Water

Infrastructure, Supply & Planning Study

# Urban Water Cycle

A City of Tucson
and Pima County
Cooperative Project

# Tucson Water Potable Water System

Tucson City Limits

Potable Water Lines (2” - 96”)

## System

$115,000,000 in Water Sales

$141,000,000 in Total Rev.

~ 800,000 Customers

225,000 Metered Services

212 Production Wells

~65 Water Storage Fac.

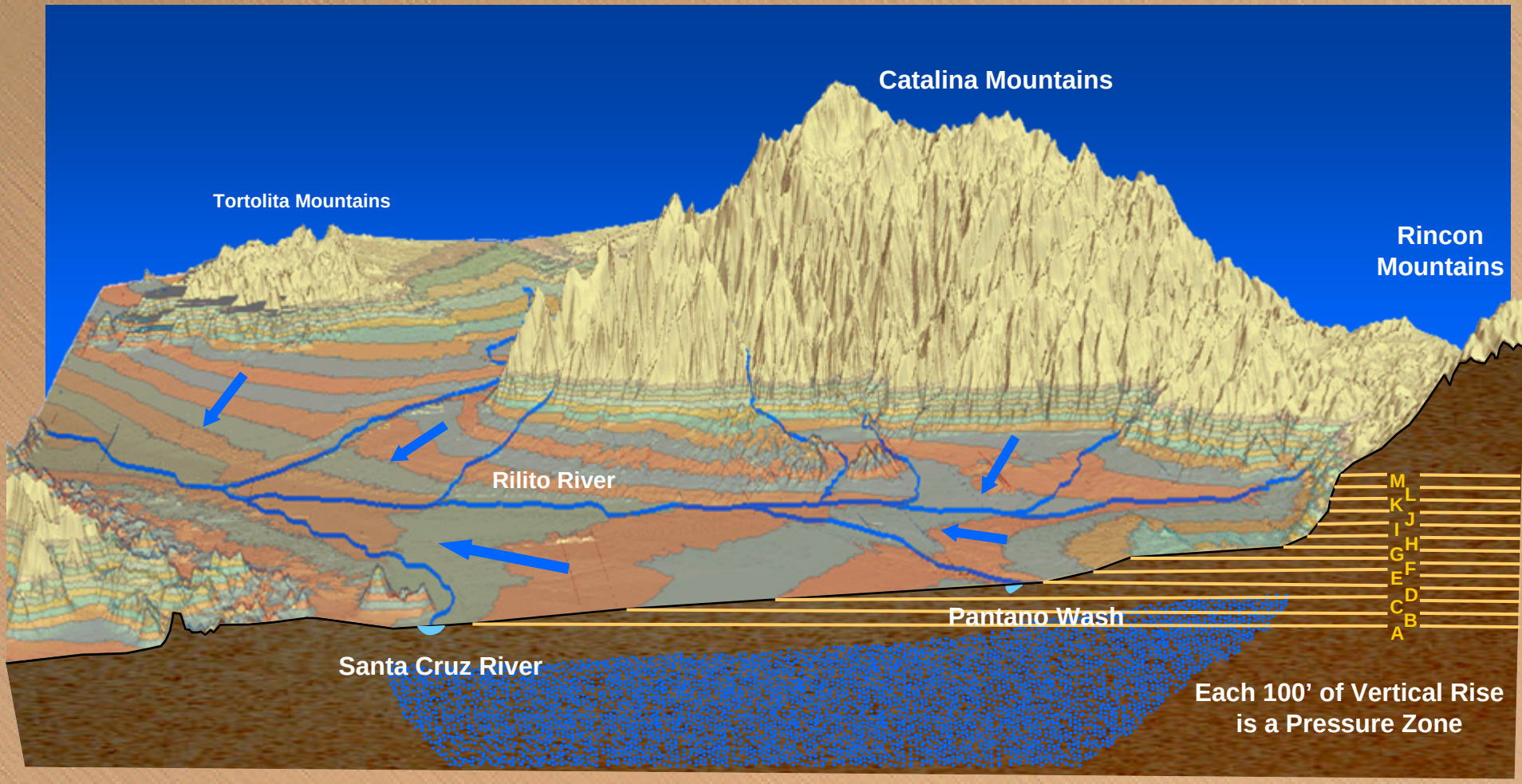
~100 Boosters

20,000 Fire Hydrants

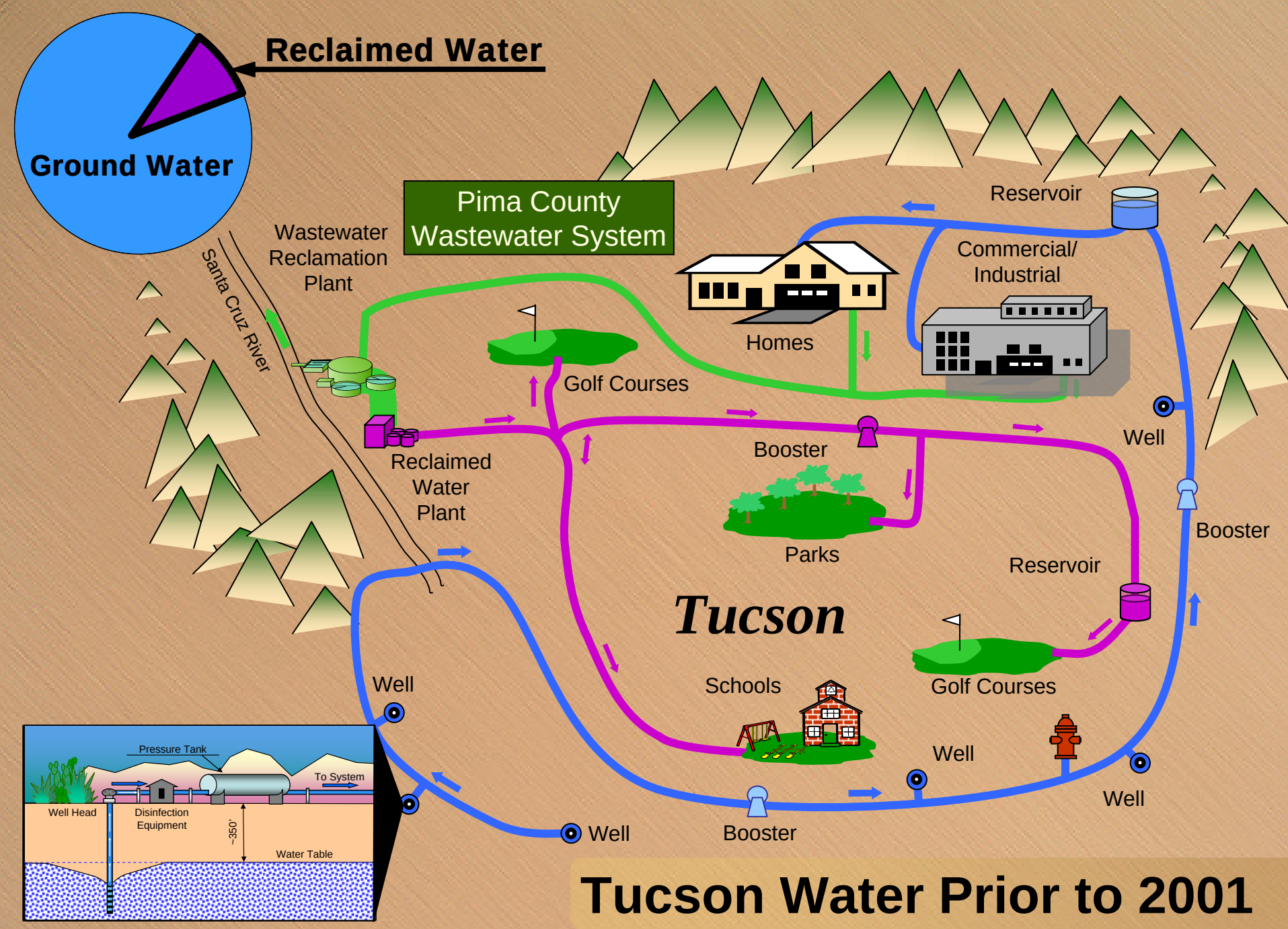
80,000 Valves

65 Water Storage Facilities

212 Production Well sites




# Pressure Zones in the Tucson Basin




# Tucson Water Prior to 2001

# Tucson Water
# Potable and Reclaimed Water Systems

Tucson City Limits

Reclaimed Water

Potable Water Lines

Tucson

## Reclaimed System

160 miles of pipeline

5 Reservoirs

10 MGD Filtration Plant

Recharge & Recovery Facilities

Deliveries - 15,203 ac-ft

820 Sites, 1,073 meters

18 golf courses

704 SF residences

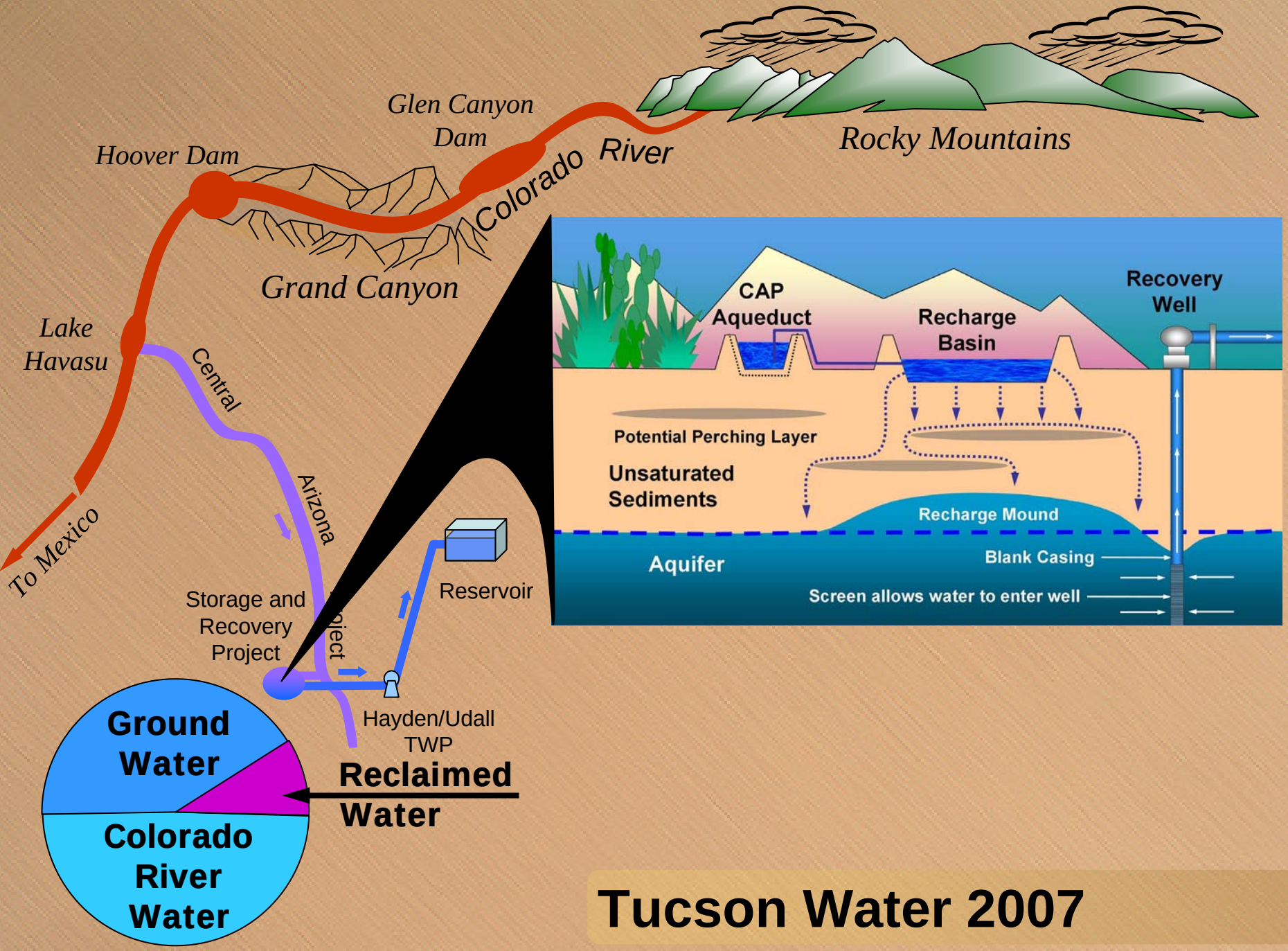
47 parks (43 City, 4 County)

61 schools

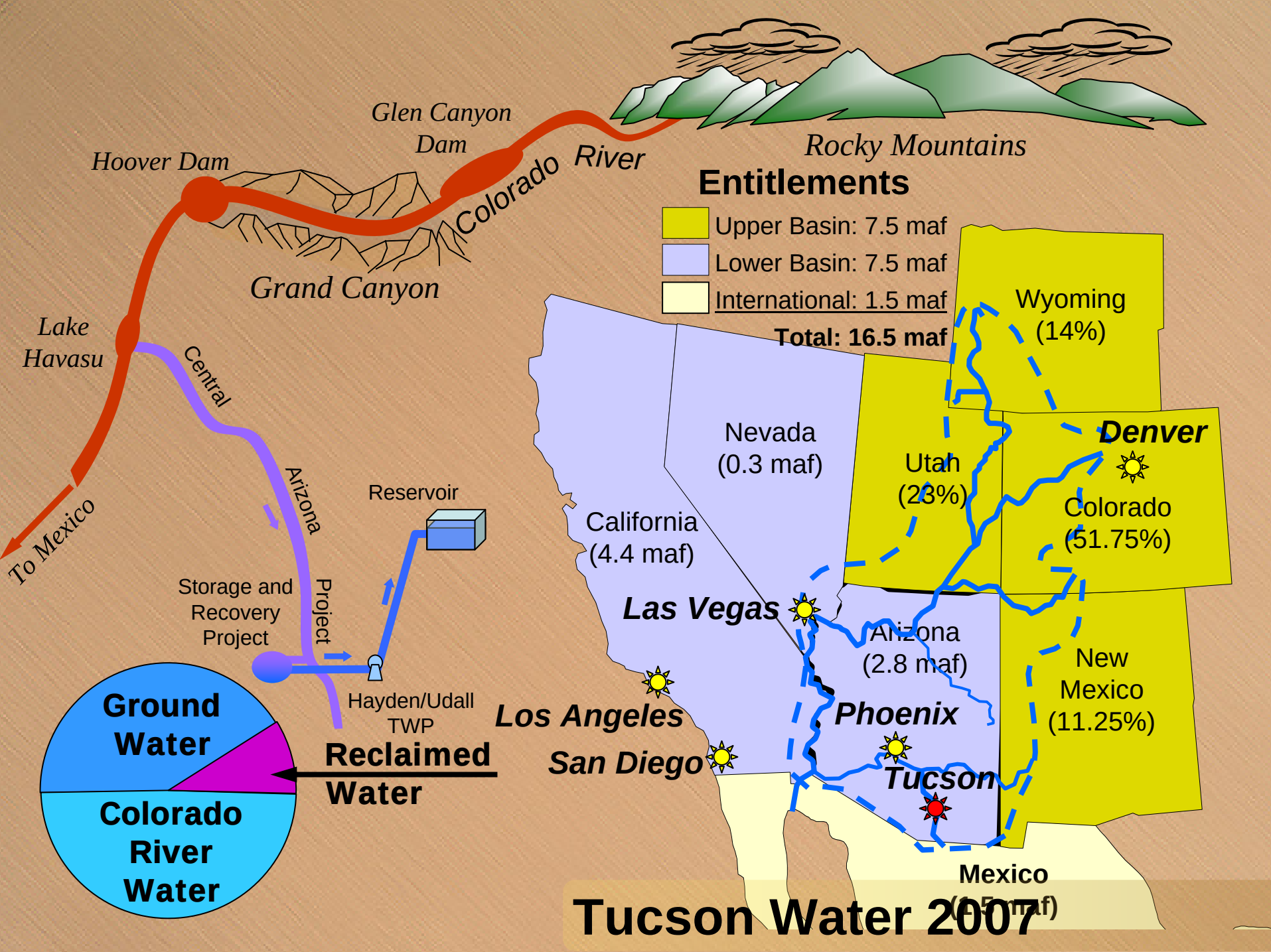
18 Golf Courses

61 Schools

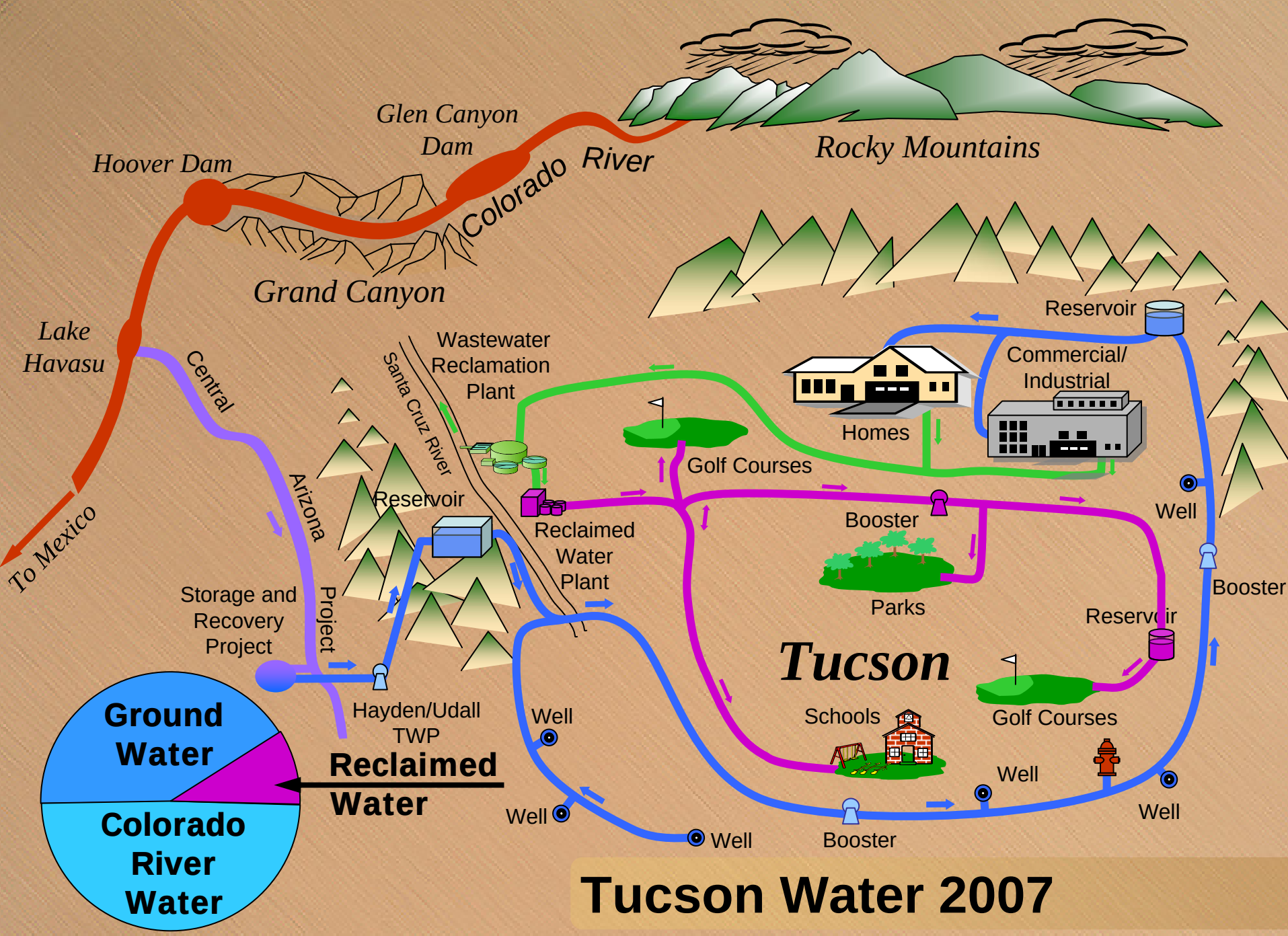
47 Parks




# Tucson Water 2007



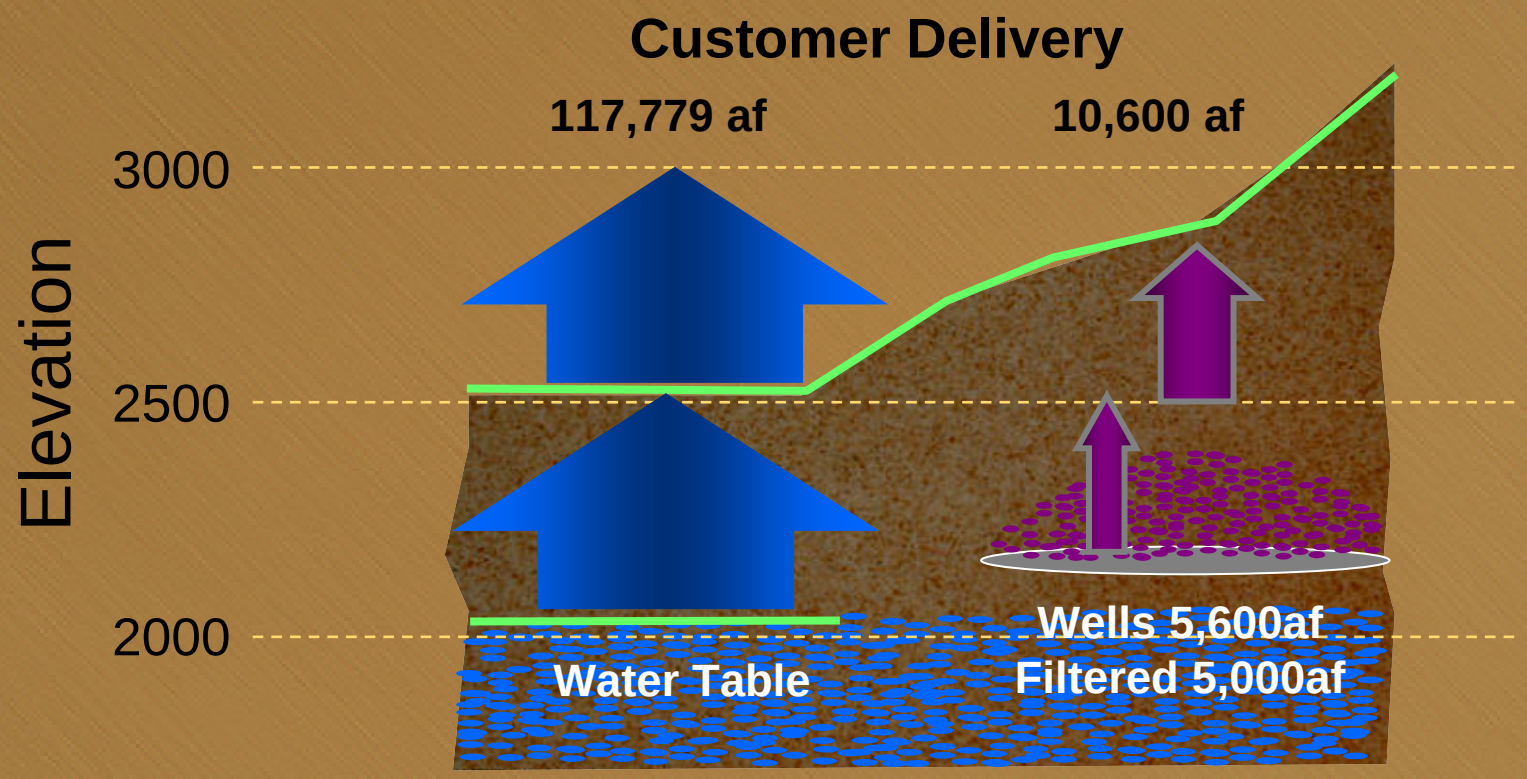

# Tucson Water 2007




# Tucson Water 2007

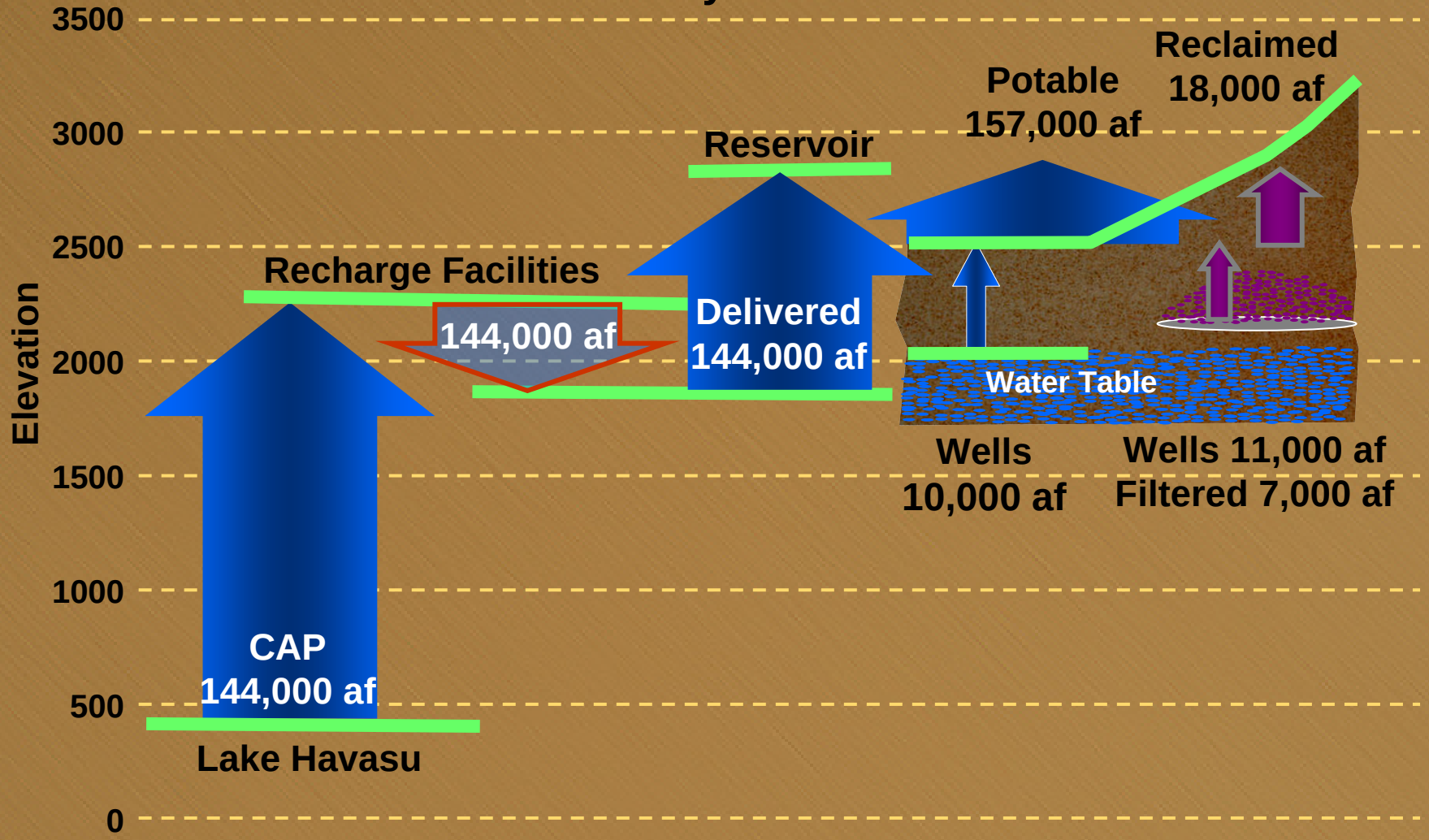
# 2000

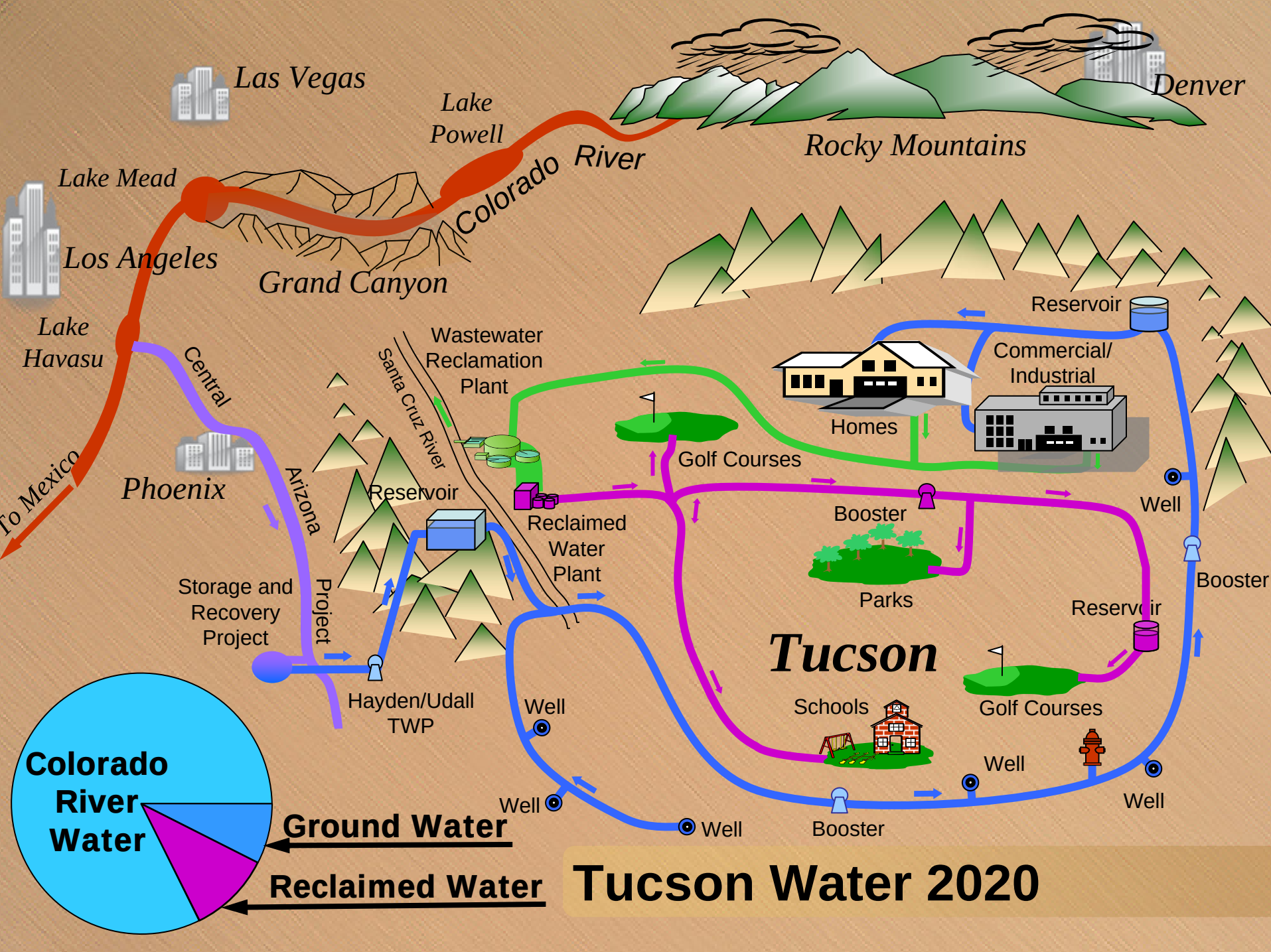
## Energy and Delivery Profile

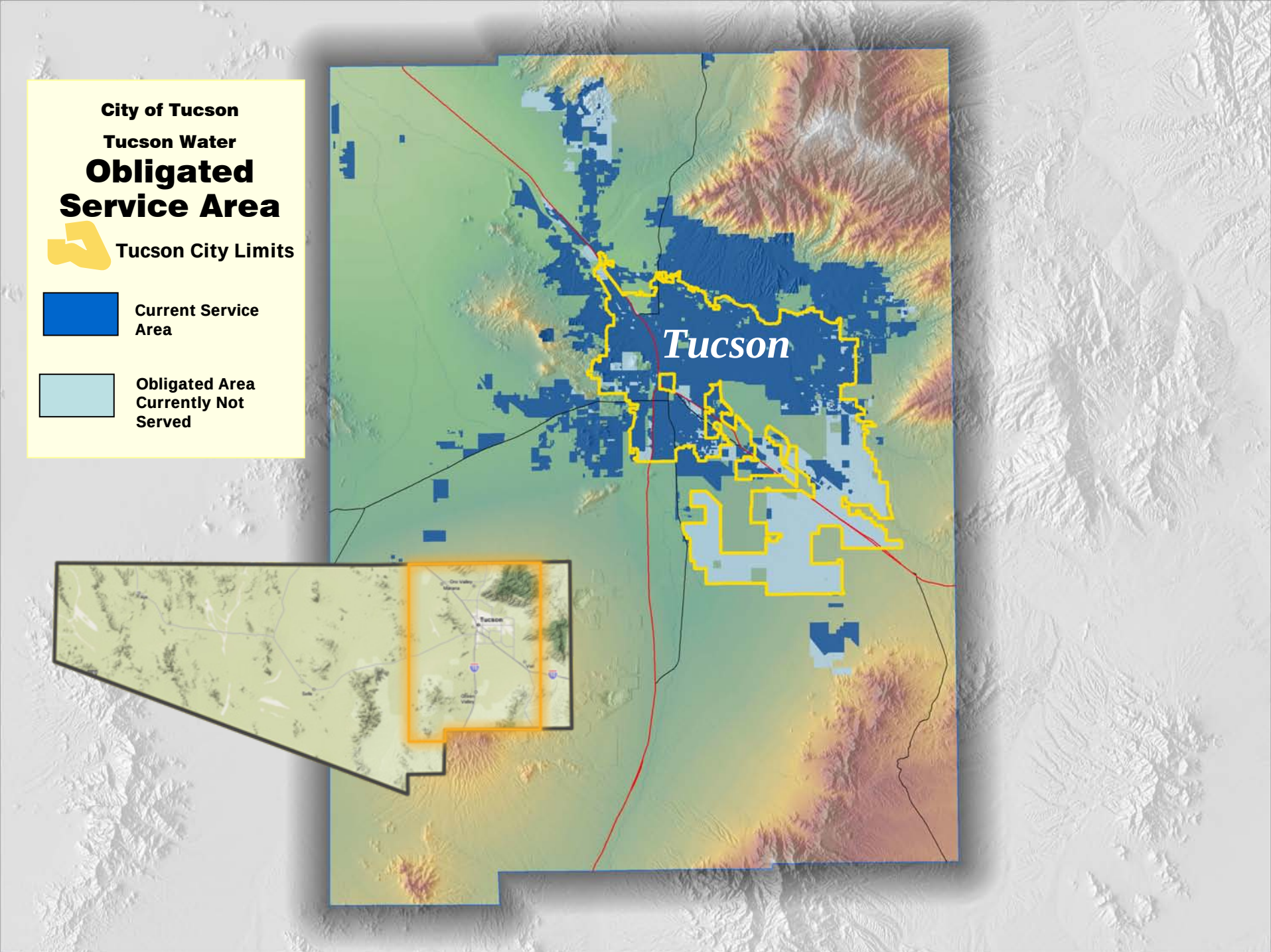


# 2020

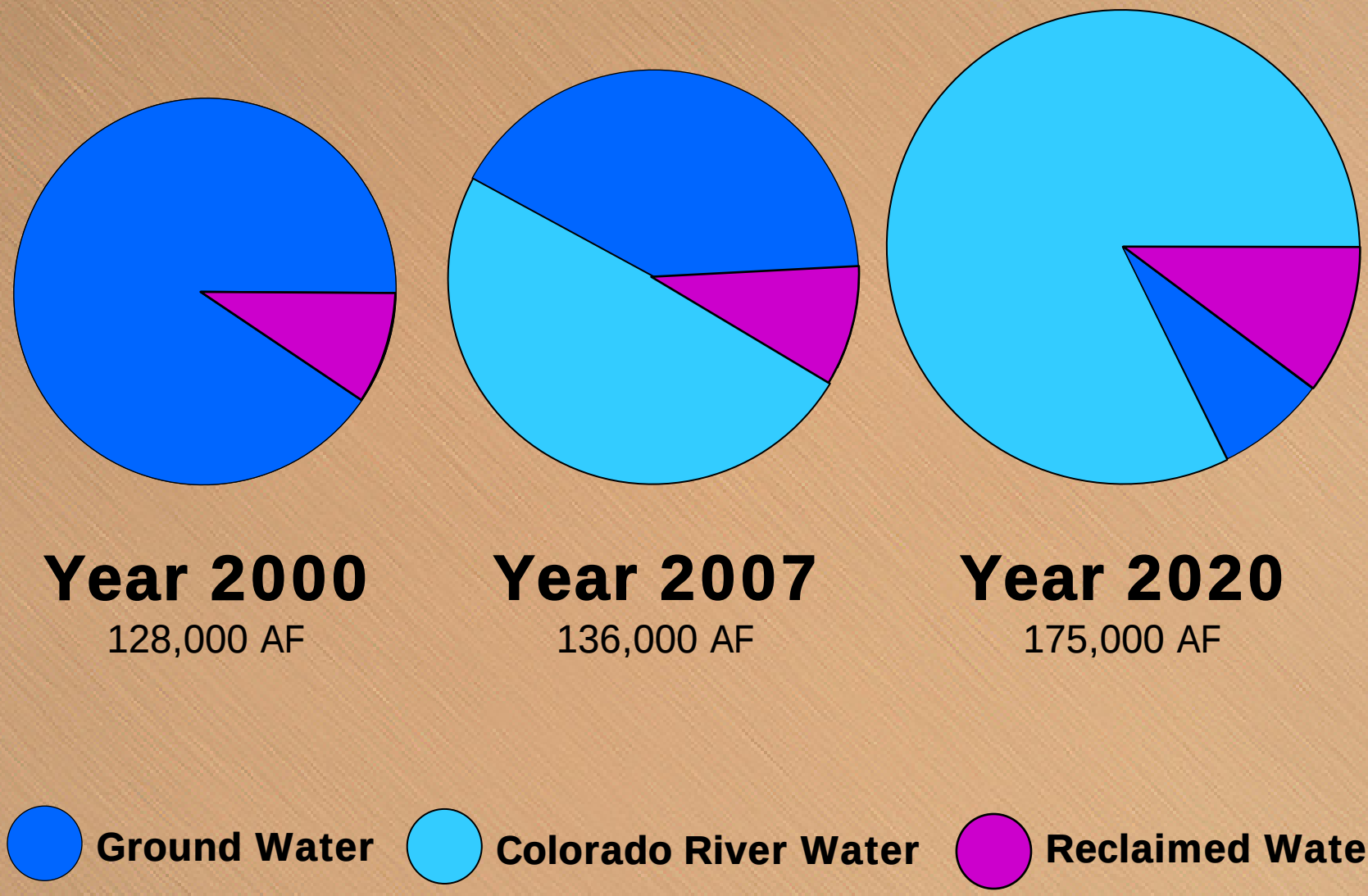
## Delivery Profile

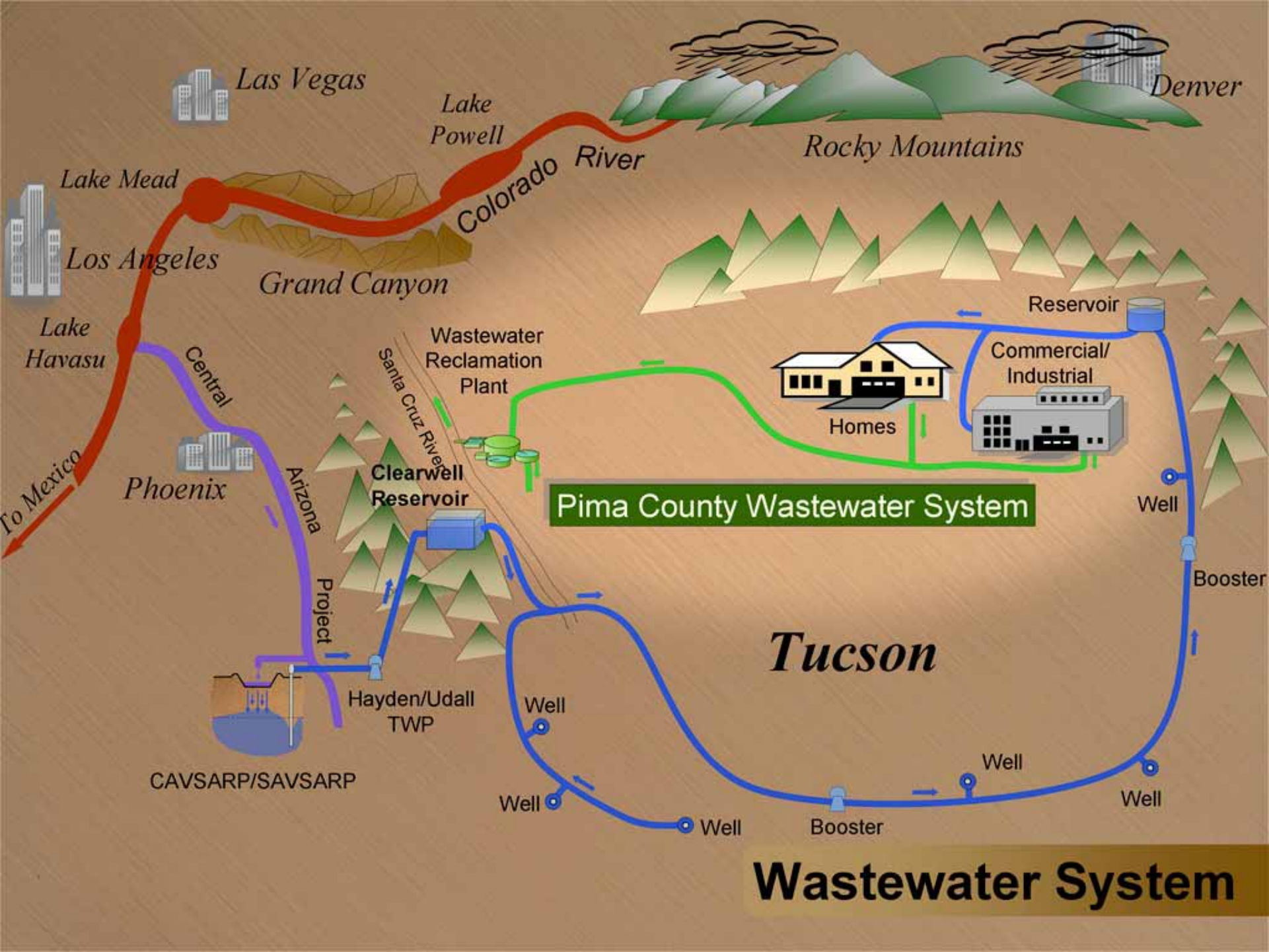



Las Vegas
Lake Powell
Denver
Rocky Mountains
Lake Mead
Colorado River
Los Angeles
Grand Canyon
Lake Havasu
Central Arizona Project
Wastewater Reclamation Plant
Santa Cruz River
Reservoir
Commercial/ Industrial
Homes
Golf Courses
To Mexico
Phoenix
Reservoir
Reclaimed Water Plant
Booster
Well
Storage and Recovery Project
Parks
Booster
Reservoir
Tucson
Hayden/Udall TWP
Well
Schools
Golf Courses
Well
Well
Well
Well
Booster
Colorado River Water
Ground Water
Reclaimed Water
Tucson Water 2020


City of Tucson
Tucson Water
Obligated Service Area
Tucson City Limits
Current Service Area
Obligated Area Currently Not Served
Tucson

# Total Water Demand

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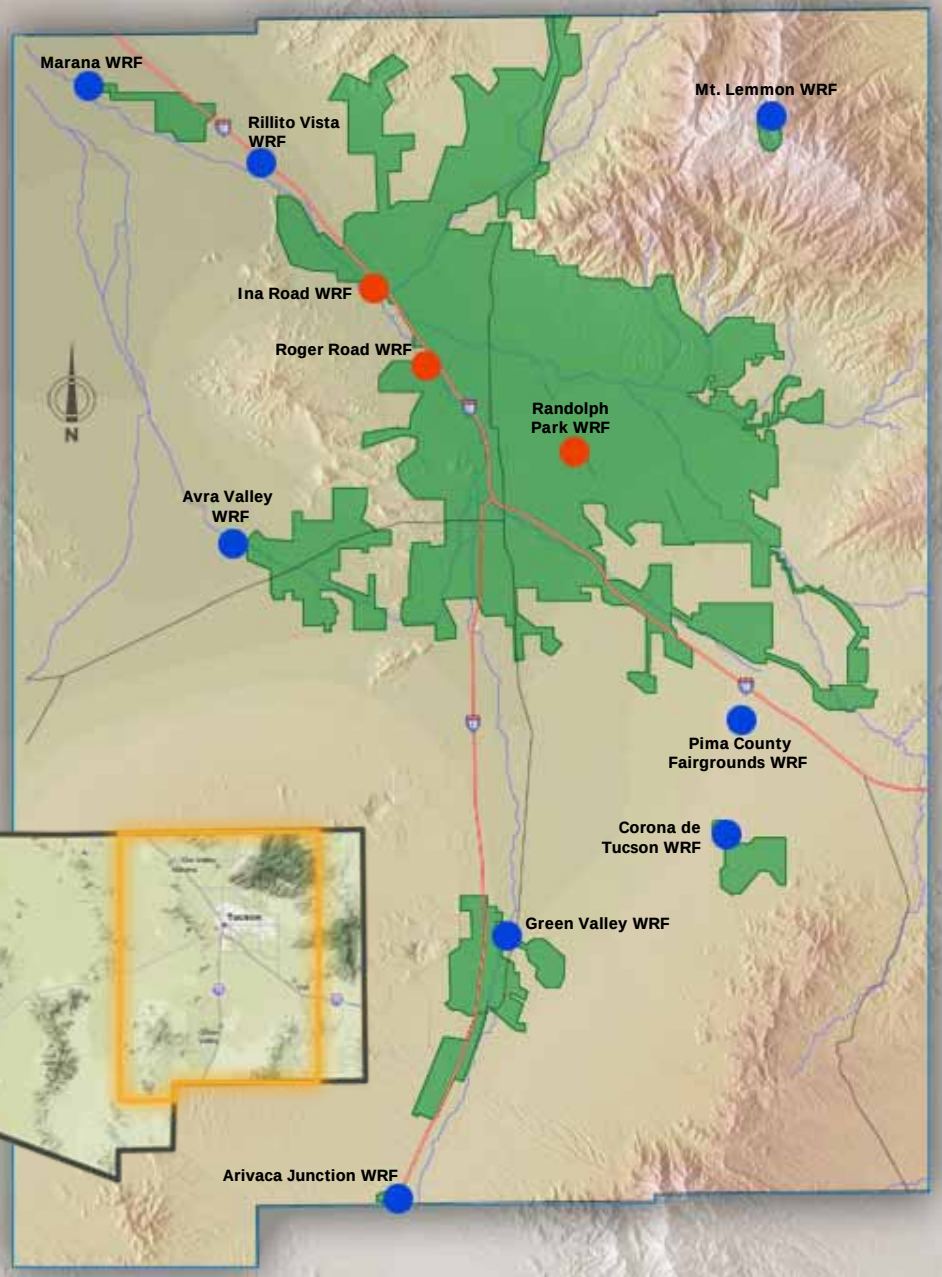
Central
Arizona
Project
To Mexico
Phoenix
Santa Cruz River
Wastewater Reclamation Plant
Reservoir
Commercial/ Industrial
Homes
Clearwell Reservoir
Pima County Wastewater System
Well
Booster
Tucson
Hayden/Udall TWP
CAVSARP/SAVSARP
Well
Well
Well
Well
Booster
Well
Wastewater System

# Pima County Regional Wastewater Reclamation Department

- Regional Sewer Service Area
- Metropolitan Wastewater Reclamation Facilities (WRF)
- Sub-Regional WRFs

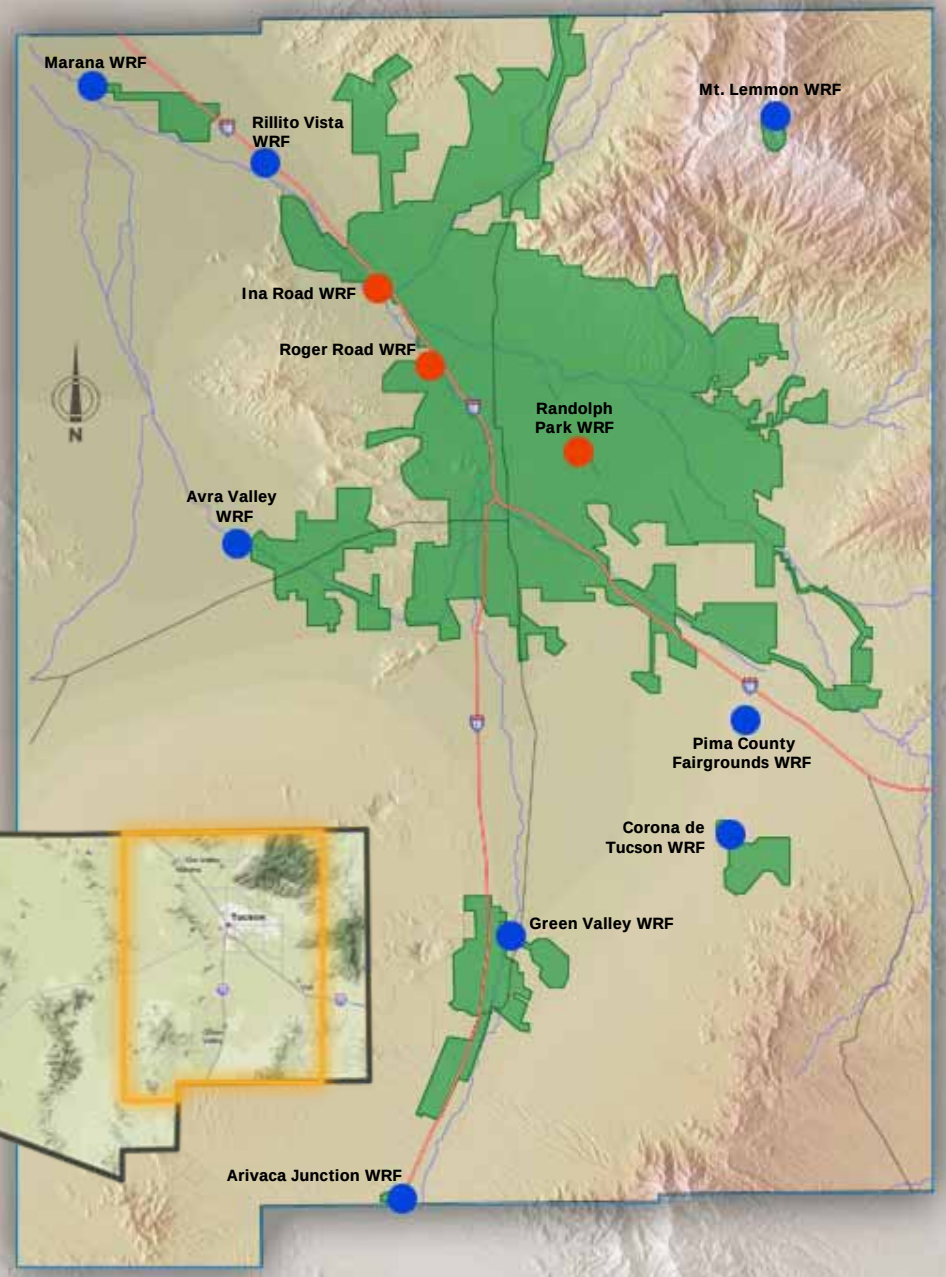



Pima County

- Eleven Wastewater Reclamation Facilities
  - Three metropolitan and eight sub-regional
- 3400+ miles of sewer pipe
- 64.8 million gallons per day (MGD) of treated wastewater
- 30 dry tons per day of biosolids to be applied to agricultural lands

# Pima County Regional Wastewater Reclamation Department

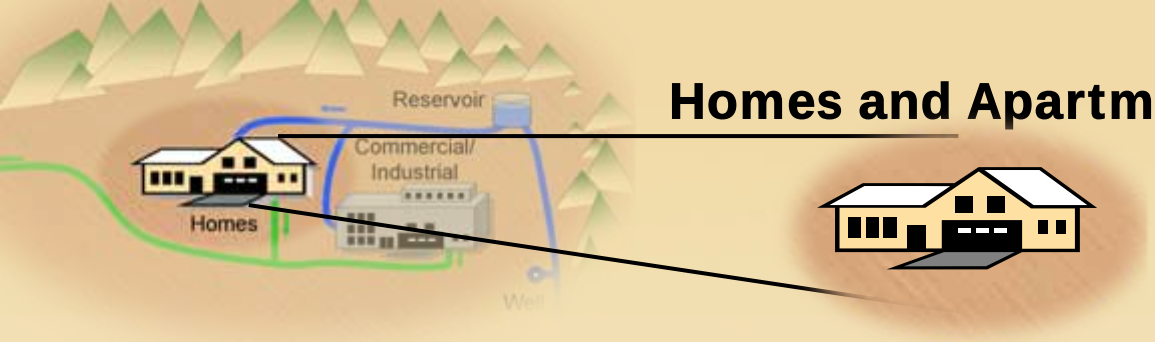
- Regional Sewer Service Area
- Metropolitan Wastewater Reclamation Facilities (WRF)
- Sub-Regional WRFs



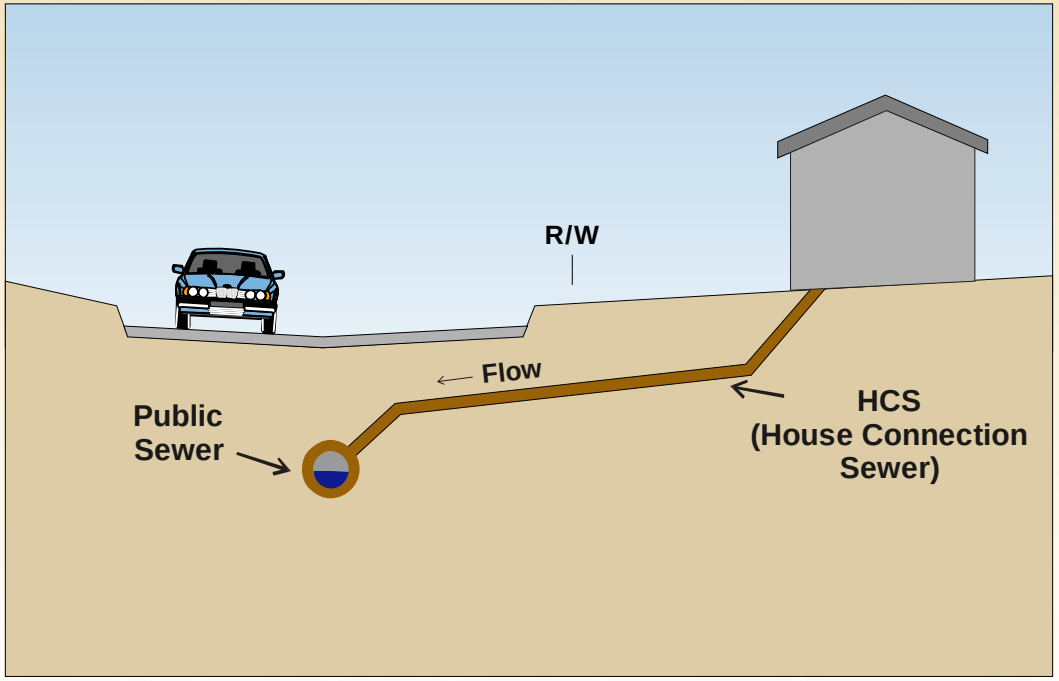

Pima County

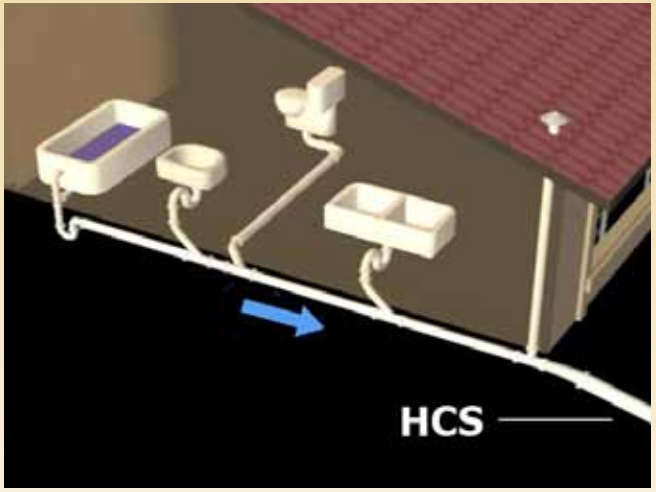
- Clean Water Act
- Pima Association of Governments 208 Plan
  - Designated Management Agency (DMA)
- 1979 City/County Intergovernmental Agreement
- Arizona Revised Statute 11-264

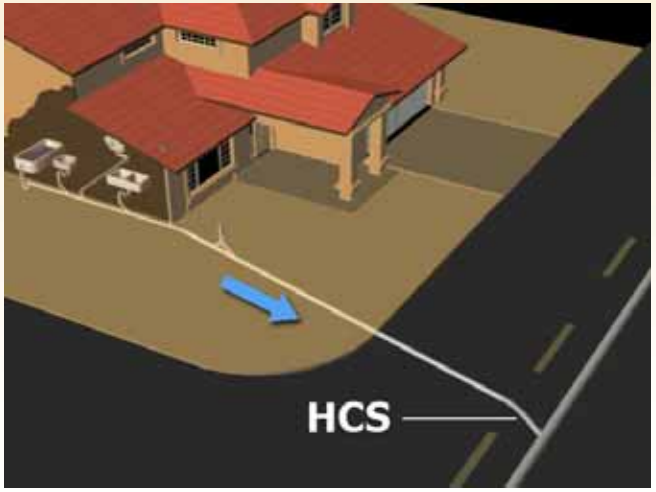
# Homes and Apartments

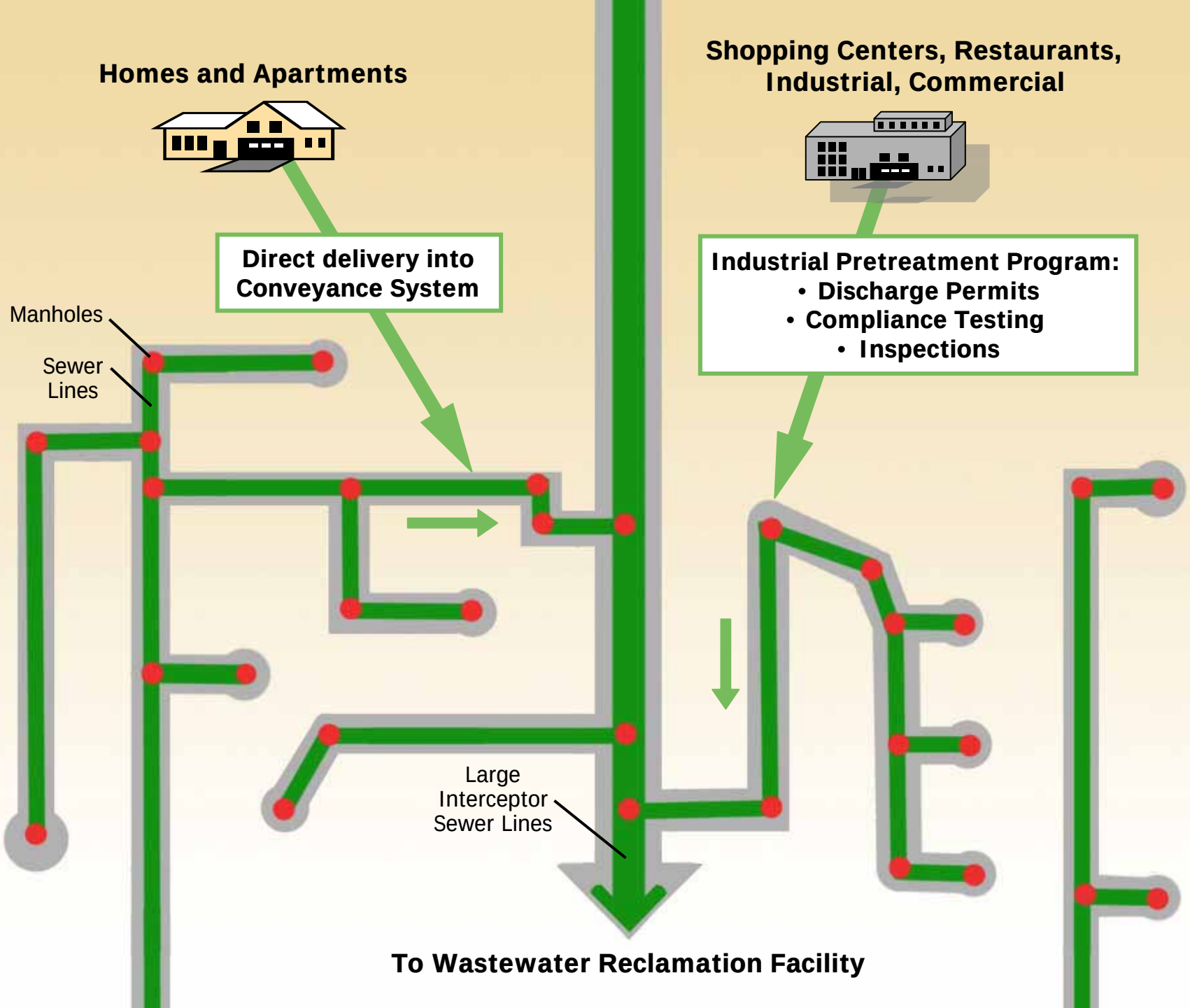


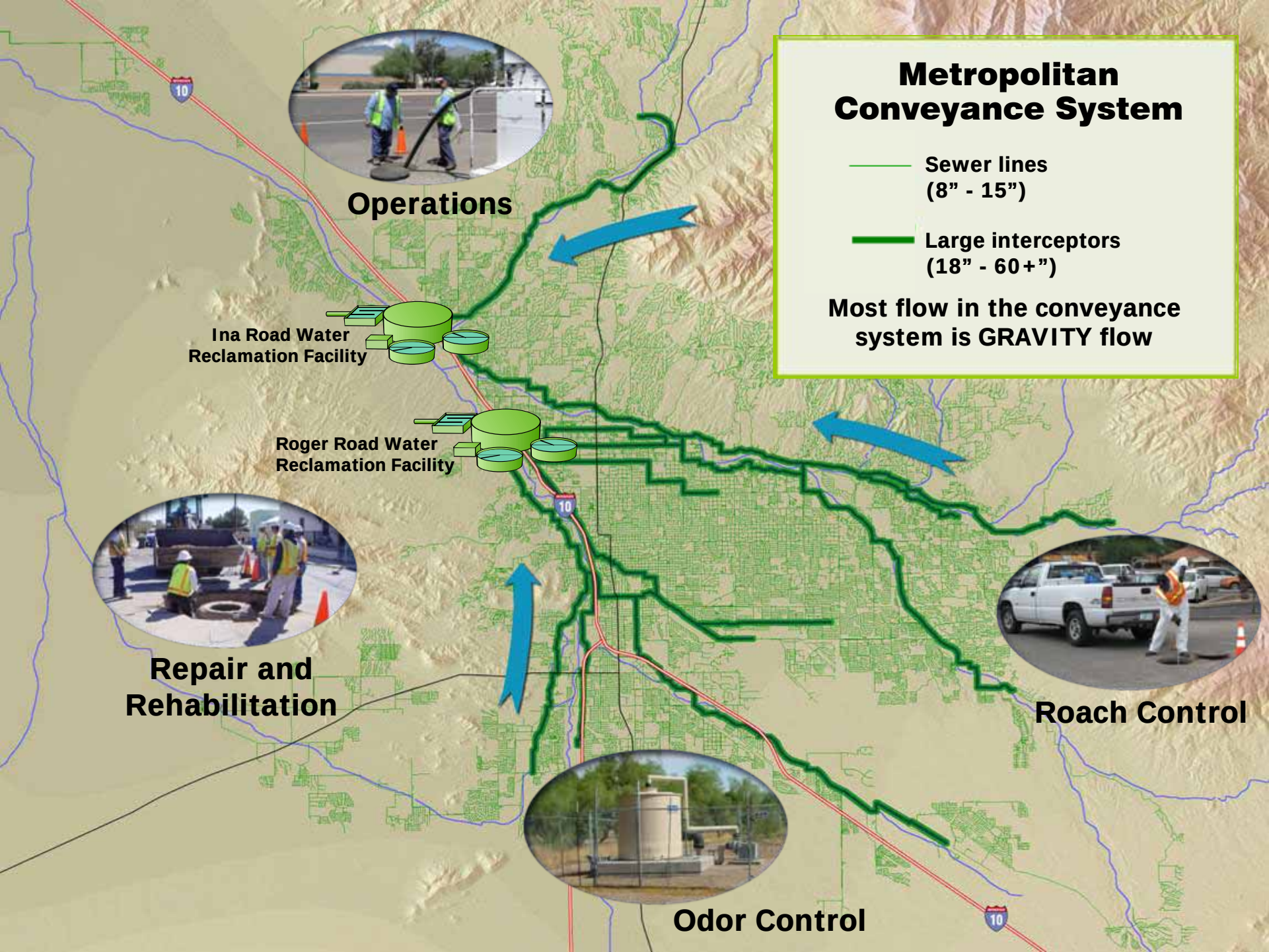

**Connected to public sewer**
**with house connection sewer (HCS)**




Homes and Apartments
Shopping Centers, Restaurants, Industrial, Commercial
Direct delivery into Conveyance System
Industrial Pretreatment Program:
• Discharge Permits
• Compliance Testing
• Inspections
Manholes
Sewer Lines
Large Interceptor Sewer Lines
To Wastewater Reclamation Facility


Metropolitan Conveyance System
Sewer lines (8” - 15”)
Large interceptors (18” - 60+”)
Most flow in the conveyance system is GRAVITY flow
Operations
Ina Road Water Reclamation Facility
Roger Road Water Reclamation Facility
Repair and Rehabilitation
Roach Control
Odor Control
10

# Conveyance System Certification

PIMA COUNTY
REGIONAL WASTEWATER
RECLAMATION DEPARTMENT
Conveyance Division

ISO 9001
ISO 14001
CERTIFIED by TÜV

PIMA COUNTY
REGIONAL WASTEWATER
RECLAMATION DEPARTMENT
Conveyance Division

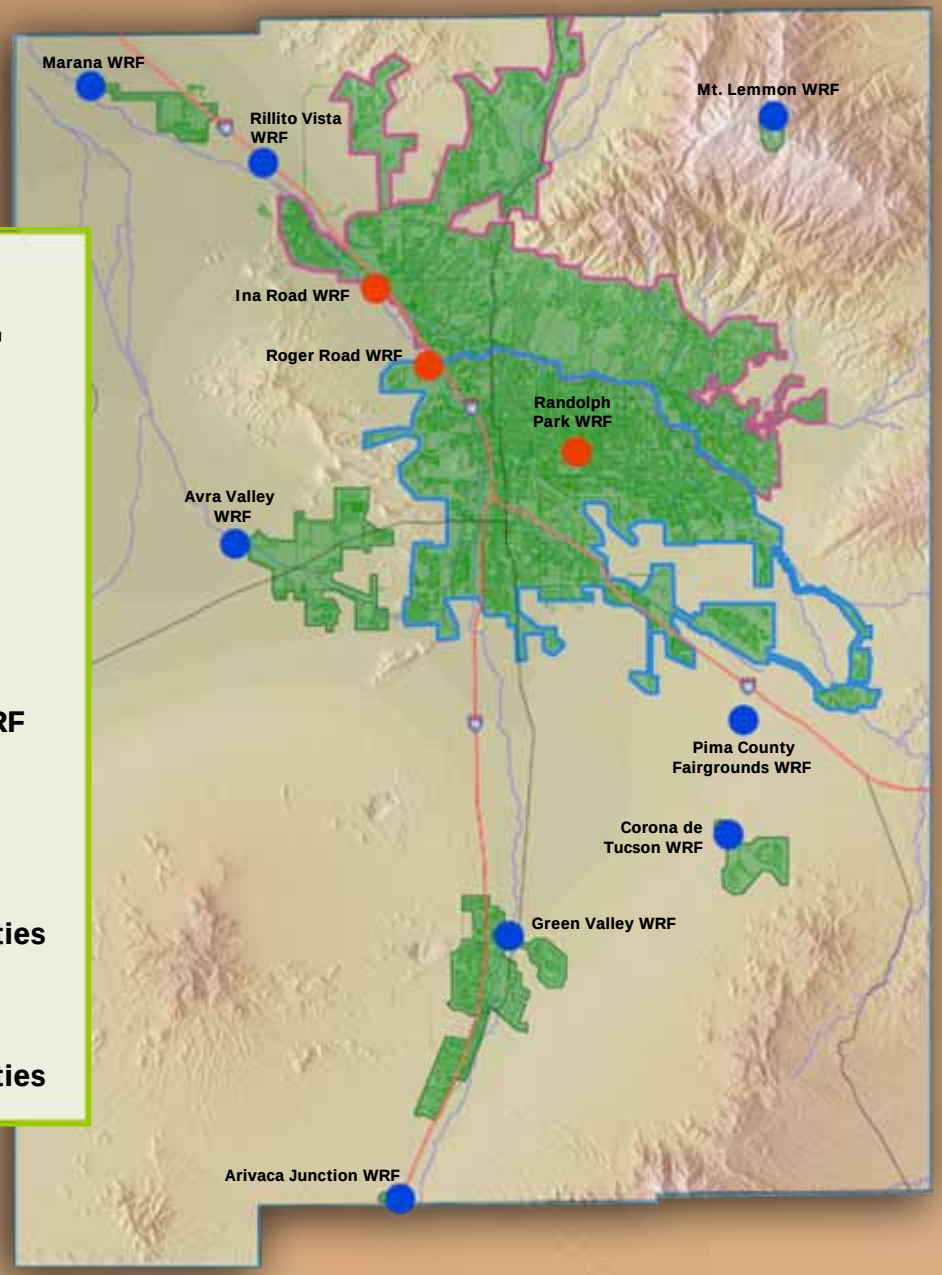
In Compliance with
OHSAS 18001:1999
SAFETY

## International Standards Organization (ISO) and Occupational Health and Safety Assessment Series (OHSAS) Certification

- **Simultaneous certification in ISO 9001, ISO 14001, and OHSAS 18001 in February 2008**
- **First agency in the U.S. to receive all three at the same time**

# Regional Wastewater System – Treatment

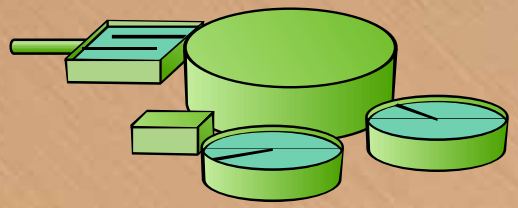
- Service Area
- Ina Road WRF Service Area – 198 sq. miles
- Roger Road WRF Service Area – 275 sq. miles
- Metropolitan Wastewater Reclamation Facilities
- Sub-Regional Wastewater Reclamation Facilities



**Effluent produced in 2007: 64.8 million gallons per day (MGD)**

**Biosolids produced in 2007: 30 dry tons per day**

# Typical Treatment Process



**Physical**

**Screening, Grit Removal**

**Primary Clarification**
(Removes suspended solids)

Solids

**Biological**

**Bacterial Processing**

Activated Sludge

Biological Nutrient Removal / Activated Sludge

Biotowers

**Digestion of Solids**

**Methane**

**Agricultural Land Use**

**Physical**

**Secondary Clarification**
(Settling of bacteria)

Solids

**Chemical**

**Disinfection**
(Chemical or ultraviolet light)

**Reuse**

**Discharge / Riparian**

# Avra Valley WRF

**Capacity: 2.2 MGD**

**Latest Improvements:**
**Expansion to 4.0 MGD (underway) – $54.3 million**

**Effluent: 1.22 MGD**

**Effluent Quality: Class B+**

**Percolation Pond**

**2.2 to 4.0 MGD Expansion**

# Corona de Tucson WRF

**Capacity: 1.3 MGD**

**Latest Improvements:**
**0.3 to 1.3 MGD**
**Expansion – $9.3 million**

**Effluent: 0.204 MGD**

**Effluent Quality: Class B+**

**Combined Oxidation Ditch / Clarifier**

# Green Valley WRF

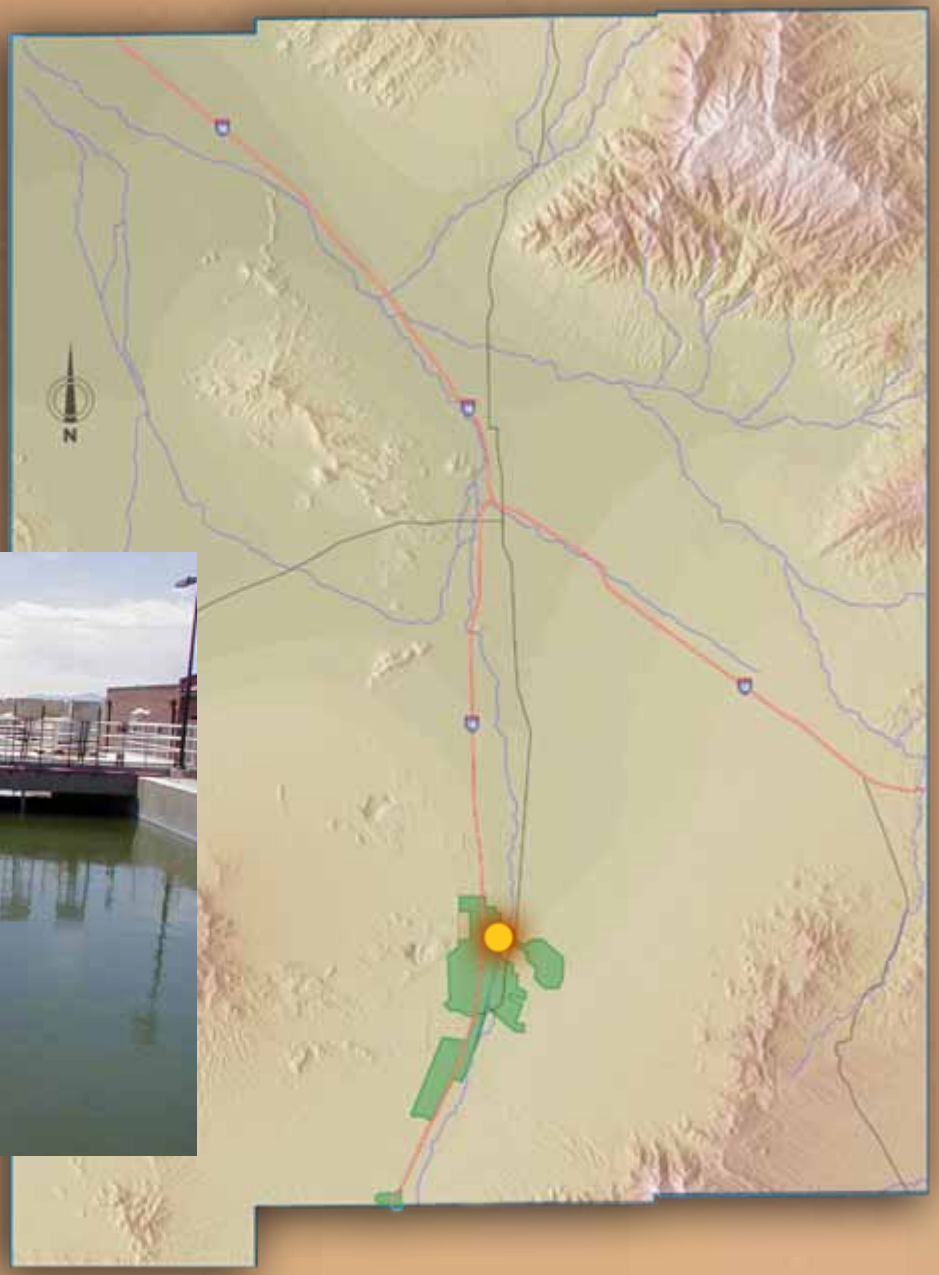
**Capacity: 4.1 MGD**

**Latest Improvements:**
**2.1 to 4.1 MGD**
**Expansion – $17.9 million**

**Effluent: 1.78 MGD**

**Effluent Quality: Class B+**

**Oxidation Ditch**



# Ina Road WRF

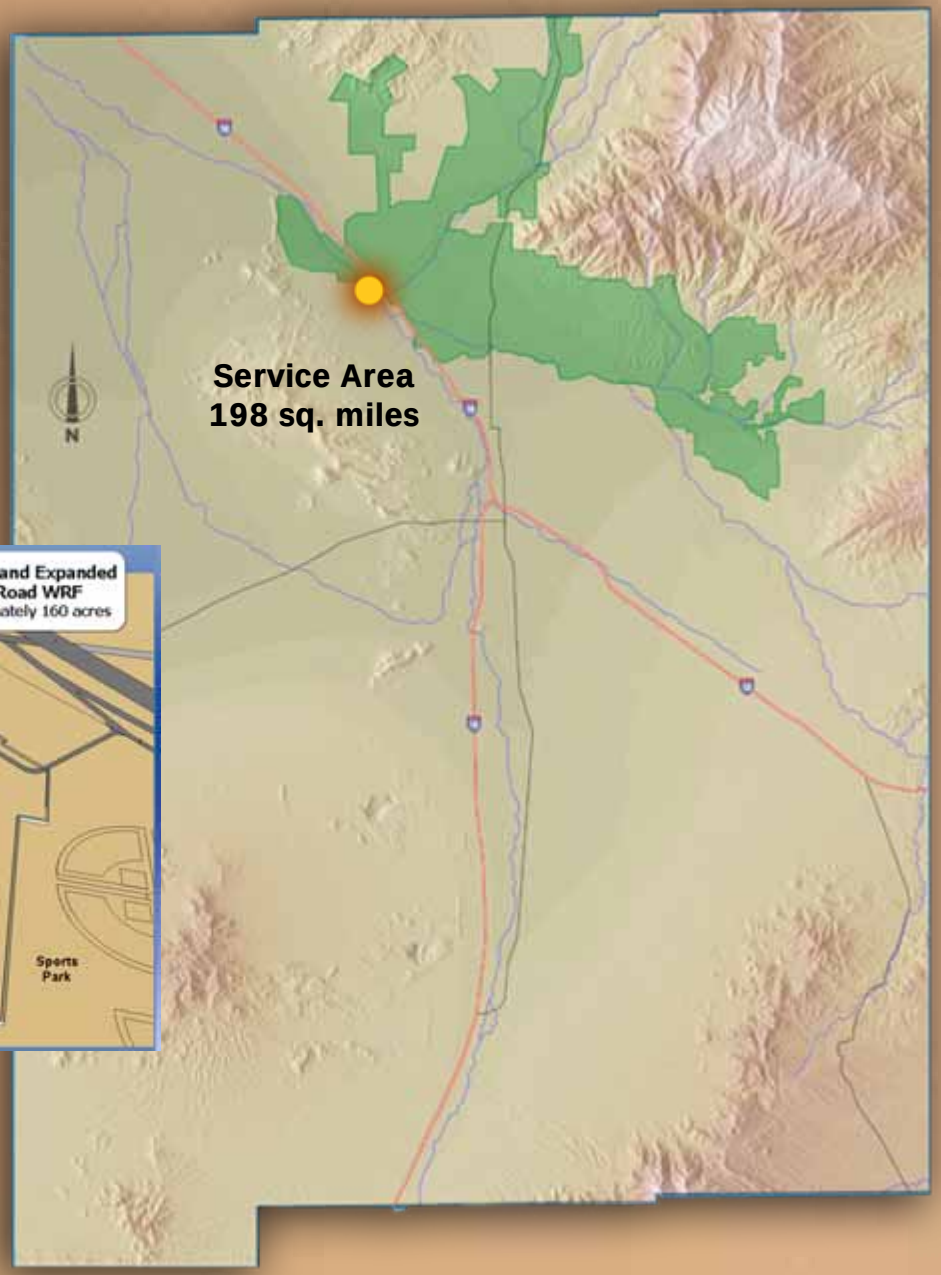
**Capacity: 37.5 MGD**

**Latest Improvements:**
**25.0 to 37.5 MGD**
**Expansion – $92 million**

**Effluent: 24.87 MGD**

**Effluent Quality: Class B**

**Proposed expansion to 50 MGD with Class A+ effluent (Regional Optimization Master Plan)**



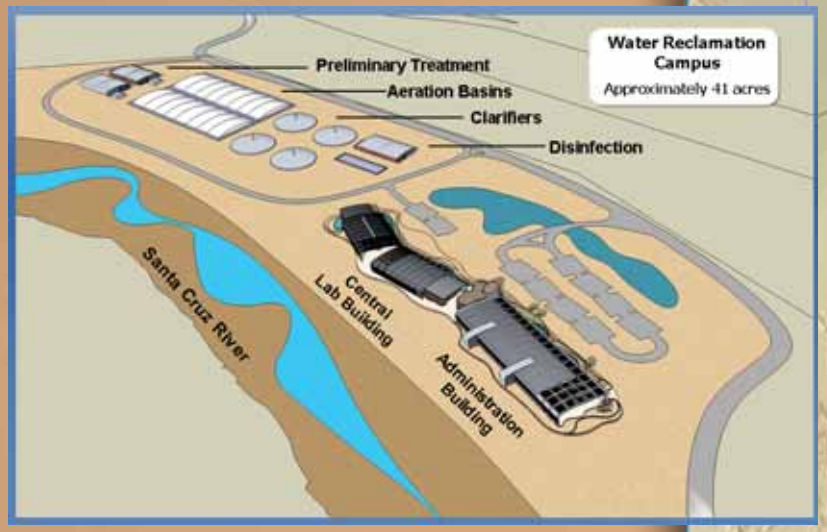
# Roger Road WRF

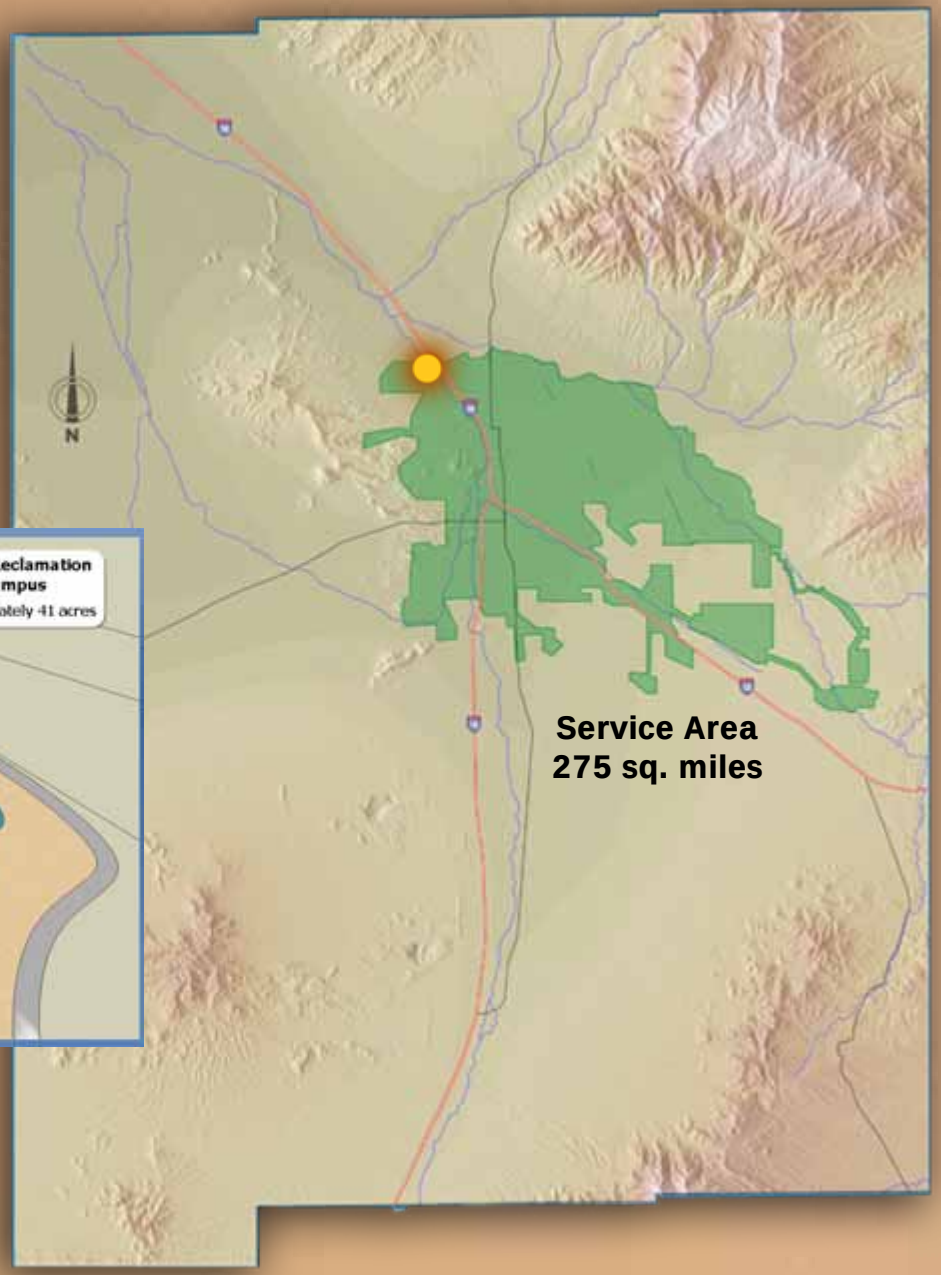
**Capacity: 41.0 MGD**

**Latest Improvements:**
**Odor control and process upgrades – $20 million**

**Effluent: 33.70 MGD**

**Effluent Quality: Class B**




**Proposed 32 MGD Water Reclamation Campus with Class A+ effluent adjacent to the current Roger Road WRF (Regional Optimization Master Plan)**

# Randolph Park WRF

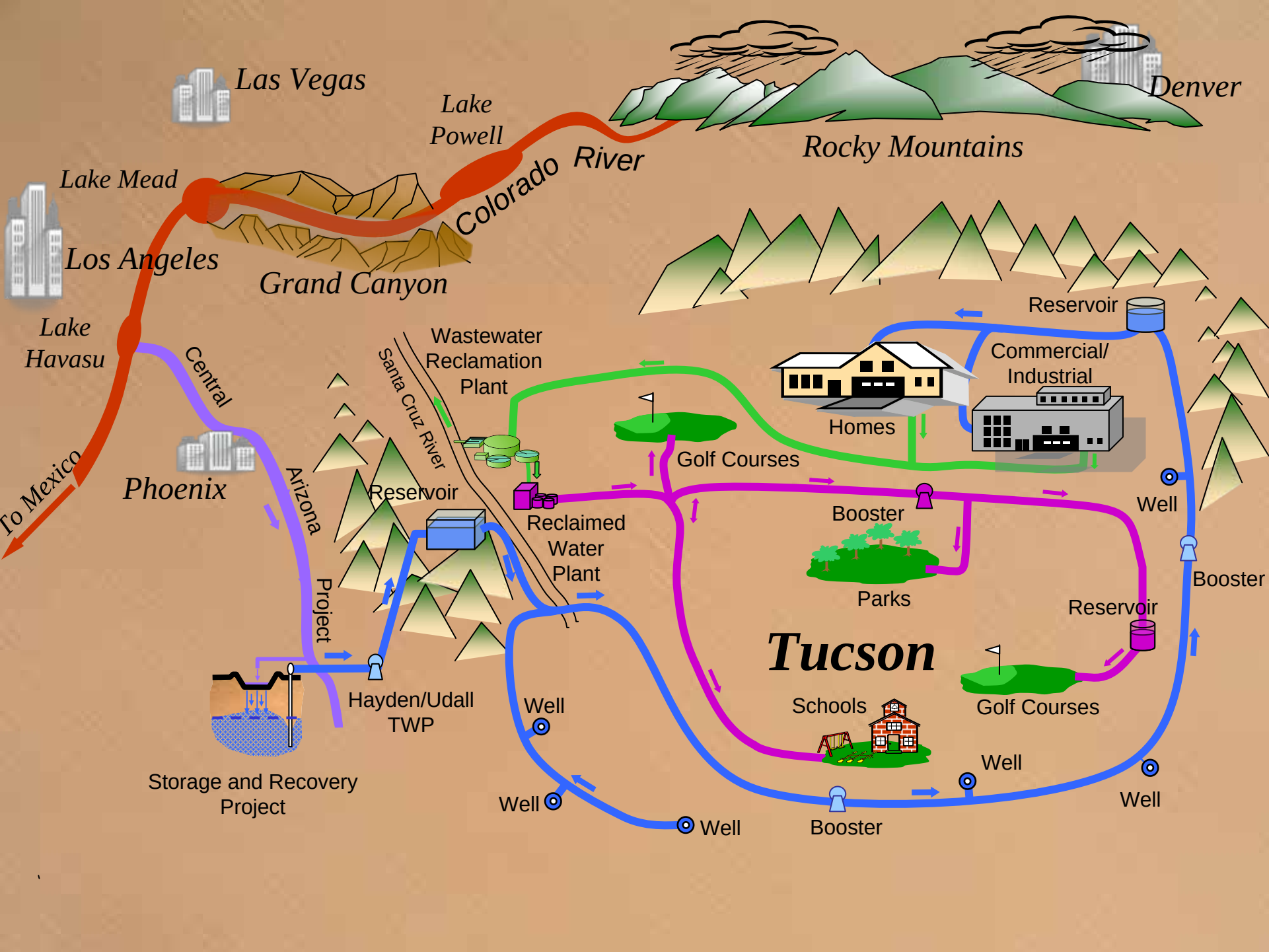
**Capacity: 3.0 MGD**

**Latest Improvements:**
**Conversion of 1.0 MGD activated sludge plant to 3.0 MGD membrane filtration plant – $43 million**

**Effluent: 2.33 MGD**

**Effluent Quality: Class A**

**Pump Room**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Golf Courses
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Commercial/ Industrial
Reservoir
Well
Booster
Parks
Reservoir
Tucson
Schools
Golf Courses
Booster
Hayden/Udall TWP
Storage and Recovery Project
Well
Well
Well
Well
Well
Booster

# Key Elements of Local Water and Wastewater Systems

Shaped by history, geography, and climate

Complex systems dependent on technology and energy

Expensive to build, operate, and maintain

Quantity and quality issues

Complex regulatory framework

Water

Infrastructure, Supply & Planning Study

# Questions

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Water

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