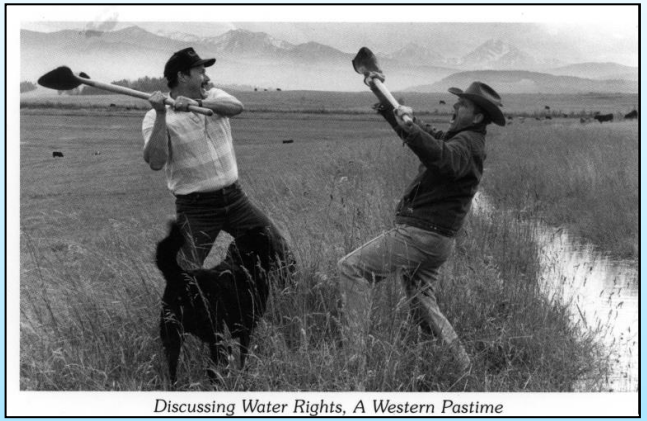
# COLORADO WATER
# A LEADERSHIP CHALLENGE

COLORADO WATER CENTER @ CSU
WATER LITERATE LEADERS
DECEMBER 13, 2023
LISA DARLING, EXECUTIVE DIRECTOR
SOUTH METRO WATER SUPPLY AUTHORITY

# THIS MORNING'S AGENDA

- A bit about Colorado Water
- Aurora Water and the Development of the Prairie Waters Project
- South Metro Water Supply Authority
- The WISE Partnership
- SPROWG and the Platte Valley Partnership

# COLORADO WATER LAW



*Discussing Water Rights, A Western Pastime*

- **Doctrine of Prior Appropriation**
  - "First in Time is First in Right"
  - Water is a property right
- **A water right is established by a water court decree**
  - A decree will be very specific as to location, amount, and use of the right
  - The decree defines the priority of the right
- **Water Court**
  - Seven divisional courts in Colorado
  - Have jurisdiction in the determination of water rights, the use and administration of water, and all other water matters within the jurisdiction of the water divisions.

# WATER TERMS

- **ACRE FOOT —** the volume of water required to cover one acre of land to a depth of one foot: 43,560 cubic feet or 325,851 gallons. One acre foot of water will serve 2 to 3 households for a year.

- **CONSUMPTIVE USE —** the actual amount of water totally consumed during its use. This water does not return to any stream system. Examples include the water evaporated from your clothes during the drying process; boiling water while cooking; the actual amount of water taken up by the roots of a crop, such as onions, hay or your lawn grass.

- **RETURN FLOW** — unconsumed water that returns to its source, a lake or a river, after its first use.

- **WATER RIGHT —** a right decreed by the water court to take water from a stream. This decreed right gives the owner the authority to remove a specified amount of water from the river. It is assigned a priority date by the water court. In Colorado, water rights are considered personal property rights and are subject to all the laws and freedoms given other personal property rights.

# AURORA'S HISTORY

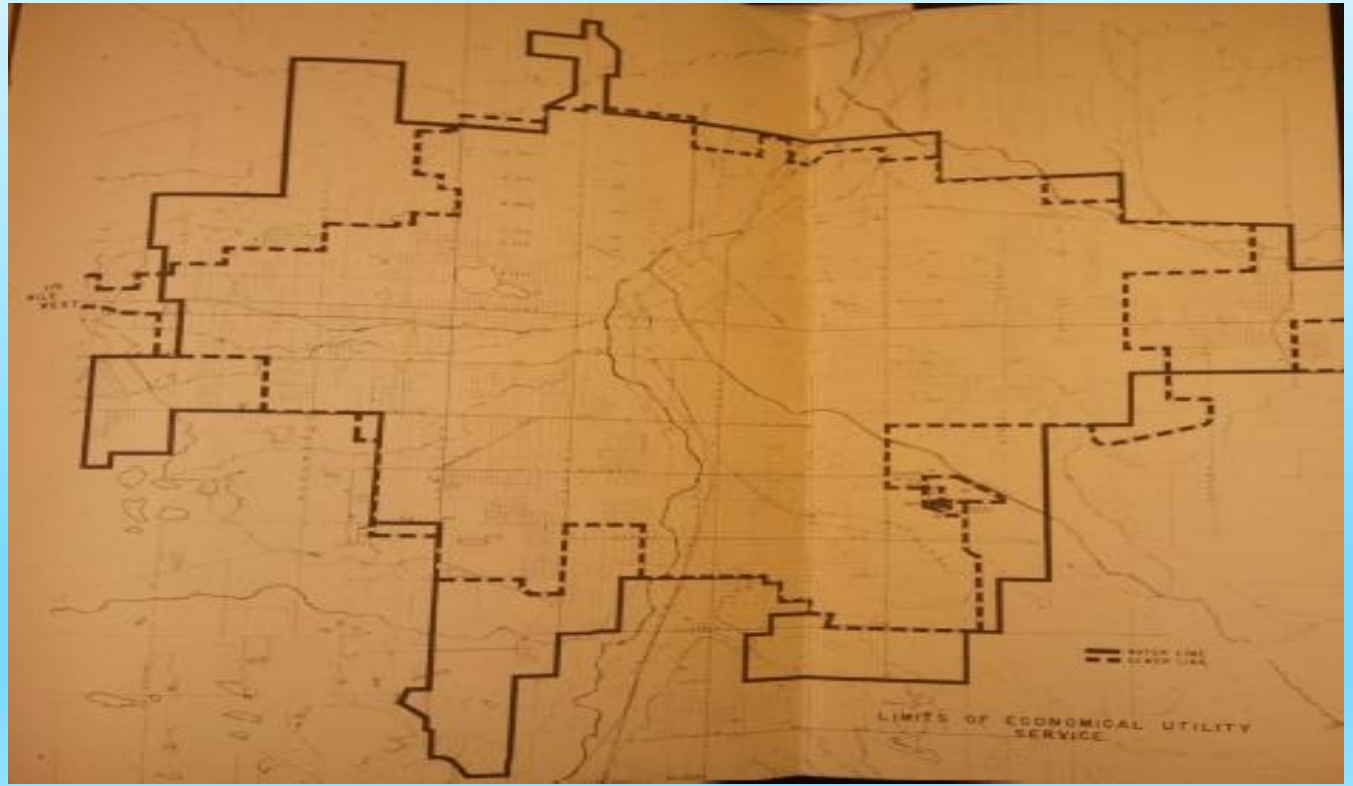
• In 1891, the City of Aurora was originally named Fletcher by its founder, former Chicago resident Donald Fletcher.

• 1929 - Colorado's Secretary of State recognized Aurora—with 2,000 residents—as a city, and tax revenues were appropriated for sewers, roads and fire stations. Today, Aurora generates over $140 million in revenues.

•1954 - Denver Water Board imposes a "Blue Line" in the suburbs beyond which it will no longer grant permits for new water taps. Parts of Aurora fall out of the Denver Water Board service area.

•1958 - Aurora enters into an agreement with the City of Colorado Springs to construct the "Homestake Project," designed to use water rights purchased on the Western Slope and bring that water to the two cities.

# THE DENVER WATER BOARD "BLUE" AND "BROWN" LINE CIRCA 1950




Source: Urbanized Denver and the Metropolitan Area: A Basis For Our Policy Decision on our Utilities, Major Streets, and Annexation Denver Planning Commission (1953).

# COUNCIL SHOWED GREAT FORESIGHT

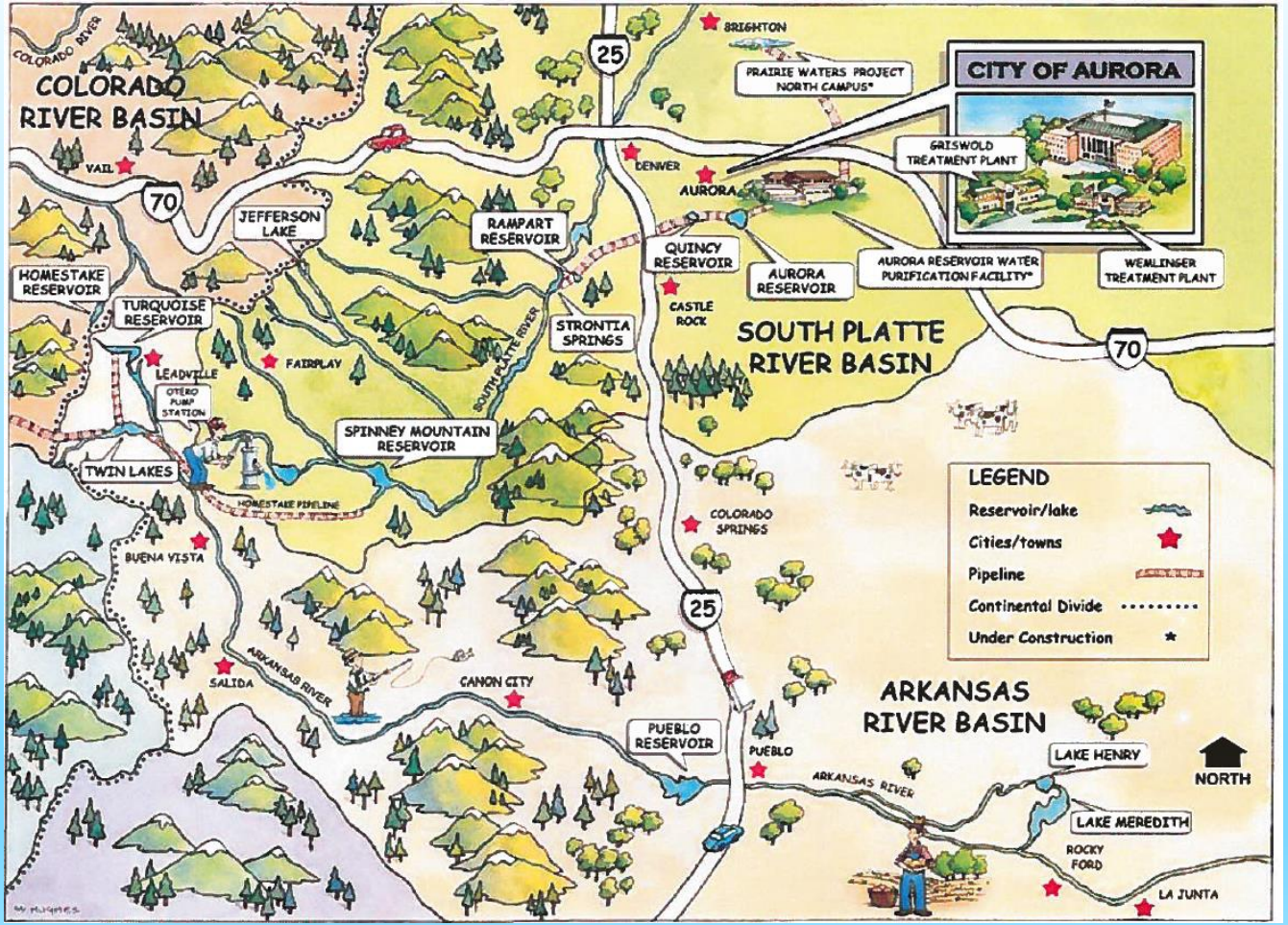
## Three Directives

1. Supplies should be developed in multiple basins

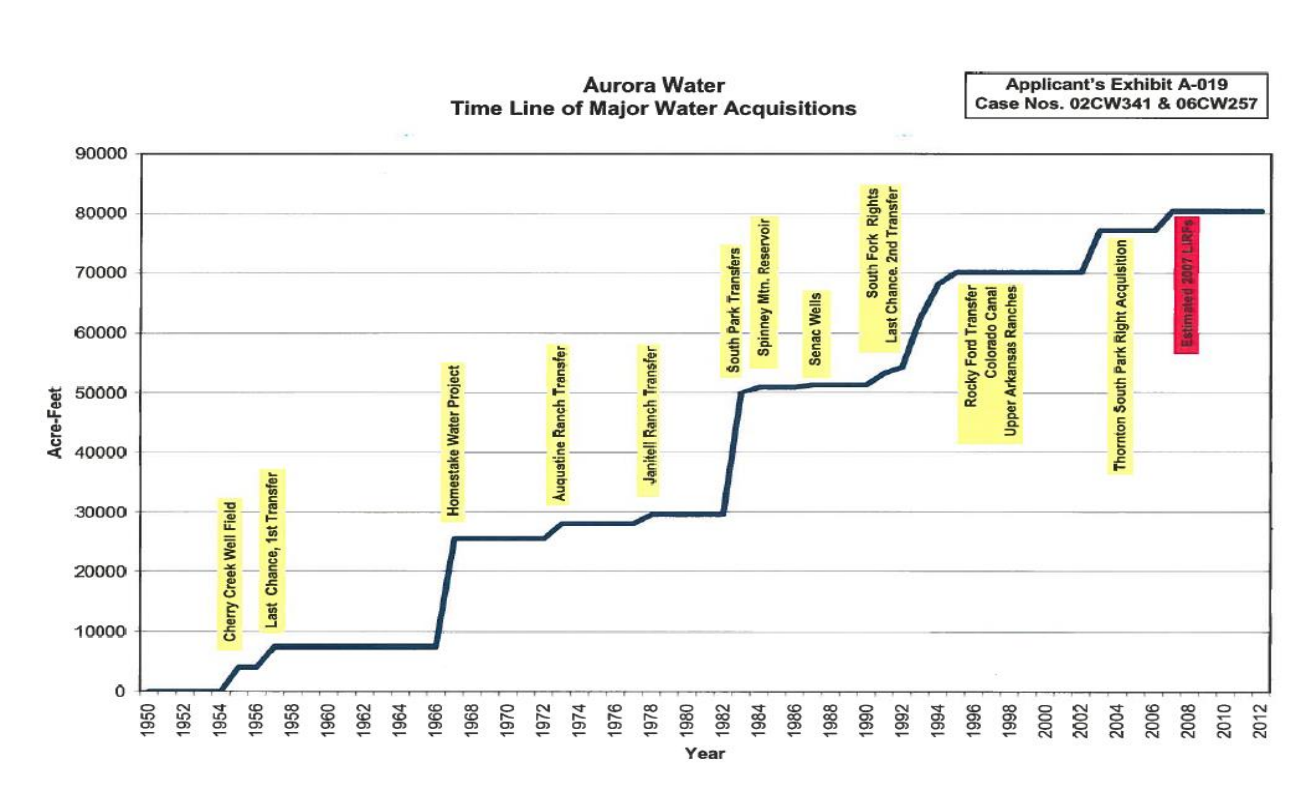
2. Supplies should be renewable
   - Non-tributary groundwater for drought circumstances only

3. System should be able to withstand a “Design drought” of the 50s

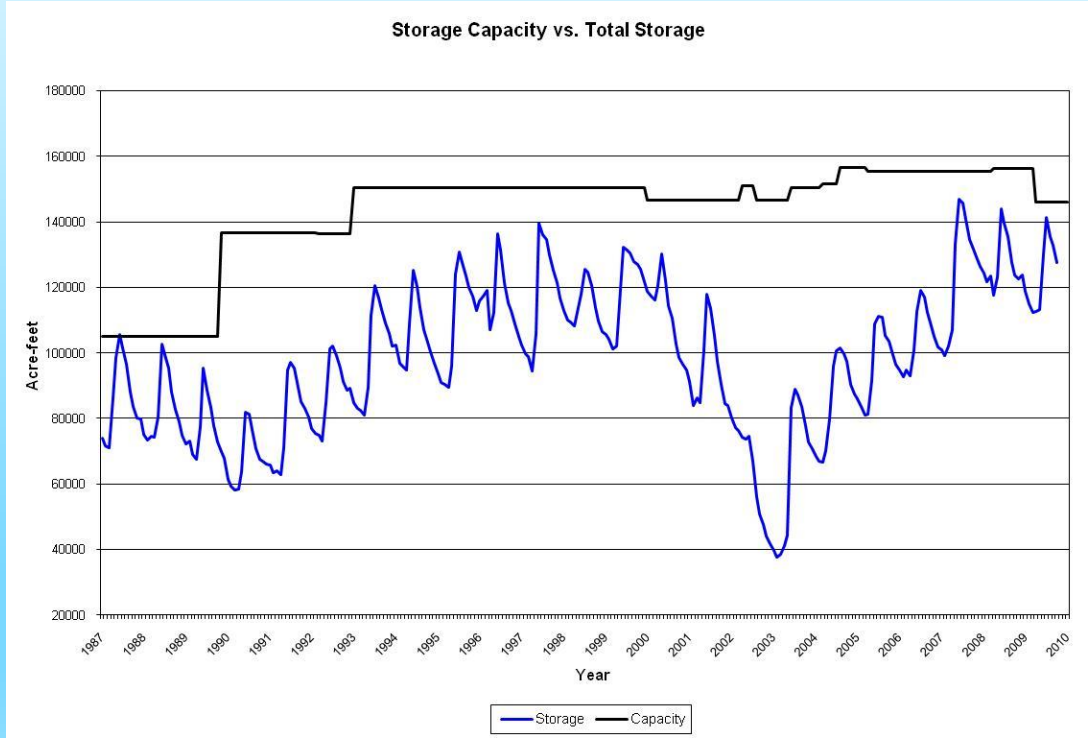
# HOMESTAKE DAM CONSTRUCTION


COLORADO RIVER
COLORADO RIVER BASIN
VAIL
70
JEFFERSON LAKE
HOMESTAKE RESERVOIR
TURQUOISE RESERVOIR
LEADVILLE
OTERO PUMP STATION
FAIRPLAY
SOUTH PLATTE RIVER
RAMPART RESERVOIR
STRONTIA SPRINGS
SPINNEY MOUNTAIN RESERVOIR
TWIN LAKES
HOMESTAKE PIPELINE
BUENA VISTA
SALIDA
ARKANSAS RIVER
CANON CITY
PUEBLO RESERVOIR
PUEBLO
ARKANSAS RIVER
LAKE HENRY
LAKE MEREDITH
ROCKY FORD
LA JUNTA
NORTH
BRIGHTON
25
PRAIRIE WATERS PROJECT NORTH CAMPUS*
CITY OF AURORA
GRISWOLD TREATMENT PLANT
DENVER
AURORA
QUINCY RESERVOIR
AURORA RESERVOIR
AURORA RESERVOIR WATER PURIFICATION FACILITY*
WEMLINGER TREATMENT PLANT
CASTLE ROCK
SOUTH PLATTE RIVER BASIN
70
COLORADO SPRINGS
25
LEGEND
Reservoir/lake
Cities/towns
Pipeline
Continental Divide
Under Construction
ARKANSAS RIVER BASIN

# TIMELINE OF MAJOR WATER ACQUISITIONS



# 2002 WATER CRISIS



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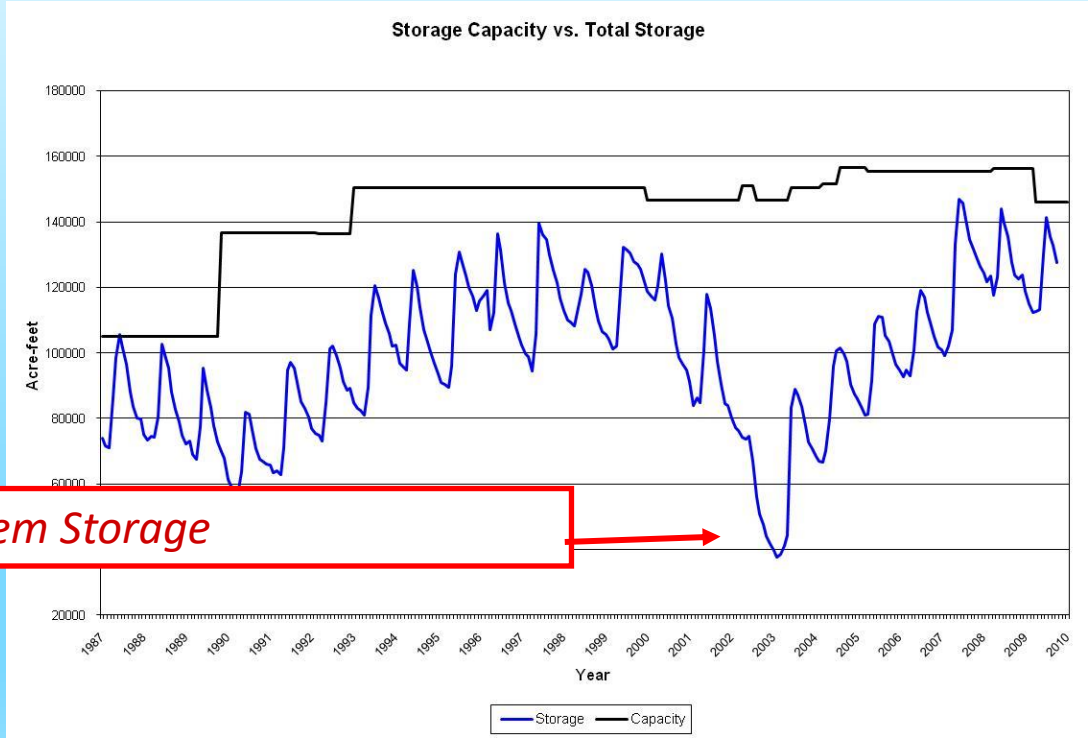
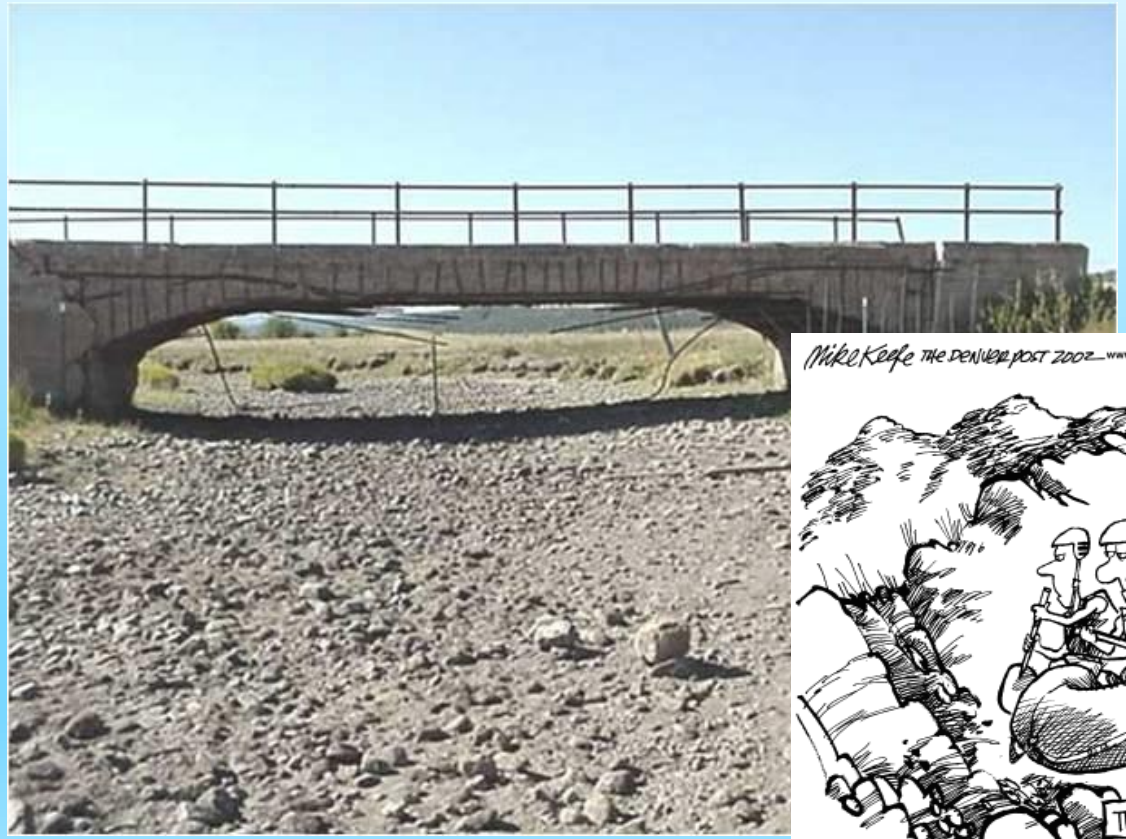



*26% of System Storage*

# DROUGHT EFFECTS ON WATER RESERVOIRS

# A NEW REALITY?



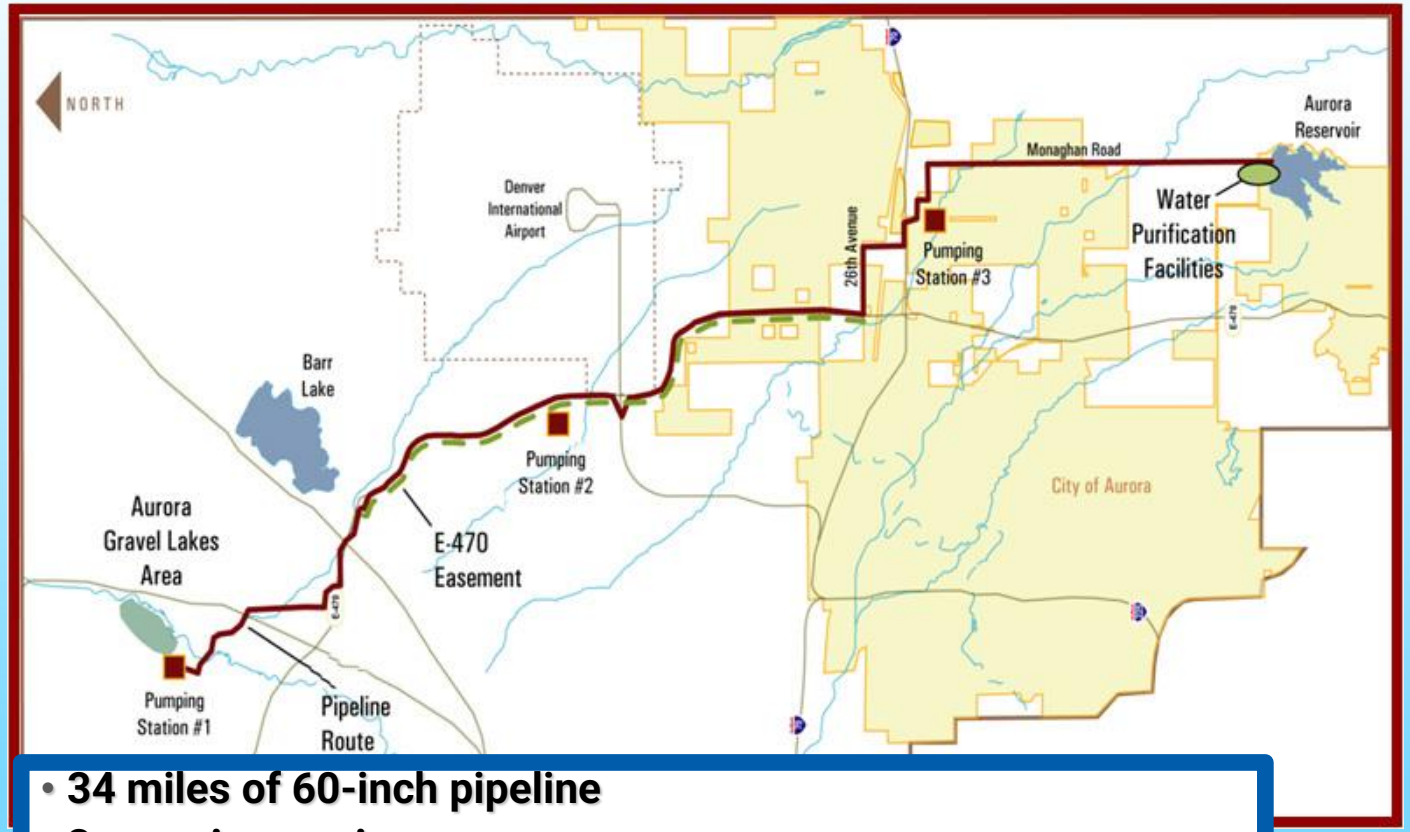
# AURORA CONDUCTED COMPREHENSIVE INTEGRATED RESOURCE PLANNING

•50 potential projects

- Range of individual project yields:
  - 2,000 to 48,000 acre-feet/year

- Basins of Origin:
  - Colorado River
  - Arkansas River
  - South Platte River

- Demand Management Included with Water Supply Forecasts




- **34 miles of 60-inch pipeline**
- **3 pumping stations**
- **North Campus (bank filtration and aquifer recharge and recovery)**
- **50-mgd water purification facility**

# WHY WAS THIS THE RIGHT SUSTAINABLE PROJECT FOR AURORA?

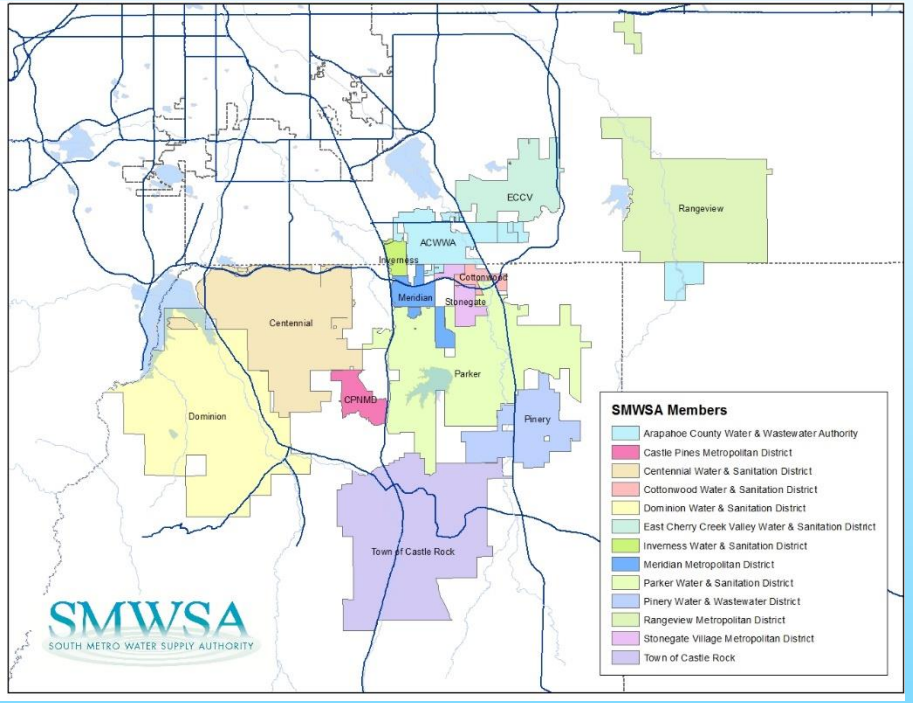
- **Responsible Use of Resources**
  - Reduces the need for trans-basin diversions from Western Slope
  - Maximizing use of an in-basin renewable resource
  - Uses water rights already owned by the City of Aurora
- **River Water Quality Benefits**
  - Minimizes need for waste discharges such as brine from RO
  - Uses natural treatment systems
- **Environmental Benefits**
  - Avoids the impacts to wilderness landscapes
  - Maintains rural open space and river corridor habitat
- **Protects Public Health**
  - Improves reliability of Aurora's purification processes
  - Exceeds current regulations and meets Aurora's high standards
  - Can respond to changes in water quality
- **Cost Effective and Practical**
  - Reduces cost of purification
  - Maximizes use of $300 million in water rights already owned by the city

# THEN WHAT?

# MOTHER NATURE SAVES THE DAY!

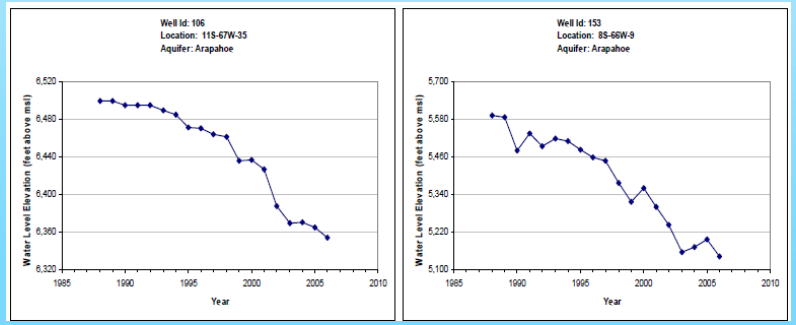
# WHO WE ARE

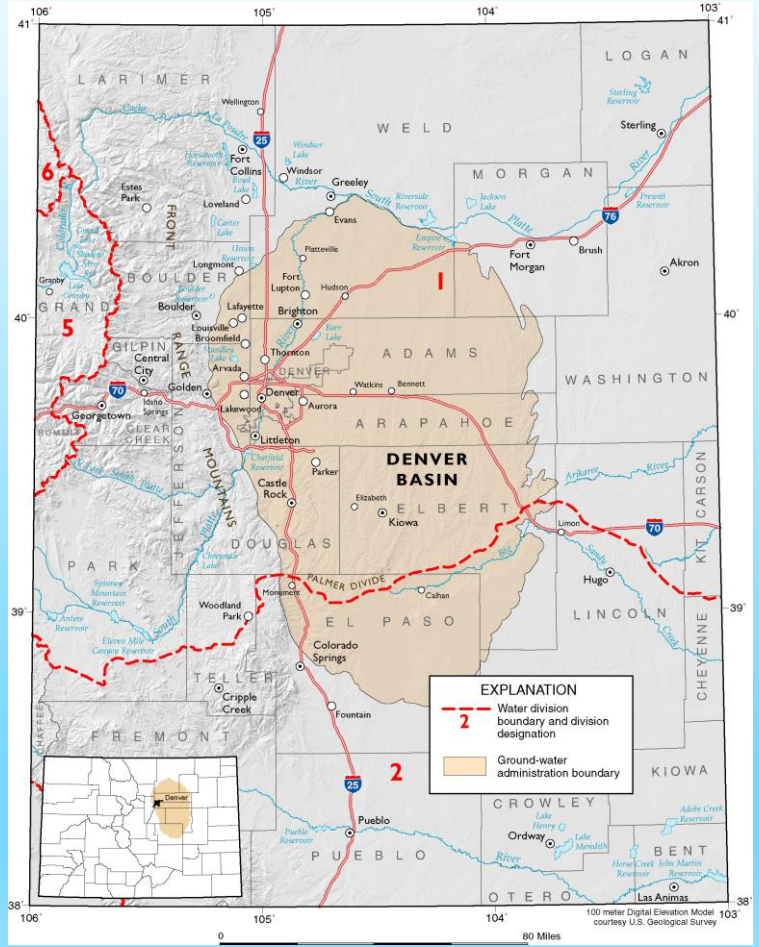
- 13 Members
- Serve 300,000 people
- Projected to serve 550,000 people by 2050
  - 80% of Douglas County
  - 10% of Arapahoe County



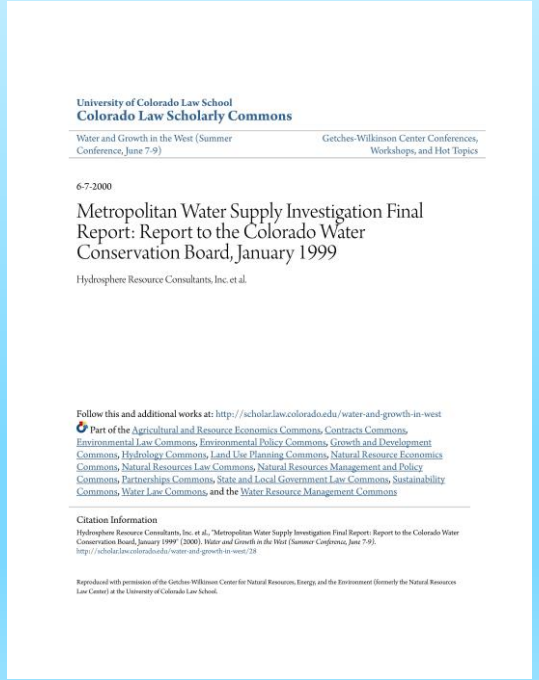
# DENVER BASIN AQUIFER SYSTEM

- Great water quality
- But….



# 1999 Metropolitan Study



University of Colorado Law School
Colorado Law Scholarly Commons

Water and Growth in the West (Summer Conference, June 7-9) | Getches-Wilkinson Center Conferences, Workshops, and Hot Topics

6-7-2000

Metropolitan Water Supply Investigation Final Report: Report to the Colorado Water Conservation Board, January 1999

Hydrosphere Resource Consultants, Inc. et al.

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Citation Information

Hydrosphere Resource Consultants, Inc. et al., "Metropolitan Water Supply Investigation Final Report: Report to the Colorado Water Conservation Board, January 1999" (2000). *Water and Growth in the West (Summer Conference, June 7-9)*.
http://scholar.law.colorado.edu/water-and-growth-in-west/28

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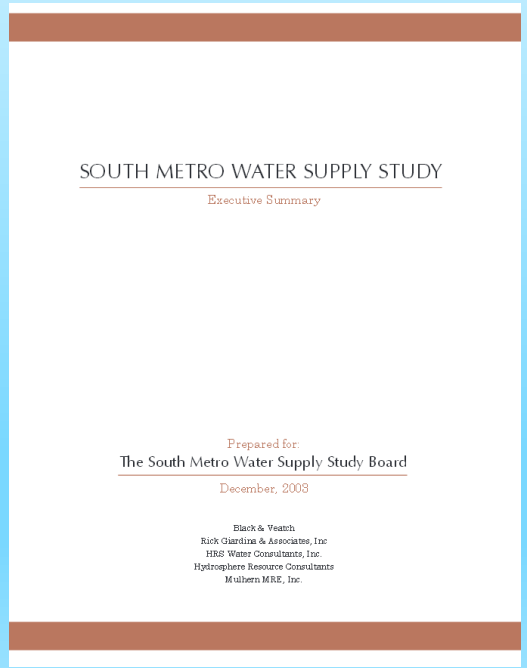
# 2003 South Metro Water Supply Study



SOUTH METRO WATER SUPPLY STUDY

Executive Summary

Prepared for:
The South Metro Water Supply Study Board

December, 2003

Black & Veatch
Rick Giardina & Associates, Inc
HRS Water Consultants, Inc.
Hydrosphere Resource Consultants
Mulhern MRE, Inc.

# Flashback

Rocky Mountain News

# Running dry

Much of Douglas County's well water, once thought abundant enough for a century, could drop out of reach in 10 to 20 years



Rocky Mountain News

RUNNING DRY: PART 4

**$3 billion water fix**

**Douglas urges supply-sharing** with Denver; new-home tap fee $14,800. 5A

"Should we put a warning on the front door (of new homes relying on non-replenishable groundwater) like we do cigarettes?"
– Gov. Roy Romer

***Series from the 2003 Rocky Mountain News***

# SOUTH METRO WATER SUPPLY AUTHORITY

Goal: Shift away from nonrenewable sources of water

Plan based on three pillars:

- Partnerships – Leverage relationships with each other, local governments in the region, and other water providers
- Investment – In supply and storage projects, individually and collectively
- Efficiency – Become a leader in conservation and the efficient use of water

SMWSA
SOUTH METRO WATER SUPPLY AUTHORITY

# TREMENDOUS PROGRESS

Shift to Renewable Supply

- Early 2000's:  60% nonrenewable; Many of the region's largest water providers were 100% nonrenewable
- By 2020:  22% nonrenewable
- By buildout (2065) it will be down to 15%
- Some entities are already almost completely renewable on average

Searching for Ground Water

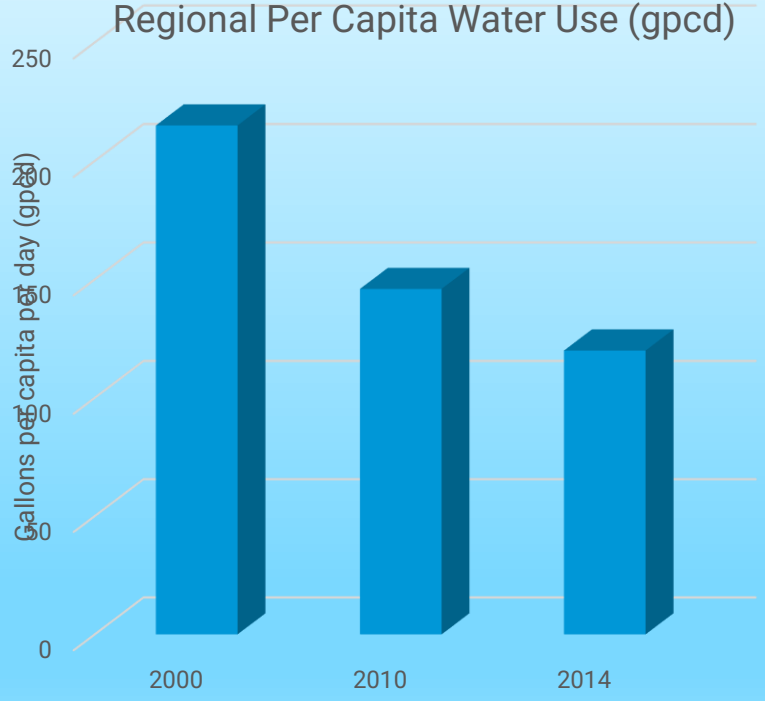
# TREMENDOUS PROGRESS

Conservation and Efficiency

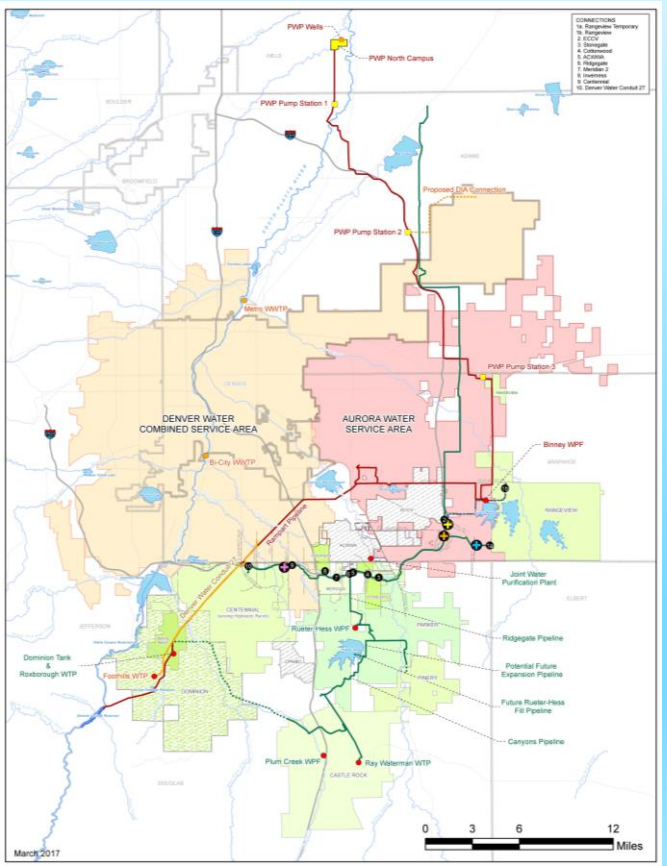
- Reduced per capita water demands across the region by 30%

- The region currently averages about 120 GPCD.

- The region is set up to reuse all of the supplies that are legally able to be reused.



# WHAT IS WISE?




**Denver & Aurora Water Supplies**

↓

**Aurora's PWP Infrastructure**

↓

**Delivery to Aurora, Denver, & SMWA**

Uses $800 million in existing infrastructure

- Cost Recovery for Aurora's Investments
- Purchase of existing "Western Pipeline"

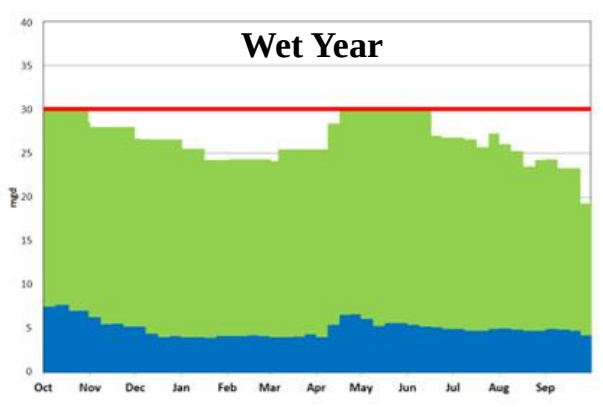
Construction of ~$120M of new infrastructure

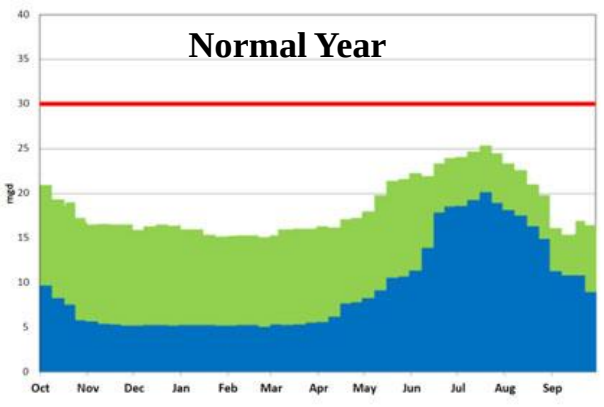
# WISE:
# WATER SUPPLY BENEFITS

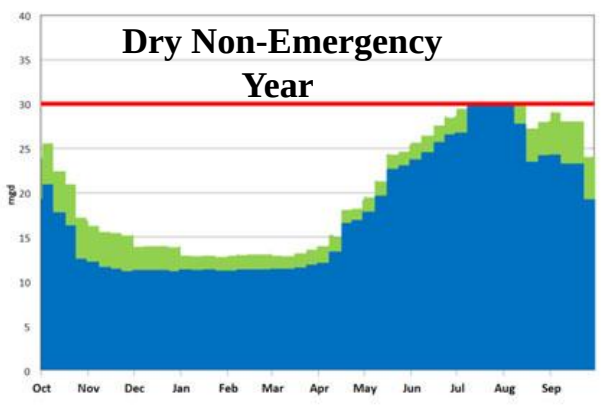
- Aurora Water
  - Offset PWP costs (annual revenue of $10M)
  - Continued use of PWP for drought supply
- SMWSA
  - Renewable supply for SMWSA (100KAF/10yr)
  - Allows use of Denver Basin aquifer for drought supply
- Denver Water
  - Drought and emergency supplies for Denver

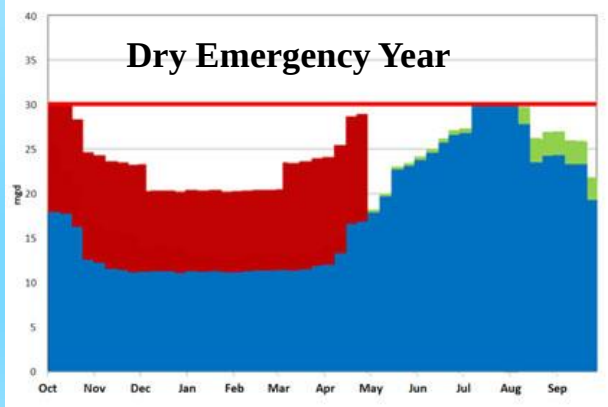
- **Opens the door to regional cooperation**
- **Total Affected Population = 2 million**

# PWP Anticipated Operations




AW deliveries
DW deliveries
SMWSA deliveries
Modeled System Capacity

# SIMILAR COLLABORATIONS

- Metropolitan Water District of Southern California
  - A regional wholesaler that provides water for 26 member public agencies to deliver - either directly or through their sub-agencies - to nearly 19 million people living in Los Angeles, Orange, Riverside, San Bernardino, San Diego and Ventura counties.  The district imports water from the Colorado River and Northern California to supplement local supplies, and helps its members develop increased water conservation, recycling, storage and other resource-management programs.

- Southern Nevada Water Authority
  - Provides wholesale water treatment and delivery for the greater Las Vegas Valley and is responsible for acquiring and managing long-term water resources, constructing and operating regional water facilities and promoting water conservation for Southern Nevada

INTERIM WATER RESOURCES REVIEW COMMITTEE

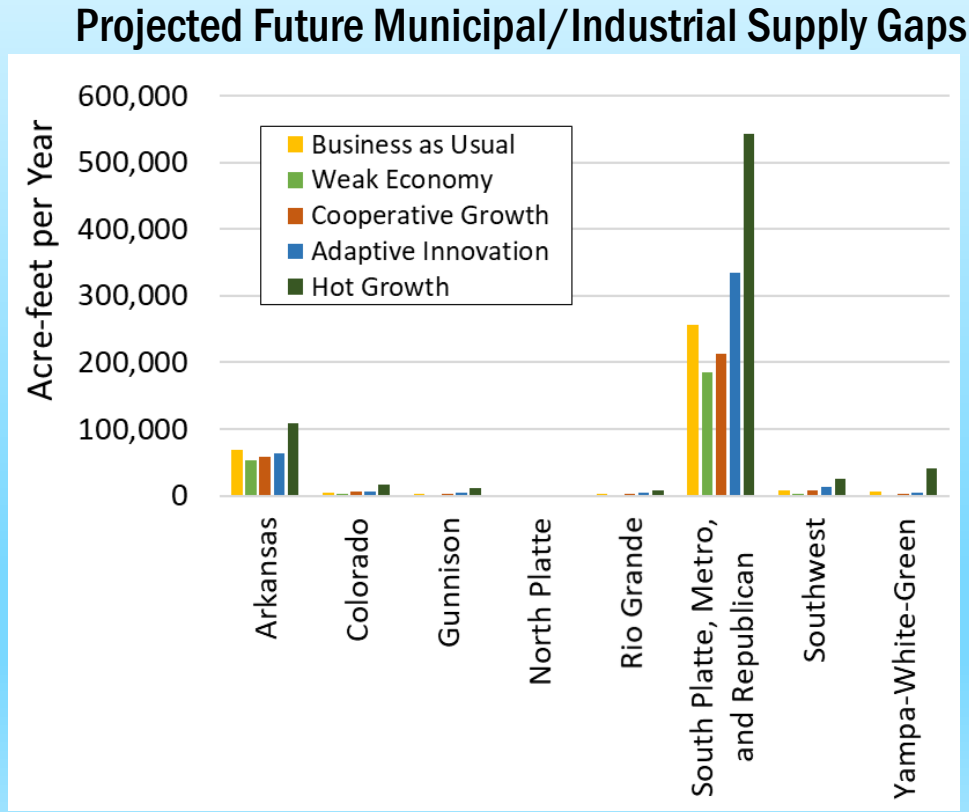
# Briefing on the South Platte Regional Opportunities Water Group (SPROWG) Feasibility Study

October 24, 2019

# Communities in the South Platte River Basin continue to aggressively implement conservation measures, but more supply will be needed

Basin population is expected to grow to around 6 million by the year 2050

In addition to municipal and industrial use, water is also needed for agriculture and for environment and recreation



**South Platte Basin Implementation Plan (SPBIP)**
described the original "Conceptual Future In-Basin Multipurpose Project" in Section 4.6.2

**Dec 2013 – April 2015**

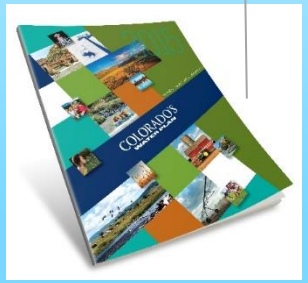
**South Platte Regional Opportunities Working Group (SPROWG)**
advanced the SPBIP concept and developed the initial regional water project

**June 2015 – May 2018**

**South Platte BIP**
Phase 2

**Date TBD**

**May 2013 – Nov 2015**

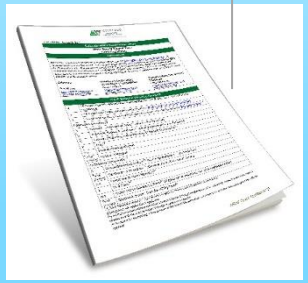



**Colorado's Water Plan**
voiced the need for storage and collaborative projects

**Jan 2017 – Dec 2017**


**South Platte Storage Study (SPSS)**
identified potential South Platte
River storage projects

**June 2018 – Oct 2018**

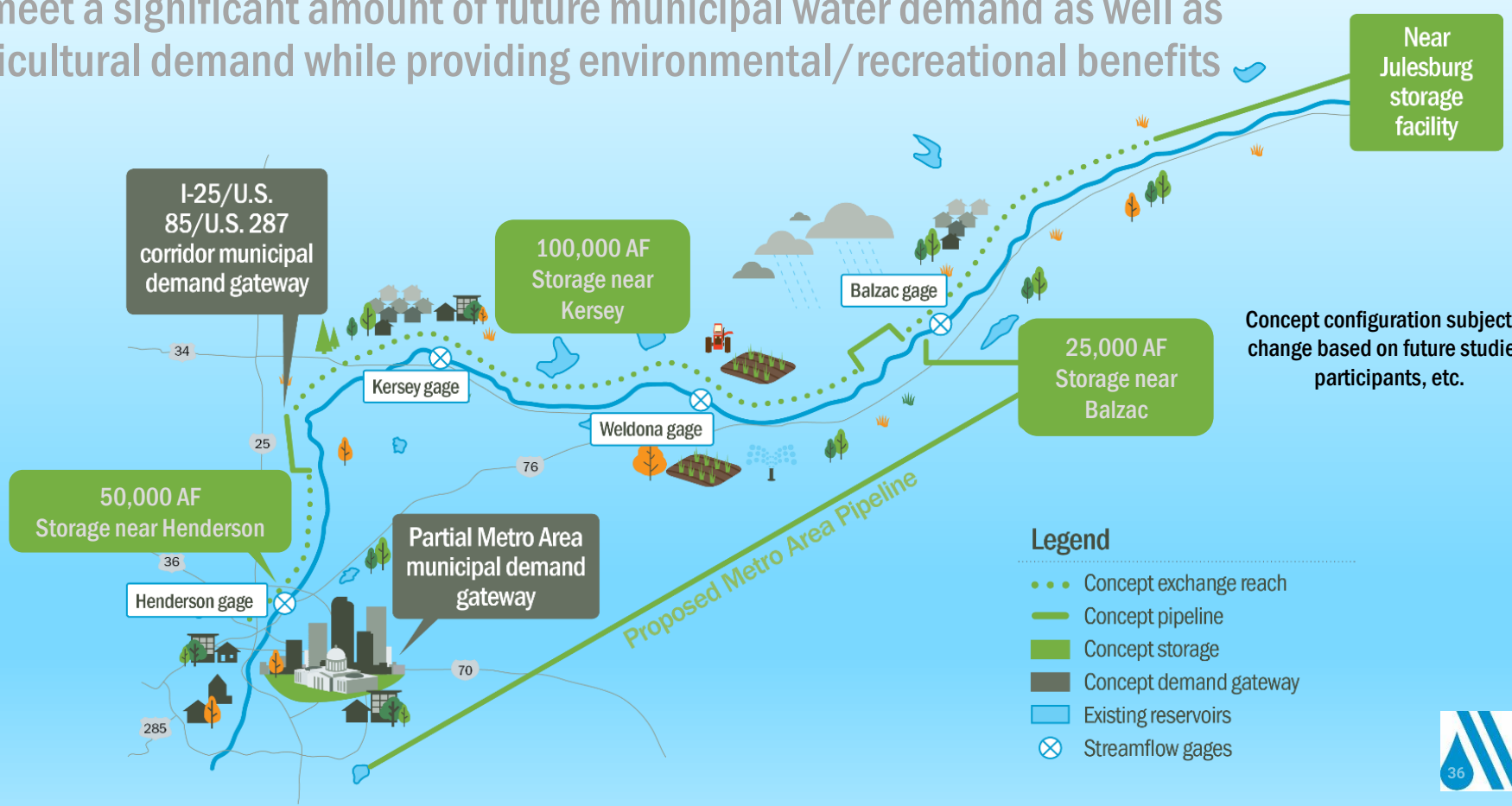


**SPROWG Task Force**
developed scope of study and grant application for feasibility study

**Mar 2019 – Mar 2020**

**SPROWG Feasibility Study**
will conduct outreach, explore organizational alternatives, and refine the concept

# SPROWG contemplates new storage, exchanges, and potential pipelines to meet a significant amount of future municipal water demand as well as agricultural demand while providing environmental/recreational benefits




Concept configuration subject to change based on future studies, participants, etc.

## Principles describing what SPROWG *IS*

- SPROWG will advance the goals of the **South Platte/Metro Basin Implementation Plan (BIP) and Colorado's Water Plan**.

- SPROWG intends to provide at least **50,000 acre-feet of yield** to meet part of the projected municipal and industrial water supply project gap in the South Platte basin. **A significant portion of this yield is targeted for smaller but rapidly growing communities between Denver and Greeley and also larger communities in the Denver Metro area and northern Colorado**. The project will also explore providing supplies to smaller communities east of Greeley.

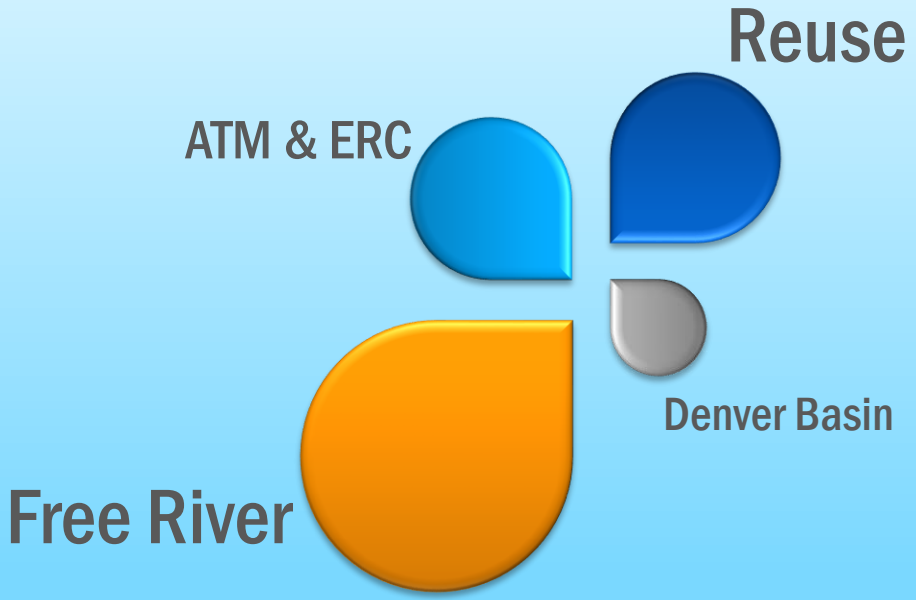
- SPROWG intends to meet a **portion of the agricultural gap**.

- SPROWG will identify and incorporate **strategies to address environmental and recreational needs**.

## Principles describing what SPROWG *IS*

- SPROWG intends to **enhance the ability to conduct alternative water transfers**, thus reducing the need for traditional buy-and-dry transfers.
- SPROWG will utilize different **sources of water** available in the South Platte basin and manage them conjunctively to achieve an overall reliable yield beyond what an individual source could produce.
- SPROWG is intended to help water supply organizations and water users **maximize the use of in-basin supplies**.
- SPROWG intends to improve integration of **water quality** and quantity planning and management activities.

**SPROWG will manage different sources of water conjunctively**




*Concept Water Supplies*

## Infrastructure components provide the means to maximize use of water supplies:

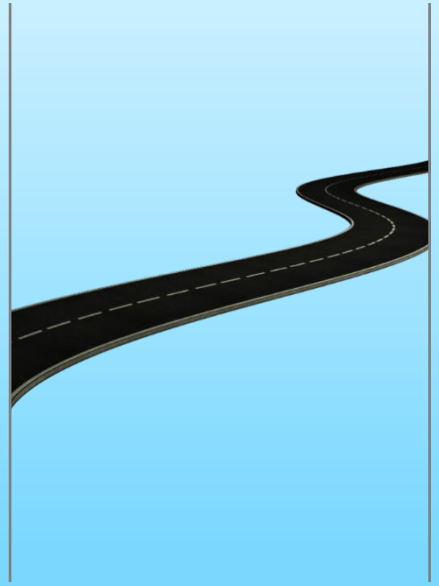
- Utilize unappropriated supply
- Ability to utilize ATMs
- Enhance exchange capacity
- Coordinate reservoir operations

## Principles describing what SPROWG *IS NOT*

- SPROWG is **not** intended to be **a substitute for existing or planned projects**.
- SPROWG is **not** intended to be used to deliver water developed from the **permanent dry up of irrigated lands** in the South Platte basin.
- SPROWG is **not** intended to **store supplies** from an existing or new **transmountain diversion project** (though it will provide a means to utilize unused reusable return flows from transmountain diversions).

## The SPROWG Feasibility Study was completed in early 2020

- Results of research on organizational framework
- Results of outreach
- Concept refinements
- Water treatment strategies
- Cost estimates
- Outreach and education plan



## Where is this heading?

- Incorporate into South Platte Basin Implementation Plan
- Continue to promote concept and seek participants
- Collaborate on organizational framework
- Collaborate on concept configuration and components based on participant needs

**State support and funding are crucial for continuing momentum**


www.youtube.com/HelmerReenberg


www.youtube.com/HelmerReenberg

# DISCUSSION AND QUESTIONS

Please contact me at:

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South Metro WISE Authority
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With thanks!