

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT

Scott E. Bennett, P.E.
Director
Telephone (501) 569-2000
Voice/TTY 711



P.O. Box 2261
Little Rock, Arkansas 72203-2261
Telefax (501) 569-2400
www.arkansashighways.com

July 13, 2017

Ms. M. Elaine Edwards
Chief, Regulatory Division
Little Rock District Corps of Engineers
P.O. Box 867
Little Rock, AR 72203-0867

RE: AHTD Job Number 110642
Beaver Bayou Str. & Apprs. (S)
Phillips County

Dear Ms. Edwards:

Enclosed are the Categorical Exclusion, supporting illustrations and proposed construction plans for the referenced project. The proposed AHTD project will replace a bridge with a reinforced concrete box culvert over Beaver Bayou on Hwy. 85 in Phillips County. The existing 77' x 28' bridge will be replaced on existing location with a quintuple 12' x 11' x 66' reinforced concrete box culvert. The new approaches will consist of two 11-foot side paved travel lanes with 4-foot shoulders. A temporary detour to the east of the existing alignment will be utilized for maintenance of traffic during construction. Construction of the box culvert and new approaches will permanently fill 0.33 acre of bottomland hardwood wetlands and, due to construction of the detour, will temporarily impact 1.26 acres of bottomland hardwood forests. Stream impacts resulting in the bridge replacement are estimated to be less than 0.1 acre. Total impacts to waters of the United States for the construction of the box culvert and temporary detour are estimated at approximately 1.6 acres.

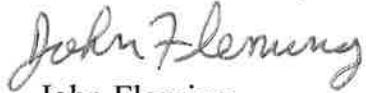
The AHTD proposes the use of 21.3 wetland credits to mitigate the 1.6 acres of wetland impacts. The wetland credits will be provided from the Department's Glaise Creek Mitigation Bank.

The proposed project will not impact Federal or State lands, National or State wild or scenic rivers, or Extraordinary Resource water bodies or Ecologically Sensitive Waters. AHTD design standards must comply with FEMA-approved local floodplain ordinances.

AHTD Job Number 110642
Nationwide 23 Permit Packet
Page 2 of 2

Please review this project for concurrence that construction can proceed under the terms of a Nationwide 23 for Categorical Exclusions. If additional information is required, please contact Kayti Ewing or Josh Seagraves of my staff at (501) 569-2522.

Sincerely,

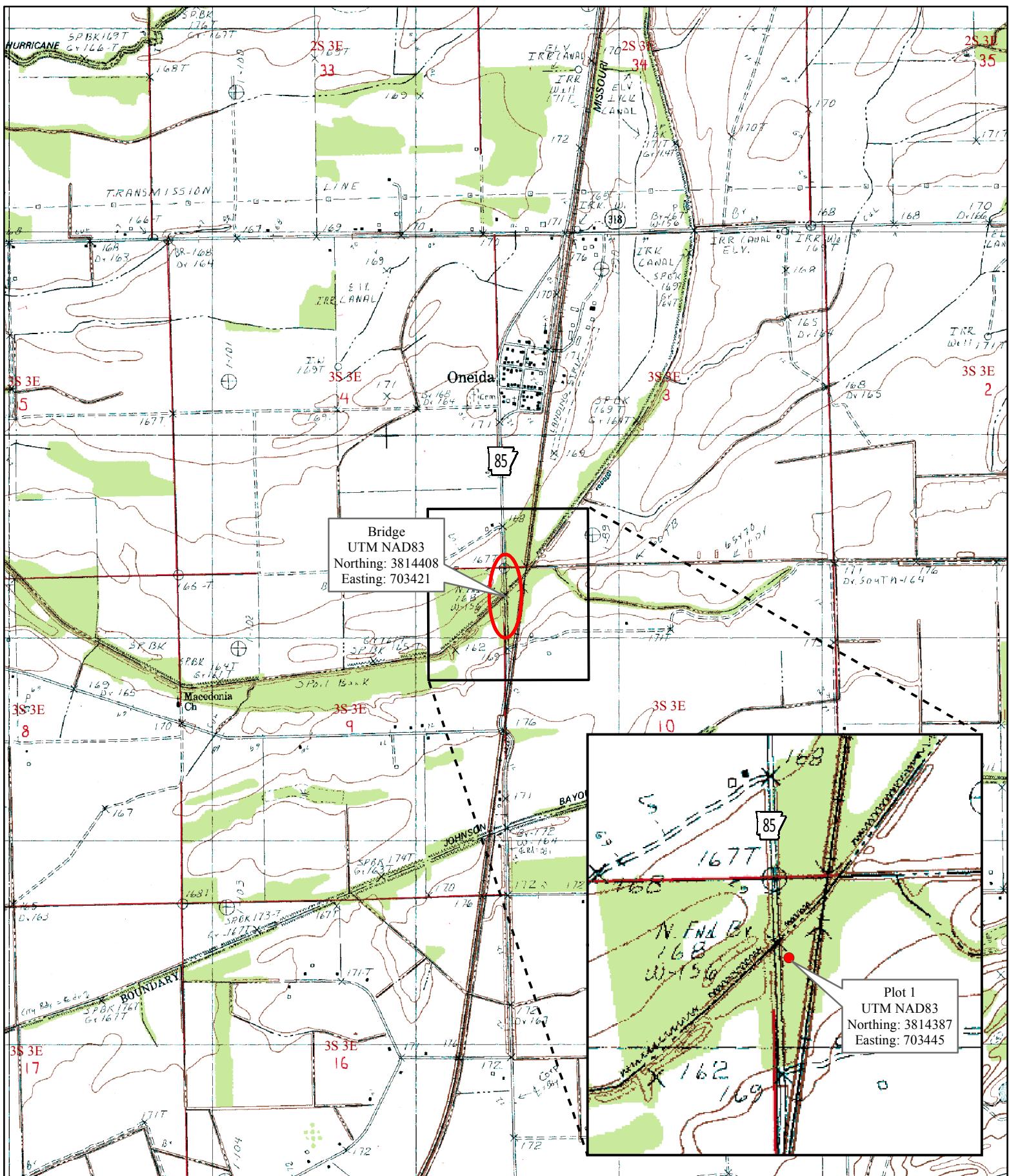


John Fleming
Division Head
Environmental Division

Enclosures

- Categorical Exclusion
- Supporting Illustrations
- Proposed Construction Plans

JF:JS:KE:ym



Job 110642
Beaver Bayou Str. & Apprs.
(Hwy. 85)
Phillips County

N
0 1,000 2,000
Feet

AHTD - Environmental GIS - Strawn
June 26, 2017

Lakeview 1982 USGS Topographic Map

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT

INTER OFFICE MEMORANDUM

June 15, 2017

TO: Master Files

FROM: John Fleming, Division Head, Environmental Division 

SUBJECT: AHTD Job Number 110642
FAP Number NHPP-0054(22)
Beaver Bayou Str. & Apprs. (S)
Bridge Number M3950
Phillips County
Tier 2 Categorical Exclusion

The Environmental Division has reviewed the referenced project and it falls within the definition of a Tier 2 Categorical Exclusion under 23 Code of Federal Regulations, Section 771.117, and the AHTD/FHWA Memorandum of Agreement on the processing of Categorical Exclusions. A public hearing will not be offered for this project.

The purpose of this system preservation project is to replace a bridge with a reinforced concrete box culvert over Beaver Bayou on Highway 85 in Phillips County, Arkansas. The total length of the project is approximately 0.032 mile. A project location map is attached.

Highway 85 consists of two 11-foot paved travel lanes with no shoulders and no right of way of record.

The existing 77' x 28' bridge (M3950) consists of four spans composed of timber girders with a reinforced concrete deck.

The bridge will be replaced on existing location with a quintuple 12' x 11' x 66' reinforced concrete box culvert. The new approaches will consist of two 11-foot wide paved travel lanes with 4-foot wide shoulders. A temporary detour to the east of the existing alignment will be utilized for maintenance of traffic during construction. The

AHTD Job Number 110642
Tier 2 Categorical Exclusion
Page 2 of 3

new right of way width will be 120 feet. Approximately 1.0 acre of additional right of way will be required for this project.

Design data for this project is as follows:

Design Year	Average Daily Traffic	Percent Trucks	Design Speed
2018	770	4	60 mph
2038	860	4	60 mph

No environmental justice issues, hazardous waste deposits, prime farmland, relocatees, protected waters, or underground storage tanks are associated with this project. Cultural resource impacts are not anticipated; concurrence from the State Historic Preservation Officer is attached.

A review of IPaC indicated that there was a potential to impact the following species: Ivory-billed Woodpecker (*Campephilus principalis*), Piping Plover (*Charadrius melanotos*) and Pallid sturgeon (*Scaphirhynchus albus*). However, the proposed project area is void of these species' specific habitat, and a 'no effect' determination was made.

Permanent impacts to bottomland hardwood forests are estimated at 0.33 acre, and temporary impacts to forested wetlands, due to construction of the detour, are estimated at 1.26 acres. Total wetland impacts are estimated at 1.6 acres. Stream impacts resulting from the bridge replacement are estimated to be less than 0.1 acre. The AHTD proposes the use of 15.8 wetland credits to mitigate the 1.6 acres of wetland impacts. The wetland credits will be mitigated at the Glaise Creek Mitigation Bank located in Woodruff County. Construction of the proposed project should be allowed under the terms of a Nationwide Permit 23 for Approved Categorical Exclusions.

Phillips County participates in the National Flood Insurance Program. All of the floodplain encroachments within this highway construction project will be designed to comply with the county's local flood damage prevention ordinance. The project lies within the Zone AE, Special Flood Hazard Area. The final project design will be reviewed to confirm that the design is adequate and that the potential risk to life and property are minimized. Adjacent properties should not be impacted nor have a greater flood risk than existed before construction of the project. None of the encroachments will constitute a significant floodplain encroachment or a significant risk to property or life.

Based upon the AHTD's *Policy on Highway Traffic Noise Abatement*, a noise analysis is not required for this project. The project meets the criteria for a Type III project established in 23 CFR 772. Therefore, the project requires no analysis for highway traffic noise impacts. Type III projects do not involve added capacity, construction of new through lanes or auxiliary lanes, changes in the horizontal or vertical alignment of the roadway, or exposure of noise sensitive land uses to a new or existing highway noise source. AHTD acknowledges that a noise analysis is required if changes to the proposed project result in reclassification to a Type I project.

Attachments:

Project Location Map
SHPO Clearance
U.S. Fish & Wildlife Species List
Environmental Study Checklist
Design Sheet

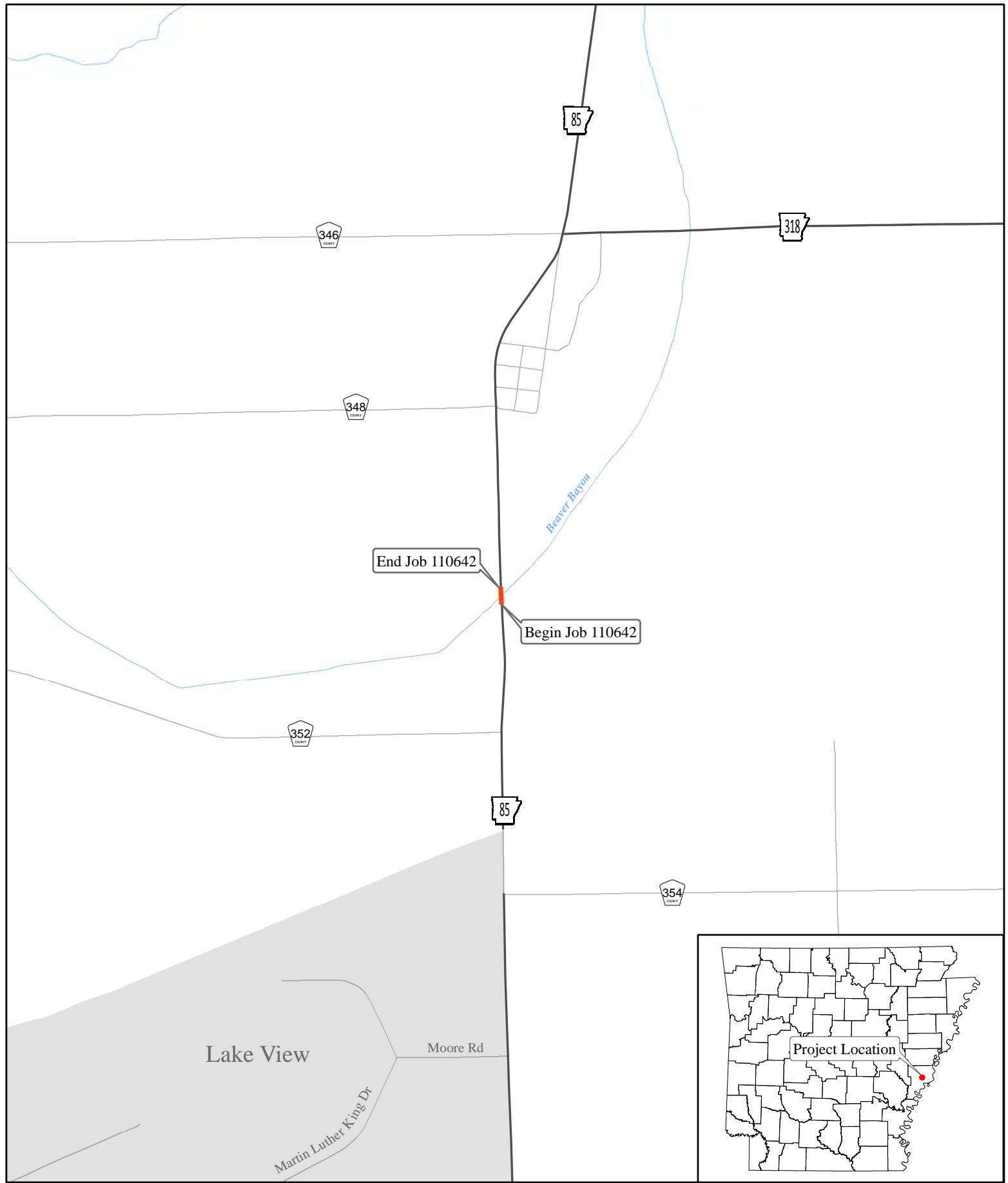
Approved:



Kevin Thornton
Assistant Chief Engineer-Planning

JF:KS:fc

- c: Program Management
Right of Way
Roadway Design
District 1
FHWA
Master File



0 1,000 2,000
Feet

AHTD-Environmental GIS-Hopkins
May 19, 2017

Job 110642
Beaver Bayou Str. & Apprs.
(Hwy. 85)
Phillips County

Project Location

ARKANSAS STATE HIGHWAY
AND
TRANSPORTATION DEPARTMENT

97044.01
FHWA

Scott E. Bennett, P. E.
Director
Telephone (501) 569-2000
Voice/TTY 711



P.O. Box 2261
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May 22, 2017

RECEIVED
AHTD

Ms. Stacy Hurst
State Historic Preservation Officer
1100 North Street
Little Rock, AR 72201

AHPP

MAY 24 2017

MAY 26 2017
ENVIRONMENTAL
DIVISION

Re: AHTD Job Number 110642
Beaver Bayou Str. & Apprs. (S)
Phillips County

Dear Ms. Hurst:

A Project Identification Form for the referenced project is enclosed. Please review for concurrence with the findings of my staff. If you have any questions or require additional information, please contact Milton Hughes of my staff at 501-569-2080.

Sincerely,

brenda l rice
John Fleming
Division Head
Environmental Division

Enclosure

JF:DW:MH:ym

Date: MAY 24 2017

No known historic properties will be affected by this undertaking. This effect determination could change should new information come to light.

Meredith Russell
Arkansas State Historic Preservation Office

MAY 24 2017



United States Department of the Interior

FISH AND WILDLIFE SERVICE
Arkansas Ecological Services Field Office
110 South Amity Suite 300
Conway, AR 72032-8975
Phone: (501) 513-4470 Fax: (501) 513-4480
<http://www.fws.gov/arkansas-es>



In Reply Refer To:

May 25, 2017

Consultation Code: 04ER1000-2017-SLI-0806

Event Code: 04ER1000-2017-E-01097

Project Name: 110642 Beaver Bayou Str. & Apprs.

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies endangered, threatened, proposed, and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.). **This letter only provides an official species list and technical assistance; if you determine that listed species and/or designated critical habitat may be affected in any way by the proposed project, even if the effect is wholly beneficial, consultation with the Service will be necessary.**

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 et seq.), federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found on our website.

Please visit our website at <http://www.fws.gov/arkansas-es/IPaC/home.html> for species-specific guidance to avoid and minimize adverse effects to federally endangered, threatened, proposed, and candidate species. Our web site also contains additional information on species life history and habitat requirements that may be useful in project planning.

If your project involves in-stream construction activities, oil and natural gas infrastructure, road construction, transmission lines, or communication towers, please review our project

specific guidance at <http://www.fws.gov/arkansas-es/IPaC/ProjSpec.html>.

The karst region of Arkansas is a unique region that covers the **northern third of Arkansas** and we have specific guidance to conserve sensitive cave-obligate and bat species. **Please visit <http://www.fws.gov/arkansas-es/IPaC/Karst.html> to determine if your project occurs in the karst region and to view karst specific-guidance.** Proper implementation and maintenance of best management practices specified in these guidance documents is necessary to avoid adverse effects to federally protected species and often avoids the more lengthy formal consultation process.

If your species list includes any mussels, Northern Long-eared Bat, Indiana Bat, Yellowcheek Darter, Red-cockaded Woodpecker, or American Burying Beetle, your project may require a presence/absence and/or habitat survey prior to commencing project activities. Please check the appropriate species-specific guidance on our website to determine if your project requires a survey. We strongly recommend that you contact the appropriate staff species lead biologist (see office directory or species page) prior to conducting presence/absence surveys to ensure the appropriate level of effort and methodology.

Under the ESA, it is the responsibility of the Federal action agency or its designated representative to determine if a proposed action "may affect" endangered, threatened, or proposed species, or designated critical habitat, and if so, to consult with the Service further. Similarly, it is the responsibility of the Federal action agency or project proponent, not the Service, to make "no effect" determinations. If you determine that your proposed action will have "no effect" on threatened or endangered species or their respective critical habitat, you do not need to seek concurrence with the Service. Nevertheless, it is a violation of Federal law to harm or harass any federally-listed threatened or endangered fish or wildlife species without the appropriate permit.

Through the consultation process, we will analyze information contained in a biological assessment that you provide. If your proposed action is associated with Federal funding or permitting, consultation will occur with the Federal agency under section 7(a)(2) of the ESA. Otherwise, an incidental take permit pursuant to section 10(a)(1)(B) of the ESA (also known as a habitat conservation plan) is necessary to harm or harass federally listed threatened or endangered fish or wildlife species. In either case, there is no mechanism for authorizing incidental take "after-the-fact." For more information regarding formal consultation and HCPs, please see the Service's Consultation Handbook and Habitat Conservation Plans at www.fws.gov/endangered/esa-library/index.html#consultations.

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, **the accuracy of this species list should be verified after 90 days.** This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and

implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. **Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.**

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Arkansas Ecological Services Field Office
110 South Amity Suite 300
Conway, AR 72032-8975
(501) 513-4470

Project Summary

Consultation Code: 04ER1000-2017-SLI-0806

Event Code: 04ER1000-2017-E-01097

Project Name: 110642 Beaver Bayou Str. & Apprs.

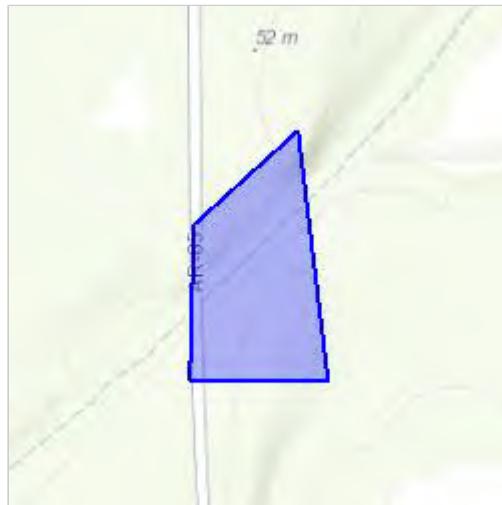
Project Type: BRIDGE CONSTRUCTION / MAINTENANCE

Project Description: Bridge replacement to the east side of Beaver Bayou Ditch in Phillips County on Highway 85.

Project Location:

Approximate location of the project can be viewed in Google Maps:

<https://www.google.com/maps/place/34.45166994988365N90.78501181952142W>



Counties: Phillips, AR

Endangered Species Act Species

There is a total of 3 threatened, endangered, or candidate species on your species list. Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area. Please contact the designated FWS office if you have questions.

Birds

NAME	STATUS
Ivory-billed Woodpecker (<i>Campephilus principalis</i>) No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/8230	Endangered
Piping Plover (<i>Charadrius melanotos</i>) Population: except Great Lakes watershed There is a final critical habitat designated for this species. Your location is outside the designated critical habitat. Species profile: https://ecos.fws.gov/ecp/species/6039	Threatened

Fishes

NAME	STATUS
Pallid Sturgeon (<i>Scaphirhynchus albus</i>) No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/7162	Endangered

Critical habitats

There are no critical habitats within your project area.

AHTD ENVIRONMENTAL IMPACTS ASSESSMENT FORM

AHTD Job Number 110642 FAP Number NHPP-0054(22)

Job Title Beaver Bayou Str. & Apprs. (S)

Environmental Impacts	None	Minor	Significant	Comments
Air Quality	X			
Construction Impacts		X		Temporary
Cultural Resources	X			
Economic	X			
Endangered Species	X			
Energy Resources	X			
Environmental Justice>Title VI	X			
Fish and Wildlife		X		Temporary during Construction
Floodplains		X		
Forest Service Property	X			
Hazardous Materials/Landfills	X			
Land Use Impacts	X			
Migratory Birds		X		Migratory Bird SP
Navigation/Coast Guard	X			
Noise Levels	X			
Prime Farmland	X			
Protected Waters	X			
Public Recreation Lands	X			
Public Water Supply/WHPA	X			
Relocatees	X			
Section 4(f)/6(f)	X			
Social	X			
Underground Storage Tanks	X			
Visual Impacts	X			
Stream Impacts		X		
Water Quality		X		Temporary during construction
Wetlands		X		NW 23
Wildlife Refuges	X			

Section 401 Water Quality Certification Required?

No

Short-term Activity Authorization Required?

Yes

Section 404 Permit Required?

Yes Type NW 23

Remarks:

Signature of Evaluator

Kaitlyn Sj

Date

6-13-12

ROADWAY DESIGN REQUEST

Job Number 110642 FAP No. _____ County Phillips

Job Name Beaver Bayou Str. & Apprs. (S)

Design Engineer Stephen Sichmeller Environmental Staff _____

Brief Project Description Replace existing bridge with R.C. Box Culvert.

A. Existing Conditions:

Roadway Width: 22' Shoulder Type/Width: _____

Number of Lanes and Width: 2-11' Existing Right-of-Way: N/A

Sidewalks? _____ Location: _____ Width: _____

Bike Lanes? _____ Location: _____ Width: _____

B. Proposed Conditions:

Roadway Width: 22' Shoulder Type/Width: 4' (2' Paved)

Number of Lanes and Width: 2-11' Proposed Right-of-Way: 120'

Sidewalks? _____ Location: _____ Width: _____

Bike Lanes? _____ Location: _____ Width: _____

C. Construction Information:

If detour: Where: East Length: 0.204 mile(s)

D. Design Traffic Data:

<u>2018</u>	ADT: <u>770</u>	<u>2038</u>	ADT: <u>860</u>	% Trucks: <u>4</u>
Design Speed: <u>60</u> m.p.h.				

E. Approximate total length of project: 0.032 mile(s)

F. Justification for proposed improvements: System Preservation.

G. Total Relocatee: 0 Residences: 0 Businesses: 0

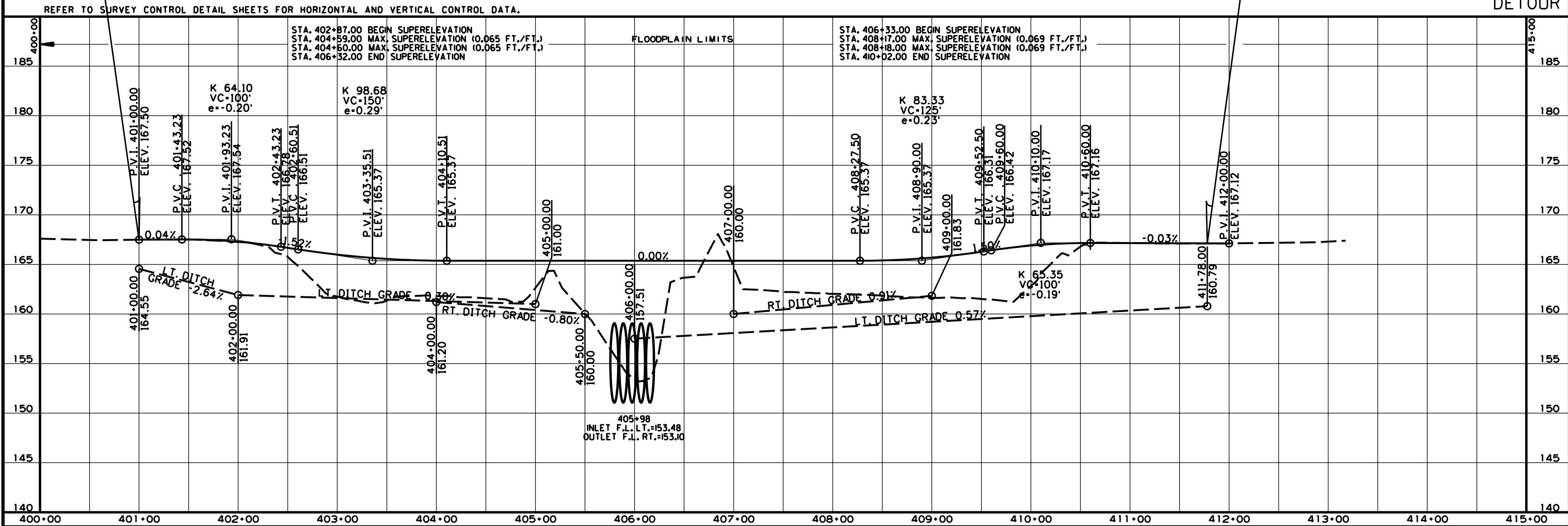
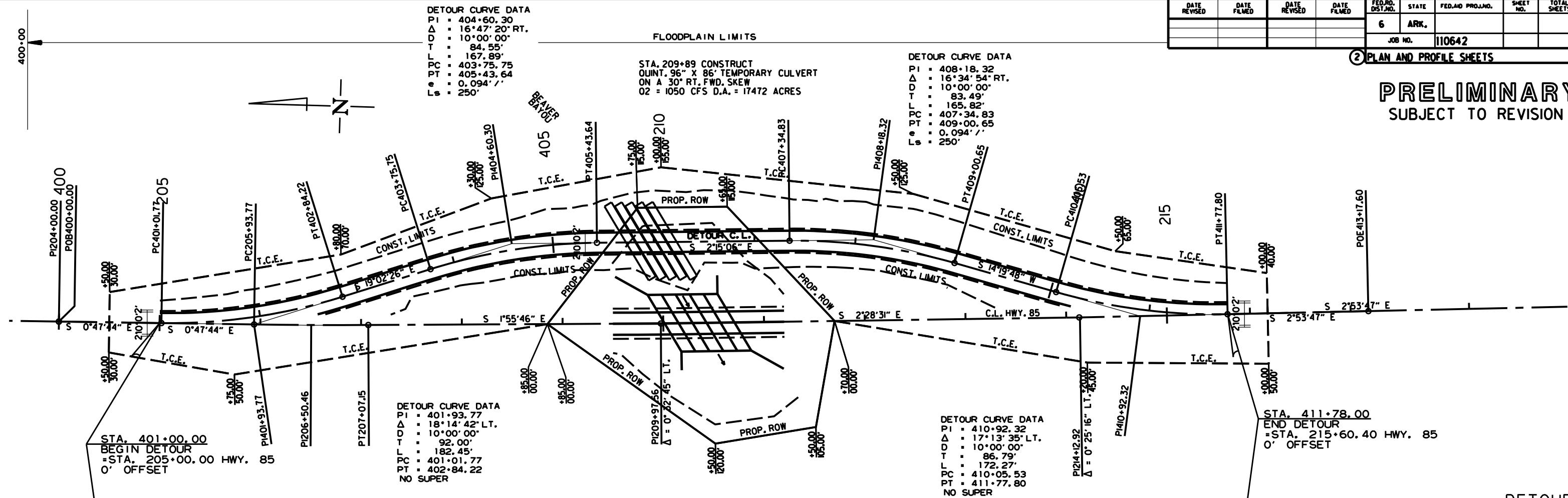
H. Have you coordinated with any outside agencies (e.g., FHWA, City, County, etc.)? No

Agency/Official	Person Contacted	Date

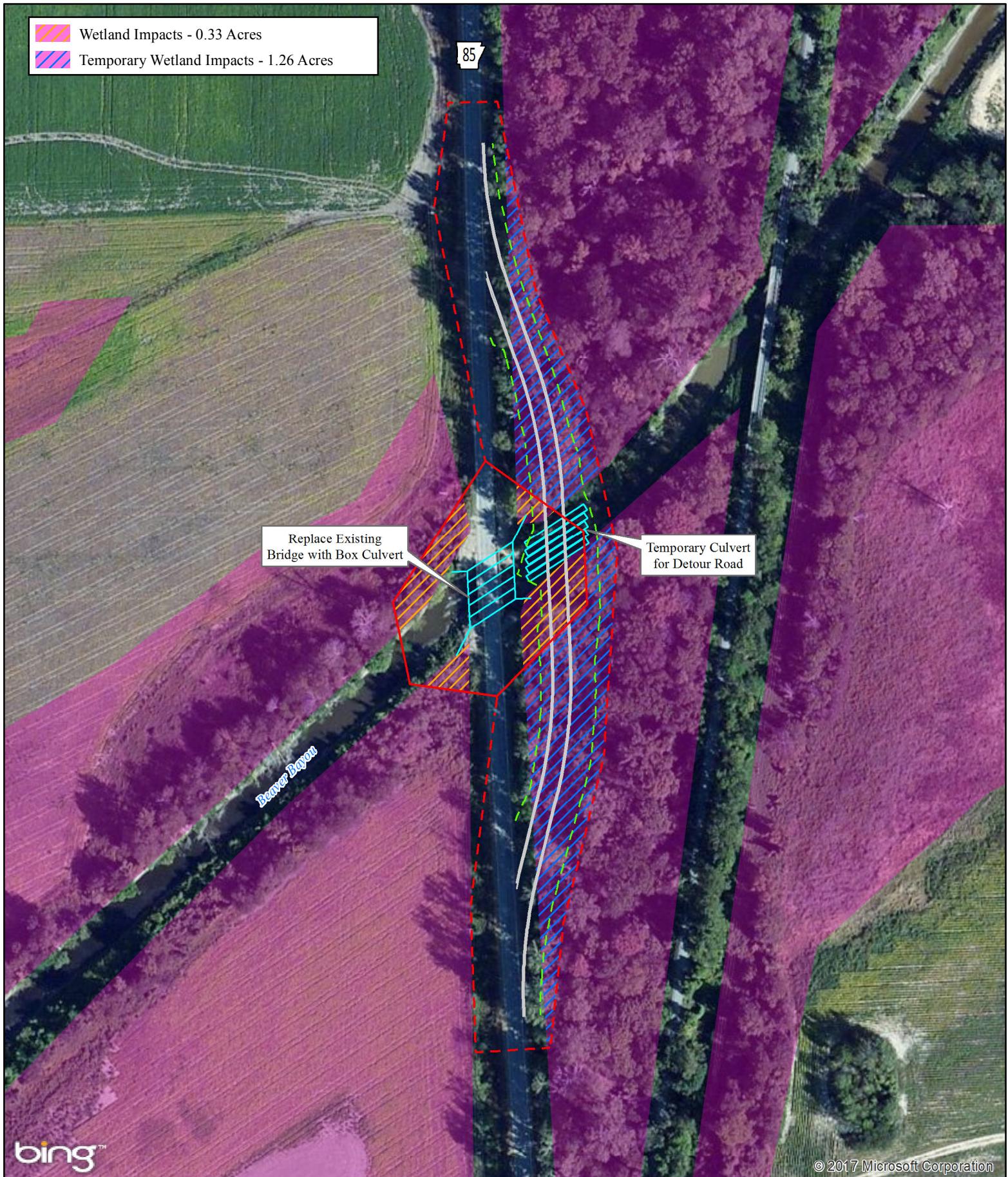
FED.RD. DIST.MO.	STATE	FED.AID PROJNO.	SHEET NO.	TOTAL SHEETS
			DATE REVISED	DATE FILMED
6	ARK.	JOB NO. 110642		

② PLAN AND PROFILE SHEETS

PRELIMINARY SUBJECT TO REVISION



 Wetland Impacts - 0.33 Acres
 Temporary Wetland Impacts - 1.26 Acres



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0 75 150
Feet

AHTD - Environmental GIS - Strawn
June 26, 2017

Job 110642
Beaver Bayou Str. & Apprs.
(Hwy. 85)
Phillips County

Proposed Right of Way
Temporary Construction Easement
Proposed Detour Road
Detour Construction Limits
Wetland

Appendix II

Summary 2002 Charleston SOP for Calculating Required Mitigation Credits

Definitions

Cumulative impact factor, $\sum AA_i$ stands for the sum of the acres of adverse impacts to aquatic areas for the overall project. When computing this factor, round to the nearest tenth decimal place using even number rounding. Thus 0.01 and 0.050 are rounded down to give a value of zero while 0.051 and 0.09 are rounded up to give 0.1 as the value for the cumulative impact factor. The cumulative impact factor for the overall project must be used in each area column on the Required Mitigation Credits Worksheet.

Duration means the length of time adverse impacts will last (in years).

Dominant impact factors include fill, impound, drain, dredge, clear, and shade.

Existing Condition means the degree of disturbance.

Fully functional means the system type is functionally naturally. Examples: pristine wetlands or riverine habitats, wetlands with no effective drainage.

Slightly impaired means site disturbances have occurred but functional recovery could be reversed through natural processes, such as clear-cut wetlands, utility corridors, wetlands with ditches that impair but don't eliminate wetland hydrology.

Impaired means functional recovery from disturbance is unlikely to occur naturally. Bedded pine monoculture, severely fragmented areas, channelized streams. Vegetated ditches are here included.

Very impaired means full recovery would require major restoration effort. Filled areas, drained wetlands.

Location is here defined for the GCMBS in order to increase mitigation ratios for impacts occurring further from the mitigation site.

On site is here defined as impacts occurring in the Black River, Cache River/Bayou DeView, and Lower White River Wetland Planning Areas.

Off site is here defined as impacts occurring in the L'Anguille River, St. Francis, and Big Creek Wetland Planning Areas.

Lost Type categories are based on the suite of functions that they perform.

Type A includes: Riverine systems including headwaters and riparian zones
 Bottomland hardwoods

Type B includes: Seeps and bogs
 Savannahs and flatwoods
 Depressions
 Pocosins and bays

Type C includes: Man-made lakes and ponds
 Vegetated lake littoral
 Impoundments

Other habitat types need to be evaluated and assigned a category ranking. Farmed wetlands and vegetated ditches are here defined as Type C. Scrub-Shrub wetlands are here defined as Type B.

Priority Category means designated areas of aquatic systems that provide functions of recognized importance because of their inherent functions, their position in the landscape, or their rarity.

Primary priority areas provide important contributions to biodiversity or high levels of functions contributing to landscape or human values. Examples include Wild and Scenic Rivers, Heritage or TNC natural areas, national wildlife refuges, old growth communities, etc.

Secondary priority areas include bay forest, high elevation seep, pond cypress pond, upland depression swamp forest, etc.

Tertiary priority areas include cypress-tupelo swamps, bottomland hardwood, pine flatwoods, etc.

Addendum to Charleston Compensatory

Mitigation Method dated September 19, 2002

This supplement should be used within the Little Rock District Corps of Engineers geographic boundary as a regional modification. Page 23 of 73:

Lost Type

Type A

- Swamps (Bald Cypress or Tupelo)
- Fens and Seeps
- Rare and Unique Regional Wetlands (such as fens, seeps, and sand depressions)
- Bottomland hardwood wetlands

Type B

- Swamps (other than Bald Cypress or Tupelo)
- Wet meadows
- Natural pond borders
- Herbaceous and forested depressions

Type C

- Man-made lakes and ponds
- Vegetated lake littoral
- Impoundments
- Shallow cove areas

Page 25 of 73:

Priority Category

Primary Priority

Designated Primary Priority Areas include:

- Wild and Scenic Rivers
- Outstanding Resource Waters
- Essential Fish Habitat
- Waters on the 303(d) list
- Trout waters
- State Heritage Trust Preserves
- National Wildlife Refuges
- Waters officially designated by State or Federal agencies as high priority areas
- Old growth climax communities that have unique habitat structural complexity likely to support rare communities of plants or animals. And the following categories of rare aquatic systems:
- Upland Bog
- Fens
- Sandpond
- Wet prairie
- Piedmont Seepage Forest

- Limestone Sink
- Bald Cypress and Tupelo Gum Swamps

Secondary Priority

- Carolina Bay
- High Elevation Seep
- Bay Forest
- Salt Shrub Thicket
- Bottomland hardwood
- Swale Pocosin
- Pond Cypress Pond
- Seepage Pocosin
- Upland Depression Swamp Forest

Tertiary Priority

- Non-alluvial wetland forest
- Pine flatwoods
- Non-alluvial herbaceous/scrub shrub wetlands
- Waters of the US excluding streams (i.e. ponds)

ADVERSE IMPACT FACTORS FOR WETLANDS AND OTHER WATERS OF THE U.S. EXCLUDING STREAMS

FACTORS	OPTIONS					
Lost Type	Type C 0.2		Type B 2.0		Type A 3.0	
Priority Category	Tertiary 0.5		Secondary 1.5		Primary 2.0	
Existing Condition	Very Impaired 0.1		Impaired 1.0		Slightly Impaired 2.0	
Duration	Seasonal 0.1	0 to 1 0.2	1 to 3 0.5	3 to 5 1.0	5 to 10 1.5	Over 10 2.0
Dominant Impact	Shade 0.2	Clear 1.0	Dredge	Drain 2.0	Impound 2.5	Fill 3.0
Cumulative Impact	$0.05 \times \sum AA_i$					
Location	On Site 0.0			Off Site 3.0		

REQUIRED MITIGATION CREDITS WORKSHEET

Factor	Area 1	Area 2
Lost Type	Type A 3.0	Type A 3.0
Priority Category	Secondary 1.5	Secondary 1.5
Existing Condition	Slightly Impaired 2.0	Slightly Impaired 2.0
Duration	Over 10 2.0	1 to 3 0.5
Dominant Impact	Permanent Fill 3.0	Temporary Fill 3.0
Cumulative Impact	0.1	0.1
Location	Off Site 3.0	Off Site 3.0
Sum of r Factors	R ₁ = 14.6	R ₂ = 13.1
Impacted Area	AA ₁ = 0.33	AA ₂ = 1.26
R x AA=	4.8	16.5

$$\text{Total Required Credits} = \sum (R \times AA) = \underline{\underline{21.3}}$$

The average credit per acre at the Glaise Creek Mitigation Bank is 3.5 (6.1 acres). The equivalent acreage ratio is 3.8:1.