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
FIND IT

Explore new technologies firsthand and understand the relevance for your utility
SEE IT

Evaluate the applicability of the innovation for your context
TRY IT

Spread knowledge gained across the water sector
SHARE IT

Implement the innovation within the water business
DO IT
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](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 …

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 FACED 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!
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

The land area of all these cities COMBINED would fit within Houston's land area
CHALLENGE #1

Hurricane Harvey (2016)
HOUSTON HAS TUNNEL VISION
CHALLENGE #2

2 Billion Dollar Consent Decree (2019)
# INTERNAL/EXTERNAL RESOURCES WORKING (TOGETHER)

<table>
<thead>
<tr>
<th>Contractor Work</th>
<th>City Work</th>
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<td>![Contractor Work Image]</td>
<td>![City Work Image]</td>
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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

Century of Drought Cycles
New water sources are needed to meet demands of increasing population.

![Graph showing projected water demands and supply vs. population growth from 2020 to 2070. The graph illustrates the need for new water sources to meet increased population demands.]
El Paso’s Water Sources: Today vs. 2070

TODAY - 2018
Water Supply: 158,000 AF
Normal (Non-drought) Conditions

- Rio Grande: 40%
- Mesilla: 17%
- Hueco Wells: 38%
- Desal: 5%

2070 Estimates
Water Supply: 210,000 AF
Normal (Non-drought) Conditions

- Rio Grande: 32%
- Mesilla: 13%
- Hueco: 21%
- Importation: 13%
- Desal: 10%
- 11% AWPF ASR

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

- Treated Source Water
- Microfiltration or Ultrafiltration
- RO
- UV w/ Advanced Oxidation
- GAC
- Chlorine Disinfection
- Final Stabilization
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

Making the Wastewater Network Visible

Collecting Data  Analyzing Data  Actionable Insights

Kando’s end-to-end solution Clear Upstream provides continuous awareness of events in wastewater networks.

Clear Upstream detects pollution events, evaluates their impact and spots their source, as a result, Kando’s customers see a reduction of OPEX and CAPEX, environmental effects and wastewater related nuisances.
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

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<th>External focus</th>
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<td><strong>ADHOCRACY CULTURE</strong></td>
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<td>COHESIVENESS</td>
<td>CREATIVITY</td>
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<td>RULES &amp; UNIFORMITY</td>
<td>GOAL ACHIEVEMENT</td>
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<td>LEADERSHIP IN FORM OF</td>
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<td>ADMINISTRATOR</td>
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<td>CLEAR EXPECTATIONS</td>
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<td>PREDICTABILITY</td>
<td>GOAL ORIENTATION</td>
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<td>SMOOTH OPERATIONS</td>
<td>SERVICE DELIVERY</td>
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Flexibility, spontaneity

Control, order, stability
Leadership in an Uncertain World

THINKING
Better informed for better decisions
- Strategic thinking –
- Critical thinking –
- Creative thinking –

CONNECTING
Co-creating with dignity
- Sharing (leadership, vision & strategy) –
- Collaboration & communication –
- Emotional intelligence (EQ) –
- Vulnerability & courage –

UNDERSTANDING
Bridging different perspectives
- An integrated worldview –
- Bridging & peacemaking –
- Authenticity –
- Understanding yourself –

DOING
Ambidexterity and adaptability
- Ambidextrous –
- Dealing with wicked problems –
- Agile - but long-term thinking –
- Adaptable - but focused –
- Anticipatory & resilient –
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?
<table>
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<tr>
<th>Key considerations</th>
<th>What are we trying to achieve?</th>
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<tbody>
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<td></td>
<td>Does our direction <em>still</em> have the right “fit” with the environment within which we operate?</td>
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<td>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?</td>
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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

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<td>How do I see the world? Where does our organisation fit into the community &amp; natural world?</td>
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<td>Am I comfortable at <em>respectfully</em> bridging different perspectives?</td>
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<td>What are my blindspots?</td>
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<tr>
<td>What do I need to do AND what do I need to <em>be</em>?</td>
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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