



HDR

An aerial photograph of Lake Erie, showing a large body of water with several key locations marked. At the top, a long breakwall extends into the water. Below it, the shoreline features Edgewater Park with a marina, a highway interchange labeled I-90, and Gordon Park. To the right, a large dike labeled Dike 14 is visible. The background is a dark blue sky.

Federal Breakwall

Lake Erie

Edgewater Park

I-90

Dike 14

Gordon Park

 FirstEnergy Power 

February 02, 2023

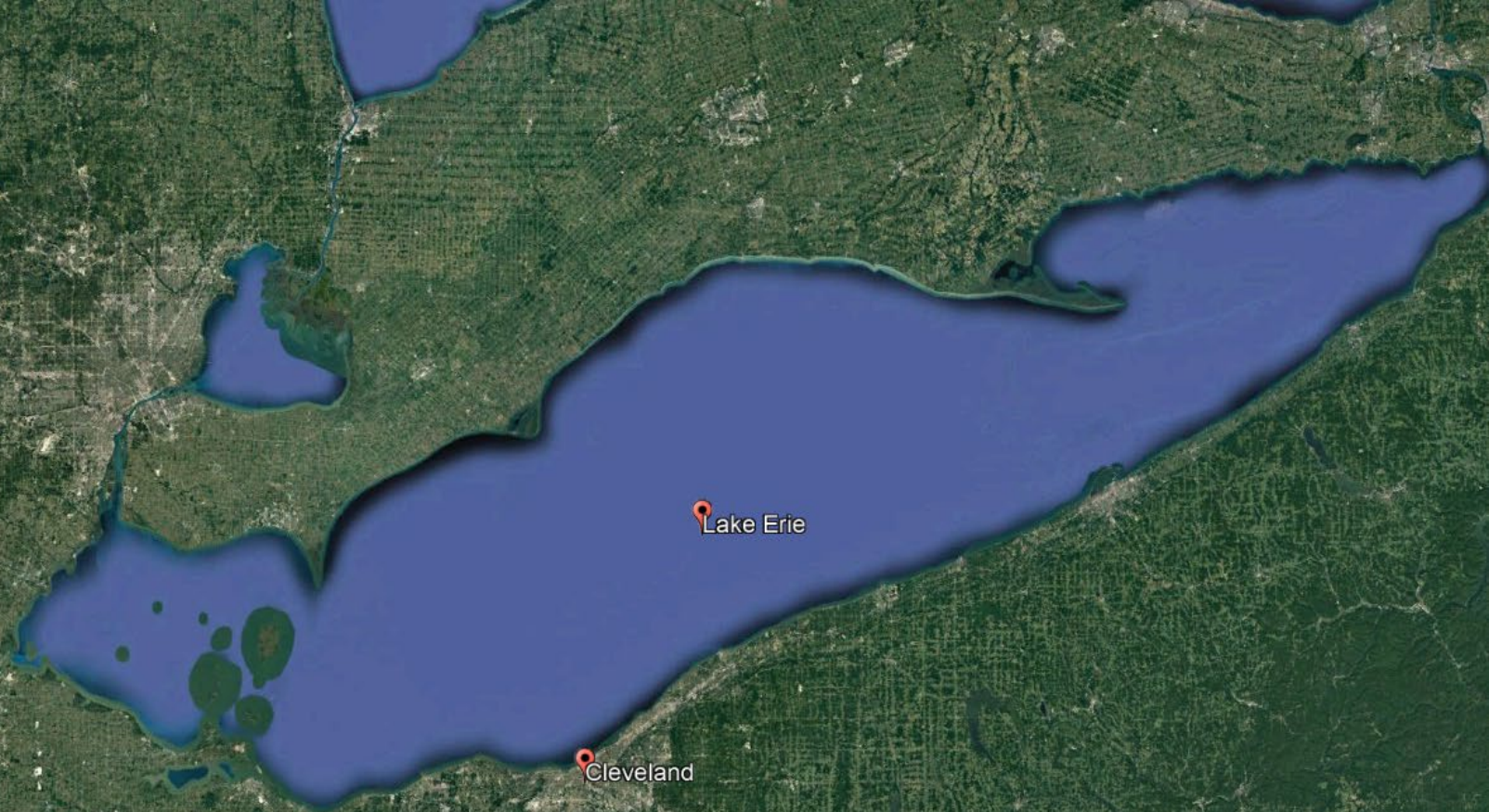
CHEERS!

Cleveland Harbor Eastern

Embayment Resilience Study

Lessons from the Great Lake's most
Ambitious Multi-Phase Resiliency Plan

FLORIDA SHORE & BEACH
PRESERVATION ASSOCIATION
A League of Cities and Counties on Beach and Coastal Issues



Lake Erie

Cleveland



01

DIKE 14



Dike 14: From **Blue** to Brown to Green

- Private Estate turned Public Park in 1892
- Cleveland's Premier turn-of-the-century destination
- Famous for fishing, boating, bathing, & picnicking
- Migratory bird corridor at the mouth of Doan Brooks & Shaker Lakes



Dike 14: From Blue to **Brown** to Green

- An 8-acre solid waste landfill - “Cleveland Lakefront Dump”
- Operated by the City from about 1930 to 1970
- In 1962, two ships from the U.S. Steel Fleet sunk to create a reef
- Landfill operations continued around & over the boats between 1962-1970



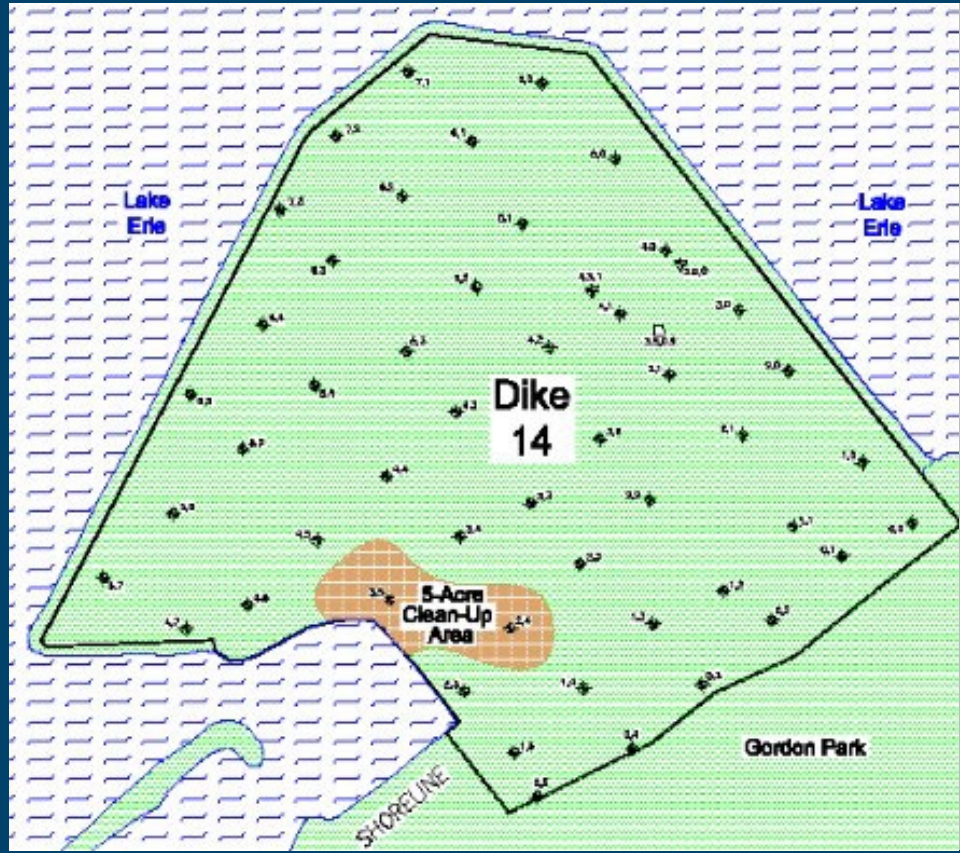
Dike 14: From Blue to **Brown** to Green

- Creation of Dike 14 DMMA
- In 1979, the USACE began filling Dike 14 with Cuyahoga River & Cleveland Harbor shipping channel dredged sediments
- In 1999, the USACE placed the final load of dredged material



Dike 14: From Blue to Brown to Green

- Left undisturbed for ~15 years, most of the 88-acre site didn't require cleanup
- Mitigated ~5-acre area associated with the former landfill
 - Low levels of PCBs, PAHs, & lead
 - Ongoing seasonal monitoring



Dike 14: From Blue to Brown to Green

- Only significant natural area along the Cleveland Lakefront
- Only accessible natural area between Huron to the west & Mentor Marsh to the east
- Important bird migration stopover site before crossing Lake Erie
- 280+ species of birds
- 29+ species of butterflies
- 26 native plant species
- 16 mammals
- 2 reptiles
- 9 native trees & shrubs





02

CHEERS!

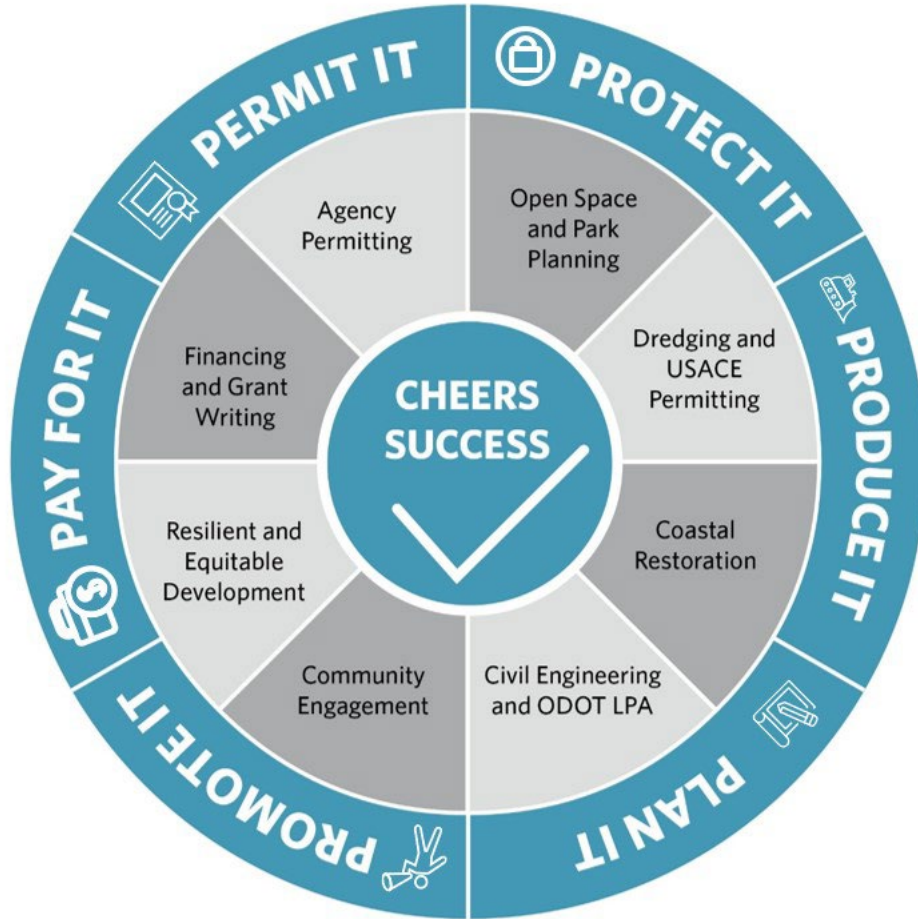




Cleveland

A large, white, three-dimensional sign spelling out the word "Cleveland" in a cursive font. The sign is mounted on a bed of brown mulch. In the background, there is a green lawn, a body of water, and the Cleveland skyline under a clear blue sky. A large tree is visible on the right side of the frame.

CHEERS DESIGN



An aerial photograph of the western shore of Lake Erie. At the top, a long, thin breakwall extends into the water. Below it, the dark blue water of the lake dominates the upper half. A long, multi-lane highway, I-90, runs horizontally across the middle. To the left of the highway is a large marina with many boat slips. To the right is a park area with a smaller marina. Below the highway is a large industrial facility with several large rectangular basins. On the far right, a dike structure extends into the water. Labels in white text identify these features: Federal Breakwall, Lake Erie, Cleveland Metroparks, I-90, FirstEnergy Power Plant, Gordon Park, and Dike 14.

Federal Breakwall

Lake Erie

Cleveland Metroparks

Dike 14

I-90

Gordon Park

FirstEnergy Power Plant

Federal Breakwall

PHASE B: The Isle
36 acres

Lake Erie

Edgewater Park



The Cove

The Lakeshore

PHASE A: The Lakeshore
64 acres (43 new acres)

03

LESSONS LEARNED





LESSONS LEARNED



Plan It



Promote It



Pay for It



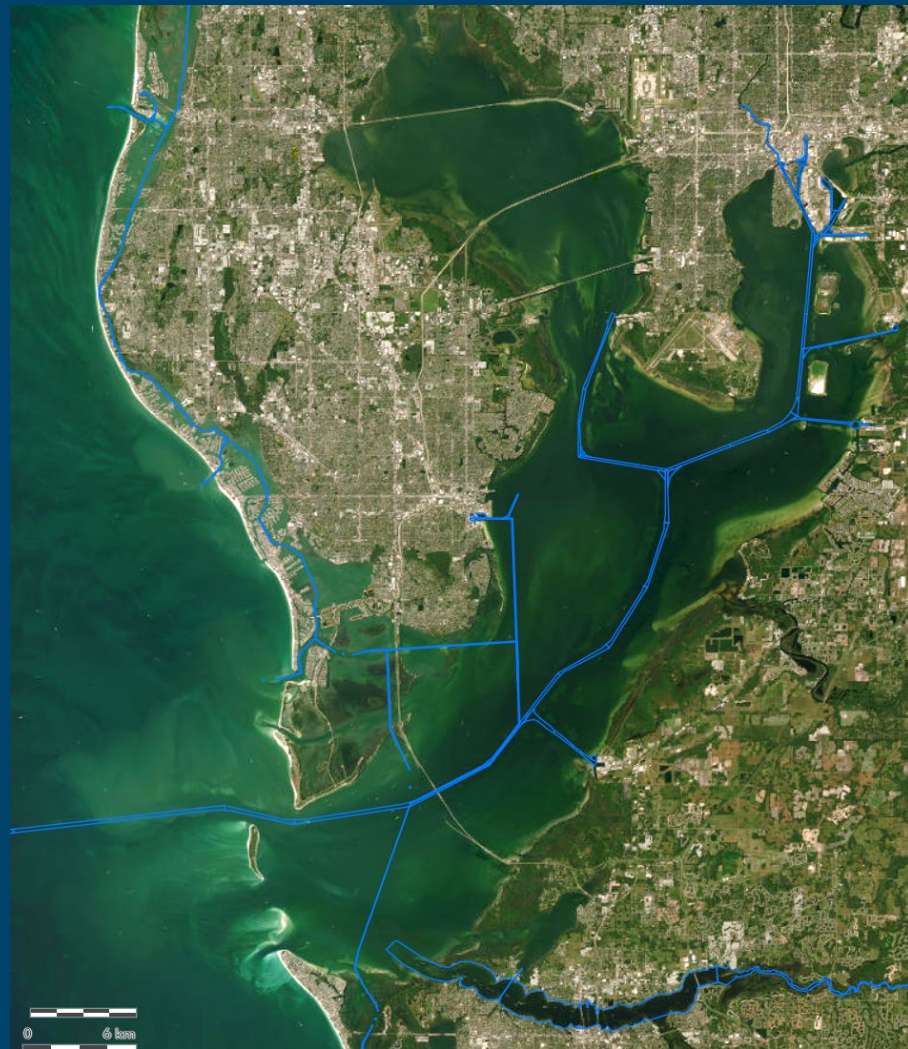
Permit It



Protect It



Produce It





Plan It

- Emphasize Existing Resources
- Determine Desired Outcomes
- Project Conditions Data

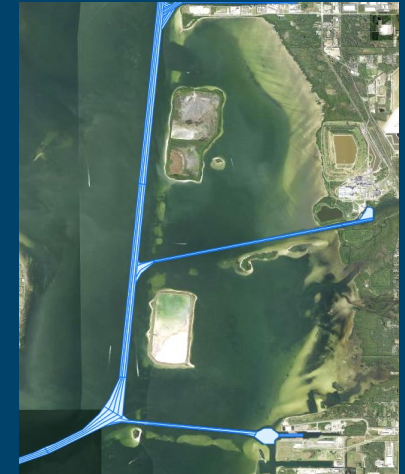
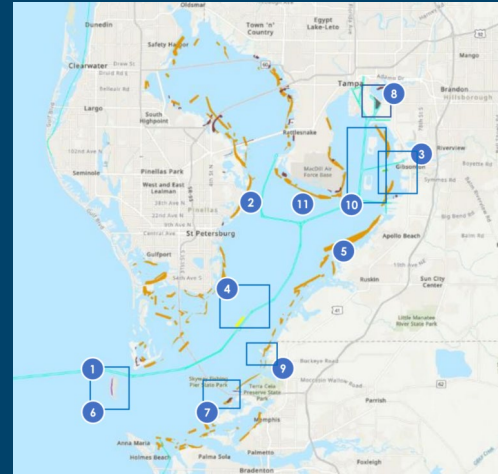
LESSONS LEARNED

LEGEND

Tampa Harbor Channels

Beneficial Use Opportunities

- 1 Egmont Key Beach Placement (1 MCY)
- 2 Dredged Holes (1.5 MCY) (not all suitable for restoration)
- 3 Alafia Bank Sanctuary Islands (~500 KCY) (Island Creation/Restoration)
- 4 Hardbottom Creation Site (1.7 MCY) (previously permitted)
- 5 Nearshore Breakwaters (~100 KCY) (potential restoration sites)
- 6 Egmont Key Island Restoration (5 MCY)
- 7 Manatee County Boat Ramp (1-2 MCY)
- 8 East Bay Port Expansion (3-4 MCY)
- 9 Manbird Key Island Restoration
- 10 Shoreline Restoration at DMMAs
- 11 Reddish Egret Habitat (bay-wide, location TBD)



FEASIBILITY STUDY (2021-2024)



PRECONSTRUCTION ENGINEERING DESIGN (2025-2026)

- Design Data Collection
- Detailed Design

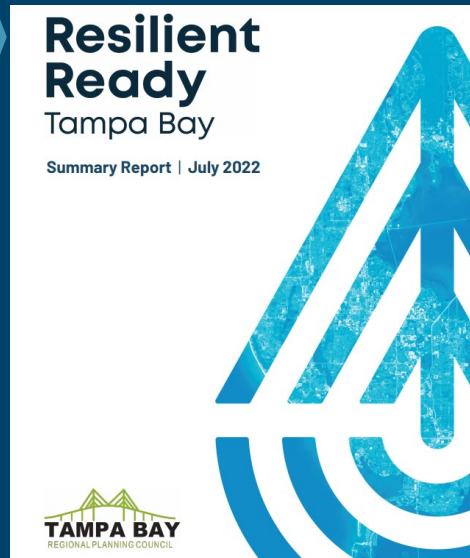
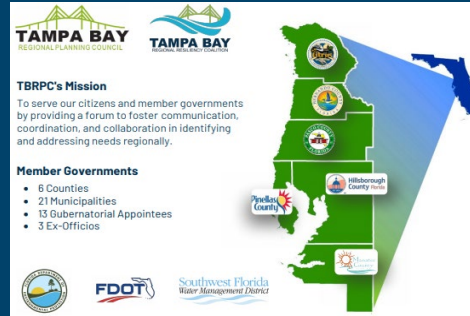
CONSTRUCTION PHASE (2026+)

- Real Estate Acquisition
- Relocations (if needed)
- Plans & Specifications
- Construction



Promote It

LESSONS LEARNED



- Stakeholder engagement in developing & selecting alternatives
 - Evaluating alternative
 - Refining the concepts
- Build coalitions & partnerships
- Understand what resonates





Pay for It

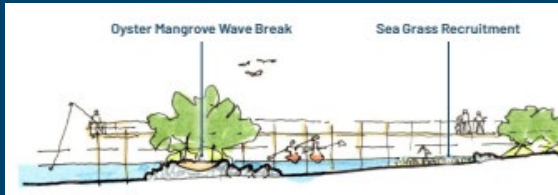
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- Planning & construction cannot be implemented without funding
- Can the project itself generate funds
 - Federal funds, grants, tolls, usage fees?
 - Public-private partnerships?
 - Mitigation credits, etc.?
- Unique climate for long-term funding





Permit It

LESSONS LEARNED



Why we need to improve environmental resilience on the eastern lakefront:

- + Impact of Climate Change
- + More Frequent and Intense Storm and Weather Events
- + Impact of Waves, Ice, and Erosion on the Shoreline and Critical Infrastructure
- + Flooding and High Lake Levels
- + Limited Nearshore Habitat
- + Degraded Water Quality and Aquatic Habitat
- + Lack of Natural Shoreline Protection
- + Large Availability of Dredge Material that Needs to be Beneficially Used or Stored
- + Increase in Average Temperatures

- Connecting regulatory reviewers to its potential environmental renewal
- Connecting the public to its possible ecological splendor
- Connecting Port Tampa Bay, FDEP, USACE, counties, & municipalities to its long-term adaptive planning benefits





- + Lack of Equity in Availability and Access to Open Spaces and Recreational Amenities
- + Safety and Security Concerns
- + Vulnerable Communities with Limited Ability to Respond to Environmental or Economic Shocks
- + Need for Intergenerational and Community Gathering Spaces



Protect It

LESSONS LEARNED

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- Nearshore breakwaters (also known as longshore bars) were historically significant features in Tampa Bay
- Over time they have disappeared

- When land reclamation fails
 - Generally, because of the extremely energetic environmental conditions
 - Adaptive management, fail & rebuild, & other strategies should be reviewed
 - Plan & budget for inevitable impacts



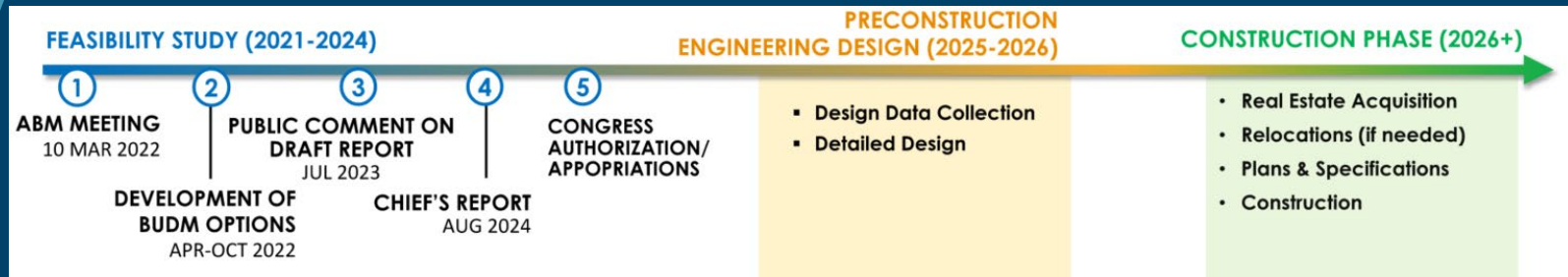


Produce It

LESSONS LEARNED

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- Actively managing deliverable quality is essential to minimizing cost & eliminating schedule overruns
- Advance schedule & reduce cost while maintaining quality
- Set industry benchmarks for excellence
- With CHEERS! – focused on providing environmental equity elements first
- With PTB – focus on economics?



Joe Wagner, PE, D.NE, BCEE
Senior Dredging Engineer
Ports & Harbors

76 S. Laura Street, Suite 1600
Jacksonville, FL 32202
904.210.4078
joe.wagner@hdrinc.com



hdrinc.com

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