DELINEATION OF POTENTIAL SECTION 404 ISSUES

PROPOSED MISSISSISPPI COUNTY-ASTRO SITE
MISSISSIPPI COUNTY, ARKANSAS

ENERCON PROJECT NUMBER: NEPA0633

Prepared For:

Mississippi County,
Arkansas Economic Development
4701 Memorial Drive
Blytheville, Arkansas 72315

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February 19, 2016

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INTRODUCTION AND OVERVIEW OF FINDINGS

Mississippi County, Arkansas Economic Development (the Client) contracted with Enercon Services, Inc. (ENERCON) of Oklahoma City, Oklahoma to delineate Section 404 wetlands and other waters of the United States (US) within a 670-acre area of delineation located in Mississippi County, Arkansas. A brief summary of our findings is provided below.

- No wetlands or ponds were identified within the area of delineation.
- Five (5) intermittent streams/ditches, seven (7) ephemeral ditches, five (5) agricultural PTO drainages, and one (1) mapped drainage swale were identified in the area of delineation. Although unmapped ephemeral and roadside drainages are not usually jurisdictional waters of the US, the existing US Geological Survey (USGS) mapped intermittent streams will likely be regulated by the Corps under Section 404.

Project Location

The area of delineation is approximately 670 acres in size and located approximately three (3) miles west of the town of Osceola, in Mississippi County, Arkansas (Figure 1). The area of delineation is mapped on USGS topographic quadrangle Keiser, AR (7.5-minute series) (Figure 2). Coordinates for the approximate center of the area of delineation are 35.709100 x -90.035100 (NAD 83). Legal description of the site is Parts of Sections 28, 29, 32, and 33, Township 13 North, Range 10 East. This part of Mississippi County is primarily characterized by row crop agricultural fields with narrow forested corridors along drainages (Figure 3). The Mississippi River is located across the flood control levee east of the area of delineation. The area of delineation is located in the Upper Ditch No. 40 Watershed (HUC# 080202031205) of the Tyronza River Watershed (HUC# 0802020312).

Ecological Setting

The area of delineation is located in the Northern Holocene Meander Belts subset of the Mississippi Alluvial Plain ecoregion of Arkansas (73a). The Northern Holocene Meander Belts subset is a flat to nearly flat floodplain that contains the meander belts of the present and past courses of the Mississippi River. Point bars, natural levees, swales, and abandoned channels with meander scars and oxbow lakes are characteristic of this ecoregion subset. The Northern Holocene Meander Belts are underlain by Holocene alluvium. Soils on natural levees are relatively coarse-textured, well-drained, and higher than those on levee back slopes and point bars. Natural vegetation varies with site characteristics. Oaks are common in areas with silt or clay loam soils; sandy soils have fewer oaks and more sugarberry, elm, ash, pecan, cottonwood, and sycamore (Woods et al., 2004).

General Site Description

The area of delineation was comprised primarily of precision leveled row-crop agricultural fields. Crops including soybeans, corn, and rice are rotated and irrigated using wells and valley irrigation. The area of delineation is located on a moderately well-drained area of the floodplain of the Mississippi River (located 5 miles east of the site). The town of Osceola is located directly east and sits between the site and a man-made levee that prevents flooding from the Mississippi River. However, hydrology supplied through agricultural ditches and natural drainages allows water to move through the site. The surface run-off (irrigation and rain events) does not provide enough hydrology to create wetland conditions in depression areas within the area of delineation.

Vegetation and Community Types

The area of delineation was comprised of the following community types:

Row Crop Agricultural Field: The majority of this community type was planted in soybeans (*Glycine max*) or corn (*Zea mays*) and had recently been harvested at the time of the site visit (Photograph 1).

Fallow Areas: The majority of this community type is dominated by Johnson grass (*Sorghum halapense*), pigweed (*Amaranthus spinosus*), giant ragweed (*Ambrosia trifida*), and switchcane (*Arundinaria tecta*) with scattered slippery elm (*Ulmus rubra*), and black willow (*Salix nigra*) saplings. This community type is limited to the slopes of drainages within the area of delineation (Photograph 2).

Project Area Soils

The following soil map units are listed for the area of delineation: Sharkey-Steele complex, Tunica silty clay, and Steele Loamy Sand (Figure 4). Spatial data and other information regarding soils were obtained via NRCS Web Soil Survey (WSS) for Mississippi County and the Official Soil Series Description website (NRCS, 2010). All listed map units represent hydric soils or soils with a potential for hydric inclusions (Table 1).

Table 1: Soils Table

SERIES NAME (SYMBOL)	DRAINAGE CLASS	HYDRIC RATING	DESCRIPTION
Sharkey-Steel Complex (Sm)	Poorly-Moderately Drained	Yes	Linear and Concave Slopes, Found on Backswamps, Moderate-High Available Water Capacity
Tunica Silty Clay (Tu)	Poorly Drained	Yes	Convex and Concave Slopes, Found on Backswamps, High Available Water Capacity

SERIES NAME (SYMBOL)	DRAINAGE CLASS	HYDRIC RATING	DESCRIPTION
Steele Loamy Sand (So)	Moderately Well Drained	Yes	Sandy and Clayey River Deposits, Found on Level to Undulating Areas of Flood Plains, Moderate Available Water Capacity

POTENTIAL JURISDICTIONAL WATERS AND WETLANDS EVALUATION

Materials and Methods

ENERCON conducted a level 3, routine wetland delineation as described in the *Corps of Engineers Wetlands Delineation Manual* (USACE, 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region (Version 2.0)* (USACE, 2010). Field investigations for the delineation were completed on January 19 of 2016 by H. Garner. ENERCON evaluated the area of delineation for potential Section 404 issues (*i.e., wetlands and other waters of the US*).

Sample point locations were selected to evaluate those low-lying areas and other areas appearing to have at least some potential for Corps regulation under Section 404 of the CWA. Eighteen (18) sampling point locations were established throughout the area of delineation. These included five (5) wetland sample points where data on vegetation, hydrology, and soils were collected; and thirteen (13) stream sample points where ordinary high water mark (OHWM) and stream flow data was collected at each location (See figure 2).

E. B. Smith's *Keys to the Flora of Arkansas* (1994) was used to confirm certain plant identifications and the North American Digital Flora: National Wetland Plant List Version 3.1 was used to determine the wetland indicator status for the dominant species (Lichvar, R.W. and J.T. Kartesz, 2009; https://wetland_plants.usace.army.mil). Soil pits were dug with a sharpshooter shovel to a depth of approximately 16 to 18 inches, where possible, and soil colors were determined with the aid of Munsell color charts. Soil survey data from Mississippi County (Natural Resources Conservation Service (NRCS) Web Soil Survey) was used to determine map units for the area (Figure 4). Also, the NRCS *National Hydric Soils List* (dated April 2012) was used to assist in the selection of sampling points appearing to have a potential for the occurrence of hydric soils (NRCS, 2012).

Attachment 1 provides representative photographs of onsite features. Attachment 2 of this document provides completed Corps field data forms specific to a total of eighteen (18) sampling point locations.

Findings and Results

Wetlands and Ponds

There were no wetlands or ponds identified within the area of delineation.

Streams and Drainages

Five (5) intermittent streams and seven (7) ephemeral drainages were identified in the area of delineation. An additional six (6) drainages not exhibiting an OHWM (tractor power take-off [PTO] field drains and drainage swales) were also identified within the area of delineation. Table 2 provides a summary of these features.

Table 2: Summary of Streams and Drainages in the Area of Delineation

FEATURE NAME	GENERAL TYPE	MAPPED ON USGS TOPO	PREDICTED JURISDICTIONAL STATUS*	AVERAGE OHWM WIDTH (feet)	LINEAR FEET / ACREAGE WITHIN PROJECT AREA
S1	Intermittent	Yes	Yes	13	2,011 / 0.60
S2	Ephemeral	Yes	Maybe	4	7,518 / 0.69
S3	Ditch	No	No	3	4,298 / NA
S4	Ditch	No	No	3	4,812 / NA
S5	Ditch	No	No	3	4,777/ NA
S6	Ditch	No	No	3	4,835 / NA
S7	Ephemeral	No	No	1	1,247 / 0.03
S8	Ephemeral	No	No	1	920 / 0.02
S9	Intermittent	Yes	Yes	4	2,595 / 0.24
S10	Intermittent	Yes	Yes	13	5,304 / 1.6
S11	Drain	No	No	N/A	486 / NA
S12	Drain	No	No	N/A	1,392 / NA
S13	Intermittent	Yes	Yes	18	1,225 / 0.51
S14	Drain	No	No	N/A	785 / NA
S15	Drain	No	No	N/A	1,180 / NA
S16	Drain	No	No	N/A	1,062 / NA
S17	Drain	No	No	N/A	2,597 / NA
S18	Intermittent	Yes	Maybe	2	2,610 /0.12
POTENTIALLY JURISDICTIONAL STREAM TOTAL: 18,652 LINEAR FEET (3.8 ACRES)					

**Jurisdictional status is subject to Corps approval.*

Intermittent Stream 1 (S1, PT18) is mapped on the USGS topographic quadrangle as an intermittent stream and named Ditch No. 43 (drainage district nomenclature). Approximately 2,011 linear feet (0.60 acres) of this channel was located within the area of delineation. This stream featured an observable ordinary high water mark (OHWM) approximately 13 feet wide

and likely supports relatively permanent water (RPW). Therefore, S1 will likely be regulated by the Corps under Section 404 (Photograph 3).

Intermittent Stream 2 (S2, PT10) is partially mapped (2,561 linear feet) on the USGS topographic quadrangle. However, approximately 7,518 linear feet (0.69 acres) of this channel was located within the area of delineation. This stream featured an observable OHWM approximately 4 feet wide, likely supports relatively permanent water, and has a significant nexus with Ditch No. 44 (S10). Therefore, S2 may be regulated by the Corps under Section 404 (See Photograph 4).

Intermittent Stream 9 (S9, PT8) is mapped on the USGS topographic quadrangle as an intermittent stream. Approximately 2,295 linear feet (0.60 acres) of this channel was located within the area of delineation. This stream featured an observable OHWM approximately 4 feet wide, likely supports relatively permanent water (RPW), and has a significant nexus with Ditch No. 44 (S10). Therefore, S9 will likely be regulated by the Corps under Section 404 (Photograph 5).

Intermittent Stream 10 (S10, PT6 & PT9) is mapped on the USGS topographic quadrangle as an intermittent stream and named Ditch No. 44 (drainage district nomenclature). Approximately 5,304 linear feet (2.8 acres) of this channel was located within the area of delineation. This stream featured an observable OHWM approximately 23 feet wide, supports relatively permanent water (RPW), and has a significant nexus with a traditionally navigable water (TNW; Tyronza River). Therefore, S10 will likely be regulated by the Corps under Section 404 (See Photograph 6).

Intermittent Stream 13 (S13, PT4) is not mapped on the USGS topographic quadrangle. However, approximately 1,225 linear feet (0.34 acres) of this channel was located within the area of delineation. This stream featured an observable OHWM approximately 12 feet wide, likely supports relatively permanent water, and has a significant nexus with Ditch No. 44 (S10). Therefore, S13 will likely be regulated by the Corps under Section 404 (See Photograph 7).

Intermittent Stream 18 (S18, PT1) is mapped on the USGS topographic quadrangle as an intermittent stream. Approximately 2,610 linear feet (0.12 acres) of this channel was located within the area of delineation. This stream featured an observable OHWM approximately 2 feet wide, supports relatively permanent water (RPW), and has a significant nexus with Ditch No. 44 (S10). Therefore, S18 may be regulated by the Corps under Section 404 (See Photograph 8).

Ephemeral Agricultural Drainages (S7, PT 15 & S8, PT14) are not mapped on the USGS topographic quadrangle. These features have an inverted parabolic cross-section, with an OHWM approximately 1 foot. While they can be filled to capacity with surface water after

precipitation events, they do not support relatively permanent water or biotic communities. Furthermore, these drainages were excavated as part of previous farm improvements to promote irrigation drainage and have been maintained, and even cropped since that time. Therefore, these drainage features will not likely be regulated by the Corps under Section 404 (Photograph 9).

Agricultural Irrigation Ditches (S3, PT17; S4, S5, & S6) are not mapped on the USGS topographic quadrangle. While these features did exhibit discernible OHWMs and while they can be filled to capacity with surface water after precipitation events, these ditches were excavated as borrow for field levee road construction and utilized for irrigation water conveyance within each field paddock only. In as such, they do not connect to any other mapped intermittent water except through water control structures associated with irrigation drainage from the field. Therefore, these ditches will not likely be regulated by the Corps under Section 404 (Photograph 10).

Power Take-Off (PTO) Field Drains/Swales (S11, PT2; S12, S14, S15, PT7; S16 & S17) are not mapped on the USGS topographic quadrangle with the exception of S11. S11 is mapped on the USGS topographic quadrangle map, but is currently a shallow drainage swale with no defined channel or discernible OHWM. All other features did not exhibit discernible OHWMs and do not support relatively permanent water or biotic communities. Therefore, these drainages will not likely be regulated by the Corps under Section 404 (Photograph 11& 12).

SUMMARY AND CONCLUSIONS

No wetlands or ponds were located within the area of delineation. Despite the large number of streams and drainages located on the area of delineation, only six (6) streams or stream segments will likely be jurisdiction of the Memphis District of the U.S. Army Corps of Engineers. Any land forming or manipulation of drainage that will fill or re-route streams 1, 2, 9, 10, 13, or 18 will require a preliminary jurisdictional determination and potentially a Section 404 permit from the Corps.

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LIST OF PREPARERS

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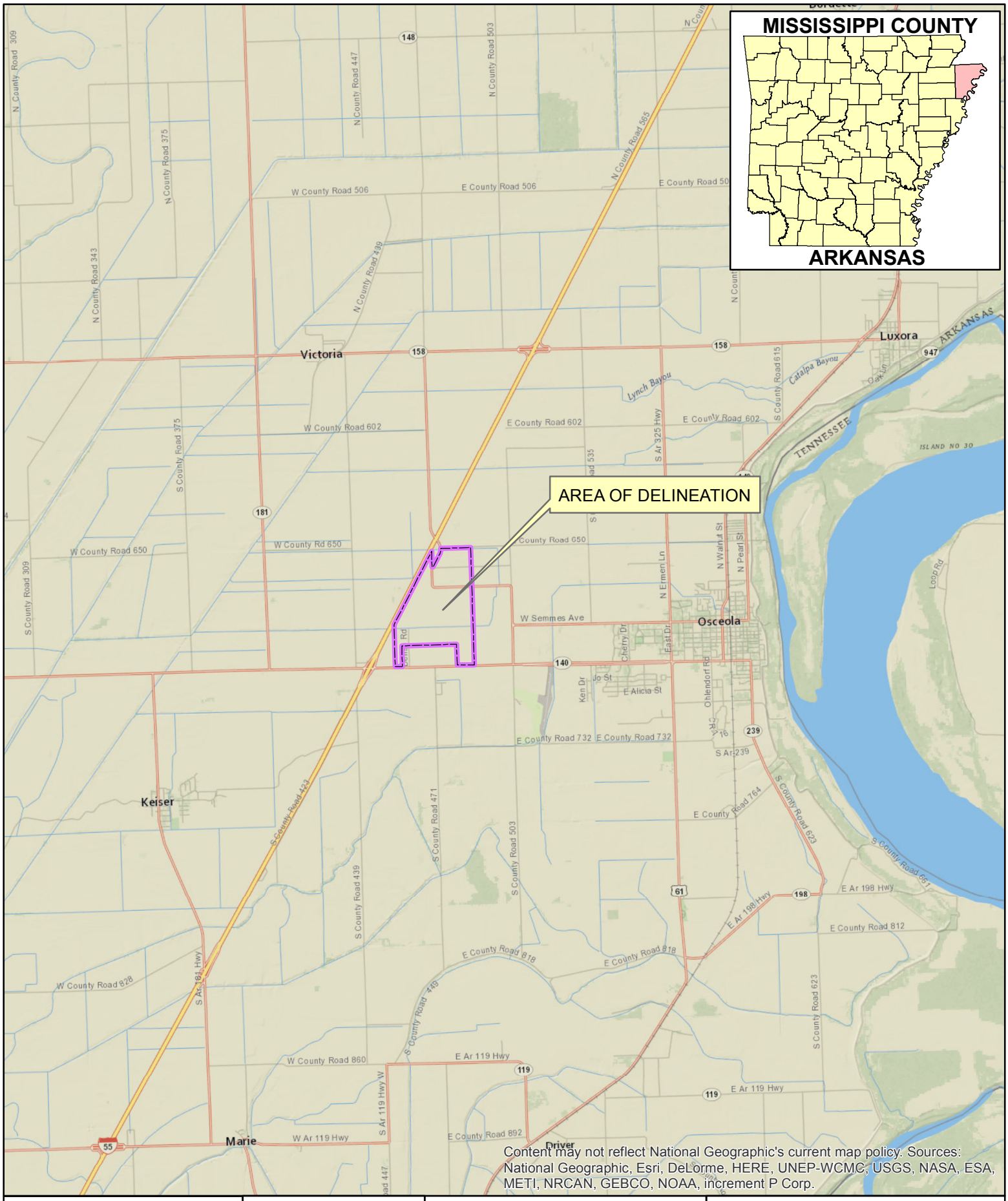

Content may not reflect National Geographic's current map policy. Sources: National Geographic, Esri, DeLorme, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.

Figure 1. Vicinity Map

ENERCON

Drawn by: H. Garner

Date: 2/15/2016

Astro Site
Wetlands and Waters Delineation
Mississippi County, Arkansas

Projection: NAD83 UTM Zone 15 North

Area of Delineation

N

0 0.75 1.5 3 Miles

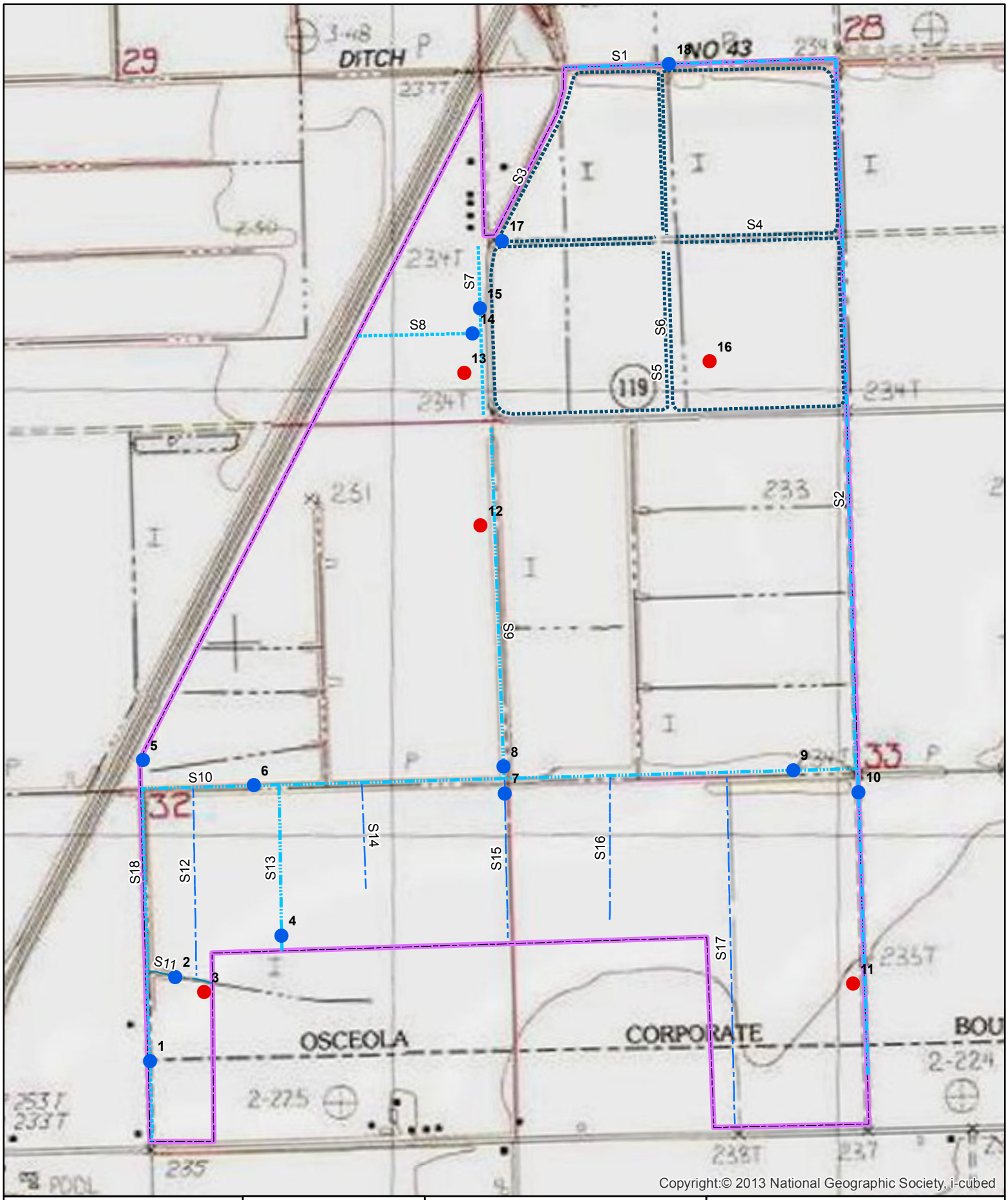

Figure 2. Wetland and stream data points and delineated waters on USGS 7.5-minute topographic quadrangle

ENERCON

Drawn by: H. Garner

Date: 2/15/2016

Astro Site
Wetlands and Waters Delineation
Mississippi County, Arkansas

Projection: NAD83 UTM Zone 15 North

Area of Delineation
Streams
Sample Points
Stream
Wetland
Ephemeral
Field Ditch
Intermittent
PTO Field Drain
Swale

N

0 450 900 1,800 Feet

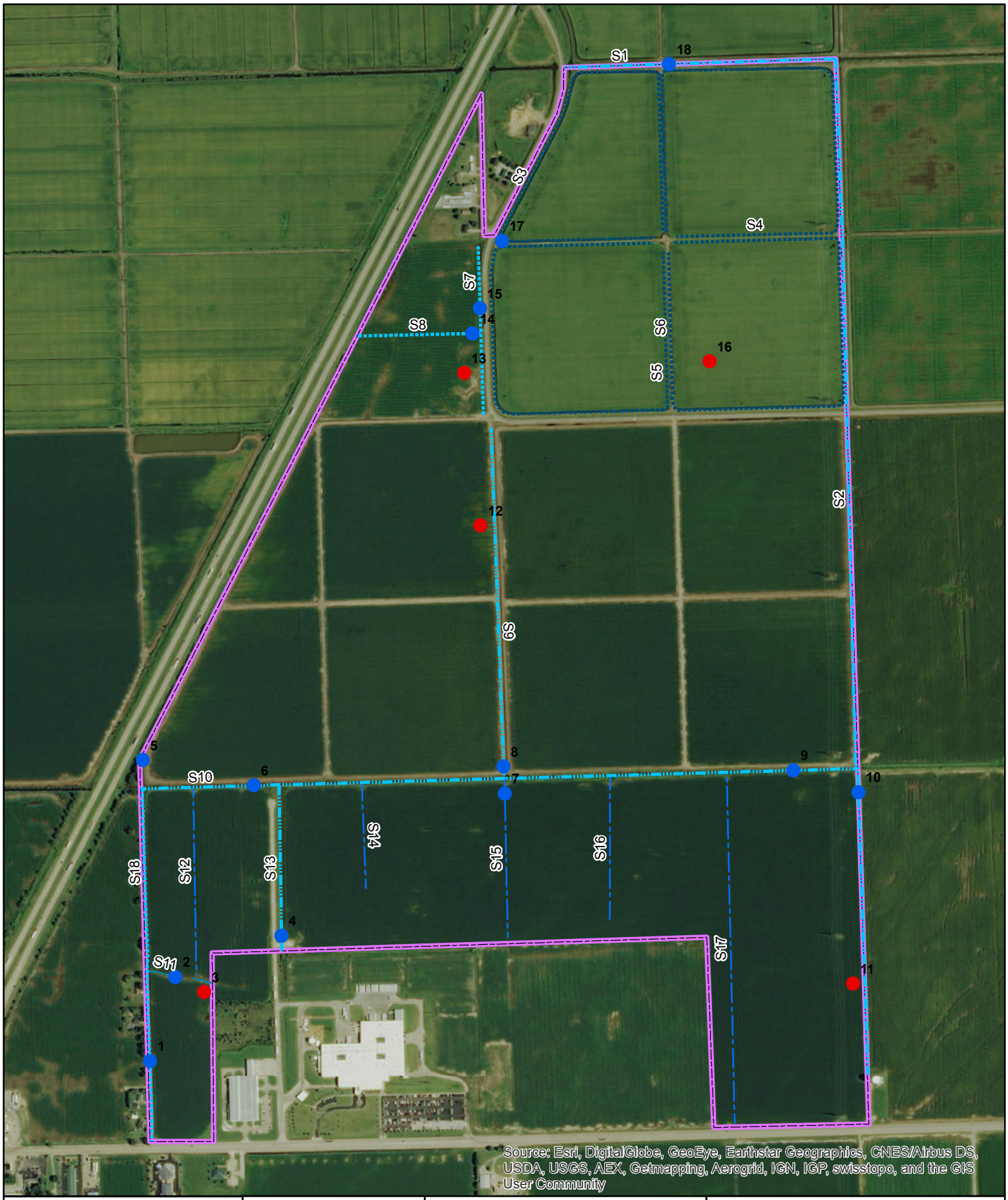

Figure 3. Wetland and stream data points and delineated waters on ESRI World Imagery (2012)

ENERCON

Drawn by: H. Garner

Date: 2/15/2016

Astro Site
Wetlands and Waters Delineation
Mississippi County, Arkansas

Projection: NAD83 UTM Zone 15 North

Area of Delineation
Streams
Sample Points
Stream
Wetland
Ephemeral
Field Ditch
Intermittent
PTO Field Drain
Swale

N

0 450 900 1,800 Feet

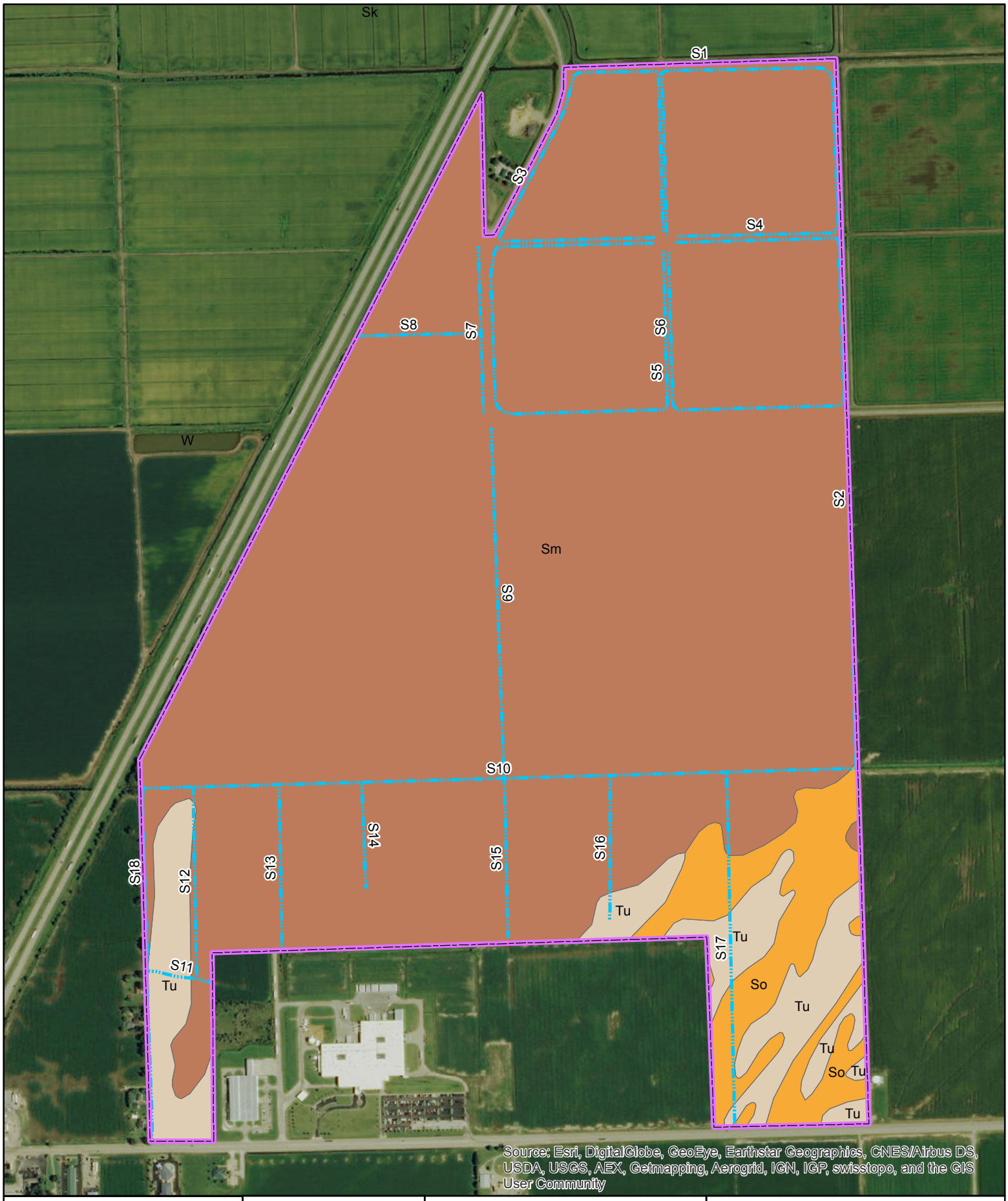

Figure 4. USDA NRCS mapped soils

Astro Site
Wetlands and Waters Delineation
Mississippi County, Arkansas

Area of Delineation
Streams

USDA Mapped Soils
Sm (Sharkey-Steele)
So (Steele Loamy Sand)
Tu (Tunica Silty Clay)

N

0 0.075 0.15 0.3 Miles

ENERCON

Drawn by: H. Garner
Date: 2/15/2016

Projection: NAD83 UTM Zone 15 North

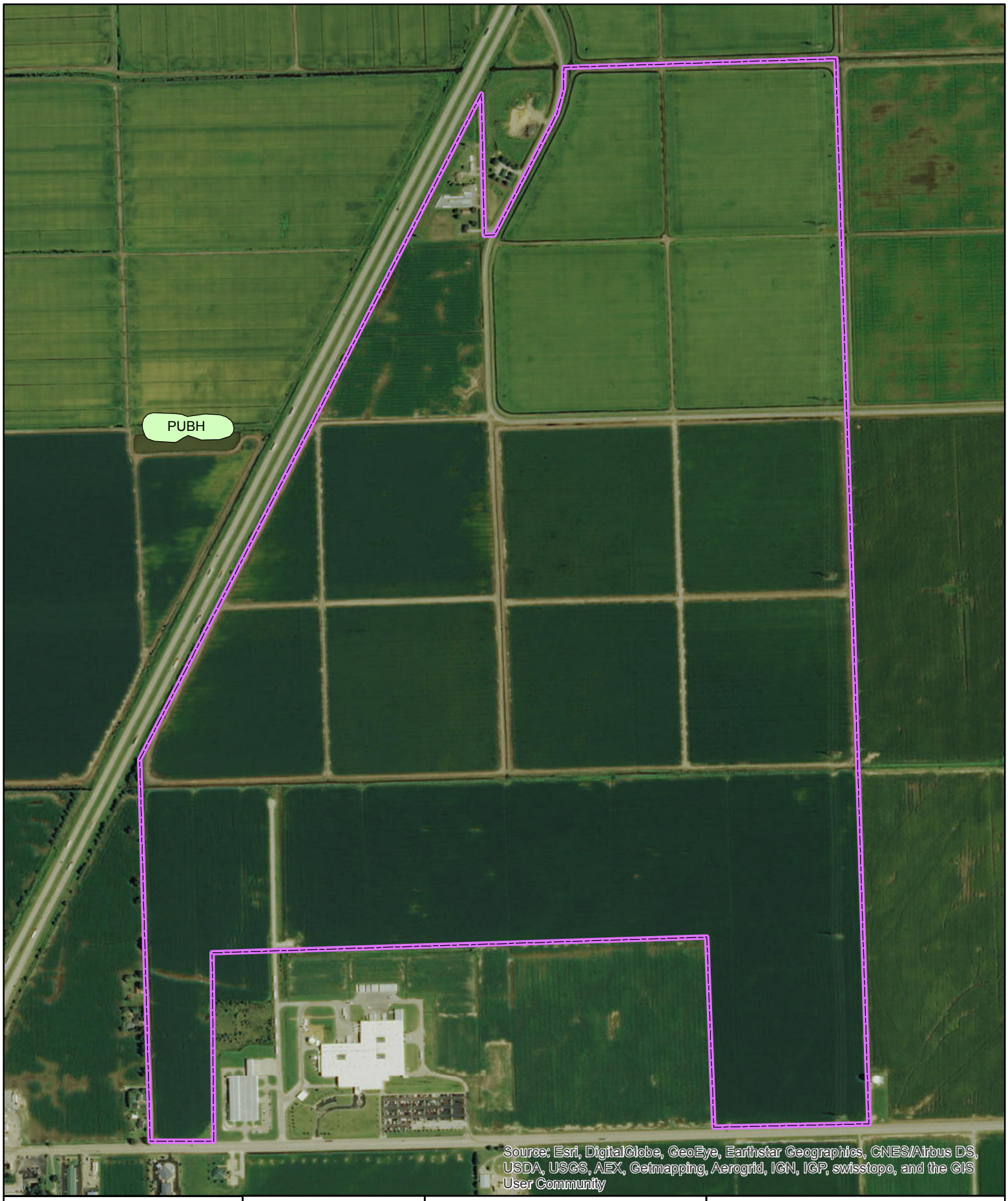

Figure 5. NWI coverage of area of delineation

ENERCON

Drawn by: H. Garner

Date: 2/15/2016

Astro Site
Wetlands and Waters Delineation
Mississippi County, Arkansas

Projection: NAD83 UTM Zone 15 North

Area of Delineation

NWI

N

0 0.075 0.15 0.3 Miles

ATTACHMENT 1:

REPRESENTATIVE SITE PHOTOGRAPHS

PHOTOGRAPHIC LOG

Photo 1. Precision leveled agricultural landscape dominating the area of delineation

Photo 2. Fallow vegetative cover primarily found along the intermittent stream banks within the area of delineation

PHOTOGRAPHIC LOG

Photo 3. Representative photograph of Stream 1 (S1) located along the north boundary of the area of delineation

Photo 4. Representative photograph of Stream 9 (S9) bisecting the area of delineation (facing north)

PHOTOGRAPHIC LOG

Photo 5. Representative photograph of Stream 10 (S10; Ditch No. 44) bisecting the area of delineation (facing west)

Photo 6. Representative photograph of Stream 13 (S13) within the area of delineation (facing north)

PHOTOGRAPHIC LOG

Photo 7. Representative photo of Stream 2 (S2) along the eastern boundary of the area of delineation (facing north)

Photo 8. Representative photo of intersection of Stream 7 and 9 (S7, S8) located in the northwestern corner of the area of delineation (facing west)

PHOTOGRAPHIC LOG

Photo 9. Representative photograph of Stream 18 (S18) along the western boundary of the area of delineation (facing south)

Photo 10. Representative photograph of agricultural ditches 3 (left) & 5 (right) surrounding 0-grade rice fields in the northern portion of the area of delineation (facing east)

PHOTOGRAPHIC LOG

Photo 11. Photograph of Stream/swale 11 (S11) located in the southwestern corner of the area of delineation (facing east)

Photo 12. Representative PTO drain within the area of delineation

PHOTOGRAPHIC LOG

Photo 13. Representative soils/ soils profile and crop residue of wetland sample points 3 and 11 within the area of delineation

Photo 14. Representative soils/soils profile of wetland sample points 12, 13, & 16 within the area of delineation

ATTACHMENT 2:

WETLAND DETERMINATION DATA FORMS

WETLAND DETERMINATION FORM

ATLANTIC AND GULF COASTAL PLAIN REGION

Project/Site: Astro Site	**City/County:** Mississippi			**Sampling Point:**	3
Applicant/Owner:	Mississippi County	**State:**	AR	**Date:**	1/19/2016
Investigators:	H.Garner	**Section, Township, Range:**	S32 T13N, R10E		
Landform (hillside, terrace, etc.):	terrace	**Local Relief (concave, convex, no**	none	**% Slope:**	0-1
Subregion (LRR or MLRA)	LRRO	**Lat:** 35.7013	**Long:**	-90.0428	**Datum:** NAD83
Soil Map Unit Name:	Sharkey-Steele Complex		**NWI Classification:**	None	

Are climatic/hydrological conditions on site typical for this time of year? YES ☑ NO ☐ (If no, explain in Remarks.)

Are "normal circumstances" present? YES ☑ NO ☐

Are VEGETATION ☐ , SOIL ☐ , or HYDROLOGY ☐ significantly disturbed? ☐

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, features, etc.

			Is the Sampled Area within a Wetland?	
			YES	**NO**
Wetland hydrology present?	YES ☐	NO ☑	☐	☑
Hydrophytic vegetation present?	YES ☐	NO ☑		
Hydric soil present?	YES ☐	NO ☑		

Remarks:

No wetland indicators were observed

HYDROLOGY

Wetland hydrology indicators (check all that apply):

Primary indicators (minimum of one required)

☐	surface water (A1)	☐	aquatic fauna (B13)	☐	surface soil cracks (B6)
☐	high water table (A2)	☐	marl deposits (B15)(LRR U)		sparsely vegetated
☐	saturation (A3)	☐	hydrogen sulfide odor (C1)	☐	concave surface (B8)
☐	water marks (B1)		oxidized rhizosphere	☐	drainage patterns (B10)
☐	sediment deposits (B2)	☐	on living roots (C3)	☐	moss trim lines (B16)
☐	drift deposits (B3)	☐	presence of reduced iron (C4)	☐	dry-season water table (C2)
☐	algal mat or crust (B4)		recent iron reduction	☐	crayfish burrows (C8)
☐	iron deposits (B5)	☐	in tilled soils (C6)	☐	saturation visible on aerial image (C9)
	inundation visible	☐	thin muck surface (C7	☑	geomorphic position (D2)
☐	on aerial image (B7)	☐	other (explain in remarks)	☐	shallow aquitard (D3)
☐	water-stained leaves (B9)			☐	FAC-neutral test (D5)
				☐	Sphagnum moss (D8)(LRRT,U)

Secondary indicators (minimum of two required)

Field Observations:

				Wetland hydrology present?	
				YES	**NO**
Surface water present?	**YES** ☐	**NO** ☑	Depth (in.)	☐	☑
Water table present?	**YES** ☐	**NO** ☑	Depth (in.)		
Saturation present? (includes capillary fringe)	**YES** ☐	**NO** ☑	Depth (in.)		

Describe recorded data (stream gauge, monitoring well, aerial photo, previous inspections), if available:

Remarks:

Wetland hydrology indicators were not observed

VEGETATION -(scientific names) Sampling Point: 3

Tree stratum (plot size: 35' radius)	absolute % cover	dominant species?	indicator status
1			0
2			0
3			0
4			0
5			0
6			0
	0	= total cover	
50% t.c. =	0	20% t.c. =	0
Sapling stratum (plot size: 15' radius)			
1			0
2			0
3			0
4			0
5			0
6			0
	0	= total cover	
50% t.c. =	0	20% t.c. =	0
Shrub stratum (plot size: 15' radius)			
1			0
2			0
3			0
4			0
5			0
6			0
	0	= total cover	
50% t.c. =	0	20% t.c. =	0
Herb stratum (plot size: 5' radius)			
1 *Zea mayes*	20	Y	FACU
2			0
3			0
4			0
5			0
6			0
	20	= total cover	
50% t.c. =	10	20% t.c. =	4
Woody vine stratum (plot size:35' radius)			
1			0
2			0
3			0
4			0
	0	= total cover	
50% t.c. =	0	20% t.c. =	0

Dominance Test worksheet:

# of dominant species that are OBL, FACW, or FAC: 0 (A)

Total # of Dominant across all strata: 1 (B)

% of Dominant species that are OBL, FACW, or FAC: 0.0 (A/B)

Prevalence Index worksheet:

Total % cover of:		Multiply by:	
OBL		x 1 =	0
FACW		x 2 =	0
FAC		x 3 =	0
FACU	20	x 4 =	80
UPL		x 5 =	0
column total	20 (A)		80 (B)

Prevalence Index = B/A= 4.00

Hydrophytic Vegetation Indicators:

- ☐ dominance test >50%
- ☐ prevalence index ≤ 3.0ˆ
- ☐ problematic hydrophytic vegˆ (explain)

ˆindicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Definitions of Vegetation Strata:

Tree- woody plants (excl. vines) approx. 20+ ft. tall and 3+ in. DBH

Sapling- woody plants (excl. vines) approx. 20+ ft tall and <3in. DBH

Shrub- woody plants (excl. vines) approx. 3-20 ft. tall

Herb- all herbaceous plants regardless of size; woody plants (except vines) <3 ft tall

Woody vines- all woody vines, regardless of height

Hydrophytic Vegetation Present?

YES ☑ **NO** ☐

Remarks: (If observed, list morphological adaptations below)

A prevalence of wetland vegetation was not observed

SOIL Sampling Point: 3

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type^	Loc°	Texture	Remarks
2	10 YR 4/3	100					sandy loam	same throughout profile
10	10 YR 4/3	100					sandy loam	
16	10 YR 4/3	100					sandy loam	

^Type: C= Concentration, D= Depletion, RM= Reduced Matrix, CS= Covered or Coated Sand Grains

°Location: PL= Pore Lining, M= Matr

Hydric Soil Indicators:

- ☐ histosol (A1)
- ☐ histic epipedon (A2)
- ☐ black histic (A3)
- ☐ hydrogen sulfide (A4)
- ☐ stratified layers (A5)
- ☐ organic bodies(A6)(LRR P,T,U)
- ☐ 5cm mucky mineral(A7)(LRR P, T, U)
- ☐ muck presence (A8)(LRR U)
- ☐ 1cm 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*:

- ☐ 1cm muck (A9)(LRR O)
- ☐ 2cm 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)(LRR T, U)
- ☐ other (explain in remarks)

*indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: none

Depth (in.):

Hydric Soils Present?

YES ☐ **NO** ☑

Remarks:

Indicators of hydric soil were not observed

WETLAND DETERMINATION FORM

ATLANTIC AND GULF COASTAL PLAIN REGION

Project/Site: Astro Site	**City/County:** Mississippi			**Sampling Point:**	11
Applicant/Owner:	Mississippi County	**State:**	AR	**Date:**	1/19/2016
Investigators:	H.Garner	**Section, Township, Range:**	S33 T13N, R10E		
Landform (hillside, terrace, etc.):	terrace	**Local Relief (concave, convex, no**	none	**% Slope:**	0-1
Subregion (LRR or MLRA)	LRRO	**Lat:** 35.7011	**Long:**	-90.0266	**Datum:** NAD83
Soil Map Unit Name:	Steele Loamy Sand		**NWI Classification:**	None	

Are climatic/hydrological conditions on site typical for this time of year? YES ☑ NO ☐ (If no, explain in Remarks.)

Are "normal circumstances" present? YES ☑ NO ☐

Are VEGETATION ☐ , SOIL ☐ , or HYDROLOGY ☐ significantly disturbed? ☐

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, features, etc.

			Is the Sampled Area within a Wetland?	
Wetland hydrology present?	YES ☐	NO ☑	**YES**	**NO**
Hydrophytic vegetation present?	YES ☐	NO ☑	☐	☑
Hydric soil present?	YES ☐	NO ☑		

Remarks:

No wetland indicators were observed

HYDROLOGY

Wetland hydrology indicators (check all that apply):

Primary indicators (minimum of one required)

☐	surface water (A1)	☐	aquatic fauna (B13)
☐	high water table (A2)	☐	marl deposits (B15)(LRR U)
☐	saturation (A3)	☐	hydrogen sulfide odor (C1)
☐	water marks (B1)		oxidized rhizosphere
☐	sediment deposits (B2)	☐	on living roots (C3)
☐	drift deposits (B3)	☐	presence of reduced iron (C4)
☐	algal mat or crust (B4)		recent iron reduction
☐	iron deposits (B5)	☐	in tilled soils (C6)
	inundation visible	☐	thin muck surface (C7
☐	on aerial image (B7)	☐	other (explain in remarks)
☐	water-stained leaves (B9)		

Secondary indicators (minimum of two required)

☐	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 image (C9)
☑	geomorphic position (D2)
☐	shallow aquitard (D3)
☐	FAC-neutral test (D5)
☐	Sphagnum moss (D8)(LRRT,U)

Field Observations:

Surface water present?	**YES** ☐	**NO** ☑	Depth (in.)
Water table present?	**YES** ☐	**NO** ☑	Depth (in.)
Saturation present? (includes capillary fringe)	**YES** ☐	**NO** ☑	Depth (in.)

Wetland hydrology present?

YES	**NO**
☐	☑

Describe recorded data (stream gauge, monitoring well, aerial photo, previous inspections), if available:

Remarks:

Wetland hydrology indicators were not observed

VEGETATION -(scientific names) Sampling Point: 11

Tree stratum (plot size: 35' radius)	absolute % cover	dominant species?	indicator status
1			0
2			0
3			0
4			0
5			0
6			0
	0	= total cover	
50% t.c. =	0	20% t.c. =	0
Sapling stratum (plot size: 15' radius)			
1			0
2			0
3			0
4			0
5			0
6			0
	0	= total cover	
50% t.c. =	0	20% t.c. =	0
Shrub stratum (plot size: 15' radius)			
1			0
2			0
3			0
4			0
5			0
6			0
	0	= total cover	
50% t.c. =	0	20% t.c. =	0
Herb stratum (plot size: 5' radius)			
1 *Zea mayes*	20	Y	FACU
2			0
3			0
4			0
5			0
6			0
	20	= total cover	
50% t.c. =	10	20% t.c. =	4
Woody vine stratum (plot size:35' radius)			
1			0
2			0
3			0
4			0
	0	= total cover	
50% t.c. =	0	20% t.c. =	0

Dominance Test worksheet:

# of dominant species that are OBL, FACW, or FAC: 0 (A)

Total # of Dominant across all strata: 1 (B)

% of Dominant species that are OBL, FACW, or FAC: 0.0 (A/B)

Prevalence Index worksheet:

Total % cover of:		Multiply by:	
OBL		x 1 =	0
FACW		x 2 =	0
FAC		x 3 =	0
FACU	20	x 4 =	80
UPL		x 5 =	0
column total	20 (A)		80 (B)

Prevalence Index = B/A= 4.00

Hydrophytic Vegetation Indicators:

- ☐ dominance test >50%
- ☐ prevalence index ≤ 3.0ˆ
- ☐ problematic hydrophytic vegˆ (explain)

ˆindicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Definitions of Vegetation Strata:

Tree- woody plants (excl. vines) approx. 20+ ft. tall and 3+ in. DBH

Sapling- woody plants (excl. vines) approx. 20+ ft tall and <3in. DBH

Shrub- woody plants (excl. vines) approx. 3-20 ft. tall

Herb- all herbaceous plants regardless of size; woody plants (except vines) <3 ft tall

Woody vines- all woody vines, regardless of height

Hydrophytic Vegetation Present?

YES ☑ **NO** ☐

Remarks: (If observed, list morphological adaptations below)

A prevalence of wetland vegetation was not observed

SOIL Sampling Point: 11

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type^	Loc°	Texture	Remarks
2	10 YR 4/3	100					sandy loam	
10	10 YR 4/3	100					sandy loam	
16	10 YR 4/3	100					sandy loam	

^Type: C= Concentration, D= Depletion, RM= Reduced Matrix, CS= Covered or Coated Sand Grains

°Location: PL= Pore Lining, M= Matr

Hydric Soil Indicators:

- ☐ histosol (A1)
- ☐ histic epipedon (A2)
- ☐ black histic (A3)
- ☐ hydrogen sulfide (A4)
- ☐ stratified layers (A5)
- ☐ organic bodies(A6)(LRR P,T,U)
- ☐ 5cm mucky mineral(A7)(LRR P, T, U)
- ☐ muck presence (A8)(LRR U)
- ☐ 1cm 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*:

- ☐ 1cm muck (A9)(LRR O)
- ☐ 2cm 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)(LRR T, U)
- ☐ other (explain in remarks)

*indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: none

Depth (in.):

Hydric Soils Present?

YES ☐ **NO** ☑

Remarks:

Indicators of hydric soil were not observed.

WETLAND DETERMINATION FORM

ATLANTIC AND GULF COASTAL PLAIN REGION

Project/Site: Astro Site	**City/County:** Mississippi			**Sampling Point:**	12
Applicant/Owner:	Mississippi County	**State:**	AR	**Date:**	1/19/2016
Investigators:	H.Garner	**Section, Township, Range:**	S32 T13N, R10E		
Landform (hillside, terrace, etc.):	terrace	**Local Relief (concave, convex, no**	none	**% Slope:**	0-1
Subregion (LRR or MLRA)	LRRO	**Lat:** 35.7106	**Long:**	-90.0355	**Datum:** NAD83
Soil Map Unit Name:	Sharkey-Steele Complex		**NWI Classification:**	None	

Are climatic/hydrological conditions on site typical for this time of year? YES ☑ NO ☐ (If no, explain in Remarks.)

Are "normal circumstances" present? YES ☑ NO ☐

Are VEGETATION ☐ , SOIL ☐ , or HYDROLOGY ☐ significantly disturbed? ☐

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, features, etc.

			Is the Sampled Area within a Wetland?	
Wetland hydrology present?	YES ☐	NO ☑	**YES**	**NO**
Hydrophytic vegetation present?	YES ☑	NO ☐	☐	☑
Hydric soil present?	YES ☑	NO ☐		

Remarks:

Two of three wetland indicators were observed

HYDROLOGY

Wetland hydrology indicators (check all that apply):

Primary indicators (minimum of one required)

☐	surface water (A1)	☐	aquatic fauna (B13)	☐	surface soil cracks (B6)
☐	high water table (A2)	☐	marl deposits (B15)(LRR U)		sparsely vegetated
☐	saturation (A3)	☐	hydrogen sulfide odor (C1)	☐	concave surface (B8)
☐	water marks (B1)		oxidized rhizosphere	☐	drainage patterns (B10)
☐	sediment deposits (B2)	☐	on living roots (C3)	☐	moss trim lines (B16)
☐	drift deposits (B3)	☐	presence of reduced iron (C4)	☐	dry-season water table (C2)
☐	algal mat or crust (B4)		recent iron reduction	☐	crayfish burrows (C8)
☐	iron deposits (B5)	☐	in tilled soils (C6)	☐	saturation visible on aerial image (C9)
	inundation visible	☐	thin muck surface (C7	☑	geomorphic position (D2)
☐	on aerial image (B7)	☐	other (explain in remarks)	☐	shallow aquitard (D3)
☐	water-stained leaves (B9)			☐	FAC-neutral test (D5)
				☐	Sphagnum moss (D8)(LRRT,U)

Secondary indicators (minimum of two required)

Field Observations:

				Wetland hydrology present?	
Surface water present?	**YES** ☐	**NO** ☑	Depth (in.)	**YES**	**NO**
Water table present?	**YES** ☐	**NO** ☑	Depth (in.)	☐	☑
Saturation present? (includes capillary fringe)	**YES** ☐	**NO** ☑	Depth (in.)		

Describe recorded data (stream gauge, monitoring well, aerial photo, previous inspections), if available:

Remarks:

Wetland hydrology indicators were not observed

VEGETATION -(scientific names) Sampling Point: 12

Tree stratum (plot size: 35' radius)	absolute % cover	dominant species?	indicator status
1			0
2			0
3			0
4			0
5			0
6			0
	0	= total cover	
50% t.c. =	0	20% t.c. =	0
Sapling stratum (plot size: 15' radius)			
1			0
2			0
3			0
4			0
5			0
6			0
	0	= total cover	
50% t.c. =	0	20% t.c. =	0
Shrub stratum (plot size: 15' radius)			
1			0
2			0
3			0
4			0
5			0
6			0
	0	= total cover	
50% t.c. =	0	20% t.c. =	0
Herb stratum (plot size: 5' radius)			
1 *Oryza sativa*	20	Y	OBL
2			0
3			0
4			0
5			0
6			0
	20	= total cover	
50% t.c. =	10	20% t.c. =	4
Woody vine stratum (plot size:35' radius)			
1			0
2			0
3			0
4			0
	0	= total cover	
50% t.c. =	0	20% t.c. =	0

Dominance Test worksheet:

# of dominant species that are OBL, FACW, or FAC: 1 (A)

Total # of Dominant across all strata: 1 (B)

% of Dominant species that are OBL, FACW, or FAC: 100.0 (A/B)

Prevalence Index worksheet:

Total % cover of:		Multiply by:	
OBL	20	x 1 =	20
FACW		x 2 =	0
FAC		x 3 =	0
FACU		x 4 =	0
UPL		x 5 =	0
column total	20 (A)		20 (B)

Prevalence Index = B/A= 1.00

Hydrophytic Vegetation Indicators:

- ☐ dominance test >50%
- ☑ prevalence index ≤ 3.0ˆ
- ☐ problematic hydrophytic vegˆ (explain)

ˆindicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Definitions of Vegetation Strata:

Tree- woody plants (excl. vines) approx. 20+ ft. tall and 3+ in. DBH

Sapling- woody plants (excl. vines) approx. 20+ ft tall and <3in. DBH

Shrub- woody plants (excl. vines) approx. 3-20 ft. tall

Herb- all herbaceous plants regardless of size; woody plants (except vines) <3 ft tall

Woody vines- all woody vines, regardless of height

Hydrophytic Vegetation Present?

YES	NO
☑	☐

Remarks: (If observed, list morphological adaptations below)

A prevalence of wetland vegetation was not observed

SOIL Sampling Point: 12

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type^	Loc°	Texture	Remarks
2	10 YR 4/3	100					silty clay	
6	10 YR 4/2	90	10 YR 4/6	10	RM	M	silty clay	
10	10 YR 4/3	100					sandy loam	
12								hardpan

^Type: C= Concentration, D= Depletion, RM= Reduced Matrix, CS= Covered or Coated Sand Grains

°Location: PL= Pore Lining, M= Matr

Hydric Soil Indicators:

☐	histosol (A1)	☐	polyvalue below surface (S8)(LRR S, T, U)
☐	histic epipedon (A2)	☐	thin dark surface (S9)(LRR S, T, U)
☐	black histic (A3)	☐	loamy mucky mineral (F1)(LRR O)
☐	hydrogen sulfide (A4)	☐	loamy gleyed matrix (F2)
☐	stratified layers (A5)	☑	depleted matrix (F3)
☐	organic bodies(A6)(LRR P,T,U)	☐	redox dark surface (F6)
☐	5cm mucky mineral(A7)(LRR P, T, U)	☐	depleted dark surface (F7)
☐	muck presence (A8)(LRR U)	☐	redox depressions (F8)
☐	1cm muck (A9)(LRR P, T)	☐	marl (F10)(LRR U)
☐	depleted below dark surface (A11)	☐	depleted ochric (F11) MLRA 151)
☐	thick dark surface (A12)	☐	iron-manganese masses (F12)(LRR O, P, T)
☐	coast prairie redox (A16)(MLRA 150A)	☐	umbric surface (F13)(LRR P, T, U)
☐	sandy mucky mineral(S1)(LRR O, S)	☐	delta ochric (F17)(MLRA 151)
☐	sandy gleyed matrix (S4)	☐	reduced vertic (F18)(MLRA 150A, 150B)
☐	sandy redox (S5)	☐	piedmont floodplain soils (F19)(MLRA 149A)
☐	stripped matrix (S6)	☐	anomalous bright loamy soils (F20)(MLRA 149A, 153C, 153D)
☐	dark surface(S7)(LRR P, S, T, U)		

Indicators for Problematic Hydric Soils*:

☐	1cm muck (A9)(LRR O)	☐	anomalous bright loamy soils (F20)(MLRA 153B)
☐	2cm muck (A10)(LRR S)	☐	red parent material (TF2)
☐	reduced vertic (F18)(outside MLRA 150A,B)	☐	very shallow dark surface (TF12)(LRR T, U)
☐	piedmont floodplain soils (F19)(LRR P, S, T)	☐	other (explain in remarks)

*indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: none

Depth (in.):

Hydric Soils Present?

YES ☑ **NO** ☐

Remarks:

Indicators of hydric soil were observed

WETLAND DETERMINATION FORM

ATLANTIC AND GULF COASTAL PLAIN REGION

Project/Site: Astro Site	**City/County:** Mississippi			**Sampling Point:**	13
Applicant/Owner:	Mississippi County	**State:**	AR	**Date:**	1/19/2016
Investigators:	H.Garner	**Section, Township, Range:**	S29 T13N, R10E		
Landform (hillside, terrace, etc.):	terrace	**Local Relief (concave, convex, no**	none	**% Slope:**	0-1
Subregion (LRR or MLRA)	LRRO	**Lat:** 35.7137	**Long:**	-90.0358	**Datum:** NAD83
Soil Map Unit Name:	Sharkey-Steele Complex		**NWI Classification:**	None	

Are climatic/hydrological conditions on site typical for this time of year? YES ☑ NO ☐ (If no, explain in Remarks.)

Are "normal circumstances" present? YES ☑ NO ☐

Are VEGETATION ☐ , SOIL ☐ , or HYDROLOGY ☐ significantly disturbed? ☐

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, features, etc.

			Is the Sampled Area within a Wetland?	
			YES	**NO**
Wetland hydrology present?	YES ☐	NO ☑	☐	☑
Hydrophytic vegetation present?	YES ☑	NO ☐		
Hydric soil present?	YES ☑	NO ☐		

Remarks:

Two of three wetland indicators were observed

HYDROLOGY

Wetland hydrology indicators (check all that apply):

Primary indicators (minimum of one required)

☐	surface water (A1)	☐	aquatic fauna (B13)	☐	surface soil cracks (B6)
☐	high water table (A2)	☐	marl deposits (B15)(LRR U)		sparsely vegetated
☐	saturation (A3)	☐	hydrogen sulfide odor (C1)	☐	concave surface (B8)
☐	water marks (B1)		oxidized rhizosphere	☐	drainage patterns (B10)
☐	sediment deposits (B2)	☐	on living roots (C3)	☐	moss trim lines (B16)
☐	drift deposits (B3)	☐	presence of reduced iron (C4)	☐	dry-season water table (C2)
☐	algal mat or crust (B4)		recent iron reduction	☐	crayfish burrows (C8)
☐	iron deposits (B5)	☐	in tilled soils (C6)	☐	saturation visible on aerial image (C9)
	inundation visible	☐	thin muck surface (C7	☑	geomorphic position (D2)
☐	on aerial image (B7)	☐	other (explain in remarks)	☐	shallow aquitard (D3)
☐	water-stained leaves (B9)			☐	FAC-neutral test (D5)
				☐	Sphagnum moss (D8)(LRRT,U)

Secondary indicators (minimum of two required)

Field Observations:

				Wetland hydrology present?	
				YES	**NO**
Surface water present?	**YES** ☐	**NO** ☑	Depth (in.)	☐	☑
Water table present?	**YES** ☐	**NO** ☑	Depth (in.)		
Saturation present? (includes capillary fringe)	**YES** ☐	**NO** ☑	Depth (in.)		

Describe recorded data (stream gauge, monitoring well, aerial photo, previous inspections), if available:

Remarks:

Wetland hydrology indicators were not observed

VEGETATION -(scientific names) Sampling Point: 13

Tree stratum (plot size: 35' radius)	absolute % cover	dominant species?	indicator status
1			0
2			0
3			0
4			0
5			0
6			0
	0	= total cover	
50% t.c. =	0	20% t.c. =	0
Sapling stratum (plot size: 15' radius)			
1			0
2			0
3			0
4			0
5			0
6			0
	0	= total cover	
50% t.c. =	0	20% t.c. =	0
Shrub stratum (plot size: 15' radius)			
1			0
2			0
3			0
4			0
5			0
6			0
	0	= total cover	
50% t.c. =	0	20% t.c. =	0
Herb stratum (plot size: 5' radius)			
1 *Oryza sativa*	20	Y	OBL
2			0
3			0
4			0
5			0
6			0
	20	= total cover	
50% t.c. =	10	20% t.c. =	4
Woody vine stratum (plot size:35' radius)			
1			0
2			0
3			0
4			0
	0	= total cover	
50% t.c. =	0	20% t.c. =	0

Dominance Test worksheet:

# of dominant species that are OBL, FACW, or FAC: 1 (A)

Total # of Dominant across all strata: 1 (B)

% of Dominant species that are OBL, FACW, or FAC: 100.0 (A/B)

Prevalence Index worksheet:

Total % cover of:		Multiply by:	
OBL	20	x 1 =	20
FACW		x 2 =	0
FAC		x 3 =	0
FACU		x 4 =	0
UPL		x 5 =	0
column total	20 (A)		20 (B)

Prevalence Index = B/A= 1.00

Hydrophytic Vegetation Indicators:

- ☐ dominance test >50%
- ☑ prevalence index ≤ 3.0ˆ
- ☐ problematic hydrophytic vegˆ (explain)

ˆindicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Definitions of Vegetation Strata:

Tree- woody plants (excl. vines) approx. 20+ ft. tall and 3+ in. DBH

Sapling- woody plants (excl. vines) approx. 20+ ft tall and <3in. DBH

Shrub- woody plants (excl. vines) approx. 3-20 ft. tall

Herb- all herbaceous plants regardless of size; woody plants (except vines) <3 ft tall

Woody vines- all woody vines, regardless of height

Hydrophytic Vegetation Present?

YES	NO
☑	☐

Remarks: (If observed, list morphological adaptations below)

A prevalence of wetland vegetation was observed. (row crop production of rice)

SOIL Sampling Point: 13

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type^	Loc°	Texture	Remarks
2	10 YR 4/3	100					silty clay	
6	10 YR 4/2	90	10 YR 4/6	10	RM	M	silty clay	
10	10 YR 4/3	100					sandy loam	
12								hardpan

^Type: C= Concentration, D= Depletion, RM= Reduced Matrix, CS= Covered or Coated Sand Grains

°Location: PL= Pore Lining, M= Matr

Hydric Soil Indicators:

☐	histosol (A1)	☐	polyvalue below surface (S8)(LRR S, T, U)
☐	histic epipedon (A2)	☐	thin dark surface (S9)(LRR S, T, U)
☐	black histic (A3)	☐	loamy mucky mineral (F1)(LRR O)
☐	hydrogen sulfide (A4)	☐	loamy gleyed matrix (F2)
☐	stratified layers (A5)	☑	depleted matrix (F3)
☐	organic bodies(A6)(LRR P,T,U)	☐	redox dark surface (F6)
☐	5cm mucky mineral(A7)(LRR P, T, U)	☐	depleted dark surface (F7)
☐	muck presence (A8)(LRR U)	☐	redox depressions (F8)
☐	1cm muck (A9)(LRR P, T)	☐	marl (F10)(LRR U)
☐	depleted below dark surface (A11)	☐	depleted ochric (F11) MLRA 151)
☐	thick dark surface (A12)	☐	iron-manganese masses (F12)(LRR O, P, T)
☐	coast prairie redox (A16)(MLRA 150A)	☐	umbric surface (F13)(LRR P, T, U)
☐	sandy mucky mineral(S1)(LRR O, S)	☐	delta ochric (F17)(MLRA 151)
☐	sandy gleyed matrix (S4)	☐	reduced vertic (F18)(MLRA 150A, 150B)
☐	sandy redox (S5)	☐	piedmont floodplain soils (F19)(MLRA 149A)
☐	stripped matrix (S6)	☐	anomalous bright loamy soils (F20)(MLRA 149A, 153C, 153D)
☐	dark surface(S7)(LRR P, S, T, U)		

Indicators for Problematic Hydric Soils*:

☐	1cm muck (A9)(LRR O)	☐	anomalous bright loamy soils (F20)(MLRA 153B)
☐	2cm muck (A10)(LRR S)	☐	red parent material (TF2)
☐	reduced vertic (F18)(outside MLRA 150A,B)	☐	very shallow dark surface (TF12)(LRR T, U)
☐	piedmont floodplain soils (F19)(LRR P, S, T)	☐	other (explain in remarks)

*indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: none

Depth (in.):

Hydric Soils Present?

YES ☑ **NO** ☐

Remarks:

Indicators of hydric soil were observed

WETLAND DETERMINATION FORM

ATLANTIC AND GULF COASTAL PLAIN REGION

Project/Site: Astro Site	**City/County:** Mississippi			**Sampling Point:**	16
Applicant/Owner:	Mississippi County	**State:**	AR	**Date:**	1/19/2016
Investigators:	H.Garner	**Section, Township, Range:**	S28 T13N, R10E		
Landform (hillside, terrace, etc.):	terrace	**Local Relief (concave, convex, no**	none	**% Slope:**	0-1
Subregion (LRR or MLRA)	LRRO	**Lat:** 35.7138	**Long:**	-90.0297	**Datum:** NAD83
Soil Map Unit Name:	Sharkey-Steele Complex		**NWI Classification:**	None	

Are climatic/hydrological conditions on site typical for this time of year? YES ☑ NO ☐ (If no, explain in Remarks.)

Are "normal circumstances" present? YES ☑ NO ☐

Are VEGETATION ☐ , SOIL ☐ , or HYDROLOGY ☐ significantly disturbed? ☐

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, features, etc.

			Is the Sampled Area within a Wetland?	
			YES	**NO**
Wetland hydrology present?	YES ☐	NO ☑	☐	☑
Hydrophytic vegetation present?	YES ☑	NO ☐		
Hydric soil present?	YES ☑	NO ☐		

Remarks:

Two of three wetland indicators were observed

HYDROLOGY

Wetland hydrology indicators (check all that apply):

Primary indicators (minimum of one required)

☐	surface water (A1)	☐	aquatic fauna (B13)	☐	surface soil cracks (B6)
☐	high water table (A2)	☐	marl deposits (B15)(LRR U)		sparsely vegetated
☐	saturation (A3)	☐	hydrogen sulfide odor (C1)	☐	concave surface (B8)
☐	water marks (B1)		oxidized rhizosphere	☐	drainage patterns (B10)
☐	sediment deposits (B2)	☐	on living roots (C3)	☐	moss trim lines (B16)
☐	drift deposits (B3)	☐	presence of reduced iron (C4)	☐	dry-season water table (C2)
☐	algal mat or crust (B4)		recent iron reduction	☐	crayfish burrows (C8)
☐	iron deposits (B5)	☐	in tilled soils (C6)	☐	saturation visible on aerial image (C9)
	inundation visible	☐	thin muck surface (C7	☑	geomorphic position (D2)
☐	on aerial image (B7)	☐	other (explain in remarks)	☐	shallow aquitard (D3)
☐	water-stained leaves (B9)			☐	FAC-neutral test (D5)
				☐	Sphagnum moss (D8)(LRRT,U)

Secondary indicators (minimum of two required)

Field Observations:

				Wetland hydrology present?	
				YES	**NO**
Surface water present?	**YES** ☐	**NO** ☑	Depth (in.)	☐	☑
Water table present?	**YES** ☐	**NO** ☑	Depth (in.)		
Saturation present? (includes capillary fringe)	**YES** ☐	**NO** ☑	Depth (in.)		

Describe recorded data (stream gauge, monitoring well, aerial photo, previous inspections), if available:

Remarks:

Wetland hydrology indicators were not observed

VEGETATION -(scientific names) Sampling Point: 16

Tree stratum (plot size: 35' radius)	absolute % cover	dominant species?	indicator status
1			0
2			0
3			0
4			0
5			0
6			0
	0	= total cover	
50% t.c. =	0	20% t.c. =	0
Sapling stratum (plot size: 15' radius)			
1			0
2			0
3			0
4			0
5			0
6			0
	0	= total cover	
50% t.c. =	0	20% t.c. =	0
Shrub stratum (plot size: 15' radius)			
1			0
2			0
3			0
4			0
5			0
6			0
	0	= total cover	
50% t.c. =	0	20% t.c. =	0
Herb stratum (plot size: 5' radius)			
1 *Oryza sativa*	20	Y	OBL
2			0
3			0
4			0
5			0
6			0
	20	= total cover	
50% t.c. =	10	20% t.c. =	4
Woody vine stratum (plot size:35' radius)			
1			0
2			0
3			0
4			0
	0	= total cover	
50% t.c. =	0	20% t.c. =	0

Dominance Test worksheet:

# of dominant species that are OBL, FACW, or FAC: 1 (A)

Total # of Dominant across all strata: 1 (B)

% of Dominant species that are OBL, FACW, or FAC: 100.0 (A/B)

Prevalence Index worksheet:

Total % cover of:		Multiply by:	
OBL	20	x 1 =	20
FACW		x 2 =	0
FAC		x 3 =	0
FACU		x 4 =	0
UPL		x 5 =	0
column total	20 (A)		20 (B)

Prevalence Index = B/A= 1.00

Hydrophytic Vegetation Indicators:

- ☐ dominance test >50%
- ☑ prevalence index ≤ 3.0ˆ
- ☐ problematic hydrophytic vegˆ (explain)

ˆindicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Definitions of Vegetation Strata:

Tree- woody plants (excl. vines) approx. 20+ ft. tall and 3+ in. DBH

Sapling- woody plants (excl. vines) approx. 20+ ft tall and <3in. DBH

Shrub- woody plants (excl. vines) approx. 3-20 ft. tall

Herb- all herbaceous plants regardless of size; woody plants (except vines) <3 ft tall

Woody vines- all woody vines, regardless of height

Hydrophytic Vegetation Present?

YES	NO
☑	☐

Remarks: (If observed, list morphological adaptations below)

A prevalence of wetland vegetation was observed. (row crop production of rice)

SOIL Sampling Point: 16

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type^	Loc°	Texture	Remarks
2	10 YR 4/3	100					silty clay	
6	10 YR 4/2	90	10 YR 4/6	10	RM	M	silty clay	
10	10 YR 4/3	100					sandy loam	
12								hardpan

^Type: C= Concentration, D= Depletion, RM= Reduced Matrix, CS= Covered or Coated Sand Grains

°Location: PL= Pore Lining, M= Matr

Hydric Soil Indicators:

☐	histosol (A1)	☐	polyvalue below surface (S8)(LRR S, T, U)
☐	histic epipedon (A2)	☐	thin dark surface (S9)(LRR S, T, U)
☐	black histic (A3)	☐	loamy mucky mineral (F1)(LRR O)
☐	hydrogen sulfide (A4)	☐	loamy gleyed matrix (F2)
☐	stratified layers (A5)	☑	depleted matrix (F3)
☐	organic bodies(A6)(LRR P,T,U)	☐	redox dark surface (F6)
☐	5cm mucky mineral(A7)(LRR P, T, U)	☐	depleted dark surface (F7)
☐	muck presence (A8)(LRR U)	☐	redox depressions (F8)
☐	1cm muck (A9)(LRR P, T)	☐	marl (F10)(LRR U)
☐	depleted below dark surface (A11)	☐	depleted ochric (F11) MLRA 151)
☐	thick dark surface (A12)	☐	iron-manganese masses (F12)(LRR O, P, T)
☐	coast prairie redox (A16)(MLRA 150A)	☐	umbric surface (F13)(LRR P, T, U)
☐	sandy mucky mineral(S1)(LRR O, S)	☐	delta ochric (F17)(MLRA 151)
☐	sandy gleyed matrix (S4)	☐	reduced vertic (F18)(MLRA 150A, 150B)
☐	sandy redox (S5)	☐	piedmont floodplain soils (F19)(MLRA 149A)
☐	stripped matrix (S6)	☐	anomalous bright loamy soils (F20)(MLRA 149A, 153C, 153D)
☐	dark surface(S7)(LRR P, S, T, U)		

Indicators for Problematic Hydric Soils*:

☐	1cm muck (A9)(LRR O)	☐	anomalous bright loamy soils (F20)(MLRA 153B)
☐	2cm muck (A10)(LRR S)	☐	red parent material (TF2)
☐	reduced vertic (F18)(outside MLRA 150A,B)	☐	very shallow dark surface (TF12)(LRR T, U)
☐	piedmont floodplain soils (F19)(LRR P, S, T)	☐	other (explain in remarks)

*indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: none

Depth (in.):

Hydric Soils Present?

YES ☑ **NO** ☐

Remarks:

Indicators of hydric soil were observed

ATTACHMENT 3:

STREAM OHWM DATA FORMS

Project: Astro Site **Date:** 1/19/2016

Location: Mississippi County, Arkansas **Investigator(s):** H.Garner

Project Description:

Wetland and waters delineation of an agricultural site potentially developed as an industrial site.

Describe the river or stream's condition (disturbances, in-stream structures, etc.):

Channelized irrigation ditches providing agricultural, storm-water, and roadside drainage/run-off. Most ditches run into Ditch No. 43 or Ditch No. 44 (both within the area of delineation) either directly or indirectly.

Off-site Information

Remotely sensed image(s) acquired? ■ **Yes** ☐ **No** [If yes, attach image(s) to datasheet(s) and indicate approx. locations of transects, OHWM, and any other features of interest on the image(s); describe below] Description:

See Figure 2 in delineation report for aerial image.

Hydrologic/hydraulic information acquired? ☐ **Yes** ■ **No** [If yes, attach information to datasheet(s) and describe below.] Description:

List and describe any other supporting information received/acquired:

Agricultural, roadside, and industrial storm water run-off inputs with backflow from Ditch No. 44 during high water conditions.

Instructions: Complete one cover sheet and one or more datasheets for each project site. Each datasheet should capture the dominant characteristics of the OHWM along some length of a given stream. Complete enough datasheets to adequately document up- and/or downstream variability in OHWM indicators, stream conditions, etc. Transect locations can be marked on a recent aerial image or their GPS coordinates noted on the datasheet.

Transect (cross-section) drawing: (choose a location that is representative of the dominant stream characteristics over some distance; label the OHWM and other features of interest along the transect; include an estimate of transect length)

Sample Point Coordinates: 35.7000,-90.0442

Inverted parabolic cross-section. No discernible OHWM. See photo 9 in delineation report appendix A

Break in Slope at OHWM: ☐ Sharp (> 60°) | ■ Moderate (30–60°) | ☐ Gentle (< 30°) | ☐ None

Notes/Description:

Sediment Texture: Estimate percentages to describe the general sediment texture above and below the OHWM

	Clay/Silt <0.05mm	Sand 0.05 – 2mm	Gravel 2mm – 1cm	Cobbles 1 – 10cm	Boulders >10cm	Developed Soil Horizons (Y/N)
Above OHWM	100					Y
Below OHWM	100					Y

Notes/Description:

Roadside ditch with mud bottom.

Vegetation: Estimate absolute percent cover to describe general vegetation characteristics above and below the OHWM

	Tree (%)	Shrub (%)	Herb (%)	Bare (%)
Above OHWM	5		50	50
Below OHWM			5	95

Notes/Description:

Crop residue only. No established vegetation within drainage or above OHWM

Other Evidence: List/describe any additional field evidence and/or lines of reasoning used to support your delineation

Mapped on USGS topographic quadrangle as intermittent, but actually only has flow immediately after precipitation events (ephemeral).

Transect (cross-section) drawing: (choose a location that is representative of the dominant stream characteristics over some distance; label the OHWM and other features of interest along the transect; include an estimate of transect length)

Sample Point Coordinates: 35.7017,-90.0435

Inverted shallow parabolic cross-section. No discernible OHWM. See photo 11 in delineation report appendix A

Break in Slope at OHWM: ☐ Sharp (> 60°) | ■ Moderate (30–60°) | ☐ Gentle (< 30°) | ■ None

Notes/Description:

Sediment Texture: Estimate percentages to describe the general sediment texture above and below the OHWM

	Clay/Silt <0.05mm	Sand 0.05 – 2mm	Gravel 2mm – 1cm	Cobbles 1 – 10cm	Boulders >10cm	Developed Soil Horizons (Y/N)
Above OHWM	N/A					N/A
Below OHWM	N/A					N/A

Notes/Description:

Agricultural drainage swale with mud bottom. No channel or OHWM.

Vegetation: Estimate absolute percent cover to describe general vegetation characteristics above and below the OHWM

	Tree (%)	Shrub (%)	Herb (%)	Bare (%)
Above OHWM	0	0	0	0
Below OHWM	0	0	0	0

Notes/Description:

Crop residue only. No established vegetation within drainage. No channel with OHWM.

Other Evidence: List/describe any additional field evidence and/or lines of reasoning used to support your delineation

Mapped on USGS topographic quadrangle as intermittent, but actually possesses no defined channel or OHWM. Historically mapped stream likely blended out through grading and annual crop tillage.

Transect (cross-section) drawing: (choose a location that is representative of the dominant stream characteristics over some distance; label the OHWM and other features of interest along the transect; include an estimate of transect length)

Sample Point Coordinates: 35.7024, -90.0408

Inverted trapezoidal cross-section.

OHWM estimated at 18 feet. See photo 6 in delineation report appendix A

Break in Slope at OHWM: ☐ Sharp (> 60°) | ■ Moderate (30–60°) | ☐ Gentle (< 30°) | ☐ None

Notes/Description:

Sediment Texture: Estimate percentages to describe the general sediment texture above and below the OHWM

	Clay/Silt <0.05mm	Sand 0.05 – 2mm	Gravel 2mm – 1cm	Cobbles 1 – 10cm	Boulders >10cm	Developed Soil Horizons (Y/N)
Above OHWM	100					Y
Below OHWM	100					Y

Notes/Description:

Ditch with mud bottom. Cowardin Code R4UB3

Vegetation: Estimate absolute percent cover to describe general vegetation characteristics above and below the OHWM

	Tree (%)	Shrub (%)	Herb (%)	Bare (%)
Above OHWM	5		90	5
Below OHWM			50	50

Notes/Description:

Other Evidence: List/describe any additional field evidence and/or lines of reasoning used to support your delineation

Unmapped on USGS topographic quadrangle

Transect (cross-section) drawing: (choose a location that is representative of the dominant stream characteristics over some distance; label the OHWM and other features of interest along the transect; include an estimate of transect length)

Sample Point Coordinates: 35.7061,-90.0441

Inverted shallow parabolic cross-section. No discernible OHWM.

Break in Slope at OHWM: ☐ Sharp (> 60°) | ■ Moderate (30–60°) | ☐ Gentle (< 30°) | ■ None

Notes/Description:

Sediment Texture: Estimate percentages to describe the general sediment texture above and below the OHWM

	Clay/Silt <0.05mm	Sand 0.05 – 2mm	Gravel 2mm – 1cm	Cobbles 1 – 10cm	Boulders >10cm	Developed Soil Horizons (Y/N)
Above OHWM	N/A					N/A
Below OHWM	N/A					N/A

Notes/Description:

Agricultural/Highway drainage swale with mud bottom. No channel or OHWM.

Vegetation: Estimate absolute percent cover to describe general vegetation characteristics above and below the OHWM

	Tree (%)	Shrub (%)	Herb (%)	Bare (%)
Above OHWM	75	0	0	25
Below OHWM	0	0	0	0

Notes/Description:

Established vegetation is trees within drainage. No channel with OHWM.

Other Evidence: List/describe any additional field evidence and/or lines of reasoning used to support your delineation

Not mapped on USGS topographic quadrangle. Drainage associated with I-55 drainage with season agricultural inputs.

Transect (cross-section) drawing: (choose a location that is representative of the dominant stream characteristics over some distance; label the OHWM and other features of interest along the transect; include an estimate of transect length)

Sample Point Coordinates: 35.7055,-90.0414

Inverted trapezoidal cross-section. OHWM estimated at 13 feet.

Break in Slope at OHWM: ☐ Sharp (> 60°) | ■ Moderate (30–60°) | ☐ Gentle (< 30°) | ☐ None

Notes/Description:

Sediment Texture: Estimate percentages to describe the general sediment texture above and below the OHWM

	Clay/Silt <0.05mm	Sand 0.05 – 2mm	Gravel 2mm – 1cm	Cobbles 1 – 10cm	Boulders >10cm	Developed Soil Horizons (Y/N)
Above OHWM	100					Y
Below OHWM	100					N

Notes/Description:

Agricultural/Highway drainage swale with mud bottom. No channel or OHWM.

Vegetation: Estimate absolute percent cover to describe general vegetation characteristics above and below the OHWM

	Tree (%)	Shrub (%)	Herb (%)	Bare (%)
Above OHWM	0	0	95	5
Below OHWM	0	0	25	75

Notes/Description:

Other Evidence: List/describe any additional field evidence and/or lines of reasoning used to support your delineation

Mapped as intermittent on USGS topographic quadrangle and labeled as Ditch No. 44.

Transect (cross-section) drawing: (choose a location that is representative of the dominant stream characteristics over some distance; label the OHWM and other features of interest along the transect; include an estimate of transect length)

Sample Point Coordinates: 35.7052,-90.0351

Inverted parabolic cross-section. No discernible OHWM

Break in Slope at OHWM: ☐ Sharp (> 60°) | ☐ Moderate (30–60°) | ☐ Gentle (< 30°) | ■ None

Notes/Description:

Sediment Texture: Estimate percentages to describe the general sediment texture above and below the OHWM

	Clay/Silt <0.05mm	Sand 0.05 – 2mm	Gravel 2mm – 1cm	Cobbles 1 – 10cm	Boulders >10cm	Developed Soil Horizons (Y/N)
Above OHWM	NA					NA
Below OHWM	NA					NA

Notes/Description:

Agricultural/Highway drainage swale with mud bottom. No channel or OHWM.

Vegetation: Estimate absolute percent cover to describe general vegetation characteristics above and below the OHWM

	Tree (%)	Shrub (%)	Herb (%)	Bare (%)
Above OHWM	0	0	95	5
Below OHWM	0	0	25	75

Notes/Description:

Other Evidence: List/describe any additional field evidence and/or lines of reasoning used to support your delineation

Not mapped on USGS topographic quadrangle. PTO generated field drainage/swale with no RPW.

Transect (cross-section) drawing: (choose a location that is representative of the dominant stream characteristics over some distance; label the OHWM and other features of interest along the transect; include an estimate of transect length)

Sample Point Coordinates: 35.7057,-90.0351

Inverted trapezoidal cross-section. OHWM estimated at 10 feet.

Break in Slope at OHWM: ☐ Sharp (> 60°) | ■ Moderate (30–60°) | ☐ Gentle (< 30°) | ☐ None

Notes/Description:

Sediment Texture: Estimate percentages to describe the general sediment texture above and below the OHWM

	Clay/Silt <0.05mm	Sand 0.05 – 2mm	Gravel 2mm – 1cm	Cobbles 1 – 10cm	Boulders >10cm	Developed Soil Horizons (Y/N)
Above OHWM	100					Y
Below OHWM	100					Y

Notes/Description:

Agricultural/Highway drainage swale with mud bottom. No channel or OHWM.

Vegetation: Estimate absolute percent cover to describe general vegetation characteristics above and below the OHWM

	Tree (%)	Shrub (%)	Herb (%)	Bare (%)
Above OHWM	0	0	95	5
Below OHWM	0	0	25	75

Notes/Description:

Other Evidence: List/describe any additional field evidence and/or lines of reasoning used to support your delineation

Mapped as intermittent on USGS topographic quadrangle. Significant nexus with Ditch No. 44.

Transect (cross-section) drawing: (choose a location that is representative of the dominant stream characteristics over some distance; label the OHWM and other features of interest along the transect; include an estimate of transect length)
Inverted trapezoidal cross-section.

Sample Point Coordinates: 35.7055,-90.0279

OHWM estimated at 13 feet.

See photo 5 in delineation report appendix A

Break in Slope at OHWM: ☐ Sharp (> 60°) | ■ Moderate (30–60°) | ☐ Gentle (< 30°) | ☐ None
Notes/Description:

Sediment Texture: Estimate percentages to describe the general sediment texture above and below the OHWM

	Clay/Silt <0.05mm	Sand 0.05 – 2mm	Gravel 2mm – 1cm	Cobbles 1 – 10cm	Boulders >10cm	Developed Soil Horizons (Y/N)
Above OHWM	100					Y
Below OHWM	100					Y

Notes/Description:

Ditch with mud bottom. Cowardin Code R4UB3

Vegetation: Estimate absolute percent cover to describe general vegetation characteristics above and below the OHWM

	Tree (%)	Shrub (%)	Herb (%)	Bare (%)
Above OHWM	5		90	5
Below OHWM			30	70

Notes/Description:

Other Evidence: List/describe any additional field evidence and/or lines of reasoning used to support your delineation

Labeled as Ditch No. 44 on USGS topographic quadrangle

Transect (cross-section) drawing: (choose a location that is representative of the dominant stream characteristics over some distance; label the OHWM and other features of interest along the transect; include an estimate of transect length)

Inverted trapezoidal cross-section.

Sample Point Coordinates: 35.7050,-90.0263

OHWM estimated at 2 feet. See photo 7 in delineation report appendix A

Break in Slope at OHWM: ☐ Sharp (> 60°) | ■ Moderate (30–60°) | ☐ Gentle (< 30°) | ☐ None
Notes/Description:

Sediment Texture: Estimate percentages to describe the general sediment texture above and below the OHWM

	Clay/Silt <0.05mm	Sand 0.05 – 2mm	Gravel 2mm – 1cm	Cobbles 1 – 10cm	Boulders >10cm	Developed Soil Horizons (Y/N)
Above OHWM	100					Y
Below OHWM	100					Y

Notes/Description:

Shallow ditch with mud bottom. Cowardin Code R4UB3

Vegetation: Estimate absolute percent cover to describe general vegetation characteristics above and below the OHWM

	Tree (%)	Shrub (%)	Herb (%)	Bare (%)
Above OHWM			90	10
Below OHWM			25	75

Notes/Description:

Other Evidence: List/describe any additional field evidence and/or lines of reasoning used to support your delineation

Transect (cross-section) drawing: (choose a location that is representative of the dominant stream characteristics over some distance; label the OHWM and other features of interest along the transect; include an estimate of transect length)

Sample Point Coordinates: 35.7145,-90.0356

Inverted parabolic cross-section. OHWM estimated at 1 foot. See photograph 8 of Appendix A.

Break in Slope at OHWM: ☐ Sharp (> 60°) | ■ Moderate (30–60°) | ☐ Gentle (< 30°) | ☐ None

Notes/Description:

Sediment Texture: Estimate percentages to describe the general sediment texture above and below the OHWM

	Clay/Silt <0.05mm	Sand 0.05 – 2mm	Gravel 2mm – 1cm	Cobbles 1 – 10cm	Boulders >10cm	Developed Soil Horizons (Y/N)
Above OHWM	100					Y
Below OHWM	100					Y

Notes/Description:

Agricultural/Highway drainage swale with mud bottom. No channel or OHWM.

Vegetation: Estimate absolute percent cover to describe general vegetation characteristics above and below the OHWM

	Tree (%)	Shrub (%)	Herb (%)	Bare (%)
Above OHWM	0	0	50	50
Below OHWM	0	0	10	90

Notes/Description:

Crop residue only.

Other Evidence: List/describe any additional field evidence and/or lines of reasoning used to support your delineation

Not mapped on USGS topographic quadrangle. No nexus with TNW or other RPW.

Transect (cross-section) drawing: (choose a location that is representative of the dominant stream characteristics over some distance; label the OHWM and other features of interest along the transect; include an estimate of transect length)

Inverted parabolic cross-section.

Sample Point Coordinates: 35.35.7150,-90.0354

OHWM estimated at 1 foot.

See photo 8 in delineation report appendix A

Break in Slope at OHWM: ☐ Sharp (> 60°) | ■ Moderate (30–60°) | ☐ Gentle (< 30°) | ☐ None
Notes/Description:

Sediment Texture: Estimate percentages to describe the general sediment texture above and below the OHWM

	Clay/Silt <0.05mm	Sand 0.05 – 2mm	Gravel 2mm – 1cm	Cobbles 1 – 10cm	Boulders >10cm	Developed Soil Horizons (Y/N)
Above OHWM	100					N
Below OHWM	100					Y

Notes/Description:

Shallow ditch with mud bottom. Cowardin Code R4UB3

Vegetation: Estimate absolute percent cover to describe general vegetation characteristics above and below the OHWM

	Tree (%)	Shrub (%)	Herb (%)	Bare (%)
Above OHWM			5	95
Below OHWM				100

Notes/Description:

Other Evidence: List/describe any additional field evidence and/or lines of reasoning used to support your delineation

Transect (cross-section) drawing: (choose a location that is representative of the dominant stream characteristics over some distance; label the OHWM and other features of interest along the transect; include an estimate of transect length)

Sample Point Coordinates: 35.7164,-90.0348

Inverted parabolic cross-section. OHWM estimated at 3 feet. See photograph 10 of Appendix A.

Break in Slope at OHWM: ■ Sharp (> 60°) | ☐ Moderate (30–60°) | ☐ Gentle (< 30°) | ☐ None

Notes/Description:

Sediment Texture: Estimate percentages to describe the general sediment texture above and below the OHWM

	Clay/Silt <0.05mm	Sand 0.05 – 2mm	Gravel 2mm – 1cm	Cobbles 1 – 10cm	Boulders >10cm	Developed Soil Horizons (Y/N)
Above OHWM	100					Y
Below OHWM	100					Y

Notes/Description:

Agricultural/Highway drainage swale with mud bottom. No channel or OHWM.

Vegetation: Estimate absolute percent cover to describe general vegetation characteristics above and below the OHWM

	Tree (%)	Shrub (%)	Herb (%)	Bare (%)
Above OHWM	0	0	50	50
Below OHWM	0	0	10	90

Notes/Description:

Crop residue only.

Other Evidence: List/describe any additional field evidence and/or lines of reasoning used to support your delineation

Not mapped on USGS topographic quadrangle. No nexus with TNW or other RPW. Excavated borrow from inside field paddock for field inspection road construction and irrigation water level control.

Transect (cross-section) drawing: (choose a location that is representative of the dominant stream characteristics over some distance; label the OHWM and other features of interest along the transect; include an estimate of transect length)

See photo 3 of delineation report.

Sample Point Coordinates: 35.7199,-90.0305

Trapazoidal cross-section with estimated OHWM at 13 feet

Break in Slope at OHWM: ■ Sharp (> 60°) | ☐ Moderate (30–60°) | ☐ Gentle (< 30°) | ☐ None
Notes/Description:

Sediment Texture: Estimate percentages to describe the general sediment texture above and below the OHWM

	Clay/Silt <0.05mm	Sand 0.05 – 2mm	Gravel 2mm – 1cm	Cobbles 1 – 10cm	Boulders >10cm	Developed Soil Horizons (Y/N)
Above OHWM	100					Y
Below OHWM	100					N

Notes/Description:

mud bottom stream; Cowardin Code R4UB3

Vegetation: Estimate absolute percent cover to describe general vegetation characteristics above and below the OHWM

	Tree (%)	Shrub (%)	Herb (%)	Bare (%)
Above OHWM			100	0
Below OHWM			0	100

Notes/Description:

Other Evidence: List/describe any additional field evidence and/or lines of reasoning used to support your delineation