COASTAL PROTECTION AND RESTORATION AUTHORITY

JANUARY 2024

Calcasieu-Sabine Large Scale Marsh and Hydrologic Restoration (CS-0087)

PROGRAM UPDATE

CS-87 Project Scope

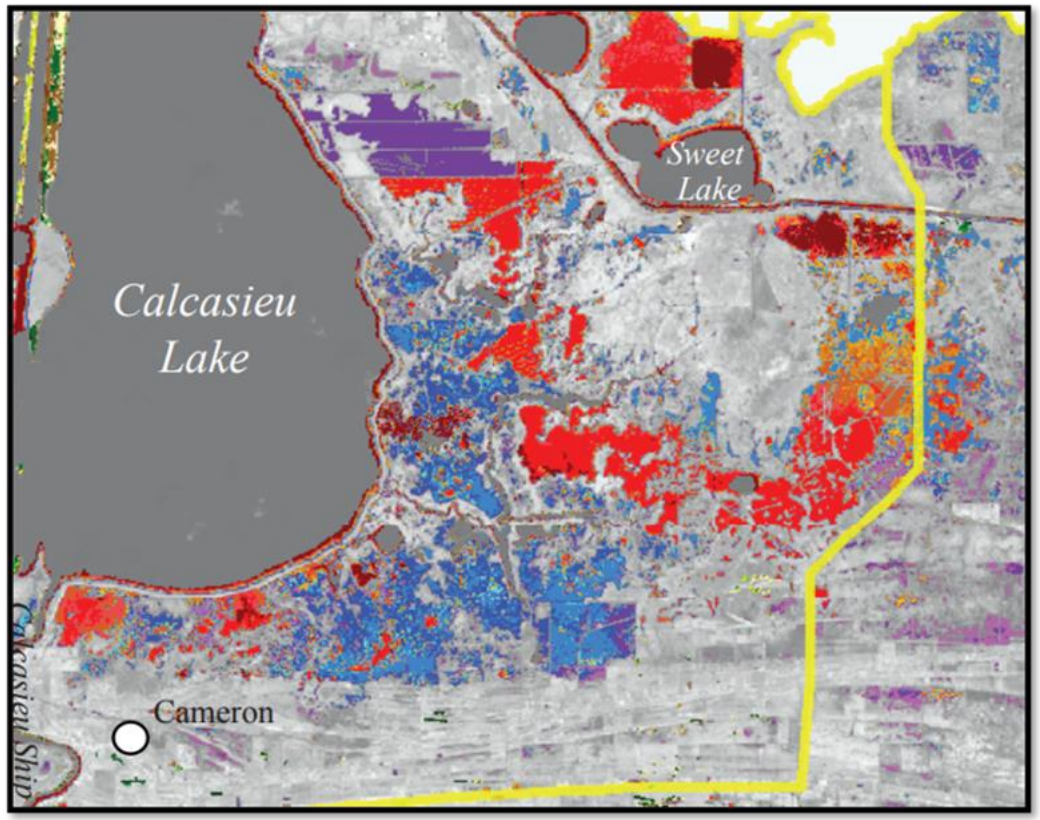
PROJECT GOAL: Reduce the rate of land loss in the Calcasieu Sabine Basin

PROJECT OBJECTIVES

- Reduce marsh stress from flood inundation through:
  - Improved drainage
  - Dredged sediment input
- Maintain marsh salinity levels achieved through existing CCW management practices

THREE MAIN PROJECT COMPONENTS

- Drainage structures with backflow prevention and/or pumping systems to improve marsh drainage
- Conveyance improvements to facilitate flow of excess water to drainage structures
- Large-scale marsh creation & nourishment to increase elevation capital

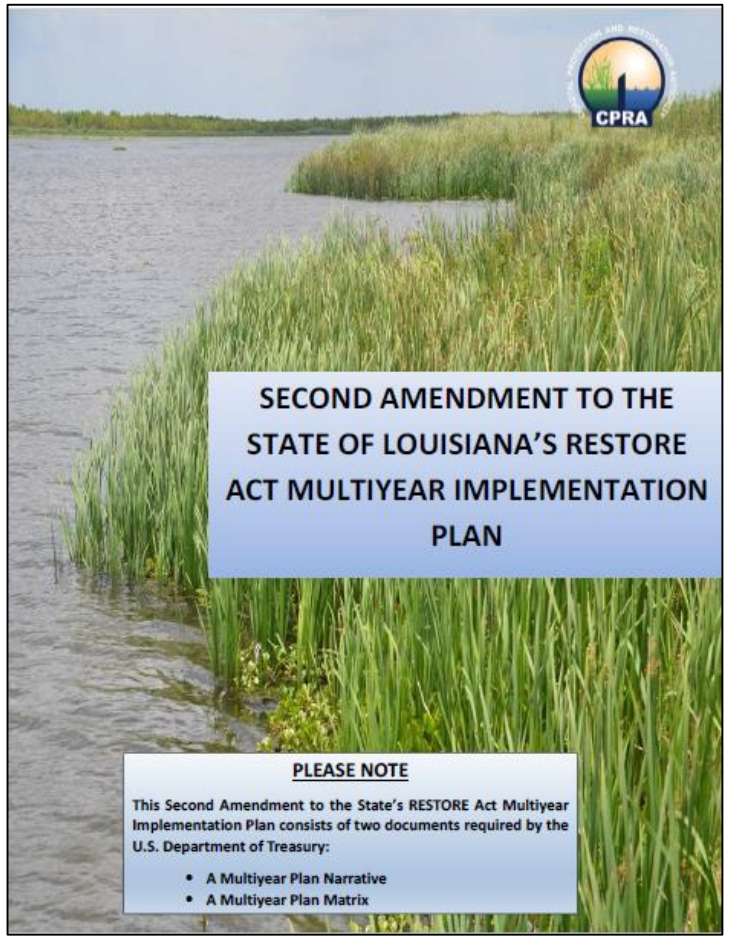


Source: Couvillion, B.R., Beck, Holly, Schoolmaster, Donald, and Fischer, Michelle, 2017, Land area change in coastal Louisiana 1932 to 2016: U.S. Geological Survey Scientific Investigations Map 3381, 16 p. pamphlet, https://doi.org/10.3133/sim3381.

Calcasieu-Sabine Large-Scale Marsh and Hydrologic Restoration Project (CS-87)

Funding Source: RESTORE Act Direct Component (Bucket 1)

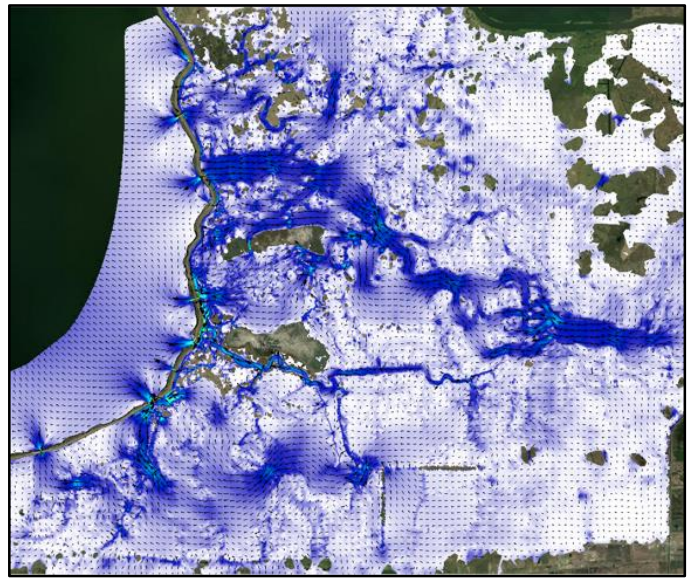
- This project replaces the discontinued Calcasieu Ship Channel Salinity Control Measures Project
- Full $260.97M Bucket 1 allocation for Louisiana dedicated to this project
  - Engineering & Design
  - Permitting
  - Construction
  - **Operations & Maintenance of Drainage Structures**
  - Monitoring and Adaptive Management

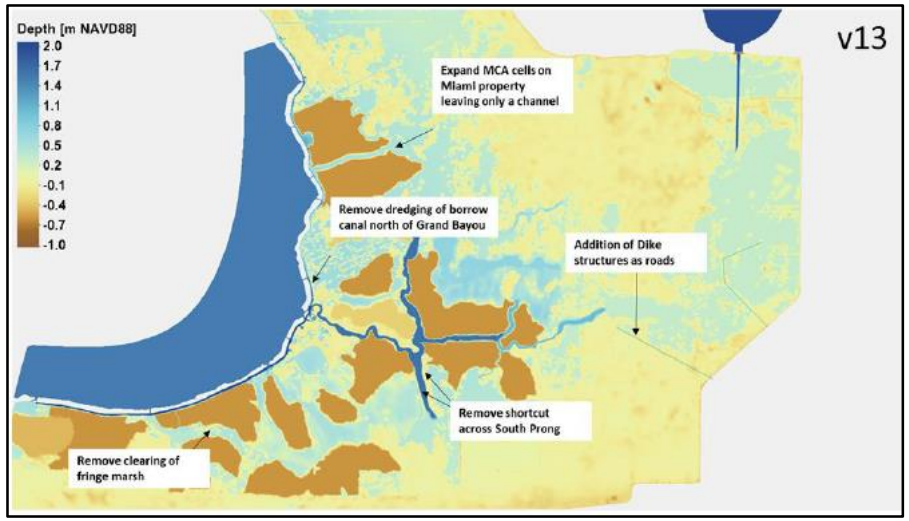


Design Optimization

Regional Modeling

- MIKE-21 model simulated watershed drainage with and without project feature alternatives
  - Evaluated varying lake rim drainage sizes and locations
  - Ensured marsh creation does not further impound water
  - Identified effective drainage pathway improvements





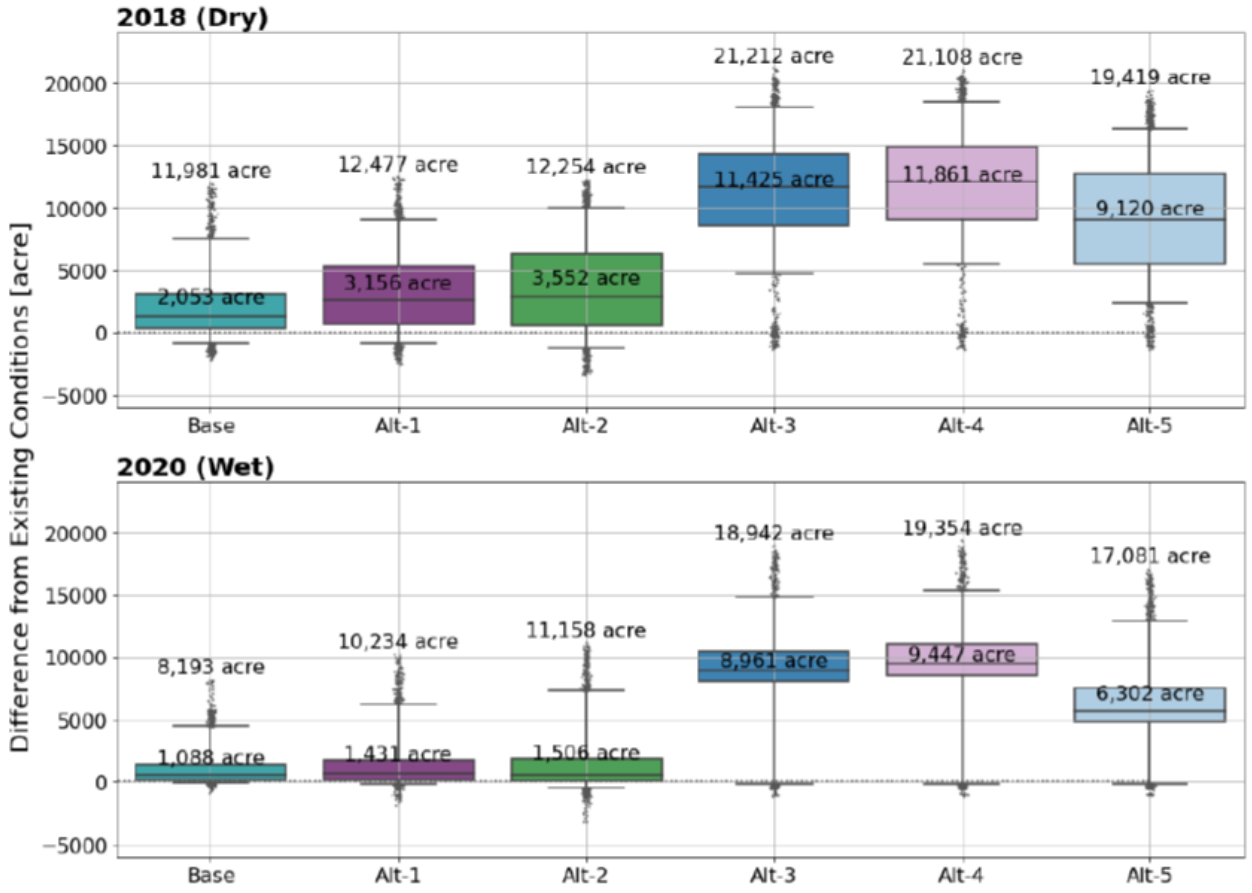
Design Optimization

Regional Modeling – Project Benefits

Water level reductions in the marsh

- Average 1.9 inches
- Peak reduction of 17 inches after a high-water event

Increased total marsh area not under flood stress by 6,300 (2020) – 9,100 (2018) acres 50% of the time



Hourly Area Below Upper Target Water Level Change from Existing Conditions

The box represents 25th, median, and 75th percentile values and whiskers represent 5th and 95th percentile limits.

Project Features

A. Lake Rim Drainage

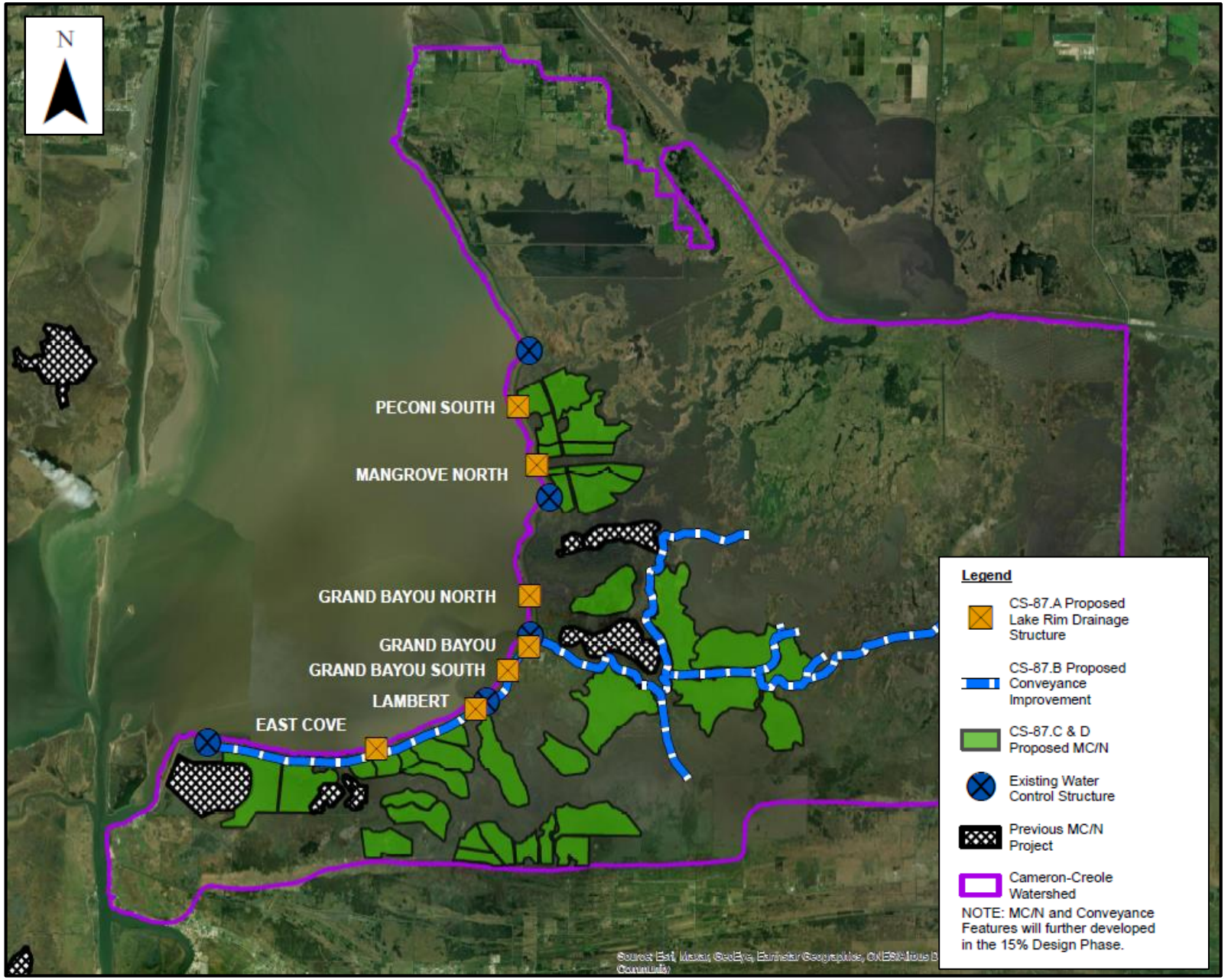
- Seven (7) proposed gravity drainage structures with backflow prevention

B. Conveyance

- Up to 18 miles of channel improvements
  - Improve drainage from back of the marsh to the Lake Rim
  - Focused on dredging of historic bayous

C. Marsh Creation

- Over 2,000 of 7,000 shown acres to be built through CS-87
  - Using dredged material from channel improvements, CSC, and offshore



Four Project Tracks for Efficiency

Milestone	Lake-Rim Drainage	MC/N with Conveyance Channel Borrow	MC/N with Inshore / Nearshore Borrow	MC/N with BUDMAT
Design Optimization	July 2022	July 2022	Early 2023	
★ 15% Design	Fall 2023	Late 2023	Early 2024	
JPA Submittal	Late 2023	Late 2023 – Early 2024	Mid - Late 2024	
30% Design	Early 2024	Mid 2024	Mid - Late 2024	
90% Design	Late 2024	Late 2024	Mid 2025	2024
Advertise for Bids	Early 2025	Mid 2025	Late 2025	Fed FY 26 or FY 28

★ Current Project Phase

NEEL-SCHAFFER Solutions you can build upon

MOTT MACDONALD

HDR

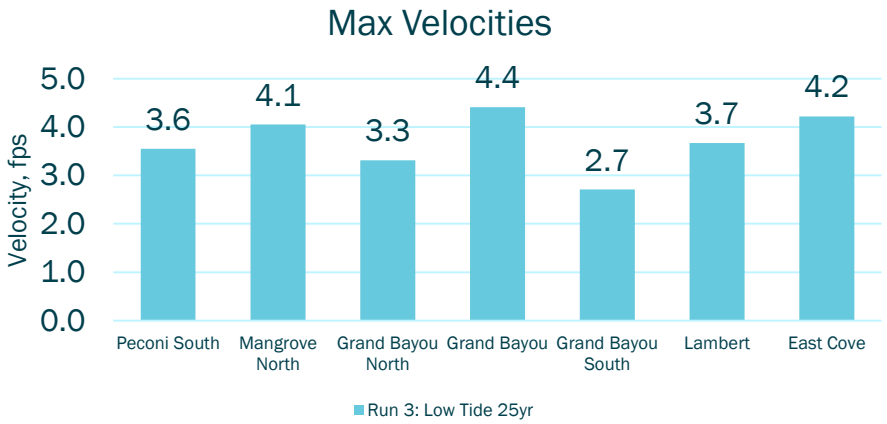
THE WATER INSTITUTE

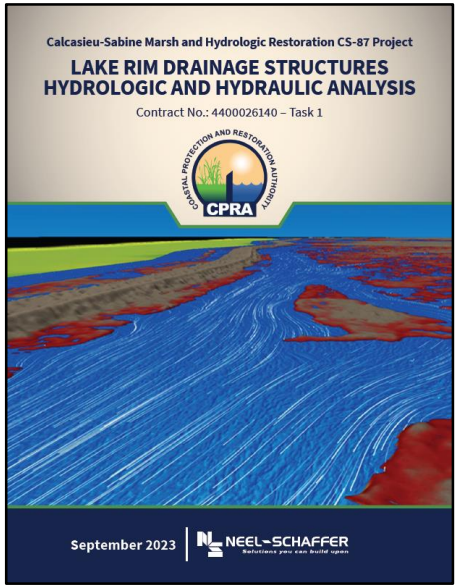
GEOENGINEERS

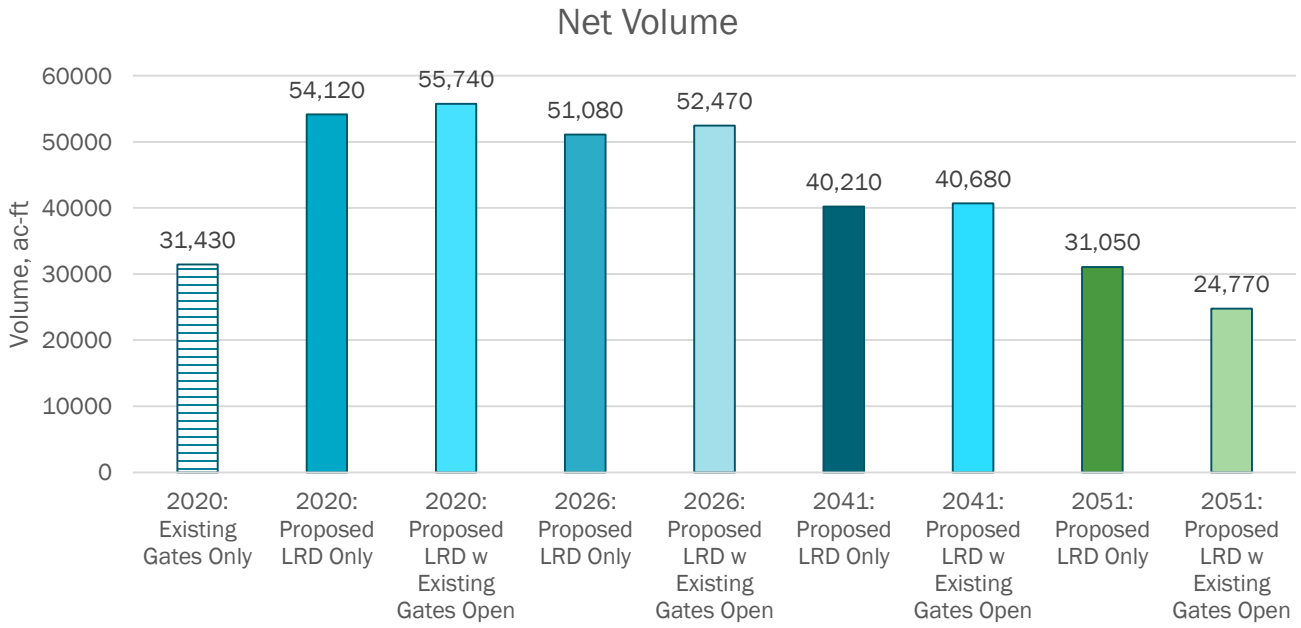
Lake-Rim Drainage Structures

H&H Modeling

- Provided recommendations on structure geometric layout
- Enabled evaluation of design details:
  - Hydraulic velocity at LRD structures was evaluated for future scour design efforts. Maximum culvert outlet velocities ranged between 1.7 to 4.4 feet per second
- Informed review of project's benefits with sea level rise projections:
  - Hydraulic efficiency declines as sea level rises, but beyond 2050 LRD structures still allow for net outflow equivalent to present-day drainage capacity







Lake-Rim Drainage Structures

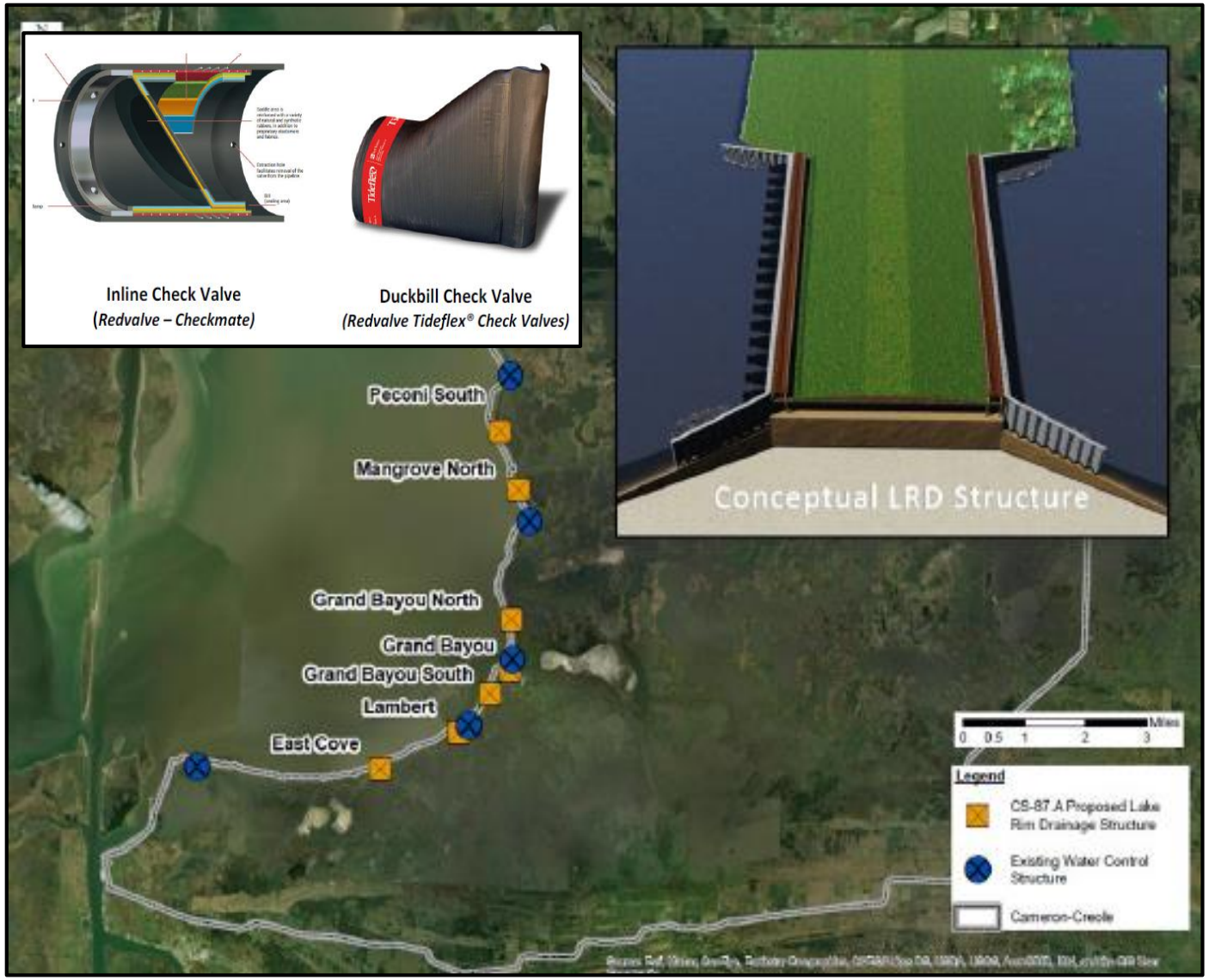
15% Structure Design

Multiple barrel 60” diameter culverts, sheet pile headwalls, trash screens, walkways, timber pile supports, and excavation/backfill of existing levee.

The total structure capacities (including additional capacity for redundancy/ resiliency) are:

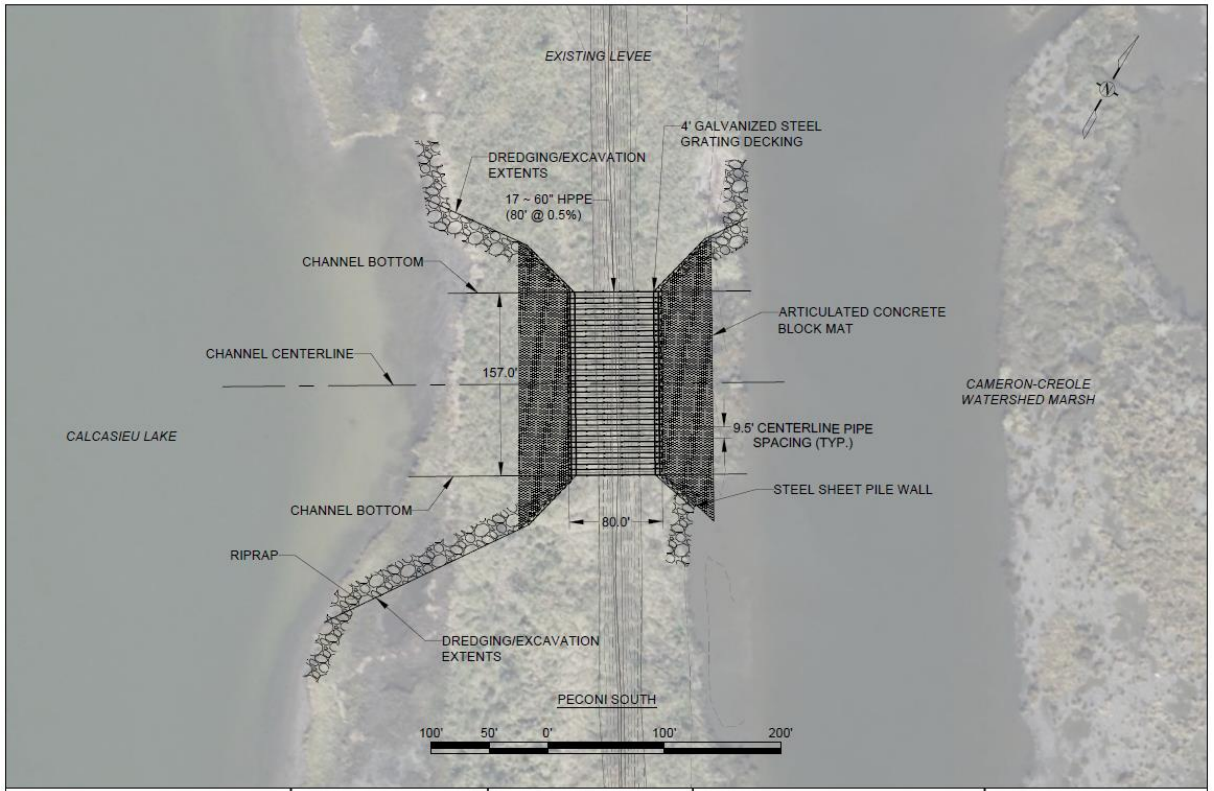
- 17 – 60” culverts each at Peconi South, Mangrove North and East Cove;
- 23 – 60” culverts each at GB North and GB South; and
- 31 – 60” culverts each at GB and Lambert

Typical culvert invert elevation: -4 ft. NAVD88.

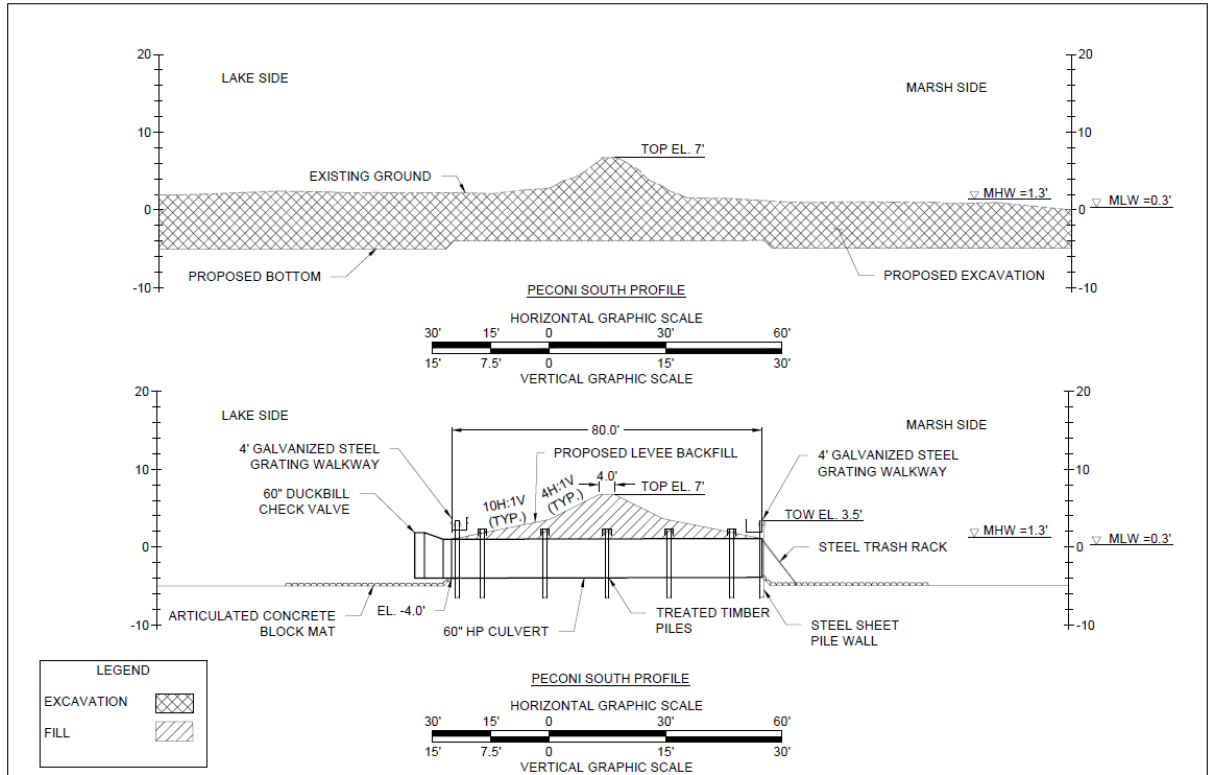


Lake-Rim Drainage Structures

15% Design – Peconi South (17 Culverts)



APPLICATION BY: COASTAL PROTECTION AND RESTORATION AUTHORITY 150 TERRACE AVENUE BATON ROUGE, LOUISIANA 70802	PRELIMINARY THESE DOCUMENTS ARE FOR DESIGN REVIEW AND NOT INTENDED FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES.	COASTAL PROTECTION AND RESTORATION AUTHORITY 150 TERRACE STREET BATON ROUGE, LOUISIANA 70802	CALCASIEU-SABINE LARGE SCALE MARSH AND HYDROLOGIC RESTORATION	LAKE RIM DRAINAGE PECONI SOUTH STRUCTURE
			STATE PROJECT NUMBER: CS-0087.A	DATE: OCTOBER 2023
DRAWN BY: SS	DESIGNED BY: LS	APPROVED BY: LS	FEDERAL PROJECT NUMBER: N/A	SHEET 10 OF 30



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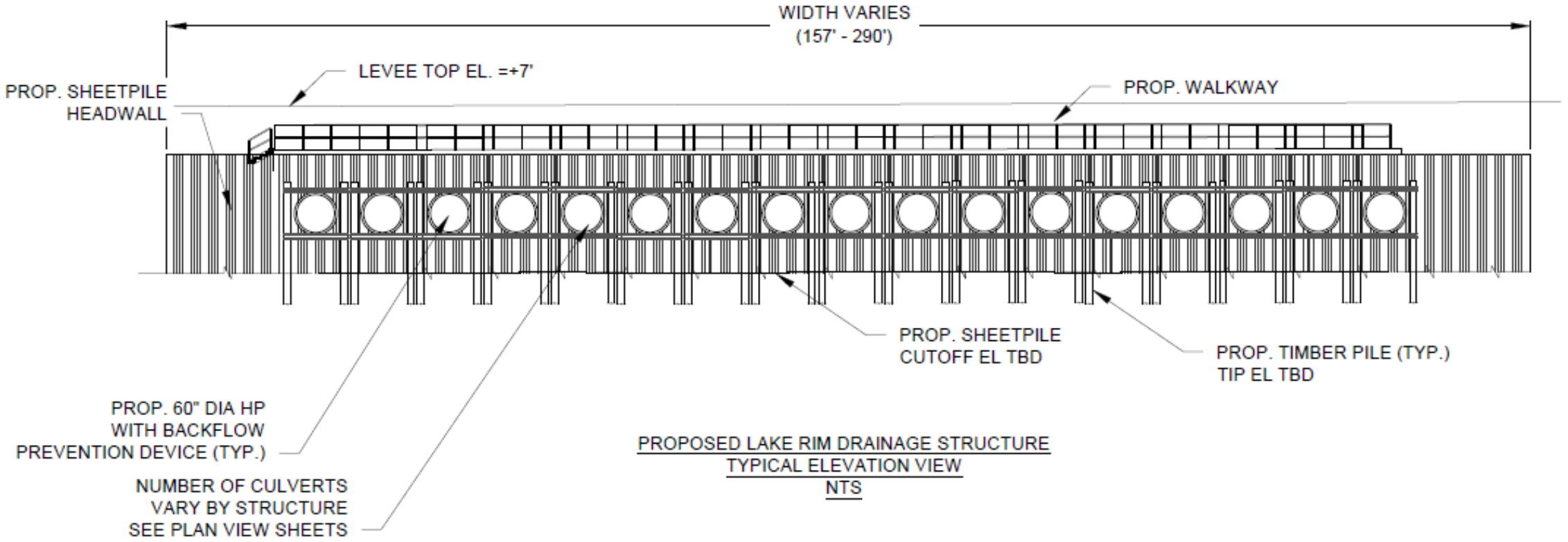
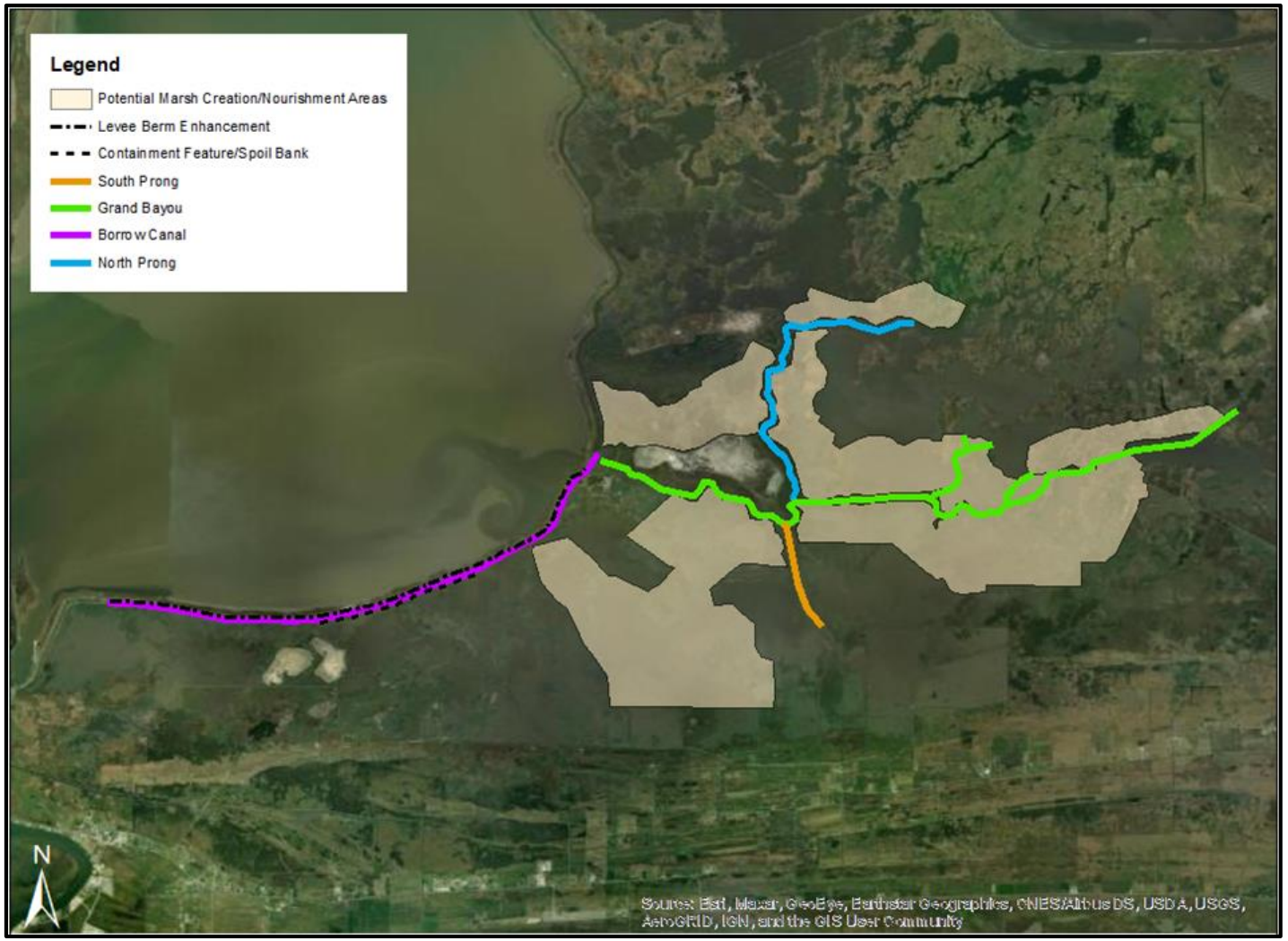
Lake-Rim Drainage Structures

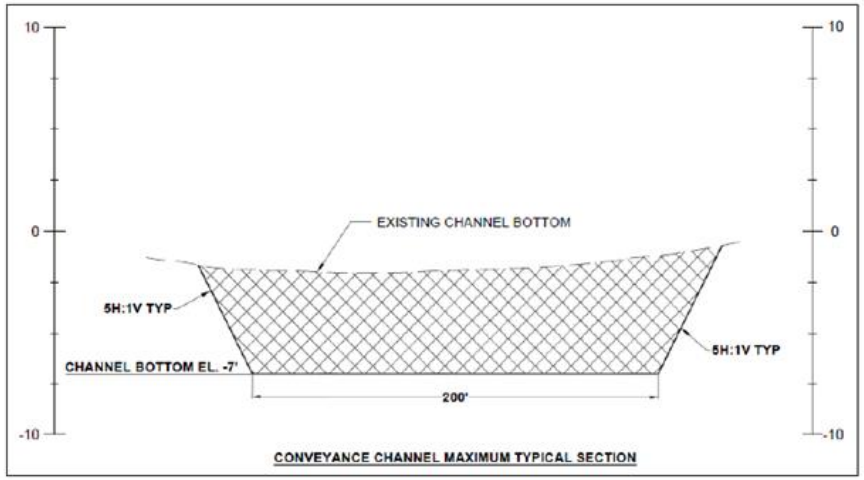
15% Design

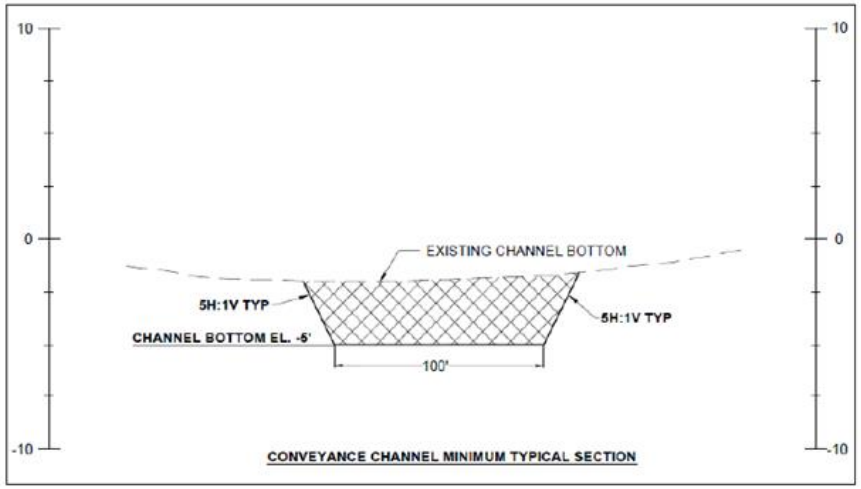


PROPOSED LAKE RIM DRAINAGE STRUCTURE
TYPICAL ELEVATION VIEW
NTS

Conveyance Improvements





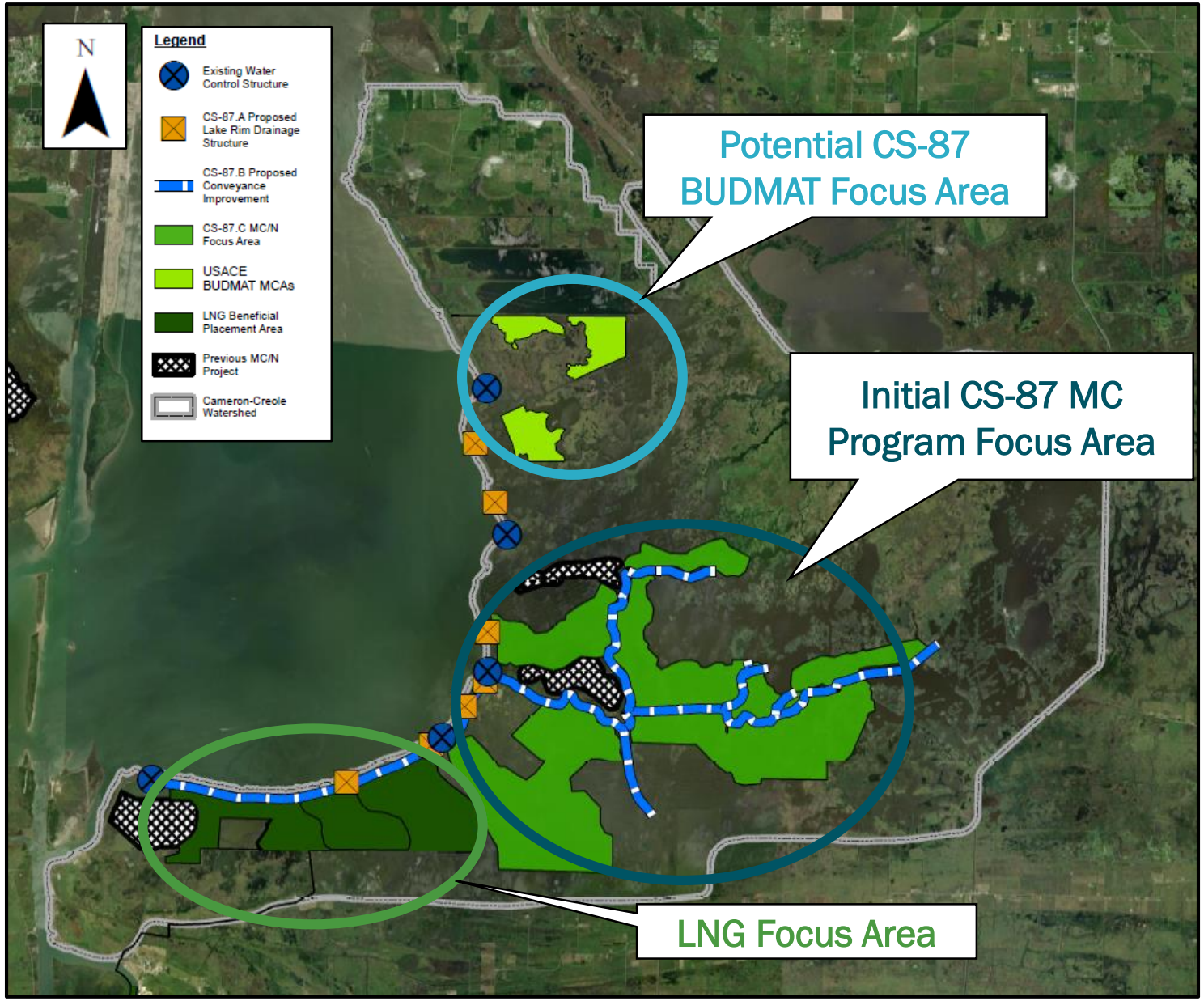


Provides up to 5.5 MCY to be used beneficially within the watershed

Marsh Creation & Nourishment

Fill Placement Area Phasing

- Large-scale marsh creation and nourishment (**over 2,000 acres**) throughout the CCW using multiple borrow sources.
    - Conveyance Improvements
    - Offshore
    - Calcasieu Ship Channel

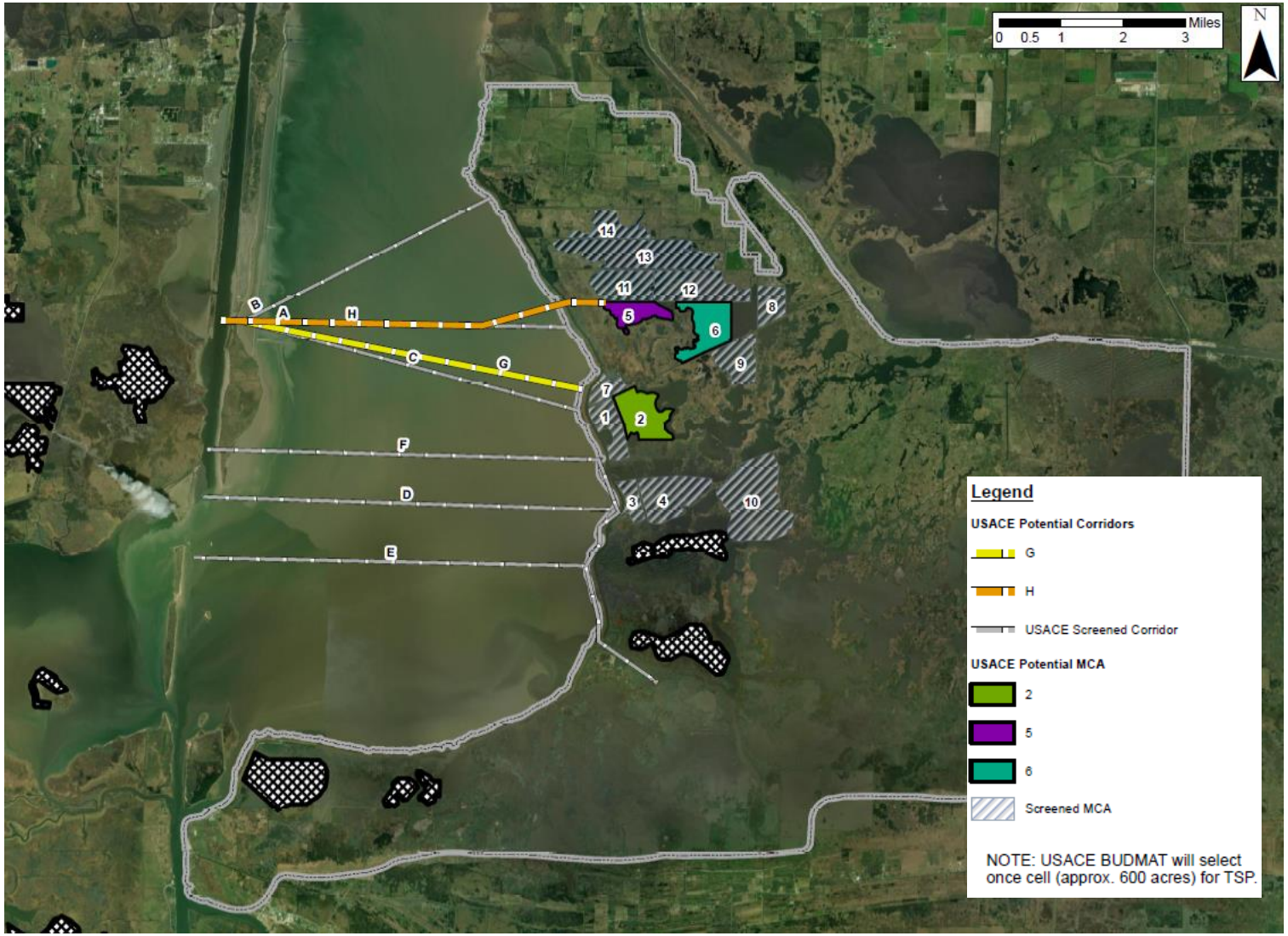


USACE BUDMAT

Project Details

- Corps of Engineers solicits, awards, and supervises CSC maintenance dredging contracts
- Incremental $ difference to use material beneficially is cost shared
  - 75% Federal
  - 25% NFS
- Reduces CPRA's cost per acre by ~80-90%
- Estimate construction in FYs 26 and 28

USACE leading evaluation, comparison, and screening of alternatives



USACE Final Alternatives Array
TSP includes MCAs 2 and 5, approx. 400 acres

Next Steps

CS-87.A Lake-Rim Drainage

- **JPA Submittal** for all 7 LRD structures (**and southern borrow canal cleanout**)
- HDR Team continuing 30% Design

CS-87.B Conveyance Improvements

- **JPA Submittal** - Finalizing beneficial-use placement plans for borrow canal material **to include in LRD JPA**
- CPRA initiating detailed design
- Evaluating costs, benefits, and cultural resources to determine final templates

CS-87.C Marsh Creation

- **JPA Submittal** for borrow area geotechnical/geophysical investigation
- Dredge pipeline conveyance corridor design coordination with landowners, additional title research

CS.87.D BUDMAT

- DIR in development, TSP approved Dec. 2023
- Field data collection to begin after 2023-2024 duck season