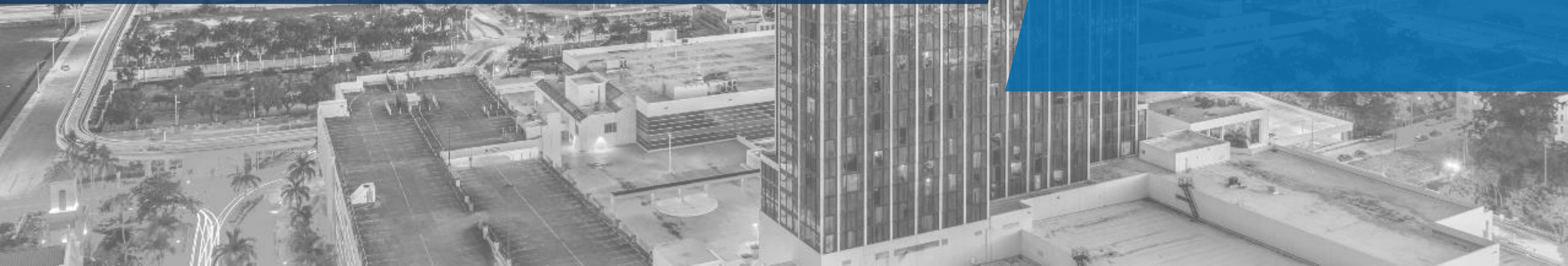


Implementing Miami-Dade County's "Connect 2 Protect" Septic Elimination Initiative.

JOSEPH CAROTHERS, PE

November 30, 2023

**THE
CORRADINO
GROUP**





AGENDA



TOPIC INTRODUCTION



INITIATIVE BACKGROUND



PROJECT FUNDING



PROJECT DESIGN



PROJECT CONSTRUCTION



QUESTIONS AND ANSWERS WITH WASD

Miami Dade Septic 2 Sewer

INITIATIVE BACKGROUND



MIAMI DADE “CONNECT 2 PROTECT”

DANGERS OF COMPROMISED SEPTIC TANKS



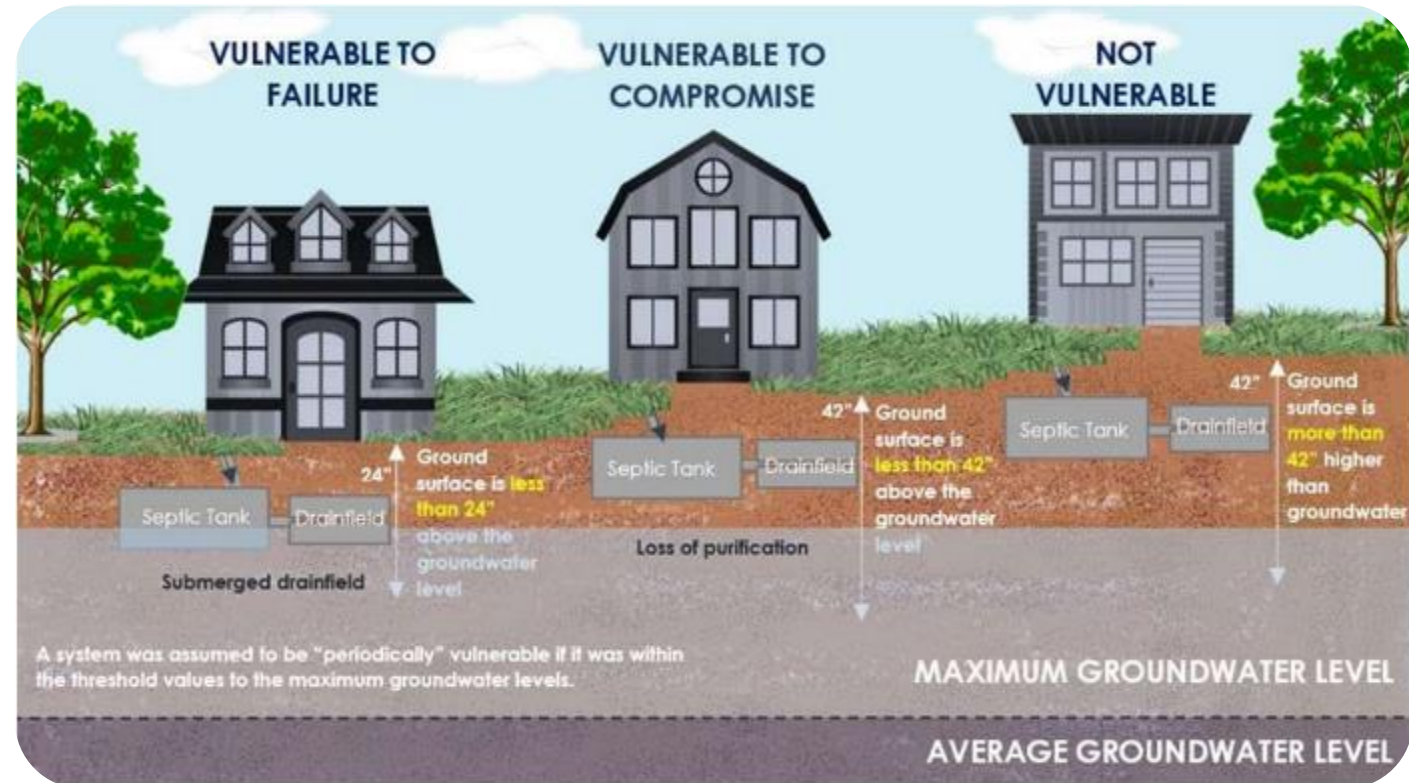
Groundwater leaching and contamination

- Damaging nutrients can be leached into the groundwater as the septic drain fields are submerged.
- Septic systems are not able to function at design levels even when the drain field is not compromised by groundwater.



Public Health Risks

- Ground water can cause the septic systems to back up, threatening the health of the users of each building.



MIAMI DADE “CONNECT 2 PROTECT”

IMPACT OF COMPROMISED SEPTIC TANKS

Environmental

Wastewater effluent reduces water quality of the greater Biscayne Bay ecosystem

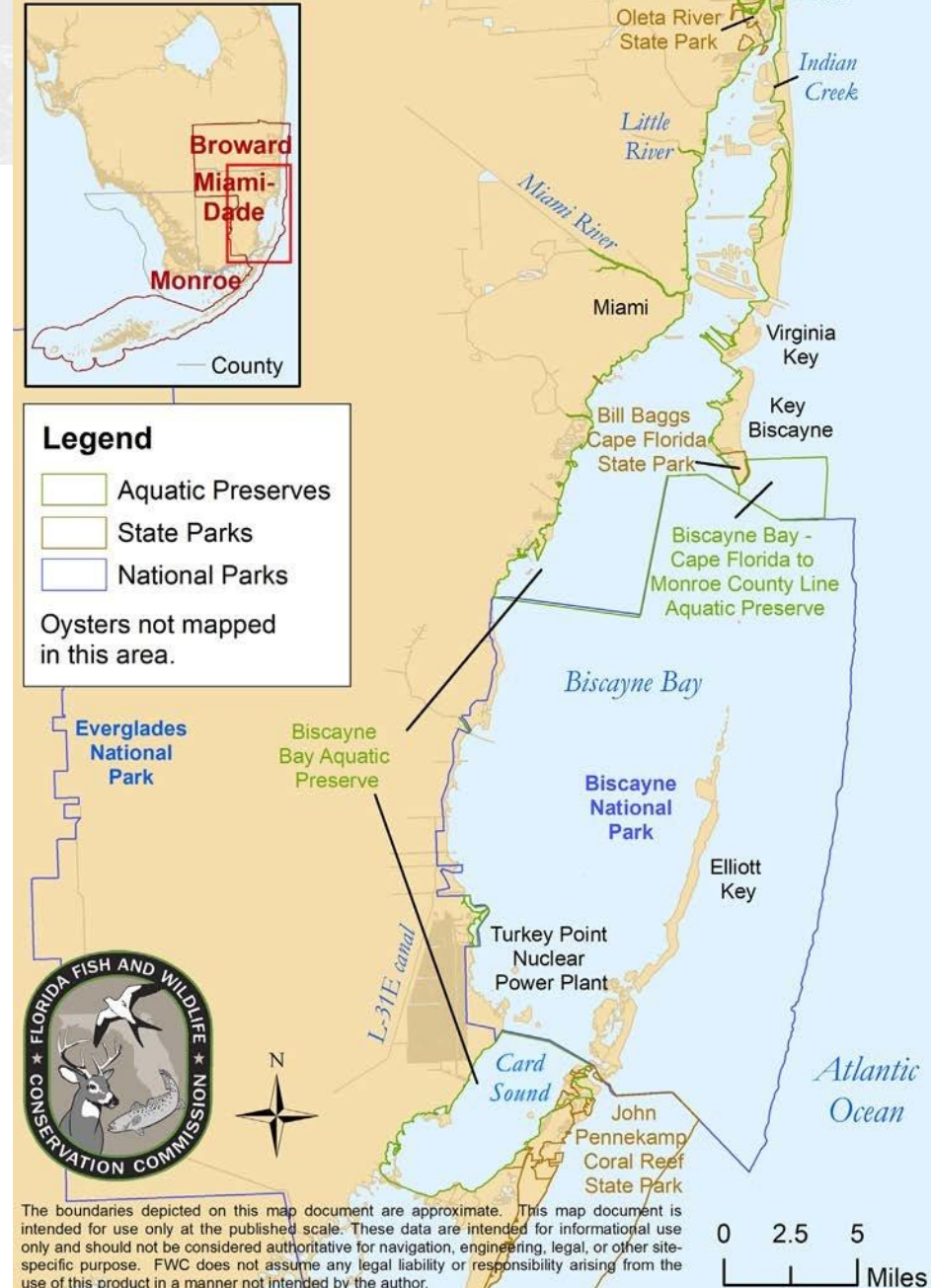
- Algal blooms
- Phosphorous and nitrogen buildup

Economic

Biscayne Bay is an economic driver four Miami-Dade

- **\$24 billion+** in economic income
- **448,000+** jobs supported

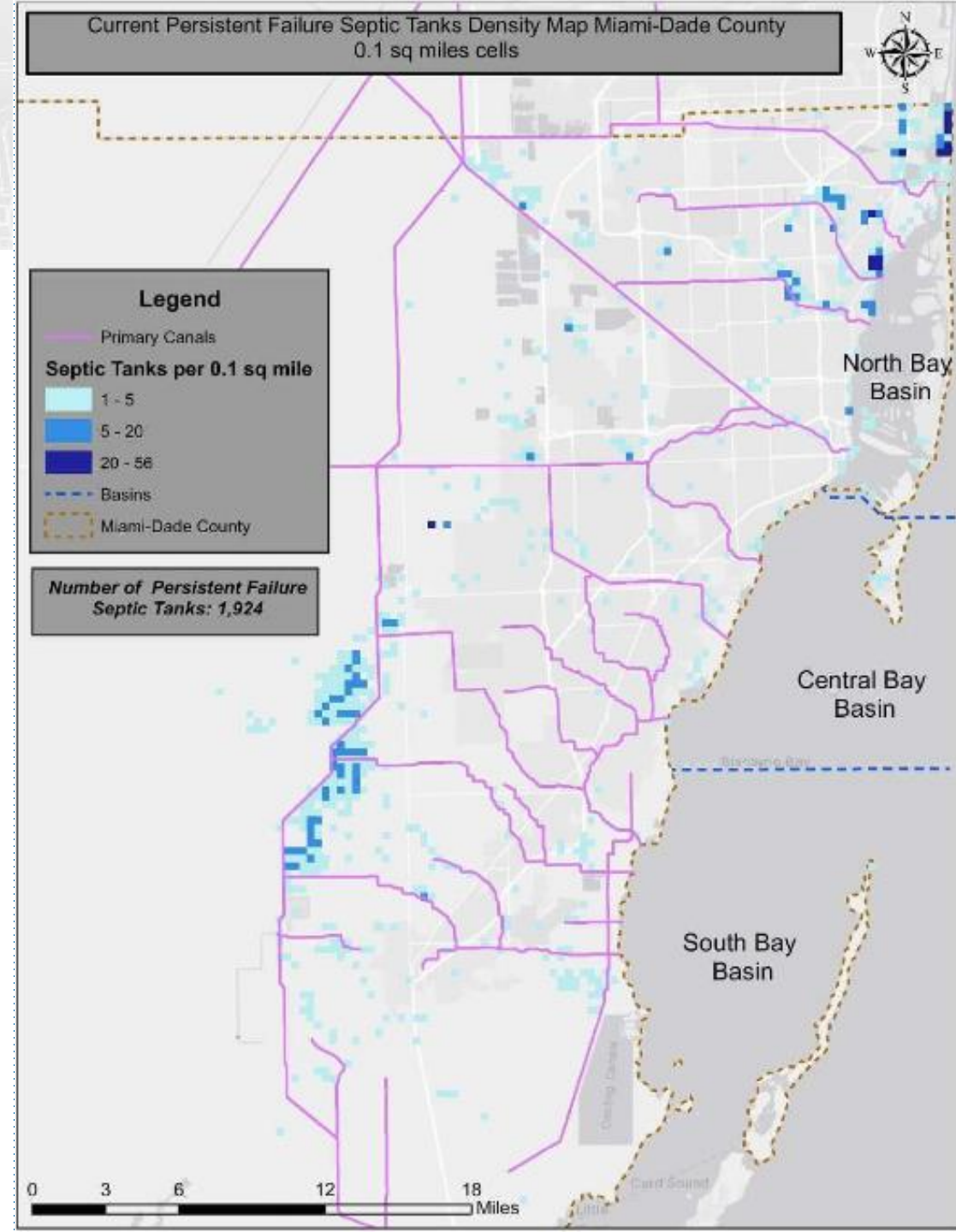
OIMMP Southeast Florida: Biscayne Bay



MIAMI DADE “CONNECT 2 PROTECT”


SEPTIC TANK ELIMINATION TO PROTECT GROUNDWATER, AND BISCAYNE BAY

- ▶ Miami Dade County has **120,000** properties served by septic systems.
- ▶ **9,000** septic systems are currently vulnerable to compromise/failure.
- ▶ This increases to **13,500** by 2040 due to sea level and groundwater level rise forecasts.
- ▶ The County has prioritized parcels based on the likelihood of failure in the immediate term.



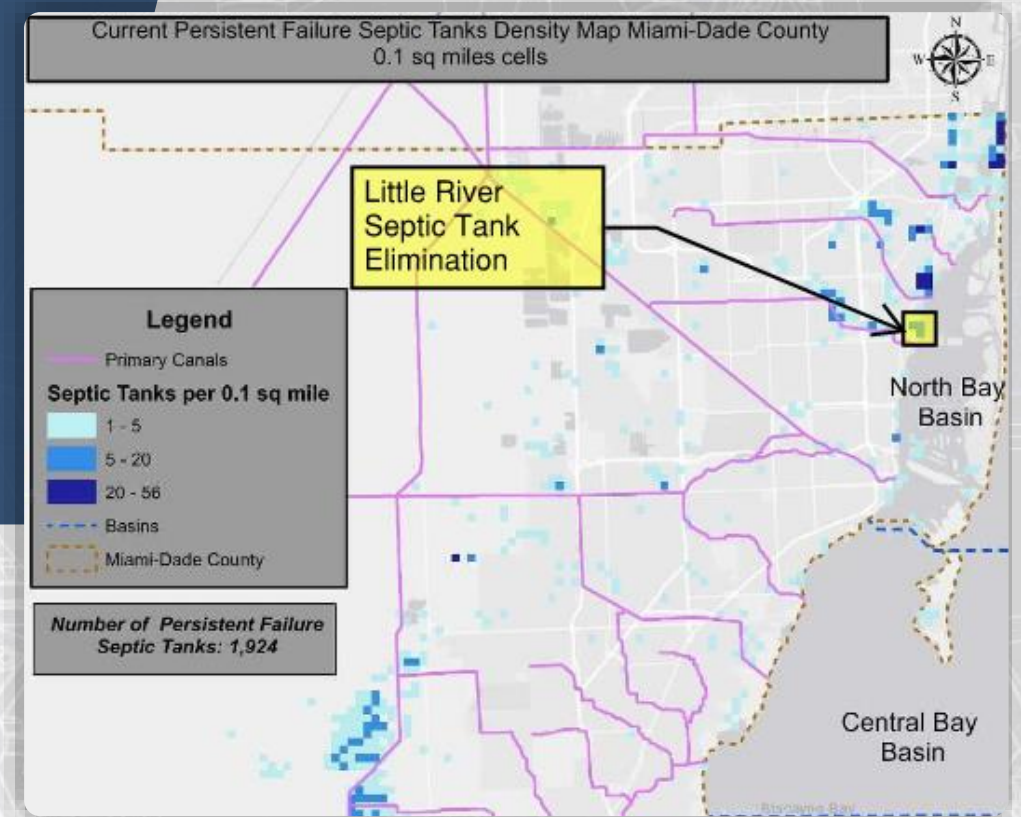
MIAMI DADE “CONNECT 2 PROTECT”

OPPORTUNITIES FOR FUNDING

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION	GENERAL OBLIGATION BOND	DIVERSE FUNDING OPPORTUNITIES
<ul style="list-style-type: none">▶ <i>Grants are available through various protection programs</i>▶ <i>Coral Reef Protection Program (Biscayne Bay)</i>	<ul style="list-style-type: none">▶ <i>Money is available from the County to make improvements within the County</i>▶ <i>Building Better Communities Bond Program</i>▶ <i>Involves improving infrastructure in the County to further economic development</i>	<ul style="list-style-type: none">▶ <i>Allow for the mobilization of different projects at the same time.</i>▶ <i>Allow for assistance from external organizations (County, State, Federal).</i> 

Miami Dade Septic 2 Sewer

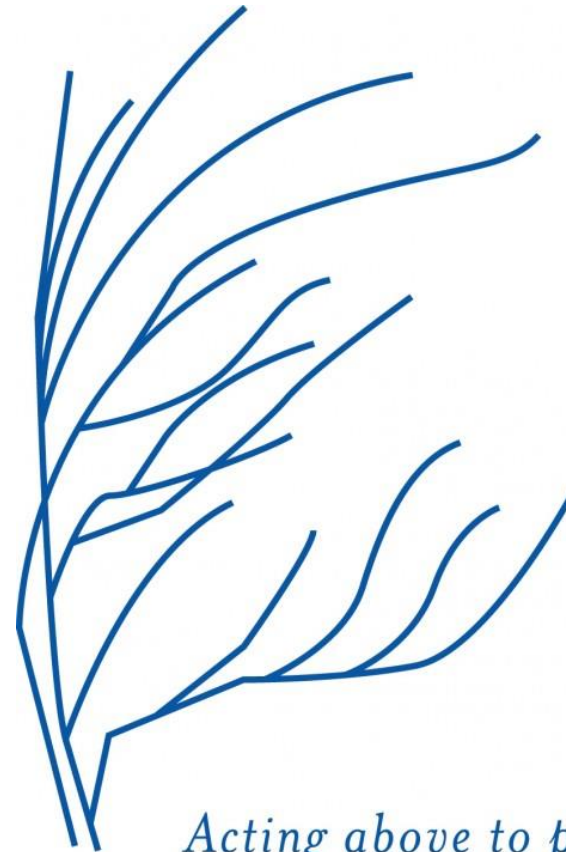
CASE STUDY AREA – LITTLE RIVER



Little River Adaptation Action Area

RESIDENTIAL SEPTIC SYSTEM ELIMINATION

- ▶ **Funded in part with FDEP grant money.**
 - Coral Reef Protection Program.
 - Elimination of nutrient based contamination of groundwaters and bay waters.
- ▶ **Residential septic tank elimination requires intense public outreach initiatives to minimize public outcry.**
- ▶ **Requires increased due diligence to determine correct tank tie in locations.**



Southeast Florida Coral Reef Initiative

Acting above to protect what's below.

Little River Adaptation Action Area

DESIGN CHALLENGES – PUBLIC OUTREACH

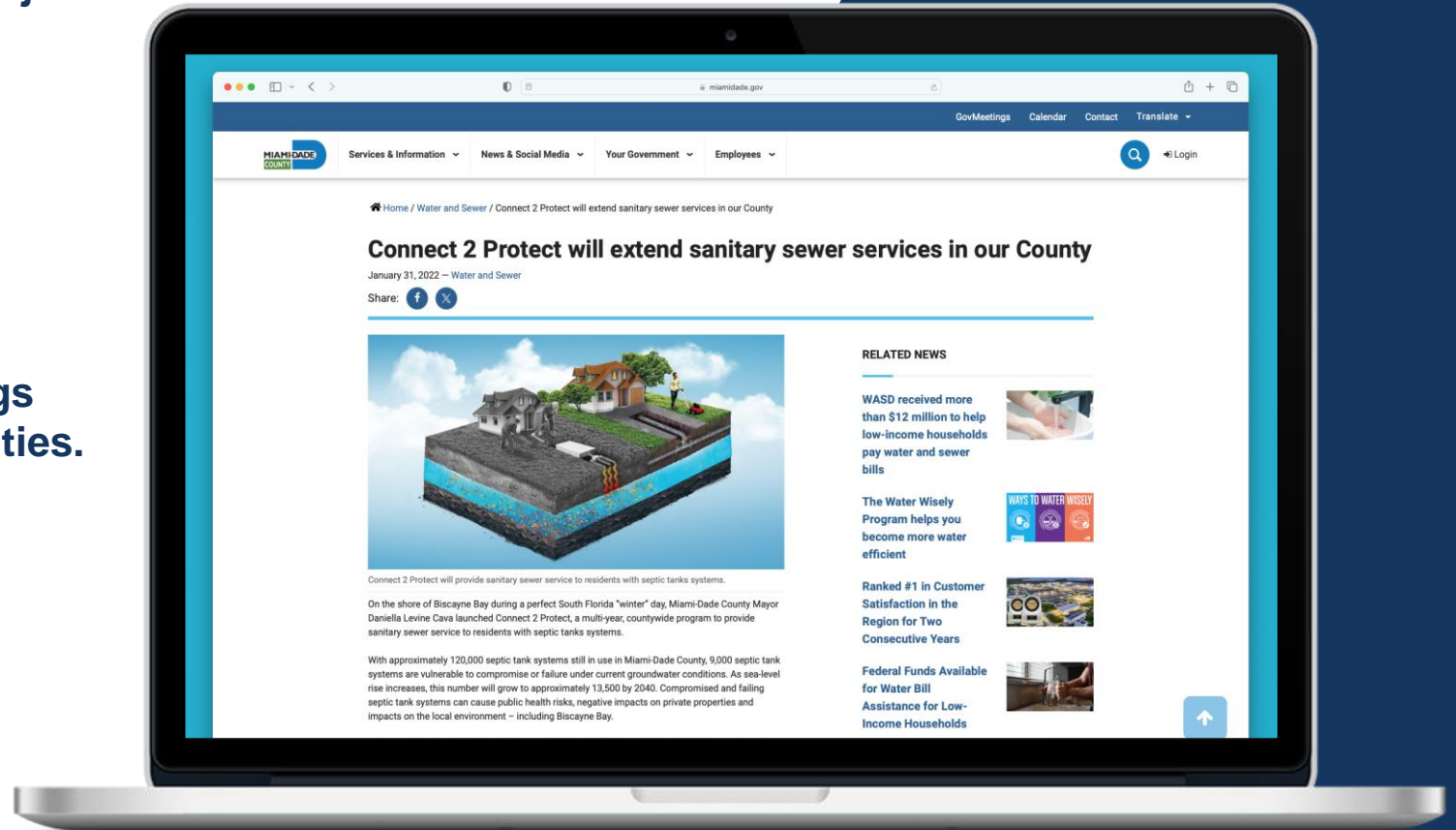
- ▶ **The public needs to understand the project goals.**
- ▶ **Understanding the immediate and long-term impacts of the project.**
 - Allowing access to private property.
 - Connection to the new gravity sewer system.
- ▶ **Public outreach helps to ensure the goodwill of the neighbors during construction.**



Little River Adaptation Action Area

DESIGN SOLUTIONS – PUBLIC OUTREACH

- ▶ **Miami-Dade Water and Sewer Dept. prioritized community involvement from the onset of the project.**
- ▶ **Prove to the community that their investment will benefit them directly.**
 - Economy of South Florida is linked to Biscayne Bay.
 - Investment in the health of the public.
- ▶ **The public was given multiple settings to learn of the project goals and realities.**
 - Public meetings
 - Informative websites
 - Individual resident attention
- ▶ **Regular periods of communication.**



Little River Adaptation Action Area

DESIGN CHALLENGES – EXISTING INFRASTRUCTURE

► Existing gravity sewer mains

- Focus on existing pipe materials at points of connection.
 - Age, condition, lining
- Existing mains may need to be constructed.

► Existing storm mains

- Need to be located completely.
- Exfiltration trench may need to be moved to allow for connections.



Little River Adaptation Action Area

DESIGN SOLUTIONS – EXISTING INFRASTRUCTURE



► Existing Storm Mains

- Survey crews can be directed to clean any structures that are filled with mud.
- Coordination with permitting agencies allows the design team to understand their limitations.

► Existing Gravity Sewer Mains

- TV all existing mains that are to be connected to by the design project.
- Incorporate the pipe age and rating into design early to avoid design interruption.



Little River Adaptation Action Area

CONSTRUCTION CHALLENGES – DEWATERING

- ▶ **Proximity to protected waterways leads to strict dewatering requirements.**
- ▶ **Often needed to pump into the sanitary sewer system**
 - Is the existing system capable of handling dewatering flows?
- ▶ **Some utilities need to be installed below the water table.**



Little River Adaptation Action Area

CONSTRUCTION SOLUTIONS – DEWATERING

- ▶ **Frequent communication with operations team at WASD was required.**
 - Monitoring of existing station pumping patterns.
- ▶ **Plug existing drainage networks to maintain water levels.**
- ▶ **Deep installation is mitigated by use of diver teams**
 - Expensive
 - Can encounter additional problems



Little River Adaptation Action Area

CONSTRUCTION CHALLENGES – SEPTIC TANK LOCATIONS

- ▶ **Not all residents know where their tanks are located.**
- ▶ **Property access.**
 - Often dealing with renters.
 - Seasonal property owners.
- ▶ **Unknown tie in elevations to existing septic tanks.**
- ▶ **Property owners are wary to have work performed on their property.**



Little River Adaptation Action Area

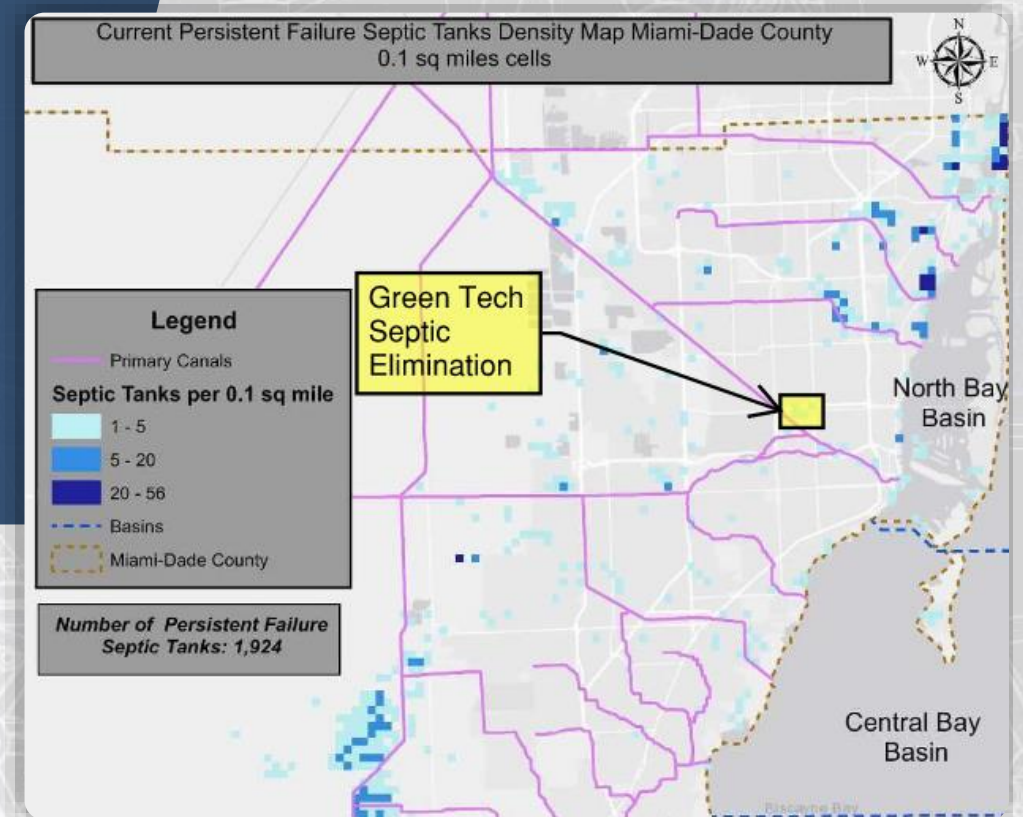
CONSTRUCTION SOLUTIONS – SEPTIC TANK LOCATIONS

- ▶ **Engage with residents/owners from the onset of the project.**
 - Facilitates site access and communication.
- ▶ **Locate septic tanks with Utility Owner representatives on site.**
- ▶ **Focus on a complete and satisfactory restoration.**
- ▶ **Ensure any located tie in locations are surveyed for tie in elevation.**



Miami Dade Septic 2 Sewer

CASE STUDY AREA – GREEN TECH CORRIDOR



Green Tech Corridor

COMMERCIAL SEPTIC SYSTEM ELIMINATION

- ▶ **Funded in part with GOB monies.**
 - Building Better Communities Bond Program
- ▶ **Commercial septic elimination is better received by property owners.**
- ▶ **Required additional utility location due to the crowded nature of commercial utility corridors.**
- ▶ **Requires increased due diligence to determine correct tank tie in locations.**



Green Tech Corridor

DESIGN CHALLENGES – CROWDED UTILITY CORRIDOR

- ▶ **Commercial utility corridors tend to be filled with utilities.**
- ▶ **Navigating existing utilities while installing laterals is critical to minimize gravity sewer depth.**
- ▶ **Not all utilities are shown in provided as built drawings.**



Green Tech Corridor

DESIGN SOLUTIONS – CROWDED UTILITY CORRIDOR

- ▶ **Use all available utility locate tools.**
 - Survey inverts
 - Soft digs where possible

- ▶ **Design for utility connections at property line.**
 - Determine required connection elevations
 - Adjust gravity sewer during design

- ▶ **Dedicate construction resources to unforeseen utility locates.**
 - Install standards for avoiding previously unlocated utilities

Green Tech Corridor

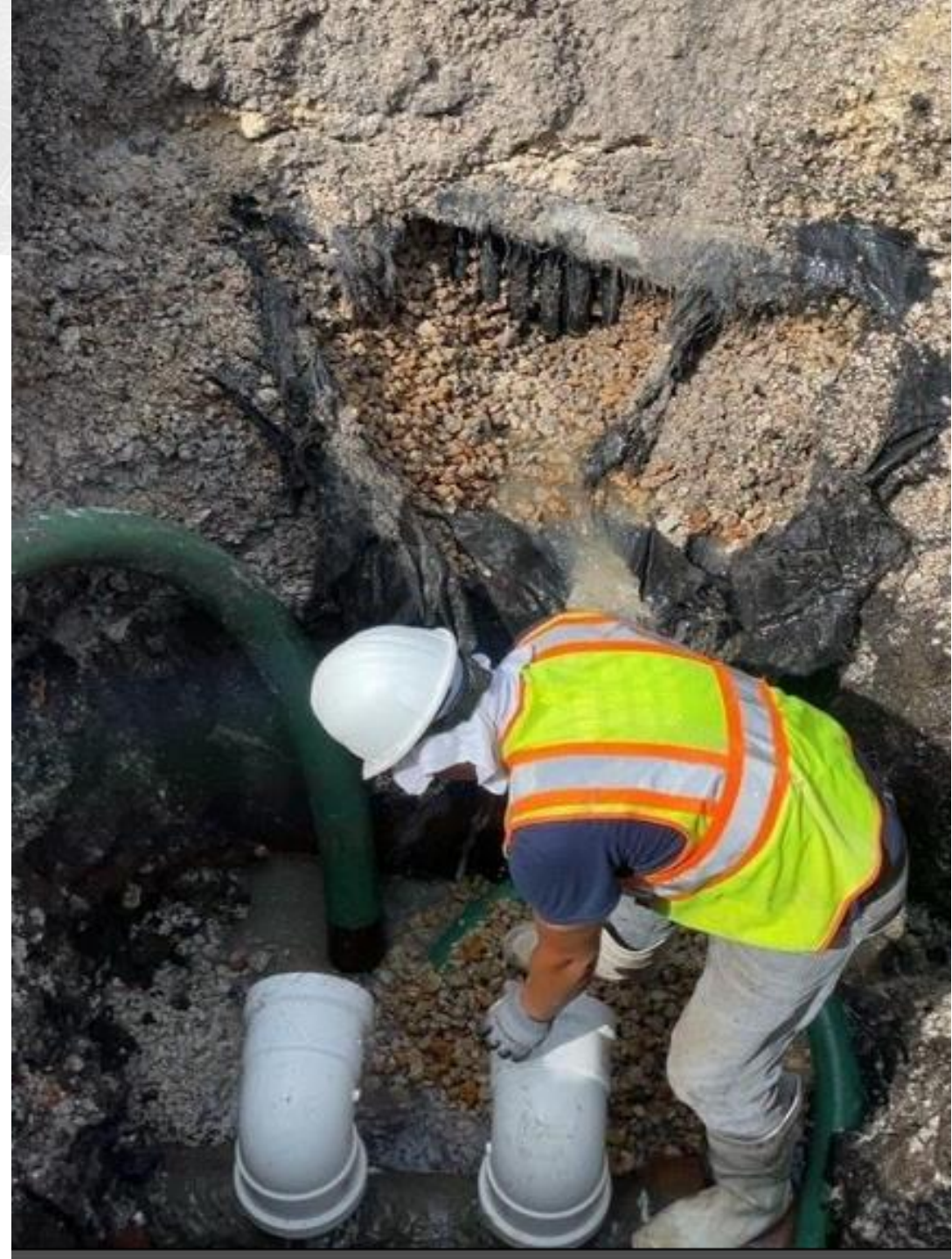
CONSTRUCTION CHALLENGES – CROWDED UTILITY CORRIDOR

- ▶ **Existing storm water infrastructure**
 - Exfiltration trench near property lines
- ▶ **Existing water mains**
 - Active and abandoned
- ▶ **Requires communication with property owners for any “private side” improvements in the Rights of Way.**

Green Tech Corridor

CONSTRUCTION CHALLENGES – CROWDED UTILITY CORRIDOR

- ▶ **Develop a standard practice for impacting exfiltration trench**
 - Requires communication with stormwater utility owner
- ▶ **Communication with all agencies to begin during design so that a constant flow of information is established**
- ▶ **Coordination with property owners to locate any “private side” utility conflicts**



Connect 2 Protect

OVERALL KEYS TO SUCCESS



COMMUNICATION IS KEY

Early and often

Establish relationships with property owners

Ensure property owners know and relate to project goals



DUE DILIGENCE IS PARAMOUNT

Accurately locate as many utilities as possible

Ensure existing gravity sewer lines are TV'd and inspected

Residential outreach should begin early

Connect 2 Protect

GENERAL PROJECT STATISTICS

▶ Little River Adaptation Area

- **88** Properties removed from septic
- **215** linear feet of gravity sewer installed
- **323** linear feet of water main installed

▶ Green Technology Corridor

- **94** Properties removed from septic
- **3,485** linear feet of gravity sewer installed
- **9,700** linear feet of water main



Juan A. Curiel, PE

*MDWASD Assistant Director
Utility Construction*

juan.curiel@miamidade.gov



Questions?



Joseph Carothers, PE

jcarothers@corradino.com

THE CORRADINO GROUP



