



# **A Colorado Perspective:**



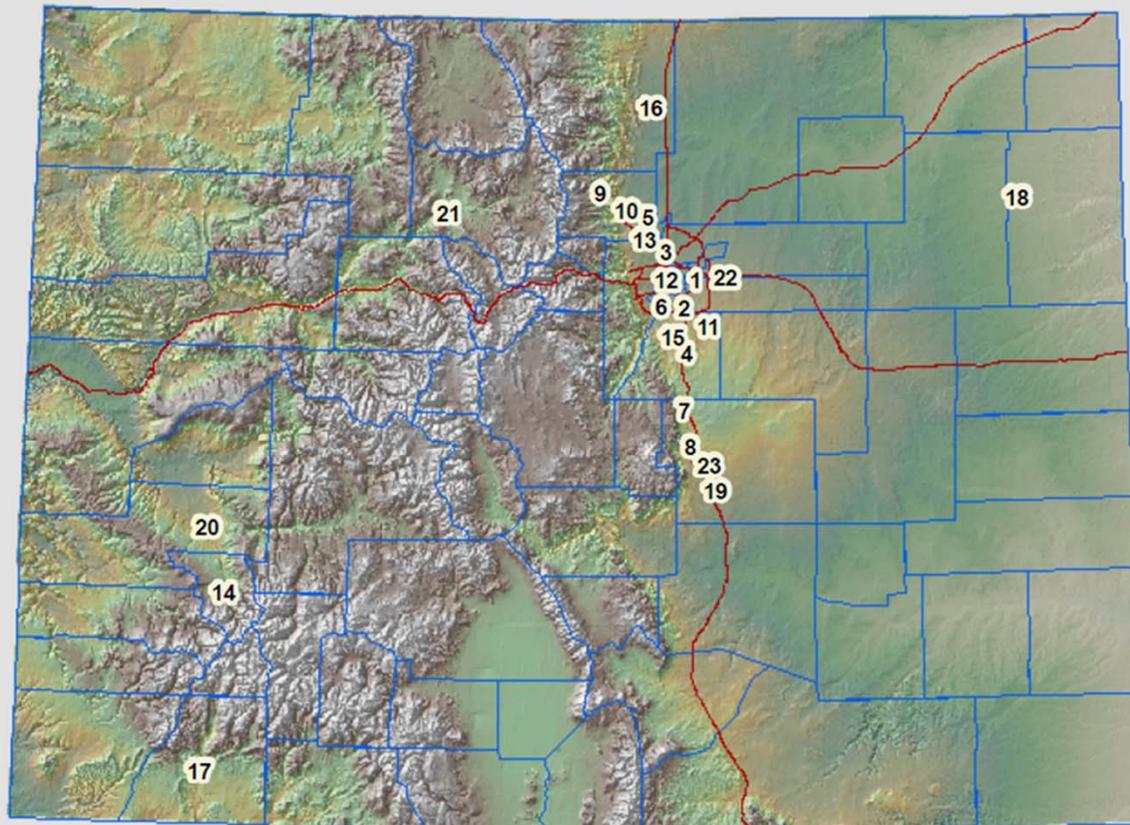
**DENVER WATER**

Western  
Colorado



Eastern  
Colorado





Colorado Reclaimed Water Providers		
1 City of Aurora	7 Donala - (Upper Monument Creek)	16 Fort Collins
2 Centennial Water and Sanitation	8 JD Philips - Colorado Springs Utilities	17 Tamarron Management - (Durango)
3 City of Westminster	9 Fairways Metro District - (Jamestown)	18 Yuma
4 Plum Creek Wastewater -(Castle Rock)	10 Superior/Superior Metro District	19 Fort Carson - (Colorado Springs)
5 City of Louisville	11 Stonegate Village - (Parker)	20 Cornerstone Metro District - (Montrose)
6 Meridian Metro District - (Englewood)	12 Denver	21 Kremmling
	13 Broomfield	22 Front Range Airport - (Watkins)
	15 Lone Tree	23 Las Vegas - Colorado Springs Utilities

— Major Highway

□ County Line

0 15 30 60 Miles





 **DENVER WATER**

# Recycle Water Helps

- **Meet growing water demands**
  - Preserve drinking water
  - Avoid developing new supplies
  - Water rights – 2 uses better than 1
  - Ensures sustainable growth
- **Reduce or delay need for new drinking water infrastructure**
- **Save \$**
- **Right water for the right use**



# Colorado Department of Public Health and Environment - Regulation 84 - Reclaimed Water



# Water Quality – 3 Categories

- **Category 3**
  - **2ndary treatment, filtered & disinfected**
  - **Turbidity –**
    - **3 NTU avg. & 5 NTU max**
  - **E – coli**
    - **75% of samples non-detect , 126/110 ml max**
  - **Lower risk than a swim beach**

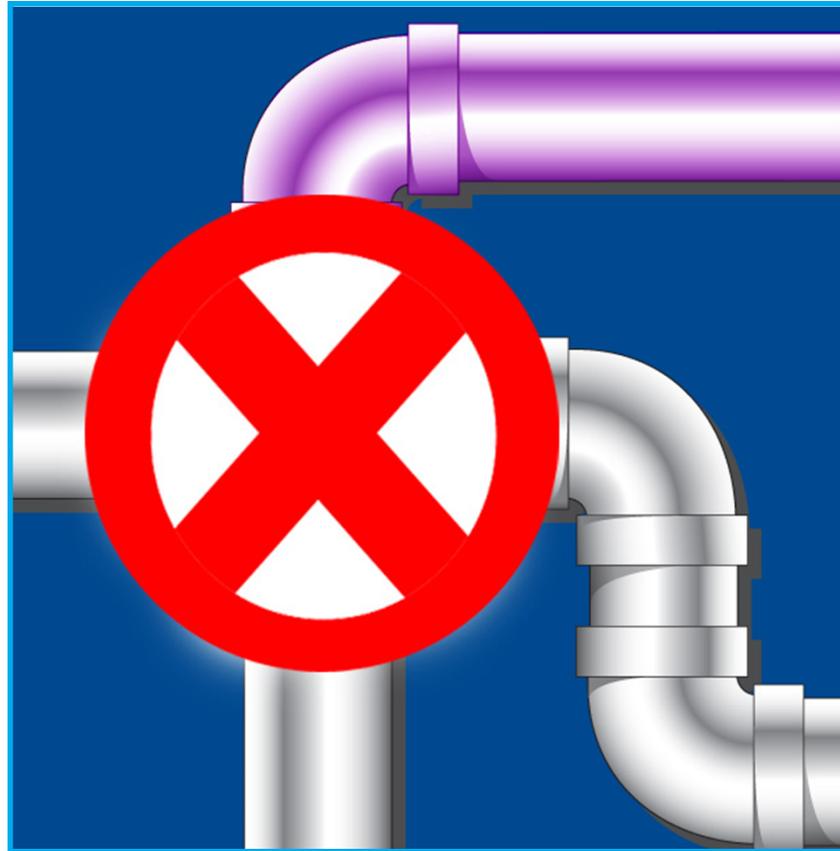
# Approved Uses

- **Industrial**
- **Landscape Irrigation**
- **Commercial**
- **Fire Protection**
- **Agricultural**

# Signs and Purple Marking



# Cross Connection Prevention





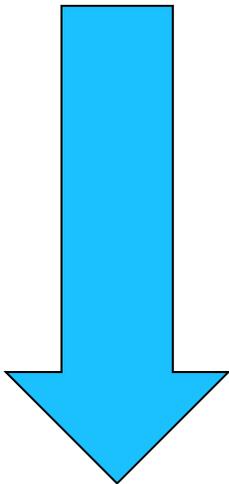
# Denver Water's Recycled Water Program



**DENVER WATER**

# History

**Blue  
River  
Decree**



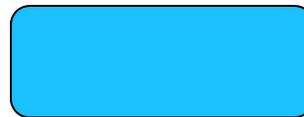
**1955**

**Successive  
Use Project**



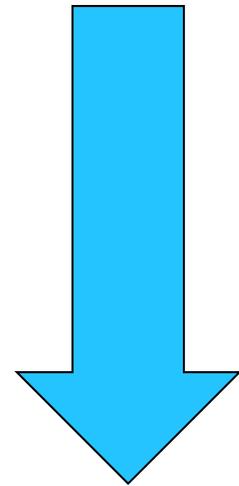
**1960 1970**

**Potable Reuse  
Demonstration  
Project**



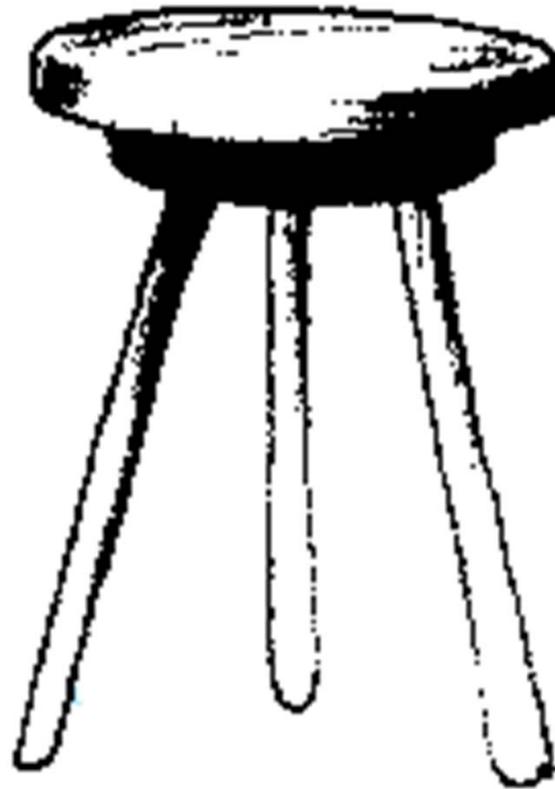
**1980 1990**

**Recycling  
Plant  
Commissioned**



**2004**

# Integrated Resource Planning

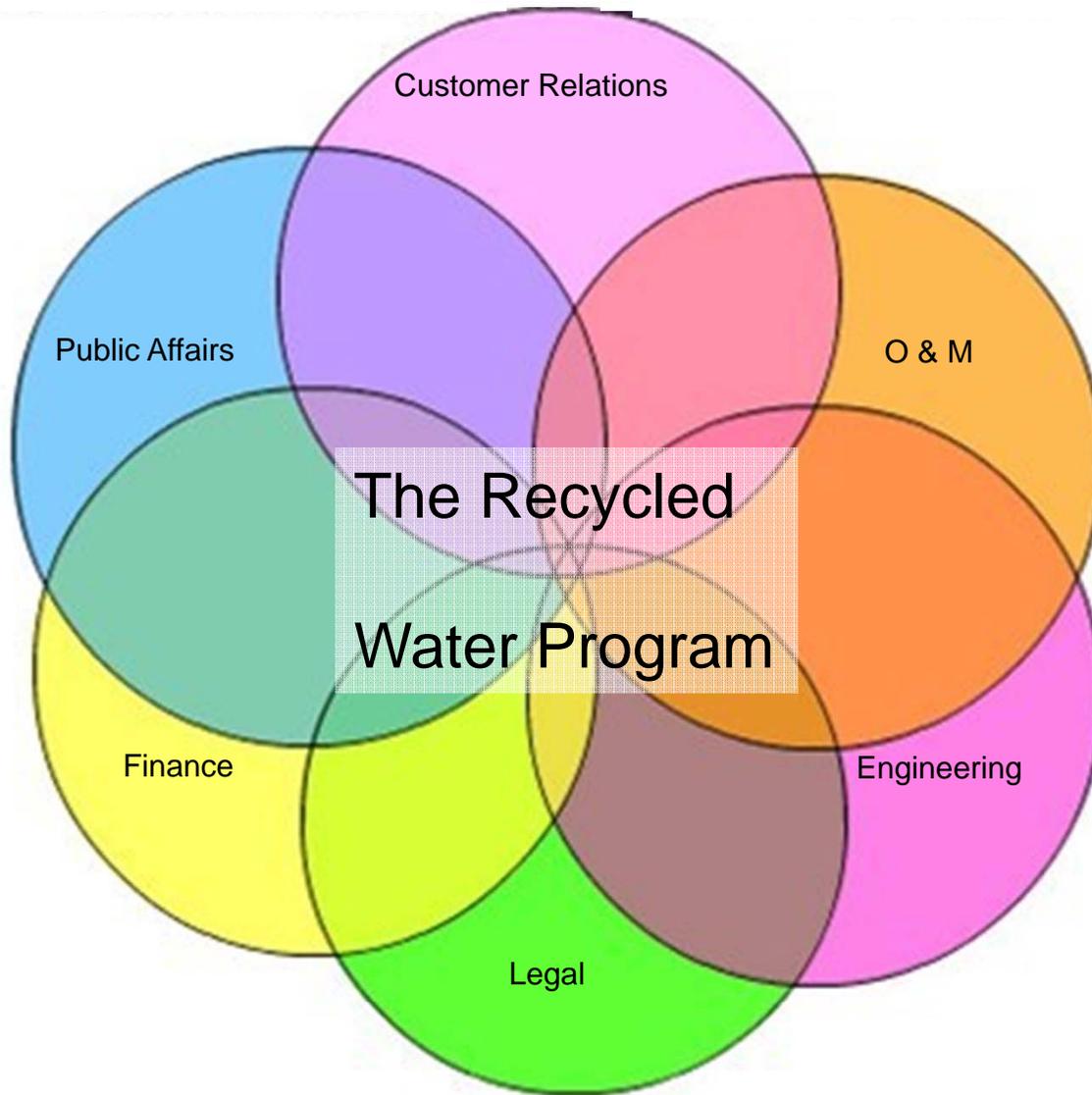


**Conservation**

**Recycling**

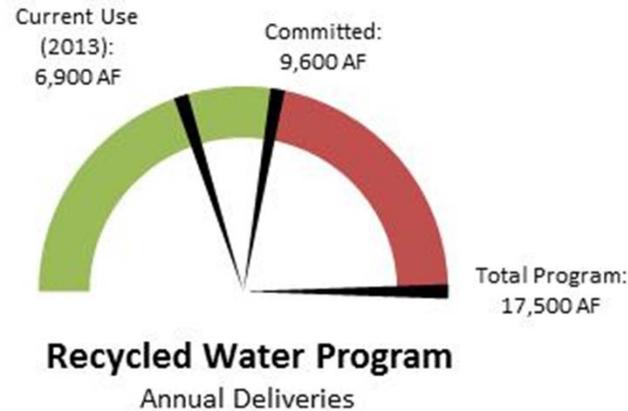
**New Supply**



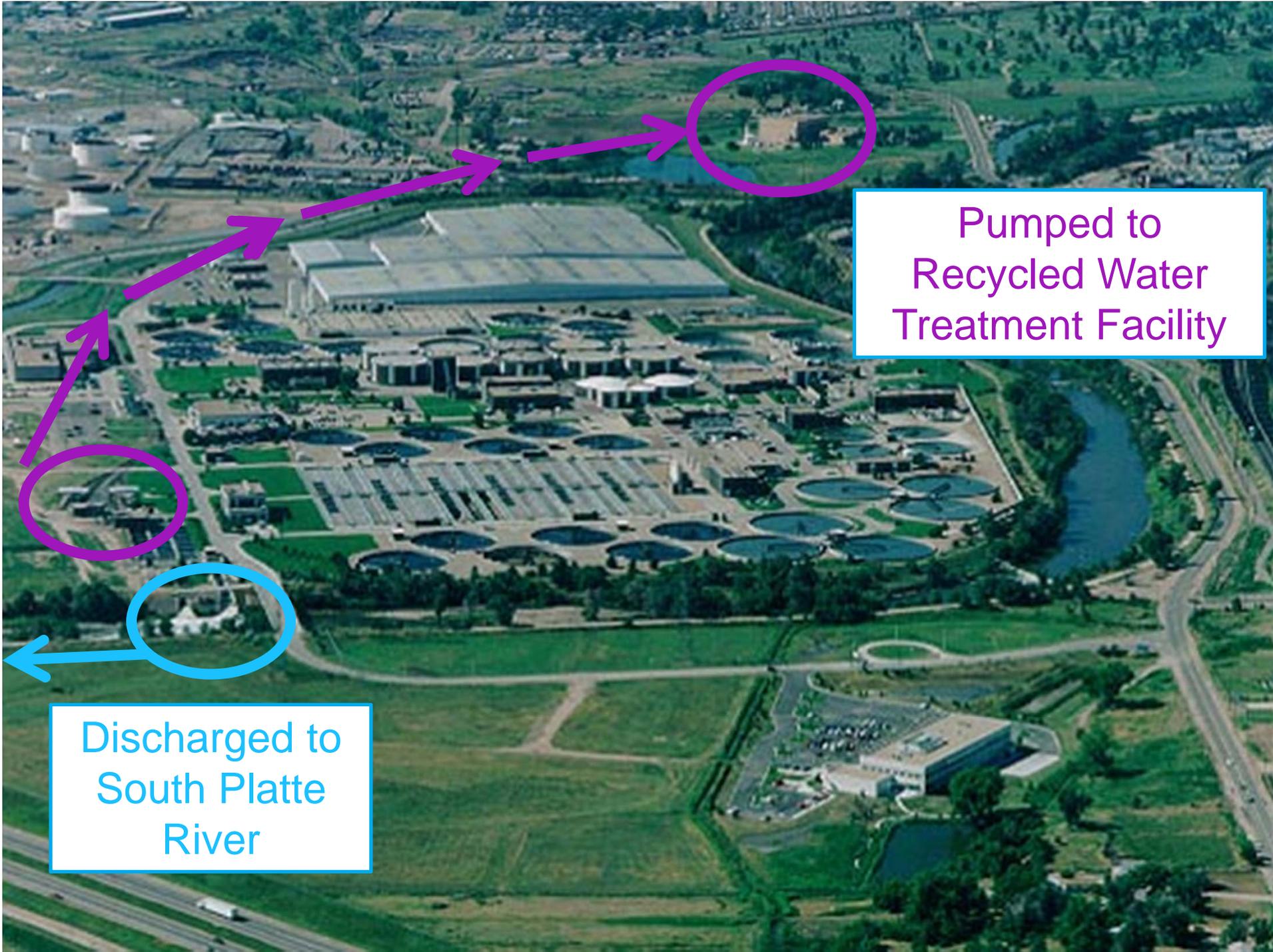


# Recycled Water Program Status

- Goal 17,500 AF/year
- \$197 million spent
- \$90 million budgeted (3.3 million 2014)



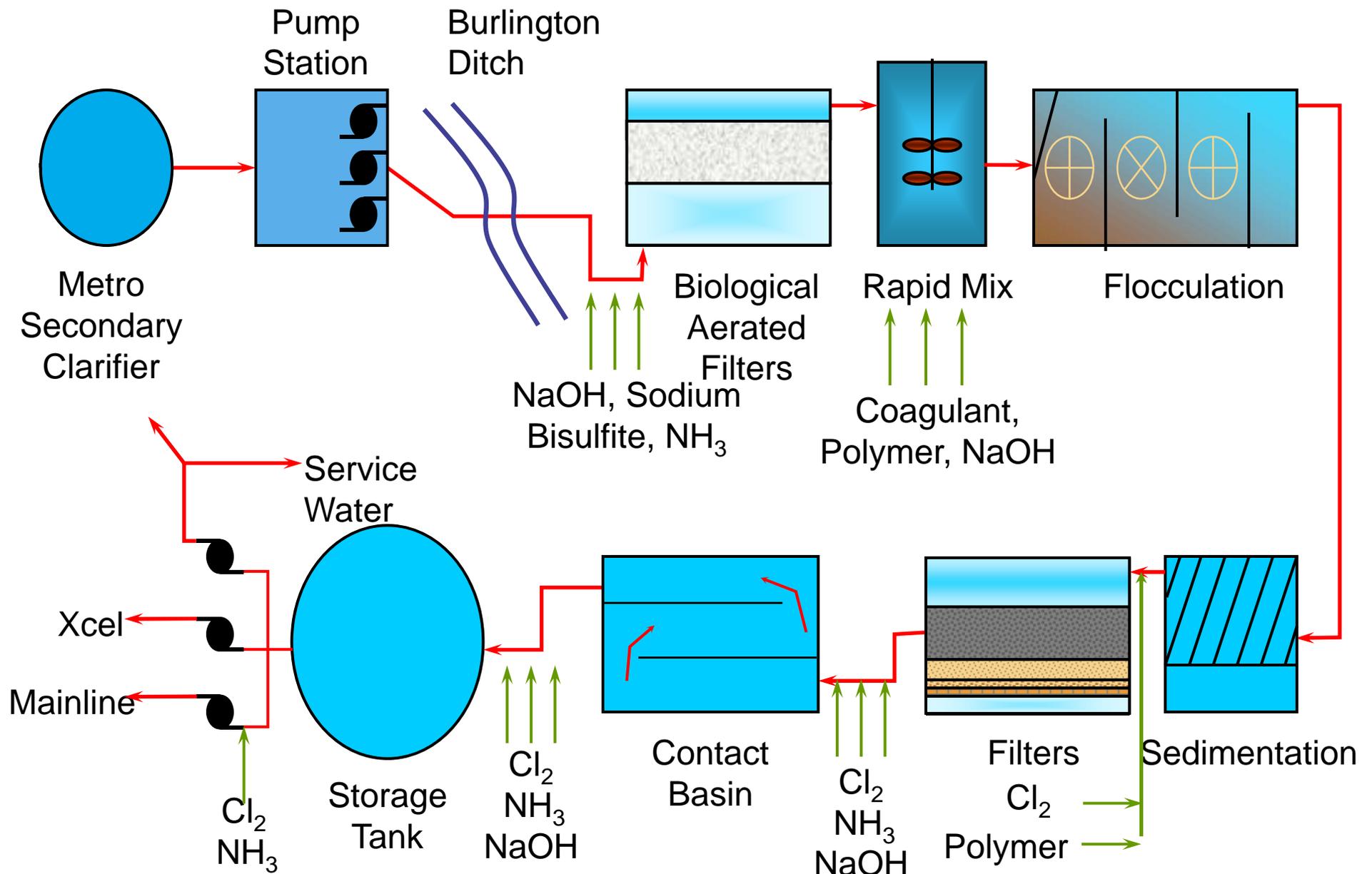




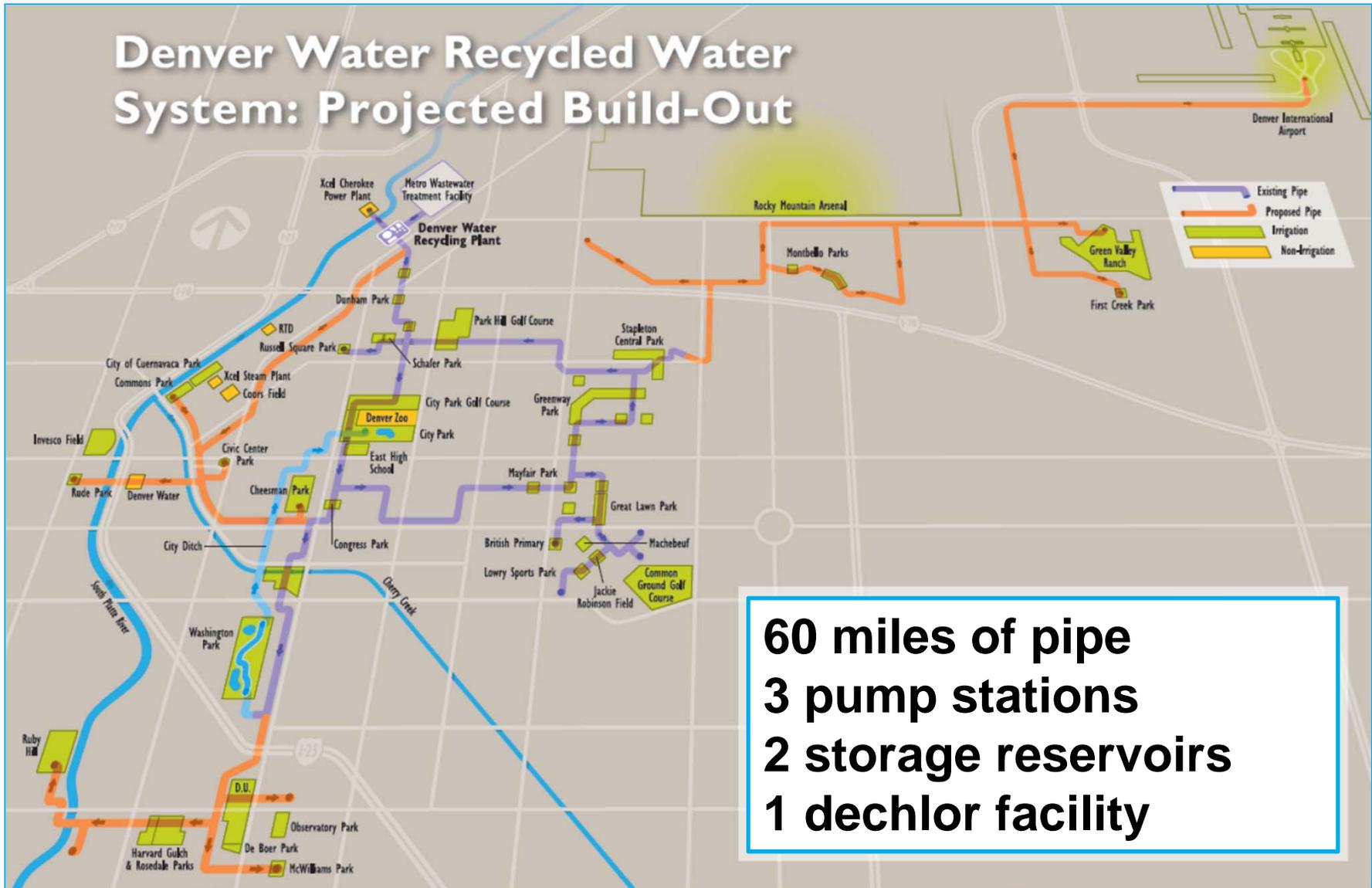
Pumped to  
Recycled Water  
Treatment Facility

Discharged to  
South Platte  
River

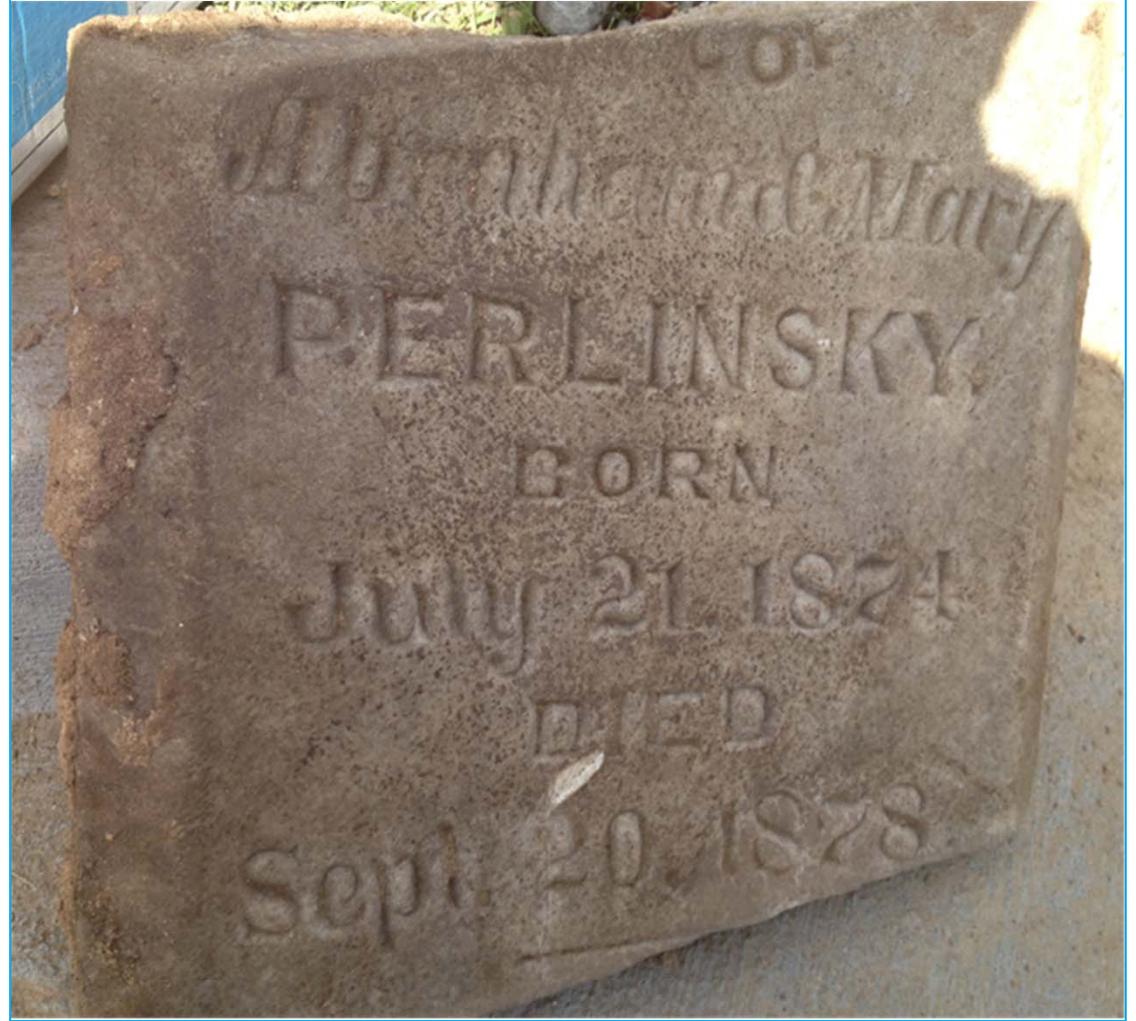
# Recycling Treatment Process



# Denver Water Recycled Water System: Projected Build-Out







# Benefit to the Customer

- **Financial**
  - **Lower Rates & Fees**
    - **\$.99 vs. \$4.81 / kgal**
    - **No Participation Fee**
    - **Recycled SDC ~ 88% of Potable**
- **Environmental & Social**
  - **Green/Sustainable**





 **DENVER WATER**



 **DENVER WATER**



 **DENVER WATER**















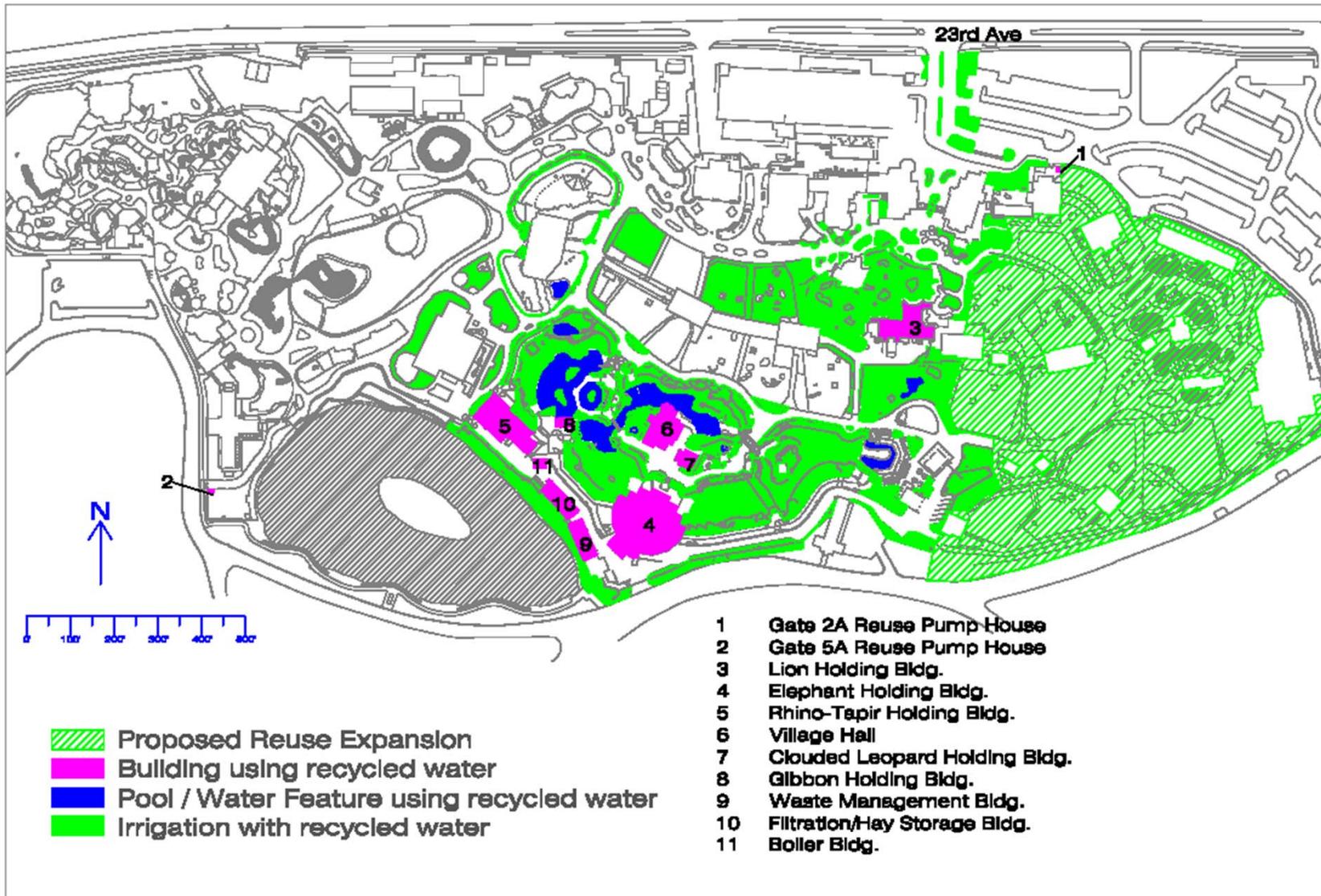
**DENVER WATER**



 DENVER WATER

# Denver Zoo Operations

- **Culture of conservation**
- **Reduced total water consumption by 37% over last decade**
- **2005 - began using recycled water**
- **Plans to replace 75% of drinking water used with recycled water – 130 mg a year**
- **2 million visitors annually**
- **80 acre campus**



<b>DENVER ZOO</b> Planning Department <small>1000 Broadway, Denver, CO 80202</small> Date: February 26, 2014	<b>Zoo Recycled Water Use</b>		Drawing # <b>1</b>
	Design: Steve Saig Drawn: Jennifer Hale Issue: N/A	Project # N/A	



# Recycled Water Infrastructure

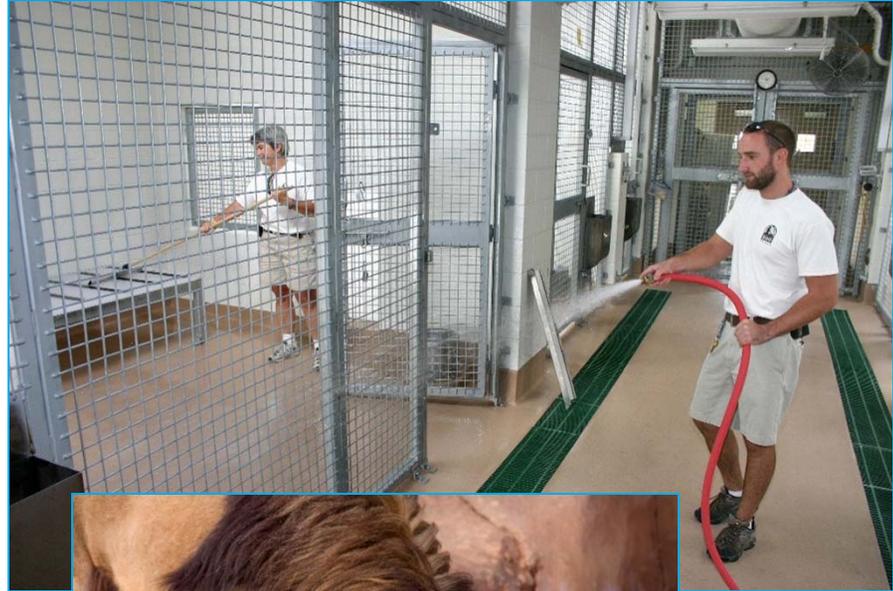
- Redundant points of entry
- 2 pressure boosting stations
- Looped private recycled water system



# Recycled Water Identification



# Predator Ridge



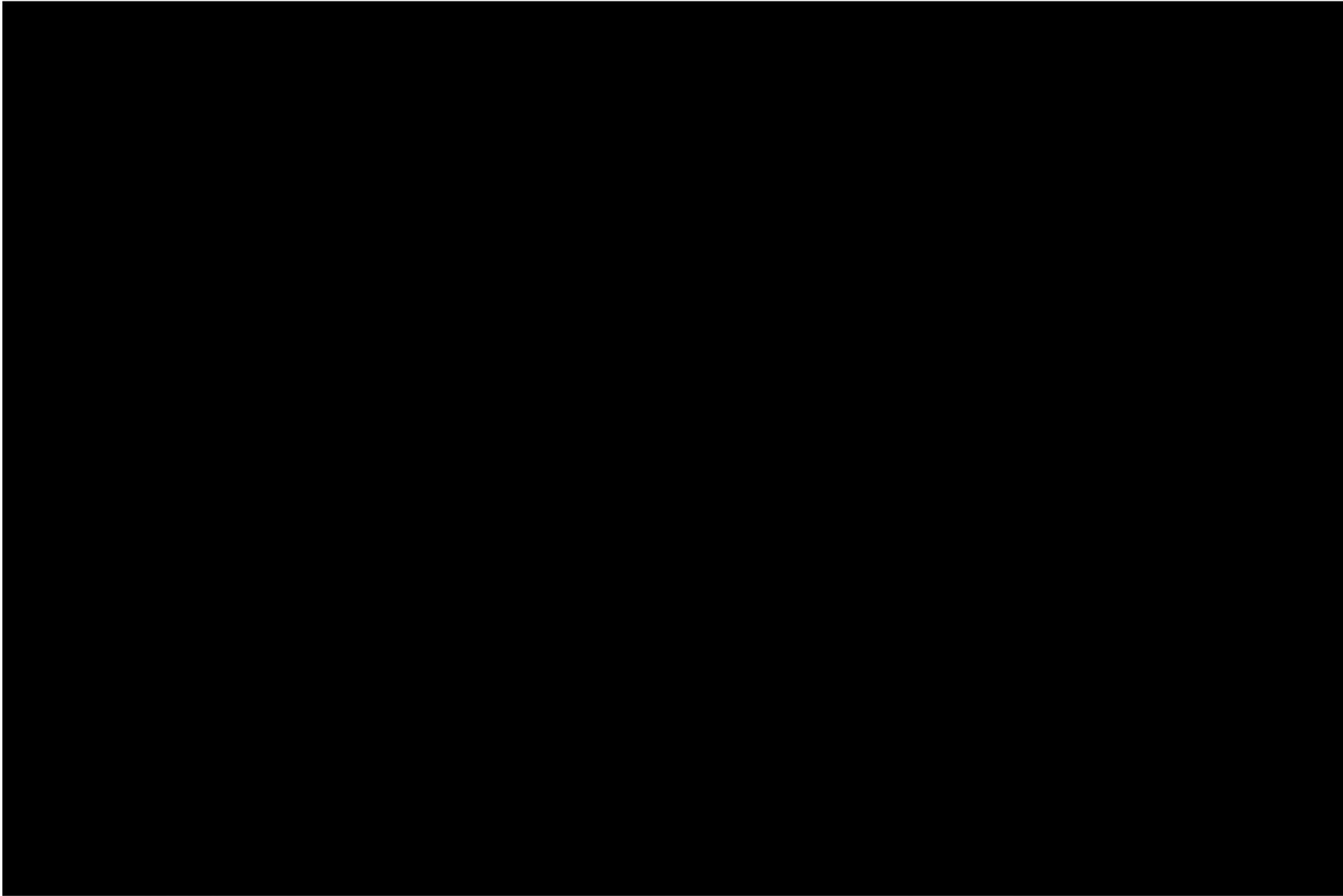
- Washdown & water features – Lions, hyenas, wild dogs
- Irrigation











 **DENVER WATER**

# WATER: TWICE IS NICE

Denver's water is too precious to use only once. We're doing our part to conserve by using **recycled water** for many jobs around the Zoo — from watering plants to cleaning animal habitats!

We use  
Recycled  
Water



Please don't drink  
from the sprinklers!

¡Favor de no  
beber agua de las  
mangueras!

Please report violations.  
Call 303-629-6229



## Signs of the Times

Look for these markers around the Zoo. They'll show you where we use recycled water to keep our landscaping green. **Please remember**— recycled water is quite clean, but **it's not drinking water.**

## Where does recycled water come from?

Treated wastewater, on its way to the South Platte River, is diverted to the Denver Water recycling plant to be cleaned again. After a complex scrubbing and filtering process, the recycled water is safe for wildlife, irrigation, and our animal friends.



# And now, a word from our Sponsors



Questions?



 DENVER WATER

# Recycled Water Cures All

- **Breaks the ice**
- **Creates hot air**
- **Generates energy**
- **Raises the dead**
- **Soothes the savage beast**
- **Provide a home for the buffalo to roam**
- **Make the grass grow**
- **Makes people happy**
- **Saves \$\$\$, water, and the world**

# Your Headline Goes Here



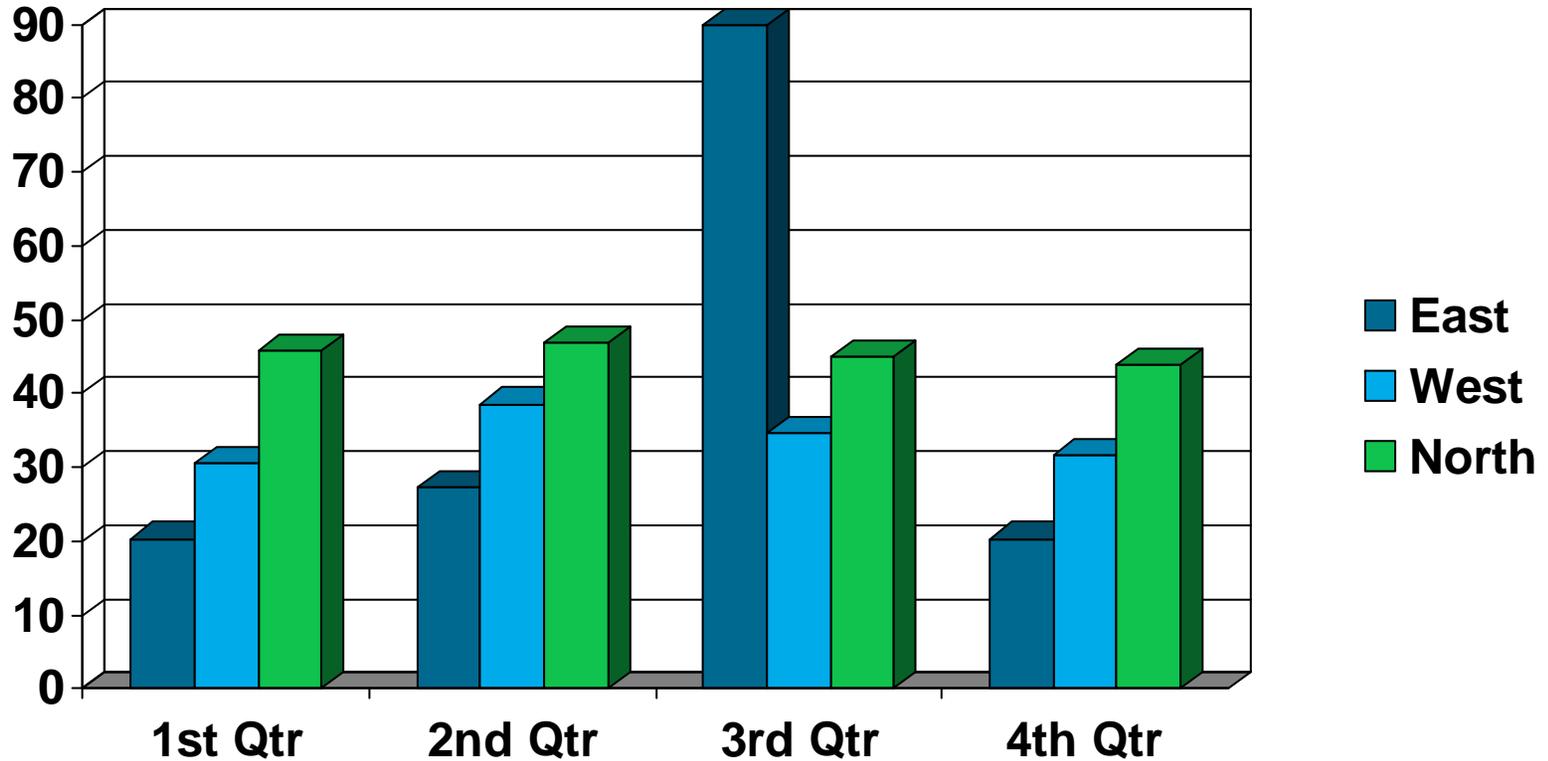
- **These Are Sample Bullets that Have Been Resized to Fit a Screen with Graphics or Photos**
- **Photo Borders Like this Are Easily Copied by:**
  - **Importing Your Picture**
  - **Click on the Watering Can Picture**
  - **Then Click on the Paintbrush in the Formatting Toolbar (Format Painter)**
  - **Then Click Once on Your Imported Photo**







# Sample Chart (double click to edit)



# Reverse Screen with Logo

1. To Make More of this style:
2. Copy & Paste this Slide
3. While in the Slide Sorter View
4. (little button on lower left of screen)
5. Do Not Apply Format/Slide Layout
6. Or this Layout will be Lost

# Reverse Screen without Logo

**To Make More of this style:  
Copy & Paste this Slide  
While in the Slide Sorter View  
(little button on lower left of screen)  
Do Not Apply Format/Slide Layout  
Or this Layout will be Lost**

# Recycled Distribution System

**60 miles of pipe**

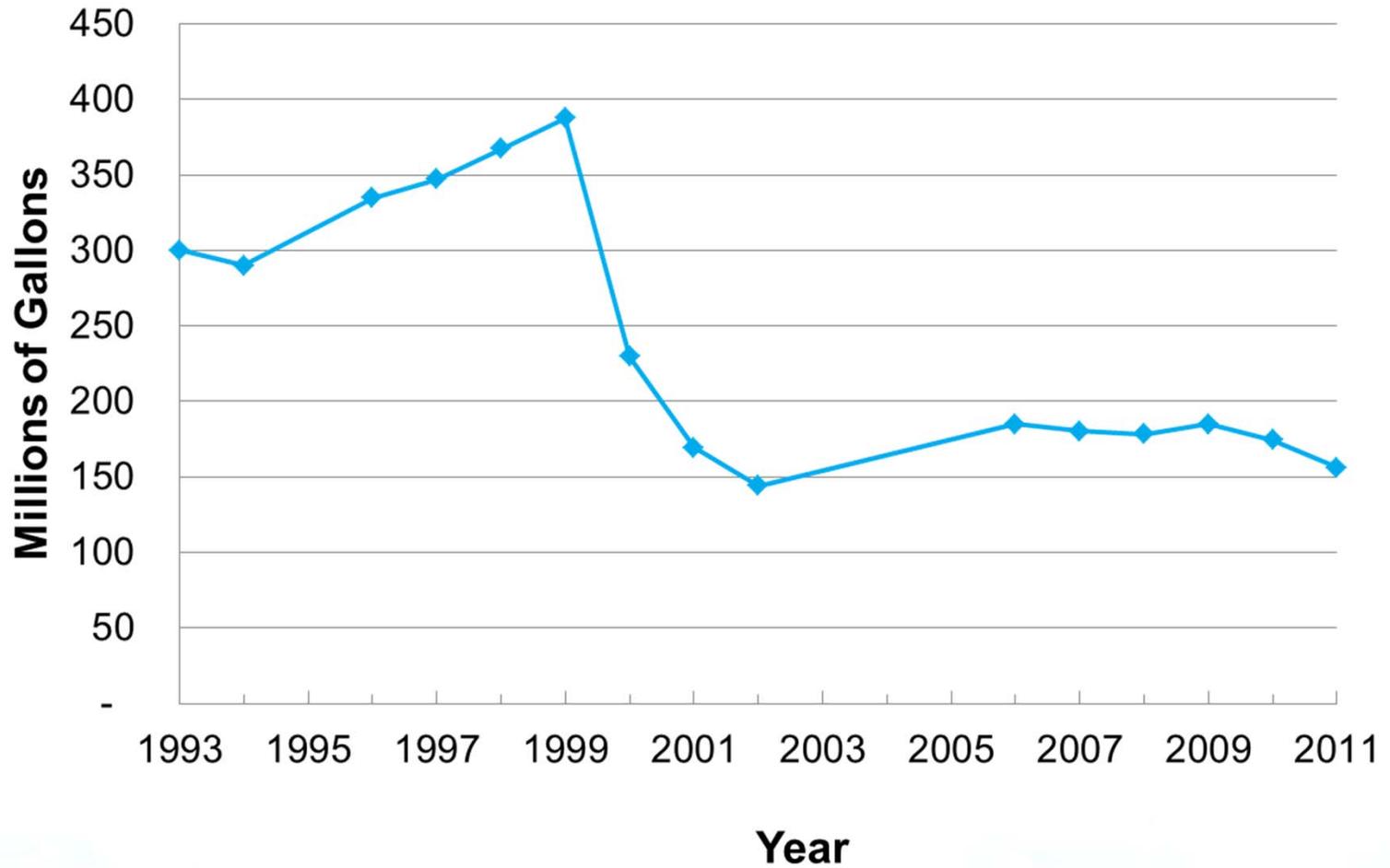
**3 Pump stations**

**2 Storage reservoirs**

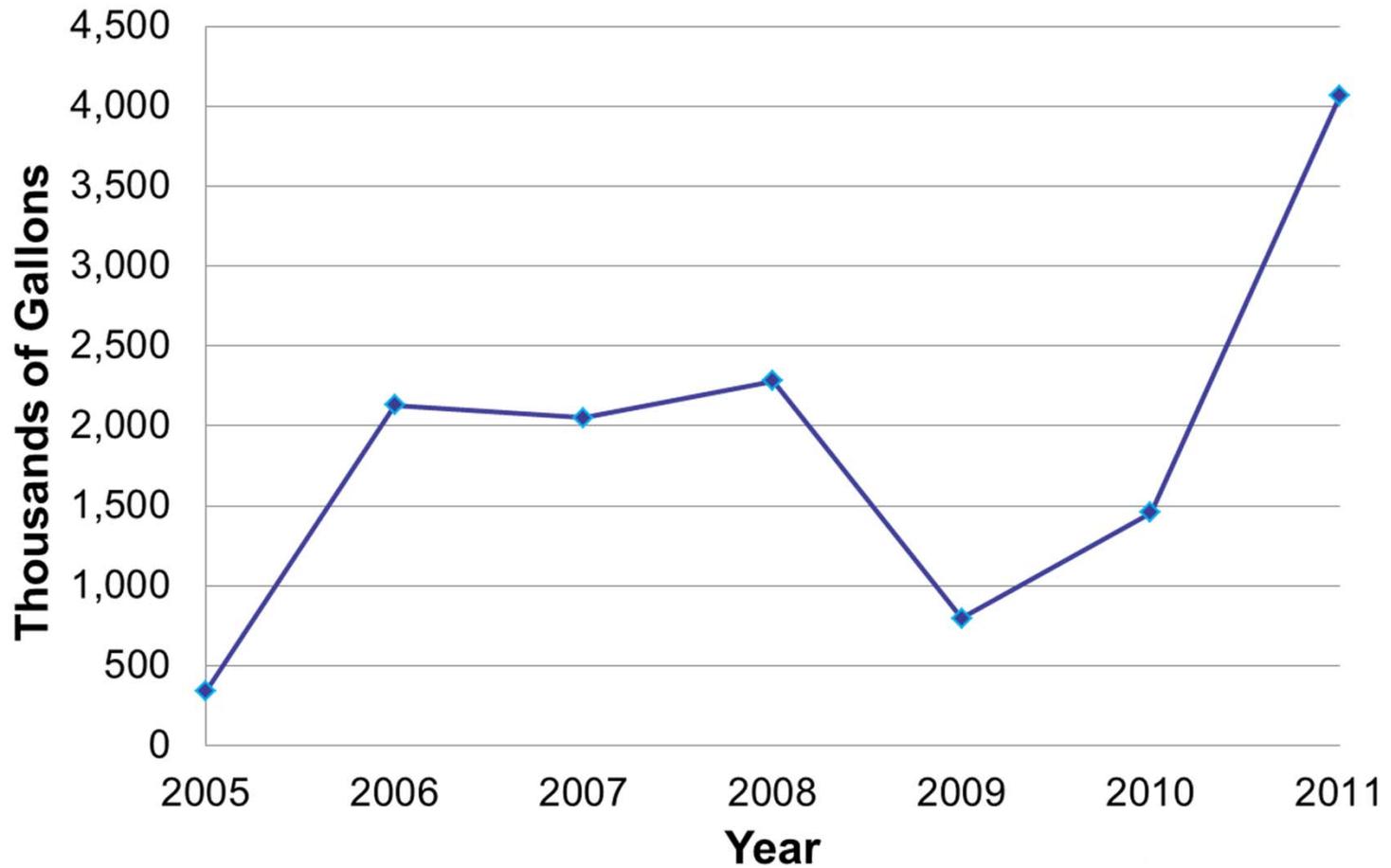
**1 Dechlorination facility**



## Denver Zoo - Historic Water Consumption 1993 - 2011 (Includes Potable + Recycled Water)



## Denver Zoo - Historic Recycled Water Consumption 2005 - 2011

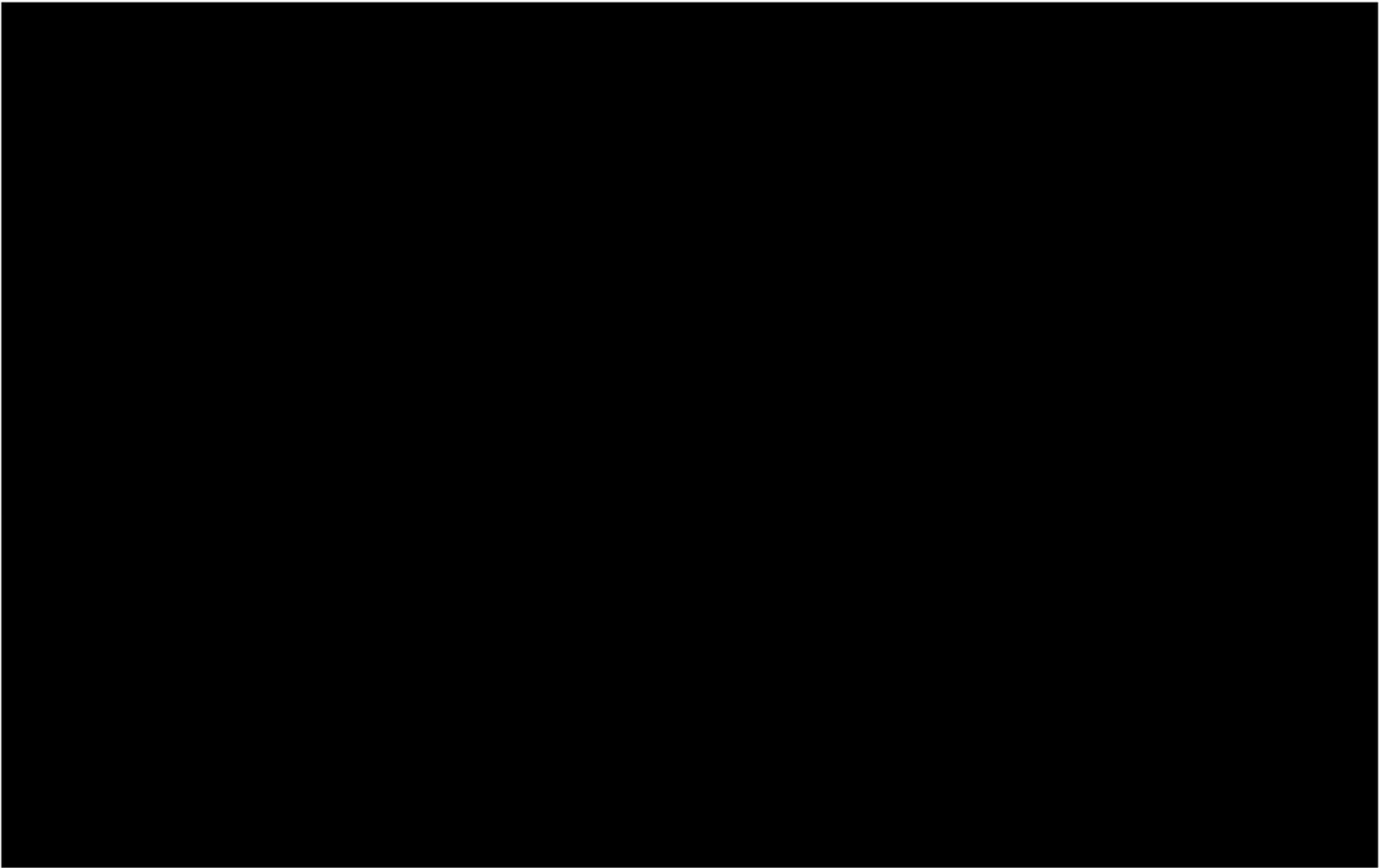


# Careful Planning & Integration

- **Incorporation into Regulation 84**
  - **Considers Animal Welfare Act**
  - **Water Quality better than required by federal law**
- **Design Reviews**
- **Cross-Connection Control**
  - **Conductivity Testing**
  - **Backflow for Containment**
- **Staff Training**

# Recycled Water Suitability

- **No observable health impacts to date for current operations**
- **Recycled water not appropriate for aquarium & reptile exhibits due to chlorine residual**
- **Recycled water under evaluation for marine species, particularly metal concentrations**



 **DENVER WATER**