

# ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT

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January 10, 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 BR3714  
Little Bodcau Creek Str. & Apprs. (S)  
Lafayette County

Dear Ms. Edwards:

The Categorical Exclusion and supporting materials for construction of the referenced project are enclosed. The proposed project will replace one bridge over Little Bodcau Creek and two overflow culverts on Lafayette County Road 25 approximately 6 miles north of Lewisville, AR.

Little Bodcau Creek is a perennial stream located in the Gulf Coastal Plain ecoregion. The existing bridge over Little Bodcau Creek (AHTD Bridge Number 21873) is comprised of two steel railroad cars supported by stacked timber abutments. The bridge is 85 feet long and 18 feet wide. The bridge has been deemed structurally deficient and functionally obsolete. The approaches consist of two 9 foot travel lanes with 0.5 foot shoulders. The replacement bridge will consist of a 155 foot long by 30.5 foot wide precast concrete channel beam structure having five 31 foot spans and consist of two 10 foot travel lanes with 4 foot shoulders. Two overflow culverts north of the bridge will be replaced with a 54 inch by 88 inch diameter 57 feet long arched corrugated metal pipe and 2.5 foot diameter by 49-foot corrugated metal pipe. Approximately 4.2 acres of new right of way will be needed to complete the project.

The widening of the approaches and construction of the structures will fill and relocate a 620' segment of an unnamed intermittent tributary on the southeast side of the existing road and permanently fill 0.63 acres of bottomland hardwood wetland. The bridge will be constructed on four concrete trestle piers on pre-stressed concrete piles; two of which are located below the ordinary high water mark (255 ft. msl) The stream will be reconstructed in the new roadside ditch as mitigation (see attached stream and wetland assessment). The Charleston Method was used to calculate 6.74 wetland credits. Wetland credits will be purchased by Lafayette County at either the AHTD owned Red Chute Mitigation Bank or at an approved mitigation bank servicing the area.

No archeological or cultural resource sites are located within or around the construction limits of the project. The SHPO concurrence is attached. No threatened or endangered species will be impacted by the construction of this project.

Job Number BR3714  
Nationwide Permit 23 Cover Letter  
Page 2 of 2

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

Sincerely,



John Fleming  
Division Head  
Environmental Division

JF:JS:BT:ym

Enclosures  
Categorical Exclusion  
Supporting Illustrations  
Proposed Construction Plans

**ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT**

**INTER OFFICE MEMORANDUM**

**December 28, 2016**

**TO:** Master Files

**FROM:** *JF* John Fleming, Division Head, Environmental Division *hPrice*

**SUBJECT:** AHTD Job Number BR3714  
FAP Number BRO-0037(33)  
Little Bodcau Creek Str. & Apprs. (S)  
Bridge Number 21873  
Lafayette 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 project is to replace a substandard bridge over Little Bodcau Creek on County Road 25 in Lafayette County. The total length of the project is approximately 0.29 mile. A project location map is attached.

The existing bridge over Little Bodcau Creek (Bridge Number 21873) is comprised of two steel railroad cars supported by stacked timber abutments. The bridge is 85 feet long and 18.2 feet wide. The bridge has a sufficiency rating of 33.4 and is considered functionally obsolete. The existing bridge approaches consist of two 8.4-foot travel lanes with 0.5-foot shoulders. The existing right of way width is 50 feet.

The new bridge will consist of a 155 foot long by 30.5 foot wide precast concrete channel beam structure having five 31-foot spans. Lafayette County Road 25 will be closed at the site to construct the new structure. The bridge approaches will consist of two 10-foot travel lanes with 4-foot shoulders. Approximately 4.2 acres of new right of way will be needed to complete the project.

Design data for this project is as follows:

Design Year	Average Daily Traffic	Percent Trucks	Design Speed
2016	70	7	40 mph
2036	90	7	40 mph

No endangered or threatened species, environmental justice issues, hazardous waste deposits, prime farmland, relocatees, protected waters, or underground storage tanks are associated with this project. No impacts to cultural resources are anticipated; concurrence from the State Historic Preservation Officer is attached. Even though Lafayette County participates in the Floodplain Insurance Program, there are no maps available for this location. No floodplain permit will be required.

The project will impact 0.63 acre of bottomland hardwood wetlands, 0.1 acre of Little Bodcau Creek, and 620 linear feet of an unnamed tributary. The unnamed tributary will be relocated to the new western roadside ditch and will include a 25-foot riparian buffer to be planted with bottomland hardwood tree species. Compensatory mitigation for unavoidable impacts to wetlands will be provided at the Department's Red Chute Mitigation Bank. A total of 6.74 wetland mitigation credits will be required. Construction of the proposed project should be allowed under the terms of Nationwide Permit 23 as defined in Federal Register 77(34):10184-10290.

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  
Environmental Study Checklist  
Design Sheets

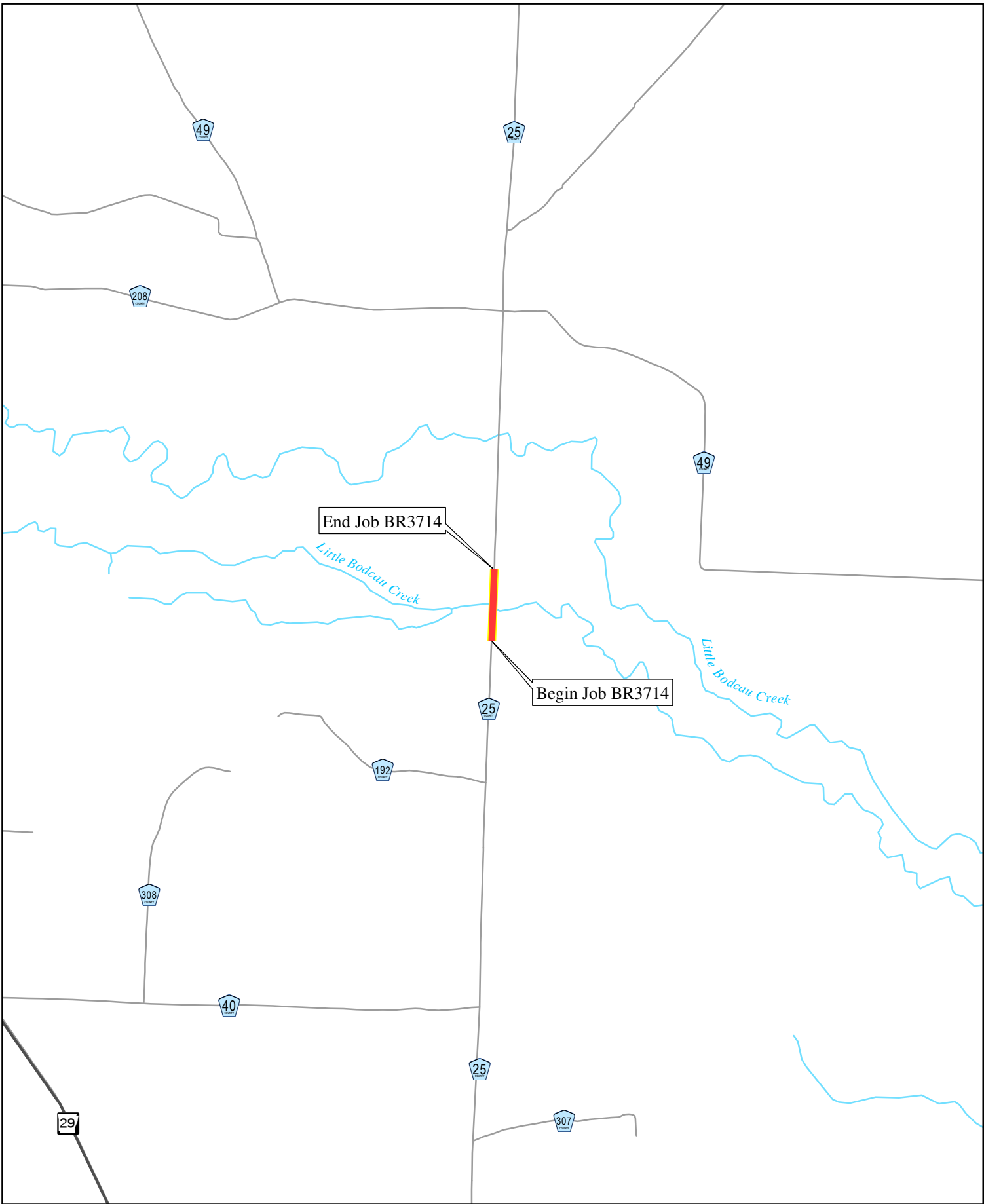
Approved:



Kevin Thornton  
Assistant Chief Engineer-Planning

JF:TT:fc

c: Program Management  
Right of Way  
State Aid  
District 3  
FHWA  
Master File

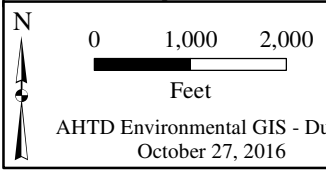


End Job BR3714

Begin Job BR3714

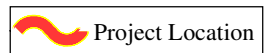
*Little Bodcau Creek*

*Little Bodcau Creek*



AHTD Environmental GIS - Dudley  
October 27, 2016

**Job BR3714**  
**Bodcau Creek Relief Str. & Apprs.**  
**Lafayette County**



ARKANSAS STATE HIGHWAY  
AND  
TRANSPORTATION DEPARTMENT

96706  
FHWA

Scott E. Bennett  
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October 5, 2016

Mr. Robert Scoggin  
Arkansas Historic Preservation Program  
1100 North Street  
Little Rock, AR 72201

RECEIVED  
AHTD

AHPP

OCT 12 2016

OCT 06 2016

ENVIRONMENTAL  
DIVISION

RE: AHTD Job No. BR3714  
Little Bodcaw Creek Str. & Apprs. (S)  
Lafayette County

Dear Mr. Scoggin:

Enclosed for your review is a Project Identification Form regarding the above referenced project. Please provide your effect finding as soon as possible. If you have any questions, contact Richard Jenkins of my staff at 569-2357.

Sincerely,

*brenda lince*  
for John Fleming  
Division Head  
Environmental Division

Enclosure  
PIF

JF:DW:RJ:ym

OCT 06 2016

Date

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

*Frances McSwain*  
Frances McSwain, Deputy State  
Historic Preservation Officer

OCT 06 2016

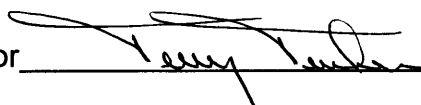
## AHTD ENVIRONMENTAL IMPACTS ASSESSMENT FORM

AHTD Job Number BR3714 FAP Number BRO-0037(33)  
 Job Title Little Bodcau Creek Str. & Apprs. (S)

Environmental Impacts	None	Minor	Significant	Comments
Air Quality	X			
Construction Impacts		X		Temporary during construction
Cultural Resources	X			SHPO clearance 10/6/2016
Economic	X			
Endangered Species	X			
Energy Resources	X			
Environmental Justice/Title VI	X			
Fish and Wildlife		X		Temporary during construction
Floodplains		X		No floodplain permit required
Forest Service Property	X			
Hazardous Materials/Landfills				
Land Use Impacts	X			
Migratory Birds	X			
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		Mitigation required
Water Quality		X		Temporary during construction
Wetlands		X		Mitigation required
Wildlife Refuges	X			

Section 401 Water Quality Certification Required? No  
 Short-term Activity Authorization Required? Yes  
 Section 404 Permit Required? Yes Type Nationwide 23

Remarks: 620 linear feet of stream and 0.63 acre of wetland will be impacted. Stream mitigation will occur onsite and wetland mitigation will be provided at the Department's Red Chute Mitigation Bank.

Signature of Evaluator  Date December 28, 2016

Date Submitted \_\_\_\_\_

Date Returned \_\_\_\_\_

## STATE AID DESIGN REQUEST

Job Number BR3714 FAP Number \_\_\_\_\_ County Lafayette

Job Name Little Bodcaw Creek Str. & Apprs. (S) – Co. Rd. 25, Str. #21873

Design Engineer: Eleanor Goins Environmental Staff: Tucker/Jenkins/Thesing

Brief Project Description: Replacement of a 85 ft. span bridge with a precast concrete bridge that has a total length of 155' – 0", which consists of five sections that are 31' – 0" Precast Concrete Spans.

### A. Existing Conditions:

1. Roadway Width: Metric \_\_\_\_\_ English 17.4 ft.
2. Shoulder Width: Metric \_\_\_\_\_ English 0.5 ft.
3. Number of Lanes and Width: Metric \_\_\_\_\_ English 2 lanes – 8.4 ft.
4. Existing Right-of-Way: Metric \_\_\_\_\_ English \_\_\_\_\_

### B. Proposed Improvements:

1. Roadway Width: Metric \_\_\_\_\_ English 20 ft.
2. Shoulder Width: Metric \_\_\_\_\_ English 4 ft.
3. Number of Lanes and Width: Metric \_\_\_\_\_ English 2 lanes – 10 ft. each
4. Average Right-of-Way: Metric \_\_\_\_\_ English \_\_\_\_\_

If bridge(s) will be replaced by culverts give dimensions: \_\_\_\_\_

### C. Construction Information:

If detour: Where: road will be closed during construction. Length: *English* \_\_\_\_\_

### D. Design Data:

2016 ADT: 70 2036 ADT: 90 Trucks: 7%

Design Speed: 40 m.p.h

E. Approximate total length of project: \_\_\_\_\_ kilometer(s) 0.29 mile(s)

F. Justification for proposed improvements: Fracturing in the R.R. Car Bridge Span.

G. Total Relocates: 0 Residences: \_\_\_\_\_ Businesses: \_\_\_\_\_

H. Have you coordinated with any of the following: (Provide name and date)

County Officials \_\_\_\_\_

State Agency \_\_\_\_\_

Federal Agency \_\_\_\_\_



BRIDGE INFORMATION – PRELIMINARY OR FINAL (Choose One)

Job Number: BR3714 FAP Number: 9970 County: Lafayette  
 Job Name: Little Bodcau Creek Str. & Apprs. (S)  
 Design Engineer: Korey Pough Environmental Staff: \_\_\_\_\_

**A. Description of Existing Bridge:**

1. Bridge Number 21873 over Little Bodcau Creek
2. Location: Rte.: CR 25 Section: \_\_\_\_\_ Log Mile: Milepost 3.88
3. Length: 85 ft Br. Rdwy. Width: 17.4 ft Deck Width (Out-to-Out): 18.2 ft
4. Type Construction: (2) steel railroad cars supported by stacked timber abutments.
5. Deficiencies: Abutment erosion, separation and differential deflection of the rail cars
6. HBRRP Eligibility: Qualif. Code: FO Sufficiency Rating: 33.4
7. Are any Condition Component Ratings at 3 or less? Yes

**B. Proposed Improvements:**

1. Length: 155 ft Br. Rdwy. Width: 28 ft Deck Width (Out-to-Out): 30.5 ft
2. Travel Lanes: (2) – 10.0' Lanes
3. Shoulder Width: 4.0' Shoulders
4. Sidewalks? No Location: \_\_\_\_\_ Width: \_\_\_\_\_ ft

**C. Construction Information:**

1. Location in relation to existing bridge: Same Location
2. Superstructure Type: Precast Concrete Channel Beams
3. Span Lengths: Five at 31 ft
4. Substructure Type: Concrete Trestle Piers on Prestressed Concrete Piles
5. Ordinary High Water Elev. (OHW): 255 No. of Bents inside OHW Contours: 2
6. Concrete Vol. below OHW: No yd<sup>3</sup> Vol. Bent Excavation: \_\_\_\_\_ yd<sup>3</sup> Vol. Backfill \_\_\_\_\_ yd<sup>3</sup>
7. Is Channel Excavation below OHW Required? No Surface Area: \_\_\_\_\_ ft<sup>2</sup> Volume: \_\_\_\_\_ yd<sup>3</sup>
8. Is Fill below OHW Req'd.? No Surface Area: \_\_\_\_\_ ft<sup>2</sup> Volume: \_\_\_\_\_ yd<sup>3</sup>
9. Is Riprap below OHW Required? No Volume: \_\_\_\_\_ yd<sup>3</sup>

**D. Work Road Information:**

1. Is Work Road(s) required? No Location: \_\_\_\_\_ Top Width: \_\_\_\_\_ ft
2. Is Fill below OHW required? No Surface Area: \_\_\_\_\_ ft<sup>2</sup> Volume \_\_\_\_\_ yd<sup>3</sup>
3. Are Pipes required to meet Backwater Criteria? No Waterway Opening: \_\_\_\_\_ ft<sup>2</sup>

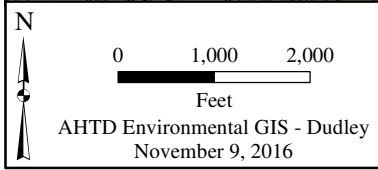
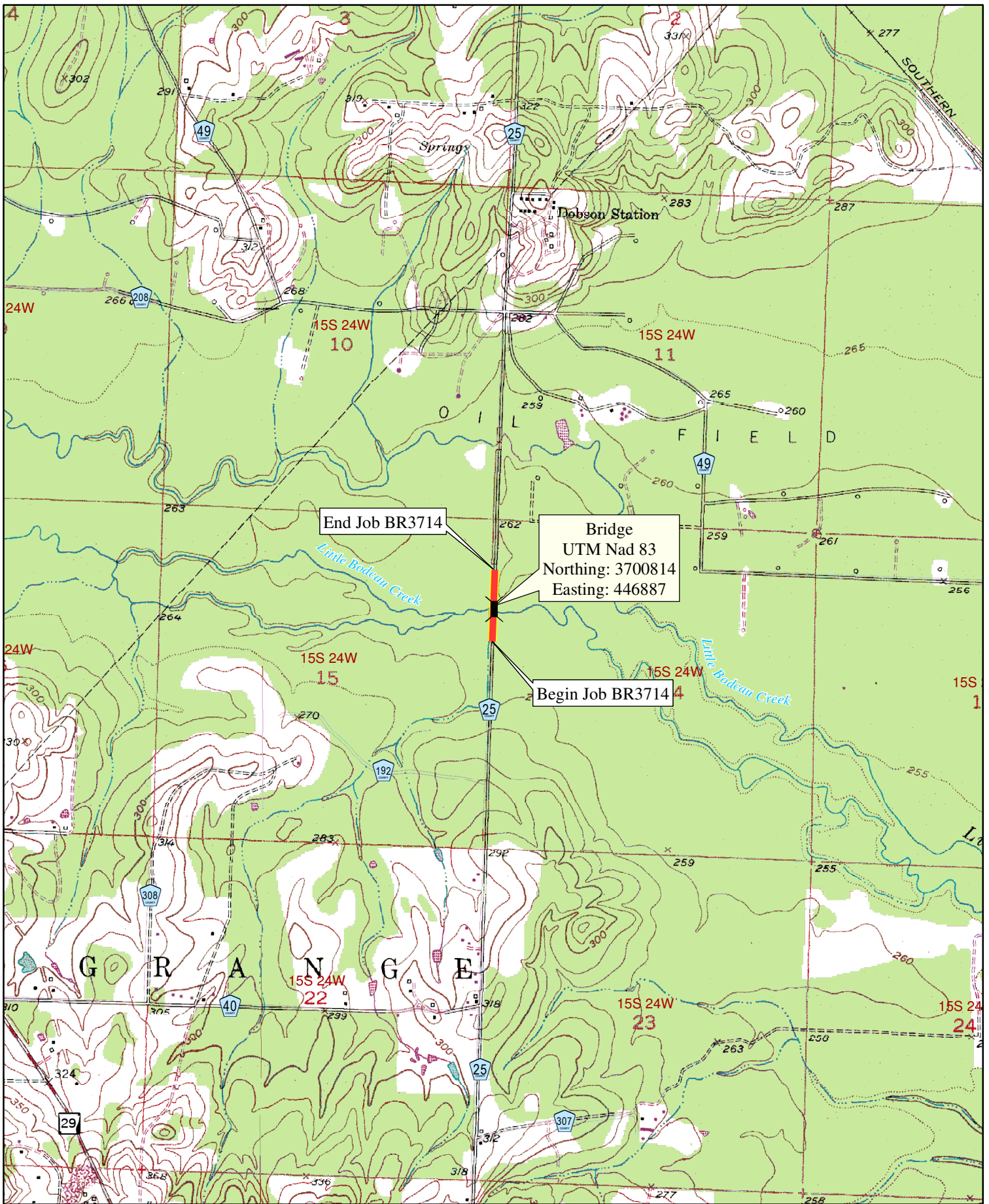
**E. Detour Information:**

1. Is a detour bridge required? No Location in relation to Existing Br.: \_\_\_\_\_
2. Length: \_\_\_\_\_ ft Br. Rdwy. Width: \_\_\_\_\_ ft Deck Elevation: \_\_\_\_\_
3. Volume of Fill below OHW: \_\_\_\_\_ yd<sup>3</sup> Surface Area: \_\_\_\_\_ ft<sup>2</sup>

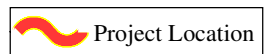
**F. Coordination with Outside Agencies (e.g., FHWA, City, County, C of E, USCG):**

Has Bridge Division coordinated with any outside agencies? \_\_\_\_\_

Agency	Person Contacted	Date
Lafayette County	Judge Mike Rowe	9/6/16 (Letter)



**Job BR3714**  
**Little Bodewick Creek Str. & Apprs.**  
**Lafayette County**



USGS Topographic Map:  
 Old Town 1978

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WETLANDS AND STREAM ASSESSMENT  
PURSUANT TO SECTION 404  
AHTD JOB NUMBER BR3714  
LITTLE BODCAW CREEK STR. & APPRS. (S)  
LAFAYETTE COUNTY



BEN THESING

ENVIRONMENTAL DIVISION  
ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT

DECEMBER 29, 2016

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### **Overview**

This analysis finds that there are no practicable alternatives to construction in the wetlands and waters of the United States adjacent to County Road 25 in Lafayette County, Arkansas. This finding is in accordance with Executive Orders 11990 on Protection of Wetlands and 11988 on Floodplain Management.

### **Project Description**

The proposed project is located in Section 15; Township 15 South; Range 24 West in Lafayette County (refer to the attached Categorical Exclusion). The proposed project will widen the existing road approaches to replace the bridge over Little Bodcau Creek and two associated overflow culverts on County Road 25 approximately 5 miles north of Lewisville, AR (Figure 1).

### **Project Area**

The project is located in the Tertiary Uplands of the South Central Plains Ecoregions of Arkansas (Woods, et. al., 2004). The project is comprised mostly of bottom land hardwood riparian surrounded by recently cleared and replanted pine plantation.



Figure 1. Topographical Map

## **Description of Wetlands and Streams**

**Wetland 1** is a bottomland hardwood wetland located on the east side of Lafayette County Road 25 (Figure 2). The wetland is dominated with water oak (*Quercus nigra*), overcup oak (*Quercus lyrata*), American hornbeam (*Carpinus caroliniana*), and erect dayflower (*Commelina erecta*). Soils in this wetland are listed as Guyton Silt Loam, which are considered hydric (Hoelsher, 1987). The matrix of the soils in this wetland at 0-4 inches have a color of 10YR 5/2 (60%) and 10Y/R 4/3 (40%); 4-8 inches matrix of 10Y/R 6/2 (70%) with redox features of 10Y/R 5/8 (20%) and 10Y/R 4/6 (10%); and 8-12 inches matrix of 10Y/R 6/2 (75%) with redox features of 7.5Y/R 4/6 (20%) and 5Y/R 4/6 (5%). Hydrology was determined by using the primary indicators of water marks, sediment deposits, and presence of reduced iron.

**Wetland 2** is a bottomland hardwood wetland located on the west side of County Road 25 (Figure 3). Wetland 2 is dominated by overcup oak, bald cypress (*Taxodium distichum*), and redvine (*Brunnichia ovata*). Soils in this wetland are listed as Guyton Silt Loam, which are considered hydric (Hoelsher, 1987). The matrix of the soils in this wetland at 0-2 inches have a color of 7.5YR 3/1 (100%); 2-9 inches matrix of 10Y/R 3/2 (98%) with redox features of 10Y/R 3/6 (2%); and 9-12 inches matrix of 10Y/R 6/2 (78%) with redox features of 10Y/R 5/8 (20%) and 10Y/R 4/6 (2%). Hydrology was determined by using the primary indicators of water marks, sediment deposits, high water table, and presence of reduced iron.

**Stream 1** is the main stem of Little Bodcau Creek flowing west to east at the bridge crossing (Figure 4). Little Bodcau Creek is tributary to Bodcau Creek within the Red River Basin (HUC 11140205). Streams within this watershed are characterized by braided channels and gravel/sand substrate bottoms.

**Stream 2** is an intermittent tributary to Little Bodcau Creek flowing generally from the southwest to northeast until being confined along the current roadside ditch (Figure 5). The channelized stream flows for 620 within the project limits. It is relatively incised and degraded with an abundance of sediment likely due to silviculture in the area and road maintenance practices. On average the channel is 5 feet wide with an ordinary high water mark averaging 6 inches from the stream bottom.





**Figure 2. Bottomland Hardwood Wetlands East of Co. Rd. 25 (Wetland 1)**



**Figure 3. Bottomland Hardwood Wetlands West of Co. Rd. 25 (Wetland 2)**



**Figure 4. Little Bodcau Creek at bridge crossing (Stream 1)**



**Figure 5. Unnamed Intermittent tributary along roadside (Stream 2)**

### **Impacts to Wetlands and Waters of the United States**

Wetland impacts include permanently filling 0.63 acres of bottomland hardwood wetlands for the construction of the new roadway embankment. The 2010 Charleston Method was used to calculate 6.74 wetland credits required for impacts. Wetland credits will be purchased by Lafayette County at either the AHTD owned Red Chute Mitigation Bank or at an approved mitigation bank servicing the area.

Impacts to streams include the replacement of the existing bridge over Little Bodcau Creek and two associated overflow culverts. Two overflow culverts replaced with one 54 inch by 88 inch diameter 57 feet long arched corrugated metal pipe and one 2.5 foot diameter by 49-foot corrugated metal pipe. The bridge will be replaced on existing location with a 155 foot long by 30 foot wide precast concrete channel beam structure having five 31-foot spans sitting on four concrete trestle piers on pre-stressed concrete piles. Two piles will be located below the ordinary high water mark (255 ft. msl). Impacts from the bridge and culvert construction will result in impacts of less than 0.1 acre. Widening of the southwestern approaches will fill a 620 foot section of Stream 2. The unnamed intermittent tributary will be reconstructed in the new roadside ditch. Approximately 172 yards of fill material will be placed in the original channel during relocation. During reconstruction, a 25 foot riparian buffer will also be planted with bottomland hardwood tree species. Channel reconstruction and riparian enhancement will fulfill all stream mitigation requirements.

Water quality will be temporarily impacted during construction due to increases in turbidity and sedimentation. Best management practices will be used to control water pollution and minimize negative impacts to wetlands due to construction runoff. Water quality will not be permanently impacted by construction of this project.

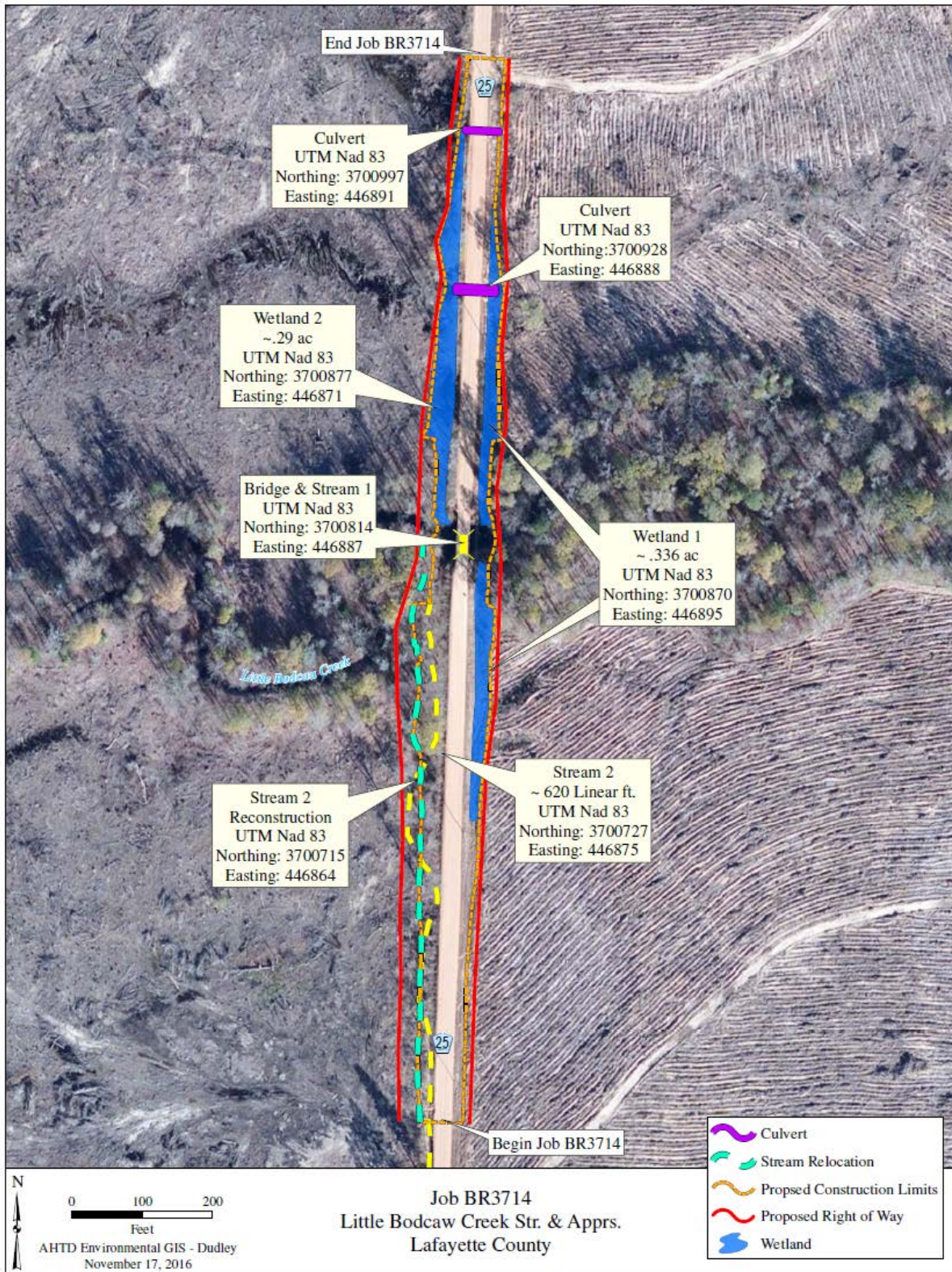


Figure 7. Aerial Photo

### **Mitigation**

Unavoidable wetland impacts resulting from this project will be the financial responsibility of Lafayette County. Mitigation will occur either at the AHTD owned Red Chute mitigation bank or at an approved mitigation bank servicing this project location. The AHTD proposes the use of 6.74 wetland credits to mitigate the 0.63 acres of wetland impacts.

Mitigation for the 620 foot portion of the unnamed tributary will occur on site. A new channel will be created with an average width of five feet and depth of one foot at the west edge of the construction limits. Cross sections and stream location can be found in the appendix. A 25 foot right of way will be acquired and retained by the county for a riparian buffer protection directly adjacent to the west edge of the new channel. Barbed wire fencing and posted signage will be erected at western edge of this right of way to prevent silviculture activities from encroaching on the channel. Bottomland hardwood bare root tree seedlings, appropriate to the area, will be planted within this riparian buffer.

Lafayette County will retain ownership and be responsible for all maintenance requirements of the newly constructed channel and riparian buffer.

### **Conclusion**

There are no practical alternatives to permanently impacting 0.63 acres of wetlands and 620 linear foot relocation of the waters of the United States during construction of this project. All practical measures to minimize harm have been included. Construction of the proposed project should be allowed under the terms of a Nationwide 23 Permit for Categorical Exclusions.

### **Literature Cited**

Hoelsher, James E.

1987 *Soil Survey of Lafayette Counties, Arkansas*. Soil Conservation Service and Arkansas Experiment Station. Published by U.S. Government Printing Office, Washington, D.C.

Woods, A.J., et al.

2004 *Ecoregions of Arkansas* (color poster with map, descriptive text, summary tables and photographs). Reston, Virginia. U.S. Geological Survey.

**Required Wetland Mitigation Credits Worksheet**

<b>Factor</b>	<b>Cleared Forested Wetland</b>
Lost Type	<b>3</b>
Priority Category	<b>0.5</b>
Existing Condition	<b>2.0</b>
Duration	<b>2.0</b>
Dominant Impact	<b>3.0</b>
Cumulative Impact	<b>0.2</b>
Sum of r Factors	$R_2=10.7$
Impacted Area	$AA_2=0.63$
R x AA=	6.74

$$\text{TOTAL REQUIRED CREDITS} = \sum (R \times AA) = 6.74$$

## WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: \_\_\_\_\_ City/County: \_\_\_\_\_ Sampling Date: \_\_\_\_\_  
 Applicant/Owner: \_\_\_\_\_ State: \_\_\_\_\_ Sampling Point: \_\_\_\_\_  
 Investigator(s): \_\_\_\_\_ Section, Township, Range: \_\_\_\_\_  
 Landform (hillslope, terrace, etc.): \_\_\_\_\_ Local relief (concave, convex, none): \_\_\_\_\_ Slope (%): \_\_\_\_\_  
 Subregion (LRR or MLRA): \_\_\_\_\_ Lat: \_\_\_\_\_ Long: \_\_\_\_\_ Datum: \_\_\_\_\_  
 Soil Map Unit Name: \_\_\_\_\_ NWI classification: \_\_\_\_\_

Are climatic / hydrologic conditions on the site typical for this time of year? Yes \_\_\_\_\_ No \_\_\_\_\_ (If no, explain in Remarks.)  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes \_\_\_\_\_ No \_\_\_\_\_  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ 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 _____ No _____ Hydric Soil Present? Yes _____ No _____ Wetland Hydrology Present? Yes _____ No _____	<b>Is the Sampled Area within a Wetland?</b> Yes _____ No _____
Remarks:	

### HYDROLOGY

<b>Wetland Hydrology Indicators:</b> <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1)                      ___ Aquatic Fauna (B13) ___ High Water Table (A2)                      ___ Marl Deposits (B15) <b>(LRR U)</b> ___ Saturation (A3)                                  ___ Hydrogen Sulfide Odor (C1) ___ Water Marks (B1)                              ___ Oxidized Rhizospheres along Living Roots (C3) ___ Sediment Deposits (B2)                      ___ Presence of Reduced Iron (C4) ___ Drift Deposits (B3)                            ___ Recent Iron Reduction in Tilled Soils (C6) ___ Algal Mat or Crust (B4)                        ___ Thin Muck Surface (C7) ___ Iron Deposits (B5)                              ___ Other (Explain in Remarks) ___ Inundation Visible on Aerial Imagery (B7) ___ Water-Stained Leaves (B9)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Sparsely Vegetated Concave Surface (B8) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ FAC-Neutral Test (D5) ___ Sphagnum moss (D8) <b>(LRR T, U)</b>
<b>Field Observations:</b> Surface Water Present? Yes _____ No _____ Depth (inches): _____ Water Table Present? Yes _____ No _____ Depth (inches): _____ Saturation Present? Yes _____ No _____ Depth (inches): _____ (includes capillary fringe)	<b>Wetland Hydrology Present? Yes _____ No _____</b>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks:	

**VEGETATION (Four Strata) – Use scientific names of plants.**

Sampling Point: \_\_\_\_\_

	Absolute % Cover	Dominant Species?	Indicator Status	
<b>Tree Stratum</b> (Plot size: _____ )				
1.	_____	_____	_____	
2.	_____	_____	_____	
3.	_____	_____	_____	
4.	_____	_____	_____	
5.	_____	_____	_____	
6.	_____	_____	_____	
7.	_____	_____	_____	
8.	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
<b>Sapling/Shrub Stratum</b> (Plot size: _____ )				
1.	_____	_____	_____	
2.	_____	_____	_____	
3.	_____	_____	_____	
4.	_____	_____	_____	
5.	_____	_____	_____	
6.	_____	_____	_____	
7.	_____	_____	_____	
8.	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
<b>Herb Stratum</b> (Plot size: _____ )				
1.	_____	_____	_____	
2.	_____	_____	_____	
3.	_____	_____	_____	
4.	_____	_____	_____	
5.	_____	_____	_____	
6.	_____	_____	_____	
7.	_____	_____	_____	
8.	_____	_____	_____	
9.	_____	_____	_____	
10.	_____	_____	_____	
11.	_____	_____	_____	
12.	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
<b>Woody Vine Stratum</b> (Plot size: _____ )				
1.	_____	_____	_____	
2.	_____	_____	_____	
3.	_____	_____	_____	
4.	_____	_____	_____	
5.	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
<b>Dominance Test worksheet:</b>				
Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)				
Total Number of Dominant Species Across All Strata: _____ (B)				
Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)				
<b>Prevalence Index worksheet:</b>				
Total % Cover of:		Multiply by:		
OBL species	_____	x 1 =	_____	
FACW species	_____	x 2 =	_____	
FAC species	_____	x 3 =	_____	
FACU species	_____	x 4 =	_____	
UPL species	_____	x 5 =	_____	
Column Totals:	_____ (A)	_____ (B)		
Prevalence Index = B/A = _____				
<b>Hydrophytic Vegetation Indicators:</b>				
___ 1 - Rapid Test for Hydrophytic Vegetation				
___ 2 - Dominance Test is >50%				
___ 3 - Prevalence Index is ≤3.0 <sup>1</sup>				
___ Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)				
<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.				
<b>Definitions of Four Vegetation Strata:</b>				
<b>Tree</b> – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.				
<b>Sapling/Shrub</b> – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.				
<b>Herb</b> – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.				
<b>Woody vine</b> – All woody vines greater than 3.28 ft in height.				
<b>Hydrophytic Vegetation Present?</b> Yes _____ No _____				
Remarks: (If observed, list morphological adaptations below).				



**SOIL**

Sampling Point: \_\_\_\_\_

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Organic Bodies (A6) **(LRR P, T, U)**
- 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- Muck Presence (A8) **(LRR U)**
- 1 cm Muck (A9) **(LRR P, T)**
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Coast Prairie Redox (A16) **(MLRA 150A)**
- Sandy Mucky Mineral (S1) **(LRR O, S)**
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) **(LRR P, S, T, U)**

- Polyvalue Below Surface (S8) **(LRR S, T, U)**
- Thin Dark Surface (S9) **(LRR S, T, U)**
- Loamy Mucky Mineral (F1) **(LRR O)**
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)
- Marl (F10) **(LRR U)**
- Depleted Ochric (F11) **(MLRA 151)**
- Iron-Manganese Masses (F12) **(LRR O, P, T)**
- Umbric Surface (F13) **(LRR P, T, U)**
- Delta Ochric (F17) **(MLRA 151)**
- Reduced Vertic (F18) **(MLRA 150A, 150B)**
- Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

**Indicators for Problematic Hydric Soils<sup>3</sup>:**

- 1 cm Muck (A9) **(LRR O)**
- 2 cm Muck (A10) **(LRR S)**
- Reduced Vertic (F18) **(outside MLRA 150A,B)**
- Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- Red Parent Material (TF2)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: \_\_\_\_\_

Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes \_\_\_\_\_ No \_\_\_\_\_

Remarks:

## WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: \_\_\_\_\_ City/County: \_\_\_\_\_ Sampling Date: \_\_\_\_\_  
 Applicant/Owner: \_\_\_\_\_ State: \_\_\_\_\_ Sampling Point: \_\_\_\_\_  
 Investigator(s): \_\_\_\_\_ Section, Township, Range: \_\_\_\_\_  
 Landform (hillslope, terrace, etc.): \_\_\_\_\_ Local relief (concave, convex, none): \_\_\_\_\_ Slope (%): \_\_\_\_\_  
 Subregion (LRR or MLRA): \_\_\_\_\_ Lat: \_\_\_\_\_ Long: \_\_\_\_\_ Datum: \_\_\_\_\_  
 Soil Map Unit Name: \_\_\_\_\_ NWI classification: \_\_\_\_\_

Are climatic / hydrologic conditions on the site typical for this time of year? Yes \_\_\_\_\_ No \_\_\_\_\_ (If no, explain in Remarks.)  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes \_\_\_\_\_ No \_\_\_\_\_  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ 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 _____ No _____ Hydric Soil Present? Yes _____ No _____ Wetland Hydrology Present? Yes _____ No _____	<b>Is the Sampled Area within a Wetland?</b> Yes _____ No _____
Remarks:	

### HYDROLOGY

<b>Wetland Hydrology Indicators:</b> <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1)                      ___ Aquatic Fauna (B13) ___ High Water Table (A2)                      ___ Marl Deposits (B15) <b>(LRR U)</b> ___ Saturation (A3)                                  ___ Hydrogen Sulfide Odor (C1) ___ Water Marks (B1)                              ___ Oxidized Rhizospheres along Living Roots (C3) ___ Sediment Deposits (B2)                      ___ Presence of Reduced Iron (C4) ___ Drift Deposits (B3)                              ___ Recent Iron Reduction in Tilled Soils (C6) ___ Algal Mat or Crust (B4)                              ___ Thin Muck Surface (C7) ___ Iron Deposits (B5)                              ___ Other (Explain in Remarks) ___ Inundation Visible on Aerial Imagery (B7) ___ Water-Stained Leaves (B9)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Sparsely Vegetated Concave Surface (B8) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ FAC-Neutral Test (D5) ___ Sphagnum moss (D8) <b>(LRR T, U)</b>
<b>Field Observations:</b> Surface Water Present? Yes _____ No _____ Depth (inches): _____ Water Table Present? Yes _____ No _____ Depth (inches): _____ Saturation Present? Yes _____ No _____ Depth (inches): _____ (includes capillary fringe)	<b>Wetland Hydrology Present? Yes _____ No _____</b>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks:	

**VEGETATION (Four Strata) – Use scientific names of plants.**

Sampling Point: \_\_\_\_\_

	Absolute % Cover	Dominant Species?	Indicator Status			
<u>Tree Stratum</u> (Plot size: _____ )				<b>Dominance Test worksheet:</b>		
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)		
2. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata: _____ (B)		
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)		
4. _____	_____	_____	_____	<b>Prevalence Index worksheet:</b>		
5. _____	_____	_____	_____		_____ Total % Cover of: _____ Multiply by: _____	
6. _____	_____	_____	_____		OBL species _____ x 1 = _____	
7. _____	_____	_____	_____		FACW species _____ x 2 = _____	
8. _____	_____	_____	_____	FAC species _____ x 3 = _____		
	_____ = Total Cover			FACU species _____ x 4 = _____		
50% of total cover: _____		20% of total cover: _____		UPL species _____ x 5 = _____		
<u>Sapling/Shrub Stratum</u> (Plot size: _____ )				Column Totals: _____ (A) _____ (B)		
1. _____	_____	_____	_____	Prevalence Index = B/A = _____		
2. _____	_____	_____	_____	<b>Hydrophytic Vegetation Indicators:</b>		
3. _____	_____	_____	_____		___ 1 - Rapid Test for Hydrophytic Vegetation	
4. _____	_____	_____	_____		___ 2 - Dominance Test is >50%	
5. _____	_____	_____	_____		___ 3 - Prevalence Index is ≤3.0 <sup>1</sup>	
6. _____	_____	_____	_____	___ Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)		
7. _____	_____	_____	_____	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.		
8. _____	_____	_____	_____		<b>Definitions of Four Vegetation Strata:</b>	
9. _____	_____	_____	_____			<b>Tree</b> – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.
10. _____	_____	_____	_____			<b>Sapling/Shrub</b> – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.
11. _____	_____	_____	_____	<b>Herb</b> – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.		
12. _____	_____	_____	_____	<b>Woody vine</b> – All woody vines greater than 3.28 ft in height.		
	_____ = Total Cover			<b>Hydrophytic Vegetation Present?</b> Yes _____ No _____		
50% of total cover: _____		20% of total cover: _____				
<u>Woody Vine Stratum</u> (Plot size: _____ )						
1. _____	_____	_____	_____			
2. _____	_____	_____	_____			
3. _____	_____	_____	_____			
4. _____	_____	_____	_____			
5. _____	_____	_____	_____			
	_____ = Total Cover					
50% of total cover: _____		20% of total cover: _____				
Remarks: (If observed, list morphological adaptations below).						

**SOIL**

Sampling Point: \_\_\_\_\_

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Organic Bodies (A6) **(LRR P, T, U)**
- 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- Muck Presence (A8) **(LRR U)**
- 1 cm Muck (A9) **(LRR P, T)**
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Coast Prairie Redox (A16) **(MLRA 150A)**
- Sandy Mucky Mineral (S1) **(LRR O, S)**
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) **(LRR P, S, T, U)**

- Polyvalue Below Surface (S8) **(LRR S, T, U)**
- Thin Dark Surface (S9) **(LRR S, T, U)**
- Loamy Mucky Mineral (F1) **(LRR O)**
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)
- Marl (F10) **(LRR U)**
- Depleted Ochric (F11) **(MLRA 151)**
- Iron-Manganese Masses (F12) **(LRR O, P, T)**
- Umbric Surface (F13) **(LRR P, T, U)**
- Delta Ochric (F17) **(MLRA 151)**
- Reduced Vertic (F18) **(MLRA 150A, 150B)**
- Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

**Indicators for Problematic Hydric Soils<sup>3</sup>:**

- 1 cm Muck (A9) **(LRR O)**
- 2 cm Muck (A10) **(LRR S)**
- Reduced Vertic (F18) **(outside MLRA 150A,B)**
- Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- Red Parent Material (TF2)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: \_\_\_\_\_

Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes \_\_\_\_\_ No \_\_\_\_\_

Remarks:

## WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: \_\_\_\_\_ City/County: \_\_\_\_\_ Sampling Date: \_\_\_\_\_  
 Applicant/Owner: \_\_\_\_\_ State: \_\_\_\_\_ Sampling Point: \_\_\_\_\_  
 Investigator(s): \_\_\_\_\_ Section, Township, Range: \_\_\_\_\_  
 Landform (hillslope, terrace, etc.): \_\_\_\_\_ Local relief (concave, convex, none): \_\_\_\_\_ Slope (%): \_\_\_\_\_  
 Subregion (LRR or MLRA): \_\_\_\_\_ Lat: \_\_\_\_\_ Long: \_\_\_\_\_ Datum: \_\_\_\_\_  
 Soil Map Unit Name: \_\_\_\_\_ NWI classification: \_\_\_\_\_

Are climatic / hydrologic conditions on the site typical for this time of year? Yes \_\_\_\_\_ No \_\_\_\_\_ (If no, explain in Remarks.)  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes \_\_\_\_\_ No \_\_\_\_\_  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ 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 _____ No _____ Hydric Soil Present? Yes _____ No _____ Wetland Hydrology Present? Yes _____ No _____	<b>Is the Sampled Area within a Wetland?</b> Yes _____ No _____
Remarks:	

### HYDROLOGY

<b>Wetland Hydrology Indicators:</b> <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1)                      ___ Aquatic Fauna (B13) ___ High Water Table (A2)                      ___ Marl Deposits (B15) <b>(LRR U)</b> ___ Saturation (A3)                                  ___ Hydrogen Sulfide Odor (C1) ___ Water Marks (B1)                              ___ Oxidized Rhizospheres along Living Roots (C3) ___ Sediment Deposits (B2)                      ___ Presence of Reduced Iron (C4) ___ Drift Deposits (B3)                              ___ Recent Iron Reduction in Tilled Soils (C6) ___ Algal Mat or Crust (B4)                              ___ Thin Muck Surface (C7) ___ Iron Deposits (B5)                              ___ Other (Explain in Remarks) ___ Inundation Visible on Aerial Imagery (B7) ___ Water-Stained Leaves (B9)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Sparsely Vegetated Concave Surface (B8) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ FAC-Neutral Test (D5) ___ Sphagnum moss (D8) <b>(LRR T, U)</b>
<b>Field Observations:</b> Surface Water Present? Yes _____ No _____ Depth (inches): _____ Water Table Present? Yes _____ No _____ Depth (inches): _____ Saturation Present? Yes _____ No _____ Depth (inches): _____ (includes capillary fringe)	<b>Wetland Hydrology Present? Yes _____ No _____</b>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks:	

**VEGETATION (Four Strata) – Use scientific names of plants.**

Sampling Point: \_\_\_\_\_

	Absolute % Cover	Dominant Species?	Indicator Status	
<b>Tree Stratum</b> (Plot size: _____ )				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____				20% of total cover: _____
<b>Sapling/Shrub Stratum</b> (Plot size: _____ )				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____				20% of total cover: _____
<b>Herb Stratum</b> (Plot size: _____ )				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
12. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____				20% of total cover: _____
<b>Woody Vine Stratum</b> (Plot size: _____ )				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____				20% of total cover: _____
<p><b>Dominance Test worksheet:</b></p> <p>Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)</p> <p>Total Number of Dominant Species Across All Strata: _____ (B)</p> <p>Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)</p> <hr/> <p><b>Prevalence Index worksheet:</b></p> <p>Total % Cover of: _____ Multiply by: _____</p> <p>OBL species _____ x 1 = _____</p> <p>FACW species _____ x 2 = _____</p> <p>FAC species _____ x 3 = _____</p> <p>FACU species _____ x 4 = _____</p> <p>UPL species _____ x 5 = _____</p> <p>Column Totals: _____ (A) _____ (B)</p> <p>Prevalence Index = B/A = _____</p> <hr/> <p><b>Hydrophytic Vegetation Indicators:</b></p> <p>___ 1 - Rapid Test for Hydrophytic Vegetation</p> <p>___ 2 - Dominance Test is &gt;50%</p> <p>___ 3 - Prevalence Index is ≤3.0<sup>1</sup></p> <p>___ Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)</p> <p><sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.</p> <hr/> <p><b>Definitions of Four Vegetation Strata:</b></p> <p><b>Tree</b> – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.</p> <p><b>Sapling/Shrub</b> – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.</p> <p><b>Herb</b> – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.</p> <p><b>Woody vine</b> – All woody vines greater than 3.28 ft in height.</p> <hr/> <p><b>Hydrophytic Vegetation Present?</b> Yes _____ No _____</p>				
Remarks: (If observed, list morphological adaptations below).				

**SOIL**

Sampling Point: \_\_\_\_\_

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Organic Bodies (A6) **(LRR P, T, U)**
- 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- Muck Presence (A8) **(LRR U)**
- 1 cm Muck (A9) **(LRR P, T)**
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Coast Prairie Redox (A16) **(MLRA 150A)**
- Sandy Mucky Mineral (S1) **(LRR O, S)**
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) **(LRR P, S, T, U)**

- Polyvalue Below Surface (S8) **(LRR S, T, U)**
- Thin Dark Surface (S9) **(LRR S, T, U)**
- Loamy Mucky Mineral (F1) **(LRR O)**
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)
- Marl (F10) **(LRR U)**
- Depleted Ochric (F11) **(MLRA 151)**
- Iron-Manganese Masses (F12) **(LRR O, P, T)**
- Umbric Surface (F13) **(LRR P, T, U)**
- Delta Ochric (F17) **(MLRA 151)**
- Reduced Vertic (F18) **(MLRA 150A, 150B)**
- Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

**Indicators for Problematic Hydric Soils<sup>3</sup>:**

- 1 cm Muck (A9) **(LRR O)**
- 2 cm Muck (A10) **(LRR S)**
- Reduced Vertic (F18) **(outside MLRA 150A,B)**
- Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- Red Parent Material (TF2)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

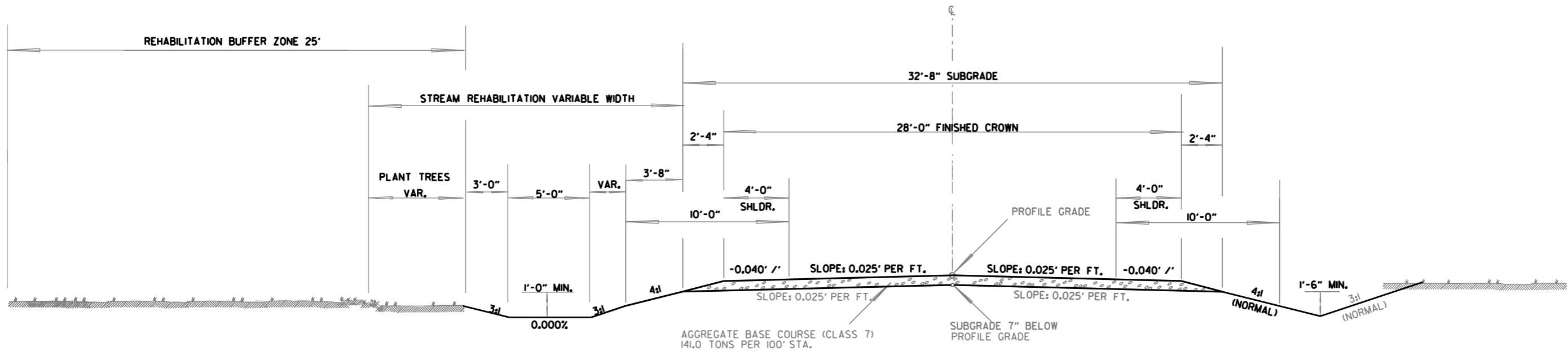
Type: \_\_\_\_\_

Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes \_\_\_\_\_ No \_\_\_\_\_

Remarks:

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
2/05/2016				6	ARK.			
						JOB NO.	BR3714	0
						4 TYPICAL SECTION OF IMPROVEMENT		



## STREAM REHABILITATION SECTION OF IMPROVEMENT

### STATIONS 97+02.00 - 103+53.00

NOTE: REFER TO CROSS SECTIONS FOR DEVIATION FROM THE NORMAL SLOPES. NO CHANGES SHALL BE MADE FROM THE PLANNED SLOPES WITHOUT THE APPROVAL OF THE ENGINEER.

NOTE: THE THICKNESS OF AGGREGATE BASE COURSE SHALL BE WITHIN PLUS OR MINUS 1" OF PLAN THICKNESS SHOWN. THE CONTRACTOR WILL CORRECT ANY DEFICIENT THICKNESS THAT DOES NOT MEET TOLERANCE INDICATED. PAYMENT WILL NOT BE MADE FOR MATERIAL PLACED IN EXCESS OF THE TOLERANCE INDICATED.

NOTE: THE ABOVE DETAILS MAY BE MODIFIED TO MEET LOCAL CONDITIONS AS DIRECTED BY THE ENGINEER.

TYPICAL SECTION OF IMPROVEMENT





For R/W Data, See Rdwy. Plans.

Place Type D Approach Gutters ("w" = 4'-0") at both ends of bridge. See Dwg. No. 58869.

DATE REVISED	DATE FILED	DATE REVISED	DATE FILED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		BR3714		
				DRAWING NO.		04938 - LAYOUT		58867

GENERAL NOTES

BENCH MARK: AHTD Pt. No. 3, 5/8" rebar with 2" cap, 9J5 Rt. of Sta. 106+17.21, Elev. = 262.26.

CONSTRUCTION SPECIFICATIONS: Arkansas State Highway and Transportation Department Standard Specifications for Highway Construction (2014 Edition) with applicable supplemental specifications and special provisions. Section and Subsection refer to the Standard Construction Specifications unless otherwise noted in the plans.

DESIGN SPECIFICATIONS: AASHTO LRFD Bridge Design Specifications (Seventh Edition, 2014) with 2015 & 2016 Interims.

LIVE LOADING: HL93 SEISMIC PERFORMANCE ZONE: I

MATERIALS AND STRENGTHS  
 Class (S/AE) Concrete (superstructure) f'c = 4,000 psi  
 Class 5 Concrete (substructure) f'c = 3,500 psi  
 Reinforcing Steel (Gr. 60, AASHTO M31 or M22, Type A) fy = 60,000 psi

BORING LOGS: Boring logs may be obtained from the Construction Contract Procurement Section of the Program Management Division.

CONCRETE PILING: All piling shall be 18" square prestressed concrete and shall be driven with an approved air, steam or diesel hammer to an ultimate bearing capacity of 198 tons per pile. Piling in end bents shall be driven before the embankment is in place. Length of piling shown are for estimating quantities only. Actual lengths to be determined in the field. Drive one 50' test pile in Bent 1, one 50' test pile in Bent 4, and one 50' test pile in Bent 6.

DRIVING SYSTEM: The driving system approval and the ultimate bearing capacity determination for piling shall be based on the requirements of Section 805.09(b), "Method B-Wave Equation Analysis (WEAP)". It is estimated that the minimum rated hammer energy required to obtain the ultimate bearing capacity for all piles will be 40,200 foot pounds per blow.

CLASS I PROTECTIVE SURFACE TREATMENT: Class I Protective Surface Treatment shall be applied to the roadway surface and to the face and top of the concrete parapet rail.

DETAIL DRAWINGS:  
 Pile Bents 58868  
 31'-0" Precast Concrete Spans 55082 & 55083  
 Concrete Piling 55022  
 Type D Approach Gutters 58869

EXISTING BRIDGE: Existing Br. No. 21873 (Mile Post 3.88) is 18.2' wide and 85.0' long and consists of two steel railroad cars supported by stacked timber abutments. The existing bridge is at the same location of the proposed bridge.

REMOVAL AND SALVAGE: Existing Br. No. 21873 shall be removed in accordance with Section 205. In addition, the Contractor shall remove the remnants of timber piling and bents from previous structures as directed by the Engineer. All the material, as well as all material from the existing bridge shall become the property of the Contractor.

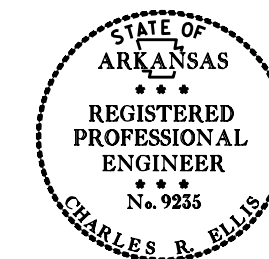
MAINTENANCE OF TRAFFIC: The road will be closed during construction.

HYDRAULIC DATA

FLOOD DESCRIPTION	FREQUENCY YEARS	① TOTAL DISCHARGE	DISCHARGE AT THIS SITE	② NATURAL WATER SURFACE ELEVATION	WATER SURFACE ELEVATION WITH BACKWATER
		CFS	CFS	FEET	FEET
Design ③	2	2,910	1,859	258.9	260.0
Base	100	14,630	12,619	261.5	261.9
Extreme	500	20,260	17,037	262.3	262.4

- ① Total discharge through this bridge and culverts approx. 2500 ft. north over Little Bodcau Creek Relief.
- ② Unconstricted water surface without structure or roadway approaches.
- ③ Design Flood based on overtopping event, 0100 Backwater Elev. for existing structure = 261.9. Proposed Low Bridge Chord Elev. = 263.60. Drainage area: 70.0 square miles. Historical H.W. Elev. = 260.99.

By written agreement with Lafayette County, if the roadway embankment within the floodplain of Little Bodcau Creek is raised in the future, additional waterway opening(s) will be required to allow a maximum 1.0 foot increase in the upstream water surface elevation.



LAYOUT OF BRIDGE OVER LITTLE BODCAU CREEK STRS. & APPRS. (S) LAFAYETTE COUNTY

COUNTY ROAD 25 ARKANSAS STATE HIGHWAY COMMISSION

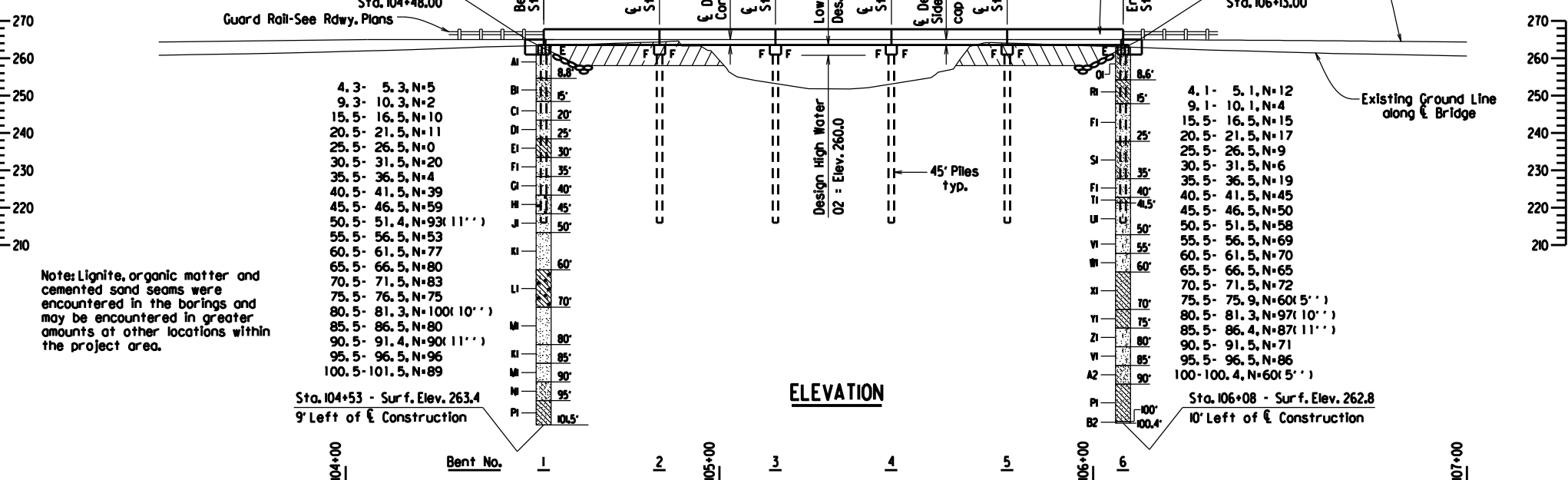
LITTLE ROCK, ARK.

DRAWN BY: KDH DATE: 7-15-16 FILENAME: bbr3714.dgn

CHECKED BY: DATE: SCALE: 1" = 20'

DESIGNED BY: DATE: BRIDGE NO. 04938 DRAWING NO. 58867

- BORING LEGEND**
- A1-Moist, Loose, Light Brown Sand
  - B1-Wet, Very Loose, Light Gray Clayey Sand
  - C1-Wet, Loose, Light Gray Sand
  - D1-Wet, Medium Dense, Dark Brown Sand with Some Organic Matter
  - E1-Wet, Very Soft, Gray Silty Clay
  - F1-Wet, Medium Dense, Gray Sand
  - G1-Wet, Very Loose, Gray Sand
  - H1-Moist, Dense, Dark Brown Silty Sand with Lignite
  - J1-Moist, Very Dense, Dark Brown Sand with Some Lignite
  - K1-Moist, Very Dense, Brown Sand
  - L1-Moist, Very Hard, Brown Silty Clay with Lignite
  - M1-Moist, Very Dense, Brown Sand with Some Clay
  - N1-Moist, Very Dense, Brown Clayey Sand
  - P1-Moist, Very Hard, Dark Brown Sandy Clay
  - Q1-Moist, Medium Dense, Brown Sand with Clay
  - R1-Moist, Soft, Brown and Gray Clay with Sand
  - S1-Wet, Loose, Gray Sand with Clay
  - T1-Moist, Hard, Dark Brown Sandy Clay with Some Gravel
  - U1-Moist, Dense, Dark Brown Silty Sand
  - V1-Moist, Very Dense, Dark Brown Silty Sand
  - W1-Moist, Very Dense, Dark Brown Silty Sand with Some Gravel
  - X1-Moist, Very Hard, Dark Gray Sandy Clay
  - Y1-Moist, Very Hard, Dark Gray Sandy Clay with Trace Gravel
  - Z1-Moist, Very Dense, Gray Silty Sand with Cemented Seams
  - A2-Moist, Very Dense, Dark Brown Clayey Sand
  - B2-Moist, Very Dense, Dark Brown Sand



PRINT DATE: dateprinted

**From:** [Theresa Russell](#)  
**To:** [Environmental Clearance](#)  
**Subject:** FW: Job No. BR3714 - Lafayette County (AHPP #96706)  
**Date:** Thursday, October 06, 2016 12:25:18 PM

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The staff of the Arkansas Historic Preservation Program has reviewed the submitted documentation for a Bridge Replacement for Job BR3714. Based on the information provided, we concur that the proposed undertaking will have no adverse effect on historic properties. This effect determination could change should additional information come to light.

Theresa Russell  
Section 106 Structure Reviewer

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