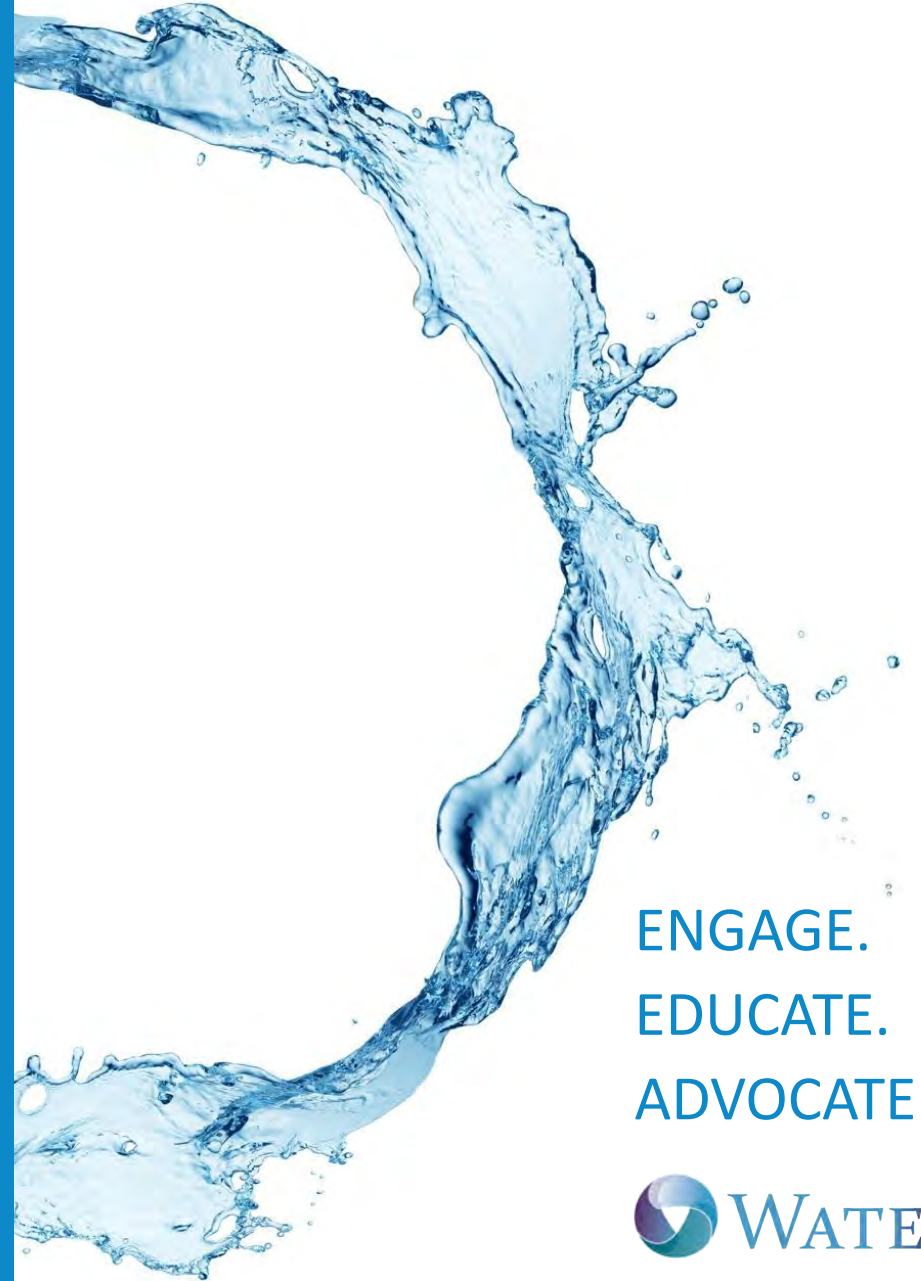


# Tel Aviv to Texas: Lessons Learned from the 2022 WateReuse Israel Delegation

WATEREUSE TEXAS  
WATEREUSE ASSOCIATION WEBCAST SERIES

**February 15, 2023**  
1:00pm-2:30pm Central  
2:00pm-3:30pm EST

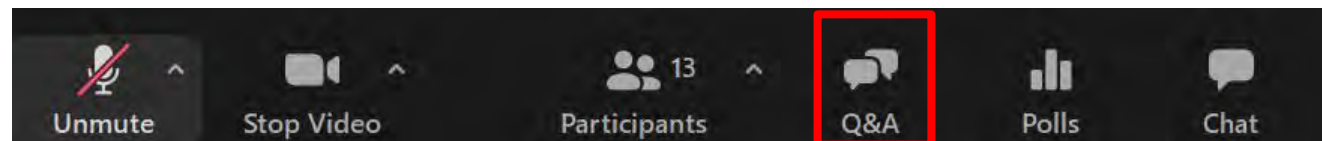


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ADVOCATE.



# A Few Notes Before We Start...

- Today's webcast is scheduled for 90 minutes.
- There is one (1) Professional Development Hour (PDH) available for this webcast. Please email the PDH form ([mmerk@watereuse.org](mailto:mmerk@watereuse.org))
- Please type questions for the presenters into the Q&A box located at the bottom of your screen.



IN COLLABORATION WITH  
THE WATER RESEARCH  
FOUNDATION

 **WATERREUSE<sup>®</sup>**  
**2023 SYMPOSIUM**  
MARCH 5-8, 2023 • MARRIOTT MARQUIS ATLANTA  
ATLANTA, GA

REIMAGINING  
WATER  
TOGETHER



## Keynote

A-P Hurd: The Water Cycle  
and the City of the Future



- 7 tracks of technical sessions
- Federal interagency workgroup
- Workshops & tours
- WaterReuse Evening Fun:  
Georgia Aquarium



# Upcoming WRTX Events

2023 Annual Membership Meeting: April 12th, 5:15 pm

Texas Water - George R Brown Convention Center, Houston, Room TBD

Reuse happy hour to follow, co-hosted with the WEAT reuse committee

Also, please join us in September for the WRTX Conference!



SEPTEMBER 20-22, 2023

HYATT REGENCY

FRISCO, TEXAS

[watereuse.org/Texas2023](http://watereuse.org/Texas2023)



## Moderator:



**Paula Paciorek**  
Division Manager,  
Houston Water  
Planning, City of  
Houston

# Today's Special Guests

Opening Remarks



**Omer Bab**  
Director of Trade and  
Regulatory Policy  
Embassy of Israel

Closing Remarks



**Danny Greenwald**  
Senior Deputy Director  
General for Regulation  
Israeli Water Authority

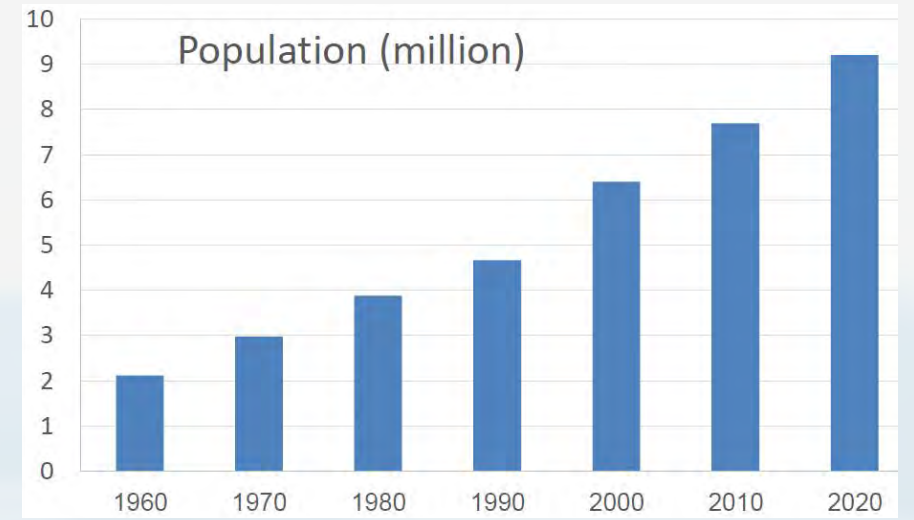




Omer Bab  
Director of Trade and  
Regulatory Policy  
Embassy of Israel



# Israel and Water Reuse



**Water Demand - ~50%  
higher than the natural  
supply**

# Integrated Water Resources Approach

## Water Production



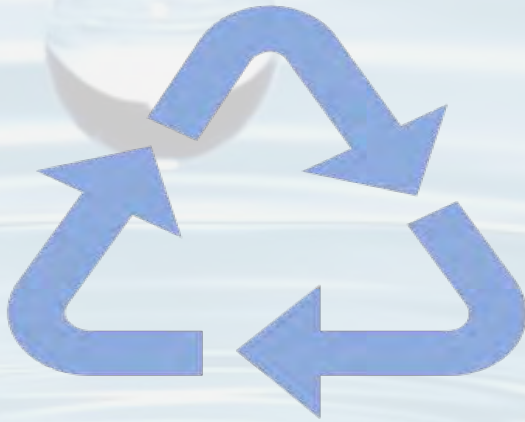
## Domestic Use



## Reclaimed Water Use

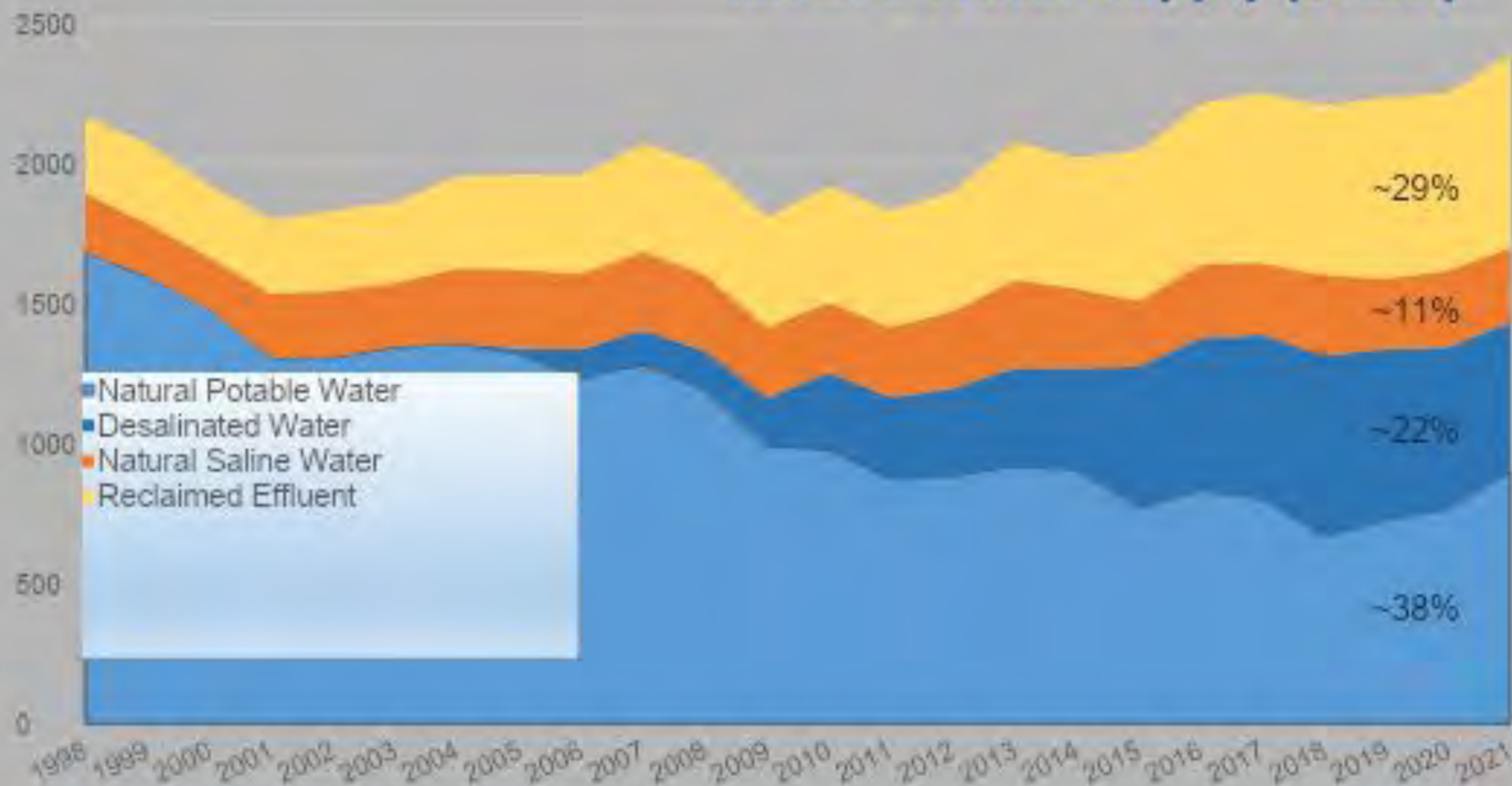


## Treatment





# Israel's Water Supply (MCM)



# Thanks!

## Contact Us:

### Embassy of Israel to the US:

Omer Bab, Director of Trade and Regulatory Policy

[Omer.Bab@israeltrade.gov.il](mailto:Omer.Bab@israeltrade.gov.il)

Josh Cohen, Director of Trade

[Joshua.Cohen@israeltrade.gov.il](mailto:Joshua.Cohen@israeltrade.gov.il)

### Economic Mission to the South Mid-West:

Orna Avraham, Economic Consul

[Orna.Avraham@israeltrade.gov.il](mailto:Orna.Avraham@israeltrade.gov.il)

# Texas Panelists Round One

## Moderator:



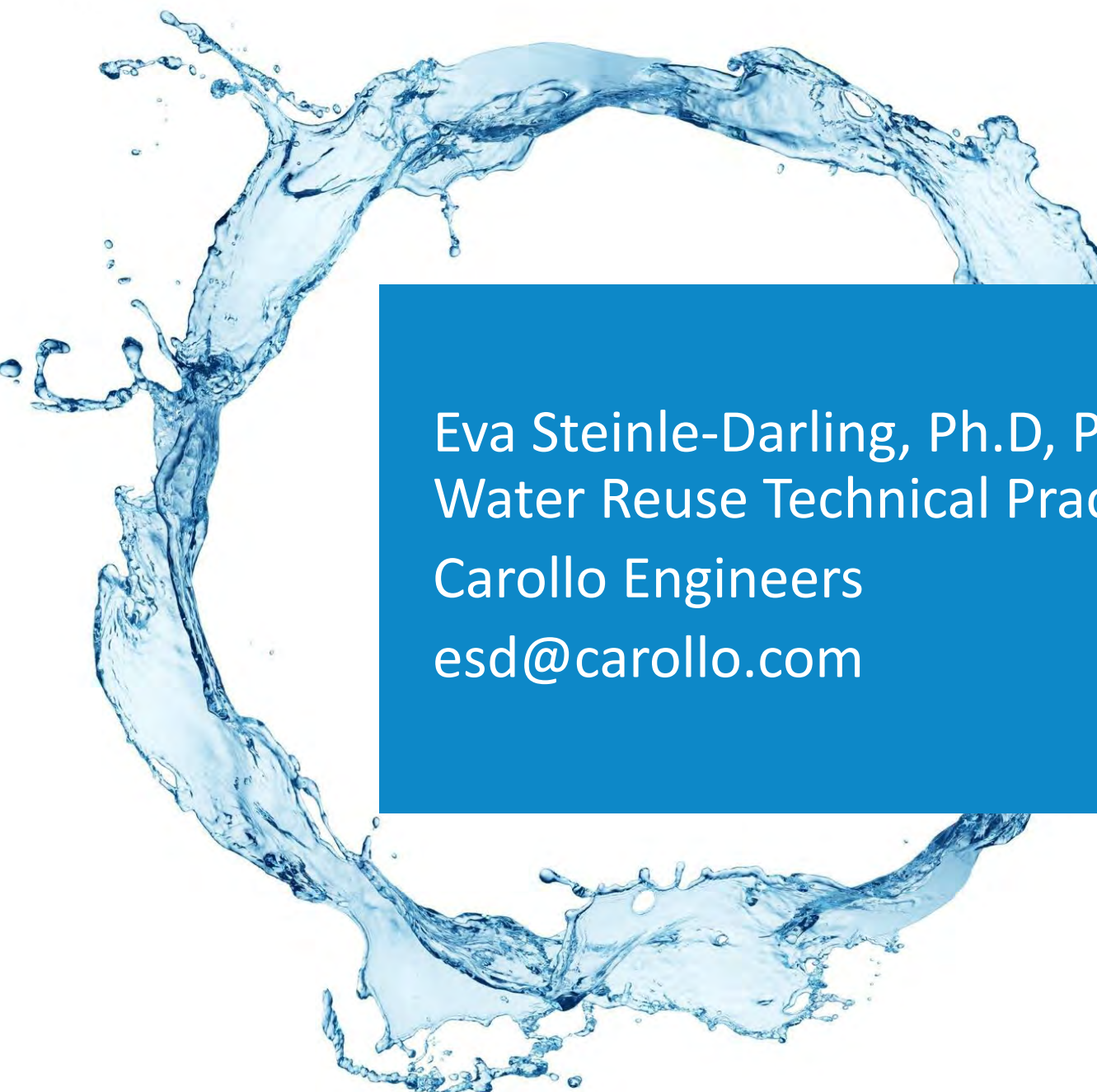
**Paula Paciorek**  
Division Manager,  
Houston Water  
Planning, City of  
Houston



**Eva Steinle-Darling, Ph.D, PE**  
Watereuse Technical Practice  
Director  
Carollo Engineers



**Kobe Nagar**  
CEO and Co-Founder  
374 Water



Eva Steinle-Darling, Ph.D, P.E.  
Water Reuse Technical Practice Director  
Carollo Engineers  
esd@carollo.com



# Curious Eva goes to Israel

WaterReuse Texas Webinar

2022 US EPA / WaterReuse Delegation

Eva Steinle-Darling, PhD, PE | [esd@carollo.com](mailto:esd@carollo.com)



# Important Lessons Learned: *Never Forget the Group Photo*



Israel Export Institute Mtg with Water Innovators



Delegation meeting with Assistant US Secretary...



Intel



Shafdan Pilot Tour

Shafdan Soil Aquifer Treatment Pond Site Visit



Ein Bokek seasonal recycled water storage pond under construction.

# Israel has used its advantage of centralization to *truly integrate* its water resources

❖ Agricultural end use is key driver of initial water quality decisions



# Key Differences to Texas Water System(s!):

1. Smaller, coastal geography allows for centralization.
2. Irrigated agriculture (end use) is a nationally strategic export product
3. Value of (recycled) water measured in economic terms.





# Israeli Successes in Tech Transfer to Global Water Sector

1. Starts with well-developed high-tech sector in Israel.
2. Known value of water results in meaningful ROI for water tech.
3. Emphasis on global export through delegation support!

Several Carollo project collaborations initiated through prior delegations, including with:

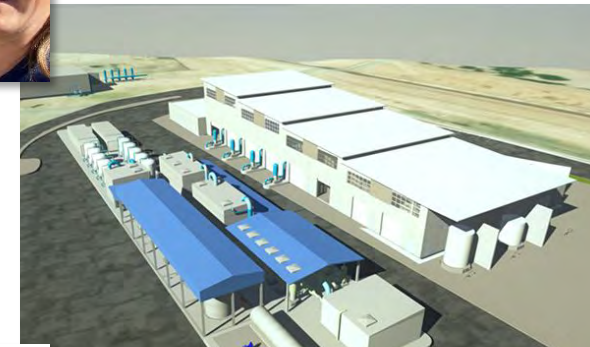


# Know-How we can bring to Israel: Advanced Treatment and (Direct) Potable Reuse!

1. CRMWD operating first municipal DPR facility in North America in Big Spring, TX
2. El Paso Water modeling the progression
  - from indirect potable (IPR),
  - to brackish desalination,
  - to direct potable (DPR).
3. Tech transfer *in progress* at Shafdan advanced treatment pilot!



Supporting CRMWD with optimization of DPR operations



Designing first direct-to-distribution DPR facility in the US in El Paso




Visiting Soil Aquifer Treatment after Shafdan Advanced Treatment Pilot

—  
Important Lessons Learned: *Recycled Water is Beautiful!*



Recycled Water Storage Pond overlooking the Dead Sea



Kobe Nagar  
CEO and Founder  
374 Water

374WATER<sup>®</sup>

 WATERREUSE<sup>®</sup>

# Kobe's Trip Learning

## A Water Ecosystem

Collaboration between private companies, regulators, government utility and end users

## Quality Fit Purpose

Different water tiers for different uses -  
Desalination for drinking, Secondary and Tertiary to Ag. (depend on crop type)

## Water Storage Capacity

Managing water inventory throughout the Year -  
Stormwater harvesting reservoirs

374WATER<sup>o</sup>

# Texas Panelists Round Two

## Moderator:



**Paula Paciorek**  
Division Manager,  
Houston Water  
Planning, City of  
Houston



**Erika Crespo**  
Assistant Deputy Director,  
Water Quality Division  
Texas Commission on  
Environmental Quality (TCEQ)



**Hunter Adams**  
Laboratory Supervisor  
City of Wichita Falls - Cypress  
Environmental Laboratory



Erika Crespo  
Assistant Deputy Director  
TCEQ Water Quality Division  
512-239-1827  
[erika.crespo@tceq.texas.gov](mailto:erika.crespo@tceq.texas.gov)



# Regulatory Framework for Water Reuse in Texas: Discussion Outline

Intro to TCEQ Water Quality Division

Wastewater Permitting Overview

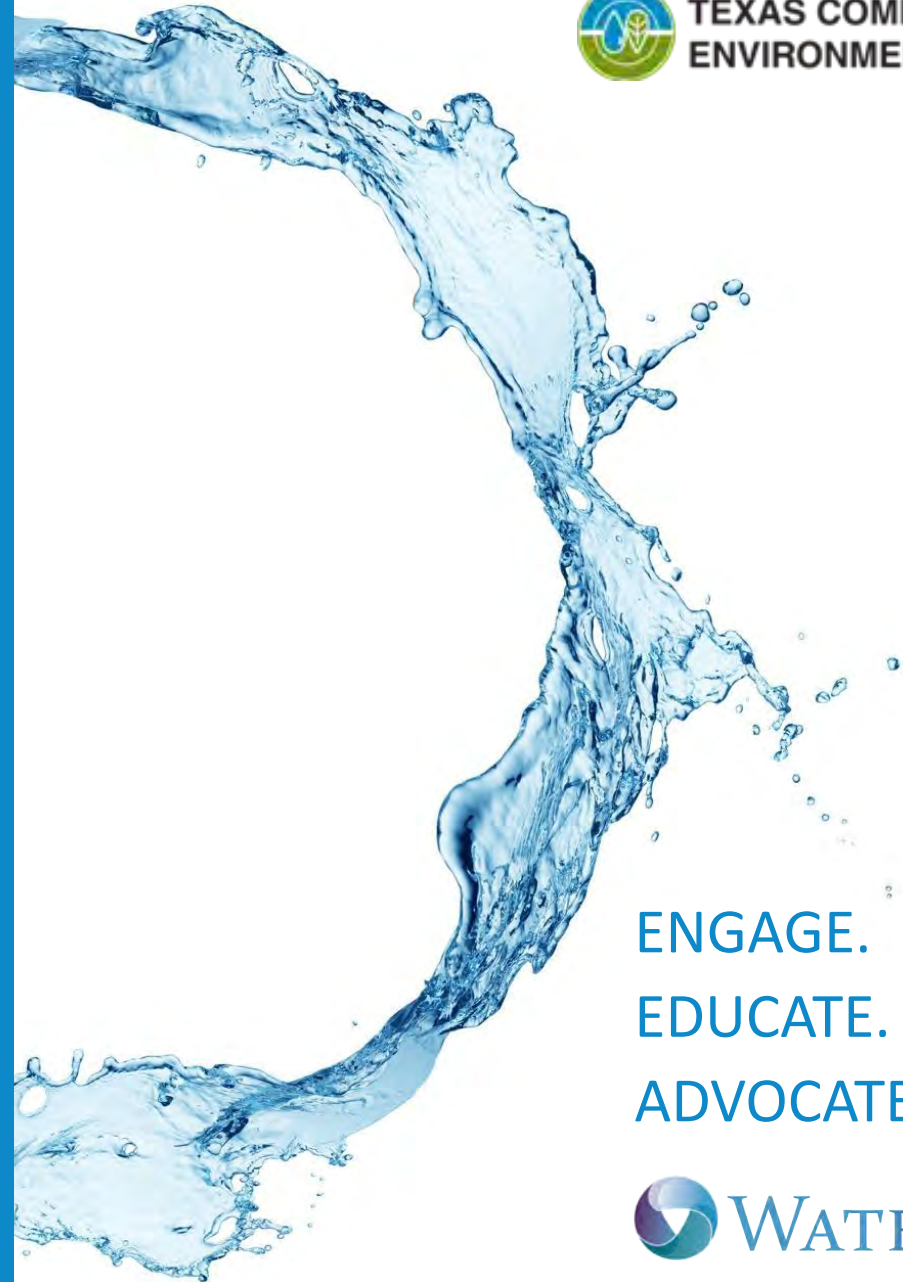
Water Reuse in Texas

End Uses for Non-Potable Reuse Systems

Similarities and Differences between Reuse Implementation in Israel and Texas



TEXAS COMMISSION ON  
ENVIRONMENTAL QUALITY



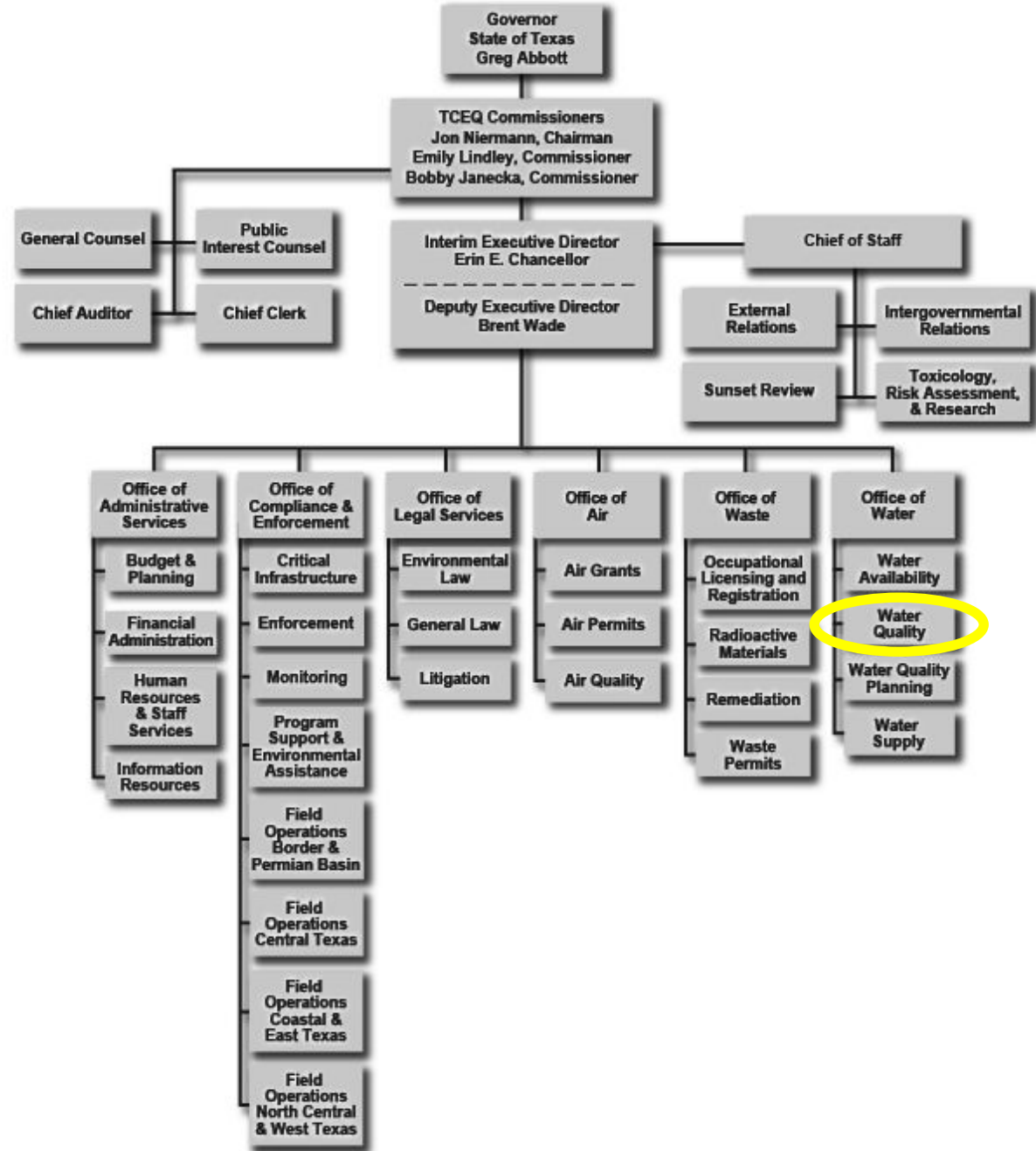
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# What an amazing trip!!





# TCEQ Water Quality Division

- Issues permit authorizations throughout the State of Texas
  - Domestic wastewater
  - Industrial wastewater
  - Sludge/Biosolids
  - Beneficial Reuse (on-demand)
  - Stormwater
  - Pretreatment
  - Concentrated animal feeding operations
- Coverage available by General Permits and Individual Permits
  - Texas Pollutant Discharge Elimination System (TPDES) permits
    - Discharging wastewater directly into water in the State
  - Texas Land Application Permit (TLAP) authorizations
    - Discharging wastewater adjacent to water in the State
- Centralized wastewater treatment systems in Texas



# Beneficial Water Reuse in Texas

## ○ Seawater Desalination

- Port of Corpus Christi Authority of Nueces County
- Harbor Island Property - TPDES Permit No. WQ0005253000
  - Issued by the Commission on 12/22/2022
  - Litigation on this permit action is ongoing

## ○ Direct Potable Reuse

- El Paso Water's Advanced Water Purification Facility (in development)

## ○ Indirect Potable Reuse

- City of Wichita Falls' Resource Recovery Facility
- El Paso Water's Fred Hervey Water Reclamation Plant
- Colorado River Municipal Water District's Raw Water Production Facility in Big Springs, Texas

## ○ Non-Potable Reuse ~ 30 TAC Chapter 210

- Domestic Wastewater
- Industrial Wastewater
- Graywater and Alternative Onsite systems



# End Uses for Non-Potable Reuse Systems in Texas (30 TAC Chapter 210)



## Domestic Reclaimed Water

- Type I

- Incidental human contact is possible
- Residential and urban irrigation
- Toilet or urinal flush water
- Fire protection/sprinkler systems

- Type II

- Irrigation in areas where the public would not encounter the reclaimed water
- Other uses where the public is not present during reuse activities



# End Uses for Non-Potable Reuse Systems in Texas (30 TAC Chapter 210)

## Industrial Reclaimed Water



- Level I
  - Only certain waste streams eligible
  - On-site use only
  - Self-implementing
  - Dust suppression / soil compaction
  - Fire protection
  - Irrigation of non-food crops

- Level II
  - Must comply with eligibility requirements
  - TCEQ review and approval of application required
  - Can be provided and used off-site



# Similarities in Reuse Implementation between Israel and Texas

- ✓ Signage requirements and purple pipes
- ✓ Centralized wastewater treatment
- ✓ Prohibition on reuse of untreated wastewater
- ✓ No spray-irrigation on food crops that may be consumed raw



# Differences in Reuse Implementation between Israel and Texas

- ❖ Legal framework
  - Israeli Water Law & Water Authority Board – one stop shop
  - Texas has right-of-capture for groundwater and implements surface water rights
- ❖ Necessity / Demand for beneficial reuse
  - Seawater desalination in Israel, but no DPR or IPR
  - Texas allows DPR and has several IPR, pending seawater desalination
- ❖ Data availability and recordkeeping requirements
- ❖ Pollutant analyses and frequency in routine monitoring

## Israel

- 36 parameters in total
- BOD<sub>5</sub>, COD, TSS, and Fecal coliform tested twice a week

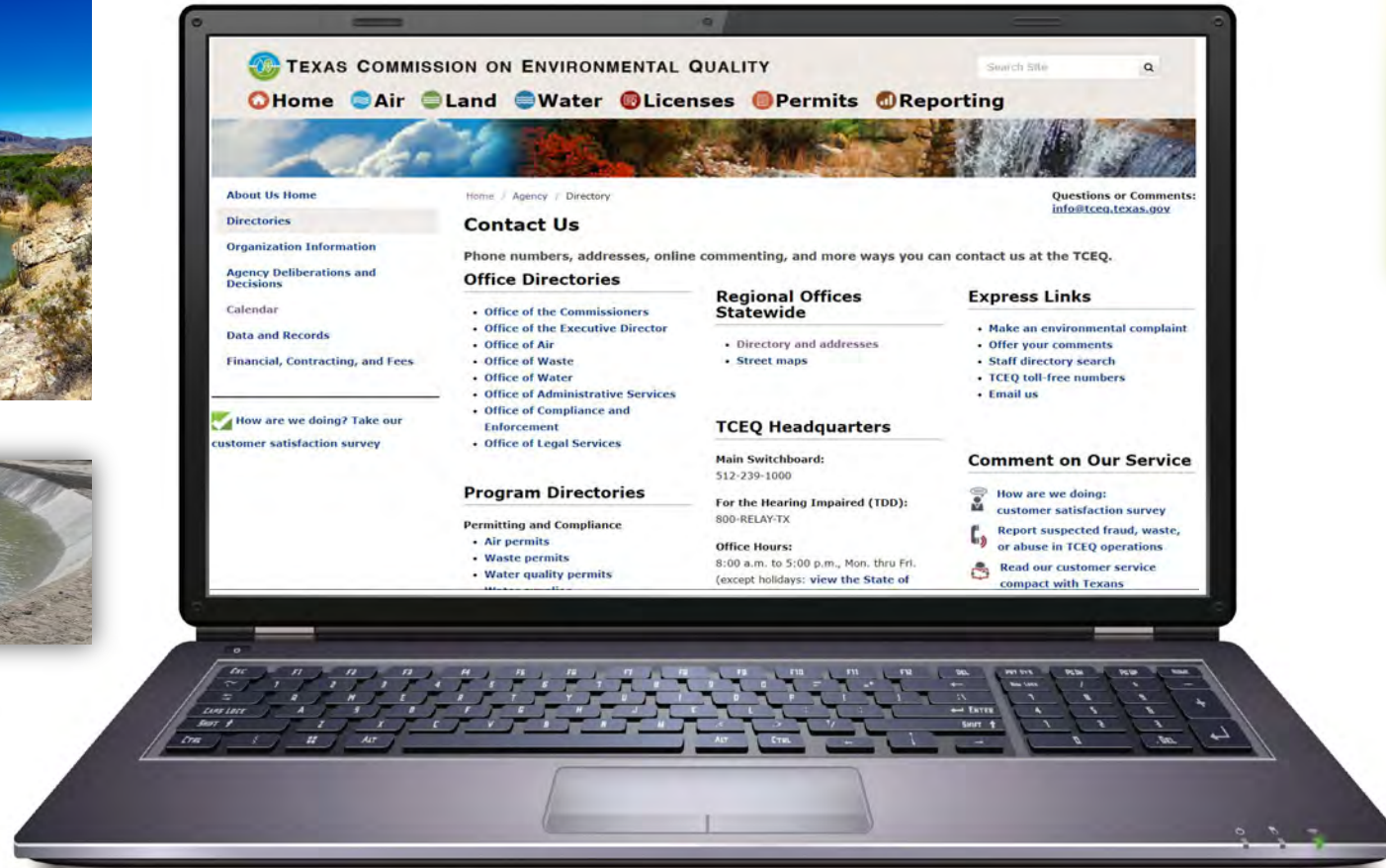
## Texas (Domestic)

- BOD<sub>5</sub>, CBOD<sub>5</sub>, turbidity, *E. coli*, and *Enterococci*
- Type I reclaimed water tested twice a week
- Type II reclaimed water tested once a week

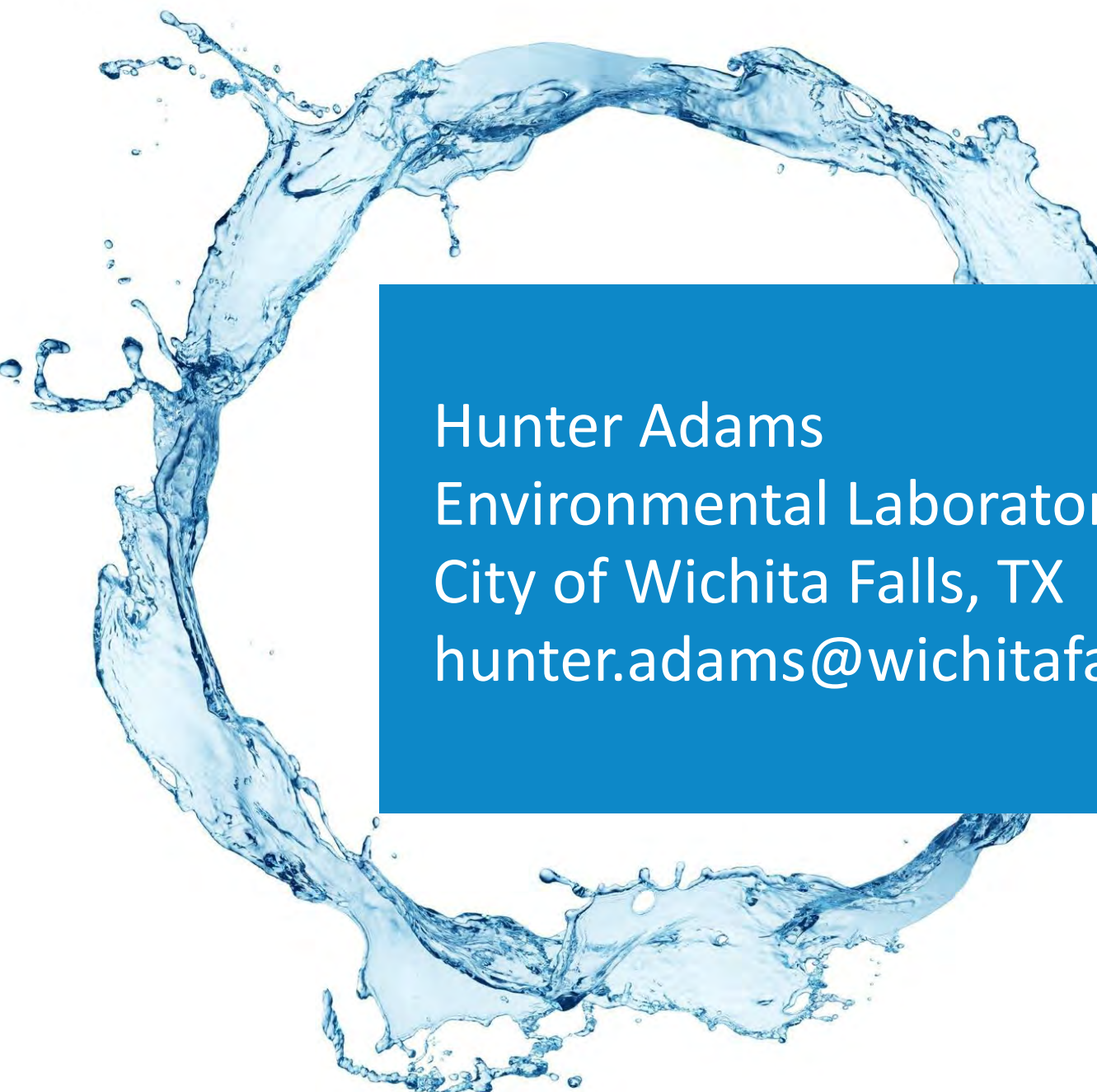




# Got any Questions / Concerns....? Contact Us!



<https://www.tceq.texas.gov/agency/directory/>

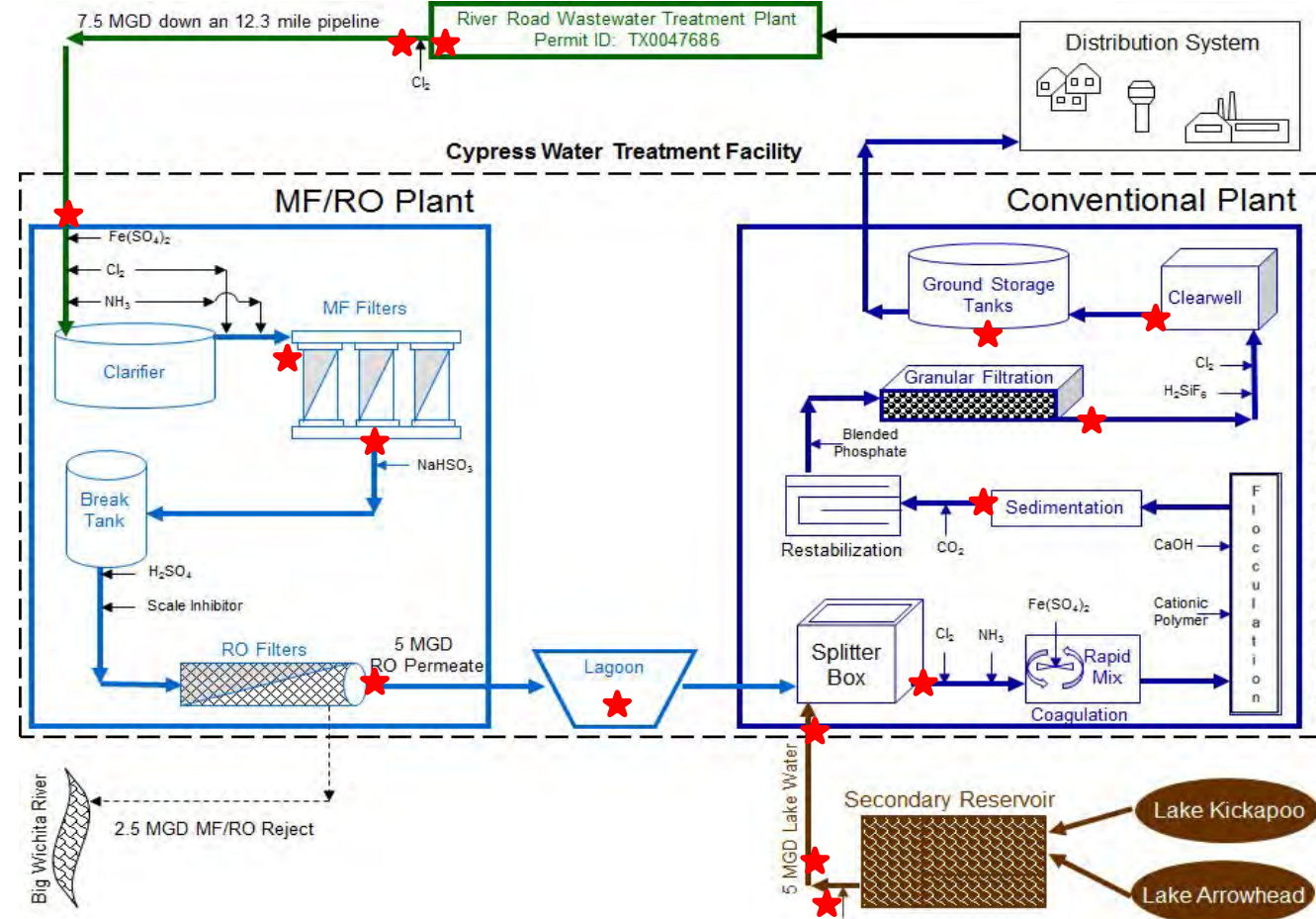


Hunter Adams  
Environmental Laboratory Supervisor  
City of Wichita Falls, TX  
[hunter.adams@wichitafallstx.gov](mailto:hunter.adams@wichitafallstx.gov)



# City of Wichita Falls, TX

- Direct Potable Reuse
  - July 9, 2014 – July 21, 2015
  - 2 Billion Gallons Reclaimed
  - Zero Failures
- Indirect Potable Reuse
  - January 1, 2018 – Present
  - 9 Billion Gallons Reclaimed



“ A town in Texas just announced a controversial plan to recycle toilet water and use it for drinking water. Dog said, 'how are you only thinking of this now?' ”



**JIMMY FALLON CRACKS JOKE ABOUT WICHITA FALLS DURING TONIGHT SHOW MONOLOGUE [VIDEO]**


# Key Takeaways from Israel

- Desert vs. Fertile Oasis
- Centralized Approach (Israel) vs. Decentralized Approach (US)
  - Streamlined Regulatory Authority (Israel)
  - National Government Heavily Invested (Israel)
  - Wild West Scenario with States in Charge (US)
- Wastewater Regulated with End User as Focus
  - In US as long as it Meets Permit = “Not My Problem”
- Desalination = “Unlimited” Drinking Water Supply
- Main Reuse Focus = Non-potable (Israel) vs. Potable (US)





THANK YOU!



Danny Greenwald  
Senior Deputy Director General  
for Regulation  
Israeli Water Authority



# Danny's trip, with the American water reuse delegation to Israel

## Insights:

- Location, location, location!
- Best quality or best value?
- Integrated management and enabling regulation
- Use of technology and diversity of uses



A dynamic splash of clear blue water, captured in mid-air, forming a large, irregular shape that frames the central text. The water droplets are sharp and detailed, creating a sense of movement and freshness.

# Question & Answer