

Appendix A

Site Photos

**Photographic Log of July 28, 2018 Site Inspection
Bayou Sara Bank Stabilization**



Photo 1 View from east bank of Bayou Sara, looking northeast/upstream along Bend 2 (July 28, 2018). Cars (right, background) are parked along Ferdinand Street.

**Photographic Log of July 28, 2018 Site Inspection
Bayou Sara Bank Stabilization**



Photo 2 View from east bank of Bayou Sara, looking north/upstream along Bend 2 (July 28, 2018).

**Photographic Log of July 28, 2018 Site Inspection
Bayou Sara Bank Stabilization**



Photo 3 View from Bend 1, near the east bank of Bayou Sara at Hydrographic Cross Section B, looking northeast across bench area (July 28, 2018). St. Francisville sewage treatment pond is beyond fence (background). During the March 22, 2016 hydrographic survey, this location was under 10 feet of water.

**Photographic Log of July 28, 2018 Site Inspection
Bayou Sara Bank Stabilization**



Photo 4 View from east bank of Bayou Sara, looking southwest/downstream (July 28, 2018).

**Photographic Log of July 28, 2018 Site Inspection
Bayou Sara Bank Stabilization**



Photo 5 View from east bank of Bayou Sara, looking west/upstream (July 28, 2018).

Appendix B
90% Construction Plans

**EXCERPTED SUPPORTING
DOCUMENTATION FROM WEST
FELICIANA PARISH, LOUISIANA
BAYOU SARA BANK STABILIZATION
PROJECT**

JANUARY 2017

90% SUBMITTAL

**Prepared by Arcadis and Manchac
Consulting Group**

**For a full version of this report, the general public can send a request to FEMA-
NOLA@dhs.gov, tel: 225 267-2962, fax: 225-346-5848 or by mail to: DEPARTMENT OF
HOMELAND SECURITY-FEMA, ATTN: EHP-Bayou Sara Bank Stabilization, 1500
MAIN STREET, BATON ROUGE, LOUISIANA 70802.**

PARISH PRESIDENT

KEVIN COUHIG

PARISH COUNCIL

SYDNEY PICOU WALKER - AT LARGE

MELVIN YOUNG - DISTRICT A

JOHN THOMPSON - DISTRICT B

MEL PERCY - DISTRICT C

WILLIAM "BILL" MAY III - DISTRICT D

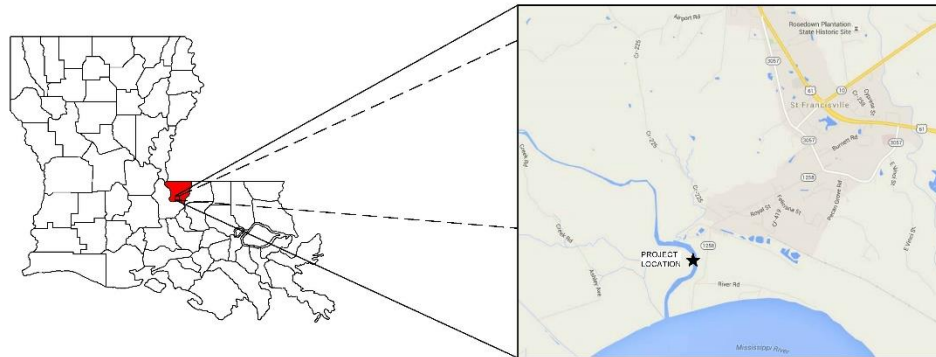


WEST FELICIANA PARISH, LOUISIANA

BAYOU SARA BANK STABILIZATION PROJECT

JANUARY 2017

90% SUBMITTAL



VICINITY MAP



PROJECT LOCATION

PREPARED BY:



DRAWING INDEX

GENERAL	
G-01	COVER SHEET & DRAWING INDEX
G-02	GENERAL NOTES, LEGEND & ABBREVIATIONS
CIVIL	
C-01	OVERALL SITE PLAN
C-02	SITE PLAN
C-03	CROSS SECTIONS I
C-04	CROSS SECTIONS II
C-05	GRADING CROSS SECTIONS I
C-06	GRADING CROSS SECTIONS II
CZ-01	TYPICAL SECTIONS & DETAILS

PRELIMINARY
NOT FOR
CONSTRUCTION

NOTES

- GENERAL:**
- CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING REQUIRED SECURITY TO PROTECT THE WORK, ITS EQUIPMENT, TOOLS, ETC, AND ANY EQUIPMENT STORED ON SITE OR ELSEWHERE.
 - EXISTING UTILITIES, STRUCTURES AND OTHER FEATURES ARE SHOWN ACCORDING TO THE BEST INFORMATION AVAILABLE AT THE TIME OF PREPARATION OF THESE PLANS. ENGINEER DOES NOT GUARANTEE THAT EXISTING CONDITIONS ARE SHOWN ABSOLUTELY CORRECT. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHOULD VERIFY AND AGREE TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES THAT OCCUR DUE TO CONSTRUCTION OPERATIONS. ANYTHING NOT SHOWN ON THESE DRAWINGS SHOULD BE BROUGHT TO THE ATTENTION OF THE ENGINEER AND SHALL NOT CONSTITUTE AN EXTRA, UNLESS APPROVED BY THE ENGINEER.
 - CONTRACTOR SHALL BE RESPONSIBLE FOR ADEQUATELY PROTECTING EXISTING STRUCTURES, UTILITIES, TREES, SHRUBS, AND OTHER ADJOINING FACILITIES AND REPAIR OR REPLACE DUE TO DAMAGE CAUSED BY CONTRACTOR.
 - THE CONTRACTOR SHALL CONTACT THE ENGINEER IMMEDIATELY CONCERNING ANY CONFLICTS ARISING DURING CONSTRUCTION OF ANY IMPROVEMENTS CALLED FOR IN THE CONSTRUCTION DOCUMENTS (PLANS AND SPECIFICATIONS).
 - KEEP ACCESS ROADS TO EXISTING PLANT OPEN AT ALL TIMES DURING CONSTRUCTION. STAGING AREA SHALL BE USED FOR CONTRACTOR'S PERSONNEL, PARKING, MATERIAL AND STORAGE. INTERFERENCE WITH EXISTING PLANT OPERATIONS WILL NOT BE ALLOWED. PROVIDE TEMPORARY ALL-WEATHER ACCESS ROADS AS NEEDED TO MAINTAIN ACCESS TO ALL UNLOADING AREAS AND OTHER AREAS OF PARKING, EGRESS AND REGRESS, THROUGHOUT THE DURATION OF THE PROJECT.
 - THE INFORMATION PROVIDED IN THESE PLANS IS SOLELY TO ASSIST THE CONTRACTOR IN ASSESSING THE NATURE AND EXTENT OF CONDITIONS WHICH MAY BE ENCOUNTERED DURING THE COURSE OF WORK. ALL PROSPECTIVE BIDDERS ARE DIRECTED, PRIOR TO BIDDING, TO CONDUCT WHATEVER INVESTIGATIONS THEY MAY DEEM NECESSARY TO ARRIVE AT THEIR OWN CONCLUSIONS REGARDING THE ACTUAL CONDITIONS THAT WILL BE ENCOUNTERED AND UPON WHICH THEIR BIDS SHALL BE BASED.
 - OBTAIN ALL REQUIRED CONSTRUCTION PERMITS PRIOR TO COMMENCEMENT OF WORK.
 - CONTRACTOR SHALL CONTACT LOUISIANA ONE CALL AT (800) 272-3020 AT LEAST 5 WORKING DAYS PRIOR TO CONSTRUCTION TO LOCATE EXISTING UTILITIES, INCLUDING PIPELINES, WITHIN THE PROJECT SITE. THE CONTRACTOR SHALL CONDUCT THE WORK IN SUCH A MANNER AS TO COOPERATE AND MINIMIZE INCONVENIENCES WITH UTILITIES. ANY UNIDENTIFIED PIPES OR STRUCTURES WHICH MAY BE DISCOVERED WITHIN THE LIMITS OF THE PROJECT SHALL NOT BE DISTURBED. CONSTRUCTION SHALL NOT BE PERFORMED AT THESE LOCATIONS WITHOUT APPROVAL FROM THE ENGINEER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING PIPELINE AND UTILITY OPERATIONS AT LEAST 72 HOURS IN ADVANCE OF WORK.
 - IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY ALL EXISTING UTILITY LOCATIONS, INCLUDING PIPELINES, PRIOR TO CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGES TO ANY EXISTING UTILITIES CAUSED BY THE CONTRACTOR'S NEGLIGENCE. THE DAMAGE SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE.
 - THE CONTRACTOR SHALL VISIT THE SITE OF WORK TO BECOME FAMILIAR WITH THE LOCAL CONDITIONS AND WHAT EFFECTS THE CONDITIONS MAY HAVE ON THE ACCESS AND CONSTRUCTION. PLANS AND SPECIFICATIONS ARE COMPLEMENTARY; WHAT IS REQUIRED BY ONE IS BINDING AS IF REQUIRED BY ALL. REFER TO SECTION 00700 (GENERAL CONDITIONS) PART 3.03 FOR NOTE ON RESOLVING DISCREPANCIES BETWEEN PLANS AND SPECIFICATIONS.
 - THE PROJECT IS WITHIN AND ADJACENT TO ENVIRONMENTALLY SENSITIVE AREAS. CONTRACTOR SHALL AVOID/MINIMIZE IMPACTS TO THESE AREAS DURING THE COURSE OF WORK. OWNER RESERVES THE RIGHT TO SUSPEND WORK AT ANY TIME IF IMPACTS OCCUR UNTIL SATISFACTORY CORRECTIVE MEASURES ARE IMPLEMENTED BY CONTRACTOR.
 - THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, EXISTING ELEVATIONS AND CONDITIONS SHOWN ON THE DRAWINGS PRIOR TO ORDERING MATERIAL, COMMENCEMENT OF CONSTRUCTION, AND PREPARATION OF SHOP DRAWINGS. THE ENGINEER SHALL BE NOTIFIED OF ALL DISCREPANCIES.
 - THE CONTRACTOR SHALL BE FAMILIAR WITH EXISTING SOIL CONDITIONS AT THE WORK SITE. GEOTECHNICAL INFORMATION IS PROVIDED IN THE GEOTECHNICAL REPORT.
 - SUBSTANTIAL CHANGES TO THE TOPOGRAPHY AND BATHYMETRY OF THE PROJECT SITE MAY HAVE OCCURRED SINCE THE SURVEY SHOWN IN THESE DRAWINGS. ACTUAL LOCATION OF CONSTRUCTION CENTERLINES OF PROPOSED WORK WILL BE DETERMINED BY ENGINEER PRIOR TO CONSTRUCTION BASED ON RESULTS OF CONTRACTOR'S PRE-CONSTRUCTION SURVEY.
 - THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING THE ADJACENT LAND OWNERS AT LEAST 5 WORKING DAYS PRIOR TO MOBILIZATION.
 - PURSUANT TO THE PERMITS AND RESPONSIBILITIES CLAUSE, THE CONTRACTOR IS REQUIRED TO CONTACT THE FOLLOWING ADMINISTRATOR OF THE STATE LAND OFFICE OR HIS REPRESENTATIVE TO NOTIFY THE OFFICE WHEN CONSTRUCTION WILL COMMENCE IN THE STATE OWNED SEASHORE, STATE LANDS, AND/OR STATE WATER BOTTOMS:

STATE LAND OFFICE
DIVISION OF ADMINISTRATION
JOHN LAVIN, PUBLIC LANDS ADMINISTRATOR
MOBILE: (225)342-4575

STREAM GEOMORPHOLOGY

- THE HYDROLOGY, HYDRAULICS, AND SCOUR FOR THE 100 YEAR FLOOD EVENT WERE TAKEN FROM THE ADVANCED CIRCULATION (ADCIRC) MODEL FOR THE 100 YEAR STORM (2015).
 - CROSS SECTION MAXIMUM VELOCITY: 13 FEET PER SECOND.
 - AVERAGE WIDTH OF CHANNEL IS 275 FEET.
 - TOTAL MAXIMUM POTENTIAL SCOUR DEPTH: 7.14 FEET
 - RADIUS OF CURVATURE IS 705 FEET FOR REACH 1 AND 455 FEET FOR REACH 2 BENDS.
- *CROSS SECTION MAXIMUM VELOCITY IS TAKEN AS THE VELOCITY AT THE LOCATION IN THE CROSS SECTION WITH THE GREATEST DEPTH AVERAGED VELOCITY.

GEOTECHNICAL

- VALUES OF % CLAY/SILT FOR SOIL PROPERTIES WERE DERIVED FROM THE FOLLOWING SOURCES:
 - GEOTECHNICAL BORINGS OF THE PROJECT SITE PERFORMED BY PSI WITH A REPORT DATE OF NOVEMBER 17, 2018.
 - THE SOILS ARE PREDOMINANTLY CLAYS IN THE UPPER 26 FEET, BELOW THIS DEPTH THE SOILS ARE PREDOMINANTLY SAND IN THE NORTH AND CLAY IN THE SOUTH, SEE PSI REPORT FOR MORE SPECIFIC INFORMATION.

RIPRAP

- PROVIDE WIDE-GRADED AND WELL-GRADED ANGULAR STONE WITH A D50 OF 22 INCHES AS SHOWN IN TABLE 1. THE STONE SHALL CONSIST OF FIELD STONE OR ROUGH LINEMEN QUARRY STONE.
 - THE STONE SHALL BE HARD AND ANGULAR AND OF A QUALITY THAT WILL NOT DISINTEGRATE ON EXPOSURE TO WATER OR WEATHERING
 - THE SPECIFIC GRAVITY OF THE INDIVIDUAL STONES SHALL BE AT LEAST 2.5, SPECIFIC GRAVITY OF 2.64 USED FOR CALCULATIONS.
- THE ROCK RIPRAP SIZE AND THICKNESS IS IN ACCORDANCE WITH THE FOLLOWING METHODS WITH THE U.S. ARMY CORPS OF ENGINEERS' (USACE'S) ENGINEERING MANUAL EM-1110-2-1601, RESULTING IN A DESIGN ROCK D50 SIZE OF 22 INCHES.
 - MINIMUM SAFETY FACTOR (FS) = 1.2.
- IN CROSS SECTION MAXIMUM VELOCITY = 13 FEET PER SECOND.
- CRACKING PER THE LOUISIANA DEPARTMENT OF TRANSPORTATION'S STANDARD SPECIFICATIONS FOR ROADS AND BRIDGES (2006), PART I-GENERAL PROVISIONS, SECTION 711-RIPRAP (SEE TABLE 1 ON RIGHT HAND SIDE OF PAGE).

FILTER FABRIC

USE CLASS D FABRIC PER THE LOUISIANA DEPARTMENT OF TRANSPORTATION'S STANDARD SPECIFICATIONS FOR ROADS AND BRIDGES (2006), PART X-MATERIALS, SECTION 1018- GEOTEXTILE FABRIC AND GEOCOMPOSITE SYSTEMS. (SEE TABLE 2 ON RIGHT HAND SIDE OF PAGE).

- FILTER MATERIAL TO MEET REQUIREMENTS OF THE ASTM D288-06.

NO.	DATE	DESCRIPTION	BY

WEST FELICIANA PARISH
BAYOU SARA BANK STABILIZATION PROJECT
GENERAL NOTES, LEGEND & ABBREVIATIONS

NOTES CONTINUED

- WOVEN SILT FILM GEOTEXTILES (I.E. GEOTEXTILES MADE FROM YARNS OF A FLAT, TAPE LIKE CHARACTER) WILL NOT BE ACCEPTED.
- THE FILTER FABRIC MUST BE PLACED SO THAT THE UPSTREAM SECTIONS OVERLAP THE DOWNSTREAM SECTIONS.

POLE GAUGES:

- PRODUCT: 2 INCH OD X .085 INCH WALL X 1.57 INCH ID 1020 DOM A513 ROUND STEEL TUBE OR EQUIVALENT.
- LENGTH: 8 FEET LENGTHS.

ABBREVIATIONS

- C CENTER LINE
- CU CUBIC YARD
- DIA DIAMETER
- E EXISTING
- EXIST EXISTING
- LB POUND
- LF LINEAR FEET
- MAX MAXIMUM
- MIN MINIMUM
- MM MILLIMETER
- NO NUMBER
- NOT TO SCALE
- NTS NOT TO SCALE
- RADIUS
- SAWPILE LINE
- SQ FT SQUARE FOOT
- SQ YD SQUARE YARD
- SY TYPICAL
- µM MICROMETER
- VAR VARIES

SURVEY INFORMATION

PREPARED BY:
MORRIS P. HEBERT
DATE OF HYDROGRAPHIC SURVEY WAS 3/22/2016

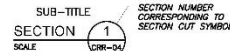
HORIZONTAL COORDINATES INDICATED HEREIN ARE REFERENCED TO THE LOUISIANA STATE PLANE COORDINATE SYSTEM, NORTH AMERICAN DATUM 1983 (NAD 83), SOUTH ZONE, US FT. VERTICAL ELEVATIONS ARE RELATIVE TO NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88), US FT. GEOD12A, AS DERIVED FROM A GLOBAL POSITIONING SYSTEM (GPS) STATIC SURVEY

SURVEY CONTROL TABLE			
POINT #	NORTHING	EASTING	ELEVATION
1	823055.0700	3261291.8700	47.79
2	823858.4280	3261462.0510	49.00

DRAWING LEGEND

<p>EXISTING</p> <p>--- CENTERLINE</p> <p>--- MAJOR CONTOUR LINE</p> <p>--- MINOR CONTOUR LINE</p> <p>--- DRAINAGE FLOW DIRECTION</p>	<p>PROPOSED</p> <p>--- CENTERLINE</p> <p>--- MAJOR CONTOUR LINE</p> <p>--- MINOR CONTOUR LINE</p> <p>--- GEOTEXTILE FABRIC</p> <p>▨ RIPRAP FILL</p> <p>▨ BLOCK MAT</p> <p>▨ COMPACTED FILL</p>	<p>--- CENTERLINE</p> <p>--- MAJOR CONTOUR LINE</p> <p>--- MINOR CONTOUR LINE</p> <p>--- GEOTEXTILE FABRIC</p> <p>▨ RIPRAP FILL</p> <p>▨ BLOCK MAT</p> <p>▨ COMPACTED FILL</p> <p>▨ ACCESS TO BE CLEARED</p> <p>▨ STAGING AREA</p> <p>▨ EXCESS CUT PLACEMENT AREA</p>
--	--	---

SECTION DESIGNATION



1 SHEET NUMBER WHERE SECTION IS CUT OR "-" IF SECTION IS CUT ON SAME SHEET AS CALL OUT

TABLE 1 IN-PLACE PROTECTION RIPRAP GRADATION REQUIREMENTS			
RIPRAP CLASS	STONE SIZE (LB)	SPHERICAL DIAMETER (FT)	PERCENT OF STONES SMALLER THAN
130 LB	650	2	100
	260	1.46	45-100
	130	1.17	15-50
	40	0.79	0-15

AREA	ACREAGE
STAGING AREA	0.95
EXCESS CUT PLACEMENT AREA	0.87

TABLE 2			
PROPERTY	TEST METHOD	D	
ADS. METRIC SIEVE, µM, MAX.	ASTM D4751	212	
GRAB TENSILE, N, MIN.	ASTM D4632	800	
% ELONGATION @ FAILURE, MIN.	ASTM D4632	50	
% ELONGATION @ 200 N, MAX.	ASTM D4632	-	
BURST STRENGTH, N, MIN.	ASTM D3787	1,260	
PUNCTURE, N, MIN.	ASTM D4833	330	
TRAPEZOID TEAR STRENGTH, N, MIN.	ASTM D4533	220	
PERMITTIVITY, SEC-1, MIN.	ASTM D4491	1	
GRAB TENSILE STRENGTH RETAINED AFTER WEATHERING 150 H, IVA LAMPS, %, MIN.	ASTM D4632, ASTM G164	70	
GRAB TENSILE STRENGTH RETAINED AFTER WEATHERING 500 H, IVA LAMPS, %, MIN.	ASTM D4632, ASTM G164	-	

ITEM	REACH 1	REACH 2	TOTAL
BLOCK MAT (SF)	36,526	38,963	72,440
RIPRAP (INCLUDES 20% LOSSES) (CY)	8,347	11,702	20,050
COMPACTED FILL (INCLUDES 20% LOSSES) (CY)	289	960	1,249
GEOTEXTILE (SF)	86,608	103,087	189,675
CUT (CY)	2,890	1,530	4,390
POLE GAUGES (UNIT)	13	13	26
ACCESS ROADS	LENGTH (LF)		
EXISTING	3,331		
CLEARED	490		
TO BE CLEARED	1,971		
TOTAL	5,482		

LA One Call

PRIOR TO WORK COMMENCEMENT, THE CONTRACTORS IS RESPONSIBLE FOR FINAL VERIFICATION OF THE LOCATION OF THE UTILITIES SHOWN ON THESE PLANS. THE CONTRACTOR SHALL CALL LOUISIANA ONE CALL (811 OR 800-272-3020) AND CITY PARISH DEPARTMENT OF PUBLIC WORKS TO HAVE UTILITIES LOCATED PRIOR TO CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING WITH THE UTILITY COMPANIES FOR ALL AREAS OF CONSTRUCTION.

ARCADIS

Manchac

1500 N. Shreveport Pike
Baton Rouge, Louisiana 70802

DESIGNED BY: D. DEHON
DRAWN BY: B. SIMPSON
CHECKED BY: B. MCMANN
CROSS CHECKED BY: P. TSCHIRKY
DATE: JANUARY 2017

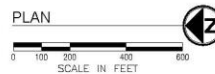
SHEET NUMBER
G-02



REACH	BEGIN STA.	END STA.
REACH 1	14+44.93	22+33.98
REACH 2	32+20.97	40+94.77

COORDINATE TABLE			
PT. NO.	DESC.	NORTHING	EASTING
1000	TBK BEGIN R1	820906.0913	328300.181111
1001	TOE BEGIN R1	820938.7925	3280954.3127
1002	TBK END R1	820996.4201	3281882.5379
1003	TOE END R1	822682.8040	3281584.9245
1004	TBK BEGIN R2	824812.3864	3281827.5095
1005	TOE BEGIN R2	824832.3903	3281933.3912
1006	TBK END R2	823881.7584	3280947.7976
1007	TOE END R2	824081.0747	3280904.8448

LEGEND:	
	= ACCESS ROAD
	= ACCESS TO BE CLEARED
	= STAGING AREA
	= EXCESS CUT PLACEMENT AREA
	← = DIRECTION OF FLOW



**PRELIMINARY
NOT FOR
CONSTRUCTION**

NO.	DATE	DESCRIPTION	BY

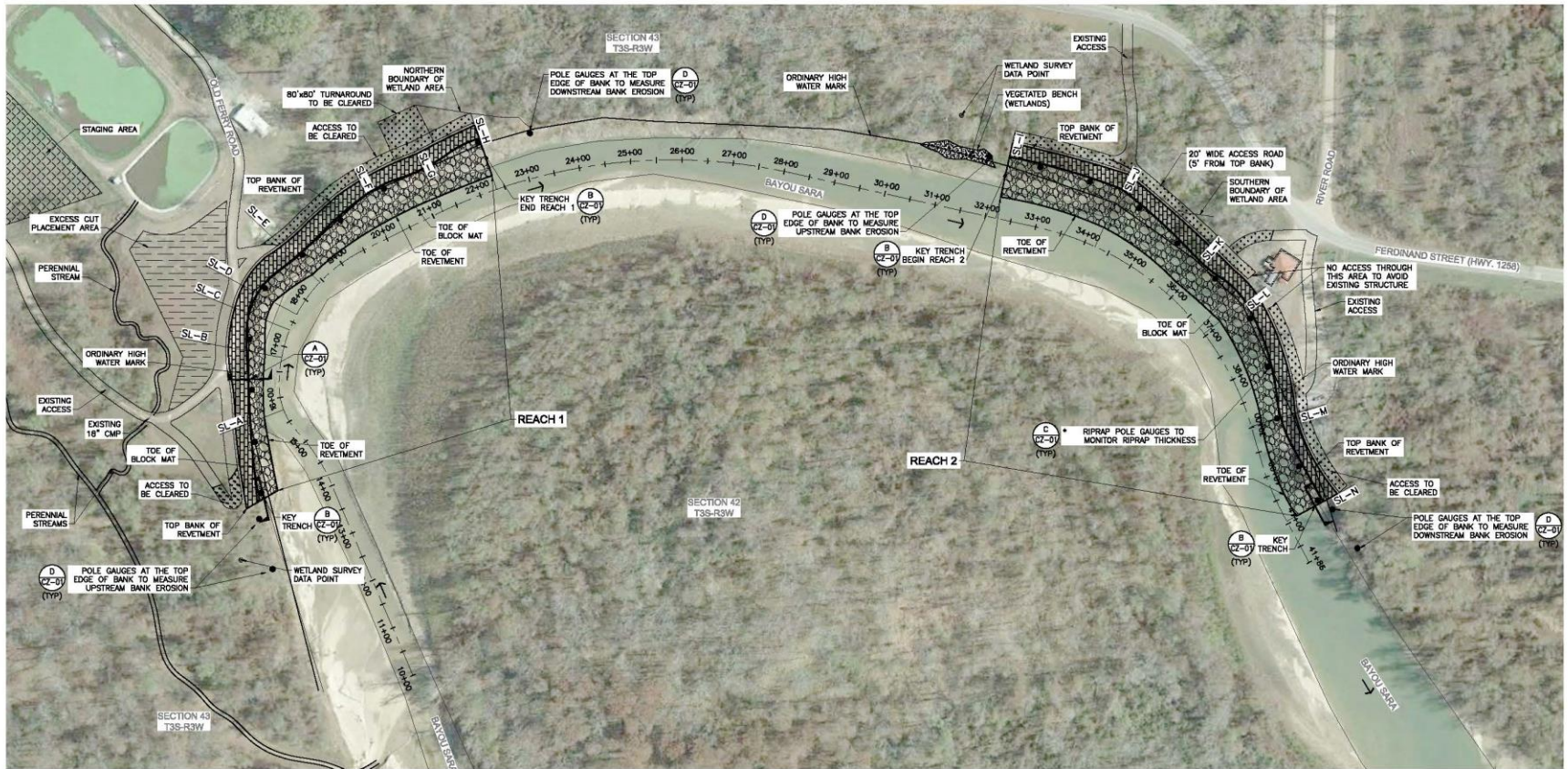
WEST FELICIANA PARISH
BAYOU SARA BANK STABILIZATION PROJECT

OVERALL SITE PLAN



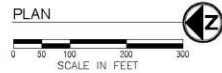
DESIGNED BY: D. DEHON
DRAWN BY: B. SIMPSON
CHECKED BY: B. MCMANN
CROSS CHECKED BY: P. TSCHIRKY
DATE: JANUARY 2017

SHEET
NUMBER
C-01



REACH	BEGIN STA.	SAMPLE LINE	END STA.	SAMPLE LINE
REACH 1	14+44.93	N/A	22+33.98	SL-H
REACH 2	32+20.97	SL-I	40+84.77	SL-N

NOTE:
 POLE GAUGES SHALL BE INSTALLED ALONG THE ENTIRE REVEMENT APPROXIMATELY 3 FEET BELOW THE TOE OF BLOCK MAT SPACED 100' APART ALONG THE ENTIRE ALIGNMENT.



LEGEND:

- ACCESS ROAD
- ACCESS TO BE CLEARED
- BLOCK MAT
- RIPRAP FILL
- STAGING AREA
- EXCESS CUT PLACEMENT AREA
- POLE GAUGE
- DIRECTION OF FLOW

PRELIMINARY
 NOT FOR
 CONSTRUCTION

WEST FELICIANA PARISH
 BAYOU SARA BANK STABILIZATION PROJECT

SITE PLAN



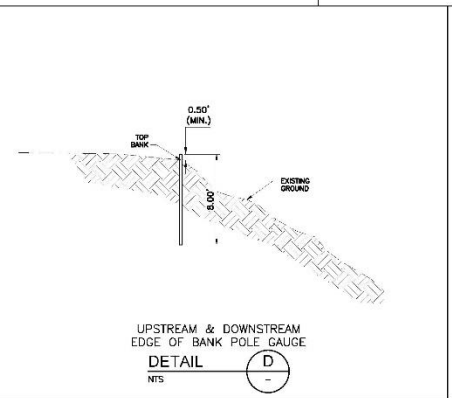
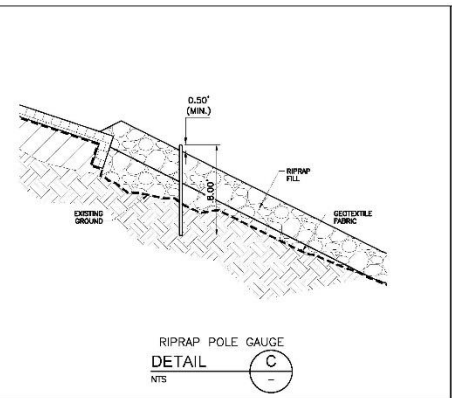
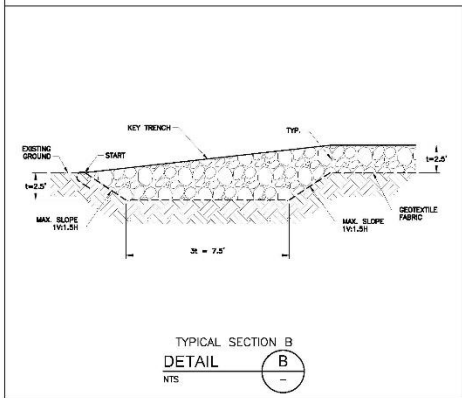
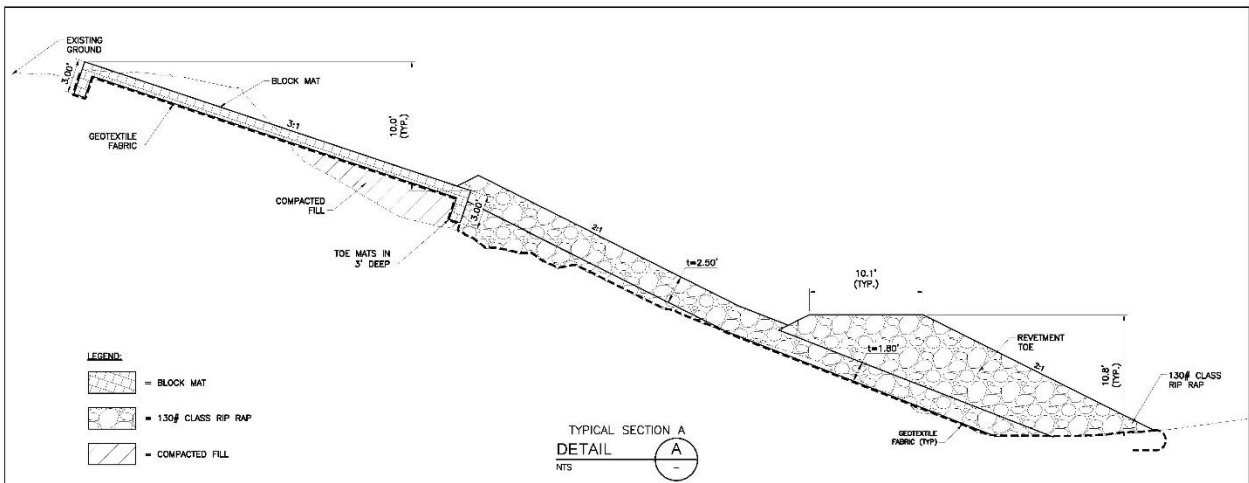
DESIGNED BY: D. DEHON
 DRAWN BY: B. SIMPSON
 CHECKED BY: B. MCMANN
 CROSS CHECKED BY: P. TSHIRKY
 DATE: JANUARY 2017

SHEET
 NUMBER
C-02

NO.	DATE	DESCRIPTION	BY

T.B.D.

BLOCK MAT START & TERMINATION
DETAIL
NTS



- NOTES:**
1. POLE GAUGES - USE 2 INCH DIA ROUND STEEL TUBE TO CONSTRUCT POLE GAUGES.
 2. INSTALL RIPRAP POLE GAUGES PRIOR TO PLACING RIPRAP.

**PRELIMINARY
NOT FOR
CONSTRUCTION**

NO.	DATE	DESCRIPTION	BY

WEST FELICIANA PARISH
BAYOU SARA BANK STABILIZATION PROJECT

TYPICAL SECTIONS & DETAILS



DESIGNED BY: D. DEHON
DRAWN BY: B. SIMPSON
CHECKED BY: B. MCMANN
CROSS CHECKED BY: P. TSCHIRKY
DATE: JANUARY 2017

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CHECKED BY: B. MCMANN
CROSS CHECKED BY: P. TSCHIRKY
DATE: JANUARY 2017

SHEET NUMBER
CZ-01

2017-01-10 - Arcadis - West Feliciana Parish - Bayou Sara Bank Stabilization - CZ-01 - Preliminary - 8/27/2017 - 9:19 AM

Appendix C

Hydrologic and Hydraulic (H & H) Studies (H & H
Analysis + 30% Engineering Design; H & H
Analysis + No Rise Addendum)

EXCERPTED SUPPORTING
DOCUMENTATION FROM WEST
FELICIANA PARISH, LOUISIANA
BAYOU SARA STREAMBANK
STABILIZATION

Hydraulic and Hydrologic (H&H) Analysis
30% Engineering Design Prepared by
Arcadis and Manchac Consulting Group,
dated May 31, 2016

For a full version of this report, the general public can send a request to FEMA-
NOLA@dhs.gov, tel: 225 267-2962, fax: 225-346-5848 or by mail to: DEPARTMENT OF
HOMELAND SECURITY-FEMA, ATTN: EHP-Bayou Sara Bank Stabilization, 1500
MAIN STREET, BATON ROUGE, LOUISIANA 70802.



BAYOU SARA STREAMBANK STABILIZATION

- Hydraulic and Hydrologic (H&H) Analysis
- 30% Engineering Design

May 31, 2016

BAYOU SARA STREAMBANK STABILIZATION

- Hydraulic and Hydrologic (H&H) Analysis
- 30% Engineering Design



Brett McMann, P.E.
Project Engineer

Prepared for:

Jim Ferguson

Director of Public Works

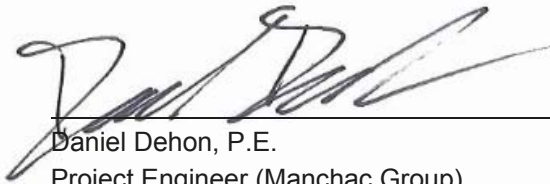
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West Feliciana Parish

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St. Francisville, Louisiana 70775



Daniel Dehon, P.E.
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Prepared by:

Arcadis U.S., Inc.

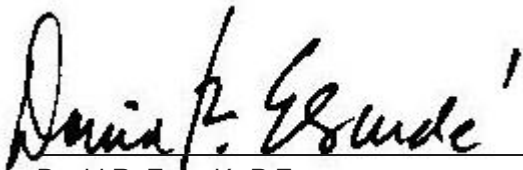
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Louisiana 70816

Tel 225 292 1004

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David R. Escudé, P.E.
Project Manager

Our Ref.:

LA003333.0001.00002

Date:

May 31, 2016

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CONTENTS

Acronyms and Abbreviations.....	iii
1 Introduction	1
2 Data Collection and Modeling summary.....	3
2.1 Data Collection: Survey	3
2.2 Data Collection: Modeling.....	3
2.3 H&H Analysis	6
2.4 Model Calibration and Validation	8
2.5 Assessment of River Flow in Bayou Sara	10
3 Stone Armor Sizing	13
3.1 Stone Armor Sizing Methodology	13
3.2 Filter Layer Design.....	15
3.3 Toe Design.....	16
4 Civil Site Design	18
5 Engineer’s Preliminary Opinion of Probable Cost.....	19
6 Recommendations and Next Steps	20
7 References.....	21

TABLES

Table 1. Bayou Sara Flow Rates and Given Return Frequencies	8
Table 2. Revetment Toe Protection Methods.....	16
Table 3. Preliminary Opinion of Probable Cost – Bends Only	19
Table 4. Preliminary Opinion of Probable Cost – Bends and Straight Section	20

FIGURES

Figure 1. Sewer Treatment Pond and Ferdinand Street Location.....	1
Figure 2. Land Loss between 1998 and 2014	2
Figure 3. USACE’s HEC-RAS Model Domain.....	4
Figure 4. Bayou Sara Revised HEC-RAS Model Domain.....	5

FIGURES (CONTINUED)

Figure 5. USACE Gages in Model Domain	6
Figure 6. Bayou Sara Watershed	7
Figure 7. Regional Regression Equations	7
Figure 8. Model Calibration 2003	9
Figure 9. Model Validation 2011	10
Figure 10. Water Surface Elevation and Channel Flow Velocity along Bayou Sara – 2011.....	11
Figure 11. HEC-RAS Model Cross Sections	12
Figure 12. Flow Velocity and Water Surface Elevation at Cross-Section 14.40 during 2003	13
Figure 13. Revetment Toe Protection Methods.....	17
Figure 14. Typical Launchable Toe Design.....	18

APPENDICES

A	Project Location Survey
B	HEC – RAS Model Results
C	Stone Armor Sizing Calculation
D	Quantity Calculations
E	Grading Plans and Civil Drawings

ACRONYMS AND ABBREVIATIONS

AOS	Apparent Opening Size
cfs	Cubic Feet per Second
FHWA	Federal Highway Administration
GNSS	Global Navigation Satellite System
GPS	Global Positioning System
HEC-RAS	Hydrologic Engineering Center River Analysis System
HUC	Hydrologic Unit Code
H&H	Hydraulic and Hydrologic
LADOTD	Louisiana Department of Transportation and Development
LiDAR	Light Detection and Ranging
MPH	Morris P. Hebert, Inc.
NAVD88	North American Vertical Datum of 1988
NFF Program	National Flood-Frequency Program
RM	River Mile
USACE	U.S. Army Corps of Engineers
USGS	U.S. Geological Survey

1 INTRODUCTION

This technical report identifies the data and methodology that were used to complete the Hydraulic and Hydrologic (H&H) Analysis for the mitigation and stabilization of Bayou Sara's riverbanks due to rapidly increasing stream bank erosion. The H&H Analysis was conducted to demonstrate how severe the streambank erosion conditions are along Bayou Sara near its confluence with the Mississippi River and determine the most effective streambank mitigation protection. Based on the H&H data compiled from the analysis, it was concluded that the most effective mitigation solution for the Bayou Sara streambank stabilization would be comprised of strategically armoring the two bends of Bayou Sara within the project location. This would provide the highest level of erosion protection for areas identified in the Application and Benefit Cost Analysis. Stone armoring the northern bend (Bend #1) within the project area would provide mitigation protection for the Sewer Treatment Pond Facility, which serves more than 700 customers and the northeastern section of Ferdinand Street (Figure 1).



Figure 1. Sewer Treatment Pond and Ferdinand Street Location

Historical aerial photography allowed estimation of the top of bank. It was calculated that, between 1998 and 2014, the observed erosion rate in this section was, on average, approximately 10 feet per year.

BAYOU SARA STREAMBANK STABILIZATION

Approximately 3.4 acres of land was lost as shown in this 2013 image (Figure 2). Stone armoring the southern bend (Bend #2) would provide mitigation protection for the central/southeastern section of Ferdinand Street, the U.S. Army Corps of Engineers (USACE) access to the 210-acre Casting Fields, Oyster Bar (a commercial structure), the River Landing, and a local boat launch (Figure 1). The H&H Analysis substantiated the 1.6-year Recurrence Interval for sustained erosion that is occurring along the project site. The H&H Analysis also validated the engineer-estimated damages that would be a direct result if both the Sewer Treatment Pond and Ferdinand Street were compromised by erosion and continued land loss. The continued funding of Phase 1 from the Federal Emergency Management Agency for this project is critical to provide a mitigated solution for the ongoing streambank erosion of Bayou Sara and the sustained property losses in the immediate project area. This project will provide immediate erosion mitigation protection for the two critical cut bank sections of Bayou Sara that were identified as a direct result of the H&H Analysis.



Figure 2. Land Loss between 1998 and 2014

2 DATA COLLECTION AND MODELING SUMMARY

2.1 Data Collection: Survey

The site survey consisted of performing a single-beam bathymetry survey in order to gather data to support the hydrographic analysis. The area surveyed is from the intersection of Bayou Sara with the Mississippi River to approximately 1.25 miles north in Bayou Sara. Morris P. Hebert, Inc. (MPH) surveyed eight transects spaced approximately every 900 feet within Bayou Sara on March 22, 2016 (Appendix A). MPH performed the survey utilizing a 19-foot vessel with a 90-horsepower outboard motor with a draft of 1.5 feet. A Trimble Digital Surface Model 232 Differential Global Positioning System receiver and antenna were set up approximately 5 feet from the stern of the vessel. The antenna was approximately 1.5 feet above the roof of the cabin of the vessel while the single-beam echosounder was mounted directly below the global positioning system (GPS) receiver. The survey was conducted utilizing GPS-Navigation survey methods and sub-meter accuracies as defined by manufacturers' specifications. MPH utilized a 4-degree beam width Transducer with Odom Echotrac to perform the survey work. All raw data were collected and processed in HYPACK® survey software.

Unusually high water at the time of the survey prevented topographic survey services from being performed. Due to these conditions, additional transects were performed with the single-beam bathymetry in an attempt to capture the necessary data. Once the survey was completed, MPH performed on-site quality assurance/quality control of the collected data.

In order to reference the collected data to North American Vertical Datum of 1988 (NAVD88) elevations, MPH set a control point on site. The control point can be described as *"TO REACH THE MONUMENT FROM THE INTERSECTION OF HWY 61 AND HWY 3057, TRAVEL SOUTH ON HWY 3057 FOR 1.0 MI TO THE JUNCTION WITH HWY 1258/FERDINARD ST. TURN LEFT ON HWY 1258/FERDINARD STAND TRAVEL SOUTHWEST FOR 1.8 MI TO THE END OF THE ASPHALT ROAD. THE STATION IS ON THE LEFT APPROXIMATELY 20 FT NORTH OF THE END OF THE ASPHALT ROAD, 25 FT WEST OF THE CENTERLINE OF THE ROAD, AND 3 FT EAST OF THE FENCE LINE. IT IS A 3/4" IRON ROD WITH CAP DRIVEN TO GROUND LEVEL."* A combination Trimble R8 global navigation satellite system (GNSS) (base)/R8 GNSS (rover) GPS Receiver was used to continually monitor water elevations throughout the duration of the survey. A static survey was also performed while the control point was being observed. Trimble Business Center was used to process all GPS survey data collected.

2.2 Data Collection: Modeling

The primary purpose of the one-dimensional modeling analysis was to evaluate flow velocity near the proposed river bank protection and to determine riprap size. The scope of services included obtaining topographic and bathymetric data; acquiring Mississippi River hydrodynamic data; setting up, modifying, calibrating, and validating the one-dimensional model; developing the design scenarios for model simulations; predicting the flow velocity; and sizing the riprap near the project location.

The USACE's Hydrologic Engineering Center River Analysis System (HEC-RAS) model was selected as the ideal tool because the USACE had an existing model from the 2011 high-flow event on the Mississippi River. This model was selected due to the fact that the stage of the Mississippi River is the major

BAYOU SARA STREAMBANK STABILIZATION

contributor to stage and flow conditions in the lower reaches of Bayou Sara. Therefore, the behavior and conditions of the Mississippi River had to be fully captured and understood in order to determine flow and velocities within Bayou Sara, which are required for stone armor sizing calculations.

The USACE model domain extends from Venice, Louisiana, at River Mile (RM) 10.7 above Head of Passes to Tarbert Landing at RM 306 above Head of Passes along the Mississippi River (Figure 3). The HEC-RAS model was provided by the USACE New Orleans District, validated, and used to assess the 2011 high-flow event.

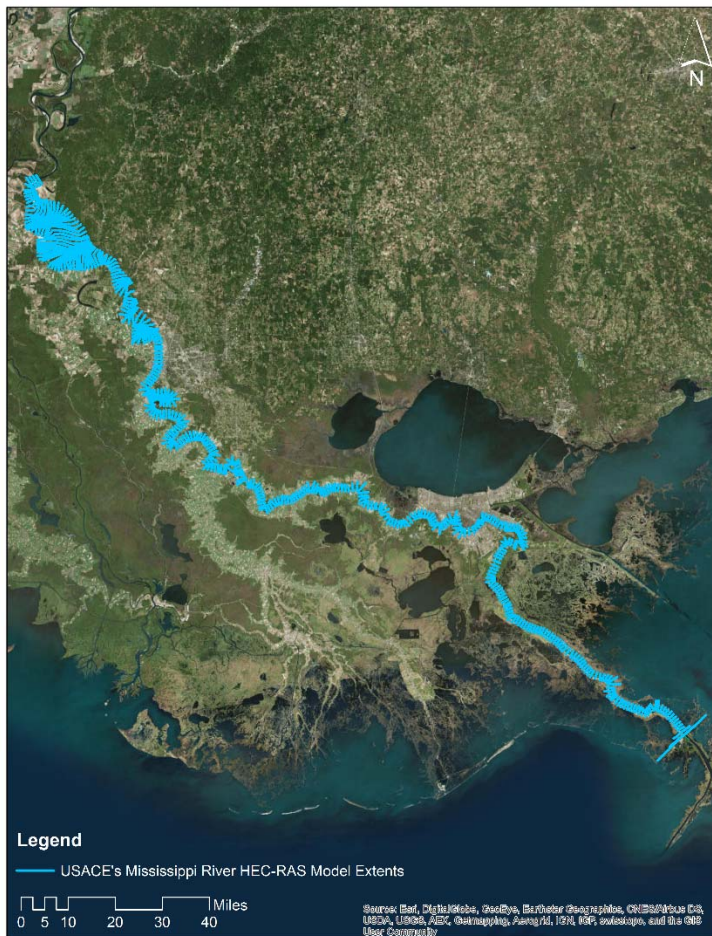


Figure 3. USACE's HEC-RAS Model Domain.

The domain was quite extensive and much larger than what was required for the Bayou Sara analysis; thus, the domain was reduced considerably to only include the project's area of interest. The model's overbank sections were augmented with bathymetric and topographic survey data collected for the project (Figure 4). HEC-RAS channel cross sections within Bayou Sara were aligned exactly with those surveyed for the project.

BAYOU SARA STREAMBANK STABILIZATION

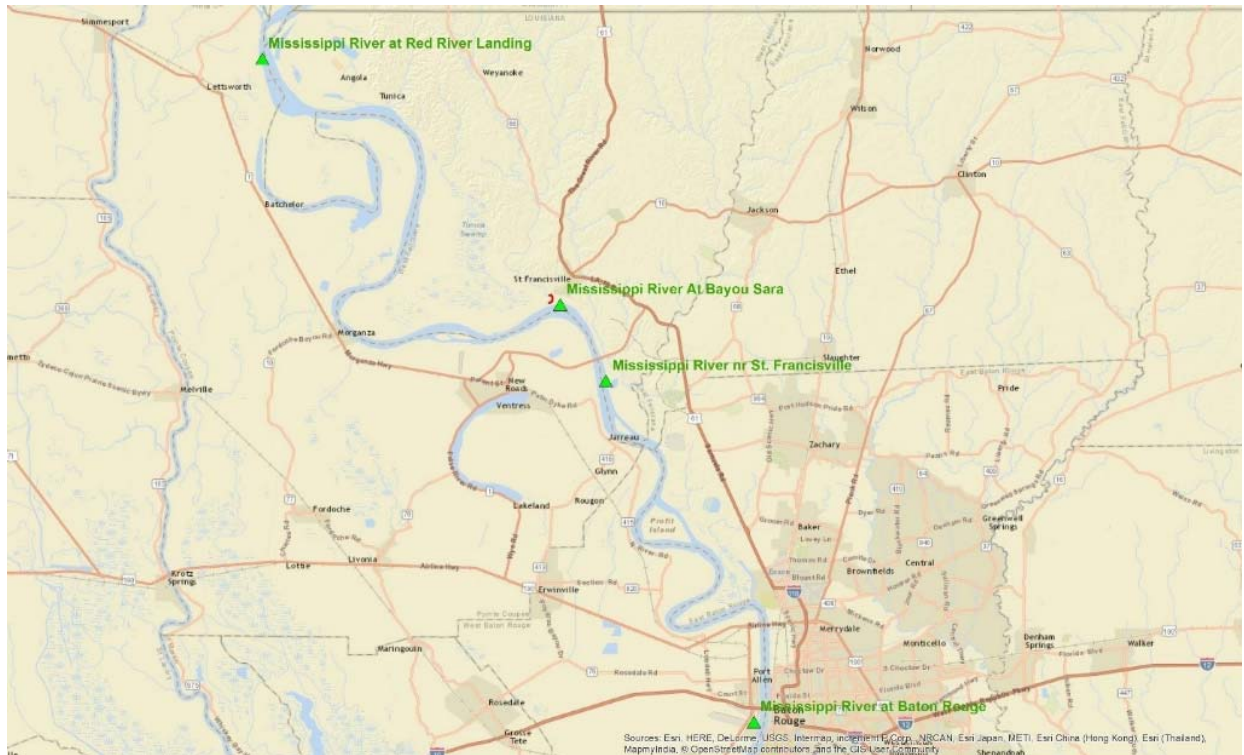


Figure 5. USACE Gages in Model Domain

2.3 H&H Analysis

There are no stream gages or recorded data publicly available for the volume of flow in Bayou Sara attributable to precipitation runoff. The watershed of Bayou Sara is located in the Pine Hills Region. The U.S. Geological Survey (USGS) classifies watersheds and sub watersheds into various levels of aggregation. These are characterized by Hydrologic Unit Code (HUC) values. Bayou Sara's watershed corresponds to the HUC-10 level of classification and is depicted on Figure 6. To estimate the peak flow for upstream inflow, regional regression equations (Figure 7) were used to calculate the flow rate for different return periods based on USGS National Flood-Frequency (NFF) Program's "Methods for Estimating Flood Magnitude and Frequency in Rural Areas in Louisiana, 2001" (USGS 2001).

BAYOU SARA STREAMBANK STABILIZATION

The following were measured and/or assumed for the regional regression equations:

Drainage Area (DA)

$DA = 448.49$ square kilometers = 173.16 square miles

Main Channel Slope (SLP)

$SLP = 10.08$ feet per mile

Mean Annual Precipitation (AP)

$AP = 56$ inches

Computing the values provides the following flow rates attributable to precipitation runoff in Bayou Sara for various return frequencies as shown in Table 1 where Q_T is the peak discharge for recurrence interval T, 2 to 500.

Table 1. Bayou Sara Flow Rates and Given Return Frequencies

Discharge Recurrence Interval	Discharge (cubic feet per second)
Q_2	7,190
Q_5	13,463
Q_{10}	18,735
Q_{25}	26,476
Q_{50}	33,058
Q_{100}	40,329
Q_{500}	59,727

2.4 Model Calibration and Validation

The model domain for this study was extracted to only include the part of the USACE model from Baton Rouge, Louisiana, to Tarbert Landing (small domain) with a few cross sections added near the junction of Bayou Sara. The cross sections of Bayou Sara were constructed using Light Detection and Ranging (LiDAR) data and survey data. The boundary conditions for the Mississippi River portion of the model include upstream inflow and downstream water stage. The daily hydrograph of discharge observed at Tarbert Landing was used for the upstream boundary conditions. The daily water stage observed at Venice was used as the downstream boundary conditions.

The HEC-RAS model needed to be recalibrated because of the modifications described above. Two periods were selected: 01/01/2003 to 12/31/2003 and 01/01/2011 to 12/31/2011. The model was calibrated for the year 2003, representing a normal or average flow year, in fully unsteady flow mode. Validation was performed for the year 2011 to check the performance of the calibrated model for extreme flood events. A final Manning's n value of 0.027 was assigned to the small domain. The value is a measure of the surface roughness or friction of the model's domain. The USACE model domain assigned a Manning's n value of 0.030 to the reach between RM 306 and RM 50.2 and 0.022 to the reach between

BAYOU SARA STREAMBANK STABILIZATION

RM 49.8 and RM 10.2. Figure 8 shows a comparison between the observed and simulated water surface elevations at Red River Landing (RM 302.8), Bayou Sara (RM 265.38), and Baton Rouge (RM 228.5) for the calibration period. Because of the consistent match between the modeled and observed data, it was concluded that the model was calibrated properly to reproduce river hydraulics in the reduced model domain.

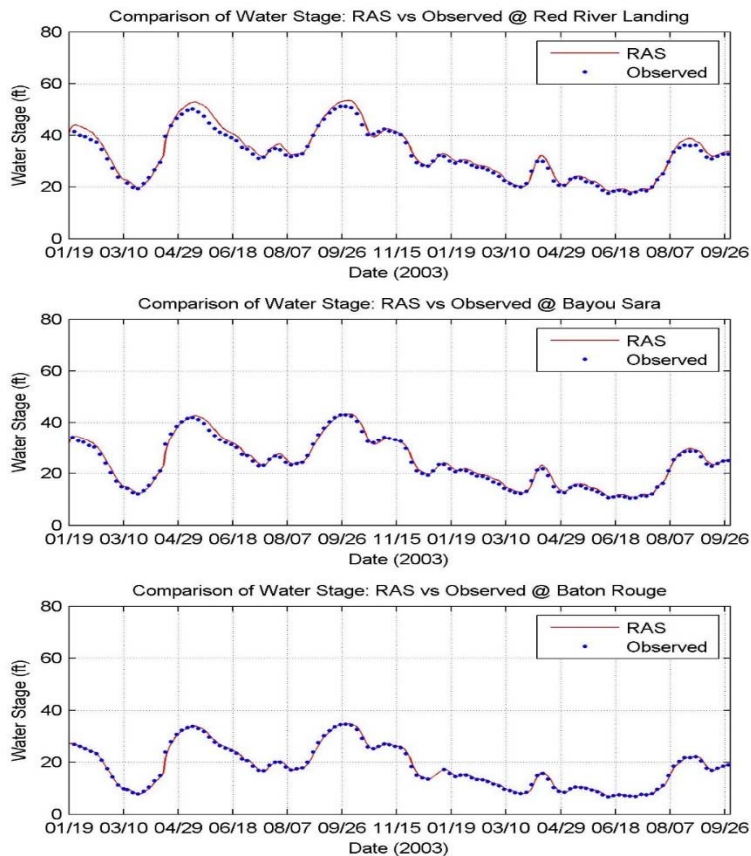


Figure 8. Model Calibration 2003

Model validation for the year 2011 was performed without any adjustments to the parameters of the existing model in order to assess model performance for extreme flood events, such as that which occurred in 2011. Figure 9 shows a comparison between the observed and simulated water surface elevation at the same locations for the validation period. Once again, due to the consistent match between modeled and observed data, it was concluded that the model was calibrated properly to reproduce river hydraulics in the reduced model domain. Following calibration and validation of model hydrodynamics, the next step was to investigate conditions of flow in Bayou Sara.

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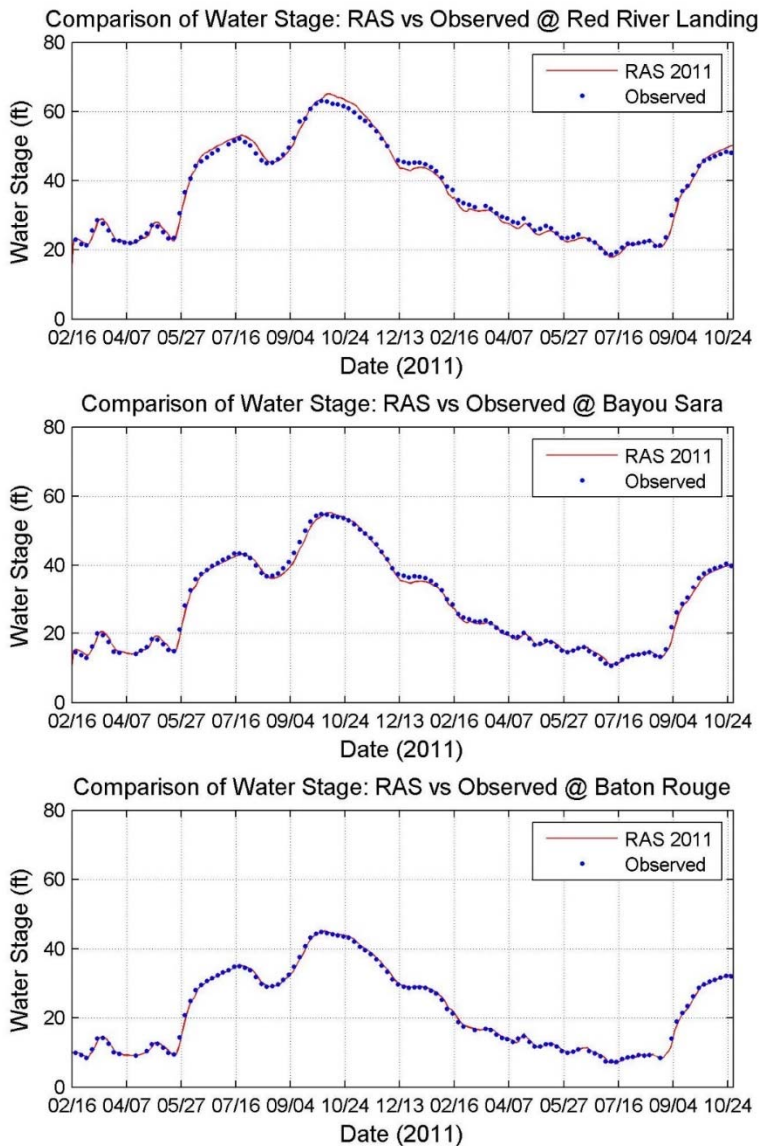


Figure 9. Model Validation 2011

2.5 Assessment of River Flow in Bayou Sara

After the HEC-RAS was calibrated and validated, additional simulations were performed to assess the river flow velocity used to size riprap armoring for bank protection. Rock riprap design is comprised of three primary steps: preliminary data analysis, rock sizing, and revetment detail design. The purpose of this H&H Analysis was to compile the data, including channel cross-section surveys, soil conditions,

BAYOU SARA STREAMBANK STABILIZATION

historical problems, etc., and then determine the design discharge and design water surface elevation at the irregular design sections to size the riprap armor.

The water surface elevation and channel velocity time series of 2011 show that the highest flow velocities occur during low water levels. It also demonstrated that the water level in lower Bayou Sara was controlled by the water level in the Mississippi River. An example of a data analysis plot is shown on Figure 10. The upper plot shows the time series of water surface elevation and flow velocity at cross-section 14.40 (Figure 11). The lower plot shows the correlation between water surface elevation and flow velocity, which can be used for riprap design for flow velocity and water depth at different locations.

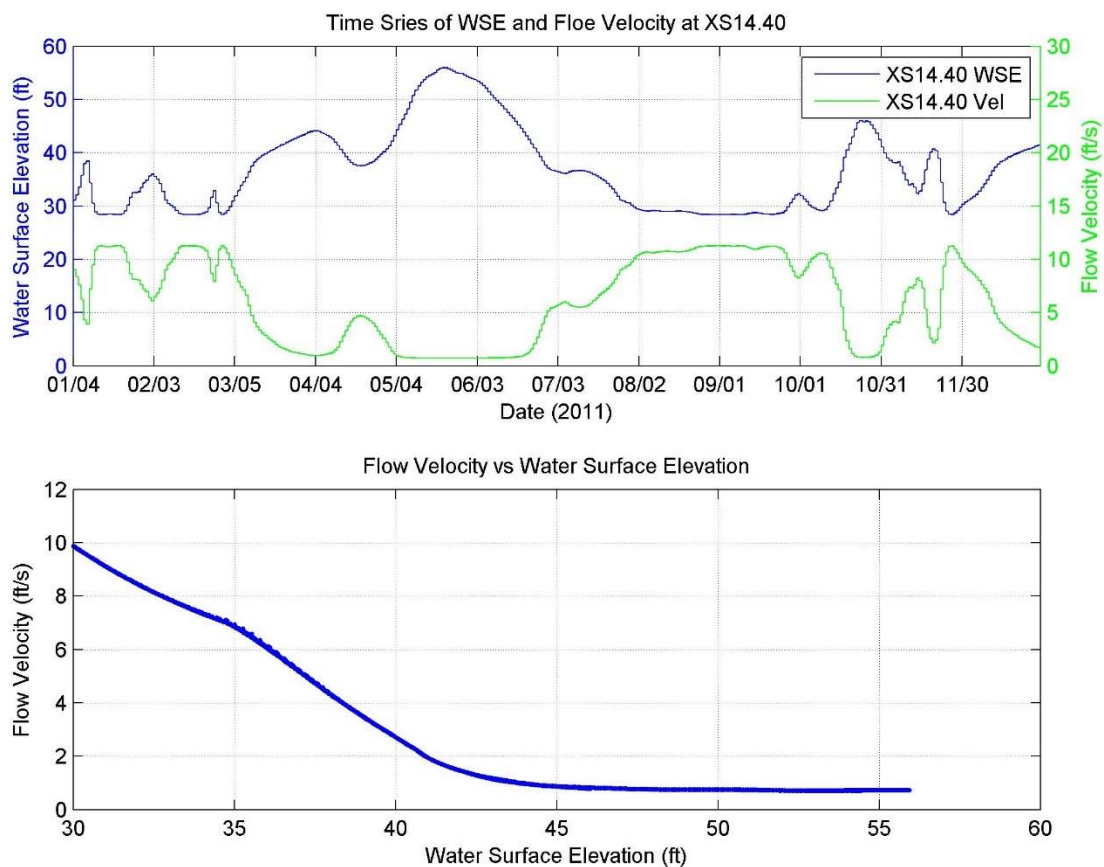


Figure 10. Water Surface Elevation and Channel Flow Velocity along Bayou Sara – 2011

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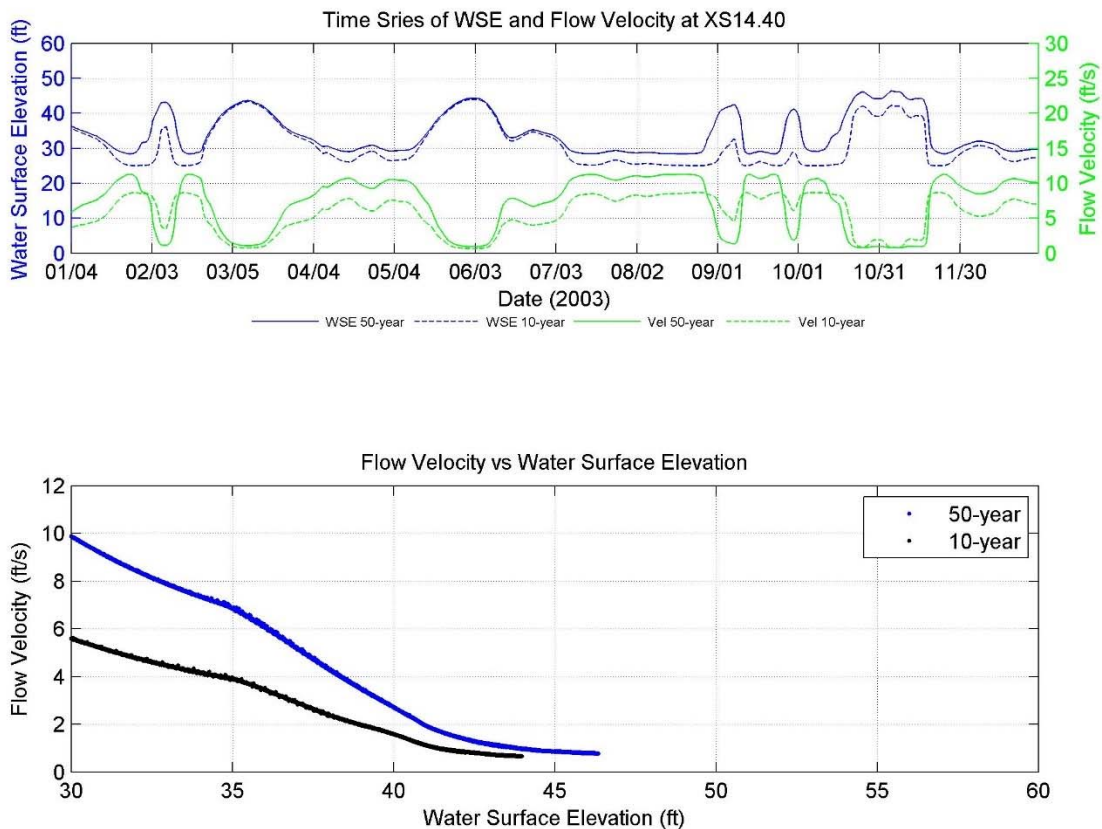


Figure 12. Flow Velocity and Water Surface Elevation at Cross-Section 14.40 during 2003

3 STONE ARMOR SIZING

3.1 Stone Armor Sizing Methodology

There are various methods for determining sufficient stone armor size to resist external forces, such as current and waves, in order to prevent stream bank erosion. This analysis focused on the Federal Highway Administration's (FHWA's) HEC-11 (1989) methodology and used USACE Engineer Manual (EM) 1110-2-1601 (1994) as a check. Riprap is classified universally by average diameter and weight. Both methods calculate a D_{50} , or mean diameter of stone class, required to resist the forces anticipated at a project location. HEC-11 and EM 1110-2-1601 calculations of D_{50} are summarized below and detailed information is provided in Appendix C. It should be noted that both methods identify a minimum bank slope standard of 1.5H:1V, with a slope of 2H:1V recommended. This analysis assumes all bank sections in the project area will be regraded to 2H:1V slopes prior to placement of armoring materials.

BAYOU SARA STREAMBANK STABILIZATION

Riprap sizing calculations were performed using the following equation from HEC-11 methodology.

$$D_{50} = \frac{(0.00594 \times V_a^3)}{(d_{avg}^{0.5} \times K_1^{1.5})} \times C$$

Where:

D_{50} = Median riprap particle size with 50% of stones within the gradation

V_a = Average velocity in the main channel

D_{avg} = Average flow depth in the main channel

K_1 = Bank angle correction factor

C = Stability and specific gravity correction factor.

This calculation yields a D_{50} of 1.3 feet, which corresponds approximately to a 130-pound riprap as classified in the Louisiana Department of Transportation and Development's (LADOTD's) "Standard Specifications for Roads and Bridges" (2006). In order to cross-check the riprap sizing, calculations were performed using HEC-11 methodology, EM 1110-2-1601.

$$D_{30} = S_f \cdot C_s \cdot C_v \cdot C_t \cdot d \cdot \left[\frac{\gamma_w}{(\gamma_s - \gamma_w)} \right]^{0.5} \times \left[\frac{V}{(K_1 \times g \times d)} \right]^{2.5}$$

Where:

D_{30} = Median riprap particle size with 50% of stones within the smaller gradation

S_f = Safety factor

C_s = Stability coefficient

C_v = Vertical velocity distribution coefficient

C_t = Thickness coefficient

D = Depth of flow

γ_w = Unit weight of water

γ_s = Unit weight of stone riprap

V = Velocity of flow

K_1 = Side slope correction factor

This calculation yields a D_{30} of 1.27 feet (converts to a D_{50} of 1.55 feet), which generally is between 130-pound and 255-pound class riprap as classified by LADOTD (2006). The primary difference between the two methods is the introduction of a safety factor in the USACE methodology. The analysis team deemed the 130-pound class stone sufficient for the project location for several reasons:

- The project is not located on a major navigable waterway; therefore, bank slope failure would not impede navigation or waterborne commerce.
- The only major infrastructure along the eroding bank (the Sewer Treatment Pond, Ferdinand Street, and a commercial property) are set back at a sufficient distance from the bank and the remedial

action plan includes re-grading the banks to a shallower 2H:1V slope; therefore, the minimum factor of safety was deemed sufficient.

- The bank armoring and re-grading is not intended to stop flooding or overtopping of Bayou Sara. The Sewer Treatment Pond, Ferdinand Street, and the Oyster Bar all flood periodically under present conditions.

3.2 Filter Layer Design

Filter layers are often required when placing riprap armoring along stream banks and shorelines to ensure that currents are unable to scour the in-situ bed material from underneath the armor layer, which could induce armor or slope failures. There are two primary filter layer types: granular aggregates and geotextile fabrics. Cost is the deciding factor for final selection of filter type. Should a granular filter be cost-effective, both the HEC-11 and EM 1110-2-1601 methodologies suggest that the minimum filter layer thickness should equate to $1 \times D_{100}$ of the selected riprap class or $1.5 \times D_{50}$ of the selected riprap class, whichever is greater. It also should be no less than approximately 1 foot in overall thickness. For 130-pound class riprap, the minimum filter layer thickness is approximately 2 feet if placed in the dry. If placed in the wet, the minimum layer thickness doubles to approximately 4 feet to account for uncertainties in underwater construction.

In order to ensure stability between the in-situ bed materials, filter layer, and riprap armoring, a filter ratio is calculated. This ratio is intended to ensure that piping through the filter material is prevented, while at the same time maintaining necessary permeability for drainage through the layers. Should there be a large variance between the in-situ bed material and the riprap size, more than one filter layer and layer size may be required. The filter ratio is defined in HEC-11 as:

$$\frac{D_{15} \text{ Coarser Layer}}{D_{85} \text{ Finer Layer}} < 5 < \frac{D_{15} \text{ Coarser Layer}}{D_{15} \text{ Finer Layer}} < 40$$

A limitation of this 30% level of analysis is that no geotechnical investigations have been performed and, therefore, assumptions regarding the in-situ bed material were made based on typical material found in the Mississippi River.

Should a geotextile fabric filter be deemed cost-effective and the preferred solution, several guidelines for material composition and placement must be adhered to, as outlined in HEC-11. These include:

- Fabric shall consist of long chain polymers composed of at least 85% polyolefins, polyesters, or polyamides.
- Geotextiles should not be exposed to Ultra Violet rays longer than the manufacturer's prescribed amount. According to HEC-11 "*Low resistance to ultraviolet degradation fabrics (more than 30% strength loss at 500 hours exposure ASTM D-4355) should not be exposed to sunlight for more than 7 days. Geotextiles with higher resistance to ultraviolet degradation should not be exposed for more than 30 days. NOTE: Geotextiles can be manufactured or finished to resist degradation due to prolonged exposure to ultraviolet radiation, i.e., fabrics resistant to exposure for multi-year periods (from 5 to 25 years) are not uncommon.*"
- Piping Resistance (soil retention) (8).

BAYOU SARA STREAMBANK STABILIZATION

- Soil with 50% or less particles by weight passing U.S. No. 200 Sieve; Apparent Opening Size (AOS) less than 0.6 millimeter (mm) (greater than #30 U.S. Std. Sieve).
- Soil with more than 50% particles by weight passing U.S. No. 200 Sieve; AOS less than 0.3mm (greater than #50 U.S. Std. Sieve).
- Permeability of fabric greater than permeability of soil.
- Minimum physical characteristics as outlined in Table 2 below. Test methods are in accordance with procedures outlined in the FHWA Geotextile Engineering Manual.

Table 2. Revetment Toe Protection Methods

Test Methods	Drainage		Erosion Control	
	Class A	Class B	Class A	Class B
Grab Strength (minimum in either principal direction), Newtons	800	356	890	400
Elongation (minimum in either principal direction), Newtons	Not Specified	Not Specified	15%	15%
Puncture Strength, Pascals	800	111	800	178
Burst Strength, Pascals	2.00E+06	-9.00E+05	2.20E+06	1.00E+06
Trapezoid Tear, Newtons	222	111	222	-133

3.3 Toe Design

Adequate toe protection is required to prevent scour-induced slope instability at the base of the revetment. Various methods for toe construction are shown on Figure 13, which is taken from EM 1110-2-1601.

EM 1601 notes *“Method A applies when toe excavation can be applied in the dry; the riprap layer may extend below the existing ground line a distance exceeding the anticipated depth of scour. If excavation quantities are prohibitive, the concept of Method D can be adapted to reduce excavation... Method D is a useful technique where water levels prohibit excavation for a toe section; it is to place a launchable section at the toe of the bank. Even if excavation is practicable, this method may be preferred for cost savings if the cost of extra stone required to produce a launched thickness equal to or greater than T plus the increase shown in Table 3-2 is exceeded by the cost of excavation required to carry the design thickness, T, down the slope. This concept simply uses toe scour as a substitute for mechanical excavation...Shape of the stone section before launching is not critical, but thickness of section is important because thickness controls the rate at which rock is released in the launching process. For gradual scour in regular bendways, the height of the stone section before launching should be from 2.5 to 4.0 times the bank protection thickness, T. For rapid scour in impinged flow environments, or in gravel bed streams, the stone section height before launching should be 2.5 to 3.0 T...Stone is lost downstream during the launching process; and the larger the scour depth, the greater the percentage of stone lost in the launching process.”*

BAYOU SARA STREAMBANK STABILIZATION

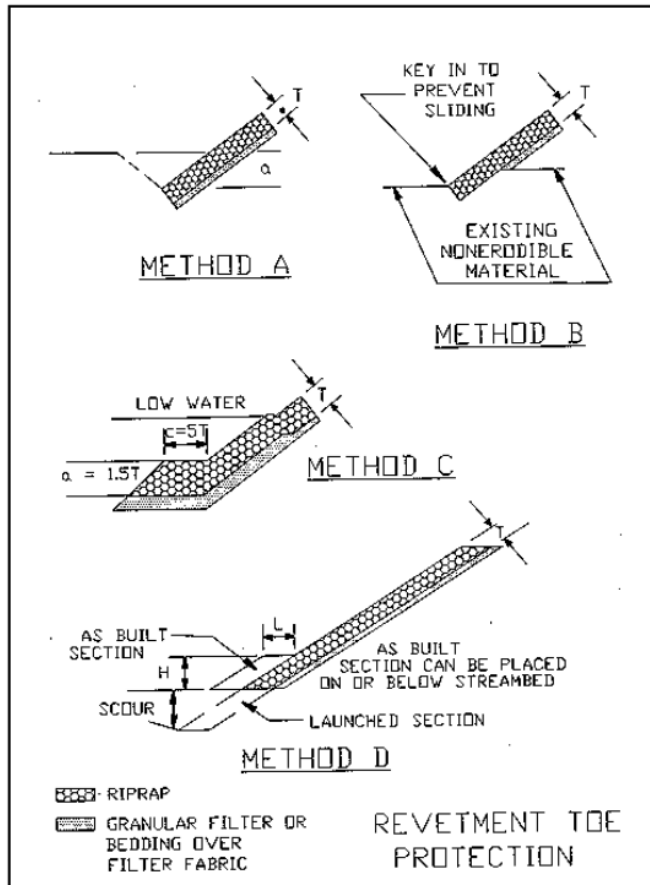


Plate B-43

Figure 13. Revetment Toe Protection Methods

The primary consideration for toe design will be the ability to construct the revetment in the wet or dry. Because water levels can fluctuate greatly at the project location throughout the year and the computed maximum scour depth is relatively deep, Method D was selected. HEC-11 methodology computed a maximum potential scour depth of -12 feet below the Bayou Sara stream bed based on estimates of in-situ bed material grain size. This method was confirmed using the U.S. Department of the Interior-Bureau of Reclamation's Technical Guideline for Computing Degradation and Local Scour (1984), which yielded a maximum scour depth of 19 feet below the Bayou Sara stream bed. Excavating from 12 to 19 feet below the stream bed would require conditions in the stream bed of Bayou Sara to be almost entirely dry because a substantial portion of the bed would have to be excavated to ensure revetment placement to such a substantial depth below the bed. Conversely, launchable stone could be constructed in the wet or dry and would provide a contractor more options for placement and time of year to construct the feature.

Launchable stone toe dimensions were calculated and typical toe dimensions for the northern bend (SL-7 cross section) and the southern bend (SL-20 cross section) on Figure 14 below. Cross sections SL-7 and SL-20 are also referenced as Bend #1 and Bend #2.

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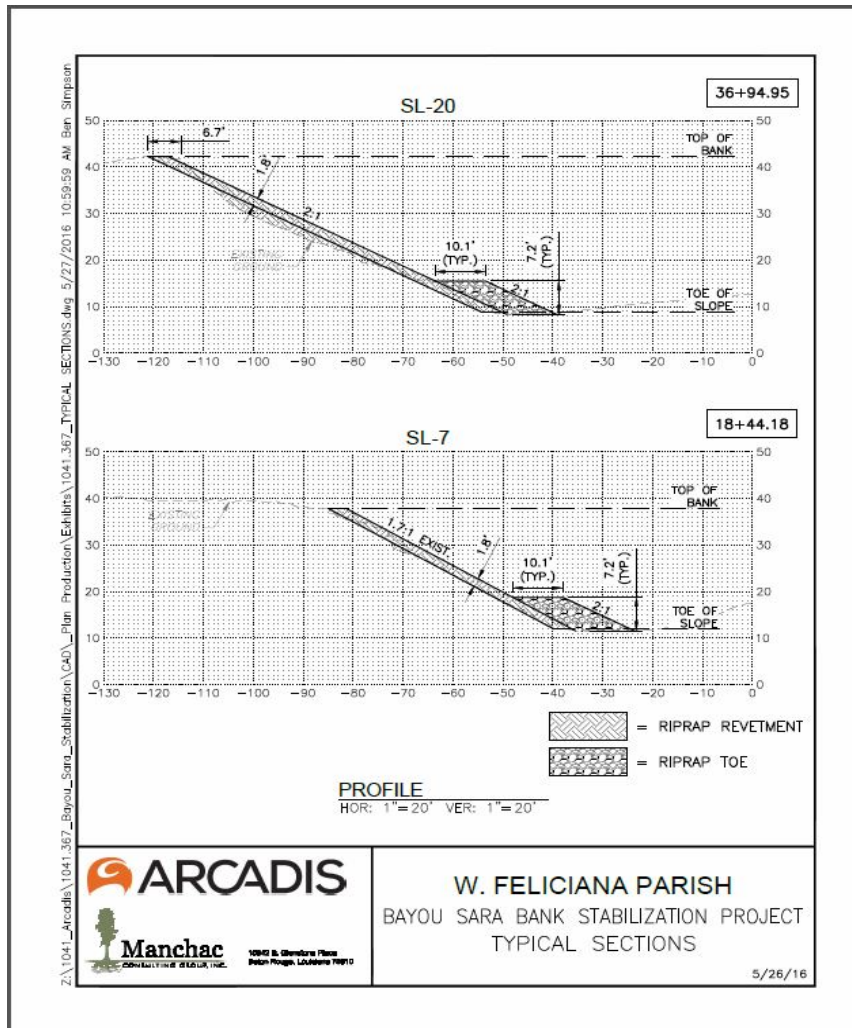


Figure 14. Typical Launchable Toe Design

4 CIVIL SITE DESIGN

Survey data from MPH were imported into AutoCAD to begin the preliminary plans. Cross sections of the Bayou Sara project site were generated according to survey data. Based on design criteria, a grading plan was developed to achieve a slope not greater than 2H:1V along the embankment. This resulted in a cross-sectional area for both the cut and fill required to achieve the design slope. The average end method was then used to calculate the cut and fill volumes. Once the bank surface was graded in the plans, the revetment and toe were placed on the slope according to the design. Volumes required for the revetment and toe were then calculated using the average end method. All quantity calculations are provided in Appendix D. Plan and profile sections of the areas to be armored are provided in Appendix E.

5 ENGINEER'S PRELIMINARY OPINION OF PROBABLE COST

Construction is estimated to cost approximately \$2.49 million for the preferred mitigation solution depending upon access route, availability of fill material, water levels in the Bayou, and material and fuel prices at time of construction. A breakdown of cost items and unit cost assumptions are provided in Table 3 below. In addition to the baseline estimate of \$2.49 million for regrading and armoring the two bends within the project area, an additional cost estimate of \$3.46 million was calculated for not only armoring the two bends, but also the straight section of cut bank between the two bends (Table 4). This represents an incremental cost increase of approximately \$960,000 to regrade and armor the straight section of bank between the bends. The incremental cost increase was analyzed as an alternative, but not selected as the preferred mitigation solution. By strategically armoring the two bends with engineered mitigation protection measures, the preliminary opinion of probable costs for the project increased by \$1,811 after the H&H Analysis and 30% Engineering Design were conducted.

Table 3. Preliminary Opinion of Probable Cost – Bends Only

Item	Quantity	Unit	Unit Cost	Total
Riprap Revetment Materials				
Grading and Shaping	1	LS	\$160,000.00	\$160,000
Geotextile Underlay	22,370	SY	\$8.00	\$178,960
130# Class Riprap	19,621	CY	\$85.00	\$1,667,774
Subtotal				\$2,006,733
Total Estimated Material and Labor Cost				\$2,006,800
Basic Engineering and Additional Services				
Basic Services Fee (Per Office of Facility Planning and Control with 1.15 Difficulty Factor)				\$200,480
Topographic Survey				\$25,000
Geotechnical				\$30,000
Hydraulic Analysis				\$50,000
Construction Observation (based on 6-month construction duration)				\$65,000
Subtotal				\$370,480
Project and Grant Management			5.0%	\$118,864
Total Estimated Engineering and Additional Services Cost				\$489,344
Total Estimated Project Cost				\$2,496,140

BAYOU SARA STREAMBANK STABILIZATION

Table 4. Preliminary Opinion of Probable Cost – Bends and Straight Section

Item	Quantity	Unit	Unit Cost	Total
Riprap Revetment Materials				
Grading and Shaping	1	LS	\$200,000.00	\$200,000
Geotextile Underlay	32,270	SY	\$8.00	\$258,159
130# Class Riprap	28,120	CY	\$85.00	\$2,390,234
Subtotal				\$2,848,393
Total Estimated Material and Labor Cost				\$2,848,400
Basic Engineering and Additional Services				
Basic Services Fee (Per Office of Facility Planning and Control with 1.15 Difficulty Factor)				\$277,140
Topographic Survey				\$25,000
Geotechnical				\$30,000
Hydraulic Analysis				\$50,000
Construction Observation (based on 6-month construction duration)				\$65,000
Subtotal				\$447,140
Project and Grant Management			5.0%	\$164,777
Total Estimated Engineering and Additional Services Cost				\$611,917
Total Estimated Project Cost				\$3,460,320

6 RECOMMENDATIONS AND NEXT STEPS

Required steps for the next phase of analysis include several integral actions to complete the analysis and design. These include:

- Development of a geotechnical testing plan and collection of requisite geotechnical data to investigate the gradation and properties of the in-situ soils comprising the stream bed and banks of Bayou Sara within the project area. These data will allow for the refinement of scour depth calculations and, ultimately, refinement of the toe design. Additionally, these data will confirm that the calculated re-graded side slope dimensions are fully stable under a variety of conditions and loadings.
- Additional survey cross-section collection will enable more accurate calculation of cut/fill quantities within the project area.
- A detailed cost estimate using tools such as the RSMeans database will enable optimization of cost calculations to ensure there are sufficient funds within the project budget to armor the two bends according to industry standards as well as to investigate if additional funds would be available to armor the straight section of cut bank connecting the two bends.

BAYOU SARA STREAMBANK STABILIZATION

- When sufficient design details are available to establish the construction footprint of the project, permitting activities should be initiated with federal and state agencies. A Joint Permit application for the Louisiana Department of Natural Resources and USACE should be initiated early in the process to avoid delays in the schedule. Permitting of geotechnical investigations may be necessary depending on method or acquisition and location.

7 REFERENCES

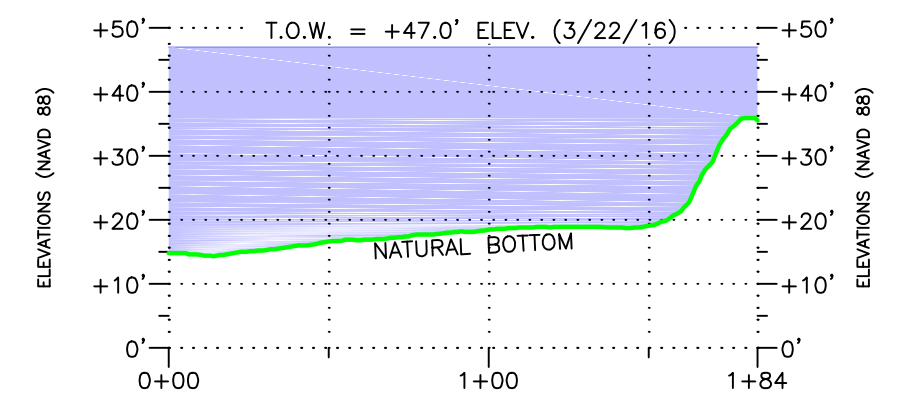
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APPENDIX A

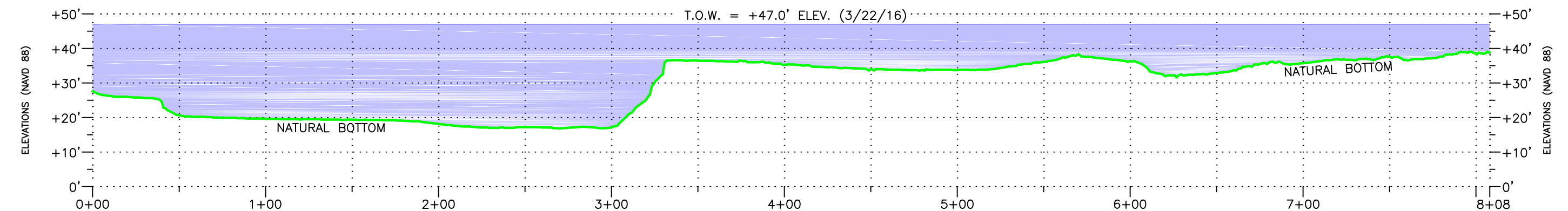
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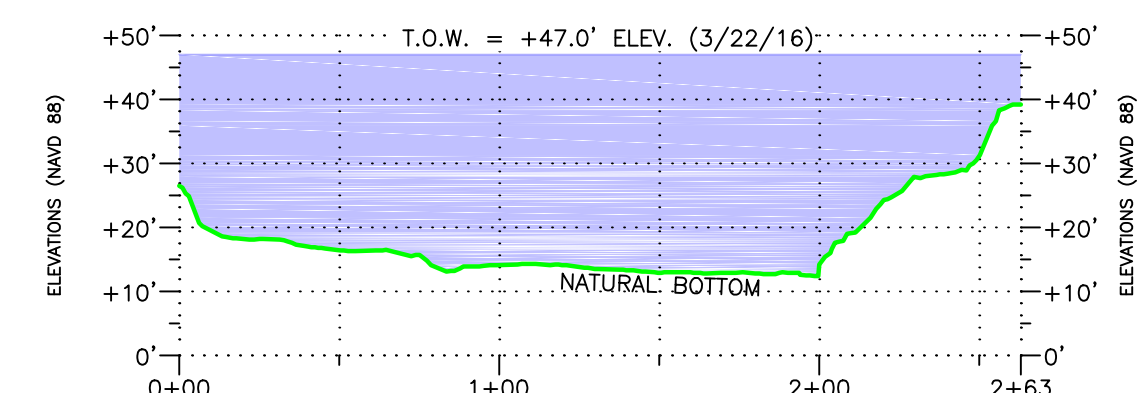
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SECTIONS 42 & 43, T03S-R03W



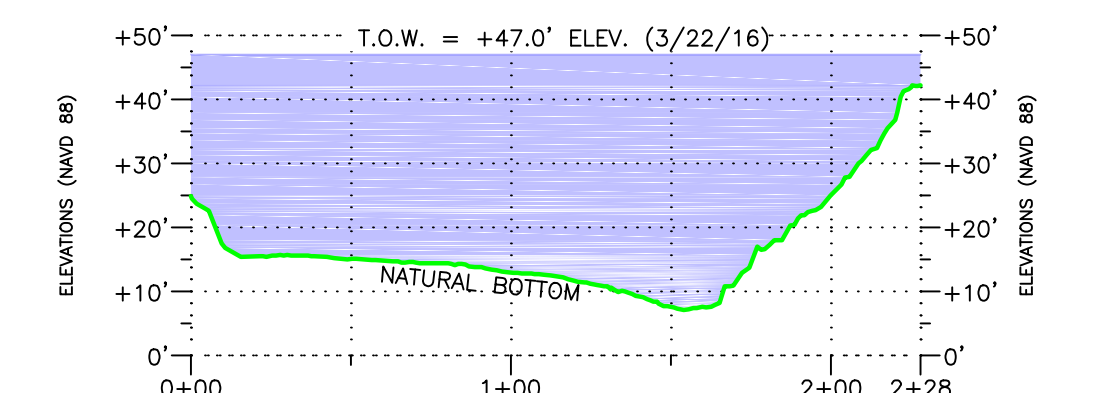
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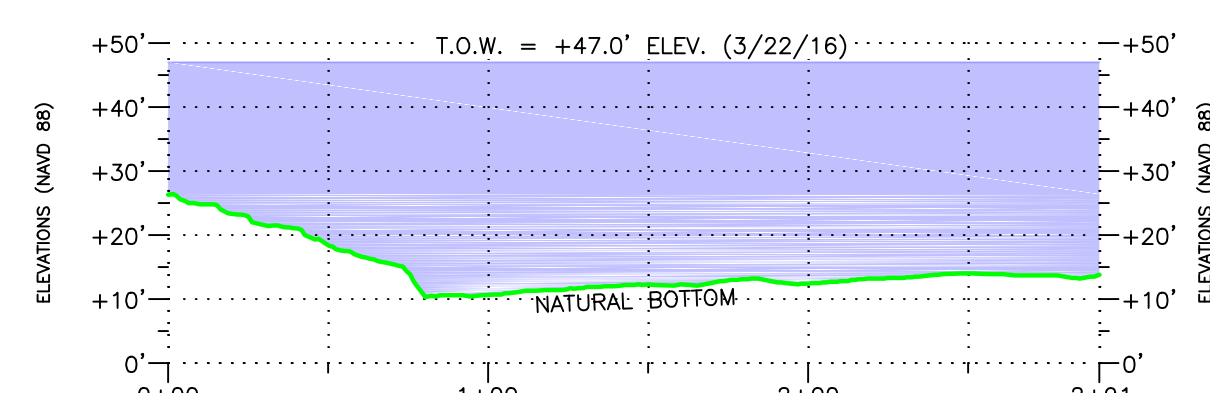
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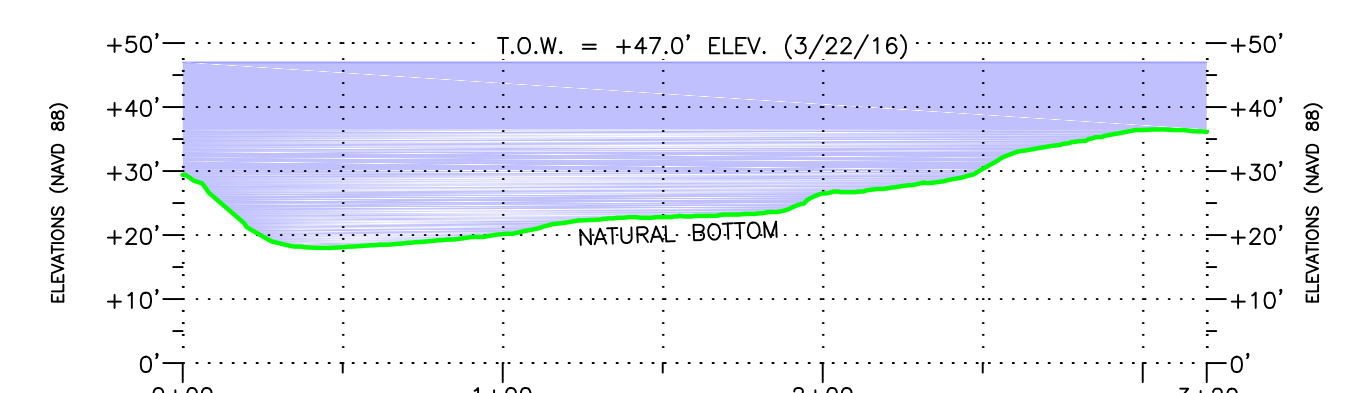
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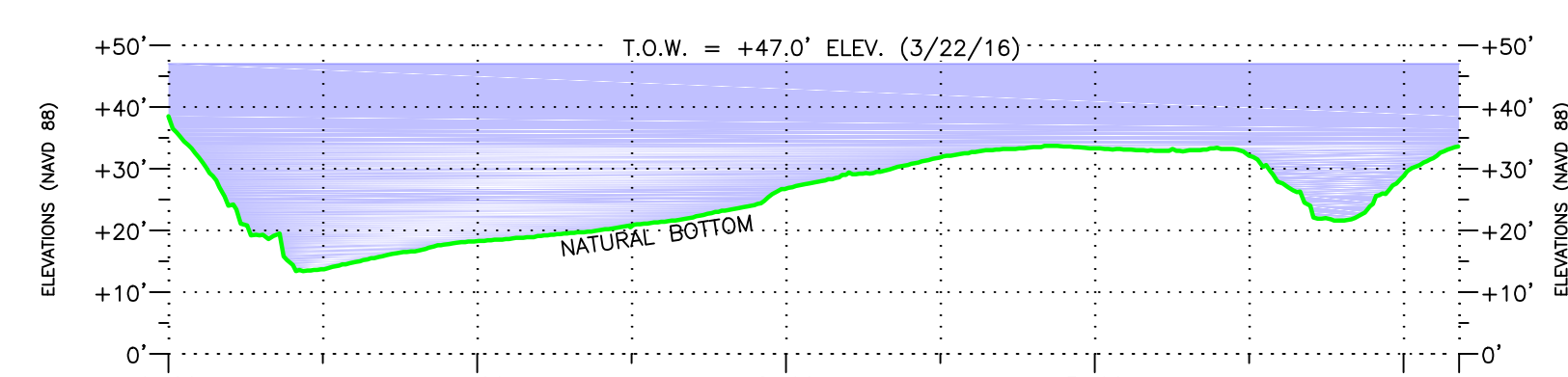
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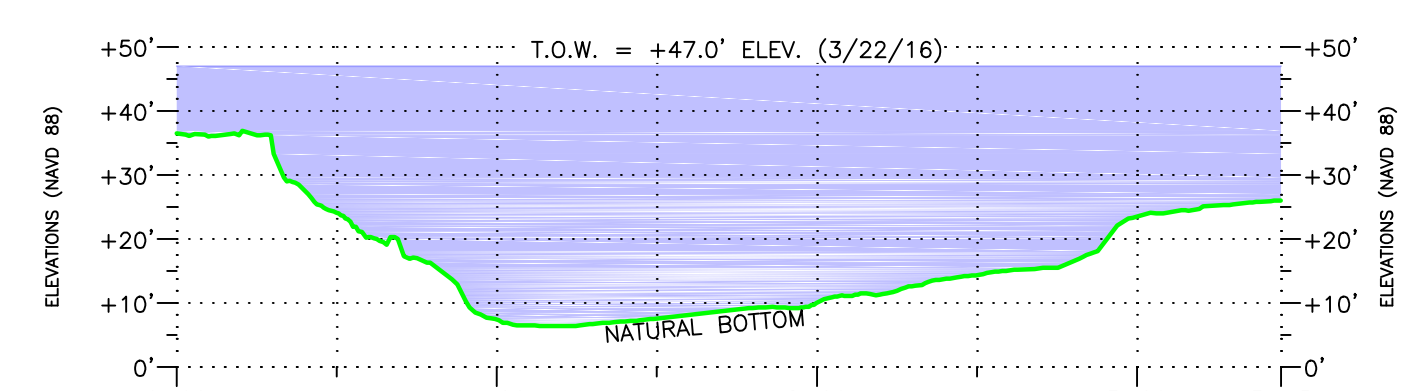
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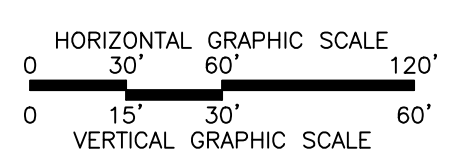


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NOTES:
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TO REACH THE MONUMENT FROM THE INTERSECTION OF HWY 61 AND HWY 3057, TRAVEL SOUTH ON HWY 3057 FOR 1.0 MI TO THE JUNCTION WITH HWY 1258/FERDINAND ST. TURN LEFT ON HWY 1258/FERDINAND ST. AND TRAVEL SOUTHWEST FOR 1.8 MI TO THE END OF THE ASPHALT ROAD. THE STATION IS ON THE LEFT APPROXIMATELY 20 FT NORTH OF THE END OF THE ASPHALT ROAD, 25 FT WEST OF THE CENTERLINE OF THE ROAD, AND 3 FT EAST OF THE FENCE LINE. IT IS A 3/4" IRON ROD WITH CAP DRIVEN TO GROUND LEVEL.
THIS DRAWING WAS PREPARED FOR TOPOGRAPHIC PURPOSES ONLY, AND IS NOT A PROPERTY BOUNDARY SURVEY AND AS SUCH DOES NOT COMPLY WITH THE MOST RECENT "STANDARDS OF PRACTICE FOR PROPERTY BOUNDARY SURVEYS" AS ADOPTED BY THE LOUISIANA PROFESSIONAL ENGINEERING AND LAND SURVEYING BOARD.
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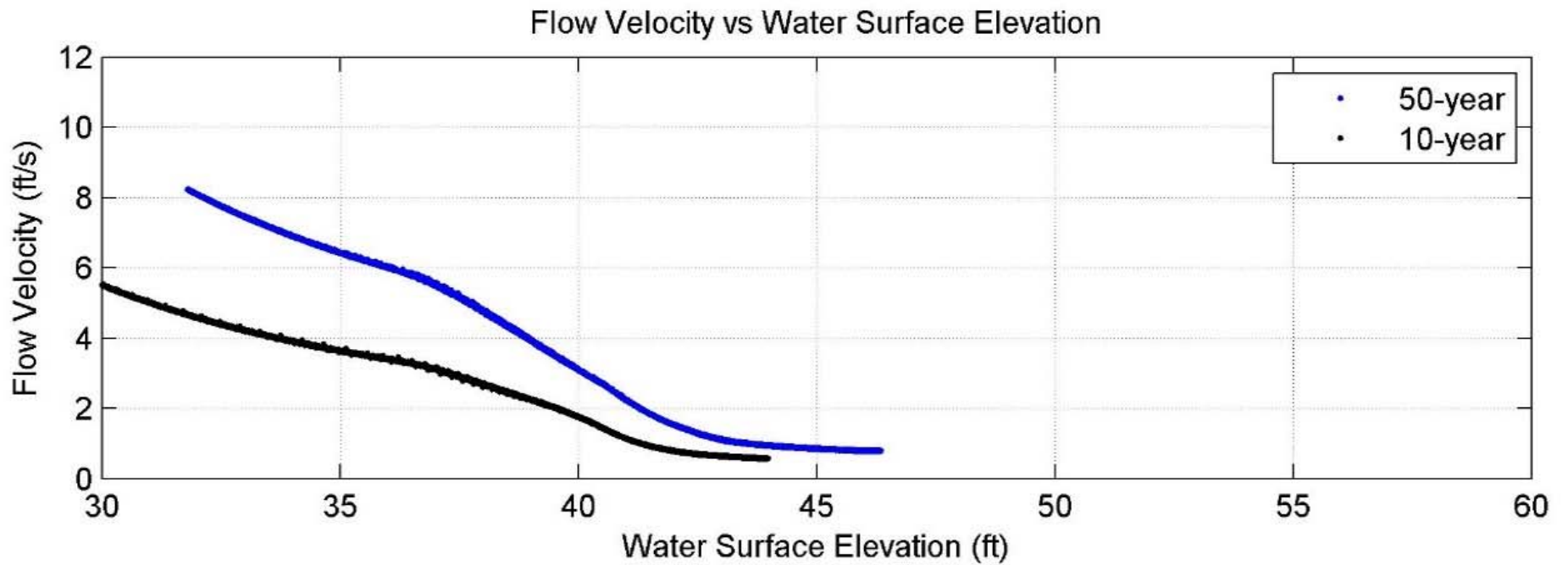
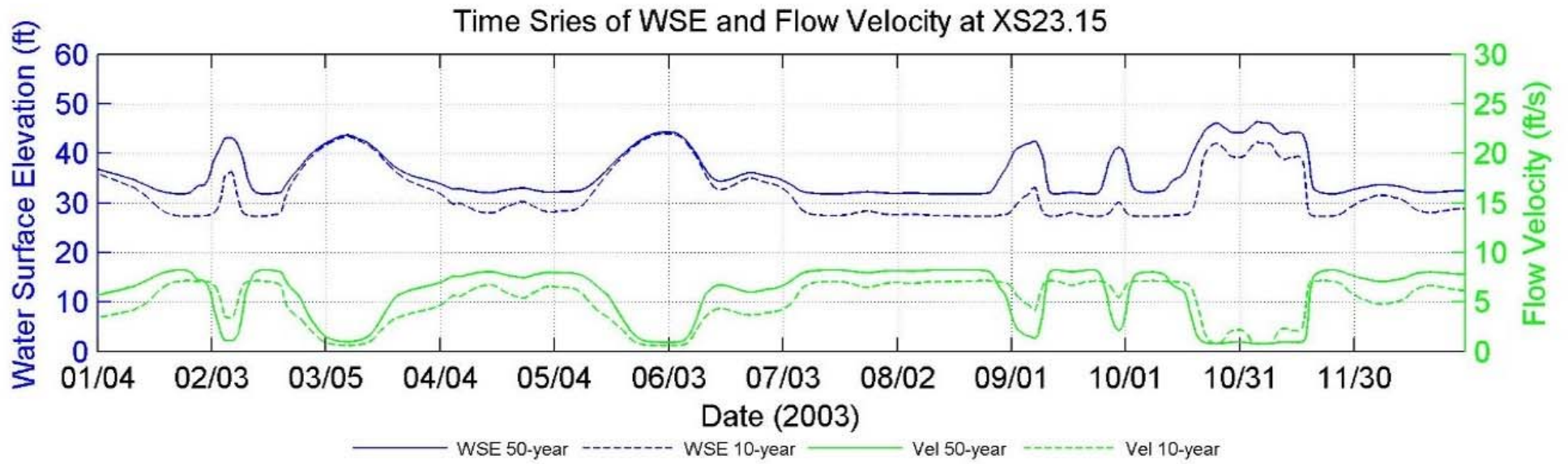
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DRAWN BY: KDT		SHEET: 1 OF 1	
CHKD./APPD. BY: JCM		SCALE: AS SHOWN	
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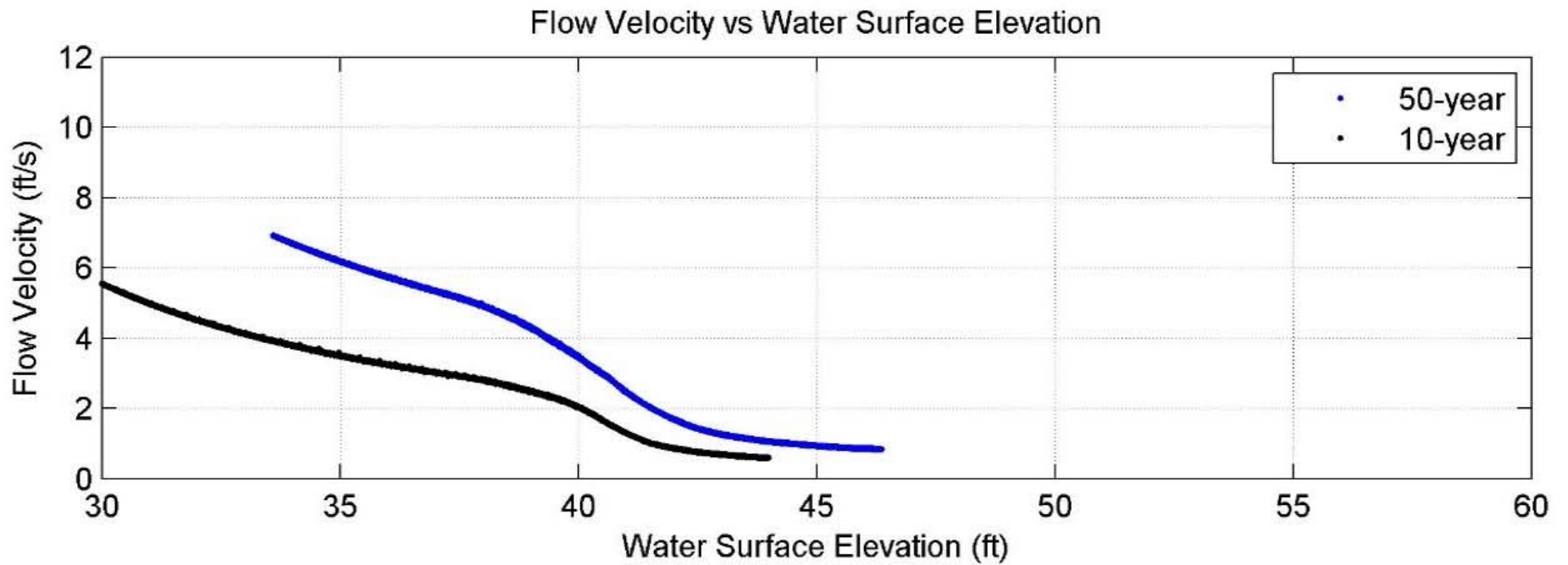
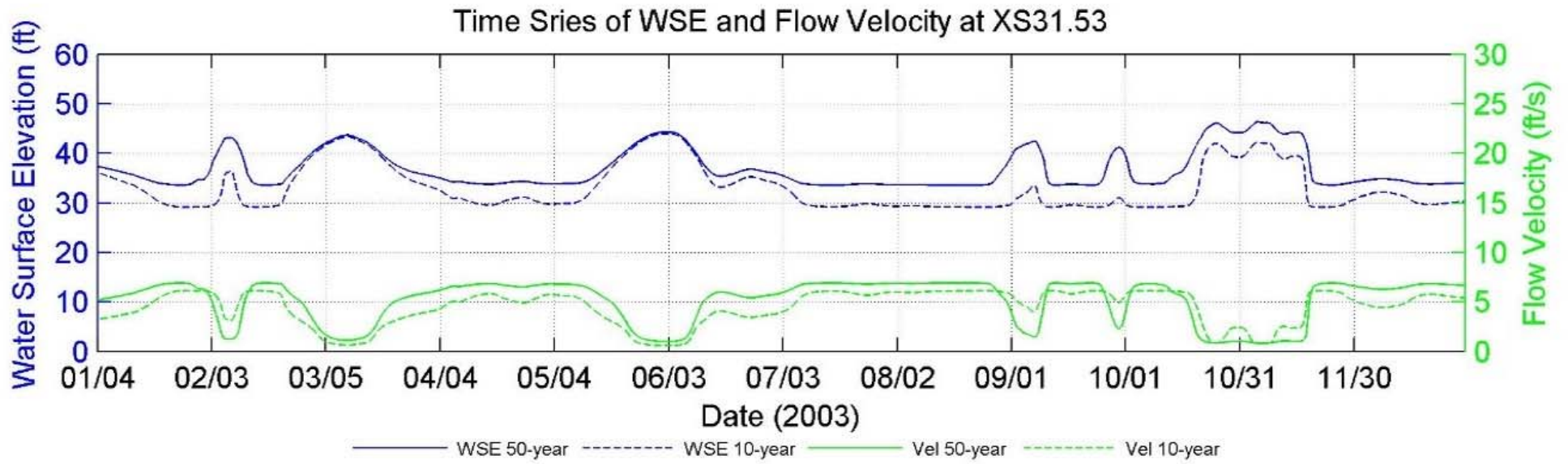
Morris P. Hebert, Inc.
SURVEYING • ENGINEERING • ENVIRONMENTAL SERVICES • FIELD SERVICES • GIS
P.O. BOX 1168 • 383 CORPORATE DRIVE • HOUMA, LOUISIANA 70364 • (850) 879-2751
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TEXAS SURVEY FIRM REGISTRATION NUMBER: 10183786 (HOUMA OFFICE)

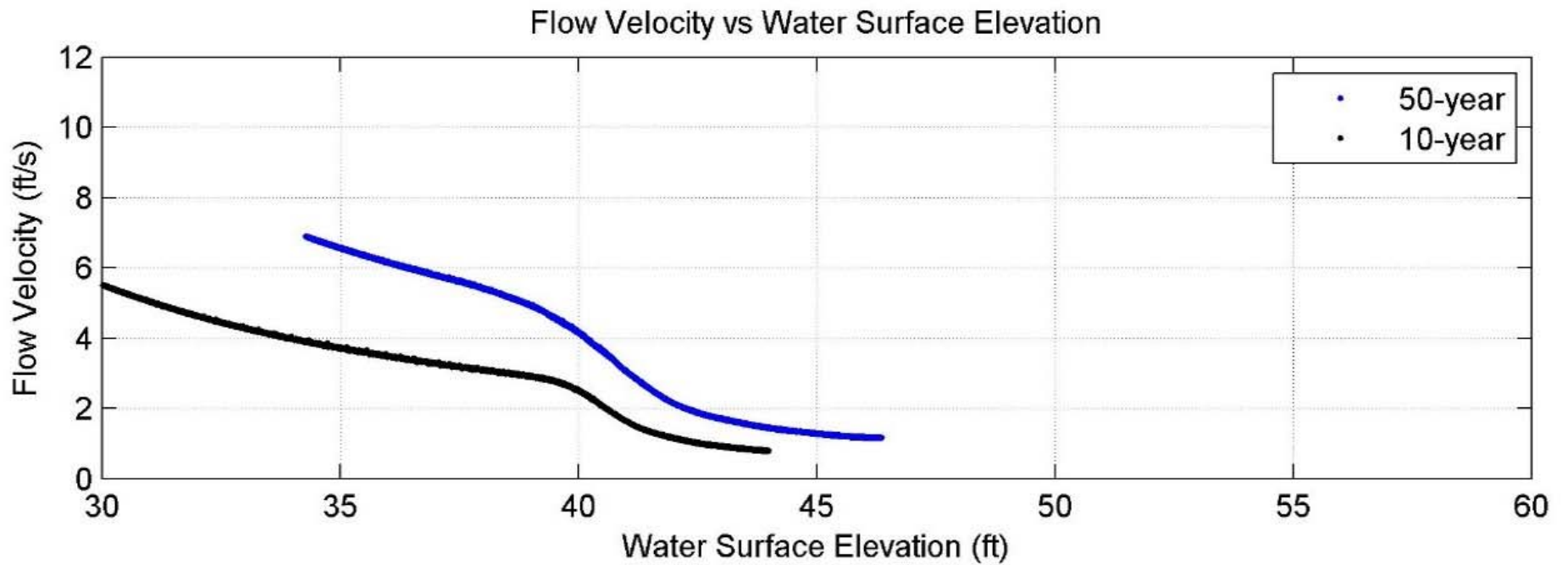
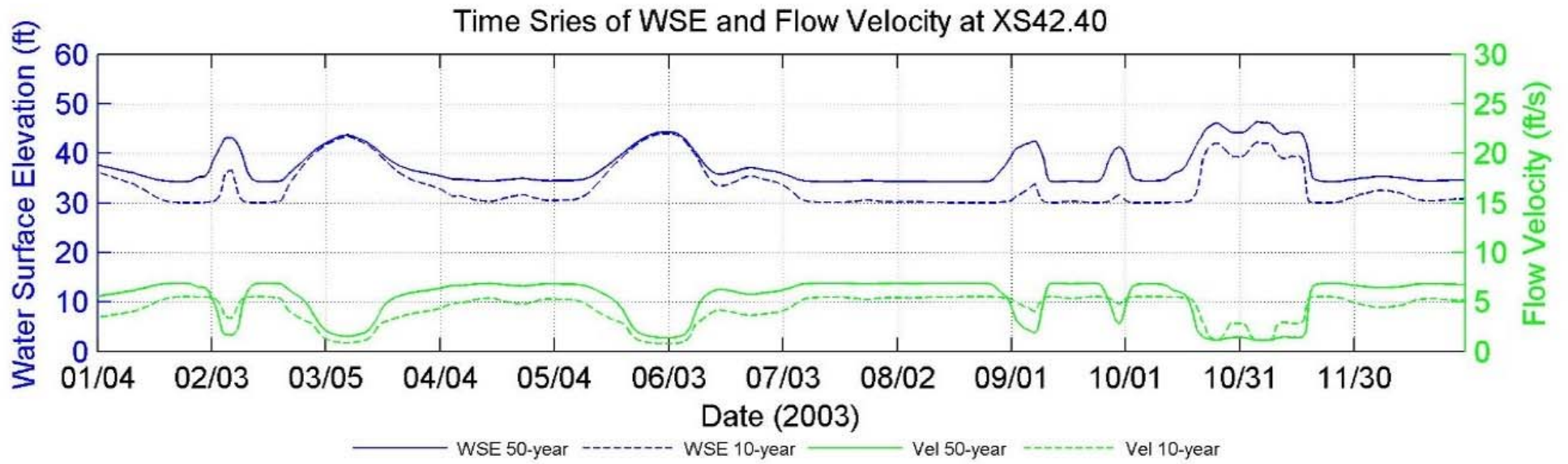
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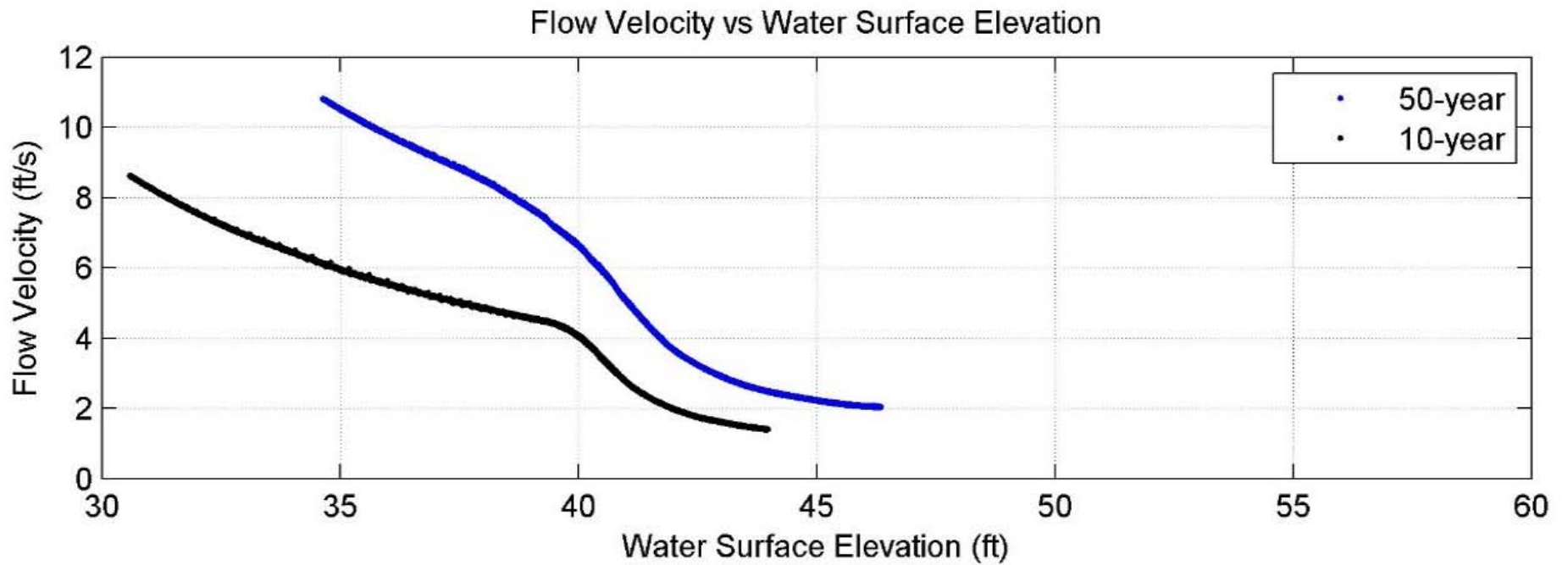
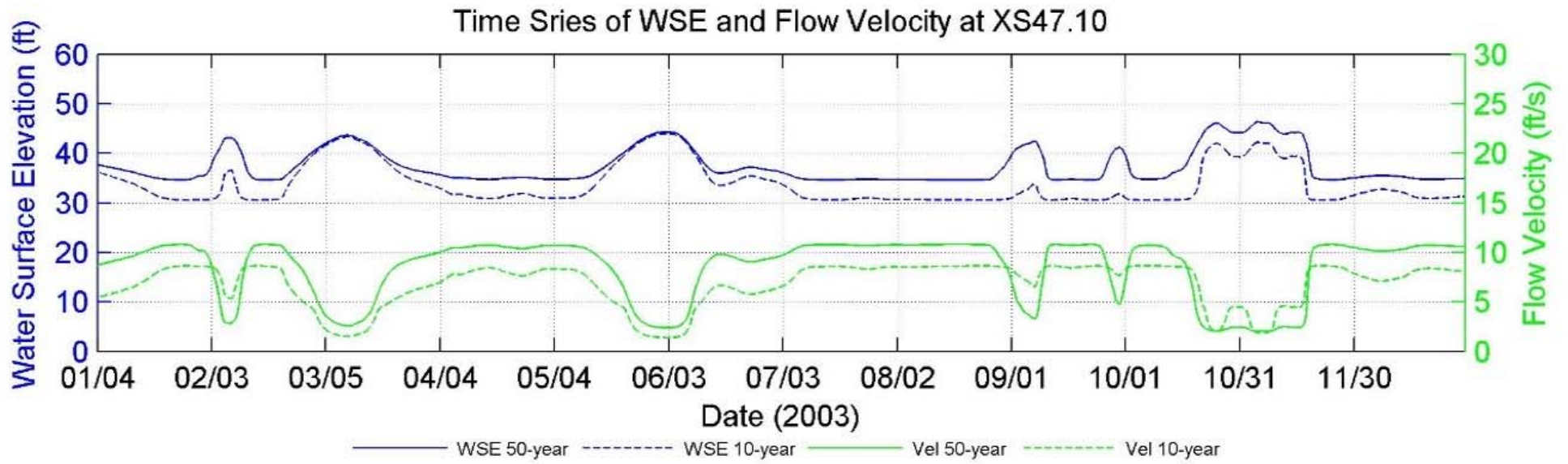
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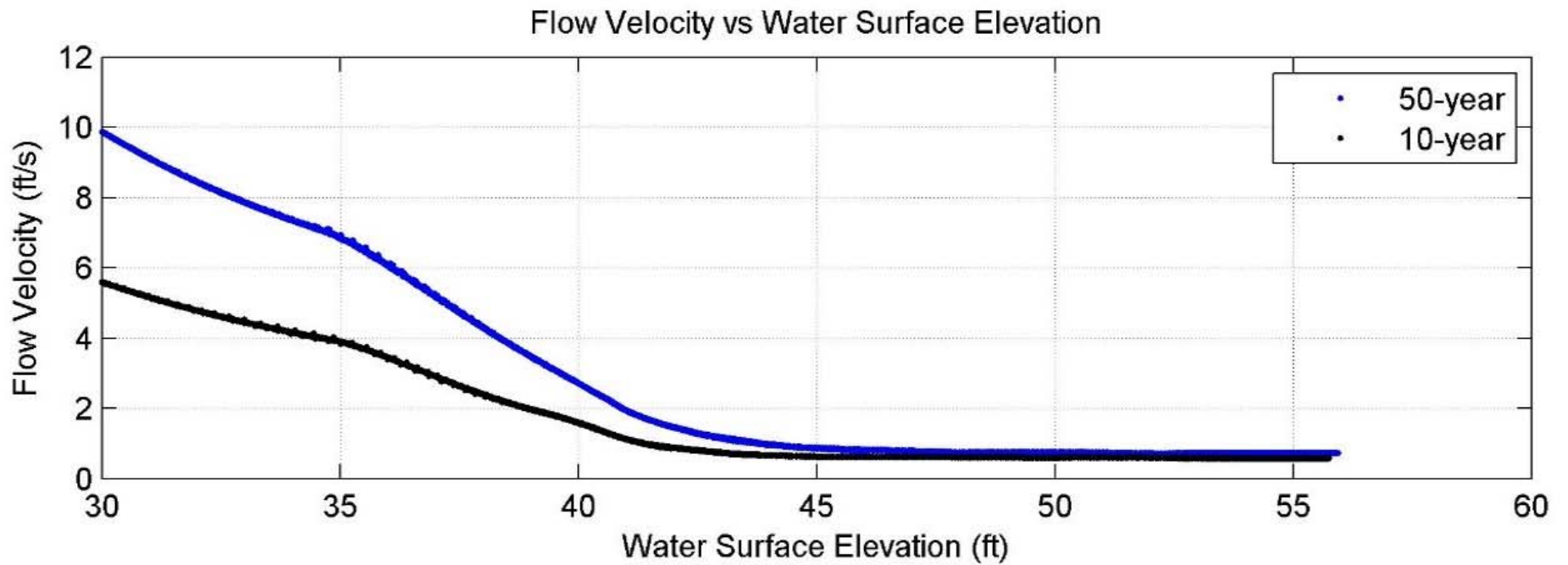
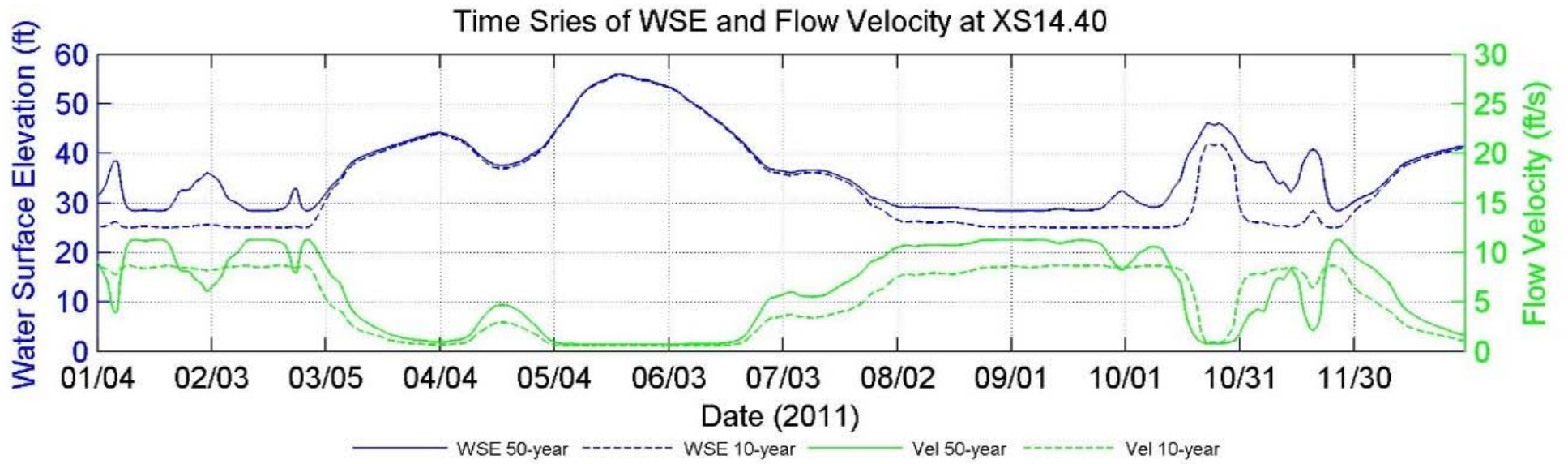


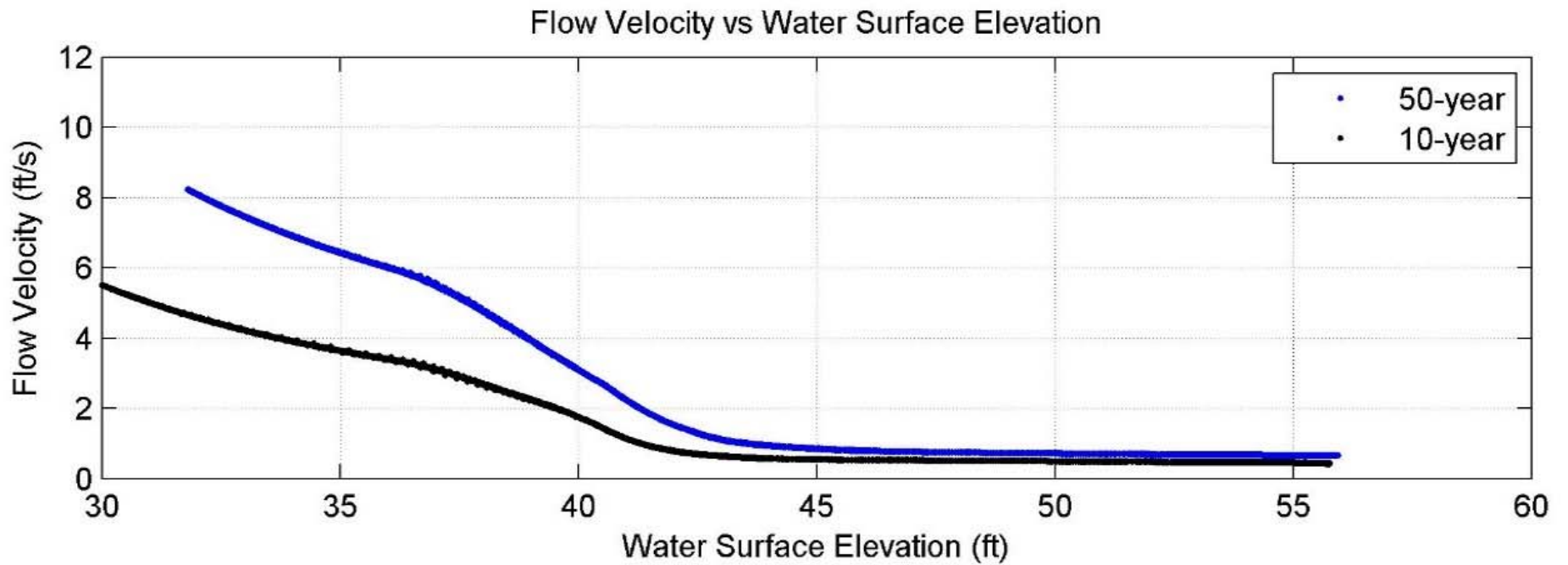
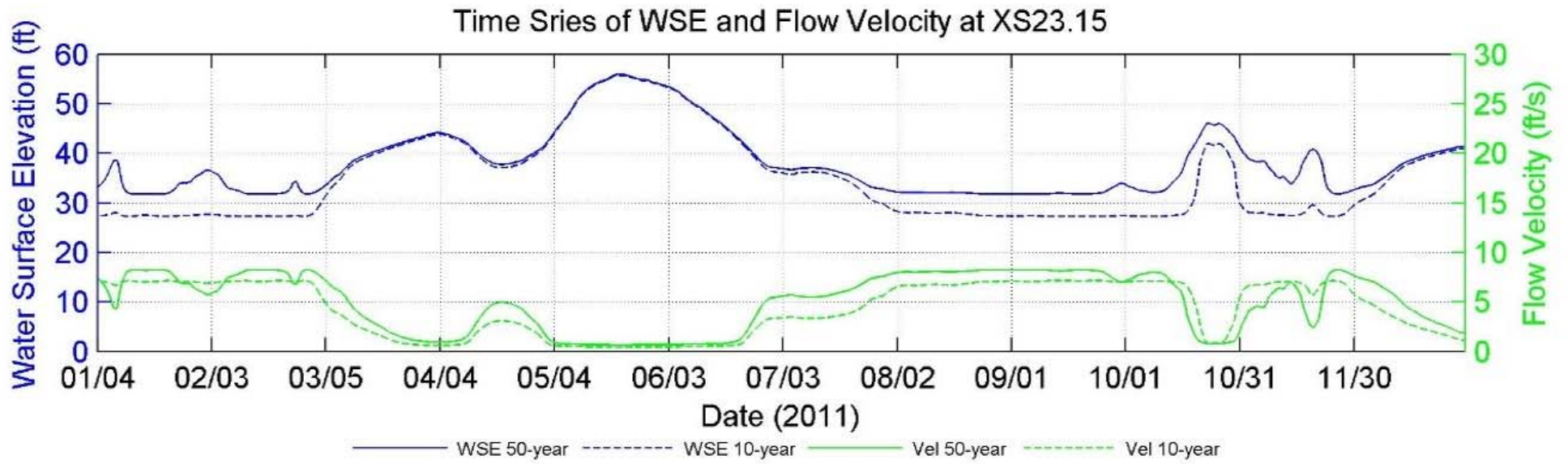


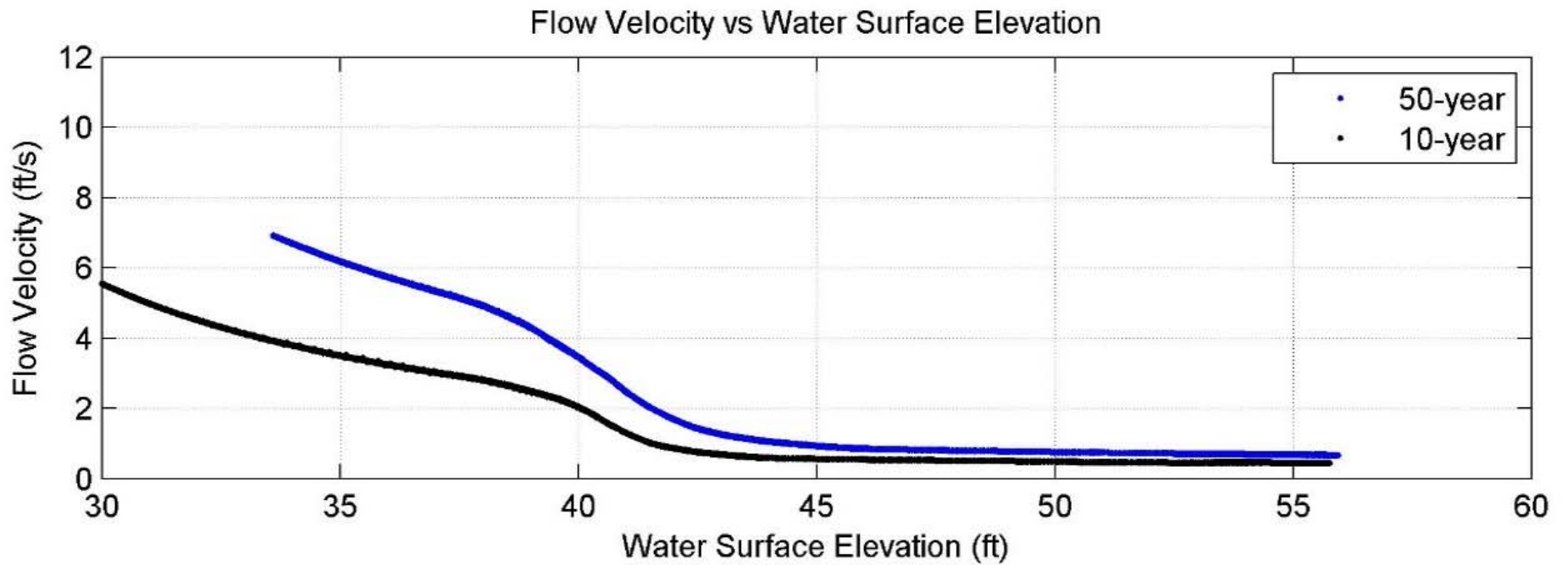
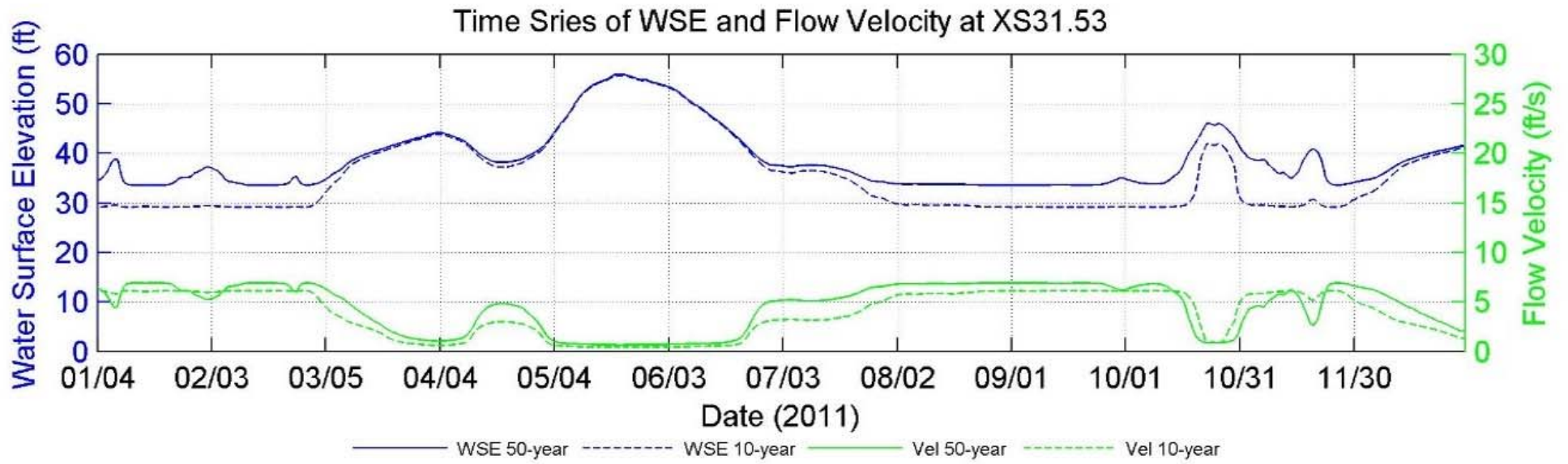


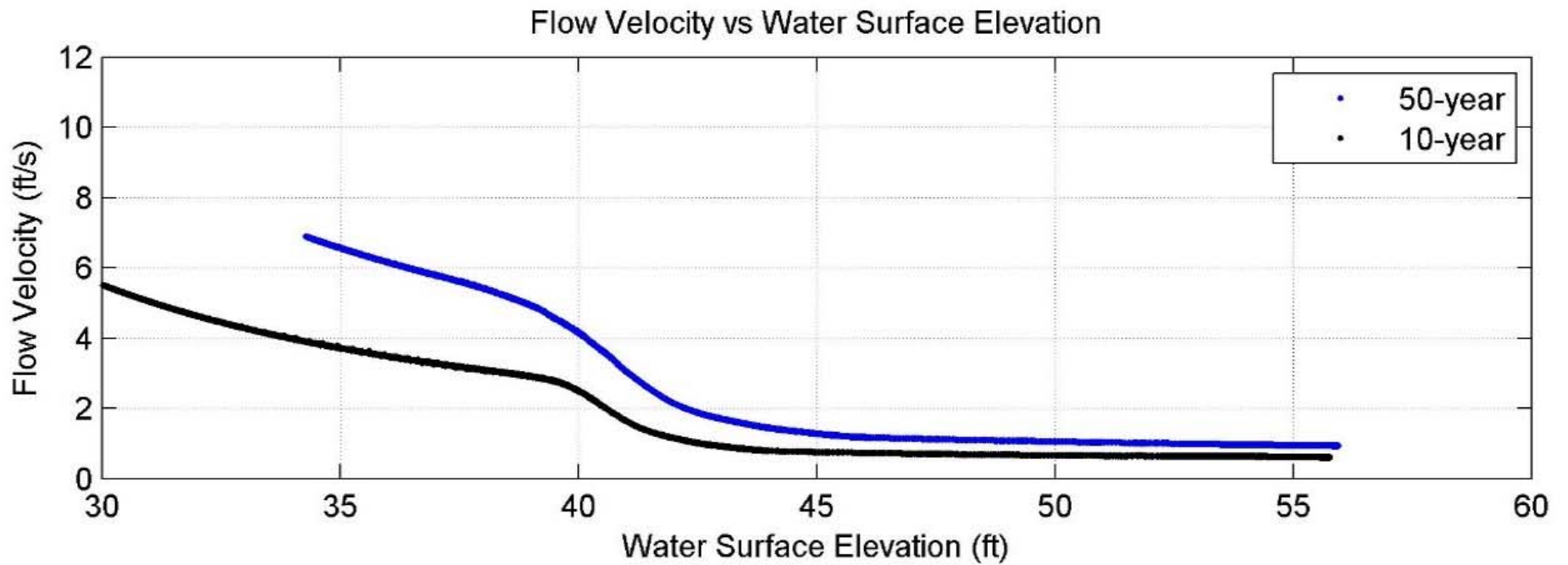
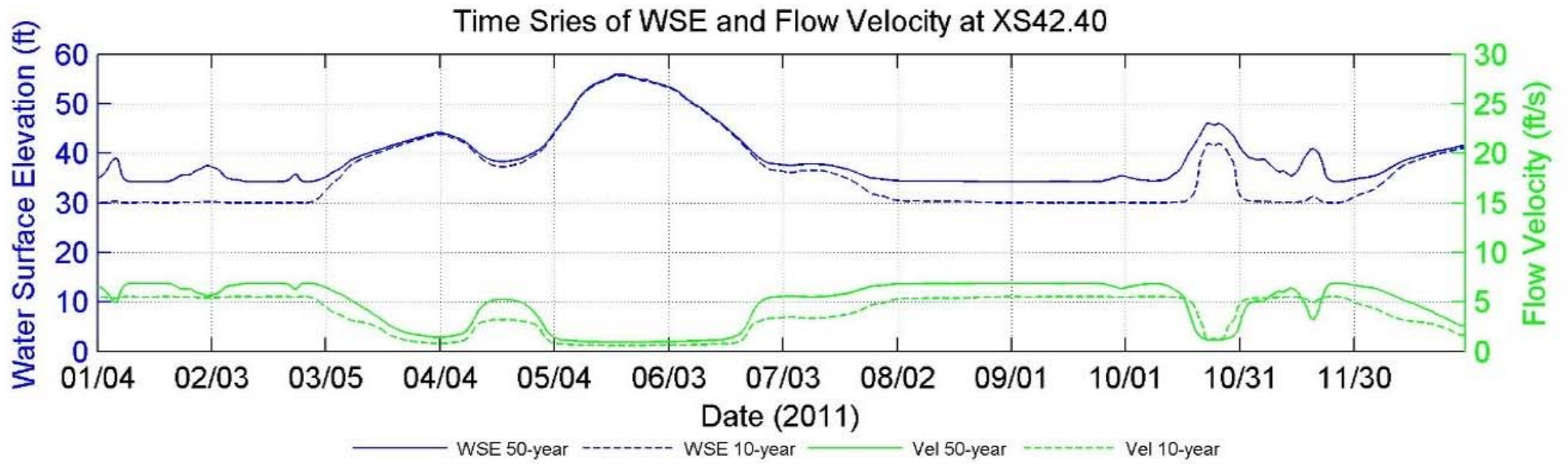


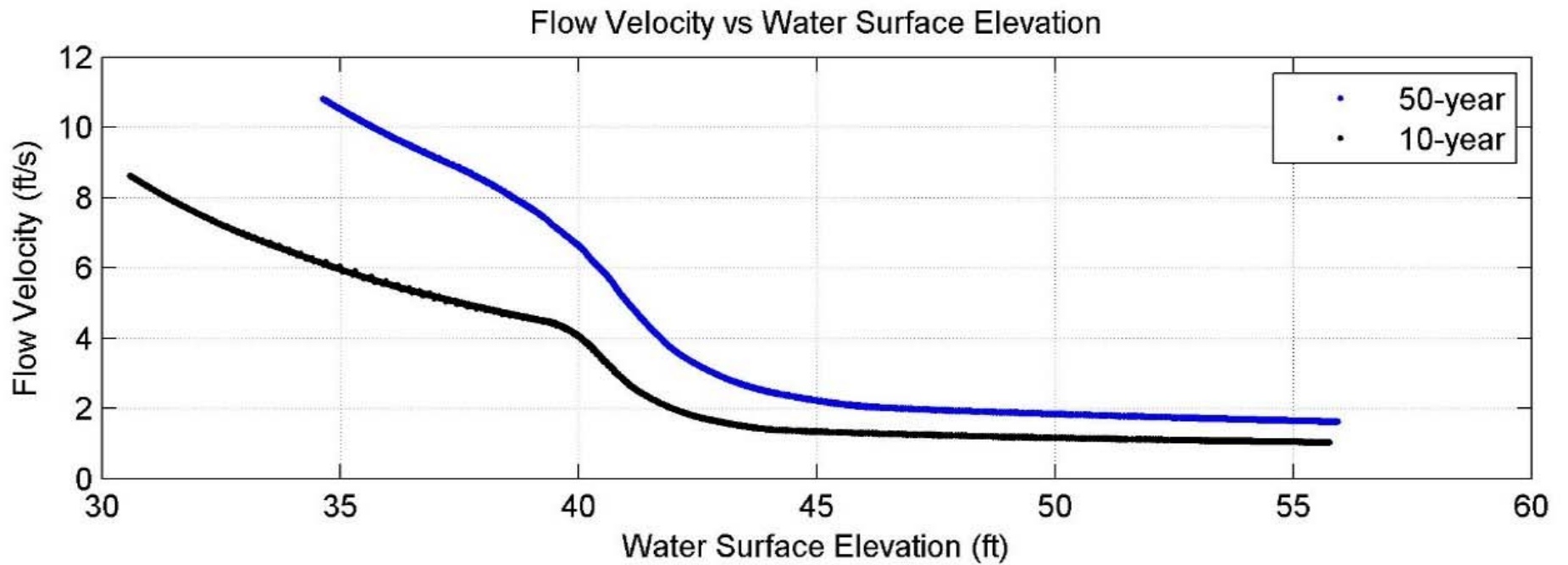
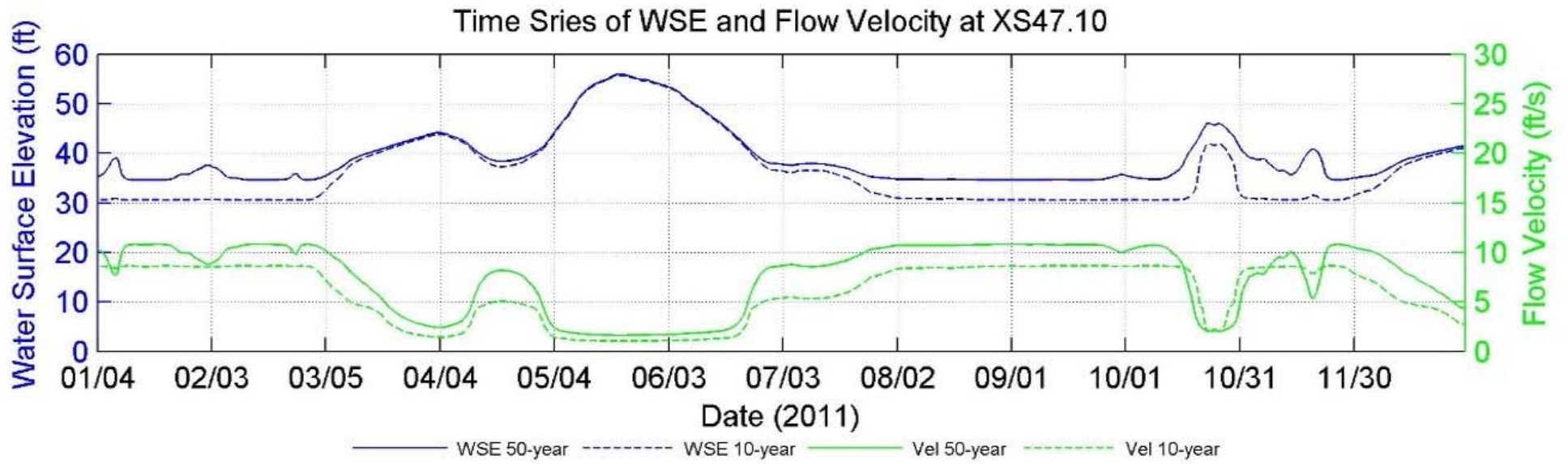












APPENDIX C

Stone Armor Sizing Calculation



APPENDIX D

Quantity Calculations



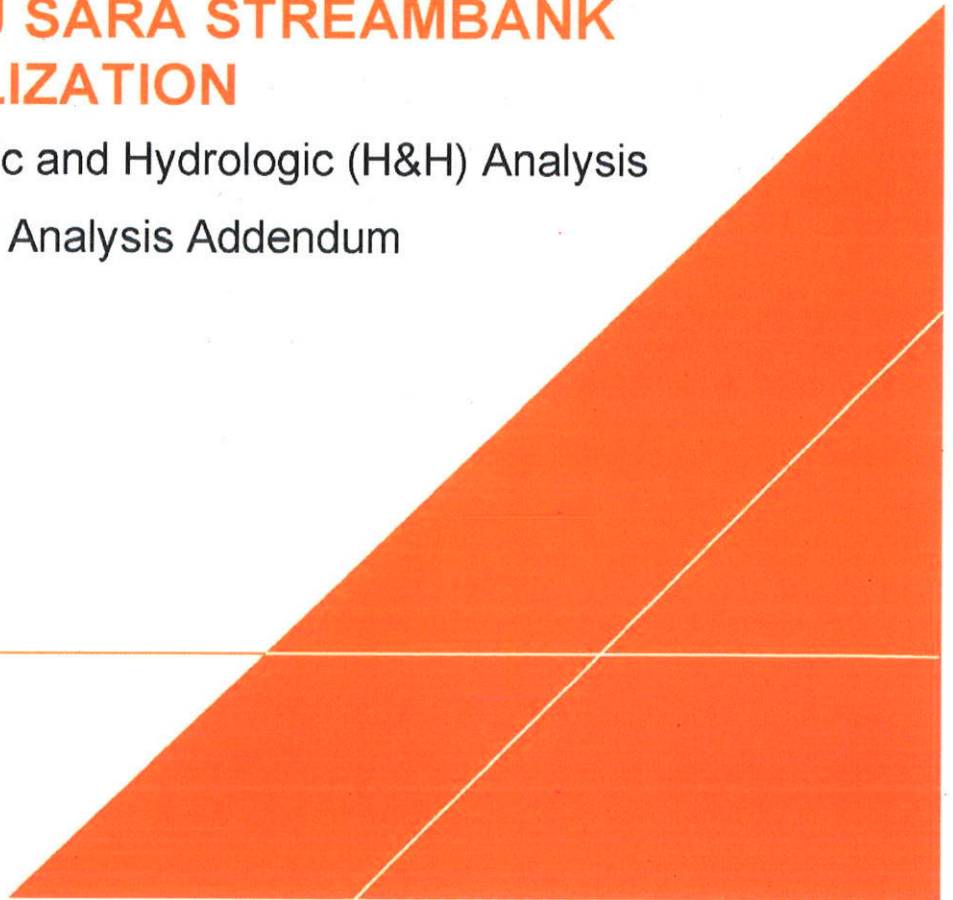


WEST FELICIANA PARISH

BAYOU SARA STREAMBANK STABILIZATION

- Hydraulic and Hydrologic (H&H) Analysis
- No Rise Analysis Addendum

May 15, 2017



BAYOU SARA STREAMBANK STABILIZATION

BAYOU SARA STREAMBANK STABILIZATION

- Hydraulic and Hydrologic (H&H) Analysis
- No Rise Analysis Addendum

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Our Ref.:
LA003333.0001.00002

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May 15, 2017

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BAYOU SARA STREAMBANK STABILIZATION

CONTENTS

Acronyms and Abbreviations.....	ii
1 Introduction.....	Error! Bookmark not defined.
1.1 Data Collection: Survey.....	1
1.2 Data Collection: Modeling.....	2
1.3 H&H Analysis.....	2
1.4 Model Validation.....	4
1.5 Assessment of River Flow in Bayou Sara.....	6
2 References.....	9

TABLES

Table 1. Bayou Sara Flow Rates and Given Return Frequencies.....	4
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FIGURES

Figure 1. Updated Channel Cross Sections.....	1
Figure 2. Bayou Sara Watershed.....	3
Figure 3. Regional Regression Equations.....	3
Figure 4. Model Calibration 2003.....	5
Figure 5. Model Validation 2011.....	6
Figure 6. Water Surface Elevation and Channel Flow Velocity along Bayou Sara.....	7
Figure 7. Water Surface Elevation and Channel Flow Velocity along Bayou Sara.....	8
Figure 8. Flow Impacts on WSE in Bayou Sara.....	8
Figure 9. Flow Impacts on WSE in Mississippi River.....	8
Figure 10. Mississippi River Discharge.....	9

APPENDICES

Appendix A: Model HEC-RAS Results

BAYOU SARA STREAMBANK STABILIZATION

ACRONYMS AND ABBREVIATIONS

BFE	Base Flood Elevation
cfs	Cubic Feet per Second
GNSS	Global Navigation Satellite System
GPS	Global Positioning System
HEC-RAS	Hydrologic Engineering Center River Analysis System
HUC	Hydrologic Unit Code
H&H	Hydraulic and Hydrologic
MPH	Morris P. Hebert, Inc.
NAVD88	North American Vertical Datum of 1988
NFF Program	National Flood-Frequency Program
RM	River Mile
USACE	U.S. Army Corps of Engineers
USGS	U.S. Geological Survey
WSE	Water Surface Elevation

1 SUMMARY

This technical report addendum identifies the data and methodology that were used to complete the NO-Rise Hydraulic and Hydrologic (H&H) Analysis for the stabilization of Bayou Sara's riverbanks due to rapidly increasing stream bank erosion. The analysis was conducted to demonstrate that the proposed streambank armoring solution would not significantly affect the 100-year floodplain of the project area. Based on the H&H data compiled from the analysis, it was concluded that the maximum increase in water surface elevation caused by the proposed feature is +0.70 feet in elevation. This case is only likely when the discharge in the Mississippi River (the tailwater condition), is very low (approximately 400,000 cfs), such as in the months of August through September. When the Mississippi River stage is higher, there are no significant observable differences in Future With and Without Project conditions.

1.1 Data Collection: Survey

As part of the analysis, recent survey data was incorporated into the U.S. Army Corps of Engineers' (USACE's) Hydrologic Engineering Center River Analysis System (HEC-RAS) model to more accurately capture the bathymetry and topography of Bayou Sara and its overbank areas by adding cross sections as noted in orange below (Figure 1). The site survey consisted of performing a single-beam bathymetry survey in order to gather data to support the hydrographic analysis. Morris P. Hebert, Inc. (MPH) surveyed eight transects spaced approximately every 100 feet within Bayou Sara on March 22, 2016. MPH performed the survey utilizing a 19-foot vessel with a 90-horsepower outboard motor with a draft of 1.5 feet. A Trimble Digital Surface Model 232 Differential Global Positioning System (GPS) receiver and antenna were set up approximately 5 feet from the stern of the vessel. The antenna was approximately 1.5 feet above the roof of the cabin of the vessel while the single-beam echosounder was mounted directly below the GPS receiver. The survey was conducted utilizing GPS-Navigation survey methods and sub-meter accuracies as defined by manufacturers' specifications. MPH utilized a 4-degree beam width Transducer with Odom Echotrac to perform the survey work. All raw data were collected and processed in HYPACK® survey software.



Figure 1. Updated Channel Cross Sections

BAYOU SARA STREAMBANK STABILIZATION

In order to reference the collected data to North American Vertical Datum of 1988 (NAVD88) elevations, MPH set a control point on site. The control point can be described as *"TO REACH THE MONUMENT FROM THE INTERSECTION OF HWY 61 AND HWY 3057, TRAVEL SOUTH ON HWY 3057 FOR 1.0 MI TO THE JUNCTION WITH HWY 1258/FERDINARD ST. TURN LEFT ON HWY 1258/FERDINARD STAND TRAVEL SOUTHWEST FOR 1.8 MI TO THE END OF THE ASPHALT ROAD. THE STATION IS ON THE LEFT APPROXIMATELY 20 FT NORTH OF THE END OF THE ASPHALT ROAD, 25 FT WEST OF THE CENTERLINE OF THE ROAD, AND 3 FT EAST OF THE FENCE LINE. IT IS A 3/4" IRON ROD WITH CAP DRIVEN TO GROUND LEVEL."* A combination Trimble R8 global navigation satellite system (GNSS) (base)/R8 GNSS (rover) GPS Receiver was used to continually monitor water elevations throughout the duration of the survey. A static survey was also performed while the control point was being observed. Trimble Business Center was used to process all GPS survey data collected.

1.2 Data Collection: Modeling

The primary purpose of the one-dimensional modeling analysis was to evaluate flow velocity and water surface elevation near the proposed river bank protection and to determine riprap size. The scope of services included obtaining topographic and bathymetric data; acquiring Mississippi River hydrodynamic data; setting up, modifying, calibrating, and validating the one-dimensional model; developing the design scenarios for model simulations; predicting the flow velocity; and sizing the riprap near the project location.

As discussed previously in the H&H report delivered during the 30% Design Phase, the HEC-RAS model was selected as the ideal tool because the USACE had an existing model from the 2011 high-flow event on the Mississippi River. This model was selected since the stage of the Mississippi River is the major contributor to stage and flow conditions in the lower reaches of Bayou Sara. Therefore, the behavior and conditions of the Mississippi River had to be fully captured and understood to determine flow and velocities within Bayou Sara, which are required for stone armor sizing calculations.

1.3 H&H Analysis

There are no stream gages or recorded data publicly available for the volume of flow in Bayou Sara attributable to precipitation runoff. The watershed of Bayou Sara is located in the Pine Hills Region. The U.S. Geological Survey (USGS) classifies watersheds and sub watersheds into various levels of aggregation. These are characterized by Hydrologic Unit Code (HUC) values. Bayou Sara's watershed corresponds to the HUC-10 level of classification and is depicted on Figure 2. To estimate the peak flow for upstream inflow, regional regression equations (Figure 3) were used to calculate the flow rate for different return periods based on USGS National Flood-Frequency (NFF) Program's "Methods for Estimating Flood Magnitude and Frequency in Rural Areas in Louisiana, 2001" (USGS 2001).

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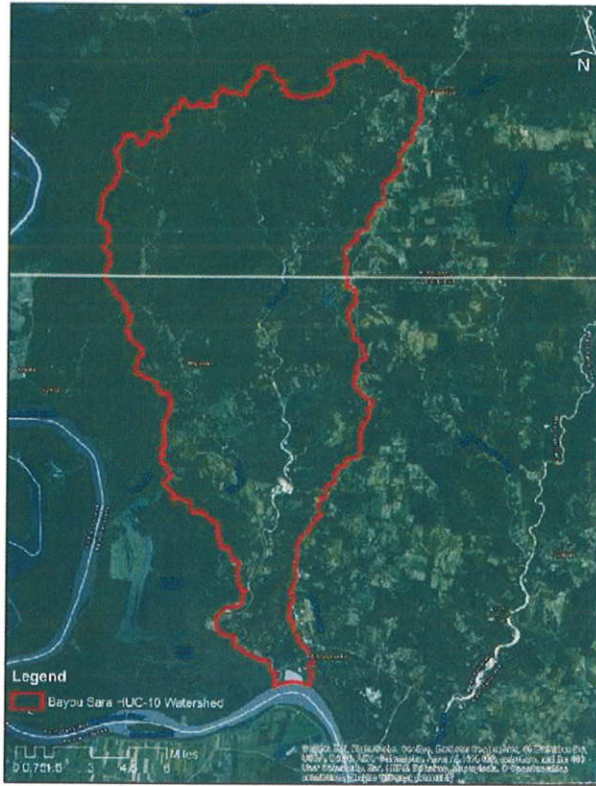


Figure 2. Bayou Sara Watershed

[Q_T , peak discharge for recurrence interval T, 2 to 500 years, in cubic feet per second; A, drainage area, in square miles; SLP, main channel slope, in feet per mile; AP, mean annual precipitation, in inches, during the period 1951-1980]

Regression equations	Standard error of estimate, in percent	Equivalent years of record
Pine Hills region		
$Q_2 = 5.80DA^{0.744}SLP^{0.374}(AP-35)^{0.796}$	±47	3
$Q_5 = 13.3DA^{0.760}SLP^{0.385}(AP-35)^{0.694}$	±42	5
$Q_{10} = 19.5DA^{0.768}SLP^{0.392}(AP-35)^{0.658}$	±41	6
$Q_{25} = 28.0DA^{0.778}SLP^{0.401}(AP-35)^{0.629}$	±43	8
$Q_{50} = 34.6DA^{0.785}SLP^{0.407}(AP-35)^{0.616}$	±46	9
$Q_{100} = 41.2DA^{0.791}SLP^{0.412}(AP-35)^{0.610}$	±49	9
$Q_{500} = 56.0DA^{0.803}SLP^{0.425}(AP-35)^{0.608}$	±57	10

Figure 3. Regional Regression Equations

BAYOU SARA STREAMBANK STABILIZATION

The following were measured and/or assumed for the regional regression equations:

Drainage Area (DA) = 448.49 square kilometers = 173.16 square miles

Main Channel Slope (SLP) = 10.08 feet per mile

Mean Annual Precipitation (AP) = 56 inches

Computing the values provides the following flow rates attributable to precipitation runoff in Bayou Sara for various return frequencies as shown in Table 1 where Q_T is the peak discharge for recurrence interval T, 2 to 500.

Table 1. Bayou Sara Flow Rates and Given Return Frequencies

Discharge Recurrence Interval	Discharge (cubic feet per second)
Q_2	7,190
Q_5	13,463
Q_{10}	18,735
Q_{25}	26,476
Q_{50}	33,058
Q_{100}	40,329
Q_{500}	59,727

For the No-Rise analysis, the design team altered the model's upstream and downstream boundary conditions for Bayou Sara. On the downstream end, the Mississippi River was assumed to be under normal flow conditions, which would limit influence of water surface elevations in Bayou Sara. On the upstream end, a 100-year flow of 40,329 cfs was modelled flowing down Bayou Sara towards the Mississippi River.

1.4 Model Validation

As was previously done in the 30% Design H&H analysis, model calibration was performed. As a recap from the previous analysis, the model domain for this study was extracted to only include the part of the USACE model from Baton Rouge, Louisiana, to Tarbert Landing (small domain) with a few cross sections added near the junction of Bayou Sara. The boundary conditions for the Mississippi River portion of the model include upstream inflow and downstream water stage. The daily hydrograph of discharge observed at Tarbert Landing was used for the upstream boundary conditions. The daily water stage observed at Venice was used as the downstream boundary conditions.

The HEC-RAS model was re-validated for the years of 2003 and 2011. Figure 3 and Figure 4 show a comparison between the observed and simulated water surface elevations at Red River Landing (RM 302.8), Bayou Sara (RM 265.38), and Baton Rouge (RM 228.5) for the validation periods. Because of the consistent match between the modeled and observed data, it was concluded that the model with revised cross-sections described in Section 1.1 is still valid to reproduce river hydraulics at the study site.

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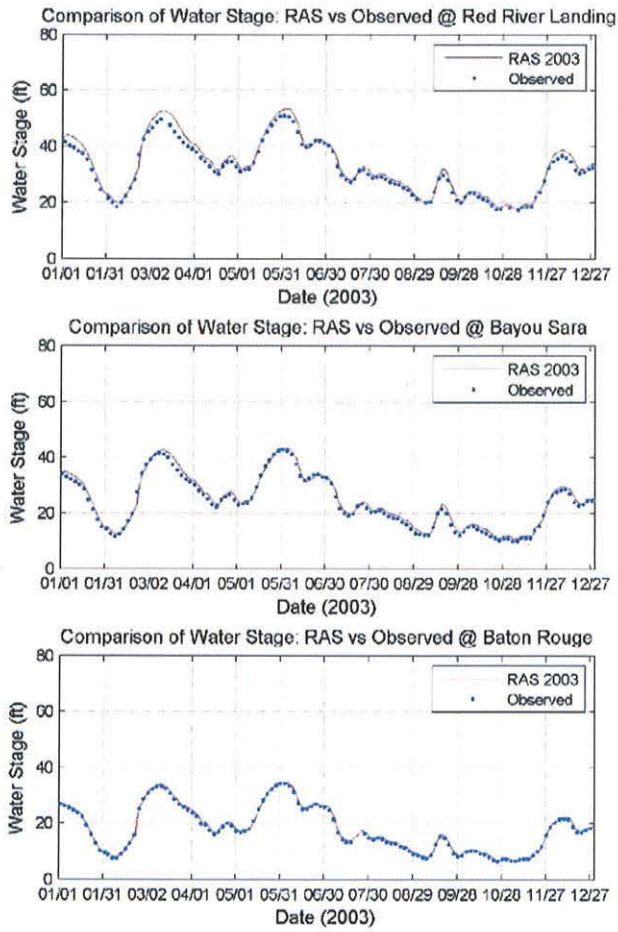


Figure 4. Model Calibration 2003

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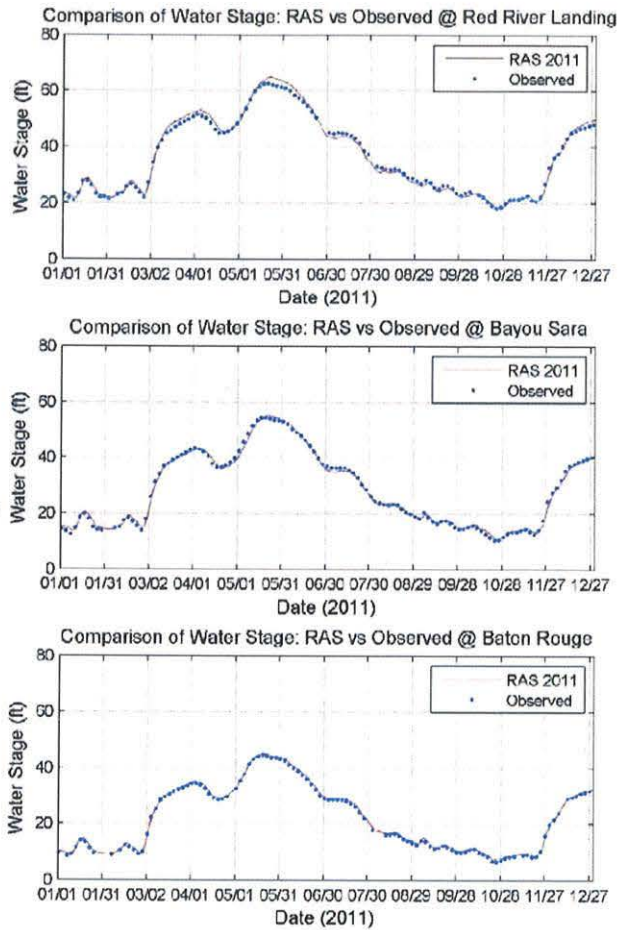


Figure 5. Model Validation 2011

1.5 Assessment of River Flow in Bayou Sara

Using the validated HEC-RAS model, simulations were performed to assess the river flow with and without the proposed project under the 100-year recurrence frequency flow rate. The purpose of this H&H Analysis was to assess what, if any, impacts the proposed features would have on the water surface elevation (WSE) in Bayou Sara floodplain. In summary, with the project implemented, the water levels at cross-sections near the project feature were slightly elevated (< 1.0-foot total change) when the stage was lower than the 100-year Base Flood Elevation (BFE), but showed no change when stage was at or higher than the 100-year BFE. For downstream cross-sections near the Mississippi River, there was no

BAYOU SARA STREAMBANK STABILIZATION

noticeable impact on the WSE due to the implementation of the project. Three types of plots were provided in Appendix A for reference:

- 1) Flow condition plots: time series of flow stage and flow velocity for "Future With Project" and "Future Without Project" conditions at the 100-year recurrence frequency.
- 2) Difference in flow condition between "Future with Project" and "Future Without Project" conditions at the 100-year recurrence frequency.
- 3) Flow stage and difference in flow stage.

The WSE and channel velocity time series demonstrated that the water level in lower Bayou Sara does not appreciably change with the project feature in-place when stage in the Mississippi River is at normal or high flow conditions; the maximum WSE change is +0.70 feet (Figures 6 & 7) near where the upstream revetment begins, but this condition is only observed when the Mississippi River is in low flow conditions AND the flows down Bayou Sara are less than the 100-year flow (Figures 8 & 9). For comparison, the discharge plots for the Mississippi River for 2003 and 2011 are shown in Figure 10. All model results are provided in Appendix A.

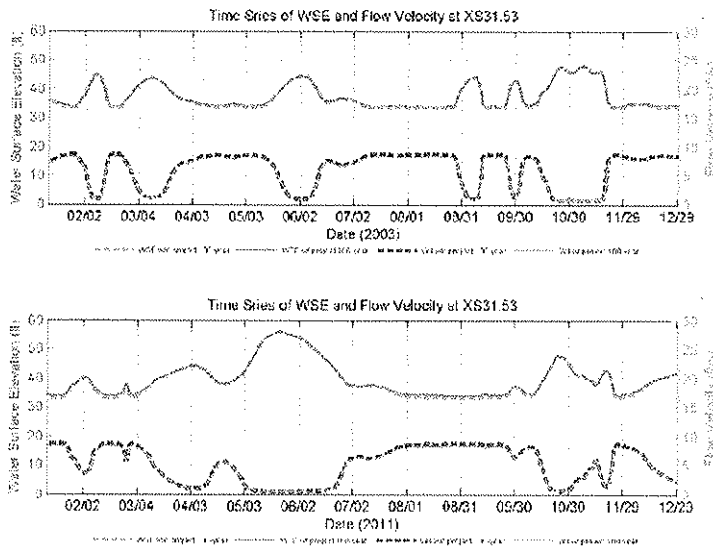


Figure 6. Water Surface Elevation and Channel Flow Velocity along Bayou Sara

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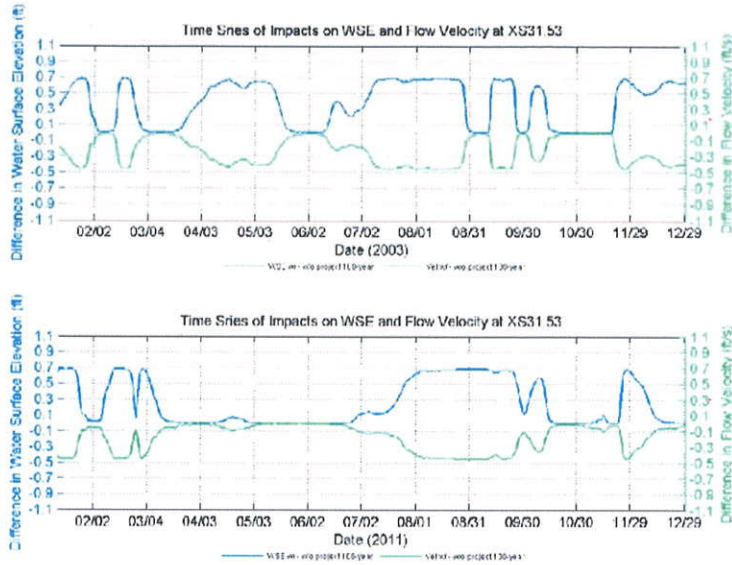


Figure 7. Water Surface Elevation and Channel Flow Velocity along Bayou Sara

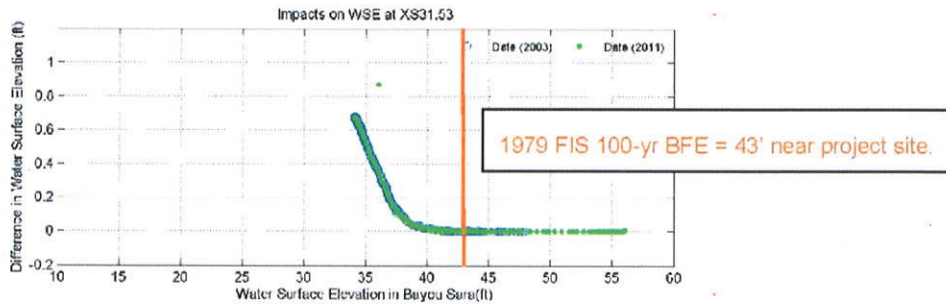


Figure 8. Flow Impacts on WSE in Bayou Sara

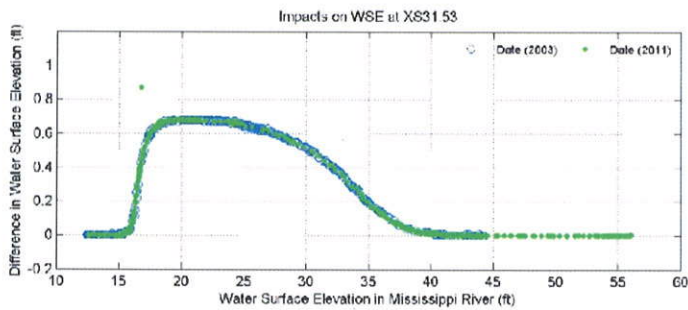


Figure 9. Flow Impacts on WSE in Mississippi River

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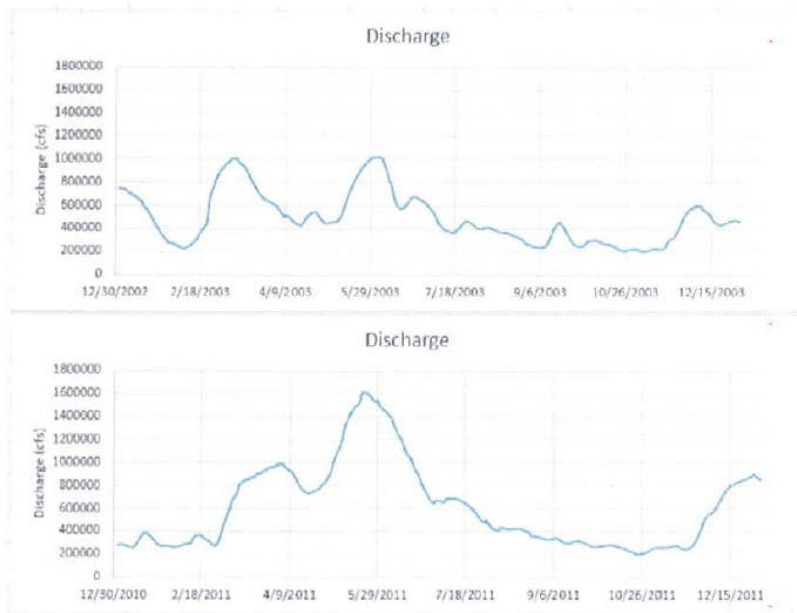
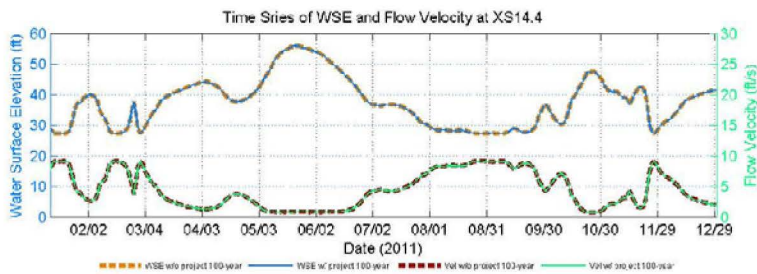
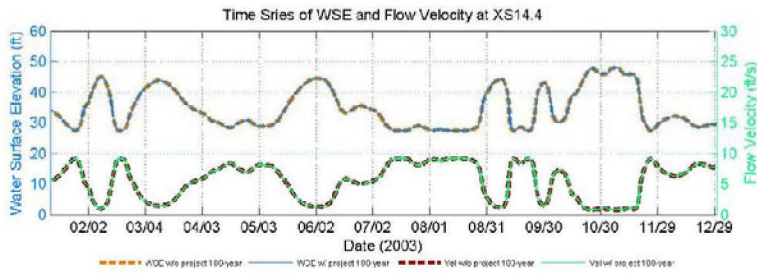
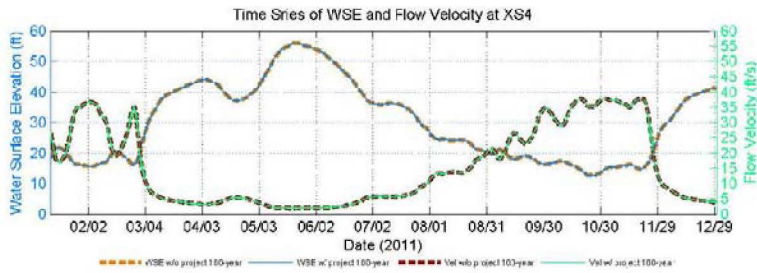
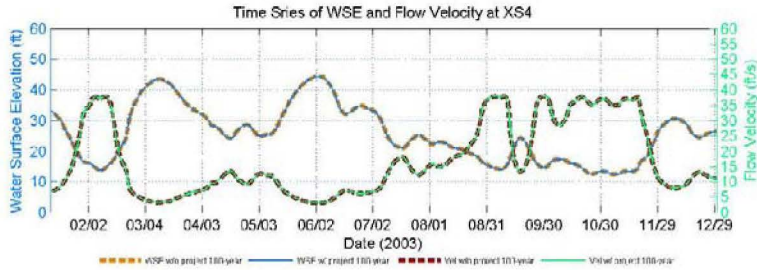


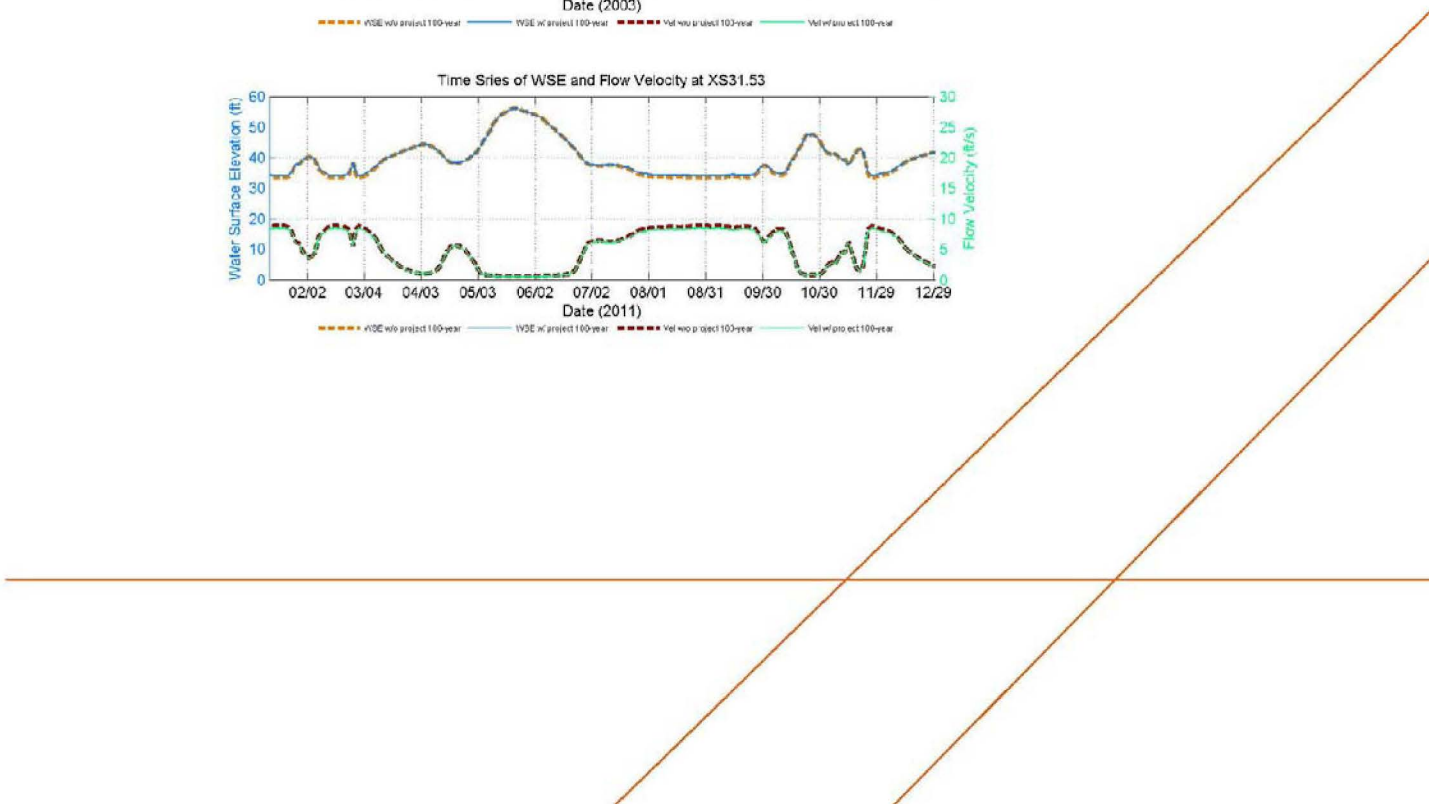
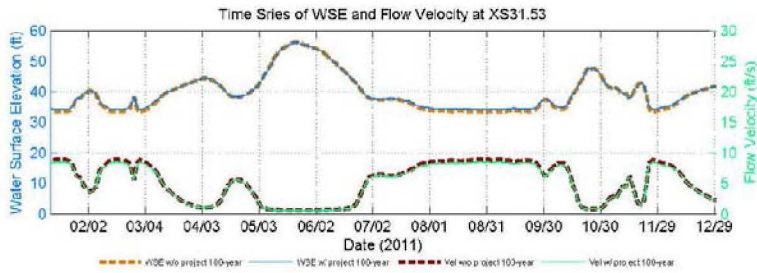
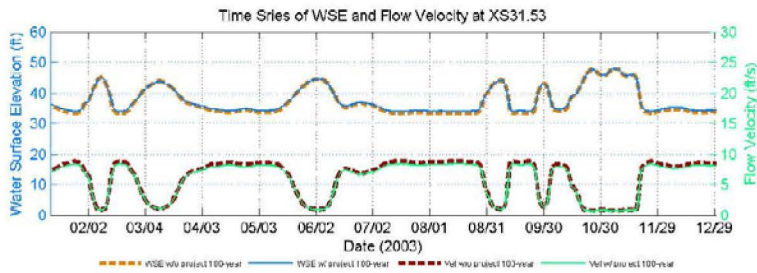
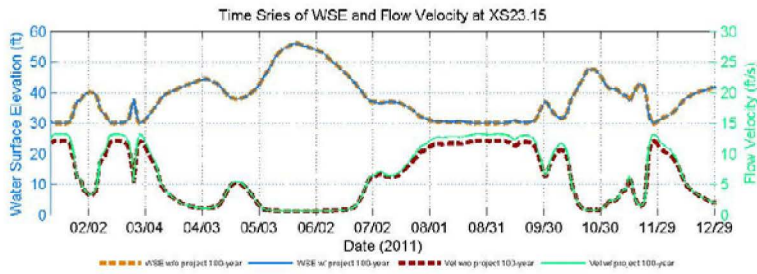
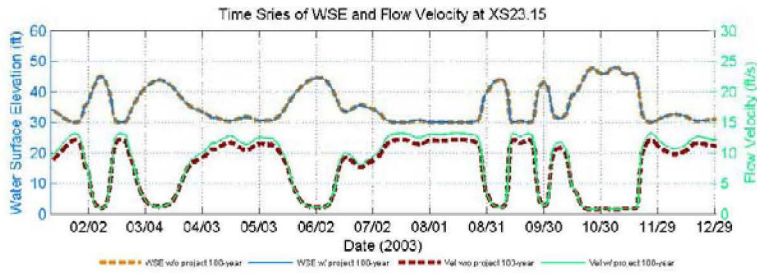
Figure 10. Mississippi River Discharge

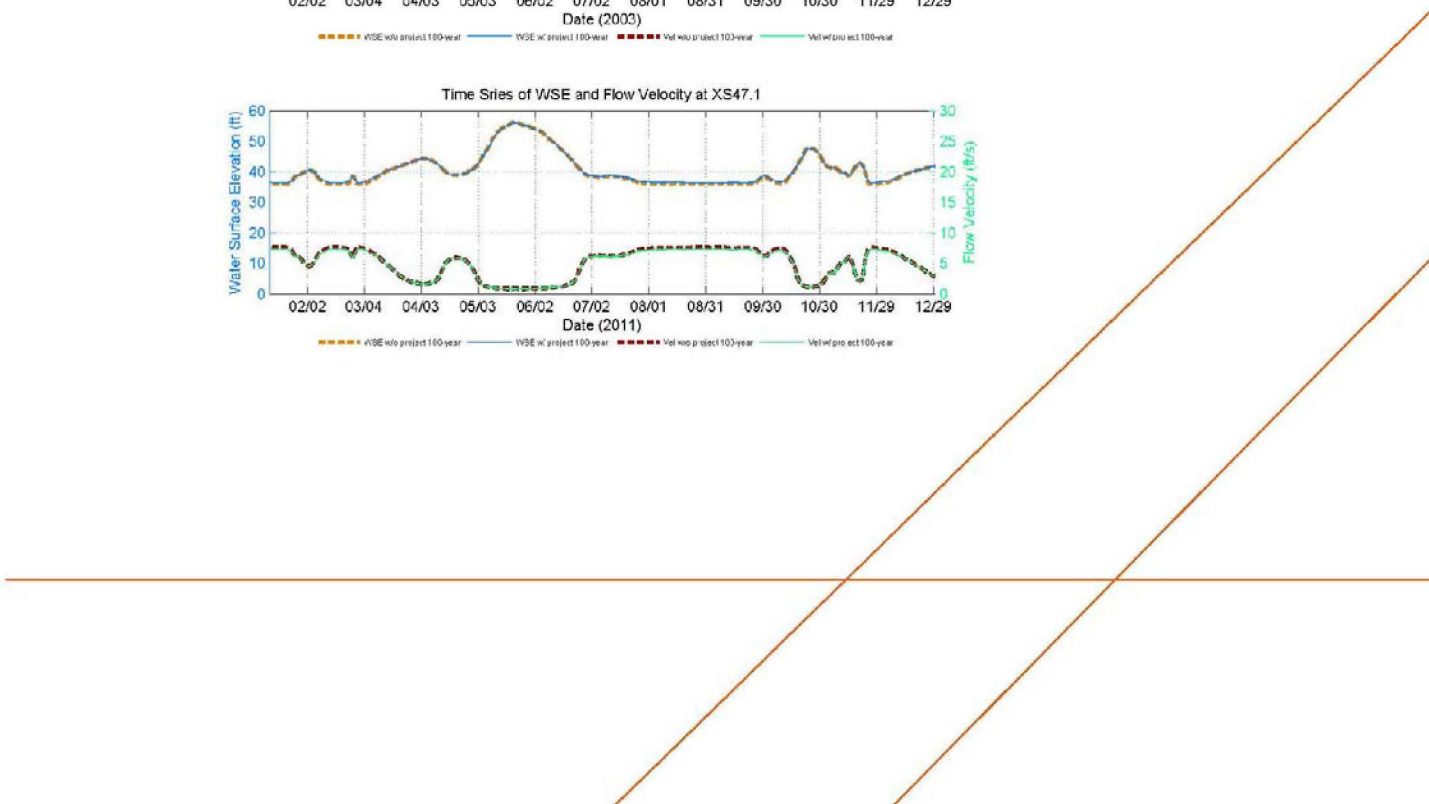
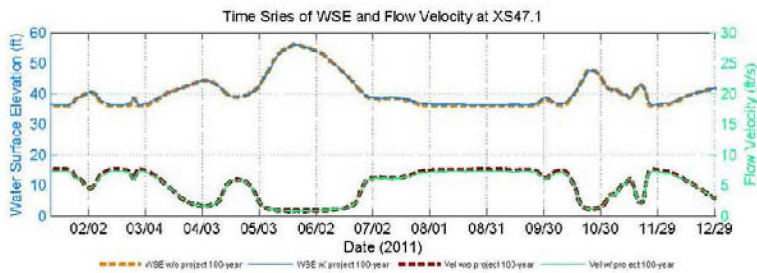
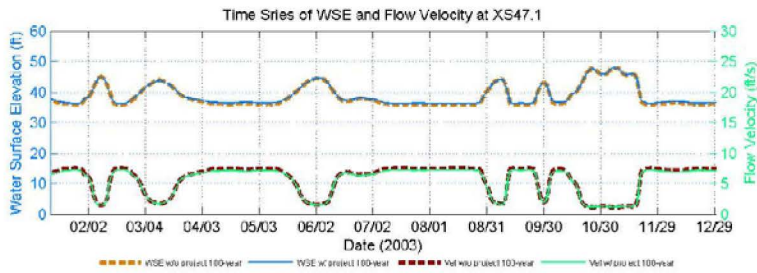
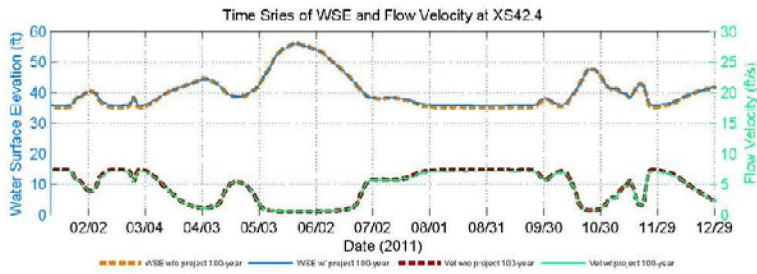
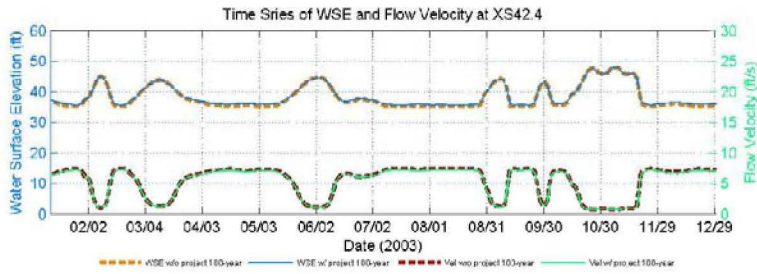
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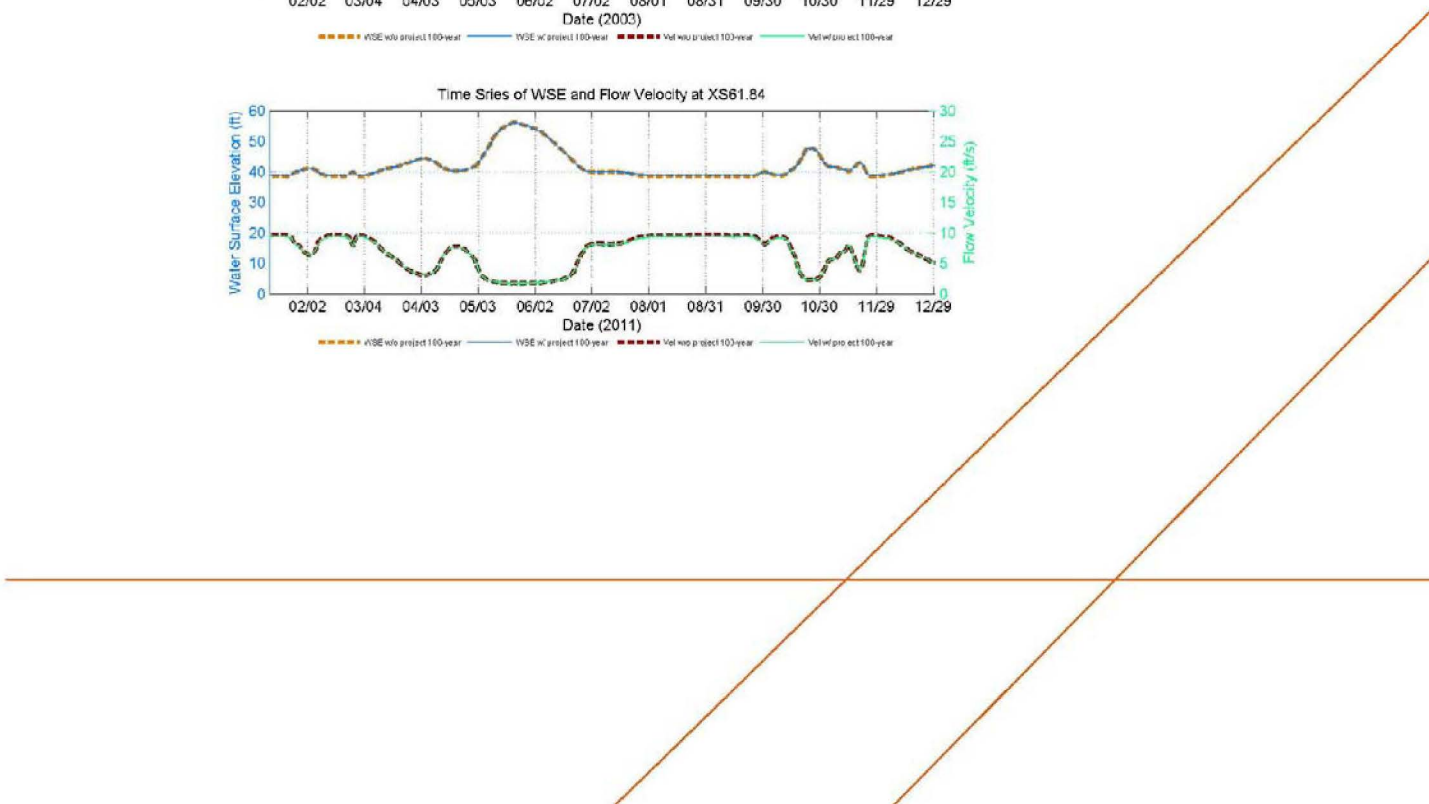
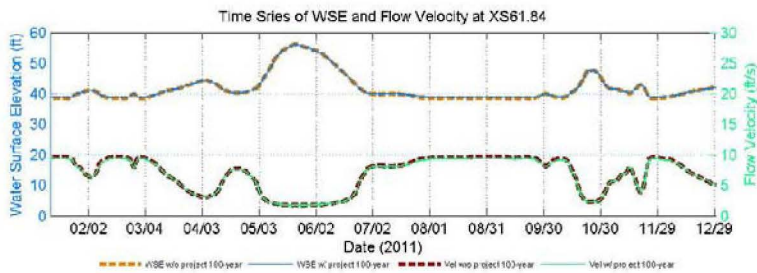
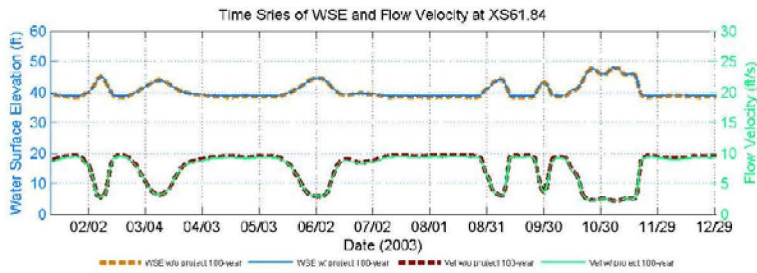
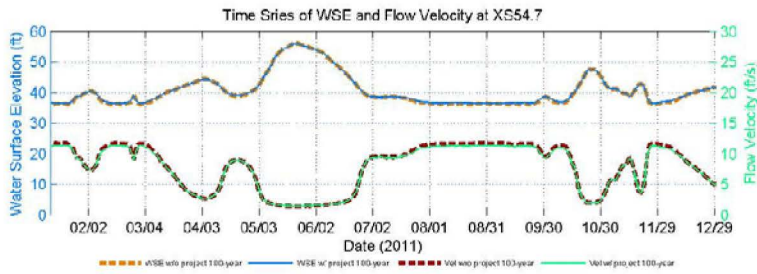
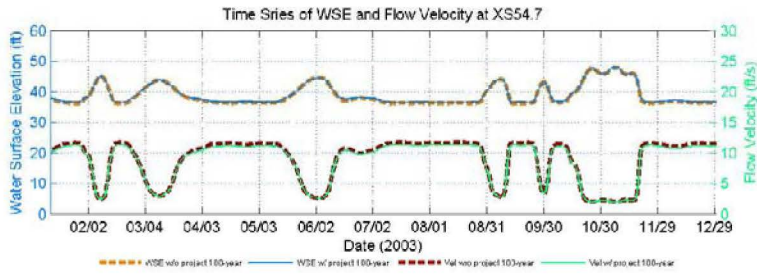
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<http://rivergages.mvr.usace.army.mil/WaterControl/new/layout.cfm>. Last accessed: May 26.
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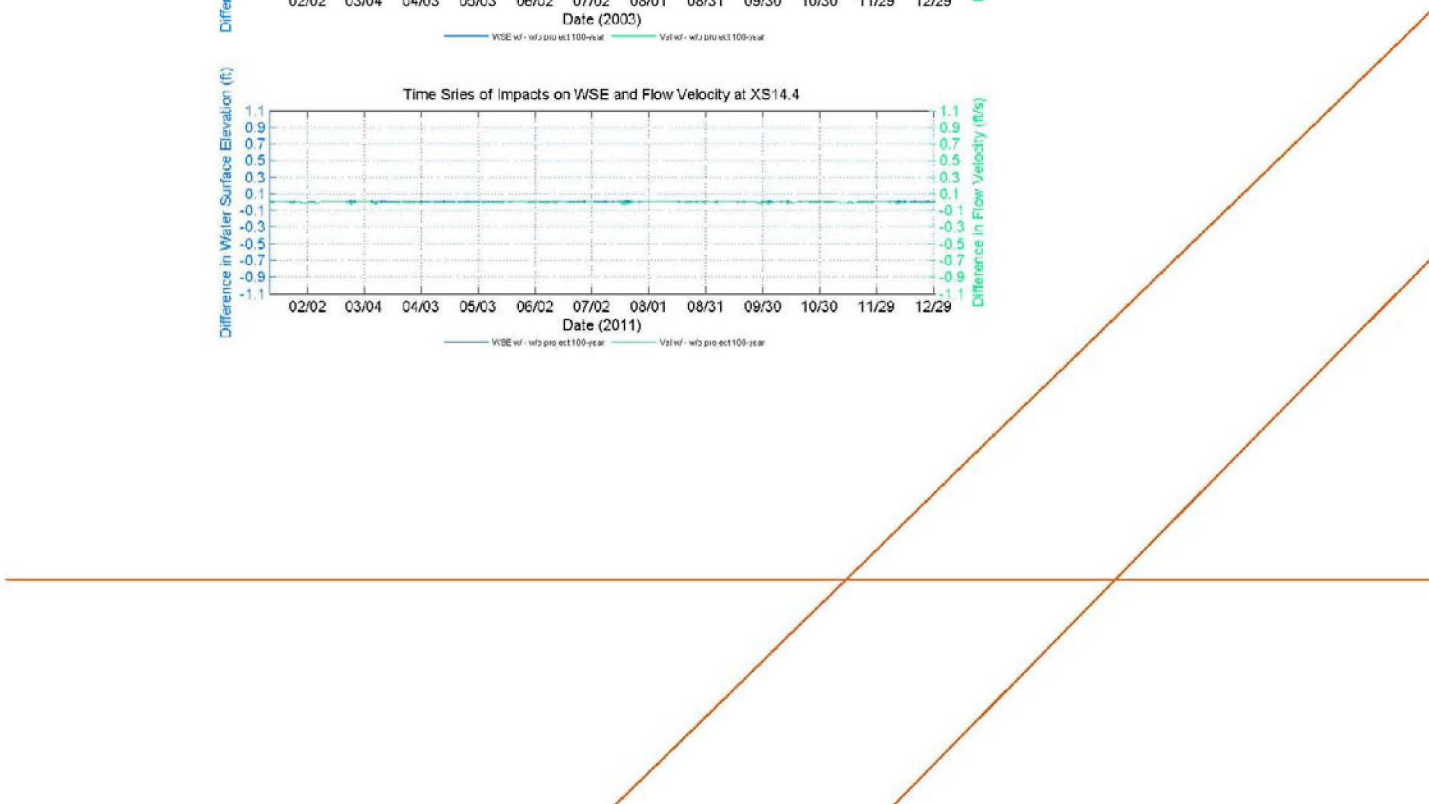
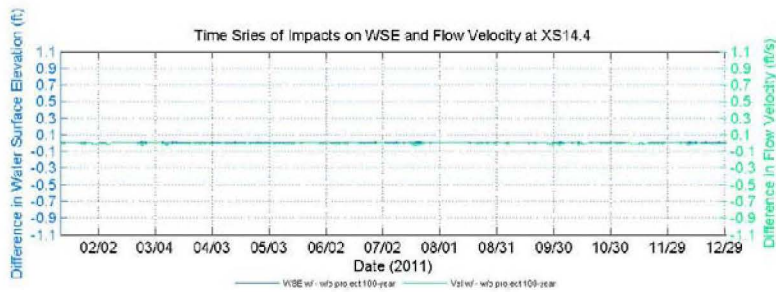
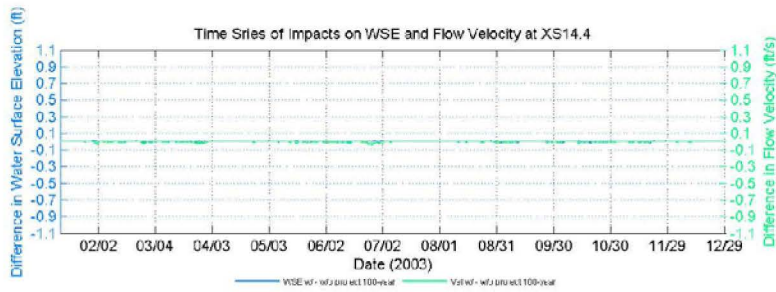
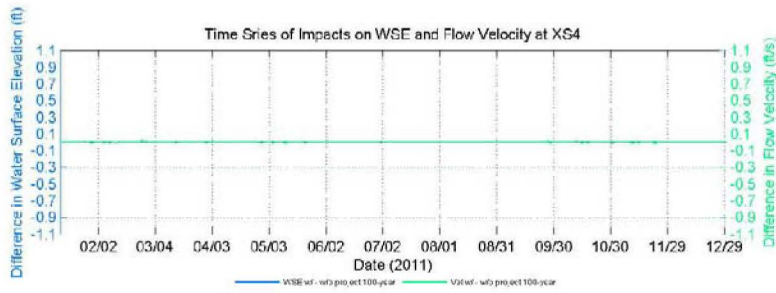
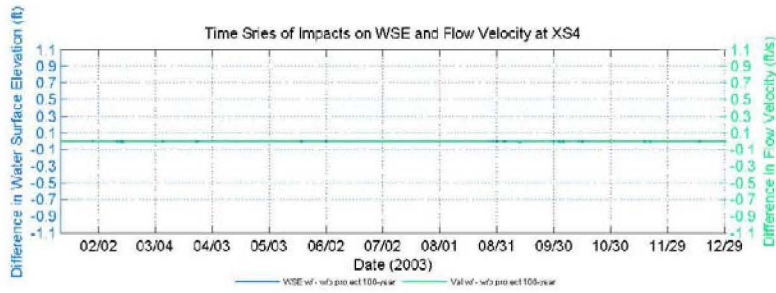
Appendix A: Model HEC-RAS Results

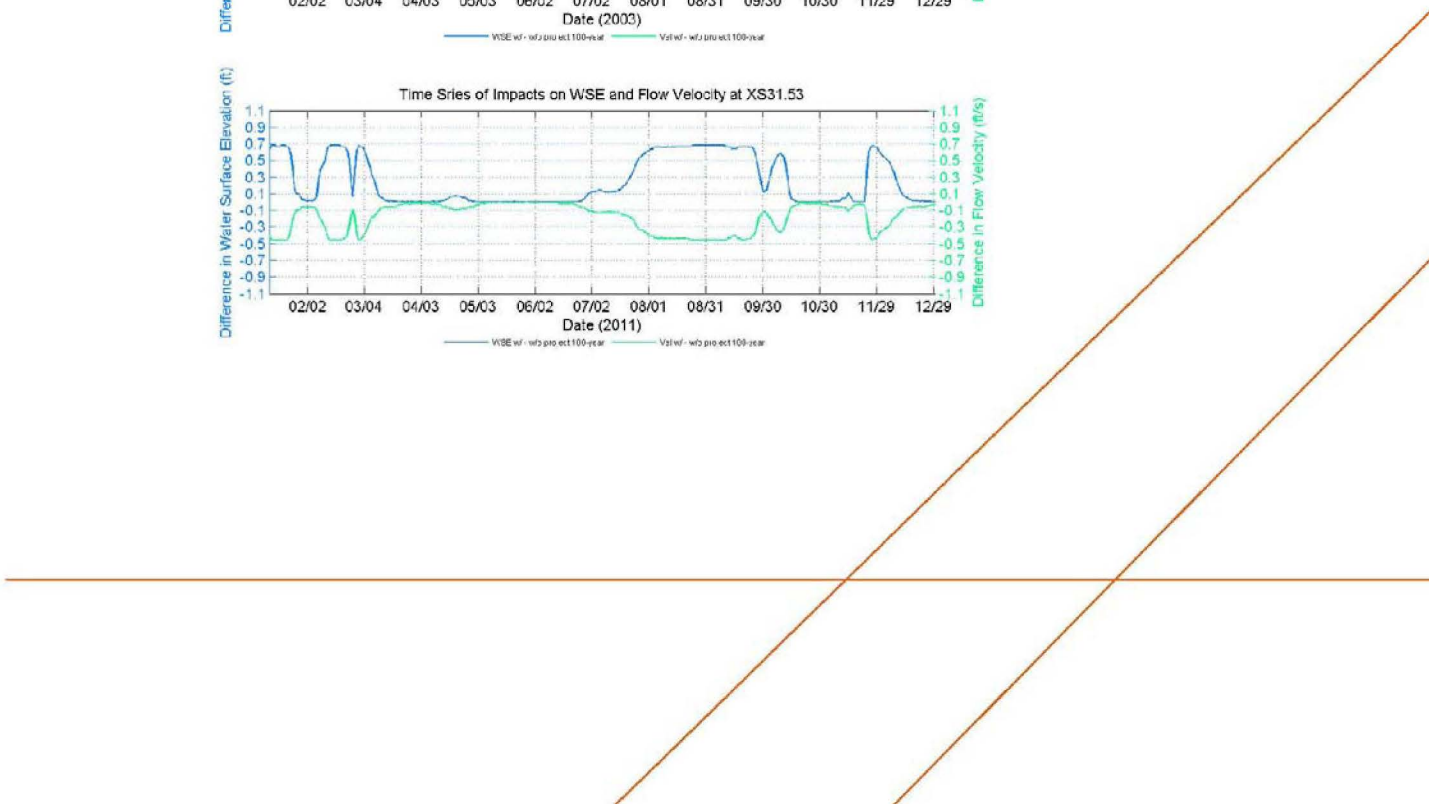
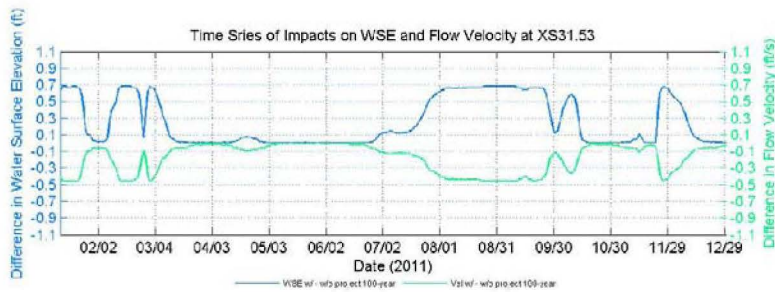
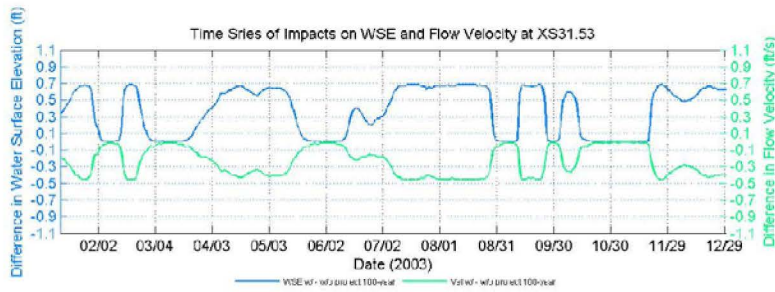
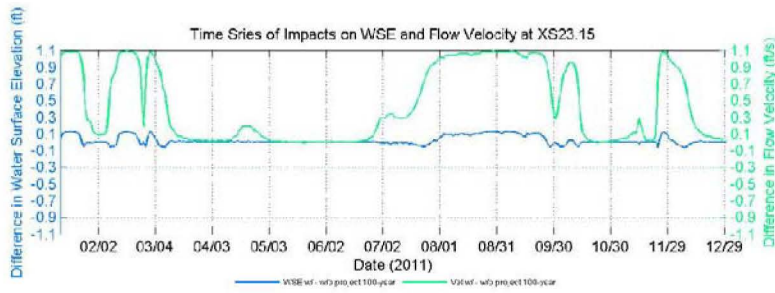
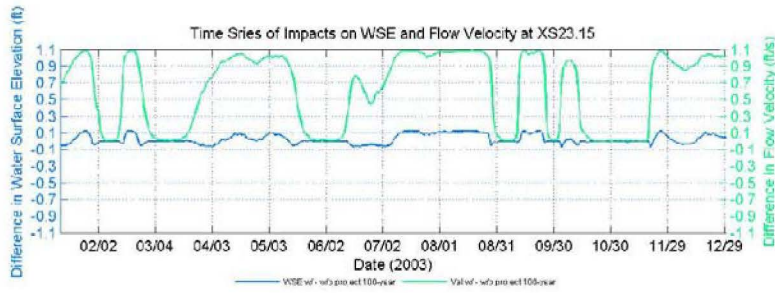


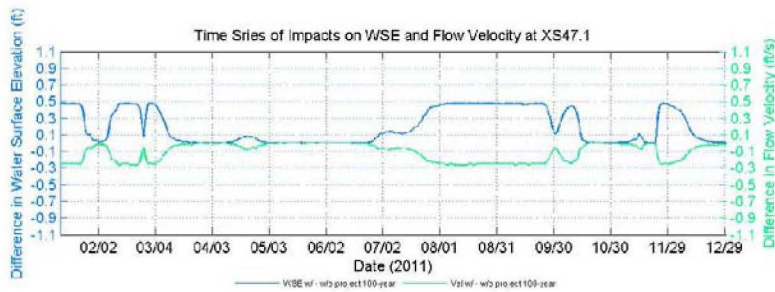
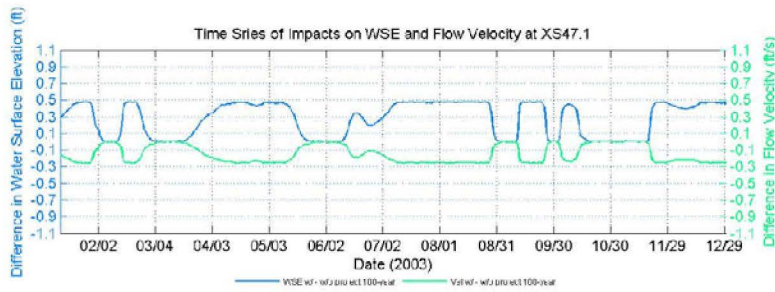
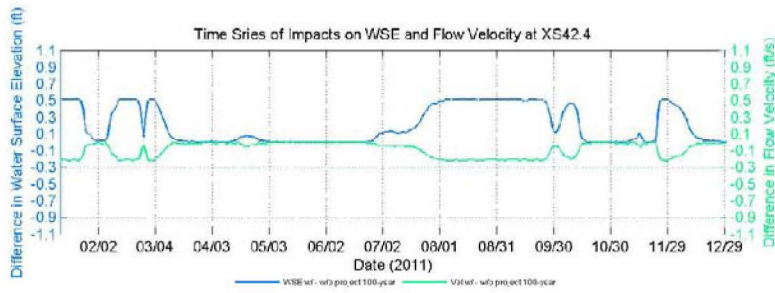
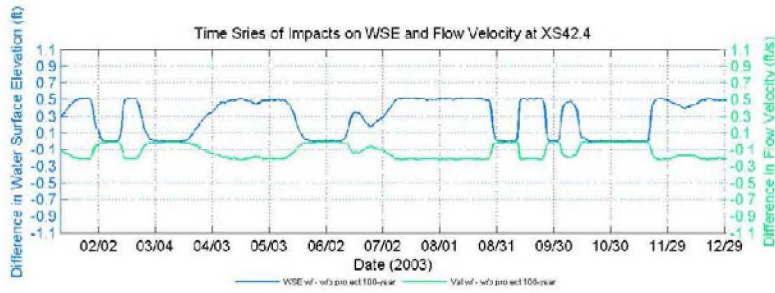


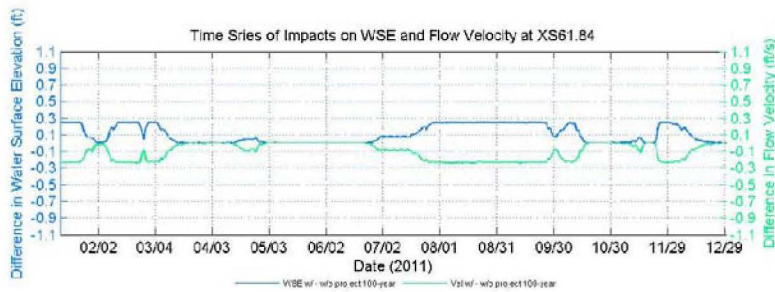
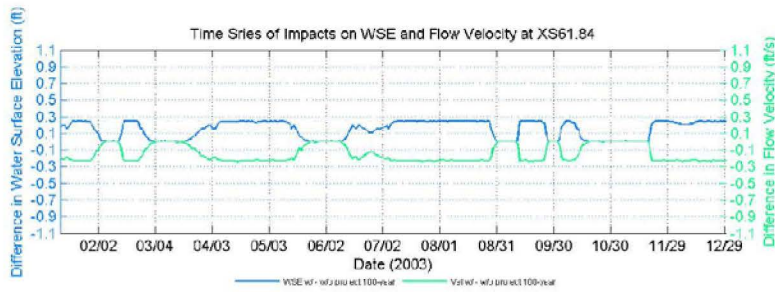
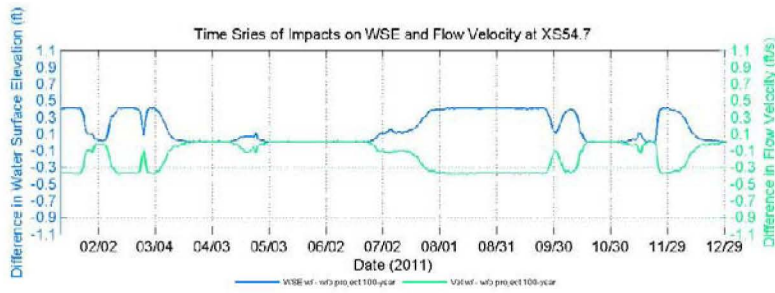
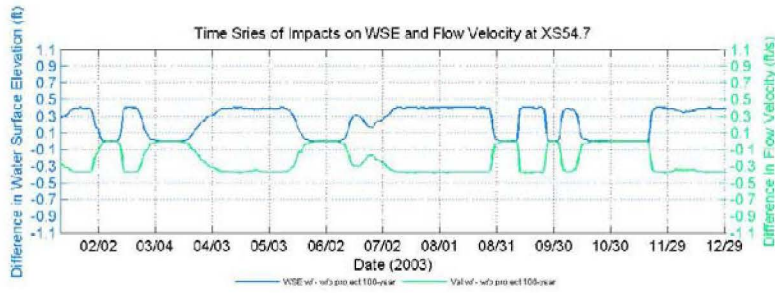


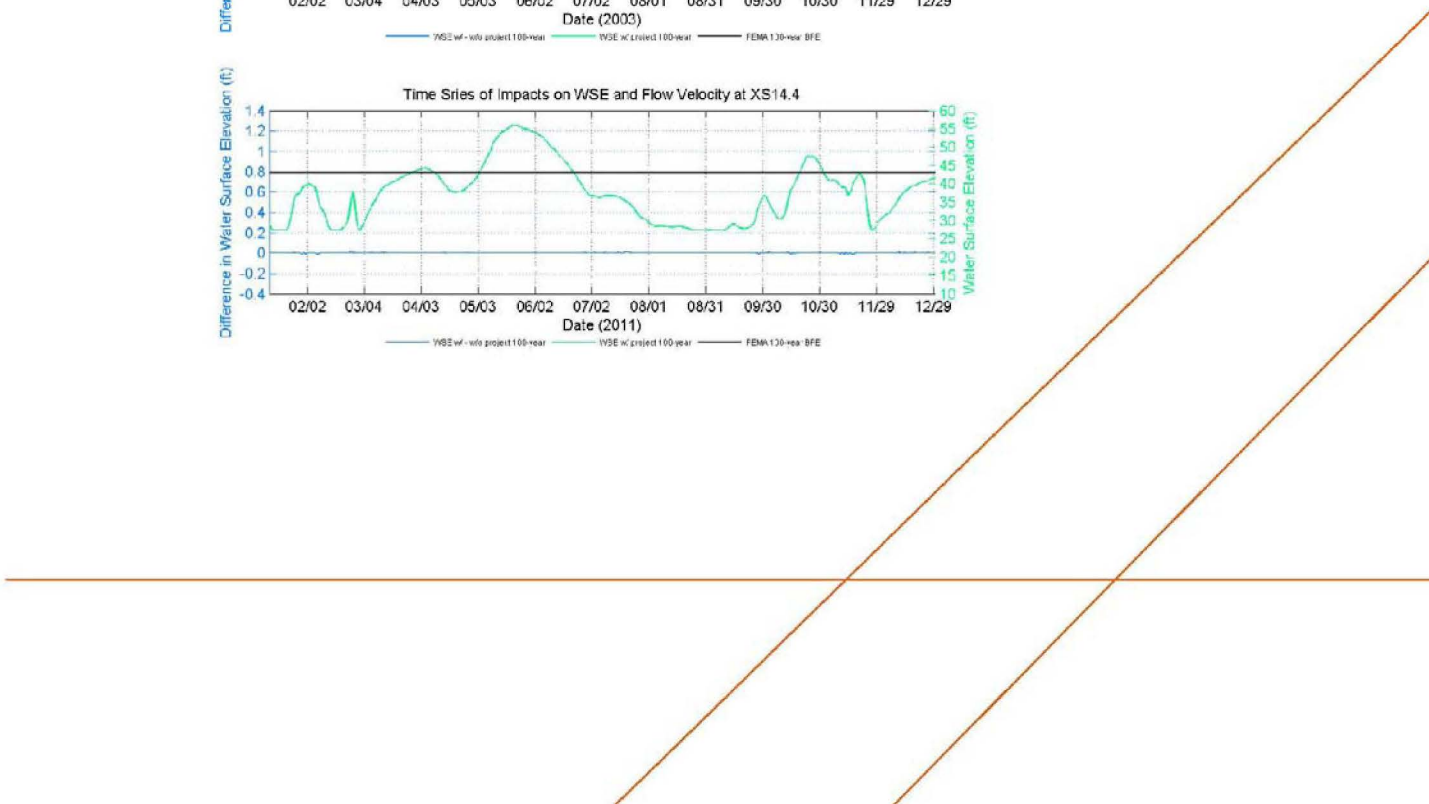
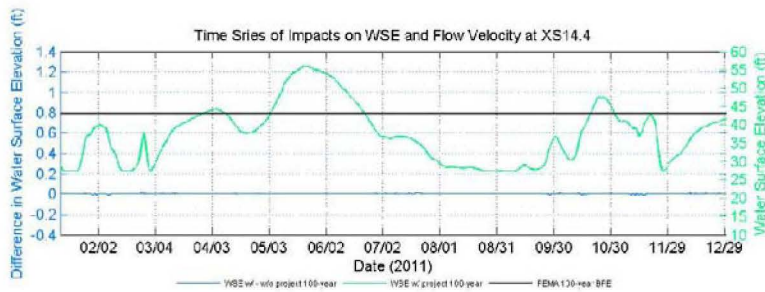
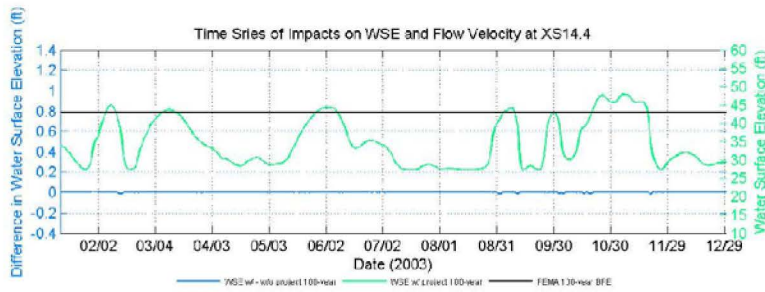
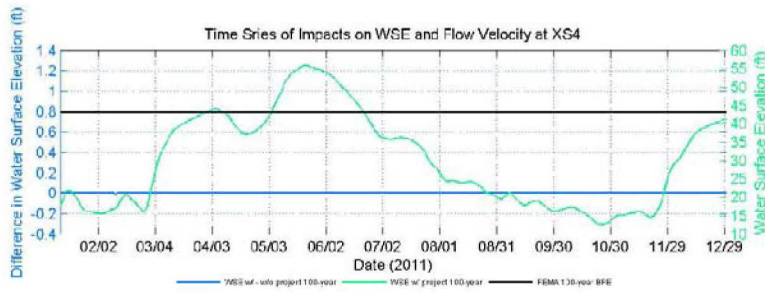
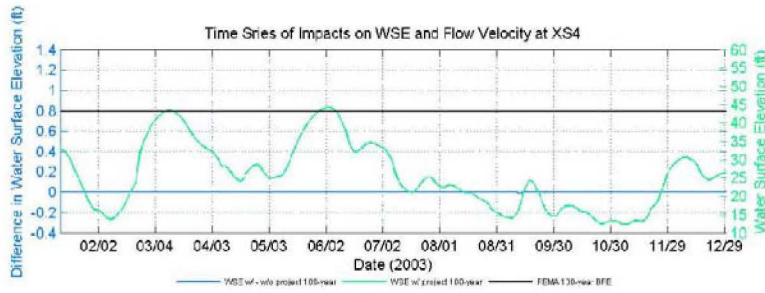


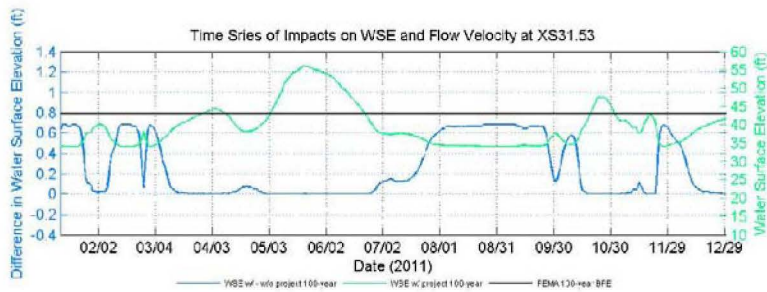
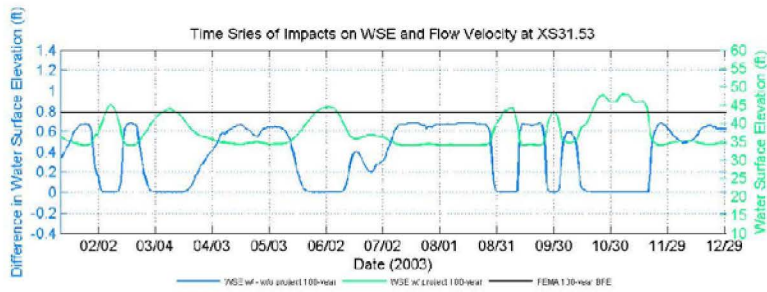
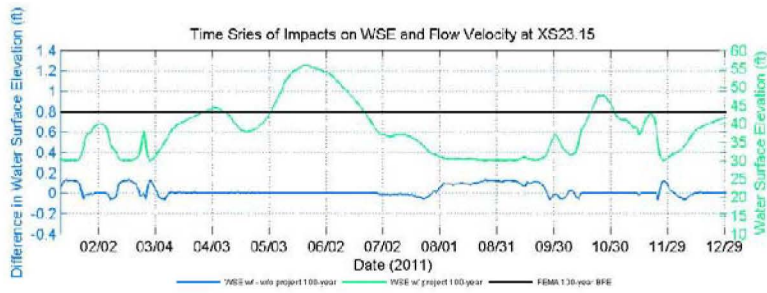
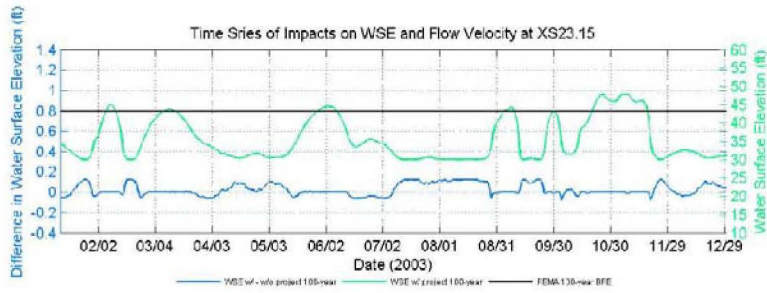


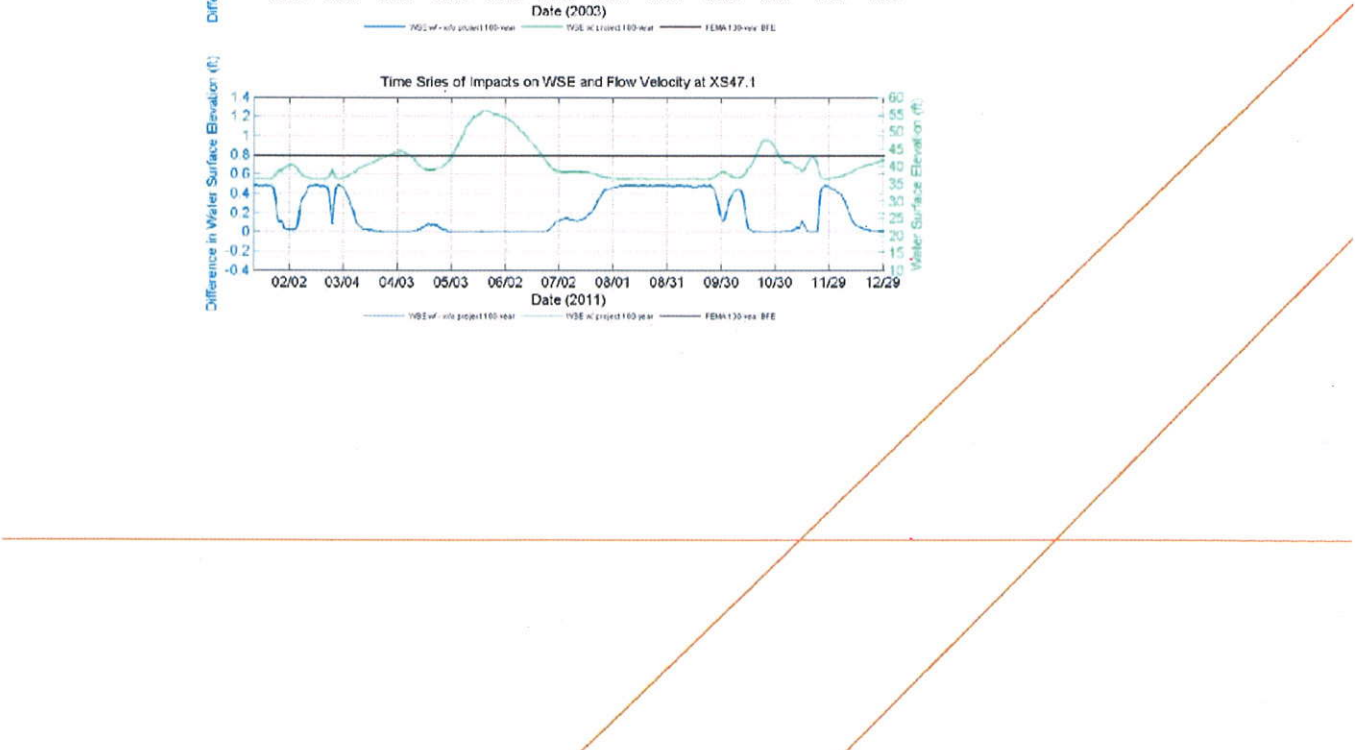
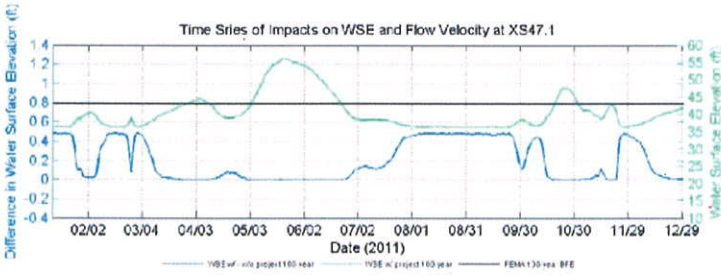
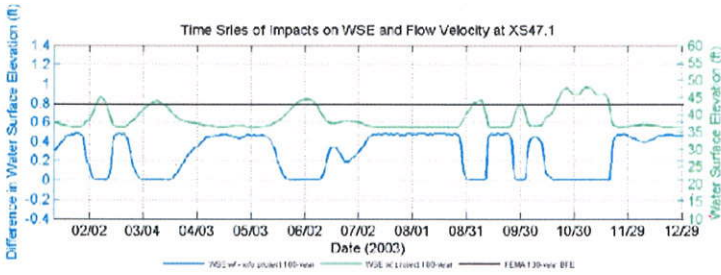
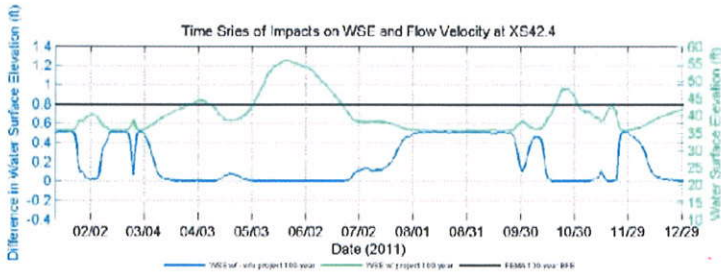
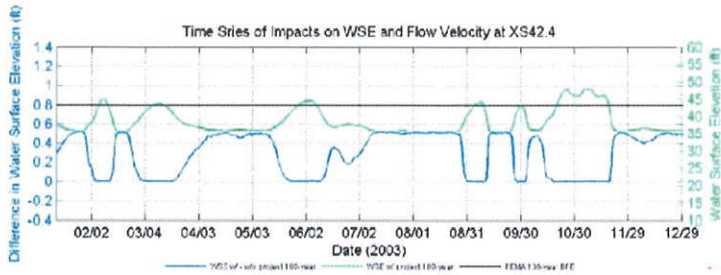


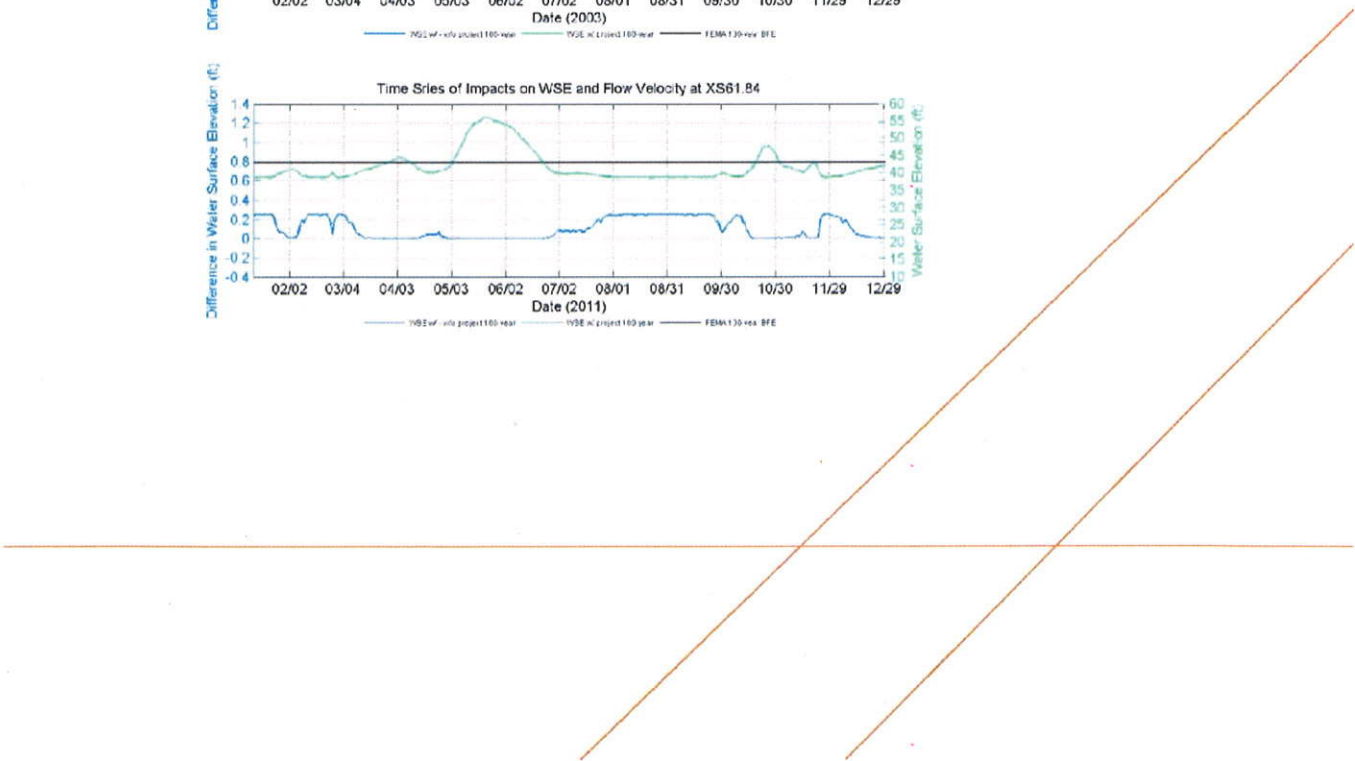
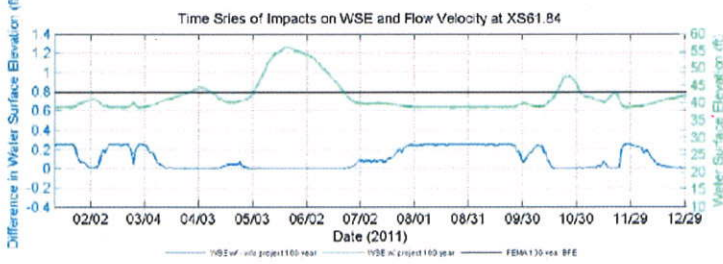
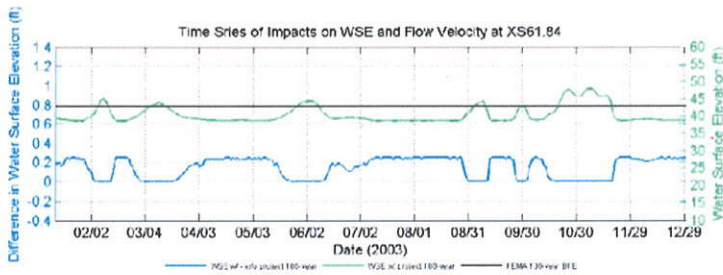
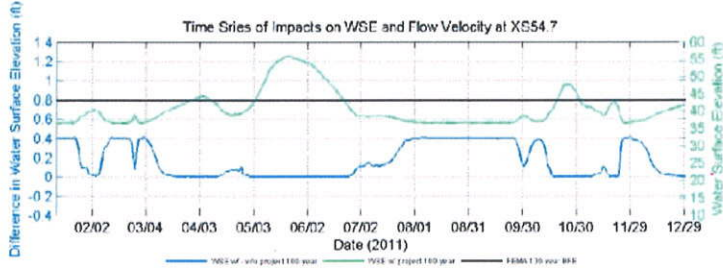
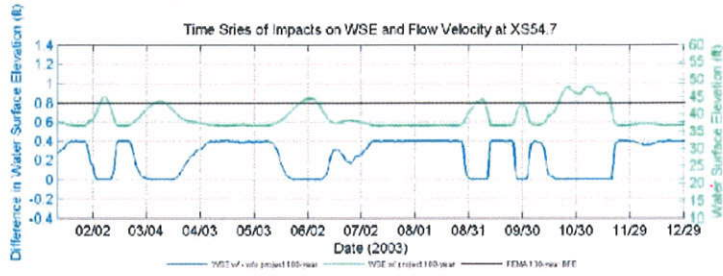












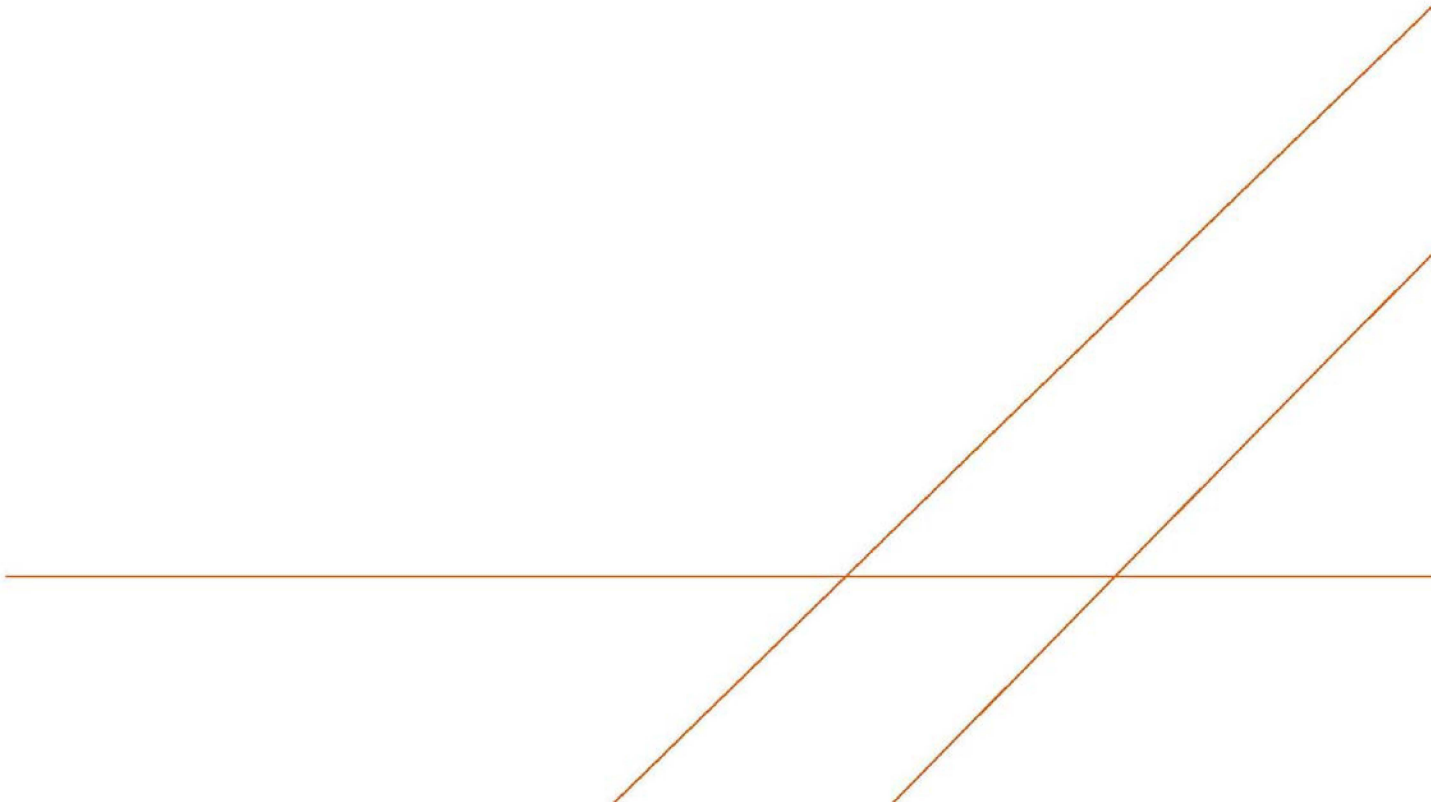
Arcadis U.S., Inc.

10352 Plaza Americana Drive
Baton Rouge, Louisiana 70816

Tel 225 292 1004

Fax 225 218 9677

www.arcadis.com



Appendix D
External Agency Correspondence

From: Lunsford, Mark (CTR)
Sent: Tuesday, August 9, 2016 1:11 PM
To: Linda.Hardy@la.gov; gutierrez.raul@epa.gov; cmichon@wlf.la.gov; Amy.E.Powell@usace.army.mil
Cc: Pitts, Melanie; Spann, Tiffany
Subject: Scoping Notification/Solicitation of Views West Feliciana Parish, Bayou Sara Streambank Stabilization, HMGP# 1603-0436, DR-1603-LA
Attachments: 1603 Bayou Sara Rev SOW.pdf; Bayou Sara SOV Ltr Attachment.pdf

Subject: Request for Solicitation of Views (SOV) for HMGP# 1603-0436 Bayou Sara Streambank Stabilization

U.S. Department of Homeland Security

August 9, 2016

Federal Emergency Management Agency

FEMA-DR 1603/1607 LA

Louisiana Recovery Office

1500 Main St., Baton Rouge, LA 70802



FEMA

MEMORANDUM TO: See Distribution

SUBJECT: Scoping Notification/Solicitation of Views

West Feliciana Parish, Bayou Sara Streambank Stabilization, HMGP# 1603-0436, DR-1603-LA

To Whom It May Concern:

The Department of Homeland Security's Federal Emergency Management Agency (FEMA) is mandated by the U.S. Congress to administer Federal disaster assistance pursuant to the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act), PL 93-288, as amended. Section 404 of the Stafford Act authorizes FEMA's Hazard Mitigation Grant Program (HMGP) to provide funds to states and local governments to implement long-term hazard mitigation measures after a major disaster declaration. FEMA is considering providing HMGP funding for the attached project in relation to Hurricane Katrina (DR-1603-LA).

Please review the attached project description to determine whether your office has any objections to the proposed project and whether any permits from your office would need to be obtained.

West Feliciana Parish, the applicant, requests funding to stabilize the Bayou Sara streambank along two bends between St. Francisville and the Mississippi River. The two bends would be armored with a stone riprap revetment and riprap toes placed at the base of the embankment. The proposed project would prevent streambank encroachment of the St. Francisville sewage treatment lagoon, which serves more than 700 customers, and also provide erosion protection for Ferdinand Street, which provides St. Francisville's sole access for Mississippi River riverboat tourism.

To ensure compliance with the National Environmental Policy Act (NEPA), Executive Orders (EOs), and other applicable Federal regulations, FEMA-EHP will be preparing an Environmental Assessment (EA). To assist us in preparation of the EA, FEMA-EHP requests that your office review the attached documents for a determination as to the requirements of any formal consultations, regulatory permits, determinations, or authorizations.

We would appreciate your comments on this project within thirty (30) days. If we do not receive comments from you within this time period, we will assume that you have no concerns or issues with the proposed project. If appropriate, FEMA will add the condition that the applicant will be required to obtain applicable permits from your office.

Comments may be emailed to mark.lunsford@associates.fema.dhs.gov or mailed to the attention of Mark Lunsford, Environmental Department, at the address above. For questions regarding this matter, please contact Mark Lunsford, Environmental Protection Specialist at (504) 875-1173.

Sincerely,

Tiffany Spann-Winfield,

Deputy Environmental Liaison Officer, FEMA LRO

FEMA 1603/1607-DR-LA

Distribution: LDEQ, USEPA, LDWF, USACE

Attachment: Scope of Work, Project Plans

Mark Lunsford
Environmental & Historic Preservation (EHP)
Environmental Protection Specialist
1603/1607-DR-LA
BB (504) 875-1173

Porter, Bonnie

From: Gutierrez, Raul <Gutierrez.Raul@epa.gov>
Sent: Tuesday, August 9, 2016 3:16 PM
To: Lunsford, Mark (CTR)
Subject: RE: Scoping Notification/Solicitation of Views West Feliciana Parish, Bayou Sara Streambank Stabilization, HMGP# 1603-0436, DR-1603-LA

The U.S. Environmental Protection Agency (EPA) has completed your request for a solicitation of views concerning the Bayou Sara Streambank Stabilization project in West Feliciana Parish, Louisiana. The scope of the work for the project includes stabilizing the Bayou Sara streambank along two bends between St. Francisville and the Mississippi River. The two bends would be armored with a stone riprap revetment and riprap toes placed at the base of the embankment. The proposed project would prevent streambank encroachment of the St. Francisville sewage treatment lagoon, which serves more than 700 customers, and also provide erosion protection for Ferdinand Street, which provides St. Francisville's sole access for Mississippi River riverboat tourism. The comments that follow are being provided relative to the EPA's *404(b)(1) Guidelines for Specification of Disposal Sites for Dredged or Fill Material (40 CFR Part 230)* and *Executive Order 11990*.

Our preliminary review revealed jurisdictional waters of the U.S. occur on the proposed site. At this time, the EPA does not object to the project as proposed and recommends coordination with the U.S. Army Corps of Engineers at the New Orleans District Office to verify which permits are needed. Thanks for the opportunity to review the proposed project. If you have any questions or would like to discuss the issue further, please do not hesitate to contact me.

Raul Gutierrez, Ph.D.
Wetlands Section (6WQ-EM)
US EPA Region 6
(504) 862-2371

Office:
US Army Corps of Engineers
New Orleans District
CEMVN-OD-SC
Post Office Box 60267
New Orleans, Louisiana 70160-0267

depending on local water quality considerations. Therefore if your water system improvements include water softeners, you are advised to contact the LDEQ Water Permits to determine if special water quality-based limitations will be necessary.

- Any renovation or remodeling must comply with LAC 33:III.Chapter 28, Lead-Based Paint Activities; LAC 33:III.Chapter 27, Asbestos-Containing Materials in Schools and State Buildings (includes all training and accreditation); and LAC 33:III.5151, Emission Standard for Asbestos for any renovations or demolitions.
- If any solid or hazardous wastes, or soils and/or groundwater contaminated with hazardous constituents are encountered during the project, notification to LDEQ's Single-Point-of-Contact (SPOC) at (225) 219-3640 is required. Additionally, precautions should be taken to protect workers from these hazardous constituents.

Currently, West Feliciana Parish is classified as attainment with the National Ambient Air Quality Standards and has no general conformity determination obligations.

Please send all future requests to my attention. If you have any questions, please feel free to contact me at (225) 219-3954 or by email at linda.hardy@la.gov.

Sincerely,

Linda M. Hardy

Louisiana Dept. of Environmental Quality

Office of the Secretary

P.O. Box 4301

Baton Rouge, LA 70821-4301

Phone: (225) 219-3954

Fax: (225) 219-3971

Email: linda.hardy@la.gov



JOHN BEL EDWARDS
GOVERNOR

State of Louisiana
DEPARTMENT OF WILDLIFE AND FISHERIES
OFFICE OF WILDLIFE

CHARLIE MELANCON
SECRETARY

Date August 26, 2016

Name Mark Lundsford

Company FEMA

Street Address 1500 Main Street

City, State, Zip Baton Rouge, LA 70802

Project West Feliciana Parish
Bayou Sara Streambank Stabilization

Project ID 1852016

Invoice Number 16082619

Personnel of the Coastal & Nongame Resources Division have reviewed the preliminary data for the captioned project. After careful review of our database, no impacts to rare, threatened, or endangered species or critical habitats within Louisiana's boundary are anticipated for the proposed project. No state or federal parks, wildlife refuges or scenic streams are known at the specified site within Louisiana's boundaries.

The Louisiana Natural Heritage Program (LNHP) has compiled data on rare, endangered, or otherwise significant plant and animal species, plant communities, and other natural features throughout the state of Louisiana. Heritage reports summarize the existing information known at the time of the request regarding the location in question. The quantity and quality of data collected by the LNHP are dependent on the research and observations of many individuals. In most cases, this information is not the result of comprehensive or site-specific field surveys; many natural areas in Louisiana have not been surveyed. This report does not address the occurrence of wetlands at the site in question. Heritage reports should not be considered final statements on the biological elements or areas being considered, nor should they be substituted for on-site surveys required for environmental assessments. LNHP requires that this office be acknowledged in all reports as the source of all data provided here. If at any time Heritage tracked species are encountered within the project area, please contact the LNHP Data Manager at 225-765-2643. If you have any questions, or need additional information, please call 225-765-2357.

Sincerely,

for 
Amity Bass, Coordinator
Natural Heritage Program

From: Lunsford, Mark (CTR)
Sent: Friday, October 21, 2016 12:34 PM
To: 'Martinez.Omar@epa.gov'
Cc: Pitts, Melanie; Spann, Tiffany
Subject: FW: Scoping Notification/Solicitation of Views West Feliciana Parish, Bayou Sara Streambank Stabilization, HMGP# 1603-0436, DR-1603-LA
Attachments: Bayou Sara SOV Ltr Attachment.pdf; 1603 Bayou Sara Rev2 SOW.pdf

Subject: Request for Solicitation of Views (SOV) for HMGP# 1603-0436 Bayou Sara Streambank Stabilization

U.S. Department of Homeland Security

October 21, 2016

Federal Emergency Management Agency

FEMA-DR 1603/1607 LA

Louisiana Recovery Office

1500 Main St., Baton Rouge, LA 70802



FEMA

MEMORANDUM TO: Sole Source Aquifer Program, U.S. EPA Region 6

SUBJECT: Scoping Notification/Solicitation of Views

West Feliciana Parish, Bayou Sara Streambank Stabilization, HMGP# 1603-0436, DR-1603-LA

To Omar T. Martinez:

The Department of Homeland Security's Federal Emergency Management Agency (FEMA) is mandated by the U.S. Congress to administer Federal disaster assistance pursuant to the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act), PL 93-288, as amended. Section 404 of the Stafford Act authorizes FEMA's Hazard Mitigation Grant Program (HMGP) to provide funds to states and local governments to implement long-term hazard mitigation measures after a major disaster declaration. FEMA is considering providing HMGP funding for the attached project in relation to Hurricane Katrina (DR-1603-LA).

Please review the attached project description to determine whether your office has any objections to the proposed project and whether any permits from your office would need to be obtained.

West Feliciana Parish, the applicant, requests funding to stabilize the Bayou Sara streambank along two bends between St. Francisville and the Mississippi River. The two bends would be armored with a stone riprap revetment and riprap toes placed at the base of the embankment. The proposed project would prevent streambank encroachment of the St. Francisville sewage treatment lagoon, which serves more than 700 customers, and also provide erosion protection for Ferdinand Street, which provides St. Francisville's sole access for Mississippi River riverboat tourism.

To ensure compliance with the National Environmental Policy Act (NEPA), Executive Orders (EOs), and other applicable Federal regulations, FEMA-EHP will be preparing an Environmental Assessment (EA). To assist us in preparation of the EA, FEMA-EHP requests that your office review the attached documents for a determination as to the requirements of any formal consultations, regulatory permits, determinations, or authorizations.

We would appreciate your comments on this project within thirty (30) days. If we do not receive comments from you within this time period, we will assume that you have no concerns or issues with the proposed project. If appropriate, FEMA will add the condition that the applicant will be required to obtain applicable permits from your office.

Comments may be emailed to mark.lunsford@associates.fema.dhs.gov or mailed to the attention of Mark Lunsford, Environmental Department, at the address above. For questions regarding this matter, please contact Mark Lunsford, Environmental Protection Specialist at (504) 875-1173.

Sincerely,

Tiffany Spann-Winfield,
Deputy Environmental Liaison Officer, FEMA LRO
FEMA 1603/1607-DR-LA

Attachment: Scope of Work, Project Plans

Mark Lunsford
Environmental & Historic Preservation (EHP)
Environmental Protection Specialist
1603/1607-DR-LA
BB (504) 875-1173



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 6
1445 ROSS AVENUE, SUITE 1200
DALLAS TX 75202-2733

December 14, 2016

Ms. Tiffany Spann-Winfield, Deputy Environmental Liaison Officer
Federal Emergency Management Agency
FEMA-DR 1603/1607 DR-LA
Louisiana Recovery Office
1500 Main Street, Baton Rouge, LA 70802

Dear Ms. Spann-Winfield:

We have received your October 21, 2016, letter requesting our evaluation of the potential environmental impacts which might result from the following project:

**The Bayou Sara Streambank Stabilization Project to Provide
Erosion Protection for Sewage Treatment Pond
The Bayou Sara Streambank along two bends between
St. Francisville & the Mississippi River
HMGP 1603-0436, DR-1603-LA
West Feliciana Parish, St. Francisville, Louisiana**

The project, proposed for financial assistance through the Federal Emergency Management Agency-Hazard Mitigation Grant Program (FEMA-HMGP) funds, is located on the Southern Hills aquifer system which has been designated a sole source aquifer (SSA) by the EPA. Based on the information provided for the project, we have determined that the project, as proposed, should not have an adverse effect on the quality of the ground water underlying the project site.

This approval of the proposed project does not relieve the applicant from adhering to other State and Federal requirements, which may apply. This approval is based solely upon the potential impact to the quality of ground water as it relates to the EPA's authority pursuant to Section 1424(e) of the Safe Drinking Water Act.

If you did not include the parish, project description, project location, area map, plat or the federal funding agency, please do so in future SSA correspondence.

If you have any questions on this letter or the SSA program please contact me at (214) 665-8485.

Sincerely yours,



Omar T. Martinez, Coordinator
Sole Source Aquifer Program
Ground Water/UIC Section

cc: Mr. Mark Lunsford, Environmental Protection Specialist
Jesse Means, LDEQ

From: [Pitts, Melanie](#)
To: "Daivd_oster@fws.gov"
Cc: [Spann, Tiffany](#)
Subject: West Feliciana Parish, Bayou Sara Streambank Stabilization, HMGP# 1603-0436, DR-1603-LA
Date: Tuesday, April 10, 2018 2:22:00 PM
Attachments: [LA ESA project development report - Feb 2018 - Bayou Sara - AMENDED.PDF](#)
[image001.png](#)
[1603 Bayou Sara Rev SOW.PDF](#)
[1603-0436 Biological Assessment -Pallid sturgeon.pdf](#)
[Bayou Sara SOV Ltr Attachment \(003\).pdf](#)
[Bayou Sara 90% Submittal 2017.03.23.pdf](#)
Importance: High

U.S. Department of
Homeland Security

April 10, 2018
Management Agency

Federal Emergency

FEMA-DR 1603/1607 LA

Office

Louisiana Recovery

Rouge, LA 70802

1500 Main St., Baton



FEMA

MEMORANDUM TO: U.S. Fish and Wildlife Service Louisiana Ecological Services Office

SUBJECT: RE: West Feliciana Parish, Bayou Sara Streambank Stabilization, HMGP# 1603-0436, DR-1603-LA

Mr. David Oster:

Per our conversation, The Department of Homeland Security's Federal Emergency Management Agency (FEMA) is mandated by the U.S. Congress to administer Federal disaster assistance pursuant to the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act), PL 93-288, as amended. Section 404 of the Stafford Act authorizes FEMA's Hazard Mitigation Grant Program (HMGP) to provide funds to states and local governments to implement long-term hazard mitigation measures after a major disaster declaration. FEMA has received an application from The Parish of West Feliciana. The Parish has requested, through the State of Louisiana Governor's Office of Homeland Security and Emergency Preparedness (LA GOHSEP), that FEMA provide disaster assistance consisting of federal grant funds in accordance with the provisions of the Stafford Act. The proposed project includes the stabilization of the Bayou Sara bank located in St. Francisville, West Feliciana Parish, Louisiana. Specifically, the project is located on the bank of Bayou Sara, beginning approximately 1,835 feet (ft) upstream from the mouth of the Mississippi River. The center of the project area is located at Latitude 30.768413, Longitude -91.394385.

FEMA has determined that the proposed project may affect, but is not likely to adversely affect, ESA-listed Pallid Sturgeon (*Scaphirhynchus albus*) as described below, and is therefore requesting concurrence with our determinations pursuant to Section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. § 1536), and the consultation procedures at 50 C.F.R. Part 402.

Pursuant to our request for informal consultation, FEMA is providing, enclosing, or otherwise identifying the following information:

- A description of the action to be considered;
- Construction Plans;
- A Biological Assessment;
- Endangered Species Act (ESA) Project Review and Guidance for Other Federal Trust Resources Report

If you have questions, please contact Tiffany Spann-Winfield of our Environmental Historic Preservation Division at 504-218-6800 or tiffany.spann@fema.dhs.gov. Please reference file number HMGP 1603-0346 in all correspondence related to this consultation

Sincerely,

Tiffany Spann-Winfield,
Deputy Environmental Liaison Officer, FEMA LRO
FEMA 1603/1607-DR-LA

MELANIE PITTS (O'KEEFE)
SUPERVISORY ENVIRONMENTAL PROTECTION SPECIALIST
DHS-FEMA
504-427-8000
MELANIE.PITTS@FEMA.DHS.GOV



Endangered Species Act (ESA) Project Review and Guidance for Other Federal Trust Resources Report

Instructions

Please submit a copy of this report to the Louisiana Ecological Services Office for review at lafayette@fws.gov. Contact our office at (337) 291-3100 for further assistance.

Project Description: West Feliciana Parish proposes to armor two bends of Bayou Sara to provide erosion protection for the St. Francisville sewage treatment plant (STP) pond and a portion of Ferdinand Street, which is the sole access to the Mississippi River for St. Francisville. Preliminary site plans would armor approximately 1,300 feet along the large bend along the STP pond and approximately 900 feet further south by the Oyster Bar adjacent to Ferdinand Street. Each revetment would include a base of riprap fill extending from a revetment toe at a 2:1 slope up to or above the Ordinary High Water Mark (OHWM). The upper portion of the streambank would consist of concrete block mats with a 3:1 slope.

Prior to installing the revetment, the existing streambank slopes would be cut and filled with compacted fill to achieve 2: 1 slopes on the embankment. Streambanks would then be covered with a geotextile filter fabric and armored with 130-pound class stone riprap revetment with riprap toes placed at the base of the slopes. The excavated streambank materials would be deposited within the 0.87 acre Excess Cut Placement Area located between the STP lagoons and the loop access road around the STP.

If there are sufficient funds available, West Feliciana Parish may also armor the east bank of Bayou Sara between the two large bends.

This project development report is to amend the one previously submitted, which erroneously stated that dredging would be involved in the project. All streambank work would be completed above the high water line.

Requesting Agency: Federal Emergency Management Agency (FEMA)

Project Coordinates: Latitude: 30.765819 Longitude: -91.396711

Point of Contact: Bonnie Porter

Address: 1500 Main St.

City: Baton Rouge

State: Louisiana

Zip Code: 70122

Phone Number 1: 504-210-7263 **Phone Number 2:** _____

Email Address: bonnie.porter@fema.dhs.gov

Does the proposed action only involve telecommunication structure(s)?

No

Would the proposed action occur entirely within an existing footprint or rights-of-way (ROW)?

No

Would any portion of the proposed action occur within one of these areas of interest?

Yes

Pallid Sturgeon

Would the proposed action result in riverine pathway obstruction (such as construction of dams, hydropower plants, etc.)?

No

Would the proposed action involve addition of or modifications to water intake structures?

No

Would the proposed action involve modifications to existing or construction of new diversion structure or turbines?

No

Would the proposed action involve dredging activities?

No

Conclusion:

We have determined that the proposed action is not likely to adversely affect the Pallid Sturgeon.

TIFFANY R SPANN WINFIELD

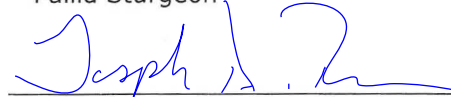
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WINFIELD
Date: 2018.04.04 08:29:49 -05'00'

Project Representative

Date

Based on the information provided in this report, as well as any pertinent correspondence and documentation saved to the project file at our office (if applicable), the Service concurs with your "not likely to adversely affect" determination for the following species:

Pallid Sturgeon



*Louisiana Ecological Services Office
U.S. Fish and Wildlife Service*

27 Jun 18

Date

Section 7 consultation for the proposed action is concluded when you receive signature from this office. To ensure continued compliance with the ESA, reinstate consultation when:

- new information reveals that the action may affect listed species or designated critical habitat in a manner or to an extent not considered in this consultation
- the action is modified in a manner that causes effects to listed species or designated

critical habitat not considered in this consultation

- a new species is listed or critical habitat designated that the action may affect.

Migratory Bird Conservation Recommendations

Bald Eagle

The proposed project area may provide nesting habitat for the bald eagle (*Haliaeetus leucocephalus*), which was officially removed from the List of Endangered and Threatened Species as of August 8, 2007. However, the bald eagle remains protected under the Bald and Golden Eagle Protection Act (BGEPA) (54 Stat. 250, as amended, 16 U.S.C. 668a-d) and the Migratory Bird Treaty Act (MBTA) (40 Stat. 755, as amended; 16 U.S.C. 703 et seq.) The Louisiana Department of Wildlife and Fisheries (LDWF) has not collected comprehensive bald eagle survey data since 2008, and new active, inactive, or alternate nests may have been constructed within the proposed project area since that time.

The Service developed the National Bald Eagle Management (NBEM) Guidelines to provide landowners, land managers, and others with information and recommendations to minimize potential project impacts to bald eagles, particularly where such impacts may constitute "disturbance," which is prohibited by the BGEPA. A copy of the NBEM Guidelines is available at:

<http://www.fws.gov/migratorybirds/pdf/management/nationalbaldeaglenagementguidelines.pdf>

In southern Louisiana parishes, eagles typically nest in mature trees (e.g., baldcypress, sycamore, willow, etc.) near fresh to intermediate marshes or open water. Bald eagles may also nest in mature pine trees near large lakes in central and northern Louisiana. If a bald eagle nest occurs or is discovered within 660 feet of the proposed project area, then an evaluation must be performed to determine whether the project is likely to disturb nesting bald eagles. That evaluation may be conducted on-line at: <https://www.fws.gov/southeast/our-services/eagle-technical-assistance>. Following completion of the evaluation, that website will provide a determination of whether additional consultation is necessary.

Colonial Waterbirds

In accordance with the Migratory Bird Treaty Act of 1918 (as amended), please be advised should the project area be located in or near wetland habitats which may be inhabited by colonial nesting waterbirds and/or seabirds, additional restrictions may be necessary.

Colonies may be present that are not currently listed in the database maintained by the Louisiana Department of Wildlife and Fisheries. That database is updated primarily by (1) monitoring previously known colony sites and (2) augmenting point-to-point surveys with flyovers of adjacent suitable habitat. Although several comprehensive coast-wide surveys have been recently conducted to determine the location of newly-established nesting colonies, we recommend that a qualified biologist inspect the proposed work site for the presence of undocumented nesting colonies during the nesting season because some waterbird colonies may change locations year-to-year. To minimize disturbance to colonial nesting birds please refer to our colonial nesting waterbird guidance on the LESO Webpage https://www.fws.gov/lafayette/Migratory_Birds/MigBird.html.

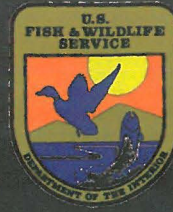
Additional Migratory Bird Conservation Recommendations

During the project impact analysis process developers should identify project-related impacts to migratory birds and the conservation measures that will be used to mitigate them. For additional Migratory Bird Conservation recommendations, guidance and tools to help reduce impacts to birds and their habitats please visit the LESO webpage https://www.fws.gov/lafayette/Migratory_Birds/MigBird.html and the Service's Migratory Bird Program Webpage (<https://www.fws.gov/birds/bird-enthusiasts/threats-to-birds/collisions/communication-towers.php>).



The Louisiana Black Bear

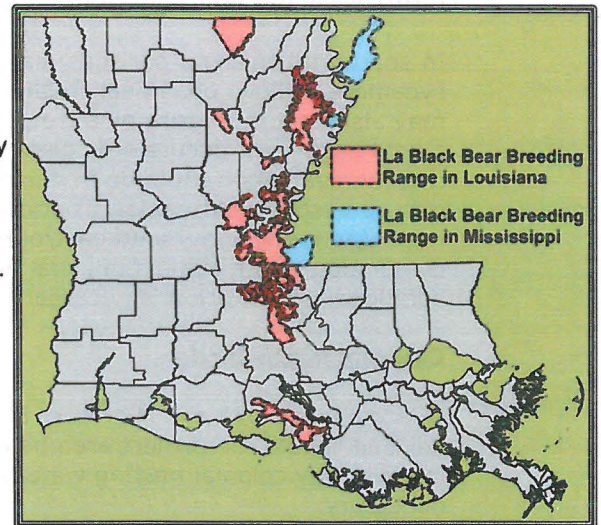
Recovered and Delisted



Post-Delisting Conservation Considerations

The Louisiana black bear (*Ursus americanus luteolus*) was listed as a threatened subspecies in 1992. Due to recovery, it was officially removed from the List of Endangered and Threatened Species on March 11, 2016 (effective April 11, 2016); critical habitat designation for this subspecies has also been withdrawn. Because the Louisiana black bear is no longer protected under the Endangered Species Act (ESA), *consultation with the U.S. Fish and Wildlife Service (Service) is not required for this subspecies.* The Louisiana black bear remains protected under Louisiana state law, and the Louisiana Department of Wildlife and Fisheries (LDWF) will continue to actively manage this subspecies. The Service and LDWF have developed a plan to extensively monitor the status of the Louisiana black bear for 7 years following its delisting (until year 2022). That monitoring will be undertaken to detect any potential population decreases or threat increases that may warrant the implementation of measures to ensure that the Louisiana black bear remains secure from risk of extinction.

The Louisiana black bear is primarily associated with forested wetlands, but will utilize a variety of other habitat types, including scrub-shrub, marsh, spoil banks, and upland forests. They normally den from December through April and preferred den sites include large, hollow trees (36 inches or more in diameter at breast height) with sufficiently sized openings that allow access to interior cavities. Although ESA consultation is no longer required regarding project impacts on this subspecies, in the interest of conserving the Louisiana black bear, projects proposed in areas of the state that are inhabited by bears should be designed to avoid adversely affecting this subspecies or its habitat. (A current Louisiana black bear breeding area map is located at:



https://www.fws.gov/Lafayette/pdf/LA_Black_Bear_Breeding_Habitat_Map.pdf)

Conservation measures for the Louisiana black bear include:

- reducing the footprint of proposed actions to the maximum extent feasible
- avoiding impacts to potential den trees that are 36 inches or more in diameter at breast height
- implementing programs to prevent the habituation of bears to human-associated food sources (e.g., use of "bear-proof" waste disposal containers or daily removal of food and garbage)
- avoiding vegetative clearing during the black bear denning season (i.e., December 1 through April 30).

For additional information regarding the Louisiana black bear and project-specific conservation measures that may be required by the LDWF, please contact Maria Davidson (Large Carnivore Program Manager) at (337) 262-2080 or mdavidson@wff.la.gov.



DEPARTMENT OF THE ARMY
NEW ORLEANS DISTRICT, CORPS OF ENGINEERS
7400 LEAKE AVENUE
NEW ORLEANS, LOUISIANA 70118

REPLY TO
ATTENTION OF:
Operations Division
Central Evaluation Section

March 9, 2018

SUBJECT: MVN-2017-0368-CQ
Nationwide Permit-13

West Feliciana Parish
5934 Commerce Street / Post Office Box 1921
Saint Francisville, Louisiana 70775

Gentlemen:

This is in regard to your permit application dated March 22, 2017 requesting Department of the Army approval to install and maintain concrete block mats, rip rap material, and compacted fill for bank stabilization measures along the Bayou Sara streambank, near St. Francisville, in West Feliciana Parish, Louisiana.

This office has determined that your project, as shown in the attached drawings, is authorized by **Nationwide Permit Number 13**, as found in the January 6, 2017, Federal Register, Reissuance of Nationwide Permits (82 FR 1983). Enclosed is a copy of the nationwide permit and the general conditions with which you must comply.

Based on the project description, qualifying criteria for this permit are that the activity will not exceed the placement of an average of one cubic yard per running foot along the bank below the plane of ordinary high water mark, the total linear length of the bank stabilization measure cannot exceed 500 feet in total length along the bank, and the permit does not involve discharges of dredged or fill material into special aquatic sites. In consideration of the need to re-stabilize the site to prevent further damage, it is anticipated that the proposed activity will result in minimal adverse impacts to Bayou Sara. As such, a waiver to the above mentioned criteria of NWP-13 is granted.

You are reminded that Nationwide Permit General Condition 30 requires you to provide a signed certification stating that the authorized work was conducted in accordance with the permit, including any special conditions, and that mitigation (if required) was completed in accordance with the permit. We have attached this form. The permittee must sign the attached form and a copy of this nationwide permit authorization letter must be attached. Send this to: U.S. Army Corps of Engineers, New Orleans District, ATTN: CEMVN-OD-SC, 7400 Leake Avenue, New Orleans, Louisiana 70118.

In addition, the following special conditions are made part of this authorization:

1. The permittee is aware that all necessary local, state and parish approvals must be obtained prior to the commencement of work at the project site.
2. The permittee shall assure that all material used during construction shall be pollutant free in accordance with the EPA Guidelines for Discharge of Dredged or Fill Material, found in 40 CFR 230. The material may be obtained offsite or from site preparation. Offsite material shall not be obtained from wetlands or from areas that may adversely affect adjacent wetlands. Any excess material shall be placed in an upland area and properly contained or stabilized to prevent entry into adjacent wetlands of other waters.
3. The permittee is aware that future site visits and inspections of the project site may be conducted by personnel of the New Orleans District Corps of Engineers, Regulatory Branch (CEMVN) and/or other resource agencies in order to assess project compliance with the requirements of this authorization.
4. Construction activities shall not cause more than minimal and temporal water quality degradation of any adjacent wetland, stream, or water body. Appropriate erosion and siltation controls must be utilized during construction to prevent sediment runoff into adjacent wetlands and waterways. Sediment control techniques could include but are not limited to the use of secured hay bales, sediment/silt fencing, wooden or vinyl barriers, and/or seeding or sodding of exposed or disturbed areas. These structures should be maintained in effective operating condition until sediments are stabilized by vegetation and other impervious surfaces.
5. The project area has been identified as an area of interest for federally recognized Native American Tribes. If during the course of work at the site, prehistoric and/or historic aboriginal cultural materials are discovered, the permittee will contact CEMVN. CEMVN will initiate the required federal, state, and Tribal coordination to determine the significance of the cultural materials and the need, if applicable, for additional cultural resource investigations.
6. The permittee shall limit clearing, excavation and the placement of fill material to areas essential to the project. The remainder of the property shall be left in its natural state. If the authorized project requires any additional work not expressly permitted herein, or impacts any wetlands (or "other waters of the US") other than the areas indicated on the attached drawings, the permittee must apply for an amendment to this authorization prior to commencement of work.
7. To minimize potential impacts to adjacent wetlands from construction activities, the permittee shall mark the boundaries of wetlands with clearly recognizable markers to avoid encroachment. All contractors, foremen, and/or on-site workers involved in construction activities shall be briefed as to location of the markers and the avoidance of wetlands.

8. Issuance of this permit confirms that CEMVN has been provided with written notification from the Cypress Plantation Farm, LLC that the permittee has contracted for 0.1 acre of bottomland hardwoods restoration mitigation credit at Cypress Plantation II Mitigation Bank. The Cypress Plantation Farm, LLC has assumed responsibility for completing the mitigation in accordance with the Cypress Plantation II Mitigation Bank Mitigation Banking Instrument and has recorded the allocation of the mitigation required by this permit in the Regulatory In-Lieu Fee and Bank Information Tracking System (RIBITS).

The authorized work would neither affect any species listed as endangered by the U. S. Departments of Interior or Commerce, nor affect any habitat designated as critical to the survival and recovery of any endangered species.

This determination is only applicable to the permit program administered by the U. S. Army Corps of Engineers. It does not eliminate the need to obtain other applicable federal, state, or local approvals before beginning work.

Permittee is aware that this office may reevaluate its decision on this permit at any time the circumstances warrant.

This determination relative to the nationwide permit expires on March 18, 2022.

Should you have any further questions concerning this matter, please contact Kenny Blanke of this office at (504) 862-1217.

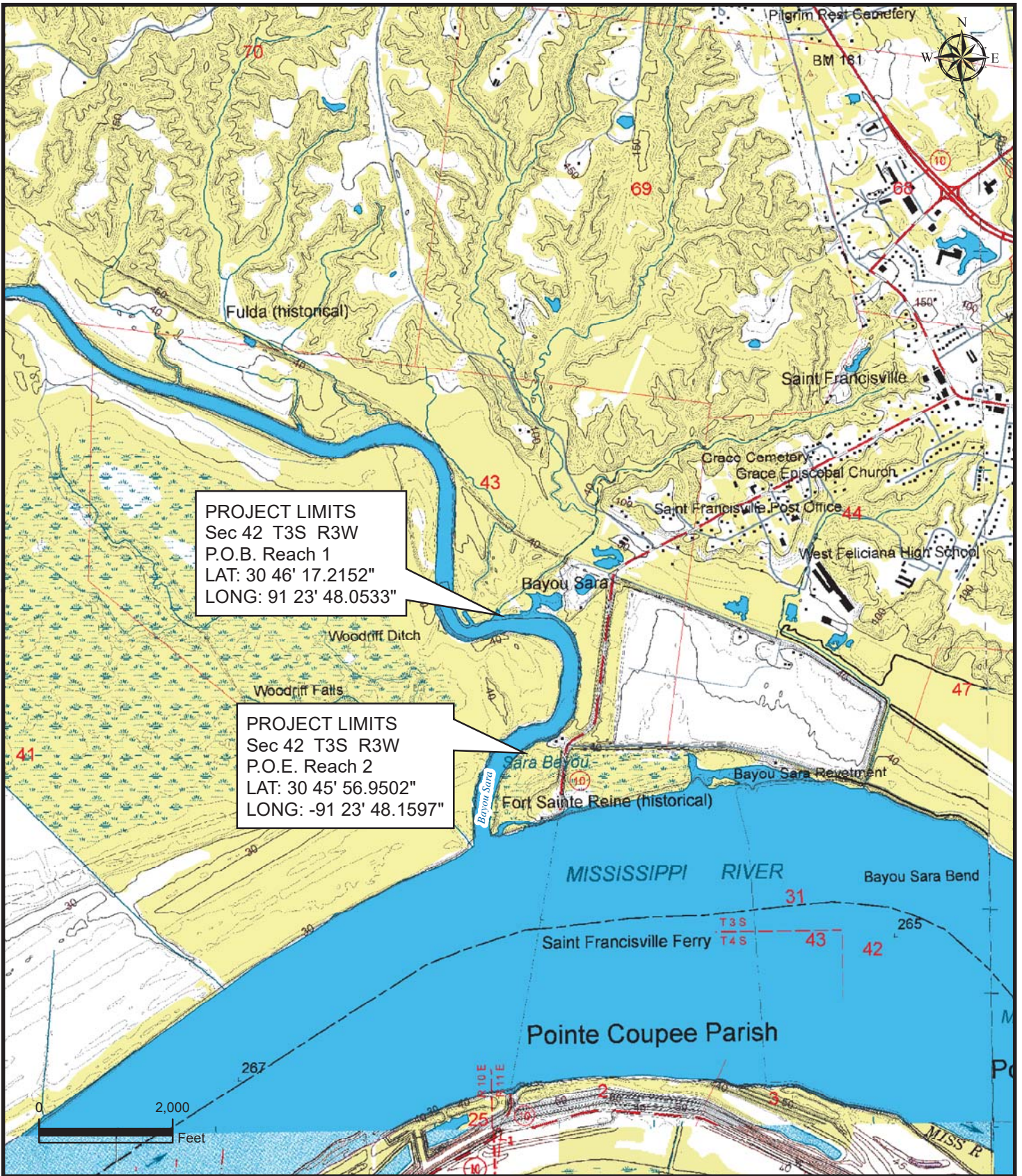
Sincerely,

HERMAN.JOHN.MATTHEW.1119334280
TTHEW.1119334280

Digitally signed by
HERMAN.JOHN.MATTHEW.1119334280
DN: c=US, o=U.S. Government, ou=DoD, ou=PKI,
ou=ISA, cn=HERMAN.JOHN.MATTHEW.1119334280
Date: 2018.03.09 13:01:59 -06'00'

for Martin S. Mayer
Chief, Regulatory Branch

Enclosures



PROJECT LOCATION MAP

Bayou Sara West Feliciana Parish, Louisiana

ARCADIS Design & Construction
 for natural and built assets
 10352 Plaza Americana Drive
 Baton Rouge, Louisiana 70816
 Tel: 225.292.1004
 Fax: 225.218.9677
 www.arcadis.com

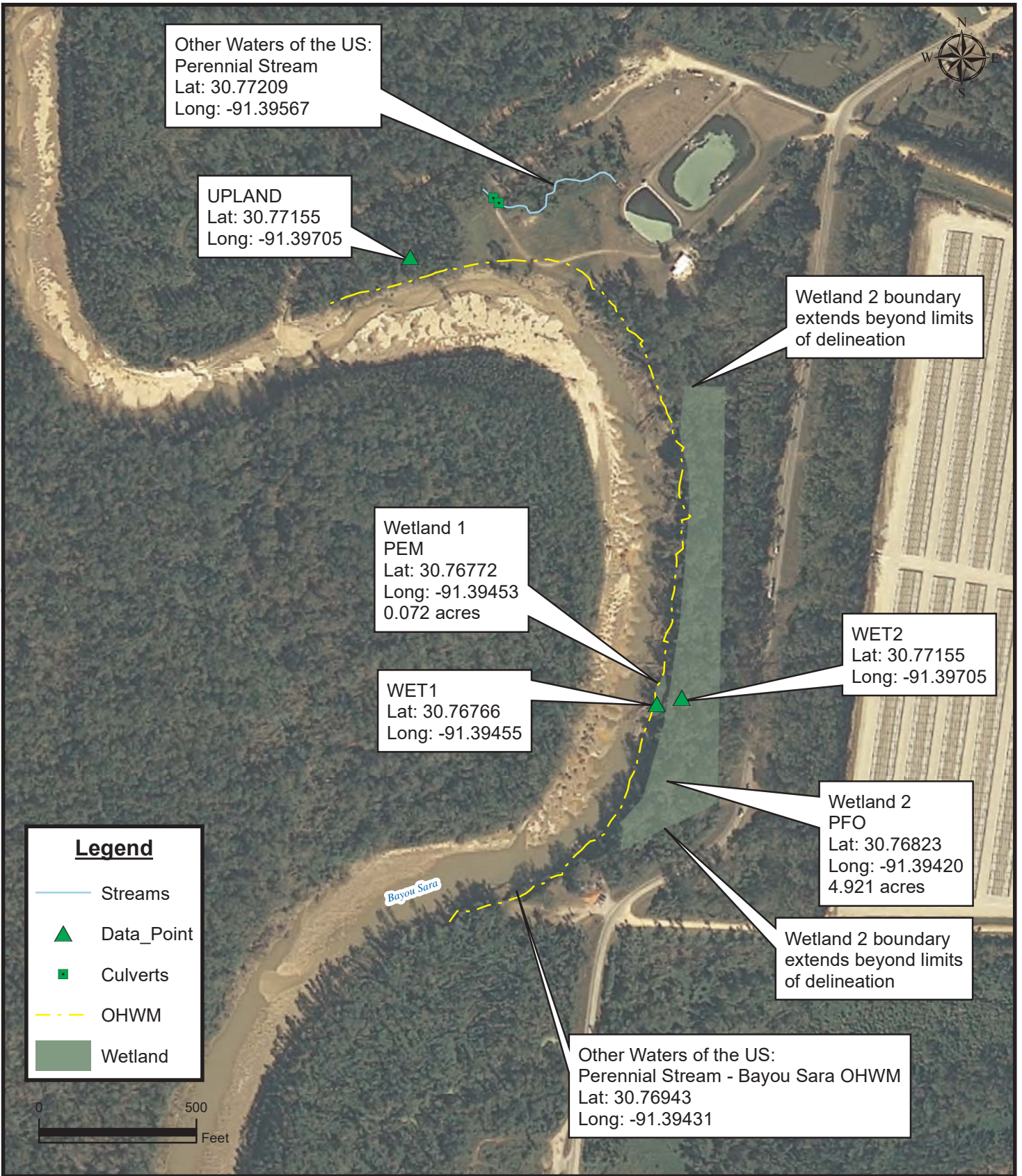
Project Manager:
 KJ

Task Manager:
 MS

Project No.:
 LA003333.0001

Figure No.

1



Other Waters of the US:
Perennial Stream
Lat: 30.77209
Long: -91.39567

UPLAND
Lat: 30.77155
Long: -91.39705

Wetland 2 boundary
extends beyond limits
of delineation

Wetland 1
PEM
Lat: 30.76772
Long: -91.39453
0.072 acres

WET2
Lat: 30.77155
Long: -91.39705

WET1
Lat: 30.76766
Long: -91.39455

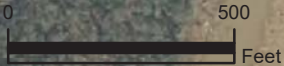
Wetland 2
PFO
Lat: 30.76823
Long: -91.39420
4.921 acres

Wetland 2 boundary
extends beyond limits
of delineation

Other Waters of the US:
Perennial Stream - Bayou Sara OHWM
Lat: 30.76943
Long: -91.39431

Legend

- Streams
- ▲ Data_Point
- Culverts
- - - OHWM
- Wetland

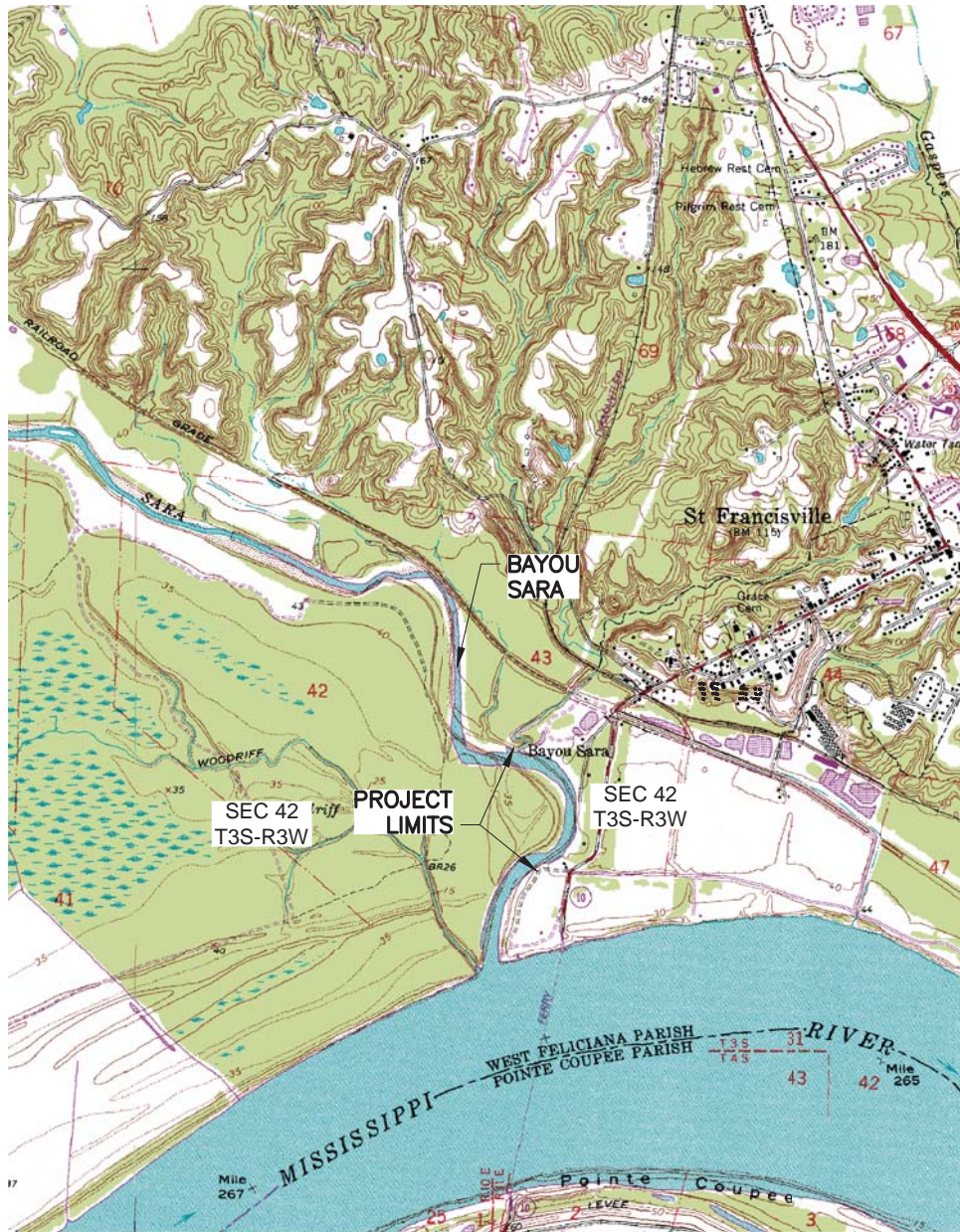


WETLAND AND SOIL SAMPLE LOCATIONS

ARCADIS Design & Construction
for natural and built assets
10352 Plaza Americana Drive
Baton Rouge, Louisiana 70816
Tel: 225.292.1004
Fax: 225.218.9677
www.arcadis.com

**Bayou Sara
West Feliciana Parish, Louisiana**

Project Manager: KJ
Task Manager: MS
Project No.: LA003333.0001
Figure No. 2



SCALE 1"=3,000'



THESE PLATS ARE TO BE USED EXCLUSIVELY FOR THE ACQUISITION OF REGULATORY PERMITS.



3850 N CAUSEWAY BLVD
SUITE 1600
METAIRIE, LOUISIANA
T. (504) 832-4174
F. (504) 832-2145
www.arcadis-us.com

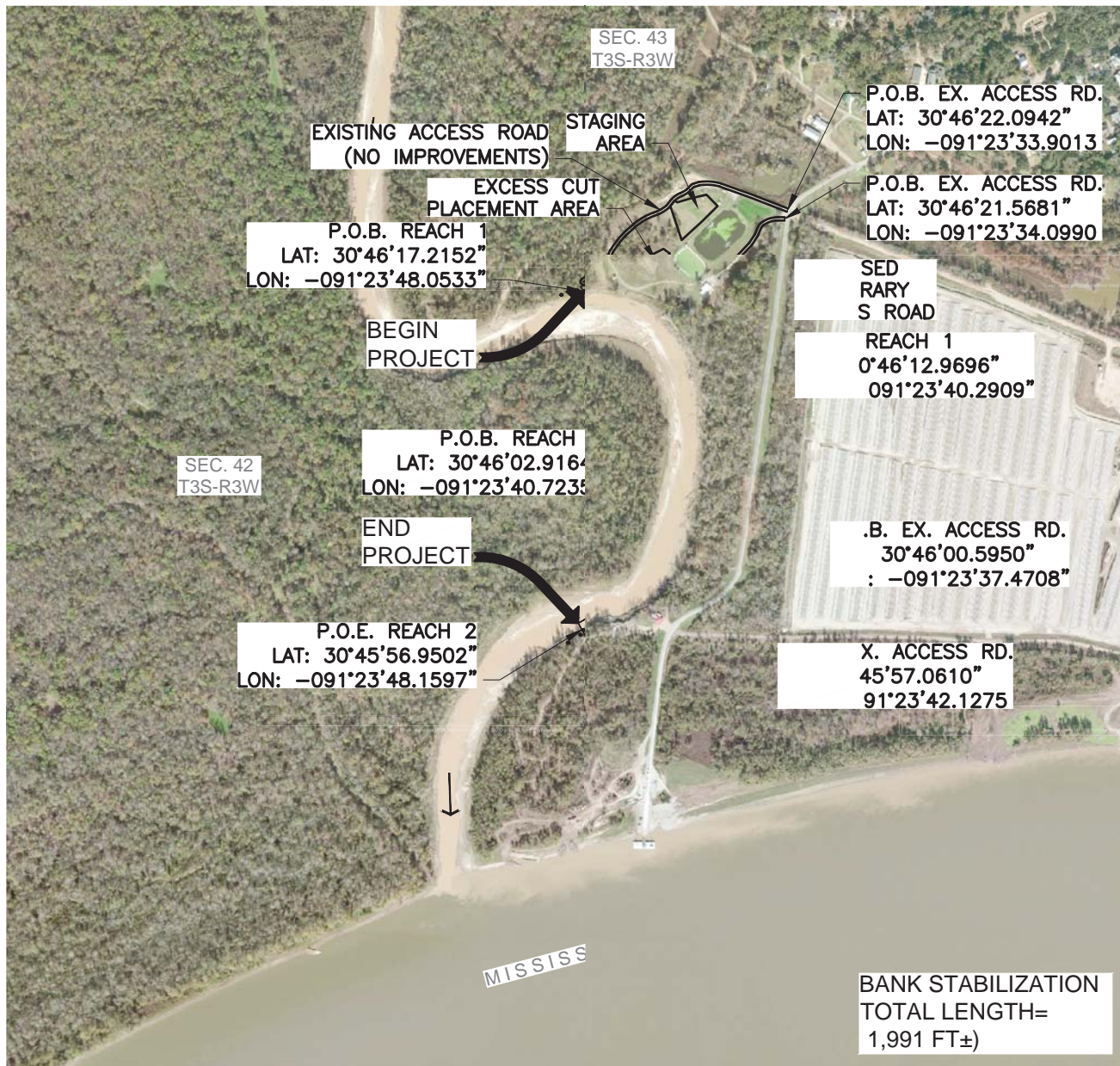


SHEET TITLE
BAYOU SARA BANK STABILIZATION PROJECT
W. FELICIANA PARISH, LA
PERMIT DRAWINGS

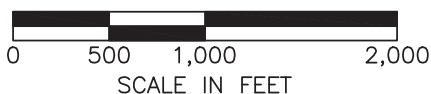
VICINITY MAP

REV. 04

SHEET P-01



SCALE 1"=1,000'



NOTE:
ALL LOCATIONS REFERENCED TO NAD83 (2011)

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SHEET TITLE
BAYOU SARA BANK STABILIZATION PROJECT
W. FELECIANA PARISH, LA
PERMIT DRAWINGS

PROJECT LOCATION
REV. 04

SHEET P-02



SCALE 1"=1,000'



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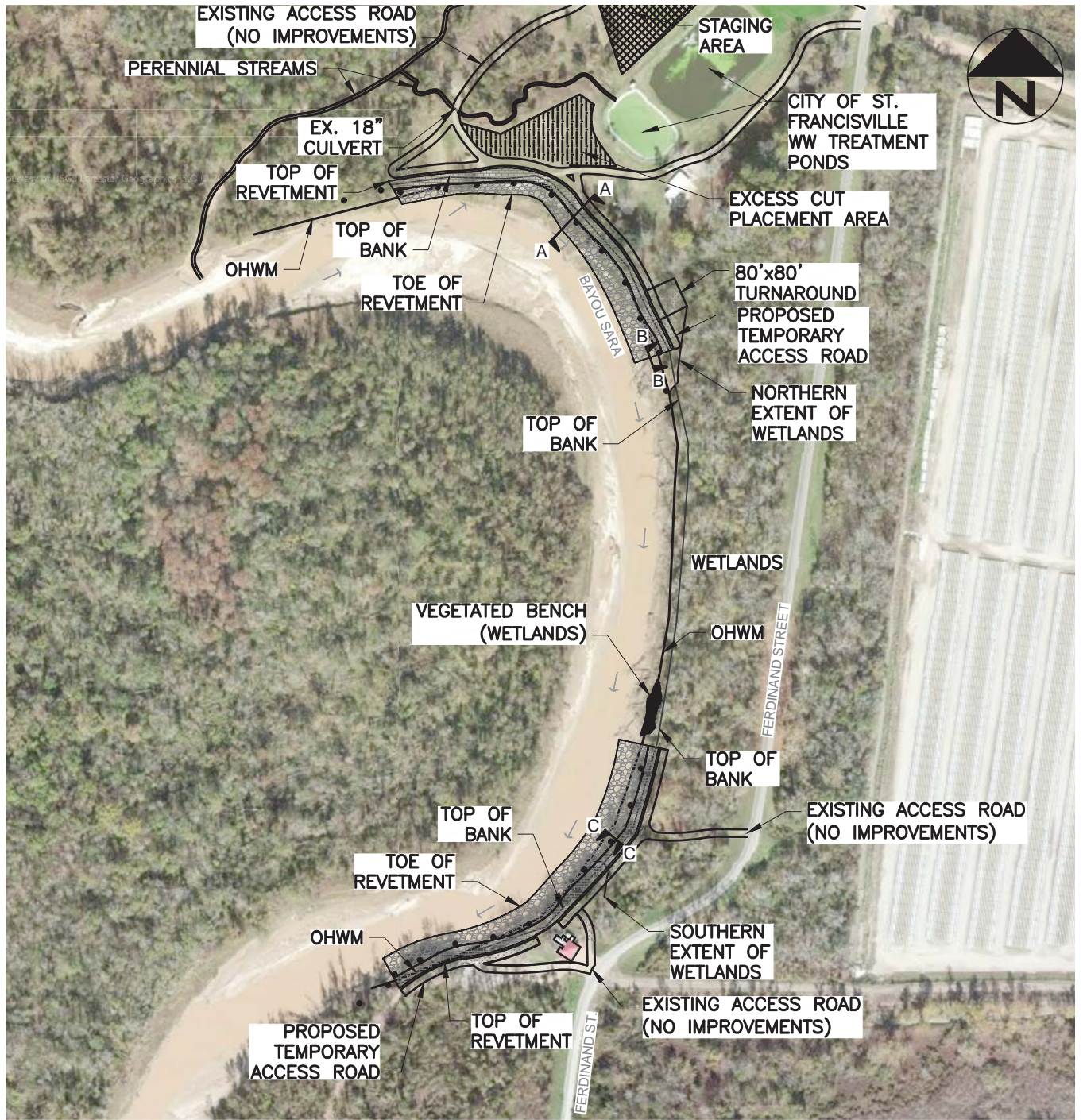


SHEET TITLE
BAYOU SARA BANK STABILIZATION PROJECT
W. FELECIANA PARISH, LA
PERMIT DRAWINGS

WORK LIMITS

REV. 04

SHEET P-03



SCALE 1"=400'



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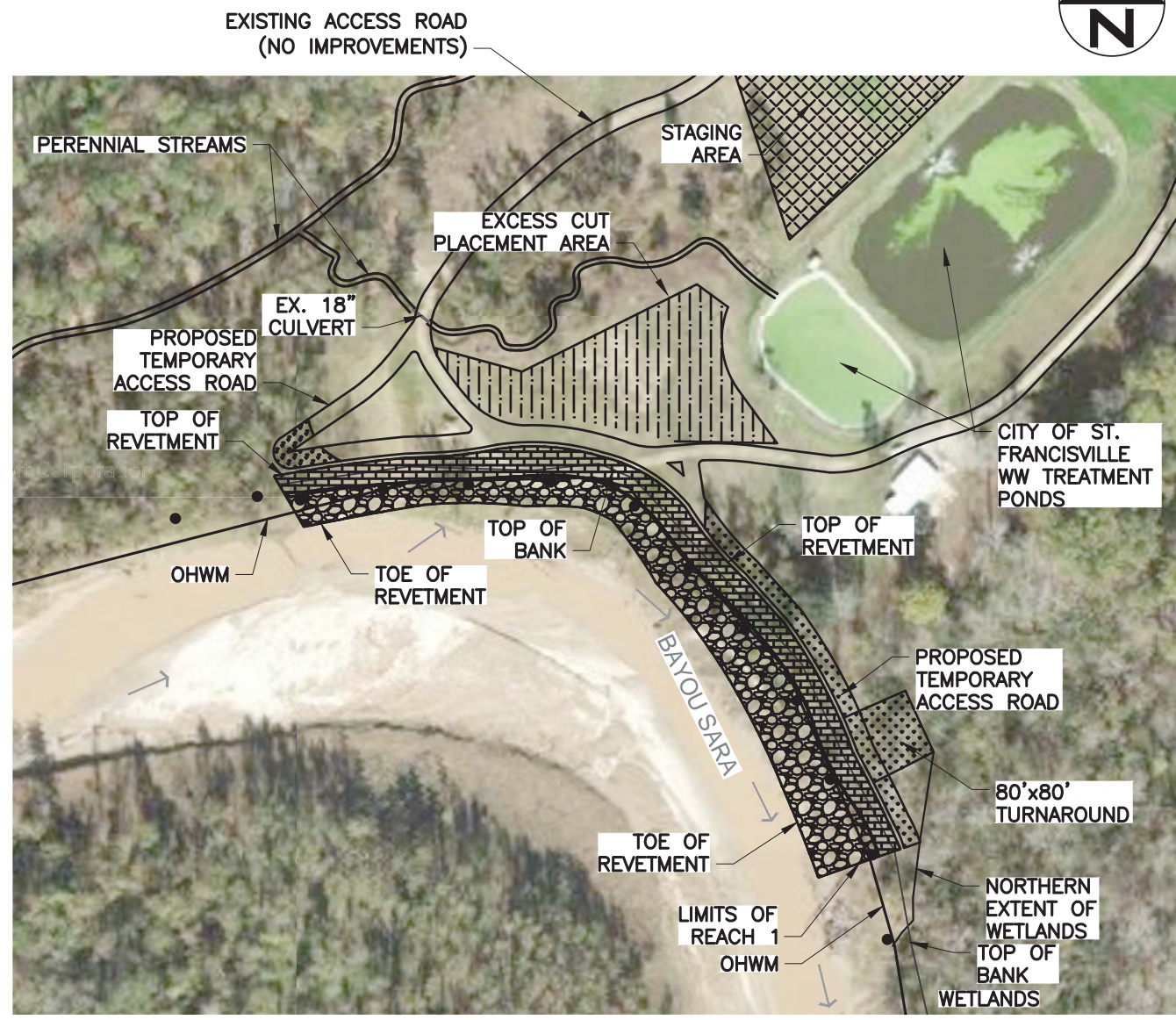
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SUITE 1600
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F. (504) 832-2145
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SHEET TITLE
BAYOU SARA BANK STABILIZATION PROJECT
W. FELECIANA PARISH, LA
PERMIT DRAWINGS

OVERALL PLAN VIEW
REV. 04






SHEET P-04



SCALE 1"=200'



LEGEND:

-  = BLOCK MAT
-  = RIPRAP FILL
-  = ACCESS TO BE CLEARED
-  = STAGING AREA
-  = EXCESS FILL PLACEMENT AREA

THESE PLATS ARE TO BE USED EXCLUSIVELY FOR THE ACQUISITION OF REGULATORY PERMITS.

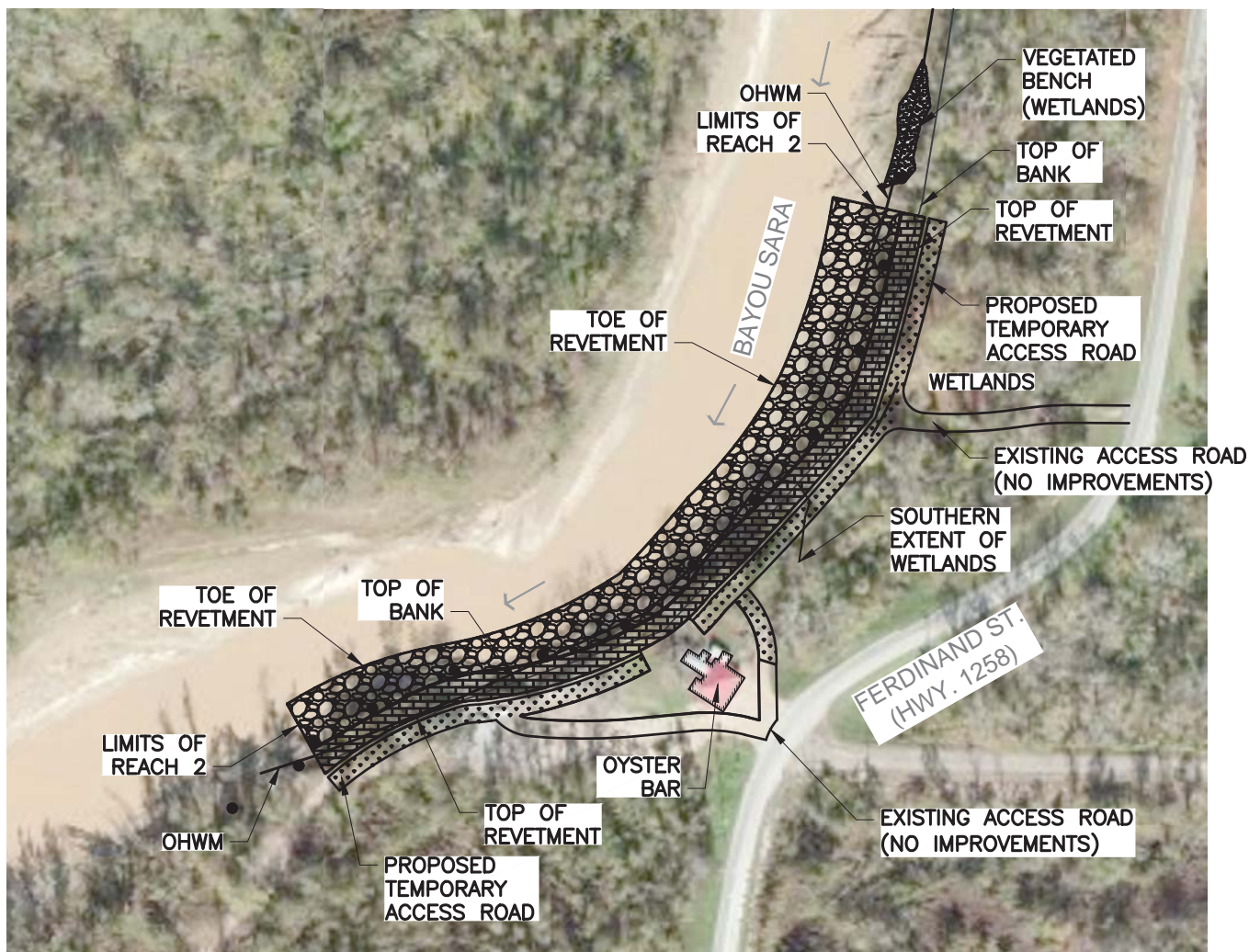


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SHEET TITLE
BAYOU SARA BANK STABILIZATION PROJECT
W. FELECIANA PARISH, LA
PERMIT DRAWINGS





REACH 1 - PLAN VIEW
REV. 04



SCALE 1"=200'



LEGEND:

-  = BLOCK MAT
-  = RIPRAP FILL
-  = ACCESS TO BE CLEARED
-  = VEGETATED BENCH (WETLANDS)

THESE PLATS ARE TO BE USED EXCLUSIVELY FOR THE ACQUISITION OF REGULATORY PERMITS.



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www.arcadis-us.com

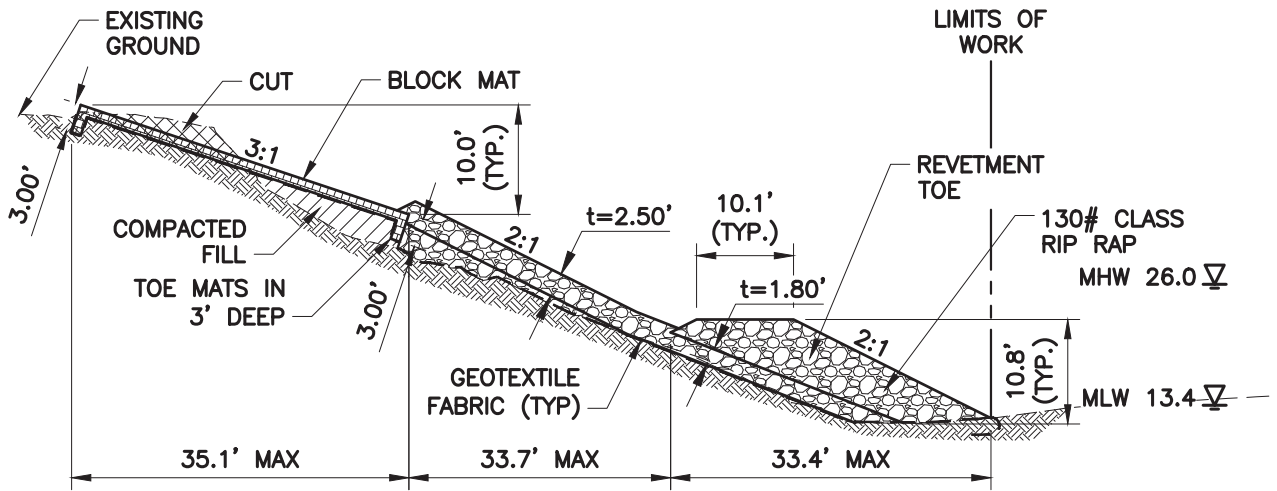


SHEET TITLE
BAYOU SARA BANK STABILIZATION PROJECT
W. FELECIANA PARISH, LA
PERMIT DRAWINGS





REACH 3 - PLAN VIEW

REV. 04

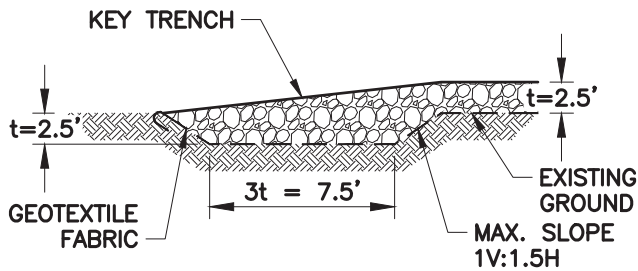
SHEET P-06



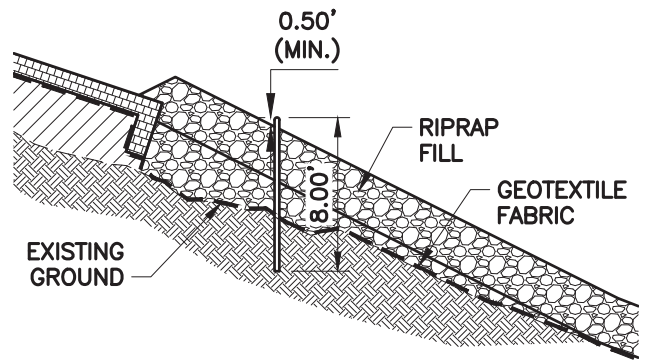
LEGEND:

-  = BLOCK MAT
-  = 130# CLASS RIP RAP
-  = COMPACTED FILL
-  = CUT

TYPICAL SECTION A
N.T.S.



TYPICAL SECTION B
N.T.S.



TYPICAL SECTION C
RIPRAP POLE GAUGE
N.T.S.

THESE PLATS ARE TO BE USED EXCLUSIVELY FOR THE ACQUISITION OF REGULATORY PERMITS.



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SHEET TITLE
BAYOU SARA BANK STABILIZATION PROJECT
W. FELECIANA PARISH, LA
PERMIT DRAWINGS

TYPICAL SECTIONS

REV. 04

SHEET P-07

ITEM	REACH 1	REACH 2	TOTAL
BLOCK MAT (SF)	36,526	38,963	72,440
BLOCK MAT ABOVE OHWM (CY)	653	567	1,220
BLOCK MAT BELOW OHWM (CY)	23	98	121
BLOCK MAT IN WETLAND (CY)	N/A	79.5	79.5
RIPRAP (INCLUDES 20% LOSSES) (CY)	8,347	11,702	20,050
RIPRAP ABOVE OHWM (INCLUDES 20% LOSSES) (CY)	1,204	2,065	3,269
RIPRAP BELOW OHWM (INCLUDES 20% LOSSES) (CY)	7,144	9,637	16,781
COMPACTED FILL (INCLUDES 20% LOSSES) (CY)	289	960	1,249
COMPACTED FILL ABOVE OHWM (INCLUDES 20% LOSSES) (CY)	253	629	882
COMPACTED FILL BELOW OHWM (INCLUDES 20% LOSSES) (CY)	36	331	367
CUT (CY)	2,860	1,530	4,390
GEOTEXTILE (SF)	86,608	103,067	189,675
POLE GAUGES (UNIT)	13	13	26
4" GRAVEL FILL FOR ACCESS ROADS (CY)*	—	—	1337

ACCESS ROADS	LENGTH (LF)	AREA (SF)	ACREAGE
EXISTING	3,331	66,628	1.53
NOT WOODED	490	9,808	0.23
WOODED	1,971	39,412	0.90
UPLAND	5,416	108,321	2.49
WETLAND	376	7,527	0.17
TOTAL	5,492	115,848	2.66

REVTMENT FOOTPRINT	
ITEM	ACREAGE
OTHER WATERS OF THE U.S. BELOW OHWM	2.06
NON-WETLAND	1.49
WETLAND	0.09
TOTAL	3.64

AREA	ACREAGE
STAGING AREA	0.95
EXCESS CUT PLACEMENT AREA	0.87
WORK LIMITS	9.04

NOTE:

* NO FILL FOR ACCESS WILL BE PLACED IN THE IDENTIFIED WETLAND AREAS.

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SHEET TITLE

**BAYOU SARA BANK STABILIZATION PROJECT
W. FELECIANA PARISH, LA
PERMIT DRAWINGS**

QUANTITIES

REV. 04

SHEET P-08



Nationwide Permit Summary

*33 CFR Part 330; Issuance of Nationwide Permits – March 19, 2017
and Regional Conditions for Louisiana*

Nationwide Permit 13 – Bank Stabilization. Bank stabilization activities necessary for erosion control or prevention, such as vegetative stabilization, bioengineering, sills, rip rap, revetment, gabion baskets, stream barbs, and bulkheads, or combinations of bank stabilization techniques, provided the activity meets all of the following criteria:

- (a) No material is placed in excess of the minimum needed for erosion protection;
- (b) The activity is no more than 500 feet in length along the bank, unless the district engineer waives this criterion by making a written determination concluding that the discharge will result in no more than minimal adverse environmental effects (an exception is for bulkheads—the district engineer cannot issue a waiver for a bulkhead that is greater than 1,000 feet in length along the bank);
- (c) The activity will not exceed an average of one cubic yard per running foot, as measured along the length of the treated bank, below the plane of the ordinary high water mark or the high tide line, unless the district engineer waives this criterion by making a written determination concluding that the discharge will result in no more than minimal adverse environmental effects;
- (d) The activity does not involve discharges of dredged or fill material into special aquatic sites, unless the district engineer waives this criterion by making a written determination concluding that the discharge will result in no more than minimal adverse environmental effects;
- (e) No material is of a type, or is placed in any location, or in any manner, that will impair surface water flow into or out of any waters of the United States;
- (f) No material is placed in a manner that will be eroded by normal or expected high flows (properly anchored native trees and treetops may be used in low energy areas);
- (g) Native plants appropriate for current site conditions, including salinity, must be used for bioengineering or vegetative bank stabilization;
- (h) The activity is not a stream channelization activity; and
- (i) The activity must be properly maintained, which may require repairing it after severe storms or erosion events. This NWP authorizes those maintenance and repair activities if they require authorization.

This NWP also authorizes temporary structures, fills, and work, including the use of temporary mats, necessary to construct the bank stabilization activity. Appropriate measures must be taken to maintain normal downstream flows and minimize flooding to the maximum extent practicable, when temporary structures, work, and discharges, including cofferdams, are

necessary for construction activities, access fills, or dewatering of construction sites. Temporary fills must consist of materials, and be placed in a manner, that will not be eroded by expected high flows. After construction, temporary fills must be removed in their entirety and the affected areas returned to preconstruction elevations. The areas affected by temporary fills must be revegetated, as appropriate.

Notification: The permittee must submit a pre-construction notification to the district engineer prior to commencing the activity if the bank stabilization activity: (1) Involves discharges into special aquatic sites; or (2) is in excess of 500 feet in length; or (3) will involve the discharge of greater than an average of one cubic yard per running foot as measured along the length of the treated bank, below the plane of the ordinary high water mark or the high tide line. (See general condition 32.)

(Authorities: Section 10 of the Rivers and Harbors Act of 1899 and section 404 of the Clean Water Act)

A. Nationwide Permit General Conditions

Note: To qualify for NWP authorization, the prospective permittee must comply with the following general conditions, as applicable, in addition to any regional or case-specific conditions imposed by the division engineer or district engineer. Prospective permittees should contact the appropriate Corps district office to determine if regional conditions have been imposed on an NWP. Prospective permittees should also contact the appropriate Corps district office to determine the status of Clean Water Act Section 401 water quality certification and/ or Coastal Zone Management Act consistency for an NWP. Every person who may wish to obtain permit authorization under one or more NWPs, or who is currently relying on an existing or prior permit authorization under one or more NWPs, has been and is on notice that all of the provisions of 33 CFR 330.1 through 330.6 apply to every NWP authorization. Note especially 33 CFR 330.5 relating to the modification, suspension, or revocation of any NWP authorization.

1. **Navigation.** (a) No activity may cause more than a minimal adverse effect on navigation. (b) Any safety lights and signals prescribed by the U.S. Coast Guard, through regulations or otherwise, must be installed and maintained at the permittee's expense on authorized facilities in navigable waters of the United States. (c) The permittee understands and agrees that, if future operations by the United States require the removal, relocation, or other alteration, of the structure or work herein authorized, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the permittee will be required, upon due notice from the Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal or alteration.

2. **Aquatic Life Movements.** No activity may substantially disrupt the necessary life cycle movements of those species of aquatic life indigenous to the waterbody, including those species that normally migrate through the area, unless the activity's primary purpose is to impound water. All permanent and temporary crossings of waterbodies shall be suitably culverted, bridged, or otherwise designed and constructed to maintain low flows to sustain the movement of those aquatic species. If a bottomless culvert cannot be used, then the crossing should be designed and constructed to minimize adverse effects to aquatic life movements.

3. **Spawning Areas.** Activities in spawning areas during spawning seasons must be avoided to the maximum extent practicable. Activities that result in the physical destruction (e.g., through excavation, fill, or downstream smothering by substantial turbidity) of an important spawning area are not authorized.

4. **Migratory Bird Breeding Areas.** Activities in waters of the United States that serve as breeding areas for migratory birds must be avoided to the maximum extent practicable.

5. **Shellfish Beds.** No activity may occur in areas of concentrated shellfish populations, unless the activity is directly related to a shellfish harvesting activity authorized by NWP 4 and 48, or is a shellfish seeding or habitat restoration activity authorized by NWP 27.

6. **Suitable Material.** No activity may use unsuitable material (e.g., trash, debris, car bodies, asphalt, etc.). Material used for construction or discharged must be free from toxic pollutants in toxic amounts (see section 307 of the Clean Water Act).

7. **Water Supply Intakes.** No activity may occur in the proximity of a public water supply intake, except where the activity is for the repair or improvement of public water supply intake structures or adjacent bank stabilization.

8. **Adverse Effects From Impoundments.** If the activity creates an impoundment of water, adverse effects to the aquatic system due to accelerating the passage of water, and/or restricting its flow must be minimized to the maximum extent practicable.

9. **Management of Water Flows.** To the maximum extent practicable, the preconstruction course, condition, capacity, and location of open waters must be maintained for each activity, including stream channelization, storm water management activities, and temporary and permanent road crossings, except as provided below. The activity must be constructed to withstand expected high flows. The activity must not restrict or impede the passage of normal or high flows, unless the primary purpose of the activity is to impound water or manage high flows. The activity may alter the preconstruction course, condition, capacity, and location of open waters if it benefits the aquatic environment (e.g., stream restoration or relocation activities).

10. **Fills Within 100-Year Floodplains.** The activity must comply with applicable FEMA-approved state or local floodplain management requirements.

11. **Equipment.** Heavy equipment working in wetlands or mudflats must be placed on mats, or other measures must be taken to minimize soil disturbance.

12. **Soil Erosion and Sediment Controls.** Appropriate soil erosion and sediment controls must be used and maintained in effective operating condition during construction, and all exposed soil and other fills, as well as any work below the ordinary high water mark or high tide line, must be permanently stabilized at the earliest practicable date. Permittees are encouraged to perform work within waters of the United States during periods of low-flow or no-flow, or during low tides.

13. **Removal of Temporary Fills.** Temporary fills must be removed in their entirety and the affected areas returned to pre-construction elevations. The affected areas must be revegetated, as appropriate.

14. **Proper Maintenance.** Any authorized structure or fill shall be properly maintained, including maintenance to ensure public safety and compliance with applicable NWP general conditions, as well as any activity-specific conditions added by the district engineer to an NWP authorization.

15. **Single and Complete Project.** The activity must be a single and complete project. The same NWP cannot be used more than once for the same single and complete project.

16. **Wild and Scenic Rivers.** (a) No NWP activity may occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a “study river” for possible inclusion in the system while the river is in an official study status, unless the appropriate Federal agency with direct management responsibility for such river, has determined in writing that the proposed activity will not adversely affect the Wild and Scenic River designation or study status.

(b) If a proposed NWP activity will occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a “study river” for possible inclusion in the system while the river is in an official study status, the permittee must submit a pre-construction notification (see general condition 32). The district engineer will coordinate the PCN with the Federal agency with direct management responsibility for that river. The permittee shall not begin the NWP activity until notified by the district engineer that the Federal agency with direct management responsibility for that river has determined in writing that the proposed NWP activity will not adversely affect the Wild and Scenic River designation or study status.

(c) Information on Wild and Scenic Rivers may be obtained from the appropriate Federal land management agency responsible for the designated Wild and Scenic River or study river (e.g., National Park Service, U.S. Forest Service, Bureau of Land Management, U.S. Fish and Wildlife Service). Information on these rivers is also available at: <http://www.rivers.gov/>.

17. Tribal Rights. No NWP activity may cause more than minimal adverse effects on tribal rights (including treaty rights), protected tribal resources, or tribal lands.

18. Endangered Species. (a) No activity is authorized under any NWP which is likely to directly or indirectly jeopardize the continued existence of a threatened or endangered species or a species proposed for such designation, as identified under the Federal Endangered Species Act (ESA), or which will directly or indirectly destroy or adversely modify the critical habitat of such species. No activity is authorized under any NWP which “may affect” a listed species or critical habitat, unless ESA section 7 consultation addressing the effects of the proposed activity has been completed. Direct effects are the immediate effects on listed species and critical habitat caused by the NWP activity. Indirect effects are those effects on listed species and critical habitat that are caused by the NWP activity and are later in time, but still are reasonably certain to occur.

(b) Federal agencies should follow their own procedures for complying with the requirements of the ESA. If preconstruction notification is required for the proposed activity, the Federal permittee must provide the district engineer with the appropriate documentation to demonstrate compliance with those requirements. The district engineer will verify that the appropriate documentation has been submitted. If the appropriate documentation has not been submitted, additional ESA section 7 consultation may be necessary for the activity and the respective federal agency would be responsible for fulfilling its obligation under section 7 of the ESA.

(c) Non-federal permittees must submit a pre-construction notification to the district engineer if any listed species or designated critical habitat might be affected or is in the vicinity of the activity, or if the activity is located in designated critical habitat, and shall not begin work on the activity until notified by the district engineer that the requirements of the ESA have been satisfied and that the activity is authorized. For activities that might affect Federally-listed endangered or threatened species or designated critical habitat, the pre-construction notification must include the name(s) of the endangered or threatened species that might be affected by the proposed activity or that utilize the designated critical habitat that might be affected by the proposed activity. The district engineer will determine whether the proposed activity “may affect” or will have “no effect” to listed species and designated critical habitat and will notify the non-Federal applicant of the Corps’ determination within 45 days of receipt of a complete pre-construction notification. In cases where the non-Federal applicant has identified listed species or critical habitat that might be affected or is in the vicinity of the activity, and has so notified the Corps, the applicant shall not begin work until the Corps has provided notification that the

proposed activity will have “no effect” on listed species or critical habitat, or until ESA section 7 consultation has been completed. If the non-Federal applicant has not heard back from the Corps within 45 days, the applicant must still wait for notification from the Corps.

(d) As a result of formal or informal consultation with the FWS or NMFS the district engineer may add species-specific permit conditions to the NWP.

(e) Authorization of an activity by an NWP does not authorize the “take” of a threatened or endangered species as defined under the ESA. In the absence of separate authorization (e.g., an ESA Section 10 Permit, a Biological Opinion with “incidental take” provisions, etc.) from the FWS or the NMFS, the Endangered Species Act prohibits any person subject to the jurisdiction of the United States to take a listed species, where “take” means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. The word “harm” in the definition of “take” means an act which actually kills or injures wildlife. Such an act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering.

(f) If the non-federal permittee has a valid ESA section 10(a)(1)(B) incidental take permit with an approved Habitat Conservation Plan for a project or a group of projects that includes the proposed NWP activity, the non-federal applicant should provide a copy of that ESA section 10(a)(1)(B) permit with the PCN required by paragraph (c) of this general condition. The district engineer will coordinate with the agency that issued the ESA section 10(a)(1)(B) permit to determine whether the proposed NWP activity and the associated incidental take were considered in the internal ESA section 7 consultation conducted for the ESA section 10(a)(1)(B) permit. If that coordination results in concurrence from the agency that the proposed NWP activity and the associated incidental take were considered in the internal ESA section 7 consultation for the ESA section 10(a)(1)(B) permit, the district engineer does not need to conduct a separate ESA section 7 consultation for the proposed NWP activity. The district engineer will notify the non-federal applicant within 45 days of receipt of a complete pre-construction notification whether the ESA section 10(a)(1)(B) permit covers the proposed NWP activity or whether additional ESA section 7 consultation is required.

(g) Information on the location of threatened and endangered species and their critical habitat can be obtained directly from the offices of the FWS and NMFS or their world wide Web pages at <http://www.fws.gov/> or <http://www.fws.gov/ipac> and <http://www.nmfs.noaa.gov/pr/species/esa/> respectively.

19. Migratory Birds and Bald and Golden Eagles. The permittee is responsible for ensuring their action complies with the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. The permittee is responsible for contacting appropriate local office of the U.S.

Fish and Wildlife Service to determine applicable measures to reduce impacts to migratory birds or eagles, including whether “incidental take” permits are necessary and available under the Migratory Bird Treaty Act or Bald and Golden Eagle Protection Act for a particular activity.

20. Historic Properties. (a) In cases where the district engineer determines that the activity may have the potential to cause effects to properties listed, or eligible for listing, in the National Register of Historic Places, the activity is not authorized, until the requirements of Section 106 of the National Historic Preservation Act (NHPA) have been satisfied.

(b) Federal permittees should follow their own procedures for complying with the requirements of section 106 of the National Historic Preservation Act. If pre-construction notification is required for the proposed NWP activity, the Federal permittee must provide the district engineer with the appropriate documentation to demonstrate compliance with those requirements. The district engineer will verify that the appropriate documentation has been submitted. If the appropriate documentation is not submitted, then additional consultation under section 106 may be necessary. The respective federal agency is responsible for fulfilling its obligation to comply with section 106.

(c) Non-federal permittees must submit a pre-construction notification to the district engineer if the NWP activity might have the potential to cause effects to any historic properties listed on, determined to be eligible for listing on, or potentially eligible for listing on the National Register of Historic Places, including previously unidentified properties. For such activities, the preconstruction notification must state which historic properties might have the potential to be affected by the proposed NWP activity or include a vicinity map indicating the location of the historic properties or the potential for the presence of historic properties. Assistance regarding information on the location of, or potential for, the presence of historic properties can be sought from the State Historic Preservation Officer, Tribal Historic Preservation Officer, or designated tribal representative, as appropriate, and the National Register of Historic Places (see 33 CFR 330.4(g)). When reviewing pre-construction notifications, district engineers will comply with the current procedures for addressing the requirements of section 106 of the National Historic Preservation Act. The district engineer shall make a reasonable and good faith effort to carry out appropriate identification efforts, which may include background research, consultation, oral history interviews, sample field investigation, and field survey. Based on the information submitted in the PCN and these identification efforts, the district engineer shall determine whether the proposed NWP activity has the potential to cause effects on the historic properties. Section 106 consultation is not required when the district engineer determines that the activity does not have the potential to cause effects on historic properties (see 36 CFR 800.3(a)). Section 106 consultation is required when the district engineer determines that the activity has the potential to cause effects on historic properties. The district engineer will conduct consultation with consulting parties identified under 36 CFR 800.2(c) when he or she makes any of the following effect determinations for the purposes of section 106 of the NHPA: no historic

properties affected, no adverse effect, or adverse effect. Where the non-Federal applicant has identified historic properties on which the activity might have the potential to cause effects and so notified the Corps, the non-Federal applicant shall not begin the activity until notified by the district engineer either that the activity has no potential to cause effects to historic properties or that NHPA section 106 consultation has been completed.

(d) For non-federal permittees, the district engineer will notify the prospective permittee within 45 days of receipt of a complete pre-construction notification whether NHPA section 106 consultation is required. If NHPA section 106 consultation is required, the district engineer will notify the non-Federal applicant that he or she cannot begin the activity until section 106 consultation is completed. If the non-Federal applicant has not heard back from the Corps within 45 days, the applicant must still wait for notification from the Corps.

(e) Prospective permittees should be aware that section 110k of the NHPA (54 U.S.C. 306113) prevents the Corps from granting a permit or other assistance to an applicant who, with intent to avoid the requirements of section 106 of the NHPA, has intentionally significantly adversely affected a historic property to which the permit would relate, or having legal power to prevent it, allowed such significant adverse effect to occur, unless the Corps, after consultation with the Advisory Council on Historic Preservation (ACHP), determines that circumstances justify granting such assistance despite the adverse effect created or permitted by the applicant. If circumstances justify granting the assistance, the Corps is required to notify the ACHP and provide documentation specifying the circumstances, the degree of damage to the integrity of any historic properties affected, and proposed mitigation. This documentation must include any views obtained from the applicant, SHPO/ THPO, appropriate Indian tribes if the undertaking occurs on or affects historic properties on tribal lands or affects properties of interest to those tribes, and other parties known to have a legitimate interest in the impacts to the permitted activity on historic properties.

21. Discovery of Previously Unknown Remains and Artifacts. If you discover any previously unknown historic, cultural or archeological remains and artifacts while accomplishing the activity authorized by this permit, you must immediately notify the district engineer of what you have found, and to the maximum extent practicable, avoid construction activities that may affect the remains and artifacts until the required coordination has been completed. The district engineer will initiate the Federal, Tribal, and state coordination required to determine if the items or remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

22. Designated Critical Resource Waters. Critical resource waters include, NOAA-managed marine sanctuaries and marine monuments, and National Estuarine Research Reserves. The district engineer may designate, after notice and opportunity for public comment, additional waters officially designated by a state as having particular environmental or ecological

significance, such as outstanding national resource waters or state natural heritage sites. The district engineer may also designate additional critical resource waters after notice and opportunity for public comment.

(a) Discharges of dredged or fill material into waters of the United States are not authorized by NWP's 7, 12, 14, 16, 17, 21, 29, 31, 35, 39, 40, 42, 43, 44, 49, 50, 51, and 52 for any activity within, or directly affecting, critical resource waters, including wetlands adjacent to such waters.

(b) For NWP's 3, 8, 10, 13, 15, 18, 19, 22, 23, 25, 27, 28, 30, 33, 34, 36, 37, 38, and 54, notification is required in accordance with general condition 32, for any activity proposed in the designated critical resource waters including wetlands adjacent to those waters. The district engineer may authorize activities under these NWP's only after it is determined that the impacts to the critical resource waters will be no more than minimal.

23. **Mitigation.** The district engineer will consider the following factors when determining appropriate and practicable mitigation necessary to ensure that the individual and cumulative adverse environmental effects are no more than minimal:

(a) The activity must be designed and constructed to avoid and minimize adverse effects, both temporary and permanent, to waters of the United States to the maximum extent practicable at the project site (i.e., on site).

(b) Mitigation in all its forms (avoiding, minimizing, rectifying, reducing, or compensating for resource losses) will be required to the extent necessary to ensure that the individual and cumulative adverse environmental effects are no more than minimal.

(c) Compensatory mitigation at a minimum one-for-one ratio will be required for all wetland losses that exceed 1/10-acre and require preconstruction notification, unless the district engineer determines in writing that either some other form of mitigation would be more environmentally appropriate or the adverse environmental effects of the proposed activity are no more than minimal, and provides an activity-specific waiver of this requirement. For wetland losses of 1/10-acre or less that require preconstruction notification, the district engineer may determine on a case-by case basis that compensatory mitigation is required to ensure that the activity results in only minimal adverse environmental effects.

(d) For losses of streams or other open waters that require pre-construction notification, the district engineer may require compensatory mitigation to ensure that the activity results in no more than minimal adverse environmental effects. Compensatory mitigation for losses of streams should be provided, if practicable, through stream rehabilitation, enhancement, or preservation, since streams are difficult to-replace resources (see 33 CFR 332.3(e)(3)).

(e) Compensatory mitigation plans for NWP activities in or near streams or other open waters will normally include a requirement for the restoration or enhancement, maintenance, and legal protection (e.g., conservation easements) of riparian areas next to open waters. In some cases, the restoration or maintenance/protection of riparian areas may be the only compensatory mitigation required. Restored riparian areas should consist of native species. The width of the required riparian area will address documented water quality or aquatic habitat loss concerns. Normally, the riparian area will be 25 to 50 feet wide on each side of the stream, but the district engineer may require slightly wider riparian areas to address documented water quality or habitat loss concerns. If it is not possible to restore or maintain/protect a riparian area on both sides of a stream, or if the waterbody is a lake or coastal waters, then restoring or maintaining/protecting a riparian area along a single bank or shoreline may be sufficient. Where both wetlands and open waters exist on the project site, the district engineer will determine the appropriate compensatory mitigation (e.g., riparian areas and/or wetlands compensation) based on what is best for the aquatic environment on a watershed basis. In cases where riparian areas are determined to be the most appropriate form of minimization or compensatory mitigation, the district engineer may waive or reduce the requirement to provide wetland compensatory mitigation for wetland losses.

(f) Compensatory mitigation projects provided to offset losses of aquatic resources must comply with the applicable provisions of 33 CFR part 332.

(1) The prospective permittee is responsible for proposing an appropriate compensatory mitigation option if compensatory mitigation is necessary to ensure that the activity results in no more than minimal adverse environmental effects. For the NWPs, the preferred mechanism for providing compensatory mitigation is mitigation bank credits or in-lieu fee program credits (see 33 CFR 332.3(b)(2) and (3)). However, if an appropriate number and type of mitigation bank or in-lieu credits are not available at the time the PCN is submitted to the district engineer, the district engineer may approve the use of permittee-responsible mitigation.

(2) The amount of compensatory mitigation required by the district engineer must be sufficient to ensure that the authorized activity results in no more than minimal individual and cumulative adverse environmental effects (see 33 CFR 330.1(e)(3)). (See also 33 CFR 332.3(f)).

(3) Since the likelihood of success is greater and the impacts to potentially valuable uplands are reduced, aquatic resource restoration should be the first compensatory mitigation option considered for permittee-responsible mitigation.

(4) If permittee-responsible mitigation is the proposed option, the prospective permittee is responsible for submitting a mitigation plan. A conceptual or detailed mitigation plan may be used by the district engineer to make the decision on the NWP verification request, but a final mitigation plan that addresses the applicable requirements of 33 CFR 332.4(c)(2) through (14)

must be approved by the district engineer before the permittee begins work in waters of the United States, unless the district engineer determines that prior approval of the final mitigation plan is not practicable or not necessary to ensure timely completion of the required compensatory mitigation (see 33 CFR 332.3(k)(3)).

(5) If mitigation bank or in-lieu fee program credits are the proposed option, the mitigation plan only needs to address the baseline conditions at the impact site and the number of credits to be provided.

(6) Compensatory mitigation requirements (e.g., resource type and amount to be provided as compensatory mitigation, site protection, ecological performance standards, monitoring requirements) may be addressed through conditions added to the NWP authorization, instead of components of a compensatory mitigation plan (see 33 CFR 332.4(c)(1)(ii)).

(g) Compensatory mitigation will not be used to increase the acreage losses allowed by the acreage limits of the NWPs. For example, if an NWP has an acreage limit of 1/2-acre, it cannot be used to authorize any NWP activity resulting in the loss of greater than 1/2- acre of waters of the United States, even if compensatory mitigation is provided that replaces or restores some of the lost waters. However, compensatory mitigation can and should be used, as necessary, to ensure that an NWP activity already meeting the established acreage limits also satisfies the no more than minimal impact requirement for the NWPs.

(h) Permittees may propose the use of mitigation banks, in-lieu fee programs, or permittee-responsible mitigation. When developing a compensatory mitigation proposal, the permittee must consider appropriate and practicable options consistent with the framework at 33 CFR 332.3(b). For activities resulting in the loss of marine or estuarine resources, permittee responsible mitigation may be environmentally preferable if there are no mitigation banks or in-lieu fee programs in the area that have marine or estuarine credits available for sale or transfer to the permittee. For permittee responsible mitigation, the special conditions of the NWP verification must clearly indicate the party or parties responsible for the implementation and performance of the compensatory mitigation project, and, if required, its long-term management.

(i) Where certain functions and services of waters of the United States are permanently adversely affected by a regulated activity, such as discharges of dredged or fill material into waters of the United States that will convert a forested or scrub-shrub wetland to a herbaceous wetland in a permanently maintained utility line right-of-way, mitigation may be required to reduce the adverse environmental effects of the activity to the no more than minimal level.

24. Safety of Impoundment Structures. To ensure that all impoundment structures are safely designed, the district engineer may require non-Federal applicants to demonstrate that the structures comply with established state dam safety criteria or have been designed by qualified

persons. The district engineer may also require documentation that the design has been independently reviewed by similarly qualified persons, and appropriate modifications made to ensure safety.

25. Water Quality. Where States and authorized Tribes, or EPA where applicable, have not previously certified compliance of an NWP with CWA section 401, individual 401 Water Quality Certification must be obtained or waived (see 33 CFR 330.4(c)). The district engineer or State or Tribe may require additional water quality management measures to ensure that the authorized activity does not result in more than minimal degradation of water quality.

26. Coastal Zone Management. In coastal states where an NWP has not previously received a state coastal zone management consistency concurrence, an individual state coastal zone management consistency concurrence must be obtained, or a presumption of concurrence must occur (see 33 CFR 330.4(d)). The district engineer or a State may require additional measures to ensure that the authorized activity is consistent with state coastal zone management requirements.

27. Regional and Case-By-Case Conditions. The activity must comply with any regional conditions that may have been added by the Division Engineer (see 33 CFR 330.4(e)) and with any case specific conditions added by the Corps or by the state, Indian Tribe, or U.S. EPA in its section 401 Water Quality Certification, or by the state in its Coastal Zone Management Act consistency determination.

28. Use of Multiple Nationwide Permits. Use of Multiple Nationwide Permits. The use of more than one NWP for a single and complete project is prohibited, except when the acreage loss of waters of the United States authorized by the NWPs does not exceed the acreage limit of the NWP with the highest specified acreage limit. For example, if a road crossing over tidal waters is constructed under NWP 14, with associated bank stabilization authorized by NWP 13, the maximum acreage loss of waters of the United States for the total project cannot exceed 1/3-acre.

29. Transfer of Nationwide Permit Verifications. If the permittee sells the property associated with a nationwide permit verification, the permittee may transfer the nationwide permit verification to the new owner by submitting a letter to the appropriate Corps district office to validate the transfer. A copy of the nationwide permit verification must be attached to the letter, and the letter must contain the following statement and signature:

"When the structures or work authorized by this nationwide permit are still in existence at the time the property is transferred, the terms and conditions of this nationwide permit, including any special conditions, will continue to be binding on the new owner(s) of the property. To

validate the transfer of this nationwide permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below."

(Transferee)

(Date)

30. Compliance Certification. Each permittee who receives an NWP verification letter from the Corps must provide a signed certification documenting completion of the authorized activity and implementation of any required compensatory mitigation. The success of any required permittee-responsible mitigation, including the achievement of ecological performance standards, will be addressed separately by the district engineer. The Corps will provide the permittee the certification document with the NWP verification letter. The certification document will include:

(a) A statement that the authorized activity was done in accordance with the NWP authorization, including any general, regional, or activity-specific conditions;

(b) A statement that the implementation of any required compensatory mitigation was completed in accordance with the permit conditions. If credits from a mitigation bank or in-lieu fee program are used to satisfy the compensatory mitigation requirements, the certification must include the documentation required by 33 CFR 332.3(l)(3) to confirm that the permittee secured the appropriate number and resource type of credits; and

(c) The signature of the permittee certifying the completion of the activity and mitigation. The completed certification document must be submitted to the district engineer within 30 days of completion of the authorized activity or the implementation of any required compensatory mitigation, whichever occurs later.

31. Activities Affecting Structures or Works Built by the United States. If an NWP activity also requires permission from the Corps pursuant to 33 U.S.C. 408 because it will alter or temporarily or permanently occupy or use a U.S. Army Corps of Engineers (USACE) federally authorized Civil Works project (a USACE project), the prospective permittee must submit a preconstruction notification. See paragraph (b)(10) of general condition 32. An activity that requires section 408 permission is not authorized by NWP until the appropriate Corps office

issues the section 408 permission to alter, occupy, or use the USACE project, and the district engineer issues a written NWP verification.

32. Pre-Construction Notification. (a) Timing. Where required by the terms of the NWP, the prospective permittee must notify the district engineer by submitting a pre-construction notification (PCN) as early as possible. The district engineer must determine if the PCN is complete within 30 calendar days of the date of receipt and, if the PCN is determined to be incomplete, notify the prospective permittee within that 30 day period to request the additional information necessary to make the PCN complete. The request must specify the information needed to make the PCN complete. As a general rule, district engineers will request additional information necessary to make the PCN complete only once. However, if the prospective permittee does not provide all of the requested information, then the district engineer will notify the prospective permittee that the PCN is still incomplete and the PCN review process will not commence until all of the requested information has been received by the district engineer. The prospective permittee shall not begin the activity until either:

(1) He or she is notified in writing by the district engineer that the activity may proceed under the NWP with any special conditions imposed by the district or division engineer; or

(2) 45 calendar days have passed from the district engineer's receipt of the complete PCN and the prospective permittee has not received written notice from the district or division engineer. However, if the permittee was required to notify the Corps pursuant to general condition 18 that listed species or critical habitat might be affected or are in the vicinity of the activity, or to notify the Corps pursuant to general condition 20 that the activity might have the potential to cause effects to historic properties, the permittee cannot begin the activity until receiving written notification from the Corps that there is no effect on listed species or no potential to cause effects on historic properties, or that any consultation required under Section 7 of the Endangered Species Act (see 33 CFR 330.4(f)) and/or section 106 of the National Historic Preservation Act (see 33 CFR 330.4(g)) has been completed. Also, work cannot begin under NWPs 21, 49, or 50 until the permittee has received written approval from the Corps. If the proposed activity requires a written waiver to exceed specified limits of an NWP, the permittee may not begin the activity until the district engineer issues the waiver. If the district or division engineer notifies the permittee in writing that an individual permit is required within 45 calendar days of receipt of a complete PCN, the permittee cannot begin the activity until an individual permit has been obtained. Subsequently, the permittee's right to proceed under the NWP may be modified, suspended, or revoked only in accordance with the procedure set forth in 33 CFR 330.5(d)(2).

(b) Contents of Pre-Construction Notification: The PCN must be in writing and include the following information:

- (1) Name, address and telephone numbers of the prospective permittee;
- (2) Location of the proposed activity;
- (3) Identify the specific NWP or NWP(s) the prospective permittee wants to use to authorize the proposed activity;
- (4) A description of the proposed activity; the activity's purpose; direct and indirect adverse environmental effects the activity would cause, including the anticipated amount of loss of wetlands, other special aquatic sites, and other waters expected to result from the NWP activity, in acres, linear feet, or other appropriate unit of measure; a description of any proposed mitigation measures intended to reduce the adverse environmental effects caused by the proposed activity; and any other NWP(s), regional general permit(s), or individual permit(s) used or intended to be used to authorize any part of the proposed project or any related activity, including other separate and distant crossings for linear projects that require Department of the Army authorization but do not require pre-construction notification. The description of the proposed activity and any proposed mitigation measures should be sufficiently detailed to allow the district engineer to determine that the adverse environmental effects of the activity will be no more than minimal and to determine the need for compensatory mitigation or other mitigation measures. For single and complete linear projects, the PCN must include the quantity of anticipated losses of wetlands, other special aquatic sites, and other waters for each single and complete crossing of those wetlands, other special aquatic sites, and other waters. Sketches should be provided when necessary to show that the activity complies with the terms of the NWP. (Sketches usually clarify the activity and when provided results in a quicker decision. Sketches should contain sufficient detail to provide an illustrative description of the proposed activity (e.g., a conceptual plan), but do not need to be detailed engineering plans);
- (5) The PCN must include a delineation of wetlands, other special aquatic sites, and other waters, such as lakes and ponds, and perennial, intermittent, and ephemeral streams, on the project site. Wetland delineations must be prepared in accordance with the current method required by the Corps. The permittee may ask the Corps to delineate the special aquatic sites and other waters on the project site, but there may be a delay if the Corps does the delineation, especially if the project site is large or contains many wetlands, other special aquatic sites, and other waters. Furthermore, the 45 day period will not start until the delineation has been submitted to or completed by the Corps, as appropriate;
- (6) If the proposed activity will result in the loss of greater than 1/10-acre of wetlands and a PCN is required, the prospective permittee must submit a statement describing how the mitigation requirement will be satisfied, or explaining why the adverse environmental effects are no more

than minimal and why compensatory mitigation should not be required. As an alternative, the prospective permittee may submit a conceptual or detailed mitigation plan.

(7) For non-Federal permittees, if any listed species or designated critical habitat might be affected or is in the vicinity of the activity, or if the activity is located in designated critical habitat, the PCN must include the name(s) of those endangered or threatened species that might be affected by the proposed activity or utilize the designated critical habitat that might be affected by the proposed activity. For NWP activities that require pre-construction notification, Federal permittees must provide documentation demonstrating compliance with the Endangered Species Act;

(8) For non-Federal permittees, if the NWP activity might have the potential to cause effects to a historic property listed on, determined to be eligible for listing on, or potentially eligible for listing on, the National Register of Historic Places, the PCN must state which historic property might have the potential to be affected by the proposed activity or include a vicinity map indicating the location of the historic property. For NWP activities that require pre-construction notification, Federal permittees must provide documentation demonstrating compliance with section 106 of the National Historic Preservation Act;

(9) For an activity that will occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a study river for possible inclusion in the system while the river is in an official study status, the PCN must identify the Wild and Scenic River or the study river (see general condition 16); and

(10) For an activity that requires permission from the Corps pursuant to 33 U.S.C. 408 because it will alter or temporarily or permanently occupy or use a U.S. Army Corps of Engineers federally authorized civil works project, the pre-construction notification must include a statement confirming that the project proponent has submitted a written request for section 408 permission from the Corps office having jurisdiction over that USACE project.

(c) Form of Pre-Construction Notification: The standard individual permit application form (Form ENG 4345) may be used, but the completed application form must clearly indicate that it is an NWP PCN and must include all of the applicable information required in paragraphs (b)(1) through (10) of this general condition. A letter containing the required information may also be used. Applicants may provide electronic files of PCNs and supporting materials if the district engineer has established tools and procedures for electronic submittals.

(d) Agency Coordination: (1) The district engineer will consider any comments from Federal and state agencies concerning the proposed activity's compliance with the terms and conditions of the NWPs and the need for mitigation to reduce the activity's adverse environmental effects so that they are no more than minimal.

(2) Agency coordination is required for: (i) All NWP activities that require pre-construction notification and result in the loss of greater than 1/2-acre of waters of the United States; (ii) NWP 21, 29, 39, 40, 42, 43, 44, 50, 51, and 52 activities that require pre-construction notification and will result in the loss of greater than 300 linear feet of stream bed; (iii) NWP 13 activities in excess of 500 linear feet, fills greater than one cubic yard per running foot, or involve discharges of dredged or fill material into special aquatic sites; and (iv) NWP 54 activities in excess of 500 linear feet, or that extend into the waterbody more than 30 feet from the mean low water line in tidal waters or the ordinary high water mark in the Great Lakes.

(3) When agency coordination is required, the district engineer will immediately provide (e.g., via email, facsimile transmission, overnight mail, or other expeditious manner) a copy of the complete PCN to the appropriate Federal or state offices (FWS, state natural resource or water quality agency, EPA, and, if appropriate, the NMFS). With the exception of NWP 37, these agencies will have 10 calendar days from the date the material is transmitted to notify the district engineer via telephone, facsimile transmission, or email that they intend to provide substantive, site-specific comments. The comments must explain why the agency believes the adverse environmental effects will be more than minimal. If so contacted by an agency, the district engineer will wait an additional 15 calendar days before making a decision on the preconstruction notification. The district engineer will fully consider agency comments received within the specified time frame concerning the proposed activity's compliance with the terms and conditions of the NWPs, including the need for mitigation to ensure the net adverse environmental effects of the proposed activity are no more than minimal. The district engineer will provide no response to the resource agency, except as provided below. The district engineer will indicate in the administrative record associated with each pre-construction notification that the resource agencies concerns were considered. For NWP 37, the emergency watershed protection and rehabilitation activity may proceed immediately in cases where there is an unacceptable hazard to life or a significant loss of property or economic hardship will occur. The district engineer will consider any comments received to decide whether the NWP 37 authorization should be modified, suspended, or revoked in accordance with the procedures at 33 CFR 330.5.

(4) In cases of where the prospective permittee is not a Federal agency, the district engineer will provide a response to NMFS within 30 calendar days of receipt of any Essential Fish Habitat conservation recommendations, as required by section 305(b)(4)(B) of the Magnuson-Stevens Fishery Conservation and Management Act.

(5) Applicants are encouraged to provide the Corps with either electronic files or multiple copies of preconstruction notifications to expedite agency coordination.

B. Regional Conditions for all Nationwide Permits in Louisiana

Regional Condition 1. No regulated activity may cause the permanent loss or the conversion of greater than 1/2 acre of cypress swamp and/or cypress-tupelo swamp.

Regional Condition 2. No regulated activity may cause the permanent loss or the conversion of greater than ½ acre of coastal prairie, pine savanna, and/or pitcher plant bogs.

Regional Condition 3. No regulated activity is authorized under any NWP permit which has been determined to have an adverse impact upon a federal or state designated rookery and/or bird sanctuary.

Regional Condition 4. Although ESA Section 7 consultation is no longer required for the Louisiana black bear (which has been delisted due to recovery), permittees are advised that the Louisiana black bear is still protected under State of Louisiana law, and the Louisiana Department of Wildlife and Fisheries (LDWF) will continue to actively manage this subspecies. To learn more about State law requirements for Louisiana black bear protection and habitat conservation, permittees shall contact Maria Davidson (Louisiana Department of Wildlife and Fisheries - Large Carnivore Program Manager) at (337) 948-0255.

Regional Condition 5. Due to the occurrence of threatened or endangered species, **Pre-Construction Notification** shall be required for ALL regulated instream activities in the following waterways: Abita River and tributaries; Amite River (LA Highway 37 at Grangeville to Port Vincent); Bayou Bartholomew in Morehouse Parish; Bayou Boeuf and Bayou Rapides Tributaries in Rapides Parish: (Bayou Clear, Brown Creek, Burney Branch, Castor Creek, Clear Creek, Haikey s Creek, Little Bayou Clear, Little Brushy Creek, Loving Creek, Little Loving Creek, Long Branch, Mack Branch, Patterson Branch, Valentine Creek, and Williamson Branch), Bayou Rigolette tributaries in Grant Parish (Beaver Creek, Black Creek, Chandler Creek, Clear Branch, Coleman Branch, Cress Creek, Cypress Creek, Gladly Hollow, Gray Creek, Hudson Creek, James Branch, Jordon Creek, Moccasin Branch, and Swafford Creek); Bogue Falaya River and Tributaries, Bogue Chitto River and Tributaries, Lake Borgne, Lake Pontchartrain and its tributaries, Lake Saint Catherine, Little Lake, Tchefuncta River, Little Tchefuncta River, the Rigolets and West Pearl River.

Regional Condition 6. Dredged and/or fill material placed within wetlands and other waters must be free of contaminants, to the best of the applicant s knowledge.

Regional Condition 7. For work within the Louisiana Coastal Zone and/or the Outer Continental Shelf off Louisiana;

- a. The New Orleans District's Programmatic General Permit (PGP) generally supersedes the Nationwide Permit authorization for regulated activities located within the Louisiana Coastal Zone as incorporated within the New Orleans Corps District boundaries. Projects typically will not qualify for a Nationwide Permit if they qualify for the Programmatic General Permit.
- b. A joint permit application for work must first be submitted to the Louisiana Department of Natural Resources, Office of Coastal Management (OCM). OCM will then forward the request to the Corps of Engineers-New Orleans District.
- c. NWP requests that have not received a Coastal Use Permit or other consistency determination from the OCM would be processed by the Corps. However any granted authorization may be conditioned to require the applicant to obtain appropriate authorization from OCM before the NWP is valid.

Regional Condition 8. A pre-construction notification, as defined under nationwide general condition 32, will be provided for all regulated activities, excluding Nationwide 20, that meet one or both of the following criteria;

- a. Adversely affects greater than 1/10 acre of wetlands, and/or;
- b. Adversely impacts a Louisiana designated Natural and Scenic River or a state or federal wetland/wildlife management area and/or refuge.

Regional Condition 9, Supplement to General Condition 2 - Aquatic Life Movement. To support compliance with General Condition 2 of the NWPs, culverts must be sufficiently sized to maintain expected high water flows and be installed at a sufficient depth to maintain low flows to sustain the movement of aquatic species.

C. Regional Conditions Specific to Nationwide Permit 13 in Louisiana

Rip-rap material shall be free of protruding reinforcement material (i.e., rebar). Such material may pose a hazard to navigation and recreational uses.

This NWP, via disavowal of Coastal Zone certification by the Louisiana Department of Natural Resources, is considered **denied** without prejudice within the Louisiana Coastal Zone. Individual requests for approval under this NWP will ***be conditioned to require the applicant to obtain a Louisiana Department of Natural Resources determination/certification before the NWP is valid.***

D. Water Quality Nationwide Permit Regional Conditions for "Indian Country" Lands

The Environmental Protection Agency (EPA) is the agency required to address water quality certification of the 2012 nationwide permits (NWP) in Indian country¹ where a tribe has not received treatment in the same manner as a state for the Clean Water Act (CWA) Section 401 program. Tribes which have received treatment in the same manner as a state (TAS) for the water quality standards and §401 certification programs and which have EPA-approved water quality standards will be contacted by the Corps of Engineers for the water quality certification process. EPA is the agency required to address water quality certification for tribes that have not received TAS for the water quality standards and 401 certification programs. At this time, no Indian tribes in Louisiana have CWA Section 401 authority.

1. The permittee shall conduct all work in such a manner to comply with all U.S. Army Corps of Engineers §404 permit conditions.
2. The permittee shall keep a copy of this certification with conditions at the project site during all phases of construction. All contractors or subcontractors involved in the project must be provided a copy of this certification prior to commencement of activities.
3. All heavy equipment used in the project areas shall be steam cleaned before the start of the project and inspected daily for leaks. Leaking equipment must not be used in or near surface water or in a wetland area. Equipment shall be parked outside the waterbody when not in use.
4. All fuels, oil, hydraulic fluid, or other substances of this nature must not be stored, temporarily or otherwise, within the normal floodplain or the wetland. A secondary containment system for these items shall be used in the event the primary containment system leaks. Refueling or servicing of equipment must not take place within 100 feet of any watercourse or within the wetland area.
5. The construction area shall be protected such that a runoff event will not move soil or contaminants to surface water or away from the construction site. These measures shall be in place prior to the commencement of activities and inspected daily.
6. Temporary mats must be placed on stream banks, riparian areas, and wetlands, to minimize impacts to soil and vegetation from heavy equipment. Temporary access roads must be restored to pre-project conditions.

¹ "Indian Country", as defined in 18 U.S.C. 1151, means: (1) all land within the limits of any Indian reservation under the jurisdiction of the United States government, notwithstanding the issuance of any patent, and including rights-of-way running through the reservation; (2) all dependent Indian communities within the borders of the United States whether within the original or subsequently acquired territory thereof, and whether within or without the limits of a State; and (3) all Indian allotments, the Indian titles to which have not been extinguished, including rights-of-way running through the same.

7. All asphalt, concrete, and other construction materials must be properly handled and contained to prevent releases to the stream channels. All concrete that is to be poured must be fully contained in mortar-tight forms to prevent accidental releases to surface water or ground water. No discharge of any concrete to surface water or ground water may occur. Dumping of waste materials near watercourses is strictly prohibited.
8. Work in a stream channel should be limited to periods of no flow when practicable, and must be limited to periods of low flow. Avoid working within the channel during spring runoff or summer thunderstorm season.
9. When working in a stream channel, flowing water must be temporarily diverted around the work area to minimize sedimentation and turbidity problems. Acceptable diversion structures are non-erosive and include (but are not limited to) sand bags, water bladders, concrete barriers lined with plastic, and flumes.
10. The permittee shall restore all areas disturbed by construction activities to pre-project conditions. This shall include restoration of surface contours, stabilization of the soil, and restoration of appropriate native vegetation to establish permanent cover.

E. District Engineer's Decision.

1. In reviewing the PCN for the proposed activity, the district engineer will determine whether the activity authorized by the NWP will result in more than minimal individual or cumulative adverse environmental effects or may be contrary to the public interest. If a project proponent requests authorization by a specific NWP, the district engineer should issue the NWP verification for that activity if it meets the terms and conditions of that NWP, unless he or she determines, after considering mitigation, that the proposed activity will result in more than minimal individual and cumulative adverse effects on the aquatic environment and other aspects of the public interest and exercises discretionary authority to require an individual permit for the proposed activity. For a linear project, this determination will include an evaluation of the individual crossings of waters of the United States to determine whether they individually satisfy the terms and conditions of the NWP(s), as well as the cumulative effects caused by all of the crossings authorized by NWP. If an applicant requests a waiver of the 300 linear foot limit on impacts to streams or of an otherwise applicable limit, as provided for in NWPs 13, 21, 29, 36, 39, 40, 42, 43, 44, 50, 51, 52, or 54, the district engineer will only grant the waiver upon a written determination that the NWP activity will result in only minimal individual and cumulative adverse environmental effects. For those NWPs that have a waivable 300 linear foot limit for losses of intermittent and ephemeral stream bed and a 1/2-acre limit (i.e., NWPs 21, 29, 39, 40, 42, 43, 44, 50, 51, and 52), the loss of intermittent and ephemeral stream bed, plus any other losses of jurisdictional waters and wetlands, cannot exceed 1/2- acre.

2. When making minimal adverse environmental effects determinations the district engineer will consider the direct and indirect effects caused by the NWP activity. He or she will also consider the cumulative adverse environmental effects caused by activities authorized by NWP and whether those cumulative adverse environmental effects are no more than minimal. The district engineer will also consider site specific factors, such as the environmental setting in the vicinity of the NWP activity, the type of resource that will be affected by the NWP activity, the functions provided by the aquatic resources that will be affected by the NWP activity, the degree or magnitude to which the aquatic resources perform those functions, the extent that aquatic resource functions will be lost as a result of the NWP activity (e.g., partial or complete loss), the duration of the adverse effects (temporary or permanent), the importance of the aquatic resource functions to the region (e.g., watershed or ecoregion), and mitigation required by the district engineer. If an appropriate functional or condition assessment method is available and practicable to use, that assessment method may be used by the district engineer to assist in the minimal adverse environmental effects determination. The district engineer may add case-specific special conditions to the NWP authorization to address site-specific environmental concerns.

3. If the proposed activity requires a PCN and will result in a loss of greater than 1/10-acre of wetlands, the prospective permittee should submit a mitigation proposal with the PCN. Applicants may also propose compensatory mitigation for NWP activities with smaller impacts, or for impacts to other types of waters (e.g., streams). The district engineer will consider any proposed compensatory mitigation or other mitigation measures the applicant has included in the proposal in determining whether the net adverse environmental effects of the proposed activity are no more than minimal. The compensatory mitigation proposal may be either conceptual or detailed. If the district engineer determines that the activity complies with the terms and conditions of the NWP and that the adverse environmental effects are no more than minimal, after considering mitigation, the district engineer will notify the permittee and include any activity specific conditions in the NWP verification the district engineer deems necessary. Conditions for compensatory mitigation requirements must comply with the appropriate provisions at 33 CFR 332.3(k). The district engineer must approve the final mitigation plan before the permittee commences work in waters of the United States, unless the district engineer determines that prior approval of the final mitigation plan is not practicable or not necessary to ensure timely completion of the required compensatory mitigation. If the prospective permittee elects to submit a compensatory mitigation plan with the PCN, the district engineer will expeditiously review the proposed compensatory mitigation plan. The district engineer must review the proposed compensatory mitigation plan within 45 calendar days of receiving a complete PCN and determine whether the proposed mitigation would ensure the NWP activity results in no more than minimal adverse environmental effects. If the net adverse environmental effects of the NWP activity (after consideration of the mitigation proposal) are determined by the district engineer to be no more than minimal, the district engineer will provide

a timely written response to the applicant. The response will state that the NWP activity can proceed under the terms and conditions of the NWP, including any activity-specific conditions added to the NWP authorization by the district engineer.

4. If the district engineer determines that the adverse environmental effects of the proposed activity are more than minimal, then the district engineer will notify the applicant either: (a) That the activity does not qualify for authorization under the NWP and instruct the applicant on the procedures to seek authorization under an individual permit; (b) that the activity is authorized under the NWP subject to the applicant's submission of a mitigation plan that would reduce the adverse environmental effects so that they are no more than minimal; or (c) that the activity is authorized under the NWP with specific modifications or conditions. Where the district engineer determines that mitigation is required to ensure no more than minimal adverse environmental effects, the activity will be authorized within the 45-day PCN period (unless additional time is required to comply with general conditions 18, 20, and/or 31, or to evaluate PCNs for activities authorized by NWPs 21, 49, and 50), with activity specific conditions that state the mitigation requirements. The authorization will include the necessary conceptual or detailed mitigation plan or a requirement that the applicant submit a mitigation plan that would reduce the adverse environmental effects so that they are no more than minimal. When compensatory mitigation is required, no work in waters of the United States may occur until the district engineer has approved a specific mitigation plan or has determined that prior approval of a final mitigation plan is not practicable or not necessary to ensure timely completion of the required compensatory mitigation.

F. Further Information

1. District Engineers have authority to determine if an activity complies with the terms and conditions of an NWP.
2. NWPs do not obviate the need to obtain other federal, state, or local permits, approvals, or authorizations required by law.
3. NWPs do not grant any property rights or exclusive privileges.
4. NWPs do not authorize any injury to the property or rights of others.
5. NWPs do not authorize interference with any existing or proposed Federal project (see general condition 31).

G. Definitions

Best management practices (BMPs): Policies, practices, procedures, or structures implemented to mitigate the adverse environmental effects on surface water quality resulting from development. BMPs are categorized as structural or non-structural.

Compensatory mitigation: The restoration (re-establishment or rehabilitation), establishment (creation), enhancement, and/or in certain circumstances preservation of aquatic resources for the purposes of offsetting unavoidable adverse impacts which remain after all appropriate and practicable avoidance and minimization has been achieved.

Currently serviceable: Useable as is or with some maintenance, but not so degraded as to essentially require reconstruction.

Direct effects: Effects that are caused by the activity and occur at the same time and place.

Discharge: The term “discharge” means any discharge of dredged or fill material into waters of the United States.

Ecological reference: A model used to plan and design an aquatic habitat and riparian area restoration, enhancement, or establishment activity under NWP 27. An ecological reference may be based on the structure, functions, and dynamics of an aquatic habitat type or a riparian area type that currently exists in the region where the proposed NWP 27 activity is located. Alternatively, an ecological reference may be based on a conceptual model for the aquatic habitat type or riparian area type to be restored, enhanced, or established as a result of the proposed NWP 27 activity. An ecological reference takes into account the range of variation of the aquatic habitat type or riparian area type in the region.

Enhancement: The manipulation of the physical, chemical, or biological characteristics of an aquatic resource to heighten, intensify, or improve a specific aquatic resource function(s). Enhancement results in the gain of selected aquatic resource function(s), but may also lead to a decline in other aquatic resource function(s). Enhancement does not result in a gain in aquatic resource area.

Ephemeral stream: An ephemeral stream has flowing water only during, and for a short duration after, precipitation events in a typical year. Ephemeral stream beds are located above the water table year-round. Groundwater is not a source of water for the stream. Runoff from rainfall is the primary source of water for stream flow.

Establishment (creation): The manipulation of the physical, chemical, or biological characteristics present to develop an aquatic resource that did not previously exist at an upland site. Establishment results in a gain in aquatic resource area.

High Tide Line: The line of intersection of the land with the water's surface at the maximum height reached by a rising tide. The high tide line may be determined, in the absence of actual data, by a line of oil or scum along shore objects, a more or less continuous deposit of fine shell or debris on the foreshore or berm, other physical markings or characteristics, vegetation lines, tidal gages, or other suitable means that delineate the general height reached by a rising tide. The line encompasses spring high tides and other high tides that occur with periodic frequency but does not include storm surges in which there is a departure from the normal or predicted reach of the tide due to the piling up of water against a coast by strong winds such as those accompanying a hurricane or other intense storm.

Historic Property: Any prehistoric or historic district, site (including archaeological site), building, structure, or other object included in, or eligible for inclusion in, the National Register of Historic Places maintained by the Secretary of the Interior. This term includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the National Register criteria (36 CFR part 60).

Independent utility: A test to determine what constitutes a single and complete non-linear project in the Corps Regulatory Program. A project is considered to have independent utility if it would be constructed absent the construction of other projects in the project area. Portions of a multi-phase project that depend upon other phases of the project do not have independent utility. Phases of a project that would be constructed even if the other phases were not built can be considered as separate single and complete projects with independent utility.

Indirect effects: Effects that are caused by the activity and are later in time or farther removed in distance, but are still reasonably foreseeable.

Intermittent stream: An intermittent stream has flowing water during certain times of the year, when groundwater provides water for stream flow. During dry periods, intermittent streams may not have flowing water. Runoff from rainfall is a supplemental source of water for stream flow.

Loss of waters of the United States: Waters of the United States that are permanently adversely affected by filling, flooding, excavation, or drainage because of the regulated activity. Permanent adverse effects include permanent discharges of dredged or fill material that change an aquatic area to dry land, increase the bottom elevation of a waterbody, or change the use of a waterbody. The acreage of loss of waters of the United States is a threshold measurement of the impact to jurisdictional waters for determining whether a project may qualify for an NWP; it is

not a net threshold that is calculated after considering compensatory mitigation that may be used to offset losses of aquatic functions and services. The loss of stream bed includes the acres or linear feet of stream bed that are filled or excavated as a result of the regulated activity. Waters of the United States temporarily filled, flooded, excavated, or drained, but restored to pre-construction contours and elevations after construction, are not included in the measurement of loss of waters of the United States. Impacts resulting from activities that do not require Department of the Army authorization, such as activities eligible for exemptions under section 404(f) of the Clean Water Act, are not considered when calculating the loss of waters of the United States.

Navigable waters: Waters subject to section 10 of the Rivers and Harbors Act of 1899. These waters are defined at 33 CFR part 329.

Non-tidal wetland: A non-tidal wetland is a wetland that is not subject to the ebb and flow of tidal waters. Non-tidal wetlands contiguous to tidal waters are located landward of the high tide line (i.e., spring high tide line).

Open water: For purposes of the NHPs, an open water is any area that in a year with normal patterns of precipitation has water flowing or standing above ground to the extent that an ordinary high water mark can be determined. Aquatic vegetation within the area of flowing or standing water is either non-emergent, sparse, or absent. Vegetated shallows are considered to be open waters. Examples of “open waters” include rivers, streams, lakes, and ponds.

Ordinary High Water Mark: An ordinary high water mark is a line on the shore established by the fluctuations of water and indicated by physical characteristics, or by other appropriate means that consider the characteristics of the surrounding areas.

Perennial stream: A perennial stream has flowing water year-round during a typical year. The water table is located above the stream bed for most of the year. Groundwater is the primary source of water for stream flow. Runoff from rainfall is a supplemental source of water for stream flow.

Practicable: Available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes.

Pre-construction notification: A request submitted by the project proponent to the Corps for confirmation that a particular activity is authorized by nationwide permit. The request may be a permit application, letter, or similar document that includes information about the proposed work and its anticipated environmental effects. Preconstruction notification may be required by the terms and conditions of a nationwide permit, or by regional conditions. A pre-construction notification may be voluntarily submitted in cases where preconstruction notification is not

required and the project proponent wants confirmation that the activity is authorized by nationwide permit.

Preservation: The removal of a threat to, or preventing the decline of, aquatic resources by an action in or near those aquatic resources. This term includes activities commonly associated with the protection and maintenance of aquatic resources through the implementation of appropriate legal and physical mechanisms. Preservation does not result in a gain of aquatic resource area or functions.

Protected tribal resources: Those natural resources and properties of traditional or customary religious or cultural importance, either on or off Indian lands, retained by, or reserved by or for, Indian tribes through treaties, statutes, judicial decisions, or executive orders, including tribal trust resources.

Re-establishment: The manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former aquatic resource. Reestablishment results in rebuilding a former aquatic resource and results in a gain in aquatic resource area and functions.

Rehabilitation: The manipulation of the physical, chemical, or biological characteristics of a site with the goal of repairing natural/historic functions to a degraded aquatic resource. Rehabilitation results in a gain in aquatic resource function, but does not result in a gain in aquatic resource area.

Restoration: The manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former or degraded aquatic resource. For the purpose of tracking net gains in aquatic resource area, restoration is divided into two categories: Reestablishment and rehabilitation.

Riffle and pool complex: Riffle and pool complexes are special aquatic sites under the 404(b)(1) Guidelines. Riffle and pool complexes sometimes characterize steep gradient sections of streams. Such stream sections are recognizable by their hydraulic characteristics. The rapid movement of water over a coarse substrate in riffles results in a rough flow, a turbulent surface, and high dissolved oxygen levels in the water. Pools are deeper areas associated with riffles. A slower stream velocity, a streaming flow, a smooth surface, and a finer substrate characterize pools.

Riparian areas: Riparian areas are lands next to streams, lakes, and estuarine-marine shorelines. Riparian areas are transitional between terrestrial and aquatic ecosystems, through which surface and subsurface hydrology connects riverine, lacustrine, estuarine, and marine waters with their adjacent wetlands, non-wetland waters, or uplands. Riparian areas provide a

variety of ecological functions and services and help improve or maintain local water quality. (See general condition 23.)

Shellfish seeding: The placement of shellfish seed and/or suitable substrate to increase shellfish production. Shellfish seed consists of immature individual shellfish or individual shellfish attached to shells or shell fragments (i.e., spat on shell). Suitable substrate may consist of shellfish shells, shell fragments, or other appropriate materials placed into waters for shellfish habitat.

Single and complete linear project: A linear project is a project constructed for the purpose of getting people, goods, or services from a point of origin to a terminal point, which often involves multiple crossings of one or more waterbodies at separate and distant locations. The term “single and complete project” is defined as that portion of the total linear project proposed or accomplished by one owner/developer or partnership or other association of owners/developers that includes all crossings of a single water of the United States (i.e., a single waterbody) at a specific location. For linear projects crossing a single or multiple waterbodies several times at separate and distant locations, each crossing is considered a single and complete project for purposes of NWP authorization. However, individual channels in a braided stream or river, or individual arms of a large, irregularly shaped wetland or lake, etc., are not separate waterbodies, and crossings of such features cannot be considered separately.

Single and complete non-linear project: For non-linear projects, the term “single and complete project” is defined at 33 CFR 330.2(i) as the total project proposed or accomplished by one owner/developer or partnership or other association of owners/developers. A single and complete non-linear project must have independent utility (see definition of “independent utility”). Single and complete non-linear projects may not be “piecemealed” to avoid the limits in an NWP authorization. Stormwater management: Stormwater management is the mechanism for controlling stormwater runoff for the purposes of reducing downstream erosion, water quality degradation, and flooding and mitigating the adverse effects of changes in land use on the aquatic environment.

Stormwater management facilities: Stormwater management facilities are those facilities, including but not limited to, stormwater retention and detention ponds and best management practices, which retain water for a period of time to control runoff and/or improve the quality (i.e., by reducing the concentration of nutrients, sediments, hazardous substances and other pollutants) of stormwater runoff.

Stream bed: The substrate of the stream channel between the ordinary high water marks. The substrate may be bedrock or inorganic particles that range in size from clay to boulders. Wetlands contiguous to the stream bed, but outside of the ordinary high water marks, are not considered part of the stream bed.

Stream channelization: The manipulation of a stream's course, condition, capacity, or location that causes more than minimal interruption of normal stream processes. A channelized stream remains a water of the United States.

Structure: An object that is arranged in a definite pattern of organization. Examples of structures include, without limitation, any pier, boat dock, boat ramp, wharf, dolphin, weir, boom, breakwater, bulkhead, revetment, riprap, jetty, artificial island, artificial reef, permanent mooring structure, power transmission line, permanently moored floating vessel, piling, aid to navigation, or any other manmade obstacle or obstruction.

Tidal wetland: A tidal wetland is a jurisdictional wetland that is inundated by tidal waters. Tidal waters rise and fall in a predictable and measurable rhythm or cycle due to the gravitational pulls of the moon and sun. Tidal waters end where the rise and fall of the water surface can no longer be practically measured in a predictable rhythm due to masking by other waters, wind, or other effects. Tidal wetlands are located channelward of the high tide line.

Tribal lands: Any lands title to which is either: (1) Held in trust by the United States for the benefit of any Indian tribe or individual; or (2) held by any Indian tribe or individual subject to restrictions by the United States against alienation.

Tribal rights: Those rights legally accruing to a tribe or tribes by virtue of inherent sovereign authority, unextinguished aboriginal title, treaty, statute, judicial decisions, executive order or agreement, and that give rise to legally enforceable remedies.

Vegetated shallows: Vegetated shallows are special aquatic sites under the 404(b)(1) Guidelines. They are areas that are permanently inundated and under normal circumstances have rooted aquatic vegetation, such as seagrasses in marine and estuarine systems and a variety of vascular rooted plants in freshwater systems.

Waterbody: For purposes of the NWP, a waterbody is a jurisdictional water of the United States. If a wetland is adjacent to a waterbody determined to be a water of the United States, that waterbody and any adjacent wetlands are considered together as a single aquatic unit (see 33 CFR 328.4(c)(2)). Examples of "waterbodies" include streams, rivers, lakes, ponds, and wetlands.

West Feliciana Parish
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4/5/17

EHP Alternative Analysis
Bayou Sara Bank Stabilization Project
West Feliciana Parish
HMGP #1603-0436

FEMA Environmental and Historic Preservation
Project and Alternative Project Narrative

The streambank of Bayou Sara, located in St. Francisville, LA near the confluence of the Mississippi River, is severely eroding and encroaching upon the Town of St. Francisville's sewer treatment pond as well as the United States Army Corps of Engineers (USACE)'s casting fields which are used for creating and exporting concrete mats for Mississippi River levee bank stabilization. The streambank erosion is a significant hazard that will handicap West Feliciana soon if mitigation efforts are not initiated through the completion of this project.

This project will mitigate future erosion that has been increasingly evolving over the past 20 years, which can be seen utilizing historical aerial photography. The streambank erosion at the project site requires immediate attention. The threat of losing the Town of St. Francisville's sewage treatment ponds and the ingress and egress on Ferdinand Street has become imminent. The streambank has eroded within approximately 160 feet of Ferdinand Street and is even closer to the pond levees that protect the sewage treatment facility. The downstream limits of the project are approximately 1,200 feet from the confluence with the Mississippi River, which frequently floods the area and is likely a contributing factor to the streambank erosion. Historical aerial photography shows the erosion has significantly accelerated over the years and it is anticipated to impact the sewage treatment pond levee and river access road in the very near future without mitigation. The proposed project is to install approximately 3,600 linear feet of limestone rip rap revetment along the most vulnerable section of the bank, thereby halting the accelerating erosion that has been occurring at an accelerated rate over the last few years.

Three proposed avoidance/mitigation measures were determined to avoid and/or minimize effects to cultural resources in the area:

Alternate 1: Mitigate the entire length of the affected river bend

Alternate 2 (Preferred Action): Mitigate only the most vulnerable sections of the bank with reduced footprint to minimize impacts to cultural and wetland resources. Timber mat placement on roads within wetland boundaries, excavation from within perviously disturbed streambed, work will take not place in heavily saturated soils outside of stream bed.

Alternate 3: No action - imminent failure of facilities and continued destruction of archaeological site through erosion



FEMA

U.S. Department of Homeland Security
Federal Emergency Management Agency
FEMA-1603/1607-DR-LA
FEMA Louisiana Recovery Office
Environmental/Historic Preservation
1500 Main Street
Baton Rouge, LA 70802

04/10/2017

Casey Tingle
Assistant Deputy Director, Hazard Mitigation
Governor's Office of Homeland Security & Emergency Preparedness
1500 Main Street
Baton Rouge, LA 70802

RE: Section 106 Review Consultation, Hurricane Katrina, FEMA-DR-1603--LA

Applicant: West Feliciana Parish

Undertaking: Bayou Sara Bank Stabilization Project, West Feliciana Parish, Louisiana
(HMGP# 1603-0436)

Determination: Adverse Effect to Historic Properties

Dear Mr. Tingle:

The Federal Emergency Management Agency (FEMA) will be providing funds authorized under the Robert T. Stafford Disaster Relief and Emergency Assistance Act, P.L. 93-288, as amended, in response to the following major Disaster Declaration:

FEMA-1603-DR-LA, dated August 29, 2005, as amended.

FEMA, through its through its 404 Hazard Mitigation Grant Program (HMGP), proposes to fund the Bayou Sara Bank Stabilization Project, West Feliciana Parish, Louisiana (undertaking) as requested by West Feliciana Parish (Applicant). Pursuant to Section 106 of the National Historic Preservation Act of 1966, as amended, and its implementing regulations, 36 CFR 800.5(c), FEMA is providing the Tunica-Biloxi Tribe of Louisiana with the opportunity to consult on the proposed undertaking. Documentation in this letter is consistent with the requirements in 36 CFR §800.11(d).

Description of the Undertaking

FEMA, through its Hazard Mitigation Grants Program (HMGP), proposes to provide funding for bank stabilization along Bayou Sara near its confluence with the Mississippi River, located in West Feliciana Parish, Louisiana (30.769185,-91.394268). The project area for the planned undertaking is located in Section 42, Township 3S, Range 3W. A 7.5 USGS map of the location is presented in Figure 1.

The undertaking proposes to stabilize two (2) sections of streambank along Bayou Sara where severe erosion threatens to impact the Town of St. Francisville's Wastewater Treatment facility, pond levees, and the Parish's only access road (Ferdinand Street) to the Mississippi River. Ferdinand Street is vital to the Parish economy for its riverboat revenue, tourism, and the U.S. Army Corps of Engineers (USACE) access to the 210-acre St. Francisville Casting field. The streambank has eroded to within 160 feet (48.7 m) of the roadway and in close proximity to the pond levees that protect the Parish's wastewater treatment facility. If left unchecked, the road and treatment ponds will become more vulnerable to washout and loss of function. Loss of these facilities would result in significant economic damages and any damage to the sewerage treatment ponds would have additional environmental consequences.

West Feliciana Parish proposes to stabilize the streambanks of Bayou Sara by constructing two (2) revetment areas along the most vulnerable sections of the bank (Revetment-1 and Revetment-2; Figure 2), utilizing

approximately 22,640 cubic yards (17309.5 m³) of block mats, limestone riprap, and compacted fill. During staging, no improvements to existing access roads are proposed; only clearing vegetation with hand tools. Timber mats will be used for existing access roads within the archaeological site to avoid unforeseen effects to cultural resources. Additionally, the Parish's contractor will not work in overly saturated soils outside the streambed to minimize damage to the adjacent bank line. Temporary roads will be constructed along the top bank of Bayou Sara for the length of both revetment areas and will be accessed by means of the existing roads. In-filling and excavation will occur from within the previously disturbed streambed of Bayou Sara and from the new temporary access roads along the top bank using excavators, bulldozers, and dump trucks. Design plans for the Bayou Sara Bank Stabilization Project are attached (Attachment 2).

The plans call for the construction of a sheetpile or geotube cofferdam during low water conditions within the streambed (Figure 3). A combination of grading and in-filling will then be used to create a 2:1 slope ratio extending eastwards beyond the present high water mark as shown on Attachment 2. Fill material from existing approved borrow sources will be placed directly on the bank and compacted within the existing channel to match the proposed grade of the top bank (Figure 3). Following in-filling and grading, geo-textile fabric will be placed over the 2:1 sloped area. The portion of the slope below the ordinary high water mark will be armored with riprap, and concrete block mats will be installed above the ordinary high water mark.

Area of Potential Effects (APE)

Based on the design plans submitted by the Applicant, (Attachment 2), FEMA has identified a discontinuous Area of Potential Effects (APE) for both standing structures and archaeology which encompasses a total of 9.09 acres (3.67 ha) as shown in Figure 2. This APE incorporates both direct effects (access, staging, and construction areas) and indirect effects (visual). FEMA requests the Louisiana State Historic Preservation Office (SHPO) and Tribes' review and comment on the APE in accordance with II.C(2) of the 2016 LA Statewide PA.

Identification and Evaluation

Historic Properties within the APE were identified based on FEMA's review of the National Register of Historic Places (NRHP) database, the *Louisiana Cultural Resources Map* provided by SHPO, historic map research, a preliminary archaeological site visit conducted by FEMA Historic Preservation (HP) staff on July 28, 2016, and a Phase I archaeological survey conducted at the request of FEMA in November of 2016 by Coastal Environments, Inc. (CEI; Carpenter and Kelly 2017). This data was evaluated by FEMA using the NRHP Criteria.

Standing Structures

There are no standing structures located within the APE: The APE is not located within a listed or eligible National Register Historic District, nor is the APE located within the view-shed of a property individually listed in the NRHP.

Archaeology

On June 07, 2016, FEMA plotted the latitudes and longitudes of the Bayou Sara Bank Stabilization Project location against the NRHP database, the *Louisiana Cultural Resources Map* provided by SHPO, and historic maps. Based on the results of FEMA's desktop review, FEMA determined that the Bayou Sara Bank Stabilization Project, as proposed, would affect portions of the former village of Bayou Sara. Bayou Sara was first identified through archival research in 1983 by National Park Service (NPS) archaeologists conducting a cultural resources study for the USACE. NPS conducted a site visit and performed limited surface collection. This investigation resulted in the recordation of Archaeological Site 16WF37 (Bayou Sara; Greene et al., 1984). At that time the presumed function of the site was classified as a trading post and town site and no determination regarding the eligibility of Site 16WF37 for inclusion in the NRHP was made.

The village of Bayou Sara was founded by John Mills in 1790 as a trading post and cotton port. In its prime (ca. 1860), it was one of the largest shipping ports between Natchez and New Orleans. Bayou Sara remained an important center of shipping and commerce until it was devastated by a series of floods from 1912-1937 that eventually lead to the abandonment of the town. The 1909 U.S. Geological Survey, *St. Francisville, LA Quadrangle Map* provides a reference to the size of the town of Bayou Sara prior to the series of aforementioned floods. Since abandonment, notable changes to the project site include the construction of a major access road (Ferdinand Street) and the construction of a 210 acre (84.9 ha) casting facility by USACE in the 1960's that now encompasses the majority of the village's former footprint (Figure 4). Currently, a small area of forested land remains between Ferdinand Street and the banks of Bayou Sara that includes the present project area. Bayou Sarah has continued to shift eastwards and has now penetrated beyond the confines of the former ring levee that once protected the town, and an area larger than the size of an entire city block has already been claimed to erosion (also see: Carpenter and Kelly 2017).

A site visit was conducted by FEMA HP staff on July 28, 2016. At the time of this visit no visible intact cultural remains were observed on the surface due to heavy vegetation. However, water levels were extremely low and a thick layer of modern trash, mostly consisting of plastic, was observed in the cut bank profile within the proposed Revetment-1 area (Figure 5). This layer appeared to have been recently exposed and ranged in depth from approximately 25-100 centimeters below surface (cmbs; 9.8-39.3 in) and was observed throughout a major portion of the northern river bend. Severe erosion was also evident in the Revetment-2 area (Figure 6) where the sharply cut bank line could be observed collapsing under its own weight.

During a follow-up site visit on March 15, 2017, FEMA HP staff observed that the cut bank line within the Revetment-2 footprint shown Figure 6 had further retroceded and exposed additional deposits of historic artifacts – see Figures 7 and 8. The modern debris/trash deposits within the Revetment-1 footprint shown in Figure 5 had continued to erode – see Figure 9, and there was severe erosion in the northeastern portion of the Revetment-1 area - see Figure 10.

FEMA's background research indicates that only a portion of the former village of Bayou Sara was included within the recorded boundary of Site 16WF37, and FEMA's July 28, 2016, site visit did not provide enough information to determine the extent and the NRHP eligibility of Site 16WP37. In November of 2016, FEMA contracted Coastal Environments, Inc. (CEI) to conduct a Phase I archaeological survey of the Bayou Sara Bank Stabilization project area. The surveyed area encompassed approximately 8 acres (3.2 ha) and was focused along the entirety of the eastern river bend where the proposed revetment areas will be constructed and three (3) additional staging areas. It also included an area which had been proposed for marine construction staging activities at the riverboat landing located at the end of Ferdinand Street, but is no longer being considered.

The Phase I archaeological survey of the Bayou Sara Bank Stabilization Project consisted of both pedestrian survey and sub-surface testing (Carpenter and Kelly 2017). Pedestrian survey identified historic features and artifacts associated with the former village both at the ground level and within the exposed cut-banks of Bayou Sara throughout the majority of the project area. Feature types identified included historic ceramic and glass concentrations, brick piers, paving, cistern bases, asphalt paving, and remnant portions of the former ring levee that protected the town. Shovel testing also revealed potentially intact sub-surface deposits in both revetment areas (Figure 2). Artifact types recovered dated from the late-eighteenth century through the twentieth century and included historic glass, ceramics, and metal objects. Based on the results of the aforementioned survey, CEI submitted an LA SHPO Site Form Update proposing to increase the boundary of 16WF37 to encompass the entire former extent of the village of Bayou Sarah as is indicated in historic map overlays (Carpenter and Kelly 2017); albeit noting that it is probable a significant portion of the site was destroyed during the construction of the St. Francisville Casting field and portions lost due to continued river erosion. On March 7, 2017, SHPO adopted the proposed site boundary change increasing the total size of the site from 0.98 Acres (0.39 ha) to 122.73 Acres (49.66 ha), encompassing the majority of the Bayou Sara Bank Stabilization APE as

is seen in Figure 2. CEI further advised that the construction of the rock revetments may adversely affect some of these remains and recommended that the site be evaluated for its eligibility for inclusion in the NRHP.

Based on the aforementioned Identification and Evaluation, FEMA has determined that Site 16WF37 (Bayou Sara) is eligible for NRHP under Criterion D for purposes of this Section 106 review.

Copies or Summaries of Views by Consulting Parties and the Public

FEMA is forwarding this letter and the attached documentation to the Governor's Office Of Homeland Security and Emergency Preparedness, West Feliciana Parish Government, and West Feliciana Parish Historical Society and Museum for their review and comments as required by 36 CFR §800.4(d)(1), and we request that these potential consulting parties provide comments within the 30 days provided by the 2016 LA Statewide PA.

FEMA will also post a notice on the Louisiana Department of Culture, Recreation & Tourism website: (<http://www.crt.state.la.us/dataprojects/culturalassets/fema106/>) describing this undertaking, its effects on historic properties, and FEMA's proposed treatment to mitigate adverse effects for a 15 day comment period.

Assessment of Effects to Historic Properties

The proposed Bayou Sara Bank Stabilization Project includes ground disturbing activities that will affect the historic property in a way that will directly affect the characteristics that make the property eligible for the NRHP and per 36 CFR 800.6, FEMA has determined a finding of **Historic Properties Adversely Affected** for this undertaking and is submitting it to you for your review and comment. As rapid erosion continues to impact significant portions of the project area, including a portion of Site 16WF37, FEMA proposes to expedite the resolution of adverse effects through application of Treatment Measures (TMs) set out in Appendix C of the 2016 LA Statewide PA as described in Attachment 1 of this letter.

Resolution of Adverse Effects

Following Stipulation II.C.5(b) of the 2016 LA Statewide PA, FEMA has requested that West Feliciana Parish Government consider ways to revise the Scope of Work (SOW) to substantially conform to the standards, and/or avoid or minimize adverse effects for National Register listed or eligible traditional cultural properties and/or archaeological properties. A written description of feasible alternatives considered by West Feliciana Government is attached to this letter (Attachment 3). As a result, the proposed Scope of Work for this project was re-examined, and based on hydraulic studies, it was determined that the overall project footprint could be reduced to minimize potential impacts to cultural and wetland resources while also decreasing total project costs. Now only two (2) revetment areas along the most vulnerable sections of the bank are planned rather than the continuous revetment that was originally proposed. Additionally, in an effort to further minimize the construction footprint and potential effects to Site 16WF37, the Applicant has committed to using existing access roads to the maximum extent possible and staging construction activities from within the previously disturbed stream channel as is feasible. However, even with the proposed SOW changes it will still be impossible to avoid adversely affecting those portions of Site 16WF37 contained within the eroding bank.

In accordance with II.C.6(a) of the 2016 LA Statewide PA, Abbreviated Consultation Process, FEMA may propose in writing to the consulting parties to resolve the adverse effects of the undertaking through the application of one or more TMs in Appendix C after taking into consideration the significance of the historic properties affected, the severity of the adverse effect(s) and avoidance or minimization of the adverse effect(s). FEMA has determined that the significance of Site 16WP37 can be documented through archaeological data recovery and agrees with the Applicant's efforts to minimize effects to the site, and FEMA recommends that the adverse effects of the undertaking will be adequately mitigated through implementation of the Treatment Measures IX: Archaeological Research Design and Data Recovery Plan and III: Public Interpretation, in Appendix C as described below:

IX. Archaeological Research Design and Data Recovery Plan

FEMA has developed a draft Research Design for the Bayou Sara Bank Stabilization Project Phase III Archaeological Mitigation (Data Recovery Plan), intended to mitigate the adverse effects to archaeological Site 16WF37. The data recovery plan was developed in accordance with the ACHP's "Recommended Approach for Consultation on Recovery of Significant Information for Archaeological Sites" (<http://www.achp.gov/archguide.html>) and the Louisiana Division of Archaeology (LDOA) Phase III (data recovery) Investigations Field Standards.

FEMA has attached the proposed Data Recovery Plan to this letter (Attachment 1) and is submitting it to SHPO and Tribes for a 30 day comment period. FEMA will review SHPO and Tribal comments and revise the plan to reflect the comments received. Once comments have been incorporated into the Data Recovery Plan, FEMA will ensure the plan is implemented in accordance with LDOA Phase III (data recovery) Investigations Field Standards and the Secretary of Interior Standards for Archaeological Documentation (www.nps.gov/history/local-law/arch_stnds_7.htm).

Following the successful implementation of the Data Recovery Plan, FEMA's selected archaeological contractor will notify FEMA with an "End of Fieldwork" letter and/or email that demonstrates completion of the collection of data from the field. FEMA will forward the "End of Fieldwork" to consulting parties. Following FEMA's written acknowledgement, the Applicant may proceed with construction.

- A. FEMA will implement the Research Design for Archaeological Site 16WF37 (Bayou Sara) Archaeological Mitigation set out in Attachment 1.
- B. Building on the previous Phase I results (Carpenter and Kelly 2017), the Research Design is intended to collect data from the archaeological site through the sampling of cultural deposits and the identification and excavation of additional historic features; analyze artifacts; describe the requirements for technical reporting and curation; and include a public education component.
- C. The archaeological investigations must be performed by, or under the supervision of, an individual who meets the Professional Standards, as defined below.

"Standards"—shall mean the Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation (Federal Register 48(190) 1983:44716-44737) and SHPO Division of Archaeology Phase III data recovery and report standards (<http://www.crt.state.la.us/cultural-development/archaeology/section-106/index>).

"Professional Standards"—shall mean the Secretary of the Interior's Professional Qualification Standards set out at 48 FR 44716, September 29, 1983, for Archaeology.

- D. Following completion of the archaeological fieldwork and analysis, FEMA will consult with West Feliciana Parish to determine what artifacts property owners will donate to the State of Louisiana Department of Culture, Recreation and Tourism – Division of Archaeology.

III. Public Interpretation

Following the completion of fieldwork, FEMA, the GOHSEP, and West Feliciana Parish will consult with SHPO, participating Tribes, and others, as appropriate, to design an educational or public interpretive plan.

Bayou Sara Bank Stabilization Project, West Feliciana Parish, Louisiana (HMGP# 1603-0436).

Conclusion


FEMA is submitting the data recovery plan and its proposal to address the Adverse Effects of this undertaking through TMs and for your review and comment. FEMA requests your comments within 30 days on:

- FEMA's determination that Site 16WF37 is eligible for inclusion in the NRHP for the purpose of this undertaking;
- FEMA's determination that the Bayou Sara Bank Stabilization Project will result in an Adverse Effect to Historic Properties; and
- FEMA's proposal to address the effects to Site 16WF37 through the TMs IX and III set out in Appendix C of the 2016 LA Statewide PA.

We look forward to your concurrence with FEMA's determinations and the proposed Treatment Measures. Should you have any questions or need additional information, please contact me at (504) 247-7771 or jerame.cramer@fema.dhs.gov, or, Jeremiah Kaplan, Historic Preservation Specialist, at (504) 598-5397 or Jeremiah.Kaplan@fema.dhs.gov.

Sincerely,
**JERAME J
CRAMER**

Jeramé J. Cramer
Environmental Liaison Officer
FEMA-DR-1603-LA, FEMA-DR-1607-LA

 Digitally signed by JERAME J CRAMER
DN: c=US, o=U.S. Government, ou=Department
of Homeland Security, ou=FEMA, ou=People,
cn=JERAME J CRAMER,
0.9.2342.19200300.100.1.1=0972893910.FEMA
Date: 2017.04.10 11:10:27 -05'00'

CC: File
Harry St. Pierre - GOHSEP
Ellen Ibert - GOHSEP

Enclosures

References:

Carpenter, Michael P., and David B. Kelly

2017 Draft Phase I Archaeological Survey of the Bayou Sara Bank Stabilization Project, West Feliciana Parish, Louisiana. Report prepared by Coastal Environments, Inc. for the Federal Emergency Management Agency (FEMA), U.S. Department of Homeland Security, Louisiana Recovery Office, 1500 Main Street, Baton Rouge, Louisiana 70802 (LA DOA Report No. 22-5503).

Greene, Jerome A., A. Berle Clemensen, John C. Paige, David R. Stuart, Lawrence F. Van Horn

1984 Mississippi River Cultural Resources Survey: A Comprehensive Study: Phase I. Report prepared by the Southeast/Southwest Team of the National Park Service for the U.S. Army Corps of Engineers, New Orleans District. New Orleans, Louisiana (LA DOA Report No. 22-5503).

U.S. Geological Survey

1909 *St. Francisville, LA* [Contours]. 1:65,000. 15 Minute Series (Topographic). Reston, VA: USGS. Copy on file, FEMA Historic Preservation, 1500 Main Street, Baton Rouge, LA 70802.

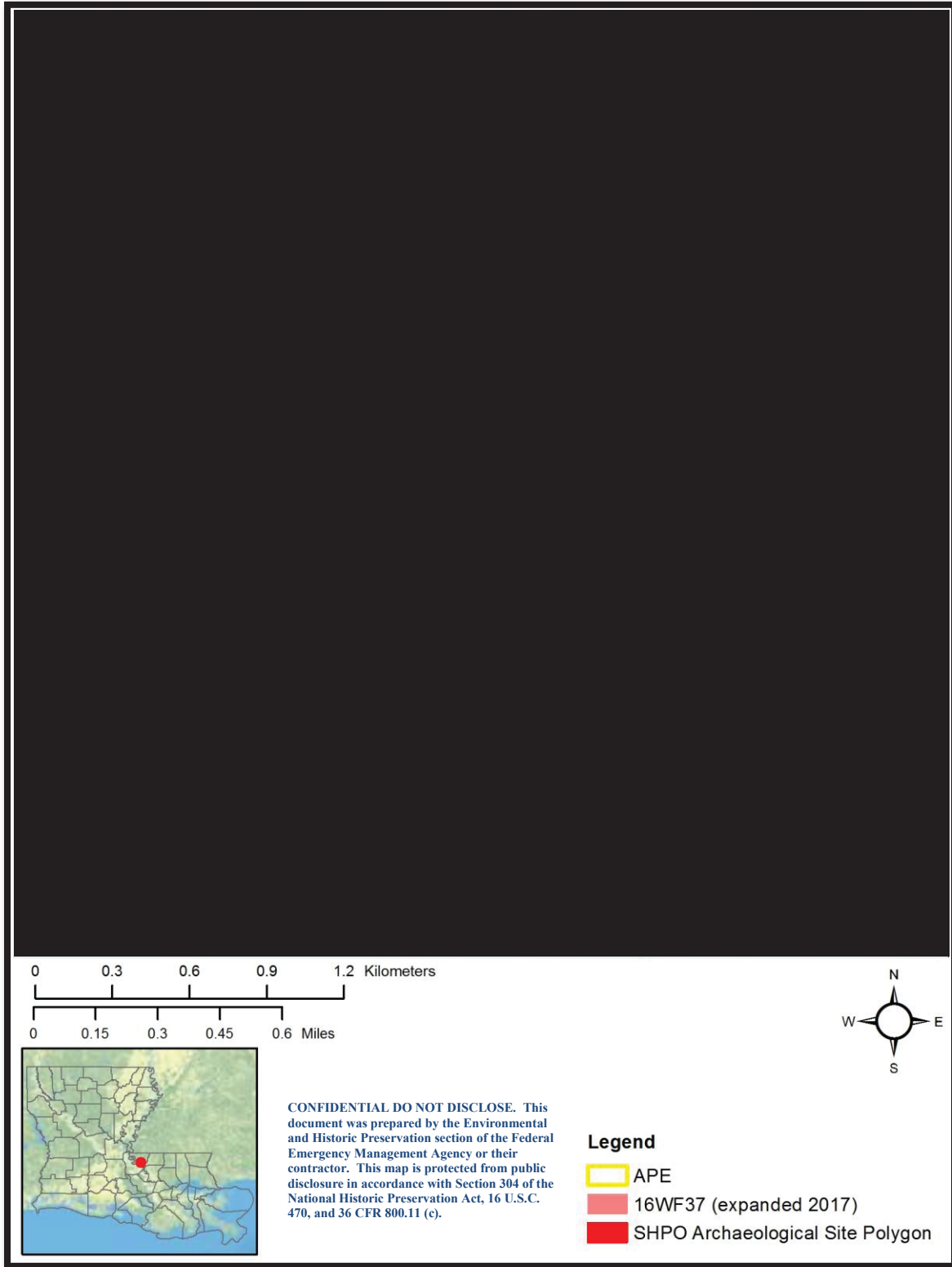


Figure 1. USGS 7.5 Quad map displaying Bayou Sara Bank Stabilization APE with former 16WF37 (1984) and revised (2017) 16WF37 LA SHPO Site Polygon boundaries.

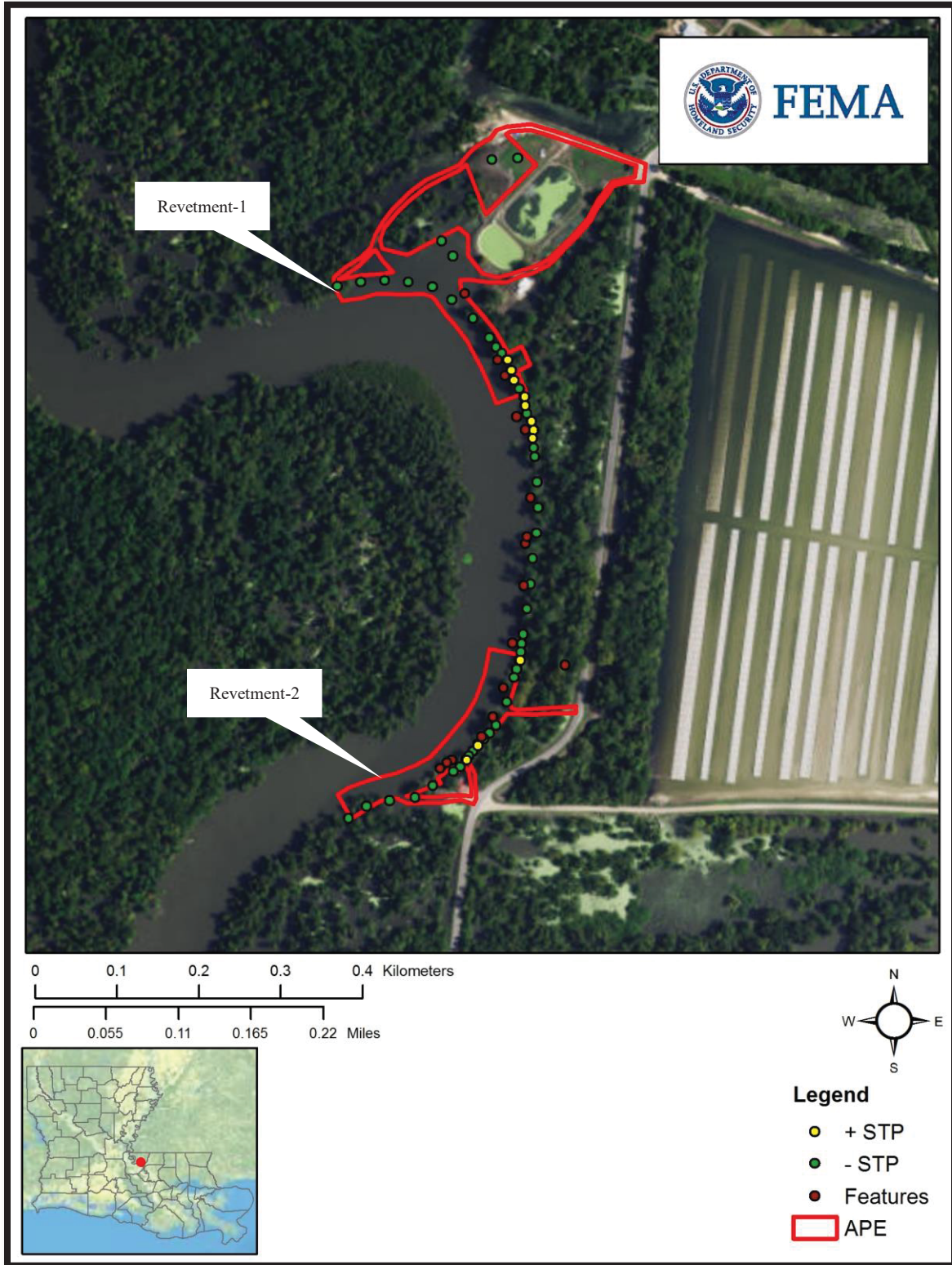


Figure 2. Aerial imagery displaying Bayou Sara Bank Stabilization APE with 2017 CEI testing locations.

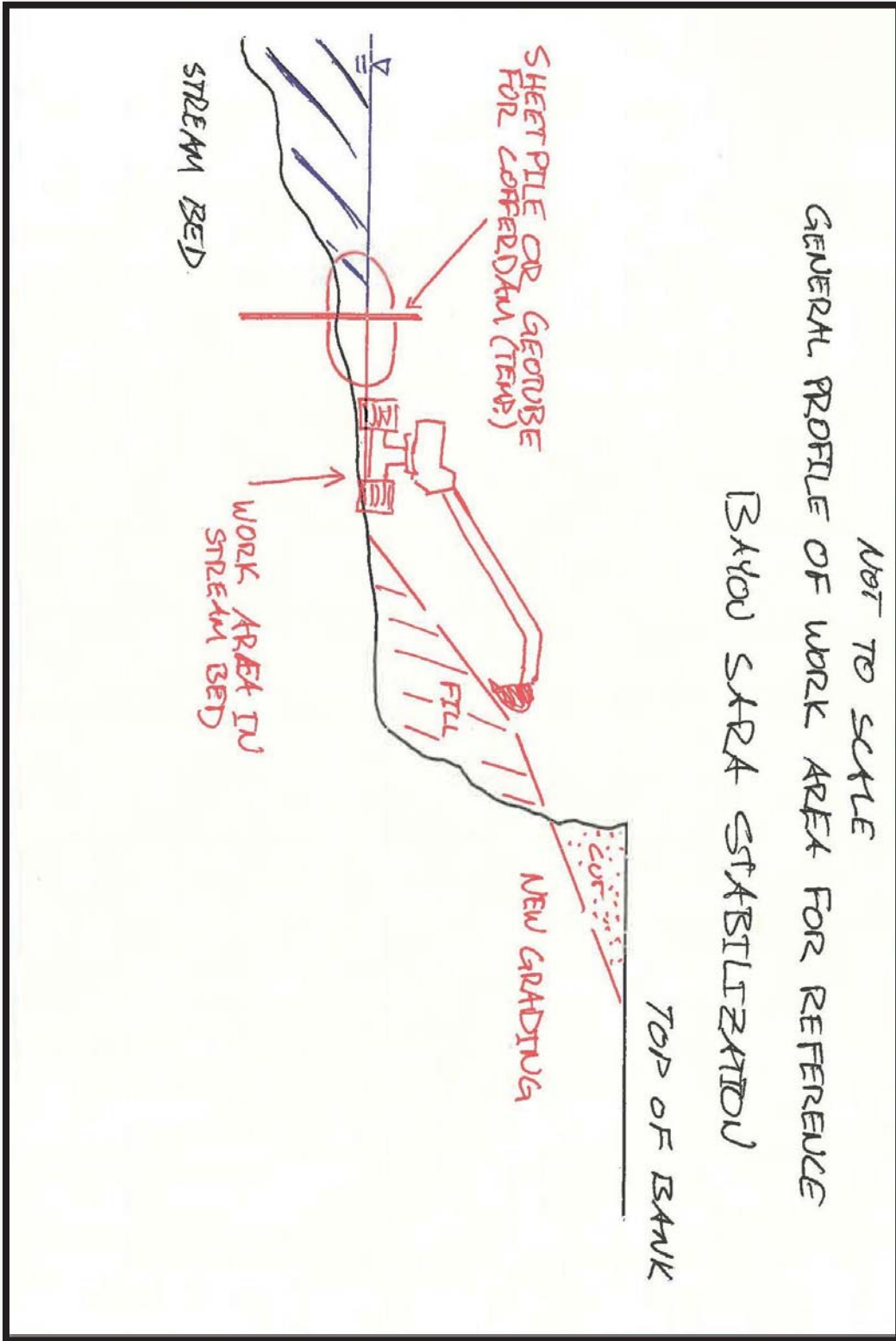


Figure 3. Schematic depicting general profile of work area.



Figure 4. Excerpt from the 1909 U.S. Geological Survey, *St. Francisville, LA* Quadrangle Map with APE location projected.



Figure 5. Revetment-1, facing southeast, displaying modern debris/trash deposit (07/28/2016).



Figure 6. Revetment-2, facing northeast, displaying heavy bank erosion during low water (07/28/2016).



Figure 7. Revetment-2, cut-bank facing northeast, displaying ongoing erosion (03/15/2017)



Figure 8. Revetment-2, facing east, bank profile displaying exposed cultural materials (03/15/2017).



Figure 9. Revetment-1, facing southeast, displaying modern debris/trash deposit (03/15/2017).



Figure 10. Displaying recent erosion, facing east from the northeastern extent of the proposed Revetment-1 area (03/15/2017).

Attachment 1: Research Design for Bayou Sara Bank Stabilization Project Archaeological Mitigation

Potential Research Questions to be Addressed by the Data Recovery of site 16WF37

Building on the previous Phase I results (Carpenter and Kelly 2017), this Research Design is intended to collect data from Site 16WF37 (Bayou Sara) through the sampling of cultural deposits and the identification and excavation of historic features, provide supplemental material culture analysis, and include a public education component.

Site 16WF37 (Bayou Sara) has the potential to contain archaeological deposits associated with periods of historic significance correlating to the following LA SHPO Cultural Units within Management Unit IV (Smith et al. 1983): *Exploration and Colonization* 1541-1803, *Antebellum Louisiana* 1803-1860, *War and Aftermath* 1800-1890, *Industrialization and Modernization* 1890-1940, and continuing up until the early-twentieth century. The subsequent culture historical themes and research goals concerning this region that can potentially be addressed through archaeological Phase III data recovery for the Bayou Sara Bank Stabilization Project have been identified from the *Louisiana Comprehensive Archaeological Plan* (Smith, et al. 1983). Specific themes include: *The Influence of the Mississippi River on Historic Settlement, the Development of the Frontier Town, and the Steamboat Era.*

Prior to the commencement of field work, FEMA's archaeological contractor will utilize the proposed research questions below and previous archaeological/historical research on Bayou Sara to draft research questions to be addressed in the Phase III fieldwork and submit them to FEMA for review. FEMA will forward the proposed research questions to the consulting parties and provide a five (5) business day review. FEMA will provide the contractor any comments to the research questions so they may be revised appropriately. Additional research goals may be developed if Phase III excavations yield data that is not presently addressed in the research themes.

The former town of Bayou Sara was founded by John Mills in 1790 as a trading post and rapidly became a thriving river port. In its prime, it was one of the largest shipping ports between Natchez and New Orleans prior to 1860. As such, Site 16WF37 provides a unique opportunity to study the development of riverine trading posts in Louisiana beginning near the terminus of the *Exploration and Colonization* 1541-1803 LA SHPO thematic period and continuing up until the early-twentieth century. Examples of research question could include, but are not limited to, the following:

- Did different modes of transportation change the availability of commercial goods? If so, what type of commodities were available and what was the origin of those goods and building materials?
- What percentage of foodstuffs was being produced and consumed locally versus those being exported and imported through river trade?
- Did access to different modes of transportation influence the physical layout of the village of Bayou Sara (e.g., flatboat, steamboat, and railroad)? If so, what type of commodities were available and what was the origin of those goods (local vs. non-local)?
- Is there any evidence of the role Native Americans with the Bayou Sara community? What was the relationship between with Indian Cultures and settlers?
- What can be learned from comparing/contrasting Bayou Sara with other historically significant trading post communities? As is feasible, data recovered should be used to facilitate broad comparisons with other early commerce centers in different regions (e.g., colonial Canada and eastern colonial America) that relied on similar/different modes of transportation.

Treatment Measure IX: Archaeological Research Design and Data Recovery Plan:

The Area of Potential Effects (APE) for archaeology is based on the design plans submitted by the Applicant (See HMGP-1603-00436 AE Consultation Letter: Attachment 2) and measures 9.09 acres (3.67 ha). The Archaeological APE incorporates all access, staging, and construction areas necessary to execute this project. Within the APE, archaeological Phase III mitigation will be focused within the footprints of two (2) proposed revetment areas along the most vulnerable sections of the bank (FOCUS AREA-1 and FOCUS AREA-2; Figure 2). Both revetments will be constructed of block mats, limestone riprap, and compacted fill and include temporary roads that will be constructed along the top bank of Bayou Sara for the length of both revetment areas and will be accessed by means of existing roads.

FOCUS AREA-1

FOCUS AREA-1 (Figure 2) measures approximately 1.99 acres (0.80 ha) and is located in the northern portion of the project area. A Phase I Survey was conducted throughout the entirety of FOCUS AREA-1 in November of 2016 by Coastal Environments, Inc. (CEI; Carpenter and Kelly 2017). A total of 14 shovel test pits were excavated within this area. Generally, shovel testing revealed a buried “A” horizon overlain by approximately 25-30 centimeters (9.8-11.8 in) of more recent flood deposits. Positive STPs (n = 3) were confined to the southern-most portion of this area and contained a mix of materials including pieces of bottle glass, brick, and a sherd of blue transfer printed whiteware. Additionally, in the central portion of FOCUS AREA-1, pedestrian survey identified a remnant (i.e., not in-situ) steam engine or boiler foundation likely associated with the former Bayou Sara Lumber Company mill, and remnant portions of the former Sun Street (asphalt and gravel) could be observed in the cut-bank of Bayou Sarah.

FOCUS AREA-2

FOCUS AREA-2 (Figure 2) measures approximately 2.26 acres (0.91 ha) and is located in the southern portion of the project area. A Phase I Survey was conducted throughout the entirety of FOCUS AREA-2 in November of 2016 by Coastal Environments, Inc. (CEI; Carpenter and Kelly 2017). A total of 18 shovel test pits were excavated within FOCUS AREA-2. Positive STPs (n = 3) were identified both within the northern and central portions of FOCUS AREA-2 and contained a mix of materials including pieces of coal, brick fragments, unidentified ferrous iron, glass, and salt-glazed stoneware. Soil stratigraphy in FOCUS AREA-2 is similar to that of FOCUS AREA-1 (see above). Additionally, in the northern portion of FOCUS AREA-2 pedestrian survey identified brick piers, paving, and rubble concentrations, a possible gravel road, and buried historic ceramic concentrations in the cut-bank of Bayou Sara.

Archaeological Mitigation:

Archaeological investigation will be aimed at controlled sampling of cultural deposits, the identification and excavation of historic features, determining the integrity and significance of any such archaeological deposits and/or features, and to provide site mapping that can be used by others to facilitate future research planning and site treatment measures for 16WF37. To the maximum extent possible, all test units will be placed where intact cultural deposits were identified during the Phase I archaeological survey and/or where available historic maps indicate that subsurface features such are likely to be located. FEMA proposes that a minimum of four (4), and a maximum of six (6), hand-excavated 1 x 1 meter (3.2 x 3.2 ft) test units be excavated to mitigate the potential effects of the proposed undertaking. A minimum of one (1) test unit will be excavated within each focus area (or may use larger excavation blocks if required to reach deeply buried deposits). The placement of all remaining test units will fall within the confines of FOCUS AREA-1 and FOCUS AREA-2 and will be left to the discretion of the supervisory project archaeologist as is warranted. Furthermore, utilizing map data collected during the previous Phase I survey (Carpenter and Kelly 2017), FEMA’s contractor will produce a detailed site map that includes all features within, and in reasonably close proximity, to the Archaeological APE. A 7.5 USGS map of the undertaking location is presented in Figure 1 and a map depicting the Archaeological APE and both Focus

Areas is included as Figure 2. The excavation of all test units specified within this research design will adhere to the sampling strategy outlined in the Field Methodology section described below.

Field Methodology

Fieldwork will consist of the hand-excavation of 1 x 1 meter (3.2 x 3.2 ft) test units and detailed site mapping.

Test Units

Test units should be excavated as per the Standards and should be used to recover detailed stratigraphic information, collect provenienced artifact samples, and investigate any cultural features identified.

There is potential that deeply buried strata exist that have not yet been identified within Site 16WF37 that have the potential to yield deposits dating as early as the *Exploration and Colonization* 1541-1803 LA SHPO Management Unit (Smith et al. 1983). If such deposits exist within Site 16WF37 they would likely be contained within these deeply buried strata. All units should extend to a minimum of 20 cm (7.8-in) into culturally sterile sub-soil. Excavation should proceed by 5 to 10 cm levels (1.9-3.9 in) within the natural stratigraphy. In the absence of observable stratigraphy excavation should be proceed using 5 cm or 10 cm (1.9-3.9 in) arbitrary levels. All excavated soils will be minimally screened through ¼ mesh. If cultural features are identified, then each must be mapped in plan-view, photographed, and then bisected and screened. Additionally a minimum of three (3) liters of soil should be taken from non-structural feature and/or midden fill for subsequent flotation and macro-botanical recovery and analysis. Flotation samples from large features such as privies should consist of five (5) to ten liters of feature matrix; however, if a feature is composed of less than three (3) liters of matrix fill, then all fill from that feature should be collected for flotation. Following bisection, each feature must be profiled and photographed in conjunction with a scale, north arrow, and photo board at the time of excavation. Each feature recorded must also be addressed in the technical report. Recordation of each test unit must be conducted according to the Standards. Additionally, the location of each test unit must be mapped and included in the technical report and the site map.

Standards and Reporting

Within 72 hours of completing fieldwork, the contractor will send/email a written notice to FEMA summarizing their findings – ‘End of Fieldwork’ notification. FEMA will forward this notification to consulting parties.

Field work will be carried out following the Louisiana Division of Archaeology’s Phase III Standards (<http://www.crt.state.la.us/archaeology/intro106.aspx>) as well as the ACHP’s “Recommended Approach for Consultation on Recovery of Significant Information for Archaeological Sites,” (<http://www.achp.gov/archguide.html>).

Following completion of the fieldwork, all results will be presented in a report format that meets the Division of Archaeology’s Phase III Reporting Standards and the Secretary of Interior Standards for Archaeological Documentation (www.nps.gov/history/locallaw/arch_stnds_7.htm).

A draft report will be produced at the end of fieldwork. FEMA will forward two (2) hard copies and one (1) digital to SHPO and a digital copy to all other consulting parties for a thirty day review. A final report incorporating the consulting parties’ comments will be submitted to SHPO and consulting parties. FEMA’s archaeological contractor will also submit a site update form that reports the results of the data recovery project to the Division of Archaeology. Following completion of all analysis and the acceptance of the final report, records, photographs, field notes, and those artifacts not requested by property owners will be curated with:

State of Louisiana Department of Culture, Recreation and Tourism – Division of Archaeology

P.O. Box 44247

Baton Rouge, LA 70804-4247

(225) 342-8170

In the curation facility at:

Galvez Building, Room B-023

602 N. Fifth St.

Baton Rouge, LA 70802

(225) 342-4475

Treatment Measure III: Public Interpretation

FEMA has requested West Feliciana Parish's input to identify possible public outreach options and any existing resources that the Parish feels would be effective avenues to present 16WF37 to the public. West Feliciana Parish has expressed interest in working with the West Feliciana Parish Historical Society and Museum to develop and distribute educational material regarding the former town of Bayou Sara and the results of data recovery efforts at Site 16WF37. FEMA agrees that this is an appropriate approach to public outreach and that the educational material (e.g., a pamphlet, booklet, or web page) developed in coordination with SHPO, Tribes, the Parish, the West Feliciana Parish Historical Society and Museum, and any other appropriate party that has the potential to contribute to the overall understanding of the history of Bayou Sarah (16WF37) and West Feliciana Parish. Therefore, in partial fulfillment of the TMs for the Bayou Sarah Bank Stabilization project, FEMA will produce educational material regarding 16WF37. This may include unrestricted use and distribution of educational materials to the West Feliciana Parish Government, the West Feliciana Parish Historical Society and Museum, and other consulting parties.

Within six months of the completion of the draft archaeological report, FEMA will consult with SHPO, Tribes, the GOHSEP, West Feliciana Parish, and the West Feliciana Parish Historical Society to develop, produce, and distribute public outreach materials as required under Treatment Measure III: Public Interpretation.

References:

Carpenter, Michael P., and David B. Kelly

2017 Draft Phase I Archaeological Survey of the Bayou Sara Bank Stabilization Project, West Feliciana Parish, Louisiana. Report prepared by Coastal Environments, Inc. for the Federal Emergency Management Agency (FEMA), U.S. Department of Homeland Security, Louisiana Recovery Office, 1500 Main Street, Baton Rouge, Louisiana 70802 (LA DOA Report No. 22-5503).

Greene, Jerome A., A. Berle Clemensen, John C. Paige, David R. Stuart, Lawrence F. Van Horn

1984 Mississippi River Cultural Resources Survey: A Comprehensive Study: Phase I. Report prepared by the Southeast/Southwest Team of the National Park Service for the U.S. Army Corps of Engineers, New Orleans District. New Orleans, Louisiana (LA DOA Report No. 22-5503).

Smith, Steven D., Phillip G. Rivet, Kathleen M. Byrd and Nancy W. Hawkins

1983 *Louisiana's Comprehensive Archaeological Plan*. State of Louisiana Department of Culture, Recreation and Tourism, Office of Cultural Development, Division of Archaeology, Baton Rouge, Louisiana.

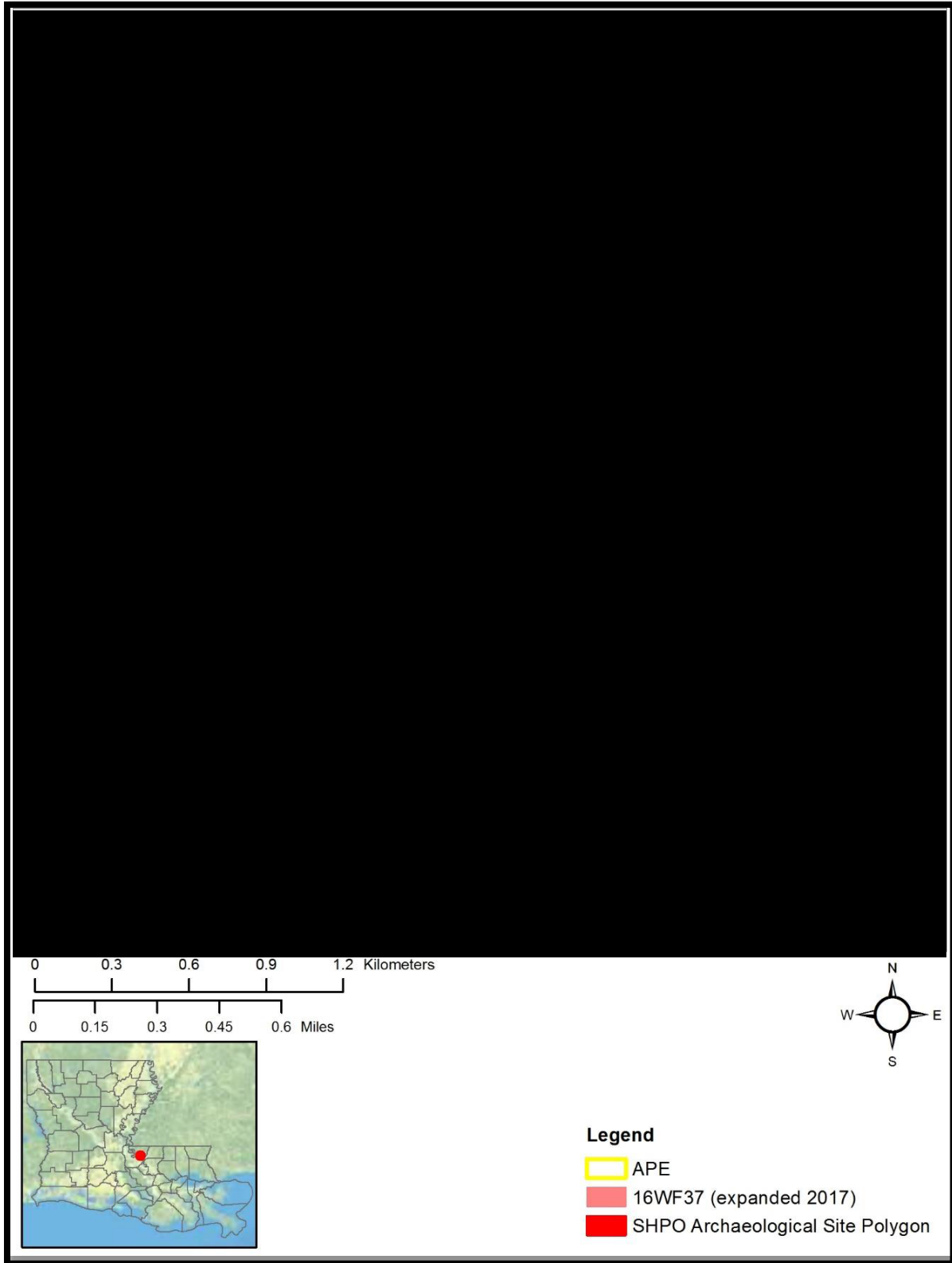


Figure 1. USGS 7.5 Quad map displaying Bayou Sara Bank Stabilization APE with former 16WF37 (1984) and revised (2017) 16WF37 LA SHPO Site Polygon boundaries.

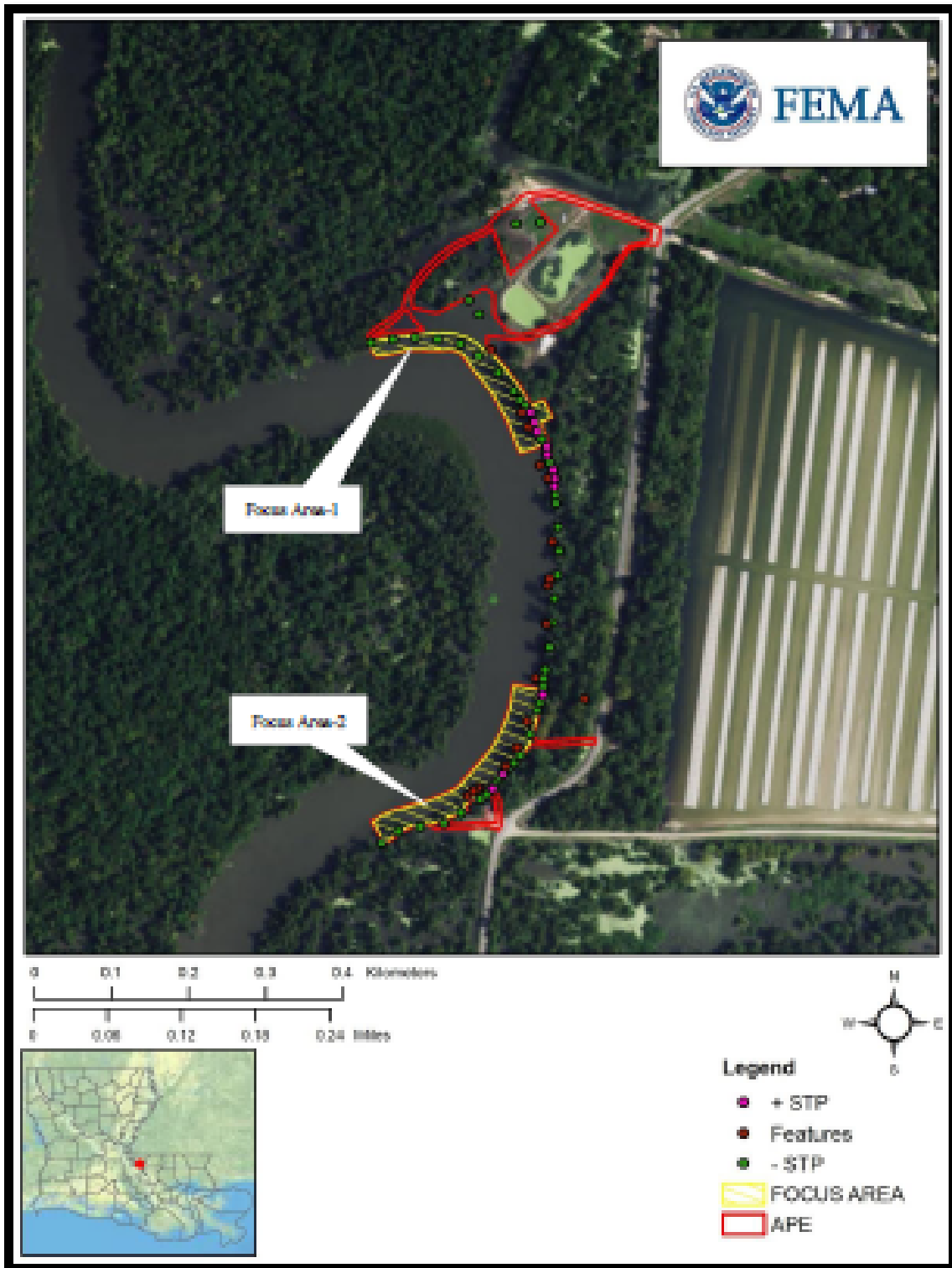


Figure 2. Aerial imagery displaying Bayou Sara Bank Stabilization Archaeological APE, FOCUS AREA locations, and 2017 CEI Phase I testing locations/recorded features.



BILLY NUNGESSER
LIEUTENANT GOVERNOR

State of Louisiana
OFFICE OF THE LIEUTENANT GOVERNOR
DEPARTMENT OF CULTURE, RECREATION & TOURISM
OFFICE OF CULTURAL DEVELOPMENT
DIVISION OF ARCHAEOLOGY

RENNIE S. BURAS, II
DEPUTY SECRETARY

May 8, 2017

Mr. Jeramé J. Cramer
Environmental Liaison Officer
FEMA-DR-1603-LA, FEMA-DR-1607-LA
FEMA Louisiana Recovery Office
1500 Main Street
Baton Rouge, LA 70802

RE: Section 106 Review Consultation, Hurricane Katrina, FEMA-DR-1603--LA
Applicant: West Feliciana Parish
Undertaking: Bayou Sara Bank Stabilization Project, West Feliciana Parish, Louisiana
(HMGP# 1603-0436)
Determination: Adverse Effect to Historic Properties

Dear Mr. Cramer:

This is in response to your letter dated April 10, 2017, concerning the above-referenced project. We concur with your recommendation to treat 16WF37 as eligible for listing on the National Register of Historic Places, and concur that the proposed undertaking will have an adverse effect. We have reviewed the enclosed archaeological research design and data recovery plan. We agree with the field methodology. Furthermore, we look forward to working with FEMA and other parties to develop an educational or public interpretive plan.

If you have any questions, please do not hesitate to contact Rachel Watson in the Division of Archaeology at (225) 342-8165 or rwatson@crt.la.gov.

Sincerely,

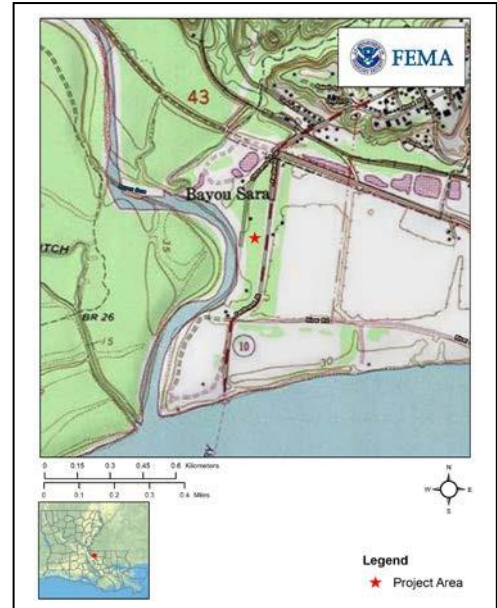
Kristin Sanders
Deputy State Historic Preservation Officer

Seeking Public Comment NHPA/NEPA
West Feliciana Parish
Bayou Sara Bank Stabilization Project
Near St. Francisville, West Feliciana Parish, LA

West Feliciana Parish has requested FEMA funding from the 404 Hazard Mitigation Grant Program (HMGP) to stabilize two section of streambank along Bayou Sara near its confluence with the Mississippi River. Severe erosion of the streambank threatens the Town of St. Francisville's Wastewater Treatment facility; pond levees; and St. Ferdinand Street, the Parish's only access road to the Mississippi River. Ferdinand Street is vital to the Parish economy for its riverboat revenue, tourism, and the U.S. Army Corps of Engineers access to the St. Francisville Casting field. The streambank has eroded to within 160 feet (48.7 m) of the roadway, in close proximity to the pond levees that protect the Parish's wastewater treatment facility. If left unchecked, the road and treatment ponds will become more vulnerable to washout and loss of function. Loss of these facilities would result in significant economic damages, and damage to the sewerage treatment ponds would have environmental consequences.

Federal regulations require FEMA, as funding agency, to identify if any of the properties are historic properties (listed in or eligible for listing in the National Register of Historic Places - NRHP); to assess the effects the project will have on historic properties; to seek ways to avoid, minimize, or mitigate any adverse effects to historic properties; and to evaluate the proposed action's potential for significant impacts to the human and natural environment.

FEMA has determined that these activities will adversely affect the site of the village of Bayou Sara, founded in 1790 as a trading post and cotton port. It was one of the largest shipping ports between Natchez and New Orleans. Bayou Sara remained an important center of shipping and commerce until it was abandoned following a series of floods from 1912-1937. FEMA proposes to mitigate the adverse effects through Treatment Measures, Archaeological Research Design and Data Recovery Plan and Public Interpretation, included in the 2016 Statewide Programmatic Agreement among FEMA, the Louisiana State Historic Preservation Officer, the Governor's Office of Homeland Security and Emergency Preparedness, and participating Tribes. Any member of the public is encouraged to provide views on how the project may affect historic properties and ways that these effects may be avoided, minimized, or mitigated.



Cut bank at Bayou Sara facing northeast, showing the ongoing erosion. FEMA

FEMA requests comments from any member of the public by April 27, 2017.

Comments can be posted at: <http://www.crt.state.la.us/culturalassets/fema106/>

Or mailed to: FEMA Mail Center/Historic Preservation
1500 Main Street
Baton Rouge, LA 70802

Post your comments soon – all comments must be posted or postmarked by April 27, 2017.

Caused by the high winds and heavy rains of Hurricanes Katrina and the subsequent widespread flooding damaged many buildings in Orleans Parish, LA. In the aftermath of the hurricane, the FEMA is issuing this public notice as part of its responsibilities under the Advisory Council on Historic Preservation's regulations, 36 CFR Part 800, implementing Section 106 of the National Historic Preservation Act of 1966, as amended (NHPA). This notice applies to activities carried out by the Public Assistance (PA) program implemented under the authority of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, 42 U.S.C. §§5152-5206.

FEMA Seeking Public Comment - West Feliciana

<http://wfparish.org/news/2017/4/fema-seeking-public-comment>

Seeking Public Comment NHPA/NEPA1 West Feliciana Parish
Bayou Sara Bank Stabilization Project
Near St. Francisville, West Feliciana Parish, LA

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Cut bank at Bayou Sara facing northeast, showing the ongoing erosion. FEMA_

[Access Permits & Inspections Portal \(http://www.mypermitnow.org\)](http://www.mypermitnow.org)

[View Documents \(http://wfparish.org/view/documents\)](http://wfparish.org/view/documents)

[Watch Meetings \(http://new.livestream.com/live70775\)](http://new.livestream.com/live70775)

[Request Citizens Service \(https://westfelicianaparish.formstack.com/forms/csr\)](https://westfelicianaparish.formstack.com/forms/csr)

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[Contact \(http://wfparish.org/i-want-to/contact\)](http://wfparish.org/i-want-to/contact)

Appendix E
Biological Resources and Wetlands Findings
Report



WEST FELICIANA PARISH

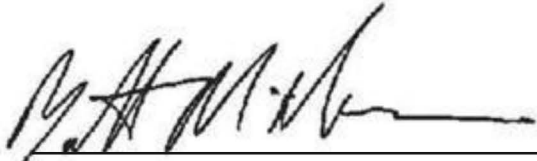
BIOLOGICAL RESOURCES AND WETLAND FINDINGS REPORT

Bayou Sara Streambank Stabilization
West Feliciana Parish, Louisiana
HMGP Project No. 1603-125-003

March 20, 2017



BIOLOGICAL RESOURCES AND WETLAND FINDINGS REPORT



Brett McMann, P.E.
Staff Engineer

Bayou Sara Streambank Stabilization
West Feliciana Parish, Louisiana
HMGP Project No. 1603-125-0003

Prepared for:

West Feliciana Parish Department of Public
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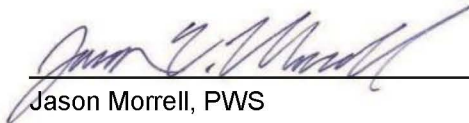
Our Ref.:

LA003333.0001

Date:

March 20, 2017

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Jason Morrell, PWS
Project Ecologist



Mike Schulze
Project Scientist

CONTENTS

1	Introduction	1
2	Study Area	1
3	Study Area Characteristics	1
4	Methodology	2
	4.1 Biological and Ecological	2
	4.2 Wetlands and Surface Waters	2
5	Data and Desktop Survey Findings	3
6	Findings	4
	6.1 Biological and Ecological	4
	6.2 Wetlands and Streams	4
	6.2.1 Wetlands	5
	6.2.2 Streams	6
	6.3 Wetland Function and Value	6
	6.4 Potential Wetland Impacts	7
	6.5 Potential Impacts to Surface Waters	8
	6.6 Wetland Mitigation	8
7	References	9

TABLES

Table 1. Study Area Soils	3
Table 2. State and Federally Protected Species within West Feliciana Parish, Louisiana	3
Table 3. Potential Wetland Impacts	5
Table 4. Potential Stream Impacts	5
Table 5. Louisiana Rapid Assessment Method (LRAM) Factors and Associated i-Value	7
Table 6. LRAM Impact Factors for Each Wetland within the Proposed Revetment Footprint	8

FIGURES

Figure 1 Project Location Map

Figure 2 Wetland and Soil Sample Locations

PERMIT DRAWINGS

APPENDICES

A Wetland Determination Data Forms – Atlantic and Gulf Coastal Plain Region

B Custom Soil Resource Report for West Feliciana Parish, Louisiana, and Hydric Soil List

C Photographic Log

1 INTRODUCTION

West Feliciana Parish is located between Baton Rouge, Louisiana, and Natchez, Mississippi, with its main corridors being U.S. Highway 61 (north-south) and Louisiana Highway 10 (east-west). The Parish is bordered by the Mississippi River from the northwestern corner to the southern side. The Parish is currently being impacted by one of the river's tributaries, Bayou Sara, which is eroding the streambanks near its confluence with the Mississippi River. Construction of the proposed project to mitigate erosion by stabilizing the streambank will take place within the identified Study Area (Figure 1) comprising approximately 3,600 feet along Bayou Sara, in which severe erosion is impacting the Town of St. Francisville's Wastewater Treatment Facility, pond levees, and the Parish's only access road (Ferdinand Street) to the Mississippi River. Ferdinand Street is vital to the Parish economy for its riverboat revenue, tourism, and the U.S. Army Corps of Engineers (USACE) access to the 210-acre Casting Field. The USACE uses Ferdinand Street for access to their Casting Field, where artificial bank materials for the Mississippi River are produced.

Stabilizing the streambank, which has eroded over the past 20 years, at the proposed project site will mitigate the threat of losing access to the Town of St. Francisville's Wastewater Treatment Facility Ponds, as well as access to the river via Ferdinand Street. The streambank degradation has eroded to within 160 feet of the roadway and has migrated in proximity to the pond levees that protect the Wastewater Treatment Facility. The downstream limits of the proposed project are approximately 1,200 feet from the confluence of Bayou Sara and the Mississippi River.

Arcadis U.S., Inc. (Arcadis) performed a study to delineate and evaluate the general quality of wetlands within the Study Area as part of the Bayou Sara Streambank Stabilization project.

2 STUDY AREA

The Study Area comprises approximately 3,600 feet along Bayou Sara, a tributary to the Mississippi River located in West Feliciana Parish, Louisiana. The Study Area is bounded by Bayou Sara on the west and the Town of St. Francisville's Wastewater Treatment Facility to the north. The Study Area was further defined by access roads, staging areas, and an excess cut placement area for the proposed project.

3 STUDY AREA CHARACTERISTICS

West Feliciana Parish is 426 square miles in size, of which 23 square miles are water, and is located along the meander of the Mississippi River. Bayou Sara empties into the Mississippi River at St. Francisville. In the late 1600s, the town of Bayou Sara was established as a river port and became a bustling port town throughout the 1800s. The Bayou originates near the Mississippi state line in the vicinity of Lake Rosemound and flows southward through the Tunica Swamp before reaching the Mississippi River. Bayou Sara currently serves as a recreational location for fishing, hiking, and canoeing with privately owned land housing homes and camps. The Study Area lies within the south-central region of the Mississippi River Delta Plain (Daigle, et. al. 2006) and the Mississippi Alluvial Plain Section, in the western portion of the Parish.

Elevations within West Feliciana Parish range from approximately 30 to 360 feet above mean sea level along the Mississippi River and approximately 38 feet along Bayou Sara near its confluence with the

Mississippi River. West Feliciana Parish is located within a portion of two watersheds: Bayou-Sara Thompson and Lower Mississippi-Baton Rouge. The Study Area is located within the West Central Louisiana Coastal watershed - U.S. Geological Survey [USGS] hydrologic unit code 08070100 (USGS 2016).

4 METHODOLOGY

4.1 Biological and Ecological

Section 7 of the Endangered Species Act of 1973 (as amended) requires that federal agencies ensure any action authorized, funded, or carried out by that agency is not likely to adversely impact threatened or endangered species or result in destruction of critical habitat. A review of the Louisiana Department of Wildlife and Fisheries (LDWF), Louisiana Natural Heritage Program (LNHP; LDWF 2016a, b) database was conducted for the Study Area as well as a review of the U.S. Fish and Wildlife Service (USFWS) Information for Planning and Conservation (IPaC) database for West Feliciana Parish.

Arcadis scientists conducted a site visit on October 27, 2016. The biological team consisted of Mike Schulze and Jason Morrell. The team reviewed species descriptions prior to the field survey to identify suitable habitat for target species provided in the LDWF rare species fact sheet (LDWF 2016a). The Study Area was then assessed for protected species habitat suitability.

4.2 Wetlands and Surface Waters

Wetlands are defined by the U.S. Environmental Protection Agency and USACE as “those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions” (40 Code of Federal Regulations [CFR] Subpart 230.3 and 33 CFR Subpart 328.3). Any action that proposes to place dredge or fill materials into wetlands and other waters of the U.S. is regulated by the USACE.

Potential wetland areas were initially identified using the USGS Saint Francisville, Louisiana, 1998 quadrangle map (Figure 2); USFWS online National Wetland Inventory (NWI) wetland mapping tool (2016); USDA/NRCS Custom Soil Resource Report for West Feliciana Parish, Louisiana (2007); Google Earth images, and other available data. This information was used to locate known surface waters and wetlands occurring within the Study Area and to locate areas with the potential for containing jurisdictional wetlands and other waters of the U.S.

All wetlands identified within the Study Area were evaluated in accordance with Executive Order 11990, Protection of Wetlands (1977), and the technical guidelines and methods for wetland delineations as set forth in the USACE Wetland Delineation Manual (1987) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region Wetland Delineation Manual (2010).

The wetland delineation was performed on October 27, 2016. Each wetland site was documented with photographs and field notes, and boundaries were located using a Trimble Geo 7X global positioning system unit with an external Trimble Zephyr Model 2 antennae. Observations of vegetation, hydrology, soils, and other visible wetland indicators were recorded on Wetland Determination Forms – Atlantic and

Gulf Coastal Plain Region (Appendix A). Nomenclature and indicator status on the data sheets and in this report follow the updated National Wetlands Plant List for the Atlantic and Gulf Coastal Plain (Lichvar et al. 2016), which was also consulted for plant identification purposes.

5 DATA AND DESKTOP SURVEY FINDINGS

The wooded area to the west of the Town of St. Francisville Wastewater Treatment Ponds is mapped as Palustrine Scrub Shrub on the USFWS NWI maps. No other areas within the Study Area are mapped as wetlands on the NWI maps.

Soils within the Study Area are mapped by NRCS as Morganfield and Bigbee soils, frequently flooded (Table 1). Morganfield soils are located on floodplains, consist of silt loam, and are classified as well drained. Bigbee soils are located on terraces, consist of loamy sand to sand, and are classified as excessively drained. The Morganfield and Bigbee soils, frequently flooded map unit is classified by the NRCS as hydric (Appendix B).

Table 1. Study Area Soils

Soil Symbol	Soil Name	Hydric
MB	Morganfield and Bigbee soils, frequently flooded	Yes, Depressions

Source: USGS 2017.

An LNHP database query for rare animals, plants, and natural communities that exist within West Feliciana Parish returned three results: the pallid sturgeon (*Scaphirhynchus albus*) and interior least tern *Sternula antillarum athalassos*) are designated as federally endangered; and the Louisiana black bear (*Ursus americanus luteolus*) has been delisted due to recovery. The USFWS IPaC tool was also used to determine if any species of concern occur within West Feliciana Parish that were not included within the LNHP query results. The IPaC list contains no additional federally listed species that are likely to occur within West Feliciana Parish. Table 2 lists the threatened and endangered species known to occur within West Feliciana Parish and their status.

Table 2. State and Federally Protected Species within West Feliciana Parish, Louisiana

Common Name	Scientific Name	State Status	Federal Status
Pallid Sturgeon	<i>Scaphirhynchus albus</i>	Endangered	Endangered
Louisiana Black Bear	<i>Ursus americanus luteolus</i>	Recovery	Delisted
Interior Least Tern	<i>Sternula antillarum athalassos</i>	Endangered	Endangered

Source: LNHP list of rare and threatened species in West Feliciana Parish, LA (November 2016; Appendix C) and USFWS IPaC query for West Feliciana Parish, LA (November 2016; Appendix C).

The pallid sturgeon (*Scaphirhynchus albus*) is a bottom-dwelling, slow-growing fish that exists in the Mississippi River below the confluence of the Missouri River. Because this species exists predominantly along the bottom depths of the river and not within the confines of the shallower Study Area of Bayou Sara, a biological determination of “no effect” is recommended for the pallid sturgeon.

The Louisiana black bear (*Ursus americanus luteolus*) was delisted from the Lists of Threatened and Endangered Wildlife under the Endangered Species Act in March of 2016 due to recovery. The habitat of the Louisiana black bear typically remains in deeply wooded areas unaffected by human encroachment.

Because of the Study Area's proximity to Ferdinand Street, the Town of St. Francisville Wastewater Treatment Facilities, and the Mississippi River's landing for the town of St. Francisville, where unloading and boarding of tourists on the American Queen Riverboat occur, human activity and road traffic likely deter bear usage of the area as foraging habitat. Most of the proposed project will take place within the banks of Bayou Sara, with terrestrial impacts limited to temporary access roads and staging areas. A small portion (0.09 acre) of bottomland hardwoods would be impacted by the proposed project. No black bear den trees (visible cavities in trees that have a diameter at breast height ≥ 36 inches) were noted within the proposed revetment footprint. Therefore, a biological determination of "may affect, but not likely to adversely affect" is recommended for the Louisiana black bear.

Least terns (*Sternula antillarum athalassos*) nest on barren to sparsely vegetated sandbars along rivers, sand and gravel pits, lake and reservoir shorelines, and occasionally gravel rooftops. They hover over and dive into standing or flowing water to catch small fish. No barren sandbars suitable for nesting habitat was observed in the Study Area; however, Bayou Sara could represent foraging habit for least terns. Most of the proposed project will take place within the banks of Bayou Sara. A biological determination of "may affect, but not likely to adversely affect" is recommended for the least tern because of the presence of adjacent suitable habitat.

The National Oceanic and Atmospheric Administration (NOAA) essential fish habitat (EFH) mapping tool was used to determine if EFH would be impacted by the proposed project. Based on the tool, EFH is typically designated within coastal waters or within the Gulf of Mexico. Therefore, the proposed project will not impact EFH (NOAA 2016).

6 FINDINGS

6.1 Biological and Ecological

During the site visit, the field team observed suitable foraging habitat for the least tern and black bear. No federally listed species, nesting habitat, or critical habitat would be impacted by the proposed project. The project "may affect, but not likely to adversely affect" the black bear and least tern. A biological determination of "no effect" is recommended for the pallid sturgeon. No secondary impacts to state species of special concern would be anticipated from construction of the proposed improvements. The bottomland hardwoods along Ferdinand Street could be foraging habitat for the black bear, but no suitable den trees were observed within the proposed revetment footprint.

6.2 Wetlands and Streams

Waters of the U.S. identified within the Study Area include two perennial streams and two wetland areas. These waters are described below and listed in Tables 3 and 4. Wetland determination forms for each wetland and upland data point are included in Appendix A. A photographic log is provided in Appendix C.

Table 3. Potential Wetland Impacts

Resource	Latitude	Longitude	Cowardin Classification	Acres	Total Fill Area Within Project Limits (acre)	Total Fill Within Wetlands (cubic yards)
Wetland 1	30.76772	-91.39453	Palustrine Emergent (PEM)	0.072	0	0
Wetland 2	30.76823	-91.39420	Palustrine Forested (PFO)	4.921	0.09	79.5 (block mats)
Total				4.993	0.09	79.5

Source: Cowardin et al. 1979.

Table 4. Potential Stream Impacts

Stream Name	Latitude	Longitude	Observed Characteristics	Area of Fill Placement Below OHWM (acres)	Total Fill Below OHWM (cubic yards)	Linear Feet of Impacted Stream	Total Area within Study Area (acres)
Bayou Sara	30.76943	-91.39431	Perennial Stream; 3,600 feet in Study Area, approx. 160 feet wide	2.06	(block mats) 121 (riprap) 16,781 (compacted fill) 367	1,991	13.223
Unnamed Tributary of Bayou Sara	30.77209	-91.39567	Perennial Stream; 542 feet in Study Area, approx. 1 foot wide	0	0	0	0.012
Total				2.06	17,269	1,991	13.235

6.2.1 Wetlands

Wetland 1 is located just north of Reach 2 adjacent to Bayou Sara and below the ordinary high water mark (OHWM). Wetland 1 is inundated by Bayou Sara during high water stages.

A data point was collected within Wetland 1 to confirm the presence of jurisdictional wetlands at this location. The dominant vegetative species for Wetland 1 is seedbox (*Ludwigia alternifolia*). Black willow (*Salix nigra*) was present but not dominant in Wetland 1 because of inundation and foraging by North American beaver (*Castor canadensis*). The soils are Morganfield and Bigbee, frequently flooded, which are classified by NRCS as hydric in depressions. The hydric soil indicator redox dark surface (F6) was present at this site. Primary hydrology indicators at this site include surface water (A1), high water table (A2), saturation (A3), drift deposits (B3), inundation visible on aerial imagery (B7), and oxidized rhizospheres along live roots (C3). Secondary wetland hydrology indicators included surface soil cracks (B6) and geomorphic position (D2). Wetland 1 is a palustrine emergent (PEM) wetland (Cowardin et al. 1979).

Wetland 2 is located just south of Reach 1 and extends to Reach 2 along the top of bank adjacent to Bayou Sara. Wetland 2 is inundated by Bayou Sara during high water stages. Water levels in Bayou Sara in this portion of the watershed are controlled by the Mississippi River.

A data point was collected within Wetland 2 to confirm the presence of jurisdictional wetlands at this location. The dominant vegetative species for Wetland 2 are Ash-leaf maple (*Acer negundo*), black tupelo (*Nyssa sylvatica*), southern dewberry (*Rubus trivialis*), horsebrier (*Smilax rotundifolia*), and muscadine (*Vitis rotundifolia*). Soils are Morganfield and Bigbee, frequently flooded, which are classified by NRCS as hydric in depressions. The hydric soil indicator depleted matrix (F3) was present at this site. The primary hydrology indicator for this site was inundation visible on aerial imagery (B7). Secondary wetland hydrology indicators included drainage patterns (B10) and geomorphic position (D2). Wetlands 2 is a palustrine forested (PFO) wetland (Cowardin et al. 1979).

No improvements to the access road through Wetland 2 are proposed; only clearing with hand tools and the temporary use of timber mats may be necessary for the access road. Access roads will be restored to pre-project conditions upon completion of work. Portions of Wetland 2 (0.09 acres) will be impacted by the proposed revetment due to the placement of 79.5 cubic yards of concrete block mats.

6.2.2 Streams

An unnamed perennial stream was delineated in the Study Area flowing from the southernmost Wastewater Treatment Pond in a westerly direction to its confluence with an unnamed tributary of Bayou Sara. This stream was mapped on the USGS quadrangle adjacent to Town of St. Francisville property, but beyond the Study Area (See Figure 2). Within the Study Area, the perennial stream is conveyed beneath an access road within the Wastewater Treatment Facilities property via a 12-inch corrugated metal pipe culvert. No improvements are proposed for the culvert, and the stream will not be impacted by the proposed project.

Bayou Sara is a perennial tributary to the Mississippi River and drains a large portion of West Feliciana Parish. The Bayou flows south and connects to the Mississippi River just south of the Study Area. The Mississippi River flows to the southeast where it empties into the Gulf of Mexico. Stabilization of the downstream left bank of Bayou Sara is the primary purpose of the proposed project. Therefore, the OHWM of the downstream left bank was delineated throughout the Study Area.

All access roads within the Study Area are existing and do not cross waters of the U.S. except where noted above. No other waters of the U.S. or wetlands were observed in or crossing the access roads, staging area, or excess cut placement area.

6.3 Wetland Function and Value

Not all wetlands perform all wetland functions nor do they perform all wetland functions equally well. The

To determine the value of each wetland within the proposed revetment footprint, ecologists used the USACE New Orleans District, Louisiana Wetlands Rapid Assessment Method (LRAM) for compensatory mitigation (USACE 2015). The output from LRAM can be used for calculating compensatory mitigation associated with USACE-authorized activities under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act of 1899 and in accordance with the 2008 Final Rule – Compensatory Mitigation for Losses of Aquatic Resources (33 CFR Part 332). Table 5 shows the factors and possible ratings for the LRAM method.

The LRAM classifies each wetland impacted by the proposed action based on the five factors shown in Table 5. Each factor is assigned an option and each option has an associated impact value or i-value. The i-value for each factor is added, then multiplied by the area of the impacted wetland (acres), and a arcadis.com

LRAM debit is generated. Equation 1 below shows the formula for calculating LRAM debits.

$$\text{Equation 1: } \sum (i) \times W = \text{LRAM Debit}$$

Table 5. Louisiana Rapid Assessment Method (LRAM) Factors and Associated i-Value

Factor	Option	i-Value
Wetland Status	Rare, Imperiled, Difficult to Replace (RID)	3
	Secure	2
	Degraded	1
Habitat Condition	High	3
	Medium	2
	Low	1
Hydrologic Condition	High	3
	Medium	2
	Low	1
Negative Influences	High	-0.5
	Medium	-0.2
	Low	0
Impact Type	Full/Permanent Loss	3
	Partial/Temporary Loss	0.5

Source: USACE Louisiana Rapid Assessment Method V1.0, 2015.

6.4 Potential Wetland Impacts

Wetland impacts from the proposed revetment are based on the fill area necessary for a stable revetment and slopes of the revetment to provide an acceptable safety factor for bank stabilization. The impact type for Wetland 2 was classified as “full/permanent loss.” Although this site is within the required revetment footprint for the proposed project, it will not be converted to other land use. Wetland 1 will be within the clear zone for the proposed project and will maintain its current function. Table 6 shows the LRAM options selected for Wetland 2 and the calculated i-value for the impacted wetland.

Table 6. LRAM Impact Factors for Each Wetland within the Proposed Revetment Footprint

Wetland	Wetland Status	Habitat Condition	Hydrologic Condition	Negative Influences	Impact Type	i-Value
Wetland 2	2	3	2	-0.2	3	9.8
Total						9.8

Wetland mitigation is discussed in Section 6.6. However, because the area of impacted wetlands is less than the threshold required for mitigation (0.1 acre) set forth by the 2012 Nationwide Permit General Conditions (Federal Register 2012), the final LRAM debit was not calculated. Table 6 shows the total i-value for the impacted wetland.

6.5 Potential Impacts to Surface Waters

Table 4 in Section 6.2 shows the potential impact the proposed project would have on surface waters. Approximately 1,991 linear feet (2.06 acres) of Bayou Sara would be impacted by the proposed project. Approximately 17,269 cubic yards of material (121 cubic yards of block mats, 16,781 cubic yards of riprap, and 367 cubic yards of compacted fill) would be placed within the OHWM of Bayou Sara for bank stabilization. The proposed project would not impact the unnamed tributary of Bayou Sara.

6.6 Wetland Mitigation

Wetlands impacted due to construction of the proposed project do not meet the mitigation requirements set forth by the USACE 2012 Nationwide Permit General Conditions as mentioned in Section 6.4.

Construction activities associated with the proposed revetment would impact wetlands and surface waters to varying degrees. Land clearing during construction would remove vegetative cover with the potential to increase surface runoff during storm events leading to erosion and increased sediment deposited in surface waters. To aid in minimizing such impacts, placement and monitoring of erosion control measures for soil stabilization along with temporary and permanent vegetation measures at the start of, during, and after construction would be incorporated into project construction plans and specifications.

Measures to minimize impacts to wetlands include hand clearing of wetland vegetation as well as limiting clearing to the minimum required for construction and the use of wetland areas outside the construction limits will be prohibited for construction support activities (borrow sites, waste sites, storage, parking, access, etc.). To minimize impacts resulting from the proposed action, the project specifications require that the contractor take certain measures toward reducing environmental (wetland) impacts.

It has been determined that there is no practicable alternative to the proposed project involving impacts to streams and wetlands, and the proposed action includes all practicable measures to minimize harm to waters of the U.S. that may result from this project.

7 REFERENCES

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WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Site: <u>Bayou Sara</u> City/County: <u>West Feliciana</u> Sampling Date: <u>10/27/2016</u>	
Applicant/Owner: <u>West Feliciana Parish</u> State: <u>LA</u> Sampling Point: <u>Wetland 1</u>	
Investigator(s): <u>M. Schulze, J. Morrell</u> Section, Township, Range: <u>SEC 42, T3S, R3W</u>	
Landform: (hillslope, terrace, etc.): <u>Terrace along Bayou Sara</u> Local relief (concave, convex, none): <u>none</u> Slope %: <u>5%</u>	
Subregion (LRR or MLRA): <u>LRR-O</u> Lat. <u>30.76766</u> Long. <u>-91.39455</u> Datum: <u>NAD83</u>	
Soil Map Unit Name: <u>(MB) Morganfield and Bigbee Soils, frequently flooded</u> NWI Classification: <u>None</u>	
Are climatic/hydrologic conditions on the site typical for time of year? Yes <u>X</u> No <u> </u> (If no, explain in the Remarks)	
Are Vegetation <u>No</u> Soil <u>No</u> or Hydrology <u>No</u> significantly disturbed? Are "Normal Circumstances" present? Yes <u>X</u> No <u> </u>	
Are Vegetation <u>No</u> Soil <u>No</u> or Hydrology <u>No</u> naturally problematic? (If needed, explain any answers in Remarks)	
SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.	
Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u> Hydric Soil Present? Yes <u>X</u> No <u> </u> Wetland Hydrology Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u>X</u> No <u> </u>
Remarks: All criteria met: Wetland. PEM shelf along Bayou Sara where bank has sloughed and water is penetrating soil layer.	
HYDROLOGY	
Wetland Hydrology Indicators:	
Primary Indicators (check all that apply)	Secondary Indicators
<input checked="" type="checkbox"/> Surface Water (A1)	<input checked="" type="checkbox"/> Aquatic Fauna (B13)
<input checked="" type="checkbox"/> High Water Table (A2)	<input checked="" type="checkbox"/> Surface Soil Cracks (B6)
<input checked="" type="checkbox"/> Saturation (A3)	<input checked="" type="checkbox"/> Marl Deposits (B15) (LRR U)
<input type="checkbox"/> Water Marks (B1)	<input checked="" type="checkbox"/> Sparsely Vegetated Concave Surface (B8)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)
<input type="checkbox"/> Drift Deposits (B3)	<input checked="" type="checkbox"/> Oxidized Rhizosphere along Live Roots (C3)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Moss Trim Lines
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input checked="" type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Water Stained Leaves (B9)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soil (C6)
	<input type="checkbox"/> Crayfish Burrows (C8)
	<input type="checkbox"/> Thin Muck Surface (C7)
	<input checked="" type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
	<input type="checkbox"/> Other (Explain in Remarks)
	<input checked="" type="checkbox"/> Geomorphic Position (D2)
	<input type="checkbox"/> Shallow Aquitard (D3)
	<input type="checkbox"/> FAC-Neutral Test (D5)
	<input type="checkbox"/> Sphagnum Moss (D8) (LRR T, U)
Field Observations:	
Surface Water Present? Yes <u> </u> No <u>X</u> Depth (inches) <u> </u> No <u> </u>	Wetland Hydrology Present? Yes <u>X</u> No <u> </u>
Water Table Present? Yes <u>X</u> No <u> </u> Depth (inches) <u>4"</u>	
Saturation Present? Yes <u>X</u> No <u> </u> Depth (inches) <u>Surface</u>	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: Aerial Photographs 1998, 1999, 2004 through 2016. Area was inundated during site visits on 7/28/16 and 12/30/2016.	
Remarks: Water on surface outside of soil pit. Shelf along perennial stream with sloughing of bank, which has allowed water to saturate soil from upslope. Photo of soil pit and in all four cardinal directions. Six primary and two secondary indicators observed.	

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

VEGETATION					Sampling Point:	Wetland 1
<u>Tree Stratum</u> Plot size: r=30'		Absolute % Cover	Dominant Species	Indicator Status	Dominance Test Worksheet Number of dominant species that are OBL, FACW, or FAC: <u>1</u> (A) Total number of dominant species across all strata: <u>1</u> (B) Percent of dominant species that are OBL, FACW, or FAC: <u>100%</u> (A/B)	
1.	_____	_____	_____	_____		
2.	_____	_____	_____	_____		
3.	_____	_____	_____	_____		
4.	_____	_____	_____	_____		
5.	_____	_____	_____	_____		
6.	_____	_____	_____	_____		
		<u>0</u> = Total Cover				
50% of total Cover: <u>0</u>		20% of Total Cover: <u>0</u>				
<u>Sapling Stratum</u> Plot size: r=15'		Absolute % Cover	Dominant Species	Indicator Status		
1.	_____	_____	_____	_____		
2.	_____	_____	_____	_____		
3.	_____	_____	_____	_____		
4.	_____	_____	_____	_____		
5.	_____	_____	_____	_____		
6.	_____	_____	_____	_____		
		<u>0</u> = Total Cover				
50% of total Cover: _____		20% of Total Cover: <u>0</u>				
<u>Shrub Stratum</u> Plot size: r=10'		Absolute % Cover	Dominant Species	Indicator Status	Hydrophytic Vegetation Indicators: x 1 - Rapid Test for Hydrophytic Vegetation x 2 - Dominance Test is >50% x 3 - Prevalence Index is ≤3.0* Problematic Hydrophytic Vegetation* (Explain) *Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic	
1.	_____	_____	_____	_____		
2.	_____	_____	_____	_____		
3.	_____	_____	_____	_____		
4.	_____	_____	_____	_____		
5.	_____	_____	_____	_____		
6.	_____	_____	_____	_____		
		<u>0</u> = Total Cover				
50% of total Cover: <u>0</u>		20% of Total Cover: <u>0</u>				
<u>Herb Stratum</u> Plot size: r=5'		Absolute % Cover	Dominant Species	Indicator Status		
1.	<u>Ludwigia alternifolia</u>	<u>40</u>	<u>Y</u>	<u>OBL</u>		
2.	<u>Salix nigra</u>	<u>10</u>	<u>N</u>	<u>OBL</u>		
3.	<u>Cyperus strigosus</u>	<u>5</u>	<u>N</u>	<u>FACW</u>		
4.	_____	_____	_____	_____		
5.	_____	_____	_____	_____		
6.	_____	_____	_____	_____		
7.	_____	_____	_____	_____		
8.	_____	_____	_____	_____		
9.	_____	_____	_____	_____		
10.	_____	_____	_____	_____		
11.	_____	_____	_____	_____		
		<u>55</u> = Total Cover				
50% of total Cover: <u>27.5</u>		20% of Total Cover: <u>11</u>				
<u>Woody Vine Stratum</u> Plot size: r=30'		Absolute % Cover	Dominant Species	Indicator Status	Hydrophytic Vegetation Present? Yes <u>X</u> No _____	
1.	_____	_____	_____	_____		
2.	_____	_____	_____	_____		
3.	_____	_____	_____	_____		
4.	_____	_____	_____	_____		
5.	_____	_____	_____	_____		
		<u>0</u> = Total Cover				
50% of total Cover: <u>0</u>		20% of Total Cover: <u>0</u>				
Remarks: Shrub willows outside plot. Majority have been eaten by beavers. <i>Sagittaria latifolia</i> outside plot. Vegetation is sprouting after inundation observed during recent months including site visits on 7/28/2016.						

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Site: <u>Bayou Sara</u> City/County: <u>West Feliciana</u> Sampling Date: <u>10/27/2016</u>	
Applicant/Owner: <u>West Feliciana Parish</u> State: <u>LA</u> Sampling Point: <u>Wetland 2</u>	
Investigator(s): <u>M. Schulze, J. Morrell</u> Section, Township, Range: <u>SEC 42, T3S, R3W</u>	
Landform: (hillslope, terrace, etc.): <u>Terrace along Bayou Sara</u> Local relief (concave, convex, none): <u>none</u> Slope %: <u>2%</u>	
Subregion (LRR or MLRA): <u>LRR-O</u> Lat. <u>30.76771</u> Long. <u>-91.3943</u> Datum: <u>NAD83</u>	
Soil Map Unit Name: <u>(MB) Morganfield and Bigbee Soils, frequently flooded</u> NWI Classification: <u>None</u>	
Are climatic/hydrologic conditions on the site typical for time of year? Yes <u>X</u> No <u> </u> (If no, explain in the Remarks)	
Are Vegetation <u>No</u> Soil <u>No</u> or Hydrology <u>No</u> significantly disturbed? Are "Normal Circumstances" present? Yes <u>X</u> No <u> </u>	
Are Vegetation <u>No</u> Soil <u>No</u> or Hydrology <u>No</u> naturally problematic? (If needed, explain any answers in Remarks)	
SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.	
Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u> Hydric Soil Present? Yes <u>X</u> No <u> </u> Wetland Hydrology Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u>X</u> No <u> </u>
Remarks: All criteria met - area is a Palustrine Forested wetland. Area is frequently inundated for long periods of time because water depth in Bayou Sara is controlled by the Mississippi River. Standing water frequently observed, especially in winter and spring.	
HYDROLOGY	
Wetland Hydrology Indicators:	
Primary Indicators (check all that apply)	Secondary Indicators
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Aquatic Fauna (B13)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Marl Deposits (B15) (LRR U)
<input type="checkbox"/> Saturation (A3)	<input checked="" type="checkbox"/> Hydrogen Sulfide Odor (C1) X
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Oxidized Rhizosphere along Live Roots (C3)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soil (C6)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Thin Muck Surface (C7)
<input type="checkbox"/> Iron Deposits (B5)	<input checked="" type="checkbox"/> Other (Explain in Remarks) X
<input checked="" type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Water Stained Leaves (B9)	<input type="checkbox"/> Shallow Aquitard (D3)
	<input type="checkbox"/> FAC-Neutral Test (D5)
	<input type="checkbox"/> Sphagnum Moss (D8) (LRR T, U)
Field Observations:	
Surface Water Present? Yes <u> </u> No <u>X</u> Depth (inches) <u> </u>	Wetland Hydrology Present? Yes <u>X</u> No <u> </u>
Water Table Present? Yes <u> </u> No <u>X</u> Depth (inches) <u> </u>	
Saturation Present? Yes <u> </u> No <u>X</u> Depth (inches) <u> </u>	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: Aerial Photographs 1998, 1999, 2004 through 2016.	
Remarks: Plot on top of bank - above Wetland 1. Subject to Mississippi River flooding especially in winter and spring. Photo of soil pit and in all four cardinal directions. One primary and two secondary indicators observed.	

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

VEGETATION					Sampling Point:	Wetland 2
<u>Tree Stratum</u> Plot size: r=30'		Absolute % Cover	Dominant Species	Indicator Status	Dominance Test Worksheet Number of dominant species that are OBL, FACW, or FAC: <u>5</u> (A) Total number of dominant species across all strata: <u>6</u> (B) Percent of dominant species that are OBL, FACW, or FAC: <u>83%</u> (A/B)	
1.	<u>Acer negundo</u>	40	Y	FAC		
2.	<u>Platanus occidentalis</u>	15	N	FACW		
3.	<u>Carya illinoensis</u>	15	N	FACU		
4.	<u>Celtis laevigata</u>	10	N	FACW		
5.	_____	_____	_____	_____		
6.	_____	_____	_____	_____		
		80 = Total Cover				
50% of total Cover: <u>40</u>		20% of Total Cover: <u>16</u>				
<u>Sapling Stratum</u> Plot size: r=15'		Absolute % Cover	Dominant Species	Indicator Status		
1.	<u>Nyssa sylvatica</u>	10	Y	FAC		
2.	<u>Celtis laevigata</u>	2	N	FACW		
3.	_____	_____	_____	_____		
4.	_____	_____	_____	_____		
5.	_____	_____	_____	_____		
6.	_____	_____	_____	_____		
		12 = Total Cover				
50% of total Cover: <u>6</u>		20% of Total Cover: <u>2.4</u>				
<u>Shrub Stratum</u> Plot size: r=10'		Absolute % Cover	Dominant Species	Indicator Status	Hydrophytic Vegetation Indicators: _____ 1 - Rapid Test for Hydrophytic Vegetation x _____ 2 - Dominance Test is >50% _____ 3 - Prevalence Index is ≤3.0* _____ Problematic Hydrophytic Vegetation* (Explain) *Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic	
1.	_____	_____	_____	_____		
2.	_____	_____	_____	_____		
3.	_____	_____	_____	_____		
4.	_____	_____	_____	_____		
5.	_____	_____	_____	_____		
6.	_____	_____	_____	_____		
		0 = Total Cover				
50% of total Cover: <u>0</u>		20% of Total Cover: <u>0</u>				
<u>Herb Stratum</u> Plot size: r=5'		Absolute % Cover	Dominant Species	Indicator Status		
1.	<u>Rubus trivialis</u>	40	Y	FACU		
2.	<u>Smilax rotundifolia</u>	10	Y	FAC		
3.	_____	_____	_____	_____		
4.	_____	_____	_____	_____		
5.	_____	_____	_____	_____		
6.	_____	_____	_____	_____		
7.	_____	_____	_____	_____		
8.	_____	_____	_____	_____		
9.	_____	_____	_____	_____		
10.	_____	_____	_____	_____		
11.	_____	_____	_____	_____		
		50 = Total Cover				
50% of total Cover: <u>25</u>		20% of Total Cover: <u>10</u>				
<u>Woody Vine Stratum</u> Plot size: r=30'		Absolute % Cover	Dominant Species	Indicator Status	Hydrophytic Vegetation Present? Yes <u>X</u> No _____	
1.	<u>Vitis rotundifolia</u>	30	Y	FAC		
2.	<u>Smilax rotundifolia</u>	20	Y	FAC		
3.	<u>Toxicodendron radicans</u>	10	N	FAC		
4.	<u>Mikania scandens</u>	2	N	FACW		
5.	_____	_____	_____	_____		
		62 = Total Cover				
50% of total Cover: <u>31</u>		20% of Total Cover: <u>12.4</u>				
Remarks: Shrub willows outside plot have been eaten by beavers. <i>Sagittaria latifolia</i> outside plot.						

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Site: <u>Bayou Sara</u> City/County: <u>West Feliciana</u> Sampling Date: <u>10/27/2016</u>	
Applicant/Owner: <u>West Feliciana Parish</u> State: <u>LA</u> Sampling Point: <u>UPLAND</u>	
Investigator(s): <u>M. Schulze, J. Morrell</u> Section, Township, Range: <u>SEC 42, T3S, R3W</u>	
Landform: (hillslope, terrace, etc.): <u>Terrace along Bayou Sara</u> Local relief (concave, convex, none): <u>none</u> Slope %: <u>2%</u>	
Subregion (LRR or MLRA): <u>LRR-O</u> Lat. <u>30.77155</u> Long. <u>-91.39705</u> Datum: <u>NAD83</u>	
Soil Map Unit Name: <u>(MB) Morganfield and Bigbee Soils, frequently flooded</u> NWI Classification: <u>PFO</u>	
Are climatic/hydrologic conditions on the site typical for time of year? Yes <u>X</u> No <u> </u> (If no, explain in the Remarks)	
Are Vegetation <u>No</u> Soil <u>No</u> or Hydrology <u>No</u> significantly disturbed? Are "Normal Circumstances" present? Yes <u>X</u> No <u> </u>	
Are Vegetation <u>No</u> Soil <u>No</u> or Hydrology <u>No</u> naturally problematic? (If needed, explain any answers in Remarks)	
SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.	
Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u> Hydric Soil Present? Yes <u> </u> No <u>X</u> Wetland Hydrology Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Remarks: Hydric soils not present.	
HYDROLOGY	
Wetland Hydrology Indicators:	
Primary Indicators (check all that apply)	Secondary Indicators
Surface Water (A1)	Aquatic Fauna (B13) <u>X</u>
High Water Table (A2)	Marl Deposits (B15) (LRR U)
Saturation (A3)	Hydrogen Sulfide Odor (C1)
Water Marks (B1)	Oxidized Rhizosphere along Live Roots (C3)
Sediment Deposits (B2)	Presence of Reduced Iron (C4)
Drift Deposits (B3)	Recent Iron Reduction in Tilled Soil (C6)
Algal Mat or Crust (B4)	Thin Muck Surface (C7)
Iron Deposits (B5)	Other (Explain in Remarks)
Inundation Visible on Aerial Imagery (B7)	<u>X</u> Geomorphic Position (D2)
Water Stained Leaves (B9)	Shallow Aquitard (D3)
	FAC-Neutral Test (D5)
	Sphagnum Moss (D8) (LRR T, U)
Field Observations:	
Surface Water Present? Yes <u> </u> No <u>X</u> Depth (inches) <u>> 16"</u>	Wetland Hydrology Present? Yes <u>X</u> No <u> </u>
Water Table Present? Yes <u> </u> No <u>X</u> Depth (inches) <u>> 16"</u>	
Saturation Present? Yes <u> </u> No <u>X</u> Depth (inches) <u>> 16"</u>	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: Aerial Photographs 1998, 1999, 2004 thru 2016.	
Remarks: Two secondary indicators observed. Flat area along Bayou Sara - dominated by <i>Salix nigra</i> trees. Photo of soil pit and in all four cardinal directions.	

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

VEGETATION					Sampling Point:	UPLAND
Tree Stratum Plot size: r=30'		Absolute % Cover	Dominant Species	Indicator Status	Dominance Test Worksheet Number of dominant species that are OBL, FACW, or FAC: <u>5</u> (A) Total number of dominant species across all strata: <u>5</u> (B) Percent of dominant species that are OBL, FACW, or FAC: <u>100%</u> (A/B)	
1.	<u>Salix nigra</u>	45	Y	OBL		
2.	<u>Platanus occidentalis</u>	5	N	FACW		
3.	<u>Carya illinoensis</u>	3	N	FACU		
4.	_____					
5.	_____					
6.	_____					
		53 = Total Cover				
50% of total Cover: <u>26.5</u>		20% of Total Cover: <u>10.6</u>				
Sapling Stratum Plot size: r=15'						
1.	_____					
2.	_____					
3.	_____					
4.	_____					
5.	_____					
6.	_____					
		0 = Total Cover				
50% of total Cover: <u>0</u>		20% of Total Cover: <u>0</u>				
Shrub Stratum Plot size: r=10'					Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0* Problematic Hydrophytic Vegetation* (Explain)	
1.	_____					
2.	_____					
3.	_____					
4.	_____					
5.	_____					
6.	_____					
		0 = Total Cover				
50% of total Cover: <u>0</u>		20% of Total Cover: <u>0</u>				
Herb Stratum Plot size: r=5'						
1.	<u>Campsis radicans</u>	30	Y	FAC		
2.	<u>Heliotropium procumbens</u>	20	Y	FACW		
3.	<u>Clematis crispa</u>	16	N	FACW		
4.	<u>Cardiospermum microcarpum</u>	5	N	FAC		
5.	<u>Carya illinoensis</u>	5	N	FACU		
6.	<u>Vernonia fasciculata</u>	2	N	FACW		
7.	<u>Saururus cernuus</u>	2	N	OBL		
8.	<u>Solanum nigrum</u>	2	N	FACU		
9.	<u>Betula nigra</u>	1	N	FACW		
10.	<u>Salix nigra</u>	1	N	OBL		
11.	_____					
		84 = Total Cover				
50% of total Cover: <u>42</u>		20% of Total Cover: <u>16.8</u>				
Woody Vine Stratum Plot size: r=30'					Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____	
1.	<u>Campsis radicans</u>	20	Y	FAC		
2.	<u>Clematis crispa</u>	5	Y	FACW		
3.	_____					
4.	_____					
5.	_____					
		25 = Total Cover				
50% of total Cover: <u>12.5</u>		20% of Total Cover: <u>5</u>				
Remarks: Indicators of hydrophytic vegetation observed.						

APPENDIX B

Custom Soil Resource Report for West Feliciana Parish, Louisiana,
and Hydric Soil List



APPENDIX C

Photographic Log



PHOTOGRAPHIC LOG

Client Name:

West Feliciana Parish

Site Location:

Bayou Sara

Contact/Task No.

LA003333.0001

Photo No.

1

Date:

10/27/2016

Description:

View of east bank (downstream left) of Bayou Sara near southern limit of Study Area (end of Reach 2), facing south.



Photo No.

2

Date:

10/27/2016

Description:

View of east bank of Bayou Sara near southern limit of Study Area, facing north (boat launch in background) along Reach 2.



PHOTOGRAPHIC LOG

Client Name: West Feliciana Parish	Site Location: Bayou Sara	Contact/Task No. LA003333.0001
--	-------------------------------------	--

Photo No. 3	Date: 10/27/2016	
Description: View of east bank of Bayou Sara, facing south in Reach 2 (note slope failure).		

Photo No. 4	Date: 10/27/2016	
Description: View of east bank of Bayou Sara near middle of Study Area, facing south.		

PHOTOGRAPHIC LOG

Client Name:

West Feliciana Parish

Site Location:

Bayou Sara

Contact/Task No.

LA003333.0001

Photo No.

5

Date:

10/27/2016

Description:

Soil sample at Sampling Point Wetland 1.



Photo No.

6

Date:

10/27/2016

Description:

Overview of Wetland 1, facing north. Wetland 1 is north of Reach 2.



PHOTOGRAPHIC LOG

Client Name:

West Feliciana Parish

Site Location:

Bayou Sara

Contact/Task No.

LA003333.0001

Photo No.

7

Date:

10/27/2016

Description:

Overview of Wetland 1, facing east.



Photo No.

8

Date:

10/27/2016

Description:

Overview of Wetland 1, facing south.



PHOTOGRAPHIC LOG

Client Name:

West Feliciana Parish

Site Location:

Bayou Sara

Contact/Task No.

LA003333.0001

Photo No.

9

Date:

10/27/2016

Description:

Overview of Wetland 1, facing west across Bayou Sara.



Photo No.

10

Date:

10/27/2016

Description:

Overview from northern end of Wetland 1, facing south (note surface water).



PHOTOGRAPHIC LOG

Client Name:

West Feliciana Parish

Site Location:

Bayou Sara

Contact/Task No.

LA003333.0001

Photo No.

11

Date:

10/27/2016

Description:

Overview of Bayou Sara near the end of Reach 1, facing south.



Photo No.

12

Date:

10/27/2016

Description:

Overview of Bayou Sara in Reach 1, facing northwest (Wastewater Treatment Facility property).



PHOTOGRAPHIC LOG

Client Name:
West Feliciana Parish

Site Location:
Bayou Sara

Contact/Task No.
LA003333.0001

Photo No.
13

Date:
10/27/2016

Description:
Overview of Bayou Sara near the beginning of Reach 1, facing east.



Photo No.
14

Date:
10/27/2016

Description:
Soil sample at Sampling Point Upland.



PHOTOGRAPHIC LOG

Client Name:

West Feliciana Parish

Site Location:

Bayou Sara

Contact/Task No.

LA003333.0001

Photo No.

15

Date:

10/27/2016

Description:

Overview of Sampling Point Upland, facing west.



Photo No.

16

Date:

10/27/2016

Description:

Overview of Sampling Point Upland, facing north.



PHOTOGRAPHIC LOG

Client Name:

West Feliciana Parish

Site Location:

Bayou Sara

Contact/Task No.

LA003333.0001

Photo No.

17

Date:

10/27/2016

Description:

Overview of Sampling Point Upland, facing east.



Photo No.

18

Date:

10/27/2016

Description:

Overview of Sampling Point Upland, facing south.



PHOTOGRAPHIC LOG

Client Name:

West Feliciana Parish

Site Location:

Bayou Sara

Contact/Task No.

LA003333.0001

Photo No.

19

Date:

10/27/2016

Description:

Perennial stream from west side of access road, facing west.



Photo No.

20

Date:

10/27/2016

Description:

Perennial stream from east side of access road, facing west (12-inch corrugated metal pipe culvert inlet).



PHOTOGRAPHIC LOG

Client Name:

West Feliciana Parish

Site Location:

Bayou Sara

Contact/Task No.

LA003333.0001

Photo No.

21

Date:

10/27/2016

Description:

Perennial stream from west side of access road, facing east (12-inch corrugated metal pipe culvert outlet).



Photo No.

22

Date:

10/27/2016

Description:

Soil at Sampling Point Wetland 2.



PHOTOGRAPHIC LOG

Client Name:

West Feliciana Parish

Site Location:

Bayou Sara

Contact/Task No.

LA003333.0001

Photo No.

23

Date:

10/27/2016

Description:

Overview of Sampling Point
Wetland 2, facing south.



Photo No.

24

Date:

10/27/2016

Description:

Overview of Sampling Point
Wetland 2, facing west.



PHOTOGRAPHIC LOG

Client Name:

West Feliciana Parish

Site Location:

Bayou Sara

Contact/Task No.

LA003333.0001

Photo No.

25

Date:

10/27/2016

Description:

Overview of Sampling Point
Wetland 2, facing north.



Photo No.

26

Date:

10/27/2016

Description:

Overview of Sampling Point
Wetland 2, facing east.



PHOTOGRAPHIC LOG

Client Name: West Feliciana Parish	Site Location: Bayou Sara	Contact/Task No. LA003333.0001
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Photo No. 27	Date: 10/27/2016	
Description: Overview of Wetland 2 near northern end showing drainage patterns, facing east toward Ferdinand Street.		

Photo No. 28	Date: 10/27/2016	
Description: Overview of boundary of Wetland 2 near northern end showing shallow ditch, facing south.		

PHOTOGRAPHIC LOG

Client Name:

West Feliciana Parish

Site Location:

Bayou Sara

Contact/Task No.

LA003333.0001

Photo No.

29

Date:

10/27/2016

Description:

Overview of boundary of Wetland 2 near northern end showing shallow ditch, facing north.



Photo No.

30

Date:

10/27/2016

Description:

Overview of Wetland 2 near middle of wetland, facing east toward Ferdinand Street.



PHOTOGRAPHIC LOG

Client Name:

West Feliciana Parish

Site Location:

Bayou Sara

Contact/Task No.

LA003333.0001

Photo No.

31

Date:

10/27/2016

Description:

Overview of Wetland 2 near southern end, facing south.



Photo No.

32

Date:

4/2011
(Google Street View)

Description:

Access Road to Reach 2 from Ferdinand Street, facing west.



PHOTOGRAPHIC LOG

Client Name: West Feliciana Parish	Site Location: Bayou Sara	Contact/Task No. LA003333.0001
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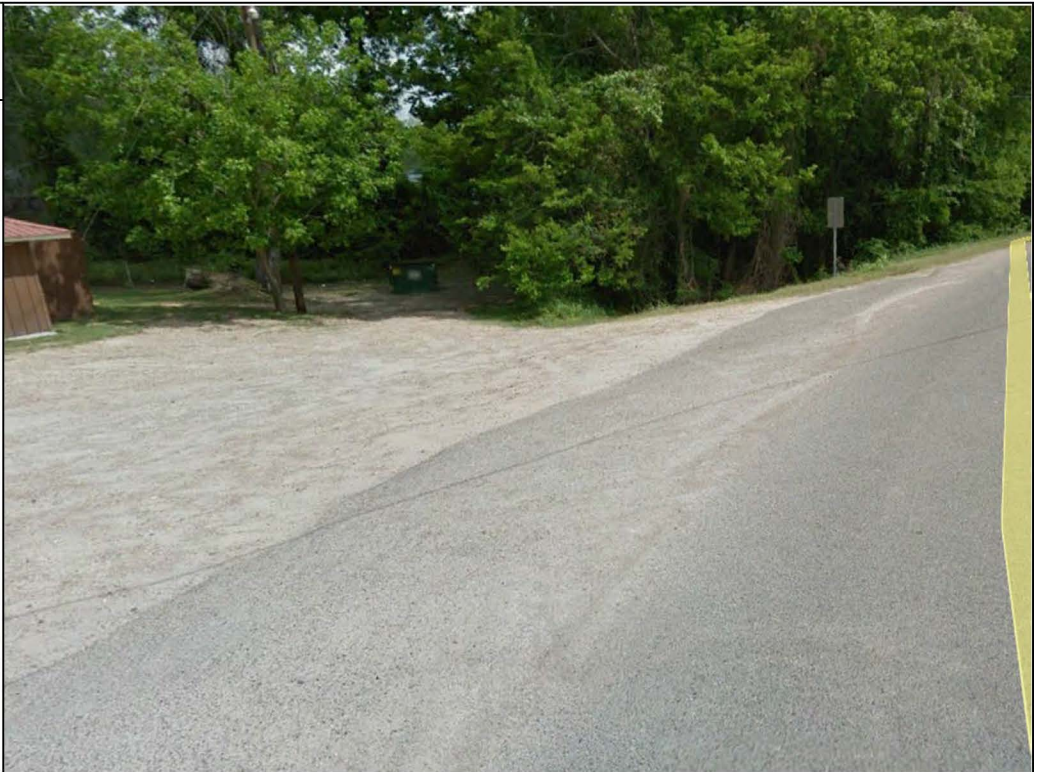

Photo No. 33	Date: 10/27/2016	
Description: Access Road to Reach 2 from Ferdinand Street, facing west.		

Photo No. 34	Date: 4/2011 (Google Street View)	
Description: Access Road to northern end of Reach 2 from Ferdinand Street, facing west.		

PHOTOGRAPHIC LOG

Client Name:

West Feliciana Parish

Site Location:

Bayou Sara

Contact/Task No.

LA003333.0001

Photo No.

35

Date:

10/27/2016

Description:

Southern access road to St. Francisville Wastewater Treatment Ponds from Ferdinand Street, facing southwest.



Photo No.

36

Date:

10/27/2016

Description:

Northern access road to St. Francisville Wastewater Treatment Ponds from Ferdinand Street, facing southwest.



PHOTOGRAPHIC LOG

Client Name: West Feliciana Parish	Site Location: Bayou Sara	Contact/Task No. LA003333.0001
--	-------------------------------------	--


Photo No. 37	Date: 10/27/2016	
Description: Overview of staging area, facing south.		

Photo No. 38	Date:	
Description: Overview of excess cut placement area, facing northeast.		

Arcadis U.S., Inc.

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Baton Rouge, Louisiana 70816

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A decorative graphic consisting of three orange lines: a horizontal line extending across the width of the page, and two parallel diagonal lines extending from the bottom left towards the top right.

Appendix F

8-Step Process, Public Notice, and Draft Findings of No Significant Impact

8-STEP PROCESS

EO 11988-FLOODPLAIN MANAGEMENT EO 11990-WETLAND PROTECTION

DATE: 3/12/2018

PREPARED BY: Bonnie Porter

PROJECT: Bayou Sara Streambank Stabilization

Hazard Mitigation Grant Program Project No. 1603-436, FEMA Disaster 1603-DR-LA

LOCATION: West Feliciana Parish, LA

LATITUDE/ LONGITUDE: 30.772841, -91.392866

STEP 1 Determine whether the proposed action is located in a wetland and/or The 100-yr floodplain (500-year floodplain for critical actions [44 CFR 9.4]), or whether it has the potential to affect or be affected by a floodplain or a wetland (see 44 CFR 9.7).

A wetlands delineation was conducted along the Bayou Sara project corridor on October 27, 2016. The results of this survey were documented in a Biological Resources and Wetlands Findings Report prepared by ARCADIS Design & Consultancy for West Feliciana Parish on March 20, 2017. Wetlands identified along the project corridor were evaluated in accordance with EO 11990.

A palustrine forested (PFO) wetland was identified just south of Reach 1, which is along the large bend of the east bank of Bayou Sara adjacent to the St. Francisville Sewage Treatment Plant (STP). This PFO wetland extends southward to Reach 2, which is along the large bend of the east bank of Bayou Sara adjacent to the Oyster Bar (see Figure 2 in the Biological Resources and Wetlands Findings Report in Appendix E). Approximately 0.09 acre of the wetland would be covered by revetment fill material consisting of riprap and concrete block mats. Wetland functions would be permanently lost from this fill activity.

An additional palustrine emergent (PEM) wetland was also identified to the north of Reach 2 along the east bank of Bayou Sara (see Figure 2 in Appendix B). This wetland would not be affected by the proposed action.

Flood Insurance Rate Map (FIRM) Community-Panel Number 220245-006B Effective Date of February 13, 1979, shows the Bayou Sara project corridor area within Flood Zone A with no base flood elevations (BFEs) determined.

Arcadis Consulting conducted a Hydraulic and Hydrologic (H&H) Analysis on May 31, 2016. The results of the H&H showed a maximum increase of 0.70 feet

in the Bayou Sara Water Surface Elevation (WSE) when the Mississippi River discharge is very low (approximately 400,000 cubic feet/second (cfs)), such as in August and September. A 100-year flood event was modeled using a flow of 40,329 cfs down Bayou Sara. The results showed no change in WSEs in cross-sections near the revetments when stages were at or higher than the 100-year BFE. For downstream cross-sections near the Mississippi River, there was no observable differences in WSE due to implementation of the project. The overall impact of the proposed action on the hydrology and floodplain of Bayou Sara and the Mississippi River would be expected to be negligible.

Per 44 CFR 9.11(d)(4)...Until a regulatory floodway is designated, no new construction, substantial improvements, or other development (including fill) shall be permitted within the base floodplain unless it is demonstrated that the cumulative effect of the proposed development, when combined with all other existing and anticipated development, will not increase the water surface elevation of the base flood more than one foot at any point within the community. The above H&H results show that this regulatory requirement is satisfied for the project.

STEP 2 Notify the public at the earliest possible time of the intent to carry out an action in a floodplain or wetland, and involve the affected and interested public in the decision making process (see 44 CFR 9.8).

A cumulative public notice concerning the Hazard Mitigation Grant Program (HMGP) Assistance in floodplain and wetland areas has been or will be published (???) in the New Orleans Times-Picayune, Baton Rouge Advocate, Lafayette Daily Advertiser, Lake Charles American Press, Hammond Star, Monroe News-Star, Shreveport Times, and the Alexandria Daily Town Talk.

STEP 3 Identify and evaluate practicable alternatives to locating the proposed action in a floodplain or wetland (including alternative sites, actions and the "no action" option) [see 44 CFR 9.9]. If a practicable alternative exists outside the floodplain or wetland, FEMA must locate the action at the alternative site.

The No Action Alternative does not meet the purpose and need of protecting the St. Francisville STP lagoons from being eroded away by Bayou Sara and is not a practicable alternative.

The proposed action and considered alternatives described in draft EA Sections 3.2 and 3.3, respectively, are within the Bayou Sara and Mississippi River floodplain. Since FIRM Community-Panel #22045-006B shows Flood Zone A extending northward of the St. Francisville STP, there are no practicable alternative sites outside of the floodplain. The location and siting of the proposed action revetments along the east bank of Bayou Sara have minimized impacts to

wetlands along this corridor. There is no practicable alternative that avoids impacts to wetlands while meeting the project purpose and need.

STEP 4 Identify the full range or potential direct or indirect impacts associated with, the occupancy or modification of floodplains and wetlands and the potential direct and indirect support of floodplain and wetland development that could result from the proposed action (see 44 CFR 9.10).

In addition to the permanent loss of 0.09 acre of PFO wetland south of Reach 1 described in Step 1, vegetation removal along a 375-foot section of existing access road covering 0.17 acre within this wetland adjacent to the north portion of Reach 2 north of the Oyster Bar would also occur (see Sheet P-06 in Appendix E.

The PEM wetland described in Step 1, which covers 0.07 acre, would be permanently lost to the additional revetment that would be constructed between Reach 1 and 2 under the Considered Alternative.

The H&H results, summarized in Step 1, show minimal changes in WSEs in Bayou Sara during low flow conditions on the Mississippi River to no observable differences in BFE WSEs during modeled 100-year flood events. These floodplain effects are considered to be negligible.

STEP 5 Minimize the potential adverse impacts and support to or within floodplains and wetlands to be identified under step # 4, restore and preserve the natural and beneficial values served by floodplains, and preserve and enhance the natural and beneficial values served by wetlands (see 44 CFR 9.11).

Vegetation removal along the existing access road within the PFO wetland adjacent to the north portion of Reach 2 north of the Oyster Bar described in Step 4 would be accomplished using hand tools. Timber mats would be laced over the access road section within this wetland surface, if necessary. Upon completion of revetment construction, access roads would be restored to pre-project conditions. Clearing would be limited to the minimum required for construction and the use of wetland areas outside the construction limits would be prohibited for support activities, including borrow sites, parking and access road use, etc. The proposed action would include all practicable measures to minimize hard to wetlands that may result from this project.

The New Orleans District (NOD) is also requiring West Feliciana Parish to purchase 0.1 acres of wetland credits from an approved wetlands mitigation bank. West Feliciana Parish purchased 0.1 acre of credit from Cypress Plantation Mitigation Bank on February 20, 2018. The wetland impacts from construction of the proposed action would be expected to be minor. The purchase of the mitigation bank credits is judged by USACE NOD to be suitable mitigation for this impact.

If the Considered Alternative continuous revetment were constructed, hand tools and timber mats would be used in the manner described for the Proposed Action. The clearance area would be limited to the minimum required for construction and the use of wetland areas outside construction limits would be prohibited as described for the Proposed action. Wetland mitigation would also be required.

No floodplain mitigation is required beyond coordination with the West Feliciana Parish Floodplain Administrator.

STEP 6 Reevaluate the proposed action to determine first, if it is still practicable in light of its exposure to flood hazards, the extent to which it will aggravate the hazards to others. And it's potential to disrupt floodplain and wetland values and second, if alternatives preliminarily rejected at step # 3 are practicable in light of the information gained in steps # 4 and # 5. FEMA shall not act in a floodplain or wetland unless it is the only practicable location (see 44 CFR 9.9).

The H&H included in appendix C of the EA demonstrates the project will not increase the WSE within the floodway and have minimal potential to disrupt floodplain values. On February 20, 2018, West Feliciana Parish purchased 0.1 acre of credit from Cypress Plantation Mitigation Bank in order to offset the 0.1 acres of wetlands that would be loss during this project. After reevaluating the hazards against the benefits of the proposed project, FEMA has determined the project is practicable. The potential to disrupt wetland values has been minimized as evidenced by the granting of the Clean Water Act Section 404 permit by USACE NED under NWP 13. The H & H analysis demonstrates a minimal potential to disrupt floodplain values.

STEP 7 Prepare and provide the public with a finding and public explanation of any final decision that the floodplain or wetland is the only practicable alternative (see 44 CFR 9.12).

Public notice of the availability of the draft EA was published in the St. Francisville Democrat and the Advocate. Public notices published in the St. Francisville Democrat on two (2) consecutive Thursdays (month/day and month/day, 2017) and for five (5) consecutive weekdays in The Advocate beginning Monday, month/day and ending on Friday, month/day, 2017 to alert the public that the Draft EA and FONSI are available for review at the West Feliciana Parish Library, 5114 Burnett Road in St. Francisville, and the West Feliciana Parish Courthouse at 4785 Prosperity Street, St. Francisville. There was a 30-day comment period beginning on day, month/day and concluding on day, month/day at 4 pm.

STEP 8 Review the implementation and post-implementation phases of the proposed action to ensure that the requirements of the order are fully implemented. Oversight responsibility shall be integrated into existing processes.

APPROVAL CONDITIONED ON REVIEWS OF IMPLEMENTATION
AND POST IMPLEMENTATION PHASES TO ENSURE
COMPLIANCE WITH THE ORDER(S).

Project has been reviewed for compliance with 44 CFR Part 9.

**FEMA PUBLIC NOTICE
OF AVAILABILITY FOR THE
DRAFT ENVIRONMENTAL ASSESSMENT AND
DRAFT FINDING OF NO SIGNIFICANT IMPACT
FOR THE PROPOSED BAYOU SARA STREAMBANK STABILIZATION PROJECT
IN ST. FRANCISVILLE, WEST FELICIANA PARISH, LOUISIANA**

Interested parties are hereby notified that the Federal Emergency Management Agency (FEMA) has prepared a draft Environmental Assessment (EA) and draft Finding of No Significant Impact (FONSI) in compliance with the National Environmental Policy Act (NEPA). The purpose of the draft EA is to assess the effects on the human and natural environment from constructing revetments along Bayou Sara adjacent to the St. Francisville Sewage Treatment Plant (STP) and the Oyster Bar in West Feliciana Parish, St. Francisville, Louisiana.

The proposed project is intended to prevent erosion of the Bayou Sara streambank from undercutting the STP lagoons and protect Ferdinand Street, which provides access to the U.S. Army Corps of Engineers' St. Francisville Casting Field, located east of Ferdinand Street, and is St. Francisville's sole road access to the Mississippi River.

The purpose of the draft EA is to analyze the potential environmental impacts associated with the preferred action and alternatives. The draft EA evaluates a No Action Alternative; the Preferred Alternative: Construct two (2) Revetments Adjacent to the St. Francisville STP and the Oyster Bar; and a Considered Alternative: Construct a Continuous Revetment from the St. Francisville STP to the Oyster Bar.

The draft FONSI is FEMA's finding that the proposal would not have a significant effect on the human and natural environment.

The Draft EA and Draft FONSI is available for review at the West Feliciana Library, at 5114 Burnett Road in St. Francisville, LA 70775. The documents can also be downloaded from FEMA's website at <http://www.fema.gov/resource-document-library>.

This public notice is published in The Advocate for five (5) days beginning Monday, August 20, 2018 and ending on Friday, August 24, 2018. This public notice will also be published in the St. Francisville Democrat (journal of record), the Clinton Watchman, and The Zachary Advocate & Plainsman on consecutive Thursdays - August 23, 2018 and August 30, 2018. There is a 30 day comment period, beginning on Monday, August 20, 2018 and concluding on Wednesday, September 19, 2018 at 4 p.m.

Comments may be mailed to: DEPARTMENT OF HOMELAND SECURITY-FEMA EHP-Bayou Sara Streambank Stabilization, 1500 MAIN STREET, BATON ROUGE, LOUISIANA 70802. Comments may be emailed to: fema-noma@fema.dhs.gov or faxed to: 225-346-5848. Verbal comments will be accepted or recorded at 225-267-2962. If no substantive comments are received, the draft EA and associated draft FONSI will become final.



FEMA

U.S. Department of Homeland Security
Federal Emergency Management Agency
Region VI - Louisiana Recovery Office
1500 Main Street
Baton Rouge, Louisiana 70802

**DRAFT FINDING OF NO SIGNIFICANT IMPACT
FOR THE
BAYOU SARA STREAMBANK STABILIZATION PROJECT
ST. FRANCISVILLE, WEST FELICIANA PARISH, LOUISIANA
HAZARD MITIGATION GRANT PROGRAM
*HMGP 1603-0436/DR-1603-LA***

BACKGROUND

The West Feliciana Parish Government, the applicant, through the Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP) has requested federal funding through the Federal Emergency Management's (FEMA) 404 Hazard Mitigation Grant Program (HMGP) to prevent streambank erosion from damaging utility and road infrastructure in the Parish.

The east bank of Bayou Sara has experienced significant erosion on the reach between St. Francisville and the confluence with the Mississippi River. The streambank along a large bend on the east bank of the Bayou and an access road west of a sewage treatment lagoon at the St. Francisville Sewage Treatment Plant (STP) has experienced significant erosion since at least 1998. Streambank erosion at this location was estimated to average over five (5) feet per year from 1998 to 2005, over eight (8) feet per year in 2006 and 2007, over 14 feet per year from 2008 to 2010, and approximately four (4) feet per year from 2012 to 2014. An estimated 3.4 acres of land at this bench area has been lost to streambank erosion during this period.

This project would provide mitigation necessary to prevent erosion of the streambank and undercutting the sewage treatment lagoon, which serves more than 700 customers. The project would also provide erosion protection for Ferdinand Street, which provides access to a U. S. Army Corps of Engineers (USACE) storage facility to the east of the street, and a local boat launch. Ferdinand Street is also St. Francisville's sole road access to the Mississippi River, which is important for local tourism derived from riverboat visits.

An Environmental Assessment (EA) was prepared in accordance with the FEMA Instruction 108-1-1 and the Department of Homeland Security Instruction 023-01-001-01, pursuant to Section 102 of the National Environmental Policy Act of 1969 (NEPA), as implemented by the regulations promulgated by the President's Council on Environmental Quality (40 Code of Federal Regulations [CFR] Parts 1500-1508). The purpose of the EA was to analyze the potential environmental impacts associated with the proposed work, and

to determine whether to prepare an Environmental Impact Statement (EIS) or Finding of No Significant Impact (FONSI).

The proposed action is to construct two (2) revetments along the large bends of the east bank of Bayou Sara adjacent to the STP (Reach 1) and downstream near the Oyster Bar (Reach 2). The EA also analyzed a No Action Alternative, and a Considered Alternative of constructing a continuous revetment from the St. Francisville STP to the Oyster Bar that would include the two (2) revetments included in the proposed action plus an additional section of streambank located between Reaches 1 and 2. A complete description of these alternatives is included in the EA, which is incorporated by reference in this document.

FINDINGS

FEMA has evaluated the proposed project for significant adverse impacts to geology and soils, water resources (surface water, groundwater, and wetlands), floodplains, air quality, biological resources (vegetation, fish and wildlife, Federally-listed threatened or endangered species and critical habitats), cultural resources, environmental justice, climate change, traffic and transportation, public health and safety, noise, hazardous materials and cumulative impacts. The results of these evaluations as well as consultations and input from other federal and state agencies are presented in the EA.

CONDITIONS AND MITIGATION MEASURES

The following conditions must be met as part of the implementation of the project. Failure to comply with these conditions may jeopardize federal funds:

- The Applicant must follow all applicable local, state, and federal laws, regulations, and requirements and obtain and comply with all required permits and approvals prior to initiating work.
- Applicant must follow all conditions listed in U.S. Army Corps of Engineers MVN-2017-0368-CQ Nationwide Permit-13
- Applicant must, install and monitor appropriate erosion and sediment controls, and stabilization practices.
- Applicant must obtain and/or update all necessary approvals and environmental permits regarding this proposed project.
- If your project results in a discharge to waters of the state, submittal of a Louisiana Pollutant Discharge Elimination System (LPDES) application may be necessary.
- If the project results in a discharge of wastewater to an existing wastewater treatment system, that wastewater treatment system may need to modify its LPDES permit before accepting the additional wastewater.
- All precautions should be observed to protect the groundwater of the region.

- All precautions should be observed to control nonpoint source pollution from construction activities. Louisiana Department of Environment Quality (LDEQ) has stormwater general permits for construction areas equal to or greater than one (1) acre. It is recommended that you contact the LDEQ Water Permits Division at (225) 219-9371 to determine if your proposed project requires a permit.
- If your project will include a sanitary wastewater treatment facility, a Sewage Sludge and Biosolids Use or Disposal Permit is required. An application or Notice of Intent will be required if the sludge management practice includes preparing biosolids for land application or preparing sewage sludge to be hauled to a landfill.
- Please be advised that water softeners generate wastewaters that may require special limitations depending on local water quality considerations. Therefore, if your water system improvements include water softeners, you are advised to contact the LDEQ Water Permits to determine if special water quality-based limitations will be necessary.
- Any renovation or remodeling must comply with Louisiana Administrative Code (LAC) 33:III.Chapter 28, Lead-Based Paint Activities; LAC 33:III.Chapter 27, Asbestos-Containing Materials in Schools and State Buildings (includes all training and accreditation); and LAC 33:III.5151, Emission Standard for Asbestos for any renovations or demolitions.
- Vehicle operation times should be kept to a minimum. Area soils must be covered and/or wetted, if necessary, during construction to minimize dust
- After construction of revetments, restore existing access roads to pre-project conditions.
- Use all practicable measures to minimize hazards to wetlands.
- Conduct revetment construction activities during low-flow periods to the maximum extent possible.
- If any solid or hazardous wastes, or soils and/or groundwater contaminated with hazardous constituents are encountered during the project, notification to LDEQ's Single-Point-of-Contact (SPOC) at (225) 219-3640 is required. Additionally, precautions should be taken to protect workers from these hazardous constituents.
- If any species that are tracked by the Louisiana Natural Heritage Program (LNHP) are encountered, contacting the LNHP Data Manager at 225-765-2643 is required.
- Use existing access roads to the maximum extent possible.
- Execute the Phase III Data Recovery Project (LA Statewide PA TM IX).
- Develop and implement Public Interpretation (LA Statewide PA TM III).
- Louisiana Unmarked Human Burial Sites Preservation Act: If human bone or unmarked grave(s) are present within the project area, notify the West Feliciana Parish Sheriff's Office within 24 hours of discovery. The Applicant shall also notify FEMA and the Louisiana Division of Archaeology at 225-342-8170 within 72 hours of discovery.

- Construction activities must comply with Occupational Safety and Healthy Act (OSHA) Construction Industry Standards.
- Implementation of a “no wake” zone on Bayou Sara during construction near the revetments is recommended.
- Installation of temporary fencing between the Oyster Bar parking lot and the Reach 2 revetment is also recommended.
- The following steps should be taken to comply with West Feliciana Parish Code Chapter 115: Install, if necessary, a screen or a buffer between uses in order to minimize the harmful impact of noise, dust and other debris, motor vehicle headlight glare or other artificial light intrusion, and other objectionable activities or impacts conducted on or created by an adjoining or nearby use. Install silt fences, if necessary, to prevent storm and run-off erosion, particularly along embankments on water ways and road ways.
- The applicant shall handle, manage, and dispose of petroleum products, hazardous materials and/or toxic waste in accordance with all local, state and Federal agency requirements. All coordination pertaining to these activities should be documented and copies forwarded to the state and FEMA as part of the permanent project files.
- The applicant shall handle, manage, and dispose of petroleum products, hazardous materials and toxic waste in accordance with all local, state and Federal requirements.
- If spills of fuels, oils or hydraulic fluids from vehicles and equipment occur, use sorbent pads or other spill control supplies to stop the release of these materials and promptly containerize any contaminated materials and/or sediment/soil. Leaky vehicles and equipment must be taken out of service for repair before returning them to service. If any hazardous wastes, or soils and/or groundwater contaminated with hazardous constituents are encountered during the project, notification to LDEQ’s SPOC at (225) 219-3640 is required.
- Notification to the National Response Center at 800-424-8802 if an oil discharge to water occurs.
- The construction contractor shall comply with Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) hazardous substance release reporting requirement, if an applicable release occurs.
- If hazardous materials are unexpectedly encountered in the project area during the proposed construction operations, appropriate measures for the proper assessment, remediation, management and disposal of the contamination would be initiated in accordance with applicable federal, state, and local regulations.
- Failure to comply with these conditions may make part of all of the project ineligible for FEMA funding.

- During the project impact analysis process developers should identify project-related impacts to migratory birds and the conservation measures that will be used to mitigate them. For additional Migratory Bird Conservation recommendations, guidance and tools to help reduce impacts to birds and their habitats please visit the LESO webpage: https://www.fws.gov/lafayette/Migratory_Birds/MigBird.html and the Service's Migratory Bird Program Webpage (<https://www.fws.gov/birds/bird-enthusiasts/threats-to-birds/collisions/communication-towers.php>).
- The applicant must review the National Bald Eagle Management (NBEM) Guidelines is available at: <http://www.fws.gov/migratorybirds/pdf/management/nationalbaldeaglenanagementguidelines.pdf> to minimize potential project impacts to bald eagles, particularly where such impacts may constitute "disturbance," which is prohibited by the Bald and Golden Eagle Protection Act (BGEPA).
- If a bald eagle nest occurs or is discovered within 660 feet of the proposed project area, then USFWS requires an evaluation to be performed to determine whether the project is likely to disturb nesting bald eagles. The applicant is required to conduct the evaluation on-line at: <https://www.fws.gov/southeast/our-services/eagle-technical-assistance>. Following completion of the evaluation, that website will provide a determination of whether additional consultation is necessary. All coordination pertaining to these activities should be documented and copies forwarded to the state and FEMA as part of the permanent project files
- U.S. Fish and Wildlife Service (USFWS) recommends that a qualified biologist inspect the proposed work site for the presence of undocumented nesting colonies during the nesting season because some waterbird colonies may change locations year-to-year. To minimize disturbance to colonial nesting birds please refer to the colonial nesting waterbird guidance on the Louisiana Ecological Services Office (LESO) Web page https://www.fws.gov/lafayette/Migratory_Birds/MigBird.html.

The following conservation measures for Pallid sturgeon must be employed by construction personnel as a requirement of FEMA funding:

- All personnel related to the construction project will receive worker awareness training on the Pallid sturgeon. This training will include at a minimum: the laws protecting the sturgeon (Endangered Species Act of 1973) as a federally threatened species, a definition of "take" as it applies to the Endangered Species Act § 3.19, the fines and possible imprisonment for take of a sturgeon, and images of the sturgeon as it is likely to be seen in Bayou Sara and the Mississippi River. All personnel must sign a worker awareness training *sign-in sheet* as a record of their attendance and training received. Any new workers that did not receive the initial training will need to be trained before working in or near construction areas.
- Informational signs will be posted at visible locations in any construction area where in-water work occurs, including all project-related vessels. The signs will have an image of a sturgeon as it is likely to be seen in Bayou Sara, the federal listing status of the sturgeon, possible punishment for

take of a sturgeon, and phone numbers to immediately call in the event a sturgeon is seen: USFWS's Lafayette Field Office, (337) 291-3100, and the LNHP, (225) 765-2800.

- These informational signs will be weather-proofed (laminated) and large enough so that they can be read from a distance of 20 feet. Signs will be posted prior to and for the duration of the construction project.
- One (1) person per construction site will be made responsible by their crew lead (if not the lead personally) to call the phone numbers stated above in the event a sturgeon is sighted.
- All construction personnel will be responsible for monitoring water-related activities for the presence of sturgeons as part of their regular duties.
- The following are special conditions that will be followed in the event a sturgeon is sighted within 100 yards of the project area:
 - i. All construction personnel will have “*Stop Work*” authority if they see a sturgeon within 50 feet of a construction activity, including moving vessels.
 - ii. All vessels will operate at no-wake/idle speeds within 100 yards of the work area.
 - iii. In-water sediment barriers or siltation barriers will need to be re-secured and monitored.
 - iv. Work will only resume without restriction when a previously sighted sturgeon is greater than 100 yards away from the project area.
- Construction work shall only be done during fall low water, outside the spawning season of Pallid sturgeon.
- Per 44 CFR 9.11(d)(4) “there shall be no encroachments, including fill, new construction, substantial improvements of structures or facilities, or other development within a designated regulatory floodway that would result in any increase in flood levels within the community during the occurrence of the base flood discharge. Until a regulatory floodway is designated, no new construction, substantial improvements, or other development (including fill) shall be permitted within the base floodplain unless it is demonstrated that the cumulative effect of the proposed development, when combined with all other existing and anticipated development, will not increase the water surface elevation of the base flood more than one foot at any point within the community.”
- Coordination with the West Feliciana Parish Floodplain Administrator is required.

- 44 CFR 9.11(d)(6), no project should be built to a floodplain management standard that is less protective than what the community has adopted in local ordinances through their participation in the National Flood Insurance Program. The applicant is required to coordinate with the local floodplain administrator regarding floodplain permit(s) prior to the start of any activities. All coordination pertaining to these activities and applicant compliance with any conditions should be documented and copies forwarded to the LA GOHSEP and FEMA for inclusion in the permanent project files.
- Sediment control features (Best Management Procedures [BMPs]) will be implemented on land to limit sediment delivery to the Bayou Sara and Mississippi River. Sediment control features will be required around all dredged material, unclean gravel, sand, and/or soil stockpiles. These features may include, but would not be limited to: sediment (silt) fences, straw wattles (fiber rolls), straw bales, sandbag barriers, plastic sheeting, storm drain inlet protection, and street sweeping/vacuuming. As with any stormwater control methods, the implementation of the appropriate controls will be dictated by the type and amount of sediment being controlled and the forecasted environmental conditions. Monitoring of sediment control features will be required prior to and during rain events to ensure control features are installed correctly and are functioning properly.
- In-water silt barriers (turbidity curtains) will be utilized within the Bayou Sara for all aspects of the project, including bank cut and installation of geo-fabric and riprap. Silt barriers will need to be installed in a manner that contains the dislodged sediments within the immediate work area.
- The applicant agrees that if it receives any Federal aid as a result of the attached project application, it will accept responsibility, at its own expense if necessary, for the routine maintenance of any real property, structures, or facilities acquired or constructed as a result of such Federal aid. Routine maintenance shall include, but not be limited to, such responsibilities as keeping vacant land clear of debris, garbage, and vermin; keeping stream channels, culverts, and storm drains clear of obstructions and debris; and keeping detention ponds free of debris, trees, and woody growth.
- The choice of erosion control measure to be employed will be based on the type and duration of disturbance. For example, areas disturbed due to heavy equipment may receive mulch or hydroseeding to control sediment runoff, as needed.
- Any floating debris will be trapped by the silt barrier and removed from the water, and in-water work will only be conducted when waters are calm enough to allow for the efficacy of the silt barrier system. Disposal of all debris will conform to local, state, and federal laws and standards.
- In-water work and all BMPs identified above may be subject to additional stipulations based on permitting requirements by the U.S. Army Corps of Engineer under § 10 of the Rivers and Harbors Act of 1899 and § 404 of the Clean Water Act under the Nationwide Permit No. 13 (Bank Stabilization), dated March 9, 2018.

- Applicant must comply with all conditions listed in following permits: The Louisiana Department of Environmental Quality (LDEQ) issued the Water Quality Certification (WQC) 160629-02 for the USACE Reissuance of Nationwide Permits, including NWP 13, to the New Orleans District (NOD) on February 14, 2017. The WQC is subject to the State of Louisiana NWP Regional Conditions, February 2017.
- All coordination pertaining to these activities and applicant compliance with any conditions should be documented and copies forwarded to GOHSEP and FEMA for inclusion in the permanent project files. New construction must also be compliant with current codes and standards.

CONCLUSIONS

Based upon the incorporated EA, and in accordance with Presidential Executive Orders 12898 (Environmental Justice), 11988 (Floodplain Management), and 11990 (Wetland Protection), FEMA has determined that the proposed action implemented with the conditions and mitigation measures outlined above and in the EA will not have any significant adverse effects on the quality of the natural and human environment. As a result of this FONSI, an EIS will not be prepared (FEMA Instruction 108-1-1) and the proposed action alternative as described in the EA may proceed.

APPROVALS

Jerame Cramer	Date
Environmental Liaison Officer	
Louisiana Recovery Office	

Thomas M. "Mike" Womack	Date
Director of the Louisiana Recovery Office	
FEMA -DR-1603-1607-LA	