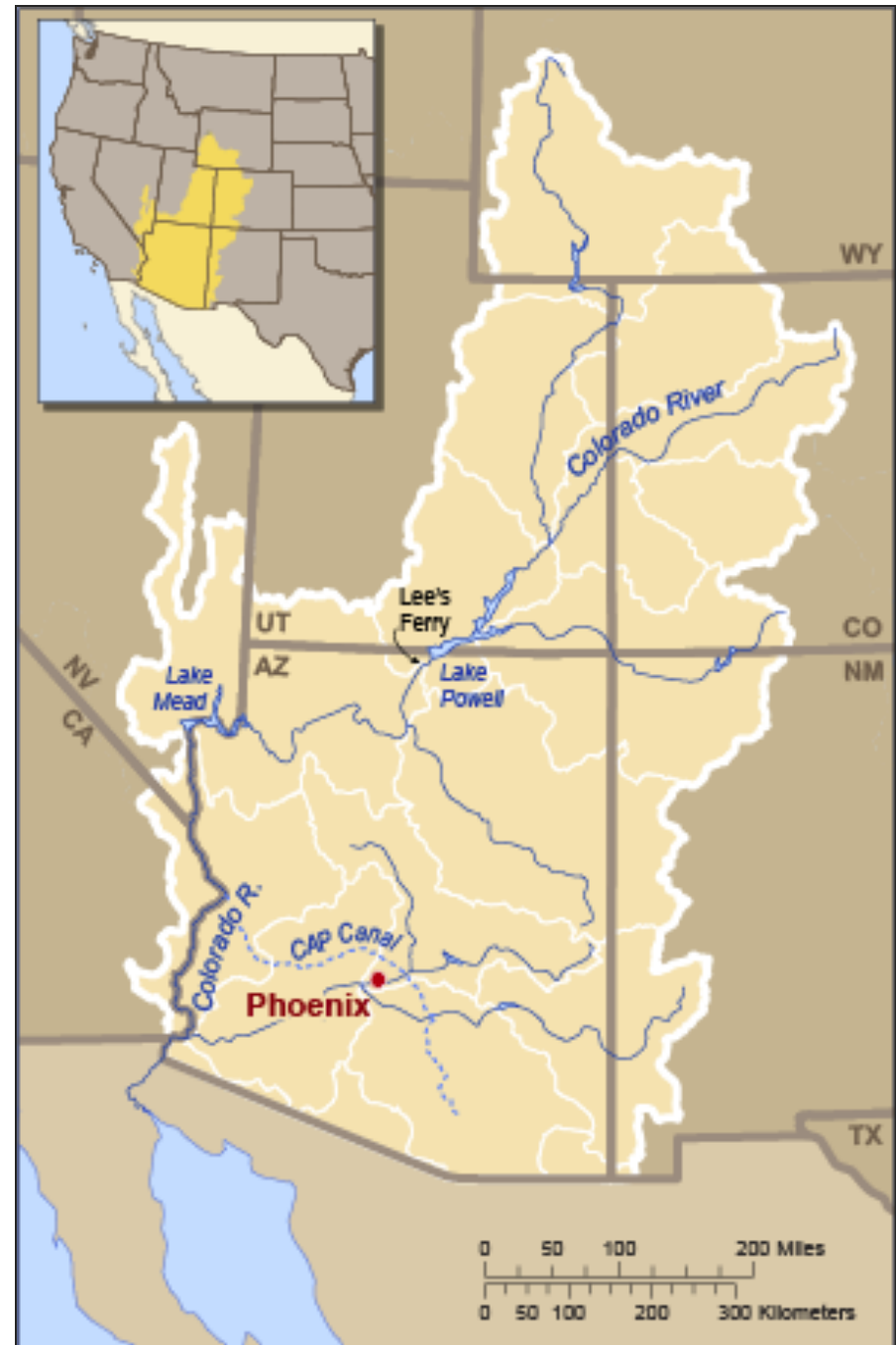
# SRP System

- ▶ Supplied by snowpack from the Mogollon Rim
- ▶ Salt River Valley farmlands pledged as collateral in exchange for the federal government's construction of Roosevelt Dam and the delivery system in 1902
- ▶ City now receives this water from SRP at water treatment plants and distributes it to urbanized "on-project" lands



# CAP System

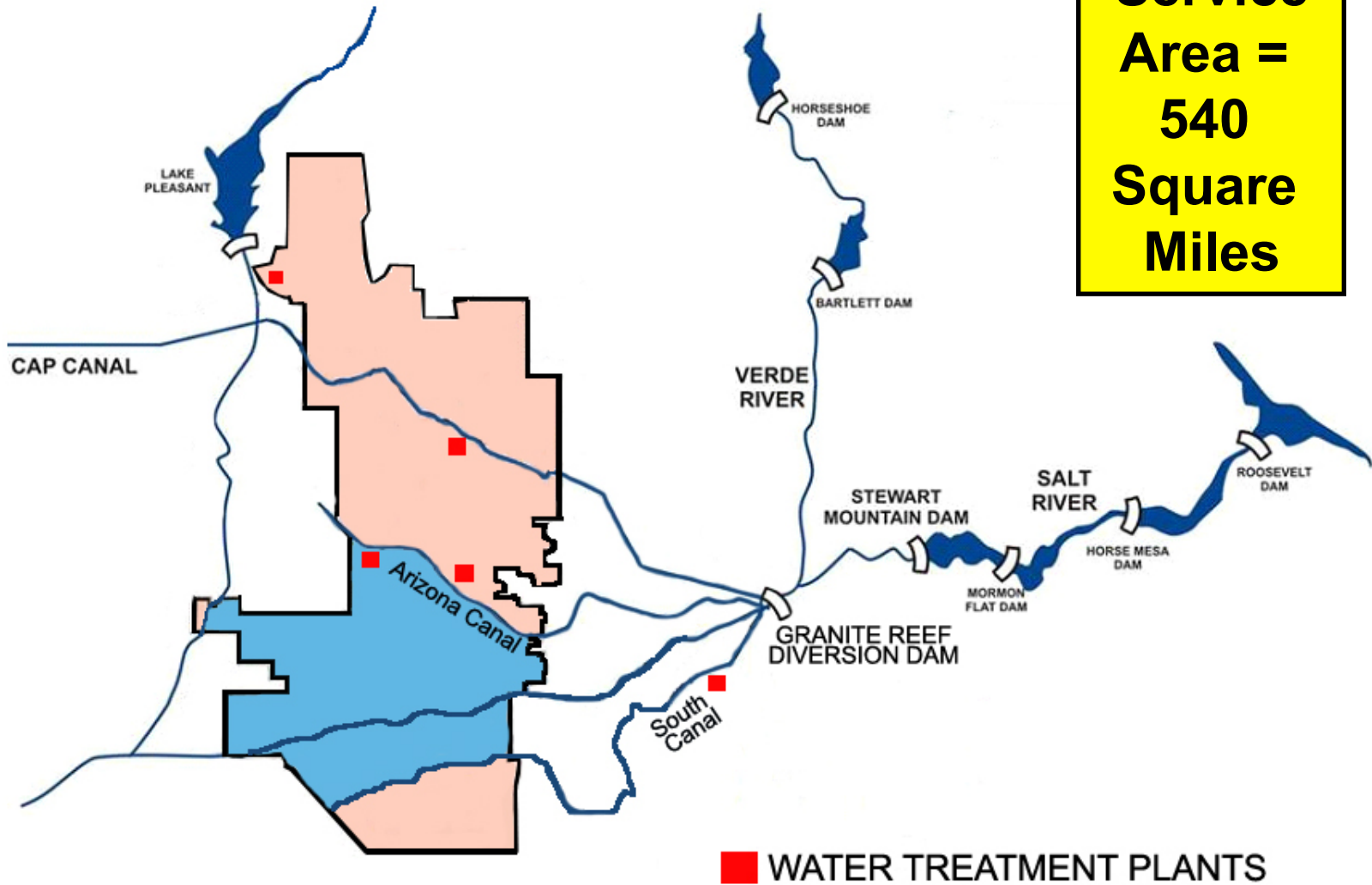
- **Colorado River watershed – depends on snowfall from Wyoming, Colorado and Utah**
- **Major lower basin users – California, Arizona, Nevada, Republic of Mexico**
- **In order to get CAP built, Arizona agreed to junior status when there is a shortage**
- **CAP conveys water from the Colorado River approximately 190 miles to Phoenix – first deliveries to the City in 1986**



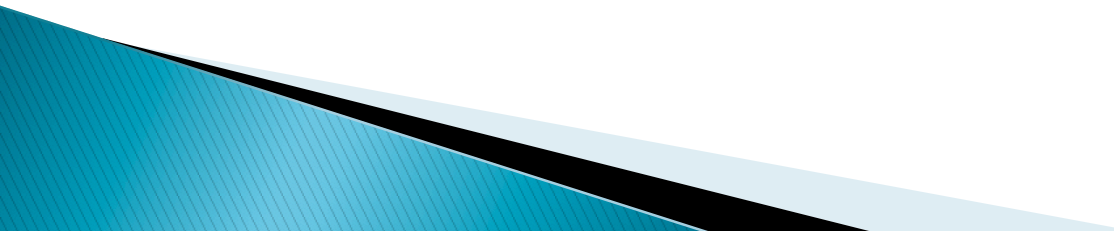


# Phoenix Water System

**Phoenix  
Service  
Area =  
540  
Square  
Miles**



# Phoenix System

- ▶ **97% of water supplied comes from direct use of renewable surface water supplies**
  - ▶ **Very little reliance on recharge and recovery strategy used by other Arizona communities (indirect use of surface water)**
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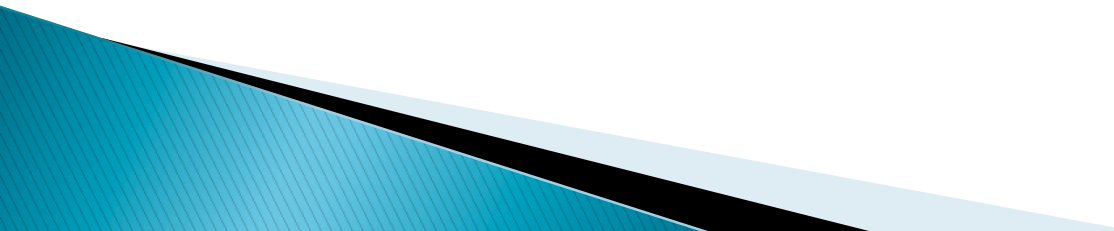
# Benefits of Direct Use

- ▶ **Direct use of surface water preserves aquifers for the future**
  - prevents regional cones of depression in the aquifer that occur from recharging far away from the area of recovery
  - preserves aquifer elasticity so that future recharge and recovery are more productive
  - prevents subsidence
  - prevents groundwater contamination
  - single-point of treatment can be less expensive

# Benefits of Direct Use

- ▶ **Direct use of surface water preserves aquifers for the future**
  - Colorado River is over-allocated
  - Mega droughts occur in our watersheds that literally decimate civilizations
  - Groundwater should be conserved as a contingency against drought and long-term climate change
- ▶ **Phoenix invested hundreds of millions of \$\$\$ to use renewable surface water supplies and reclaimed water rather than non-renewable, fossil groundwater**

# Benefits of Indirect Use

- ▶ **Distributed system means fewer large points of failure**
  - ▶ **Wells are inexpensive, installed in smaller capacity increments**
  - ▶ **During surface water shortages, can continue to pump groundwater without disruption**
- 

**Phoenix is built for drought**



# Drought Preparation

- ▶ Hold more surface water supplies than needed under non-drought conditions to provide a buffer during shortages
  - 149,000 AF P3-Indian/M&I priority CAP water
  - 39,000 AF agricultural priority CAP water
    - 36,000 converts to M&I in 2044
  - Plan to acquire
    - 12,000 AF M&I priority CAP from ASLD
    - 3,500 AF M&I priority CAP from WMAT settlement

# Drought Preparation

- ▶ Hold more surface water supplies than needed under non-drought conditions to provide a buffer during shortages
  - 25,000 Gatewater
    - accrue up to 150,000/YR
  - 20,000 AF RID-SRPMIC-Phoenix exchange water
  - 32,000 New Conservation Space water
    - accrue up to 200,000/YR
- ▶ These supplies provide an excellent surface water buffer during shortages



# Drought Preparation

- ▶ **Well capacity**
  - **Currently well capacity limited**
    - **5% of peak day demand**
  - **New well field on-line in 2020**
    - **Additional 3% of peak day demand**
    - **10,000 AF/Y**

# Drought Preparation

- ▶ **Many paths to redundancy**
  - Rely on someone else's well capacity during shortage
  - Explore short-term lease options during drought
  - Collaborate with Colorado basin-states to prevent shortages
  - Rely on Arizona Water Banking Authority

# Drought Preparation

- ▶ **Redundancy in the Salt River Valley Water Users' Association**
  - Boundaries of the association
  - Groundwater
  - Normal Flow

# Let's have a new conversation

▶ Supply ~~vs~~ Demand

▶ Resiliency and redundancy