CPRA
Coastal Protection and Restoration Authority of Louisiana

Industry Day 2015

CPRA
Engineering Division
April 14, 2015

committed to **our coast**

Restoration Projects

Substantially Designed Not Yet Funded

1. **Northwest Turtle Bay Marsh Creation**
2. Cameron Meadows Marsh Creation and Terracing
3. Cole's Bayou Marsh Creation

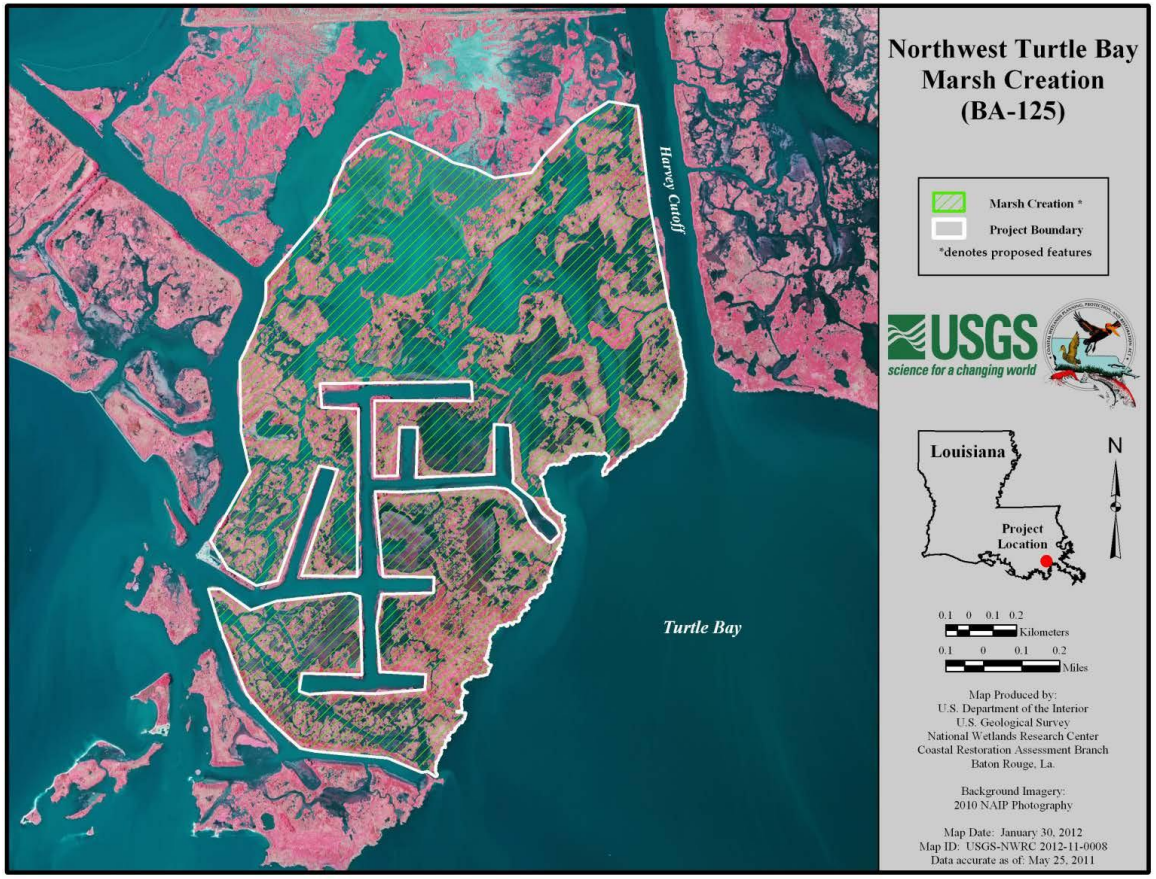
Northwest Turtle Bay Marsh Creation

Thomas McLain, E.I.
Engineering Division
April 14, 2015

committed to **our coast**

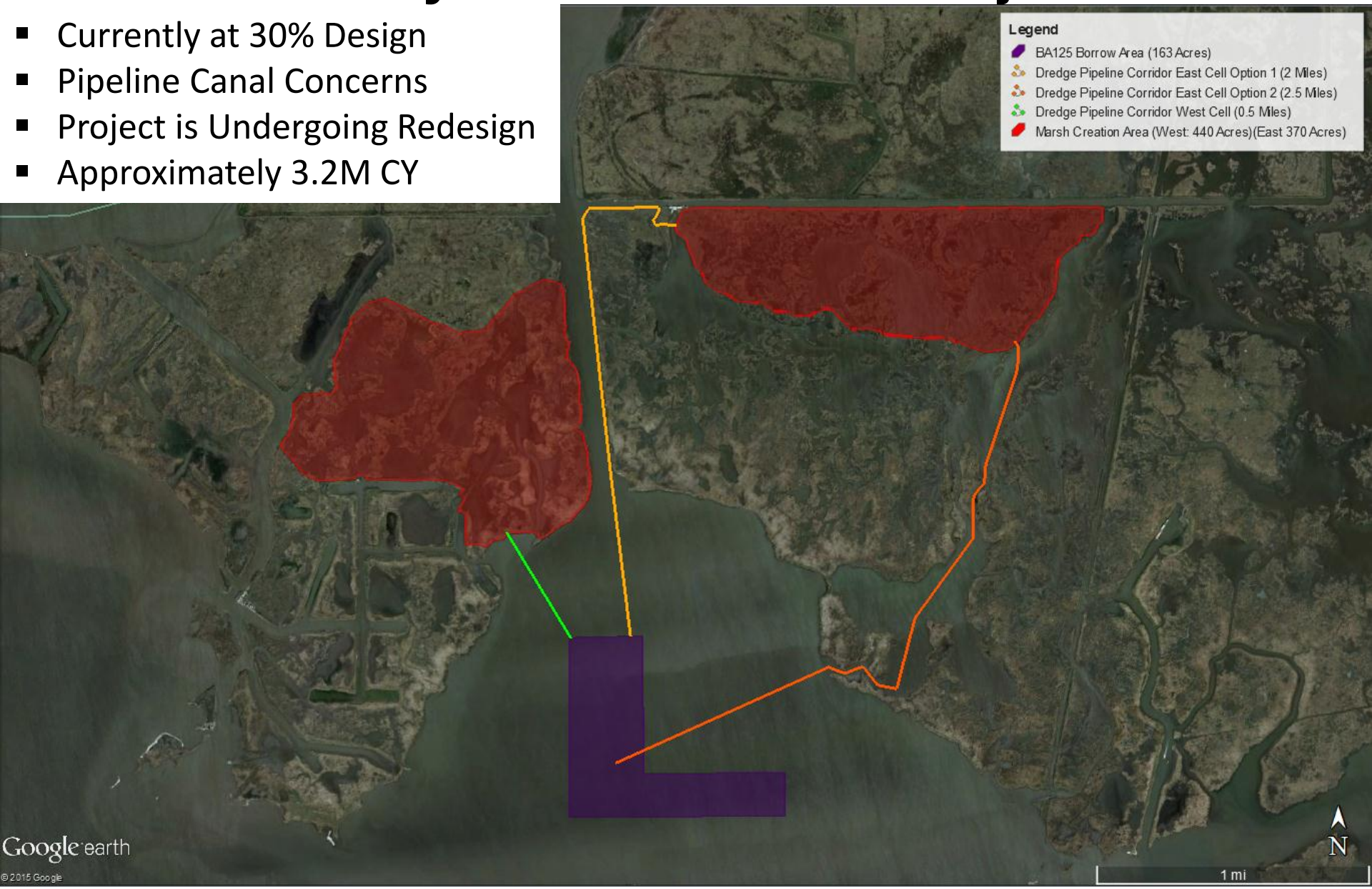
NW Turtle Bay Marsh Creation Project Summary

- Jefferson Parish
- 423 Acres of Marsh Creation
- 337 Acres of Marsh Nourished
- Borrow Source: Turtle Bay
- Federal Sponsor: US Fish & Wildlife Service, Kevin Roy
- PM: Keith Boeneke (CB&I)
- NRCS Turned Over Design of the Project to CPRA Summer 2014
- Continuing with Minimal Containment Concept



NW Turtle Bay Marsh Creation Project Status

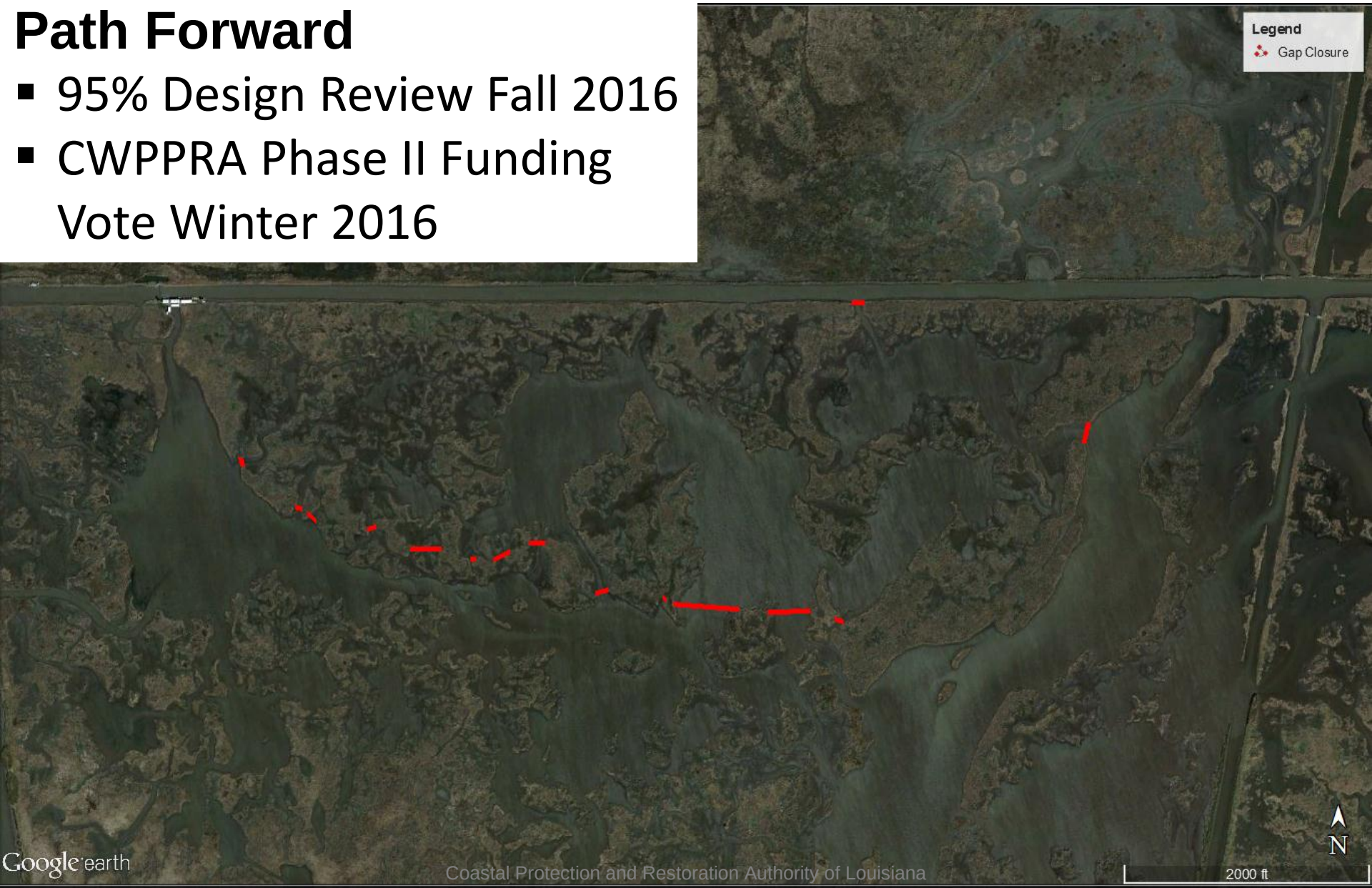
- Currently at 30% Design
- Pipeline Canal Concerns
- Project is Undergoing Redesign
- Approximately 3.2M CY



NW Turtle Bay Marsh Creation

Path Forward

- 95% Design Review Fall 2016
- CWPPRA Phase II Funding Vote Winter 2016



QUESTIONS

Restoration Projects

Substantially Designed Not Yet Funded

1. Northwest Turtle Bay Marsh Creation

2. **Cameron Meadows Marsh Creation and Terracing**

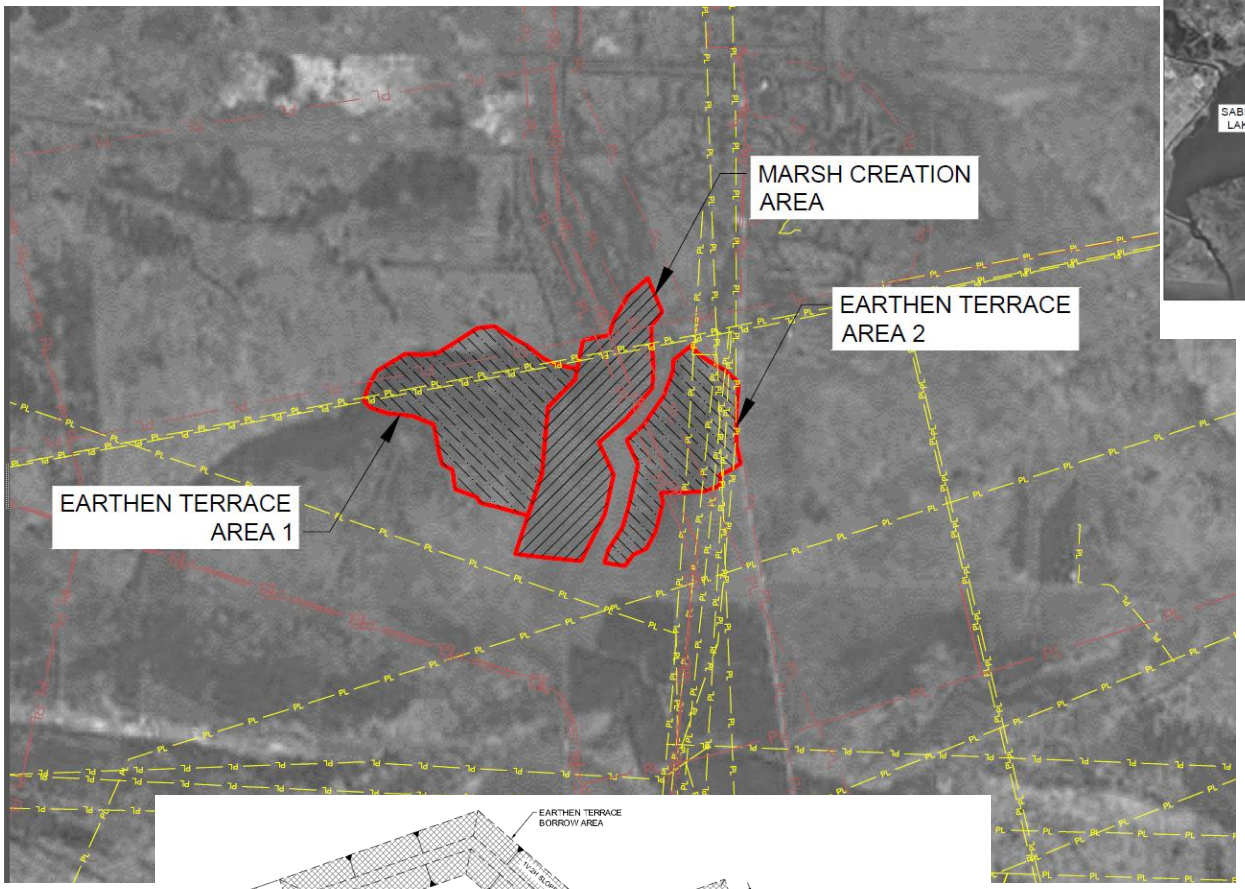
3. Cole's Bayou Marsh Creation

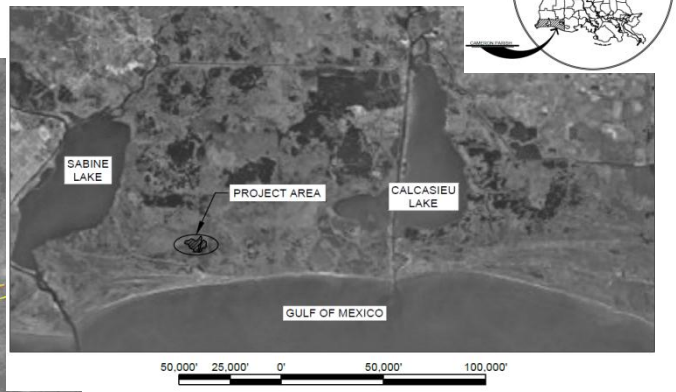
Cameron Meadows Marsh Creation and Terracing (CS-66)

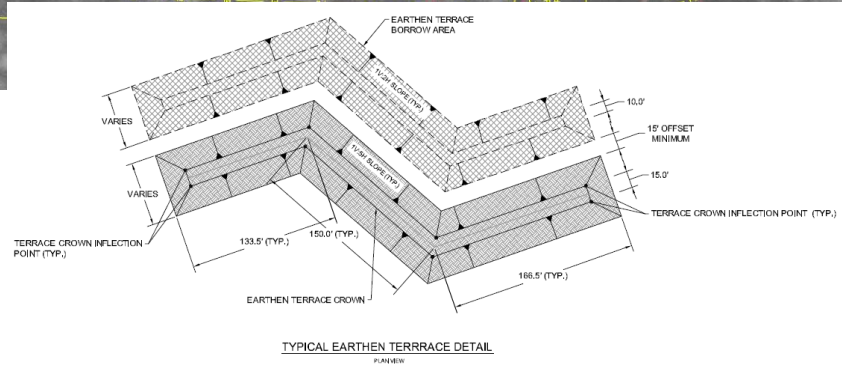
Julia Wall, E.I.
Engineering Division
April 14, 2015

committed to **our coast**

PROJECT FEATURES





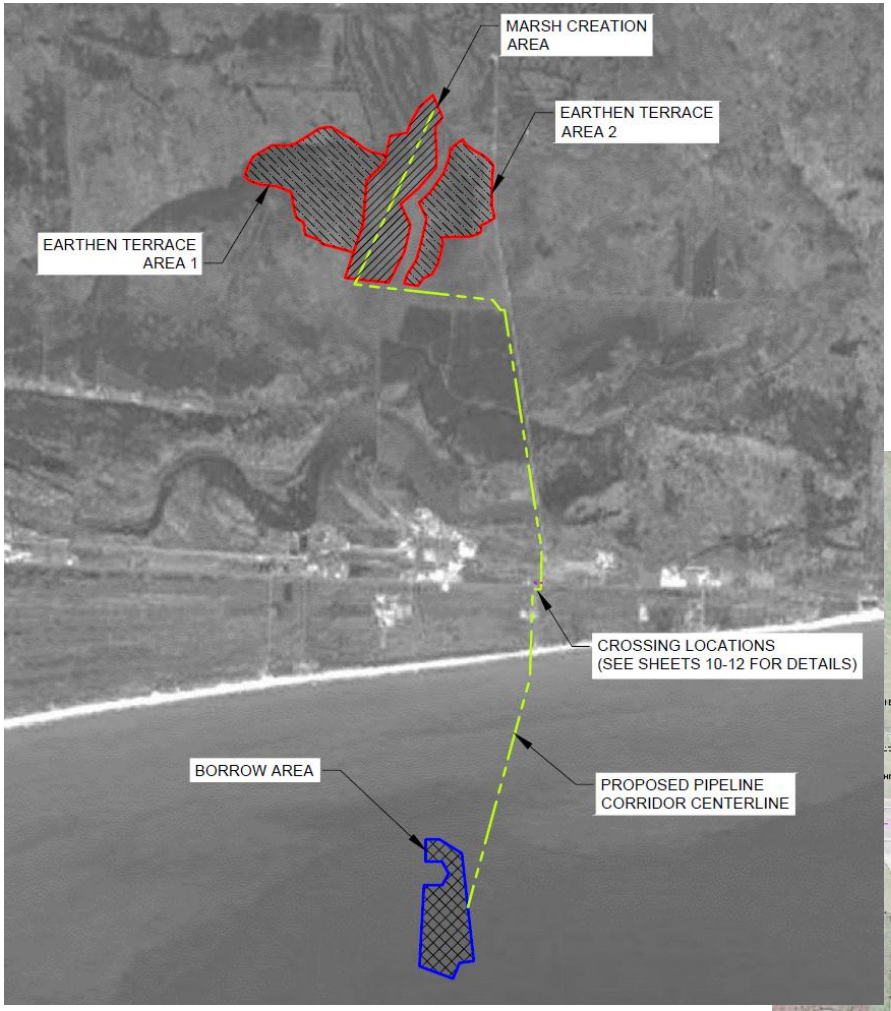


TYPICAL EARTHEN TERRRACE DETAIL

- 350 Acres Marsh Creation (2M CY of Sediment)
- 20,000 LF Earthen Containment Dikes
- 35,000 LF Terrace
- Hydrologic Restoration

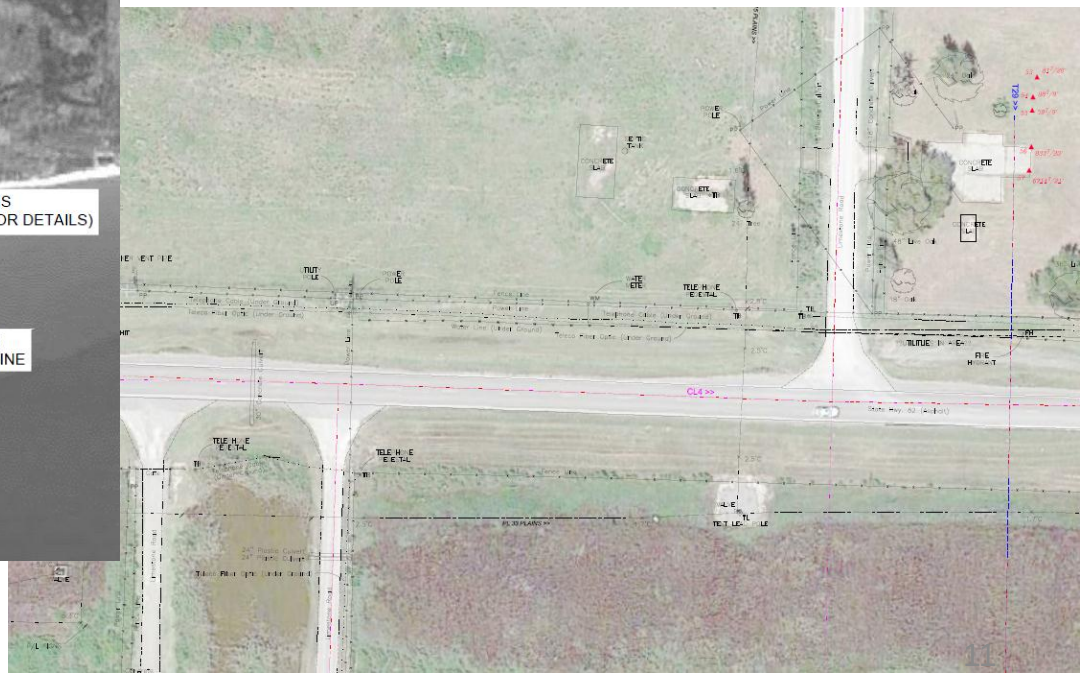
- Design Constraint: Pipelines

Borrow Area



- Existing Elevation: -20 to -25 ft. NAVD88
- Cut Elevation: -34.5 to -37 ft. NAVD88
- Available Material: ~4.9M CY
- Avg. Pumping Distance: 6 miles

- Design Constraint: Crossing LA82



PROJECT STATUS

- Engineering and Design: 2014-2015
  - Hydrodynamic modeling
  - Topographic, bathymetric, and magnetometer survey
  - Geotechnical investigation
  - Offshore borrow site investigation
- Compete for CWPRRA Phase II Funding: Winter 2015
  - Landright agreements
  - Permit

QUESTIONS

Restoration Projects

Substantially Designed Not Yet Funded

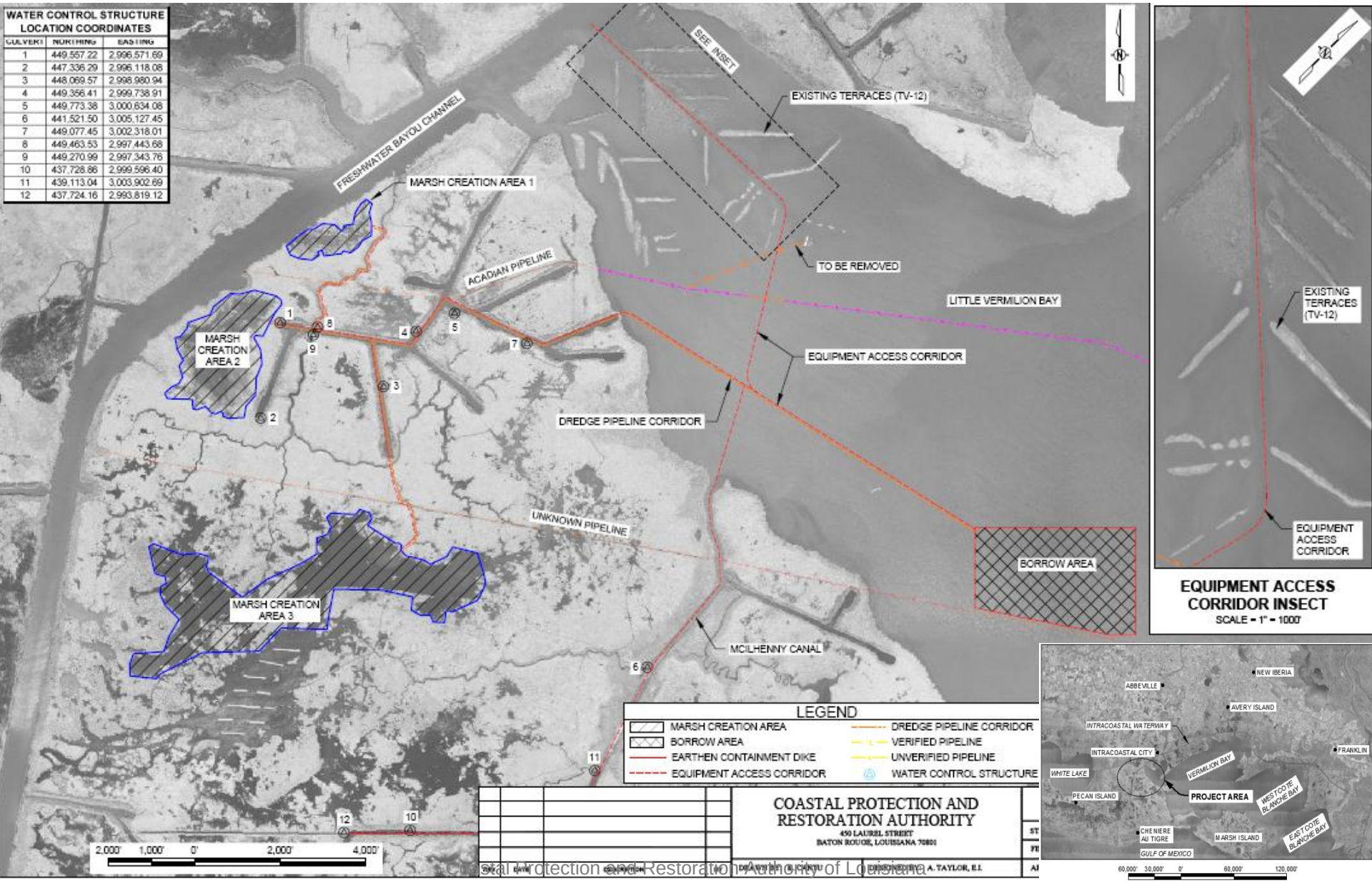
1. Northwest Turtle Bay Marsh Creation
2. Cameron Meadows Marsh Creation and Terracing
3. **Cole's Bayou Marsh Creation**

Cole's Bayou Marsh Restoration (TV-63)

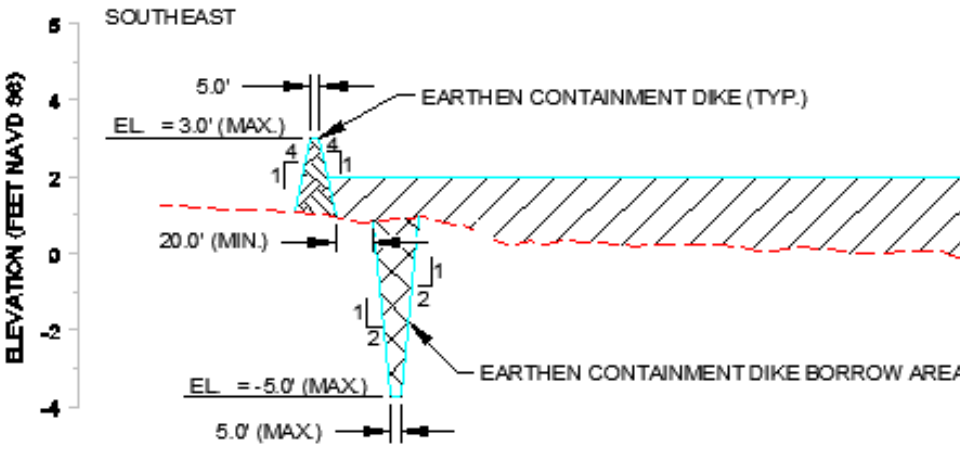
Amanda Taylor, E.I.
Engineering Division
April 14, 2015

committed to **our coast**

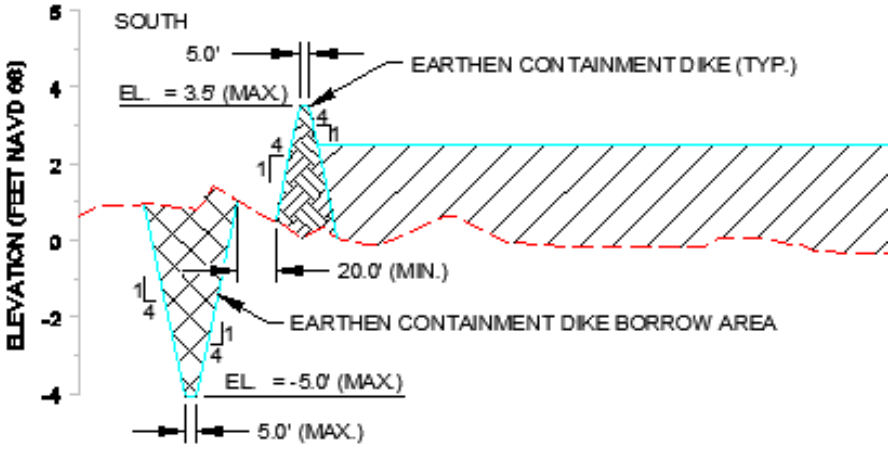
Proposed Project Features



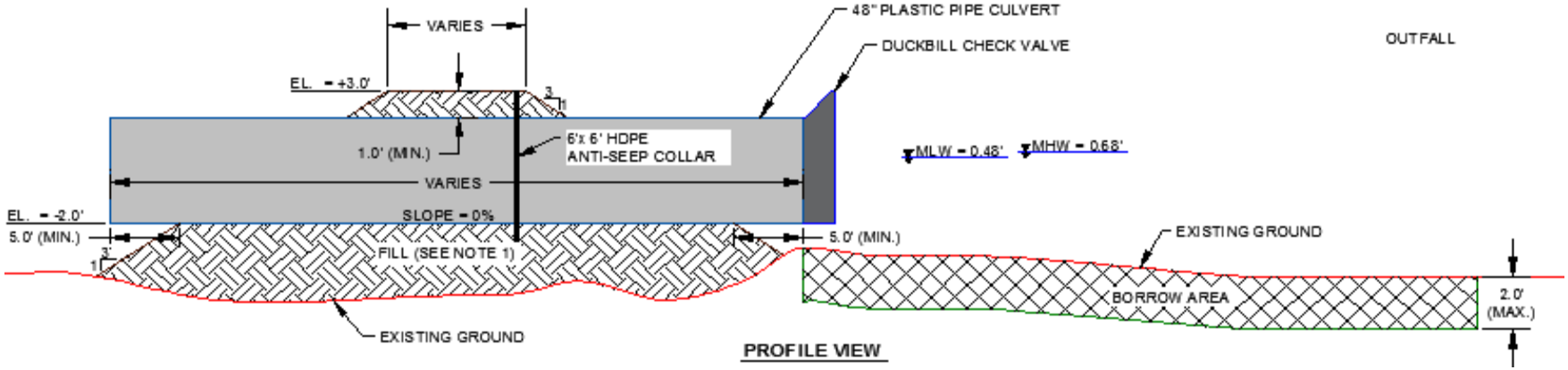
Proposed Project Features



Earthen Containment Dike Typical for Marsh Creation Cells 1 & 2



Earthen Containment Dike Typical for Marsh Creation Cell 3



Water Control Structure Typical Section

Design Considerations

- Pipelines

Design Considerations

- Dredge Pipeline Alignment

- Equipment Access Corridor
  - ~11,000 LF of dredging
  - ~10 ft. total draft

Estimated Schedule

- Engineering and Design- Fall 2015
- Compete for Phase II Funding- Winter 2015
  - Apply for permit
  - Complete Landrights

QUESTIONS

Restoration Projects

Design Complete/ Construction Funds Available

1. **NRDA Caillou Lake Headlands**
2. Lost Lake Marsh Creation and Hydrologic Restoration
3. Cheniere Ronquille Barrier Island Restoration
4. Oyster Bayou Marsh Restoration
5. Cameron Creole Watershed Grand Bayou Marsh Creation
6. Bayou Bonfouca Marsh Creation
7. Living Shoreline Demonstration Project

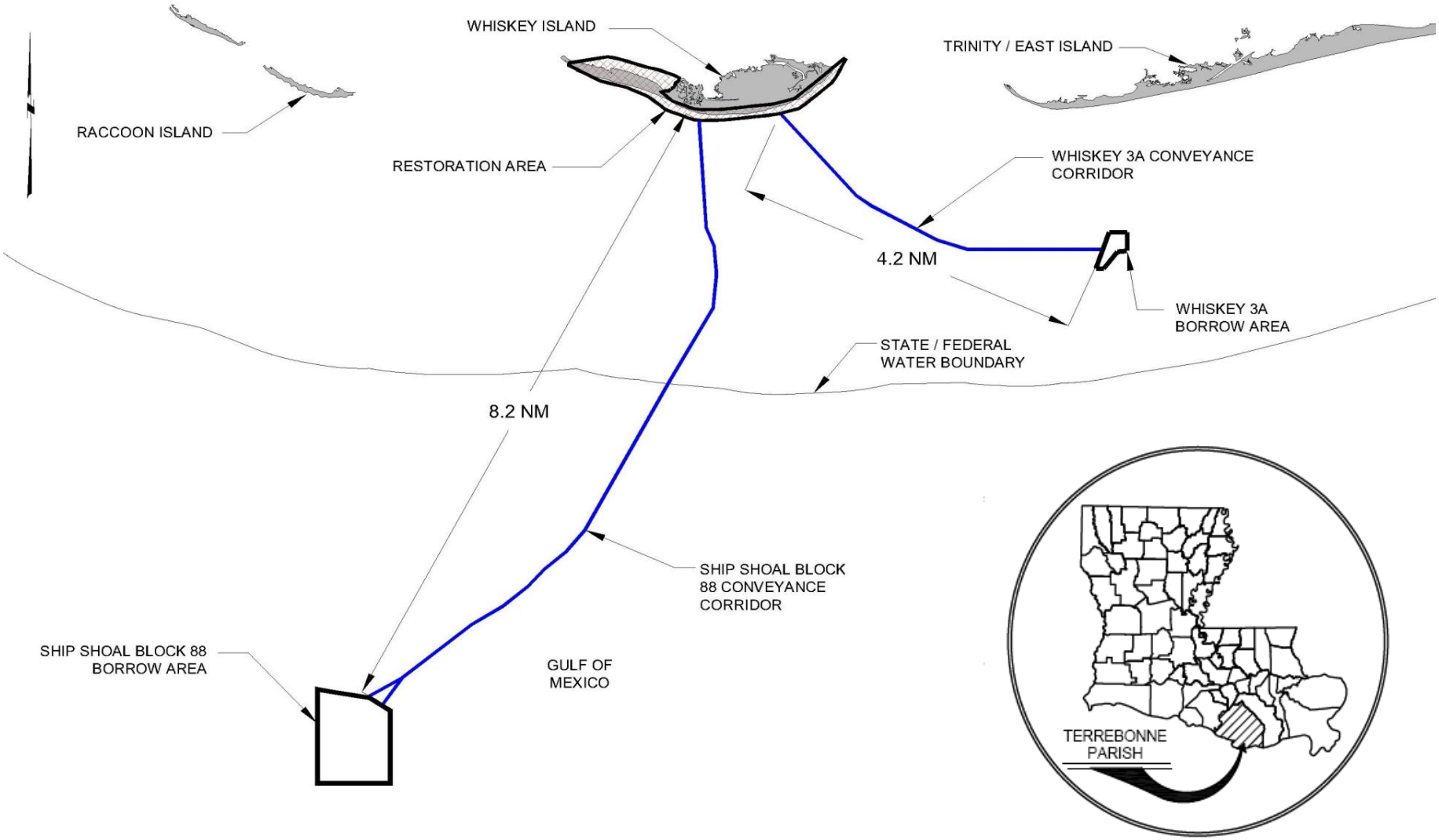
CPRA
Coastal Protection and Restoration Authority of Louisiana

NRDA Caillou Lake Headlands (TE-100)

Jacques Boudreaux, E.I.
CPRA – Engineering Division
April 14, 2015

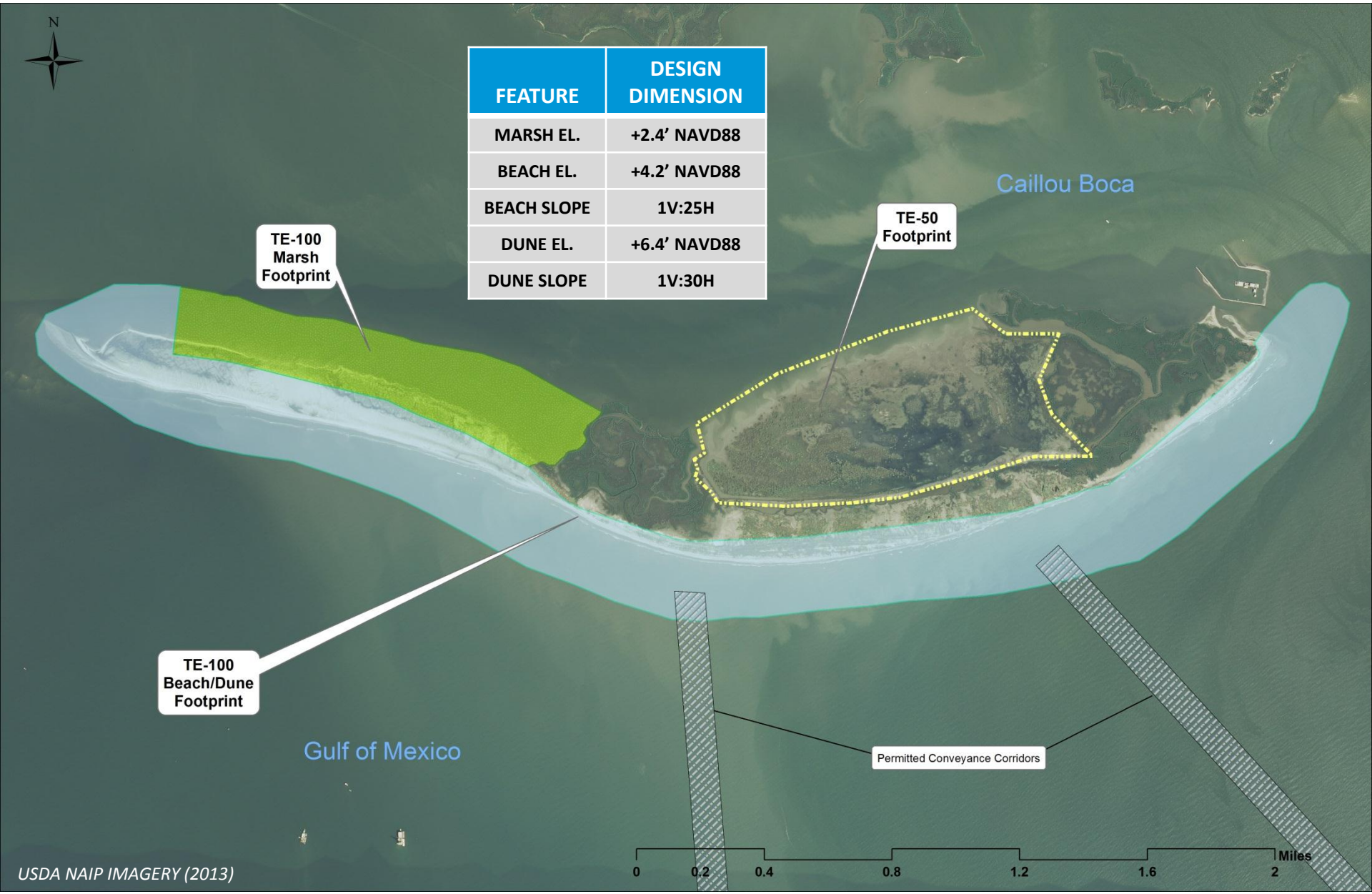
committed to **our coast**

TE-100 PROJECT VICINITY



BACKGROUND

- Located in Terrebonne Hydrologic Basin, Isles Dernieres Barrier Island Chain
- Proximity to Whiskey Island Back Barrier Marsh Creation Project (TE-50), Constructed by WMI 2008-2009 Through CWPPRA PPL 13
- Feasibility Study Funded Through LCA Via TBBSR Program
- Construction Funding Source: NRDA Phase III ER


N
FEATURE
DESIGN DIMENSION
MARSH EL.
+2.4' NAVD88
BEACH EL.
+4.2' NAVD88
BEACH SLOPE
1V:25H
DUNE EL.
+6.4' NAVD88
DUNE SLOPE
1V:30H
Caillou Boca
TE-100 Marsh Footprint
TE-50 Footprint
TE-100 Beach/Dune Footprint
Gulf of Mexico
Permitted Conveyance Corridors
USDA NAIP IMAGERY (2013)
0
0.2
0.4
0.8
1.2
1.6
2
Miles

FEATURES

CONSTRCUTED BEACH/DUNE HABITAT	=	**754 ACRES**
CONSTRUCTED MARSH HABITAT	=	**179 ACRES**
SHIP SHOAL BLOCK 88 CONVEYANCE	=	**10.2 MILES**
OPTIONAL WHISKEY 3A CONVEYANCE	=	**5.2 MILES**
DURATION OF CONSTRUCTION CONTRACT	=	**650 DAYS**

PROJECT FEATURES OF INTEREST	UNIT	ESTIMATED BID QUANTITY
BEACH AND DUNE FILL	CY	8,358,200
MARSH FILL	CY	885,900
*BEACH SEPARATION DIKE	LF	19,600
*MARSH CONTAINMENT DIKE	LF	9,530

**OPTIONAL, PENDING SELECTION OF MARSH BORROW AREA*

PROJECT SCHEDULE

- OCM Permitting Finalized Winter 2014
- Sand Lease Between BOEM and CPRA Currently Underway
- Plans and Specs Under Review
- CPRA Bid Advertisement Anticipated Summer 2015

QUESTIONS

Restoration Projects

Design Complete/ Construction Funds Available

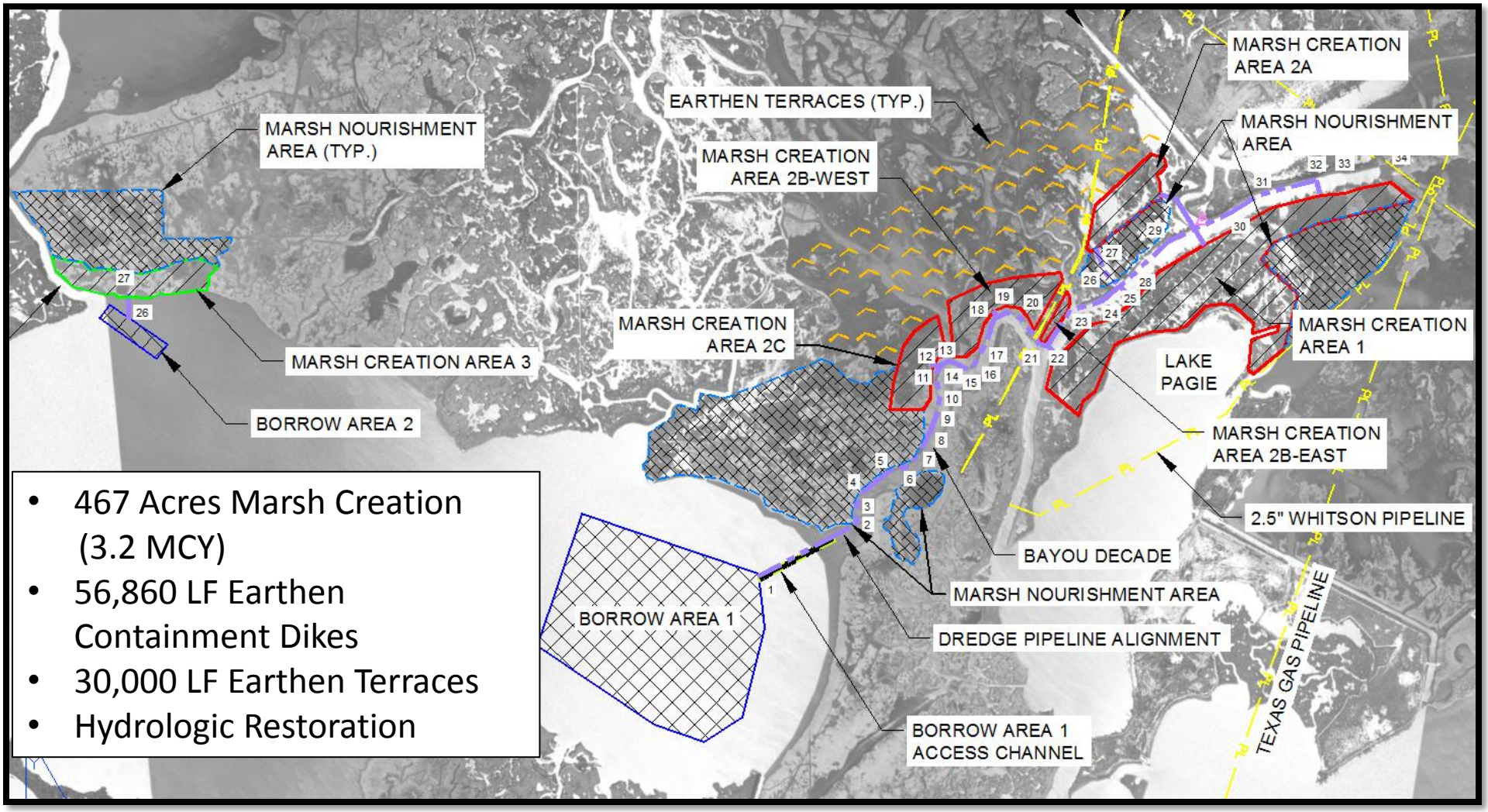
1. NRDA Caillou Lake Headlands
2. **Lost Lake Marsh Creation and Hydrologic Restoration**
3. Cheniere Ronquille Barrier Island Restoration
4. Oyster Bayou Marsh Restoration
5. Cameron Creole Watershed Grand Bayou Marsh Creation
6. Bayou Bonfouca Marsh Creation
7. Living Shoreline Demonstration Project

Lost Lake Marsh Creation and Hydrologic Restoration (TE-72)

Greg Mattson II, E.I.
Engineering Division
April 14, 2015

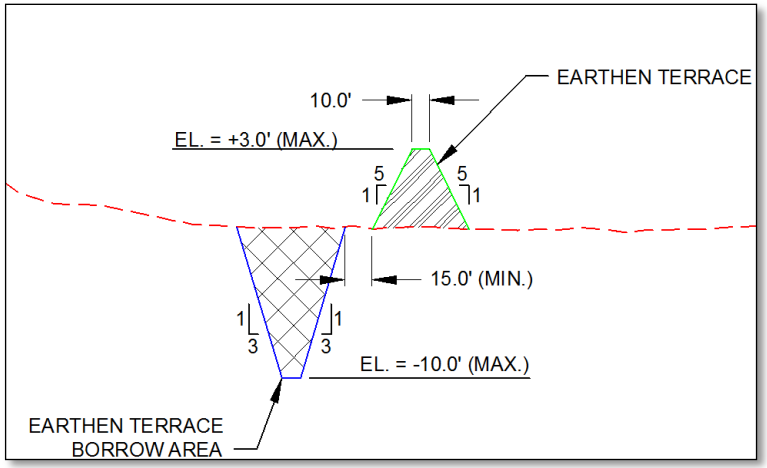
committed to **our coast**

Project Features

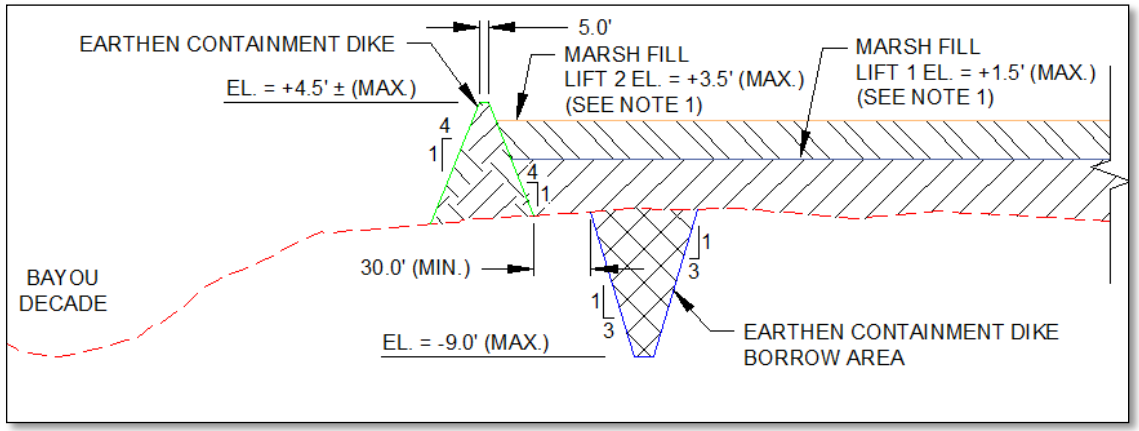


- 467 Acres Marsh Creation (3.2 MCY)
- 56,860 LF Earthen Containment Dikes
- 30,000 LF Earthen Terraces
- Hydrologic Restoration

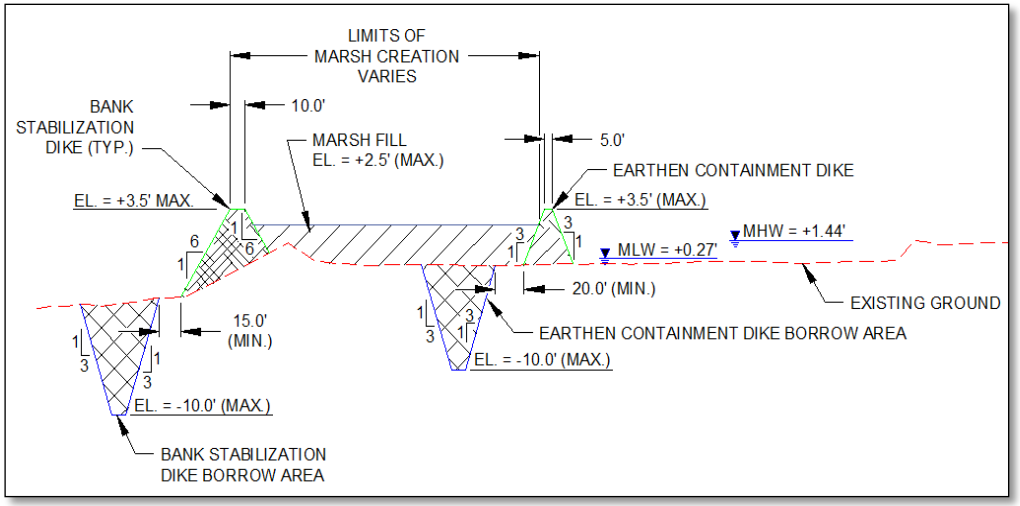
Project Features



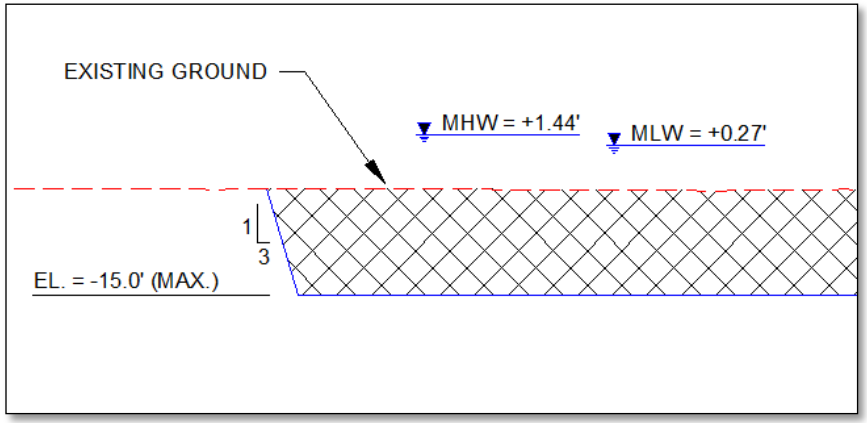
Earthen Terrace Design



Marsh Creation Area 1 Cross Section



Marsh Creation Area 3 Cross Section



Typical Borrow Area Cross Section

Estimated Schedule

- Construction is Funded
- Land Rights Completed
- Permit Mod Being Processed
- Pre-bid-- Mid 2015
- Construction Start– Late 2015

QUESTIONS

Restoration Projects

Design Complete/ Construction Funds Available

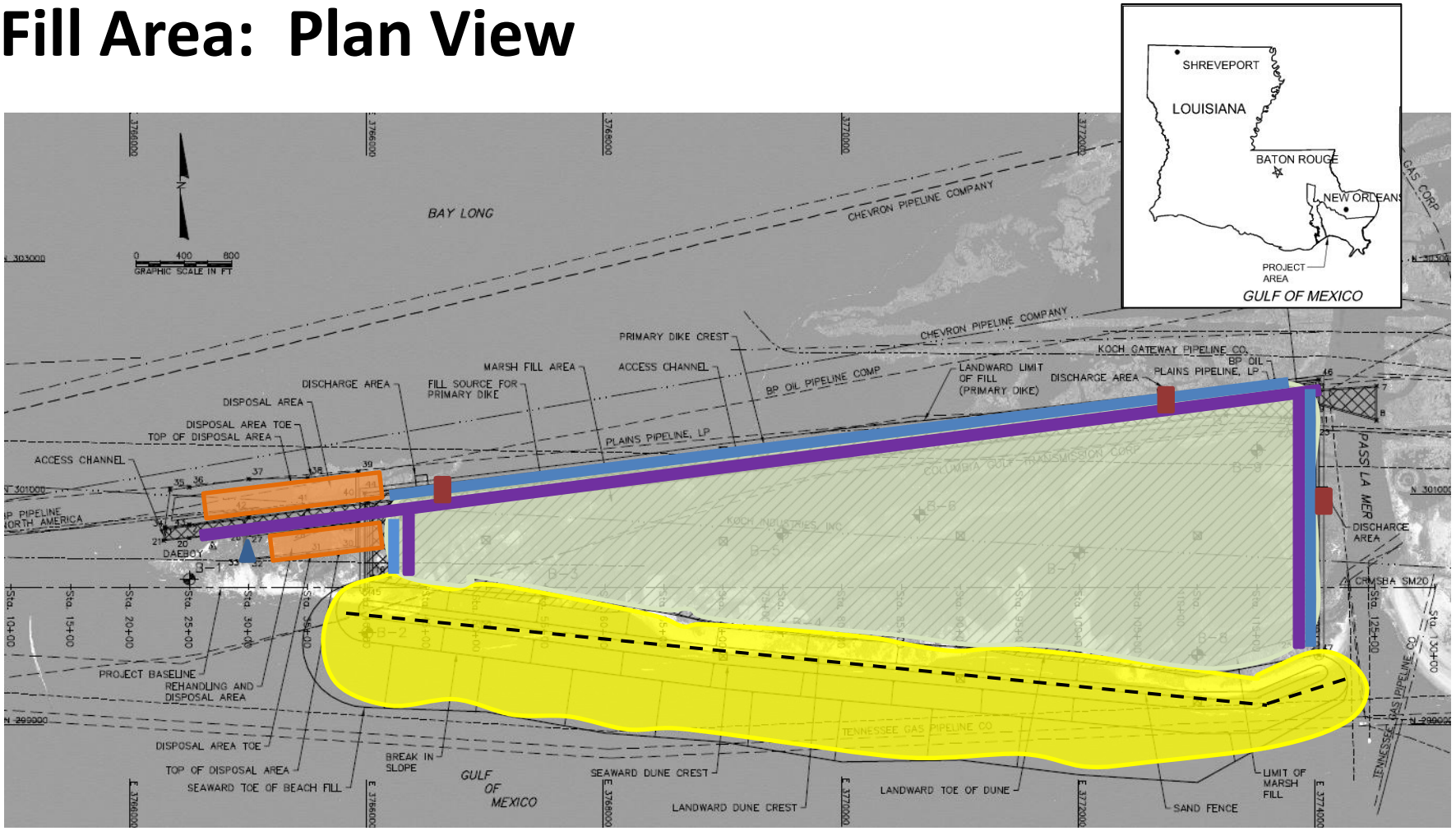
1. NRDA Caillou Lake Headlands
2. Lost Lake Marsh Creation and Hydrologic Restoration
3. **Cheniere Ronquille Barrier Island Restoration**
4. Oyster Bayou Marsh Restoration
5. Cameron Creole Watershed Grand Bayou Marsh Creation
6. Bayou Bonfouca Marsh Creation
7. Living Shoreline Demonstration Project

Chenier Ronquille Barrier Island Restoration Project (BA-76)

Julia Wall, E.I.
Engineering Division
April 14, 2015

committed to **our coast**

Fill Area: Plan View



Beach and Dune

Back Marsh

Access Channel

Primary Containment

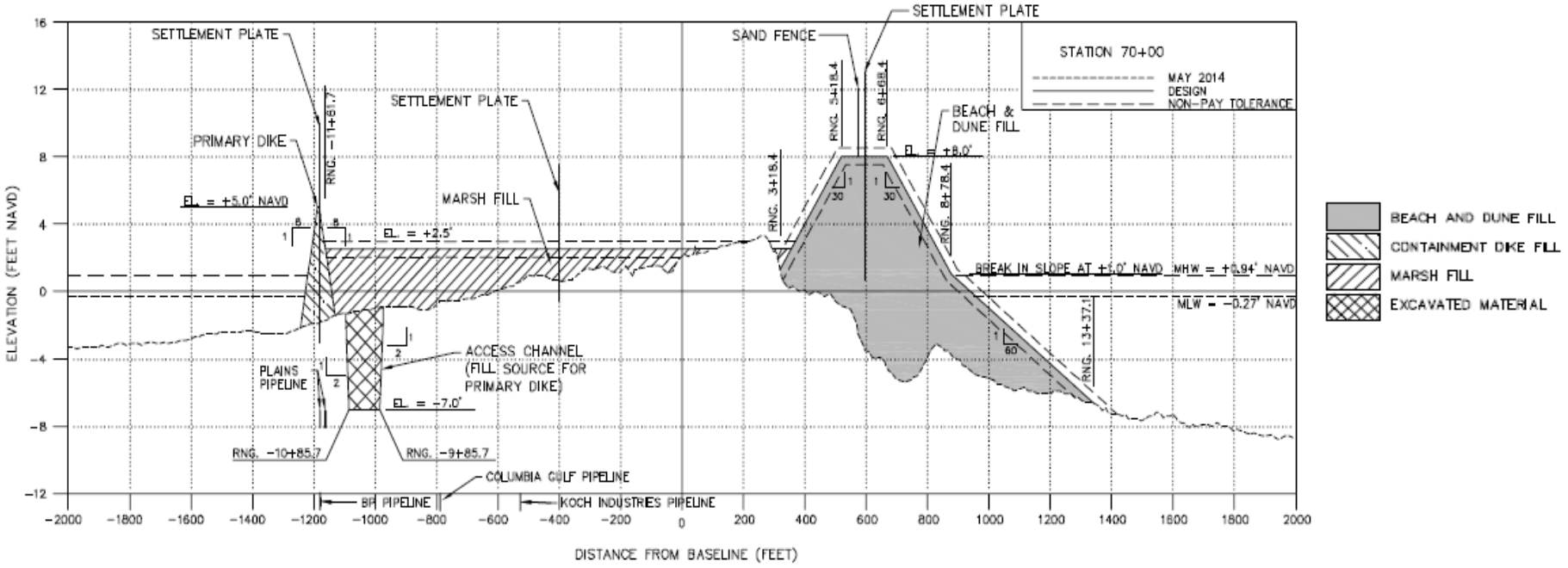
Sand Fence

Temporary Disposal Area

Discharge Area

Monument

Fill Area: Cross-Sections



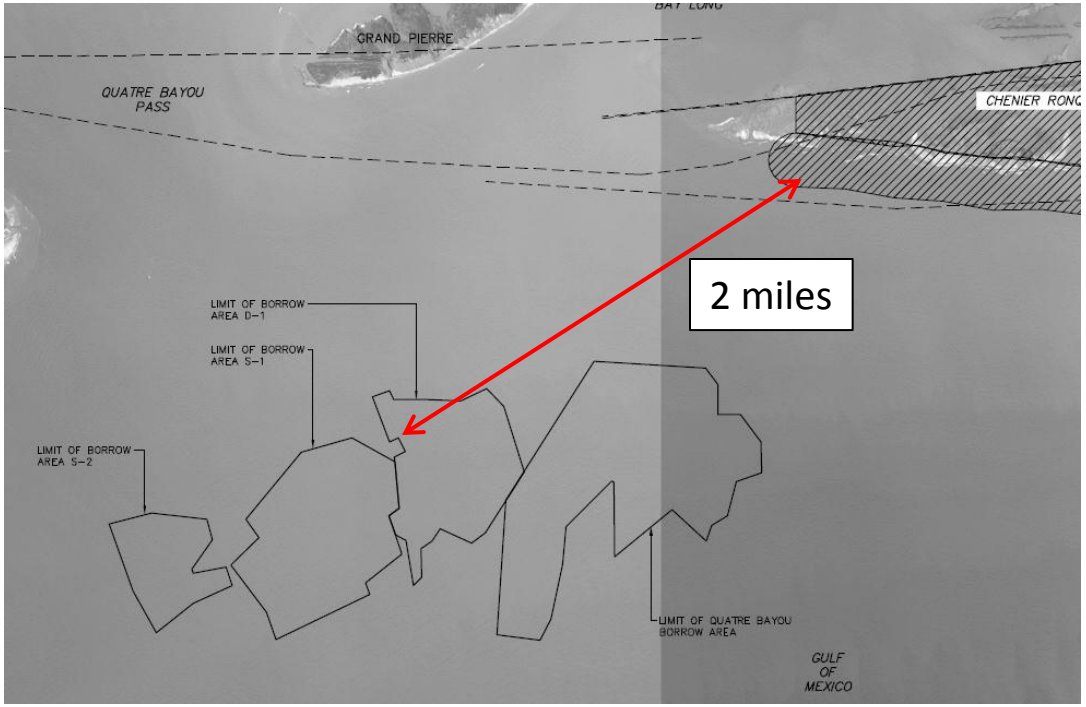
Project Feature	Construction Elevation (ft. NAVD88)
Dune Fill	8.0
Marsh Fill	2.5
Primary Containment Dike	5.0
Access Channel	-7.0

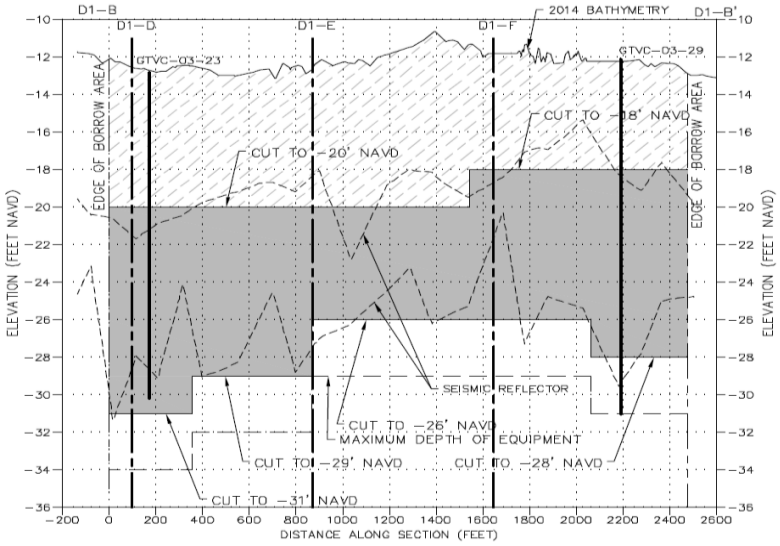
Description of Work	Estimated Quantity	Unit
Dune and Beach Fill	1,644,500	CY
Marsh Fill	986,900	CY
Primary Containment Dike	11,000	LF
Sand Fencing	8,700	LF

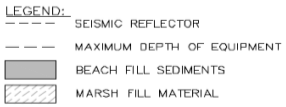
Borrow Area

Plan View

- 4 Permitted Areas
  - 3 Sand Sources
  - 2 Marsh Sources
- Average Pumping Distance: ~2 miles







Cross-Sections

S1 & S2: -8 < Sand Cut < -16 ft.

D1: -10 < Marsh Cut < -18 ft.

D1: -18 < Sand Cut < -26 ft.

Quatre Bayou: -10 < Marsh Cut < -18

Project Status

- Funded through NRDA
- Designed by Coastal Planning and Engineering (CB&I)
- NOAA/NMFS to bid for construction

- DNR/OCM Consistency and USACE Permit approved
- Land agreements to be completed
- Oyster lease acquisition ongoing

- Scheduled to bid Fall 2015
- Estimated construction duration: 310 days

QUESTIONS

Restoration Projects

Design Complete/ Construction Funds Available

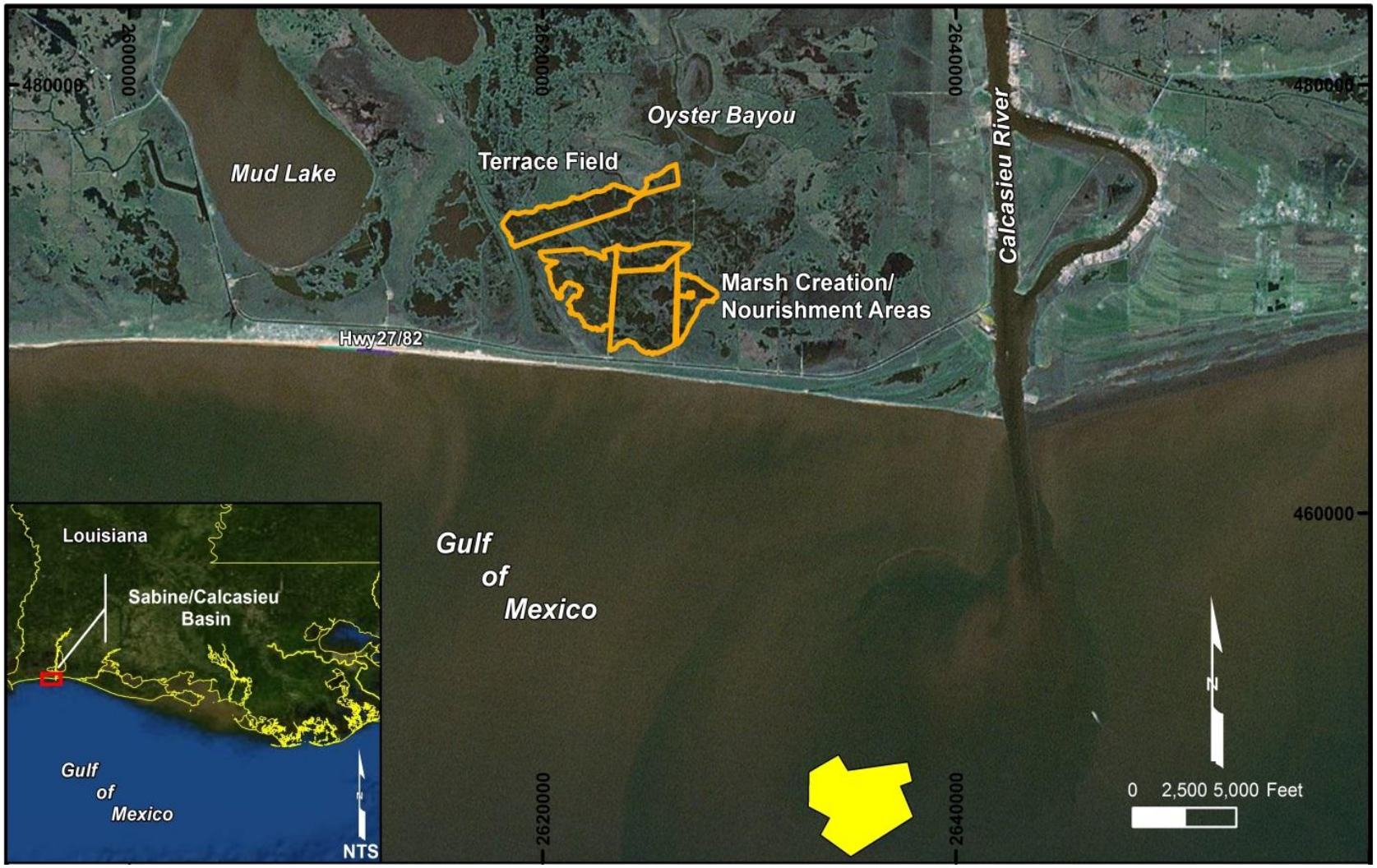
1. NRDA Caillou Lake Headlands
2. Lost Lake Marsh Creation and Hydrologic Restoration
3. Cheniere Ronquille Barrier Island Restoration
4. **Oyster Bayou Marsh Restoration**
5. Cameron Creole Watershed Grand Bayou Marsh Creation
6. Bayou Bonfouca Marsh Creation
7. Living Shoreline Demonstration Project

Oyster Bayou Marsh Restoration (CS-59)

Kodi Guillory, P.E.
Engineering Division

committed to **our coast**

Vicinity Map

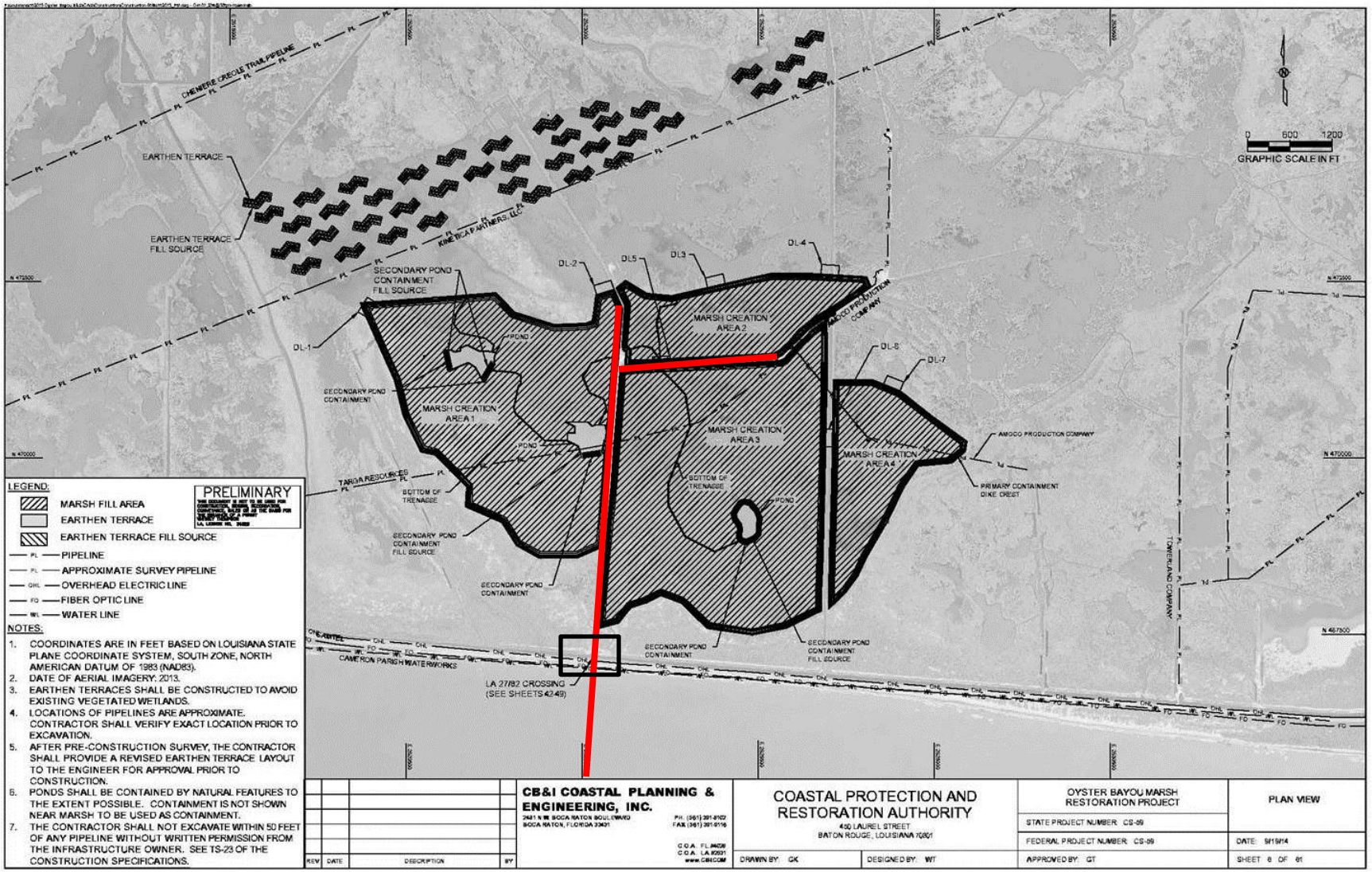


Project Information

- CWPPRA PPL 21
- Federal Sponsor: NOAA's National Marine Fisheries Service (NMFS) is the
- Creates/Nourishes 605 acres of marsh
- Phase 2 Funding Request: Approved in January 2015

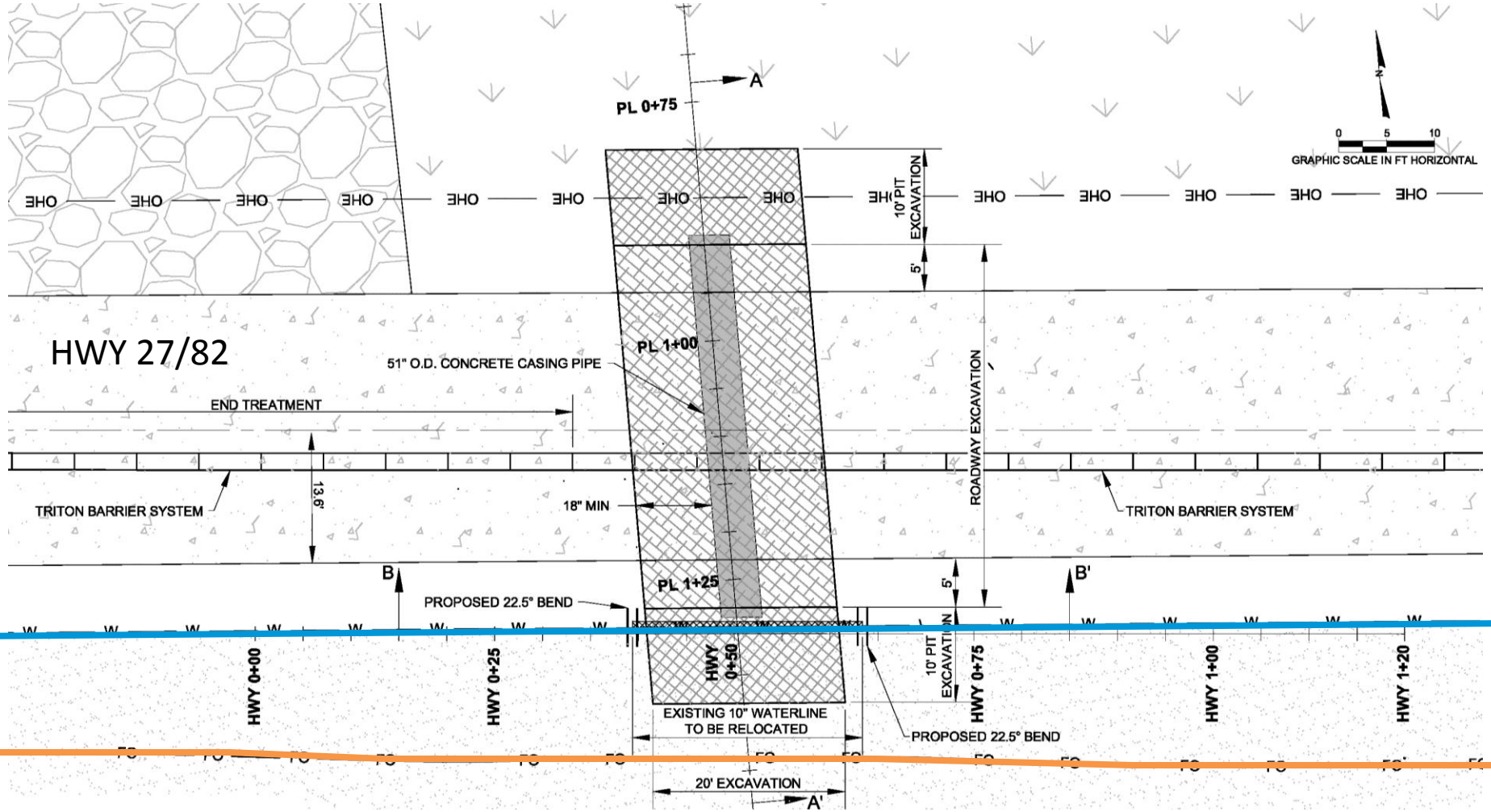
- Dredge Volume (cut): 3,307,660 CY
- Earthen Containment Dikes: 45,000 LF
- Earthen Terraces: 17,550 LF
- Maximum Pump Distance: 5.5 miles

Project Layout



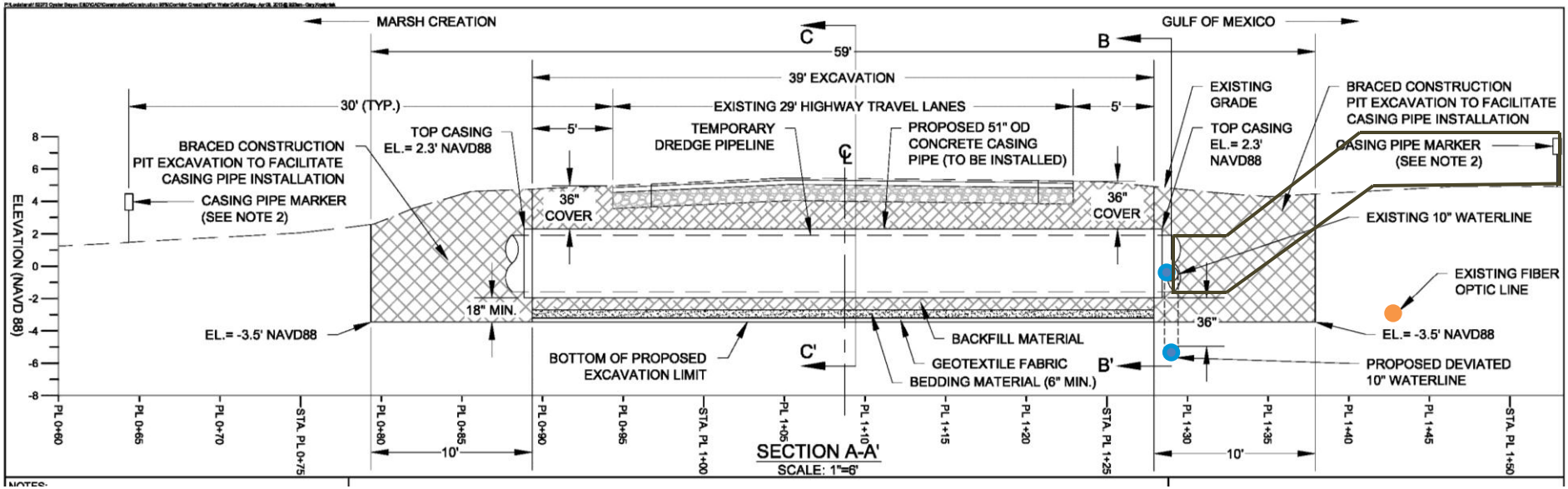
Dredge Pipeline Corridor

Dredge Pipeline Corridor

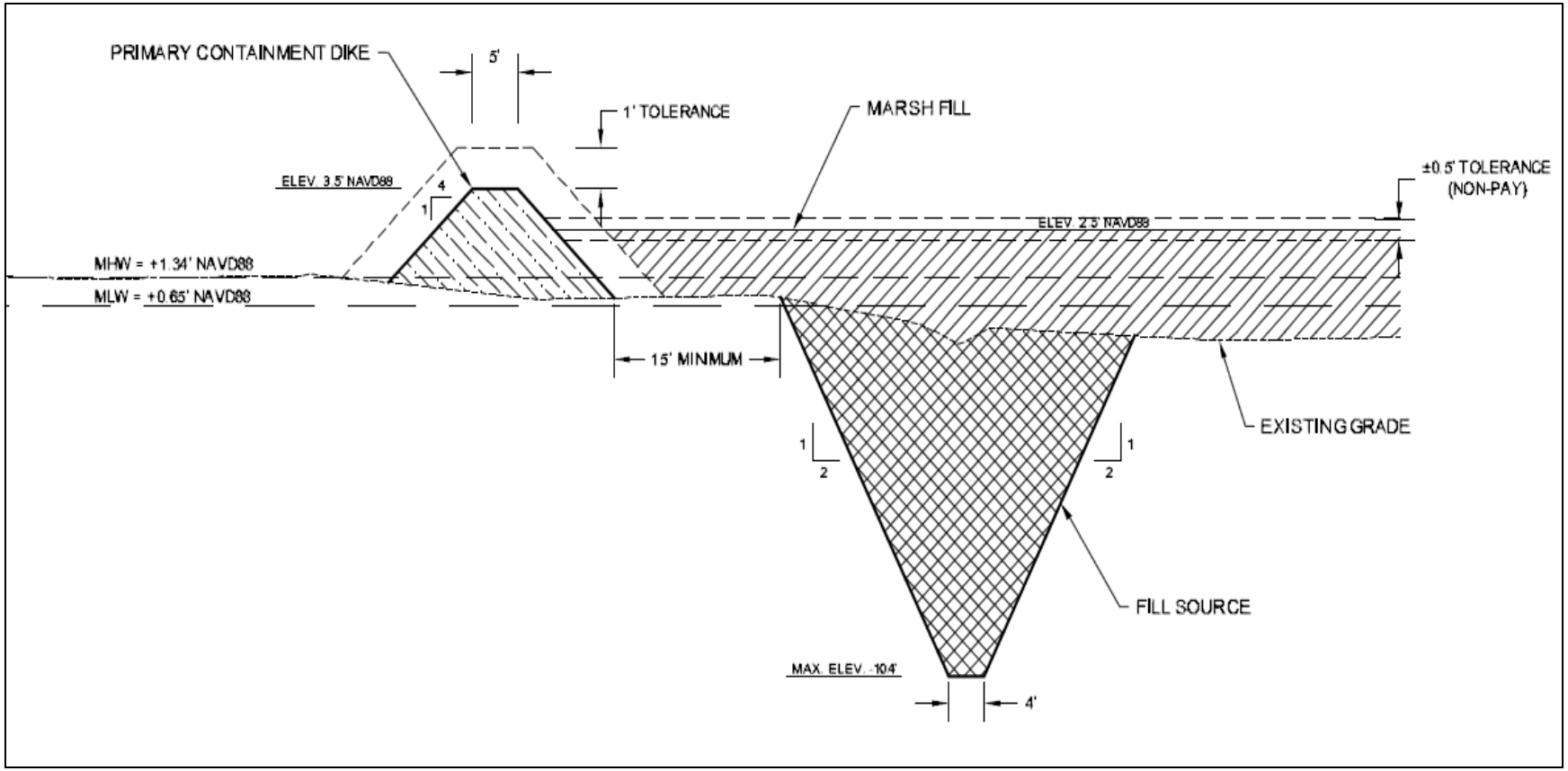


CS-33 Beach Fill

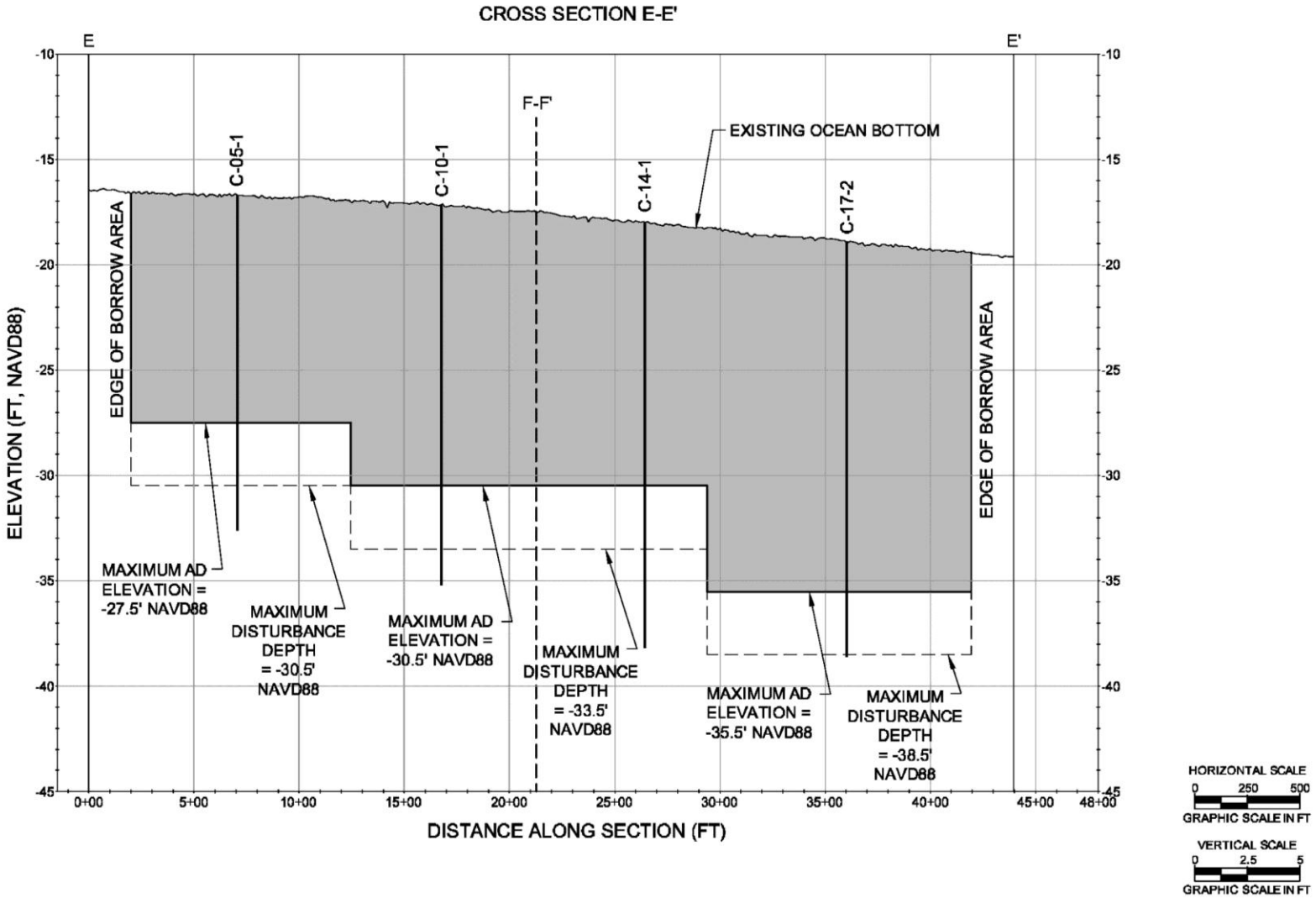
Dredge Pipeline Corridor



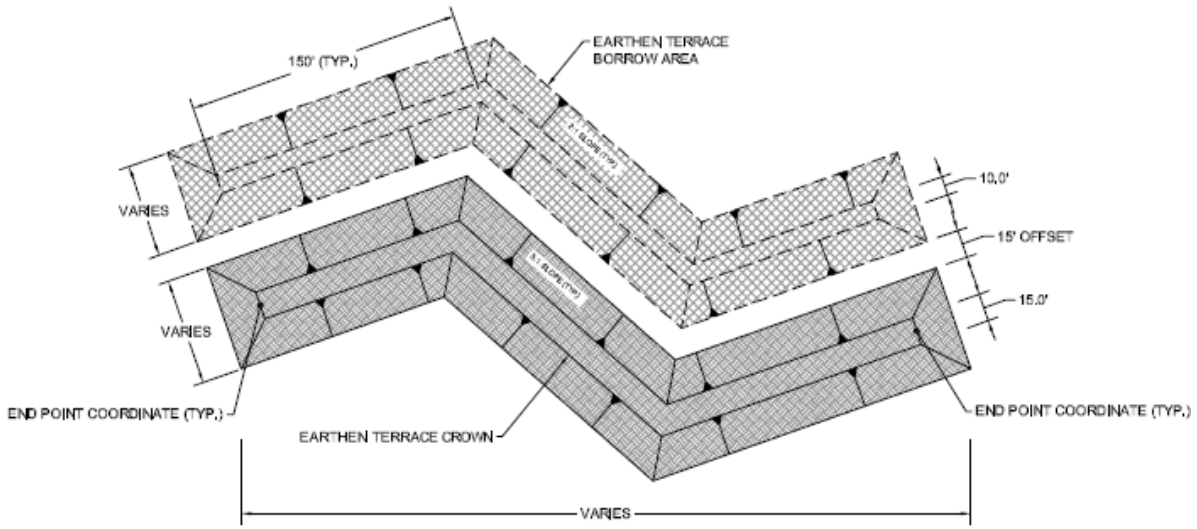
Typical Section – Marsh Creation

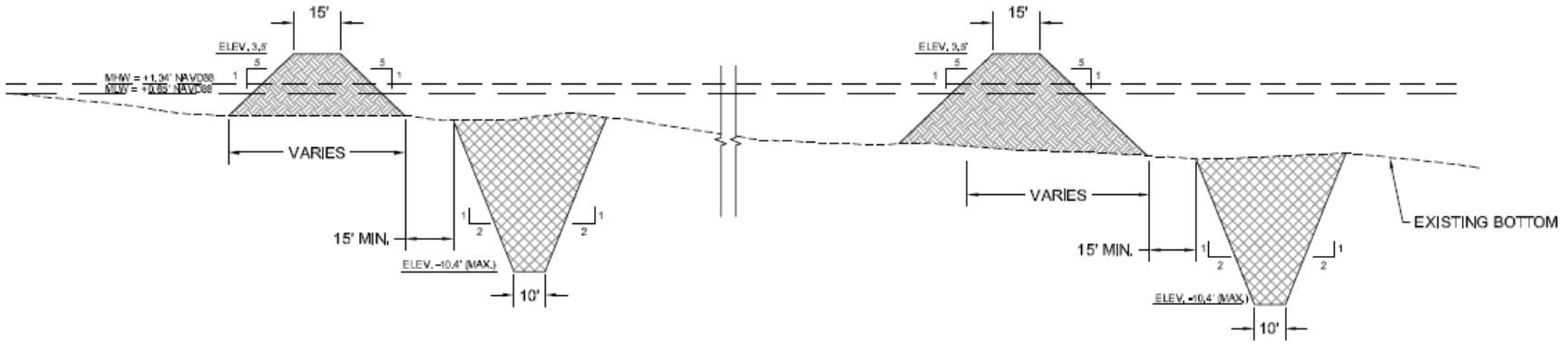


Typical Section – Offshore Borrow



Typical Section – Earthen Terraces





TYPICAL EARTHEN TERRRACE CROSS SECTION

NOT TO SCALE

Schedule

- Phase 2 Funding Request: Approved in January 2015
- Design: Substantially Complete (dredge pipeline crossing at highway)
- Permitting: Underway
- Landrights/Servitude Agreements: Underway
- Advertisement: Late 2015/Early 2016

QUESTIONS

Restoration Projects

Design Complete/ Construction Funds Available

1. NRDA Caillou Lake Headlands
2. Lost Lake Marsh Creation and Hydrologic Restoration
3. Cheniere Ronquille Barrier Island Restoration
4. Oyster Bayou Marsh Restoration
5. **Cameron Creole Watershed Grand Bayou Marsh Creation**
6. Bayou Bonfouca Marsh Creation
7. Living Shoreline Demonstration Project

Cameron-Creole Watershed Grand Bayou Marsh Creation

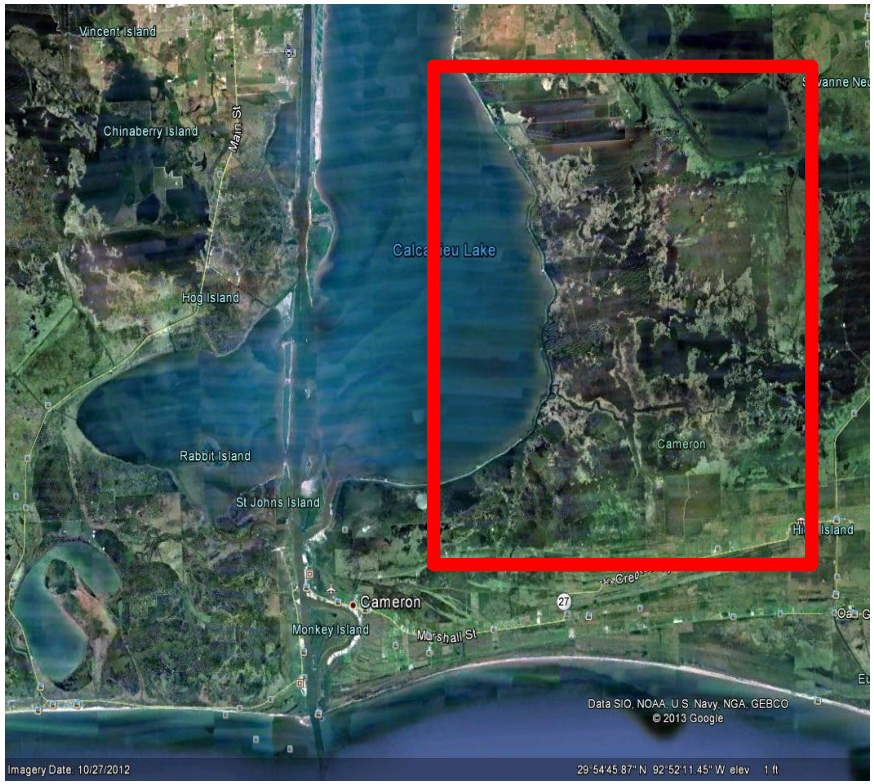
Thomas McLain, E.I.
Engineering Division
April 14, 2015

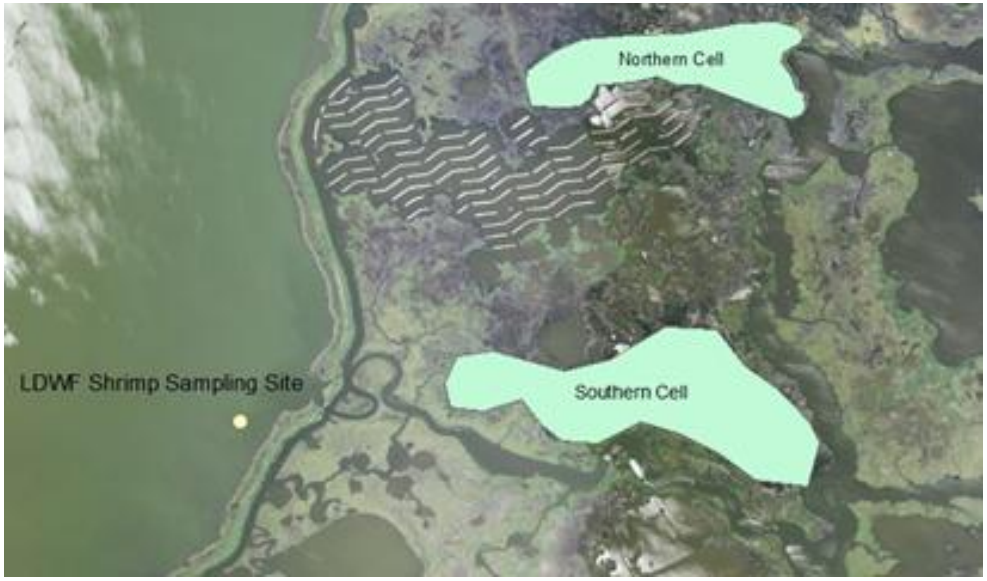
committed to **our coast**

Cameron-Creole Watershed Grand Bayou Marsh Creation

Summary

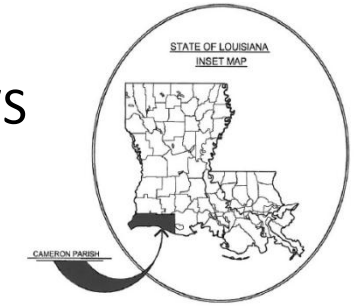
- Cameron Parish
- 617 Acres of Marsh Creation
  - Northern Cell: 219 Acres
  - Southern Cell: 398 Acres
- Borrow Source: Calcasieu Lake
- Federal Sponsor: US Fish & Wildlife Service



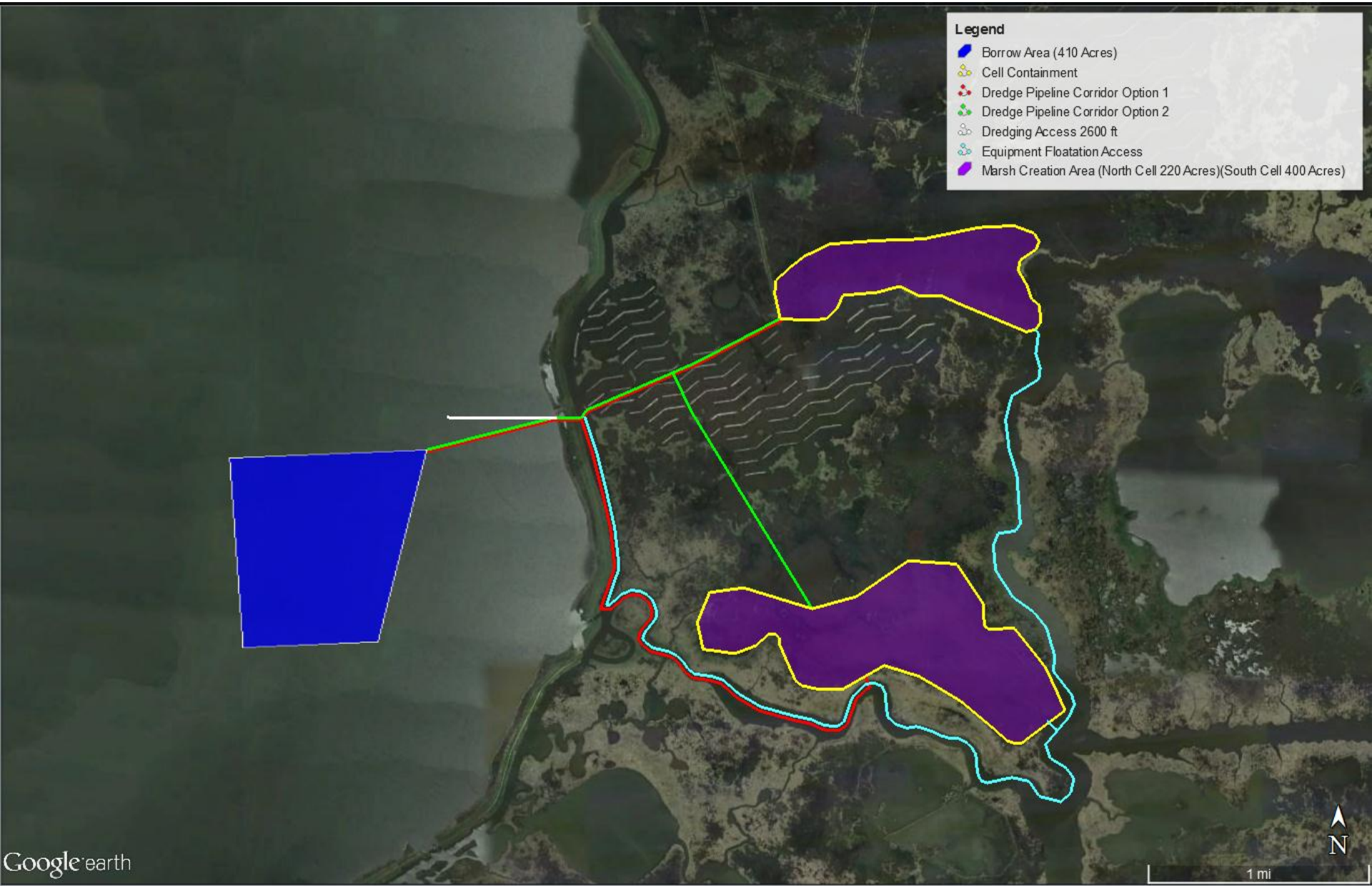


Federal PM:
Angela Trahan, USFWS

CPRA PM:
Garvin Pittman, CB&I



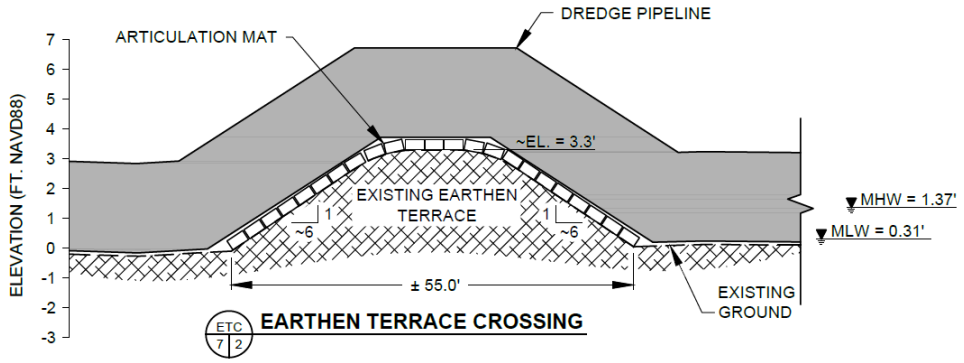
Cameron-Creole Watershed Grand Bayou Marsh Creation

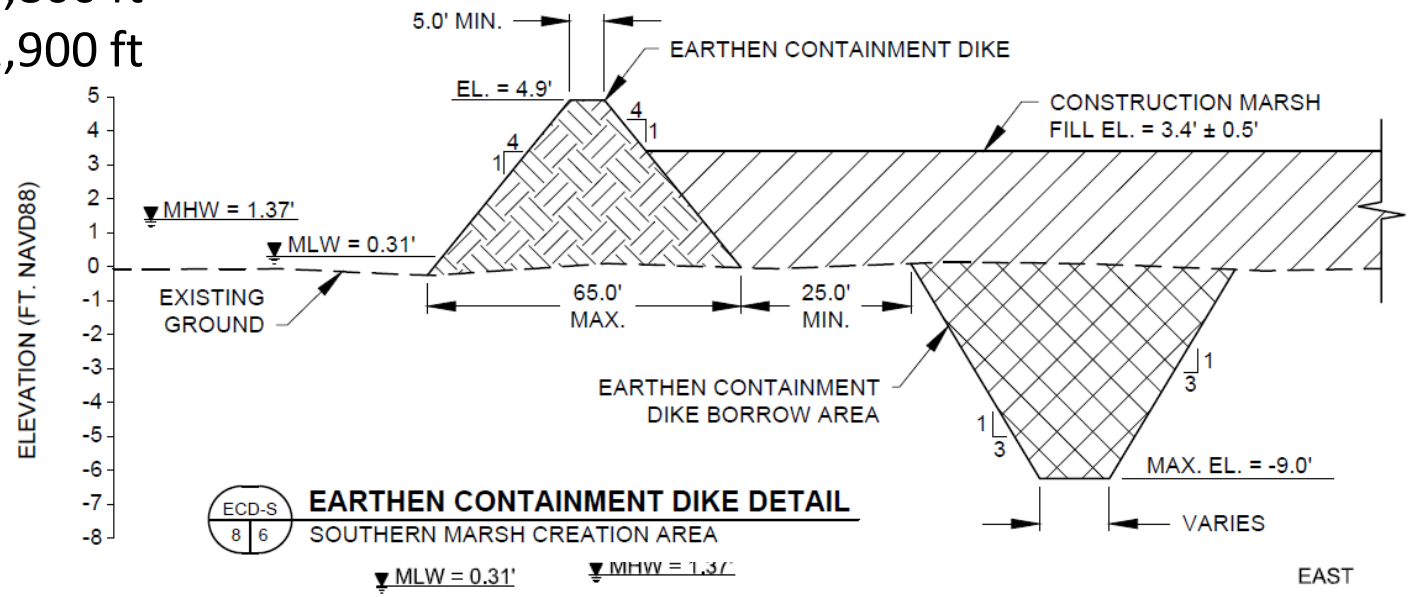


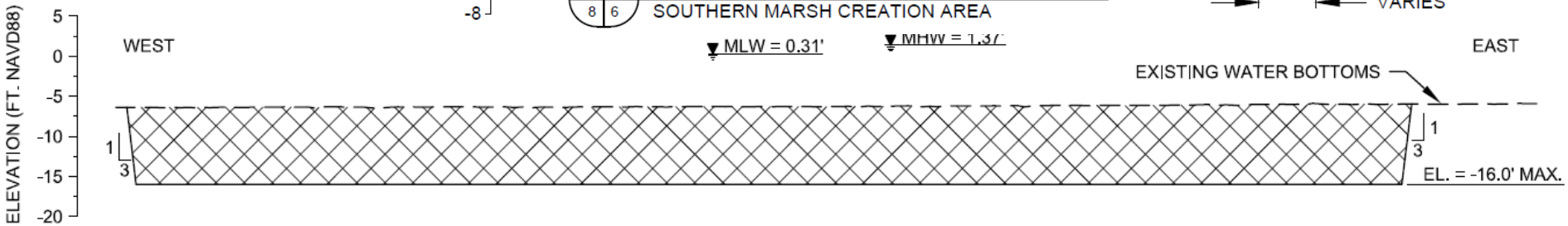
Cameron-Creole Watershed Grand Bayou Marsh Creation

Quantities

- Cut Volume
  - 2,565,250 CY
  - 10 ft Cut Depth
- Containment Length
  - North Cell: 16,800 ft
  - South Cell: 21,900 ft







Cameron-Creole Watershed Grand Bayou Marsh Creation

Recent Milestones

- Received CWPPRA Tech Committee Vote for Phase II Funding Q4 2014
- Coastal Use Permit Application Submitted Q2 2015

Path Forward

- Developing Plans & Specifications
- Plan to go for Bidding Q4 2015

Issues/ Concerns

- LDWF has Expressed Turbidity Concerns in Calcasieu Lake

QUESTIONS

Restoration Projects

Design Complete/ Construction Funds Available

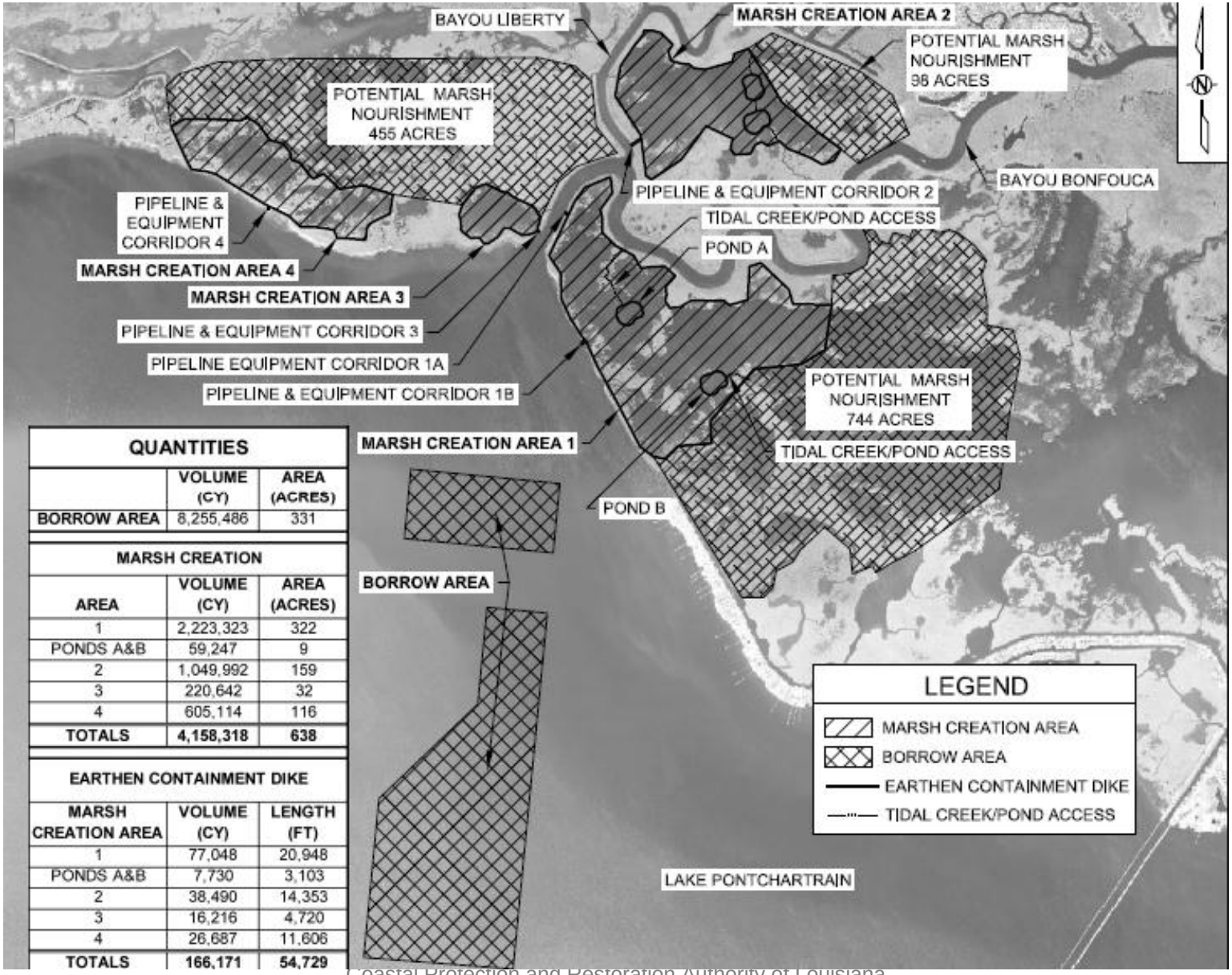
1. NRDA Caillou Lake Headlands
2. Lost Lake Marsh Creation and Hydrologic Restoration
3. Cheniere Ronquille Barrier Island Restoration
4. Oyster Bayou Marsh Restoration
5. Cameron Creole Watershed Grand Bayou Marsh Creation
6. **Bayou Bonfouca Marsh Creation**
7. Living Shoreline Demonstration Project

Bonfouca Marsh Creation (PO-104)

Shannon Haynes, P.E.
Engineering Division
April 14, 2015

committed to **our coast**

Project Plan

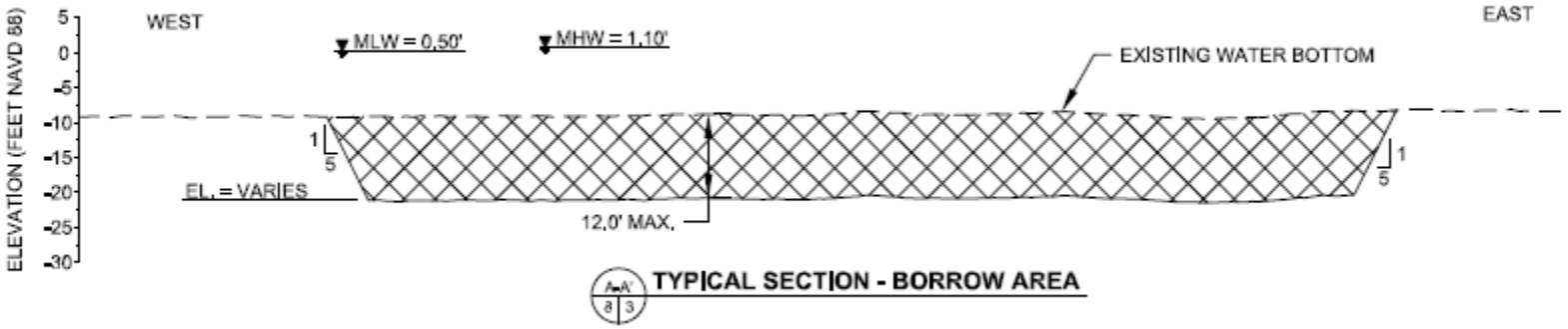


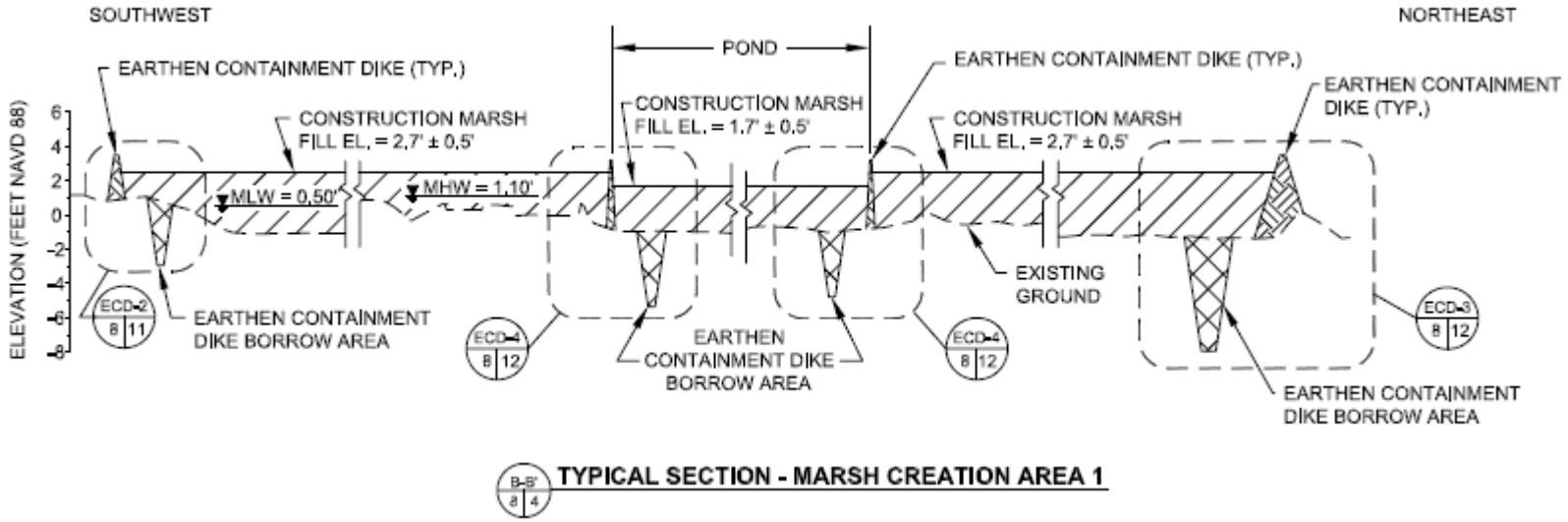
QUANTITIES		
	VOLUME (CY)	AREA (ACRES)
BORROW AREA	8,255,486	331

MARSH CREATION		
AREA	VOLUME (CY)	AREA (ACRES)
1	2,223,323	322
PONDS A&B	59,247	9
2	1,049,992	159
3	220,642	32
4	605,114	116
TOTALS	**4,158,318**	**638**

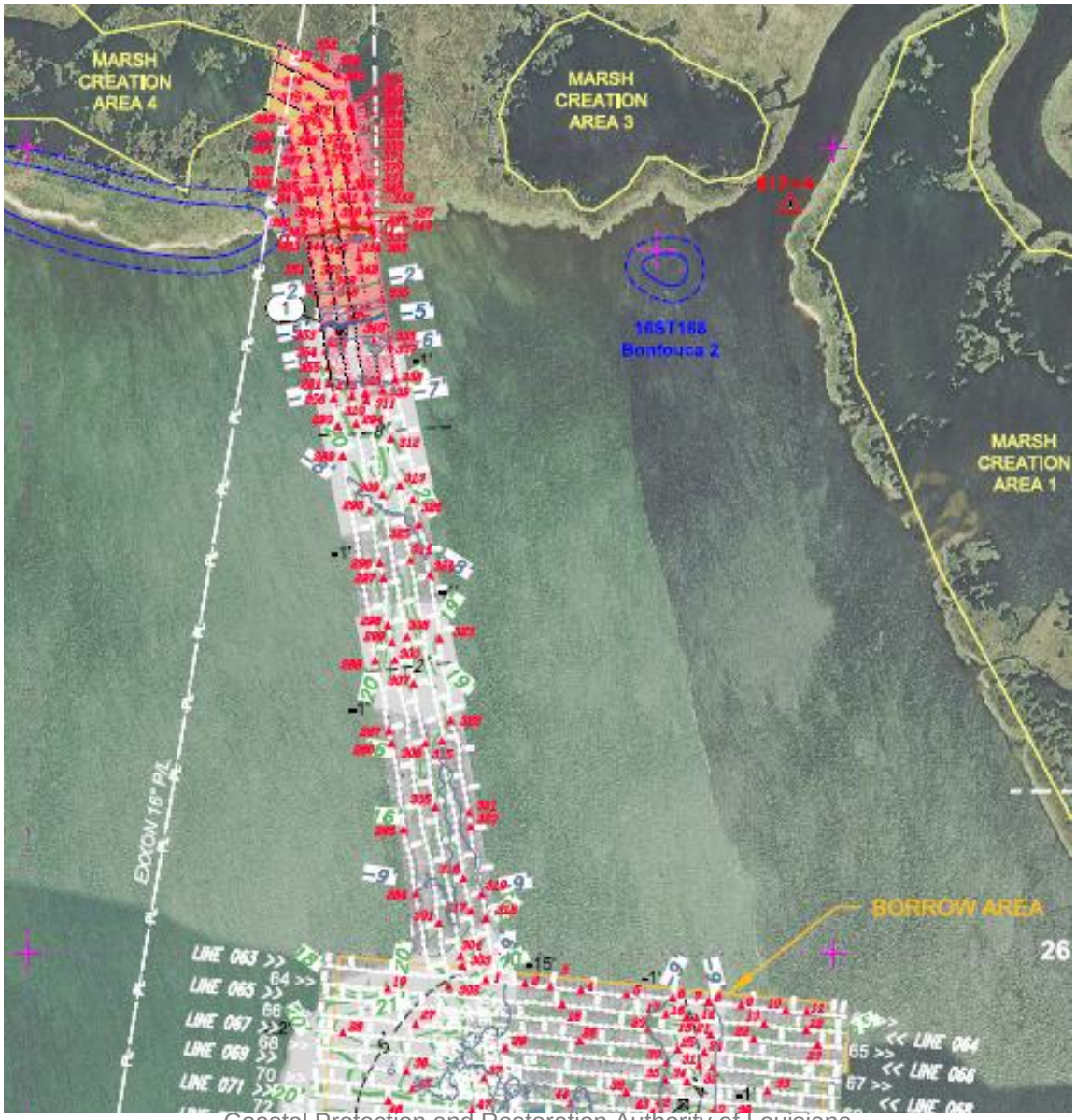
EARTHEN CONTAINMENT DIKE		
MARSH CREATION AREA	VOLUME (CY)	LENGTH (FT)
1	77,048	20,948
PONDS A&B	7,730	3,103
2	38,490	14,353
3	16,216	4,720
4	26,687	11,606
TOTALS	**166,171**	**54,729**

Proposed Project Features





Design Issues/Constraints



Estimated Schedule

- Engineering and Permitting - October 2015
- Construction is funded
- No Dredging Window for Sturgeon
- Construction Start – January 2016

QUESTIONS

Restoration Projects

Design Complete/ Construction Funds Available

1. NRDA Caillou Lake Headlands
2. Lost Lake Marsh Creation and Hydrologic Restoration
3. Cheniere Ronquille Barrier Island Restoration
4. Oyster Bayou Marsh Restoration
5. Cameron Creole Watershed Grand Bayou Marsh Creation
6. Bayou Bonfouca Marsh Creation
7. **Living Shoreline Demonstration Project**

CPRA
Coastal Protection and Restoration Authority of Louisiana

Living Shoreline Demonstration Project (PO-148)

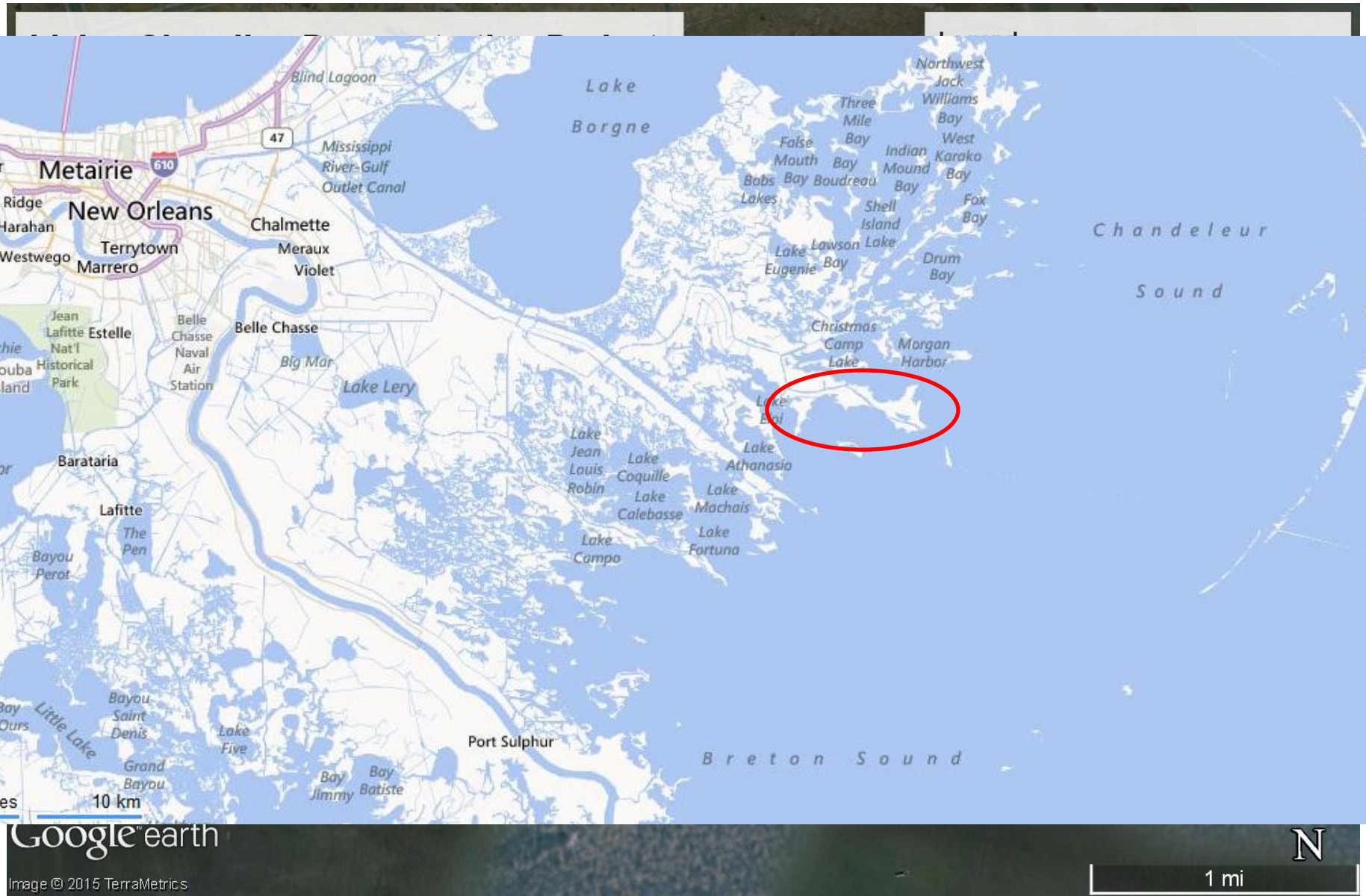
Tye Fitzgerald, P.E.
Engineering Division
April 14, 2015

committed to **our coast**

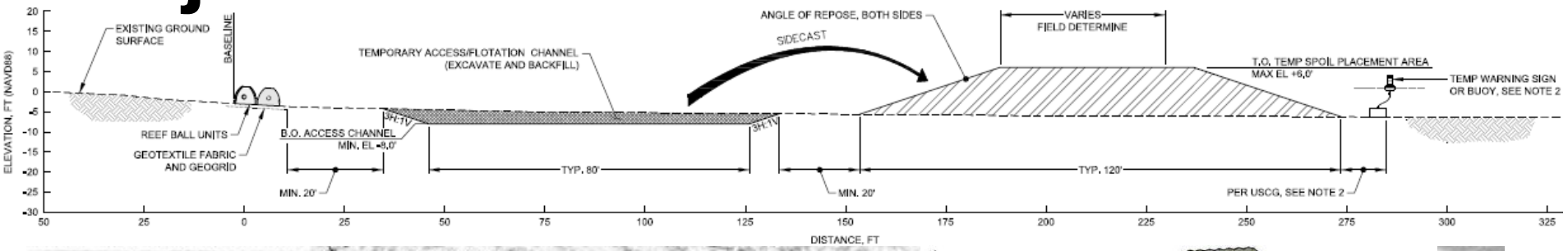
Project Background

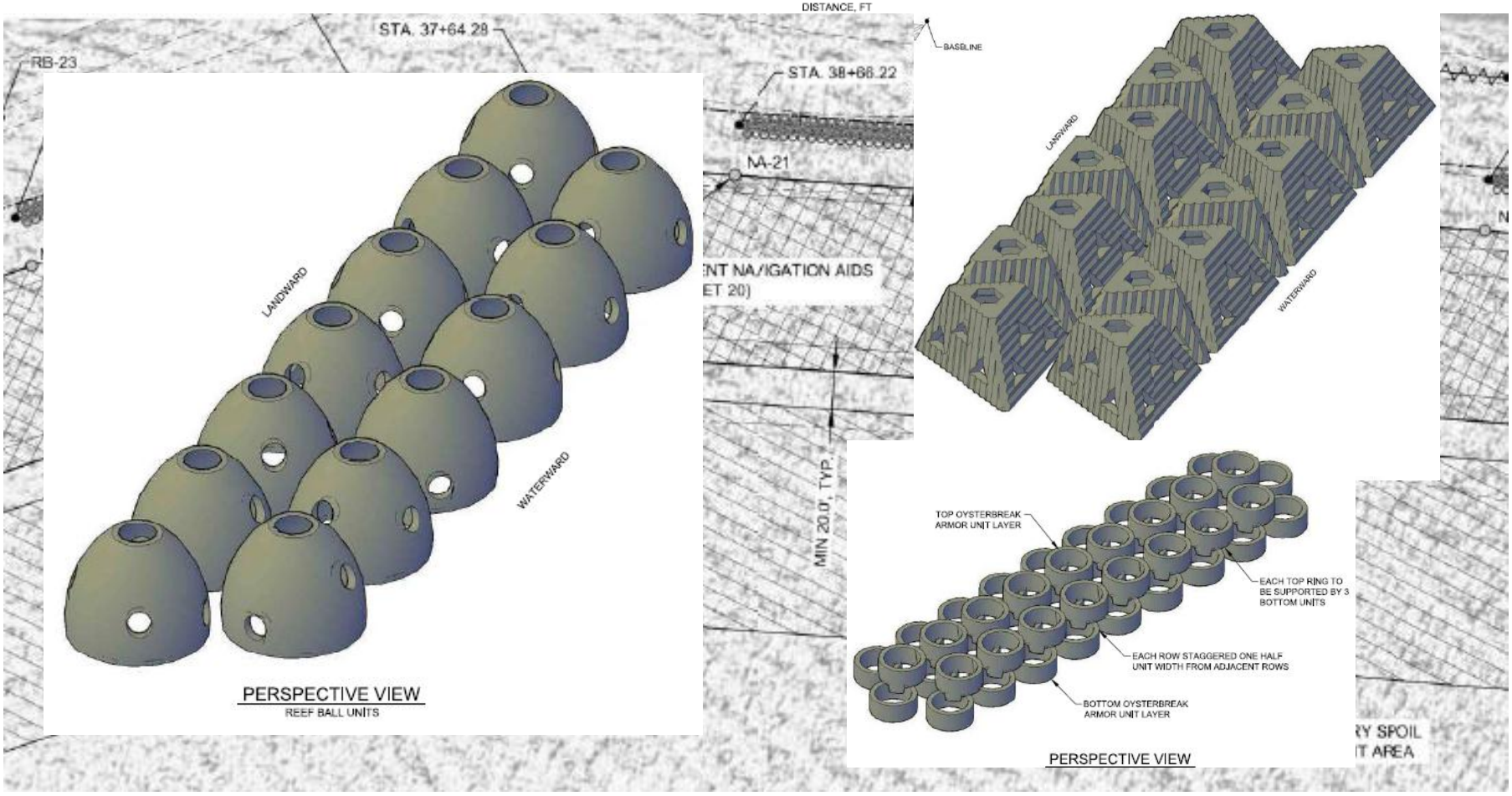
- Located in St. Bernard Parish
- Proposing Living Breakwater Structures (approximately 4 different products)
- Approximately 11,200 LF of Shoreline Protection
- CIAP Funded

PO-148 Project Location



Project Features





Project Schedule

- Permits — Summer 2015
- Plans & Specifications — Summer 2015
- Bid Advertisement — Fall 2015

QUESTIONS

Flood Protection Projects

1. Morganza to the Gulf Reach L
2. Delcambre-Avery Canal – Control Structure
3. Bayou Tigre – Control Structure
4. Bayou Tigre – Pump Station

CPRA
Coastal Protection and Restoration Authority of Louisiana

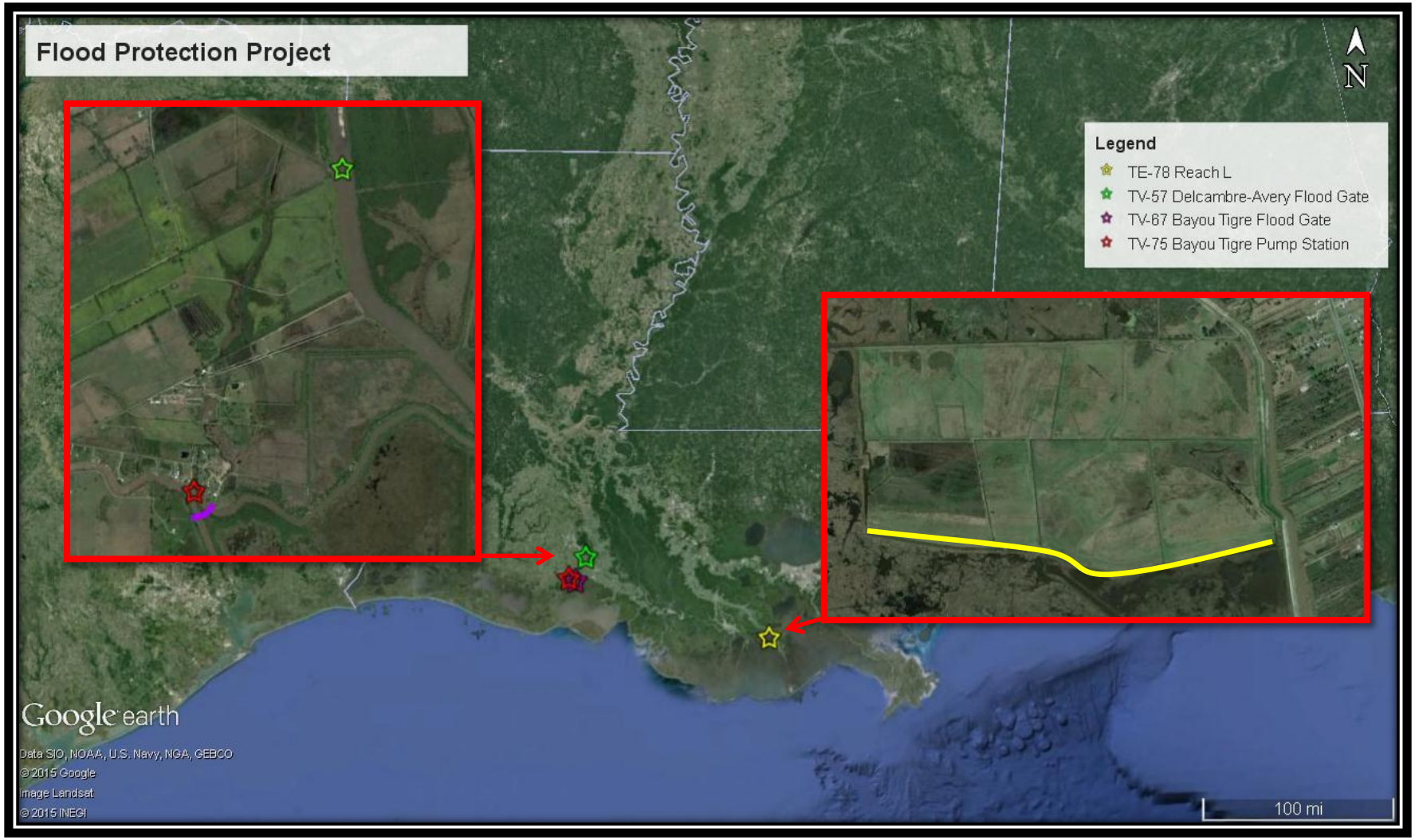
Flood Protection Projects

TE-78 MTOG Reach L
TV-57 Delcambre-Avery Canal – Control Structure
TV-67 Bayou Tigre – Control Structure
TV-75 Bayou Tigre – Pump Station

Binh Dao, E.I.
Engineering Division
April 14, 2015

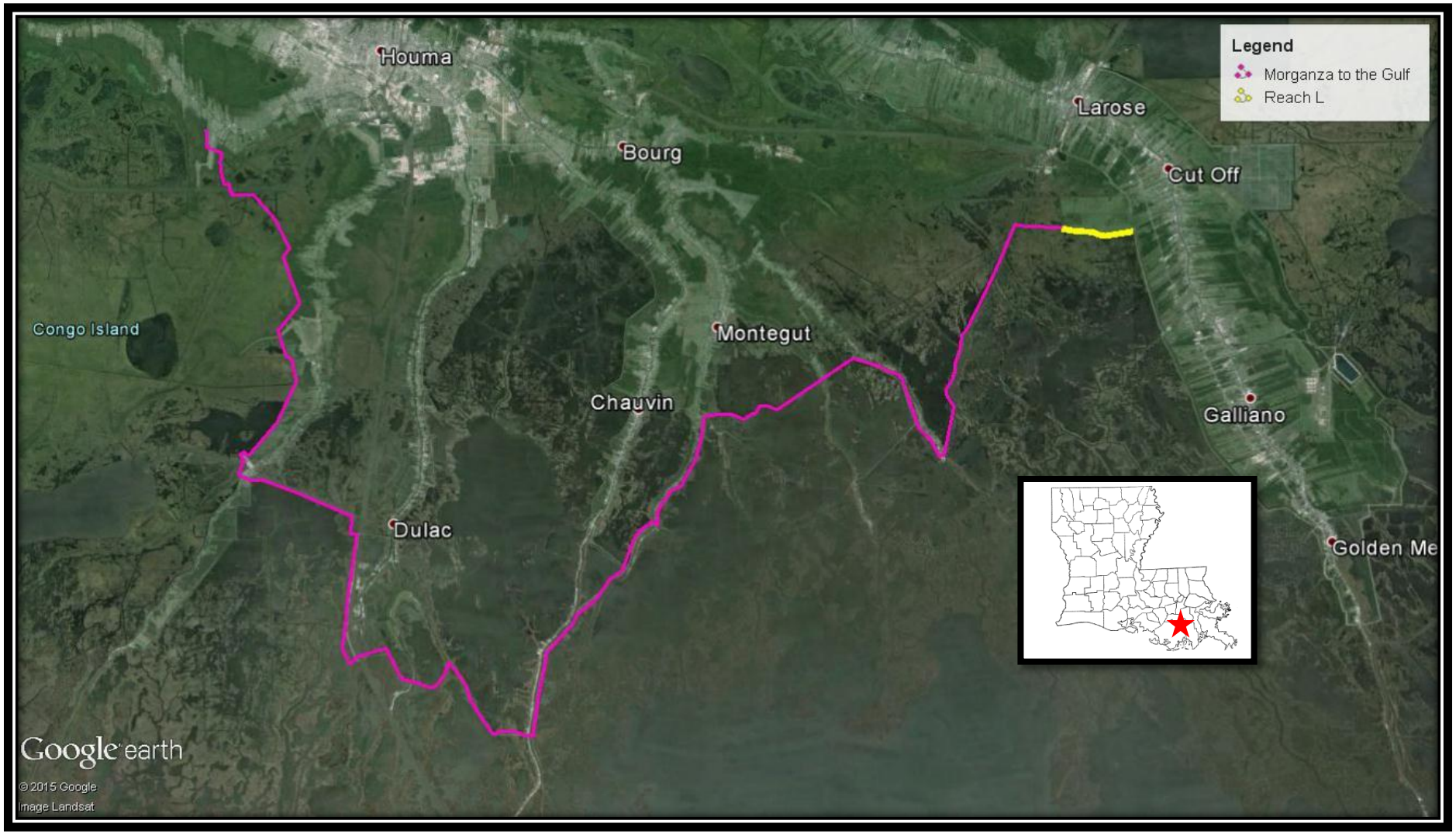
committed to **our coast**

Project Overview



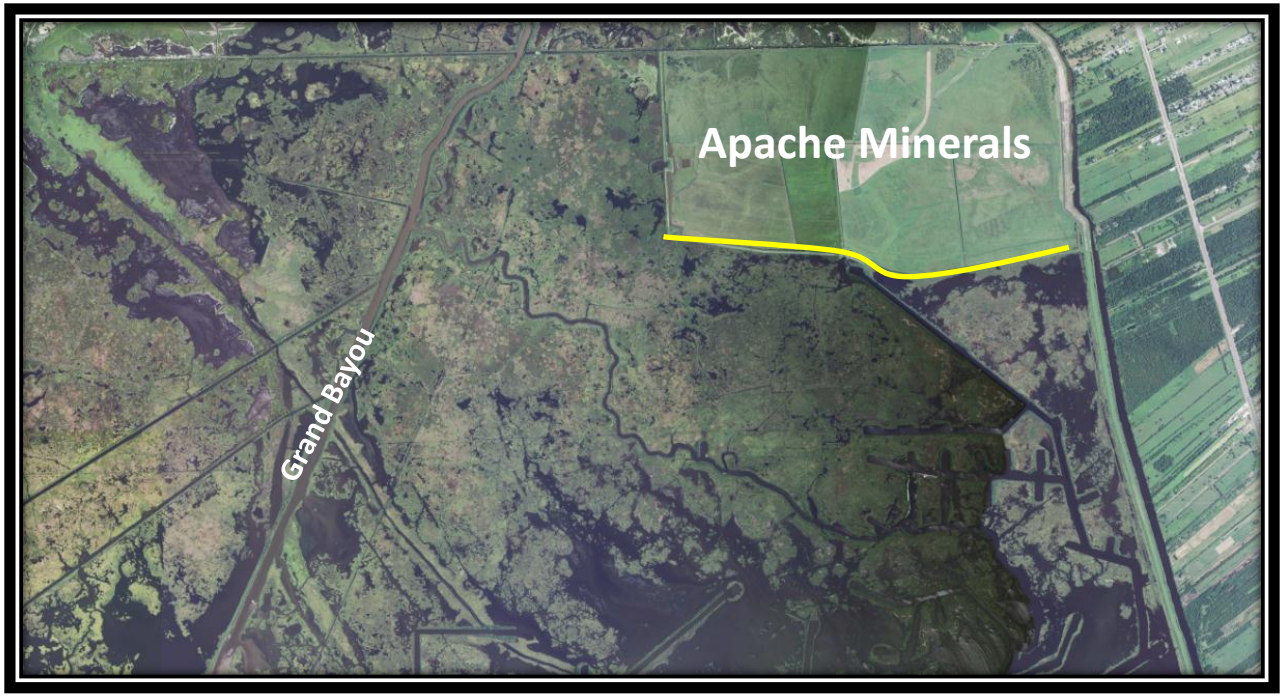
Project Background

Cut Off/Pointe-Aux-Chene Levee Rehabilitation

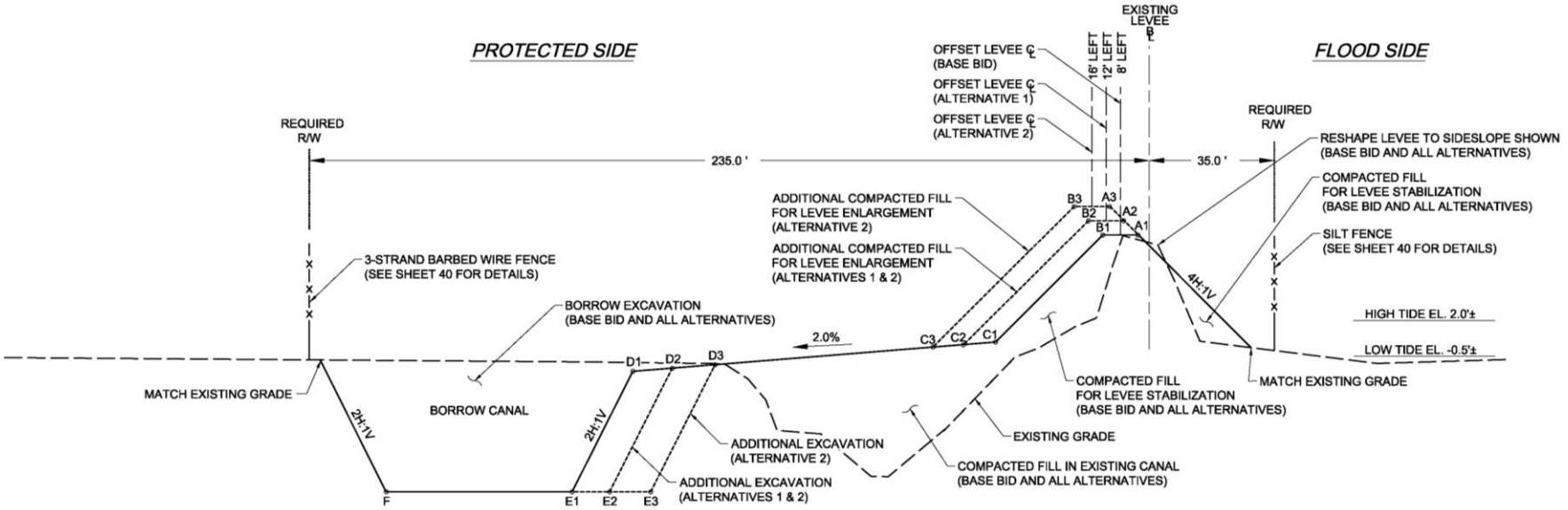


Project Background

- Apache Minerals
- Existing levee elevation



Levee Design



STA. 468+00 TO STA. 512+50 AND STA. 517+00 TO STA. 578+00

TYPICAL SECTION - LEVEE AND BORROW CANAL

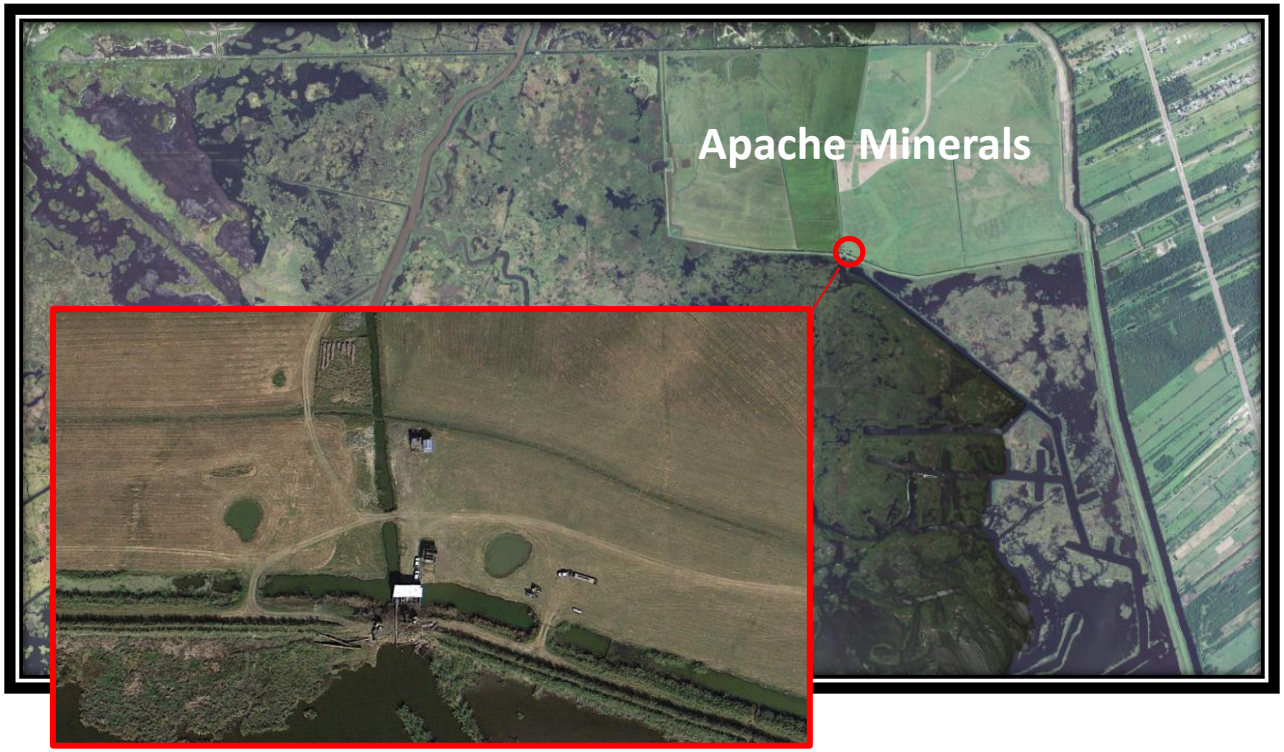
N.T.S

BASE BID			
MARK	DESCRIPTION	OFFSET	ELEVATION
A1	LEVEE CROWN - FLOOD SIDE	-3.00	8.00
B1	LEVEE CROWN - PROTECTED SIDE	-13.00	8.00
C1	LEVEE TOE - PROTECTED SIDE	-43.00	0.50
D1	BORROW AREA - TOP OF SLOPE (RIGHT)	-144.50	-1.55
E1	BORROW AREA - BOTTOM OF SLOPE (RIGHT)	-161.50	-10.00
F	BORROW AREA - BOTTOM OF SLOPE (LEFT)	-213.50	-10.00

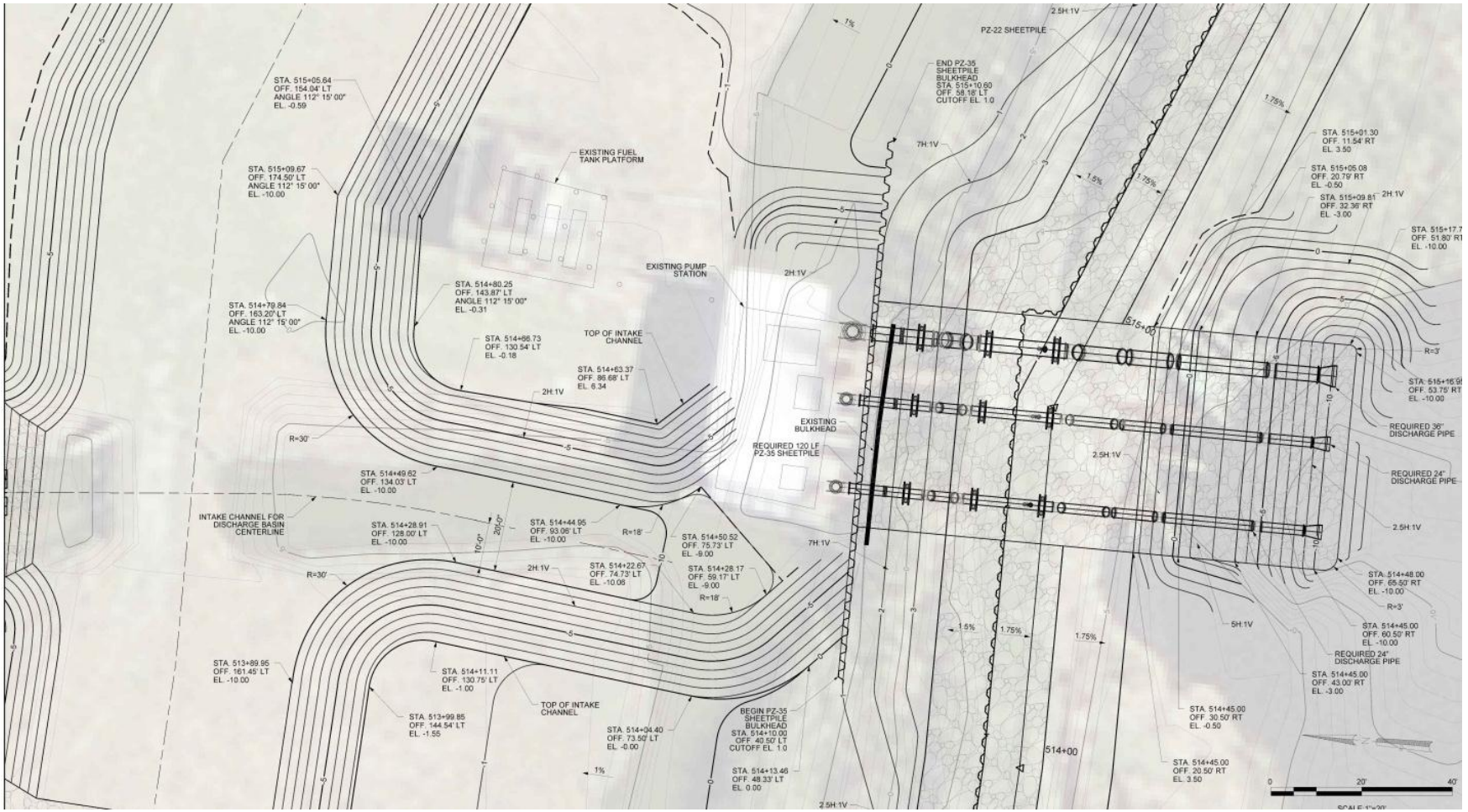
ALTERNATIVE NO. 1			
MARK	DESCRIPTION	OFFSET	ELEVATION
A2	LEVEE CROWN - FLOOD SIDE	-8.00	9.00
B2	LEVEE CROWN - PROTECTED SIDE	-18.00	9.00
C2	LEVEE TOE - PROTECTED SIDE	-52.00	0.30
D2	BORROW AREA - TOP OF SLOPE (RIGHT)	-133.50	-1.35
E2	BORROW AREA - BOTTOM OF SLOPE (RIGHT)	-151.00	-10.00
F	BORROW AREA - BOTTOM OF SLOPE (LEFT)	-213.50	-10.00

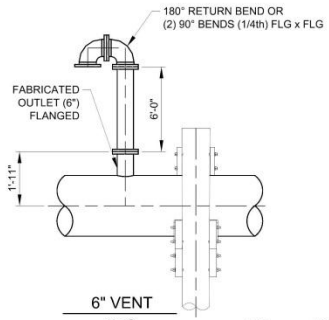
ALTERNATIVE NO. 2			
MARK	DESCRIPTION	OFFSET	ELEVATION
A3	LEVEE CROWN - FLOOD SIDE	-11.00	10.00
B3	LEVEE CROWN - PROTECTED SIDE	-21.00	10.00
C3	LEVEE TOE - PROTECTED SIDE	-60.50	0.15
D3	BORROW AREA - TOP OF SLOPE (RIGHT)	-121.50	-1.10
E3	BORROW AREA - BOTTOM OF SLOPE (RIGHT)	-139.50	-10.00
F	BORROW AREA - BOTTOM OF SLOPE (LEFT)	-213.50	-10.00

Project Plan View of Pump Station



Pump Station





6" VENT

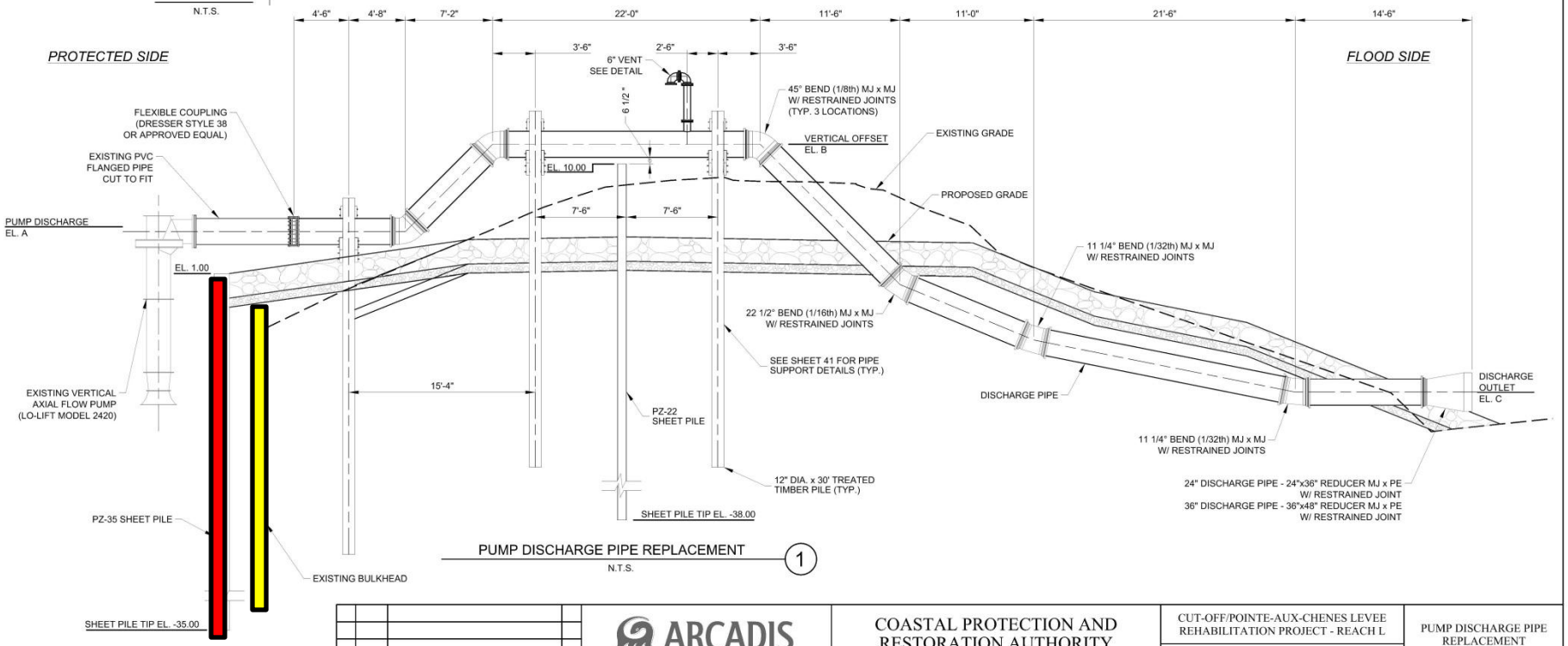
N.T.S.

PIPE DIA.	ELEVATION		
	A	B	C
24"	4.60	11.75	-8.60
36"	5.10	12.25	-8.10

NOTES:

1. ALL PIPE TO BE PLAIN END DUCTILE IRON, CLASS 250, EXCEPT WHERE NOTED.

2. ALL FITTINGS TO BE MECHANICAL JOINT WITH RESTRAINT. RESTRAINING GLAND TO BE MEGALUG SERIES 1100 OR APPROVED EQUAL.



PUMP DISCHARGE PIPE REPLACEMENT (1)

N.T.S.

REV.	DATE	DESCRIPTION	BY

ARCADIS
Infrastructure · Water · Environment · Buildings
10352 PLAZA AMERICANA DRIVE
BATON ROUGE, LOUISIANA 70816
T. 225.292.1004 | F. 225.218.9677

COASTAL PROTECTION AND RESTORATION AUTHORITY
450 LAUREL STREET
BATON ROUGE, LOUISIANA 70801

CUT-OFF/POINTE-AUX-CHENES LEVEE REHABILITATION PROJECT - REACH L

PUMP DISCHARGE PIPE REPLACEMENT

STATE PROJECT NUMBER: TE-78

FEDERAL PROJECT NUMBER: N/A

DATE: 4/16/2014

DRAWN BY: AJL | DESIGNED BY: GJK | APPROVED BY: DLF

SHEET 23 OF 44

Quantities

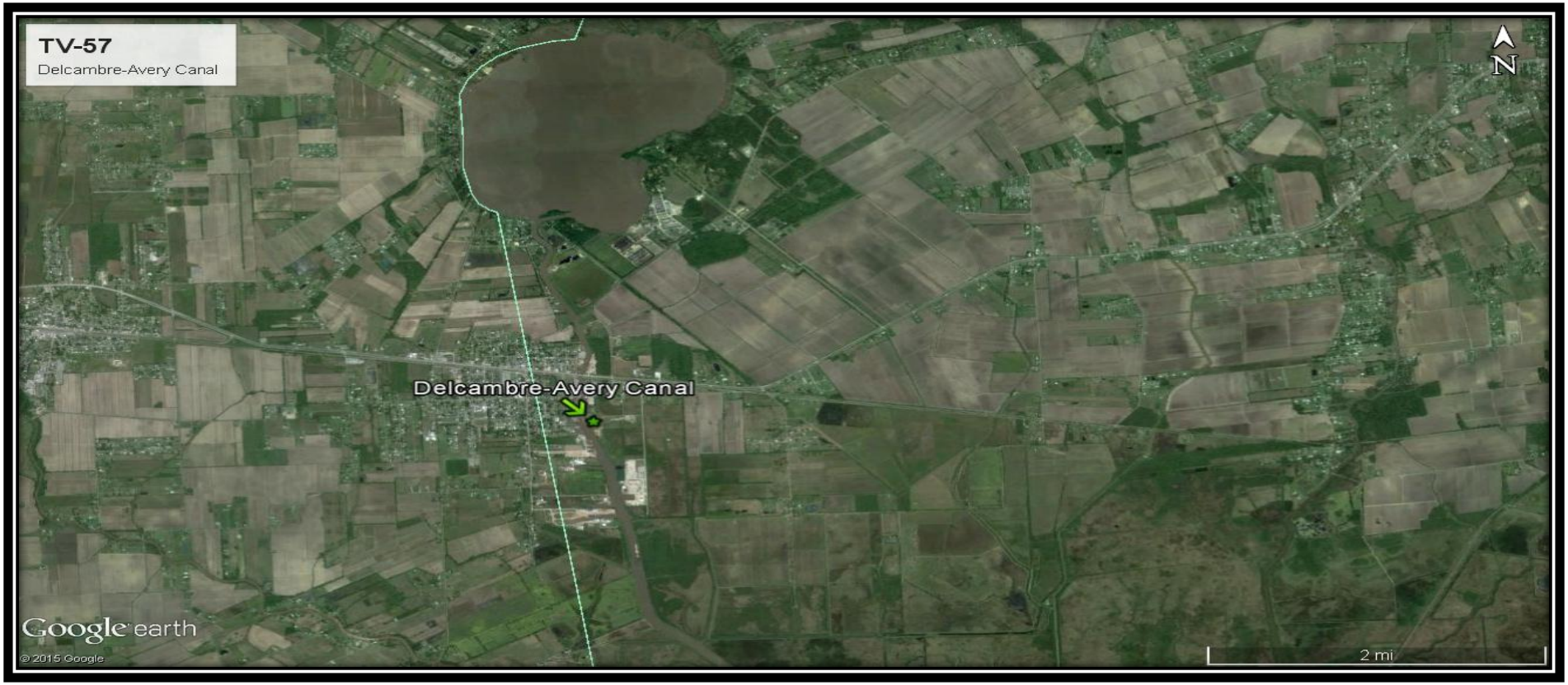
Estimated Quantities		
Separator Geotextile	SY	5,000
Embankment, Compacted Fill	CY	225,000
Piling, Steel	SF	18,800
Seeding & Mulching	AC	45
24” Culvert	LF	800
Filter Stone	CY	400
55-LB Class Riprap	TON	3,700

TE-78 Reach L
Estimated Schedule

Task	Estimated Date
E&D	September 2014
Permitting & Land Rights	Summer 2015
Estimated Construction	Fall 2015

Project Background
TV-57 Delcambre-Avery Canal

- Project Location:
  Iberia Parish



Proposed Project Features

Project Information

- Potentially reduces inland flooding to portions of Iberia and Vermilion Parishes due to small storms and rainfall events
- Site selection, design criteria and associated cost estimates will be a part of the Basis of Design (Phase 1) document
- Level of protection is restricted by the surrounding topography

Project Features

- Flood gate structure across Delcambre-Avery Canal
- The maximum width for a control structure across Delcambre-Avery canal is approximately 125 feet

TV-57 Delcambre-Avery

- Estimated Schedule

Task	Completion Date
Intergovernmental Agreement	Pending
Basis of Design Document	Fall 2015

Project Background

TV-67 Bayou Tigre- Flood Gate
TV-75 Bayou Tigre – Pump Station

- Project Location:
  Vermilion Parish

TV-67 Bayou Tigre – Flood Gate

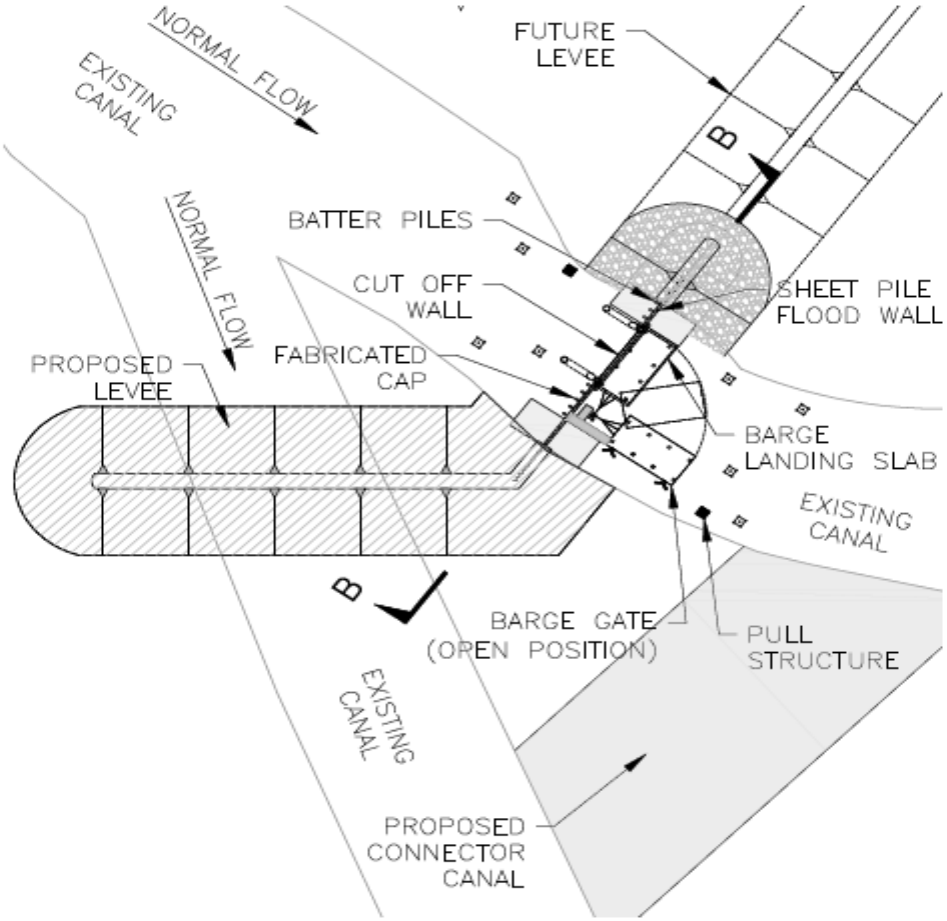
Project Information

- Proposed elevation is +17.0 ft. 50 year event (2% AEP)
- 50-year design life
- Potentially reduces inland flooding to portions of Vermilion Parish during small storm & rainfall event
- Level of protection is restricted by the surrounding topography

Project Features

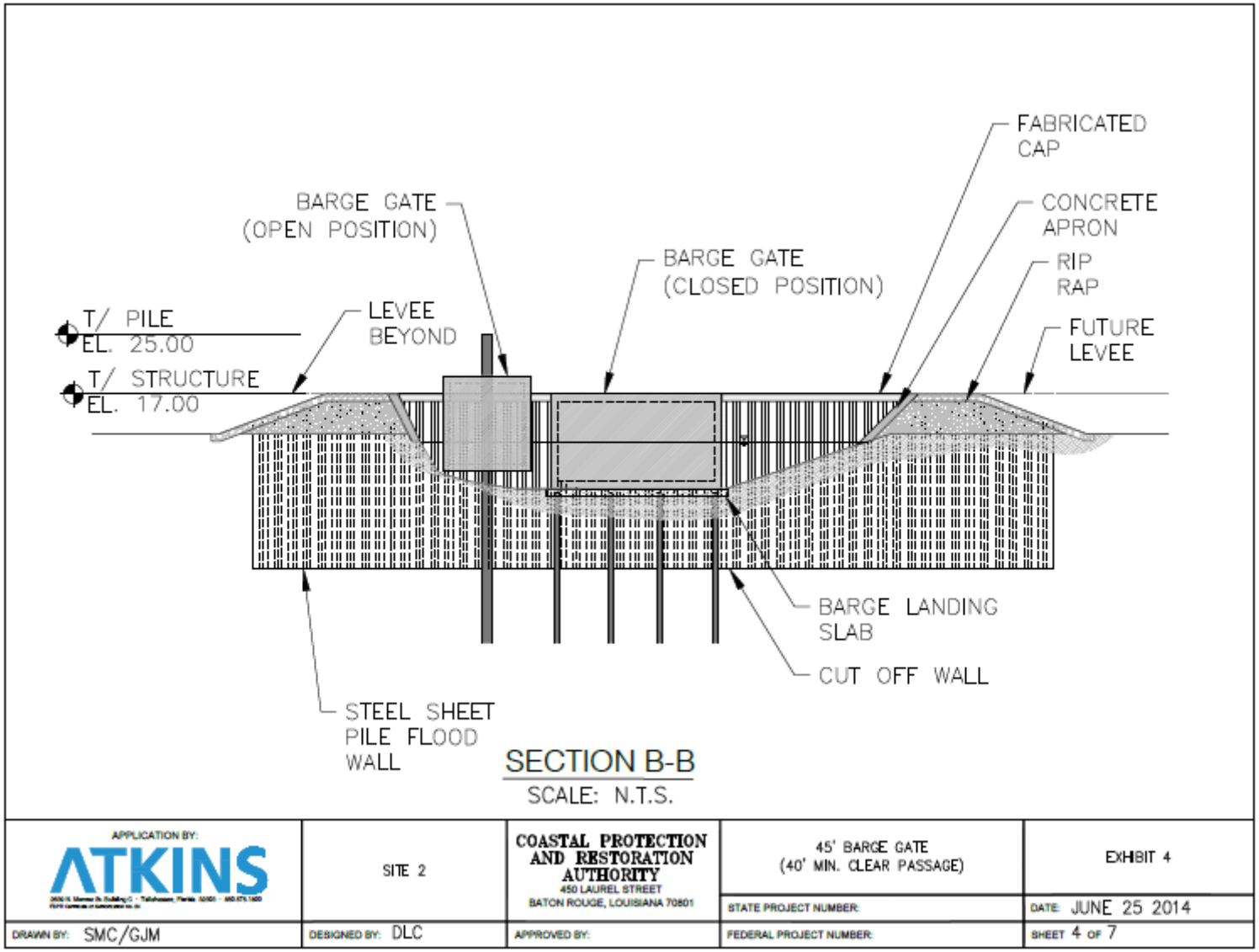
- Approximately 40-foot-wide steel barge gate with structural tie-ins
- Canal depth are approximately 12-14 ft deep

Proposed Project Features



APPLICATION BY: ATKINS	SITE 2	COASTAL PROTECTION AND RESTORATION AUTHORITY 450 LAUREL STREET BATON ROUGE, LOUISIANA 70801	45' BARGE GATE (40' MIN. CLEAR PASSAGE)	EXHIBIT 3
			STATE PROJECT NUMBER:	DATE: JUNE 25 2014
DRAWN BY: SMC/GJM	DESIGNED BY: DLC	APPROVED BY:	FEDERAL PROJECT NUMBER:	SHEET 3 OF 7

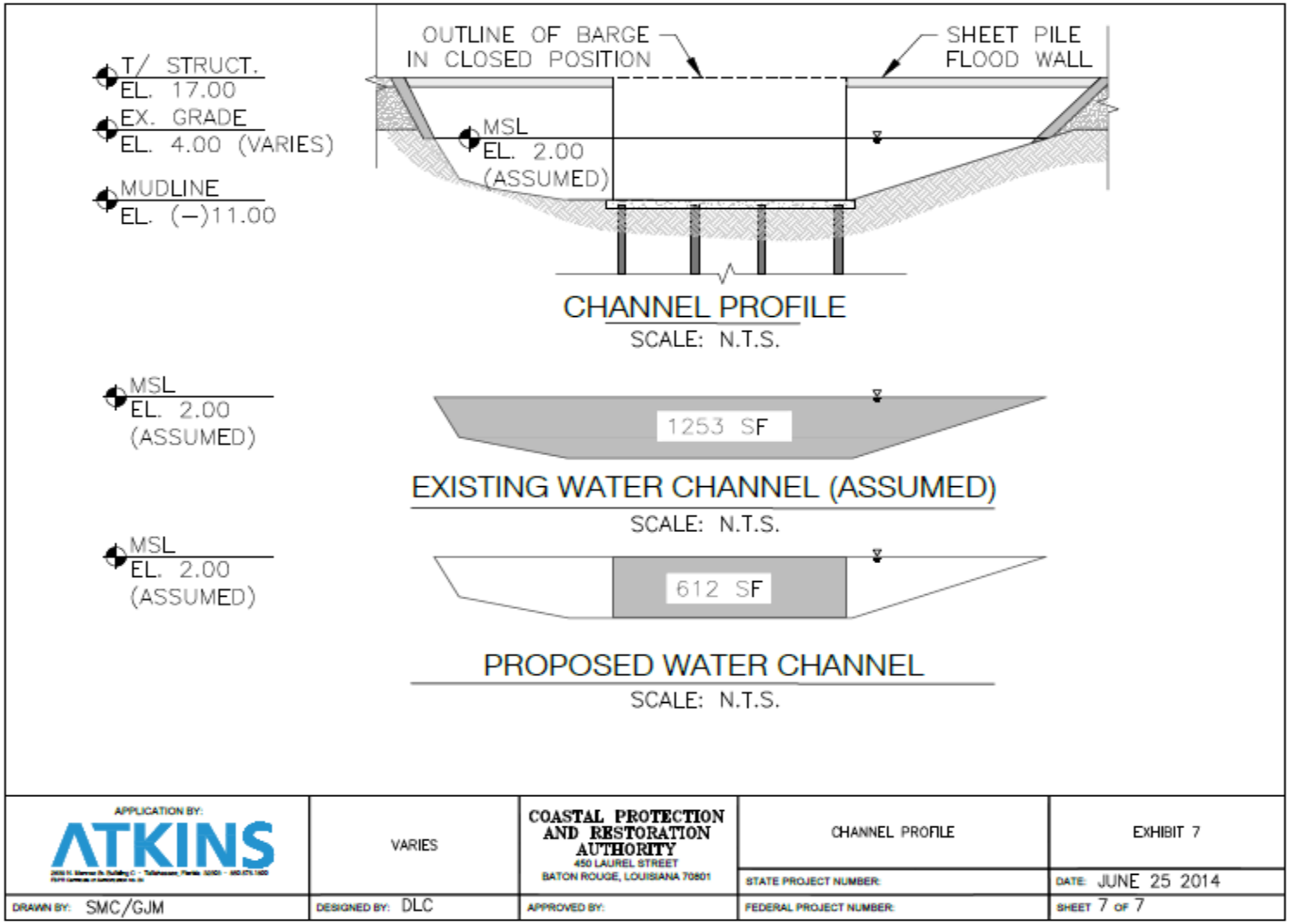
Proposed Swing Gate Features



Proposed Swing Gate Features

- Maximum Swing Gate Closing Time (4 hours maximum)
- Occupancy (3 personnel maximum)
- Minimized Maintenance (Corrosion Protection/Sacrificial)
- Redundancy
- Power (120V/240V/Diesel)
- Pumps

Channel Profile



Proposed Project Features
TV-75 Bayou Tigre – Pump Station

Project Information

- Site selection, design criteria & the associated cost for this project will be determined during Basis of Design (Phase 1)
- Will aide in pumping water to the flood side once Bayou Tigre flood gate is in the closed position

Project Features

- According to the Four Closures Structure study completed by Fenstermaker & Associates in 2013, an estimated capacity of 530 cfs is required to relieve upstream ponding due to the closure of the structures

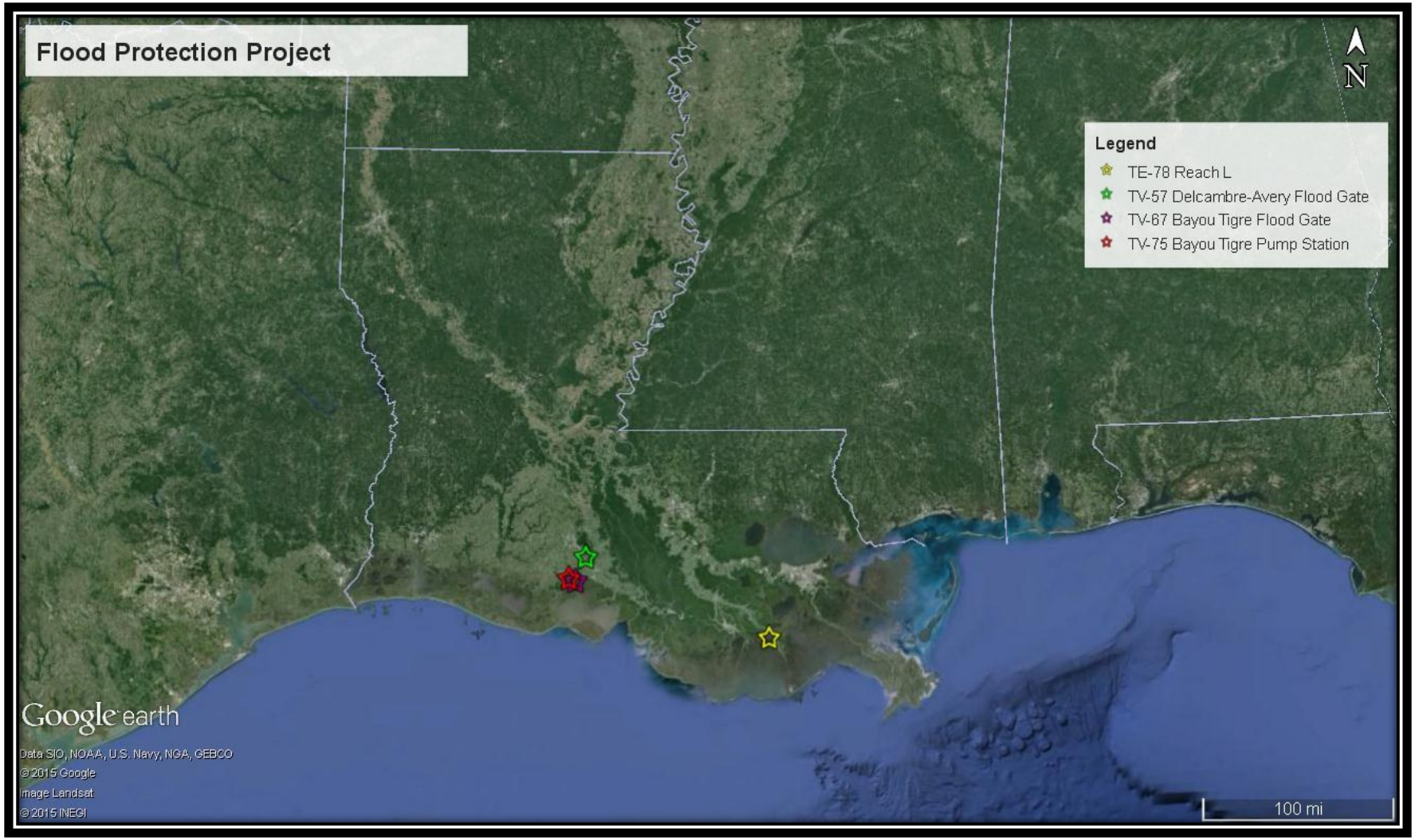
Bayou Tigre – Flood Gate
Estimated Schedule

Task	Estimated Date
Field Data Collection	Ongoing
Phase 2 (Preliminary Design)	Fall 2015
Phase 3 (Final Design)	Spring 2016
Develop Bid Documents	Spring 2016
Flood Gate Construction	Spring 2016

Bayou Tigre – Pump Station
Estimated Schedule

Task	Estimated Date
Scope of Work Development	Ongoing
Pump Station Design Completion	Spring 2016

QUESTIONS


Flood Protection Project
N
Legend
TE-78 Reach L
TV-57 Delcambre-Avery Flood Gate
TV-67 Bayou Tigre Flood Gate
TV-75 Bayou Tigre Pump Station
Google earth
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
© 2015 Google
Image Landsat
© 2015 INEGI
100 mi