FIELD ENVIRONMENTAL REPORT

Jurisdictional Waters Determinations and Threatened and Endangered Species Assessments

Replace Pipe and Hydrotest Tennessee River Project

MAY 2024

PREPARED FOR

Tennessee Gas Pipeline Company, L.L.C.

PREPARED BY

SWCA Environmental Consultants

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Replace Pipe and Hydrotest Tennessee River Project

Prepared for

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SWCA Project No. 88382

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SWCA assumes this report may be used to support permitting activities with the Tennessee Department of Environment and Conservation (TDEC). All hydrological determinations findings discussed in this Report are true, accurate, and complete.

Mikala Drees

Mikala Drees, QHP-IT

(Reviewed by Heath Garner, QHP / Certificate No. 1196-TN20)

ACRONYMS AND ABBREVIATIONS

APT	Antecedent Precipitation Tool
BBS	Breeding Bird Survey
BCC	Birds of Conservation Concern
BCR	Bird Conservation Region
BGEPA	Bald and Golden Eagle Protection Act of 1940, as amended
BMPs	Best Management Practices
CFR	Code of Federal Regulations
CLO	Cornell Lab of Ornithology
CWA	Clean Water Act of 1972
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act of 1973, as amended
FAC	Facultative
FACU	Facultative Upland
FACW	Facultative Wetland
FEMA	Federal Emergency Management Act
FERC	Federal Energy Regulatory Commission
GIS	Geographic Information System
HUC	Hydrologic Unit Code
IPaC	Information Planning and Consultation
MBTA	Migratory Bird Treaty Act of 1918, as amended
NHD	National Hydrography Dataset
NLCD	National Land Cover Database
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory
OBL	Obligate
OHWM	Ordinary High-Water Mark
PEM	Palustrine Emergent
PFO	Palustrine Forested
P.L.	Public Law
Plan	FERC's Upland Erosion Control, Revegetation, and Maintenance Plan
Procedures	FERC's Wetland and Waterbody Construction and Mitigation Procedures
Project	Replace Pipe and Hydrotest Tennessee River Project
QHP-IT	Qualified Hydrological Professional In-Training
RHA	Rivers and Harbors Act of 1899
Survey Area	Approximately 9.56 acres of primarily pasture/hay and cultivated crop land located in Decatur and Perry Counties, Tennessee
SWCA	SWCA Environmental Consultants
T.C.A.	Tennessee Code Annotated
T&E	Threatened and Endangered
TDEC	Tennessee Department of Environment and Conservation

TGP	Tennessee Gas Pipeline Company, L.L.C.
TRAM	Tennessee Rapid Assessment Method for Wetlands
TWRA	Tennessee Wildlife Resources Agency
USACE	U.S. Army Corps of Engineers
U.S.C.	U.S. Code
USDA	U.S. Department of Agriculture
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WOTS	Waters of the State
WOTUS	Waters of the United States
WWC	Wet Weather Conveyance

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1 INTRODUCTION

On behalf of Tennessee Gas Pipeline Company, L.L.C. (TGP), SWCA Environmental Consultants (SWCA) has prepared this Field Environmental Report for the proposed Replace Pipe and Hydrotest Tennessee River Project (Project). The Project will involve a class change replacement on 2,200 feet of Line 100-2 and Valve Section 77-2 in Decatur and Perry counties, Tennessee (Appendix A, Figure 1). The Project will require a hydrostatic test of the Tennessee River crossing from station 423+00 to 455+50 and replacing the existing 26-inch AO Smith pipe from station 455+50 to 477+50. The Project will be completed pursuant to 18 Code of Federal Regulations (CFR) § 2.55 - Auxiliary installations and replacement facilities, under the Natural Gas Act through the Federal Energy Regulatory Commission (FERC).

SWCA is seeking concurrence from the U.S. Fish and Wildlife Service (USFWS) Tennessee Ecological Services Field Office for our effects determinations for threatened and endangered (T&E) species detailed in the following sections. SWCA is also seeking concurrence from the Tennessee Wildlife Resources Agency (TWRA) for our effects determinations for the state protected species detailed in the following sections.

This Field Environmental Report details field surveys completed in May 2024 by SWCA for the Project, which comprises 9.56 acres of primarily pasture/hay and cultivated cropland in Decatur and Perry Counties, Tennessee (Survey Area) (Appendix A, Figure 2). The objective of this report is to provide information on the potential T&E species and environmental resources identified by SWCA biologists as follows:

- Federal rare, threatened, or endangered species regulated by the USFWS under the Endangered Species Act of 1973, as amended (ESA), the Bald and Golden Eagle Protection Act of 1940, as amended (BGEPA), and/or the Migratory Bird Treaty Act of 1918, as amended (MBTA);
- Tennessee Department of Environment and Conservation (TDEC) Natural Heritage Inventory Program Rare Species;
- Jurisdictional waters of the United States (WOTUS) regulated by the U.S. Army Corps of Engineers (USACE) under Section 404 of the Clean Water Act of 1972 (CWA) and Section 10 of the Rivers and Harbors Act of 1899 (RHA); and
- Waters of the State (WOTS) as regulated by TDEC under the Tennessee Water Quality Control Act of 1977 and Section 401 of the CWA.

In addition, this report summarizes the methodology used to identify habitats and environmental resources in the field, descriptions of the resources identified, and potential regulatory and/or construction concerns.

2 REGULATORY FRAMEWORK

2.1 Threatened and Endangered Species

The ESA (16 United States Code [U.S.C.] A-1535-1543, Public Law [P.L.] 93-205) prohibits any person or entity from causing a take of any plant or animal species on the Secretary of the Interior's list of threatened and endangered species (Section 9(a)(1)(b)) and states that it is the responsibility of each federal agency to ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence, or result in the destruction or adverse modification of habitat determined to be critical to the conservation of any such species (Section 7(a)(2)). The ESA defines a *take* as the harassment, harm, pursuit, hunting, shooting, killing, trapping, capture, or collection of such species.

The BGEPA provides for the protection of the bald eagle (*Haliaeetus leucocephalus*) and the golden eagle (*Aquila chrysaetos*) by prohibiting the take of any bald or golden eagle, alive or dead, including any part, nest, or egg, unless allowed by permit (16 U.S.C. 668(a); 50 CFR 22). The BGEPA defines a *take* as the pursuit, shooting, shooting at, poisoning, wounding, killing, capturing, trapping, collecting, molesting, or disturbing of a bald or golden eagle.

The MBTA states that it is illegal for anyone to take, possess, import, export, transport, sell, purchase, barter, or offer for sale, purchase, or barter, any migratory bird, or the parts, nests, or eggs of such a bird, except under the terms of a valid permit.

2.2 Jurisdictional Waters of the United States

According to the USACE, WOTUS includes territorial seas, tidal waters, traditional navigable waters, interstate waters, the tributaries that contribute perennial or intermittent flow to such waters, certain ditches, certain ponds and lakes, wetlands adjacent to other jurisdictional waters, or impoundments of these waters (e.g., rivers, creeks, streams, lakes, reservoirs). Special aquatic resources associated with these waters are also considered WOTUS and include sanctuaries and refuges, wetlands, mud flats, vegetated shallows, coral reefs, and riffle and pool complexes.

In the state of Tennessee, the pre-2015 regulatory regime consistent with the Sackett v. U.S. Environmental Protection Agency (EPA) decision is the operative definition of WOTUS (EPA 2024).

2.3 Jurisdictional Waters of the State of Tennessee

The Tennessee Water Quality Control Act of 1977 defines WOTS as "any and all water, public or private, on or beneath the surface of the ground, that are contained within, flow through, or border upon Tennessee or any portion thereof, except those bodies of water confined to and retained within the limits of private property in single ownership that do not combine or effect a junction with natural surface or underground waters" (Tennessee Code Annotated [T.C.A.] Section 69-3-103(45)). Additionally, TDEC defines wetlands as "an area that is inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances does support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include "swamps, marshes, bogs, and similar areas" (Rule 0400-40-07-.03[31] of the Tennessee Water Quality Control Act of 1977).

3 METHODOLOGY

3.1 Desktop Resource Review

This desktop resources review relies solely on publicly and readily available data, such as published literature, online resources, reports, maps, aerial photography, databases, public records, geographic information system (GIS) data sets, and SWCA's in-house sources. Sources for the Project setting review include the U.S. Geological Survey (USGS) National Land Cover Database (NLCD) (USGS 2024a) and the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Web Soil Survey (USDA NRCS 2024).

Sources for biological data review included the USFWS Information Planning and Consultation (IPaC) database (USFWS 2024a), the USFWS Critical Habitat Portal, and the TDEC Division of Natural Areas Rare Species by Quadrangle review (TDEC 2024). Other data sources included a review of the USGS's North American Breeding Bird Survey (BBS) database (Pardieck et al. 2015), Cornell Lab of Ornithology (CLO 2024), and the National Audubon Society's eBird database (eBird 2024). These sources were used to identify avian species known to occur within or in proximity to the Survey Area and determine whether any Birds of Conservation Concern (BCC) may utilize the Survey Area as nesting habitat.

Aquatic resources reviews focused on areas potentially subject to federal and state jurisdiction. Under the authorities of Section 10 of the RHA and/or Section 404 of the CWA, the USACE and/or USEPA regulate WOTUS that include, but are not limited to, wetlands, streams, rivers, and impoundments. Under the authority of Sections 401 and 402 of the CWA, the state of Tennessee, through the TDEC, regulates activities that could affect the water quality of a WOTUS and surface water within the state of Tennessee. Prior to performing the delineation, SWCA conducted a resource review of available background information to help identify portions of the Survey Area most likely to contain wetlands and/or other WOTUS and WOTS (i.e., waterbodies). Resources reviewed included: the USFWS National Wetlands Inventory (NWI) (USFWS 2024b); USGS Digital Elevation Model (USGS 2024c), National Hydrography Dataset (NHD) (USGS 2024b), NLCD (USGS 2024a), and historic USGS topographic quadrangles; the Federal Emergency Management Agency (FEMA) National Flood Hazard Layer Viewer (FEMA 2024); the USDA NRCS Web Soil Survey (USDA NRCS 2024); and aerial imagery. To assess wetland hydrology with respect to rainfall normality within the Survey Area, SWCA used the Antecedent Precipitation Tool (APT) method (USACE 2024).

3.2 Field Reconnaissance

3.2.1 Threatened and Endangered Species

SWCA conducted a field reconnaissance of the Survey Area in May 2024. GPS data uploaded with the Survey Area were used for general orientation and locating the Project boundaries. The field reconnaissance consisted of pedestrian visual surveys to verify mapped land cover data and evaluate the presence or absence of suitable habitat and occurrences of listed species shown in Appendix B within the Survey Area.

3.2.2 Wetlands Field Survey of Potential Jurisdictional Waters of the United States

3.2.2.1 WETLANDS FIELD SURVEY

SWCA conducted field surveys of the Survey Area on May 1 and 2, 2024, and followed the wetland delineation guidelines provided in both the *Corps of Engineers Wetlands Delineation Manual* (Manual) (USACE 1987) and the subsequent *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region* (Version 2.0) (Regional Supplement) (USACE 2012). Field surveys consisted of a pedestrian, meandering transect throughout the Survey Area to assess the presence or absence of the three wetland parameters (i.e., hydrophytic vegetation, hydric soils, and wetland hydrology).

SWCA completed data sheets, which document representative areas of uniformity (i.e., similar vegetation, soils, and hydrology) at select locations (i.e., data points) within the Survey Area to identify wetland and non-wetland areas based on the presence or absence of the wetland parameters (Appendix C). Potential data point locations include wetland/non-wetland boundaries, NWI/NHD feature locations, areas suggestive of inundation or saturation in aerial imagery evaluated during the desktop reviews, and the various non-wetland vegetation community types encountered within the Survey Area. At each data point, SWCA took photographs to support the information recorded on the data sheets and documented the general conditions observed in the field (Appendix D).

SWCA used a Geode GNS2 GPS unit to geographically reference features, such as data point locations and wetland/waterbody boundaries, identified during the delineation. GIS software was used to differentially correct (i.e., post-process) collected features, calculate areas, and generate the Project wetland delineation map.

Vegetation Community Types and Hydrophytic Vegetation

SWCA categorized vegetation community types within the Survey Area into one of three categories based on the uppermost layer of vegetation that comprised at least 30 percent areal cover: emergent/herbaceous, shrub/scrub, or forested. SWCA further characterized wetland communities using the USFWS' *Classification of Wetlands* and *Deepwater Habitats of the United States* (FGDC 2013). Wetland and non-wetland vegetation communities were differentiated by the presence or absence of hydrophytic vegetation, respectively.

To assess this parameter consistently with the Regional Supplement, SWCA personnel listed all plants by strata within circular sample plots centered at each data point and estimated the percentage of each plant species' areal cover within the sample plot. Then, based on the USACE's *National Wetland Plant List: 2020 Wetland Ratings* (USACE 2021), SWCA personnel assigned the appropriate wetland indicator status rating to each species and assessed dominance and prevalence values, as appropriate, to determine if the assessed plant community met the hydrophytic vegetation parameter.

Hydric Soils

To assess this parameter consistently with the Regional Supplement, SWCA personnel extracted soil samples to a depth of no more than 20 inches at the data points and recorded soil characteristics (e.g., color, texture) necessary for comparison to known indicators. The hydric soil parameter was considered to be met if the soil profile matched the description of a regionally accepted hydric soil indicator.

Wetland Hydrology

In accordance with the Regional Supplement, SWCA recorded all indications of periodic inundation and/or soil saturation within an assessed area and compared them to known wetland hydrology indicators. If the area displayed at least one primary indicator or two secondary indicators, the wetland hydrology parameter was considered met.

3.2.2.2 WATERBODIES FIELD SURVEY

Waterbodies within the Survey Area that possessed an ordinary high-water mark (OHWM) were delineated by SWCA biologists. SWCA delineated the OHWM following the recommendations of the *USACE Regulatory Guidance Letter 05-05: Ordinary High Water Mark Identification* (USACE 2005). Furthermore, TDEC defines a watercourse as any human-made, modified, or natural hydrologic feature with a defined channel which discretely conveys flowing water. Watercourses were further identified as either "Streams" or "Wet Weather Conveyance" (WWC) according to the TDEC *Guidance for Making Hydrologic Determinations* (TDEC 2020). This guidance outlines the primary field indicators of WWCs and streams in addition to the secondary field indicators to be used in the absence of any primary indicators; hydrologic determination field datasheets were completed for each watercourse (Appendix C). The TDEC Hydrologic Determination primary field indicators for WWC and streams are listed below (TDEC 2020).

WWCs are watercourses that contain one or more of the following indicators and not considered WOTS:

- Water flow only in a direct response to precipitation runoff in their immediate locality.
- A channel that remains above the groundwater table.
- Is not suitable for drinking water supplies.
- Does not have sufficient water to support fish, or multiple populations of aquatic organisms whose life cycle includes an aquatic phase of at least 2 months.

Streams are watercourses that contain one or more of the following indicators:

- Flowing water after ≥7 rain-free days.
- A natural connection to the groundwater table.
- Displays evidence of being used as a drinking-water supply.
- Contains multiple populations of obligate lotic organisms or fish.

If none of the above indicators are observed during the field investigation, a watercourse can still be classified using a series of 28 secondary geomorphic, hydrologic, and biologic indicators, each of which is assigned a score based on its quality/quantity. If the sum of these scores reaches the minimum threshold of 19, the watercourse is considered a stream, otherwise it is considered a WWC (and not a WOTS).

For each waterbody, SWCA took photographs and documented its general characteristics (e.g., OHWM dimensions, geomorphology, flow, substrate).

3.3 Jurisdictional Review

SWCA consulted the re-established pre-2015 regulatory regime (40 CFR 230.3) to determine the potential jurisdictional status of all delineated features as described in section 1.1. SWCA's opinion of the potential jurisdictional status of each wetland and waterbody is based upon best professional judgement and previous

experience working on projects within the region. Additionally, SWCA followed the guidelines set forth in the Tennessee Water Quality Control Act of 1977 defining WOTS. A hydrological determination of each apparent linear watercourse was conducted in accordance with the April 2020 TDEC Division of Water Pollution Control Guidance for Making Hydrologic Determinations V 1.5 (TDEC 2020) by a Tennessee Qualified Hydrological Professional In-Training (QHP-IT) to determine its jurisdictional status. Linear watercourses were classified as streams (jurisdictional WOTS) or wet weather conveyances (non-jurisdictional).

The delineation findings contained within this report represent the professional opinion of SWCA and are not a verification or jurisdictional determination of WOTUS or WOTS. No other warranty, expressed or implied, is made.

4 RESULTS

4.1 Desktop Resources Review

4.1.1 Land Cover

The Survey Area consists of ten field-verified NLCD-mapped units. The majority of the Survey Area has been confirmed to be pasture/hay (27.5%) and cultivated crops (26.9%) land cover; eight additional land uses were mapped within the Survey Area (Table 1; Appendix A, Figure 2a – 2c).

Table 1. Field-Verified NLCD Land Cover Types Within the Survey Area

NLCD Land Cover Type	Acreage within Survey Area[1]	Percentage of Survey Area[1]
Pasture/Hay	2.63	27.5%
Cultivated Crops	2.57	26.9%
Woody Wetlands	1.22	12.7%
Developed, Open Space	1.19	12.5%
Developed, Low Intensity	0.75	7.9%
Mixed Forest	0.44	4.6%
Deciduous Forest	0.43	4.5%
Open Water	0.21	2.2%
Developed, Medium Intensity	0.70	0.7%
Grassland/Herbaceous	0.04	0.4%
Total[2]	**9.56**	**100%**

Source: USGS (2024a)

[1] Acreages and percentages are rounded to 0.1.

[2] Total values may differ slightly from total expected acreage values due to rounding.

4.1.2 Threatened and Endangered Species

SWCA reviewed the USFWS IPaC database (USFWS 2024a) and TDEC Division of Natural Areas Rare Species by Quadrangle (TDEC 2024) to develop a list of federally T&E species or state protected species known to occur or have the potential to occur in the Survey Area (Appendix B). Table 2 lists federal T&E species, state protected species, and birds of conservation concern (BCCs) with the potential to occur in the Survey Area. BCCs are a result of the 1988 amendment to the Fish and Wildlife Conservation Act mandating the USFWS to "identify species, subspecies, and populations of all migratory nongame birds that, without additional conservation actions, are likely to become candidates for listing under the ESA of 1973" (USFWS 2008). Bird species considered for the BCC list include nongame birds, gamebirds without hunting seasons, and ESA candidate, proposed, and recently delisted species. The BCC species identified on the USFWS IPaC are protected under the MBTA. In addition, bald eagles are protected by the BGEPA and the MBTA, and bald eagles have the potential to occur in the Survey Area.

The potential for the occurrence of each federally listed species and state protected species was summarized according to the categories listed below. Potential for occurrence categories are as follows:

- ***Known to occur***: the species has been documented in the Survey Area by a reliable observer.
- ***May occur***: the Survey Area is within the species' currently known range, and habitat types within the Survey Area resemble those known to be used by the species.
- ***Unlikely to occur***: the Survey Area is within the species' currently known range, but habitat types within the Survey Area do not resemble those known to be used by the species.
- ***Does not occur***: the Survey Area is clearly outside the species' currently known range.

Species that do not occur or are unlikely to occur are not described in section 4.2.1.

Those species listed as a candidate for federal listing or as T&E by the USFWS were assigned to one of three categories of possible effect, following USFWS recommendations. The evaluation of impacts to species is limited to the Survey Area and does not assess the impacts to the species or their habitats at regional or global levels. The effects determinations recommended by the USFWS (USFWS 1998) are defined below:

- ***May affect, is likely to adversely affect*** adverse effects to listed species may occur as a direct or indirect result of the Project, and the effect is not discountable, insignificant, or beneficial.
- ***May affect, is not likely to adversely affect***: the Project may affect listed species and/or critical habitat; however, the effects are expected to be discountable, insignificant, or completely beneficial.
- ***No effect***: the Project will not affect federally listed species or critical habitat.

The BGEPA prohibits anyone, without the proper permit, from taking bald eagles or golden eagles, including their parts, nests, or eggs. The two possible effects determinations for taking bald eagles or golden eagles are defined below:

- ***Will cause a take***: the Project and its activities are reasonably anticipated to cause a take of bald eagles or golden eagles, including their parts, nests, or eggs.
- ***Unlikely to cause a take***: the Project and its activities are not reasonably anticipated to cause a take of bald eagles or golden eagles, including their parts, nests, or eggs.

4.1.3 Bird Conservation Regions

Bird Conservation Regions (BCRs) are ecologically distinct regions in North America with similar bird communities, habitats, and resource management issues (USFWS 2008). The USFWS identifies BCC within ecological BCRs that are priorities for conservation action, with the intent to prevent or eliminate the need for the ESA, Section 4, as amended, listing by taking proactive management and conservation actions. The Survey Area is located within the Southeastern Coast Plain BCR 27 (USFWS 2021). The USFWS IPaC report (Appendix B) identified 12 BCC species associated with the Survey Area, including: bobolink (*Dolichonyx oryzivorus*), chimney swift (*Chaetura pelagica*), eastern whip-poor-will (*Antrostomus vociferus*), field sparrow (*Spizella pusilla*), Kentucky warbler (*Geothlypis formosa*), lesser yellowlegs (*Tringa flavipes*), prairie warbler (*Setophaga discolor*), prothonotary warbler (*Protonotaria citrea)*, red-headed woodpecker (*Melanerpes erythrocephalus*), rusty blackbird (*Euphagus carolinus*), semipalmated sandpiper (*Calidris pusilla*), and wood thrush (*Hylocichla mustelina*). Information on the probability of presence and breeding season can be found in Appendix B.

Table 2. Federal Listed Threatened, Endangered and Candidate Species, State Protected Species, and Birds of Conservation Concern with Potential to Occur Within the Survey Area

Common Name (*Scientific Name*)	Status[1]	Listed on IPaC?	Range or Habitat Requirements	Potential for Occurrence in Survey Area	Determination of Effect
Birds					
Bald Eagle (*Haliaeetus leucocephalus*)	BGEPA, MBTA, SP	Yes	Ranges throughout North America and is a year-round resident in Alabama (CLO 2024). Breeds in forested areas near large bodies of water. Bald Eagles winter on reservoirs and large rivers in Tennessee (TWRA 2024a). Nest in tall trees or cliffs near water, with breeding pairs typically returning to the same nest annually. In Tennessee, egg laying peaks in late February (TWRA 2024a).	*May occur*. There were no tall trees observed within the Survey Area; however, the Survey Area is adjacent to the Cumberland River, which may provide suitable foraging habitat for this species. The USFWS bald eagle mapper was consulted and determined there was one nest within 1 mile of the Survey Area (Esri 2024). The nearest nest is located approximately 0.38 miles south of the Survey Area. There were no occurrences for this species within 1 mile of the Survey Area. The nearest individual observation was recorded in April 2024, where one individual was observed approximately 1.50 miles north of the Survey Area (eBird 2024). No nests or individuals were observed during the field survey.	Not likely to cause a take See Section 4.2.1.1
Golden Eagle (*Aquila chrysaetos*)	BGEPA, MBTA, SP	Yes	The golden eagle is a western bird that is rare but regularly known to winter in Tennessee. Between 1995 and 2006, 47 captive-raised golden eagles were released in Tennessee. This species is most likely to be observed in Tennessee between mid-November to early March (TWRA 2024g). In Tennessee, Golden Eagles are more likely to be found near wooded areas interspersed with patches of open habitat (TWRA 2024g).	*May occur*. The survey area contained potentially suitable habitat for this species in the wooded and open areas of the Survey Area. The nearest occurrence for this species was observed in February 2024, approximately 5.09 miles north of the Survey Area at the Tennessee National Wildlife Refuge (eBird 2024). Although this species may occur transiently over the Survey Area, no tree clearing is proposed for the Project, therefore, impacts to this species are not anticipated.	Not likely to cause a take See Section 4.2.1.1
Whooping Crane (*Grus americana*)	EPNE	Yes	This species relies on shallow marshes and adjacent open grasslands (NWF 2024). Whooping cranes will use a variety of habitats during migration and feeding, predominantly in palustrine or riverine wetland systems but also in lacustrine wetlands, agricultural fields, and flooded croplands (Austin and Richert 2001). CWS and USFWS (2005) suggest landscapes characterized as “wetland mosaic” provide the most suitable migration stopover habitat. This species is considered a very rare migrant and winter resident in Middle and East Tennessee (TWRA 2024b).	*Unlikely to occur*. The nearest occurrence for this species was observed in December 2017, approximately 5.10 miles north of the Survey Area at the Tennessee National Wildlife Refuge (eBird 2024). Although the Project is within the range for this species, there are no known occurrences within 5 miles of the Survey Area (eBird 2024), and suitable habitat is not present within the Survey Area.	No effect

Common Name (*Scientific Name*)	**Status[1]**	**Listed on IPaC?**	**Range or Habitat Requirements**	**Potential for Occurrence in Survey Area**	**Determination of Effect**
Clams					
Longsolid (*Fusconaia subrotunda*)	FT	Yes	This species is found in streams to medium rivers with sand or gravel substrates and low flows; the species likely has a tolerance for pool habitats (NatureServe 2024b).	*Unlikely to occur.* No construction activities will occur within the Tennessee River. Therefore, impacts within the river are not anticipated.	*No effect*
Orangefoot Pimpleback (*Plethobasus cooperianus*)	FE, SP	Yes	This species is found in medium to large rivers with moderate gradients in sand, gravel, and cobble substrates in riffles and shoals (NatureServe 2024c).	*Unlikely to occur.* No construction activities will occur within the Tennessee River. Therefore, impacts within the river are not anticipated.	*No effect*
Pink Mucket (*Lampsilis abrupta*)	FE	Yes	This species is associated with large rivers with fast flowing waters, although recently, it has been observed in impoundments with river-lake conditions. Found in waters with strong currents, rocky or boulder substrates, with depths up to about 1 meter, but is also found in deeper waters with slower currents and sand and gravel substrates (NatureServe 2024d).	*Unlikely to occur.* No construction activities will occur within the Tennessee River. Therefore, impacts within the river are not anticipated.	*No effect*
Ring Pink (*Obovaria retusa*)	FE, SP	Yes	This species is found in medium to large rivers in gravel and sand bars (NatureServe 2024e).	*Unlikely to occur.* No construction activities will occur within the Tennessee River. Therefore, impacts within the river are not anticipated.	*No effect*
Spectaclecase (*Cumberlandia monodonta*)	FE	Yes	This species is found in rivers and large stream systems with clear, moderately flowing water and a variety of substrates, including mud, gravel, sand, and cobble with shallow riffles (NatureServe 2024f)	*Unlikely to occur.* No construction activities will occur within the Tennessee River. Therefore, impacts within the river are not anticipated.	*No effect*
White Wartyback (*Plethobasus cicatricosus*)	FE	Yes	This species was presumed to inhabit shoals and riffles in large rivers like the Tennessee (NatureServe 2024g)	*Unlikely to occur.* No construction activities will occur within the Tennessee River. Therefore, impacts within the river are not anticipated.	*No effect*
Fish					
Flame Chub (*Hemitremia flammea*)	SP	No	This species prefers springs and spring-fed streams with lush aquatic vegetation within the Tennessee & middle Cumberland River watersheds (TDEC 2024).	*Unlikely to occur.* No construction activities will occur within the Tennessee River. Therefore, impacts within the river are not anticipated.	*No effect*
Firebelly Darter (*Etheostoma pyrrhogaster*)	SP	No	This species is found in sand and gravel bottomed pools of headwaters, creeks, and small rivers within the upper Coastal Plain in Obion River watershed; west Tennessee (TDEC 2024).	*Unlikely to occur.* No construction activities will occur within the Tennessee River. Therefore, impacts within the river are not anticipated.	*No effect*
Insects					

Common Name (*Scientific Name*)	**Status[1]**	**Listed on IPaC?**	**Range or Habitat Requirements**	**Potential for Occurrence in Survey Area**	**Determination of Effect**
Monarch Butterfly (*Danaus plexippus*)	FC	Yes	Overwinter in the mature oyamel fir forests in the mountains of central Mexico. In March, they travel to the northern United States and Canada (USFWS 2024c). Pine, fir, and cedar trees are often chosen for roosting (USDA USFS 2024). During the breeding season, they are typically found in open grassy areas, laying their eggs exclusively on the milkweed plant (USFWS 2024d). Milkweed plants can be found in a wide range of habitats, including, but not limited to, prairies, fields, open woodlands, and roadsides (USFWS 2024d).	*May occur.* Suitable habitat for the milkweed plant is present throughout the open rights-of-way within the Survey Area, and the Survey Area falls within the species' migration corridor (USDA USFS 2024). No individual monarchs or milkweeds were observed during the field survey.	*May affect, is not likely to adversely affect* See Section 4.2.1.2
Mammals					
Gray Bat (*Myotis grisescens*)	FE	Yes	Gray bats occupy caves or cave-like structures year-round (NatureServe 2024a). While gray bats prefer caves, summer colonies have been documented using dams, mines, quarries, concrete box culverts, and the undersides of bridges (USFWS 2024e). Summer caves must be warm or have restricted rooms that can trap the body heat of clustered bats (USFWS 2024e).	*May occur.* No caves or sinkholes were identified within the Survey Area and there are no known occurrences of this species within the quadrangle for the Survey Areas (TDEC 2024). Should caves or sinkholes be identified, TGP will avoid work in these areas. Suitable habitat may be present within the three culverts observed during field survey. TGP will avoid culverts that could provide suitable habitat for this species. Suitable foraging habitat for this species exists within the Survey Area due to its proximity to nearby ponds and waterbodies. To minimize potential impacts to foraging habitat for gray bats, TGP will implement best management practices (BMPs) in accordance with FERC's Upland Erosion Control, Revegetation, and Maintenance Plan (Plan; FERC 2013a) and Wetland and Waterbody Construction and Mitigation Procedures (Procedures; FERC 2013b) during pipeline replacement.	*May affect, is not likely to adversely affect* See Section 4.2.1.3
Northern Long-eared Bat (*Myotis septentrionalis*)	FE	Yes	This species uses forested areas for roosting, foraging, and commuting between summer and winter habitat (USFWS 2024f). Preferred habitat includes areas with a dense growth of trees and underbrush covering a large tract and a natural chamber or series of chambers in the earth or on the side of a hill or cliff (USFWS 2024f). In winter, individuals hibernate in caves and abandoned mines, often with other species of bats (USFWS 2024f).	*May occur.* Suitable habitat for this species is present within hickory shagbark (*C. ovata*) within the Survey Area. No caves or sinkholes were identified and there are no known occurrences of this species within the quadrangle for the Survey Area (TDEC 2024). Should caves or sinkholes be identified, TGP will avoid work in those areas. No tree clearing is anticipated within the Survey Area. Therefore, impacts to this species are not anticipated.	*May affect, is not likely to adversely affect* See Section 4.2.1.3

Common Name (*Scientific Name*)	**Status[1]**	**Listed on IPaC?**	**Range or Habitat Requirements**	**Potential for Occurrence in Survey Area**	**Determination of Effect**
Tricolored Bat (*Perimyotis subflavus*)	PE	Yes	This species occupies a wide variety of habitats, including caves, mines, and rock crevices during the winter and small caves, hollow trees, under tree bark, brush piles, buildings, culverts, and artificial roosting boxes during non-winter months (USFWS 2024g).	*May occur.* Suitable habitat for this species is present within hickory shagbark (*C. ovata*) within the Survey Area. No caves or sinkholes were identified and there are no known occurrences of this species within the quadrangle for the Survey Area (TDEC 2024). Should caves or sinkholes be identified, TGP will avoid work in those areas. No tree clearing is anticipated within the Survey Area. Therefore, impacts to this species are not anticipated.	*May affect, is not likely to adversely affect* See Section 4.2.1.3
Plants					
Rough Rattlesnake-root (*Prenanthes aspera*)	SP	No	This species has been documented in prairies, glades, and barrens (TDEC 2024).	Unlikely to occur. Suitable habitat for the species does not exist within the Survey Area	*No effect*
Blue Sage (*Salvia azurea var. grandiflora*)	SP	No	This species is found in barrens ecosystems (TDEC 2024).	*Unlikely to occur.* This species is known only to occur in barrens ecosystems, which are not present within the Survey Area.	*No effect*
Bearded Rattlesnake-root (*Prenanthes barbata*)	SP	No	This species occurs in barrens and dry woodlands in the state of Tennessee (TDEC 2024).	*Unlikely to occur.* This species is known to occur in barrens and dry woodlands, which are not present within the Survey Area. No individuals were observed during field survey.	*No effect*
Creamflower Tick-Trefoil (*Desmodium ochroleucum*)	SP	No	This species occurs in sandy dry woodlands in the state of Tennessee (TDEC 2024).	*Unlikely to occur.* This species is known to occur in sandy dry woodlands, which are not present within the Survey Area. No individuals were observed during field survey.	*No effect*
Wedge-leaved Whitlow-grass (*Draba cuneifolia*)	SP	No	This species has been documented in barrens and glades (TDEC 2024).	*Unlikely to occur.* This species is known to occur in barrens and glades, which are not present within the Survey Area. No individuals were observed during field survey.	*No effect*
Hairy Fimbristylis (*Fimbristylis puberula*)	SP	No	This species occurs in wet prairies and wooded areas in the state of Tennessee (TDEC 2024).	*Unlikely to occur.* This species is known to occur in wet prairies and woods, which are not present within the Survey Area. No individuals were observed during field survey.	*No effect*

Common Name (*Scientific Name*)	**Status[1]**	**Listed on IPaC?**	**Range or Habitat Requirements**	**Potential for Occurrence in Survey Area**	**Determination of Effect**
Great Plains Ladies'-tresses (*Spiranthes magnicamporum*)	SP	No	This species occurs in glades ecosystems in the state of Tennessee (TDEC 2024).	*Unlikely to occur.* This species is known to occur in glades, which are not present within the Survey Area. No individuals were observed during field survey.	*No effect*
Western False Gromwell (*Lithospermum bejariense*)	SP	No	This species occurs in glades ecosystems in the state of Tennessee (TDEC 2024).	*Unlikely to occur.* This species is known to occur in glades, which are not present within the Survey Area. No individuals were observed during field survey.	*No effect*
Flat-stemmed Spike-rush (*Eleocharis compressa*)	SP	No	This species occurs in wet limestone glades ecosystems in the state of Tennessee (TDEC 2024).	*Unlikely to occur.* This species is known to occur in wet limestone glades, which are not present within the Survey Area. No individuals were observed during field survey.	*No effect*
Slender Blazing-star (*Liatris cylindracea*)	SP	No	This species is found in barrens ecosystems (TDEC 2024).	*Unlikely to occur.* This species is known only to occur in barrens ecosystems, which are not present within the Survey Area.	*No effect*
Western Tennessee Valley Limestone Hill Barrens (*Juniperus virginiana / Schizachyrium scoparium - (Andropogon gerardii, Sorghastrum nutans) - Silphium terebinthinaceum Wooded Grassland*)	SP	No	The Silurian limestone outcroppings in the Western Valley are considered some of the most extensive in the unglaciated United States. This glade/barrens complex is classified as a Western Valley Limestone Hill Barren community and is considered a globally imperiled community (TWRA 2024h).	*Does not occur.* The Survey Area includes residential properties and pasture land that does not support the glades/barren habitat for this plant community.	*No effect*
Reptiles					
Alligator Snapping Turtle (*Macrochelys temminckii*)	PT	Yes	This species usually occurs in large and deep bodies of water such as lakes, large rivers, and deep sloughs, often among submerged logs or root snags (TWRA 2024f).	*Unlikely to occur.* No construction activities will occur within the Tennessee River. Therefore, impacts within the river are not anticipated.	*No effect*
Critical Habitat					
Critical Habitat	N/A	Yes	Not applicable	*No critical habitat present.*	*No effect*

[1] Status: BCC = Birds of Conservation Concern; BGEPA = Bald and Golden Eagle Protection Act; EPNE = Experimental Population, Non-Essential; FC= Federal Candidate; FE = Federal Endangered; FT = Federal Threatened; PE = Proposed Endangered; PT = Proposed Threatened; N/A = Not Applicable

4.1.4 Hydrology

The Project components are entirely within the Tennessee Region (2-digit hydrologic unit code [HUC] 06) in the Tennessee River-Marsh Creek Subwatershed (HUC 060400010705). The Survey Area contains approximately 0.65 acre of mapped NWI wetlands and 0.03 acre of mapped NHD streams/waterbodies. Approximately 6.88 acres of the Survey Area is located within the limits of the 100-year floodplain (Zone AE) (FEMA 2024).

SWCA calculated the APT wetland hydrologic condition for May 2024 using APT data from multiple stations located within 25 miles of the site (Global Historical Climatology Network 2024; USACE 2024). The precipitation and 30-year normal range values used to calculate the monthly wetland hydrologic condition during the delineation are provided in Appendix E. According to the APT output, the Survey Area was experiencing normal hydrologic conditions during field surveys in May 2024.

4.1.5 Soils

According to the NRCS soil survey, twenty-nine map units are present within the components of the Survey Area (Appendix A, Figure 3), and one of the soil map units is listed as a hydric soil that contains hydric components (Tables 3 and 4) (USDA NRCS 2024). Appendix F provides descriptions of the NRCS soil map units present within the Survey Area.

Table 3. All NRCS-mapped Soils Within the Survey Area

Map Unit Name (Symbol)	Hydric Criteria	Acreage Within Survey Area[1]	Percentage of Survey Area[1]
Decatur County			
Taft silt loam, 0 to 2 percent slopes (Ta)	No	1.7	18.0%
Wolftever silt loam, slightly eroded phase (Wc)	No	0.8	8.6%
Lindell silt loam, 0 to 2 percent slopes, occasionally flooded (La)	No	0.3	3.1%
Wolftever silt loam (Wb)	No	0.2	2.0%
Talbott silt loam, rolling phase (Tc)	No	0.2	1.8%
Collins Silt Loam (Bo)	No	0.2	1.7%
Talbott-Rock outcrop, severely eroded rolling phase (Tr)	No	0.2	1.6%
Talbott-Rock outcrop, eroded rolling phase (To)	No	0.1	1.4%
Talbot silty clay loam, eroded rolling phase (Te)	No	0.1	1.3%
Talbott-Rock outcrop, eroded hilly phase (Tn)	No	0.1	1.0%
Emory silt loam (Eb)	No	0.1	0.7%
Melvin silt loam (Me)	Yes	0.1	0.5%
Robertsville silt loam (Ra)	Yes	<0.1	0.4%
Rough gullied land and Talbott (Rg)	No	<0.1	0.3%
Talbott-Rock outcrop, severely eroded hilly phase (Tp)	No	<0.1	0.2%
Talbott-Rock outcrop, rolling phase (Tl)	No	<0.1	0.1%
Talbott silty clay loam, severely eroded rolling phase (Th)	No	<0.1	<0.1%
	County Subtotal	4.1	42.7%

Map Unit Name (Symbol)	Hydric Criteria	Acreage Within Survey Area[1]	Percentage of Survey Area[1]
Perry County			
Staser fine sandy loam, occasionally flooded (Sa)	No	1.2	12.5%
Pickwick silt loam, 2 to 5 percent slopes, eroded (PkB2)	No	1.0	10.0%
Wolftever silt loam, 1 to 6 percent slopes, eroded, occasionally flooded (WfB2)	No	0.7	7.1%
Braxton-Talbott complex, 15 to 35 percent slopes, severely eroded (BtE3)	No	0.5	5.1%
Talbott-Mimosa complex, 15 to 35 percent slopes, very rocky (TbE)	No	0.5	5.1%
Busseltown loam, 1 to 6 percent slopes, eroded, rarely flooded (BuB2)	No	0.4	4.6%
Lobelville silt loam, occasionally flooded (Lo)	No	0.4	4.2%
Paden silt loam, 0 to 3 percent slopes, rarely flooded (PdA)	No	0.4	4.0%
Pickwick silt loam, 5 to 12 percent slopes, severely eroded (PkC3)	No	0.3	3.3%
Rock outcrop-Barfield complex, 10 to 30 percent slopes (RoD)	No	<0.1	<0.1%
Water	N/A	0.1	1.5%
	County Subtotal	5.5	57.3%
	Total[2]	**9.6**	**100.0%**

Source: USDA NRCS (2024)

[1] Acreages and percentages are rounded to 0.1.

[2] Totals may vary due to rounding.

Table 4. NRCS-mapped Hydric Soils and Their Hydric Characteristics Within the Survey Area

	Hydric Component Characteristics			
Map Unit Name (Symbol)	Component Name (Unit Percent)	Landform	Hydric Group[1]	Acreage within the Survey Area[2]
Melvin silt loam (Me)	Melvin (100%)	Floodplains	B/D	0.1
Robertsville silt loam (Ra)	Robertsville (100%)	Floodplains	D	<0.1
			Total[3]	**0.1**

Source: USDA NRCS (2024)

[1] Hydric Group: B = Soils having moderate infiltration rates when thoroughly wetted; D (Undrained areas) = Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet.

[2] Acreages are rounded to 0.01 acre.

4.2 Field Results

4.2.1 Threatened and Endangered Species

Species that do not occur or are unlikely to occur, as identified in Table 2, are not described in this section.

4.2.1.1 BIRDS

Bald Eagle (*Haliaeetus leucocephalus*)

Current Federal Status: Other (protected under BGEPA; BCC)

Current State Status: Recovered

Description, Habitat, and Range Requirements: The bald eagle is a large, white-headed, and white-tailed raptor that was initially listed as endangered in 1967. Delisted under the ESA in 2007, the bald eagle continues to have protection under the BGEPA (USFWS 2007). Bald eagles range across most of North America and are fairly common in winter, spring, and fall in the Tennessee Valley region, wintering on reservoirs and large rivers in Tennessee (OA 2024; TWRA 2024c). Bald eagles are opportunistic predators that feed primarily on fish within large, perennial bodies of water. Large nests are most often built in the crowns of tall trees, usually near water. There are over 175 nesting pairs of bald eagles in Tennessee as of 2012, and most of these birds remain in the state year-round (TWRA 2024c). Individuals from more northern breeding populations migrate to Tennessee for the winter, arriving in late October, and peak numbers of 300 to 500 individuals occur in late January to mid-February (TWRA 2024c).

Recommended bald eagle management guidelines are detailed in the *National Bald Eagle Management Guidelines* composed by the USFWS (2007). The aim of these guidelines is to advise interested parties of activities that may disturb and cause a take of this species. Certain avoidance and mitigation methods are recommended within 660 feet of an active or alternate bald eagle nest.

Potential for Occurrence: Bald eagles are found statewide in Tennessee; however, they are concentrated primarily along rivers and large bodies of water. No tall trees were observed within the Survey Area; however, the Survey Area is located adjacent to the Cumberland River, which may provide suitable foraging habitat for this species. The Bald Eagle Mapper was consulted and determined there was one nest within 1 mile of the Survey Area (Esri 2024). The nearest nest is located approximately 0.38 mile south of the Survey Area. It is unknown if this nest was active during the 2023-2024 nesting season, however, according to eBird, no individual bald eagle occurrences for this species within 1 mile of the Survey Area. The nearest individual observation was recorded in April 2024, approximately 1.50 miles north of the Survey Area (eBird 2024). No nests or individuals were observed during the field survey.

Determination of Impact: Project activities are unlikely to adversely affect bald eagles due to the lack of preferred habitat within the Survey Area in conjunction with the lack of observed nests in the Survey Area. However, TGP should be aware of possible bald eagle occurrences within 5 miles of the area and implement appropriate best management practices as outlined in the National Bald Eagle Management Guidelines (USFWS 2007) should any nests be observed during construction or other Project activities to ensure that Project activities are “unlikely to cause a take” of bald eagles.

Golden Eagle (*Aquila chrysaetos*)

Current Federal Status: Other (protected under BGEPA; BCC)

Current State Status: Threatened

Description, Habitat, and Range Requirements: In North America, golden eagles range from Alaska to northern Mexico. In the United States, they are most commonly found in the western half of the country. However, they can occasionally be seen in eastern locations, particularly during migration or the winter (USFWS 2024h). Golden eagles are one of the largest and fastest raptors in North America (AAB 2024). This species has long, broad wings that are held in a slight "V" when soaring, and legs that are feathered to the toes. The adult is dark brown with golden tinged feathers on the back of the head (TWRA 2024g). Between 1995

and 2006, 47 captive-raised golden eagles were released in Tennessee. This species is most likely to be observed in Tennessee between mid-November to early March (TWRA 2024g). In Tennessee, Golden Eagles are more likely to be found near wooded areas interspersed with patches of open habitat (TWRA 2024g).

Recommended golden eagle management guidelines are detailed in the *National Bald Eagle Management Guidelines* composed by the USFWS (2007). The aim of these guidelines is to advise interested parties of activities that may disturb and cause a take of this species. Certain avoidance and mitigation methods are recommended within 660 feet of an active or alternate golden eagle nest.

Potential for Occurrence: Golden eagles are concentrated primarily along wooded areas interspersed with patches of open habitat which was observed within the Survey Area. In Tennessee, this species is observed sporadically between mid-November to early March (TWRA 2024g). In February 2024, one individual was observed approximately 5.09 miles north of the Survey Area at the Tennessee National Wildlife Refuge (eBird 2024). No individuals or nests were observed during field survey.

Determination of Impact: Project activities are unlikely to adversely affect golden eagles due to the lack observations within 1 mile of the Survey Area in conjunction with the lack of observed nests in the Survey Area. However, TGP should be aware of possible golden eagle occurrences within 5 miles of the area and implement appropriate best management practices as outlined in the National Bald Eagle Management Guidelines (USFWS 2007) should any nests be observed during construction or other Project activities to ensure that Project activities are "unlikely to cause a take" of golden eagles.

4.2.1.2 INSECTS

Monarch Butterfly (*Danaus plexippus*)

Current Federal Status: Candidate

Current State Status: Not Listed

Description, Habitat, and Range Requirements: The monarch butterfly is a large butterfly characterized by its vibrant orange wings with black veining and borders contrasted by white spots. In North America, the eastern populations overwinter in the mature oyamel fir forests in the mountains of central Mexico. In March, they make one of the most phenomenal cross-country journeys, traveling over 2,000 miles to the northern U.S. and Canada (USDA USFS 2024). Monarchs travel only during the day and require roost sites at night. Pine, fir, and cedar trees are often chosen for roosting (USDA USFS 2024). During the breeding season, monarchs are typically found in open grassy areas, laying their eggs exclusively on the milkweed plant (USFWS 2024c; NPS 2024). Milkweed plants can be found in a wide range of habitats, including, but not limited to, prairies, fields, open woodlands, and roadsides (Xerces Society 2024a). Throughout all times of the year, monarchs rely on a diversity of nectar-rich plants for energy (Xerces Society 2024b).

Potential for Occurrence: The monarch butterfly is listed on the USFWS IPaC Official Species List. No individuals were observed during the field survey; however, suitable habitat for milkweed species is present throughout the right-of-way, and the Survey Area falls within the species' migration corridor (USDA USFS 2024). Therefore, the monarch butterfly may occur within the Survey Area.

Determination of Impact: The Project would temporarily disturb suitable habitat for the monarch butterfly; however, disturbance of potential habitat would be limited to a narrow pipeline replacement corridor, and these areas would be allowed to return to pre-construction conditions over time. Due to the limited size of the pipeline replacement corridor, the ability to allow these areas to return to pre-construction conditions, and this species' mobility within the limited habitat, the Project is not anticipated to have an adverse effect on the monarch butterfly. TGP understands there is no requirement to consult on candidate species.

4.2.1.3 MAMMALS

Gray Bat (*Myotis grisescens*)

Current Federal Status: Endangered

Current State Status: Protected

Description, Habitat, and Range Requirements: The gray bat is a medium-sized insectivorous bat with an overall length of about 3.5 inches and a wingspan of 10 to 11 inches (USFWS 2024e). This species occurs in the southeastern and midwestern United States within limestone karst areas marked by landscape features, including caves, sinkholes, springs, and other features that can provide suitable habitat for this species (USFWS 2024e). This species is closely associated with water, where it drinks and forages for night-flying insects. Gray bats inhabit caves year-round, but typically use different caves for winter and summer residence and will sometimes use man-made tunnels as their summer quarters (TWRA 2024d). Mating occurs in the fall, and females enter hibernation soon after breeding (TWRA 2024d).

Potential for Occurrence: The gray bat is listed on the USFWS IPaC Official Species list. No individuals were observed during the survey and no caves are known to occur within 0.5 miles of the Project. Occurrence of this species within the Survey Area is considered possible due to the Survey Area's location within the species' range, the presence of suitable foraging habitat associated with nearby rivers, ponds, streams, and wetlands, and the presence of potential roosting habitat within the three culverts present within the Survey Area.

Determination of Impact: The gray bat would not likely pose a constraint for the Project. To minimize potential impacts to gray bats, TGP will implement best management practices (BMPs) in accordance with FERC's Plan and Procedures (FERC 2013a and 2013b) during pipeline replacements. It is recommended that if culverts are to be impacted by the pipeline replacement, these culverts are checked prior to impact to ensure no individuals are present. If individuals are present, further consultation with USFWS may be required. With the implementation of applicable BMPs and adherence to the FERC's Plan and Procedures, it is anticipated that the Project "may affect, not likely to adversely affect" this species.

Northern Long-eared Bat (*Myotis septentrionalis*)

Current Federal Status: Endangered

Current State Status: Protected

Description, Habitat, and Range Requirements: As its name suggests, the northern long-eared bat is distinguished by its long ears, particularly as compared to other bats in the genus Myotis (USFWS 2024f). This species typically overwinters in caves or mines and spends the remainder of the year in forested habitats (USFWS 2024f). While males can be found in caves year-round, females form small maternity colonies and can be found in barns, attics, and under tree bark or shutters (TWRA 2024e). Due to white-nose syndrome, this is one of the rarest bats in Tennessee (TNBWG 2024).

Potential for Occurrence: The northern long-eared bat is listed on the USFWS IPaC Official Species list. Occurrence of this species within the Survey Area is considered possible due to the Survey Area's location within the species' range and potential suitable habitat in the Survey Areas. No individuals were observed during the survey. While suitable habitat was observed, this habitat was not continuous throughout the Survey Area.

Determination of Impact: The northern long-eared bat would not likely pose a constraint for the Project. To minimize potential impacts to northern long-eared bats, TGP will implement best management practices

(BMPs) in accordance with FERC's Plan and Procedures (FERC 2013a and 2013b) during pipeline replacements. It is recommended that if culverts are to be impacted by the pipeline replacement, these culverts are checked prior to impact to ensure no individuals are present. If individuals are present, further consultation with USFWS may be required. No tree clearing is anticipated within the Survey Area. With the implementation of applicable BMPs, adherence to the FERC's Plan and Procedures, and lack of tree clearing, it is anticipated that the Project "may affect, not likely to adversely affect" this species.

Tricolored Bat (*Perimyotis subflavus*)

Current Federal Status: Proposed Endangered

Current State Status: Not Protected

Description, Habitat, and Range Requirements: The tricolored bat is one of the smallest bats native to North America. The once common species is wide-ranging across the eastern and central United States and portions of southern Canada, Mexico, and Central America. During the winter, tricolored bats are found in caves and mines, although in the southern United States, where caves are sparse, tricolored bats are often found roosting in road-associated culverts. During the spring, summer, and fall, tricolored bats are found in forested habitats where they roost in trees, primarily among leaves. As its name suggests, the tricolored bat is distinguished by its unique tricolored fur that appears dark at the base, lighter in the middle, and dark at the tip (USFWS 2024g).

On September 13, 2022, the USFWS announced a proposal to list the tricolored bat as endangered under the ESA. The bat faces extinction due to the impacts of white-nose syndrome, a deadly disease affecting cave-dwelling bats across the continent (USFWS 2024g).

Potential for Occurrence: The tricolored bat is listed on the USFWS IPaC Official Species list. The Survey Area contains shagbark hickory trees that may provide roosting habitat for the tricolored bat; however, suitable forested habitat was not continuous throughout the Survey Area. No individuals were observed during the survey.

Determination of Impact: To minimize potential impacts to tricolored bats, TGP will implement best management practices (BMPs) in accordance with FERC's Plan and Procedures (FERC 2013a and 2013b) during pipeline replacements. It is recommended that if culverts are to be impacted by the pipeline replacement, these culverts are checked prior to impact to ensure no individuals are present. If individuals are present, further consultation with USFWS may be required. No tree clearing is anticipated within the Survey Area. With the implementation of applicable BMPs, adherence to the FERC's Plan and Procedures, and lack of tree clearing, it is anticipated that the Project "may affect, not likely to adversely affect" this species.

4.2.2 Potential Jurisdictional Waters of the United States

4.2.2.1 WETLANDS

SWCA identified one vegetation community type within the Survey Area, including one wetland vegetation community (i.e., palustrine emergent [PEM] wetland) and one non-wetland/upland vegetation community [herbaceous]). The vegetative species identified at each data point, along with their areal coverage, are recorded on the data sheets in Appendix C.

A photographic log, which includes a representative subset of the vegetation communities observed within the Survey Area as viewed from select data points, is provided in Appendix D.

Direct observations of soil samples found that the typical soil matrices and typical redox components were 10YR, 7.5YR, and 5YR in hue. Soil textures observed were silt loam and silty clay. All wetland areas displayed a depleted matrix (F3) hydric soil indicator. Non-wetland/upland areas failed to display hydric soil indicators or displayed hydric soils but failed to meet vegetation and/or hydrology parameters. Refer to Appendix C for data-point-specific soil observations.

Wetland hydrology indicators observed in the field included primary wetland hydrology indicators (i.e., drift deposits) and secondary wetland hydrology indicators (i.e., positive facultative [FAC]-neutral test and crayfish burrows). Refer to the data sheets in Appendix C for the wetland hydrology indicators observed at a specific data point. The Non-Hydrogeomorphic Tennessee Rapid Assessment Method for Wetlands (TRAM) data sheets documenting wetland quality can be found in Appendix H.

SWCA delineated two wetlands consisting of PEM cover types (WA001 and WA002) within the Survey Area. Consistent with the pre-2015 regulatory regime, only those wetlands with a "continuous surface connection" to waters are protected under the CWA. Due to the relatively permanent water to provide a continuous surface connection, WA001 was determined to be potentially jurisdictional under the CWA and a WOTUS. Wetland WA002 lacked relatively permanent water to provide a continuous surface connection and was determined to be non-jurisdictional under the CWA and not a WOTUS. WA001 and WA002 are still considered a potentially jurisdictional WOTS since no connection to relatively permanent waters (RPW) is required by the State of Tennessee for wetlands. Additional details are provided in Table 5. See Figure 4 in Appendix A for the locations of WA001, WA002, and corresponding data points within the Survey Area.

PEM wetland cover type **WA001** was identified during the field delineation. The survey team was able to access the wetland to collect soil samples and observe hydrologic conditions. The dominant herbaceous species and respective indicator statuses present were soft rush (*Juncus effusus;* FACW [facultative wetland]), fox sedge (*Carex vulpinoidea;* OBL [obligate]), and Bush's sedge (*Carex bushii;* FACW). This wetland exhibited a positive FAC-neutral test and crayfish burrows.

PEM wetland cover type **WA002** was identified during the field delineation. The survey team was able to access the wetland to collect soil samples and observe hydrologic conditions. The survey team also observed multiple species of wetland vegetation. The dominant herbaceous species and respective indicator statuses present were Curly dock (*Rumex crispus*; FAC [facultative upland]), fox sedge (*Carex vulpinoidea;* OBL), and Bush's sedge (*Carex bushii;* FACW). This wetland exhibited a positive facultative [FAC]-neutral test and drift deposits.

Table 5. Wetlands Identified Within the Survey Area

Figure Number (Appendix A)	Wetland ID	Latitude	Longitude	Jurisdictional Status[1,2] WOTUS / WOTS		Wetland Community Type	Wetland Acreage in Survey Corridor[3]
4	WA001	35.592371	-88.034234	Yes	Yes	PEM	0.23
4	WA002	35.601893	-88.019912	No	Yes	PEM	0.41
						Total[4]	**0.65**

[1] This determination is SWCA's professional opinion of the U.S. Army Corps of Engineers (USACE) jurisdictional status of each feature under Section 404 of the Clean Water Act (CWA).

[2] Effective August 29, 2023, wetland jurisdictional status is being interpreted as consistent with the pre-2015 regulatory regime (40 Code of Federal Regulations [CFR] 230.3).

[3] Acreages are rounded to 0.01.

[4] Total values may differ slightly from total expected values due to rounding.

4.2.2.2 WATERCOURSES

SWCA delineated three linear watercourses within the Survey Area totaling 186.3 feet or 0.03 acres. Of the three watercourses delineated within the Survey Area, SA001 and SA003 possessed relatively permanent flow and are considered potentially jurisdictional WOTUS under the CWA. Additionally, SA002 was determined to be a wet weather conveyance (WWC) by scoring under 19 on the TDEC Division of Water Resources Hydrological Determination Field Data Sheets (Appendix G). The type, likely jurisdictional status, hydrological determination scoring, length, and acreage of each watercourse within the Survey Area are provided in Table 6. Refer to Figure 4 in Appendix A for the location of each watercourse within the Survey Area. Photographs of a subset of the waterbodies are provided in Appendix D.

Table 6. Watercourses Identified Within the Survey Area

Waterbody ID	Latitude/ Longitude	HD Score	Jurisdictional Status[1,2] WOTUS/WOTS		Waterbody Type	USGS Name[3]	Waterbody Length in Survey Corridor (Feet)[4]	Waterbody Acreage in Survey Corridor[5]
SA001	35.602184/ -88.019563	21.0	Yes	Yes	Perennial Stream	UT to Cypress Creek	76.1	0.01
SA002	35.599818/ -88.023066	6.0	No	No	WWC	--	93.2	0.01
SA003	35.590137/ -88.040245	26.50	Yes	Yes	Intermittent Stream	UT to Tennessee River	17.1	<0.01
						Total[6]	186.3	**0.03**

[1] This determination is SWCA's professional opinion of the U.S. Army Corps of Engineers (USACE) jurisdictional status of each feature under Section 404 of the Clean Water Act (CWA).

[2] Effective August 29, 2023, the significant nexus test has been removed, and the adjacent wetland definition has been revised to include only wetlands that have a continuous surface connection to a waterbody that is protected under the CWA.

[3] UT = unnamed tributary, --- = unnamed waterbody

[4] Distances are rounded to 0.1.

[5] Acreages round to 0.01.

[6] Total values may differ slightly from total expected acreages and lengths due to rounding.

5 CONCLUSION

The existing conditions of the Survey Area primarily consist of pasture/hay and cultivated crops land cover. The Project will not result in the "take" or "harm" or "jeopardize the continued existence of federally listed species." Impact determinations include "*May affect, is not likely to adversely affect*" for the monarch butterfly, gray bat, northern long-eared bat, and tricolored bat with the remaining species having a "*no effect"* determination for this Project.

SWCA performed a wetland delineation for the Survey Area on May 2, 2024. The delineation identified two wetlands totaling approximately 0.65 acre and three linear watercourses totaling 186.3 feet or 0.03 acres within the Survey Area.

SWCA's opinion of the potential jurisdictional status of each wetland and waterbody is based upon best professional judgement and previous experience working on projects within the region. Consistent with the pre-2015 regulatory regime, wetland WA001 and watercourses SA001 and SA003 identified within the Survey Area are considered potentially jurisdictional, given their connection to relatively permanent water features.

The delineation findings contained within this report represent the professional opinion of SWCA and are not a verification or jurisdictional determination of WOTUS. No other warranty, expressed or implied, is made.

6 LITERATURE CITED

All About Birds (AAB). 2024. Golden Eagle. Available at: https://www.allaboutbirds.org/guide/Golden_Eagle/overview. Accessed May 2024.

Austin, J.E., and A.L. Richert. 2001. A comprehensive review of observational and site evaluation data of migrant whooping cranes in the United States, 1943-1999. U.S. Geological Survey, Northern Prairie Wildlife Research Center, Jamestown, North Dakota. Available at: https://pubs.usgs.gov/unnumbered/93805/report.pdf. Accessed May 2024.

Canadian Wildlife Service (CWS) and U.S. Fish and Wildlife Service (USFWS). 2005. International Recovery Plan for the Whooping Crane. Ottawa: Recovery of Nationally Endangered Wildlife (RENEW), and Albuquerque, New Mexico: U.S. Fish and Wildlife Service.

Cornell Lab of Ornithology (CLO). 2024. All About Birds. Available at: https://www.allaboutbirds.org/. Accessed May 2024.

eBird. 2024. An online database of bird distribution and abundance (web application). Available at: http://www.ebird.org. Accessed May 2024.

Esri. 2024. ArcGIS Bald Eagle Nests in Tennessee. Available at: https://www.arcgis.com/home/webmap/viewer.html?webmap=389e5a6293c84943b6ba644ad1f4e1d9&extent=-90.3905,34.0459,-82.2771,37.5556. Accessed May 2024.

Federal Emergency Management Agency (FEMA). 2024. National Flood Hazard Layer Viewer. Available at: https://hazards-fema.maps.arcgis.com/apps/webappviewer/index.html. Accessed May 2024.

Federal Geographic Data Committee (FGDC). 2013. Classification of Wetlands and Deepwater Habitats of the United States. FGDC-STD-004-2013. Second Edition. Wetlands Subcommittee, Federal Geographic Data Committee and U.S. Fish and Wildlife Service, Washington, D.C.

Federal Energy Regulatory Commission (FERC). 2013a. Upland Erosion Control, Revegetation and Maintenance Plan. Available at: https://www.ferc.gov/industries/gas/enviro/plan.pdf. Accessed May 2024.

_____. 2013b. Wetland and Waterbody Construction and Mitigation Procedures. Available at: https://www.ferc.gov/industries/gas/enviro/procedures.pdf. Accessed May 2024.

Global Historical Climatology Network. 2024. Available at: https://www.ncdc.noaa.gov/data-access/land-based-station-data/land-based-datasets/global-historical-climatology- network-ghcn. Accessed May 2024.

National Park Service (NPS). 2024. Milkweed and Monarchs. Available at: https://www.nps.gov/articles/000/milkweed-and-monarchs.htm. Accessed May 2024.

National Wildlife Federation (NWF). 2024. Available at: https://www.nwf.org/Educational-Resources/Wildlife-Guide/Birds/Whooping-Crane. Accessed May 2024.

NatureServe. 2024a. *Myotis grisescens*. Gray Myotis. Available at: https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.104746/Myotis_grisescens. Accessed May 2024.

_____. 2024b. *Fusconaia subrotunda*, Longsolid. Available at: https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.118395/Fusconaia_subrotunda. Accessed May 2024.

_____. 2024c. *Plethobasus cooperianus,* Orangefoot Pimpleback. Available at: https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.120557/Plethobasus_cooperianus. Accessed May 2024.

_____. 2024d. *Lampsilis abrupta,* Pink Mucket. Available at: https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.114659/Lampsilis_abrupta. Accessed May 2024.

_____. 2024e. *Obovaria retusa,* Pink Ring. Available at: https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.112130/Obovaria_retusa. Accessed May 2024.

_____. 2024f. *Margaritifera monodonta,* Spectaclecase. Available at: https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.106982/Margaritifera_monodonta. Accessed May 2024.

_____. 2024g. *Plethobasus cicatricosus,* White Wartyback. Available at: https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.119203/Plethobasus_cicatricosus. Accessed May 2024.

Outdoor Alabama (AO). 2024. Bald Eagle. Available at: https://www.outdooralabama.com/osprey-hawks-and-falcons/bald-eagle. Accessed May 2024.

Pardieck, K.L., D.J. Ziolkowski, Jr., and M.A.R. Hudson. 2015. North American Breeding Bird Survey Dataset 1966–2014, Version 2014.0. Available at: www.pwrc.usgs.gov/BBS/RawData/. Accessed May 2024.

Tennessee Bat Working Group (TNBWG). 2024. Northern Long-eared Bat. Available at: http://www.tnbwg.org/TNBWG_MYSE.html. Accessed May 2024.

Tennessee Department of Environmental Conservation (TDEC). 2020. Division of Water Pollution Control. Guidance for Making Hydrologic Determinations. Version 1.5. Available at: https://www.tn.gov/content/dam/tn/environment/water/policy-and-guidance/dwr-nr-g-03-hydrologic-determinations%E2%80%9304012020.pdf. Accessed May 2024.

_____. 2024. Rare Species by Quadrangle. Available at: https://dataviewers.tdec.tn.gov/dataviewers/. Accessed May 2024.

Tennessee Wildlife Resources Agency (TWRA). 2024a. Bald Eagles in Tennessee. Available at: https://www.tn.gov/twra/wildlife/birds/bald-eagle.html. Accessed May 2024.

_____. 2024b. Whooping Crane. Available at: https://www.tn.gov/twra/wildlife/birds/whooping-crane.html. Accessed May 2024.

_____. 2024c. Bald Eagles in Tennessee. Available at: https://www.tn.gov/twra/wildlife/birds/bald-eagle.html. Accessed May 2024.

_____. 2024d. Gray Bat, Myotis Federally Endangered. Available at: https://www.tn.gov/twra/wildlife/mammals/mammals-bats/gray-bat.html. Accessed May 2024.

_____. 2024e. Northern Long-eared Bat, Myotis. Available at: https://www.tn.gov/twra/wildlife/mammals/mammals-bats/northern-long-eared-bat.html. Accessed May 2024.

_____. 2024f. Alligator Snapping Turtle, Macrochelys temminckii. Available at: https://www.tn.gov/twra/wildlife/reptiles/turtle/alligator-snapping-turtle.html. Accessed May 2024.

_____. 2024g. Golden Eagle, *Aquila chrysaetos*. Available at: https://www.tn.gov/twra/wildlife/birds/golden-eagle.html. Accessed May 2024.

_____. 2024h. Carroll Cabin Barrens Class II Natural-Scientific State Natural Area. Available at: https://www.tn.gov/environment/program-areas/na-natural-areas/natural-areas-west-region/west-region/carroll-cabin-barrens.html. Accessed May 2024.

U.S. Army Corps of Engineers (USACE). 1987. Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1. Vicksburg, Mississippi: U.S. Army Engineers Waterways Experiment Station Environmental Laboratory.

———. 2005. Ordinary High Water Mark Identification. Regulatory Guidance Letter 05-05. Dated December 7, 2005.

———. 2012. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region Version 2.0, eds. J.F. Berkowitz, J.S. Wakeley, R.W. Lichvar, C.V. Noble. ERDC/EL TR-12-9. Vicksburg, MS: U.S. Army Engineer Research and Development Center.

———. 2021. National Wetland Plant List. 2020 National Wetland Plant List (NWPL). Dated November 2, 2021.

———. 2024. Antecedent Precipitation Tool (APT) APT v2.0.0.0 for Decatur and Perry Counties, Tennessee. U.S. Army Corps of Engineers.

U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (USDA NRCS). 2024. Web Soil Survey. U.S. Department of Agriculture, Natural Resources Conservation Service. Available at: https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx. Accessed May 2024.

U.S. Department of Agriculture (USDA) U.S. Forest Service (USFS). 2024. Monarch Butterfly Migration and Overwintering. Available at: https://www.fs.usda.gov/wildflowers/pollinators/Monarch_Butterfly/migration/index.shtml. Accessed May 2024.

U.S. Environmental Protection Agency (EPA). 2024. Waters of the United States. Definition of “Waters of the United States”: Rule Status and Litigation Update. Available at: https://www.epa.gov/wotus/definition-waters-united-states-rule-status-and-litigation-update. Accessed May 2024.

U.S. Fish and Wildlife Service (USFWS). 1998. Endangered Species Consultation Handbook. *Procedures for Conducting Consultation and Conference Activities Under Section 7 of the Endangered Species Act*. Available at: Endangered Species Consultation Handbook (fws.gov). Accessed May 2024.

———. 2007. National Bald Eagle management Guidelines. Available at: https://www.fws.gov/sites/default/files/documents/national-bald-eagle-management-guidelines_0.pdf. Accessed May 2024.

———. 2008. Birds of Conservation Concern. U.S. Department of Interior, Fish and Wildlife Service, Division of Migratory Bird Management, Arlington, Virginia. 85 pp.

_____. 2021. Birds of Conservation Concern 2021. Available at: https://www.fws.gov/sites/default/files/documents/birds-of-conservation-concern-2021.pdf. Accessed May 2024.

———. 2024a. Information for Planning and Conservation. Available at: http://ecos.fws.gov/ipac/. Accessed May 2024.

———. 2024b. National Wetlands Inventory. Available at: https://www.fws.gov/wetlands/. Accessed May 2024.

_____. 2024c. Monarchs. Available at: https://www.fws.gov/initiative/pollinators/monarchs. Accessed May 2024.

_____. 2024d. Monarch. Available at: https://www.fws.gov/species/monarch-danaus-plexippus. Accessed May 2024.

_____. 2024e. Gray Bat. Available at: https://www.fws.gov/species/gray-bat-myotis-grisescens. Accessed May 2024.

_____. 2024f. Northern Long-eared Bat. Available at: https://www.fws.gov/species/northern-long-eared-bat-myotis-septentrionalis. Accessed May 2024.

_____. 2024g. Tricolored Bat. Available at: https://www.fws.gov/species/tricolored-bat-perimyotis-subflavus. Accessed May 2024.

_____. 2024h. Golden Eagle. Available at: https://www.fws.gov/species/golden-eagle-aquila-chrysaetos. Accessed May 2024.

U.S. Geological Survey (USGS). 2024a. National Land Cover Database: Multi-Resolution Land Characteristics Consortium. Available at: https://www.mrlc.gov/. Accessed May 2024.

———. 2024b. National Hydrography Dataset. Available at: https://www.usgs.gov/core-science-systems/ngp/national-hydrography. Accessed May 2024.

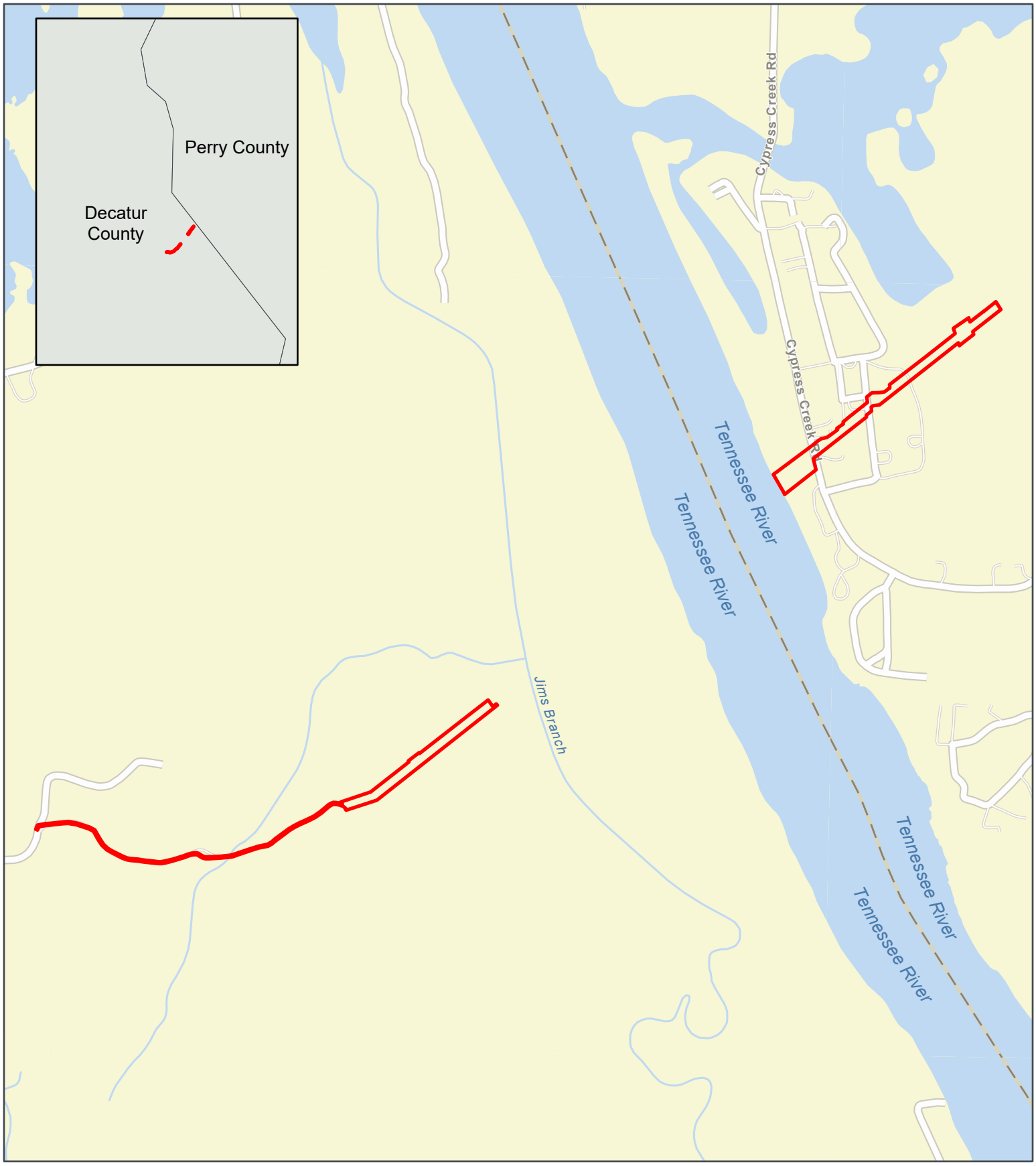
———. 2024c. Digital Elevation Model. Available at: https://www.usgs.gov/science-explorer-results?es=DEM. Accessed May 2024.

Xerces Society. 2024a. Regional Roadside Habitat for Monarchs: Milkweeds of the Southeast. Available at: https://www.xerces.org/publications/fact-sheets/roadside-habitat-for-monarchs-milkweeds-of-southeast. Accessed May 2024.

———. 2024b. Monarch Nectar Plant Guides. Available at: https://www.xerces.org/monarchs/monarch-nectar-plant-guides. Accessed May 2024.

APPENDIX A

Figures



REPLACE PIPE AND HYDROTEST TENNESSEE RIVER PROJECT

Figure 1. Project Overview

Project Area

Decatur County, TN
USGS 7.5' Quadrangle:
Perryville, TN, 35088-E1
NAD 1983 StatePlane
Tennessee FIPS 4100 Feet
35.5966°N 88.0314°W

0 540 1,080 Feet
0 130 260 Meters

N

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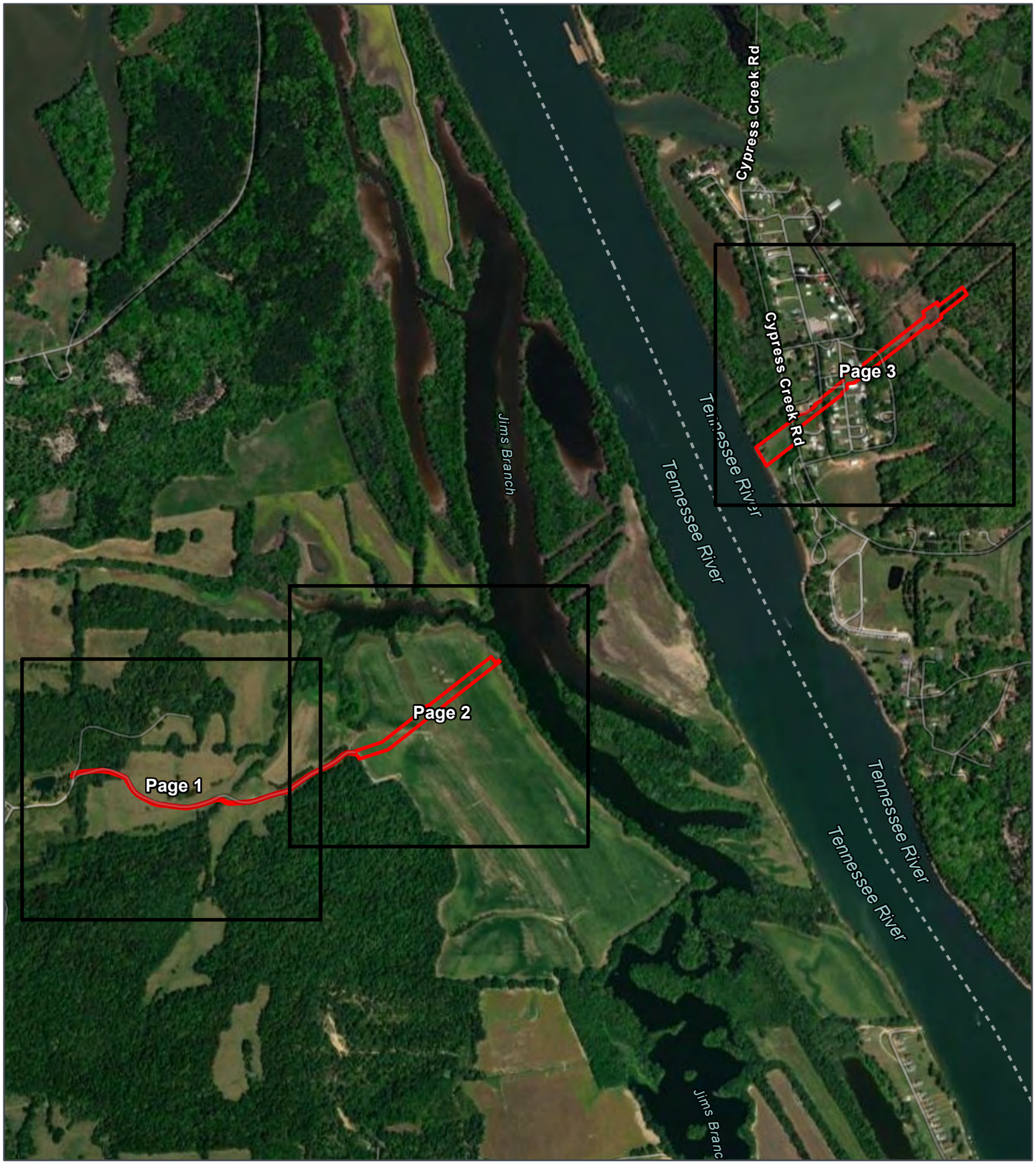
Base Map: ESRI ArcGIS Online, accessed May 2024
Updated: 5/7/2024
Project No. 88382
Layout: 1_Vicinity Aprx:
6Pipeon100-2LineTennesseeRiverHDD

SWCA ENVIRONMENTAL CONSULTANTS



REPLACE PIPE AND HYDROTEST TENNESSEE RIVER PROJECT

Figure 2a. Map Index

Map Grid Index (1:4,000)

Project Area

Decatur County, TN
USGS 7.5' Quadrangle:
Perryville, TN, 35088-E1
NAD 1983 StatePlane
Tennessee FIPS 4100 Feet
35.5958°N 88.0314°W

0 580 1,160 Feet
0 140 280 Meters

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Base Map: ESRI ArcGIS Online, accessed May 2024
Updated: 5/7/2024
Project No. 88382
Layout: 2a_MapIndex
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REPLACE PIPE AND HYDROTEST TENNESSEE RIVER PROJECT

Figure 2b. National Land Cover Dataset (2021)

- Cultivated Crops
- Developed, Open Space
- Developed, Low Intensity
- Mixed Forest
- Pasture/Hay
- Project Area

Decatur County, TN
USGS 7.5' Quadrangle:
Perryville, TN, 35088-E1
NAD 1983 StatePlane
Tennessee FIPS 4100 Feet
35.5904°N 88.0419°W

Base Map: ESRI ArcGIS Online, accessed May 2024
Updated: 5/7/2024
Project No. 88382
Layout: 2_NLCD
Aprx:
6Pipeon100-2LineTennesseeRiverHDD

0 160 320 Feet
0 40 80 Meters

N

1:4,000

SWCA ENVIRONMENTAL CONSULTANTS

REPLACE PIPE AND HYDROTEST TENNESSEE RIVER PROJECT

Figure 2c. National Land Cover Dataset (2021)

- Cultivated Crops
- Mixed Forest
- Pasture/Hay
- Woody Wetlands
- Project Area

Decatur County, TN
USGS 7.5' Quadrangle:
Perryville, TN, 35088-E1
NAD 1983 StatePlane
Tennessee FIPS 4100 Feet
35.5924°N 88.0337°W

Base Map: ESRI ArcGIS Online, accessed May 2024
Updated: 5/7/2024
Project No. 88382
Layout: 2_NLCD
Aprx:
6Pipeon100-2LineTennesseeRiverHDD

0 160 320 Feet
0 40 80 Meters

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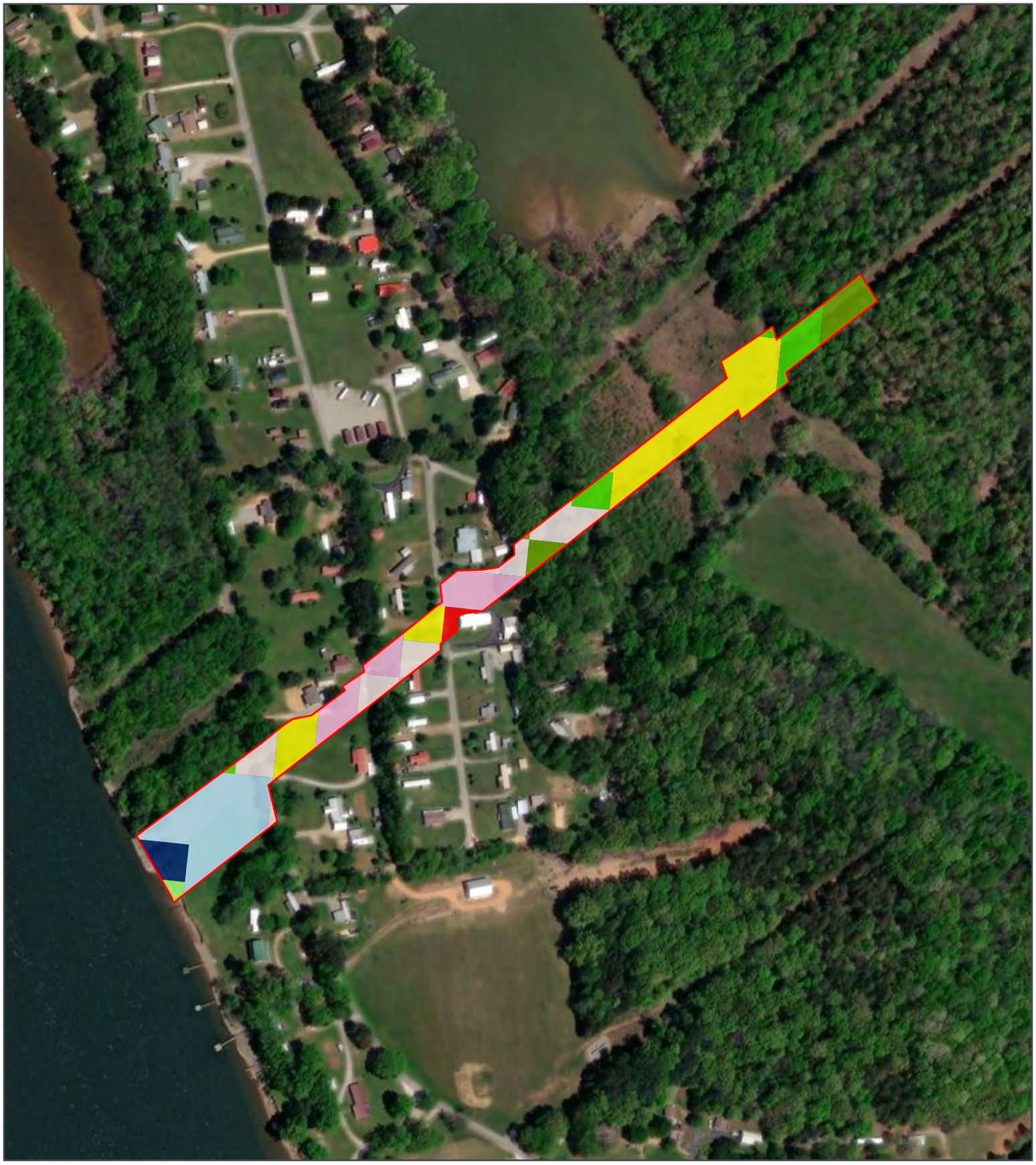
SWCA ENVIRONMENTAL CONSULTANTS



REPLACE PIPE AND HYDROTEST TENNESSEE RIVER PROJECT

Figure 2d. National Land Cover Dataset (2021)

- Developed, Open Space
- Developed, Low Intensity
- Developed, Medium Intensity
- Deciduous Forest
- Grassland/Herbaceous
- Mixed Forest
- Open Water
- Pasture/Hay
- Woody Wetlands
- Project Area

Decatur County, TN
USGS 7.5' Quadrangle:
Perryville, TN, 35088-E1
NAD 1983 StatePlane
Tennessee FIPS 4100 Feet
35.6011°N 88.021°W

Base Map: ESRI ArcGIS Online, accessed May 2024
Updated: 5/7/2024
Project No. 88382
Layout: 2_NLCD
Aprx:
6Pipeon100-2LineTennesseeRiverHDD

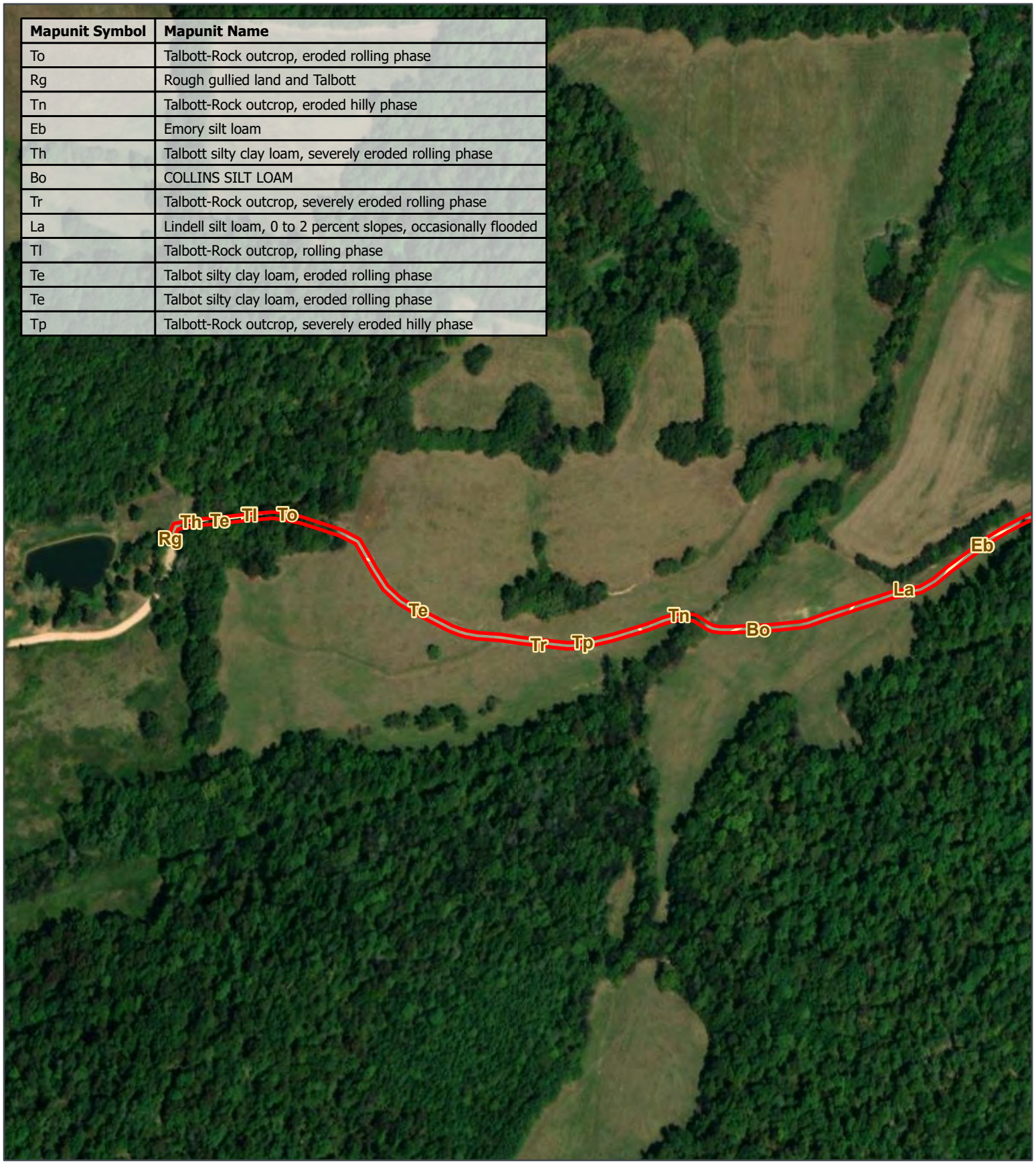
0 160 320 Feet
0 40 80 Meters

N

1:4,000

SWCA ENVIRONMENTAL CONSULTANTS

Mapunit Symbol	Mapunit Name
To	Talbott-Rock outcrop, eroded rolling phase
Rg	Rough gullied land and Talbott
Tn	Talbott-Rock outcrop, eroded hilly phase
Eb	Emory silt loam
Th	Talbott silty clay loam, severely eroded rolling phase
Bo	COLLINS SILT LOAM
Tr	Talbott-Rock outcrop, severely eroded rolling phase
La	Lindell silt loam, 0 to 2 percent slopes, occasionally flooded
Tl	Talbott-Rock outcrop, rolling phase
Te	Talbot silty clay loam, eroded rolling phase
Te	Talbot silty clay loam, eroded rolling phase
Tp	Talbott-Rock outcrop, severely eroded hilly phase



REPLACE PIPE AND HYDROTEST TENNESSEE RIVER PROJECT

Figure 3a. Soils

Soil Unit Boundary

Project Area

Decatur County, TN
USGS 7.5' Quadrangle:
Perryville, TN, 35088-E1
NAD 1983 StatePlane
Tennessee FIPS 4100 Feet
35.5904°N 88.0419°W

0 160 320 Feet
0 40 80 Meters

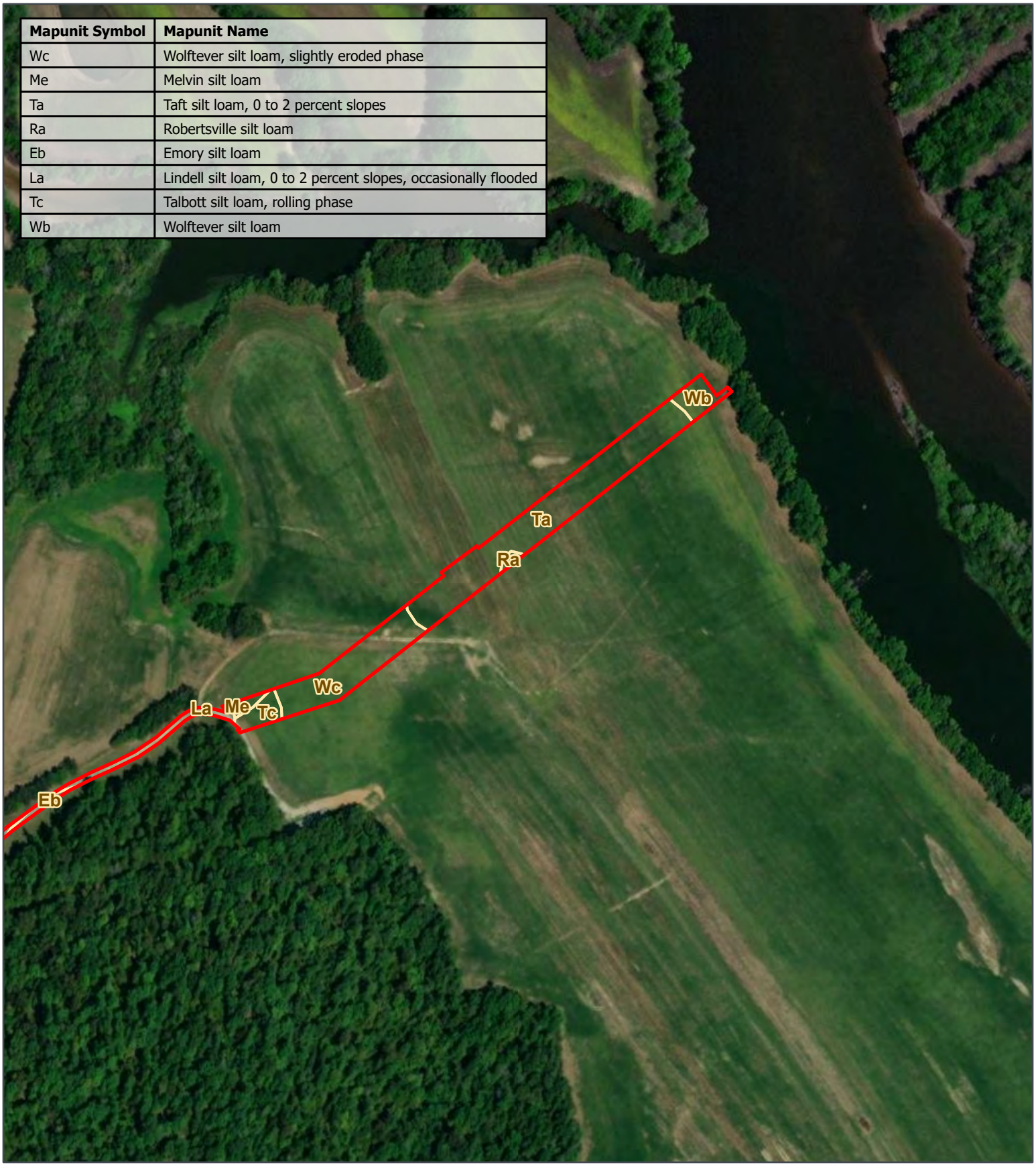
N

1:4,000

Base Map: ESRI ArcGIS Online, accessed May 2024
Updated: 5/7/2024
Project No. 88382
Layout: 3_Soils
Aprx: 6Pipeon100-2LineTennesseeRiverHDD

SWCA ENVIRONMENTAL CONSULTANTS

Mapunit Symbol	Mapunit Name
Wc	Wolftever silt loam, slightly eroded phase
Me	Melvin silt loam
Ta	Taft silt loam, 0 to 2 percent slopes
Ra	Robertsville silt loam
Eb	Emory silt loam
La	Lindell silt loam, 0 to 2 percent slopes, occasionally flooded
Tc	Talbott silt loam, rolling phase
Wb	Wolftever silt loam



REPLACE PIPE AND HYDROTEST TENNESSEE RIVER PROJECT

Figure 3b. Soils

Soil Unit Boundary

Project Area

Decatur County, TN
USGS 7.5' Quadrangle: Perryville, TN, 35088-E1
NAD 1983 StatePlane Tennessee FIPS 4100 Feet
35.5924°N 88.0337°W

0 160 320 Feet
0 40 80 Meters

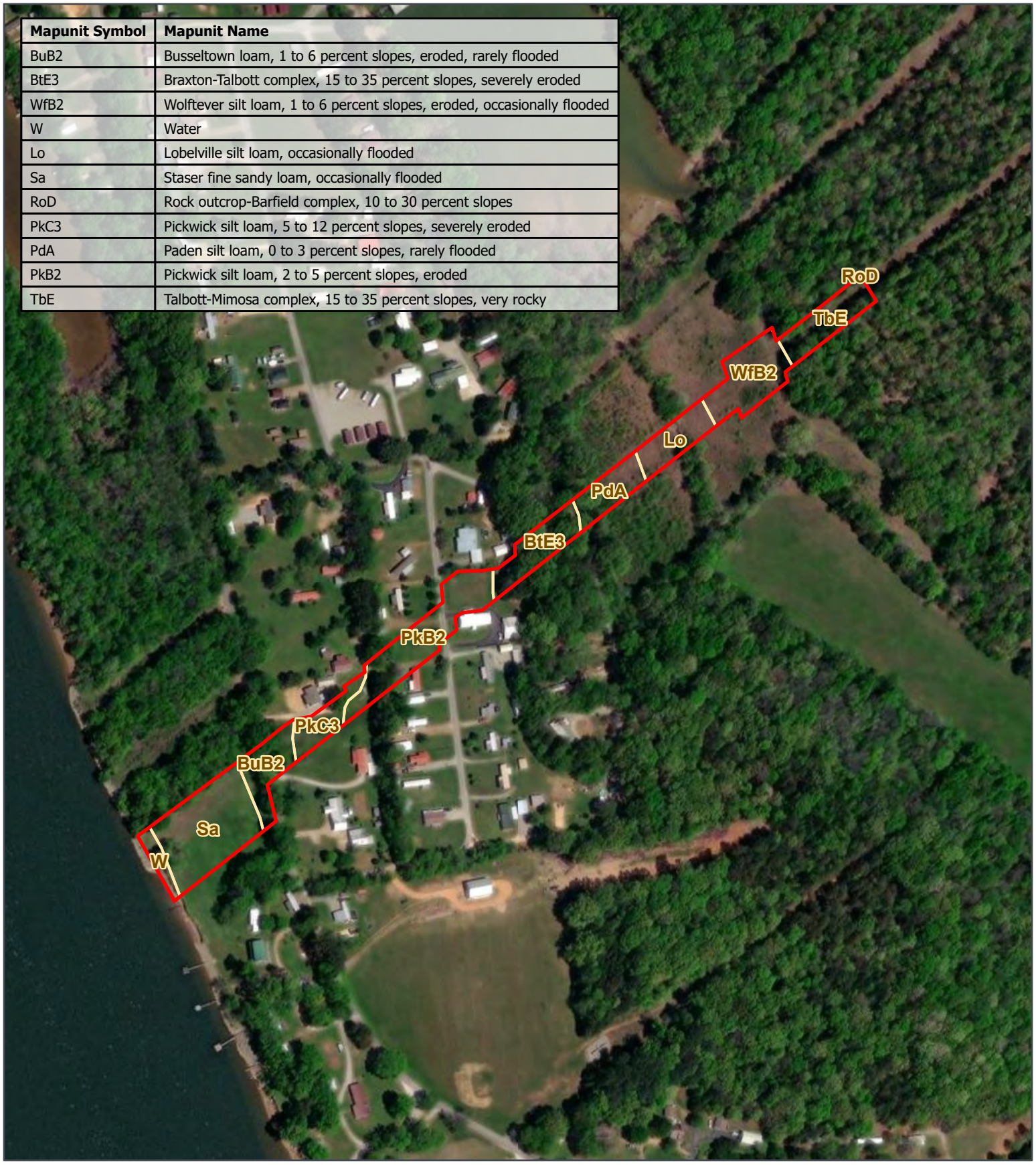
N

1:4,000

Base Map: ESRI ArcGIS Online, accessed May 2024
Updated: 5/7/2024
Project No. 88382
Layout: 3_Soils Aprx: 6Pipeon100-2LineTennesseeRiverHDD

SWCA ENVIRONMENTAL CONSULTANTS

Mapunit Symbol	Mapunit Name
BuB2	Busseltown loam, 1 to 6 percent slopes, eroded, rarely flooded
BtE3	Braxton-Talbott complex, 15 to 35 percent slopes, severely eroded
WfB2	Wolftever silt loam, 1 to 6 percent slopes, eroded, occasionally flooded
W	Water
Lo	Lobelville silt loam, occasionally flooded
Sa	Staser fine sandy loam, occasionally flooded
RoD	Rock outcrop-Barfield complex, 10 to 30 percent slopes
PkC3	Pickwick silt loam, 5 to 12 percent slopes, severely eroded
PdA	Paden silt loam, 0 to 3 percent slopes, rarely flooded
PkB2	Pickwick silt loam, 2 to 5 percent slopes, eroded
TbE	Talbott-Mimosa complex, 15 to 35 percent slopes, very rocky



REPLACE PIPE AND HYDROTEST TENNESSEE RIVER PROJECT

Figure 3c. Soils

Soil Unit Boundary

Project Area

Decatur County, TN
USGS 7.5' Quadrangle: Perryville, TN, 35088-E1
NAD 1983 StatePlane Tennessee FIPS 4100 Feet
35.6011°N 88.021°W

0 160 320 Feet
0 40 80 Meters

N

1:4,000

Base Map: ESRI ArcGIS Online, accessed May 2024
Updated: 5/7/2024
Project No. 88382
Layout: 3_Soils
Aprx: 6Pipeon100-2LineTennesseeRiverHDD

SWCA ENVIRONMENTAL CONSULTANTS

REPLACE PIPE AND HYDROTEST TENNESSEE RIVER PROJECT

Figure 4a. Aquatic Resource Delineation

Data Point
Intermittent Stream
Project Area

Decatur County, TN
USGS 7.5' Quadrangle: Perryville, TN, 35088-E1
NAD 1983 StatePlane Tennessee FIPS 4100 Feet
35.5904°N 88.0419°W

0 160 320 Feet
0 40 80 Meters

N

1:4,000

Base Map: ESRI ArcGIS Online, accessed May 2024
Updated: 5/7/2024
Project No. 88382
Layout: 4_WDR Aprx: 6Pipeon100-2LineTennesseeRiverHDD

SWCA ENVIRONMENTAL CONSULTANTS

REPLACE PIPE AND HYDROTEST TENNESSEE RIVER PROJECT

Figure 4b. Aquatic Resource Delineation

Data Point
Emergent Wetland
Project Area

Decatur County, TN
USGS 7.5' Quadrangle: Perryville, TN, 35088-E1
NAD 1983 StatePlane Tennessee FIPS 4100 Feet
35.5924°N 88.0337°W

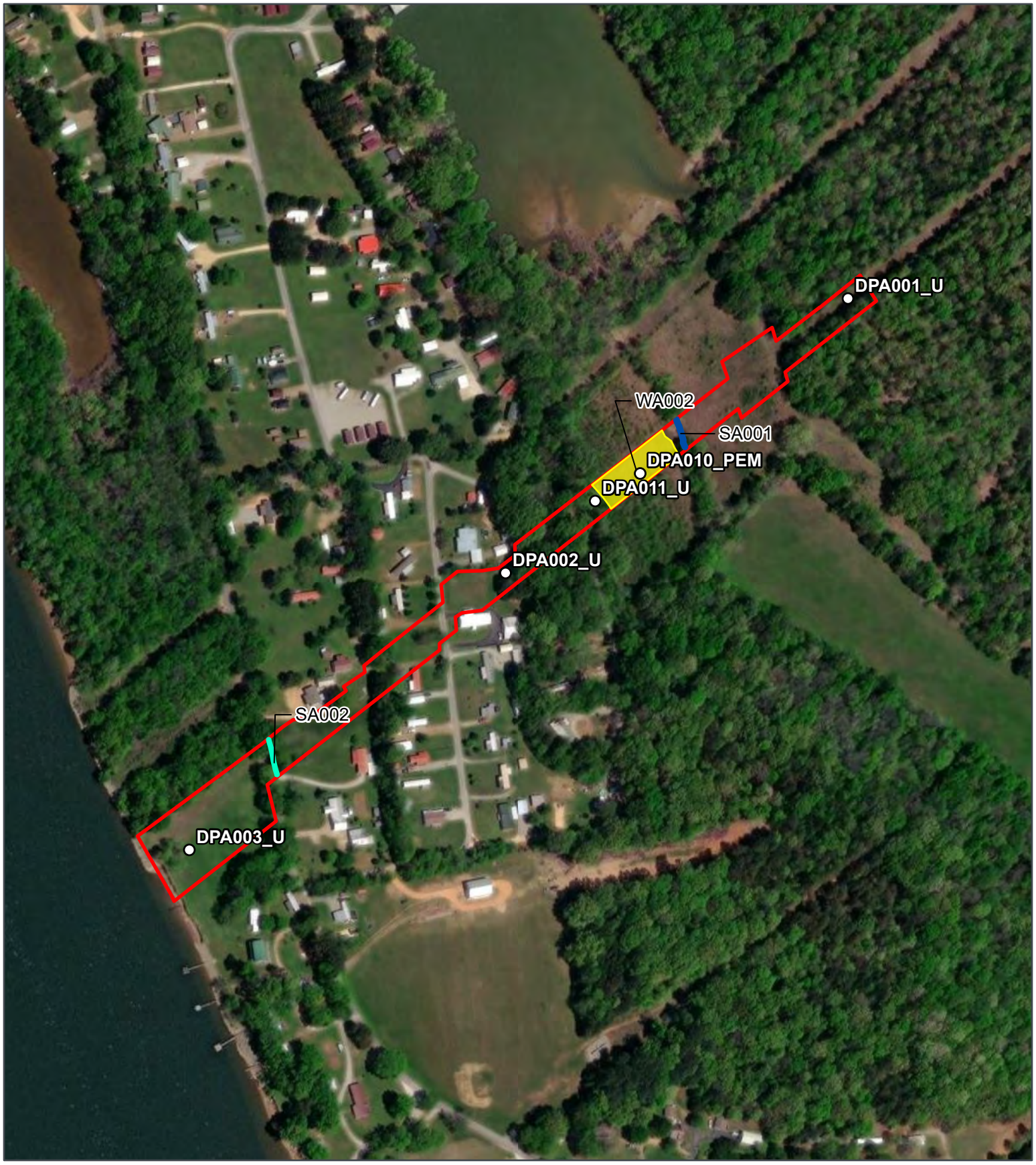
0 160 320 Feet
0 40 80 Meters

N

1:4,000

Base Map: ESRI ArcGIS Online, accessed May 2024
Updated: 5/7/2024
Project No. 88382
Layout: 4_WDR
Aprx: 6Pipeon100-2LineTennesseeRiverHDD

SWCA ENVIRONMENTAL CONSULTANTS



REPLACE PIPE AND HYDROTEST TENNESSEE RIVER PROJECT

Figure 4c. Aquatic Resource Delineation

Data Point
Emergent Wetland
Perennial Stream
Wet-Weather Conveyance
Project Area

Decatur County, TN
USGS 7.5' Quadrangle:
Perryville, TN, 35088-E1
NAD 1983 StatePlane
Tennessee FIPS 4100 Feet
35.6011°N 88.021°W

0 160 320 Feet
0 40 80 Meters

N

1:4,000

Base Map: ESRI ArcGIS Online, accessed May 2024
Updated: 5/7/2024
Project No. 88382
Layout: 4_WDR
Aprx:
6Pipeon100-2LineTennesseeRiverHDD

SWCA ENVIRONMENTAL CONSULTANTS

APPENDIX B

USFWS IPaC Official Species Lists

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Tennessee Ecological Services Field Office
446 Neal Street
Cookeville, TN 38501-4027
Phone: (931) 528-6481 Fax: (931) 528-7075

In Reply Refer To: 05/01/2024 14:11:51 UTC
Project Code: 2024-0084266
Project Name: Pipe and Hydrostatic Test TN River Project

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

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

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

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological

evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

https://www.fws.gov/sites/default/files/documents/endangered-species-consultation-handbook.pdf

Migratory Birds: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts, see https://www.fws.gov/program/migratory-bird-permit/what-we-do.

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures, see https://www.fws.gov/library/collections/threats-birds.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit https://www.fws.gov/partner/council-conservation-migratory-birds.

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

Attachment(s):

- Official Species List
- Bald & Golden Eagles
- Migratory Birds
- Wetlands

OFFICIAL SPECIES LIST

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

This species list is provided by:

Tennessee Ecological Services Field Office
446 Neal Street
Cookeville, TN 38501-4027
(931) 528-6481

PROJECT SUMMARY

Project Code: 2024-0084266
Project Name: Pipe and Hydrostatic Test TN River Project
Project Type: Natural Gas Distribution
Project Description: Replace Pipe and Hydrotest Tennessee River (MOC 56112 Class Change 525511 Valve Section 77-2 Replace 2,200’ 26-in pipe and hydrotest 26-in Tennessee River Crossing) – TGP will complete a class change replacement on 2,200 feet of Line 100-2 and Valve Section 77-2 in Decatur and Perry counties, Tennessee. The project will require a hydrostatic test of the Tennessee River crossing from station 423+00 to 455+50. TGP will replace the existing 26-inch AO Smith pipe from station 455+50 to 477+50. We understand that the Project will quality as FERC Section 2.55(b) Replacements (18 CFR § 2.55).

Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@35.60063875,-88.02188501152952,14z

Counties: Decatur and Perry counties, Tennessee

ENDANGERED SPECIES ACT SPECIES

There is a total of 12 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

MAMMALS

NAME	STATUS
Gray Bat *Myotis grisescens* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6329	Endangered
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Endangered
Tricolored Bat *Perimyotis subflavus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/10515	Proposed Endangered

BIRDS

NAME	STATUS
Whooping Crane *Grus americana* Population: U.S.A. (AL, AR, CO, FL, GA, ID, IL, IN, IA, KY, LA, MI, MN, MS, MO, NC, NM, OH, SC, TN, UT, VA, WI, WV, western half of WY) No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/758	Experimental Population, Non-Essential

REPTILES

NAME	STATUS
Alligator Snapping Turtle *Macrochelys temminckii* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4658	Proposed Threatened

CLAMS

NAME	STATUS
Longsolid *Fusconaia subrotunda* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/9880	Threatened
Orangefoot Pimpleback (pearlymussel) *Plethobasus cooperianus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1132	Endangered
Pink Mucket (pearlymussel) *Lampsilis abrupta* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/7829	Endangered
Ring Pink (mussel) *Obovaria retusa* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4128	Endangered

NAME	STATUS
Spectaclecase (mussel) *Cumberlandia monodonta* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/7867	Endangered
White Wartyback (pearlymussel) *Plethobasus cicatricosus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2549	Endangered

INSECTS

NAME	STATUS
Monarch Butterfly *Danaus plexippus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

BALD & GOLDEN EAGLES

Bald and golden eagles are protected under the Bald and Golden Eagle Protection Act[1] and the Migratory Bird Treaty Act[2].

Any person or organization who plans or conducts activities that may result in impacts to bald or golden eagles, or their habitats[3], should follow appropriate regulations and consider implementing appropriate conservation measures, as described in the links below. Specifically, please review the "Supplemental Information on Migratory Birds and Eagles".

1. The Bald and Golden Eagle Protection Act of 1940.
2. The Migratory Birds Treaty Act of 1918.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

There are likely bald eagles present in your project area. For additional information on bald eagles, refer to Bald Eagle Nesting and Sensitivity to Human Activity

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the PROBABILITY OF PRESENCE SUMMARY below to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Sep 1 to Jul 31
Golden Eagle *Aquila chrysaetos* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1680	Breeds elsewhere

PROBABILITY OF PRESENCE SUMMARY

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

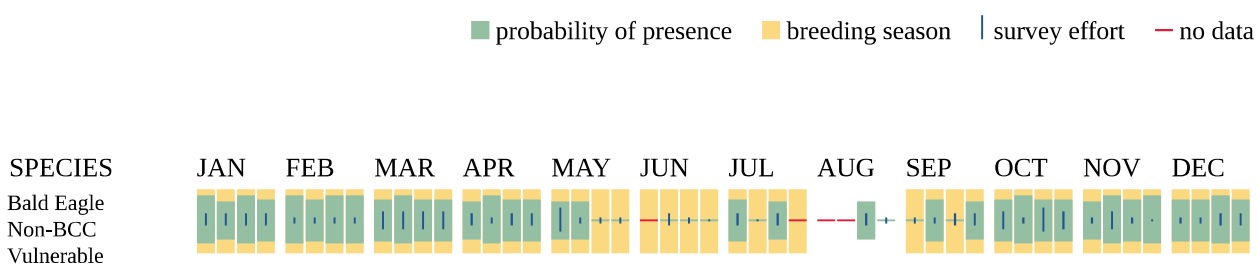
Probability of Presence (■)

Green bars; the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during that week of the year.

Breeding Season (■)
Yellow bars; liberal estimate of the timeframe inside which the bird breeds across its entire range.

Survey Effort (|)
Vertical black lines; the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

No Data (–)
A week is marked as having no data if there were no survey events for that week.



Golden Eagle
Non-BCC
Vulnerable

Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

MIGRATORY BIRDS

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats[3] should follow appropriate regulations and consider implementing appropriate conservation measures, as described in the links below. Specifically, please review the "Supplemental Information on Migratory Birds and Eagles".

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1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the PROBABILITY OF PRESENCE SUMMARY below to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Sep 1 to Jul 31

NAME	BREEDING SEASON
Bobolink *Dolichonyx oryzivorus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9454	Breeds May 20 to Jul 31
Chimney Swift *Chaetura pelagica* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9406	Breeds Mar 15 to Aug 25
Eastern Whip-poor-will *Antrostomus vociferus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/10678	Breeds May 1 to Aug 20
Field Sparrow *Spizella pusilla* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9446	Breeds Mar 1 to Aug 15
Golden Eagle *Aquila chrysaetos* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1680	Breeds elsewhere
Kentucky Warbler *Geothlypis formosa* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9443	Breeds Apr 20 to Aug 20
Lesser Yellowlegs *Tringa flavipes* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9679	Breeds elsewhere
Prairie Warbler *Setophaga discolor* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9513	Breeds May 1 to Jul 31
Prothonotary Warbler *Protonotaria citrea* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9439	Breeds Apr 1 to Jul 31
Red-headed Woodpecker *Melanerpes erythrocephalus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9398	Breeds May 10 to Sep 10

NAME	BREEDING SEASON
Rusty Blackbird *Euphagus carolinus* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9478	Breeds elsewhere
Semipalmated Sandpiper *Calidris pusilla* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9603	Breeds elsewhere
Wood Thrush *Hylocichla mustelina* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9431	Breeds May 10 to Aug 31

PROBABILITY OF PRESENCE SUMMARY

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Green bars; the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during that week of the year.

Breeding Season (■)
Yellow bars; liberal estimate of the timeframe inside which the bird breeds across its entire range.

Survey Effort (|)
Vertical black lines; the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

■ probability of presence ■ breeding season | survey effort – no data

SPECIES	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC

Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management

- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

WETLANDS

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

WETLAND INFORMATION WAS NOT AVAILABLE WHEN THIS SPECIES LIST WAS GENERATED. PLEASE VISIT HTTPS://WWW.FWS.GOV/WETLANDS/DATA/MAPPER.HTML OR CONTACT THE FIELD OFFICE FOR FURTHER INFORMATION.

IPAC USER CONTACT INFORMATION

Agency: Private Entity
Name: Ellery Harding
Address: 13 Parafox Place
City: Pensacola
State: FL
Zip: 32502
Email ellery.harding@swca.com
Phone: 4702376862

APPENDIX C

Wetland Delineation Datasheets

WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont Region

Project/Site: Replace 100-2 Line TN River HDD County: Decatur Sampling Date: May 1, 2024
Applicant/Owner: Kinder Morgan State: TN Sample Point: DPA001_U
Investigator(s): M.Drees and J.Dreger Section, Township, Range: N/A
Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 10-15%
Subregion (LRR or MLRA): N Lat: 35.603170 Long: -88.018131 Datum: North American Datum 1983
Soil Map Unit Name: Talbott-Mimosa complex, 15 to 35 percent slopes, very rocky NWI Classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) Yes (if no, explain in Remarks.)
Are Vegetation **No**, Soil **No**, or Hydrology **No** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No ____
Are Vegetation **No**, Soil **No**, or Hydrology **No** 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 **X**	
Hydric Soil Present?	Yes ____	No **X**	**Is the Sampled Area within a Wetland?** Yes ____ No **X**
Wetland Hydrology Present?	Yes ____	No **X**	

Remarks:

This point was determined not to be within a wetland due to the lack of all three wetland criteria.

HYDROLOGY

Wetland hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ____ Surface Water (A1)
- ____ High Water Table (A2)
- ____ Saturation (A3)
- ____ Water Marks (B1)
- ____ Sediment Deposits (B2)
- ____ Drift Deposits (B3)
- ____ Algal Mat or Crust (B4)
- ____ Iron Deposits (B5)
- ____ Inundation Visible on Aerial Imagery (B7)
- ____ Water-Stained Leaves (B9)
- ____ Aquatic Fauna (B13)
- ____ True Aquatic Plants (B14)
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres on Living Roots (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

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 Imagery (C9)
- ____ Stunted or Stressed Plants (D1)
- ____ Geomorphic Position (D2)
- ____ Shallow Aquitard (D3)
- ____ Microtopographic Relief (D4)
- ____ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No **X**	Depth (inches): **N/A**
Water Table Present?	Yes ____	No **X**	Depth (inches): **>20**
Saturation Present? (includes capillary fringe)	Yes ____	No **X**	Depth (inches): **>20**

Wetland Hydrology Present? Yes ____ No **X**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No positive indication of wetland hydrology was observed.

VEGETATION (Four Strata) - Use scientific names of plants.

Sampling Point: **DPA001_U**

Tree Stratum (Plot size: 30 ft.)	Absolute % cover	Dominant Species?	Indicator Status
1. *None Observed*			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1. *None Observed*			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	0 = Total Cover		
Herb Stratum (Plot size: 5 ft.)			
1. *Dichanthelium oligosanthes*	20	Yes	FACU
2. *Quercus marilandica*	15	Yes	UPL
3. *Axonopus compressus*	10	Yes	FACW
4. *Cyperus rotundus*	10	Yes	FAC
5. *Liquidambar styraciflua*	5	No	FAC
6. *Symphoricarpos orbiculatus*	5	No	FACU
7. *Salvia lyrata*	5	No	FACU
8. *Carya glabra*	5	No	FACU
9.			
10.			
11.			
12.			
	75 = Total Cover		
Woody Vine Stratum (Plot size: 30 ft.)			
1. *None Observed*			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: **2** (A)

Total Number of Dominant Species Across All Strata: **4** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **50%** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	**0**	x 1 =	**0**
FACW species	**10**	x 2 =	**20**
FAC species	**15**	x 3 =	**45**
FACU species	**35**	x 4 =	**140**
UPL species	**15**	x 5 =	**75**
Column Totals:	**75** (A)		**280** (B)

Prevalence Index = B/A = **3.73**

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤ 3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree - Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub - Woody plants, excluding woody vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** **X**

Remarks: (Include photo numbers here or on a separate sheet.)

No positive indication of hydrophytic vegetation was observed (≥50% of dominant species indexed as FAC− or drier).

SOIL

Sampling Point: **DPA001_U**

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-4	10YR 4/3	50	None	—	—	—	Silt Loam	
0-4	10YR 5/4	50	None	—	—	—	Silt Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soils Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Compact

Depth (inches): 4

Hydric Soil Present? **Yes** ___ **No** **X**

Remarks:

No positive indication of hydric soils was observed.

WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont Region

Project/Site: Replace 100-2 Line TN River HDD County: Decatur Sampling Date: May 1, 2024
Applicant/Owner: Kinder Morgan State: TN Sample Point: DPA002_U
Investigator(s): M.Drees and J.Dreger Section, Township, Range: N/A
Landform (hillslope, terrace, etc.): Hilltop Local relief (concave, convex, none): None Slope (%): 0-5%
Subregion (LRR or MLRA): N Lat: 35.601164 Long: -88.021069 Datum: North American Datum 1983
Soil Map Unit Name: Braxton-Talbott complex, 15 to 35 percent slopes, severely eroded NWI Classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) Yes (if no, explain in Remarks.)
Are Vegetation **No**, Soil **No**, or Hydrology **No** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No ____
Are Vegetation **No**, Soil **No**, or Hydrology **No** 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 **X**	**Is the Sampled Area within a Wetland?**	**Yes** ____ **No** **X**
Hydric Soil Present?	Yes ____	No **X**		
Wetland Hydrology Present?	Yes ____	No **X**		

Remarks:

This point was determined not to be within a wetland due to the lack of all three wetland criteria.

HYDROLOGY

Wetland hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ____ Surface Water (A1)
- ____ High Water Table (A2)
- ____ Saturation (A3)
- ____ Water Marks (B1)
- ____ Sediment Deposits (B2)
- ____ Drift Deposits (B3)
- ____ Algal Mat or Crust (B4)
- ____ Iron Deposits (B5)
- ____ Inundation Visible on Aerial Imagery (B7)
- ____ Water-Stained Leaves (B9)
- ____ Aquatic Fauna (B13)
- ____ True Aquatic Plants (B14)
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres on Living Roots (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

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 Imagery (C9)
- ____ Stunted or Stressed Plants (D1)
- ____ Geomorphic Position (D2)
- ____ Shallow Aquitard (D3)
- ____ Microtopographic Relief (D4)
- ____ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No **X**	Depth (inches):	**N/A**
Water Table Present?	Yes ____	No **X**	Depth (inches):	**>20**
Saturation Present? (includes capillary fringe)	Yes ____	No **X**	Depth (inches):	**>20**

Wetland Hydrology Present? **Yes** ____ **No** **X**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No positive indication of wetland hydrology was observed.

VEGETATION (Four Strata) - Use scientific names of plants.

Sampling Point: **DPA002_U**

Tree Stratum (Plot size: 30 ft.)	Absolute % cover	Dominant Species?	Indicator Status
1. *None Observed*			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1. *None Observed*			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	0 = Total Cover		
Herb Stratum (Plot size: 5 ft.)			
1. *Dichanthelium oligosanthes*	20	Yes	FACU
2. *Toxicodendron radicans*	20	Yes	FAC
3. *Solidago canadensis*	10	No	FACU
4. *Parthenocissus quinquefolia*	10	No	FACU
5. *Lespedeza cuneata*	5	No	FACU
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	65 = Total Cover		
Woody Vine Stratum (Plot size: 30 ft.)			
1. *None Observed*			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: **1** (A)

Total Number of Dominant Species Across All Strata: **2** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **50%** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	**0**	x 1 =	**0**
FACW species	**0**	x 2 =	**0**
FAC species	**20**	x 3 =	**60**
FACU species	**45**	x 4 =	**180**
UPL species	**0**	x 5 =	**0**
Column Totals:	**65** (A)		**240** (B)

Prevalence Index = B/A = **3.69**

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤ 3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree - Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub - Woody plants, excluding woody vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** **X**

Remarks: (Include photo numbers here or on a separate sheet.)

No positive indication of hydrophytic vegetation was observed (≥50% of dominant species indexed as FAC− or drier).

SOIL

Sampling Point: **DPA002_U**

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-5	7.5YR 4/6	100	None	—	—	—	Silt Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soils Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Compact

Depth (inches): 5

Hydric Soil Present? **Yes** ___ **No** **X**

Remarks:

No positive indication of hydric soils was observed.

WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont Region

Project/Site: Replace 100-2 Line TN River HDD County: Decatur Sampling Date: May 1, 2024
Applicant/Owner: Kinder Morgan State: TN Sample Point: DPA003_U
Investigator(s): M.Drees and J.Dreger Section, Township, Range: N/A
Landform (hillslope, terrace, etc.): N/A Local relief (concave, convex, none): None Slope (%): 0-5%
Subregion (LRR or MLRA): N Lat: 35.599144 Long: -88.023777 Datum: North American Datum 1983
Soil Map Unit Name: Staser fine sandy loam, occasionally flooded NWI Classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) Yes (if no, explain in Remarks.)
Are Vegetation **No**, Soil **No**, or Hydrology **No** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No ____
Are Vegetation **No**, Soil **No**, or Hydrology **No** 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 **X**	**Is the Sampled Area within a Wetland?**	**Yes** ____ **No** **X**
Hydric Soil Present?	Yes ____	No **X**		
Wetland Hydrology Present?	Yes ____	No **X**		

Remarks:

This point was determined not to be within a wetland due to the lack of all three wetland criteria.

HYDROLOGY

Wetland hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ____ Surface Water (A1)
- ____ High Water Table (A2)
- ____ Saturation (A3)
- ____ Water Marks (B1)
- ____ Sediment Deposits (B2)
- ____ Drift Deposits (B3)
- ____ Algal Mat or Crust (B4)
- ____ Iron Deposits (B5)
- ____ Inundation Visible on Aerial Imagery (B7)
- ____ Water-Stained Leaves (B9)
- ____ Aquatic Fauna (B13)
- ____ True Aquatic Plants (B14)
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres on Living Roots (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

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 Imagery (C9)
- ____ Stunted or Stressed Plants (D1)
- ____ Geomorphic Position (D2)
- ____ Shallow Aquitard (D3)
- ____ Microtopographic Relief (D4)
- ____ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No **X**	Depth (inches):	**N/A**
Water Table Present?	Yes ____	No **X**	Depth (inches):	**>20**
Saturation Present? (includes capillary fringe)	Yes ____	No **X**	Depth (inches):	**>20**

Wetland Hydrology Present? **Yes** ____ **No** **X**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No positive indication of wetland hydrology was observed.

VEGETATION (Four Strata) - Use scientific names of plants.

Sampling Point: **DPA003_U**

Tree Stratum (Plot size: 30 ft.)	Absolute % cover	Dominant Species?	Indicator Status
1. *None Observed*			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1. *None Observed*			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	0 = Total Cover		
Herb Stratum (Plot size: 5 ft.)			
1. *Trifolium repens*	30	Yes	FACU
2. *Viola sororia*	20	Yes	FAC
3. *Geranium carolinianum*	20	Yes	UPL
4. *Poa pratensis*	20	Yes	FACU
5. *Taraxacum officinale*	10	No	FACU
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30 ft.)			
1. *None Observed*			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: **1** (A)

Total Number of Dominant Species Across All Strata: **4** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **25%** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	**0**	x 1 =	**0**
FACW species	**0**	x 2 =	**0**
FAC species	**20**	x 3 =	**60**
FACU species	**60**	x 4 =	**240**
UPL species	**20**	x 5 =	**100**
Column Totals:	**100** (A)		**400** (B)

Prevalence Index = B/A = **4.00**

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤ 3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree - Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub - Woody plants, excluding woody vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** **X**

Remarks: (Include photo numbers here or on a separate sheet.)

No positive indication of hydrophytic vegetation was observed (≥50% of dominant species indexed as FAC− or drier).

SOIL

Sampling Point: **DPA003_U**

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-8	10YR 3/3	100	None	—	—	—	Silt Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soils Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Compact

Depth (inches): 8

Hydric Soil Present? Yes ___ **No X**

Remarks:

No positive indication of hydric soils was observed.

WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont Region

Project/Site: Replace 100-2 Line TN River HDD County: Decatur Sampling Date: May 2, 2024
Applicant/Owner: Kinder Morgan State: TN Sample Point: DPA004_U
Investigator(s): M.Drees and J.Dreger Section, Township, Range: N/A
Landform (hillslope, terrace, etc.): Ag. Field Local relief (concave, convex, none): None Slope (%): 0-5%
Subregion (LRR or MLRA): N Lat: 35.593760 Long: -88.032160 Datum: North American Datum 1983
Soil Map Unit Name: Wolftever silt loam NWI Classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) No (if no, explain in Remarks.)
Are Vegetation **No**, Soil **No**, or Hydrology **No** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No
Are Vegetation **No**, Soil **No**, or Hydrology **No** 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 **X**	
Hydric Soil Present?	Yes	No **X**	**Is the Sampled Area within a Wetland?** Yes No **X**
Wetland Hydrology Present?	Yes	No **X**	

Remarks:

This point was determined not to be within a wetland due to the lack of all three wetland criteria.

The survey area was determined to be drier than normal at the time of survey.

HYDROLOGY

Wetland hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

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 Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	No **X**	Depth (inches): **N/A**
Water Table Present?	Yes	No **X**	Depth (inches): **>20**
Saturation Present? (includes capillary fringe)	Yes	No **X**	Depth (inches): **>20**

Wetland Hydrology Present? Yes No **X**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No positive indication of wetland hydrology was observed.

VEGETATION (Four Strata) - Use scientific names of plants.

Sampling Point: **DPA004_U**

Tree Stratum (Plot size: 30 ft.)	Absolute % cover	Dominant Species?	Indicator Status
1. *None Observed*			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1. *None Observed*			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	0 = Total Cover		
Herb Stratum (Plot size: 5 ft.)			
1. *Lolium perenne*	60	Yes	FACU
2. *Solidago altissima*	20	Yes	FACU
3. *Allium vineale*	5	No	FACU
4. *Setaria viridis*	5	No	UPL
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	90 = Total Cover		
Woody Vine Stratum (Plot size: 30 ft.)			
1. *None Observed*			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: **0** (A)

Total Number of Dominant Species Across All Strata: **2** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **0** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	**0**	x 1 =	**0**
FACW species	**0**	x 2 =	**0**
FAC species	**0**	x 3 =	**0**
FACU species	**85**	x 4 =	**340**
UPL species	**5**	x 5 =	**25**
Column Totals:	**90** (A)		**365** (B)

Prevalence Index = B/A = **4.06**

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤ 3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree - Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub - Woody plants, excluding woody vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** **X**

Remarks: (Include photo numbers here or on a separate sheet.)

No positive indication of hydrophytic vegetation was observed (≥50% of dominant species indexed as FAC− or drier).

SOIL

Sampling Point: **DPA004_U**

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-10	10YR 3/3	100	None	—	—	—	Silt Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soils Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Compact

Depth (inches): 10

Hydric Soil Present? **Yes** ___ **No** **X**

Remarks:

No positive indication of hydric soils was observed.

WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont Region

Project/Site: Replace 100-2 Line TN River HDD County: Decatur Sampling Date: May 2, 2024
Applicant/Owner: Kinder Morgan State: TN Sample Point: DPA005_PEM
Investigator(s): M.Drees and J.Dreger Section, Township, Range: N/A
Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0-5%
Subregion (LRR or MLRA): N Lat: 35.592371 Long: -88.034234 Datum: North American Datum 1983
Soil Map Unit Name: Taft silt loam, 0 to 2 percent slopes NWI Classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) No (if no, explain in Remarks.)
Are Vegetation **No**, Soil **No**, or Hydrology **No** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No
Are Vegetation **No**, Soil **No**, or Hydrology **No** 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 **X**	No		
Hydric Soil Present?	Yes **X**	No	**Is the Sampled Area**	
Wetland Hydrology Present?	Yes **X**	No	**within a Wetland?**	**Yes X** **No**

Remarks:

This point was determined to be within a wetland due to the presence of all 3 wetland criteria.

The survey area was determined to be drier than normal at the time of survey.

HYDROLOGY

Wetland hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

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)
- **X** Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	No **X**	Depth (inches):	**N/A**
Water Table Present?	Yes	No **X**	Depth (inches):	**>20**
Saturation Present? (includes capillary fringe)	Yes	No **X**	Depth (inches):	**>20**

Wetland Hydrology Present? **Yes X** **No**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

A positive indication of wetland hydrology was observed (at least two secondary indicators).

VEGETATION (Four Strata) - Use scientific names of plants.

Sampling Point: **DPA005_PEM**

Tree Stratum (Plot size: 30 ft.)	Absolute % cover	Dominant Species?	Indicator Status
1. *None Observed*			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1. *None Observed*			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	0 = Total Cover		
Herb Stratum (Plot size: 5 ft.)			
1. *Juncus effusus*	20	Yes	FACW
2. *Carex bushii*	20	Yes	FACW
3. *Carex vulpinoidea*	20	Yes	OBL
4. *Ranunculus sardous*	15	No	FAC
5. *Phalaris arundinacea*	10	No	FACW
6. *Liquidambar styraciflua*	5	No	FAC
7. *Symphoricarpos orbiculatus*	5	No	FACU
8. *Rubus argutus*	5	No	FACU
9.			
10.			
11.			
12.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30 ft.)			
1. *None Observed*			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: **3** (A)

Total Number of Dominant Species Across All Strata: **3** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **100%** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	**20**	x 1 =	**20**
FACW species	**50**	x 2 =	**100**
FAC species	**20**	x 3 =	**60**
FACU species	**10**	x 4 =	**40**
UPL species	**0**	x 5 =	**0**
Column Totals:	**100** (A)		**220** (B)

Prevalence Index = B/A = **2.20**

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- **X** 2 - Dominance Test is >50%
- **X** 3 - Prevalence Index is ≤ 3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree - Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub - Woody plants, excluding woody vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** **X** **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

A positive indication of hydrophytic vegetation was observed (>50% of dominant species indexed as OBL, FACW, or FAC).

A positive indication of hydrophytic vegetation was observed (Prevalence Index is ≤ 3.00).

SOIL

Sampling Point: **DPA005_PEM**

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-6	10YR 4/2	98	7.5YR 4/6	2	C	M	Silt Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soils Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- **X** Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Compact

Depth (inches): 6

Hydric Soil Present? **Yes** **X** **No** ___

Remarks:

A positive indication of hydric soil was observed.

WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont Region

Project/Site: Replace 100-2 Line TN River HDD County: Decatur Sampling Date: May 2, 2024
Applicant/Owner: Kinder Morgan State: TN Sample Point: DPA006_U
Investigator(s): M.Drees and J.Dreger Section, Township, Range: N/A
Landform (hillslope, terrace, etc.): Ag. Field Local relief (concave, convex, none): None Slope (%): 0-5%
Subregion (LRR or MLRA): N Lat: 35.592306 Long: -88.034344 Datum: North American Datum 1983
Soil Map Unit Name: Taft silt loam, 0 to 2 percent slopes NWI Classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) No (if no, explain in Remarks.)
Are Vegetation **No**, Soil **No**, or Hydrology **No** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No
Are Vegetation **No**, Soil **No**, or Hydrology **No** 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 **X**	**Is the Sampled Area within a Wetland?**	**Yes** **No X**
Hydric Soil Present?	Yes	No **X**		
Wetland Hydrology Present?	Yes	No **X**		

Remarks:

This point was determined not to be within a wetland due to the lack of all three wetland criteria.

The survey area was determined to be drier than normal at the time of survey.

HYDROLOGY

Wetland hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

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 Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	No **X**	Depth (inches):	**N/A**
Water Table Present?	Yes	No **X**	Depth (inches):	**>20**
Saturation Present? (includes capillary fringe)	Yes	No **X**	Depth (inches):	**>20**

Wetland Hydrology Present? **Yes** **No X**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No positive indication of wetland hydrology was observed.

VEGETATION (Four Strata) - Use scientific names of plants.

Sampling Point: **DPA006_U**

Tree Stratum (Plot size: 30 ft.)	Absolute % cover	Dominant Species?	Indicator Status
1. *None Observed*			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1. *None Observed*			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	0 = Total Cover		
Herb Stratum (Plot size: 5 ft.)			
1. *Zea mays*	20	Yes	UPL
2. *Digitaria sanguinalis*	15	Yes	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	35 = Total Cover		
Woody Vine Stratum (Plot size: 30 ft.)			
1. *None Observed*			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: **0** (A)

Total Number of Dominant Species Across All Strata: **2** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **0** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	**0**	x 1 =	**0**
FACW species	**0**	x 2 =	**0**
FAC species	**0**	x 3 =	**0**
FACU species	**15**	x 4 =	**60**
UPL species	**20**	x 5 =	**100**
Column Totals:	**35** (A)		**160** (B)

Prevalence Index = B/A = **4.57**

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤ 3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree - Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub - Woody plants, excluding woody vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** **X**

Remarks: (Include photo numbers here or on a separate sheet.)

No positive indication of hydrophytic vegetation was observed (≥50% of dominant species indexed as FAC− or drier).

SOIL

Sampling Point: **DPA006_U**

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-7	10YR 4/2	100	None	—	—	—	Silt Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soils Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Compact

Depth (inches): 7

Hydric Soil Present? **Yes** ___ **No** **X**

Remarks:

No positive indication of hydric soils was observed.

WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont Region

Project/Site: Replace 100-2 Line TN River HDD County: Decatur Sampling Date: May 2, 2024
Applicant/Owner: Kinder Morgan State: TN Sample Point: DPA007_U
Investigator(s): M.Drees and J.Dreger Section, Township, Range: N/A
Landform (hillslope, terrace, etc.): Rangeland Local relief (concave, convex, none): None Slope (%): 0-5%
Subregion (LRR or MLRA): N Lat: 35.591018 Long: -88.037157 Datum: North American Datum 1983
Soil Map Unit Name: Lindell silt loam, 0 to 2 percent slopes, occasionally flooded NWI Classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) No (if no, explain in Remarks.)
Are Vegetation **No**, Soil **No**, or Hydrology **No** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No
Are Vegetation **No**, Soil **No**, or Hydrology **No** 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 **X**	**Is the Sampled Area within a Wetland?**	**Yes** **No X**
Hydric Soil Present?	Yes	No **X**		
Wetland Hydrology Present?	Yes	No **X**		

Remarks:

This point was determined not to be within a wetland due to the lack of all three wetland criteria.

The survey area was determined to be drier than normal at the time of survey.

HYDROLOGY

Wetland hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

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 Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	No **X**	Depth (inches):	**N/A**
Water Table Present?	Yes	No **X**	Depth (inches):	**>20**
Saturation Present? (includes capillary fringe)	Yes	No **X**	Depth (inches):	**>20**

Wetland Hydrology Present? **Yes** **No X**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No positive indication of wetland hydrology was observed.

VEGETATION (Four Strata) - Use scientific names of plants.

Sampling Point: **DPA007_U**

Tree Stratum (Plot size: 30 ft.)	Absolute % cover	Dominant Species?	Indicator Status
1. *None Observed*			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1. *None Observed*			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	0 = Total Cover		
Herb Stratum (Plot size: 5 ft.)			
1. *Trifolium dubium*	30	Yes	UPL
2. *Trifolium repens*	20	Yes	FACU
3. *Dichanthelium oligosanthes*	10	No	FACU
4. *Poa pratensis*	10	No	FACU
5. *Ranunculus sardous*	10	No	FAC
6. *Lolium perenne*	5	No	FACU
7. *Andropogon virginicus*	5	No	FACU
8.			
9.			
10.			
11.			
12.			
	90 = Total Cover		
Woody Vine Stratum (Plot size: 30 ft.)			
1. *None Observed*			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: **0** (A)

Total Number of Dominant Species Across All Strata: **2** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **0** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	**0**	x 1 =	**0**
FACW species	**0**	x 2 =	**0**
FAC species	**10**	x 3 =	**30**
FACU species	**50**	x 4 =	**200**
UPL species	**30**	x 5 =	**150**
Column Totals:	**90** (A)		**380** (B)

Prevalence Index = B/A = **4.22**

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤ 3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree - Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub - Woody plants, excluding woody vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** **X**

Remarks: (Include photo numbers here or on a separate sheet.)

No positive indication of hydrophytic vegetation was observed (≥50% of dominant species indexed as FAC− or drier).

SOIL

Sampling Point: **DPA007_U**

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-4	10YR 4/4	100	None	—	—	—	Silt Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soils Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Compact

Depth (inches): 4

Hydric Soil Present? **Yes** ___ **No** **X**

Remarks:

No positive indication of hydric soils was observed.

WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont Region

Project/Site: Replace 100-2 Line TN River HDD County: Decatur Sampling Date: May 2, 2024
Applicant/Owner: Kinder Morgan State: TN Sample Point: DPA008_U
Investigator(s): M.Drees and J.Dreger Section, Township, Range: N/A
Landform (hillslope, terrace, etc.): Rangeland Local relief (concave, convex, none): None Slope (%): 0-5%
Subregion (LRR or MLRA): N Lat: 35.590202 Long: -88.042828 Datum: North American Datum 1983
Soil Map Unit Name: Talbot silty clay loam, eroded rolling phase NWI Classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) No (if no, explain in Remarks.)
Are Vegetation **No**, Soil **No**, or Hydrology **No** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No
Are Vegetation **No**, Soil **No**, or Hydrology **No** 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 **X**	
Hydric Soil Present?	Yes	No **X**	**Is the Sampled Area within a Wetland?** Yes No **X**
Wetland Hydrology Present?	Yes	No **X**	

Remarks:

This point was determined not to be within a wetland due to the lack of all three wetland criteria.

The survey area was determined to be drier than normal at the time of survey.

HYDROLOGY

Wetland hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

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 Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	No **X**	Depth (inches): **N/A**
Water Table Present?	Yes	No **X**	Depth (inches): **>20**
Saturation Present? (includes capillary fringe)	Yes	No **X**	Depth (inches): **>20**

Wetland Hydrology Present? Yes No **X**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No positive indication of wetland hydrology was observed.

VEGETATION (Four Strata) - Use scientific names of plants.

Sampling Point: **DPA008_U**

Tree Stratum (Plot size: 30 ft.)	Absolute % cover	Dominant Species?	Indicator Status
1. *None Observed*			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1. *None Observed*			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	0 = Total Cover		
Herb Stratum (Plot size: 5 ft.)			
1. *Poa pratensis*	30	Yes	FACU
2. *Trifolium repens*	15	Yes	FACU
3. *Trifolium dubium*	15	Yes	UPL
4. *Digitaria sanguinalis*	10	No	FACU
5. *Setaria viridis*	10	No	UPL
6. *Rumex crispus*	5	No	FAC
7. *Solanum carolinense*	5	No	FACU
8.			
9.			
10.			
11.			
12.			
	90 = Total Cover		
Woody Vine Stratum (Plot size: 30 ft.)			
1. *None Observed*			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: **0** (A)

Total Number of Dominant Species Across All Strata: **3** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **0** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	**0**	x 1 =	**0**
FACW species	**0**	x 2 =	**0**
FAC species	**5**	x 3 =	**15**
FACU species	**60**	x 4 =	**240**
UPL species	**25**	x 5 =	**125**
Column Totals:	**90** (A)		**380** (B)

Prevalence Index = B/A = **4.22**

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤ 3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree - Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub - Woody plants, excluding woody vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** **X**

Remarks: (Include photo numbers here or on a separate sheet.)

No positive indication of hydrophytic vegetation was observed (≥50% of dominant species indexed as FAC− or drier).

SOIL

Sampling Point: **DPA008_U**

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-3	10YR 3/2	100	None	—	—	—	Silty Clay Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soils Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Compact

Depth (inches): 3

Hydric Soil Present? **Yes** ___ **No** **X**

Remarks:

No positive indication of hydric soils was observed.

WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont Region

Project/Site: Replace 100-2 Line TN River HDD County: Decatur Sampling Date: May 2, 2024
Applicant/Owner: Kinder Morgan State: TN Sample Point: DPA009_U
Investigator(s): M.Drees and J.Dreger Section, Township, Range: N/A
Landform (hillslope, terrace, etc.): Bottomland Hardwood Forest Local relief (concave, convex, none): None Slope (%): 0-5%
Subregion (LRR or MLRA): N Lat: 35.590784 Long: -88.044358 Datum: North American Datum 1983
Soil Map Unit Name: Talbot silty clay loam, eroded rolling phase NWI Classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) No (if no, explain in Remarks.)
Are Vegetation **No**, Soil **No**, or Hydrology **No** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No
Are Vegetation **No**, Soil **No**, or Hydrology **No** 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 **X**	
Hydric Soil Present?	Yes	No **X**	**Is the Sampled Area within a Wetland?** Yes No **X**
Wetland Hydrology Present?	Yes	No **X**	

Remarks:

This point was determined not to be within a wetland due to the lack of all three wetland criteria.

The survey area was determined to be drier than normal at the time of survey.

HYDROLOGY

Wetland hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

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 Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	No **X**	Depth (inches): **N/A**
Water Table Present?	Yes	No **X**	Depth (inches): **>20**
Saturation Present? (includes capillary fringe)	Yes	No **X**	Depth (inches): **>20**

Wetland Hydrology Present? Yes No **X**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No positive indication of wetland hydrology was observed.

VEGETATION (Four Strata) - Use scientific names of plants.

Sampling Point: **DPA009_U**

Tree Stratum (Plot size: 30 ft.)	Absolute % cover	Dominant Species?	Indicator Status
1. *Quercus falcata*	20	Yes	FACU
2. *Carya ovata*	15	Yes	FACU
3. *Juniperus virginiana*	10	Yes	FACU
4.			
5.			
6.			
7.			
8.			
	45	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1. *Juniperus virginiana*	15	Yes	FACU
2. *Ligustrum sinense*	15	Yes	FACU
3. *Acer floridanum*	10	No	UPL
4. *Ulmus alata*	10	No	FACU
5. *Carya ovata*	5	No	FACU
6.			
7.			
8.			
9.			
10.			
	55	= Total Cover	
Herb Stratum (Plot size: 5 ft.)			
1. *Verbesina virginica*	10	Yes	UPL
2. *Cercis canadensis*	10	Yes	FACU
3. *Campsis radicans*	5	Yes	FAC
4. *Trifolium pratense*	5	Yes	FACU
5. *Vitis rotundifolia*	5	Yes	FAC
6. *Parthenocissus quinquefolia*	5	Yes	FACU
7.			
8.			
9.			
10.			
11.			
12.			
	40	= Total Cover	
Woody Vine Stratum (Plot size: 30 ft.)			
1. *None Observed*			
2.			
3.			
4.			
5.			
6.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: **2** (A)

Total Number of Dominant Species Across All Strata: **11** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **18%** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	**0**	x 1 =	**0**
FACW species	**0**	x 2 =	**0**
FAC species	**10**	x 3 =	**30**
FACU species	**110**	x 4 =	**440**
UPL species	**20**	x 5 =	**100**
Column Totals:	**140** (A)		**570** (B)

Prevalence Index = B/A = **4.07**

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤ 3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree - Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub - Woody plants, excluding woody vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** **X**

Remarks: (Include photo numbers here or on a separate sheet.)

No positive indication of hydrophytic vegetation was observed (≥50% of dominant species indexed as FAC− or drier).

SOIL

Sampling Point: **DPA009_U**

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR 3/2	100	None	—	—	—	Silty Clay Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soils Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Gravel

Depth (inches): 3

Hydric Soil Present? **Yes** ___ **No** **X**

Remarks:

No positive indication of hydric soils was observed.

WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont Region

Project/Site: Replace 100-2 Line TN River HDD County: Decatur Sampling Date: May 2, 2024
Applicant/Owner: Kinder Morgan State: TN Sample Point: DPA010_PEM
Investigator(s): M.Drees and J.Dreger Section, Township, Range: N/A
Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0-5%
Subregion (LRR or MLRA): N Lat: 35.601893 Long: -88.019912 Datum: North American Datum 1983
Soil Map Unit Name: Paden silt loam, 0 to 3 percent slopes, rarely flooded NWI Classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) No (if no, explain in Remarks.)
Are Vegetation **No**, Soil **No**, or Hydrology **No** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No
Are Vegetation **No**, Soil **No**, or Hydrology **No** 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 **X**	No		
Hydric Soil Present?	Yes **X**	No	**Is the Sampled Area**	
Wetland Hydrology Present?	Yes **X**	No	**within a Wetland?**	**Yes X** **No**

Remarks:

This point was determined to be within a wetland due to the presence of all 3 wetland criteria.

The survey area was determined to be drier than normal at the time of survey.

HYDROLOGY

Wetland hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- **X** Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

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 Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No **X**	Depth (inches):	**N/A**
Water Table Present?	Yes ___	No **X**	Depth (inches):	**>20**
Saturation Present? (includes capillary fringe)	Yes ___	No **X**	Depth (inches):	**>20**

Wetland Hydrology Present? **Yes X** **No**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

A positive indication of wetland hydrology was observed (at least one primary indicator).

VEGETATION (Four Strata) - Use scientific names of plants.

Sampling Point: **DPA010_PEM**

Tree Stratum (Plot size: 30 ft.)	Absolute % cover	Dominant Species?	Indicator Status
1. *None Observed*			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1. *None Observed*			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	0 = Total Cover		
Herb Stratum (Plot size: 5 ft.)			
1. *Carex bushii*	20	Yes	FACW
2. *Rumex crispus*	15	Yes	FAC
3. *Carex vulpinoidea*	15	Yes	OBL
4. *Verbesina alternifolia*	10	No	FAC
5. *Rubus argutus*	5	No	FACU
6. *Symphoricarpos orbiculatus*	5	No	FACU
7. *Ranunculus sardous*	5	No	FAC
8. *Carex squarrosa*	5	No	FACW
9.			
10.			
11.			
12.			
	80 = Total Cover		
Woody Vine Stratum (Plot size: 30 ft.)			
1. *None Observed*			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: **3** (A)

Total Number of Dominant Species Across All Strata: **3** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **100%** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	**15**	x 1 =	**15**
FACW species	**25**	x 2 =	**50**
FAC species	**30**	x 3 =	**90**
FACU species	**10**	x 4 =	**40**
UPL species	**0**	x 5 =	**0**
Column Totals:	**80** (A)		**195** (B)

Prevalence Index = B/A = **2.44**

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- **X** 2 - Dominance Test is >50%
- **X** 3 - Prevalence Index is ≤ 3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree - Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub - Woody plants, excluding woody vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** **X** **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

A positive indication of hydrophytic vegetation was observed (>50% of dominant species indexed as OBL, FACW, or FAC).

A positive indication of hydrophytic vegetation was observed (Prevalence Index is ≤ 3.00).

SOIL

Sampling Point: **DPA010_PEM**

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR 4/2	98	7.5YR 4/6	2	C	M	Silty Clay Loam	
3-8	10YR 5/3	98	5YR 4/4	2	C	M	Silt Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soils Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- **X** Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Compact

Depth (inches): 8

Hydric Soil Present? **Yes** **X** **No** ___

Remarks:

A positive indication of hydric soil was observed.

WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont Region

Project/Site: Replace 100-2 Line TN River HDD County: Decatur Sampling Date: May 2, 2024
Applicant/Owner: Kinder Morgan State: TN Sample Point: DPA011_U
Investigator(s): M.Drees and J.Dreger Section, Township, Range: N/A
Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 0-5%
Subregion (LRR or MLRA): N Lat: 35.601690 Long: -88.020299 Datum: North American Datum 1983
Soil Map Unit Name: Paden silt loam, 0 to 3 percent slopes, rarely flooded NWI Classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) No (if no, explain in Remarks.)
Are Vegetation **No**, Soil **No**, or Hydrology **No** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No
Are Vegetation **No**, Soil **No**, or Hydrology **No** 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 **X**	
Hydric Soil Present?	Yes	No **X**	**Is the Sampled Area within a Wetland?** Yes No **X**
Wetland Hydrology Present?	Yes	No **X**	

Remarks:

This point was determined not to be within a wetland due to the lack of all three wetland criteria.

The survey area was determined to be drier than normal at the time of survey.

HYDROLOGY

Wetland hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

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 Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	No **X**	Depth (inches): **N/A**
Water Table Present?	Yes	No **X**	Depth (inches): **>20**
Saturation Present? (includes capillary fringe)	Yes	No **X**	Depth (inches): **>20**

Wetland Hydrology Present? Yes No **X**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No positive indication of wetland hydrology was observed.

VEGETATION (Four Strata) - Use scientific names of plants.

Sampling Point: **DPA011_U**

Tree Stratum (Plot size: 30 ft.)	Absolute % cover	Dominant Species?	Indicator Status
1. *None Observed*			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1. *None Observed*			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	0 = Total Cover		
Herb Stratum (Plot size: 5 ft.)			
1. *Verbesina alternifolia*	20	Yes	FAC
2. *Solidago canadensis*	10	Yes	FACU
3. *Toxicodendron radicans*	5	No	FAC
4. *Rubus argutus*	5	No	FACU
5. *Parthenocissus quinquefolia*	5	No	FACU
6. *Baptisia alba*	5	No	FACU
7.			
8.			
9.			
10.			
11.			
12.			
	50 = Total Cover		
Woody Vine Stratum (Plot size: 30 ft.)			
1. *None Observed*			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: **1** (A)

Total Number of Dominant Species Across All Strata: **2** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **50%** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	**0**	x 1 =	**0**
FACW species	**0**	x 2 =	**0**
FAC species	**25**	x 3 =	**75**
FACU species	**25**	x 4 =	**100**
UPL species	**0**	x 5 =	**0**
Column Totals:	**50** (A)		**175** (B)

Prevalence Index = B/A = **3.50**

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤ 3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree - Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub - Woody plants, excluding woody vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** **X**

Remarks: (Include photo numbers here or on a separate sheet.)

No positive indication of hydrophytic vegetation was observed (≥50% of dominant species indexed as FAC− or drier).

SOIL

Sampling Point: **DPA011_U**

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-3	10YR 4/2	100	None	—	—	—	Silty Clay Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soils Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
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- ___ Red Parent Material (F21) **(MLRA 127, 147)**

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- ___ 2 cm Muck (A10) **(MLRA 147)**
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- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Compact

Depth (inches): 3

Hydric Soil Present? Yes ___ **No** X

Remarks:

No positive indication of hydric soils was observed.

APPENDIX D

Photolog

Wetland Vegetation Communities—Palustrine Emergent (PEM) Wetlands

Figure 1. PEM wetland WA001 as viewed from DPA005_PEM; view facing north.

Figure 2. PEM wetland WA001 as viewed from DPA005_PEM; view facing east.

Figure 3.PEM wetland WA002 as viewed from DPA010_PEM; view facing north.

Figure 4.PEM wetland WA002 as viewed from DPA010_PEM; view facing east.

Non-wetland Vegetation Communities— Herbaceous Uplands

Figure 5.Herbaceous upland as viewed from DPA001_U; view facing north.

Figure 6.Herbaceous upland as viewed from DPA002_U; view facing south.

Figure 7. Herbaceous upland as viewed from DPA003_U; view facing south.

Figure 8. Herbaceous upland as viewed from DPA004_U; view facing north.

Figure 9. Herbaceous upland as viewed from DPA006_U; view facing east.

Figure 10. Herbaceous upland as viewed from DPA007_U; view facing west.

Non-wetland Vegetation Communities— Herbaceous Uplands

Figure 11. Herbaceous upland as viewed from DPA008_U; view facing south.

Figure 12. Herbaceous upland as viewed from DPA009_U; view facing south.

Figure 13. Herbaceous upland as viewed from DPA011_U; view facing south.

Waterbodies — Perennial Streams

Figure 14. Perennial stream SA001 ingress; view facing south upstream.

Figure 15. Perennial stream SA001 ingress; view facing north downstream.

Waterbodies — Intermittent Streams

Figure 16. Intermittent stream SA003 ingress; view facing southwest upstream.

Figure 17. Intermittent stream SA003 ingress; view facing northeast downstream.

Waterbodies — Wet Weather Conveyances

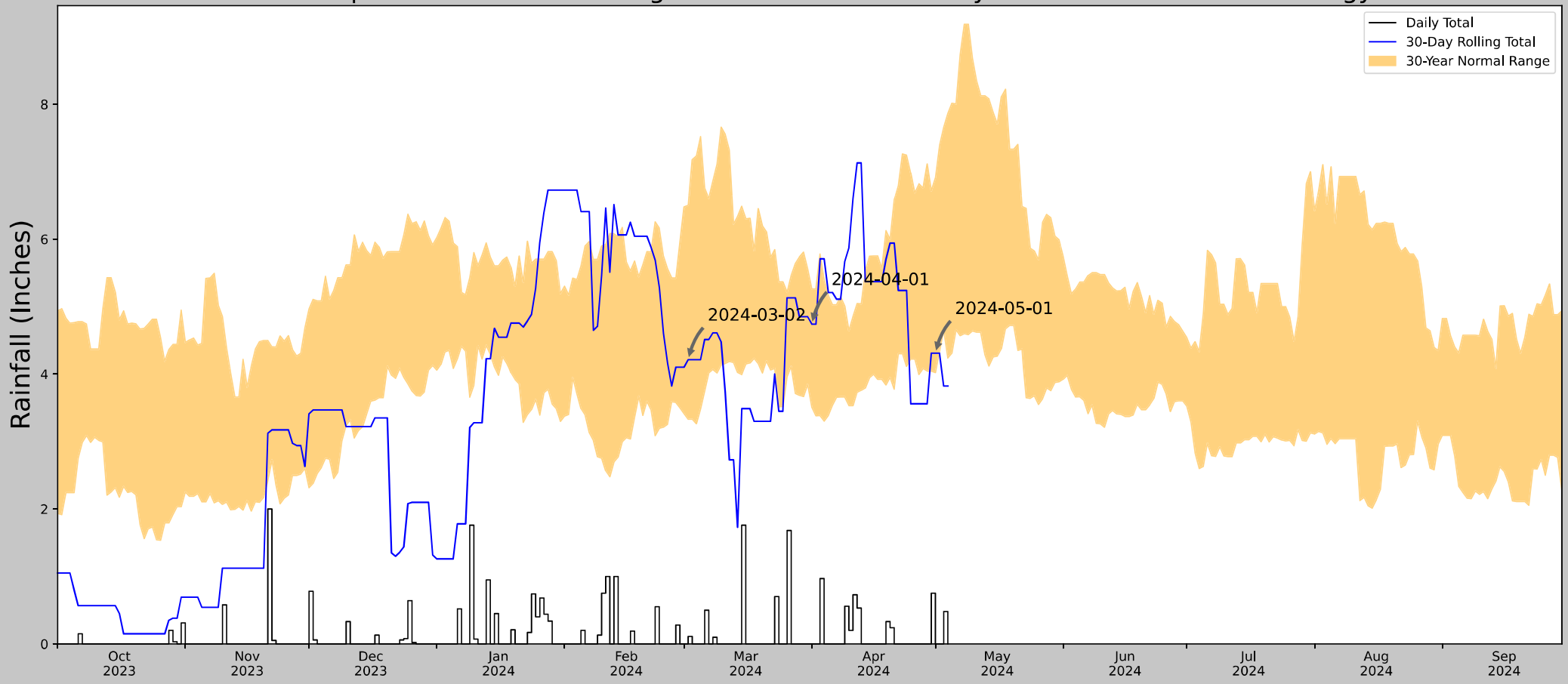
Figure 18. Wet weather conveyance SA002 ingress; view facing south upstream.

Figure 19. Wet weather conveyance SA002 ingress; view facing north downstream.

APPENDIX E

Antecedent Precipitation Tool Results

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	35.593536, -88.032589
Observation Date	2024-05-01
Elevation (ft)	366.351
Drought Index (PDSI)	Not available (2024-04)
WebWIMP H_2O Balance	Wet Season

30 Days Ending	30th %ile (in)	70th %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2024-05-01	4.022441	6.914173	4.311024	Normal	2	3	6
2024-04-01	3.511417	5.261811	4.740158	Normal	2	2	4
2024-03-02	3.330709	6.502362	4.212599	Normal	2	1	2
Result							Normal Conditions - 12

US Army Corps of Engineers

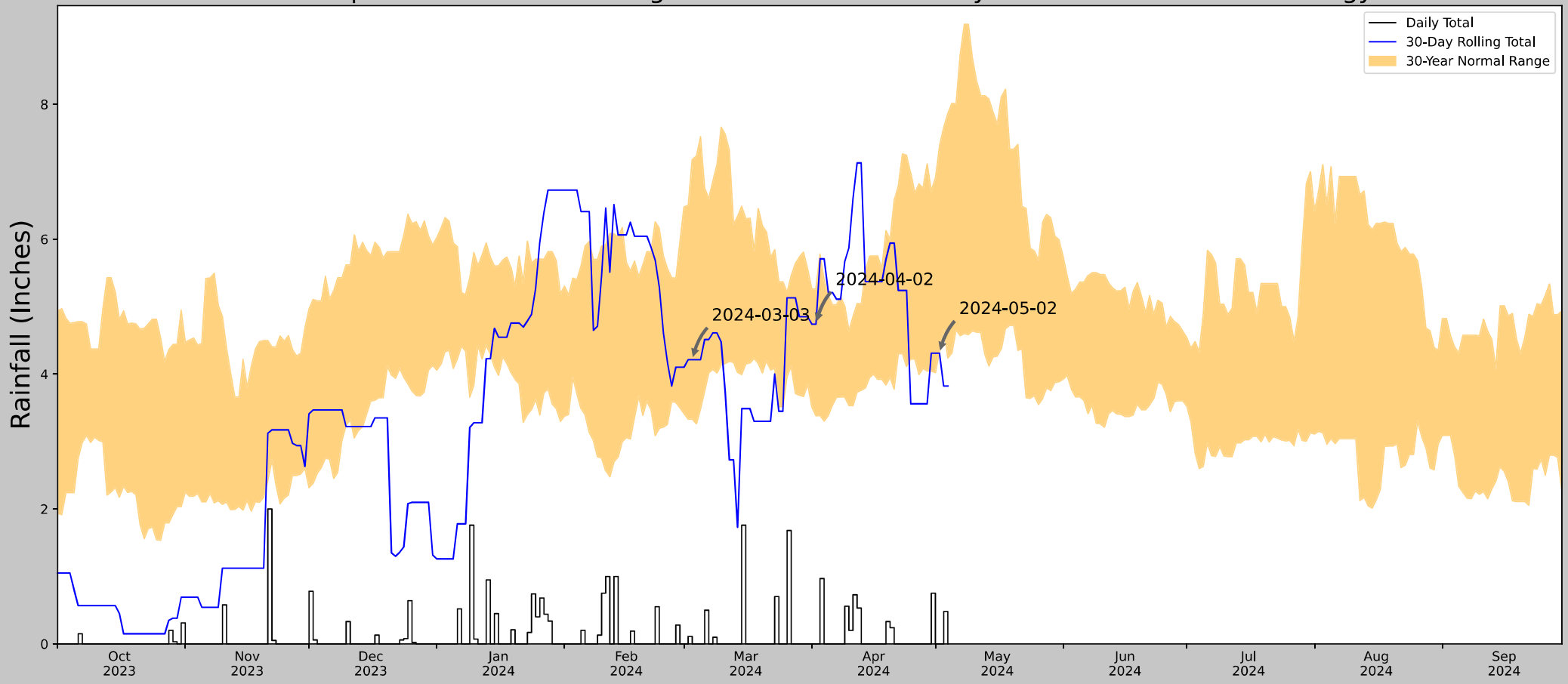
ERDC

Figures and tables made by the Antecedent Precipitation Tool Version 2.0

Developed by: U.S. Army Corps of Engineers and U.S. Army Engineer Research and Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
MOUSETAIL LANDING SP	35.6558, -88.0064	450.131	4.547	83.78	2.427	6369	89
PARSONS 0.5 E	35.6484, -88.1278	496.063	6.835	45.932	3.39	50	0
PARSONS WTP	35.6083, -88.12	410.105	7.174	40.026	3.515	2860	1
DECATURVILLE	35.5953, -88.1175	495.079	7.51	44.948	3.717	5	0
LINDEN WTP	35.6047, -87.8408	504.921	9.948	54.79	5.022	1980	0
LEXINGTON	35.6503, -88.3903	540.026	21.556	89.895	11.638	2	0
WAYNESBORO	35.3042, -87.7592	750.0	27.993	299.869	20.991	86	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	35.593536, -88.032589
Observation Date	2024-05-02
Elevation (ft)	366.351
Drought Index (PDSI)	Not available (2024-04)
WebWIMP H_2O Balance	Wet Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2024-05-02	4.335433	7.396063	4.311024	Dry	1	3	3
2024-04-02	3.381496	5.261811	4.740158	Normal	2	2	4
2024-03-03	3.330709	7.180315	4.212599	Normal	2	1	2
Result							Drier than Normal - 9

US Army Corps of Engineers

ERDC

Figures and tables made by the Antecedent Precipitation Tool Version 2.0

Developed by: U.S. Army Corps of Engineers and U.S. Army Engineer Research and Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
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PARSONS WTP	35.6083, -88.12	410.105	7.174	40.026	3.515	2860	1
DECATURVILLE	35.5953, -88.1175	495.079	7.51	44.948	3.717	5	0
LINDEN WTP	35.6047, -87.8408	504.921	9.948	54.79	5.022	1980	0
LEXINGTON	35.6503, -88.3903	540.026	21.556	89.895	11.638	2	0
WAYNESBORO	35.3042, -87.7592	750.0	27.993	299.869	20.991	86	0

APPENDIX F

Natural Resources Conservation Service

Soil Resource Report

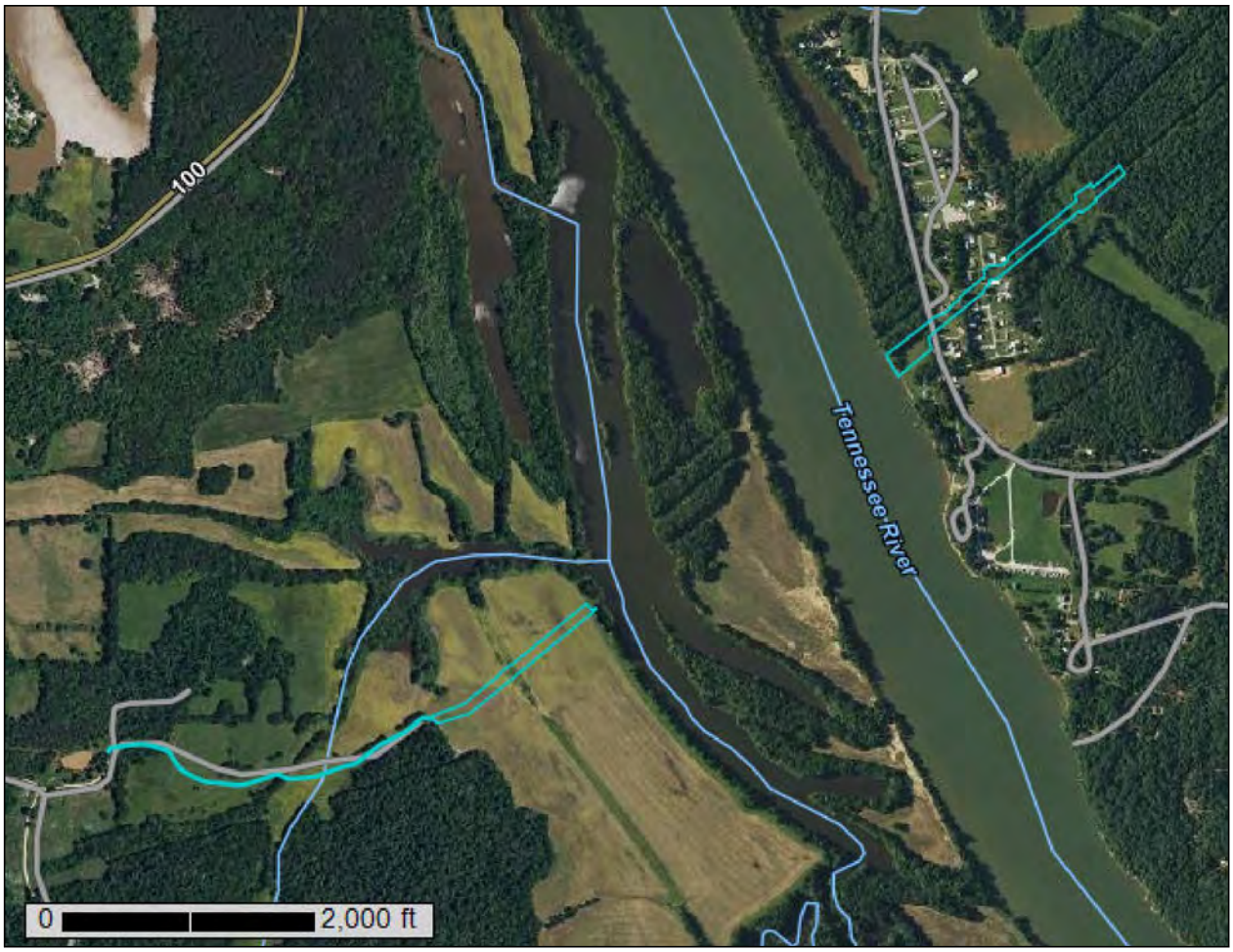
United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Decatur County, Tennessee, and Perry County, Tennessee



May 3, 2024

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

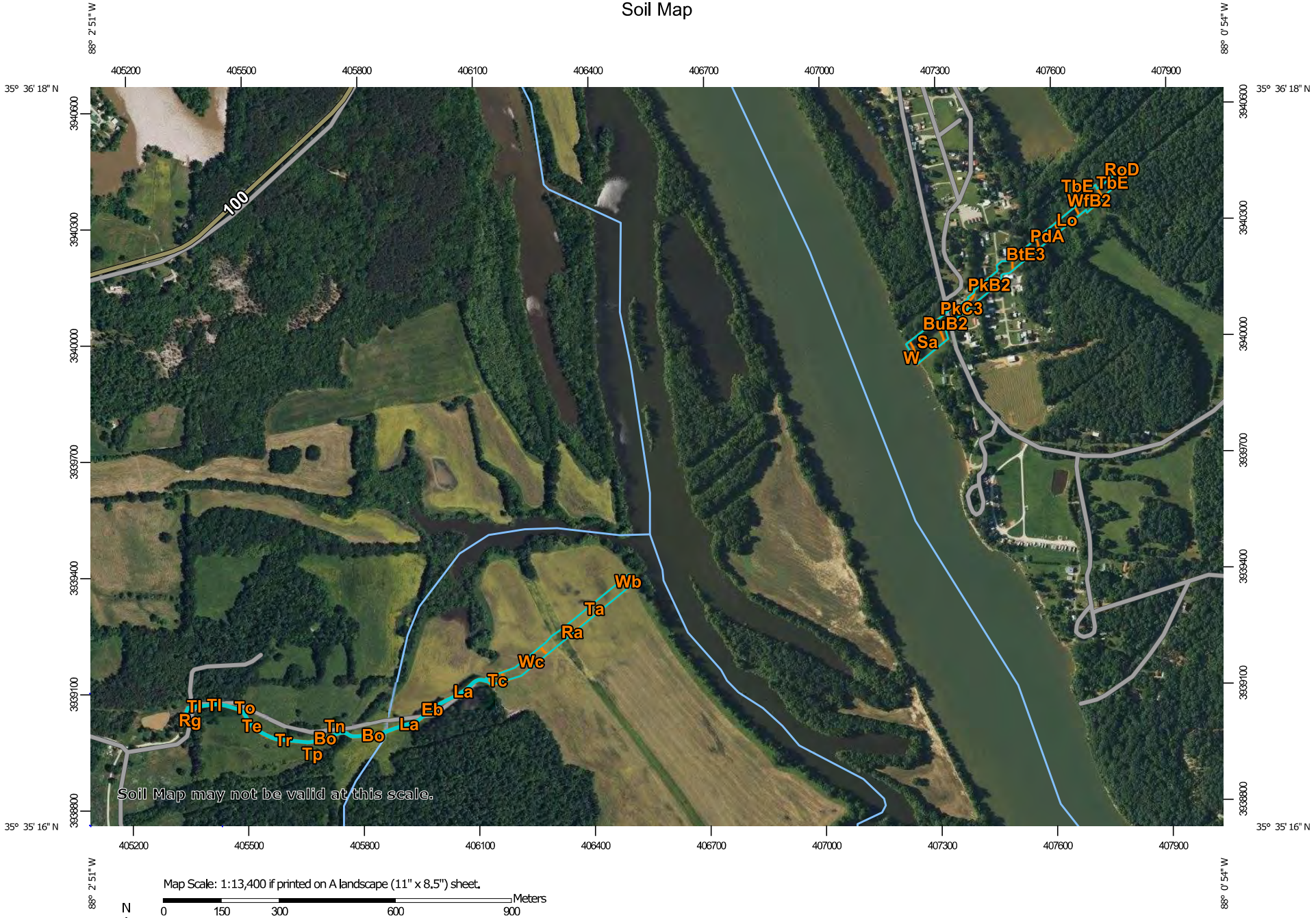
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



Map Scale: 1:13,400 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 150 300 600 900

Feet: 0 500 1000 2000 3000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Decatur County, Tennessee
Survey Area Data: Version 17, Sep 12, 2023

Soil Survey Area: Perry County, Tennessee
Survey Area Data: Version 23, Sep 12, 2023

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

MAP LEGEND

MAP INFORMATION

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 20, 2021—Jun 14, 2021

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Bo	COLLINS SILT LOAM	0.2	1.7%
Eb	Emory silt loam	0.1	0.7%
La	Lindell silt loam, 0 to 2 percent slopes, occasionally flooded	0.3	3.1%
Me	Melvin silt loam	0.1	0.5%
Ra	Robertsville silt loam	0.0	0.4%
Rg	Rough gullied land and Talbott	0.0	0.3%
Ta	Taft silt loam, 0 to 2 percent slopes	1.7	18.0%
Tc	Talbott silt loam, rolling phase	0.2	1.8%
Te	Talbot silty clay loam, eroded rolling phase	0.1	1.3%
Th	Talbott silty clay loam, severely eroded rolling phase	0.0	0.0%
Tl	Talbott-Rock outcrop, rolling phase	0.0	0.1%
Tn	Talbott-Rock outcrop, eroded hilly phase	0.1	1.0%
To	Talbott-Rock outcrop, eroded rolling phase	0.1	1.4%
Tp	Talbott-Rock outcrop, severely eroded hilly phase	0.0	0.2%
Tr	Talbott-Rock outcrop, severely eroded rolling phase	0.2	1.6%
Wb	Wolftever silt loam	0.2	2.0%
Wc	Wolftever silt loam, slightly eroded phase	0.8	8.6%
Subtotals for Soil Survey Area		**4.1**	**42.7%**
Totals for Area of Interest		**9.6**	**100.0%**

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
BtE3	Braxton-Talbott complex, 15 to 35 percent slopes, severely eroded	0.5	5.1%
BuB2	Busseltown loam, 1 to 6 percent slopes, eroded, rarely flooded	0.4	4.6%
Lo	Lobelville silt loam, occasionally flooded	0.4	4.2%
PdA	Paden silt loam, 0 to 3 percent slopes, rarely flooded	0.4	4.0%
PkB2	Pickwick silt loam, 2 to 5 percent slopes, eroded	1.0	10.0%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
PkC3	Pickwick silt loam, 5 to 12 percent slopes, severely eroded	0.3	3.3%
RoD	Rock outcrop-Barfield complex, 10 to 30 percent slopes	0.0	0.0%
Sa	Staser fine sandy loam, occasionally flooded	1.2	12.5%
TbE	Talbott-Mimosa complex, 15 to 35 percent slopes, very rocky	0.5	5.1%
W	Water	0.1	1.5%
WfB2	Wolftever silt loam, 1 to 6 percent slopes, eroded, occasionally flooded	0.7	7.1%
Subtotals for Soil Survey Area		**5.5**	**57.3%**
Totals for Area of Interest		**9.6**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Decatur County, Tennessee

Bo—COLLINS SILT LOAM

Map Unit Setting

National map unit symbol: bzk4
Elevation: 360 to 670 feet
Mean annual precipitation: 54 to 56 inches
Mean annual air temperature: 59 degrees F
Frost-free period: 200 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Chenneby and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Chenneby

Setting

Landform: Flood plains
Landform position (three-dimensional): Talf
Parent material: Silty alluvium

Typical profile

H1 - 0 to 7 inches: silt loam
H2 - 7 to 48 inches: silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 12 to 30 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Available water supply, 0 to 60 inches: High (about 10.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C
Hydric soil rating: No

Eb—Emory silt loam

Map Unit Setting

National map unit symbol: bzl0
Elevation: 360 to 610 feet
Mean annual precipitation: 55 to 56 inches
Mean annual air temperature: 59 degrees F

Frost-free period: 200 days
Farmland classification: All areas are prime farmland

Map Unit Composition
Emory and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Emory

Setting
Landform: Flood plains
Landform position (three-dimensional): Talf
Parent material: Loamy alluvium over residuum weathered from limestone

Typical profile
H1 - 0 to 8 inches: silt loam
H2 - 8 to 42 inches: silt loam
H3 - 42 to 60 inches: silty clay loam

Properties and qualities
Slope: 2 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 60 to 72 inches
Frequency of flooding: Rare
Frequency of ponding: None
Available water supply, 0 to 60 inches: High (about 11.2 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F122XY033TN - Well Drained Loamy Alluvium
Hydric soil rating: No

La—Lindell silt loam, 0 to 2 percent slopes, occasionally flooded

Map Unit Setting
National map unit symbol: 2td2y
Elevation: 500 to 850 feet
Mean annual precipitation: 48 to 58 inches
Mean annual air temperature: 57 to 61 degrees F
Frost-free period: 190 to 230 days
Farmland classification: All areas are prime farmland

Map Unit Composition
Lindell and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Lindell

Setting

Landform: Flood plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Fine-loamy alluvium derived from limestone and siltstone

Typical profile

Ap - 0 to 7 inches: silt loam
Bw - 7 to 15 inches: silt loam
Bg - 15 to 52 inches: silt loam
Cg - 52 to 79 inches: silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 12 to 16 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 11.2 inches)

Interpretive groups

Land capability classification (irrigated): 2w
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F123XY005TN - Floodplains
Hydric soil rating: No

Minor Components

Arrington

Percent of map unit: 4 percent
Landform: Flood plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Norene

Percent of map unit: 4 percent
Landform: Flood plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

Armour

Percent of map unit: 2 percent
Landform: Flood plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Me—Melvin silt loam

Map Unit Setting

National map unit symbol: bzm0
Elevation: 320 to 950 feet
Mean annual precipitation: 40 to 48 inches
Mean annual air temperature: 54 to 55 degrees F
Frost-free period: 165 to 205 days
Farmland classification: Not prime farmland

Map Unit Composition

Melvin and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Melvin

Setting

Landform: Flood plains
Landform position (three-dimensional): Talf
Parent material: Loamy alluvium derived from limestone, sandstone, and shale and/or siltstone

Typical profile

H1 - 0 to 9 inches: silt loam
H2 - 9 to 30 inches: silt loam
H3 - 30 to 62 inches: silt loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very high (about 12.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w

Hydrologic Soil Group: B/D
Ecological site: F122XY018KY - Poorly Drained Alluvium
Hydric soil rating: Yes

Ra—Robertsville silt loam

Map Unit Setting

National map unit symbol: bzmg
Elevation: 360 to 510 feet
Mean annual precipitation: 53 to 56 inches
Mean annual air temperature: 59 degrees F
Frost-free period: 200 to 205 days
Farmland classification: Not prime farmland

Map Unit Composition

Robertsville and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Robertsville

Setting

Landform: Flood plains
Parent material: Old, mixed loamy alluvium and/or colluvium derived from limestone, sandstone, and shale and/or siltstone

Typical profile

H1 - 0 to 6 inches: silt loam
H2 - 6 to 21 inches: silt loam
H3 - 21 to 45 inches: silt loam
H4 - 45 to 65 inches: silty clay loam

Properties and qualities

Slope: 1 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: D
Ecological site: F122XY013KY - Saturated Flats
Hydric soil rating: Yes

Rg—Rough gullied land and Talbott

Map Unit Setting

National map unit symbol: bzmn
Elevation: 460 to 1,400 feet
Mean annual precipitation: 45 to 55 inches
Mean annual air temperature: 57 to 63 degrees F
Frost-free period: 190 to 205 days
Farmland classification: Not prime farmland

Map Unit Composition

Talbott and similar soils: 51 percent
Gullied land: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Talbott

Setting

Landform: Hillslopes
Landform position (three-dimensional): Side slope
Parent material: Clayey residuum weathered from limestone

Typical profile

H1 - 0 to 6 inches: silty clay loam
H2 - 6 to 24 inches: clay
R - 24 to 41 inches: bedrock

Properties and qualities

Slope: 5 to 30 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 2.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: F122XY026TN - Clayey Limestone Terraces And Uplands
Hydric soil rating: No

Ta—Taft silt loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2v59m
Elevation: 350 to 1,400 feet
Mean annual precipitation: 48 to 58 inches
Mean annual air temperature: 57 to 59 degrees F
Frost-free period: 190 to 230 days
Farmland classification: Not prime farmland

Map Unit Composition

Taft and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Taft

Setting

Landform: Alluvial flats
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Silty alluvium over residuum weathered from cherty limestone

Typical profile

A - 0 to 1 inches: silt loam
E - 1 to 9 inches: silt loam
Bw - 9 to 24 inches: silt loam
E/Bx - 24 to 28 inches: silt loam
Btx - 28 to 64 inches: silt loam
2Bt - 64 to 80 inches: silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 20 to 26 inches to fragipan
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 6 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: F122XY024TN - Loess Veneered Depressional Uplands
Hydric soil rating: No

Minor Components

Dickson

Percent of map unit: 6 percent
Landform: Flats
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Guthrie

Percent of map unit: 4 percent
Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Tc—Talbott silt loam, rolling phase

Map Unit Setting

National map unit symbol: bznf
Elevation: 460 to 1,400 feet
Mean annual precipitation: 45 to 55 inches
Mean annual air temperature: 57 to 63 degrees F
Frost-free period: 190 to 205 days
Farmland classification: Not prime farmland

Map Unit Composition

Talbott and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Talbott

Setting

Landform: Hillslopes
Landform position (three-dimensional): Side slope
Parent material: Clayey residuum weathered from limestone

Typical profile

H1 - 0 to 6 inches: silt loam
H2 - 6 to 37 inches: clay
R - 37 to 41 inches: bedrock

Properties and qualities

Slope: 5 to 12 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.6 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: F122XY026TN - Clayey Limestone Terraces And Uplands
Hydric soil rating: No

Te—Talbot silty clay loam, eroded rolling phase

Map Unit Setting
National map unit symbol: bznh
Elevation: 460 to 1,400 feet
Mean annual precipitation: 45 to 55 inches
Mean annual air temperature: 57 to 63 degrees F
Frost-free period: 190 to 205 days
Farmland classification: Not prime farmland

Map Unit Composition
Talbott and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Talbott

Setting
Landform: Hillslopes
Landform position (three-dimensional): Side slope
Parent material: Clayey residuum weathered from limestone

Typical profile
H1 - 0 to 6 inches: silty clay loam
H2 - 6 to 37 inches: clay
R - 37 to 41 inches: bedrock

Properties and qualities
Slope: 5 to 12 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.5 inches)

Interpretive groups
Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: F122XY026TN - Clayey Limestone Terraces And Uplands
Hydric soil rating: No

Th—Talbott silty clay loam, severely eroded rolling phase

Map Unit Setting

National map unit symbol: bznl
Elevation: 460 to 1,400 feet
Mean annual precipitation: 45 to 55 inches
Mean annual air temperature: 57 to 63 degrees F
Frost-free period: 190 to 205 days
Farmland classification: Not prime farmland

Map Unit Composition

Talbott and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Talbott

Setting

Landform: Hillslopes
Landform position (three-dimensional): Side slope
Parent material: Clayey residuum weathered from limestone

Typical profile

H1 - 0 to 6 inches: silty clay loam
H2 - 6 to 24 inches: clay
R - 24 to 41 inches: bedrock

Properties and qualities

Slope: 5 to 12 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 2.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: F122XY026TN - Clayey Limestone Terraces And Uplands
Hydric soil rating: No

TI—Talbott-Rock outcrop, rolling phase

Map Unit Setting

National map unit symbol: bznn
Elevation: 460 to 1,400 feet
Mean annual precipitation: 45 to 55 inches
Mean annual air temperature: 57 to 63 degrees F
Frost-free period: 190 to 205 days
Farmland classification: Not prime farmland

Map Unit Composition

Talbott and similar soils: 75 percent
Rock outcrop: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Talbott

Setting

Landform: Hillslopes
Landform position (three-dimensional): Side slope
Parent material: Clayey residuum weathered from limestone

Typical profile

H1 - 0 to 6 inches: silt loam
H2 - 6 to 37 inches: clay
R - 37 to 41 inches: bedrock

Properties and qualities

Slope: 5 to 12 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: F122XY026TN - Clayey Limestone Terraces And Uplands
Hydric soil rating: No

Description of Rock Outcrop

Typical profile

R - 0 to 10 inches: bedrock

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 8s
Hydric soil rating: No

Tn—Talbott-Rock outcrop, eroded hilly phase

Map Unit Setting

National map unit symbol: bznq
Elevation: 460 to 1,400 feet
Mean annual precipitation: 45 to 55 inches
Mean annual air temperature: 57 to 63 degrees F
Frost-free period: 190 to 205 days
Farmland classification: Not prime farmland

Map Unit Composition

Talbott and similar soils: 75 percent
Rock outcrop: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Talbott

Setting

Landform: Hillslopes
Landform position (three-dimensional): Side slope
Parent material: Clayey residuum weathered from limestone

Typical profile

H1 - 0 to 6 inches: silty clay loam
H2 - 6 to 30 inches: clay
R - 30 to 41 inches: bedrock

Properties and qualities

Slope: 12 to 30 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: F122XY026TN - Clayey Limestone Terraces And Uplands
Hydric soil rating: No

Description of Rock Outcrop

Typical profile

R - 0 to 10 inches: bedrock

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8s
Hydric soil rating: No

To—Talbott-Rock outcrop, eroded rolling phase

Map Unit Setting

National map unit symbol: bznr
Elevation: 460 to 1,400 feet
Mean annual precipitation: 45 to 55 inches
Mean annual air temperature: 57 to 63 degrees F
Frost-free period: 190 to 205 days
Farmland classification: Not prime farmland

Map Unit Composition

Talbott and similar soils: 75 percent
Rock outcrop: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Talbott

Setting

Landform: Hillslopes
Landform position (three-dimensional): Side slope
Parent material: Clayey residuum weathered from limestone

Typical profile

H1 - 0 to 6 inches: silty clay loam
H2 - 6 to 30 inches: clay
R - 30 to 41 inches: bedrock

Properties and qualities

Slope: 5 to 12 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: C
Ecological site: F122XY026TN - Clayey Limestone Terraces And Uplands
Hydric soil rating: No

Description of Rock Outcrop

Typical profile
R - 0 to 10 inches: bedrock

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8s
Hydric soil rating: No

Tp—Talbott-Rock outcrop, severely eroded hilly phase

Map Unit Setting
National map unit symbol: bzns
Elevation: 460 to 1,400 feet
Mean annual precipitation: 45 to 55 inches
Mean annual air temperature: 57 to 63 degrees F
Frost-free period: 190 to 205 days
Farmland classification: Not prime farmland

Map Unit Composition
Talbott and similar soils: 75 percent
Rock outcrop: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Talbott

Setting
Landform: Hillslopes
Landform position (three-dimensional): Side slope
Parent material: Clayey residuum weathered from limestone

Typical profile
H1 - 0 to 6 inches: silty clay loam
H2 - 6 to 24 inches: clay
R - 24 to 41 inches: bedrock

Properties and qualities
Slope: 12 to 30 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 2.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: C
Ecological site: F122XY026TN - Clayey Limestone Terraces And Uplands
Hydric soil rating: No

Description of Rock Outcrop

Typical profile

R - 0 to 10 inches: bedrock

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8s
Hydric soil rating: No

Tr—Talbott-Rock outcrop, severely eroded rolling phase

Map Unit Setting

National map unit symbol: bznt
Elevation: 460 to 1,400 feet
Mean annual precipitation: 45 to 55 inches
Mean annual air temperature: 57 to 63 degrees F
Frost-free period: 190 to 205 days
Farmland classification: Not prime farmland

Map Unit Composition

Talbott and similar soils: 75 percent
Rock outcrop: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Talbott

Setting

Landform: Hillslopes
Landform position (three-dimensional): Side slope
Parent material: Clayey residuum weathered from limestone

Typical profile

H1 - 0 to 6 inches: silty clay loam
H2 - 6 to 24 inches: clay
R - 24 to 41 inches: bedrock

Properties and qualities

Slope: 5 to 12 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches

Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 2.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: F122XY026TN - Clayey Limestone Terraces And Uplands
Hydric soil rating: No

Description of Rock Outcrop

Typical profile

R - 0 to 10 inches: bedrock

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8s
Hydric soil rating: No

Wb—Wolftever silt loam

Map Unit Setting

National map unit symbol: bzp0
Elevation: 350 to 1,000 feet
Mean annual precipitation: 48 to 55 inches
Mean annual air temperature: 57 to 61 degrees F
Frost-free period: 190 to 215 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Wolftever and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wolftever

Setting

Landform: Terraces
Landform position (three-dimensional): Tread
Parent material: Clayey alluvium derived from interbedded sedimentary rock

Typical profile

H1 - 0 to 7 inches: silt loam
H2 - 7 to 15 inches: silty clay
H3 - 15 to 53 inches: silty clay
H4 - 53 to 89 inches: silty clay loam

Properties and qualities

Slope: 2 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 30 to 42 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Available water supply, 0 to 60 inches: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F122XY026TN - Clayey Limestone Terraces And Uplands
Hydric soil rating: No

Wc—Wolftever silt loam, slightly eroded phase

Map Unit Setting

National map unit symbol: bzp1
Elevation: 350 to 1,000 feet
Mean annual precipitation: 48 to 55 inches
Mean annual air temperature: 57 to 61 degrees F
Frost-free period: 190 to 215 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Wolftever and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wolftever

Setting

Landform: Terraces
Landform position (three-dimensional): Tread
Parent material: Clayey alluvium derived from interbedded sedimentary rock

Typical profile

H1 - 0 to 7 inches: silt loam
H2 - 7 to 15 inches: silty clay
H3 - 15 to 53 inches: silty clay
H4 - 53 to 89 inches: silty clay loam

Properties and qualities

Slope: 2 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 30 to 42 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Available water supply, 0 to 60 inches: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F122XY026TN - Clayey Limestone Terraces And Uplands
Hydric soil rating: No

Perry County, Tennessee

BtE3—Braxton-Talbott complex, 15 to 35 percent slopes, severely eroded

Map Unit Setting

National map unit symbol: ltc4
Elevation: 380 to 850 feet
Mean annual precipitation: 35 to 63 inches
Mean annual air temperature: 45 to 70 degrees F
Frost-free period: 183 to 232 days
Farmland classification: Not prime farmland

Map Unit Composition

Braxton and similar soils: 60 percent
Talbott and similar soils: 30 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Braxton

Setting

Landform: Hillslopes
Landform position (three-dimensional): Side slope
Parent material: Clayey alluvium and/or residuum weathered from limestone

Typical profile

H1 - 0 to 4 inches: silty clay loam
H2 - 4 to 79 inches: clay

Properties and qualities

Slope: 15 to 35 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 8.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: C
Ecological site: F122XY026TN - Clayey Limestone Terraces And Uplands
Hydric soil rating: No

Description of Talbott

Setting

Landform: Hillslopes
Landform position (three-dimensional): Side slope
Parent material: Clayey residuum weathered from limestone

Typical profile

H1 - 0 to 3 inches: silt loam
H2 - 3 to 37 inches: clay
R - 37 to 47 inches: bedrock

Properties and qualities

Slope: 15 to 35 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: C
Ecological site: F122XY026TN - Clayey Limestone Terraces And Uplands
Hydric soil rating: No

Minor Components

Minor components

Percent of map unit: 10 percent
Hydric soil rating: No

BuB2—Busseltown loam, 1 to 6 percent slopes, eroded, rarely flooded

Map Unit Setting

National map unit symbol: ltc5
Elevation: 380 to 850 feet
Mean annual precipitation: 35 to 63 inches
Mean annual air temperature: 45 to 70 degrees F
Frost-free period: 183 to 232 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Busseltown and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Busseltown

Setting

Landform: Stream terraces

Landform position (three-dimensional): Tread
Parent material: Loamy alluvium derived from limestone, sandstone, and shale

Typical profile

H1 - 0 to 9 inches: loam
H2 - 9 to 20 inches: loam
H3 - 20 to 30 inches: sandy clay loam
H4 - 30 to 80 inches: loam

Properties and qualities

Slope: 1 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 18 to 30 inches
Frequency of flooding: Rare
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: D
Ecological site: F122XY029TN - Tennessee River Fragipan Terraces
Hydric soil rating: No

Minor Components

Minor components

Percent of map unit: 10 percent
Hydric soil rating: No

Lo—Lobelville silt loam, occasionally flooded

Map Unit Setting

National map unit symbol: ltcx
Elevation: 380 to 850 feet
Mean annual precipitation: 35 to 63 inches
Mean annual air temperature: 45 to 70 degrees F
Frost-free period: 183 to 232 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Lobelville and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Lobelville

Setting

Landform: Flood plains
Landform position (three-dimensional): Tread
Parent material: Loamy alluvium over gravelly alluvium

Typical profile

H1 - 0 to 6 inches: silt loam
H2 - 6 to 19 inches: silt loam
H3 - 19 to 38 inches: gravelly silt loam
H4 - 38 to 79 inches: extremely gravelly sandy loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 19 to 30 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 7.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F122XY030TN - Moderately Well Drained Loamy Alluvium
Hydric soil rating: No

Minor Components

Minor components

Percent of map unit: 10 percent
Hydric soil rating: No

PdA—Paden silt loam, 0 to 3 percent slopes, rarely flooded

Map Unit Setting

National map unit symbol: ltd0
Elevation: 350 to 550 feet
Mean annual precipitation: 48 to 55 inches
Mean annual air temperature: 57 to 61 degrees F
Frost-free period: 180 to 210 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Paden and similar soils: 90 percent

Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Paden

Setting
Landform: Stream terraces
Landform position (three-dimensional): Tread
Parent material: Loess or silty alluvium over loamy alluvium derived from interbedded sedimentary rock

Typical profile
H1 - 0 to 8 inches: silt loam
H2 - 8 to 24 inches: silt loam
H3 - 24 to 46 inches: silt loam
H4 - 46 to 79 inches: extremely gravelly coarse sandy loam

Properties and qualities
Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 18 to 26 inches
Frequency of flooding: Rare
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.9 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C
Ecological site: F122XY029TN - Tennessee River Fragipan Terraces
Hydric soil rating: No

Minor Components

Minor components
Percent of map unit: 10 percent
Hydric soil rating: No

PkB2—Pickwick silt loam, 2 to 5 percent slopes, eroded

Map Unit Setting
National map unit symbol: ltd4
Elevation: 380 to 850 feet
Mean annual precipitation: 35 to 63 inches
Mean annual air temperature: 45 to 70 degrees F
Frost-free period: 183 to 232 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Pickwick and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pickwick

Setting

Landform: Stream terraces
Landform position (three-dimensional): Tread
Parent material: Loess over clayey alluvium derived from interbedded sedimentary rock

Typical profile

H1 - 0 to 7 inches: silt loam
H2 - 7 to 42 inches: silty clay loam
H3 - 42 to 79 inches: silty clay

Properties and qualities

Slope: 2 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: High (about 11.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F122XY027TN - Loamy Terraces
Hydric soil rating: No

Minor Components

Minor components

Percent of map unit: 10 percent
Hydric soil rating: No

PkC3—Pickwick silt loam, 5 to 12 percent slopes, severely eroded

Map Unit Setting

National map unit symbol: ltd6
Elevation: 380 to 850 feet
Mean annual precipitation: 35 to 63 inches
Mean annual air temperature: 45 to 70 degrees F

Frost-free period: 183 to 232 days
Farmland classification: Not prime farmland

Map Unit Composition
Pickwick and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pickwick

Setting
Landform: Stream terraces
Landform position (three-dimensional): Tread
Parent material: Loess over clayey alluvium derived from interbedded sedimentary rock

Typical profile
H1 - 0 to 2 inches: silt loam
H2 - 2 to 36 inches: silty clay loam
H3 - 36 to 79 inches: silty clay

Properties and qualities
Slope: 5 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: High (about 11.1 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: F122XY027TN - Loamy Terraces
Hydric soil rating: No

Minor Components

Minor components
Percent of map unit: 15 percent
Hydric soil rating: No

RoD—Rock outcrop-Barfield complex, 10 to 30 percent slopes

Map Unit Setting
National map unit symbol: ltd9
Elevation: 380 to 850 feet

Mean annual precipitation: 35 to 63 inches
Mean annual air temperature: 45 to 70 degrees F
Frost-free period: 183 to 232 days
Farmland classification: Not prime farmland

Map Unit Composition

Rock outcrop: 55 percent
Barfield and similar soils: 35 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rock Outcrop

Typical profile

R - 0 to 10 inches: bedrock

Properties and qualities

Slope: 10 to 30 percent
Surface area covered with cobbles, stones or boulders: 55.0 percent
Depth to restrictive feature: 0 inches to lithic bedrock
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydric soil rating: No

Description of Barfield

Setting

Landform: Hillslopes
Landform position (three-dimensional): Side slope
Parent material: Clayey residuum weathered from limestone

Typical profile

H1 - 0 to 6 inches: stony silty clay loam
H2 - 6 to 17 inches: channery silty clay
R - 17 to 27 inches: bedrock

Properties and qualities

Slope: 10 to 30 percent
Surface area covered with cobbles, stones or boulders: 2.0 percent
Depth to restrictive feature: 8 to 20 inches to lithic bedrock
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 2.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D

Hydric soil rating: No

Minor Components

Minor components

Percent of map unit: 10 percent
Hydric soil rating: No

Sa—Staser fine sandy loam, occasionally flooded

Map Unit Setting

National map unit symbol: ltdc
Elevation: 380 to 850 feet
Mean annual precipitation: 35 to 63 inches
Mean annual air temperature: 45 to 70 degrees F
Frost-free period: 183 to 232 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Staser and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Staser

Setting

Landform: Flood plains
Landform position (three-dimensional): Tread
Parent material: Loamy alluvium derived from interbedded sedimentary rock

Typical profile

H1 - 0 to 46 inches: fine sandy loam
H2 - 46 to 79 inches: clay loam

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Available water supply, 0 to 60 inches: High (about 10.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B

Ecological site: F122XY033TN - Well Drained Loamy Alluvium
Hydric soil rating: No

Minor Components

Minor components
Percent of map unit: 10 percent
Hydric soil rating: No

TbE—Talbott-Mimosa complex, 15 to 35 percent slopes, very rocky

Map Unit Setting
National map unit symbol: ltdm
Elevation: 380 to 850 feet
Mean annual precipitation: 35 to 63 inches
Mean annual air temperature: 45 to 70 degrees F
Frost-free period: 183 to 232 days
Farmland classification: Not prime farmland

Map Unit Composition
Talbott and similar soils: 50 percent
Mimosa and similar soils: 42 percent
Minor components: 8 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Talbott

Setting
Landform: Hillslopes
Landform position (three-dimensional): Side slope
Parent material: Clayey residuum weathered from limestone

Typical profile
H1 - 0 to 6 inches: silt loam
H2 - 6 to 30 inches: clay
H3 - 30 to 37 inches: clay
R - 37 to 47 inches: bedrock

Properties and qualities
Slope: 15 to 35 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: C
Ecological site: F122XY026TN - Clayey Limestone Terraces And Uplands
Hydric soil rating: No

Description of Mimosa

Setting

Landform: Hillslopes
Landform position (three-dimensional): Side slope
Parent material: Clayey residuum weathered from limestone

Typical profile

H1 - 0 to 6 inches: silt loam
H2 - 6 to 15 inches: clay
H3 - 15 to 55 inches: clay
R - 55 to 65 inches: bedrock

Properties and qualities

Slope: 15 to 35 percent
Depth to restrictive feature: 40 to 80 inches to lithic bedrock
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 7.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: C
Ecological site: F122XY026TN - Clayey Limestone Terraces And Uplands
Hydric soil rating: No

Minor Components

Rock outcrop

Percent of map unit: 8 percent
Hydric soil rating: No

W—Water

Map Unit Setting

National map unit symbol: lr8m
Elevation: 590 to 1,050 feet

Mean annual precipitation: 46 to 63 inches
Mean annual air temperature: 46 to 70 degrees F
Frost-free period: 189 to 213 days
Farmland classification: Not prime farmland

Map Unit Composition
Water: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

WfB2—Wolftever silt loam, 1 to 6 percent slopes, eroded, occasionally flooded

Map Unit Setting
National map unit symbol: ltdy
Elevation: 380 to 850 feet
Mean annual precipitation: 35 to 63 inches
Mean annual air temperature: 45 to 70 degrees F
Frost-free period: 183 to 232 days
Farmland classification: All areas are prime farmland

Map Unit Composition
Wolftever and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wolftever

Setting
Landform: Stream terraces
Landform position (three-dimensional): Tread
Parent material: Clayey alluvium derived from interbedded sedimentary rock

Typical profile
H1 - 0 to 4 inches: silt loam
H2 - 4 to 16 inches: silty clay loam
H3 - 16 to 65 inches: silty clay
H4 - 65 to 79 inches: silty clay loam

Properties and qualities
Slope: 1 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 30 to 42 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Available water supply, 0 to 60 inches: High (about 9.4 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e

Hydrologic Soil Group: C
Ecological site: F122XY026TN - Clayey Limestone Terraces And Uplands
Hydric soil rating: No

Minor Components

Minor components
Percent of map unit: 10 percent
Hydric soil rating: No

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

APPENDIX G

Hydrological Determination Field Data Sheets

Tennessee Department of Environment and Conservation - Division of Water Resources
312 Rosa L. Parks Ave. 11th Floor. Nashville, TN 37243

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5 (Fillable Form)

Named Waterbody: UT to Tennessee River	Date/Time: 05/01/2024 15:45
Assessors/Affiliation: M. Drees, J. Dreger - SWCA Environmental Consultants	Project ID : SA001
Site Name/Description: Replace 100-2 Line Tennesee River HDD	
Site Location: Linden	
HUC (12 digit): 060400010705	Latitude: 35.602184
Previous Rainfall (7-days) : 1.66 inch	Longitude: -88.019563
Precipitation this Season vs. Normal : average Source of recent & seasonal precip. data : USACE APT and CoCoRaHs	
Watershed Size : 32,777.02	County: Perry
Soil Type(s) / Geology : Lobelville silt loam, occasionally flooded (Lo)	Source: USDA NRCS
Surrounding Land Use : Existing pipeline right-of-way, deciduous and mixed forests, pasture/hay	
Degree of historical alteration to natural channel morphology & hydrology (select one & describe fully in Notes) : Moderate	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	☑	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	☑	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions N/A	☐	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	☑	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	☑	Stream
6. Presence of fish (except *Gambusia*)	☐	Stream
7. Presence of naturally occurring ground water table connection	☑	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	☑	Stream
9. Evidence watercourse has been used as a supply of drinking water	☑	Stream

NOTE: If any Primary Indicators 1-9 = "Yes", then no further investigation is necessary. However, assessors may choose to score secondary indicators as supporting evidence.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-DWR Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = STREAM

Secondary Indicator Score (if applicable) = 21.00

Justification / Notes :

The feature flows southeast to northwest across the right-of-way. Juvenile fish and adult turtles observes in the channel.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 8.50)	**Absent**	**Weak**	**Moderate**	**Strong**	
1. Continuous bed and bank	0	1	2	3	2
2. Sinuous channel	0	1	2	3	0
3. In-channel structure: riffle-pool sequences	0	1	2	3	1
4. Sorting of soil textures or other substrate	0	1	2	3	2
5. Active/relic floodplain	0	0.5	1	1.5	0.5
6. Depositional bars or benches	0	1	2	3	2
7. Braided channel	0	1	2	3	0
8. Recent alluvial deposits	0	0.5	1	1.5	0.5
9. Natural levees	0	1	2	3	0
10. Headcuts	0	1	2	3	0
11. Grade controls	0	0.5	1	1.5	0
12. Natural valley or drainageway	0	0.5	1	1.5	0.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3	0

B. Hydrology (Subtotal = 5.50)	**Absent**	**Weak**	**Moderate**	**Strong**	
14. Subsurface flow/discharge into channel	0	1	2	3	0
15. Water in channel and >48 hours since sig. rain	0	1	2	3	1
16. Leaf litter in channel	1.5	1	0.5	0	1.5
17. Sediment on plants or on debris	0	0.5	1	1.5	0.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5	1
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5		1.5

C. Biology (Subtotal = 7.00)	**Absent**	**Weak**	**Moderate**	**Strong**	
20. Fibrous roots in channel bed [1]	3	2	1	0	2
21. Rooted plants in the thalweg [1]	3	2	1	0	3
22. Crayfish in stream (exclude in floodplain)	0	1	2	3	0
23. Bivalves/mussels	0	1	2	3	0
24. Amphibians	0	0.5	1	1.5	0.5
25. Macrobenthos (record type & abundance)	0	1	2	3	0
26. Filamentous algae; periphyton	0	1	2	3	1
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5	0
28. Wetland plants in channel bed [2]	0	0.5	1	1.5	0.5

[1] Focus is on the presence of terrestrial plants.

[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 21.00

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Bed and bank are continuous throughout most of the reach. Low velocity observed in shallow areas upstream of reach with multiple deep pools in the mid-reach and downstream of the reach, however, the majority of stream morphology observed is run. Sorting of substrates is clear in multiple locations with cobble and boulder size material near the thalweg and finer material such as gravel, sand, and silt dominating the edges of the channel. Hydric soils were observed in the sides of the channel. A few locations throughout the reach contained FACW species; however, no vegetation was observed rooted in the thalweg. An adult frog, turtles, and juvenile fish are present within the reach.

Tennessee Department of Environment and Conservation - Division of Water Resources
312 Rosa L. Parks Ave. 11th Floor. Nashville, TN 37243

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5 (Fillable Form)

Named Waterbody: UT to Tennessee River	Date/Time: 05/01/2024 17:15
Assessors/Affiliation: M. Drees, J. Dreger - SWCA Environmental Consultants	Project ID : SA002
Site Name/Description: Replace 100-2 Line Tennesee River HDD	
Site Location: Linden	
HUC (12 digit): 060400010705	Latitude: 35.599799
Previous Rainfall (7-days) : 1.66 inch	Longitude: -88.023065
Precipitation this Season vs. Normal : average Source of recent & seasonal precip. data : USACE APT and CoCoRaHs	
Watershed Size : 32,777.02	County: Perry
Soil Type(s) / Geology : Busseltown loam, 1 to 6 percent slopes, eroded, rarely flooded (BuB2)	Source: USDA NRCS
Surrounding Land Use : Residential area - developed, open space and developed, medium intensity	
Degree of historical alteration to natural channel morphology & hydrology (select one & describe fully in Notes) : Severe	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	☐	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	☑	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions N/A	☐	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	☐	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	☑	Stream
6. Presence of fish (except *Gambusia*)	☑	Stream
7. Presence of naturally occurring ground water table connection	☑	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	☑	Stream
9. Evidence watercourse has been used as a supply of drinking water	☑	Stream

NOTE: If any Primary Indicators 1-9 = "Yes", then no further investigation is necessary. However, assessors may choose to score secondary indicators as supporting evidence.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-DWR Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = WET WEATHER CONVEYANCE

Secondary Indicator Score (if applicable) = 6.00

Justification / Notes :

The feature is a linear, human-made roadside ditch.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 2.00)	**Absent**	**Weak**	**Moderate**	**Strong**	
1. Continuous bed and bank	0	1	2	3	1
2. Sinuous channel	0	1	2	3	0
3. In-channel structure: riffle-pool sequences	0	1	2	3	0
4. Sorting of soil textures or other substrate	0	1	2	3	0
5. Active/relic floodplain	0	0.5	1	1.5	0
6. Depositional bars or benches	0	1	2	3	0
7. Braided channel	0	1	2	3	0
8. Recent alluvial deposits	0	0.5	1	1.5	0.5
9. Natural levees	0	1	2	3	0
10. Headcuts	0	1	2	3	0
11. Grade controls	0	0.5	1	1.5	0
12. Natural valley or drainageway	0	0.5	1	1.5	0.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3	0

B. Hydrology (Subtotal = 1.00)	**Absent**	**Weak**	**Moderate**	**Strong**	
14. Subsurface flow/discharge into channel	0	1	2	3	0
15. Water in channel and >48 hours since sig. rain	0	1	2	3	0
16. Leaf litter in channel	1.5	1	0.5	0	0
17. Sediment on plants or on debris	0	0.5	1	1.5	0.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5	0.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5		0

C. Biology (Subtotal = 3.00)	**Absent**	**Weak**	**Moderate**	**Strong**	
20. Fibrous roots in channel bed [1]	3	2	1	0	1
21. Rooted plants in the thalweg [1]	3	2	1	0	2
22. Crayfish in stream (exclude in floodplain)	0	1	2	3	0
23. Bivalves/mussels	0	1	2	3	0
24. Amphibians	0	0.5	1	1.5	0
25. Macrobenthos (record type & abundance)	0	1	2	3	0
26. Filamentous algae; periphyton	0	1	2	3	0
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5	0
28. Wetland plants in channel bed [2]	0	0.5	1	1.5	0

[1] Focus is on the presence of terrestrial plants.

[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 6.00

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

The watercourse exhibits a weak bed and bank and contains a moderate amount of fibrous roots throughout the channel.

Additionally, vegetation was observed rooted in the channel bed, most notably at the upgradient end of the reach.

Leaf litter was observed throughout with a low amount of sediment deposits observed.

Tennessee Department of Environment and Conservation - Division of Water Resources
312 Rosa L. Parks Ave. 11th Floor. Nashville, TN 37243

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5 (Fillable Form)

Named Waterbody: UT to Tennessee River	Date/Time: 05/02/2024 9:11
Assessors/Affiliation: M. Drees, J. Dreger - SWCA Environmental Consultants	Project ID : SA003
Site Name/Description: Replace 100-2 Line Tennesee River HDD	
Site Location: Decaturville	
HUC (12 digit): 060400010705	Latitude: 35.590125
Previous Rainfall (7-days) : 1.66 inch	Longitude: -88.040277
Precipitation this Season vs. Normal : abnormally dry Source of recent & seasonal precip. data : USACE APT and CoCoRaHs	
Watershed Size : 32,777.02	County: Decatur
Soil Type(s) / Geology : Talbott-Rock outcrop, eroded hilly phase (Tn)	Source: USDA NRCS
Surrounding Land Use : Existing pipeline right-of-way, deciduous forest, cultivated crop, pasture/hay	
Degree of historical alteration to natural channel morphology & hydrology (select one & describe fully in Notes) : Moderate	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	☑	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	☑	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions N/A	☐	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	☑	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	☑	Stream
6. Presence of fish (except *Gambusia*)	☑	Stream
7. Presence of naturally occurring ground water table connection	☑	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	☐	Stream
9. Evidence watercourse has been used as a supply of drinking water	☑	Stream

NOTE: If any Primary Indicators 1-9 = "Yes", then no further investigation is necessary. However, assessors may choose to score secondary indicators as supporting evidence.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-DWR Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = STREAM

Secondary Indicator Score (if applicable) = 26.50

Justification / Notes :

The feature flows southwest to northeast across the right-of-way. The feature has been altered via channelization. Livestock activity has also impacted the banks in some locations.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 12.50)	**Absent**	**Weak**	**Moderate**	**Strong**	
1. Continuous bed and bank	0	1	2	3	1.5
2. Sinuous channel	0	1	2	3	0
3. In-channel structure: riffle-pool sequences	0	1	2	3	1
4. Sorting of soil textures or other substrate	0	1	2	3	2
5. Active/relic floodplain	0	0.5	1	1.5	0.5
6. Depositional bars or benches	0	1	2	3	2
7. Braided channel	0	1	2	3	0
8. Recent alluvial deposits	0	0.5	1	1.5	0.5
9. Natural levees	0	1	2	3	0
10. Headcuts	0	1	2	3	1
11. Grade controls	0	0.5	1	1.5	0.5
12. Natural valley or drainageway	0	0.5	1	1.5	0.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3	3

B. Hydrology (Subtotal = 6.50)	**Absent**	**Weak**	**Moderate**	**Strong**	
14. Subsurface flow/discharge into channel	0	1	2	3	0
15. Water in channel and >48 hours since sig. rain	0	1	2	3	2
16. Leaf litter in channel	1.5	1	0.5	0	1.5
17. Sediment on plants or on debris	0	0.5	1	1.5	0.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5	1
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5		1.5

C. Biology (Subtotal = 7.50)	**Absent**	**Weak**	**Moderate**	**Strong**	
20. Fibrous roots in channel bed [1]	3	2	1	0	2
21. Rooted plants in the thalweg [1]	3	2	1	0	3
22. Crayfish in stream (exclude in floodplain)	0	1	2	3	0.5
23. Bivalves/mussels	0	1	2	3	0
24. Amphibians	0	0.5	1	1.5	0.5
25. Macrobenthos (record type & abundance)	0	1	2	3	0
26. Filamentous algae; periphyton	0	1	2	3	1
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5	0
28. Wetland plants in channel bed [2]	0	0.5	1	1.5	0.5

[1] Focus is on the presence of terrestrial plants.

[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 26.50

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Bed and bank within reach has been impacted by livestock in some sections. Upstream of the reach exhibits strong bed and bank, while downstream of the reach has interruptions. No sinuosity observed due to channelization of the reach. A small riffle occurs downstream of the reach, however much of the assessed section is run. Large woody debris upstream acts as a grade control which inhibits flow and supports the formation of a wrackline. Depositional bars and benches prevalent upstream of the reach containing recent alluvial deposits. Hydric soils and flowing water were observed throughout the reach. Fibrous roots found in channel bed downstream, but not upstream. An adult frog and crayfish burrow were observed in the channel.

APPENDIX H

Non-Hydrogeomorphic Tennessee Rapids Assessment Method Datasheets

NON-HGM Tennessee Rapid Assessment Method for Wetlands

For
PEM Wetland:
WA001
Decatur and Perry Counties

May 2024

Analysis Completed By

SWCA® ENVIRONMENTAL CONSULTANTS
13 Palafox Place
Pensacola, Florida 32502
(850)304-5535

For

State of Tennessee
Department of Environment and Conservation
Division of Water Resources
Natural Resources Unit
William R. Snodgrass Tennessee Tower
312 Rosa L. Parks Avenue, 11th Floor
Nashville, Tennessee 37243

Quantitative Rating

Metric 1. Wetland area (max 6 pts). Estimate the area of wetland and select the appropriate size class and assign score. Estimated areas should clearly place the wetland within the appropriate class.

6pts	>50 acres (west TN)	>25 acres (middle TN)	>10 acres (east TN *)	
5pts	25 - <50 acres (west TN)	10- 25 acres (middle TN)	7-<10 acres (east TN*)	
4pts	10 - <25 acres (west TN)	7-< 25acres (middle TN)	3-<7 acres (east TN*)	
3pts	3 - <10 acres (west TN)	3< 7 acres (middle TN)	1-<3 acres (east TN)	
2pts	0.3 - <3 acres (west TN)	0.5- <3 acres (middle TN)	0.5-<1 acres (east TN)	
1pt	0.1 - <0.3 acres (west TN)	<0.5 acres (middle TN)	<0.5 acres (east TN)	**1**

*More applicable to West Tennessee; use with discretion in Middle Tennessee, Consult TDEC-DWR Natural Resources Unit for use in East Tennessee.

Table 2. Metric to English conversion table with visual estimation sizes.

acres	ft^2	yd^2	ft on side	yd on side	ha	m^2	on side
50	2,177,983	241,998	1476	492	20.2	202,000	449
25	1,088,992	120,999	1044	348	10.1	101,000	318
10	435,596	48,340	660	220	4.1	41,000	203
3	130,679	14,520	362	121	1.2	12,000	110
0.3	13,067	1,452	114	38	0.12	1,200	35
0.1	4,356	484	66	22	0.04	400	20

Metric 1 Total **1**

Metric 2. Upland buffers and intensity of surrounding land uses (Max 14 points). Wetlands without upland “buffers", or that are located where human land use is more intensive, are often, but not always, more degraded and often have lower wildlife habitat resource value.

2a. Average Buffer Width (ABW). Calculate the average buffer width and select only one score. To calculate ABW, estimate buffer width on each side (max of 50m) and divide by the number of sides. Example: ABW of a wetland with buffers of 100m, 25m, 10m and 0m would be calculated as follows: ABW = (50m + 25m + 10m + 0m)/4 = 21.25m. Intensive land uses are not buffers, e.g. active row cropping, paved areas, housing developments, etc.

7pts	WIDE. >50m (164ft) or more around perimeter.	
4pts	MEDIUM. 25m to <50m (82 to <164ft) around the perimeter.	**4**
1pt	NARROW. 10m to <25m (32 to <82ft) around the perimeter.	
0pts	VERY NARROW. <10m (<32ft) around perimeter.	

2b. Intensity of predominant surrounding land use(s) Select one, or choose up to two and average score, for the intensity of the predominant land use(s) outside the wetland's buffer zone.

7pts	VERY LOW. 2nd growth or older forest, prairie, barren, wildlife area, etc.	
5pts	LOW. Old fallow field, shrub land, early successional young forest, etc.	
3pts	MODERATELY HIGH. Residential, pasture, orchard, park, conservation tillage, mowed field, etc.	**3**
1pt	HIGH. urban, industrial, row cropping, mining, construction, etc.	

Metric 2 Total **7**

Metric 3. Hydrology (Max 30 points). This metric evaluates the wetland's water budget, hydroperiod, the hydrologic connectivity of the wetland to other surface waters, and the degree to which the wetland's hydrology has been altered by human activity**. A wetland can receive no more than 30 points for Metric 3 even though it is possible to score more than 30 points.**

3a. Sources of Water. Select all that apply and sum the score. This question relates to a wetland's water budget. It also is reflective that wetlands with certain types of water sources, or multiple water sources, e.g. high pH groundwater or perennial surface water connections, can be very high quality wetlands or can have high functions and values.		
5pts	High pH groundwater (7.5-9.0)	
3pts	Other groundwater	
1pts	Precipitation	**1**
3pts	Seasonal surface water	
5pts	Perennial surface water (lake or stream)	
3b. Connectivity. Select all that apply and sum score		
1pt	**100 year floodplain.** "Floodplain" is defined as "...the relatively level land next to a stream c river channel that is periodically submerged by flood waters. It is composed of alluvium deposited by the present stream or river when it floods." Where they are available, flood insurance rate maps (FIRMs) and flood boundary and floodway maps may be used.	**1**
1pt	**Between stream/lake and other human land use.** This question asks whether the wetland is located between a surface water and a different adjacent land use, such that run-off from adjacent land use could flow through wetland before it discharges into the surface wate buffering it. "Different adjacent land uses" include agricultural, commercial, industrial, minin residential uses.	**1**
1pt	**Part of a larger wetland or upland complex.** This question asks whether the wetland is in physical proximity to, or a part of other nearby wetland or upland habitat areas.	
1pt	**Part of riparian corridor**.	
3c. Maximum water depth. Select only one and assign score. The evaluator *does not* need to actually observe the wetland when its water depth is greatest in order to award the maximum points for this question. The use of secondary indicators, as outlined in the 1987 Manual will be useful in answering this question.		
3 pts	>0.7m (27.6in)	
2pts	0.4 to 0.7m (15.7 to 27.6in)	
1pt	<0.4m (<15.7in)	**1**
3d. Duration of inundation/saturation. Select one or double check and average the scores if duration is uncertain. The use of ACOE 1987 Manual secondary indicators is necessary and expected in order to properly answer this question.		
4pts	Semi-permanently to permanently inundated or saturated	
3pts	Regularly inundated or saturated	
2pts	Seasonally inundated	
1pt	Seasonally saturated in the upper 30cm (12in) of soil	**1**

3e. Modifications to natural hydrologic regime. Check all observable modifications from list below. Score by selecting the most appropriate description of the wetland. Scores may be double checked and averaged. This question asks the evaluator to assess the "intactness" of, or lack of disturbance to, the natural hydrologic regime of the type of wetland that is being evaluated.

Once the evaluator has listed all possible past and ongoing disturbances, the evaluator should check the most appropriate category to describe the present state of the wetland. In instances where the evaluator believes that a wetland falls between two categories, or where the evaluator is uncertain as to which category is appropriate, it is appropriate to choose more than one and average the score.

The evaluator may check one or several of these possible disturbances, yet still determine that the natural hydrologic regime is intact. However, see Metric 4 where these same disturbances may be habitat alterations.

Check all that are observed present in or near the wetland.

	ditch(es), in or near the wetland		point source discharges to the (non-stormwater)
	tile(s), in or near the wetland		filling/grading activities in or near the wetland
	dike(s), in or near the wetland		road beds/RR beds in or near the wetland
	weir(s), in or near the wetland		dredging activities in or near the wetland
	stormwater inputs (addition of water)	**X**	other (specify) Mowing

Have any of the disturbances identified above caused or appear to have caused more than trivial alterations to the wetland's natural hydrologic regime.	YES Assign a score 1, 3 or 7, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 12 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 9.5.

Select one or double check adjoining numbers and average the score.		**Score**
12pts	NONE OR NONE APPARENT. There are no modifications or no modifications that are apparent to the evaluator.	
7pts	RECOVERED. The wetland appears to have recovered from past modifications.	
3pts	RECOVERING. The wetland appears to be in the process of recovering from past modifications.	**3**
1pt	RECENT OR NO RECOVERY. The modifications have occurred recently occurred, and/or the wetland has not recovered from past modifications, and/or the modifications are ongoing.	

Metric 3 Total 8

Metric 4. Habitat Alteration and Development (Max 20 points). While hydrology may be the single most important determinant for the establishment and maintenance of specific types of wetlands and wetland processes, there is a range of other factors and activities which affect wetland quality and cause disturbances to wetlands that are unrelated to hydrology. These disturbances are termed "habitat alteration." In many instances, items checked as hydrologic disturbances in Question 3e will present as alterations to a wetland's habitat or disruptions in its development (successional state). In some instances, a disturbance may be appropriately considered under both Metric 3 and Metric 4. To determine the appropriate metric scores, the evaluator should carefully determine the actual cause of the disturbance to the wetland.

4a. Substrate/Soil Disturbance. Select one or double check and average. This question evaluates physical disturbances to the soil and surface substrates of the wetland. Note also that the labels on the scoring categories are intended to be descriptive but not controlling. In some instances, it may be more appropriate to consider the scoring categories as fixed locations on a disturbance continuum, from very high to very low or no disturbance.	Examples of substrate/soil disturbance include (check all that apply): ____filling and grading __X__plowing ____grazing (hooves) ____vehicle use (off-road vehicles, construction vehicles) ____sedimentation ____dredging, and other mechanical disturbances to the soil

Have any of soil or substrate disturbances caused or appear to have caused more than trivial alterations to the wetland's natural soils	YES Assign a score 1, 2 or 3, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 4 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 3.5.

Select one or double check adjoining numbers and average the score.		**Score**
4pts	NONE OR NONE APPARENT. There are no disturbances or no disturbances apparent to the evaluator.	
3pts	RECOVERED. The wetland appears to have recovered from past disturbances.	
2pts	RECOVERING. The wetland appears to be in the process of recovering from past disturbances.	**2**
1pt	RECENT OR NO RECOVERY. The disturbances have occurred recently, and/or the wetland has not recovered from past disturbances, and/or the disturbances are ongoing.	

4b. Habitat development. Select only one and assign score. This question asks the evaluator to assign an overall qualitative rating of how well-developed the wetland is in comparison to other ecologically and/or hydrogeomorphically similar wetlands. This question presumes knowledge of the types of wetlands and the range in quality typical of the region or access to data from reference standard examples. If unsure, score as GOOD or MODERATELY GOOD.

7pts	EXCELLENT. Wetland appears to represent the best of its type or class.	
6pts	VERY GOOD. Wetland appears to be a very good example of its type or class but is lacking in characteristics which would make it excellent.	
5pts	GOOD. Wetland appears to be a good example of its type or class but because of past or present disturbances, successional state, or other reasons, is not excellent.	
4pts	MODERATELY GOOD. Wetland appears to be a fair to good example of its type or class.	
3pts	FAIR. Wetland appears to be a moderately good example of its type or class but because of past or present disturbances, successional state, etc. is not good.	
2pts	POOR TO FAIR. Wetland appears to be a poor to fair example of its type or class.	**2**
1pt	POOR. Wetland appears not to be a good example of its type or class because of past or present disturbances, successional state, etc.	

4c. Habitat alteration. This question evaluates the "intactness" the natural habitat of the type of wetland that is being evaluated. This question does not discriminate between wetlands with different types of habitat. Check all possible alterations that are observed. All available information, field visits, aerial photos, maps, etc. can be used to identify possible alterations. Evaluate whether the alteration is trivial in relation to the wetlands overall habitat. Select the most appropriate score that best describes the present state of the wetland. It is appropriate to "double check" and average scores. **The evaluator may check one or several of these possible disturbances, yet still determine that the natural habitat is intact.**

Check all that are observed present in or near the wetland

X	Mowing		Herbaceous layer/aquatic bed removal
	Grazing (cattle, horses, etc.)		Sedimentation
	Clearcutting		Dredging
	Selective cutting		Row-crop or orchard farming
	Woody debris removal		Nutrient enrichment, e.g. nuisance algae
	Toxic pollutants		Other (specify):
	Shrub/sapling removal		Other (specify):

Have any of the disturbances identified above caused or appeared to cause more than trivial alterations to the wetland's natural habitat.	YES Assign a score 1, 3 or 6, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 9 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 6.

Select one score or double check adjoining numbers and average the score.		**Score**
9pts	NONE OR NONE APPARENT. There are no past or current alterations that are apparent to the evaluator.	
6pts	RECOVERED. The wetland appears to have recovered from past alterations.	
3pts	RECOVERING. The wetland appears to be in the process of recovering from past alterations.	**1**
1pt	RECENT OR NO RECOVERY. The alterations have occurred recently, and/or the wetland has not recovered from past alterations, and/or the alterations are ongoing.	

Metric 4 Total **5**

Metric 5. Special wetland communities. Assign points in left column if the wetland meets the associated criteria below. Refer to Narrative Rating for guidance. If wetland scores over 30 points within Metric 5 further determination needed to assess if the wetland exhibits outstanding ecological or recreational values as discussed in the Narrative Rating Section.			
5pts	> $10m^2$, sphagnum or other moss or vernal pools	5pts	Superior fish, waterfowl, bat, or amphibian breeding habitat
10pts 5pts 3pts	Ecological community with global rank (NatureServe): G1 (10pts), G2 (5pts), G2/G3 (3pts) or uncommon ecological resource in the ecoregion (habitat and/or species diversity, geology, wetland type, distribution/ occurrence) (10 pts)	5pts	Wetland contains and is a buffer for a headwater stream or wetland contributes significantly to the water quality of a 303(d) listed stream and/or to surface or and/or ground water
10pts	Older-aged mature forested wetland avg. DBH >= 30 inches	10 pts	Supports species Deemed in Need of Management by TWRA or TN Special Concern by TDEC

Metric 5 Total **3**

Metric 6. Vegetation, Interspersion, and Microtopography (Max 20 points). **6a. Wetland Vegetation Communities** Check each community present both vertically and horizontally within the wetland with an area of at least 0.1 hectares or $1000m^2$ (0.2471 acres). Assign a score of 0 to 3 using Table 3 for 1-4 or Table 5 for 5-6. Sum the scores for the classes present.	**Score**
1)Aquatic Bed Includes areas of wetlands dominated by plants that grow principally on or below the surface of the water for most of the growing season in most years. Floating aquatic species like duckweed (*Lemna* spp., *Spirodela* spp.) are excluded from definition of "aquatic bed." Aquatic beds often occur as a distinct zone as an "understory" below shrubs or trees.	**0**
2)Emergent Includes areas of wetlands dominated by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. This vegetation is present for most of the growing season in most years. Common names for emergent communities include marsh, wet meadow, wet prairie, sedge meadow, and fens.	**1**
3)Shrub Includes areas of wetlands dominated by woody vegetation less than 1m (3ft.) - 6m (20 ft) tall with a dbh of <3in. The plant species include true shrubs, young trees, or trees or shrubs that are small or stunted because of environmental conditions. Shrub wetlands may represent a successional stage leading to a forested wetland or they may be relatively stable plant communities.	**0**
4)Forested Includes wetlands or areas of wetlands characterized by woody vegetation greater than 6m (20ft) or taller. Forested wetlands have an overstory of trees and often contain an understory of young trees and shrubs and an herbaceous layer, although the young tree/shrub and herbaceous layers can be largely missing from some types of forested wetlands. Some forested wetlands are "vernal pools".	**0**
5)Mudflats The "mudflat" class is equivalent to the "unconsolidated bottom/mud" class/subclass (PUB_3) described in Cowardin et al. (1979) and includes areas of wetlands characterized by exposed or shallowly inundated substrates with vegetative cover less than 30%.	**0**
6)Open water The "open water" class is equivalent to the "open water - unknown bottom" class in Cowardin et al. (1979) and includes areas that are 1) inundated, 2) un-vegetated, and 3) and "open", i.e. there is no "canopy" of any type of vegetation.	**0**

Table 3. Use this table to assign a cover score for Metric 6a to each of the vegetation communities identified on the preceding page. Refer to Table 4 for narrative description of "low," "moderate," and "high" quality.

Cover Scale	Description
0	The vegetation community is either 1) absent from wetland or 2) Comprises less than 0.1 ha (.2471 acres) of contiguous area within the wetland
1	Vegetation community is present and either, 1) comprises a significant part of the wetland's vegetation and is of low or moderate quality, or 2) if it comprises a significant part of the wetland's vegetation and is of low quality
2	The vegetation community is present and either, 1) comprises a significant part of the wetland's vegetation and is of moderate quality, or 2) the vegetation community comprises a small part of the wetland's vegetation but is of high quality
3	The vegetation community is of high quality and comprises a significant part, or more, of the wetland's vegetation

Table 4. Use this table in conjunction with Table 3 to determine what is a "low", "moderate," or " high" quality community.

Narrative	Description
Low	Low species richness and a predominance of invasive, non-native, or disturbance tolerant "weedy" species.
Moderate	Native species are the dominant component of the vegetation, although non-native or disturbance tolerant "weedy" species can also be present, and species richness is moderate to moderately high, but generally without the presence of rare, threatened, or endangered species.
High	A predominance of native species, with non-native species absent or virtually absent, and high species diversity and/or the presence of rare, threatened or endangered species.

Table 5. Mudflat and open water community cover scale.

0	Absent <0.1 ha (0.247 acres)
1	Low 0.1 to <1ha (0.247 to 2.47 acres)
2	Moderate 1 ha to < 4 ha (2.47 to 9.88 acres)
3	High 4 ha (9.88 acres) or more

6b. Horizontal (plan view) interspersion. Evaluate the wetland from a "plan view," i.e. as if the looking down upon it. See Figure 1.		**Score**
5pts	HIGH Wetland has a high degree of interspersion	
4pts	MODERATELY HIGH Wetland has a moderately high degree of interspersion	
3pts	MODERATE Wetland has a moderate degree of interspersion	
2pts	MODERATELY LOW Wetland has a moderately low degree of interspersion	
1pt	LOW Wetland has a low degree of interspersion.	**1**
0pt	NONE Wetland has no plan view interspersion	

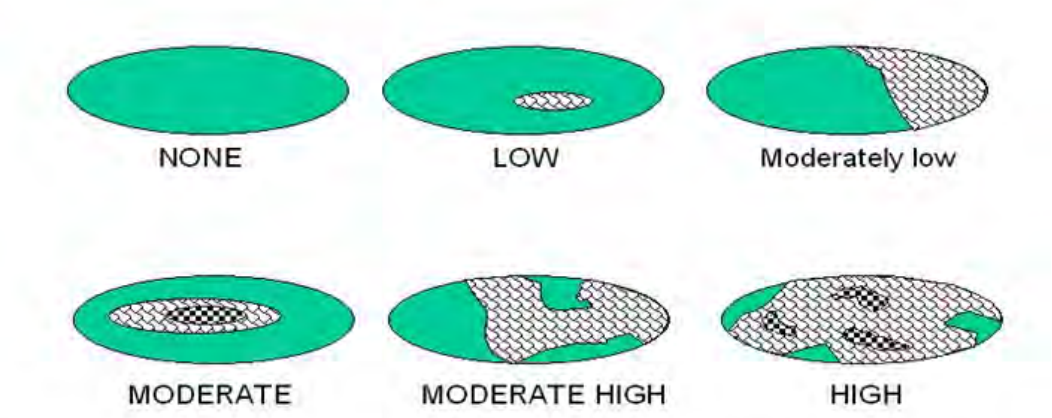


Figure 1. Hypothetical Wetlands for estimating degree of interspersion

6c. Coverage of Invasive Plant Species. Refer to Tennessee Exotic Pest Plant Council (http://www.tneppc.org/) for official list. Select only one and assign score.	**Score**
-5pts Extensive >75% areal cover of invasive species	0
-3pts Moderate 25-75% areal cover of invasive species	0
-1pts Sparse 5-25% areal cover of invasive species	0
0pt Nearly absent. <5% areal cover of invasive species	0
1pt Absent	0

6d. Microtopography. Check each feature present in the wetland. Assign cover score of 0 to 3 using Table 6. Evaluate various microtopograhic habitat features often present in wetlands.	Score
Vegetated hummocks and tussocks	0
Coarse woody debris >15cm (6in) in diameter	0
Standing dead trees >25cm (10in) diameter at breast height	0
Amphibian breeding habitat, e.g. vernal pools with standing water of sufficient duration and depth to support reproduction, or habitat for frog reproduction	0

Table 6. Cover scale for microtopographic habitat features

Microtopographic habitat quality	**Narrative description**
0	Feature is absent or functionally absent from the wetland
1	Feature is present in the wetland in very small amounts or if more common, of low quality
2	Feature is present in moderate amounts, but not of highest quality or in small amounts of highest quality
3	Present in moderate or greater amounts and of the highest quality

Metric 6 Total **2**

NON-HGM TRAM Summary Worksheet

Non-HGM Quantitative Ratings	Metric 1: Size	**1**
	Metric 2: Buffers and Surrounding Land Use	**7**
	Metric 3: Hydrology	**8**
	Metric 4: Habitat	**5**
	Matric 5: Special Wetland Communities	**3**
	Metric 6: Plant Communities, Interspersion, Microtopography	**2**
	TOTAL SCORE	**26**

NON-HGM Tennessee Rapid Assessment Method for Wetlands

For
PEM Wetland:
WA002
Decatur and Perry Counties

May 2024

Analysis Completed By

SWCA® ENVIRONMENTAL CONSULTANTS
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Pensacola, Florida 32502
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For

State of Tennessee
Department of Environment and Conservation
Division of Water Resources
Natural Resources Unit
William R. Snodgrass Tennessee Tower
312 Rosa L. Parks Avenue, 11th Floor
Nashville, Tennessee 37243

Quantitative Rating

Metric 1. Wetland area (max 6 pts). Estimate the area of wetland and select the appropriate size class and assign score. Estimated areas should clearly place the wetland within the appropriate class.

6pts	>50 acres (west TN)	>25 acres (middle TN)	>10 acres (east TN *)	
5pts	25 - <50 acres (west TN)	10- 25 acres (middle TN)	7-<10 acres (east TN*)	
4pts	10 - <25 acres (west TN)	7-< 25acres (middle TN)	3-<7 acres (east TN*)	
3pts	3 - <10 acres (west TN)	3< 7 acres (middle TN)	1-<3 acres (east TN)	
2pts	0.3 - <3 acres (west TN)	0.5- <3 acres (middle TN)	0.5-<1 acres (east TN)	
1pt	0.1 - <0.3 acres (west TN)	<0.5 acres (middle TN)	<0.5 acres (east TN)	**1**

*More applicable to West Tennessee; use with discretion in Middle Tennessee, Consult TDEC-DWR Natural Resources Unit for use in East Tennessee.

Table 2. Metric to English conversion table with visual estimation sizes.

acres	ft^2	yd^2	ft on side	yd on side	ha	m^2	on side
50	2,177,983	241,998	1476	492	20.2	202,000	449
25	1,088,992	120,999	1044	348	10.1	101,000	318
10	435,596	48,340	660	220	4.1	41,000	203
3	130,679	14,520	362	121	1.2	12,000	110
0.3	13,067	1,452	114	38	0.12	1,200	35
0.1	4,356	484	66	22	0.04	400	20

Metric 1 Total **1**

Metric 2. Upland buffers and intensity of surrounding land uses (Max 14 points). Wetlands without upland “buffers", or that are located where human land use is more intensive, are often, but not always, more degraded and often have lower wildlife habitat resource value.

2a. Average Buffer Width (ABW). Calculate the average buffer width and select only one score. To calculate ABW, estimate buffer width on each side (max of 50m) and divide by the number of sides. Example: ABW of a wetland with buffers of 100m, 25m, 10m and 0m would be calculated as follows: ABW = (50m + 25m + 10m + 0m)/4 = 21.25m. Intensive land uses are not buffers, e.g. active row cropping, paved areas, housing developments, etc.

7pts	WIDE. >50m (164ft) or more around perimeter.	
4pts	MEDIUM. 25m to <50m (82 to <164ft) around the perimeter.	
1pt	NARROW. 10m to <25m (32 to <82ft) around the perimeter.	**1**
0pts	VERY NARROW. <10m (<32ft) around perimeter.	

2b. Intensity of predominant surrounding land use(s) Select one, or choose up to two and average score, for the intensity of the predominant land use(s) outside the wetland's buffer zone.

7pts	VERY LOW. 2nd growth or older forest, prairie, barren, wildlife area, etc.	
5pts	LOW. Old fallow field, shrub land, early successional young forest, etc.	
3pts	MODERATELY HIGH. Residential, pasture, orchard, park, conservation tillage, mowed field, etc.	**3**
1pt	HIGH. urban, industrial, row cropping, mining, construction, etc.	

Metric 2 Total **4**

Metric 3. Hydrology (Max 30 points). This metric evaluates the wetland's water budget, hydroperiod, the hydrologic connectivity of the wetland to other surface waters, and the degree to which the wetland's hydrology has been altered by human activity**. A wetland can receive no more than 30 points for Metric 3 even though it is possible to score more than 30 points.**

3a. Sources of Water. Select all that apply and sum the score. This question relates to a wetland's water budget. It also is reflective that wetlands with certain types of water sources, or multiple water sources, e.g. high pH groundwater or perennial surface water connections, can be very high quality wetlands or can have high functions and values.		
5pts	High pH groundwater (7.5-9.0)	
3pts	Other groundwater	
1pts	Precipitation	**1**
3pts	Seasonal surface water	
5pts	Perennial surface water (lake or stream)	
3b. Connectivity. Select all that apply and sum score		
1pt	**100 year floodplain.** "Floodplain" is defined as "...the relatively level land next to a stream c river channel that is periodically submerged by flood waters. It is composed of alluvium deposited by the present stream or river when it floods." Where they are available, flood insurance rate maps (FIRMs) and flood boundary and floodway maps may be used.	**1**
1pt	**Between stream/lake and other human land use.** This question asks whether the wetland is located between a surface water and a different adjacent land use, such that run-off from adjacent land use could flow through wetland before it discharges into the surface wate buffering it. "Different adjacent land uses" include agricultural, commercial, industrial, minin residential uses.	
1pt	**Part of a larger wetland or upland complex.** This question asks whether the wetland is in physical proximity to, or a part of other nearby wetland or upland habitat areas.	**1**
1pt	**Part of riparian corridor**.	**1**
3c. Maximum water depth. Select only one and assign score. The evaluator *does not* need to actually observe the wetland when its water depth is greatest in order to award the maximum points for this question. The use of secondary indicators, as outlined in the 1987 Manual will be useful in answering this question.		
3 pts	>0.7m (27.6in)	
2pts	0.4 to 0.7m (15.7 to 27.6in)	
1pt	<0.4m (<15.7in)	**1**
3d. Duration of inundation/saturation. Select one or double check and average the scores if duration is uncertain. The use of ACOE 1987 Manual secondary indicators is necessary and expected in order to properly answer this question.		
4pts	Semi-permanently to permanently inundated or saturated	
3pts	Regularly inundated or saturated	
2pts	Seasonally inundated	
1pt	Seasonally saturated in the upper 30cm (12in) of soil	**1**

3e. Modifications to natural hydrologic regime. Check all observable modifications from list below. Score by selecting the most appropriate description of the wetland. Scores may be double checked and averaged. This question asks the evaluator to assess the "intactness" of, or lack of disturbance to, the natural hydrologic regime of the type of wetland that is being evaluated.

Once the evaluator has listed all possible past and ongoing disturbances, the evaluator should check the most appropriate category to describe the present state of the wetland. In instances where the evaluator believes that a wetland falls between two categories, or where the evaluator is uncertain as to which category is appropriate, it is appropriate to choose more than one and average the score.

The evaluator may check one or several of these possible disturbances, yet still determine that the natural hydrologic regime is intact. However, see Metric 4 where these same disturbances may be habitat alterations.

Check all that are observed present in or near the wetland.

	ditch(es), in or near the wetland		point source discharges to the (non-stormwater)
	tile(s), in or near the wetland		filling/grading activities in or near the wetland
	dike(s), in or near the wetland		road beds/RR beds in or near the wetland
	weir(s), in or near the wetland		dredging activities in or near the wetland
	stormwater inputs (addition of water)		other (specify)

Have any of the disturbances identified above caused or appear to have caused more than trivial alterations to the wetland's natural hydrologic regime.	YES Assign a score 1, 3 or 7, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 12 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 9.5.

Select one or double check adjoining numbers and average the score.		**Score**
12pts	NONE OR NONE APPARENT. There are no modifications or no modifications that are apparent to the evaluator.	**12**
7pts	RECOVERED. The wetland appears to have recovered from past modifications.	
3pts	RECOVERING. The wetland appears to be in the process of recovering from past modifications.	
1pt	RECENT OR NO RECOVERY. The modifications have occurred recently occurred, and/or the wetland has not recovered from past modifications, and/or the modifications are ongoing.	

Metric 3 Total 18

Metric 4. Habitat Alteration and Development (Max 20 points). While hydrology may be the single most important determinant for the establishment and maintenance of specific types of wetlands and wetland processes, there is a range of other factors and activities which affect wetland quality and cause disturbances to wetlands that are unrelated to hydrology. These disturbances are termed "habitat alteration." In many instances, items checked as hydrologic disturbances in Question 3e will present as alterations to a wetland's habitat or disruptions in its development (successional state). In some instances, a disturbance may be appropriately considered under both Metric 3 and Metric 4. To determine the appropriate metric scores, the evaluator should carefully determine the actual cause of the disturbance to the wetland.

4a. Substrate/Soil Disturbance. Select one or double check and average. This question evaluates physical disturbances to the soil and surface substrates of the wetland. Note also that the labels on the scoring categories are intended to be descriptive but not controlling. In some instances, it may be more appropriate to consider the scoring categories as fixed locations on a disturbance continuum, from very high to very low or no disturbance.	Examples of substrate/soil disturbance include (check all that apply): ____filling and grading ____plowing ____grazing (hooves) ____vehicle use (off-road vehicles, construction vehicles) ____sedimentation ____dredging, and other mechanical disturbances to the soil

Have any of soil or substrate disturbances caused or appear to have caused more than trivial alterations to the wetland's natural soils	YES Assign a score 1, 2 or 3, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 4 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 3.5.

Select one or double check adjoining numbers and average the score.		**Score**
4pts	NONE OR NONE APPARENT. There are no disturbances or no disturbances apparent to the evaluator.	**4**
3pts	RECOVERED. The wetland appears to have recovered from past disturbances.	
2pts	RECOVERING. The wetland appears to be in the process of recovering from past disturbances.	
1pt	RECENT OR NO RECOVERY. The disturbances have occurred recently, and/or the wetland has not recovered from past disturbances, and/or the disturbances are ongoing.	

4b. Habitat development. Select only one and assign score. This question asks the evaluator to assign an overall qualitative rating of how well-developed the wetland is in comparison to other ecologically and/or hydrogeomorphically similar wetlands. This question presumes knowledge of the types of wetlands and the range in quality typical of the region or access to data from reference standard examples. If unsure, score as GOOD or MODERATELY GOOD.

7pts	EXCELLENT. Wetland appears to represent the best of its type or class.	
6pts	VERY GOOD. Wetland appears to be a very good example of its type or class but is lacking in characteristics which would make it excellent.	
5pts	GOOD. Wetland appears to be a good example of its type or class but because of past or present disturbances, successional state, or other reasons, is not excellent.	
4pts	MODERATELY GOOD. Wetland appears to be a fair to good example of its type or class.	
3pts	FAIR. Wetland appears to be a moderately good example of its type or class but because of past or present disturbances, successional state, etc. is not good.	
2pts	POOR TO FAIR. Wetland appears to be a poor to fair example of its type or class.	**2**
1pt	POOR. Wetland appears <u>not</u> to be a good example of its type or class because of past or present disturbances, successional state, etc.	

4c. Habitat alteration. This question evaluates the "intactness" the natural habitat of the type of wetland that is being evaluated. This question does not discriminate between wetlands with different types of habitat. Check all possible alterations that are observed. All available information, field visits, aerial photos, maps, etc. can be used to identify possible alterations. Evaluate whether the alteration is trivial in relation to the wetlands overall habitat. Select the most appropriate score that best describes the present state of the wetland. It is appropriate to "double check" and average scores. **The evaluator may check one or several of these possible disturbances, yet still determine that the natural habitat is intact.**

Check all that are observed present in or near the wetland

X	Mowing		Herbaceous layer/aquatic bed removal
	Grazing (cattle, horses, etc.)		Sedimentation
	Clearcutting		Dredging
	Selective cutting		Row-crop or orchard farming
	Woody debris removal		Nutrient enrichment, e.g. nuisance algae
	Toxic pollutants		Other (specify):
	Shrub/sapling removal		Other (specify):

Have any of the disturbances identified above caused or appeared to cause more than trivial alterations to the wetland's natural habitat.	YES Assign a score 1, 3 or 6, or an intermediate score, depending on degree of recovery from the disturbance.	NO Assign a score of 9 since there are no or no apparent modifications.	NOT SURE Choose "recovered" and assign a score of 6.

Select one score or double check adjoining numbers and average the score.		**Score**
9pts	NONE OR NONE APPARENT. There are no past or current alterations that are apparent to the evaluator.	
6pts	RECOVERED. The wetland appears to have recovered from past alterations.	
3pts	RECOVERING. The wetland appears to be in the process of recovering from past alterations.	**1**
1pt	RECENT OR NO RECOVERY. The alterations have occurred recently, and/or the wetland has not recovered from past alterations, and/or the alterations are ongoing.	

Metric 4 Total **7**

Metric 5. Special wetland communities. Assign points in left column if the wetland meets the associated criteria below. Refer to Narrative Rating for guidance. If wetland scores over 30 points within Metric 5 further determination needed to assess if the wetland exhibits outstanding ecological or recreational values as discussed in the Narrative Rating Section.			
5pts	> $10m^2$, sphagnum or other moss or vernal pools	5pts	Superior fish, waterfowl, bat, or amphibian breeding habitat
10pts 5pts 3pts	Ecological community with global rank (NatureServe): G1 (10pts), G2 (5pts), G2/G3 (3pts) or uncommon ecological resource in the ecoregion (habitat and/or species diversity, geology, wetland type, distribution/ occurrence) (10 pts)	5pts	Wetland contains and is a buffer for a headwater stream or wetland contributes significantly to the water quality of a 303(d) listed stream and/or to surface or and/or ground water
10pts	Older-aged mature forested wetland avg. DBH >= 30 inches	10 pts	Supports species Deemed in Need of Management by TWRA or TN Special Concern by TDEC

Metric 5 Total **3**

Metric 6. Vegetation, Interspersion, and Microtopography (Max 20 points).	**Score**
6a. Wetland Vegetation Communities Check each community present both vertically and horizontally within the wetland with an area of at least 0.1 hectares or $1000m^2$ (0.2471 acres). Assign a score of 0 to 3 using Table 3 for 1-4 or Table 5 for 5-6. Sum the scores for the classes present.	
1)Aquatic Bed Includes areas of wetlands dominated by plants that grow principally on or below the surface of the water for most of the growing season in most years. Floating aquatic species like duckweed (*Lemna* spp., *Spirodela* spp.) are excluded from definition of "aquatic bed." Aquatic beds often occur as a distinct zone as an "understory" below shrubs or trees.	**0**
2)Emergent Includes areas of wetlands dominated by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. This vegetation is present for most of the growing season in most years. Common names for emergent communities include marsh, wet meadow, wet prairie, sedge meadow, and fens.	**1**
3)Shrub Includes areas of wetlands dominated by woody vegetation less than 1m (3ft.) - 6m (20 ft) tall with a dbh of <3in. The plant species include true shrubs, young trees, or trees or shrubs that are small or stunted because of environmental conditions. Shrub wetlands may represent a successional stage leading to a forested wetland or they may be relatively stable plant communities.	**0**
4)Forested Includes wetlands or areas of wetlands characterized by woody vegetation greater than 6m (20ft) or taller. Forested wetlands have an overstory of trees and often contain an understory of young trees and shrubs and an herbaceous layer, although the young tree/shrub and herbaceous layers can be largely missing from some types of forested wetlands. Some forested wetlands are "vernal pools".	**0**
5)Mudflats The "mudflat" class is equivalent to the "unconsolidated bottom/mud" class/subclass (PUB_3) described in Cowardin et al. (1979) and includes areas of wetlands characterized by exposed or shallowly inundated substrates with vegetative cover less than 30%.	**0**
6)Open water The "open water" class is equivalent to the "open water - unknown bottom" class in Cowardin et al. (1979) and includes areas that are 1) inundated, 2) un-vegetated, and 3) and "open", i.e. there is no "canopy" of any type of vegetation.	**0**

Table 3. Use this table to assign a cover score for Metric 6a to each of the vegetation communities identified on the preceding page. Refer to Table 4 for narrative description of "low," "moderate," and "high" quality.

Cover Scale	Description
0	The vegetation community is either 1) absent from wetland or 2) Comprises less than 0.1 ha (.2471 acres) of contiguous area within the wetland
1	Vegetation community is present and either, 1) comprises a significant part of the wetland's vegetation and is of low or moderate quality, or 2) if it comprises a significant part of the wetland's vegetation and is of low quality
2	The vegetation community is present and either, 1) comprises a significant part of the wetland's vegetation and is of moderate quality, or 2) the vegetation community comprises a small part of the wetland's vegetation but is of high quality
3	The vegetation community is of high quality and comprises a significant part, or more, of the wetland's vegetation

Table 4. Use this table in conjunction with Table 3 to determine what is a "low", "moderate," or " high" quality community.

Narrative	Description
Low	Low species richness and a predominance of invasive, non-native, or disturbance tolerant "weedy" species.
Moderate	Native species are the dominant component of the vegetation, although non-native or disturbance tolerant "weedy" species can also be present, and species richness is moderate to moderately high, but generally without the presence of rare, threatened, or endangered species.
High	A predominance of native species, with non-native species absent or virtually absent, and high species diversity and/or the presence of rare, threatened or endangered species.

Table 5. Mudflat and open water community cover scale.

0	Absent <0.1 ha (0.247 acres)
1	Low 0.1 to <1ha (0.247 to 2.47 acres)
2	Moderate 1 ha to < 4 ha (2.47 to 9.88 acres)
3	High 4 ha (9.88 acres) or more

6b. Horizontal (plan view) interspersion. Evaluate the wetland from a "plan view," i.e. as if the looking down upon it. See Figure 1.		**Score**
5pts	HIGH Wetland has a high degree of interspersion	
4pts	MODERATELY HIGH Wetland has a moderately high degree of interspersion	
3pts	MODERATE Wetland has a moderate degree of interspersion	
2pts	MODERATELY LOW Wetland has a moderately low degree of interspersion	
1pt	LOW Wetland has a low degree of interspersion.	**1**
0pt	NONE Wetland has no plan view interspersion	

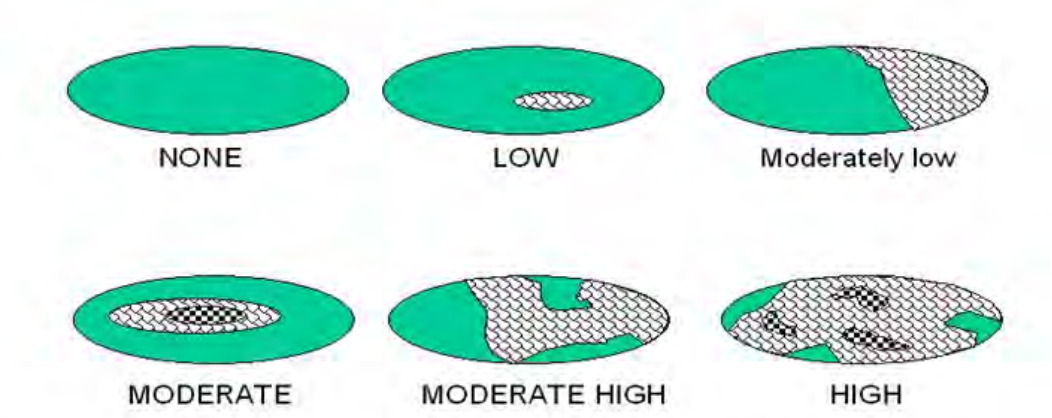

Figure 1. Hypothetical Wetlands for estimating degree of interspersion

6c. Coverage of Invasive Plant Species. Refer to Tennessee Exotic Pest Plant Council (http://www.tneppc.org/) for official list. Select only one and assign score.	**Score**
-5pts Extensive >75% areal cover of invasive species	0
-3pts Moderate 25-75% areal cover of invasive species	0
-1pts Sparse 5-25% areal cover of invasive species	0
0pt Nearly absent. <5% areal cover of invasive species	0
1pt Absent	0

6d. Microtopography. Check each feature present in the wetland. Assign cover score of 0 to 3 using Table 6. Evaluate various microtopograhic habitat features often present in wetlands.	Score
Vegetated hummocks and tussocks	0
Coarse woody debris >15cm (6in) in diameter	0
Standing dead trees >25cm (10in) diameter at breast height	0
Amphibian breeding habitat, e.g. vernal pools with standing water of sufficient duration and depth to support reproduction, or habitat for frog reproduction	0

Table 6. Cover scale for microtopographic habitat features

Microtopographic habitat quality	**Narrative description**
0	Feature is absent or functionally absent from the wetland
1	Feature is present in the wetland in very small amounts or if more common, of low quality
2	Feature is present in moderate amounts, but not of highest quality or in small amounts of highest quality
3	Present in moderate or greater amounts and of the highest quality

Metric 6 Total **2**

NON-HGM TRAM Summary Worksheet

Non-HGM Quantitative Ratings	Metric 1: Size	**1**
	Metric 2: Buffers and Surrounding Land Use	**4**
	Metric 3: Hydrology	**18**
	Metric 4: Habitat	**7**
	Matric 5: Special Wetland Communities	**3**
	Metric 6: Plant Communities, Interspersion, Microtopography	**2**
	TOTAL SCORE	**35**

Hydrologic Determination Report Submittal Checklist

TDEC Reviewer: _____

Standard Submittal

Waterlog HD #_____ Project name: Replace Pipe and Hydrotest Project 525511 County: Decatur and Perry
Other Tracking #_____

X 1. Name, address, and phone number of the current property owner(s).

X 2. Name, affiliation, and certification identification number of the QHP or QHP IT submitting the report.

X 3. QHP or QHP IT status verified.

X 4. The identification of the starting and ending points along a watercourse of the areas determined to be a wet weather conveyance.

X 5. A vicinity map, including the property boundaries or hydrologic determination review area (if different than property boundary). On linear projects, start and terminus points are required. The map should clearly indicate the specific locations of all hydrologic features identified in the report.

X 6. Specific latitude/longitude coordinates (decimal degrees) either included on the map or in the body of the hydrologic determination report.

X 7. Color photographs of each of the hydrologic features to potentially be altered or otherwise identified in the report; including the date each photograph was taken, latitude and longitude, in decimal degrees of each photograph location and indicate the location and direction of each photographic view on the site map or plan. These photographs must be representative of the overall reach of water feature evaluated. At a minimum, include a photograph of the area to potentially be altered, immediately up channel of the area to potentially be altered, and immediately down channel.

X 8. TDEC Hydrologic Determination Field Data Sheets, completed in conformance with the current TDEC-DWR Guidance for Making Hydrologic Determinations. At least one data sheet must be submitted for each watercourse to potentially be altered or identified.

N/A 9. Any previous assessments of hydrologic features on site known to the submitter. (See : http://tdeconline.tn.gov/dwr/)
Previous HD's submitted or found during TDEC review:
_____
_____

X 10. Evidence HD was conducted under normal weather conditions.

X 11. List any other information submitted with report(e.g. NRCS Soil Maps, precipitation data, site plan etc.):
APT and NRCS Soil Maps are contained within the Field Environmental Report. Project drawings are found in the ARAP Application.
_____
_____

EFO administrative required information:

_____ 1. Property owner(s) granted written permission to access land/site.

_____ 2. Is there a site, associated with this HD? If yes, then associate HD to site within Waterlog.

_____ 3. Verified HD was conducted under normal weather conditions.

Report Received: ____/____/____ Assigned date: ____/____/____ Application Complete: ____/____/____

Deficiency Letter Sent: _____ Date: ____/____/____ Field Verified: _____ Date:____/____/____

List of Report Deficiencies: Final Determination Notification Date:____/____/____

_____

_____

_____

All Required Info Received: ____/____/____

MS4: _____ MS4 Contact Date: ____/____/____

Hydrologic Determination Report Submittal Checklist Responses
Replace Pipe and Hydrotest Project 525511 (ARAP No.: *Pending*)

1. **Name, address, and phone number of the current property owner(s).**
   Response:
   Property Owner No. 1: Stacy D. Vise
   Address: 136 East Tulip Street, Decaturville, TN 38329
   Phone: 731-549-7653
   Property Owner No. 2: Tennessee Valley Authority
   Address: 400 West Summit Hill Drive, WT 11D-K, Knoxville, TN 37902
   Phone: 423-467-3853
   Property Owner No. 3: Eric H. Potts and Jennifer Etux
   Address: 5123 Miller Lake Road, Culleoka, TN 38451
   Phone: None
   Property Owner No. 4: Dwayne Coble and Jennifer Etux
   Address: 1626 Lillian Circle, Columbia, TN 38401
   Phone: 931-797-6935
   Property Owner No. 5: Ricky Kuykendall and Phyllis Etux
   Address: 9321 Renter Road, Millington , TN 38053
   Phone: 901-335-5420

2. **Name, affiliation, and certification identification number of the QHP or QHP IT submitting the report.**
   Response: QHP: Heath Garner, SWCA Environmental Consultants (Certificate No. 1196-TN20) / QHP IT: Mikala Drees, SWCA Environmental Consultants.

3. **QHP or QHP IT status verified**
   Response: These individuals were verified online at https://tnhdt.org/certified.asp. QHP-IT name: Mikala Drees / QHP name: Heath Garner (Certificate No. 1196-TN20)

4. **The identification of the starting and ending points along a watercourse of the areas determined to be a wet weather conveyance.**
   Response: There was one wet-weather conveyance (Waterbody ID: SA002) identified within the Survey Area. Please see Field Environmental Report and aquatic resource figures in Appendix A for more details.

5. **A vicinity map, including the property boundaries or hydrologic determination review area (if different than property boundary). On linear projects, start and terminus points are required. The map should clearly indicate the specific locations of all hydrologic features identified in the report.**
   Response: Please refer to the attached Field Environmental Report, Appendix A for figures of the hydrological determination review area (referred to as the Survey Area within the Field Environmental Report).

6. **Specific latitude/longitude coordinates (decimal degrees) either included on the map or in the body of the hydrologic determination report.**
   Response: Please refer to Tables 5 and 6 in the Field Environmental Report for watercourses and wetland locations.

7. **Color photographs of each of the hydrologic features to potentially be altered or otherwise identified in the report; including the date each photograph was taken, latitude and longitude, in decimal degrees of each photograph location and indicate the location and direction of each photographic view on the site map or plan. These photographs must be representative of the overall reach of water feature evaluated. At a minimum, include a photograph of the area to potentially be altered, immediately up channel of the area to potentially be altered, and immediately down channel.**
   Response: Please refer to Appendix D in the Field Environmental Report.

8. **TDEC Hydrologic Determination Field Data Sheets, completed in conformance with the current TDEC-DWR Guidance for Making Hydrologic Determinations. At least one data sheet must be submitted for each watercourse to potentially be altered or identified.**
   Response: Please see Appendix G in the Field Environmental Report for the Hydrological Determination Field Data Sheets.

9. **Any previous assessments of hydrologic features on site known to the submitter. (See: http://tdeconline.tn.gov/dwr/). Previous HD's submitted or found during TDEC review.**
   Response: Not applicable. No previous assessments were identified within the Survey Area according to the above web address.

10. **Evidence HD was conducted under normal weather conditions.**
    Response: Please refer to Appendix E in the Field Environmental Report for Antecedent Precipitation Tool (APT) data.

11. **List any other information submitted with report(e.g. NRCS Soil Maps, precipitation data, site plan etc.).**
    Response: Please refer to the appendices within the Field Environmental Report for APT (Appendix E) and NRCS Soil Maps (Appendix F). Site Plans were submitted with the ARAP application for this Project (ARAP was submitted on July 2, 2024 and is awaiting permit number assignment).