

*THE “**BIGGEST**,” THE “**BADDEST**,”
AND THE “**BESTEST**” –
COASTAL RESTORATION CAJUN STYLE*

**Presentation for:
Western Dredging Association
Dredging Summit & Expo ‘17
June 26-29, 2017**

**Presented by:
Coastal Engineering Consultants, Inc.**



The “*B I G G E S T*”

➤ “Webster’s” Definitions

- ❖ Largest in quantity or dimension
- ❖ Of greatest scope or expanse
- ❖ Exceeding that which is common to its class

➤ Selection ~ *SHEER DENSITY*

*CURRENTLY THE LARGEST,
BY VOLUME, SINGLE
RESTORATION PROJECT
UNDERTAKEN IN LOUISIANA*

CAILLOU LAKE HEADLANDS RESTORATION a.k.a. WHISKEY ISLAND

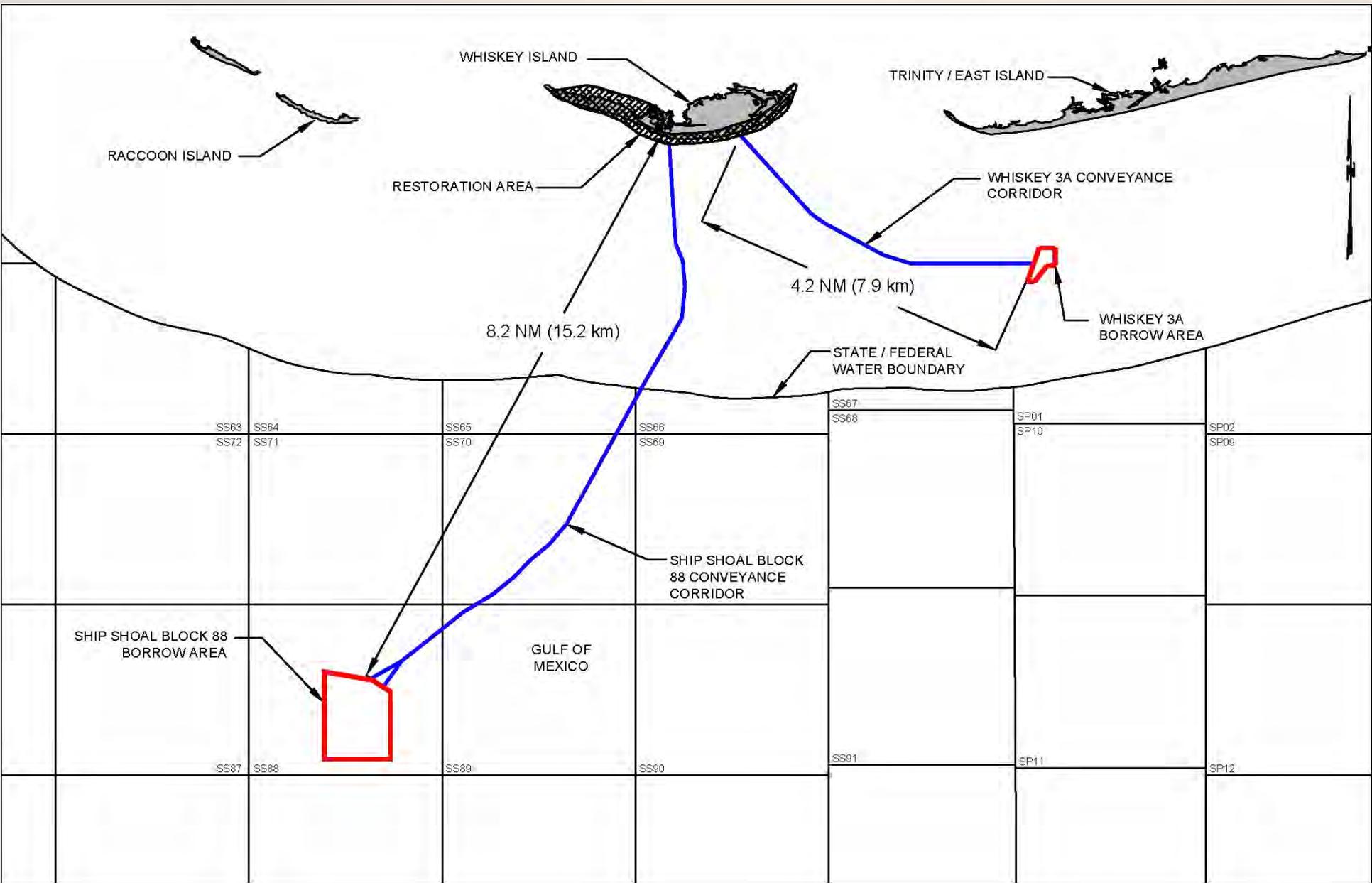


Project Facts

- **Originally part of the four-island National Ecosystem Restoration Plan in LCA Terrebonne Basin Barrier Shoreline Feasibility Study: Whiskey Island recommended as first component of construction**
- **Project reformulated into Caillou Lake Headlands Restoration**
- **Construction Cost**
 - ❖ **Engineer's Opinion of Cost = \$99.5 Million**
 - ❖ **Construction Bid Range**
 - **Low = \$103,176,805**
 - **High = \$103,184,700**
 - **Under Construction...**
- **Construction Elements**
 - ❖ **Beach/Dune Fill (Cut): 9.44 MCY (7.22 MCM) ~ 754 ac (305 ha)**
 - ❖ **Marsh Creation (Cut): 1.01 MCY (0.77 MCM) ~ 178 ac (72 ha)**
 - ❖ **Project Length: 23,700 ft (7,224 m)**
 - ❖ **PROJECT DENSITY: 441 CY/ LF (1,105 CM/m)**

\$7,385 (<0.01% Diff)

Project Overview Map



Headland Overview Map

NOTES:

1. AERIAL IMAGE FROM GOOGLE EARTH® (GOOGLE, INC.), JANUARY 25, 2015.

GULF-SIDE BEACH WIDTH RANGE: 460.0 ft to 710.0 ft (141 m to 216 m)

BEACH ELEVATION : +4.2 ft (+1.3 m) NAVD88

DUNE CREST WIDTH: 100.0 ft (30.5 m)

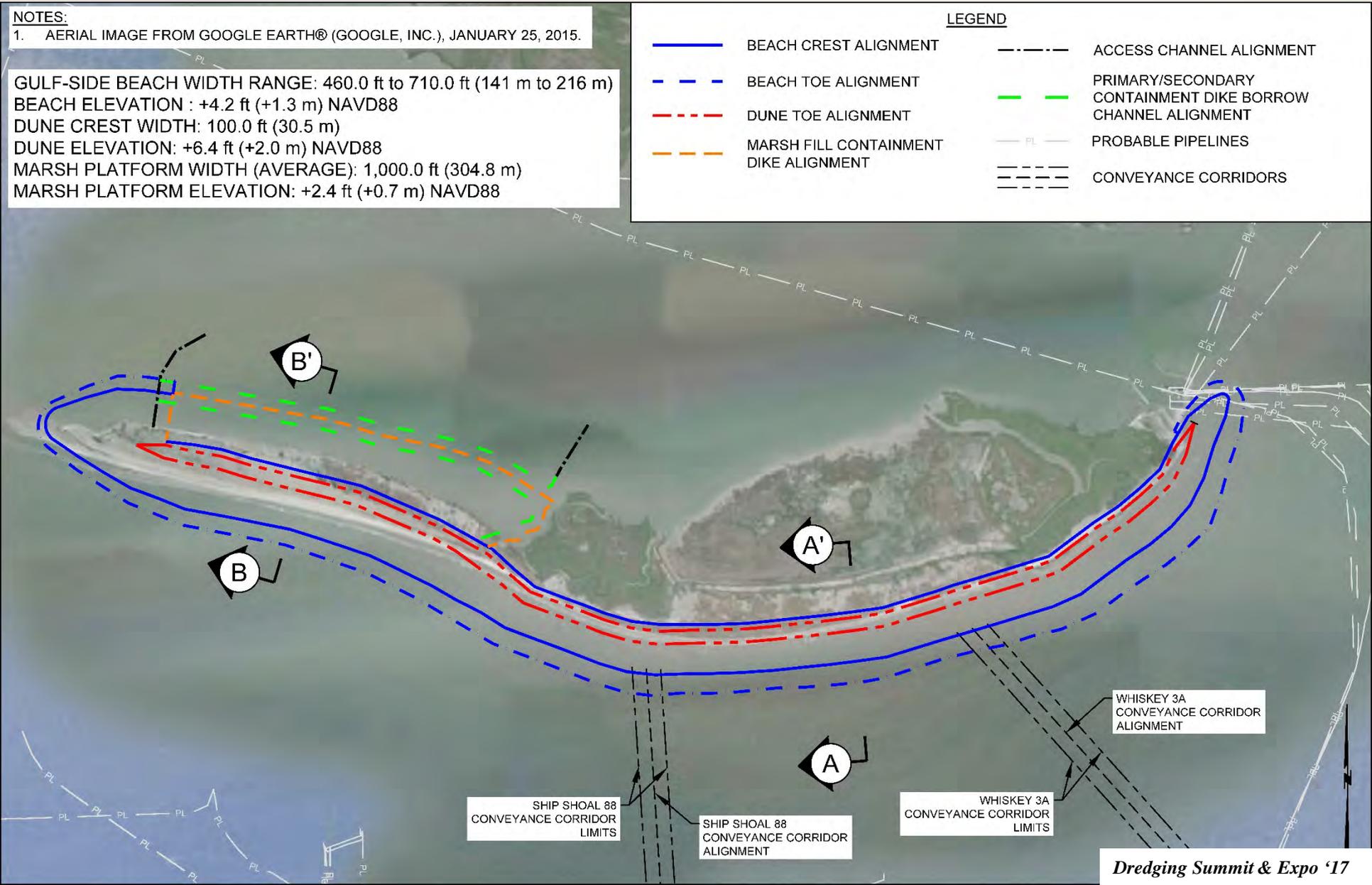
DUNE ELEVATION: +6.4 ft (+2.0 m) NAVD88

MARSH PLATFORM WIDTH (AVERAGE): 1,000.0 ft (304.8 m)

MARSH PLATFORM ELEVATION: +2.4 ft (+0.7 m) NAVD88

LEGEND

- | | | | |
|--|--|--|---|
| | BEACH CREST ALIGNMENT | | ACCESS CHANNEL ALIGNMENT |
| | BEACH TOE ALIGNMENT | | PRIMARY/SECONDARY
CONTAINMENT DIKE BORROW
CHANNEL ALIGNMENT |
| | DUNE TOE ALIGNMENT | | PROBABLE PIPELINES |
| | MARSH FILL CONTAINMENT
DIKE ALIGNMENT | | CONVEYANCE CORRIDORS |



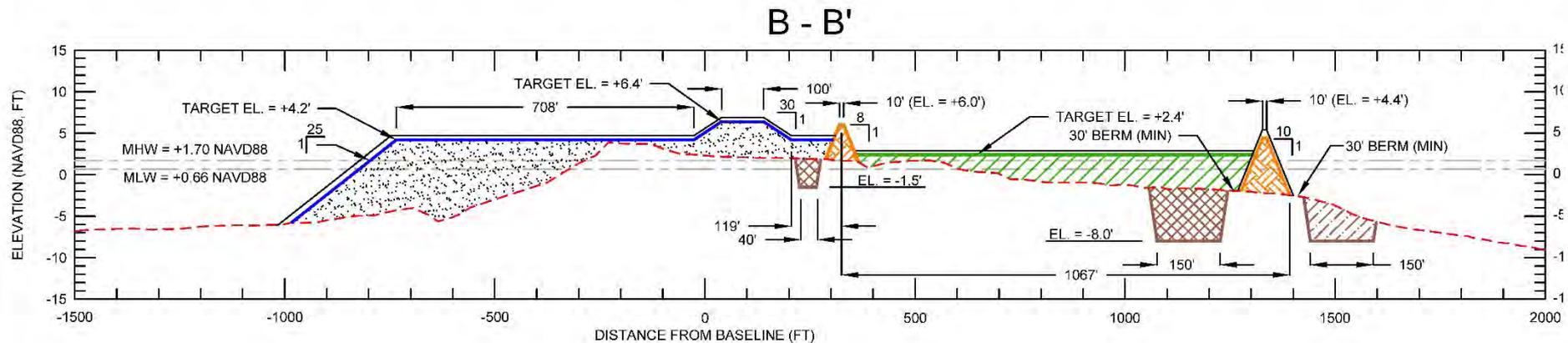
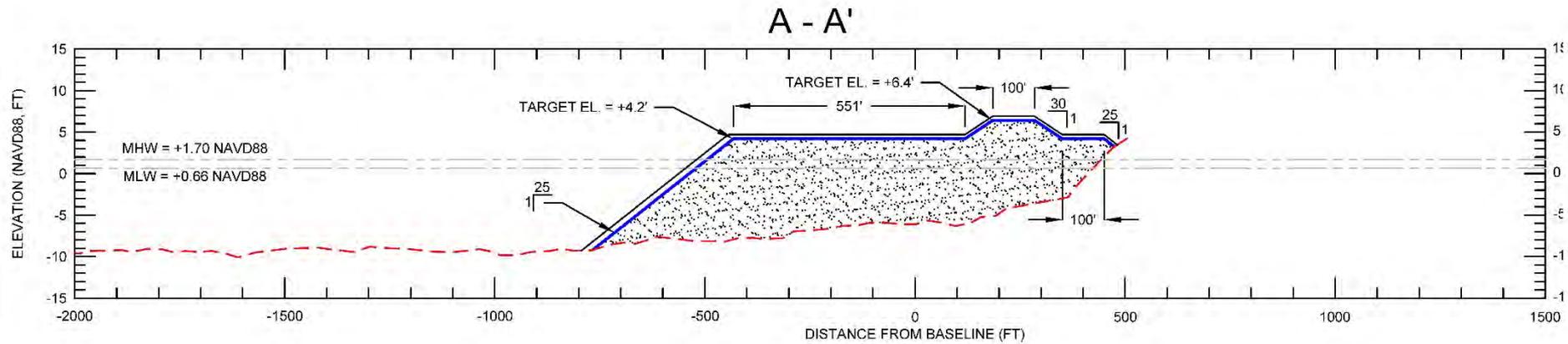
SHIP SHOAL 88
CONVEYANCE CORRIDOR
LIMITS

SHIP SHOAL 88
CONVEYANCE CORRIDOR
ALIGNMENT

WHISKEY 3A
CONVEYANCE CORRIDOR
LIMITS

WHISKEY 3A
CONVEYANCE CORRIDOR
ALIGNMENT

Headland Typical Sections



GULF-SIDE BEACH WIDTH RANGE: 460.0 ft to 710.0 ft (141 m to 216 m)

BEACH ELEVATION : +4.2 ft (+1.3 m) NAVD88

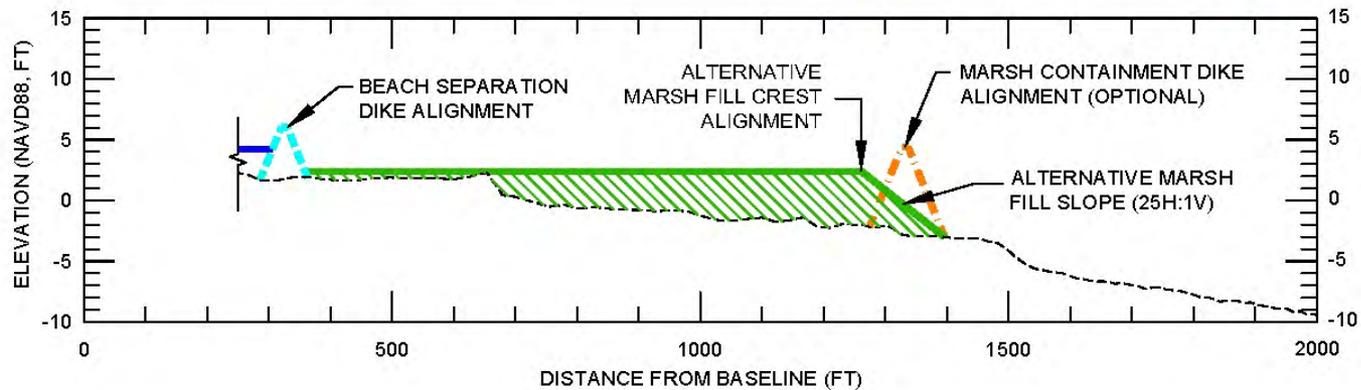
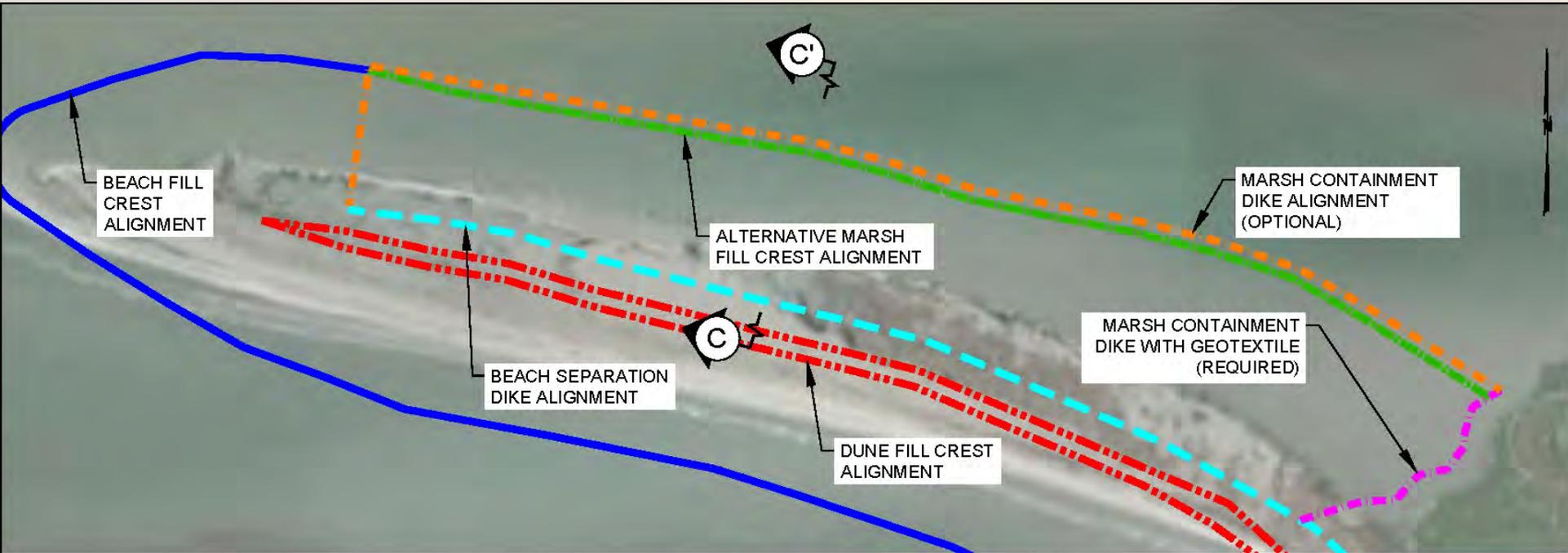
DUNE CREST WIDTH: 100.0 ft (30.5 m)

DUNE ELEVATION: +6.4 ft (+2.0 m) NAVD88

MARSH PLATFORM WIDTH (AVERAGE): 1,000.0 ft (304.8 m)

MARSH PLATFORM ELEVATION: +2.4 ft (+0.7 m) NAVD88

Alternative Marsh Construction



When Construction Takes You To The Middle Of No Where



Emergency Evac Helipad

The alternative:

21 mile boat ride (45 min) +

31 mile ambulance ride (45 min)



**The Best of Western
Whiskey Island**

Keeping your crews happy

Two quarters barges and a
recreation barge. (Note one of
them is a dredge)



And Away We Go



Building Wide



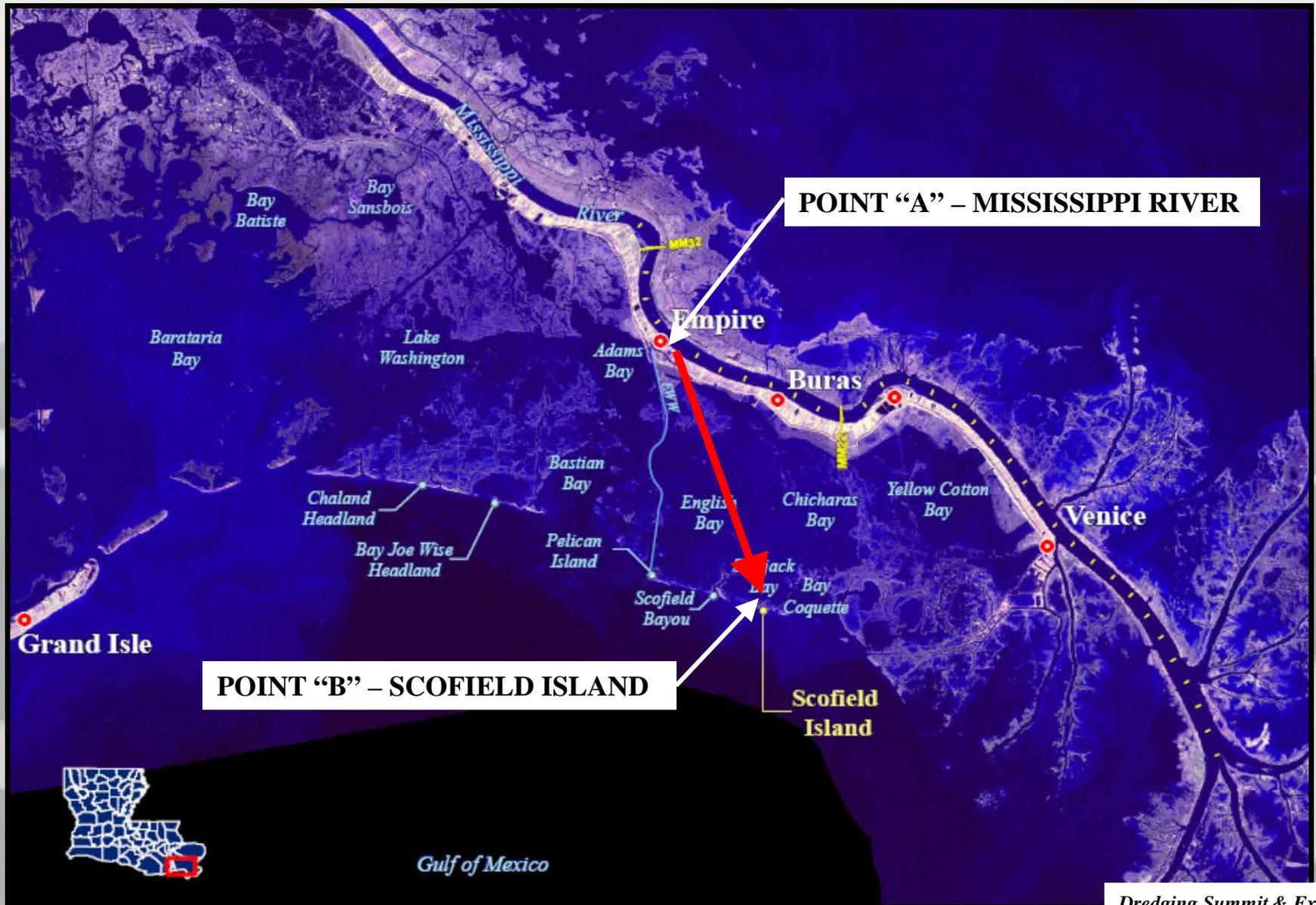
The “**BADDEST**”

➤ “Urban Dictionary” Definitions

- ❖ Coolest
- ❖ Toughest
- ❖ The “Duke”

- ## ➤ Selection ~ **FIRST USE OF MISSISSIPPI RIVER SEDIMENTS FOR BARRIER ISLAND RESTORATION AT THE TIME LONGEST SEDIMENT PIPELINE**

RIVERINE MINING – SCOFIELD ISLAND RESTORATION



Fun Facts

- **Excavated riverine sediments from one of the Nation's busiest navigational waterways**
- **Delivered riverine sediments over 22 miles (35.4 km), Nation's First for Barrier Islands**
- **Conveyance corridor required:**
 - ❖ **Casing pipe under two highways**
 - ❖ **2 levee (over) and 1 harbor canal (under) crossings**
 - ❖ **Pipeline installed along 16 miles of Empire Waterway**
 - ❖ **Provided 6 navigational crossings for commercial and recreational use over the sediment pipeline**

Fun Facts

➤ **Highlight Reel: 50,000 CY/Day (38,228 CM/day)
Production Rate**

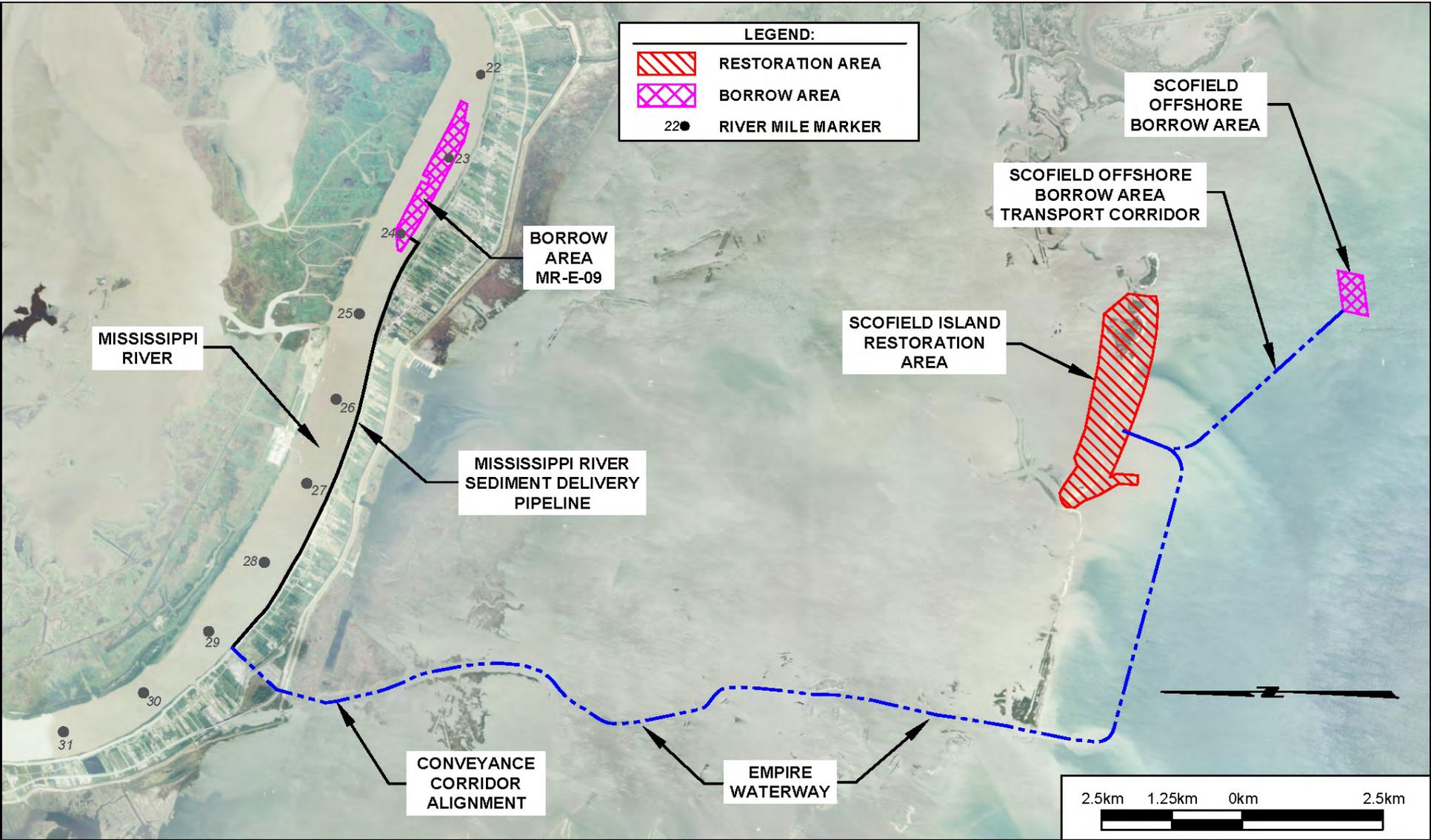
➤ **Construction Cost**

- ❖ **Engineer's Opinion of Cost = \$58.1 Million**
- ❖ **Construction Bid Range**
 - **Low = \$46.5 Million**
 - **High = \$82.3 Million**
 - **Avg. = \$64.4 Million**
 - **Final Cost = \$52.2 Million**

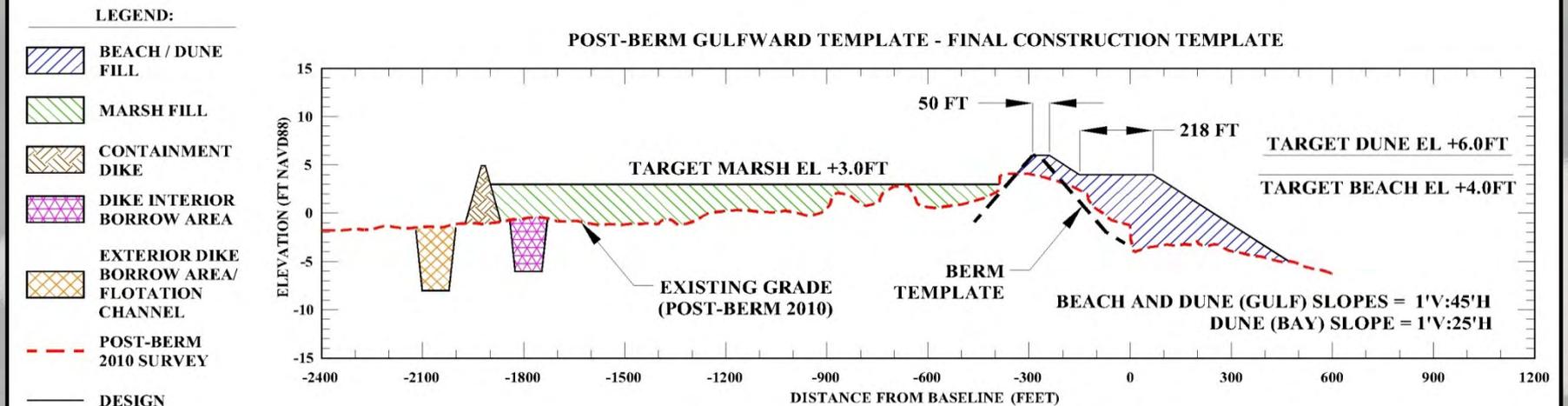
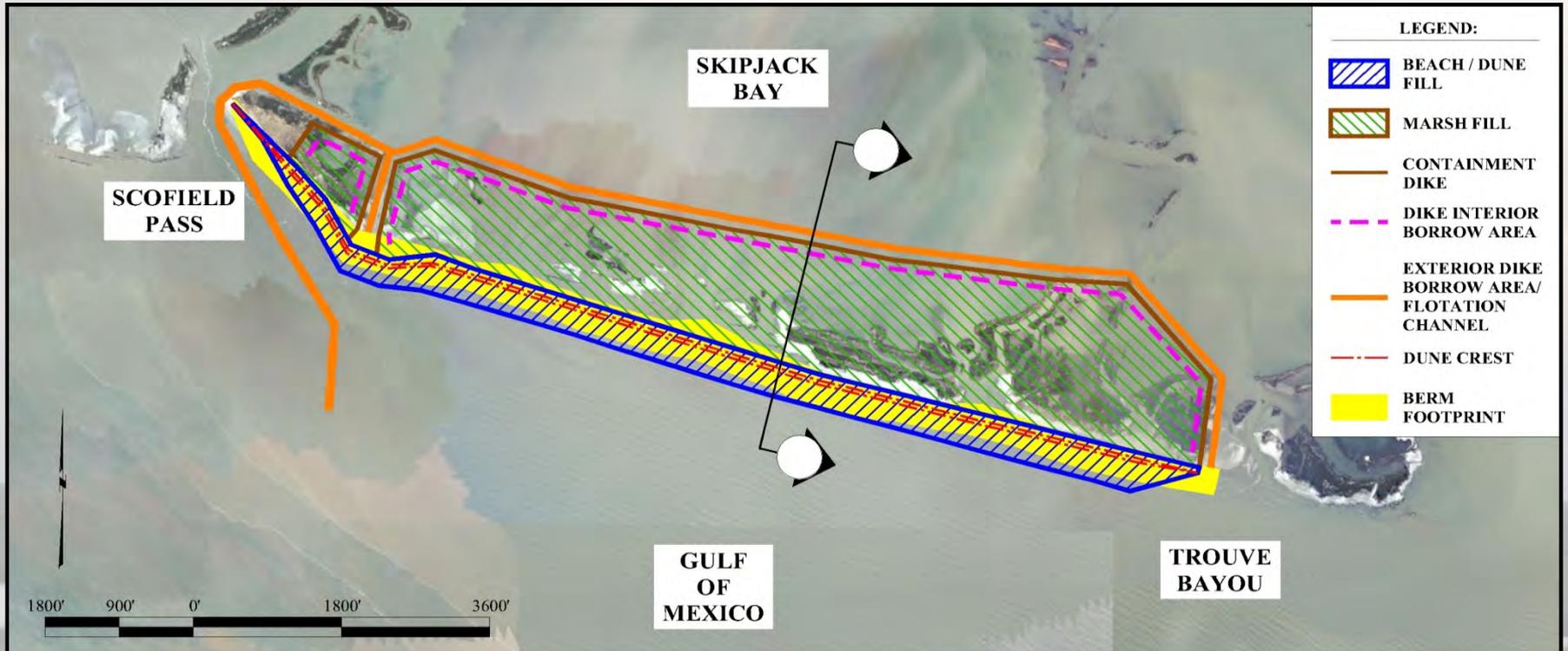
➤ **Construction Elements**

- ❖ **Beach/Dune Fill : 1.89 MCY ~ 150 ac (1.45 MCM ~ 60.7 ha)**
- ❖ **Marsh Creation: 1.63 MCY ~ 360 ac (1.25 MCM ~ 145.7 ha)**
- ❖ **Project Length: 12,670 ft (3,862 m)**
- ❖ **Project Density: 278 CY/ft (697 CM/m)**
- ❖ **Borrow Area to Island: 22 Miles (35.4 km)**

Project Elements



Construction Plan



Pre – Hurricane Isaac



Reference Point
(Oil & Gas Facility)

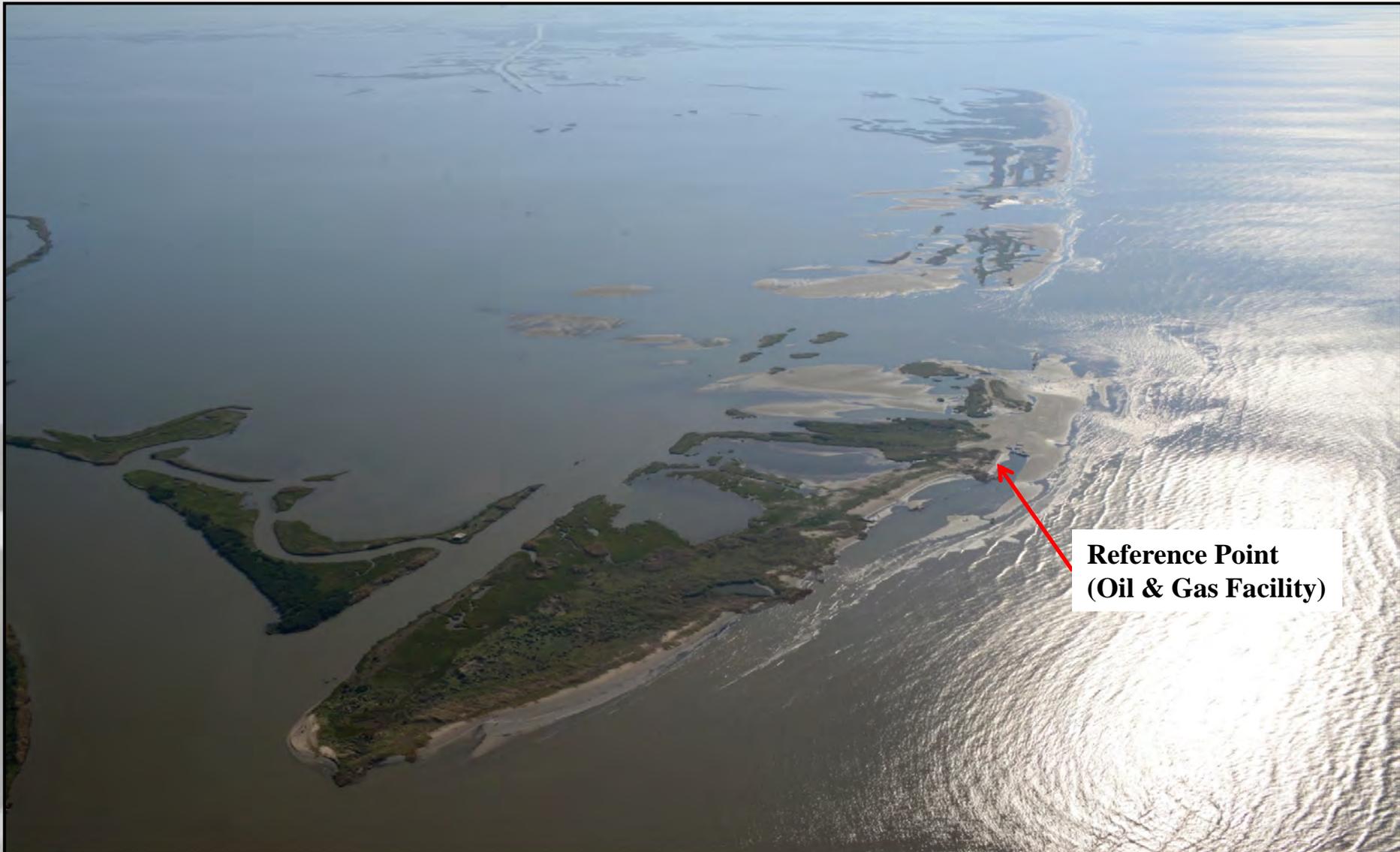


727.520.8181
www.aerophoto.com

Scofield Island

Image # 120802 6013
Date 08.02.12

Post – Hurricane Isaac



**Reference Point
(Oil & Gas Facility)**



727.520.8181
www.aerophoto.com

Scofield Island

Image # 121002 6049
Date 10.02.12

Over the River Levee and Thru the Marsh...



GLDD's California in MR

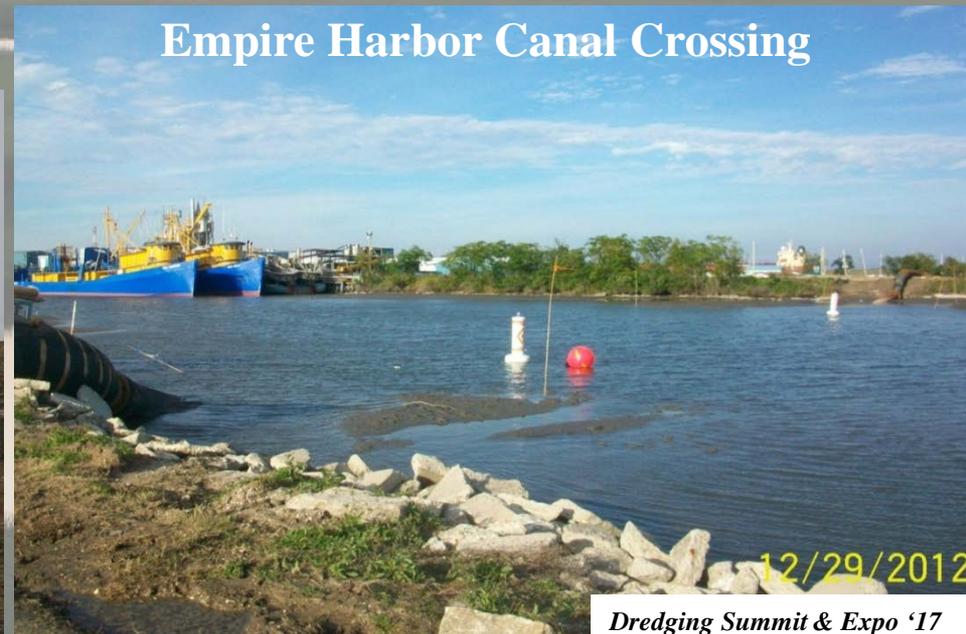


Mississippi River Levee Crossing



Hurricane Protection Levee Crossing

12.17.2012



Empire Harbor Canal Crossing

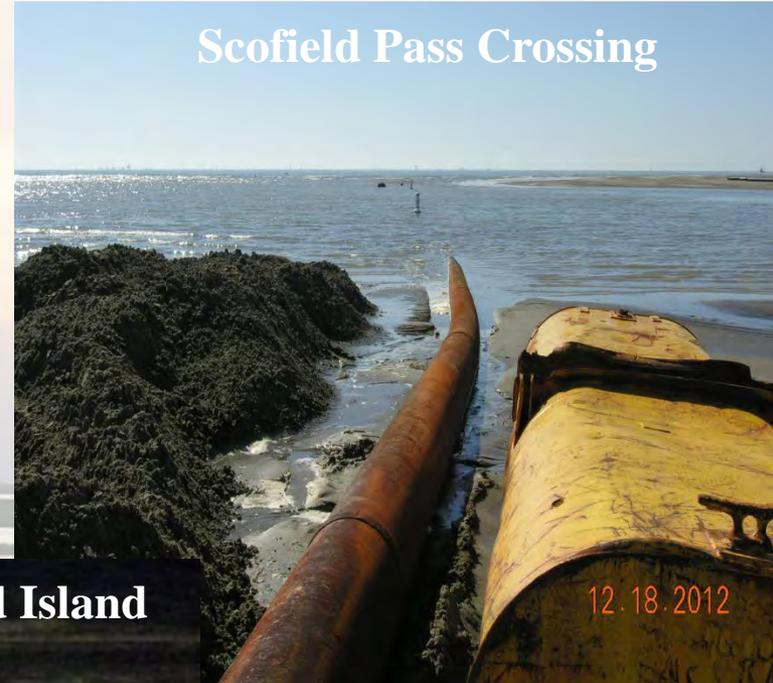
12/29/2012

To Scofield Island We Go...

Empire Marsh Crossing



Scofield Pass Crossing



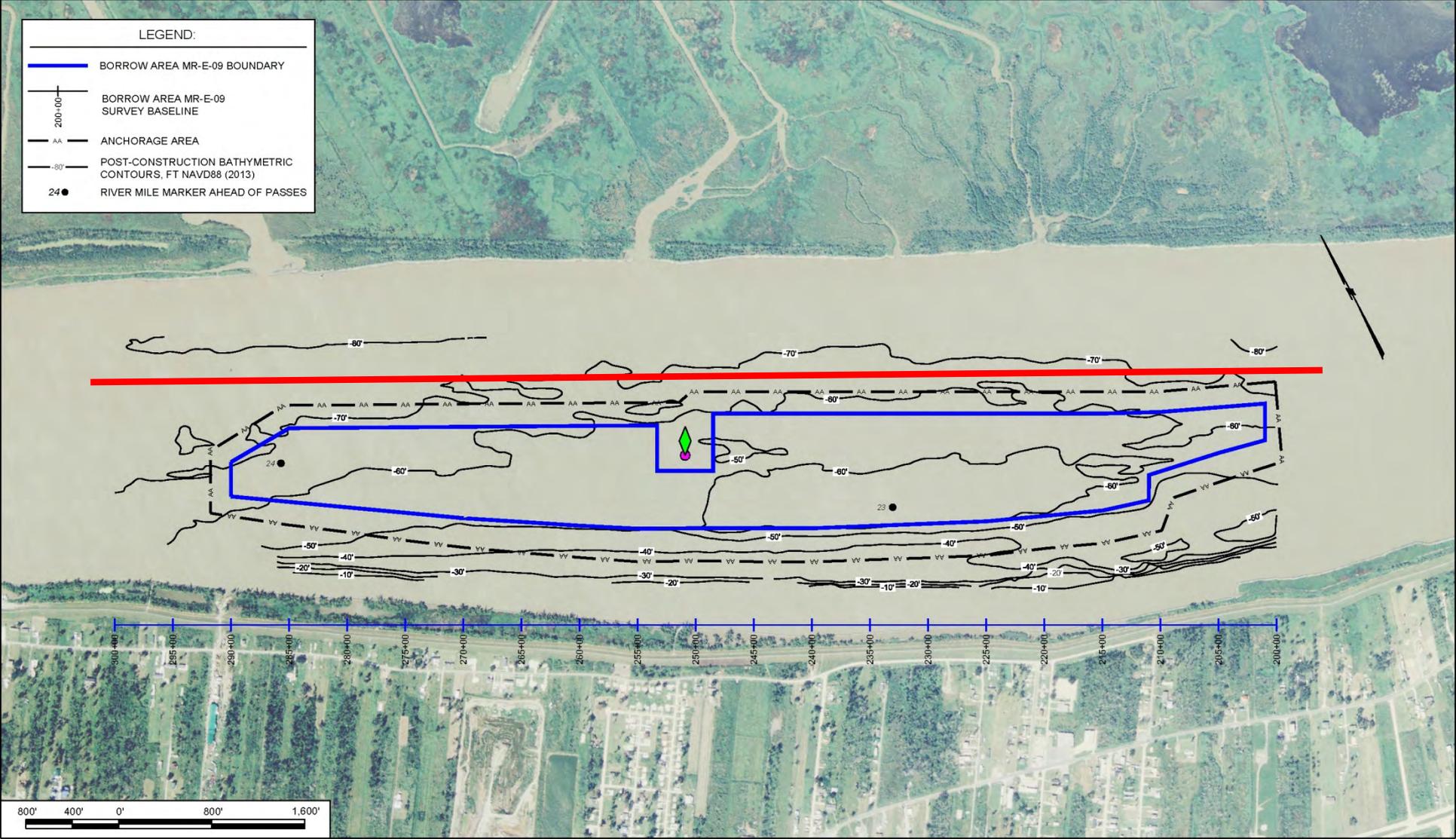
12-18-2012 First Grains of MR Sand Arrive at Scofield Island



Borrow Area MR-E Plan

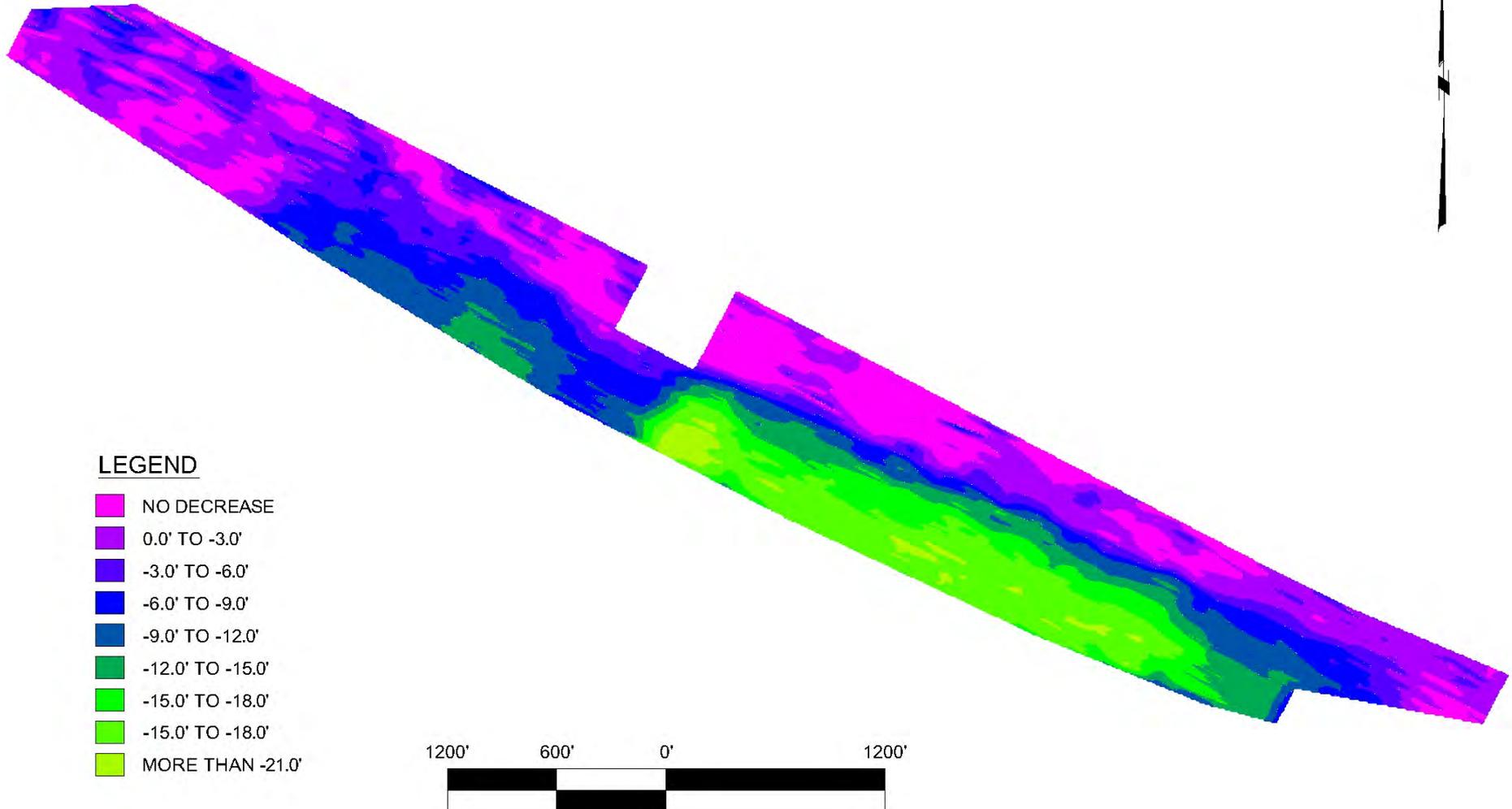
LEGEND:

-  BORROW AREA MR-E-09 BOUNDARY
-  BORROW AREA MR-E-09 SURVEY BASELINE
-  ANCHORAGE AREA
-  POST-CONSTRUCTION BATHYMETRIC CONTOURS, FT NAVD88 (2013)
-  RIVER MILE MARKER AHEAD OF PASSES



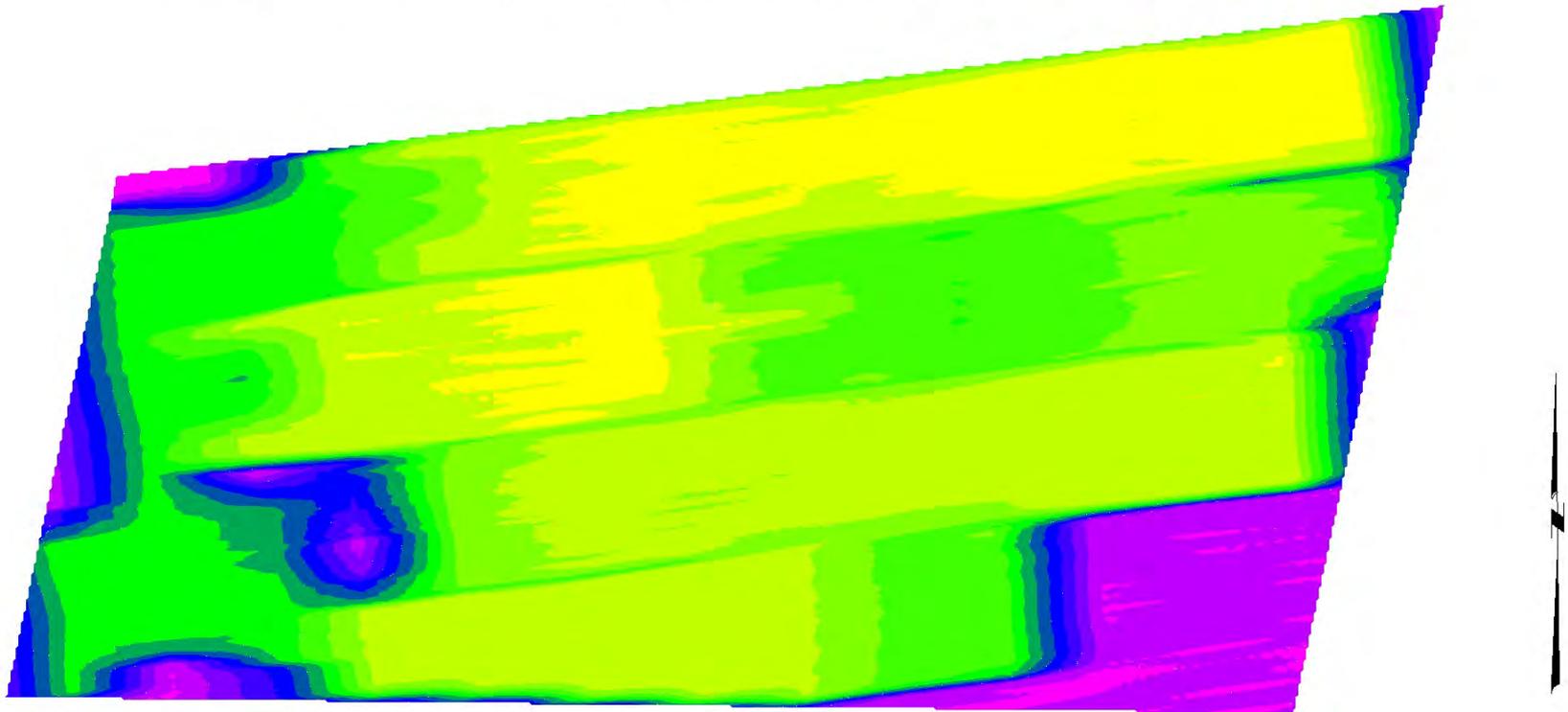
BA-40 MR-E Borrow Area Utilization

RIVERINE BORROW AREA: MR-E-09
ELEVATION CHANGES BETWEEN PRE- AND POST-CONSTRUCTION SURVEYS



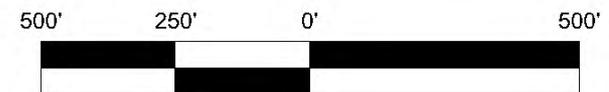
BA-40 SOBA Borrow Area Utilization

OFFSHORE BORROW AREA: SOBA
ELEVATION CHANGES BETWEEN PRE- AND POST-CONSTRUCTION SURVEYS



LEGEND

 NO DECREASE	 -10.0' TO -12.0'
 0.0' TO -2.0'	 -12.0' TO -14.0'
 -2.0' TO -4.0'	 -14.0' TO -16.0'
 -4.0' TO -6.0'	 -16.0' TO -18.0'
 -6.0' TO -8.0'	 -18.0' TO -20.0'
 -8.0' TO -10.0'	 GREATER THAN -20.0'



Scofield Island – Post-Construction



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Scofield Island

Image # 130701 6195
Date 07.01.13

The “*BESTEST*”

➤ “Online Urban Slang Dictionary” Definitions

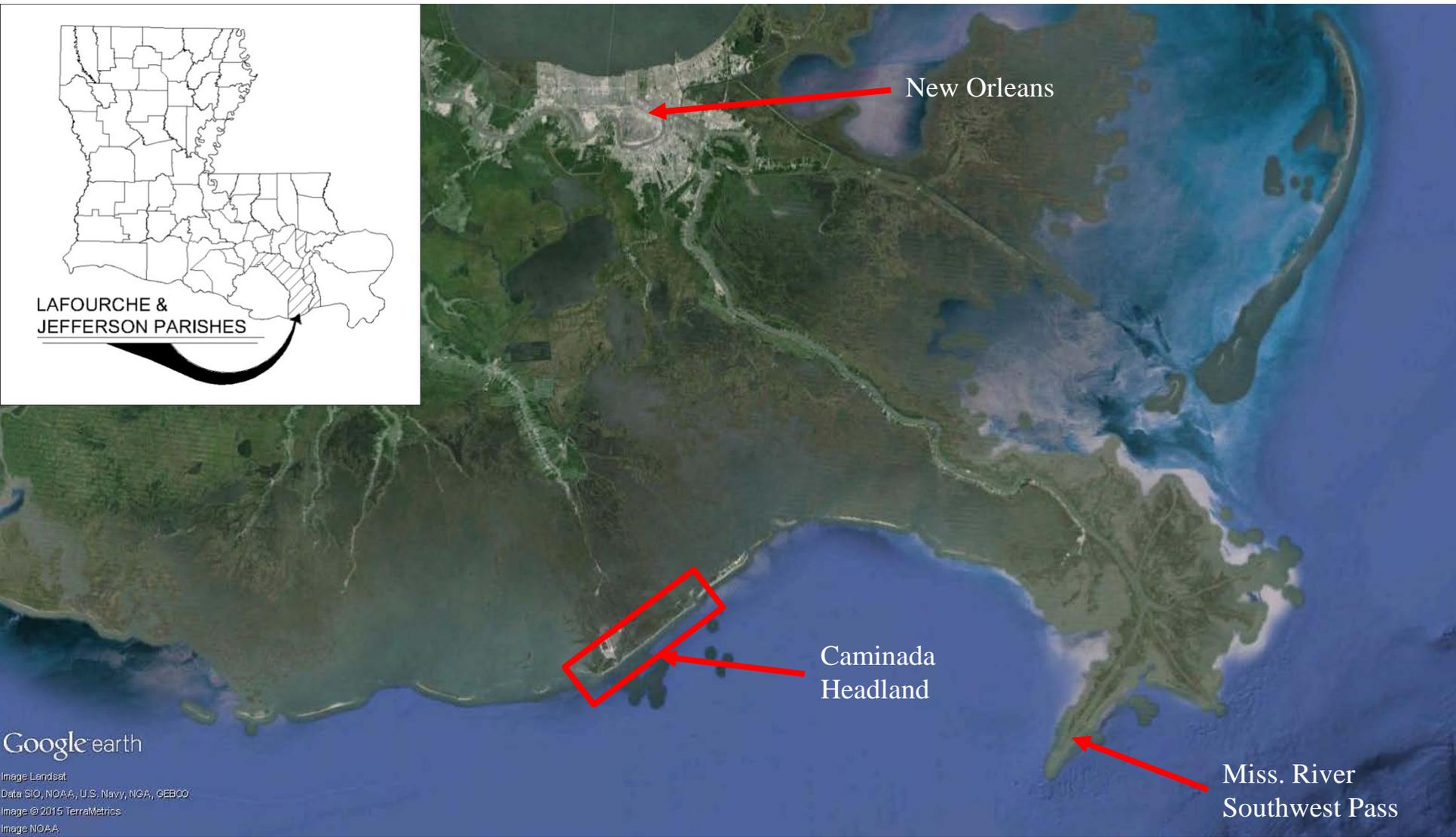
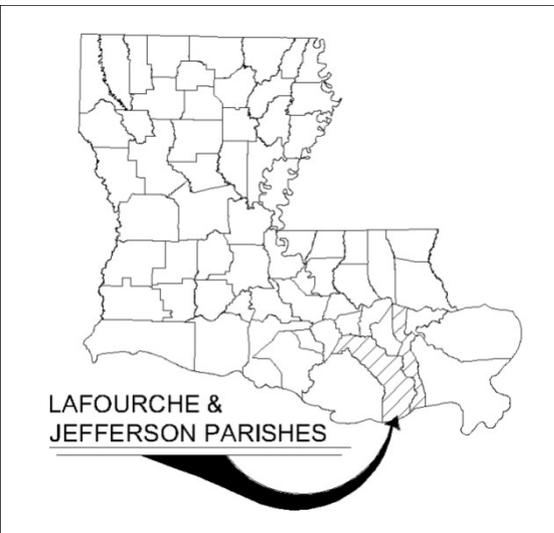
- ❖ To show exceptional quality strong enough to be described by a word that is not technically a part of the English language
- ❖ Incomparable
- ❖ Exceeding the Level of Best
- ❖ The “Best” of the Best
- ❖ Some would say grammatically correct if you are from South Louisiana

➤ Selection ~ *FIRST USE OF SHIP SHOAL*

LARGEST MONETARY INVESTMENT

LONGEST PROJECT LENGTH

CAMINADA HEADLAND BEACH AND DUNE RESTORATION



Fun Facts

➤ **Highlight Reel: 36,000 CY/Day Production Rate**

➤ **Construction Cost**

- ❖ **Engineer's Opinion of Cost = \$196.7 Million**

- ❖ **Construction Bid Range**

 - **Low = \$201.4 Million**

 - **High = \$222.3 Million**

 - **Avg. = \$211.8 Million**

 - **Final Cost = \$200.9 Million**

➤ **Construction Elements**

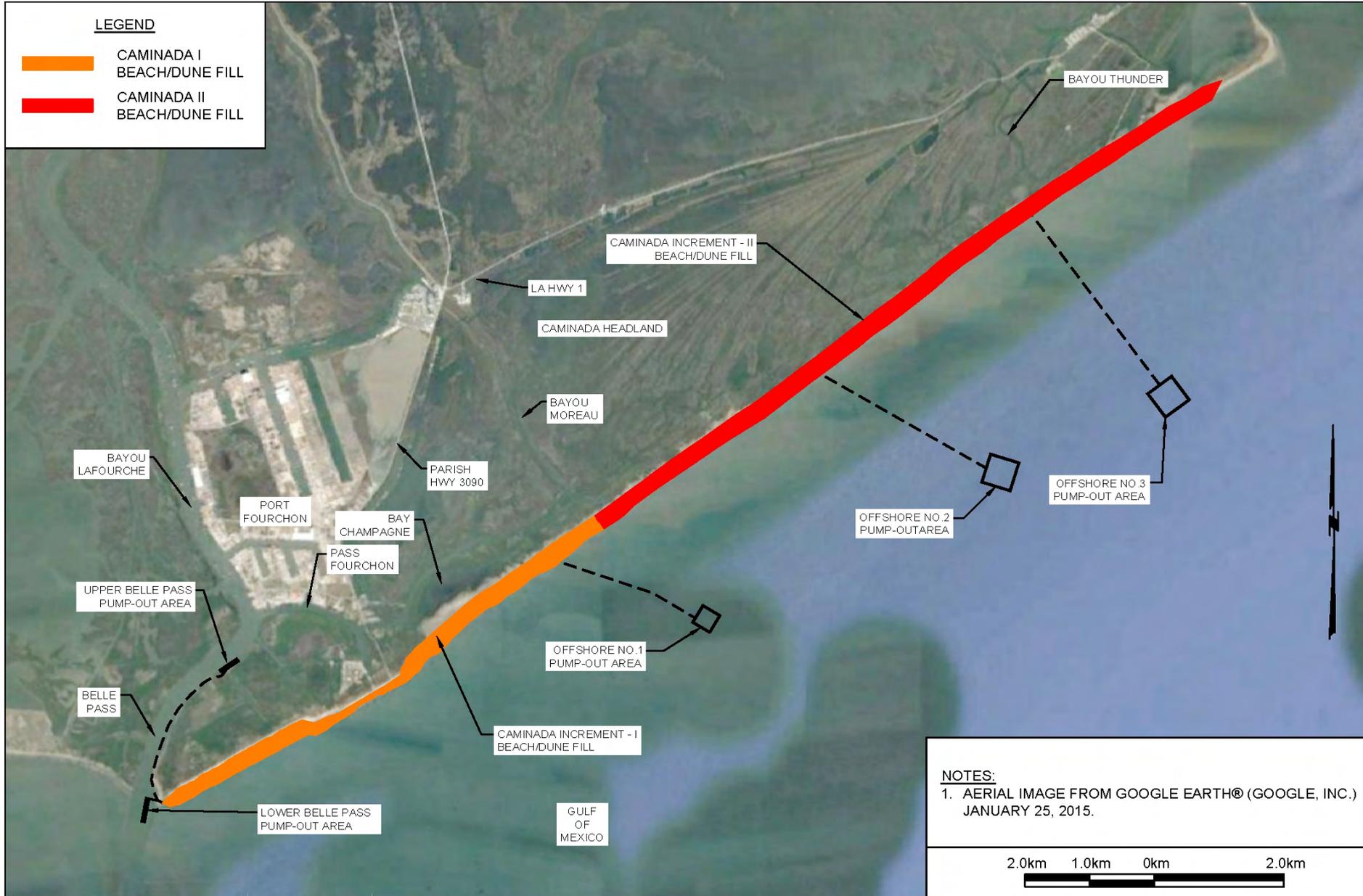
- ❖ **Beach/Dune Fill: 8.84 MCY ~ 1,060 ac (6.76 MCM ~ 429 ha)**

- ❖ **Project Length: 65,800 ft (7,224 m)**

- ❖ **Project Density: 134 CY/ ft (1,105 CM/m)**

- ❖ **Borrow Area to Island: 30+ miles (48+ km)**

Headland Overview



Typical Design Sections

Borrow Area Overview

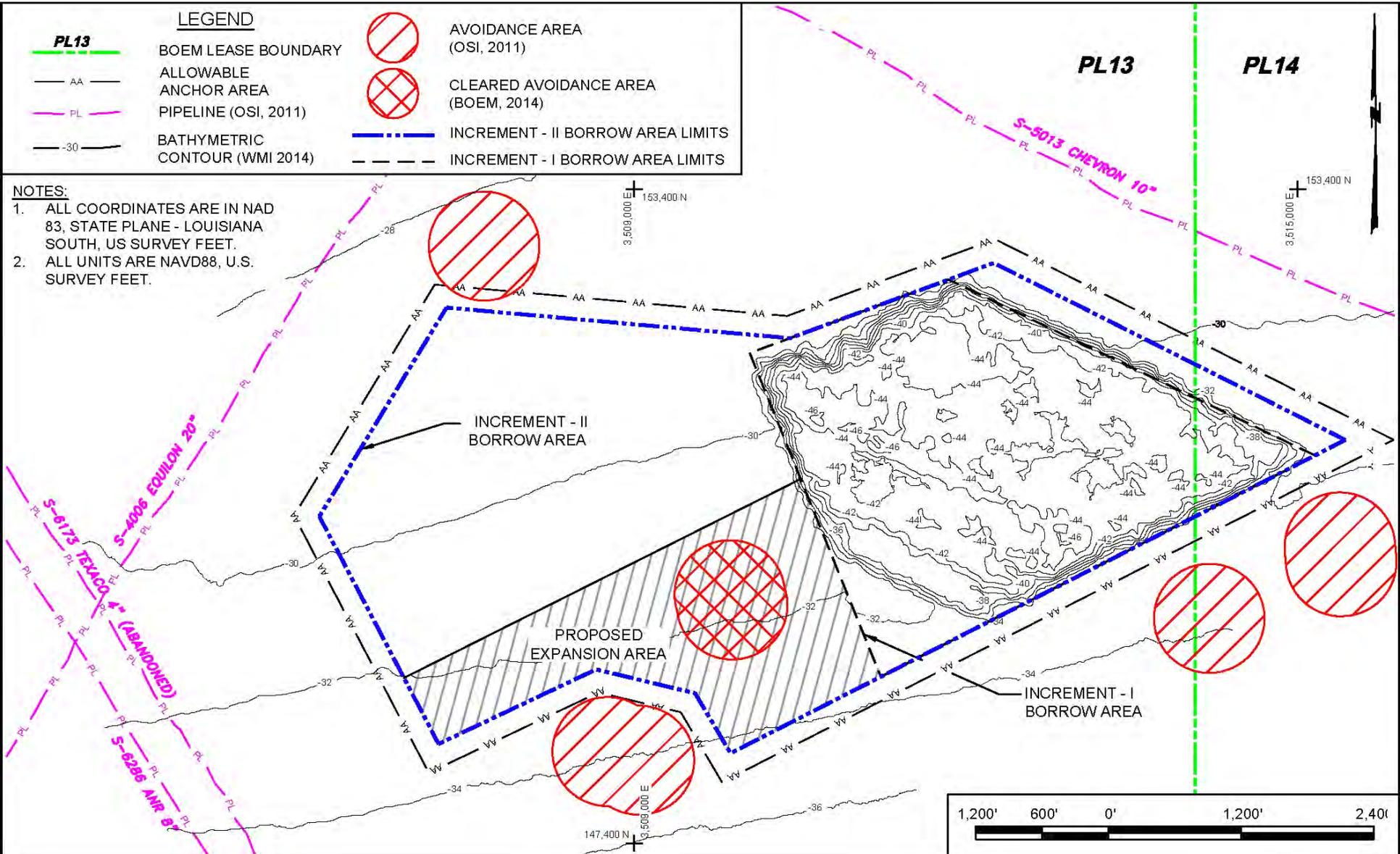
LEGEND

PL13
 BOEM LEASE BOUNDARY
 AA
 ALLOWABLE ANCHOR AREA
 PL
 PIPELINE (OSI, 2011)
 -30
 BATHYMETRIC CONTOUR (WMI 2014)

 AVOIDANCE AREA (OSI, 2011)
 CLEARED AVOIDANCE AREA (BOEM, 2014)
 INCREMENT - II BORROW AREA LIMITS
 INCREMENT - I BORROW AREA LIMITS

NOTES:

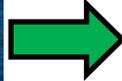
- ALL COORDINATES ARE IN NAD 83, STATE PLANE - LOUISIANA SOUTH, US SURVEY FEET.
- ALL UNITS ARE NAVD88, U.S. SURVEY FEET.



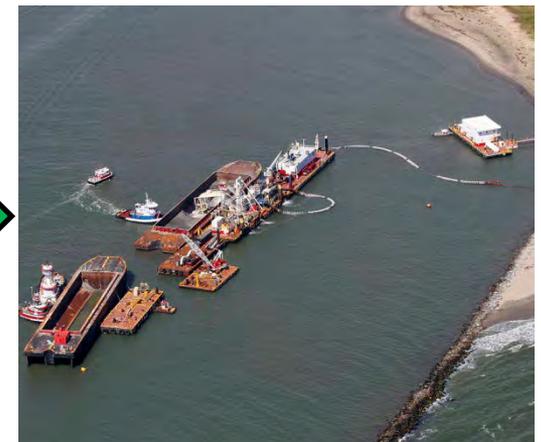
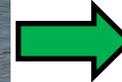
Sediment Transport Methods



Cutterhead Dredge Excavation and Filling Scow Barge via Spider Barge



Scow Barge Transport to Fill Area



Hydraulic Unloading of Scow Barge and Pump to Fill Area



Hopper Dredge Excavation and Transport to Fill Area



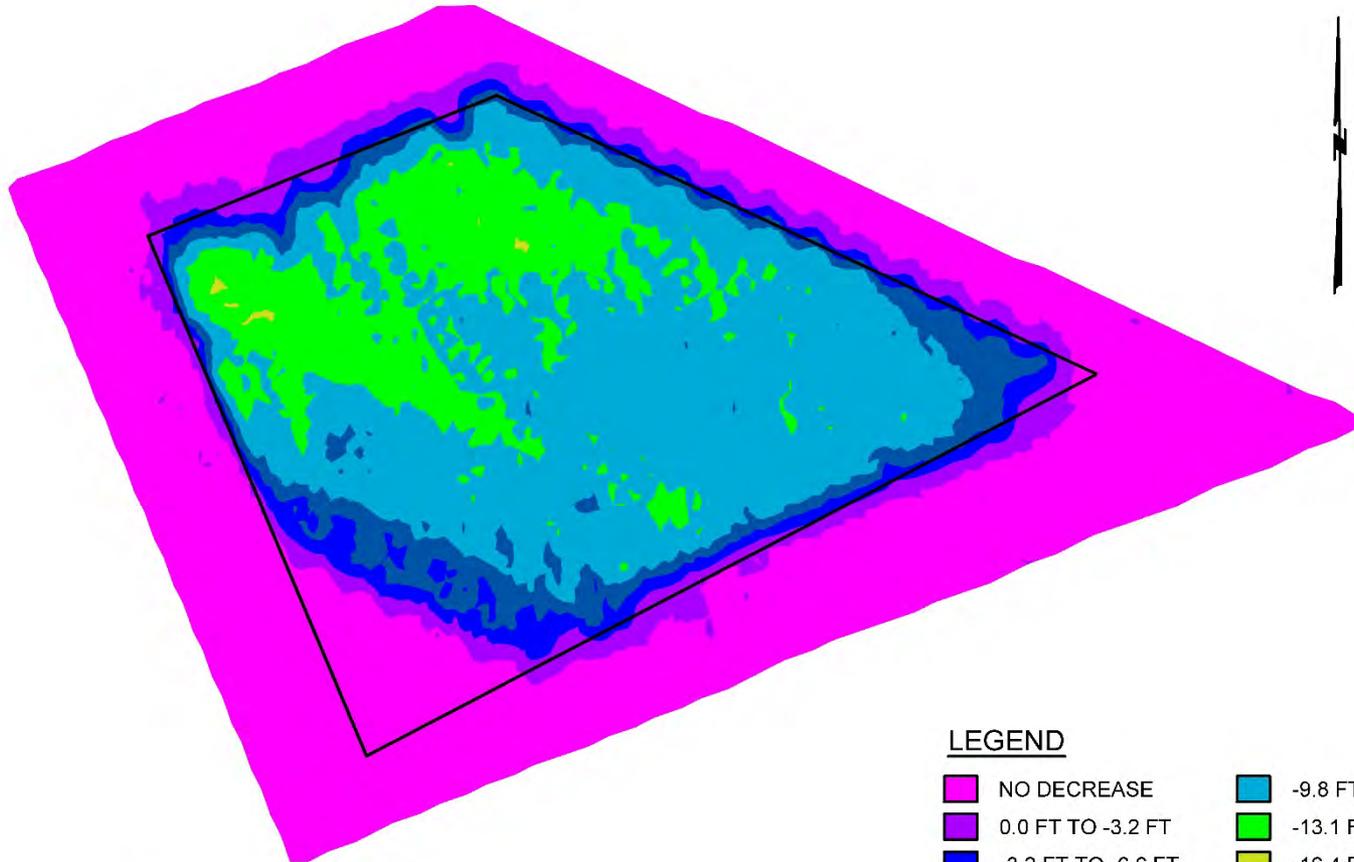
Hopper Dredge Pump to Fill Area



Discharge at Fill Area

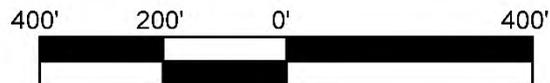
CAM I (BA-45) Borrow Area Utilization

BA-45 CAMINADA BORROW AREA: INCREMENT I
ELEVATION CHANGES BETWEEN PRE- AND POST-CONSTRUCTION SURVEYS



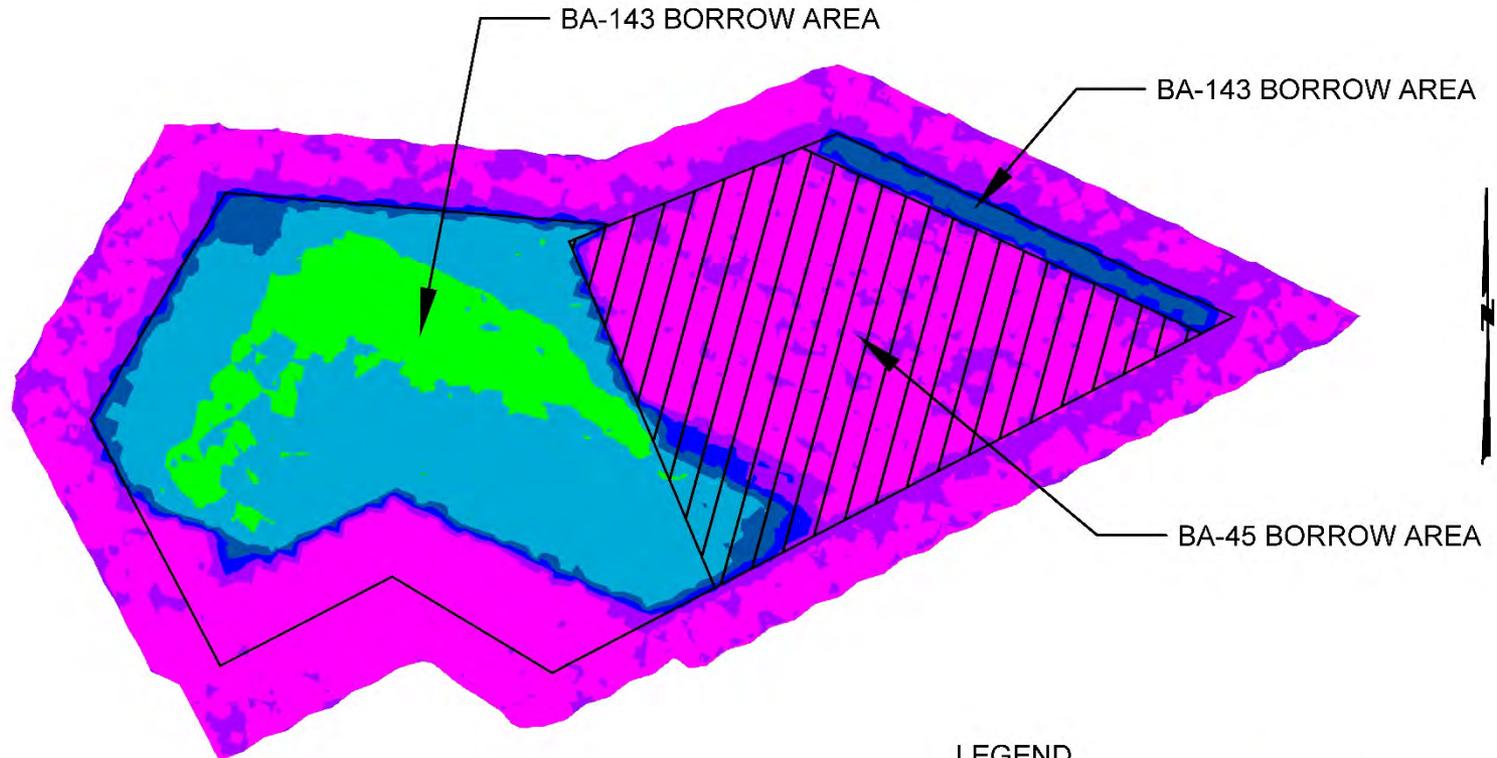
LEGEND

 NO DECREASE	 -9.8 FT TO -13.1 FT
 0.0 FT TO -3.2 FT	 -13.1 FT TO -16.4 FT
 -3.2 FT TO -6.6 FT	 -16.4 FT TO -19.7 FT
 -6.6 FT TO -9.8 FT	 MORE THAN -19.7 FT



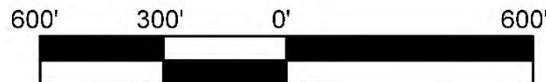
CAM II (BA-143) Borrow Area Utilization

BA-143 CAMINADA BORROW AREA: INCREMENT II
ELEVATION CHANGES BETWEEN PRE- AND POST-CONSTRUCTION SURVEYS



LEGEND

 NO DECREASE	 -9.8 FT TO -13.1 FT
 0.0 FT TO -3.2 FT	 -13.1 FT TO -16.4 FT
 -3.2 FT TO -6.6 FT	 MORE THAN -16.4 FT
 -6.6 FT TO -9.8 FT	



CAM I Completed Project

← CAM-I Start

↙ CAM-II Start

CAM II Completed Project

CAM I – CAM II Intersection



Patrick M. Quigley
Gulf Coast Air Photo
November 16, 2016

QUESTIONS

A serene sunset scene over a large body of water. The sun is a bright orange orb on the horizon, casting a warm glow across the sky and water. In the distance, a small lighthouse is visible on the left. A thin, dark vertical pole stands in the water in the foreground. The foreground is dominated by dark, silhouetted shapes, possibly rocks or a pier.