



Watershed Management Session

Florentine AB – 3:00 – 4:15 PM

Watershed Management Session

Top Water Technologies in the Last 10 Years

- **Nanotechnology in filtration**
- **Membrane chemistry**
- **Seawater desalination**
- **Smart monitoring**
- **Intelligent irrigation**
- **Wastewater processing**
- **Mobile recycling facilities**

Watershed Management Session

One Water

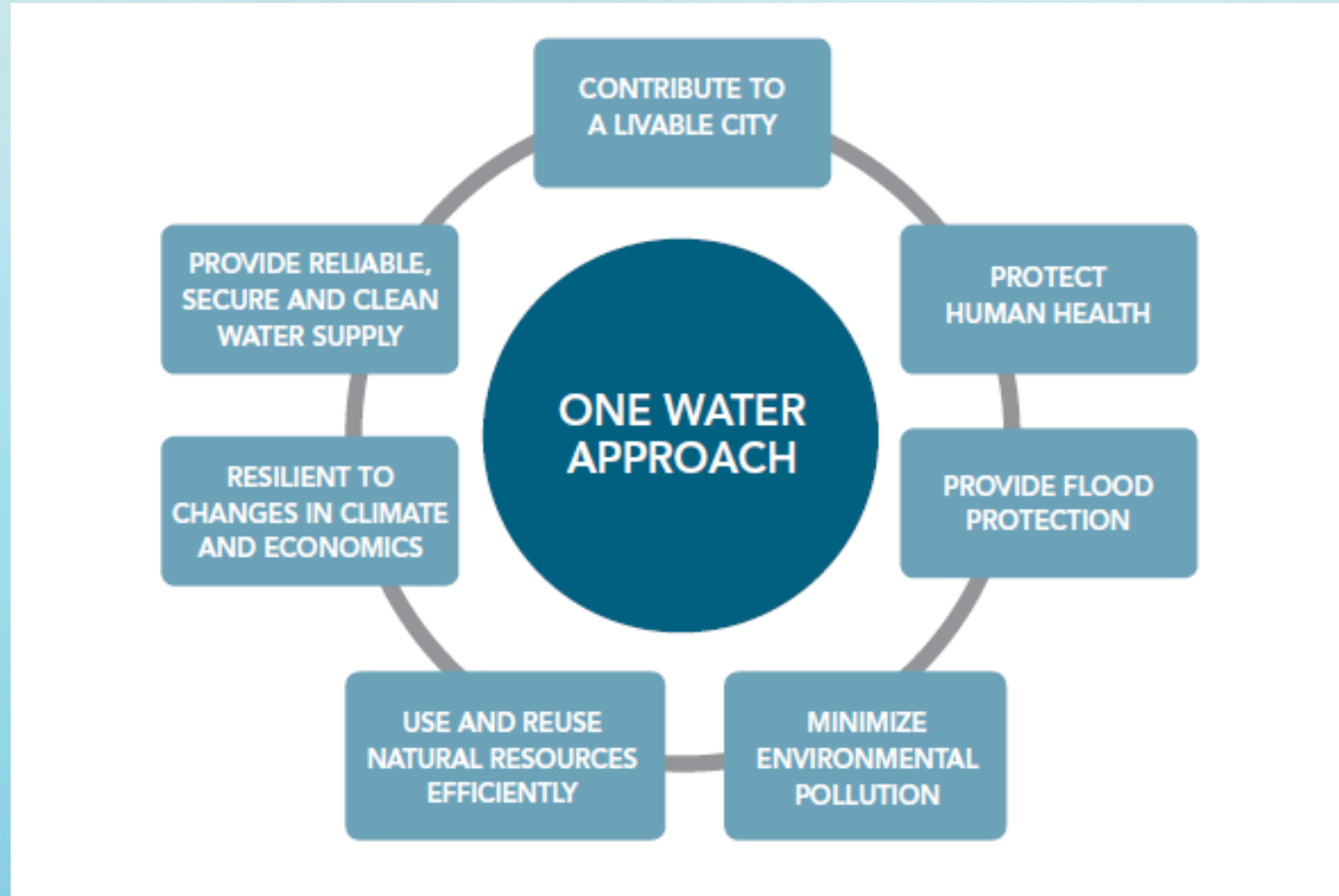
“One Water is simply defined as an integrated planning and implementation approach to managing finite water resources for long-term resiliency and reliability, meeting both community and ecosystems needs.

Watershed Management Session

Benefits by adopting One Water

- Greater resilience and reliability
- Opportunities to optimize regional infrastructure
- Sustainable community development
- New regulatory flexibility or opportunity
- Economic growth opportunity
- Increased coordination

Watershed Management Session



From Brine to Beautiful

A “One-Water” Approach for Inland Brine Disposal

Multi-State Salinity Coalition
Watershed Management Session – March 2, 2017

Mark Holmes
City of Goodyear, Arizona



Maricopa County
Parks and Recreation Department



ch2m

Background

- Largest R/O facility in the State of Arizona for drinking water supplies
 - 4.5 MGD treatment capacity

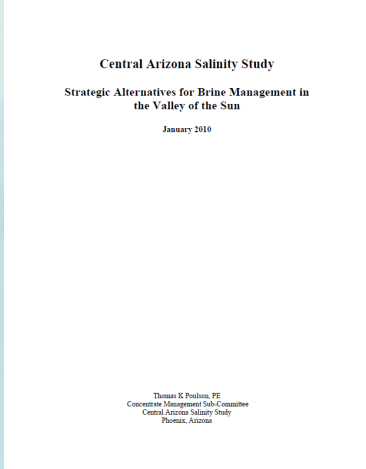


- R/O Process generates ~0.8 MGD of brine concentrate
 - Currently discharged to the City's WRF – chemically impacting this facility

Background

- Brine Concentrate has several constituents of concern
 - 8,000 mg/L TDS
 - High concentrations of
 - ❖ Selenium
 - ❖ Fluoride
 - ❖ Arsenic
 - ❖ Nitrate
- Currently sent to the City's water reclamation facility
 - Chemically impacting that facility
 - Taking up valuable capacity.

Inland Brine Disposal Dilemma



Alternative Comparison 10 mgd (millions of dollars)

10 MGD	Pipeline to Yuma	Evaporation Pond	Brine Concentrator	Soften/ RO/ VSEP	Wetlands Surface Discharge	Injection Well
Capital	\$266.11	\$651.69	\$272.71	\$286.56	\$150.22	\$ 114.46
O&M	\$ 0.62	\$ 3.50	\$ 29.75	\$ 6.90	\$ 1.75	\$ 11.31
Annualized	\$ 14.92	\$ 40.26	\$ 44.40	\$ 22.30	\$ 10.37	\$ 17.46

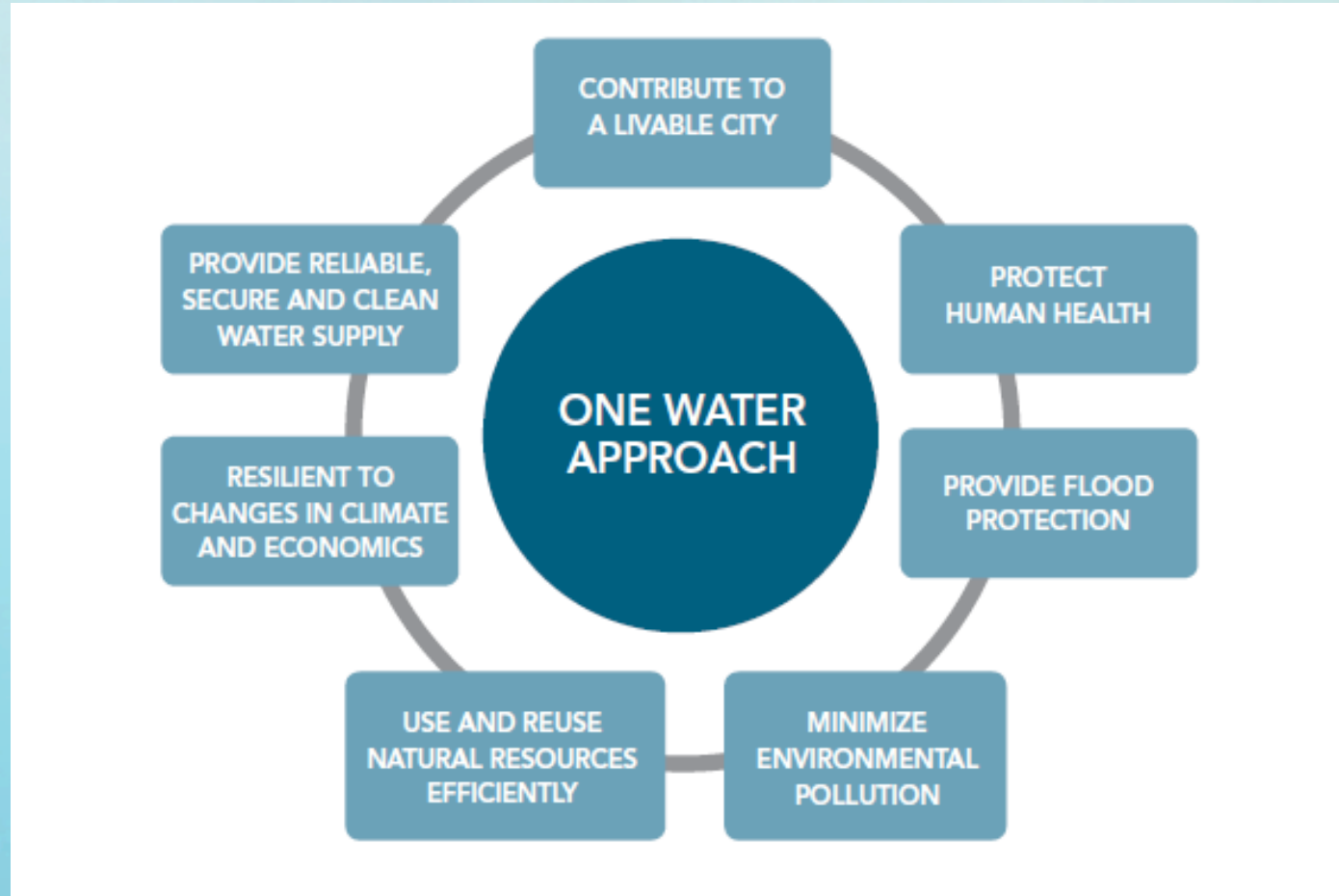


Goodyear Wanted to Examine Wetland Disposal

Developed a long partnership with the United States Bureau of Reclamation to accomplish:

1. Develop brine wetland concept – **Completed**
2. Design brine wetland pilot – **Completed**
3. Construct Pilot – Determine proof of concept – **Completed**
4. Feasibility–30% design for a demonstration project - **Completed**
5. Construct demonstration project – **Next Step**

Using One Water

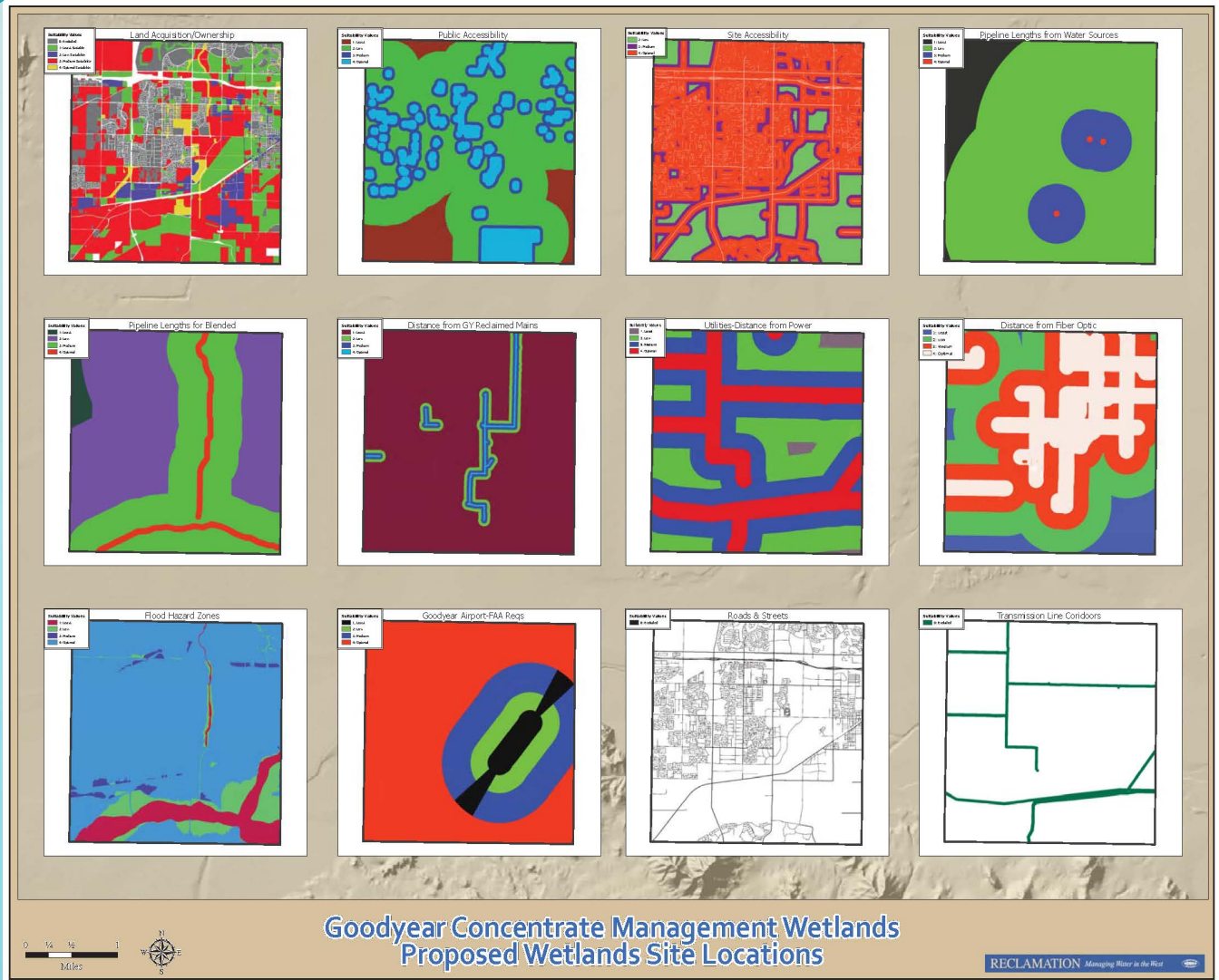


Feasibility Work

- Invited all potential stakeholders to participate
- Feasibility Work – Two parts
 1. Complete a wetland siting analysis
 2. Complete a 30% Design Concept Report (DCR)

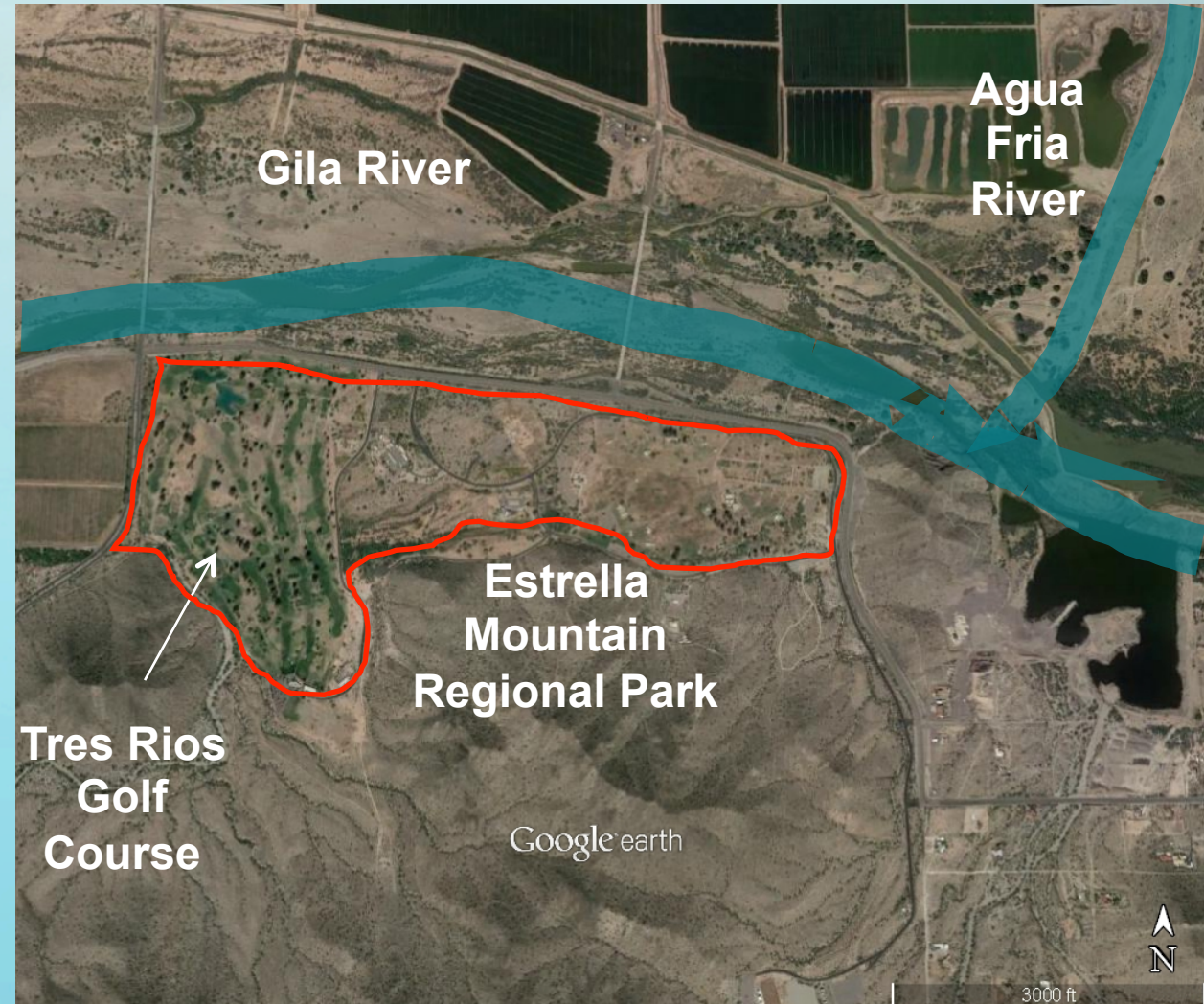
Siting Analysis

GIS Layers/Factors
Land Acquisition/Ownership
Public Accessibility
Site accessibility
Required pipeline length for Brine (6-inch)
Required pipeline length from treated Superfund (8-inch)
Required pipeline length from treated Effluent (8-inch)
Required pipeline length for Blend (12-inch)
Distance from COG reclaimed transmission main
Fiber Optic-Line Distance Needed
Energy requirements for Pumped Brine
Energy requirements for Pumped Superfund
Energy requirements for Pumped Effluent
Flood Zone Designations
Goodyear Airport Bird Strike Mitigation FAA requirements
Future Road Buffers - COG transportation planning
Power line transmission Rights-of-Way



Site Selection

- GIS siting analysis identified the Estrella Mountain Regional Park and the Tres Rio Golf Course as the optimum site
- Maricopa County Parks & Recreation the owner of the Park and Golf Course
- Had already been included as a stakeholder
- In the process of creating a new Master Plan for the park and were excited to include concept of a wetland
- Maricopa County has become a partner in locating the future wetlands



Water Blending Analysis

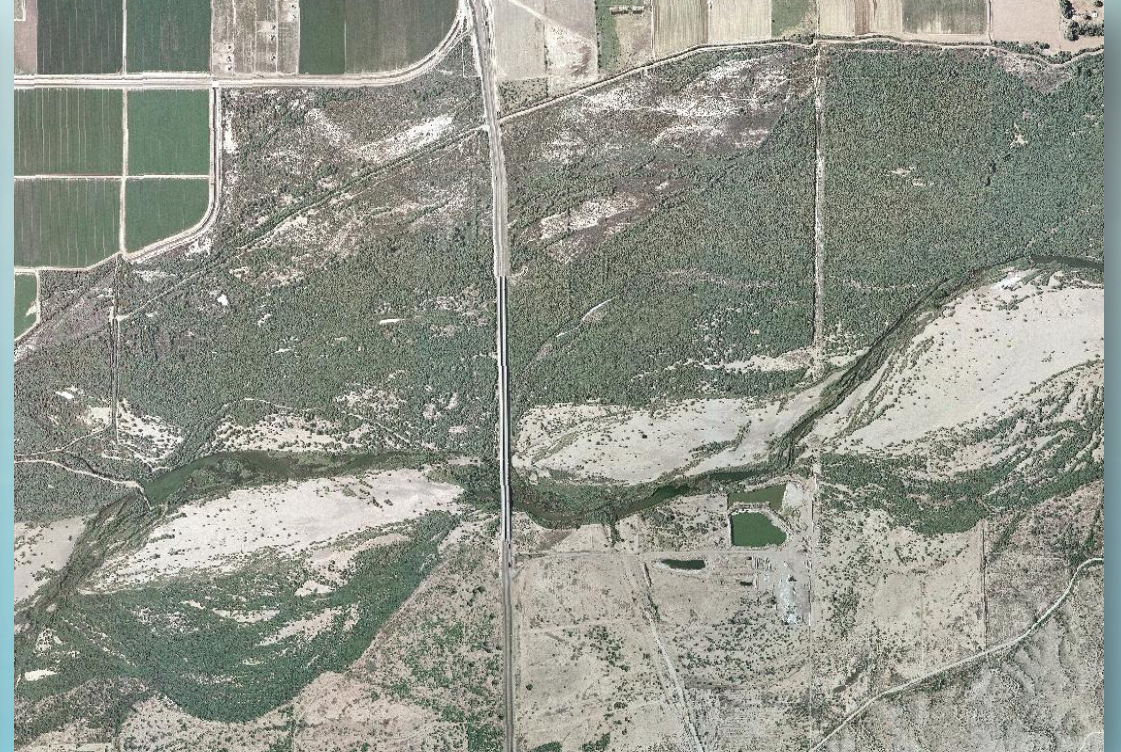
- High salinity wetland discharge will need to be blended with low salinity water to match water quality of discharge to the Gila River
- Superfund entities have expressed an eagerness for the increased pumping and treatment of water to expedite remediation
- They have become a partner in providing additional water supplies



Gila River Flooding Issues



1950



2002

Tamarisk (Salt Cedar) invasive propagation overtaking natural riparian vegetation

Gila River Flooding Issues

- Tamarisk causes a lack of river channelization
- Backs up water flows
- Increases flood zones of the river



El Rio Watercourse Plan

- Flood Control District of Maricopa County developing a strategy
 1. Flood mitigation
 2. Tamarisk removal
 3. Riparian restoration
 4. Perennial water supplies for channelizing the river and maintaining riparian vegetation
- Needs a perennial river flow



One Water Solution

- Create a beautiful wetland that will treat the City R/O brine flows
- Create a recreational, educational, and environmental enhancement at an existing recreational facility

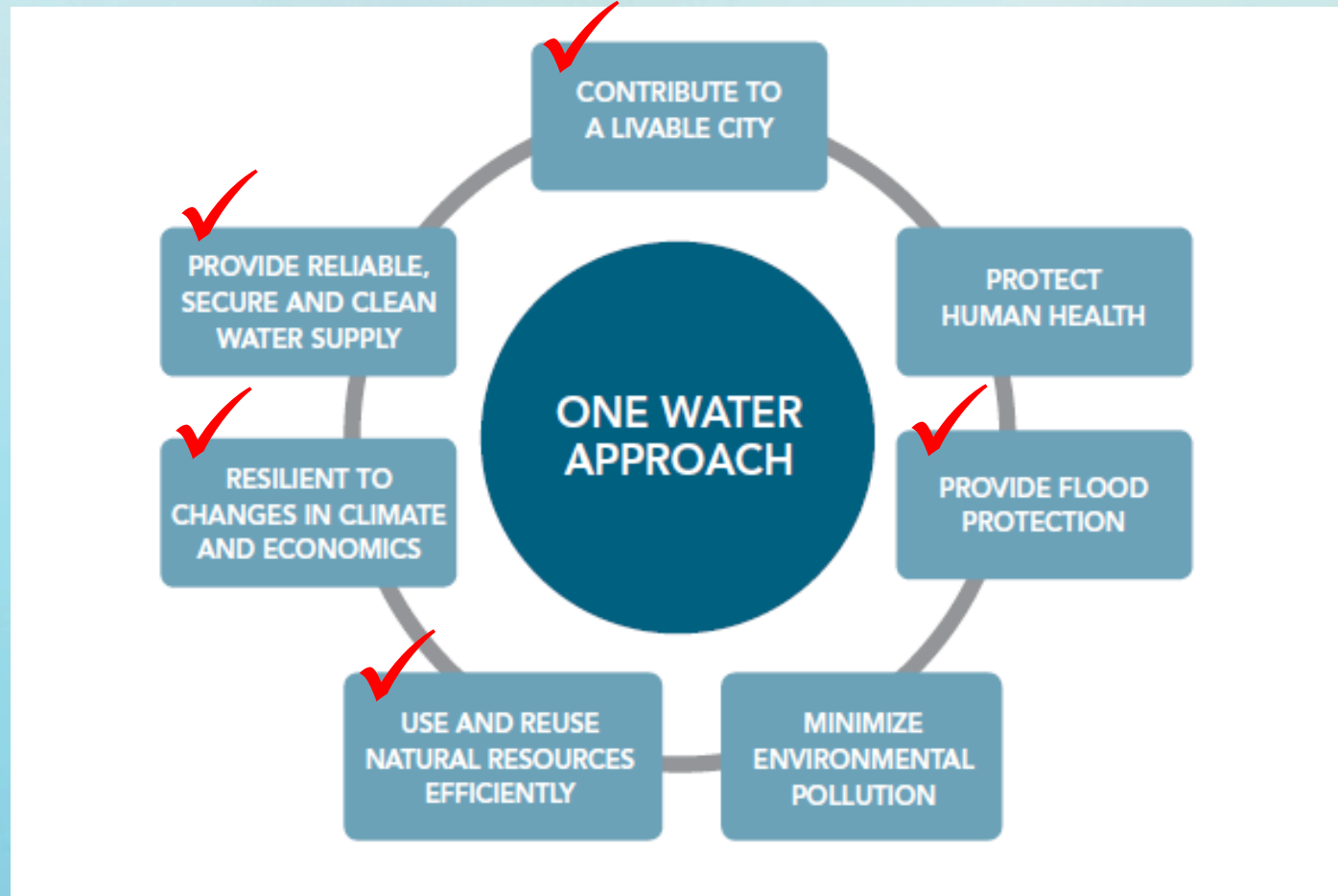


One Water Solution

- Provide a perennial water supply as part of a river restoration plan
- Maintain the restored river riparian area
- Keep the river channelized
- Mitigates flooding issues



One Water



Conclusions

From Brine to Beautiful

- Fully evaluated an inland brine disposal issue
- Included all potential stakeholders
- Developed new partnership opportunities
- Designed a beautiful wetland that will provide recreation, education, and environmental enhancements to an existing regional park
- Utilize remediated groundwater as a blending source for the wetland discharges into the Gila River
- Provide a perennial water source for the Gila River restoration, riparian health, and flood mitigation

Award Winning Approach



2016 – One Water “Program of the Year”



2016 – “Top Project”



2016 – “Most Innovative Project of the Year”



Questions
or
Comments??