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LIFT

**(Leaders Innovation
Forum for Technology)**

A joint initiative of:



THE
**Water
Research**
FOUNDATION®



**Water Environment
Federation**
the water quality people®

Welcome

LIFT Utility Working Group Meeting Learning and Innovating from Crises

August 18, 2020

Agenda

- ▶ Welcome and Introductions – Christobel Ferguson
- ▶ Learning and Innovating Through Crises – Jim McQuarrie
- ▶ Houston Faces Challenges Due to CDC Restrictions vs FEMA & CD Responsibilities – Jack Canfield
- ▶ El Paso Response to Water Security – Gilbert Trejo
- ▶ Leadership in An Uncertain World – VUCA – David Ross
- ▶ Panel Session – Q & A – Chaired by Jim McQuarrie & Erika Bailey

Vision

The water sector embraces innovation to support healthy, sustainable communities.

Mission

LIFT supports the efficient evaluation, demonstration, and deployment of innovative technologies and practices by providing a forum for collaboration among water sector partners.

Steering Committee



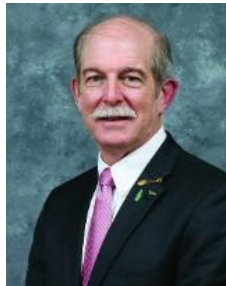
Chair

Jim McQuarrie
MWRD (Denver)



Vice-Chair

Erika Bailey
City of Raleigh



John Arena - Metropolitan Water District of Southern California

Dr. Charles Bott - Hampton Roads Sanitation District

Dr. Paul Bowen - Coca-Cola

Dr. Nancy Love - University of Michigan

Dr. Sudhir Murthy - NEW Hub

Mark Poling - Clean Water Services

Jeff Peeters - SUEZ

Dr. Tanja Rauch-Williams - Carollo

Dave Rexing - Southern Nevada Water Authority

Col Chapman (Liaison) - Queensland Urban Utilities

Jeff Lape (Liaison) - U.S. EPA

Discover the most timely
and relevant innovations

Explore new technologies firsthand
and understand the relevance for
your utility

Spread knowledge gained
across the water sector

Evaluate the applicability of
the innovation for your context

Implement the innovation within
the water business



Leading and Learning Through Crises

- ▶ **Resolve** – common sense of purpose
 - ▶ **Resilience** – adapting to new conditions
 - ▶ **Return** – developing strategy to move forward
 - ▶ **Reimagination** – the opportunity to reinvent ways of doing things
 - ▶ **Reform** – preparing, planning and creating the future
-
- ▶ Liz Weinstein – Business & Finance>Strategy
 - ▶ <https://www.business2community.com/strategy/the-5r-strategy-to-getting-your-business-back-on-track-02311899>

Learning and Innovating Through Crises

Jim McQuarrie

Director, Strategy & Innovation

Metro Wastewater Reclamation District

Chair of LIFT Steering Committee

In a recent survey of more than 200 organizations across a variety of industries...

The COVID-19 crisis presents an opportunity that few feel equipped to pursue.

Although most executives agree that innovating the business will be critical ...

... few feel equipped to face the challenge.

90%

believe that the COVID-19 crisis will fundamentally change the way they do business over the next 5 years

85%

are concerned that the COVID-19 crisis will have a lasting impact on their customers' needs and wants over the next 5 years

21%

have the expertise, resources, and commitment to pursue new growth successfully

2/3

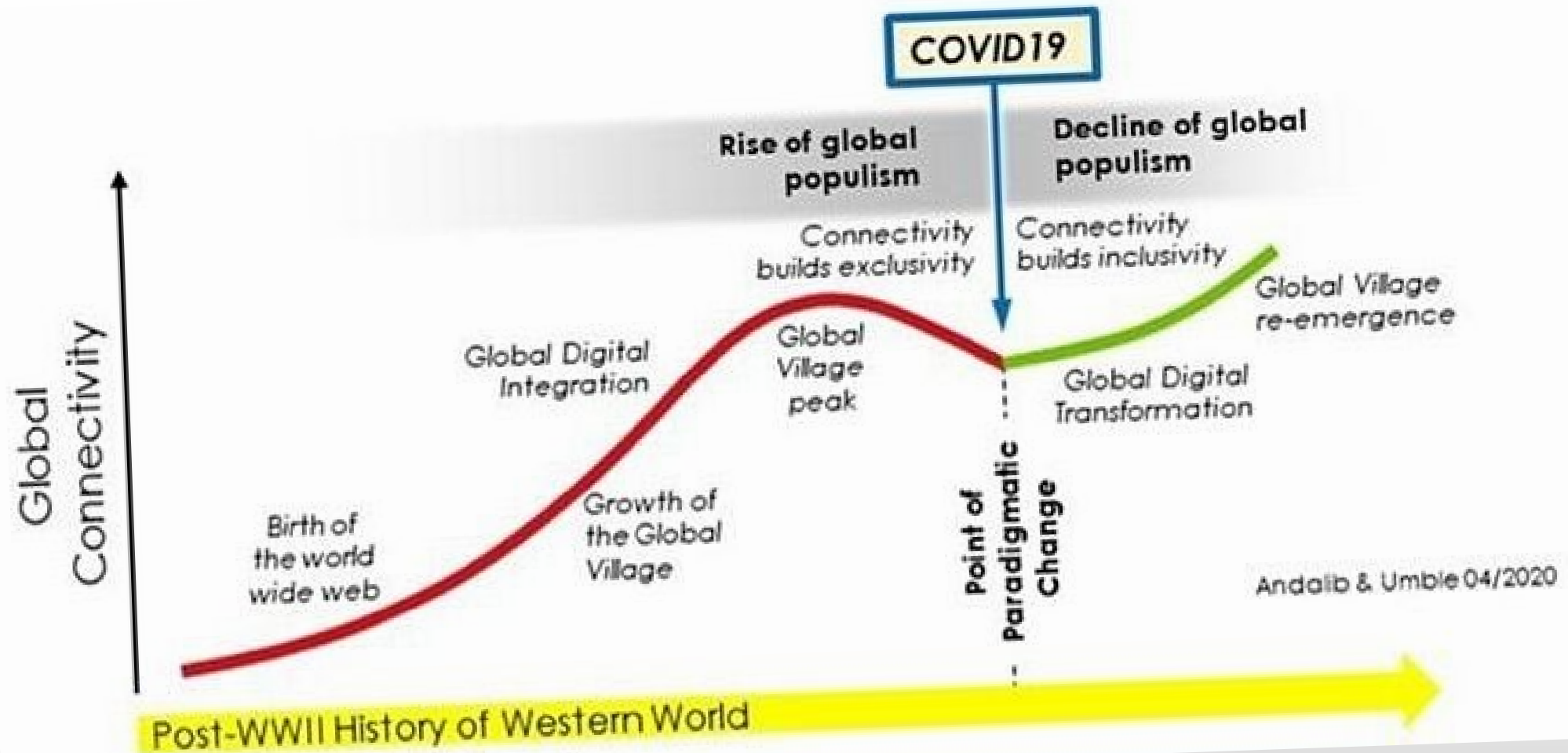
believe that this will be the most challenging moment in their executive career

McKinsey
& Company



Getting Back to Normal

- Continuity of Core Operations and Service
- Budget Cuts and Balanced Budgets
- Supply and supply chains





Moving To a New Normal

- Highly Integrated Municipal Services
- Resource Sharing and Resource Efficiency
- Data Analytics
 - Automated Supply Chain Management
 - Predictive Process and Maintenance Control
- Massive Shift in Work Force Talent
 - Changing Expectations of the Workplace

Houston Faces Challenges Due to CDC Restrictions vs FEMA & CD Responsibilities

Jack Canfield
Assistant Director
City of Houston



HOUSTON FACES CHALLENGES DUE TO CDC RESTRICTIONS VS FEMA & CD RESPONSIBILITIES

JACK CANFIELD

HOUSTON PUBLIC WORKS/WASTEWATER



A LITTLE BIT ABOUT OUR BIG TOWN



Current Census statistics show that Houston has a population of approximately 7.1 million residents; Houston Water facilitates roughly 3 million of that population, adding nearly 1.1 million more people since the 2010 census.

And, our city continues to grow!

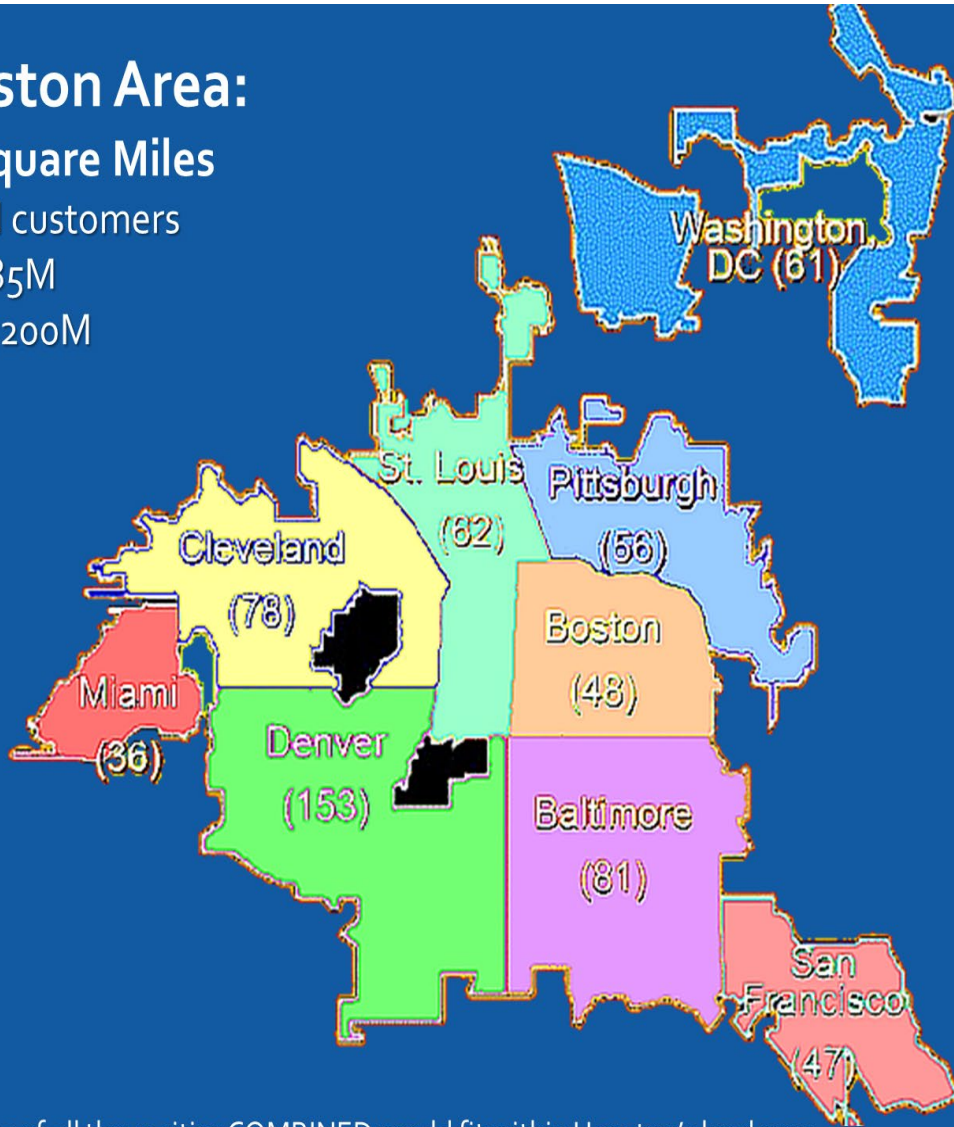
Houston Area:

650 Square Miles

2.2 mill customers

CIP \$185M

O&M \$200M



The land area of all these cities COMBINED would fit within Houston's land area

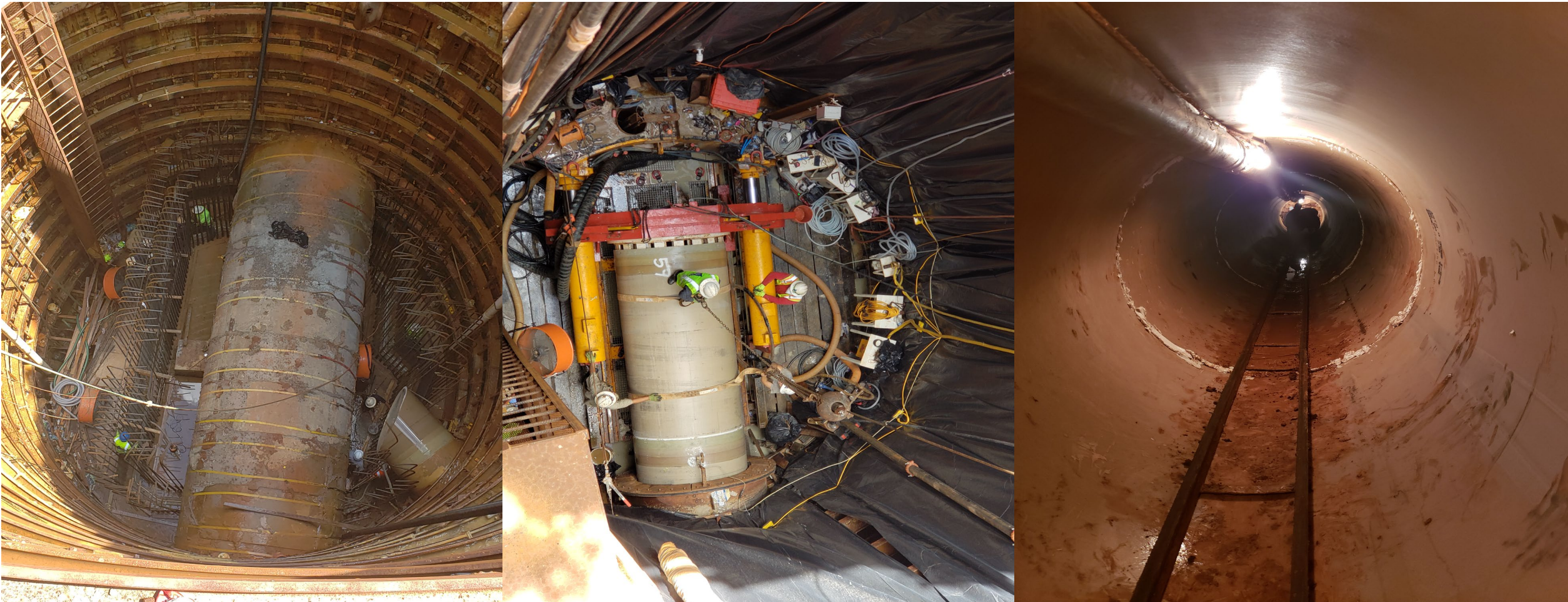
WASTEWATER INFRASTRUCTURE

- 39 WWTP (563 MGD Permit)
- 3 Wet Weather Facilities
- 384 Lift Stations
- 837 Private Lift Stations
- 5,900 miles of Sewer Pipe
- 310 miles of Force Main
- 128,000 Manholes

CHALLENGE #1

Hurricane Harvey (2016)

HOUSTON HAS TUNNEL VISION



CHALLENGE #2

2 Billion Dollar Consent Decree (2019)

INTERNAL/EXTERNAL RESOURCES WORKING (TOGETHER)

Contractor Work



City Work



CHALLENGE #3

Covid 19, AKA Coronavirus (2020)



100 YEAR PLAN



El Paso Response to Water Security


Gilbert Trejo
Chief Technical Officer at El Paso Water
President, WateReuse Association



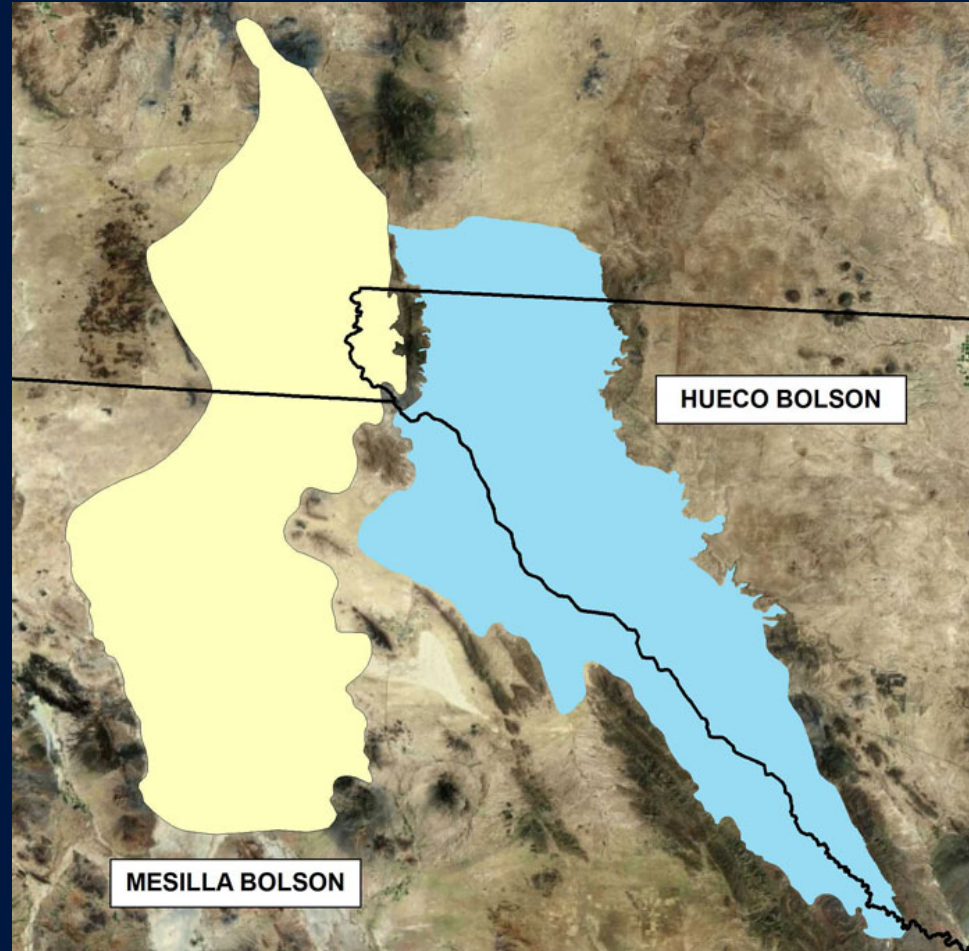
Water Supply Diversification through Water Reuse

Gilbert Trejo
Chief Technical Officer, El Paso Water
August 2020

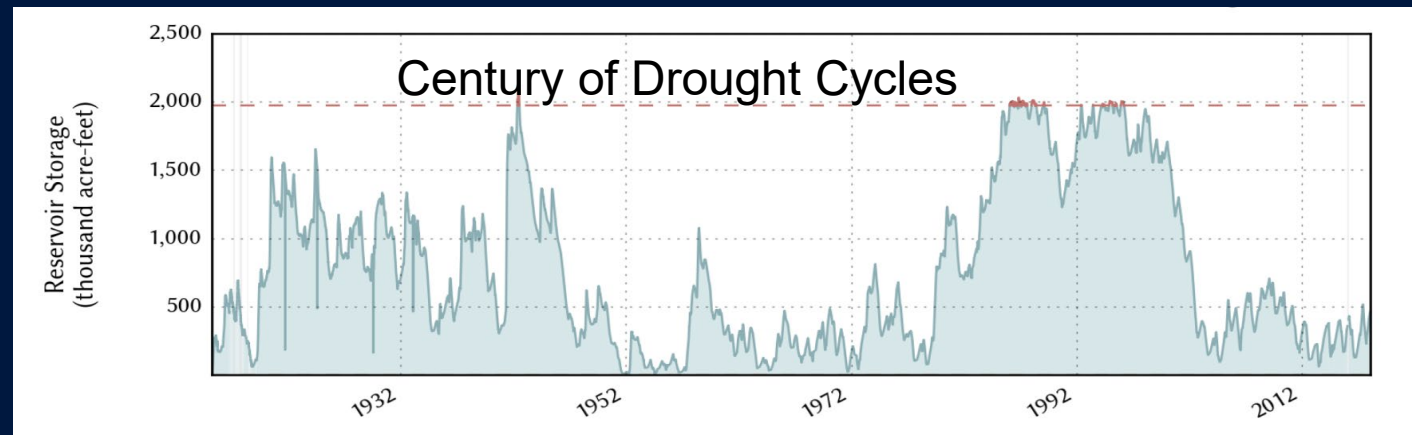
Topics for Today

- El Paso's reuse, conservation, diversification
 - Brackish Aquifer and Desalination
 - Desalination Plant/expansion plans
 - Concentrate Management
 - CERRO/well-head
 - Advanced Water Purification Facility
 - Water quality monitoring
 - KANDO, advanced warning system
 - Industrial Pretreatment Program
- 

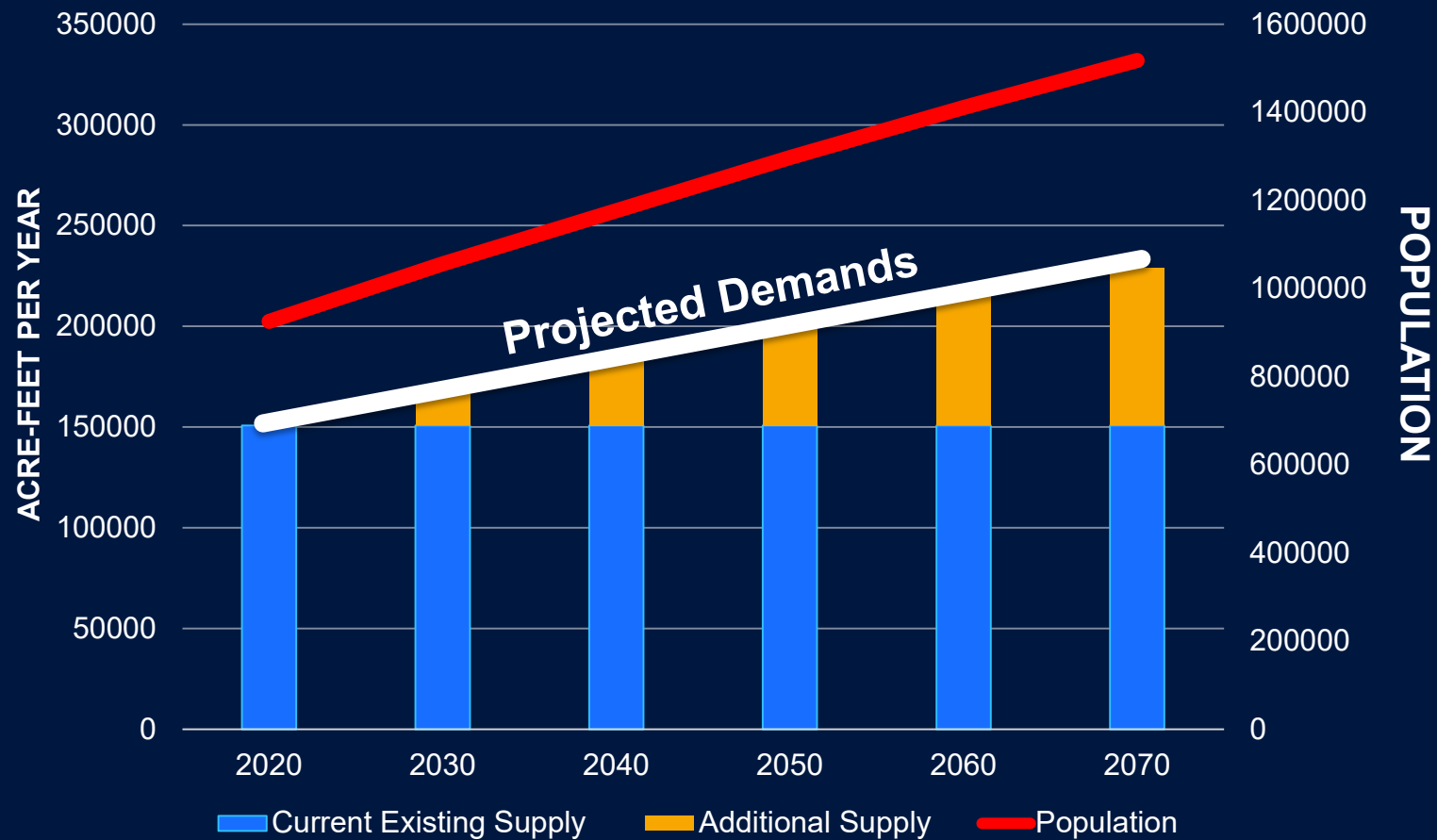
Three states, two countries, one vital resource



Rio Grande flows to Elephant Butte Reservoir



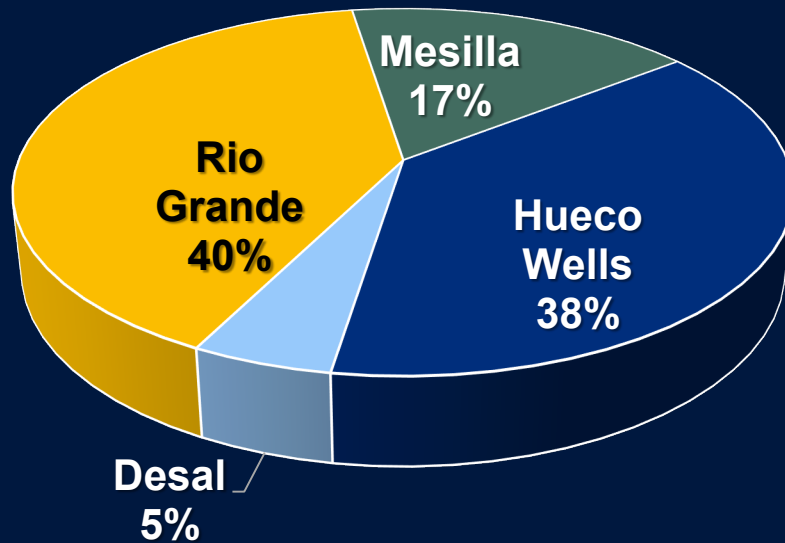
New water sources are needed to meet demands of increasing population



El Paso's Water Sources: Today vs. 2070

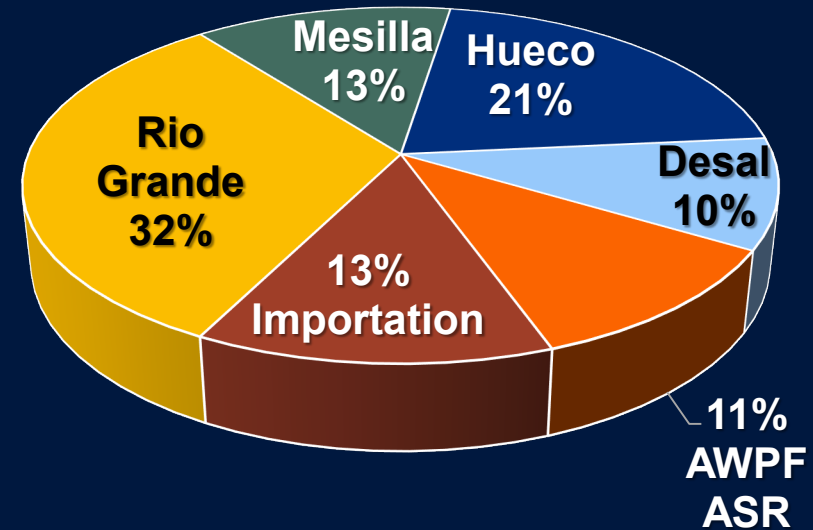
TODAY - 2018

Water Supply: **158,000 AF**
Normal (Non-drought) Conditions



2070 Estimates

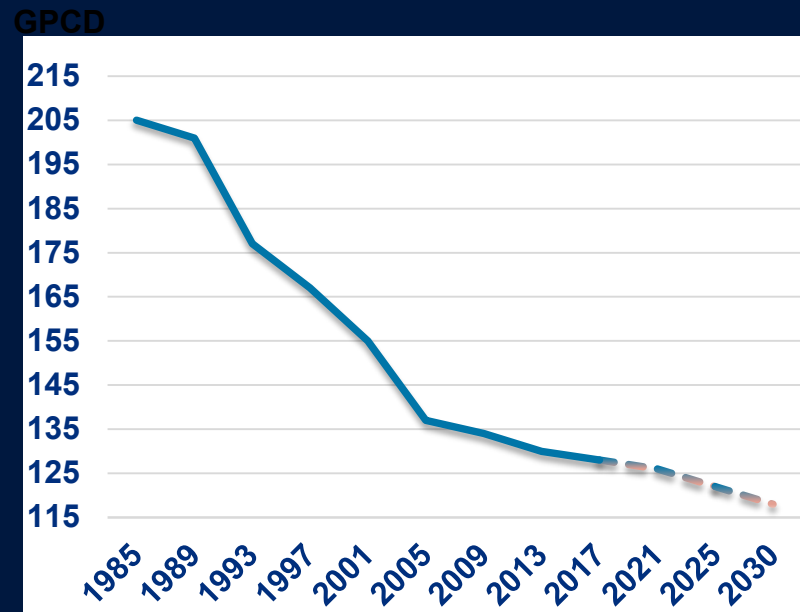
Water Supply: **210,000 AF**
Normal (Non-drought) Conditions



Ratios of different supply sources currently and in 2070 are based on concepts developed in state water plan. Rio Grande is about half of current supply during non drought.

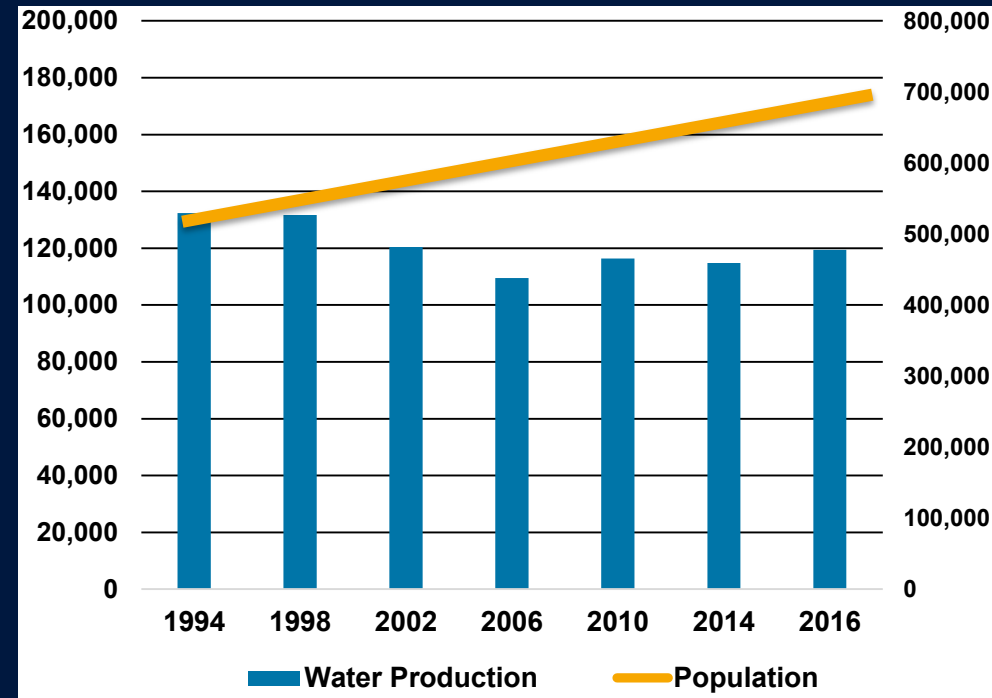
Water conservation is part of the solution

Water conservation has reduced per person consumption by 35%



1985: 205 gallons per person per day (GPCD)
Today: 128 GPCD
2030: 125 GPCD (Target)

170,000 more people using less water than 24 years ago



El Paso was early mover on reclamation



- El Paso launched water reclamation efforts in 1963
- El Paso Water produces 2.2 billion gallons annually of recycled and treated wastewater for irrigation, industrial, and construction uses
- Since 1985, we have used set quantities of reclaimed water to recharge the aquifer

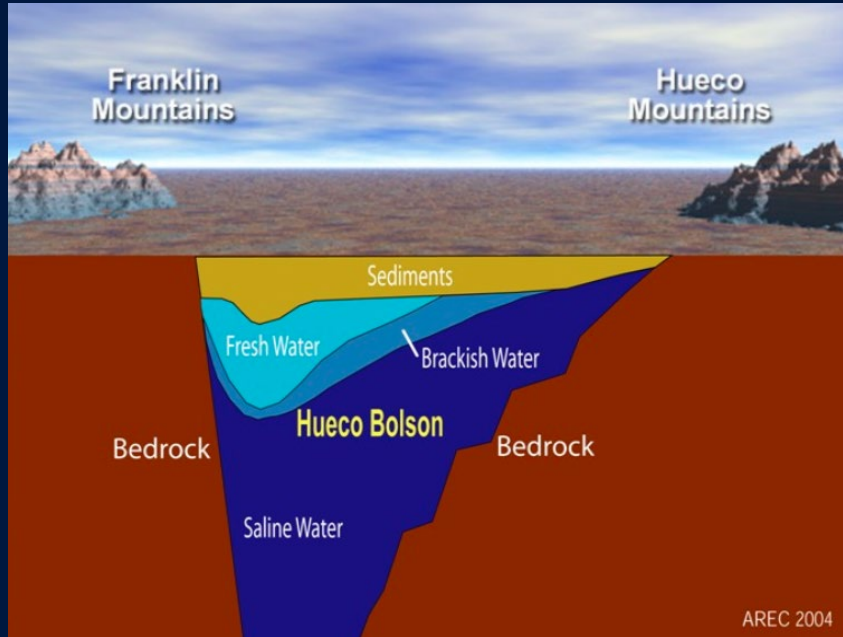
Plans underway to expand aquifer recharge with river water

For 30 years, our Fred Hervey Reclamation Plant has treated reclaimed water to drinking water standards and used it to recharge the aquifer through injection wells and infiltration basins.



EPWater has completed a feasibility study and has begun design of a new project to use water from the Rio Grande in non-peak periods to expand aquifer recharge, using an enhanced arroyo for infiltration.

Desalination in El Paso



Far more brackish and saline water in our aquifer than fresh water

Key Bailey Hutchison Desalination Plant

Opened in 2007 as the largest inland desalination plant in the world

- Built in partnership with Fort Bliss for water security and to help with drought, emergency situations, city growth, brackish water intrusion
- Produces up to 27.5 million gallons of fresh water per day
- Two phase expansion could increase production initially from 27.5 to 33.5 mgd over the next five years and then later to 42.5 mgd.

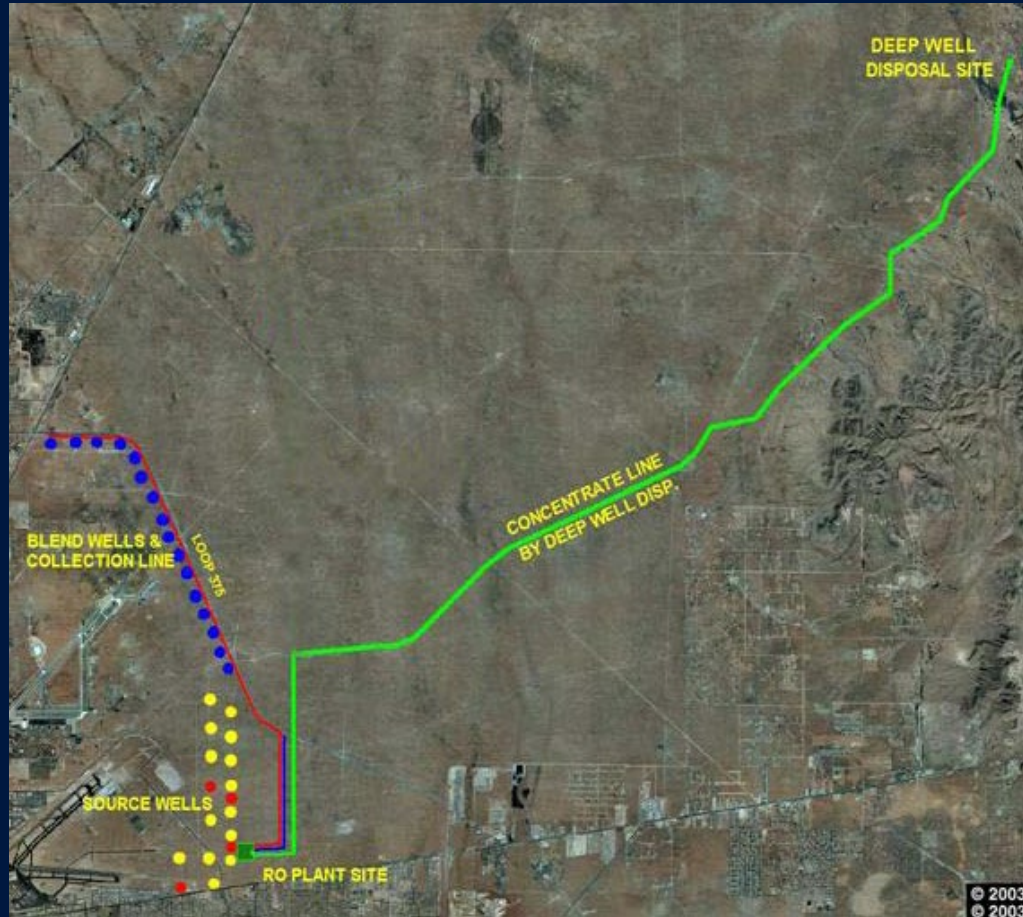


Desalination Plant protects freshwater aquifer and unlocks long-term sustainability



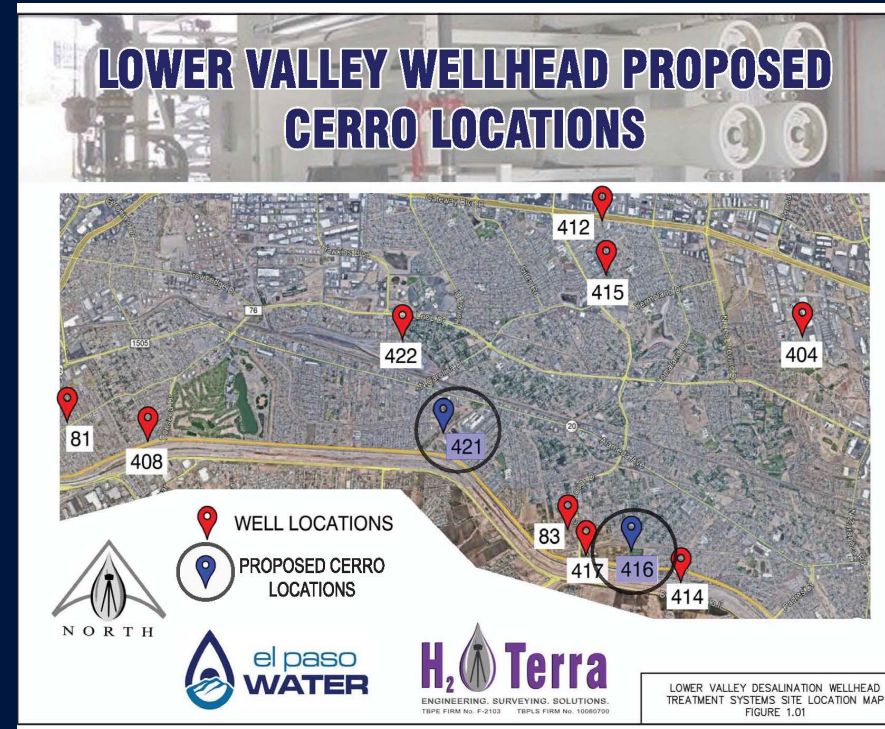
- Reduces the pressure on scarce supplies of fresh groundwater and provides drought resilience when surface water is in short supply
- Protects groundwater supplies from brackish water intrusion

Concentrate Management

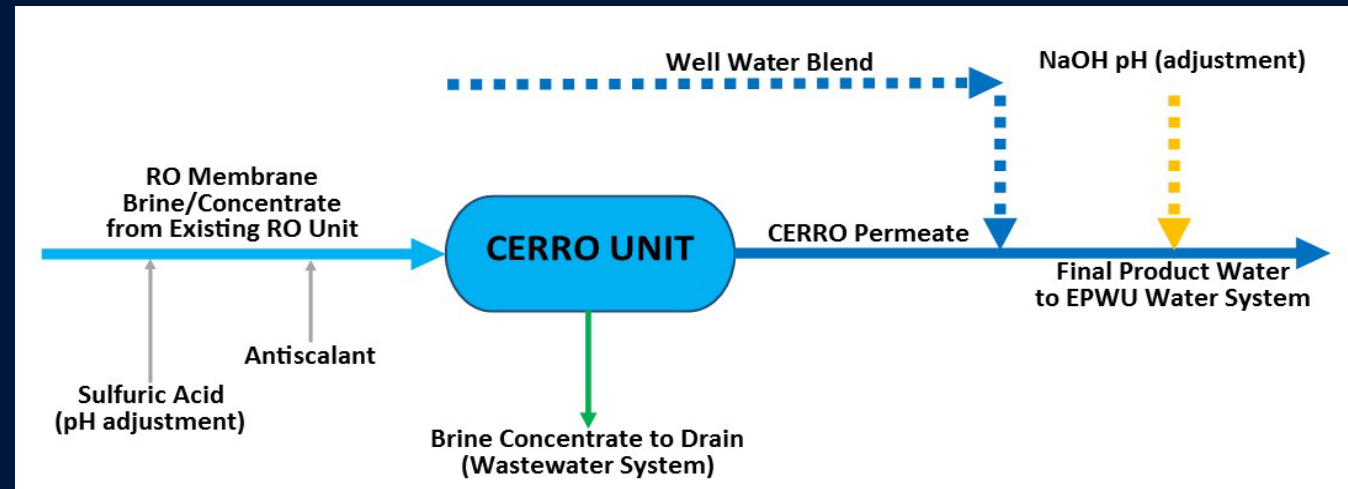


RO technology provides desalination at wellheads

- EPWater operates 11 Reverse Osmosis (RO) membrane units at Lower Valley wells to treat brackish groundwater to potable standards
- The Lower Valley wellhead RO units discharge up to 25% of their water production to the sanitary sewer as membrane concentrate



CERRO technology provides additional well optimization



- Concentrate Enhanced Reverse Recovery Osmosis (CERRO) is a new batch process that reduces the volume of concentrate produced from feed water with high TDS.
- CERRO units are planned to be added to Lower Valley RO units to increase output and decrease concentrate.

Advanced Water Purification will convert treated wastewater directly into drinking water



- Proposed as first pipe-to-pipe direct potable reuse facility of its scale in the nation
- Potential to provide up to 10 MGD for drought resilience

Independent Expert Panel Review

Administered by the National Water Research Institute



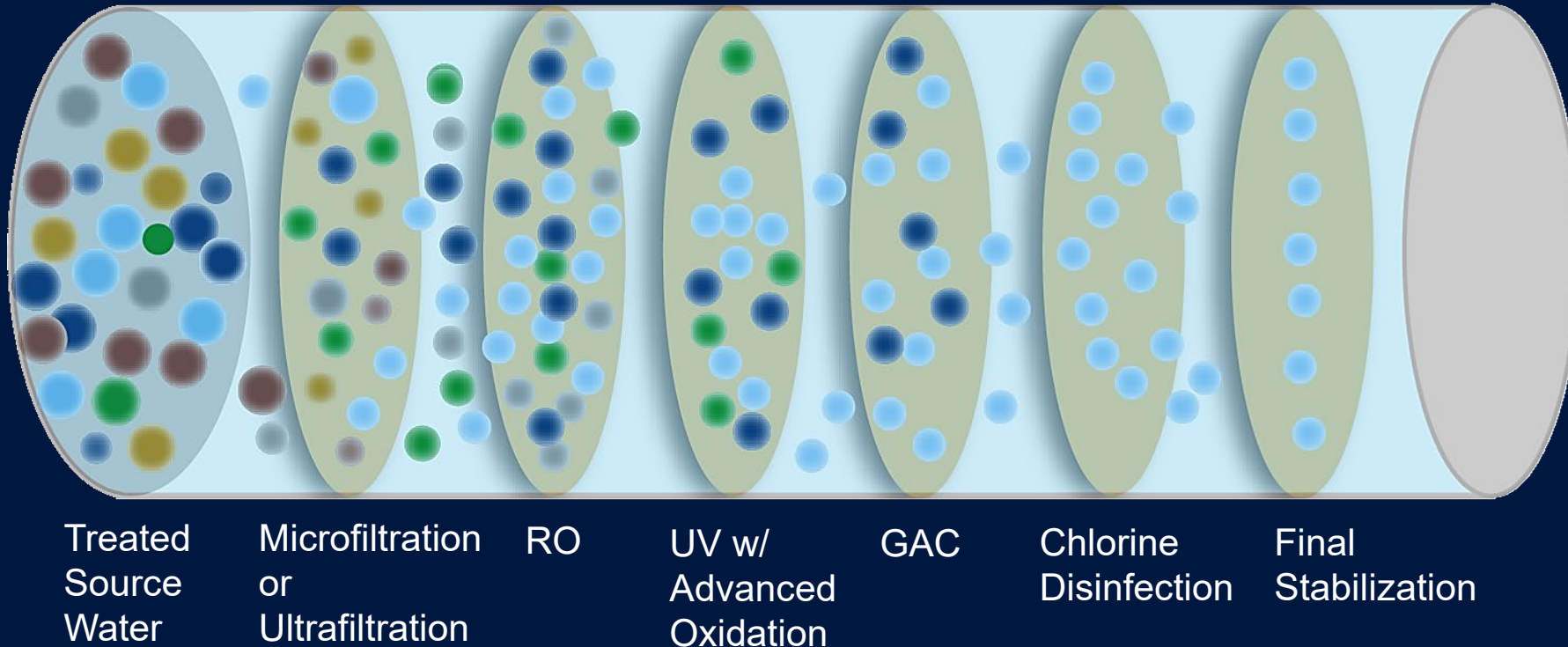
Expertise:

- Treatment engineering
- Reuse regulatory criteria
- Chemistry, microbiology
- Public health risk assessment
- Source control
- Public outreach and engagement

Input provided on:

- Design of Pilot, developing test plan
- Operating the pilot to test various treatment technologies
- Monitoring strategies
- Components of the DPR system

Series of purification technologies proposed



Successful pilot project



Panel endorsement

- Key factors:
 - Source water quality — secondary clarified water from WWTP
 - Multiple barrier approach
 - Water quality goals, including finished water goals for non-regulated constituents
 - Protection of the potable water system
 - Ongoing public outreach



Partners in Purification program

- Engagement with industrial stakeholders – beyond permitting, inspections and enforcement
- Identify and address source control dischargers into the wastewater collection system
- Tours, meetings, conversations around pretreatment



Given the importance of TCEQ's emphasis on raw water quality, upstream industrial relationships are essential to get their buy-in on standards and controls.

Improving Quality Control for Influent

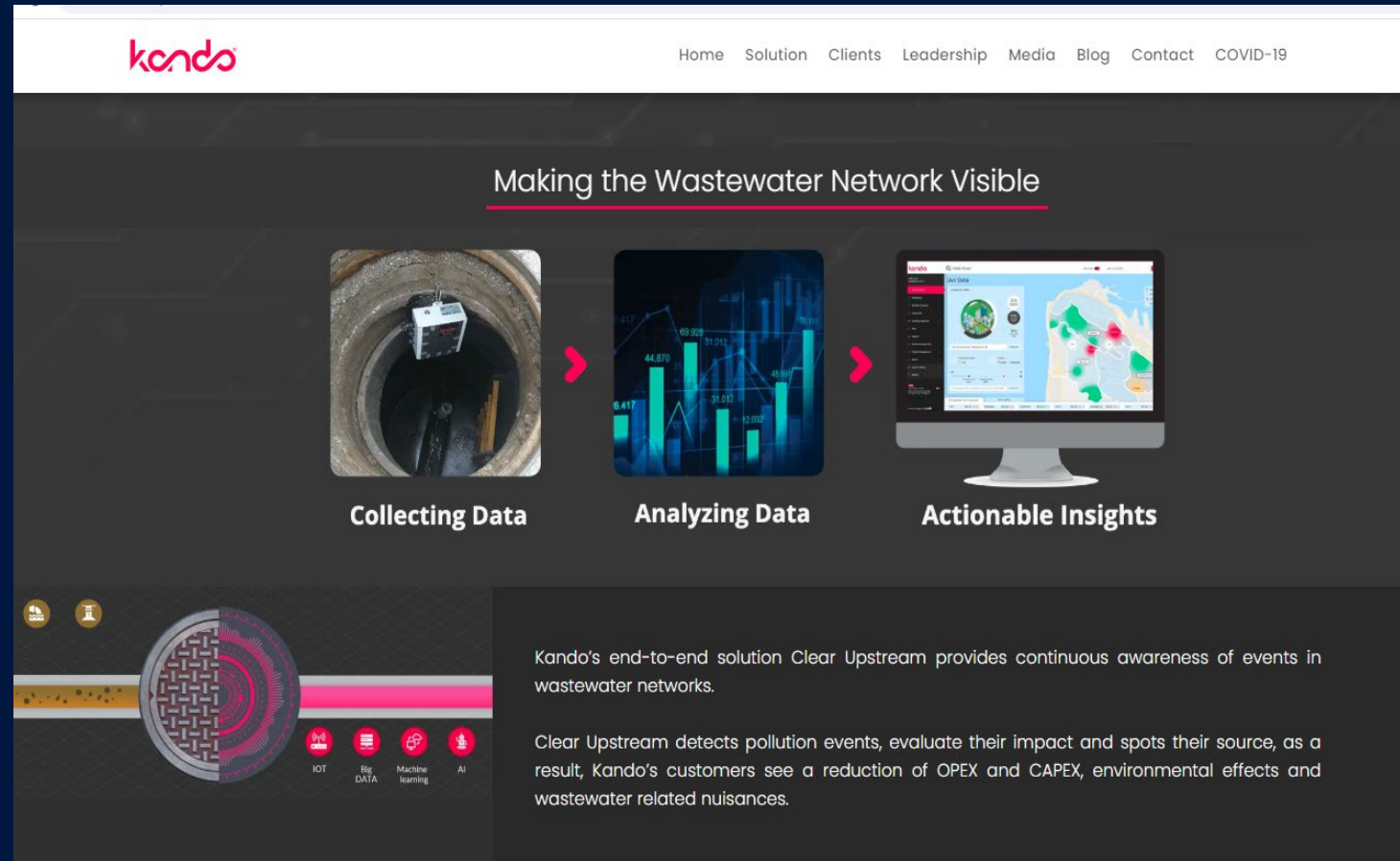
EPWater determined the need to revise the BOD industrial local limit for BOD: 300 mg/L

- Addresses increased concentration of BOD in wastewater quality (byproduct of conservation)
- Addresses compliance of our wastewater treatment plants with TCEQ design rules for treatment processes
- Improves quality of source water for AWPf
- Shifts burden to companies to make process changes

BOD-intensive industries most impacted by limit

- Food Processing
- Commercial Laundry
- Waste Treatment

Real time monitoring - Kando



Protecting the Pipes



- Unblended purified water has high acidity levels with potential to damage pipes in the distribution system
- Blending helps stabilize the pH levels
- Corrosion inhibitors will also prevent corrosion in the system

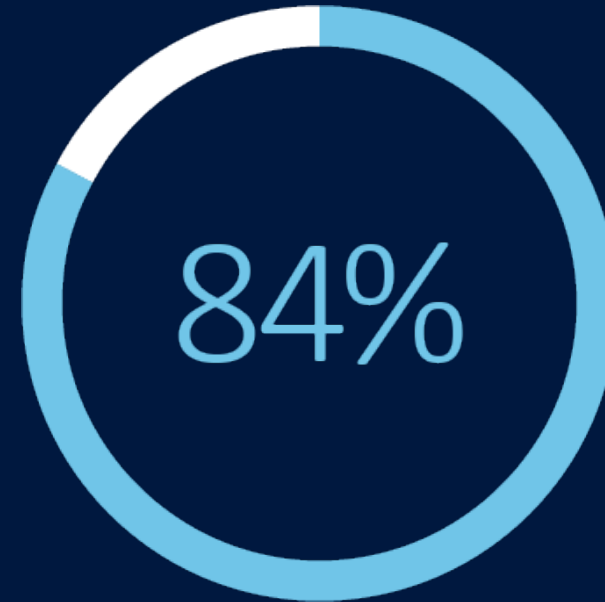
Training for managers/workers

- “One Water” workers – training and certifications required for both water and wastewater systems
- EPWater involved both water and wastewater managers in training for pilot and future facility



Stakeholder engagement

- Continuous engagement with TCEQ regulators, stakeholders and customers essential to building trust and confidence
- During pilot phase, EPWater provided significant outreach through:
 - Tours
 - Speakers bureau
 - Media relations
 - Bill inserts
 - More



Survey showed that 84% of El Pasoans support advanced purification project.

Leadership in An Uncertain World – VUCA

David Ross
Founder and Managing Director
Phoenix Strategic Management, Australia

Leadership in an Uncertain World

DAVID ROSS

18TH AUGUST, 2020



The pull of the future

**What got you here, won't
get you *there***

We don't do linear anymore....

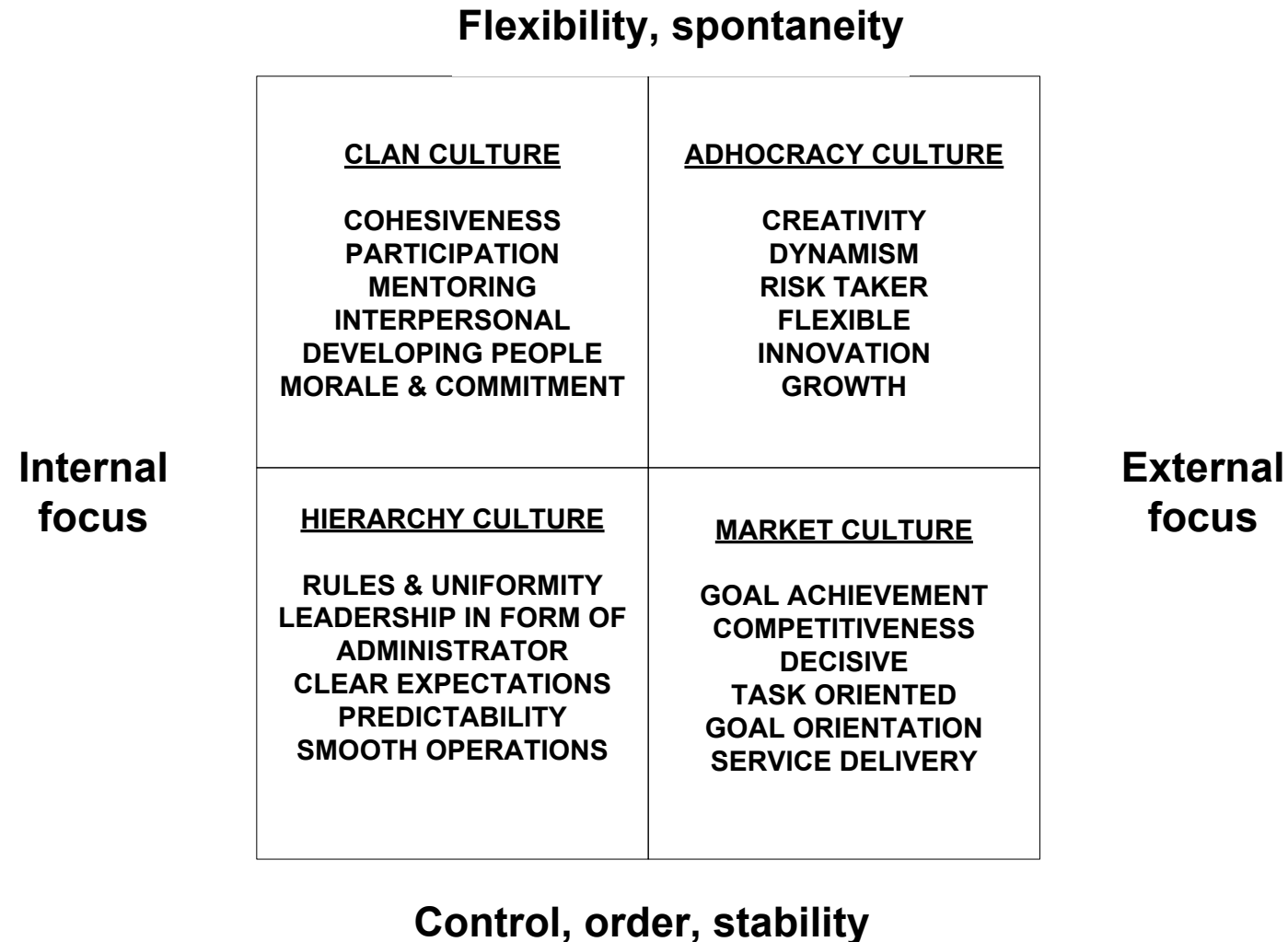
**VUCA, solastalgia
.....& trust**

The push of the present

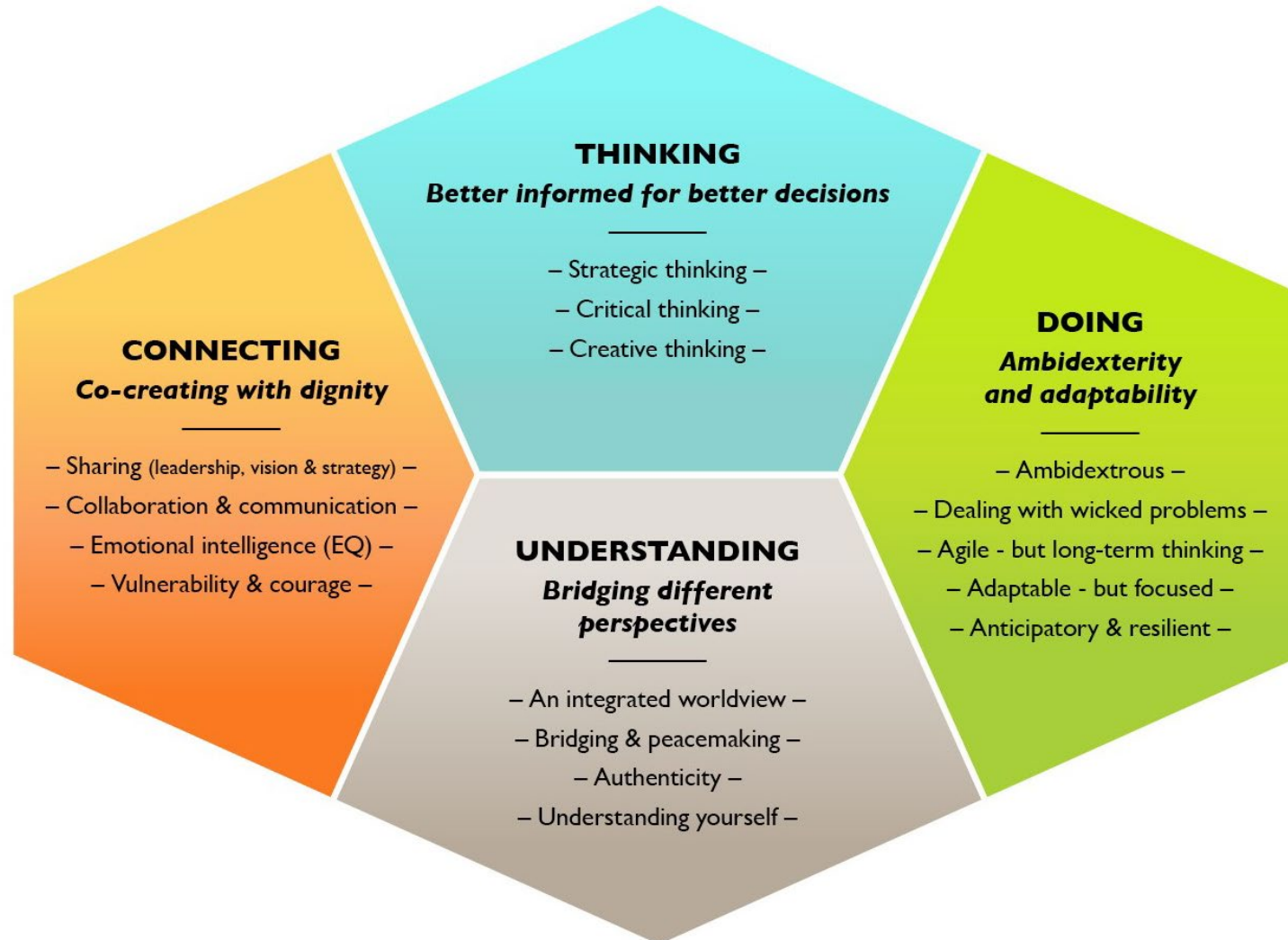


Resilience, innovation and robustness

The weight of history



Leadership in an Uncertain World



Pulling it all together



How could the “weight of history” hold your organisation back from thriving?

Pulling it all together



**What would an outsider do
in your situation, as a
leader?**

Pulling it all together



What will your legacy be?

Reflections: Thinking



Key considerations

What are we trying to achieve?

Does our direction *still* have the right “fit” with the environment within which we operate?

Do I have the appropriate information at my disposal to make a decision? Do I have appropriate breadth and depth to an understanding of my context?

Reflections: Connecting



Key considerations

Unwittingly, is my story about being the heroic leader? Can I comfortably share control with those that have relevant expertise?

How does my behaviour affect others? And how does the behaviour of others affect me?

Am I comfortable in admitting that I don't always have the answers?

Reflections: Doing



Key considerations

How do we evaluate and *adapt* with respect to the delivery of our strategic / corporate plan / programs? Are we responsive to change?

How do I hold two different perspectives as a leader? E.g. short- versus long-term? Or being adaptable while remaining focused?

Reflections: Understanding



Key considerations

How do I see the world? Where does our organisation fit into the community & natural world?

Am I comfortable at *respectfully* bridging different perspectives?

What are my blindspots?

What do I need to do AND what do I need to *be*?

Panel Session - Q&A

Jim McQuarrie & Erika Bailey

Thank You!

Comments or questions, please contact:
cferguson@waterrf.org

For more information, visit www.waterrf.org/lift