



Regional Service Through Unity... Meeting our Region's Needs Today and Tomorrow



**WINTER STORM URI LESSONS LEARNED**

**SAME Infrastructure Forum**

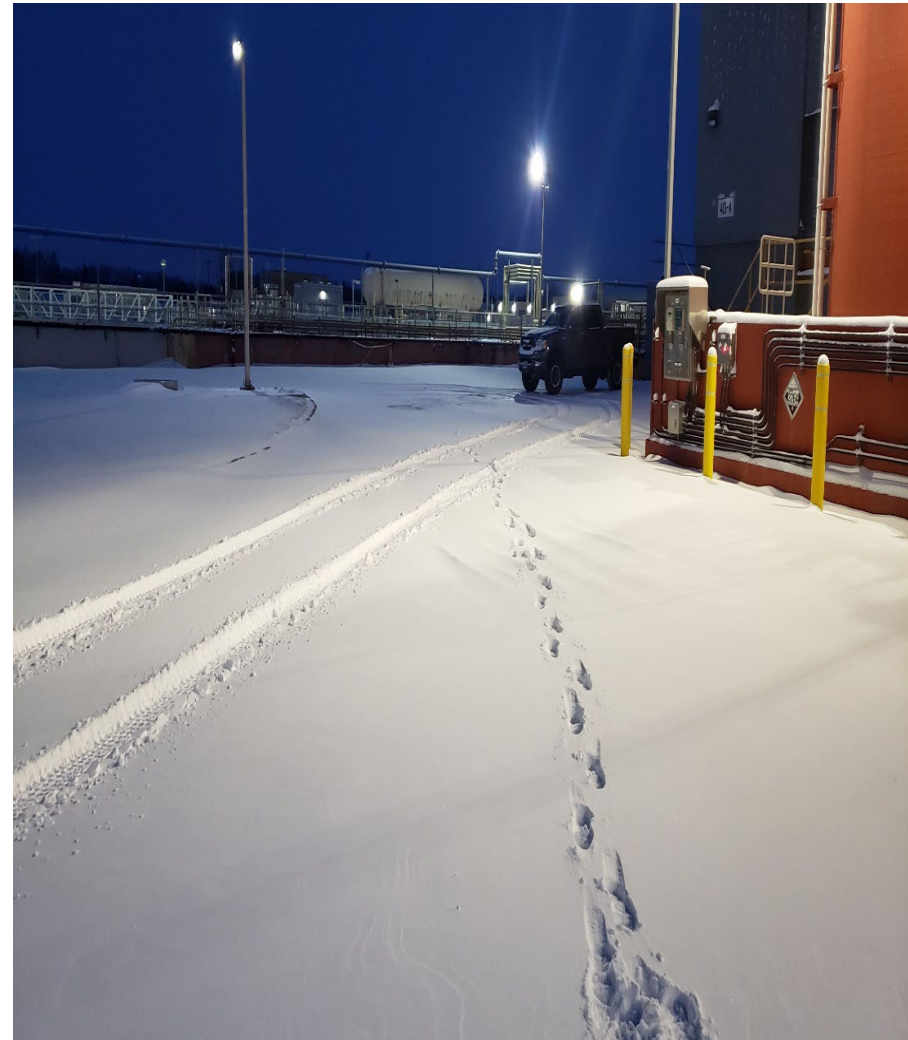
**December 2, 2022**



# WINTER STORM – A UTILITY'S PERSPECTIVE

## Outline

- Overview of North Texas Municipal Water District
- Winter Storm URI Recap
- Water System Impact
- Energy Program
- Lessons Learned





# NTMWD Wylie Water Treatment Plant

- # NTMWD Water Conveyance System

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- Member Cities**
- LAKE TEXOMA
- GRAYSON
- BOIS D'ARC LAKE
- Bonham WTP
- Leonard WTP
- FANNIN
- HUNT
- DELTA
- CHAPMAN LAKE
- DENTON
- COLLIN
- FRISCO
- MCKINNEY
- PRINCETON
- LAVON LAKE
- ALLEN
- PLANO
- Wylie WTP
- WYLIE
- FARMERSVILLE
- HOPKINS
- RICHARDSON
- ROYSE CITY
- ROCKWALL
- ROCKWALL
- DALLAS
- GARLAND
- MESQUITE
- FORNEY
- Tawakoni WTP
- LAKE TAWAKONI
- RAINS
- KAUFMAN
- VAN ZANDT
- 1st Fork Project
- Main Stem Pump Station & Pipeline
- N



# WINTER STORM URI

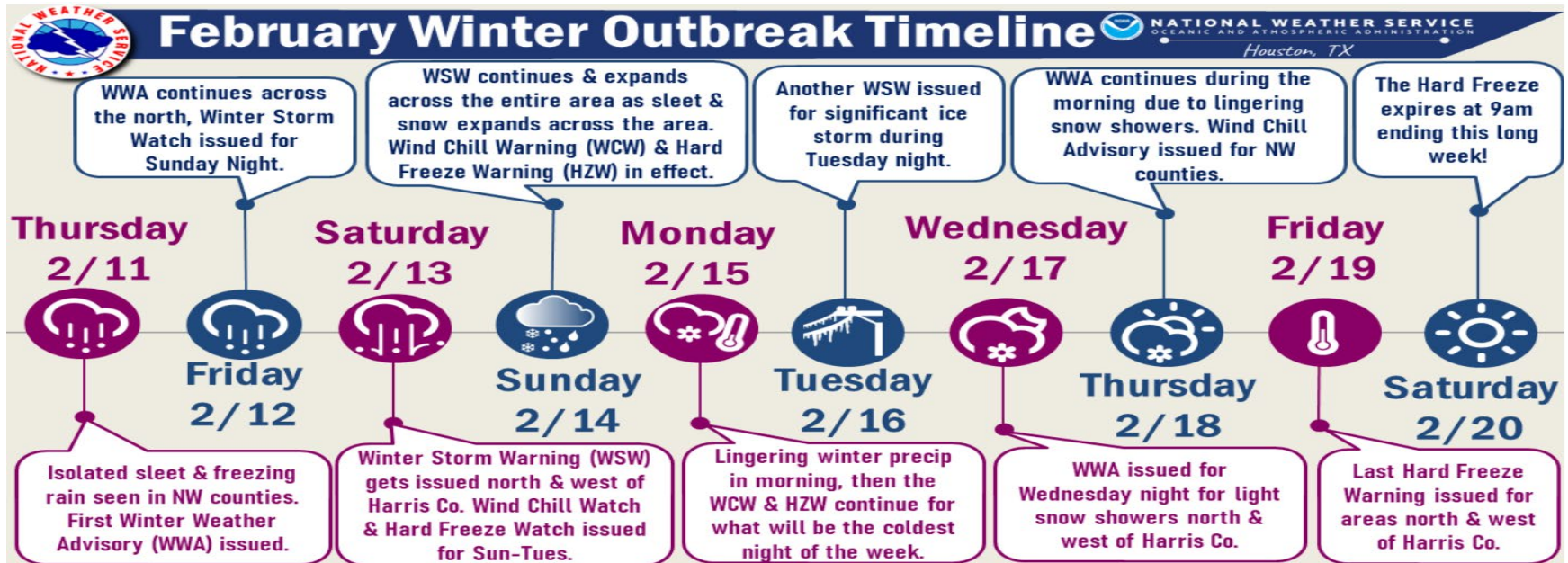
FEBRUARY 10-18, 2020, Texas Water Utilities Are Hit Hard

- 49 percent of Texans lost running water with an average disruption of 52 hours

Source: University of Houston, Hobby School of Public Affairs, "The Winter Storm of 2021"

- As a result, more than 2,300 boil water notices were issued across the state affecting approximately 14 million people

Source: (Samuels 2021; Oxner and Garnham 2021; TCEQ 2021a).

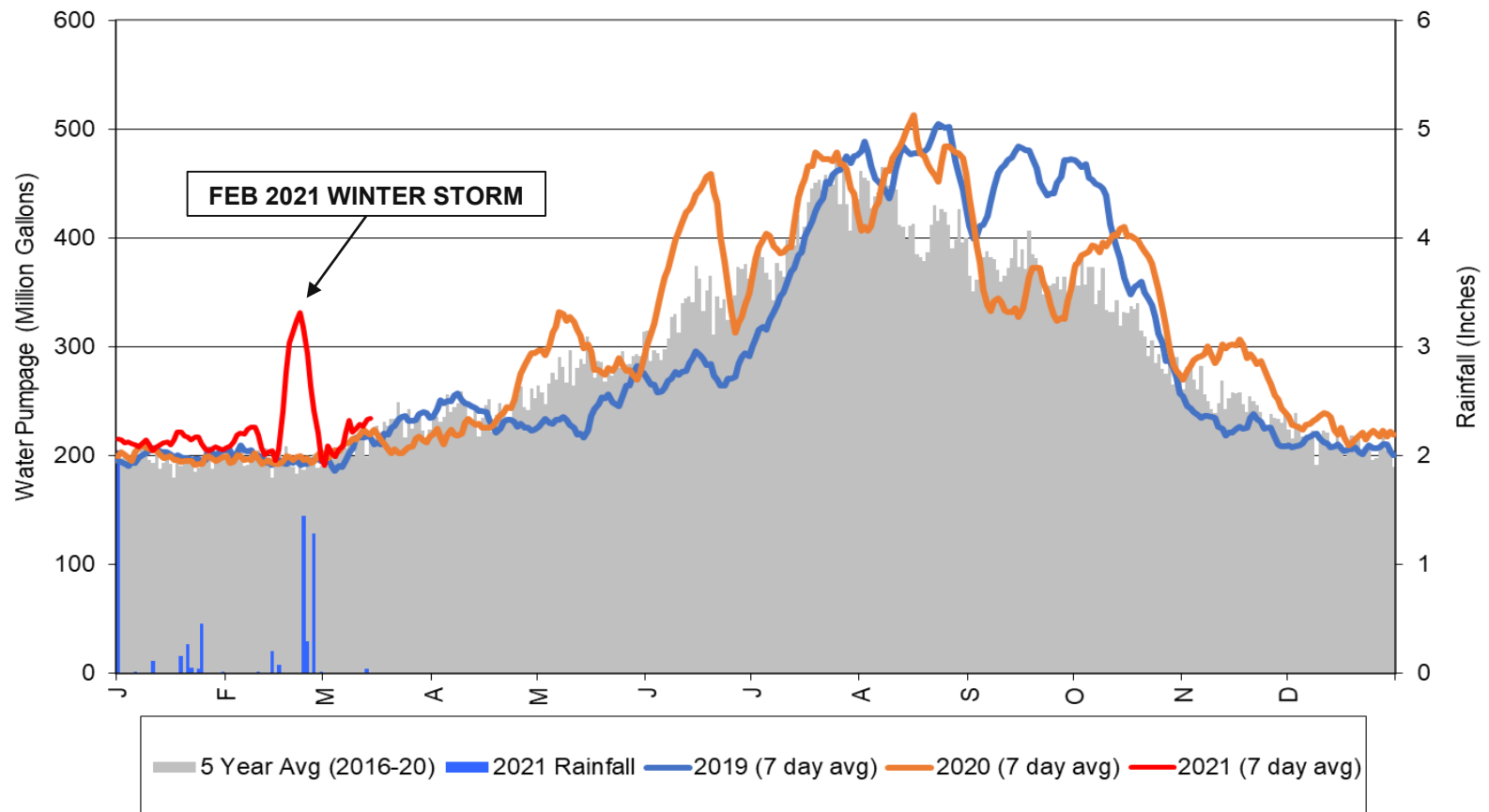




# WATER SYSTEM DEMAND

## Winter Storm Water Pumping Compared to 2019 & 2020

North Texas Municipal Water District  
7 Day Average Daily Water Consumption (2019, 2020, 2021)



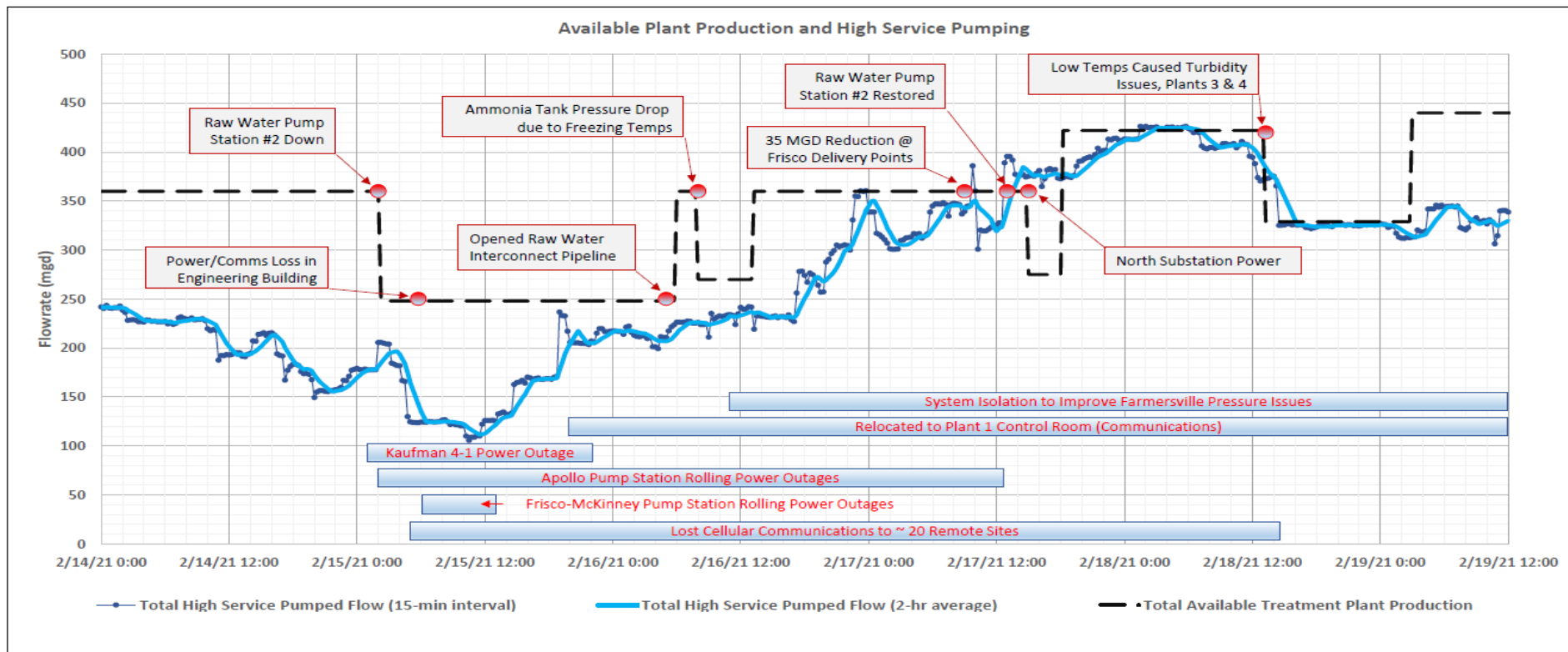




# WATER SYSTEM IMPACTS

## Winter storm timeline:

- Unprecedented volume pumped: 110 MGD on Monday to 430 MGD on Thursday (220 MGD is normal winter average)



Winter Storm Overview: Sunday (2/14) Through Friday (2/19)



## 2021 WINTER STORM EVENT

### Treatment

- Cold temperatures impact water treatment process
  - Impact to settling
    - Chlorine residual target reduced
    - Chemical systems freezing
    - House water lines feed processes
  - Impact to filtration
    - Offline equipment frozen

### Transmission

- Primary and backup communications failed
- Lost control of 20 remote sites
- Power outages at critical facilities
- High Service Pump Station Flooding

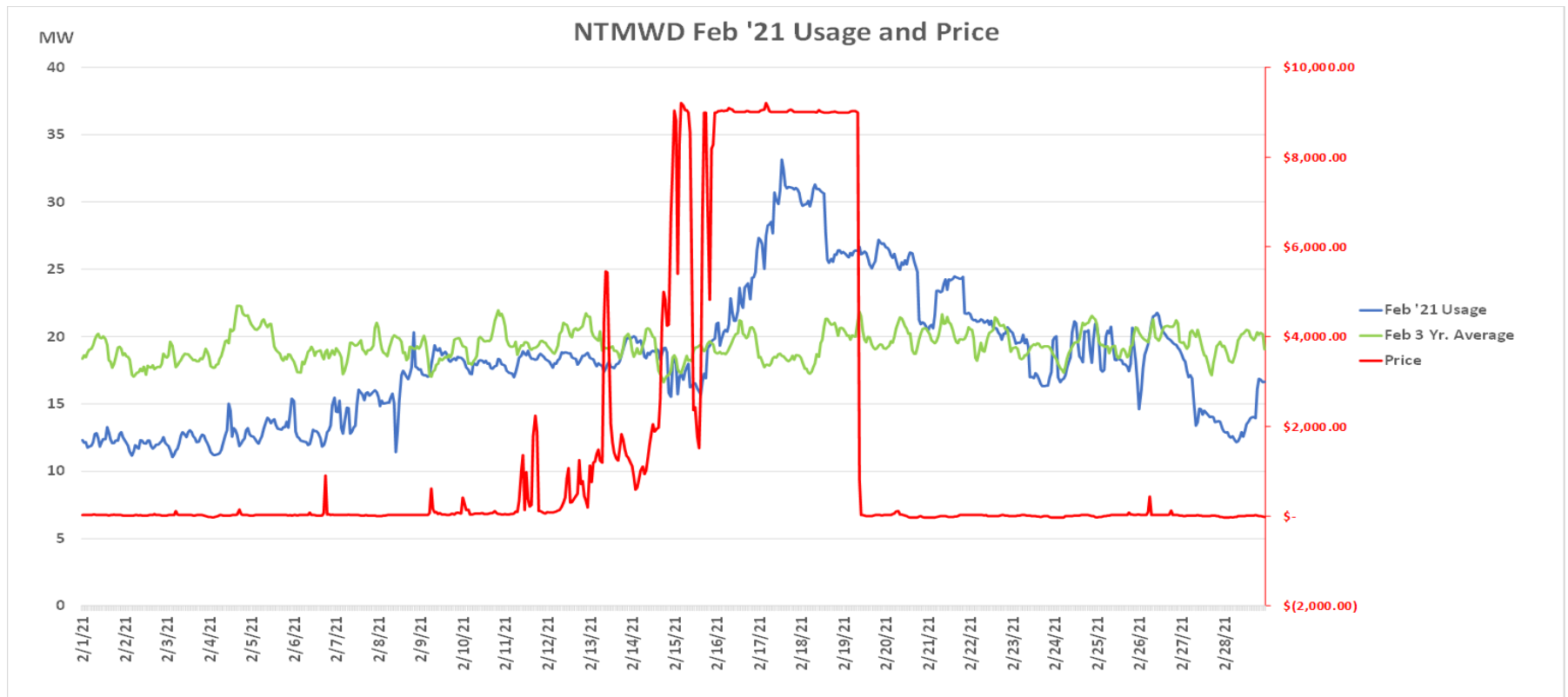




# DISTRICT ENERGY PROGRAM

## High-Cost Drivers:

- Higher than forecasted usage
- Index Prices Clearing at Market Cap (\$9,000/MWh)
- Exposure to high Index Prices during Winter







## DISTRICT ENERGY PROGRAM

### Bottom Line:

- The financial impact of the winter event was roughly the entire annual power budget (~\$27 MM)

### What worked well:

- District energy policy saved roughly ~\$23MM in potential real time power costs.
  - Total costs would have been over \$50 MM vs ~\$27MM we were billed.

### Path Forward:

- Continue to work with our suppliers and consultants to see if our policy needs to be modified to better handle potential weather driven events in the future.



# LESSONS LEARNED

## What went right:

- Team members' sacrifices
- Extended operations preparedness (Cots & MREs)
- Reactivating treatment capacity out of service for construction and maintenance
- Coordinated public responses
- Multiple backup communication tools
- Members' and Customers' reporting status of their systems
- Chemical bulk storage
- Coordinated request to conserve water
- Licensed water operators filling in from other departmental sectors





# LESSONS LEARNED

## Improvements

- Backup power capability
- Cold weather infrastructure resilience: chemical systems & piping
- More resilient comms/control systems
- Ensure open lines of communication
- Ensure proper and consistent messaging to employees
- Identify resources from outside the District that could assist if needed





# Questions?

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