Appendix G: Natural Resources Technical Memorandum

State Route 19 Environmental Assessment

From East of Eastland Avenue to East of SR-87

Lauderdale and Haywood Counties, Tennessee

PIN 102251.00

TDOT
Department of Transportation

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Attachment B Custom Soil Resource Report for Haywood County, Tennessee and Lauderdale County, Tennessee, SR-19 (U.S. Department of Agriculture, Natural Resources Conservation Service, October 30, 2025)
Attachment C FEMA Flood Insurance Rate Maps

1.0 Introduction

The Tennessee Department of Transportation (TDOT), in cooperation with the Federal Highway Administration (FHWA), is proposing improvements to approximately 15.2 miles of State Route (SR) 19 from east of Eastland Avenue in Lauderdale County to east of SR-87 in Haywood County, Tennessee (**Figure 1**). Since this project is proposed to be funded in part with federal transportation funds, the proposed project is subject to the requirements of the National Environmental Policy Act (NEPA). An Environmental Assessment (EA) is being prepared in accordance with NEPA to identify and evaluate the environmental effects of the proposed project and to identify measures to minimize harm.

This technical memorandum describes aquatic resources, wetlands, water quality, threatened and endangered species, wild and scenic rivers, geology, and floodplains within the proposed SR-19 project area and provides an estimated impacts determination for both the No-Build and Build Alternatives.

1.1 Project Background

On February 1, 2018, the FHWA approved a D-List Categorical Exclusion for the proposed widening of SR-19 from east of Eastland Avenue to east of SR-87 under TDOT project identification number (PIN) 102251.00.

Since the approval of 2018 D-List CE, the proposed SR-19 project has been divided into three segments for funding purposes; PIN 102251.01, 102251.02, and PIN 102251.03. The current EA effort is analyzing the entirety of the proposed SR-19 corridor from east of Eastland Avenue to east of SR-87 (PIN 102251.00) which is comprised of PIN 102251.01, PIN 102251.02, and PIN 102251.03 (**Figure 2**).

For more information on the proposed project background, please refer to Chapter 1 in the EA.

Figure 1 Project Location

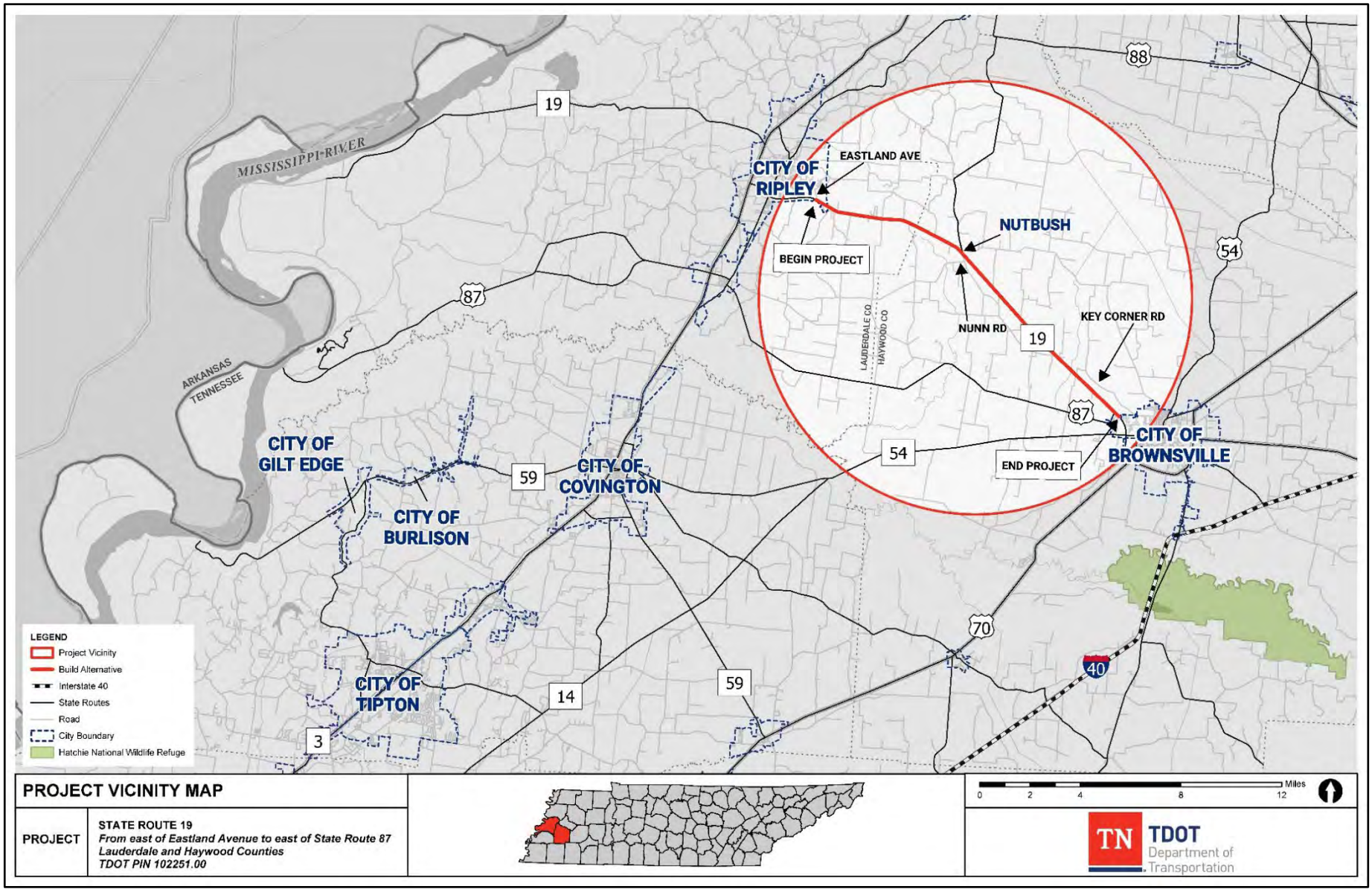
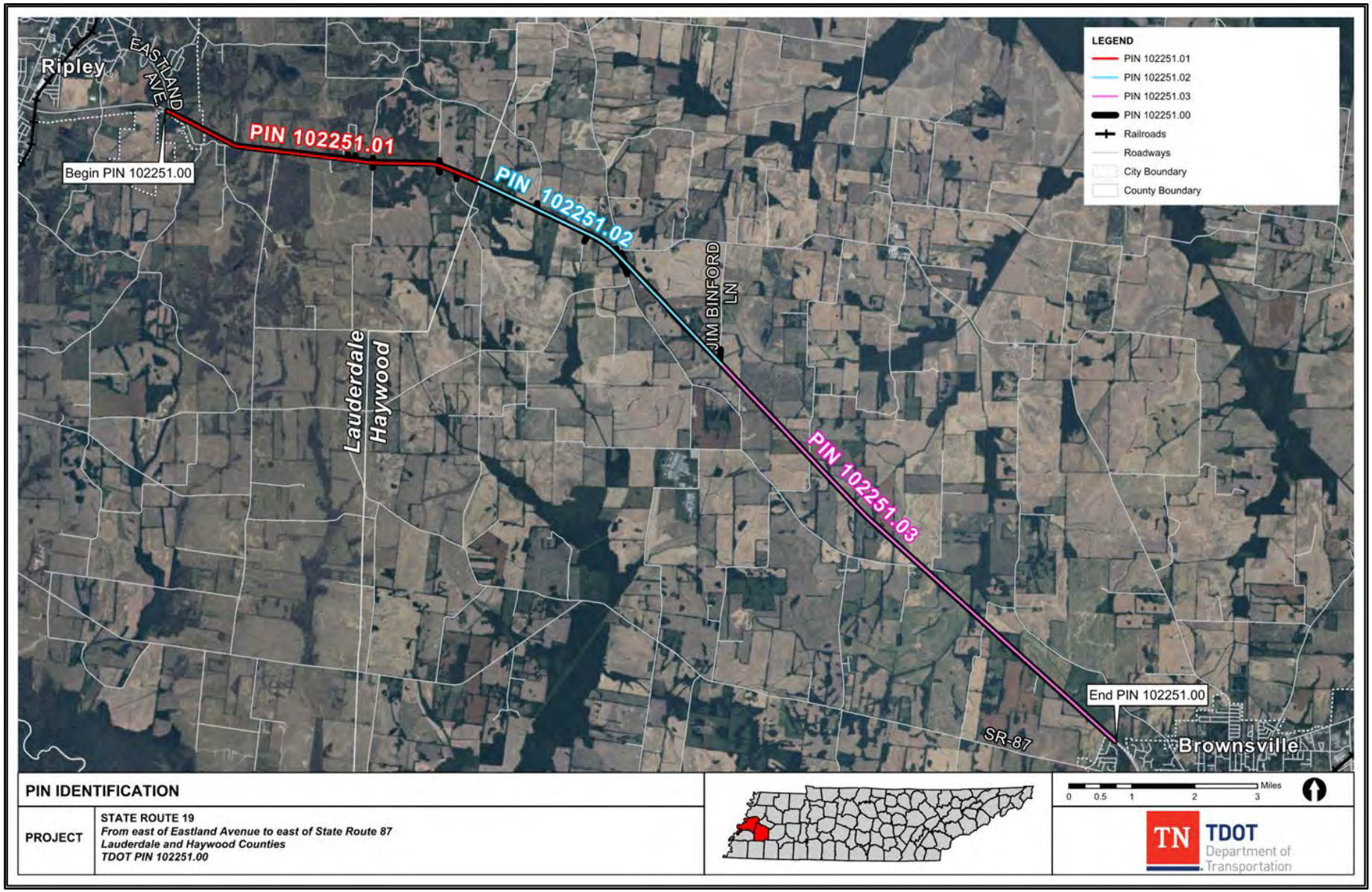


Figure 2 PIN Identification



1.2 Alternatives Under Consideration

A No-Build Alternative and one Build Alternative are being evaluated in the EA. Each alternative is described in the subsequent text below.

1.2.1 No-Build Alternative

The No-Build Alternative would leave the segment of SR-19 from east of Eastland Avenue to east of SR-87 as it currently exists except for routine maintenance and safety upgrades, as needed, or modifications that have been programmed and approved for implementation through TDOT's 25-Year Long Range Transportation Policy Plan, State Transportation Improvement Program (STIP), or TDOT 10-Year Project Plan. The No-Build Alternative is required by federal regulations to be evaluated in the EA and provides a baseline for comparing other alternatives.

1.2.2 Build Alternative

The Build Alternative proposes various roadway improvements along SR-19, from east of Eastland Avenue to east of SR-87. Proposed improvements would include widening, resurfacing, realignment of select intersections, and slope improvements (**Figure 3**).

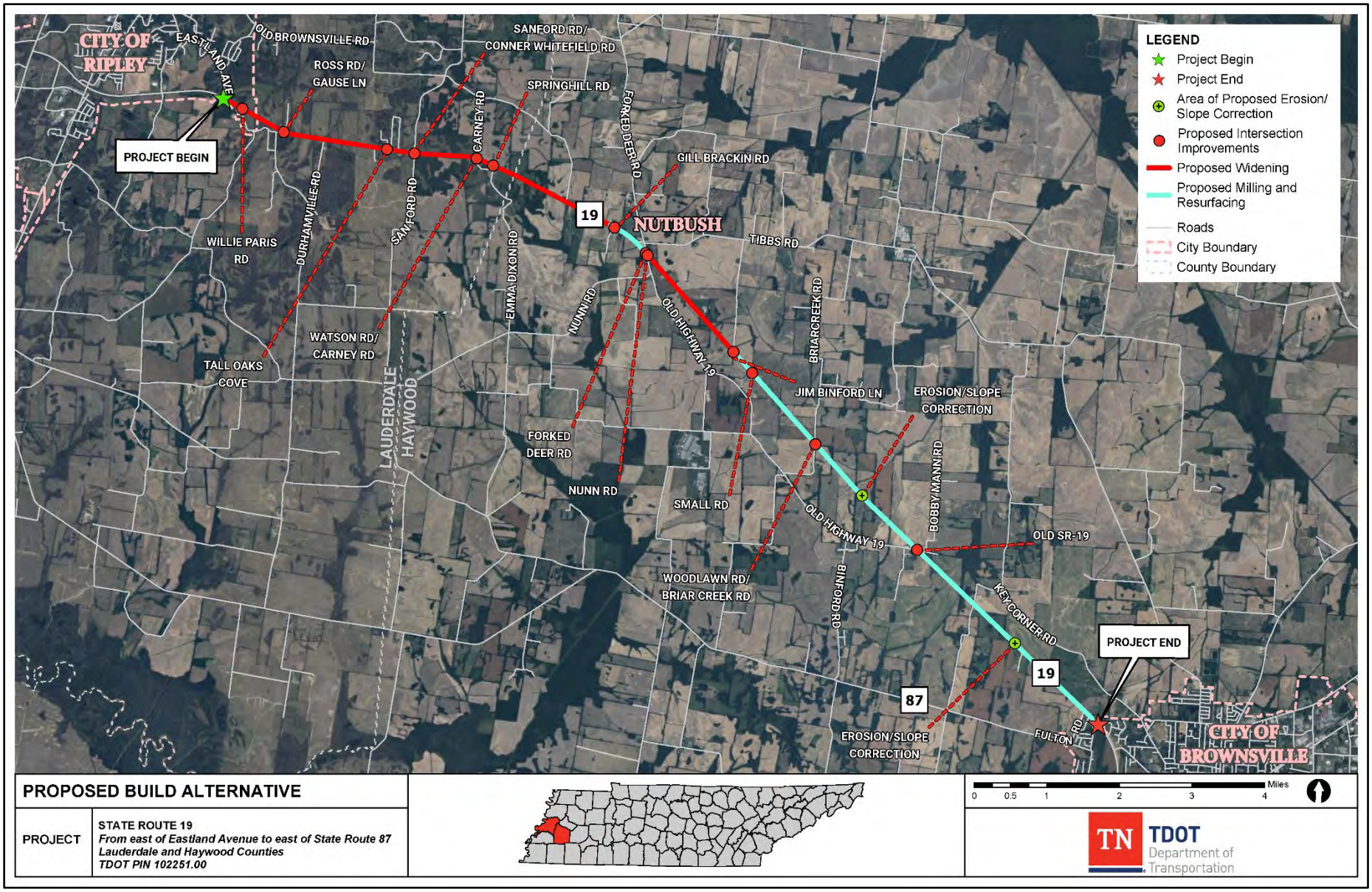
From east of Eastland Avenue in Lauderdale County to just west of Gill Brackin Road in Haywood County, the proposed project would widen the existing 11-foot travel lanes (one in each direction) to two 12-foot travel lanes with 2-foot to 10-foot shoulders (8-foot paved). Along this segment of the proposed project, the roadway would be widened primarily to the north side of the existing roadway in the Lauderdale County portion and to the south side in Haywood County. In this section, the following intersections are proposed to be realigned:

- Willie Paris Road
- Ross Road/Gause Lane
- Tall Oaks Cove
- Sanford Road/Conner Whitefield Road
- Watson Road/Carney Road
- Springhill Road

From just west of Gill Brackin Road to Nunn Road, the proposed project would mill and resurface the existing 11-foot travel lanes and 2-foot shoulders. In this section, the following intersections are proposed to be realigned:

- Forked Deer Road (SR-180)
- Nunn Road

Figure 3 Build Alternative



From Nunn Road to east of Jim Binford Lane, the proposed project would widen the existing roadway to two 12-foot travel lanes with 10-foot shoulders (8-foot paved). In this section, the following SR-19 intersection is proposed to be realigned:

- Jim Binford Lane

From east of Jim Binford Lane to east of SR-87, the proposed project would mill and resurface the existing 11-foot travel lanes and 2-foot shoulders. Additionally, the proposed project would correct erosion/slope issues from approximately 4,351 feet east of Woodlawn Road to approximately 4,411 feet west of Old SR-19 (approximately 1,700 feet) and from approximately 3,417 feet east of Patton Road to approximately 279 feet east of Westpointe Road (approximately 1,800 feet). In this section, the following intersections are proposed to be realigned:

- Small Road at SR-19
- Woodlawn Road/Briar Creek Road at SR-19
- Old SR-19 at SR-19

1.3 Environmental Technical Study Area

An Environmental Technical Study Area (ETSA) was developed for the proposed SR-19 project in order to document natural, cultural, and community resources within a broader study area than the immediate project footprint. Generally, the ETSA boundary is 250 feet on either side of the proposed centerline, 300 feet from the project termini, and 150 feet from intersections with sideroads. That way, if shifts to the proposed project design occur during project development, TDOT staff are aware of any resources that are present in the larger ETSA boundary.

2.0 Natural Resources

2.1 Environmental Studies Request

An Environmental Studies Request (ESR) was submitted to TDOT's Ecology Section on February 3, 2025, based on 2024 Line and Grade Plans. The TDOT Ecology Section provided the following response on February 5, 2025:

> "*Based on the information provided, environmental boundaries reports [EBR] dated October 23, 2024 (102251.01), October 23, 2024 (102241.02), and October 25, 2024 (PIN 102251.03) have been completed and uploaded to FileNet for the subject project. Species coordination was completed with TWRA for each PIN on the project, and the coordination documents are*

included within the EBR and with this response.[1] The project was deemed to fit Condition #1 of the TDEC [Tennessee Department of Environment and Conservation – Division of Natural Areas] MOA [Memorandum of Agreement] for all PINs. Species coordination for this project is based on current understanding of the project scope, any changes to which could lead to additional coordination being required."

In their ESR response dated February 5, 2025, the TDOT Ecology Section noted an environmental commitment specific to the section of SR-19 from east of Binford Lane to east of SR-87 in Haywood County (PIN 102251.03):

"*TDOT commits to perform all tree clearing during the winter season between October 1st and March 31st."*

Following changes to the proposed project design, Revised Line and Grade Plans from July 2025 were provided to the TDOT Ecology Section. In an email dated July 22, 2025, the TDOT Ecology Section stated that, "*I have reviewed the revised project .kmz and have determined that previous ecology studies remain valid.[2]"*

The TDOT Ecology Section ESR response dated February 5, 2025, supporting EBRs, and the TDOT Ecology Section email dated July 22, 2025, can be found in **Attachment A**.

3.0 Impacts to Natural Resources

3.1 No-Build Alternative

The No-Build Alternative would not make changes to the existing roadway network. Therefore, no direct impacts to natural resources would occur.

3.2 Build Alternative

The following sections discuss potential impacts of the Build Alternative on natural resources within the project area as presented in the July 2025 Revised Line and Grade Plans.

[1] TWRA coordination was completed for the entirety of the proposed SR-19 project corridor (PIN 102251.00) from east of Eastland Avenue to east of SR-87.
[2] The KMZ file mentioned by the TDOT Ecology Section in their July 22, 2025 email was representative of the July 2025 Revised Line and Grade Plans

3.2.1 Aquatic Resources and Wetlands

Table 1 provides a summary of potential aquatic resource and wetland impacts for each section of the proposed project. See **Attachment A** for more detailed water resource impact tables.

Table 1 Aquatic Resource Impacts[3]

Project Segment	Resource				
	Wet-Weather Conveyances/ Upland Drainage Features/ Ephemeral Streams	Perennial Streams	Intermittent Streams	Wetlands	Ponds
SR-19 from east of Eastland Avenue to Haywood County Line (PIN 102251.01)	25 (4,687 linear feet)	1 (576 linear feet)	7 (3,804 linear feet)	9 (2.33 acres)	3 (1.15 acres)
SR-19 from Haywood County Line to east of Binford Lane (PIN 102251.02)	19 (2,658 linear feet)	1 (315 linear feet)	7 (1,972 linear feet)	5 (1.73 acres)	3 (0.04 acre)
SR-19 from east of Binford Lane to east of SR-87 (PIN 102251.03)	38 (9,638 linear feet)	5 (2,582 linear feet)	14 (8,026 linear feet)	2 (0.23 acre)	2 (0.20 acre)
Total	**82 (16,983 linear feet)**	**6 (3,473 linear feet)**	**28 (13,802 linear feet)**	**16 (4.29 acres)**	**8 (1.4 acres)**

3.2.2 Water Quality

Under Section 303(d) of the Clean Water Act[4], states are required to identify and list water bodies (e.g., rivers and lakes) that do not meet state water quality standards, even after existing pollution controls are applied. For each listed water body, states must develop a Total Maximum Daily Load (TMDL) — a calculation of the maximum amount of a specific pollutant the water can receive while still meeting standards. States must also maintain and regularly update the list of impaired waters and implement plans to restore and protect water quality. In Tennessee, the Tennessee Department of Environment and Conservation (TDEC) is designated as the state agency responsible for developing and

[3] From water resource impact tables provided by the TDOT Ecology Section on August 15, 2025 (see **Attachment A**).

[4] Overview of Listing Impaired Waters under CWA Section 303(d) | US EPA

maintaining the state's 303(d) list. The most recent version of Tennessee's 303(d) list of Impaired and Threatened Waters was developed and approved by the Environmental Protection Agency (EPA) in 2024[5]. **Table 2** lists the Section 303(d) listed streams within the project area and the impairments.

Table 2 Section 303(d) Listed Streams Within the Project Area

Stream	Waterbody ID	Identified Impairments
Briar Creek	TN08010205005_0210	• Physical substrate habitat alterations due to channelization
Cane Creek	TN08010208034_3000	• Alteration in stream-side or littoral vegetative covers due to crop production (non-irrigated) • *Escherichia coli (E. Coli)* due to grazing in riparian or shoreline zones • Physical substrate habitat alterations due to channelization • Nutrients due to crop production (non-irrigated)
Lagoon Creek	TN08010208033_1000	• Dissolved oxygen, source unknown • Nutrients due to crop production (non-irrigated)
Meridian Creek	TN08010205005_0200	• Dissolved oxygen due to crop production (non-irrigated) • Phosphorus due to crop production (non-irrigated) • Physical substrate habitat alterations due to channelization • Sedimentation/siltation due to crop production (non-irrigated) and channelization
Pond Creek	TN08010205005_0300	• Physical substrate habitat alterations due to channelization

Water quality may be temporarily impacted by construction related erosion and sedimentation as a result of the Build Alternative.

3.2.3 Threatened and Endangered Species

Based on correspondence with the U.S. Fish and Wildlife Service (USFWS) dated September 18, 2024, the USFWS database indicates that the eastern portion of the proposed project lies within a summer buffer area for the proposed endangered tricolored bat (*Perimyotis*

[5] Water Quality Rules, Reports & Publications

subflavus). Based on TDOT's commitment to perform all tree clearing during the winter season between October 1st and March 31st, the USFWS concurred with TDOT's "Not Likely to Adversely Affect" determination for the tricolored bat.[6]

The USFWS also recommended that standard construction best management practices (BMP) should be implemented to ensure all project-related pollutants are kept out of project area streams and that equipment staging and maintenance areas should be developed an adequate distance away to prevent the introduction of petroleum-based products into the water. [7] The agency also recommended that, if possible, work at stream crossings be scheduled during a lower flow period.

The Tennessee Wildlife Resources Agency (TWRA) did not express any concerns for listed species and noted that the implementation of standard BMPs would be sufficient to satisfy the agency's needs in a letter dated October 17, 2017.

According to the TDOT Ecology Section in their ESR response, the proposed project meets condition #1 of the Memorandum of Agreement (MOA) between TDOT, FHWA, and the Tennessee Department of Environment and Conservation, Division of Natural Areas (TDEC DNA) and will not result in adverse effects to state listed plant species or their habitats.

TDOT completed its evaluation of potential effects to the monarch butterfly (*Danaus plexippus*) for the entire project (PINs 102251.01, 102251.02, and 102251.03) in Lauderdale County and Haywood County, Tennessee. Based on a review of the most current available species information, project design and environmental setting, TDOT has determined that the proposed action is "Not likely to jeopardize the continued existence of the Monarch Butterfly."

Copies of USFWS and TWRA correspondence and the TDOT/FHWA/TDEC DNA MOA are included in **Attachment A.**

3.2.4 Geology

Soils within the SR-19 project area are primarily silt loam (Alder, Calloway, Convent, Feliciana, Grenada, Loring, Memphis and Rosebloom series), as described in the U.S. Department of Agriculture (USDA) Web Soil Survey (**Attachment B**). According to the USDA Web Soil Survey, slopes within the SR-19 project range from zero to 3 percent (nearly level)

[6] This commitment applies specifically to SR-19 from east of Jim Binford Lane to east of SR-87 (PIN 102251.03).
[7] Construction BMPs are TDOT standard practice and will be followed during construction of the proposed project.

to 20 to 30 percent (steep) and portions of the SR-19 project area are eroded to severely eroded and occasionally flooded to frequently flooded.

The proposed project has potential for minor rock cuts due to rolling topography. Impacts to soils within the project area would be related to drainage, ground, and slope instability.

3.2.5 Floodplains

The SR-19 project area is located on six Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs) listed in **Table 3**. Copies of the FEMA FIRMs are included in **Attachment C**.

Table 3 FEMA FIRMS in the Project Area

FEMA FIRM Map	Flood Zones within Project Area
• Panel 357 of 500, Map Number 47097C0357D, Lauderdale County	No identified flood zones
• Panel 380 of 500, Map Number 47097C0380D, Lauderdale County	3.6 acres (Zone AE, 1 percent annual chance of flooding)
• Panel 100 of 400, Map Number 47075C0100D, Lauderdale and Haywood County	No identified flood zones
• Panel 115 of 400, Map Number 47075C0115D, Haywood County	No identified flood zones
• Panel 230 of 400, Map Number 47075C0230D, Haywood County	No identified flood zones
• Panel 231 of 400, Map Number 47075C0231D, Haywood County	No identified flood zones

Approximately 3.6 acres of the 100-year floodplain associated with Cane Creek are located within the proposed right-of-way of the Build Alternative between Durhamville Road and Red Bird Road (see FIRM Panel 380 of 500, Map Number 47097C0380D in **Attachment C**). Correspondence from TDOT's Structures Division dated January 14, 2025, noted that while the proposed project would intersect a designated FEMA floodplain, TDOT Structures has determined that the proposed project would not increase the base flood elevation by more than one foot and that TDOT is in compliance with FEMA standards (**Attachment C**).

3.2.6 Wild and Scenic Rivers

Wild and scenic rivers and streams are federally protected under the Wild and Scenic Rivers Act[8] for their scenic, cultural, historic, recreational, wildlife, geologic, or other values. The Bureau of Land Management (BLM), National Park Service (NPS), U.S Forest Service

[8] https://uscode.house.gov/view.xhtml?path=/prelim@title16/chapter28&edition=prelim

(USFS), and USFWS maintain the Nationwide Rivers Inventory (NRI)[9],[10] which is a listing of over 4,500 free-flowing river segments in the US that have been identified as eligible or potentially eligible for inclusion in the National Wild and Scenic Rivers System (NWSRS).

No water courses listed in the NWSRS or rivers listed in the NRI exist within the SR-19 project.

4.0 Minimization and Mitigation Measures to Address Impacts

4.1 Aquatic Resources and Wetlands

Throughout the design process, TDOT will endeavor to mitigate impacts to streams, wetlands, or any other jurisdictional water features through avoidance and minimization. Where impacts cannot be avoided or sufficiently minimized, compensatory mitigation for permanent stream/wetland impacts would be accomplished either through permittee-responsible mitigation, mitigation banking, or In-Lieu Fee mitigation to satisfy statutory requirements.

4.2 Water Quality

Some of the projected impacts to water quality would be offset by the roadway design and by the federal, state, and local regulations that require erosion and sediment control plans, the implementation of BMPs, and various water quality permits that require water quality monitoring.

4.3 Threatened and Endangered Species

TDOT has committed to perform all tree clearing during the winter season between October 1st and March 31st in the section of the project from east of Binford Lane to east of SR-87 (PIN 102251.03). If possible, work at stream crossings would be scheduled during a lower flow period. Both would be done in addition to standard BMPs that would be implemented to avoid and minimize impacts to protected species,

[9] https://www.nps.gov/subjects/rivers/nationwide-rivers-inventory.htm
[10] https://www.rivers.gov/about

4.4 Geology

As per TDOT standard practice, TDOT would likely conduct a subsurface investigation during subsequent phases of project development and develop a project-specific design to address any geotechnical or geological concerns that could be identified at that time.

4.5 Floodplains

The design of the roadway system will be consistent with the Memorandum of Understanding (MOU) between Federal Highway Administration (FHWA) and FEMA and with the floodplain management criteria set forth in the National Flood Insurance Regulations of Title 44 of the Code of Federal Regulations (CFR)[11]. It will be consistent with the requirements of floodplain management guidelines for implementing Executive Order 11988[12] and FHWA guidelines 23 CFR 650A[13].

4.6 Wild and Scenic Rivers

The Build Alternative would not result in adverse impacts to Wild and Scenic rivers as there are none within the proposed project area; therefore, no mitigation is proposed.

5.0 Natural Resources Memorandum Summary

Table 4 summarizes the potential impacts to natural resources under the No-Build Alternative and the Build Alternative as well as proposed minimization and mitigation measures to address impacts, as necessary.

[11] https://www.ecfr.gov/current/title-44
[12] https://www.epa.gov/cwa-404/floodplain-management-executive-order-11988
[13] https://www.ecfr.gov/current/title-23/chapter-I/subchapter-G/part-650/subpart-A

Table 4 Natural Resources Memorandum Summary

	No-Build Alternative	Build Alternative	
Impact Category	**Effect Determination**	**Effect Determination**	**Minimization/Mitigation Measures to Address Impacts**
Aquatic Resources	No Effect	The Build Alternative would impact the following aquatic resources: • 82 wet-weather conveyances/upland drainage features/ephemeral streams (16,983 total linear feet) • 6 perennial streams (3,473 total linear feet) • 28 intermittent streams (13,802 total linear feet) • 16 wetlands (4.29 total acres) • 8 ponds (1.4 total acres)	Throughout the design process, TDOT will endeavor to mitigate impacts on streams, wetlands, or any other jurisdictional water features through avoidance and minimization. Where impacts cannot be avoided or sufficiently minimized, compensatory mitigation for permanent stream/wetland impacts would be accomplished either through permittee-responsible mitigation, mitigation banking, or In-Lieu Fee mitigation to satisfy statutory requirements.
Water Quality	No Effect	The Build Alternative would impact five 303(d) listed streams: • Briar Creek • Cane Creek • Lagoon Creek • Meridian Creek • Pond Creek	Some of the projected impacts to water quality would be offset by the roadway design and by the federal, state, and local regulations that require erosion and sediment control plans, the implementation of BMPs, and various water quality permits that require water quality monitoring.

Table 4 Natural Resources Memorandum Summary (con't)

	No-Build Alternative	Build Alternative	
Impact Category	**Effect Determination**	**Effect Determination**	**Minimization/Mitigation Measures to Address Impacts**
Threatened and Endangered Species	No Effect	US Fish and Wildlife Service (USFWS) *East of Eastland Avenue to east of Jim Binford Lane (PINs 102251.01 and 102251.02)*: On September 18, 2024, USFWS responded that a review of their database did not indicate that any federally listed or proposed species or designated critical habitat would be impacted by the project and therefore, based on the best available information at the time, the requirements of the Endangered Species Act (ESA) are fulfilled for all species that currently receive protection under the ESA. *East of Jim Binford Lane to east of SR-87 (PIN 102251.03)*: On October 14, 2024, USFWS concurred with the determination that the Build Alternative was "Not Likely to Adversely Affect" the tricolored bat (*Perimyotis subflavus*) and noted that this finding fulfills the requirements of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.). Tennessee Wildlife Resources Agency (TWRA) On October 27, 2017, TWRA reviewed the project information for the entire length of the project and responded that implementation of standard BMPs would be sufficient to satisfy the needs of TWRA for the proposed project. Tennessee Department of Environment and Conservation Division of Natural Areas (TDEC DNA) The entire project was determined to meet Condition #1 of the Memorandum of Agreement between TDOT and TDEC DNA. TDOT completed its evaluation of potential effects to the monarch butterfly (*Danaus plexippus*) for the entire project (PINs 102251.01, 102251.02, and 102251.03) in Lauderdale County and Haywood County, Tennessee. Based on a review of the most current available species information, project design and environmental setting, TDOT has determined that the proposed action is "Not likely to jeopardize the continued existence of the Monarch Butterfly."	Standard BMPs would be implemented to avoid and minimize impacts to protected species and if possible, work at stream crossings would be scheduled during a lower flow period. In consultation with the USFWS, the following commitment has been added to the section of the project from east of Binford Lane to east of SR-87 (PIN 102251.03) – All tree clearing is to occur between October 1st and March 31st.
Geology	No Effect	The Build Alternative would result in minor rock cuts. The Build Alternative may result in impacts to geology, such as impacts to drainage and ground and slope stability.	As per TDOT standard practice, TDOT would conduct a subsurface investigation during subsequent phases of project development and develop a project-specific design to address any geotechnical or geological concerns that could be identified at that time.
Floodplains	No Effect	The Build Alternative would impact approximately 3.6 acres of FEMA designated 100-Year floodplains.	The design of the roadway system will be consistent with the MOU between FHWA and FEMA and with the floodplain management criteria set forth in the National Flood Insurance Regulations of Title 44 CFR. It will be consistent with the requirements of floodplain management guidelines for implementing Executive Order 11988 and FHWA guidelines 23 CFR 650A.
Wild and Scenic Rivers	No Effect	No Effect	Not applicable.

ATTACHMENTS

ATTACHMENT A

TDOT Ecology Section Coordination, Agency Coordination, and Supporting Materials

From: Braxton Eden
To: Brenden W. Barney
Cc: rita.m.thompson; K.Brandon Chance; Erick Hunt-Hawkins; Birch, Valerie; Jessica Schlagenhaft; Karoleen Said; Banaszak, Jennifer; Santalla, Sean
Subject: Re: R4, Lauderdale and Haywood, PIN 102251.00, SR-19 EA - FHWA Comment and Ecology
Date: Monday, March 9, 2026 2:15:20 PM
Attachments: image001.png
image002.png
image003.png
Outlook-pd2i0vul.png

CAUTION: [EXTERNAL] This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Brenden,

Thank you for the response and determination for the Monarch Butterfly. We will include the language provided in our EA and appendices.

If we have any other questions, we will be sure to reach out!

Thank you,

TN TDOT Department of Transportation

Braxton Eden
Environmental Division | Environmental Quality and NEPA Section
Email: Braxton.Eden@tn.gov

From: Brenden W. Barney <Brenden.W.Barney@tn.gov>
Sent: Monday, March 9, 2026 12:07 PM
To: Braxton Eden <Braxton.Eden@tn.gov>
Cc: Rita M. Thompson <Rita.M.Thompson@tn.gov>; K.Brandon Chance <K.Brandon.Chance@tn.gov>
Subject: RE: R4, Lauderdale and Haywood, PIN 102251.00, SR-19 EA - FHWA Comment and Ecology

Hi Braxton,

It appears the only thing out of date for ecology is the species coordination in relationship to the Monarch Butterfly (Listed after 2024). The language below can be added for ecology and should bring the analysis up to current standards:

The Tennessee Department of Transportation (TDOT) has completed its evaluation of potential effects to the monarch butterfly (Danaus plexippus) associated with the PIN 102251.00, located in Lauderdale and Haywood, Tennessee.

Based on a review of the most current available species information, project design and environmental setting, has determined that the proposed action **is not likely to jeopardize the continued existence of the Monarch Butterfly**.

Please let me know if this comes up again. Thanks.

Brenden W. Barney | Ecology Team Lead
Environmental Division / Technical Studies Section
Tennessee Tower, 14th Floor
312 Rosa L. Parks Ave., Nashville, TN 37243
m.629-234-7773
Brenden.w.Barney@tn.gov

Outlook

RE: R4, InitialTechReq, Haywood and Lauderdale County, PIN 102251.00

From Rita M. Thompson <Rita.M.Thompson@tn.gov>
Date Tue 7/22/2025 8:14 AM
To Braxton Eden <Braxton.Eden@tn.gov>
Cc Randall E. Mann <Randall.E.Mann@tn.gov>; Brenden W. Barney <Brenden.W.Barney@tn.gov>

Braxton,

I have reviewed the revised project .kmz and have determined the previous ecology studies remain valid.

Please let me know if you have questions or need additional information.

Thanks,

Rita Thompson| Statewide Technical Specialist
Environmental Division / Tech Studies Office – Ecology Unit
James K. Polk, 9th Floor
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Nashville, TN 37243
p. 615-253-2459
rita.m.thompson@tn.gov

From: TDOT.Env Ecology <TDOT.Env.Ecology@tn.gov>
Sent: Tuesday, July 15, 2025 3:03 PM
To: Lucas Mercker <Lucas.Mercker@tn.gov>
Cc: R4 EnvTechOffice <R4.EnvTechOffice@tn.gov>; Rita M. Thompson <Rita.M.Thompson@tn.gov>
Subject: FW: R4, InitialTechReq, Haywood and Lauderdale County, PIN 102251.00

FYI project design changes to a previous ESR, please work with Rita for any species coordination needs and/or project concerns. Thanks.

Brenden W. Barney | Ecology Team Lead
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From: Braxton Eden <Braxton.Eden@tn.gov>
Sent: Monday, July 14, 2025 12:01 PM
To: TDOT.Env AirNoise <TDOT.Env.AirNoise@tn.gov>; TDOT.Env Ecology <TDOT.Env.Ecology@tn.gov>; TDOT.Env HazmatOffice <TDOT.Env.HazmatOffice@tn.gov>; TDOT.Env CulturalResources <TDOT.Env.CulturalResources@tn.gov>; TDOT MultimodalPlanning <TDOT.MultimodalPlanning@tn.gov>
Cc: Erick Hunt-Hawkins <Erick.Hunt-Hawkins@tn.gov>; Birch, Valerie <Valerie.Birch@hdrinc.com>; Eden, Braxton <Braxton.Eden@hdrinc.com>; Banaszak, Jennifer <Jennifer.Banaszak@hdrinc.com>; Jessica Schlagenhaft <Jessica.Schlagenhaft@tn.gov>; Monica Kain <Monica.Kain@tn.gov>; Benjamin Webb <Benjamin.Webb@tn.gov>; Seth Hendren <Seth.Hendren@tn.gov>
Subject: RE: R4, InitialTechReq, Haywood and Lauderdale County, PIN 102251.00

Good afternoon,

Since the distribution of the original ESR in February, the proposed project design has changed after discussions with TDOT Project Management.

Please see the current proposed project description below:

The Build Alternative proposes to widen the existing two 11-foot travel lanes of SR-19 from east of Eastland Avenue in Lauderdale County to just west of Gill Brackin Road in Haywood County to two 12-foot travel lanes and widen the shoulders from 2-foot shoulders to 10-foot shoulders (8-foot paved). To widen the travel lanes in this section of the proposed project, right-of-way would need to be acquired and the travel lanes reconstructed primarily to the north side of the existing roadway in the Lauderdale County section and primarily to the south side of the roadway in Haywood County. Also, in this section of the proposed project, the following SR-19 intersections are proposed to be realigned:

- *Willie Paris Road*
- *Ross Road/Gause Lane*
- *Tall Oaks Cove*
- *Sanford Road/Conner Whitefield Road*
- *Watson Road/Carney Road*
- *Springhill Road*

From just west of Gill Brackin Road to Nunn Road, the proposed project would mill and resurface the existing 11-foot travel lanes and 2-foot shoulders. In this section, the following SR-19 intersections are proposed to be realigned:

- *Forked Deer Road (SR-180)*
- *Nunn Road*

From Nunn Road to east of Jim Binford Lane, the proposed project would widen the two existing 11-foot travel lanes and 2-foot shoulders to two 12-foot travel lanes with 10-foot shoulders (8-foot paved). In this section, the following SR-19 intersection is proposed to be realigned:

- *Jim Binford Lane*

From east of Jim Binford Lane to the project terminus east of SR-87, the proposed project would mill and resurface the existing 11-foot travel lanes and 2-foot shoulders. Additional right-of-way would be needed to correct erosion/slope issues from approximately 4,351

feet east of Woodlawn Road to approximately 4,411 feet west of Old SR-19 (approximately 1,700 feet) and from approximately 3,417 feet east of Patton Road to approximately 279 feet east of Westpointe Road (approximately 1,800 feet). In this section, the following intersections are proposed to be realigned:

- *Small Road at SR-19*
- *Woodlawn Road/Briar Creek Road at SR-19*
- *Old SR-19 at SR-19*

Attached is a revised KMZ that captures the current proposed project design for the entirety of the project corridor. NEPA is requesting a review of the above listed proposed project description + revised KMZ.

This KMZ is based on forthcoming Simplified Functional plans for all three child PINs for the whole corridor. The updated KMZ has also been placed in the OneDrive link provided in the original ESR. If your respective section requires the full PDF version of the plan sets to make a determination , those will be circulated upon receipt. However, the provided KMZ will not vary from what will be presented in the Simplified Functional plans.

Please let us know if previous responses would remain valid, if additional studies would be necessary, or any other concerns your section may have.

We appreciate your flexibility with this project. If you have any questions, please reach out!

Thank you,

TN TDOT Department of Transportation

Braxton Eden
Environmental Division | NEPA Section
James K. Polk Building, 9th Floor
Email: TDOT.Env.LocalPrograms@tn.gov

From: Braxton Eden <Braxton.Eden@tn.gov>
Sent: Monday, February 3, 2025 1:03 PM
To: TDOT.Env AirNoise <TDOT.Env.AirNoise@tn.gov>; TDOT.Env Ecology <TDOT.Env.Ecology@tn.gov>; TDOT.Env HazmatOffice <TDOT.Env.HazmatOffice@tn.gov>; TDOT.Env CulturalResources <TDOT.Env.CulturalResources@tn.gov>; TDOT MultimodalPlanning <TDOT.MultimodalPlanning@tn.gov>
Cc: Erick Hunt-Hawkins <Erick.Hunt-Hawkins@tn.gov>; Rachel Head <Rachel.Head@tn.gov>; Birch, Valerie <Valerie.Birch@hdrinc.com>; Eden, Braxton <Braxton.Eden@hdrinc.com>; Banaszak, Jennifer <Jennifer.Banaszak@hdrinc.com>
Subject: R4, InitialTechReq, Haywood and Lauderdale County, PIN 102251.00

CAUTION: [EXTERNAL] This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Date ESR request transmitted to tech: 2/3/2025

Completed ESR due: **3/25/2025**

*Review the feasibility of the above due date and respond to sender regarding the feasibility of that date by: **2/17/2025** or the next business day if on a wee

If infeasible, in the response to NEPA, briefly note why and provide an anticipated completion date.

Project Information:

County	Haywood, Lauderdale
Route	SR-19
Termini	From east of Eastland Avenue in Lauderdale County to east of SR-87 in Haywood Coun
PIN	102251.00 102251.00, 102251.02, 102251.03
Brief Project Description/Scope	From east of Eastland Avenue in Lauderdale County to just west of Gill Brackin Road in Haywood Cou would widen the two travel lanes to 12 feet with 10-foot shoulders (8-foot paved), correct geometric realign several intersections. From just west of Gill Bracken Road to the project terminus east of SR- would mill and resurface the existing 11-foot travel lanes and 2-foot shoulders and realign several
Federal Funding #	PIN 102251.00 PE-N: STP-19(47)
State Funding #	PIN 102251.00 PE-N: 38004-0217-14, 49005-0226-14
If State Only, is Federal funding anticipated?	

*Note for above: If not already known by NEPA Planner, Planner will mark "unknown." If "unknown" and a technical discipline needs this information for their wor discipline is responsible for investigating. Any findings should be shared with the NEPA Planner.

List of attachments or links to associated documentation:	1. ESR 2) ETSA (Three Files) 3) Aerial Layout KMZ OneDrive Link: SR-19, PIN 102251.00, ESR

*Note for above: ESR responses must be based on the plans/documents noted in the ESR form. Responses must **not** be based on other documents, even if more re NEPA Planners will submit an updated ESR if the review should be based on different plans/documents.	
Current NEPA Office Action	Original NEPA Document
Date of last official NEPA/TEER approval	D-List CE, 02/01/2018 (see other relevant history and notes below)
*Note for above: Where applicable, technical reviews should compare the current plans to those relevant to the above noted **official** NEPA or TEER effort to ensure the cumulative change(s) since the last official approval.	
Known changes since the last official NEPA/TEER approval	Due to an increase in relocations along the project corridor, the scope was reduced from the Supe proposed in the 2018 D-List CE. See project description above for details. The project has also since l into three child PINs.
*Note for above: Though NEPA provides the results of their comparison above, tech should still do a reasonable independent review for changes. Some changes will to some than to others (often depending on subject matter expertise).	
Other Relevant History and Notes:	Through coordination with FHWA, the class of action was raised from a D-List CE to an EA due to relocations.

If you are unable to access the link or have additional questions, please reach out.

Please continue to copy those originally copied on this request on your section's responses.

Thank you!

TN TDOT Department of Transportation

Braxton Eden
Environmental Division | NEPA Section
James K. Polk Building, 9th Floor
505 Deaderick Street, Suite 900, Nashville, TN 37243
Email: TDOT.Env.LocalPrograms@tn.gov

Environmental Studies

Ecology

Environmental Studies Request

Project Information

Route: State Route 19

Termini: From east of Eastland Avenue in Lauderdale County to east of SR-87 in Haywood County

County: Lauderdale and Haywood County

PIN: 102251.00
102251.00, 102251.02, 102251.03

Request

Request Type: Initial Environmental Study

Project Plans: ETSA

Date of Plans: 05/16/2024

Location: FTP

Link: https://tennessee-my.sharepoint.com/:f:/g/personal/jjct871_tn_gov/EifR8AHZOdxGhggLA_YFoIIB8bCrYwDxUhgrZnv1uiQCkg?e=4OBbsV

Certification

Requestor: Braxton Eden

Title: NEPA Consultant

Signature: Braxton Eden

Digitally signed by Braxton Eden
Date: 2025.02.03 12:51:29 -06'00'

Environmental Study

Technical Section

Section: Ecology

Study Results

Based on the information provided, environmental boundaries reports dated October 23, 2024 (102251.01), October 23, 2024 (102251.02), and October 25, 2024 (102251.03) have been completed and uploaded to FileNet for the subject project. Species coordination was completed with TWRA and USFWS for each PIN on the project, and the coordination documents are included within the EBR and with this response. The project was deemed to fit Condition #1 of the TDEC DNA MOA for all PINS. Species coordination for this project is based on current understanding of the project scope, any changes to which could lead to additional coordination being required.

Commitments

Did the study of this project result in any environmental commitments? **Yes**

(PIN 102251.03) - TDOT commits to perform all tree clearing during the winter season between October 1st and March 31st.

Additional Information

Is there any additional information or material included with this study? **Yes**

Type: Environmental Boundaries Report (EBR)

Location: FileNet

Certification

Responder: Rita Thompson

Title: Statewide Technical Specialist

Signature:

Digitally signed by Rita Thompson
Date: 2025.02.05 15:54:53 -06'00'

Project Name: Lauderdale County SR-19 Reconstruction (IA) Section 1 **PIN:** 102251.01

Water Resource Table for NEPA Documentation

Based on: ETSA

Date: 08/12-16/2024

Table Amounts are based on (choose only one): Estimated extent of resource within ETSA

Water Resources (Non-Wetland)

Label	Type	Latitude	Longitude	Receiving Waters	Quality	Amount (Linear Feet)	Amount (Acres)
PND-1	Pond	35.723820	-89.511091	Not Applicable	Not Applicable		0.07
PND-2	Pond	35.721975	-89.506893	Not Applicable	Not Applicable		0.04
WWC-1/EPH-1	Wet Weather Conveyance/Ephemeral	35.721747	-89.507468	Cane Creek	Not Applicable	110	
WWC-2/EPH-2	Wet Weather Conveyance/Ephemeral	35.721541	-89.505569	Cane Creek	Not Applicable	487	
WWC-3/EPH-3	Wet Weather Conveyance/Ephemeral	35.721178	-89.506259	Cane Creek	Not Applicable	445	
WWC-4/EPH-4	Wet Weather Conveyance/Ephemeral	35.720108	-89.504811	Cane Creek	Not Applicable	422	
WWC-5/EPH-5	Wet Weather Conveyance/Ephemeral	35.718456	-89.500090	Cane Creek	Not Applicable	282	
WWC-6/EPH-6	Wet Weather Conveyance/Ephemeral	35.716648	-89.493832	Cane Creek	Not Applicable	601	
STR-1	Intermittent Stream	35.716507	-89.493185	Cane Creek	Unassessed	2107	
WWC-7/UDF-1	Wet Weather Conveyance/Ephemeral	35.716236	-89.490244	Cane Creek	Not Applicable	33	
WWC-8/EPH-7	Wet Weather Conveyance/Ephemeral	35.716429	-89.490020	Cane Creek	Not Applicable	205	
WWC-9/EPH-8	Wet Weather Conveyance/Ephemeral	35.716385	-89.489664	Cane Creek	Not Applicable	156	
WWC-10/UDF-2	Wet Weather Conveyance/Ephemeral	35.716600	-89.489200	Cane Creek	Not Applicable	380	
STR-2	Intermittent Stream	35.716446	-89.486744	Cane Creek	Not Applicable	186	
WWC-11/EPH-9	Wet Weather Conveyance/Ephemeral	35.716263	-89.486752	Cane Creek	Not Applicable	69	
STR-3	Intermittent Stream	35.715969	-89.483943	Cane Creek	Unassessed	254	
WWC-12/UDF-3	Wet Weather Conveyance/Ephemeral	35.715994	-89.483843	Cane Creek	Not Applicable	30	
WWC-13/EPH-10	Wet Weather Conveyance/Ephemeral	35.715799	-89.483730	Cane Creek	Not Applicable	78	
WWC-14/EPH-11	Wet Weather Conveyance/Ephemeral	35.715646	-89.480606	Cane Creek	Not Applicable	25	
STR-4	Intermittent Stream	35.715461	-89.479659	Cane Creek	Unassessed	392	
WWC-15/UDF-4	Wet Weather Conveyance/Ephemeral	35.715552	-89.479261	Cane Creek	Not Applicable	117	
WWC-16/UDF-5	Wet Weather Conveyance/Ephemeral	35.716036	-89.479471	Cane Creek	Not Applicable	27	
WWC-17/UDF-6	Wet Weather Conveyance/Ephemeral	35.716088	-89.479469	Cane Creek	Not Applicable	25	
WWC-18/UDF-7	Wet Weather Conveyance/Ephemeral	35.714417	-89.469290	Cane Creek	Not Applicable	137	
STR-5	Perennial Stream	35.714516	-89.468701	Cane Creek	Unassessed	576	
WWC-19/EPH-12	Wet Weather Conveyance/Ephemeral	35.714515	-89.469008	Cane Creek	Not Applicable	260	
WWC-20/UDF-8	Wet Weather Conveyance/Ephemeral	35.714965	-89.467815	Cane Creek	Not Applicable	10	
WWC-21/EPH-13	Wet Weather Conveyance/Ephemeral	35.714764	-89.468077	Cane Creek	Not Applicable	105	
STR-6	Intermittent Stream	35.713931	-89.461692	Cane Creek	Unassessed	404	
WWC-22/EPH-14	Wet Weather Conveyance/Ephemeral	35.713988	-89.461434	Cane Creek	Not Applicable	82	
WWC-23/EPH-15	Wet Weather Conveyance/Ephemeral	35.713875	-89.454788	Lagoon Creek	Not Applicable	215	
WWC-24/UDF-9	Wet Weather Conveyance/Ephemeral	35.714112	-89.454901	Lagoon Creek	Not Applicable	29	
PND-3	Pond	35.712692	-89.448074	Pond Creek	Not Applicable		1.04
WWC-25/UDF-10	Wet Weather Conveyance/Ephemeral	35.713013	-89.448002	Pond Creek	Not Applicable	355	
STR-7	Intermittent Stream	35.712637	-89.446291	Pond Creek	Not Applicable	158	
STR-8	Intermittent Stream	35.710215	-89.440187	Pond Creek	Not Applicable	304	
					Total:	9,066	1.15

Water Resources (Wetland)*

Label	Type	Latitude	Longitude	Receiving Waters	Quality	Amount (Acres)
WTL-1	Emergent	35.721679	-89.506840	Not Applicable	Low Resource Value	0.18
WTL-2	Forested	35.720002	-89.504934	Not Applicable	Moderate Resource Value	0.07
WTL-3	Emergent	35.715809	-89.480593	Not Applicable	Low Resource Value	0.01
WTL-4	Emergent	35.714573	-89.464852	Cane Creek	Moderate Resource Value	0.88
WTL-5	Emergent	35.714242	-89.461393	Cane Creek	Moderate Resource Value	0.51
WTL-6	Forested	35.713644	-89.461529	Cane Creek	High Resource Value	0.25
WTL-7	Forested	35.712546	-89.447247	Pond Creek	High Resource Value	0.17
WTL-8	Forested	35.712680	-89.446627	Pond Creek	Moderate Resource Value	0.22
WTL-9	Emergent	35.710030	-89.440220	Pond Creek	Moderate Resource Value	0.04
					Total:**	2.33

*Unless described otherwise in the NEPA document; all wetlands are presumed to serve the following functions to varying degrees, based on location: wildlife habitat, flood storage, groundwater recharge, nutrient processing, contaminant filtering, and recreation.

**For the purposes of the NEPA document, Amount is assumed to be Permanent Loss.

Note- Features and estimated amounts referenced in this table are based on information available and may change as the project is further refined througout project development.

Project Name: Lauderdale County SR-19 Reconstruction (IA) Section 2 **PIN:** 102251.02

Water Resource Table for NEPA Documentation

Based on: ETSA

Date: 08/12-16/2024

Table Amounts are based on (choose only one): Estimated extent of resource within ETSA

Water Resources (Non-Wetland)

Label	Type	Latitude	Longitude	Receiving Waters	Quality	Amount (Linear Feet)	Amount (Acres)
STR-1	Intermittent Stream	35.710490	-89.439782	Pond Creek	Not Applicable	473	
WWC-1/EPH-1	Wet Weather Conveyance/Ephemeral	35.709173	-89.438208	Lagoon Creek	Not Applicable	267	
STR-2	Intermittent Stream	35.709133	-89.436447	Pond Creek	Not Applicable	334	
WWC-2/EPH-2	Wet Weather Conveyance/Ephemeral	35.706981	-89.432701	Lagoon Creek	Not Applicable	250	
WWC-3/EPH-3	Wet Weather Conveyance/Ephemeral	35.705635	-89.429254	Lagoon Creek	Not Applicable	236	
PND-1	Pond	35.705223	-89.425775	Not Applicable	Not Applicable		0.006
WWC-4/UDF-1	Wet Weather Conveyance/Ephemeral	35.701843	-89.417865	Lagoon Creek	Not Applicable	127	
WWC-5/UDF-2	Wet Weather Conveyance/Ephemeral	35.701745	-89.417986	Lagoon Creek	Not Applicable	53	
WWC-6/UDF-3	Wet Weather Conveyance/Ephemeral	35.699823	-89.413379	Lagoon Creek	Not Applicable	33	
STR-3	Intermittent Stream	35.699815	-89.413328	Lagoon Creek	Not Applicable	43	
WWC-7/UDF-4	Wet Weather Conveyance/Ephemeral	35.699630	-89.413031	Lagoon Creek	Not Applicable	219	
STR-4	Intermittent Stream	35.697125	-89.409485	Lagoon Creek	Not Applicable	6	
WWC-8/EPH-4	Wet Weather Conveyance/Ephemeral	35.695591	-89.408032	Lagoon Creek	Not Applicable	199	
STR-5	Intermittent Stream	35.693777	-89.405318	Lagoon Creek	Unassessed	607	
WWC-9/UDF-5	Wet Weather Conveyance/Ephemeral	35.693547	-89.405065	Lagoon Creek	Not Applicable	65	
WWC-10/EPH-5	Wet Weather Conveyance/Ephemeral	35.694183	-89.404858	Lagoon Creek	Not Applicable	25	
WWC-11/UDF-6	Wet Weather Conveyance/Ephemeral	35.693881	-89.404851	Lagoon Creek	Not Applicable	31	
WWC-12/UDF-7	Wet Weather Conveyance/Ephemeral	35.693641	-89.404795	Lagoon Creek	Not Applicable	56	
WWC-13/EPH-6	Wet Weather Conveyance/Ephemeral	35.689941	-89.401359	Lagoon Creek	Unassessed	129	
WWC-14/UDF-8	Wet Weather Conveyance/Ephemeral	35.690072	-89.400998	Lagoon Creek	Not Applicable	119	
PND-2	Pond	35.684865	-89.394349	Not Applicable	Not Applicable		0.003
WWC-15/EPH-7	Wet Weather Conveyance/Ephemeral	35.683964	-89.394340	Meridian Creek	Not Applicable	329	
PND-3	Pond	35.682619	-89.393178	Meridian Creek	Not Applicable		0.035
STR-6	Perennial Stream	35.681379	-89.390561	Meridian Creek	Not Supporting	315	
STR-7	Intermittent Stream	35.681240	-89.390983	Meridian Creek	Not Applicable	61	
WWC-16/UDF-9	Wet Weather Conveyance/Ephemeral	35.681079	-89.391016	Meridian Creek	Not Applicable	35	
WWC-17/UDF-1	Wet Weather Conveyance/Ephemeral	35.681080	-89.390689	Meridian Creek	Not Applicable	99	
STR-8	Intermittent Stream	35.677540	-89.385657	Meridian Creek	Not Supporting	449	
WWC-18/EPH-8	Wet Weather Conveyance/Ephemeral	35.676787	-89.385710	Meridian Creek	Not Applicable	300	
WWC-19/UDF-1	Wet Weather Conveyance/Ephemeral	35.675799	-89.384757	Meridian Creek	Not Applicable	87	
					Total:	4,946	0.04

Water Resources (Wetland)*

Label	Type	Latitude	Longitude	Receiving Waters	Quality	Amount (Acres)
WTL-1	Emergent	35.709929	-89.440314	Pond Creek	Moderate Resource Value	0.07
WTL-2	Forested	35.710336	-89.439365	Pond Creek	Moderate Resource Value	0.59
WTL-3	Emergent	35.709336	-89.436656	Pond Creek	Moderate Resource Value	0.23
WTL-4	Emergent	35.708328	-89.436165	Pond Creek	Low Resource Value	0.73
WTL-5	Emergent	35.681455	-89.391276	Meridian Creek	Moderate Resource Value	0.11
					Total:**	1.73

*Unless described otherwise in the NEPA document; all wetlands are presumed to serve the following functions to varying degrees, based on location: wildlife habitat, flood storage, groundwater recharge, nutrient processing, contaminant filtering, and recreation.

**For the purposes of the NEPA document, Amount is assumed to be Permanent Loss.

Note- Features and estimated amounts referenced in this table are based on information available and may change as the project is further refined througout project development.

Project Name: Lauderdale County SR-19 Reconstruction (IA) Section 3 **PIN:** 102251.03

Water Resource Table for NEPA Documentation

Based on: ETSA

Date: 08/12-16/2024

Table Amounts are based on (choose only one): Estimated extent of resource within ETSA

Water Resources (Non-Wetland)

Label	Type	Latitude	Longitude	Receiving Waters	Quality	Amount (Linear Feet)	Amount (Acres)
WWC-1/EPH-1	Wet Weather Conveyance/Ephemeral	35.676787	-89.385710	Meridian Creek	Not Applicable	300	
WWC-2/EPH-2	Wet Weather Conveyance/Ephemeral	35.675799	-89.384757	Meridian Creek	Not Applicable	87	
WWC-3/UDF-1	Wet Weather Conveyance/Ephemeral	35.674894	-89.382964	Meridian Creek	Not Applicable	167	
STR-1	Intermittent Stream	35.673170	-89.380944	Briar Creek	Not Applicable	158	
WWC-4/UDF-2	Wet Weather Conveyance/Ephemeral	35.672813	-89.381034	Meridian Creek	Not Applicable	135	
WWC-5/UDF-3	Wet Weather Conveyance/Ephemeral	35.669937	-89.377395	Meridian Creek	Not Applicable	352	
WWC-6/UDF-4	Wet Weather Conveyance/Ephemeral	35.670176	-89.377714	Meridian Creek	Not Applicable	77	
STR-2	Intermittent Stream	35.669881	-89.376887	Meridian Creek	Not Applicable	242	
WWC-7/UDF-5	Wet Weather Conveyance/Ephemeral	35.669278	-89.376585	Meridian Creek	Not Applicable	352	
WWC-8/EPH-3	Wet Weather Conveyance/Ephemeral	35.666542	-89.372586	Meridian Creek	Not Applicable	45	
WWC-9/UDF-6	Wet Weather Conveyance/Ephemeral	35.664326	-89.371121	Meridian Creek	Not Applicable	120	
STR-3	Intermittent Stream	35.664166	-89.371006	Meridian Creek	Not Supporting	40	
STR-3	Perennial Stream	35.664565	-89.370687	Meridian Creek	Not Supporting	237	
WWC-10/EPH-4	Wet Weather Conveyance/Ephemeral	35.663995	-89.371108	Meridian Creek	Not Applicable	99	
WWC-11/UDF-7	Wet Weather Conveyance/Ephemeral	35.658180	-89.364970	Briar Creek	Not Applicable	502	
WWC-12/UDF-8	Wet Weather Conveyance/Ephemeral	35.655932	-89.361089	Briar Creek	Not Applicable	327	
WWC-13/EPH-5	Wet Weather Conveyance/Ephemeral	35.655810	-89.361453	Briar Creek	Not Applicable	38	
STR-4	Intermittent Stream	35.655680	-89.360265	Briar Creek	Not Supporting	337	
WWC-14/EPH-6	Wet Weather Conveyance/Ephemeral	35.655935	-89.360745	Briar Creek	Not Applicable	278	
WWC-15/EPH-7	Wet Weather Conveyance/Ephemeral	35.655405	-89.360963	Briar Creek	Not Applicable	166	
WWC-16/UDF-9	Wet Weather Conveyance/Ephemeral	35.650926	-89.355243	Briar Creek	Not Applicable	46	
STR-5	Perennial Stream	35.651076	-89.354941	Briar Creek	Not Supporting	455	
WWC-17/UDF-1(	Wet Weather Conveyance/Ephemeral	35.650172	-89.354623	Briar Creek	Not Applicable	564	
WWC-18/UDF-1	Wet Weather Conveyance/Ephemeral	35.650846	-89.355159	Briar Creek	Not Applicable	28	
WWC-19/EPH-8	Wet Weather Conveyance/Ephemeral	35.647318	-89.350317	Briar Creek	Not Applicable	377	
PND-1	Pond	35.644619	-89.348408	Briar Creek	Not Applicable		0.03
WWC-20/UDF-1	Wet Weather Conveyance/Ephemeral	35.643520	-89.345941	Briar Creek	Not Applicable	197	
STR-6	Perennial Stream	35.642967	-89.345683	Briar Creek	Not Supporting	590	
STR-7	Intermittent Stream	35.642637	-89.344372	Briar Creek	Not Applicable	973	
WWC-21/UDF-1	Wet Weather Conveyance/Ephemeral	35.642837	-89.345460	Meridian Creek	Not Applicable	326	
WWC-22/UDF-1	Wet Weather Conveyance/Ephemeral	35.640764	-89.341827	Briar Creek	Not Applicable	1011	
WWC-23/UDF-1	Wet Weather Conveyance/Ephemeral	35.639146	-89.339646	Briar Creek	Not Applicable	373	
PND-2	Pond	35.638271	-89.337902	Briar Creek	Not Applicable		0.17
STR-8	Intermittent Stream	35.633048	-89.331668	Meridian Creek	Not Applicable	1134	
STR-8	Perennial Stream	35.631757	-89.329932	Meridian Creek	Not Applicable	974	
STR-9	Intermittent Stream	35.632156	-89.330733	Meridian Creek	Not Applicable	112	
WWC-24/UDF-1(	Wet Weather Conveyance/Ephemeral	35.632039	-89.330586	Meridian Creek	Not Applicable	110	
STR-10	Perennial Stream	35.630698	-89.327894	Meridian Creek	Not Supporting	326	
STR-11	Intermittent Stream	35.628376	-89.324891	Meridian Creek	Not Supporting	2390	
STR-12	Intermittent Stream	35.629833	-89.327260	Meridian Creek	Not Applicable	447	
WWC-25/UDF-1	Wet Weather Conveyance/Ephemeral	35.630022	-89.327846	Meridian Creek	Not Applicable	115	
WWC-26/UDF-1	Wet Weather Conveyance/Ephemeral	35.629082	-89.326244	Meridian Creek	Not Applicable	690	
WWC-27/UDF-1	Wet Weather Conveyance/Ephemeral	35.628889	-89.324336	Meridian Creek	Not Applicable	555	
WWC-28/UDF-2	Wet Weather Conveyance/Ephemeral	35.626564	-89.323127	Meridian Creek	Not Applicable	181	
STR-13	Intermittent Stream	35.624437	-89.319329	Meridian Creek	Not Supporting	157	
WWC-29/EPH-9	Wet Weather Conveyance/Ephemeral	35.624086	-89.319600	Meridian Creek	Not Applicable	129	
WWC-30/EPH-1(	Wet Weather Conveyance/Ephemeral	35.623004	-89.318635	Meridian Creek	Not Applicable	53	
STR-14	Intermittent Stream	35.621913	-89.315612	Meridian Creek	Not Supporting	351	
WWC-31/EPH-1	Wet Weather Conveyance/Ephemeral	35.621381	-89.315729	Meridian Creek	Not Applicable	33	
STR-15	Intermittent Stream	35.620333	-89.313919	Meridian Creek	Not Applicable	1296	
WWC-32/EPH-1	Wet Weather Conveyance/Ephemeral	35.619015	-89.312107	Meridian Creek	Not Applicable	158	
WWC-33/EPH-1	Wet Weather Conveyance/Ephemeral	35.615219	-89.307727	Meridian Creek	Not Applicable	93	
WWC-34/UDF-2	Wet Weather Conveyance/Ephemeral	35.610511	-89.300916	Bucks Creek	Not Applicable	512	
STR-16	Intermittent Stream	35.609968	-89.300204	Bucks Creek	Not Applicable	97	
WWC-35/UDF-2	Wet Weather Conveyance/Ephemeral	35.609381	-89.299368	Meridian Creek	Not Applicable	562	
STR-17	Intermittent Stream	35.609030	-89.298315	Bucks Creek	Not Applicable	291	
WWC-36/UDF-2	Wet Weather Conveyance/Ephemeral	35.608787	-89.298505	Bucks Creek	Not Applicable	113	
WWC-37/EPH-1	Wet Weather Conveyance/Ephemeral	35.608123	-89.297064	Bucks Creek	Not Applicable	140	
WWC-38/UDF-2	Wet Weather Conveyance/Ephemeral	35.607681	-89.297029	Bucks Creek	Not Applicable	225	
					Total:	20,245	0.21

Water Resources (Wetland)*

Label	Type	Latitude	Longitude	Receiving Waters	Quality	Amount (Acres)
WTL-1	Forested	35.623834	-89.319750	Meridian Creek	Moderate Resource Value	0.09
WTL-2	Forested	35.622779	-89.316955	Meridian Creek	Moderate Resource Value	0.14
					Total:**	0.23

*Unless described otherwise in the NEPA document; all wetlands are presumed to serve the following functions to varying degrees, based on location: wildlife habitat, flood storage, groundwater recharge, nutrient processing, contaminant filtering, and recreation.

**For the purposes of the NEPA document, Amount is assumed to be Permanent Loss.

Note- Features and estimated amounts referenced in this table are based on information available and may change as the project is further refined througout project development.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
ENVIRONMENTAL DIVISION
ENVIRONMENTAL TECHNICAL STUDIES OFFICE
SUITE 900, JAMES K. POLK BUILDING
505 DEADERICK STREET
NASHVILLE, TENNESSEE 37243-1402
(615) 741-3655

BUTCH ELEY
DEPUTY GOVERNOR &
COMMISSIONER OF TRANSPORTATION

BILL LEE
GOVERNOR

MEMORANDUM

To: Benjamin Webb
Project Manager, Region 4 Project Management

From: Shawn Wurst
Ecology Team Lead, Environmental Division

Date: 10/23/2024

Subject: Environmental Boundaries Report for:
SR-19 from East of Eastland Avenue to Haywood County Line
Lauderdale County
PIN Number: 102251.01

An ecological evaluation of the subject project has been conducted in response to an initial evaluation request with the following findings:

STREAMS: Eight (8) perennial/intermittent streams and Fifteen (15) ephemeral streams were identified within the proposed project limits.

WETLANDS: Nine (9) wetland features were identified within the proposed project limits.

OTHER FEATURES: Ten (10) upland drainage features and three (3) ponds were identified within the proposed project limits.

SPECIES:

- *USFWS:* USFWS coordination resulted in no effect for listed species.
- *TWRA:* TWRA coordination resulted in no concerns for listed species.
- *TDEC DNA:* The project was determined to meet Condition #1 of the MOA between TDOT and TDEC DNA.

COMMITMENTS: No commitments are required for this project.

If you have any questions or comments, please contact me at (615-516-8445) or shawn.wurst@tn.gov.

xc: TDOT.Env.Ecology@tn.gov
TDOT.Env.Permits@tn.gov
TDOT.Env.Mitigation@tn.gov
TDOT.Env.NEPA@tn.gov

ENVIRONMENTAL BOUNDARIES REPORT

Lauderdale County SR-19 Reconstruction (IA) Section 1
PIN 102251.01

Tennessee Department of Transportation

October 2024

1.0 INTRODUCTION

Tennessee Department of Transportation (TDOT) proposes to improve SR-19 in Lauderdale County from East of Eastland Avenue to the Haywood County Line (Appendix A: Figures 1 and 2). Improvements will involve reconstructing the existing two lane road to a super two lane road with 12 foot lanes, 10 foot shoulders, and improved sight distances. Johnson, Mirmiran and Thompson (JMT) has been contracted to perform an environmental boundaries survey on an on-average 520-foot-wide corridor along this 5.3-mile-long project (356 acres).

2.0 METHODOLOGY

A delineation of jurisdictional water resources under Sections 401 and 404 of the Clean Water Act of 1972 (CWA) and under the Tennessee Water Quality Control Act of 1977 was conducted August 12-16, 2024, by qualified JMT scientists. The delineation was conducted in accordance with:

- U.S. Army Corps of Engineers (USACE) Wetland Delineation Manual, Technical Report Y- 87-1 (USACE, 1987)
- USACE November 2010 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain (USACE, 2010)
- Current WOTUS rules
- TDOT guidance related to wetland data collection
- Tennessee Department of Environment and Conservation (TDEC) Division of Water Resources (DWR)
    - Tennessee Rapid Assessment Method for Wetlands (TRAM) (TDEC, 2017)
    - Guidance for Making Hydrologic Determinations, Version 1.5 (TDEC, 2020)
- Subsequent regulatory guidance.

Wetland boundaries were identified and marked with sequentially numbered flagging placed on vegetation at the jurisdictional boundaries at 25-to-50-foot intervals or as necessary to maintain visual reference between flags. Coordinates of each flag were collected with 10-centimeter GPS. Data was collected to support the jurisdictional decision. Data collected included:

- USACE Wetland Determination Data Forms - Atlantic and Gulf Coastal Plain
- TRAM Wetland Assessment Forms

Streams and wet weather conveyances (WWCs) were identified and marked on the ordinary high water mark (OHWM) on each bank. GPS was collected on centerline of channels less than 10 feet wide at the OHWM. Channels greater than 10 feet wide at OHWM were GPS located on both sides of the channel at the OHWM. Coordinates were collected along each bend, or as necessary to maintain visual reference, with 10-centimeter GPS. Environmental data was collected to support the determination. All watercourse identifications were reviewed and approved by a TDEC certified Qualified Hydrologic

Professional - In Training (QHP-IT), Preston Butler, PWS. QHP-IT certification allows practitioners to conduct hydrologic determinations (HDs) as the lead investigator. Data collected included:

- Tennessee Hydrologic Determination Field Data Sheets
- Tennessee Water Resource Forms

3.0 Water Resource Results

Water resources within the study area are located within the Lower Hatchie River Basin and South Fork Forked Deer River Basin (USGS 8-digit HUCs 08010208 and 08010205, respectively). The locations of the streams, ponds, wetlands, and WWCs within the study area are shown on Figures 4 and 5 (Appendix A).

Eight streams and 25 WWCs were identified within the study area (Appendix B). A total of approximately 4,380 linear feet of stream channel was identified within the study area (3,412 linear feet of intermittent stream and 968 linear feet of perennial stream). A total of approximately 4,687 linear feet of WWC was identified within the study area. Tennessee Hydrologic Determination (TN HD) Field Data Sheets and Water Resource forms for each of these identified features are included in Appendix B. Site photos showing these features are included in Appendix C.

Three open surface waters (ponds PND-1, 2, and 3) were identified within the study area and are detailed in the Water Resource Table (Appendix B). The three ponds' surface area totals approximately 1.15 acres within the study area. Water Resource forms for each of these identified features are included in Appendix B. All three ponds identified within the study area appear to be connected to jurisdictional features by surface flow, and therefore were considered jurisdictional

Nine wetlands totaling approximately 2.33 acres of wetland were identified within the study area (see Appendix C). Wetlands in the study area were classified as Slope wetlands based on the *Hydrogeomorphic (HGM) Classification and Description of Wetlands in Tennessee* described in the 2017 TRAM Manual. They either occurred at the base of slopes, above headwater streams, or adjacent to a developed stream channel. USACE Wetland Determination forms and TRAM Wetland Assessment forms for each wetland feature are included in Appendix B. Site photos showing the delineated features are included in Appendix C.

The TRAM manual defines Exceptional Status Wetlands as wetlands with features or characteristics that merit special attention and consideration. A determination of Exceptional Status Wetland is derived based on 13 criteria listed in the TRAM manual which includes designations of Outstanding Natural Resource Waters (ONRW) and Exceptional Tennessee Waters (ETW), as defined in the TDEC General Water Quality Criteria; ecological value; vegetative species age and composition; wildlife habitat; hydrologic connectivity; and overall TRAM value. No Exceptional Status Wetlands were found in the study area.

4.0 REFERENCES

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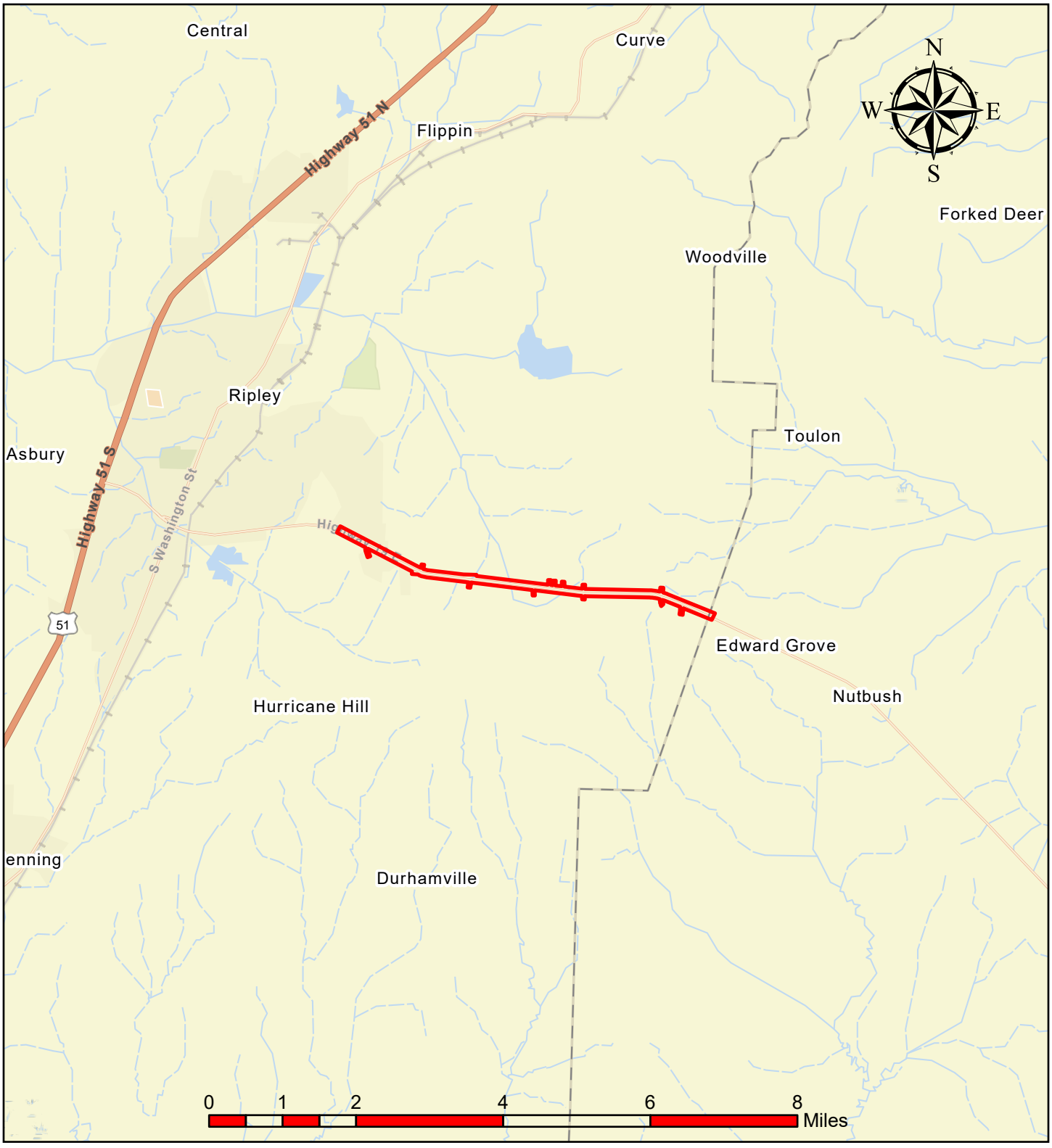
APPENDIX A: FIGURES



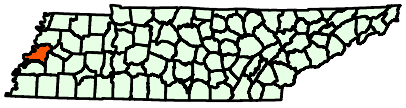
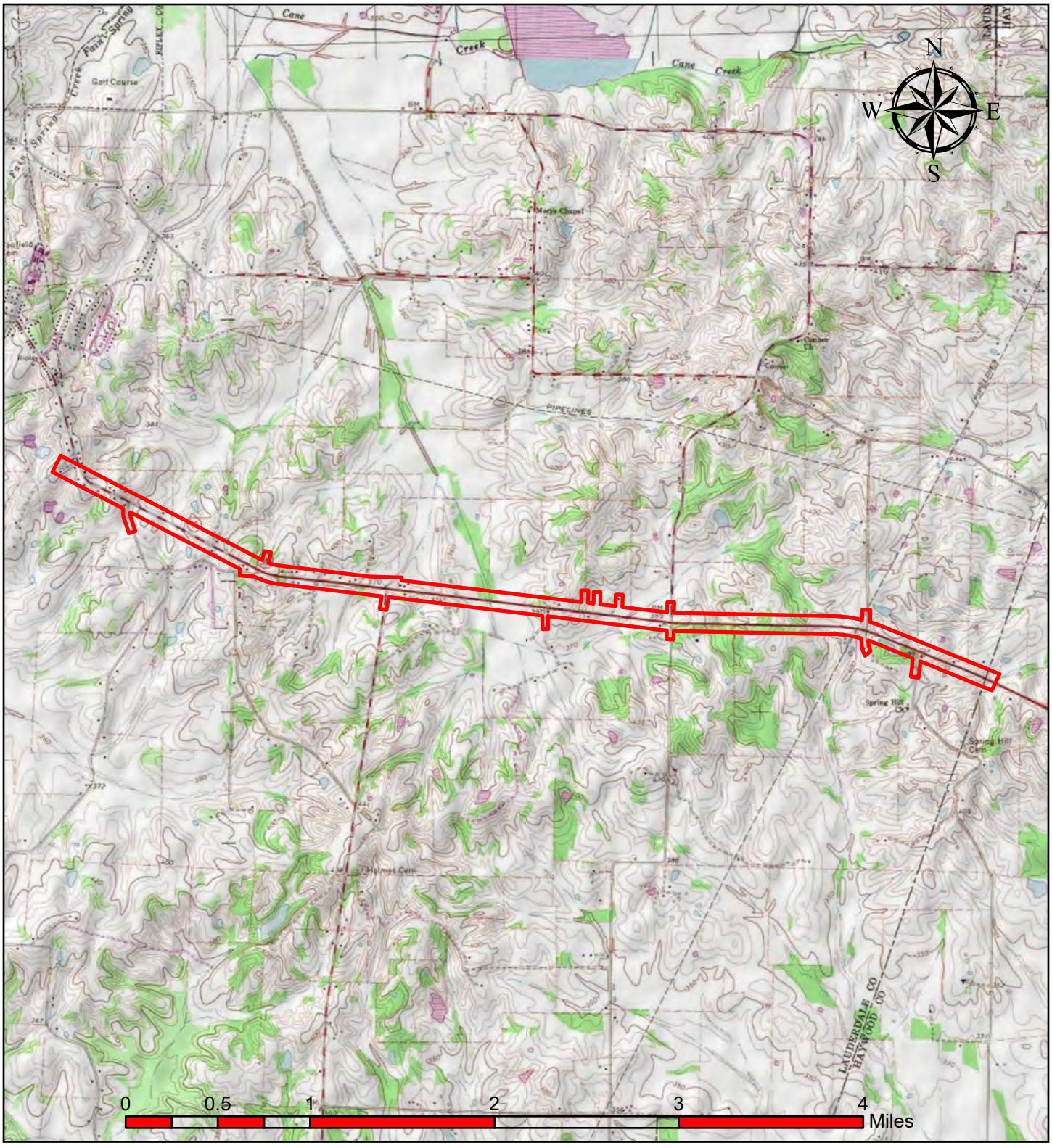


Figure 1: Vicinity Map
Lauderdale County SR-19 Reconstruction (IA) Section 1

ESRI World Street Map Basemap
September 2024

PIN 102251.01

TN TDOT Department of Transportation



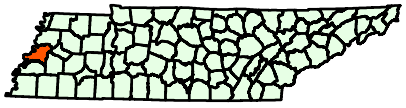
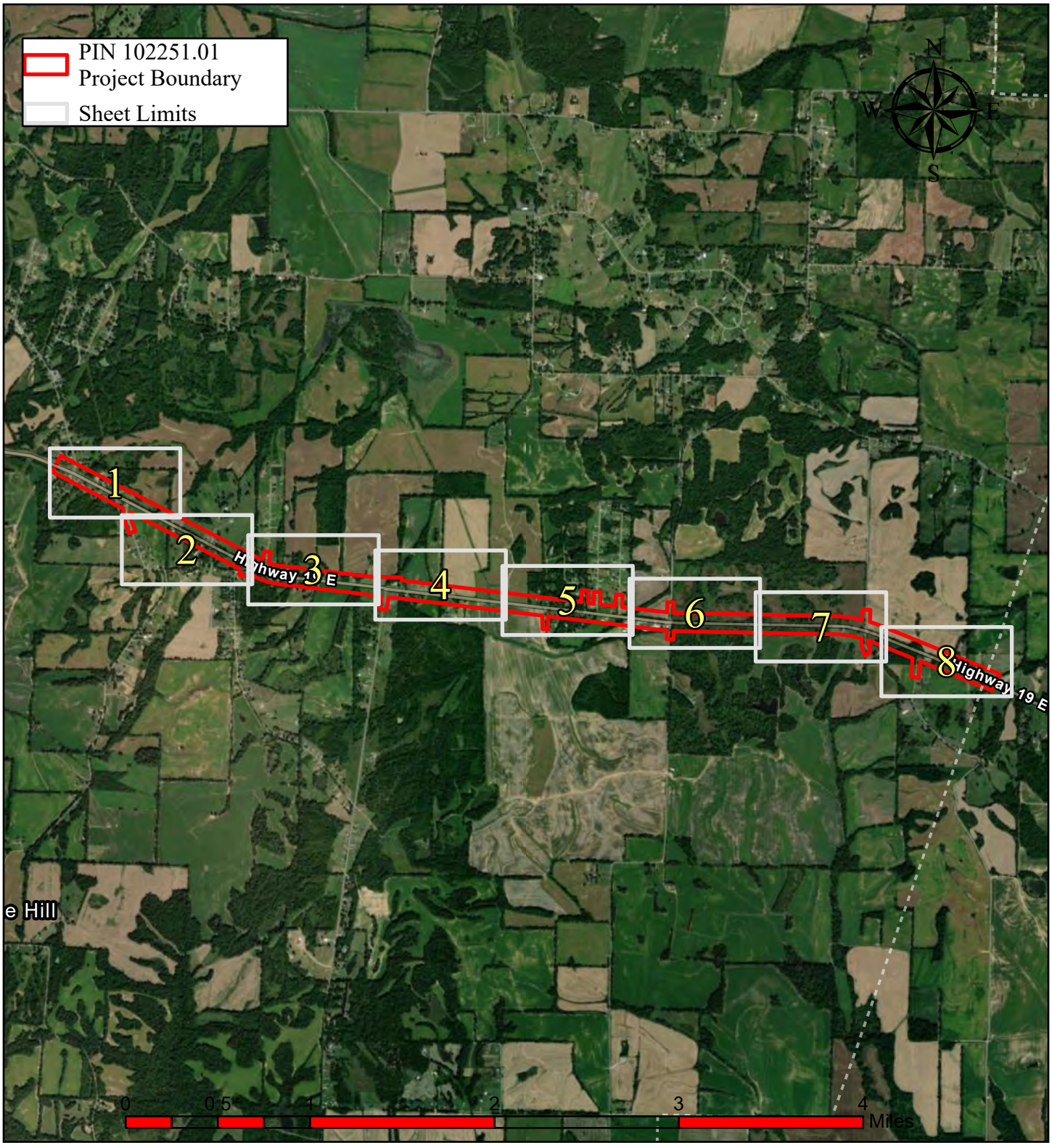


Figure 2: Topographic Map
Lauderdale County SR-19 Reconstruction (IA) Section 1

Durhamville and Ripley South, TN USGS Quadrangle
September 2024

PIN 102251.01

TN TDOT Department of Transportation



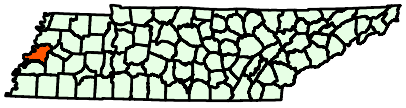
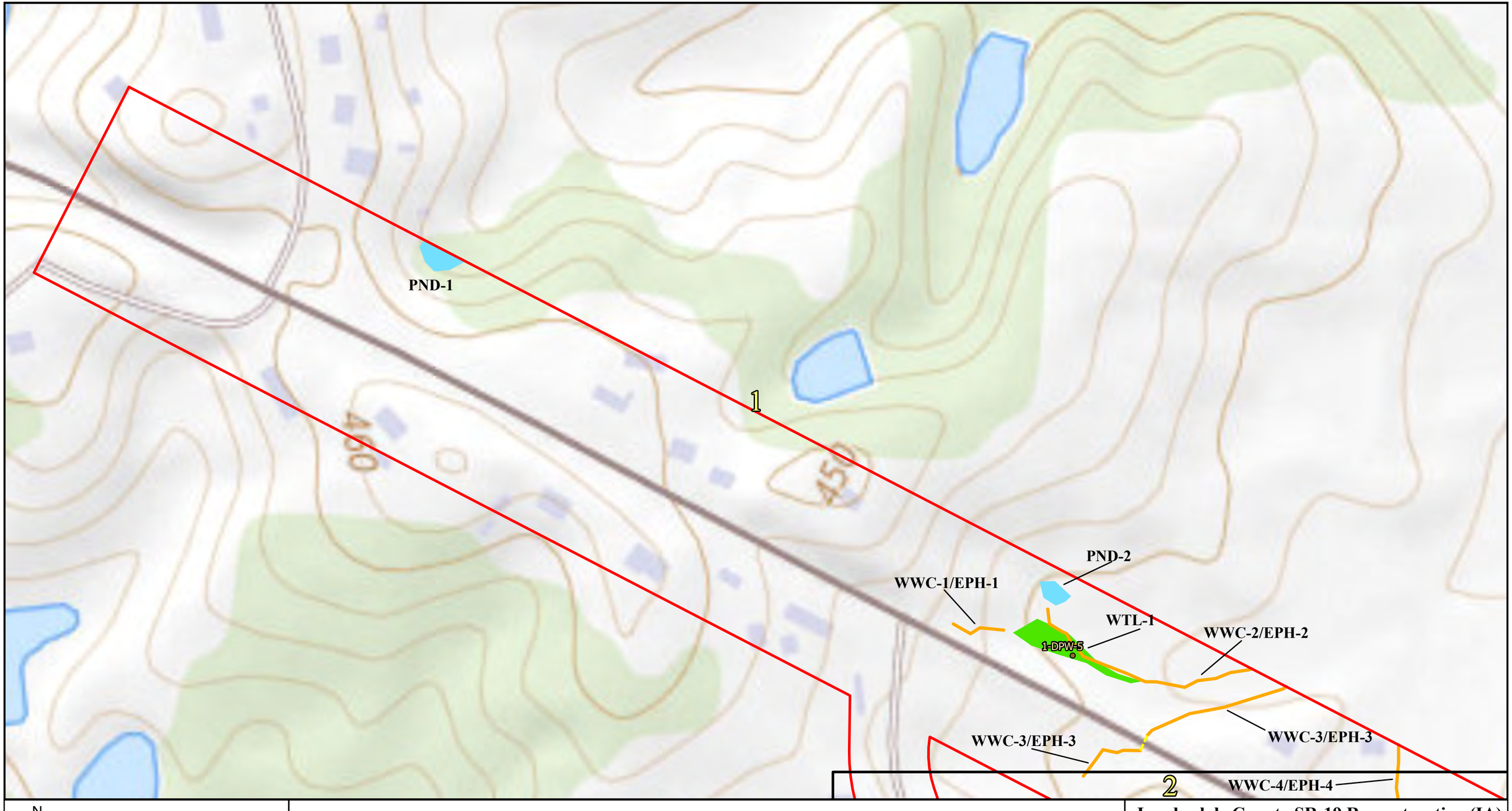


Figure 3: Aerial Map
Lauderdale County SR-19 Reconstruction (IA) Section 1

2016 Maxar Vivid Standard Imagery
September 2024

PIN 102251.01

TN TDOT Department of Transportation



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Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere

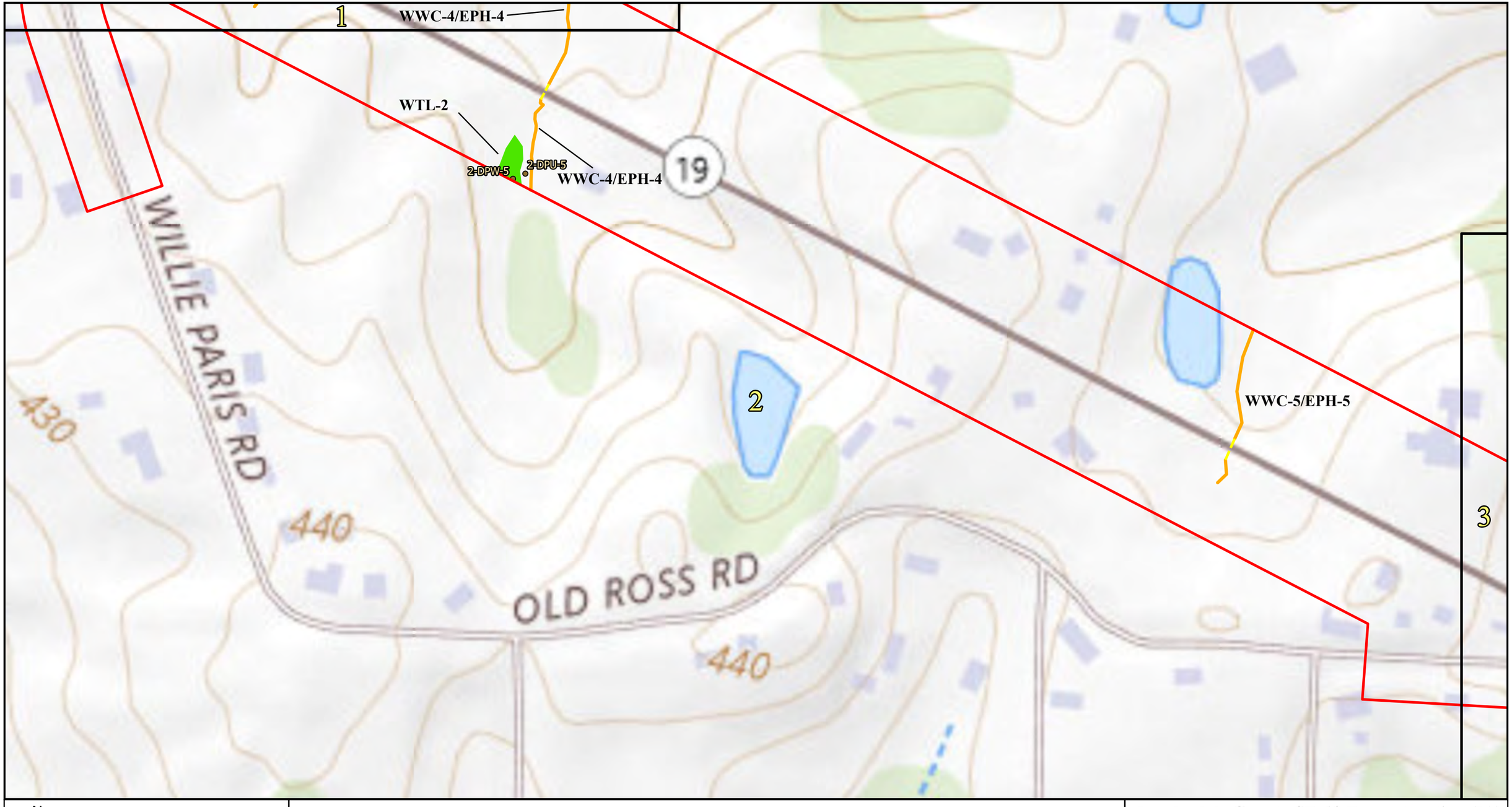
TN TDOT Department of Transportation

PIN 102251.01 Project Boundary
Sheet Limits
Wetland Data Form Location
Potential Pond (PND)
Potential Wetland (WTL)
Potential Stream (Intermittent) (STR)
Potential Stream (Perennial) (STR)
Wet Weather Conveyance (WWC)
Culvert

USGS The National Map

Lauderdale County SR-19 Reconstruction (IA)
Section 1; PIN 102251.01
TDOT

Figure 4: Topographic Map
Sheet 1 of 8
October 2024



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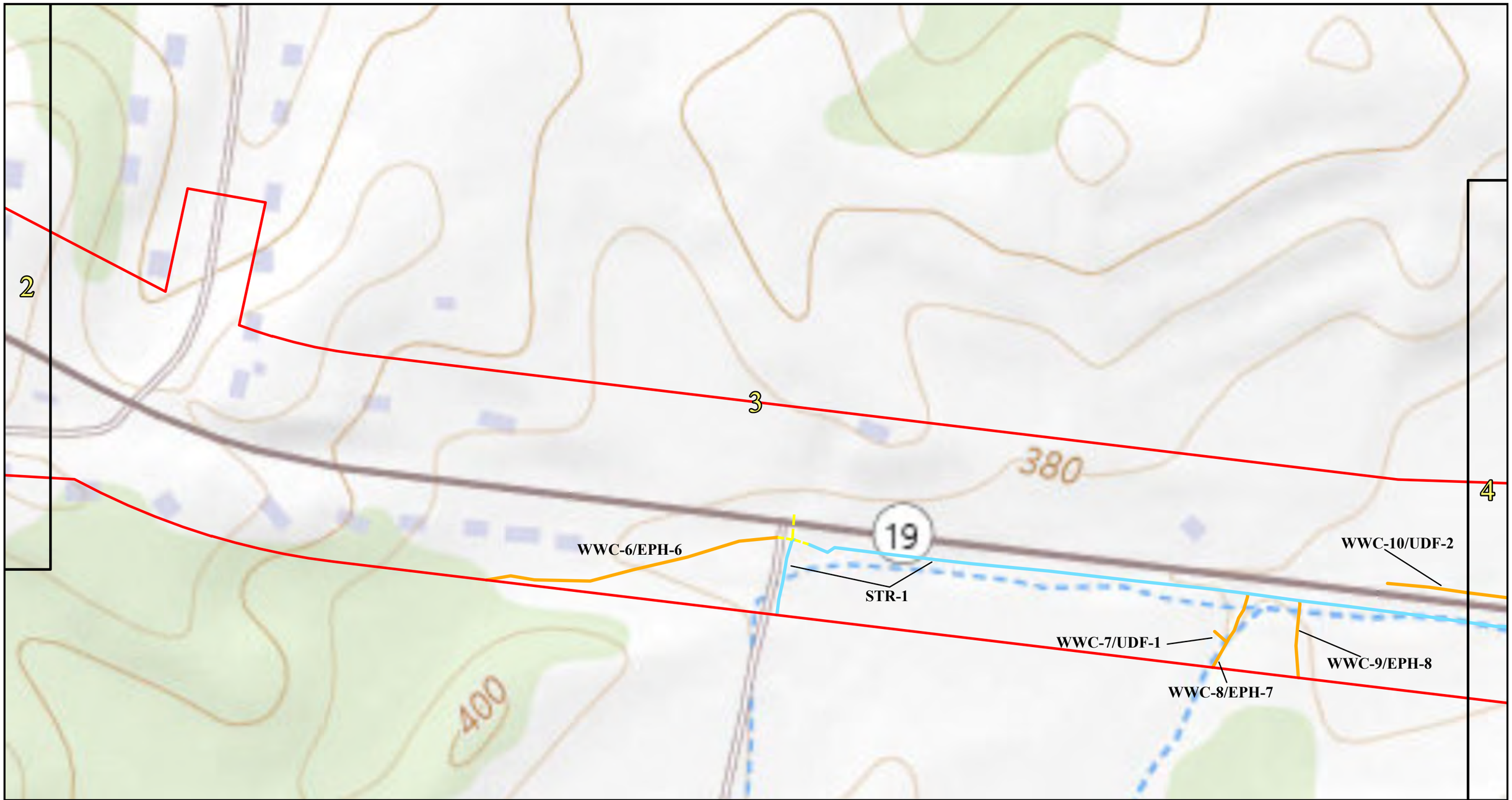
Culvert

USGS The National Map

Lauderdale County SR-19 Reconstruction (IA)
Section 1; PIN 102251.01
TDOT

Figure 4: Topographic Map
Sheet 2 of 8
October 2024



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Potential Stream (Perennial) (STR)
Wet Weather Conveyance (WWC)
Culvert

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Lauderdale County SR-19 Reconstruction (IA)
Section 1; PIN 102251.01
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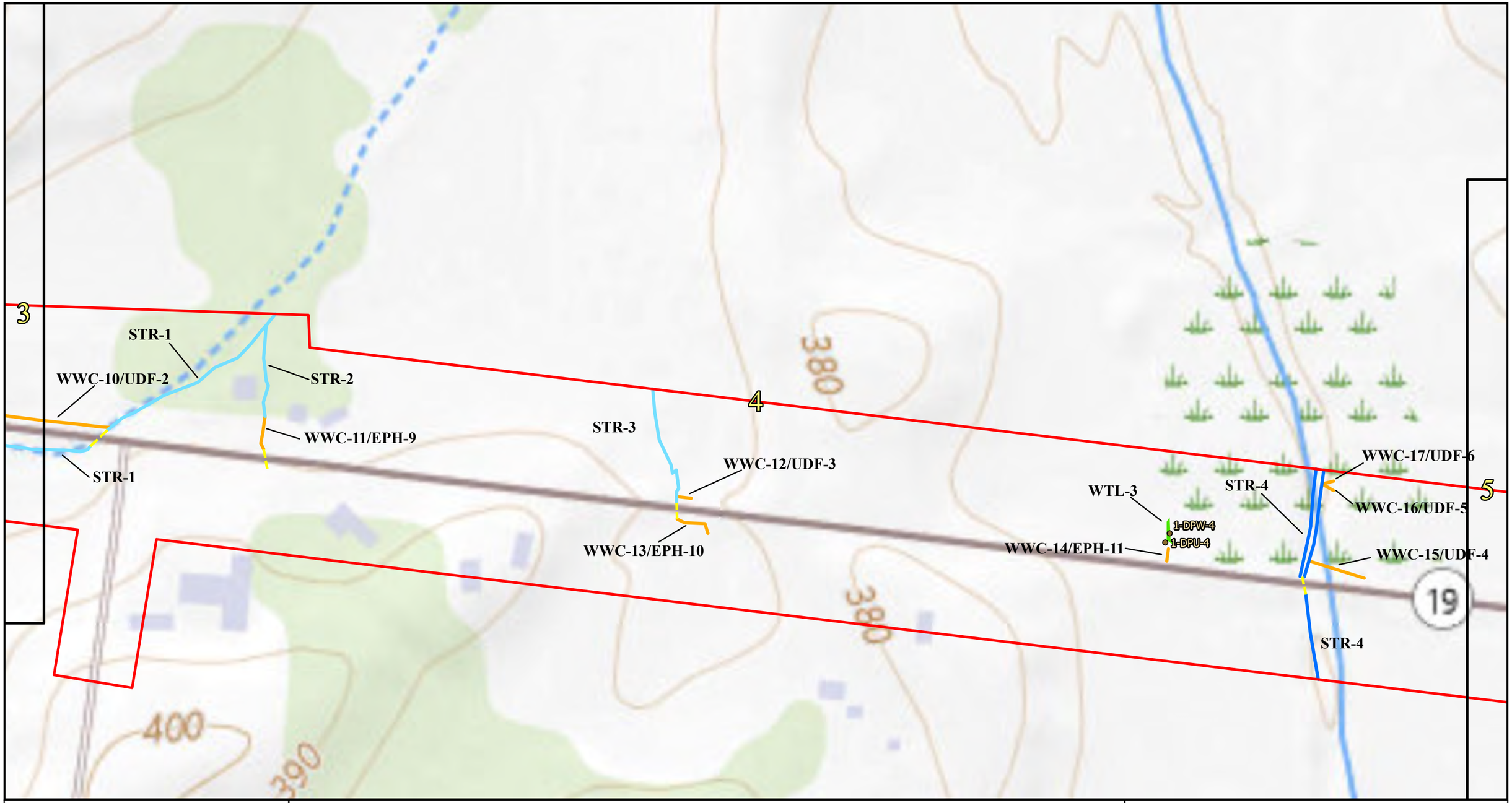
Figure 4: Topographic Map
Sheet 3 of 8
October 2024



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PIN 102251.01 Project Boundary
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Wet Weather Conveyance (WWC)
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Lauderdale County SR-19 Reconstruction (IA)
Section 1; PIN 102251.01
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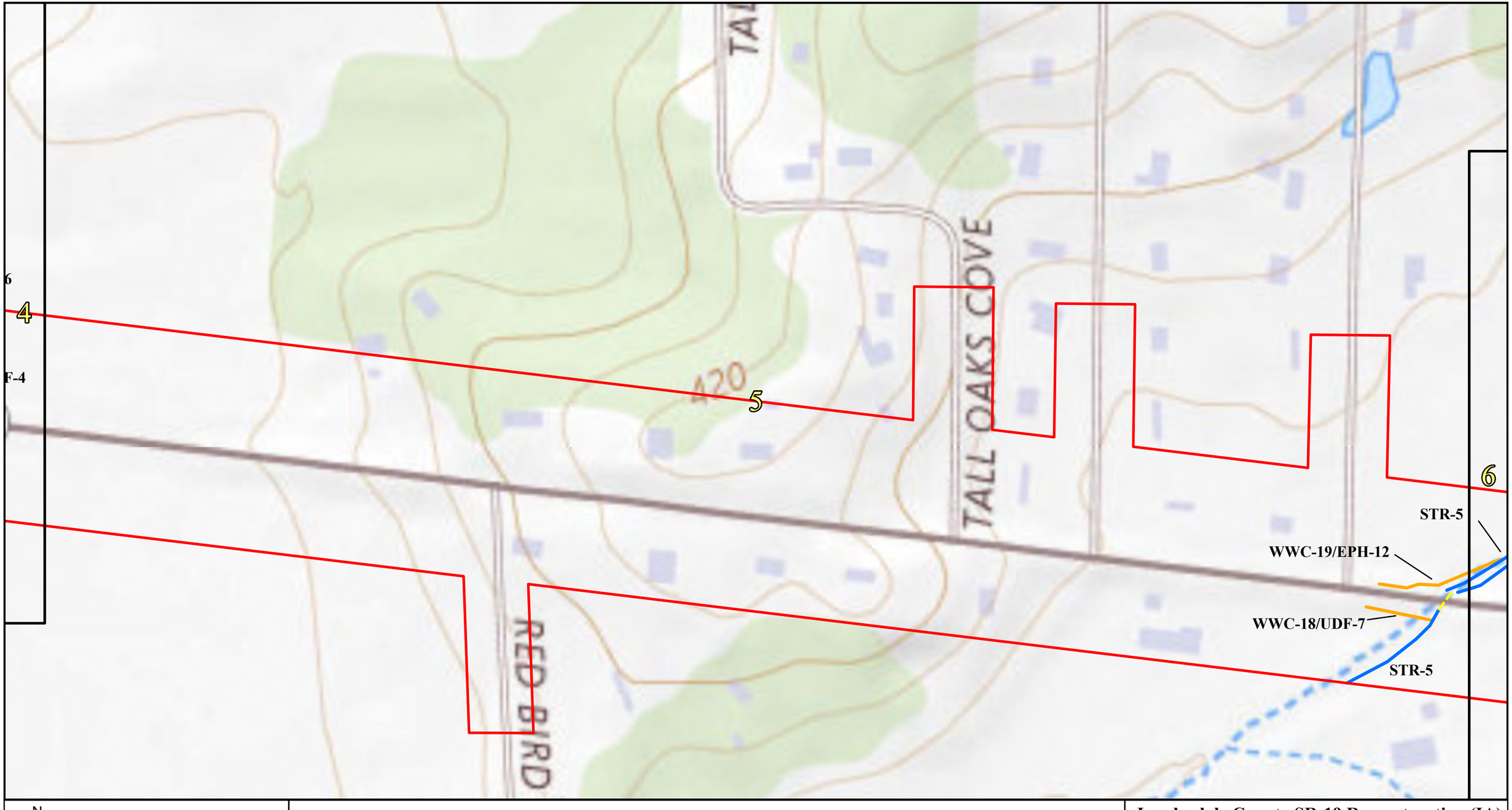
Figure 4: Topographic Map
Sheet 4 of 8
October 2024



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TN TDOT Department of Transportation

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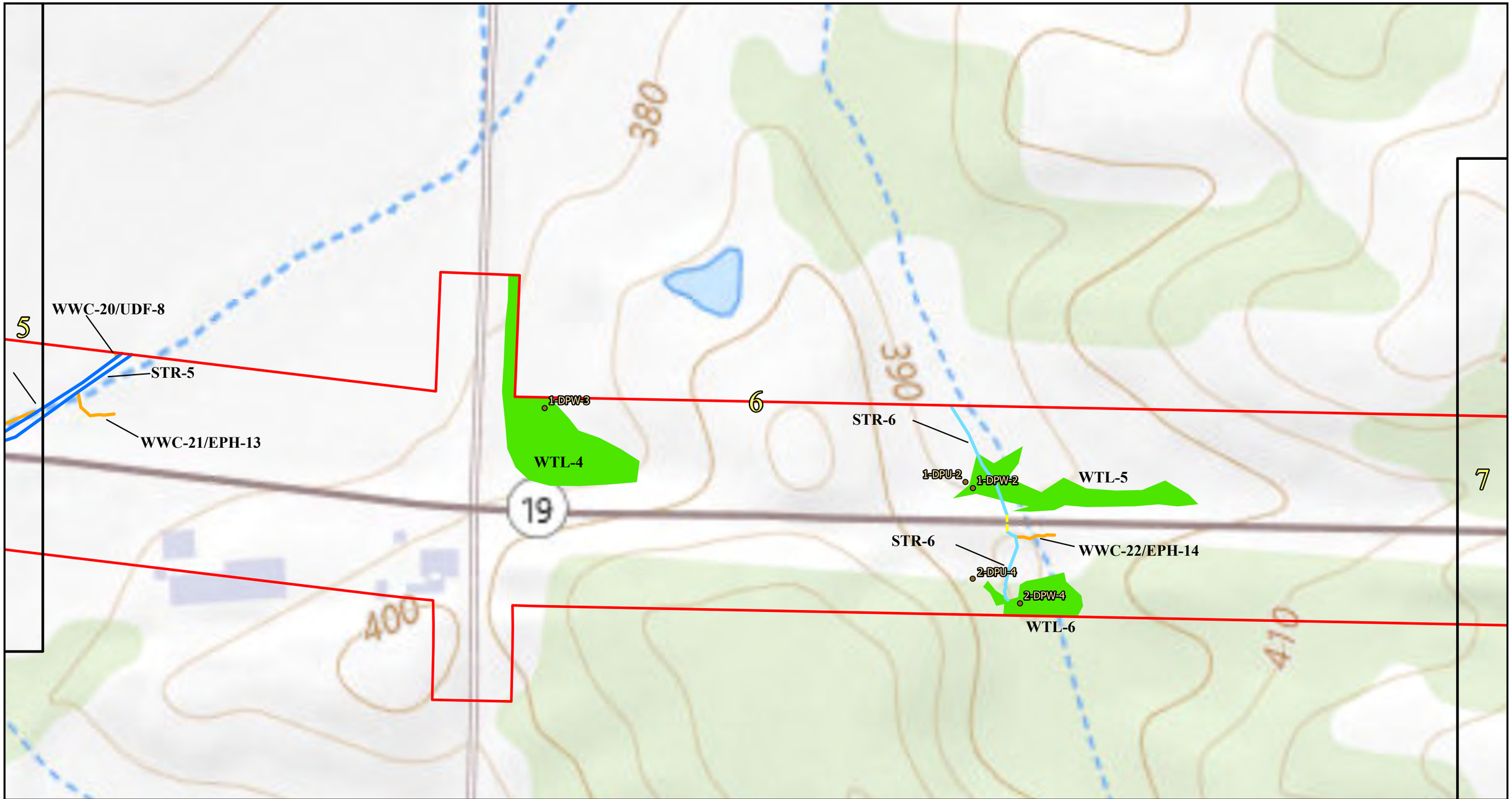
Culvert

USGS The National Map

Lauderdale County SR-19 Reconstruction (IA)
Section 1; PIN 102251.01
TDOT

Figure 4: Topographic Map
Sheet 5 of 8
October 2024



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TN TDOT Department of Transportation

PIN 102251.01 Project Boundary

Sheet Limits

Wetland Data Form Location

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Wet Weather Conveyance (WWC)

Culvert

USGS The National Map

Lauderdale County SR-19 Reconstruction (IA)
Section 1; PIN 102251.01
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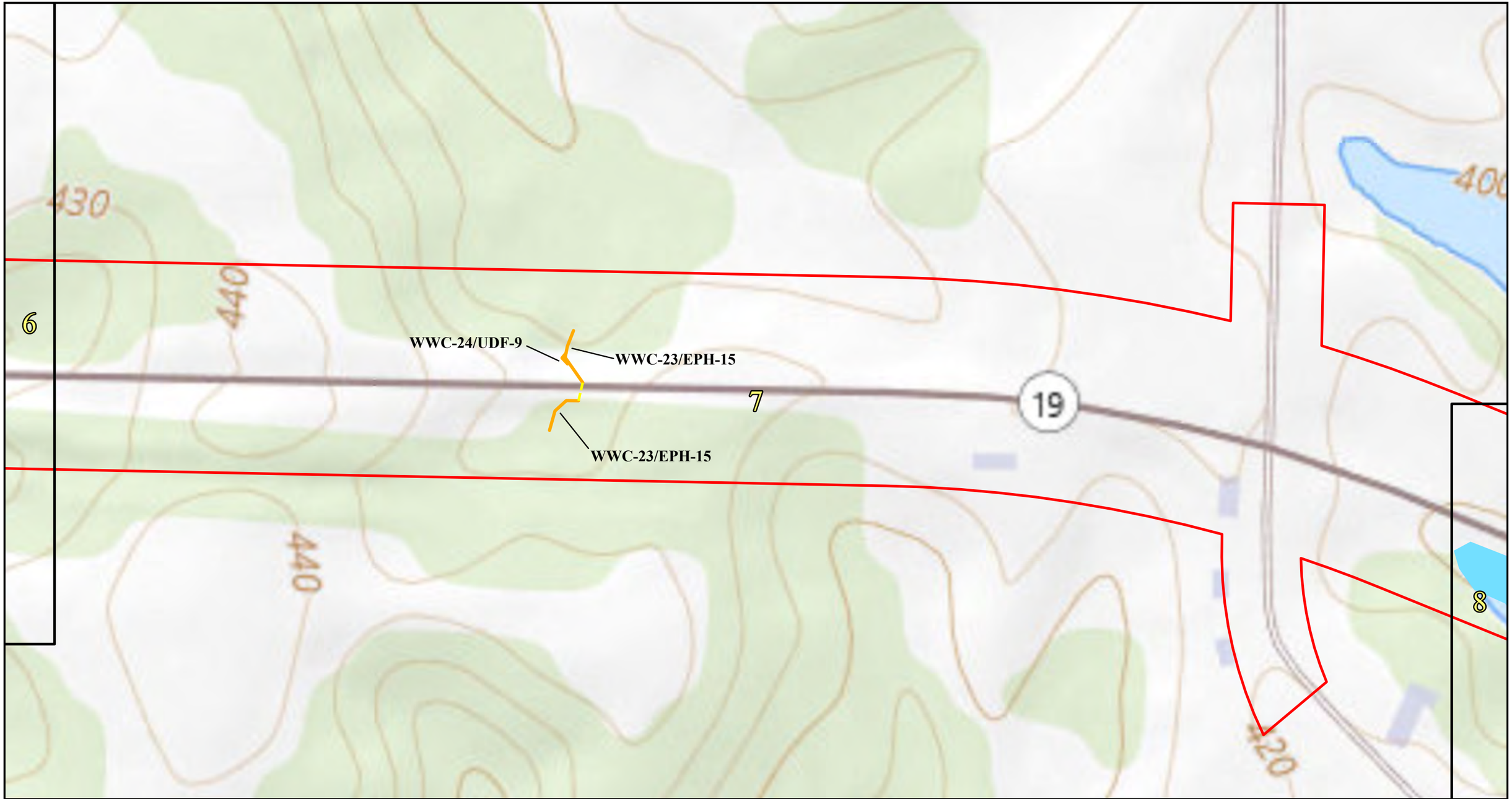
Figure 4: Topographic Map
Sheet 6 of 8
October 2024



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TN TDOT Department of Transportation

PIN 102251.01 Project Boundary
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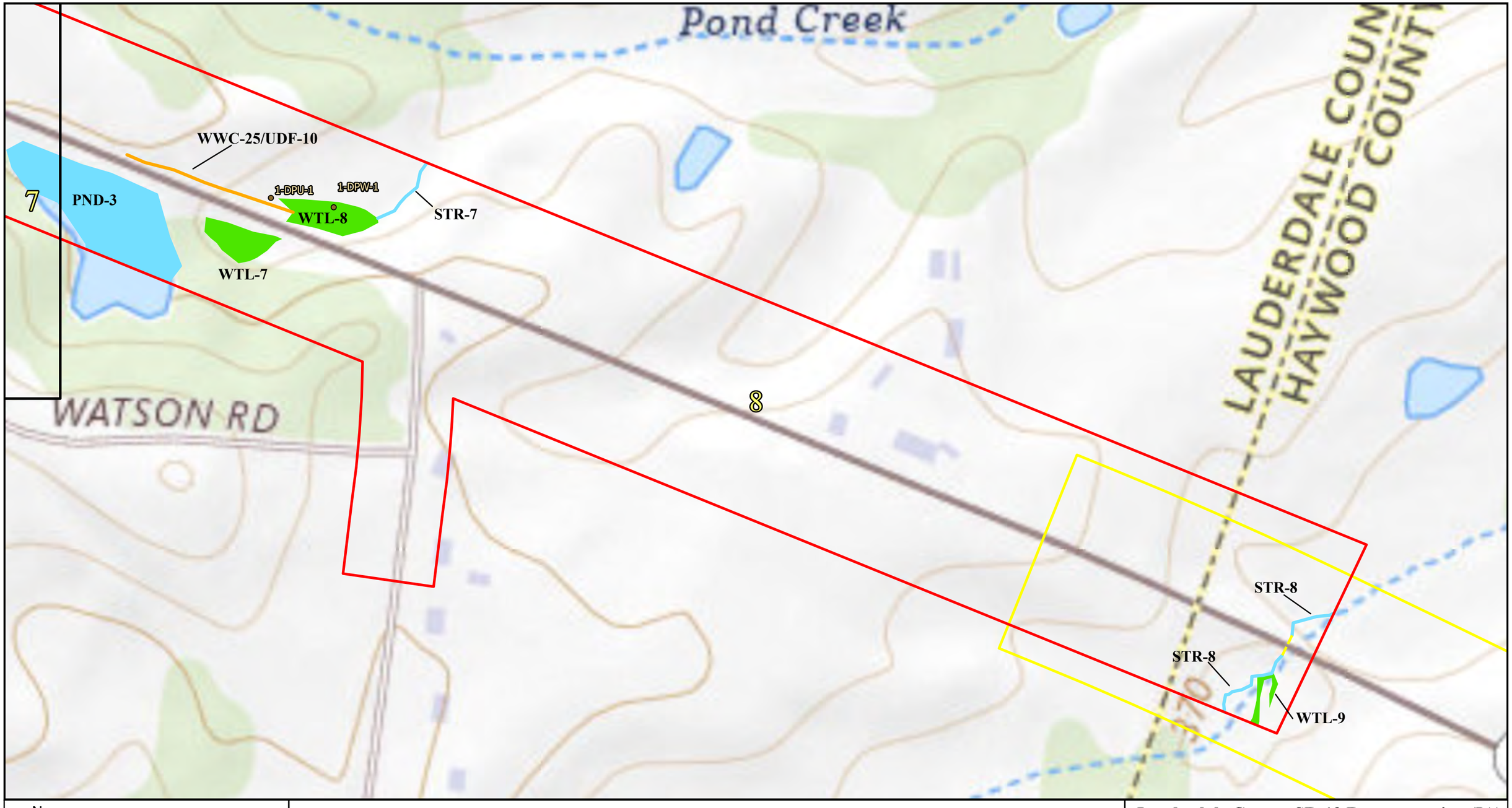
Potential Stream (Intermittent) (STR)
Potential Stream (Perennial) (STR)
Wet Weather Conveyance (WWC)
Culvert

USGS The National Map

Lauderdale County SR-19 Reconstruction (IA)
Section 1; PIN 102251.01
TDOT

Figure 4: Topographic Map
Sheet 7 of 8
October 2024



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Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere

TN TDOT Department of Transportation

- PIN 102251.01 Project Boundary
- PIN 102251.02 Project Boundary
- Sheet Limits
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- Potential Wetland (WTL)
- Potential Stream (Intermittent) (STR)
- Potential Stream (Perennial) (STR)
- Wet Weather Conveyance (WWC)
- Culvert

USGS The National Map

Lauderdale County SR-19 Reconstruction (IA)
Section 1; PIN 102251.01
TDOT

Figure 4: Topographic Map
Sheet 8 of 8
October 2024

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Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere

TN TDOT Department of Transportation

PIN 102251.01 Project Boundary
Sheet Limits
Wetland Data Form Location
Potential Pond (PND)
Potential Wetland (WTL)
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Wet Weather Conveyance (WWC)
Culvert

2016 Maxar Vivid Standard Imagery / ESRI Hybrid Reference Layer

Lauderdale County SR-19 Reconstruction (IA)
Section 1; PIN 102251.01
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Figure 5: Aerial Map
Sheet 1 of 8
October 2024

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Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere

TN TDOT Department of Transportation

- PIN 102251.01 Project Boundary
- Sheet Limits
- Wetland Data Form Location
- Potential Pond (PND)
- Potential Wetland (WTL)
- Potential Stream (Intermittent) (STR)
- Potential Stream (Perennial) (STR)
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- Culvert

2016 Maxar Vivid Standard Imagery / ESRI Hybrid Reference Layer

Lauderdale County SR-19 Reconstruction (IA)
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TDOT

Figure 5: Aerial Map
Sheet 2 of 8
October 2024

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Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere

TN TDOT Department of Transportation

- PIN 102251.01 Project Boundary
- Sheet Limits
- Wetland Data Form Location
- Potential Pond (PND)
- Potential Wetland (WTL)
- Potential Stream (Intermittent) (STR)
- Potential Stream (Perennial) (STR)
- Wet Weather Conveyance (WWC)
- Culvert

2016 Maxar Vivid Standard Imagery / ESRI Hybrid Reference Layer

Lauderdale County SR-19 Reconstruction (IA)
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TDOT

Figure 5: Aerial Map
Sheet 3 of 8
October 2024

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Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere

TN TDOT Department of Transportation

- PIN 102251.01 Project Boundary
- Sheet Limits
- Wetland Data Form Location
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- Potential Stream (Intermittent) (STR)
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- Culvert

2016 Maxar Vivid Standard Imagery / ESRI Hybrid Reference Layer

Lauderdale County SR-19 Reconstruction (IA)
Section 1; PIN 102251.01
TDOT

Figure 5: Aerial Map
Sheet 4 of 8
October 2024

N

0 150 300 US Feet

Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere

TN TDOT Department of Transportation

PIN 102251.01 Project Boundary
Sheet Limits
Wetland Data Form Location
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Culvert

2016 Maxar Vivid Standard Imagery / ESRI Hybrid Reference Layer

Lauderdale County SR-19 Reconstruction (IA)
Section 1; PIN 102251.01
TDOT

Figure 5: Aerial Map
Sheet 5 of 8
October 2024

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TN TDOT Department of Transportation

PIN 102251.01 Project Boundary
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Culvert

2016 Maxar Vivid Standard Imagery / ESRI Hybrid Reference Layer

Lauderdale County SR-19 Reconstruction (IA)
Section 1; PIN 102251.01
TDOT

Figure 5: Aerial Map
Sheet 6 of 8
October 2024

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TN TDOT Department of Transportation

PIN 102251.01 Project Boundary
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Culvert

2016 Maxar Vivid Standard Imagery / ESRI Hybrid Reference Layer

Lauderdale County SR-19 Reconstruction (IA)
Section 1; PIN 102251.01
TDOT

Figure 5: Aerial Map
Sheet 7 of 8
October 2024

N

0 150 300 US Feet

Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere

TN TDOT Department of Transportation

- PIN 102251.01 Project Boundary
- PIN 102251.02 Project Boundary
- Sheet Limits
- Wetland Data Form Location
- Potential Pond (PND)
- Potential Wetland (WTL)
- Potential Stream (Intermittent) (STR)
- Potential Stream (Perennial) (STR)
- Wet Weather Conveyance (WWC)
- Culvert

2016 Maxar Vivid Standard Imagery / ESRI Hybrid Reference Layer

Lauderdale County SR-19 Reconstruction (IA)
Section 1; PIN 102251.01
TDOT

Figure 5: Aerial Map
Sheet 8 of 8
October 2024

APPENDIX B: WATER RESOURCE TABLE ANTECEDENT PRECIPITATION TOOL (APT) DATA COLLECTION FORMS

Project Name: Lauderdale County SR-19 Reconstruction (IA) Section 1

PIN: 102251.01

Water Resource Table for EBR Report

Date: 08/12-16/2024

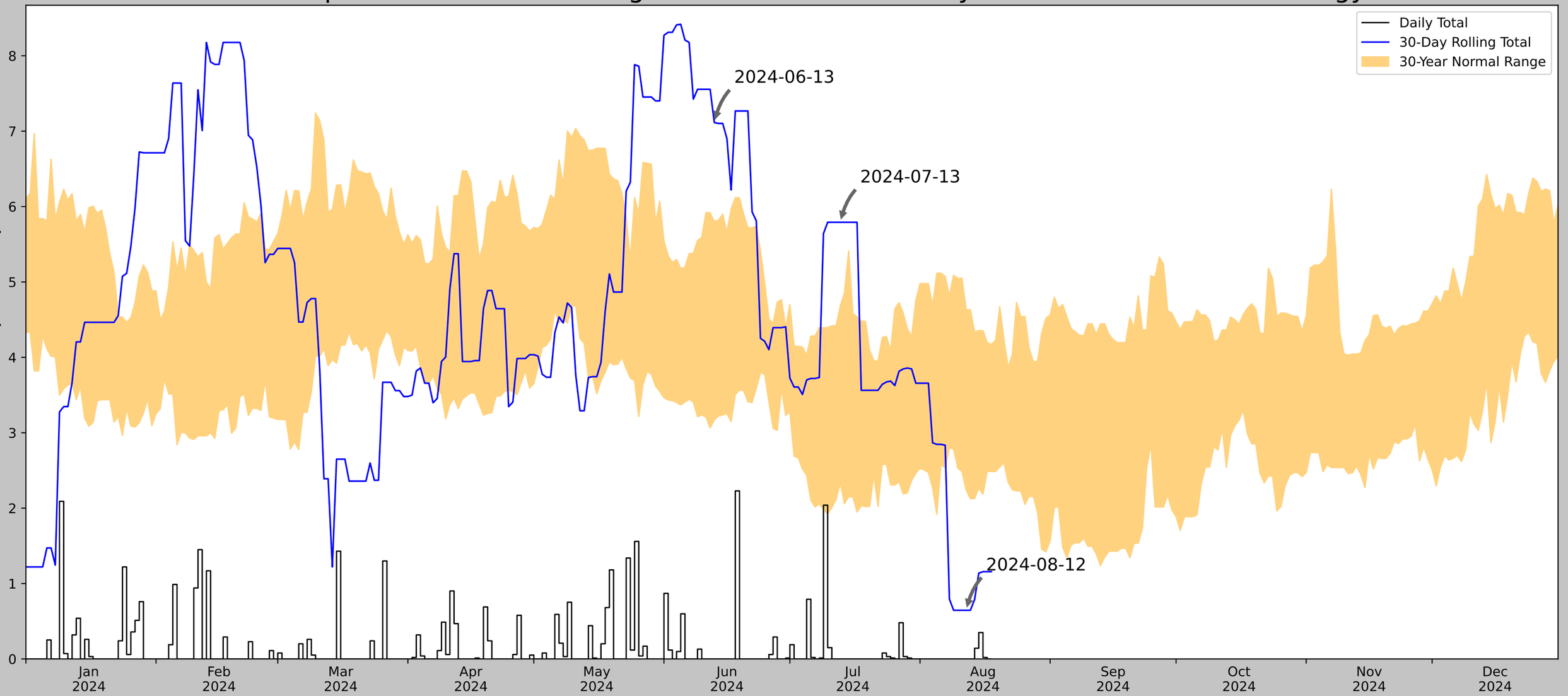
Table Amounts are based on (choose only one): Estimated extent of resource within ETSA

Water Resources (Non-Wetland)					
Label	**Type**	**Latitude**	**Longitude**	**Receiving Waters**	**Quality**
PND-1	Pond	35.723820	-89.511091	Not Applicable	Not Applicable
PND-2	Pond	35.721975	-89.506893	Not Applicable	Not Applicable
WWC-1/EPH-1	Wet Weather Conveyance/Ephemeral	35.721747	-89.507468	Cane Creek	Not Applicable
WWC-2/EPH-2	Wet Weather Conveyance/Ephemeral	35.721541	-89.505569	Cane Creek	Not Applicable
WWC-3/EPH-3	Wet Weather Conveyance/Ephemeral	35.721178	-89.506259	Cane Creek	Not Applicable
WWC-4/EPH-4	Wet Weather Conveyance/Ephemeral	35.720108	-89.504811	Cane Creek	Not Applicable
WWC-5/EPH-5	Wet Weather Conveyance/Ephemeral	35.718456	-89.500090	Cane Creek	Not Applicable
WWC-6/EPH-6	Wet Weather Conveyance/Ephemeral	35.716648	-89.493832	Cane Creek	Not Applicable
STR-1	Intermittent Stream	35.716507	-89.493185	Cane Creek	Unassessed
WWC-7/UDF-1	Wet Weather Conveyance/Ephemeral	35.716236	-89.490244	Cane Creek	Not Applicable
WWC-8/EPH-7	Wet Weather Conveyance/Ephemeral	35.716429	-89.490020	Cane Creek	Unassessed
WWC-9/EPH-8	Wet Weather Conveyance/Ephemeral	35.716385	-89.489664	Cane Creek	Not Applicable
WWC-10/UDF-2	Wet Weather Conveyance/Ephemeral	35.716600	-89.489200	Cane Creek	Not Applicable
STR-2	Intermittent Stream	35.716446	-89.486744	Cane Creek	Not Applicable
WWC-11/EPH-9	Wet Weather Conveyance/Ephemeral	35.716263	-89.486752	Cane Creek	Not Applicable
STR-3	Intermittent Stream	35.715969	-89.483943	Cane Creek	Not Applicable
WWC-12/UDF-3	Wet Weather Conveyance/Ephemeral	35.715994	-89.483843	Cane Creek	Not Applicable
WWC-13/EPH-10	Wet Weather Conveyance/Ephemeral	35.715799	-89.483730	Cane Creek	Not Applicable
WWC-14/EPH-11	Wet Weather Conveyance/Ephemeral	35.715646	-89.480606	Cane Creek	Not Applicable
STR-4	Intermittent Stream	35.715461	-89.479659	Cane Creek	Unassessed
WWC-15/UDF-4	Wet Weather Conveyance/Ephemeral	35.715552	-89.479261	Cane Creek	Not Applicable
WWC-16/UDF-5	Wet Weather Conveyance/Ephemeral	35.716036	-89.479471	Cane Creek	Not Applicable
WWC-17/UDF-6	Wet Weather Conveyance/Ephemeral	35.716088	-89.479469	Cane Creek	Not Applicable
WWC-18/UDF-7	Wet Weather Conveyance/Ephemeral	35.714417	-89.469290	Cane Creek	Not Applicable
STR-5	Perennial Stream	35.714516	-89.468701	Cane Creek	Unassessed
WWC-19/EPH-12	Wet Weather Conveyance/Ephemeral	35.714515	-89.469008	Cane Creek	Not Applicable
WWC-20/UDF-8	Wet Weather Conveyance/Ephemeral	35.714965	-89.467815	Cane Creek	Not Applicable
WWC-21/EPH-13	Wet Weather Conveyance/Ephemeral	35.714764	-89.468077	Cane Creek	Not Applicable
STR-6	Intermittent Stream	35.713931	-89.461692	Cane Creek	Not Applicable
WWC-22/EPH-14	Wet Weather Conveyance/Ephemeral	35.713988	-89.461434	Cane Creek	Not Applicable
WWC-23/EPH-15	Wet Weather Conveyance/Ephemeral	35.713875	-89.454788	Lagoon Creek	Not Applicable
WWC-24/UDF-9	Wet Weather Conveyance/Ephemeral	35.714112	-89.454901	Lagoon Creek	Not Applicable
PND-3	Pond	35.712692	-89.448074	Pond Creek	Not Applicable
WWC-25/UDF-10	Wet Weather Conveyance/Ephemeral	35.713013	-89.448002	Pond Creek	Not Applicable
STR-7	Intermittent Stream	35.712637	-89.446291	Pond Creek	Not Applicable
STR-8	Intermittent Stream	35.710215	-89.440187	Pond Creek	Not Applicable

Water Resources (Wetland)					
Label	**Type**	**Latitude**	**Longitude**	**Receiving Waters**	**Quality**
WTL-1	Emergent	35.721679	-89.506840	Not Applicable	Low Resource Value
WTL-2	Forested	35.720002	-89.504934	Not Applicable	Moderate Resource Value
WTL-3	Emergent	35.715809	-89.480593	Not Applicable	Low Resource Value
WTL-4	Emergent	35.714573	-89.464852	Cane Creek	Moderate Resource Value
WTL-5	Emergent	35.714242	-89.461393	Cane Creek	Moderate Resource Value
WTL-6	Forested	35.713644	-89.461529	Cane Creek	High Resource Value
WTL-7	Forested	35.712546	-89.447247	Pond Creek	High Resource Value
WTL-8	Forested	35.712680	-89.446627	Pond Creek	Moderate Resource Value
WTL-9	Emergent	35.710030	-89.440220	Pond Creek	Moderate Resource Value

Note- Features and estimated amounts referenced in this table are based on information available and may change as the project is further refined throughout project development.

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



Coordinates	35.695414, -89.407375
Observation Date	2024-08-12
Elevation (ft)	355.583
Drought Index (PDSI)	Incipient drought (2024-07)
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2024-08-12	2.239764	4.63189	0.645669	Dry	1	3	3
2024-07-13	2.333071	4.67874	5.791339	Wet	3	2	6
2024-06-13	3.169291	5.801969	7.114173	Wet	3	1	3
Result							Normal Conditions - 12

US Army Corps of Engineers

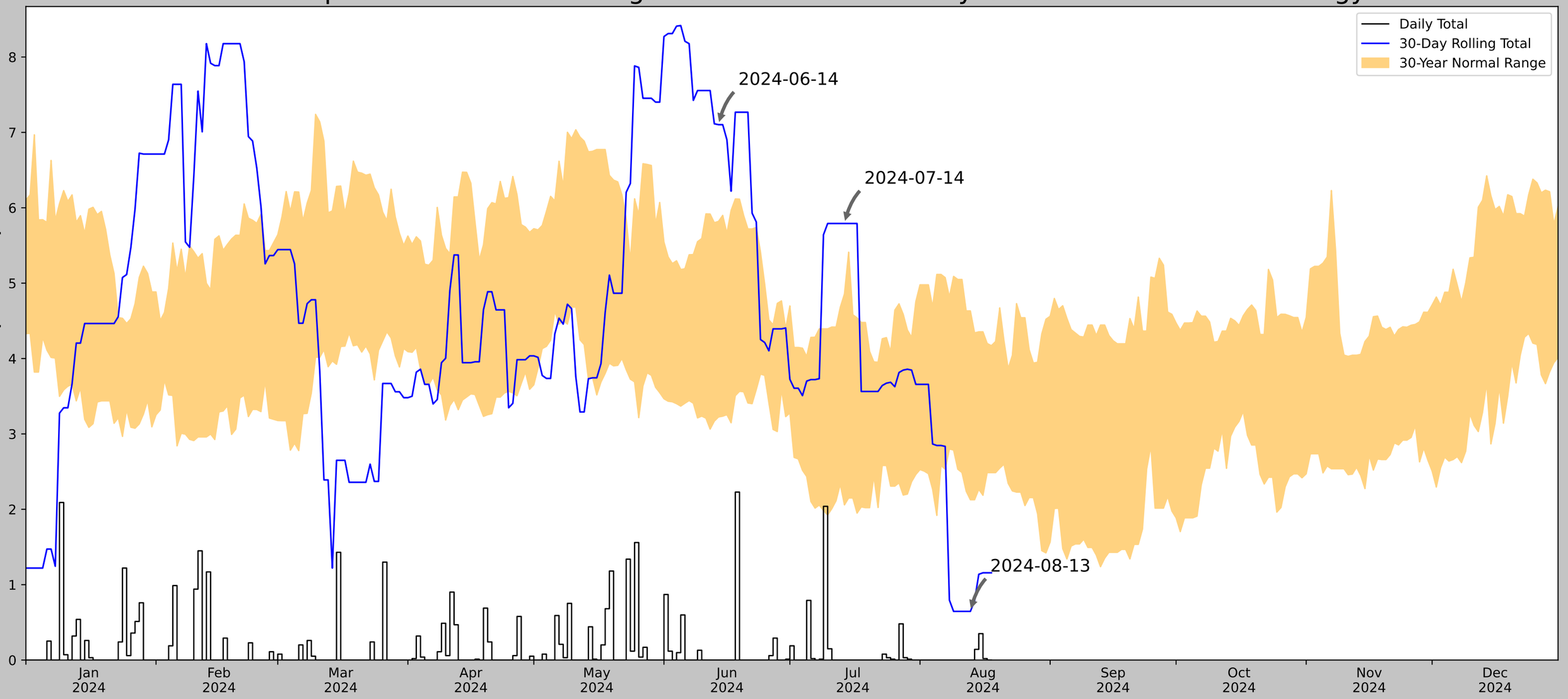
ERDC

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
BROWNSVILLE 1.0 SE	35.5841, -89.2423	348.097	12.045	7.486	5.51	5741	90
BROWNSVILLE	35.5908, -89.2597	374.016	1.082	25.919	0.515	5451	0
ALAMO 1 N	35.7978, -89.1175	348.097	16.342	0.0	7.354	95	0
SOMERVILLE 10N	35.365, -89.3475	342.848	16.255	5.249	7.4	23	0
RIPLEY	35.7178, -89.4986	399.934	17.1	51.837	8.581	41	0
JACKSON MCKELLAR- SIPES AP	35.5933, -88.9169	423.885	18.295	75.788	9.619	1	0

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



Coordinates	35.695414, -89.407375
Observation Date	2024-08-13
Elevation (ft)	355.583
Drought Index (PDSI)	Incipient drought (2024-07)
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2024-08-13	2.125984	4.63189	0.645669	Dry	1	3	3
2024-07-14	2.057874	4.857087	5.791339	Wet	3	2	6
2024-06-14	3.22441	5.819685	7.102362	Wet	3	1	3
Result							Normal Conditions - 12

US Army Corps of Engineers

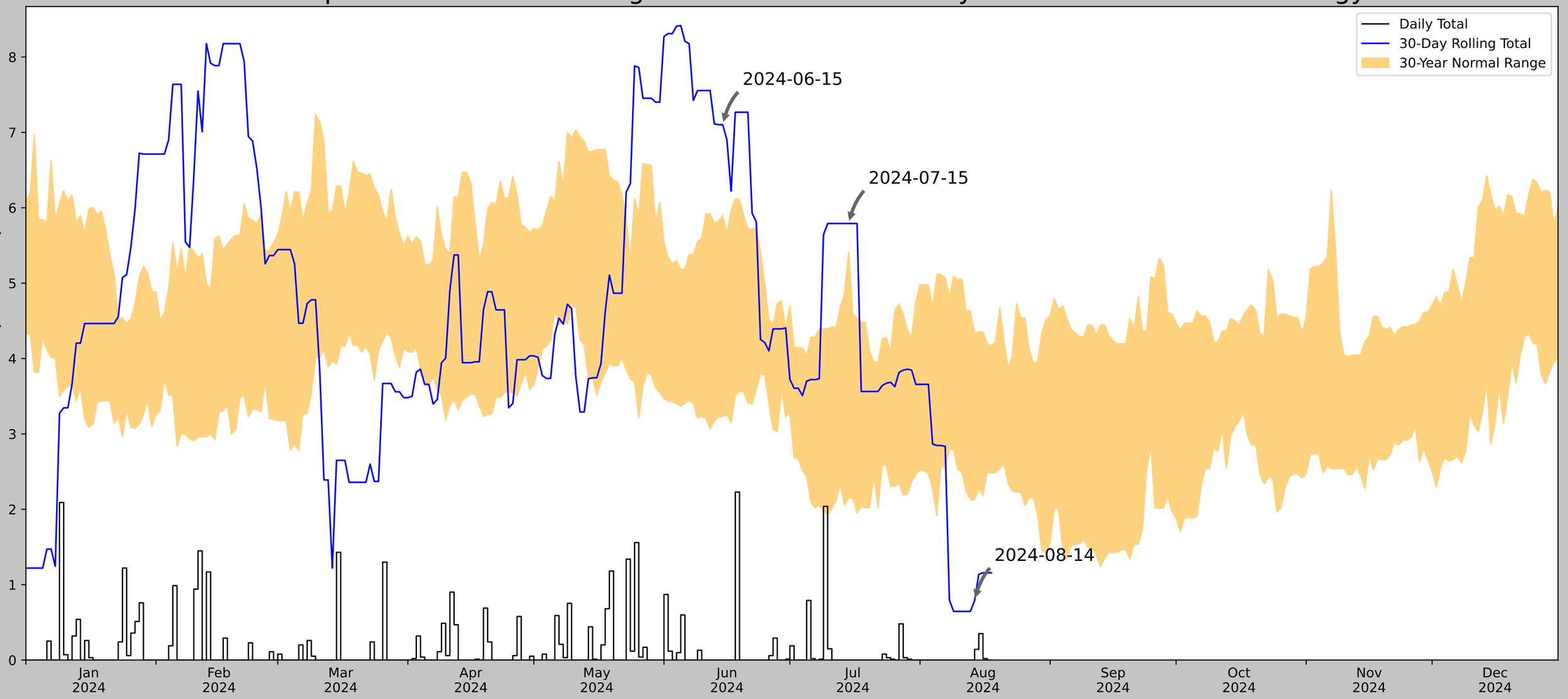
ERDC

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
BROWNSVILLE 1.0 SE	35.5841, -89.2423	348.097	12.045	7.486	5.51	5741	90
BROWNSVILLE	35.5908, -89.2597	374.016	1.082	25.919	0.515	5451	0
ALAMO 1 N	35.7978, -89.1175	348.097	16.342	0.0	7.354	95	0
SOMERVILLE 10N	35.365, -89.3475	342.848	16.255	5.249	7.4	23	0
RIPLEY	35.7178, -89.4986	399.934	17.1	51.837	8.581	41	0
JACKSON MCKELLAR- SIPES AP	35.5933, -88.9169	423.885	18.295	75.788	9.619	1	0

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



Coordinates	35.695414, -89.407375
Observation Date	2024-08-14
Elevation (ft)	355.583
Drought Index (PDSI)	Incipient drought (2024-07)
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2024-08-14	2.125984	4.340551	0.787402	Dry	1	3	3
2024-07-15	2.15	5.411417	5.791339	Wet	3	2	6
2024-06-15	3.235039	5.899606	7.102362	Wet	3	1	3
Result							Normal Conditions - 12

US Army Corps of Engineers

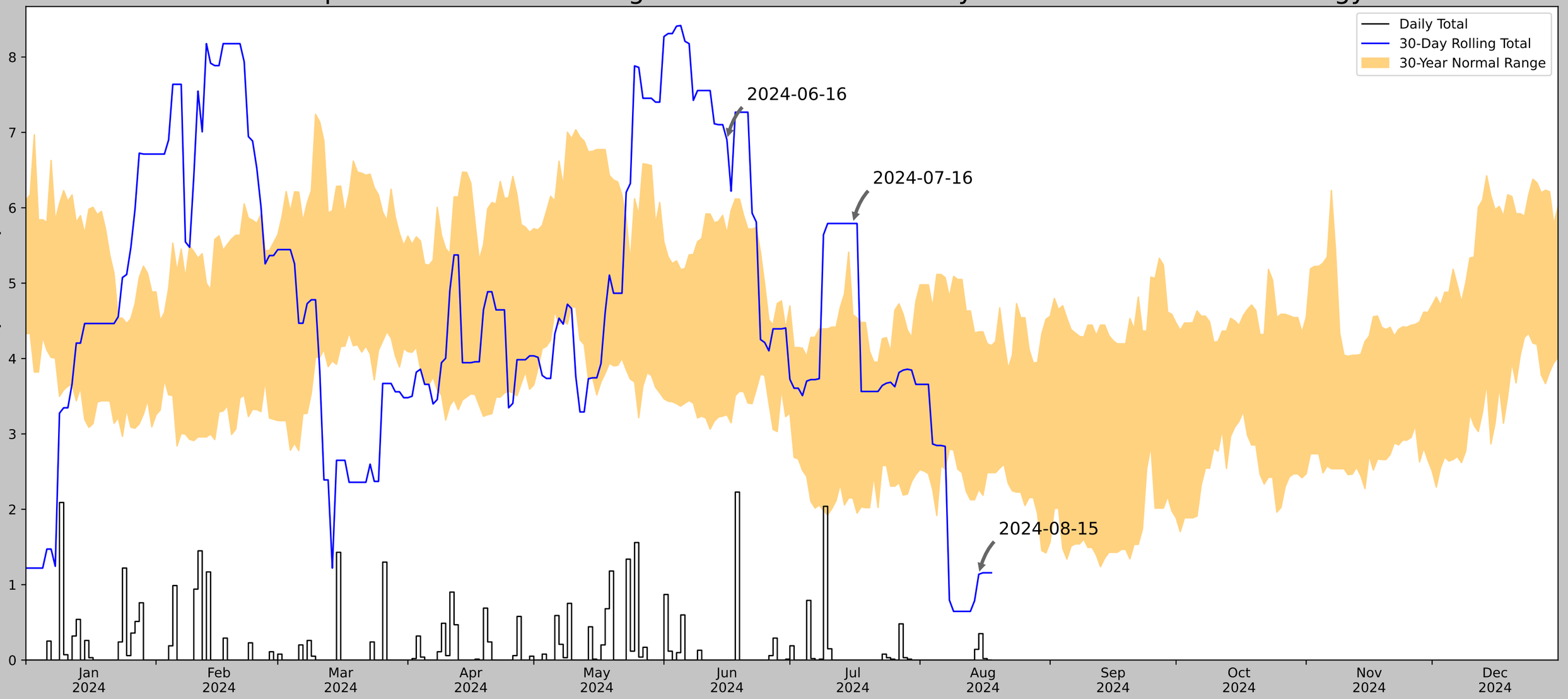
ERDC

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
BROWNSVILLE 1.0 SE	35.5841, -89.2423	348.097	12.045	7.486	5.51	5741	90
BROWNSVILLE	35.5908, -89.2597	374.016	1.082	25.919	0.515	5451	0
ALAMO 1 N	35.7978, -89.1175	348.097	16.342	0.0	7.354	95	0
SOMERVILLE 10N	35.365, -89.3475	342.848	16.255	5.249	7.4	23	0
RIPLEY	35.7178, -89.4986	399.934	17.1	51.837	8.581	41	0
JACKSON MCKELLAR- SIPES AP	35.5933, -88.9169	423.885	18.295	75.788	9.619	1	0

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



Coordinates	35.695414, -89.407375
Observation Date	2024-08-15
Elevation (ft)	355.583
Drought Index (PDSI)	Incipient drought (2024-07)
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2024-08-15	2.264567	4.354331	1.137795	Dry	1	3	3
2024-07-16	2.15	4.581103	5.791339	Wet	3	2	6
2024-06-16	3.255118	5.661418	6.901575	Wet	3	1	3
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
BROWNSVILLE 1.0 SE	35.5841, -89.2423	348.097	12.045	7.486	5.51	5741	90
BROWNSVILLE	35.5908, -89.2597	374.016	1.082	25.919	0.515	5451	0
ALAMO 1 N	35.7978, -89.1175	348.097	16.342	0.0	7.354	95	0
SOMERVILLE 10N	35.365, -89.3475	342.848	16.255	5.249	7.4	23	0
RIPLEY	35.7178, -89.4986	399.934	17.1	51.837	8.581	41	0
JACKSON MCKELLAR- SIPES AP	35.5933, -88.9169	423.885	18.295	75.788	9.619	1	0

Ecology Field Data Sheet: **Water Resources**

Project: Lauderdale County, SR-19, 102251.01					
Biologist:	RB & BC	**Affiliation:**	JMT	**Date:**	08-15-24

1-Station: from plans	East of Eastland Ave. on SR-19								
2-Map label and name	PND-1								
3-Latitude/Longitude	35.723820, -89.511091								
4-Feature description:									
-channel identification	perennial stream		intermittent stream		ephemeral stream		wwc		
-HD score (if applicable)	N/A - Pond								
-OHWM indicators	bed & banks	✓	deposition		presence of litter debris		scour		veg absent, bent, matted ✓
	change in plant community	✓	destruction of terrestrial veg	✓	multiple observe flow events		sediment sorting		water staining ✓
	change in soil character	✓	leaf litter disturb or absent		natural line impressed on bank		shelving		wracking
-channel bottom width	N/A		-top of bank width		N/A				
-width and max depth at ordinary high water mark	width 110', max depth undetermined								
-width at bankfull	N/A								
-bank height	LDB - N/A				RDB - N/A				
-riffle/pool complex or other specialized habitat present?	No								
-dominant riparian species: ----------(LDB /RDB)----------	LDB: goldenrod, giant hogweed, green ash								
	RDB: goldenrod, giant hogweed, green ash								
-particle size distribution %	Silt/Sand: 100		Gravel:		Cobble:		Boulder:		Bedrock:
5-photo numbers	01								
6-HUC -8 Code & Name	08010208 - Lower Hatchie								
7-Assessed	yes		no	✓					
8-ETW	yes		no	✓					
9-303 (d) List	yes		siltation		habitat:		other:		
	no	✓							
10-Notes	Pond extends beyond the project boundary so its connection to downstream waters could not be assessed.								

Ecology Field Data Sheet: **Water Resources**

Project: Lauderdale County, SR-19, 102251.01					
Biologist:	RB & BC	**Affiliation:**	JMT	**Date:**	08-15-24

1-Station: from plans	East of Willie Parris Rd. on the North side SR-19									
2-Map label and name	PND-2									
3-Latitude/Longitude	35.721975, -89.506893									
4-Feature description:										
-channel identification	perennial stream		intermittent stream		ephemeral stream		wwc			
-HD score (if applicable)	N/A - Pond									
-OHWM indicators	bed & banks	✓	deposition		presence of litter debris		scour		veg absent, bent, matted	✓
	change in plant community	✓	destruction of terrestrial veg	✓	multiple observe flow events		sediment sorting		water staining	✓
	change in soil character	✓	leaf litter disturb or absent		natural line impressed on bank		shelving		wracking	
-channel bottom width	N/A		-top of bank width		N/A					
-width and max depth at ordinary high water mark	width 50', max depth undetermined									
-width at bankfull	N/A									
-bank height	LDB - N/A				RDB - N/A					
-riffle/pool complex or other specialized habitat present?	No									
-dominant riparian species: ----------(LDB /RDB)----------	LDB: sweetgum, slippery elm, green ash									
	RDB: sweetgum, slippery elm, green ash									
-particle size distribution %	Silt/Sand:	100	Gravel:		Cobble:		Boulder:		Bedrock:	
5-photo numbers	02									
6-HUC -8 Code & Name	08010208 - Lower Hatchie									
7-Assessed	yes		no	✓						
8-ETW	yes		no	✓						
9-303 (d) List	yes		siltation		habitat:		other:			
	no	✓								
10-Notes	Pond overflows into WWC-2/EPH-2 and WTL-1.									

Ecology Field Data Sheet: **Water Resources**

Project: Lauderdale County, SR-19, 102251.01					
Biologist:	RF & MM	**Affiliation:**	JMT	**Date:**	08-15-24

1-Station: from plans	~0.02 miles East of Willie Paris Rd on SR-19										
2-Map label and name	WWC-1/EPH-1										
3-Latitude/Longitude	35.721747, -89.507468										
4-Feature description:											
-channel identification	perennial stream		intermittent stream		ephemeral stream		wwc	✓			
-HD score (if applicable)	15										
-OHWM indicators	bed & banks	✓	deposition		presence of litter debris	✓	scour		veg absent, bent, matted		
	change in plant community		destruction of terrestrial veg		multiple observe flow events		sediment sorting		water staining		
	change in soil character		leaf litter disturb or absent		natural line impressed on bank		shelving		wracking		
-channel bottom width	1'			-top of bank width		10'					
-width and max depth at ordinary high water mark	4' width, 3" depth										
-width at bankfull	4'										
-bank height	LDB - 4'			RDB - 7'							
-riffle/pool complex or other specialized habitat present?	No										
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Wooded										
	RDB: Roadside										
-particle size distribution %	Silt/Sand:	80	Gravel:	20	Cobble:		Boulder:		Bedrock:		
5-photo numbers	3										
6-HUC -8 Code & Name	08010208 - Lower Hatchie										
7-Assessed	yes			no	✓						
8-ETW	yes			no	✓						
9-303 (d) List	yes		siltation		habitat:		other:				
	no	✓									
10-Notes	Feeds into 1-WTL-G.										

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Cane Creek		Date/Time: 8/15/24
Assessors/Affiliation: RF, MM; JMT		Project ID : 102251.01
Site Name/Description: WWC-1/EPH-1		
Site Location: ~0.02 miles East of Willie Paris Rd on SR-19		
HUC (12 digit): 080102080701	Latitude: 35.721747	
Previous Rainfall (7-days) : < 0.5 inches	Longitude: -89.507468	
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0		
Watershed Size : < 0.01 sq. miles	County: Lauderdale	
Soil Type(s) / Geology : Adler Silt Loam	Source: NRCS Web Soil Survey	
Surrounding Land Use : Agriculture		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 15

Justification / Notes :

Incipient drought (based on APT).

Slightly altered around agricultural field.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 9)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 2)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 4)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 15

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: TN SR-19 City/County: Lauderdale County Sampling Date: 2024-09-16

Applicant/Owner: TDOT State: Tennessee Sampling Point: 1-DPW-3

Investigator(s): Rhiannon Flickinger and Miranda McKiernan Section, Township, Range:

Landform (hillslope, terrace, etc.): Slope Local relief (concave, convex, none): Concave Slope (%): 3

Subregion (LRR or MLRA): P 134 Lat: 35.71426433 Long: -89.46201273 Datum: NAD83_2011

Soil Map Unit Name: Ad - Adler silt loam, 0 to 2 percent slopes, occasionally flooded NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓	No _____	
Wetland Hydrology Present?	Yes ✓	No _____	

Remarks:

WTL-5

Form also represents WTL-4 and WTL-1

Large, slope wetland located at the roadside toe-of-slope, connected to a stream. Receives hydrology from upland/roadside runoff and feeds into the stream.

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)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along 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)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes _____	No ✓	Depth (inches): _____
Water Table Present?	Yes _____	No ✓	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No ✓	Depth (inches): _____

Wetland Hydrology Present? Yes ✓ No _____

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

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: 1-DPW-3

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix nigra	15	✓	OBL
2. Liquidambar styraciflua	5	✓	FAC
3.			
4.			
5.			
6.			
7.			
8.			
	20 = Total Cover		
50% of total cover: 10.00	20% of total cover: 4.00		

Sapling/Shrub Stratum (Plot size: 30 ft r)			
1. Platanus occidentalis	5	✓	FACW
2. Salix nigra	5	✓	OBL
3.			
4.			
5.			
6.			
7.			
8.			
	10 = Total Cover		
50% of total cover: 5.00	20% of total cover: 2.00		

Herb Stratum (Plot size: 30 ft r)			
1. Dichanthelium clandestinum	40	✓	FACW
2. Microstegium vimineum	35	✓	FAC
3. Andropogon gerardii	20	✓	FAC
4. Solidago altissima	20	✓	FACU
5. Ambrosia artemisiifolia	15		FACU
6. Scirpus atrovirens	15		OBL
7. Carex frankii	10		OBL
8. Cyperus strigosus	10		FACW
9. Salix nigra	5		OBL
10. Melothria pendula	3		FAC
11. Verbena urticifolia	3		FAC
12.			
	176 = Total Cover		
50% of total cover: 88.00	20% of total cover: 35.20		

Woody Vine Stratum (Plot size: 30 ft r)			
1. Lonicera japonica	10	✓	FACU
2.			
3.			
4.			
5.			
	10 = Total Cover		
50% of total cover: 5.00	20% of total cover: 2.00		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 7 (A)

Total Number of Dominant Species Across All Strata: 9 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 77.77 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	50	x 1 =	50
FACW species	55	x 2 =	110
FAC species	66	x 3 =	198
FACU species	45	x 4 =	180
UPL species	0	x 5 =	0
Column Totals:	216 (A)		538 (B)

Prevalence Index = B/A = 2.49

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☑ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four 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 vines, less than 3 in. DBH and greater than 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 ____

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: 1-DPW-3

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 - 5.5	2.5YR 4/2	98	10YR 5/8	2	C	M	Silty Clay Loam	
5.5 - 12	10YR 5/2	93	10YR 5/8	7	C		Silty Clay Loam	
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✓ **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: TN SR-19 City/County: Lauderdale County Sampling Date: 2024-08-14

Applicant/Owner: TDOT State: Tennessee Sampling Point: 1-DPU-2

Investigator(s): Rhiannon Flickinger and Miranda McKiernan Section, Township, Range:

Landform (hillslope, terrace, etc.): Upland Local relief (concave, convex, none): Linear Slope (%): 2

Subregion (LRR or MLRA): P 134 Lat: 35.7142951 Long: -89.4620578 Datum: NAD83_2011

Soil Map Unit Name: Ad - Adler silt loam, 0 to 2 percent slopes, occasionally flooded NWI classification: UPL

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

WTL-5 upland form
Form also represents uplands adjacent to wetland WTL-4, WTL-1

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)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along 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)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes _____	No ✓	Depth (inches): _____
Water Table Present?	Yes _____	No ✓	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No ✓	Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

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

Remarks:

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

Sampling Point: 1-DPU-2

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size: 30 ft r)			
1. Rubus argutus	30	✓	FAC
2. Diospyros virginiana	5		FAC
3.			
4.			
5.			
6.			
7.			
8.			
	35 = Total Cover		
50% of total cover: 17.50	20% of total cover: 7.00		
Herb Stratum (Plot size: 30 ft r)			
1. Solidago altissima	50	✓	FACU
2. Ambrosia artemisiifolia	25	✓	FACU
3. Andropogon gerardii	25	✓	FAC
4. Rubus allegheniensis	5		UPL
5. Rubus argutus	5		FAC
6. Toxicodendron radicans	5		FAC
7. Ulmus americana	3		FAC
8.			
9.			
10.			
11.			
12.			
	118 = Total Cover		
50% of total cover: 59.00	20% of total cover: 23.60		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of 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: 50.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	73	x 3 =	219
FACU species	75	x 4 =	300
UPL species	5	x 5 =	25
Column Totals:	153 (A)		544 (B)

Prevalence Index = B/A = 3.55

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four 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 vines, less than 3 in. DBH and greater than 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 ✓

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: 1-DPU-2

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 - 12	10YR 5/4	98	10YR 5/8	2	C	M	Clay Loam	
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** ✓

Remarks:

An affirmative response to 1-6 of the Decision Table identifies the wetland per rule as an Outstanding Natural Resource Water (ONRW) or Exceptional Tennessee Waters (ETW). A positive response to 7-13 requires a final determination by the Department.

#	**Wetland Feature Decision Table** PIN 102251.01; WTL-1	**Yes/No**	**Affirmative Result**
1	The wetland has been designated as an **Outstanding Natural Resource Water (ONRW)** by the Department under 0400-40-03-.06(5)(a)**.**	No	**ORNW**
2	The wetland has previously been designated and documented as an Exceptional Tennessee Water (ETW) by the Department under 0400-40-03-.06(4)(a)(7)	No	**ETW**
3	The wetland is within state or national parks, wildlife refuges, forests, wilderness areas, natural areas, or is a designated State Scenic Rivers or Federal Wild and Scenic Rivers.	No	**ETW**
4	The wetland is known to contain a documented non-experimental population of state or federally listed threatened or endangered aquatic or semi-aquatic plants, or aquatic animals.	No	**ETW**
5	The wetland or the area it is in has been designated by the U.S. Fish and Wildlife Service as "**Critical Habitat**" for any threatened or endangered aquatic or semi-aquatic plant or aquatic animal species.	No	**ETW**
6	The wetland falls within an area designated as Lands Unsuitable for Mining pursuant to the federal Surface Mining Control and Reclamation Act where such designation is based in whole or in part on impacts to water resource values	No	**ETW**
7	**The wetland exhibits outstanding ecological or recreational values such as, but not limited to, those as outlined in 8-12**	No	Determination Required by TDEC
8	The wetland fits within the species composition concept for any plant community found in the state of Tennessee **ranked G2, G1, or more imperiled** at the "Association" classification level according to the NatureServe and Natural Heritage Ranking system (e.g. "bog", "fen", and "wet prairie/barren" communities).	No	Determination Required by TDEC
9	The wetland is **an uncommon resource** (e.g. vernal pools, headwater wetlands, sinks, spring/seeps, glades, newly described communities, high recreational or socioeconomic value) in the region and/or is deemed such by concurrence of qualified scientists.	No	Determination Required by TDEC
10	The wetland is an **older aged forested wetland** comprised of overstory trees with an average diameter at breast height (dbh) being **greater than or equal to 30 in** within the WAA.	No	Determination Required by TDEC
11	The wetland is observed and documented to be a **significant waterfowl, songbird, shorebird, amphibian, bat, fish habitat area**. These may include rookeries, migratory congregations, nesting sites, breeding areas, etc.	No	Determination Required by TDEC
12	The wetland is **hydrologically connected** to and/or has significant ecological contribution to an **ETW**	No	Determination Required by TDEC
13	The wetland has High Resource Value as determined by a **score of 75 and above** using the TRAM or non-HGM TRAM (to be determined after completing the quantitative portion of this manual)	No	Determination Required by TDEC

End of Narrative Rating. Begin Quantitative Rating on Next Page.

HGM FUNCTIONAL ASSESSMENT
SLOPE WETLANDS

Date: 08/15/2024 Project Name SR-19, 102251.01

Field Personnel RB, BC Wetland Name/Location WTL-1

Read instructions prior to conducting assessments. If project area is large or highly heterogeneous requiring the designation of several WAAs, a separate assessment should be performed for each WAA. CHECK THE APPROPRIATE BLANK(S) BELOW.

V1: Hydroperiod (HYDRO)

☐ 1. Hydrology not altered (SI = 1.0)
- no fill material or excessive sediment
- no ditches/drainage tiles
- no alteration to overland runoff, groundwater discharge/recharge
- no roads or other impediments to surface or groundwater
- no excavation

☑ 2. Hydrology slightly altered (SI = 0.75)
- portion of site with minimal fill or sediment
- portion of site with drainage ditches/tiles
- some alteration to overland runoff, groundwater discharge/recharge
- roads or other impediments, water flow slightly altered
- minor portion of site excavated

☐ 3. Hydrology moderately altered (SI = 0.5)
- portion of site with moderate fill or sediment
- portion of site with drainage ditches/tiles
- some alteration to overland runoff, groundwater discharge/recharge
- roads or other impediments, water flow moderately altered
- moderate portion of site excavated

☐ 4. Hydrology significantly altered (SI = 0.25)
- portion of site with significant fill or sediment
- portion of site with drainage ditches/tiles
- significant alteration to overland runoff, groundwater discharge/recharge
- roads or other impediments, water flow significantly altered
- significant portion of site excavated

☐ 5. Hydrology severely altered (SI = 0.1)
- entire site impacted by fill or excessive sediment
- entire site with numerous drainage ditches/tiles
- no contributions to or from overland runoff, groundwater discharge/recharge
- roads or other impediments, water flow completely blocked
- entire wetland affected

V2: Wetland Watershed Integrity (WSHEDINT)

Use weighted average as discussed on page 10. Examples of land uses and multipliers listed below

A = Percentage forested with no impervious surfaces _____
B = Percentage permeable land, (e.g., park, golf course, pasture, hay, orchard, tree farm, or similar) 100
C = Percentage low density residential, construction, or similar _____
D = Percentage high density residential, or similar _____
E = Percentage urban, commercial, industrial, or similar _____

V2 = (A x 1.0) + (B x 0.75) + (C x 0.5) + (D x 0.25) + (E x 0.01)/(100) = 0.75

V3: Canopy Tree Size Class (TSIZE)

1. Average size of canopy trees > 3 in. DBH

☐ ≥ 15 in. (SI = 1.0) ☐ 10 – 14 in. (SI = 0.75) ☐ 6 – 9 in. (SI = 0.5) ☐ 3 – 5 in. (SI = 0.25)
☑ < 3 in. or no trees present, go to V5

V4: Canopy Tree Density (TDEN)

1. Average number of canopy trees (> 3 in. DBH) per 30-ft. radius plot

☐ 5 – 10 (SI = 1.0) ☐ 11 – 15 (SI = 0.75) ☐ > 15 (SI = 0.5) ☐ 1 – 4 (SI = 0.5)

V5: Shrub Cover (SCOV)

1. Average percent cover of shrubs (woody stems < 3 in. DBH and taller than 3 ft.) per 30-ft. radius plot

☐ > 20 (SI = 1.0) ☑ < 20, go to V6

V6: Ground Vegetation Cover (GVC)

1. Average percent cover of ground vegetation per 30-ft. radius plot

☑ ≥ 70 (SI = 1.0) ☐ 55 – 69 (SI = 0.75) ☐ 45 – 54 (SI = 0.5) ☐ 30 – 44 (SI = 0.25) ☐ 20 – 29 (SI = 0.1)
☐ < 20 (SI=0.0)

V7: Vegetation Composition and Diversity (COMP)

1. Check the dominant species from Groups 1, 2, and 3 below using the 50/20 rule. If tree cover is < 20%, check the dominants in the next tallest stratum. If a dominant does not appear in lists below, but is a native species, it can be added to Group 1 or 2 species based on the scientific literature or professional judgement. Native shrub and herbaceous species are assigned to Group 2. When using shrub or herbaceous write in the number of dominant species. Dominant invasive species are checked regardless of stratum. *

GROUP 1 (Reference Standard)		GROUP 2 (Native Ubiquitous)		GROUP 3 (Invasive)
☐ Water oak	☐ Pin oak	☐ American elm	☐ Green ash	☐ European/Chinese privet
☐ Bur oak	☐ Shumard oak	☐ Slippery elm	☐ Red maple	☐ Japanese honeysuckle
☐ Willow oak	☐ Bald cypress	☐ Sweetgum	☐ Silver maple	☐ Japanese stiltgrass
☐ Swamp chestnut oak	☐ Water tupelo	☐ Blackgum	☐ Black willow	☐ Purple loosestrife
☐ Cherrybark oak	☐ S. black gum	☐ Silky dogwood	☐ Sycamore	☐ Giant reed
☐ Swamp white oak	☐ Persimmon	☐ Boxelder	☐ _____	☐ Tall fescue
☐ Nuttall oak	☐ Am. hornbeam	☐ Tulip poplar	☐ _____	☐ Phragmites
☐ Overcup oak	☐ _____	____ Number native shrub spp.		☐ _____
☐ _____	☐ _____	3 Number native herbaceous spp.		☐ _____

2. Using the number of dominants in Groups 1, 2, and 3 above, calculate a quality index (Q) using the following formula: [(1.0 x # of checked dominants in Group 1) + (0.66 x # of checked dominants in Group 2) + (0.0 x # of checked dominants in Group 3)]/ total # of checked dominants in all groups = 0.66

3. Multiply Q above by one of the following constants that reflects species richness:[1]

- ○ a) if ≥ 4 species from Groups 1 and/or 2 occur as dominants, multiply Q by 1.0 _____
- ◉ b) if 3 species from Groups 1 and/or 2 occur as dominant, multiply Q by 0.75 0.495
- ○ c) if 2 species from Groups 1 and/or 2 occur as dominants, multiply Q by 0.50 _____
- ○ d) if 1 species from Groups 1 and/or 2 occurs as dominant, multiply Q by 0.25 _____
- ○ e) if no species from Groups 1 and/or 2 occurs as dominant, multiply Q by 0.0 _____

4. Calculate the square root of the value from Step 3 above. This value is the SI for **V7**= 0.70

*In some Depression wetlands and in some small WAAs (e.g., <0.5 acres), relatively few species (e.g., overcup oak) may be present. In cases in which this is the normal condition, Q can be multiplied by 1.0 if only 1 or 2 species are dominant.

V8: Soil Organic Matter (ORGANIC)

1. Surface horizons unaltered

☐ 100 percent cover of O and/or A horizon present (SI = 1.0)

2. Surface horizons altered. Estimate the percent of the WAA in which neither an O or A horizon is present. 45

3. Subtract the sum of the values from Step 2 from 100. Convert this value to a decimal. This value is the SI for V8 (e.g., if 75 % of the WAA does not have an O or A horizon due to a significant disturbance, it will have an SI of 0.25).

V9: Buffer (BUFFER)

1. Determine the Connection Index (CI) by estimating the percent of the wetland surrounded by suitable buffer habitat.

☐ 90% – 100% (CI = 1.0) ☐ 75% – 89% (CI = 0.75) ☐ 40% – 74% (CI = 0.5) ☐ 10% – 39% (CI = 0.25)
☑ < 10% (CI = 0.1)

2. Multiply the CI by one if the following values:

- ○ a) if average buffer width is ≥ 492 ft., multiply by 1.0
- ○ b) if average buffer is 98 ft to 491 ft., multiply by 0.66
- ○ c) if average buffer width is 33 ft to 97 ft., multiply by 0.33
- ◉ d) if average buffer width is < 33 ft., multiply by 0.1

3. This value is the SI for **V9 =** 0.01 **.**

VALUES USED TO CALCULATE FUNCTIONAL CAPACITY INDICES (FCIs)

SUBINDEX VALUES:

V1 0.75 (HYDRO) V3 _____ (TSIZE) V5 _____ (SCOV) V7 0.70 (COMP) V9 0.01 (BUFFER)

V2 0.75 (WSHEDINT) V4 _____ (TDEN) V6 1.00 (GVC) V8 0.55 (ORGANIC)

Slope Wetland

WTL-1

V1: HYDROPERIOD	**0.75**	**Function 1: Maintain Hydrologic Regime**
V2: WETLAND WATERSHED INTEGRITY	**0.75**	(V1 x V2)^(1/2)
V3: CANOPY TREE CLASS	**GOTOV5**	
V4: CANOPY TREE DENSITY	**N/A**	**Function 2: Maintain Biogeochemical Processes**
V5: SHRUB COVER	**GOTOV6**	
V6: GROUND VEGETATION COVER	**1**	
V7: VEGETATION COMPOSITION AND DIVERSITY	**0.70**	
2. Q =	**0.66**	
# of Group 1 Dominants	0	
# of Group 2 Dominants	3	
# of Group 3 Dominants	0	
SPECIES RICHNESS CONSTANT	0.75	
V8: SOIL ORGANIC MATTER	**0.55**	
V9:BUFFER	**0.01**	
1. Connection Index	0.1	
2. Buffer width value (0-1)	0.1	

$$\text{FCI (trees present)} = \left((V1 \times V2)^{1/2} \times \left(\frac{\frac{V3+V4}{2} + V8}{2} \right) \right)^{1/2}$$

$$\text{FCI (shrubs present)} = \left((V1 \times V2)^{1/2} \times \left(\frac{V5+V8}{3} \right) \right)^{1/2}$$

$$\text{FCI (ground cover)} = \left((V1 \times V2)^{1/2} \times \left(\frac{V6+V8}{5} \right) \right)^{1/2}$$

Function 3: Maintain Characteristic Plant Community

$$\text{FCI (trees present)} = \frac{(V1 \times V2)^{1/2} + 2\left(\frac{V3+V4+V7}{3}\right)}{3}$$

$$\text{FCI (shrubs present)} = \frac{(V1 \times V2)^{1/2} + 2\left(\frac{V5+V7}{2}\right)}{6}$$

$$\text{FCI (groundcover)} = \frac{(V1 \times V2)^{1/2} + 2\left(\frac{V6+V7}{2}\right)}{9}$$

Function 4: Maintain Characteristic Wildlife Community:

$$\text{FCI (trees)} = \frac{(V1 \times V2)^{1/2} + 2\left(\frac{V3+V4+V7}{3}\right) + V9}{4}$$

$$\text{FCI (shrubs present)} = \frac{(V1 \times V2)^{1/2} + 2\left(\frac{V5+V7}{2}\right) + V9}{6}$$

$$\text{FCI (groundcover)} = \frac{(V1 \times V2)^{1/2} + 2\left(\frac{V6+V7}{2}\right) + V9}{9}$$

FCI 1 =	**0.75**	**Final Tree =**	**#VALUE!**
FCI 2 trees=	**#VALUE!**	**Final Shrubs=**	**#VALUE!**
		Final Herbaceous =	**0.44**
FCI 2 shrubs=	**#VALUE!**		
FCI 2 ground =	**0.48**		
FCI 3 trees=	**#VALUE!**		
FCI 3 shrubs=	**#VALUE!**		
FCI 3 ground =	**0.27**		
FCI 4 trees=	**#VALUE!**		
FCI 4 shrubs=	**#VALUE!**		
FCI 4 ground =	**0.27**		

TRAM Summary Worksheet

Project: SR-19, PIN 102251.01, WTL-1

Exceptional Status Wetlands		**Check if applicable**
	1. **ONRW**	☐
	2. **ETW**	☐
	3. **Further Review Requested:** Attach Wetland Background and Exceptional Status Wetlands Worksheet	☐
	COMMENTS/NOTES:	
Quantitative Rating scores	Function: Hydrologic Regime	0.75
	Function: Biogeochemical Processes	0.48
	Function: Retain Particulates	n/a
	Function: Plant Community	0.27
	Function: Wildlife Community	0.27
	Quantitative Score (Average of FCIs x 100)	44.25
	Value Added (Significant Size) Total	0
Total of Quantitative and Value Added Scores	**TOTAL SCORE**	44.25

Ecology Field Data Sheet: **Water Resources**

Project: Lauderdale County, SR-19, 102251.01					
Biologist:	RF & RB	**Affiliation:**	JMT	**Date:**	08-15-24

1-Station: from plans	~0.02 miles East of Willie Paris Rd on SR-19									
2-Map label and name	WWC-2/EPH-2									
3-Latitude/Longitude	35.721541, -89.505569									
4-Feature description:										
-channel identification	perennial stream		intermittent stream		ephemeral stream		wwc	✓		
-HD score (if applicable)	9									
-OHWM indicators	bed & banks	✓	deposition		presence of litter debris		scour		veg absent, bent, matted	
	change in plant community		destruction of terrestrial veg		multiple observe flow events		sediment sorting		water staining	
	change in soil character		leaf litter disturb or absent		natural line impressed on bank		shelving		wracking	
-channel bottom width	1'			-top of bank width		2'				
-width and max depth at ordinary high water mark	6" width, 6" depth									
-width at bankfull	2'									
-bank height	LDB - 1.5'			RDB - 1.5'						
-riffle/pool complex or other specialized habitat present?	No									
-dominant riparian species: ----------(LDB /RDB)----------	LDB: soybeans									
	RDB: soybeans									
-particle size distribution %	Silt/Sand:	90	Gravel:	10	Cobble:		Boulder:		Bedrock:	
5-photo numbers	5									
6-HUC -8 Code & Name	08010208 - Lower Hatchie									
7-Assessed	yes		no	✓						
8-ETW	yes		no	✓						
9-303 (d) List	yes		siltation		habitat:		other:			
	no	✓								
10-Notes	channel is ditched through ag field planted with soybeans at time of evaluation									

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Cane Creek		Date/Time: 8/15/24
Assessors/Affiliation: RF, RB; JMT		Project ID : 102251.01
Site Name/Description: WWC-2/EPH-2		
Site Location: ~0.02 miles East of Willie Paris Rd on SR-19		
HUC (12 digit): 080102080701	Latitude: 35.721541	
Previous Rainfall (7-days) : < 0.5 inches	Longitude: -89.505569	
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0		
Watershed Size : 0.04 sq. miles	County: Lauderdale	
Soil Type(s) / Geology : Adler and Loring Silt Loam	Source: NRCS Web Soil Survey	
Surrounding Land Use : Agricultural		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 9

Justification / Notes :

Incipient drought (based on APT).

Severely altered around agricultural fields.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 4)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 1)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 4)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 9

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : channel is ditched through ag field planted with soybeans at time of evaluation

Ecology Field Data Sheet: **Water Resources**

Project: Lauderdale County, SR-19, 102251.01					
Biologist:	RB & BC	**Affiliation:**	JMT	**Date:**	08-14-24

1-Station: from plans	North side of SR-19 south ~0.13 miles of Willie Paris Road								
2-Map label and name	WWC-3/EPH-3								
3-Latitude/Longitude	35.721178, -89.506259								
4-Feature description:									
-channel identification	perennial stream		intermittent stream		ephemeral stream		wwc	✓	
-HD score (if applicable)	8								
-OHWM indicators	bed & banks	✓	deposition		presence of litter debris	✓	scour		veg absent, bent, matted
	change in plant community		destruction of terrestrial veg	✓	multiple observe flow events		sediment sorting		water staining
	change in soil character		leaf litter disturb or absent		natural line impressed on bank		shelving		wracking ✓
-channel bottom width	4'		-top of bank width		8'				
-width and max depth at ordinary high water mark	3' width, 1' max depth								
-width at bankfull	5'								
-bank height	LDB - 6'		RDB - 6'						
-riffle/pool complex or other specialized habitat present?	No								
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Agriculture field								
	RDB: sweet-gum, virginia creeper, muscadine								
-particle size distribution %	Silt/Sand: 100		Gravel:		Cobble:		Boulder:		Bedrock:
5-photo numbers	6-8								
6-HUC -8 Code & Name	08010208 - Lower Hatchie								
7-Assessed	yes		no	✓					
8-ETW	yes		no	✓					
9-303 (d) List	yes		siltation		habitat:		other:		
	no	✓							
10-Notes									

Revised July 2022

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Cane Creek		Date/Time: 08/14/24
Assessors/Affiliation: RB, BC; JMT		Project ID : 102251.01
Site Name/Description: WWC-3/EPH-3		
Site Location: North side of SR-19 south ~0.13 miles of Willie Paris Rd		
HUC (12 digit): 080102080701	Latitude: 35.721178	
Previous Rainfall (7-days) : < 0.5 inches	Longitude: -89.506259	
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0		
Watershed Size : < 0.01 sq. miles	County: Lauderdale	
Soil Type(s) / Geology : Loring Silt Loam	Source: NRCS Web Soil Survey	
Surrounding Land Use : Low Density Residential, Agricultural		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 8

Justification / Notes :

Incipient drought (based on APT).

Moderately altered around agricultural fields.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 2.5)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 1.5)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 4)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants.

[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 8

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: TN SR-19 City/County: Lauderdale County Sampling Date: 2024-08-15

Applicant/Owner: TDOT State: Tennessee Sampling Point: 2-DPW-5

Investigator(s): Preston Butler and Britt Fleming Section, Township, Range:

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 1

Subregion (LRR or MLRA): P 134 Lat: 35.720002 Long: -89.504934 Datum: NAD83_2011

Soil Map Unit Name: MeE3 - Memphis silt loam, 12 to 20 percent slopes, severely eroded, northern phase NWI classification: PFO

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓	No _____	
Wetland Hydrology Present?	Yes ✓	No _____	

Remarks:

WTL-2

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)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☑ Oxidized Rhizospheres along 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)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes _____	No ✓	Depth (inches): _____
Water Table Present?	Yes _____	No ✓	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No ✓	Depth (inches): _____

Wetland Hydrology Present? Yes ✓ No _____

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

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: 2-DPW-5

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1. Liquidambar styraciflua	50	✓	FAC
2. Salix nigra	30	✓	OBL
3.			
4.			
5.			
6.			
7.			
8.			
	80	= Total Cover	
50% of total cover: 40.00	20% of total cover: 16.00		
Sapling/Shrub Stratum (Plot size: 30 ft r)			
1. Prunus serotina	10	✓	FACU
2. Liquidambar styraciflua	10	✓	FAC
3.			
4.			
5.			
6.			
7.			
8.			
	20	= Total Cover	
50% of total cover: 10.00	20% of total cover: 4.00		
Herb Stratum (Plot size: 30 ft r)			
1. Microstegium vimineum	40	✓	FAC
2. Mimulus ringens	10		OBL
3. Scirpus cyperinus	10		OBL
4. Carex triangularis	5		FACW
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	65	= Total Cover	
50% of total cover: 32.50	20% of total cover: 13.00		
Woody Vine Stratum (Plot size: 30 ft r)			
1. Lonicera japonica	20	✓	FACU
2. Toxicodendron radicans	5	✓	FAC
3.			
4.			
5.			
	25	= Total Cover	
50% of total cover: 12.50	20% of total cover: 5.00		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 71.42 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	50	x 1 =	50
FACW species	5	x 2 =	10
FAC species	105	x 3 =	315
FACU species	30	x 4 =	120
UPL species	0	x 5 =	0
Column Totals:	190 (A)		495 (B)

Prevalence Index = B/A = 2.60

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☑ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four 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 vines, less than 3 in. DBH and greater than 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

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: 2-DPW-5

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 - 4	10YR 5/4	40	7.5YR 3/4	10	C	PL	Silt	
0 - 4	10YR 5/2	50	7.5YR 3/4	10	C	PL	Silt	
4 - 12	10YR 5/2	90	7.5YR 3/4	10	C	M	Silt	
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✓ **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: TN SR-19 City/County: Lauderdale County Sampling Date: 2024-08-15

Applicant/Owner: TDOT State: Tennessee Sampling Point: 2-DPU-5

Investigator(s): Preston Butler and Britt Fleming Section, Township, Range:

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 1

Subregion (LRR or MLRA): P 134 Lat: 35.720031 Long: -89.50485 Datum: NAD83_2011

Soil Map Unit Name: MeE3 - Memphis silt loam, 12 to 20 percent slopes, severely eroded, northern phase NWI classification: NA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Upland adjacent to WTL-2

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)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along 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)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes _____	No ✓	Depth (inches): _____
Water Table Present?	Yes _____	No ✓	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No ✓	Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

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

Remarks:

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

Sampling Point: 2-DPU-5

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1. Liquidambar styraciflua	40	✓	FAC
2. Populus deltoides	40	✓	FAC
3. Salix nigra	10		OBL
4.			
5.			
6.			
7.			
8.			
	90	= Total Cover	
50% of total cover: 45.00	20% of total cover: 18.00		
Sapling/Shrub Stratum (Plot size: 30 ft r)			
1. Populus deltoides	30	✓	FAC
2. Acer negundo	20	✓	FAC
3.			
4.			
5.			
6.			
7.			
8.			
	50	= Total Cover	
50% of total cover: 25.00	20% of total cover: 10.00		
Herb Stratum (Plot size: 30 ft r)			
1. Microstegium vimineum	2		FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	2	= Total Cover	
50% of total cover: 1.00	20% of total cover: 0.40		
Woody Vine Stratum (Plot size: 30 ft r)			
1. Lonicera japonica	20	✓	FACU
2. Vitis rotundifolia	5	✓	FAC
3.			
4.			
5.			
	25	= Total Cover	
50% of total cover: 12.50	20% of total cover: 5.00		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 83.33 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	10	x 1 =	10
FACW species	0	x 2 =	0
FAC species	137	x 3 =	411
FACU species	20	x 4 =	80
UPL species	0	x 5 =	0
Column Totals:	167 (A)		501 (B)

Prevalence Index = B/A = 3.00

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four 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 vines, less than 3 in. DBH and greater than 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

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: 2-DPU-5

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 - 12	10YR 5/4	100					Silt	
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** ✓

Remarks:

An affirmative response to 1-6 of the Decision Table identifies the wetland per rule as an Outstanding Natural Resource Water (ONRW) or Exceptional Tennessee Waters (ETW). A positive response to 7-13 requires a final determination by the Department.

#	**Wetland Feature Decision Table** PIN 102251.01; WTL-2	**Yes/No**	**Affirmative Result**
1	The wetland has been designated as an **Outstanding Natural Resource Water (ONRW)** by the Department under 0400-40-03-.06(5)(a)**.**	No	**ORNW**
2	The wetland has previously been designated and documented as an Exceptional Tennessee Water (ETW) by the Department under 0400-40-03-.06(4)(a)(7)	No	**ETW**
3	The wetland is within state or national parks, wildlife refuges, forests, wilderness areas, natural areas, or is a designated State Scenic Rivers or Federal Wild and Scenic Rivers.	No	**ETW**
4	The wetland is known to contain a documented non-experimental population of state or federally listed threatened or endangered aquatic or semi-aquatic plants, or aquatic animals.	No	**ETW**
5	The wetland or the area it is in has been designated by the U.S. Fish and Wildlife Service as "**Critical Habitat**" for any threatened or endangered aquatic or semi-aquatic plant or aquatic animal species.	No	**ETW**
6	The wetland falls within an area designated as Lands Unsuitable for Mining pursuant to the federal Surface Mining Control and Reclamation Act where such designation is based in whole or in part on impacts to water resource values	No	**ETW**
7	**The wetland exhibits outstanding ecological or recreational values such as, but not limited to, those as outlined in 8-12**	No	Determination Required by TDEC
8	The wetland fits within the species composition concept for any plant community found in the state of Tennessee **ranked G2, G1, or more imperiled** at the "Association" classification level according to the NatureServe and Natural Heritage Ranking system (e.g. "bog", "fen", and "wet prairie/barren" communities).	No	Determination Required by TDEC
9	The wetland is **an uncommon resource** (e.g. vernal pools, headwater wetlands, sinks, spring/seeps, glades, newly described communities, high recreational or socioeconomic value) in the region and/or is deemed such by concurrence of qualified scientists.	No	Determination Required by TDEC
10	The wetland is an **older aged forested wetland** comprised of overstory trees with an average diameter at breast height (dbh) being **greater than or equal to 30 in** within the WAA.	No	Determination Required by TDEC
11	The wetland is observed and documented to be a **significant waterfowl, songbird, shorebird, amphibian, bat, fish habitat area**. These may include rookeries, migratory congregations, nesting sites, breeding areas, etc.	No	Determination Required by TDEC
12	The wetland is **hydrologically connected** to and/or has significant ecological contribution to an **ETW**	No	Determination Required by TDEC
13	The wetland has High Resource Value as determined by a **score of 75 and above** using the TRAM or non-HGM TRAM (to be determined after completing the quantitative portion of this manual)	No	Determination Required by TDEC

End of Narrative Rating. Begin Quantitative Rating on Next Page.

HGM FUNCTIONAL ASSESSMENT
SLOPE WETLANDS

Date: 08/15/2024 Project Name SR-19, 102251.01

Field Personnel PB, BF Wetland Name/Location WTL-2

Read instructions prior to conducting assessments. If project area is large or highly heterogeneous requiring the designation of several WAAs, a separate assessment should be performed for each WAA. CHECK THE APPROPRIATE BLANK(S) BELOW.

V1: Hydroperiod (HYDRO)

☐ 1. Hydrology not altered (SI = 1.0)
- no fill material or excessive sediment
- no ditches/drainage tiles
- no roads or other impediments to surface or groundwater
- no excavation
- no alteration to overland runoff, groundwater discharge/recharge

☐ 2. Hydrology slightly altered (SI = 0.75)
- portion of site with minimal fill or sediment
- portion of site with drainage ditches/tiles
- roads or other impediments, water flow slightly altered
- minor portion of site excavated
- some alteration to overland runoff, groundwater discharge/recharge

☑ 3. Hydrology moderately altered (SI = 0.5)
- portion of site with moderate fill or sediment
- portion of site with drainage ditches/tiles
- some alteration to overland runoff, groundwater discharge/recharge
- roads or other impediments, water flow moderately altered
- moderate portion of site excavated

☐ 4. Hydrology significantly altered (SI = 0.25)
- portion of site with significant fill or sediment
- portion of site with drainage ditches/tiles
- significant alteration to overland runoff, groundwater discharge/recharge
- roads or other impediments, water flow significantly altered
- significant portion of site excavated

☐ 5. Hydrology severely altered (SI = 0.1)
- entire site impacted by fill or excessive sediment
- entire site with numerous drainage ditches/tiles
- no contributions to or from overland runoff, groundwater discharge/recharge
- roads or other impediments, water flow completely blocked
- entire wetland affected

V2: Wetland Watershed Integrity (WSHEDINT)

Use weighted average as discussed on page 10. Examples of land uses and multipliers listed below

A = Percentage forested with no impervious surfaces 15
B = Percentage permeable land, (e.g., park, golf course, pasture, hay, orchard, tree farm, or similar) 75
C = Percentage low density residential, construction, or similar 10
D = Percentage high density residential, or similar _____
E = Percentage urban, commercial, industrial, or similar _____

V2 = (A x 1.0) + (B x 0.75) + (C x 0.5) + (D x 0.25) + (E x 0.01)/(100) = 0.76

V3: Canopy Tree Size Class (TSIZE)

1. Average size of canopy trees > 3 in. DBH

☐ ≥ 15 in. (SI = 1.0) ☐ 10 – 14 in. (SI = 0.75) ☐ 6 – 9 in. (SI = 0.5) ☑ 3 – 5 in. (SI = 0.25)
☐ < 3 in. or no trees present, go to V5

V4: Canopy Tree Density (TDEN)

1. Average number of canopy trees (> 3 in. DBH) per 30-ft. radius plot

☑ 5 – 10 (SI = 1.0) ☐ 11 – 15 (SI = 0.75) ☐ > 15 (SI = 0.5) ☐ 1 – 4 (SI = 0.5)

V5: Shrub Cover (SCOV)

1. Average percent cover of shrubs (woody stems < 3 in. DBH and taller than 3 ft.) per 30-ft. radius plot

☐ > 20 (SI = 1.0) ☑ < 20, go to V6

V6: Ground Vegetation Cover (GVC)

1. Average percent cover of ground vegetation per 30-ft. radius plot

☐ ≥ 70 (SI = 1.0) ☐ 55 – 69 (SI = 0.75) ☐ 45 – 54 (SI = 0.5) ☐ 30 – 44 (SI = 0.25) ☐ 20 – 29 (SI = 0.1)
☑ < 20 (SI=0.0)

V7: Vegetation Composition and Diversity (COMP)

1. Check the dominant species from Groups 1, 2, and 3 below using the 50/20 rule. If tree cover is < 20%, check the dominants in the next tallest stratum. If a dominant does not appear in lists below, but is a native species, it can be added to Group 1 or 2 species based on the scientific literature or professional judgement. Native shrub and herbaceous species are assigned to Group 2. When using shrub or herbaceous write in the number of dominant species. Dominant invasive species are checked regardless of stratum. *

GROUP 1 (Reference Standard)		GROUP 2 (Native Ubiquitous)		GROUP 3 (Invasive)
☐ Water oak	☐ Pin oak	☐ American elm	☐ Green ash	☐ European/Chinese privet
☐ Bur oak	☐ Shumard oak	☐ Slippery elm	☐ Red maple	☐ Japanese honeysuckle
☐ Willow oak	☐ Bald cypress	☑ Sweetgum	☐ Silver maple	☑ Japanese stiltgrass
☐ Swamp chestnut oak	☐ Water tupelo	☐ Blackgum	☑ Black willow	☐ Purple loosestrife
☐ Cherrybark oak	☐ S. black gum	☐ Silky dogwood	☐ Sycamore	☐ Giant reed
☐ Swamp white oak	☐ Persimmon	☐ Boxelder	☑ black cherry	☐ Tall fescue
☐ Nuttall oak	☐ Am. hornbeam	☐ Tulip poplar	☐ _____	☐ Phragmites
☐ Overcup oak	☐ _____	____ Number native shrub spp.		☐ _____
☐ _____	☐ _____	2 Number native herbaceous spp.		☐ _____

2. Using the number of dominants in Groups 1, 2, and 3 above, calculate a quality index (Q) using the following formula: [(1.0 x # of checked dominants in Group 1) + (0.66 x # of checked dominants in Group 2) + (0.0 x # of checked dominants in Group 3)]/ total # of checked dominants in all groups = 0.55

3. Multiply Q above by one of the following constants that reflects species richness:[1]

- ○ a) if ≥ 4 species from Groups 1 and/or 2 occur as dominants, multiply Q by 1.0 _____
- ○ b) if 3 species from Groups 1 and/or 2 occur as dominant, multiply Q by 0.75 _____
- ◉ c) if 2 species from Groups 1 and/or 2 occur as dominants, multiply Q by 0.50 0.275
- ○ d) if 1 species from Groups 1 and/or 2 occurs as dominant, multiply Q by 0.25 _____
- ○ e) if no species from Groups 1 and/or 2 occurs as dominant, multiply Q by 0.0 _____

4. Calculate the square root of the value from Step 3 above. This value is the SI for **V7**= 0.52

*In some Depression wetlands and in some small WAAs (e.g., <0.5 acres), relatively few species (e.g., overcup oak) may be present. In cases in which this is the normal condition, Q can be multiplied by 1.0 if only 1 or 2 species are dominant.

V8: Soil Organic Matter (ORGANIC)

1. Surface horizons unaltered

☑ 100 percent cover of O and/or A horizon present (SI = 1.0)

2. Surface horizons altered. Estimate the percent of the WAA in which neither an O or A horizon is present.

3. Subtract the sum of the values from Step 2 from 100. Convert this value to a decimal. This value is the SI for V8 (e.g., if 75 % of the WAA does not have an O or A horizon due to a significant disturbance, it will have an SI of 0.25).

V9: Buffer (BUFFER)

1. Determine the Connection Index (CI) by estimating the percent of the wetland surrounded by suitable buffer habitat.

☐ 90% – 100% (CI = 1.0) ☐ 75% – 89% (CI = 0.75) ☑ 40% – 74% (CI = 0.5) ☐ 10% – 39% (CI = 0.25)
☐ < 10% (CI = 0.1)

2. Multiply the CI by one if the following values:

- ○ a) if average buffer width is ≥ 492 ft., multiply by 1.0
- ○ b) if average buffer is 98 ft to 491 ft., multiply by 0.66
- ◉ c) if average buffer width is 33 ft to 97 ft., multiply by 0.33
- ○ d) if average buffer width is < 33 ft., multiply by 0.1

3. This value is the SI for **V9 =** 0.17 **.**

VALUES USED TO CALCULATE FUNCTIONAL CAPACITY INDICES (FCIs)

SUBINDEX VALUES:

V1 0.50 (HYDRO) V3 0.25 (TSIZE) V5 go to V6 (SCOV) V7 0.52 (COMP) V9 0.17 (BUFFER)

V2 0.76 (WSHEDINT) V4 1.00 (TDEN) V6 1.00 (GVC) V8 1.0 (ORGANIC)

Slope Wetland

WTL-2

V1: HYDROPERIOD	**0.5**	
V2: WETLAND WATERSHED INTEGRITY	**0.76**	
V3: CANOPY TREE CLASS	**0.25**	
V4: CANOPY TREE DENSITY	**1**	
V5: SHRUB COVER	**GOTOV6**	
V6: GROUND VEGETATION COVER	**n/a**	
V7: VEGETATION COMPOSITION AND DIVERSITY	**0.52**	
2. Q =	**0.55**	
# of Group 1 Dominants	0	
# of Group 2 Dominants	5	
# of Group 3 Dominants	1	
SPECIES RICHNESS CONSTANT	0.5	
V8: SOIL ORGANIC MATTER	**1**	
V9:BUFFER	**0.17**	
1. Connection Index	0.5	
2. Buffer width value (0-1)	0.33	

Function 1: Maintain Hydrologic Regime

(V1 x V2)^(1/2)

FCI 1 = **0.62** **Final Tree =** **0.60**

Function 2: Maintain Biogeochemical Processes

$$\text{FCI (trees present)} = \left((V1 \times V2)^{1/2} \times \left(\frac{\frac{V3+V4}{2}+V8}{2}\right)\right)^{1/2}$$

FCI 2 trees= **0.71** **Final Shrubs=** **#VALUE!**

Final Herbaceous = **#VALUE!**

$$\text{FCI (shrubs present)} = \left((V1 \times V2)^{1/2} \times \left(\frac{V5+V8}{3}\right)\right)^{1/2}$$

FCI 2 shrubs= **#VALUE!**

$$\text{FCI (ground cover)} = \left((V1 \times V2)^{1/2} \times \left(\frac{V6+V8}{5}\right)\right)^{1/2}$$

FCI 2 ground = **#VALUE!**

Function 3: Maintain Characteristic Plant Community

$$\text{FCI (trees present)} = \frac{(V1 \times V2)^{1/2} + 2\left(\frac{V3+V4+V7}{3}\right)}{3}$$

FCI 3 trees= **0.60**

$$\text{FCI (shrubs present)} = \frac{(V1 \times V2)^{1/2} + 2\left(\frac{V5+V7}{2}\right)}{6}$$

FCI 3 shrubs= **#VALUE!**

$$\text{FCI (groundcover)} = \frac{(V1 \times V2)^{1/2} + 2\left(\frac{V6+V7}{2}\right)}{9}$$

FCI 3 ground = **#VALUE!**

Function 4: Maintain Characteristic Wildlife Community:

FCI 4 trees= **0.49**

$$\text{FCI (trees)} = \frac{(V1 \times V2)^{1/2} + 2\left(\frac{V3+V4+V7}{3}\right) + V9}{4}$$

FCI 4 shrubs= **#VALUE!**

$$\text{FCI (shrubs present)} = \frac{(V1 \times V2)^{1/2} + 2\left(\frac{V5+V7}{2}\right) + V9}{6}$$

FCI 4 ground = **#VALUE!**

$$\text{FCI (groundcover)} = \frac{(V1 \times V2)^{1/2} + 2\left(\frac{V6+V7}{2}\right) + V9}{9}$$

TRAM Summary Worksheet

Project: SR-19, PIN 102251.01, WTL-2

Exceptional Status Wetlands		**Check if applicable**
	1. **ONRW**	☐
	2. **ETW**	☐
	3. **Further Review Requested:** Attach Wetland Background and Exceptional Status Wetlands Worksheet	☐
	COMMENTS/NOTES:	
Quantitative Rating scores	Function: Hydrologic Regime	0.62
	Function: Biogeochemical Processes	0.71
	Function: Retain Particulates	n/a
	Function: Plant Community	0.60
	Function: Wildlife Community	0.49
	Quantitative Score (Average of FCIs x 100)	60.50
	Value Added (Significant Size) Total	0
Total of Quantitative and Value Added Scores	**TOTAL SCORE**	60.50

Ecology Field Data Sheet: **Water Resources**

Project: Lauderdale County, SR-19, 102251.01					
Biologist:	PB & BF	**Affiliation:**	JMT	**Date:**	08-15-24

1-Station: from plans	Directly west of 2515 SR-19								
2-Map label and name	WWC-4/EPH-4								
3-Latitude/Longitude	35.720108, -89.504811								
4-Feature description:									
-channel identification	perennial stream		intermittent stream		ephemeral stream		wwc	✓	
-HD score (if applicable)	16								
-OHWM indicators	bed & banks	✓	deposition	✓	presence of litter debris		scour	✓	veg absent, bent, matted ✓
	change in plant community		destruction of terrestrial veg		multiple observe flow events		sediment sorting	✓	water staining
	change in soil character		leaf litter disturb or absent		natural line impressed on bank		shelving	✓	wracking ✓
-channel bottom width	1.5'		-top of bank width		10'				
-width and max depth at ordinary high water mark	8' width, 3' max depth								
-width at bankfull	6'								
-bank height	LDB - 6'		RDB - 7'						
-riffle/pool complex or other specialized habitat present?	No								
-dominant riparian species: ----------(LDB /RDB)----------	LDB: sweet-gum								
	RDB: sweet-gum, poison ivy								
-particle size distribution %	Silt/Sand:	100	Gravel:		Cobble:		Boulder:		Bedrock:
5-photo numbers	11-14								
6-HUC -8 Code & Name	08010208 - Lower Hatchie								
7-Assessed	yes		no	✓					
8-ETW	yes		no	✓					
9-303 (d) List	yes		siltation		habitat:		other:		
	no	✓							
10-Notes									

Revised July 2022

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Cane Creek		Date/Time: 08/13/24
Assessors/Affiliation: PB, BF; JMT		Project ID : 102251.01
Site Name/Description: WWC-4/EPH-4		
Site Location: Directly west of 2515 SR-19		
HUC (12 digit): 080102080701	Latitude: 35.720108	
Previous Rainfall (7-days) : < 0.5 inches	Longitude: -89.504811	
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0		
Watershed Size : 0.04 sq. miles	County: Lauderdale	
Soil Type(s) / Geology : Memphis Silt Loam	Source: NRCS Web Soil Survey	
Surrounding Land Use : Low Density Residential, Agricultural		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 16

Justification / Notes :

Incipient drought (based on APT).

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 9)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	0.5 1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	0.5 1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 4)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 3)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants.

[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 16

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Ecology Field Data Sheet: **Water Resources**

Project: Lauderdale County, SR-19, 102251.01					
Biologist:	JC & JG	**Affiliation:**	JMT	**Date:**	08-15-24

1-Station: from plans	Northwest of Durhamville Rd meeting SR-19, on southside of road.								
2-Map label and name	WWC-5/EPH-5								
3-Latitude/Longitude	35.718456, -89.500090								
4-Feature description:									
-channel identification	perennial stream		intermittent stream		ephemeral stream		wwc	✓	
-HD score (if applicable)	5								
-OHWM indicators	bed & banks	✓	deposition		presence of litter debris		scour		veg absent, bent, matted	
	change in plant community		destruction of terrestrial veg		multiple observe flow events		sediment sorting		water staining	
	change in soil character		leaf litter disturb or absent		natural line impressed on bank		shelving		wracking	
-channel bottom width	1'		-top of bank width	10'					
-width and max depth at ordinary high water mark	1' width, <1" max depth								
-width at bankfull	1'								
-bank height	LDB - 2'		RDB - 2'						
-riffle/pool complex or other specialized habitat present?	No								
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Sweet gum, red oak, grapevine, poison ivy								
	RDB: Sweet gum, red oak, grapevine, poison ivy								
-particle size distribution %	Silt/Sand:	100	Gravel:		Cobble:		Boulder:		Bedrock:	
5-photo numbers	15-18								
6-HUC -8 Code & Name	08010208 - Lower Hatchie								
7-Assessed	yes		no	✓					
8-ETW	yes		no	✓					
9-303 (d) List	yes		siltation		habitat:		other:		
	no	✓							
10-Notes									

Revised July 2022

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Cane Creek		Date/Time: 08/12/24
Assessors/Affiliation: JC, JG; JMT		Project ID : 102251.01
Site Name/Description: WWC-5/EPH-5		
Site Location: Northwest of Durhamville Rd meeting SR-19		
HUC (12 digit): 080102080701	Latitude: 35.718456	
Previous Rainfall (7-days) : <0.5 inches	Longitude: -89.500090	
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0		
Watershed Size : <0.02 sq. miles	County: Lauderdale	
Soil Type(s) / Geology : Memphis Silt Loam	Source: NRCS Web Soil Survey	
Surrounding Land Use : Low Density Residential, Agricultural		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 5

Justification / Notes :

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 5)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 0)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 0)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Ecology Field Data Sheet: **Water Resources**

Project: Lauderdale County, SR-19, 102251.01					
Biologist:	JC & JG	**Affiliation:**	JMT	**Date:**	08-14-24

1-Station: from plans	Joe Springfield Rd meeting SR-19									
2-Map label and name	WWC-6/EPH-6									
3-Latitude/Longitude	35.716648, -89.493832									
4-Feature description:										
-channel identification	perennial stream		intermittent stream		ephemeral stream		wwc	✓		
-HD score (if applicable)	12									
-OHWM indicators	bed & banks	✓	deposition		presence of litter debris		scour		veg absent, bent, matted	
	change in plant community		destruction of terrestrial veg		multiple observe flow events		sediment sorting		water staining	
	change in soil character		leaf litter disturb or absent		natural line impressed on bank		shelving		wracking	
-channel bottom width	1'		-top of bank width		8'					
-width and max depth at ordinary high water mark	2' width, 6" max depth									
-width at bankfull	12'									
-bank height	LDB - 4'		RDB - 4'							
-riffle/pool complex or other specialized habitat present?	No									
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Johnson grass, Bermuda grass									
	RDB: Johnson grass, Bermuda grass									
-particle size distribution %	Silt/Sand:	90	Gravel:	10	Cobble:		Boulder:		Bedrock:	
5-photo numbers	19-20									
6-HUC -8 Code & Name	08010208 - Lower Hatchie									
7-Assessed	yes		no	✓						
8-ETW	yes		no	✓						
9-303 (d) List	yes		siltation		habitat:		other:			
	no	✓								
10-Notes	10% riprap									

Revised July 2022

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Cane Creek		Date/Time: 08/12/24
Assessors/Affiliation: JC, JG; JMT		Project ID : 102251.01
Site Name/Description: WWC-6/EPH-6		
Site Location: Joe Springfield Road meeting SR-19		
HUC (12 digit): 080102080701	Latitude: 35.716648	
Previous Rainfall (7-days) : <0.5 inches	Longitude: -89.493832	
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0		
Watershed Size : 0.06 sq. miles	County: Lauderdale	
Soil Type(s) / Geology : Alder Silt Loam	Source: NRCS Web Soil Survey	
Surrounding Land Use : Low Density Residential. Agricultural		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 12

Justification / Notes :

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 7)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 0.5)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 4.5)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 12

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Could not access western reach, directly opposite to STR-Z (separated by road).

Tree frogs. Crayfish in mud tower

Ecology Field Data Sheet: **Water Resources**

Project: Lauderdale County, SR-19, 102251.01					
Biologist:	PB & BF	**Affiliation:**	JMT	**Date:**	08-15-24

1-Station: from plans	East of Joe Springfield Rd on SR-19										
2-Map label and name	STR-1										
3-Latitude/Longitude	35.716507, -89.493185										
4-Feature description:											
-channel identification	perennial stream		intermittent stream	✓	ephemeral stream		wwc				
-HD score (if applicable)	17.5										
-OHWM indicators	bed & banks	✓	deposition		presence of litter debris	✓	scour		veg absent, bent, matted	✓	
	change in plant community	✓	destruction of terrestrial veg	✓	multiple observe flow events		sediment sorting		water staining		
	change in soil character	✓	leaf litter disturb or absent		natural line impressed on bank		shelving	✓	wracking	✓	
-channel bottom width	5'		-top of bank width		16'						
-width and max depth at ordinary high water mark	width 6', max depth 3'										
-width at bankfull	6'										
-bank height	LDB - 5'				RDB - 5'						
-riffle/pool complex or other specialized habitat present?	No										
-dominant riparian species: ----------(LDB /RDB)----------	LDB: black willow, pecan, green ash										
	RDB: green ash, American elm, muscadine										
-particle size distribution %	Silt/Sand:	100	Gravel:		Cobble:		Boulder:		Bedrock:		
5-photo numbers	21-26										
6-HUC -8 Code & Name	08010208 - Lower Hatchie										
7-Assessed	yes		no	✓							
8-ETW	yes		no	✓							
9-303 (d) List	yes		siltation		habitat:		other:				
	no	✓									
10-Notes	South of SR-19 (form location) emerges from forested area and runs parallel to SR-19 until it reaches a bridge to flow under SR-19. North of SR-19, channel flows through forested area dominated by pokeweed, jewelweed, and various tree species. Channel bottom width across SR-19 is 1', TOB width is 7', width and max depth at OHWM is 4' and 3", respectively. Bank height on left and right bank is 1'.										

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Cane Creek	Date/Time: 08/15/24
Assessors/Affiliation: PB, BF; JMT	Project ID : 102251.01
Site Name/Description: STR-1	
Site Location: East of Joe Springfield Road on SR-19	
HUC (12 digit): 080102080701	Latitude: 35.716507
Previous Rainfall (7-days) : < 0.5 inches	Longitude: -89.493185
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0	
Watershed Size : 0.2 sq. miles	County: Lauderdale
Soil Type(s) / Geology : Alder Silt Loam	Source: NRCS Web Soil Survey
Surrounding Land Use : Low Density Residential, Agricultural	
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = 17.5

Justification / Notes :

Incipient drought (based on APT). NHD stream also shows up on USGS Topo (unnamed).

Severely altered around agriculture fields.

Culvert where Joe Springfield Road meets SR-19 acts as grade control going under SR-19. This stream flows north to the east. Stream was dry on southern/western end where form was recorded.

Water was low (< 3") and stagnant towards the eastern end where it meets 2-STR-AA.

North of SR-19, stream has more sinuosity, more grade control, and less fibrous roots in channel bed.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 9)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	0.5 1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 4)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 4.5)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 17.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : tadpoles

Ecology Field Data Sheet: **Water Resources**

Project: Lauderdale County, SR-19, 102251.01					
Biologist:	JC & JG	**Affiliation:**	JMT	**Date:**	08-15-24

1-Station: from plans	Northwest of Durhamville Rd meeting SR-19									
2-Map label and name	WWC-7/UDF-1									
3-Latitude/Longitude	35.716236, -89.490244									
4-Feature description:										
-channel identification	perennial stream		intermittent stream		ephemeral stream		wwc	✓		
-HD score (if applicable)	3									
-OHWM indicators	bed & banks	✓	deposition		presence of litter debris		scour		veg absent, bent, matted	
	change in plant community		destruction of terrestrial veg		multiple observe flow events		sediment sorting		water staining	
	change in soil character		leaf litter disturb or absent		natural line impressed on bank		shelving		wracking	
-channel bottom width	1'		-top of bank width		8'					
-width and max depth at ordinary high water mark	1' width, 2" max depth									
-width at bankfull	1'									
-bank height	LDB - 4'		RDB - 4'							
-riffle/pool complex or other specialized habitat present?	No									
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Johnson grass, morning glory, rubrus sp, rose									
	RDB: Johnson grass, morning glory, rubrus sp, rose									
-particle size distribution %	Silt/Sand:	100	Gravel:		Cobble:		Boulder:		Bedrock:	
5-photo numbers	27-28									
6-HUC -8 Code & Name	08010208 - Lower Hatchie									
7-Assessed	yes		no	✓						
8-ETW	yes		no	✓						
9-303 (d) List	yes		siltation		habitat:		other:			
	no	✓								
10-Notes										

Revised July 2022

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Cane Creek		Date/Time: 08/12/24
Assessors/Affiliation: JC, JG; JMT		Project ID : 102251 .01
Site Name/Description: WWC-7/UDF-1		
Site Location: Northwest of Durhamville Rd meeting SR-19		
HUC (12 digit): 080102080701	Latitude: 35.716236	
Previous Rainfall (7-days) : <0.5 inches	Longitude: -89.490244	
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0		
Watershed Size : 0.33 sq. miles	County: Lauderdale	
Soil Type(s) / Geology : Alder Silt Loam	Source: NRCS Web Soil Survey	
Surrounding Land Use : Low Density Residential, Agricultural		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 3

Justification / Notes :

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 3)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 0)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 0)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 3

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Feature starts at culvert under ag access road, other side is crop. Flows into 2-WWC-AS.

Ecology Field Data Sheet: **Water Resources**

Project: Lauderdale County, SR-19, 102251.01					
Biologist:	JC & JG	**Affiliation:**	JMT	**Date:**	08-15-24

1-Station: from plans	Northwest of Durhamville Rd meeting SR-19									
2-Map label and name	WWC-8/EPH-7									
3-Latitude/Longitude	35.716429, -89.490020									
4-Feature description:										
-channel identification	perennial stream		intermittent stream		ephemeral stream		wwc	✓		
-HD score (if applicable)	11									
-OHWM indicators	bed & banks	✓	deposition		presence of litter debris		scour	✓	veg absent, bent, matted	
	change in plant community	✓	destruction of terrestrial veg		multiple observe flow events		sediment sorting		water staining	
	change in soil character		leaf litter disturb or absent		natural line impressed on bank		shelving		wracking	
-channel bottom width	2.5'		-top of bank width	10'						
-width and max depth at ordinary high water mark	2' width, 6" max depth									
-width at bankfull	6'									
-bank height	LDB - 5'		RDB - 5'							
-riffle/pool complex or other specialized habitat present?	No									
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Sweet-gum, cottonwood, slippery elm, poison ivy, elderberry									
	RDB: Sweet-gum, cottonwood, slippery elm, poison ivy, elderberry									
-particle size distribution %	Silt/Sand:	100	Gravel:		Cobble:		Boulder:		Bedrock:	
5-photo numbers	29-30									
6-HUC -8 Code & Name	08010208 - Lower Hatchie									
7-Assessed	yes		no	✓						
8-ETW	yes		no	✓						
9-303 (d) List	yes		siltation		habitat:		other:			
	no	✓								
10-Notes										

Revised July 2022

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Cane Creek	Date/Time: 08/12/24
Assessors/Affiliation: JC, JG; JMT	Project ID : 102251.01
Site Name/Description: WWC-8/EPH-7	
Site Location: Northwest of Durhamville Rd meeting SR-19	
HUC (12 digit): 080102080701	Latitude: 35.716429
Previous Rainfall (7-days) : <0.5 inches	Longitude: -89.490020
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0	
Watershed Size : 0.33 sq. miles	County: Lauderdale
Soil Type(s) / Geology : Alder Silt Loam	Source: NRCS Web Soil Survey
Surrounding Land Use : Low Density Residential, Agricultural	
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 11

Justification / Notes :

Incipient Drought (based on APT)

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 6.5)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 2.5)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 2)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 11

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Bank to the east had been clear cut.

Ecology Field Data Sheet: **Water Resources**

Project: Lauderdale County, SR-19, 102251.01					
Biologist:	JC & JG	**Affiliation:**	JMT	**Date:**	08-15-24

1-Station: from plans	Northwest of Durhamville Rd meeting SR-19								
2-Map label and name	WWC-9/EPH-8								
3-Latitude/Longitude	35.716385, -89.489664								
4-Feature description:									
-channel identification	perennial stream		intermittent stream		ephemeral stream		wwc	✓	
-HD score (if applicable)	4								
-OHWM indicators	bed & banks	✓	deposition		presence of litter debris		scour		veg absent, bent, matted
	change in plant community		destruction of terrestrial veg		multiple observe flow events		sediment sorting		water staining
	change in soil character		leaf litter disturb or absent		natural line impressed on bank		shelving		wracking
-channel bottom width	1'		-top of bank width		6'				
-width and max depth at ordinary high water mark	2' width, 3" max depth								
-width at bankfull	4'								
-bank height	LDB - 2'		RDB - 2'						
-riffle/pool complex or other specialized habitat present?	No								
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Sweet gum, black willow, elder berry, rubrus sp, grapevine								
	RDB: Sweet gum, black willow, elder berry, rubrus sp, grapevine								
-particle size distribution %	Silt/Sand:	100	Gravel:		Cobble:		Boulder:		Bedrock:
5-photo numbers	31-32								
6-HUC -8 Code & Name	08010208 - Lower Hatchie								
7-Assessed	yes		no	✓					
8-ETW	yes		no	✓					
9-303 (d) List	yes		siltation		habitat:		other:		
	no	✓							
10-Notes									

Revised July 2022

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Cane Creek	Date/Time: 08/12/24
Assessors/Affiliation: JC, JG; JMT	Project ID : 102251.01
Site Name/Description: WWC-9/EPH-8	
Site Location: Northwest of Durhamville Rd meeting SR-19	
HUC (12 digit): 080102080701	Latitude: 35.716385
Previous Rainfall (7-days) : <0.5 inches	Longitude: -89.489664
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0	
Watershed Size : 0.33 sq. miles	County: Lauderdale
Soil Type(s) / Geology : Alder Silt Loam	Source: NRCS Web Soil Survey
Surrounding Land Use : Low Density Residential, Agricultural	
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 4

Justification / Notes :

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 3)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 0)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 1)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5 1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 4

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Wooded area to the west of feature clear cut. Flows into 2-STR-Z.

Ecology Field Data Sheet: **Water Resources**

Project: Lauderdale County, SR-19, 102251.01					
Biologist:	RF & MM	**Affiliation:**	JMT	**Date:**	08-14-24

1-Station: from plans	~0.08 miles West of Durhamville Rd on SR-19										
2-Map label and name	WWC-10/UDF-2										
3-Latitude/Longitude	35.71660, -89.48920										
4-Feature description:											
-channel identification	perennial stream		intermittent stream		ephemeral stream		wwc	✓			
-HD score (if applicable)	7										
-OHWM indicators	bed & banks	✓	deposition		presence of litter debris	✓	scour		veg absent, bent, matted		
	change in plant community		destruction of terrestrial veg		multiple observe flow events		sediment sorting		water staining		
	change in soil character		leaf litter disturb or absent		natural line impressed on bank		shelving		wracking		
-channel bottom width	2'			-top of bank width		4'					
-width and max depth at ordinary high water mark	2' width, 3" max depth										
-width at bankfull	4'										
-bank height	LDB - 3'				RDB - 3'						
-riffle/pool complex or other specialized habitat present?	No										
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Agricultural land										
	RDB: Maintained roadway shoulder										
-particle size distribution %	Silt/Sand:	80	Gravel:	20	Cobble:		Boulder:		Bedrock:		
5-photo numbers	33										
6-HUC -8 Code & Name	08010208 - Lower Hatchie										
7-Assessed	yes		no	✓							
8-ETW	yes		no	✓							
9-303 (d) List	yes		siltation		habitat:		other:				
	no	✓									
10-Notes	Flows through culverts below agricultural access points, feeds 1-STR-AB.										

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Cane Creek		Date/Time: 8/14/24
Assessors/Affiliation: RF, MM; JMT		Project ID : 102251.01
Site Name/Description: WWC-10/UDF-2		
Site Location: ~0.08 miles West of Durhamville Rd on SR-19		
HUC (12 digit): 080102080701	Latitude: 35.71660	
Previous Rainfall (7-days) : < 0.5 inches	Longitude: -89.48920	
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0		
Watershed Size : <0.01 sq. miles	County: Lauderdale	
Soil Type(s) / Geology : Adler Silt Loam	Source: NRCS Web Soil Survey	
Surrounding Land Use : Agriculture		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 7

Justification / Notes :

Incipient drought (based on APT).

Moderately altered around agricultural fields.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 2.5)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2 2.5	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 2.5)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 2)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 7

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Fed by a grass-lined swale collecting upland/ag runoff; flows through culverts below farm access; feeds into 1-STR-AB

Ecology Field Data Sheet: **Water Resources**

Project: Lauderdale County, SR-19, 102251.01					
Biologist:	RF & MM	**Affiliation:**	JMT	**Date:**	08-14-24

1-Station: from plans	~0.05 miles East of Durhamville Rd on SR-19									
2-Map label and name	STR-2									
3-Latitude/Longitude	35.716446, -89.486744									
4-Feature description:										
-channel identification	perennial stream		intermittent stream	✓	ephemeral stream		wwc			
-HD score (if applicable)	16									
-OHWM indicators	bed & banks	✓	deposition		presence of litter debris	✓	scour		veg absent, bent, matted	
	change in plant community		destruction of terrestrial veg		multiple observe flow events		sediment sorting	✓	water staining	
	change in soil character		leaf litter disturb or absent		natural line impressed on bank		shelving	✓	wracking	
-channel bottom width	1'		-top of bank width		4'					
-width and max depth at ordinary high water mark	4' width, 6" max depth									
-width at bankfull	4'									
-bank height	LDB - 1.5'				RDB - 1.5'					
-riffle/pool complex or other specialized habitat present?	No									
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Eastern poison ivy									
	RDB: Eastern poison ivy									
-particle size distribution %	Silt/Sand:	80	Gravel:	20	Cobble:		Boulder:		Bedrock:	
5-photo numbers	34-35									
6-HUC -8 Code & Name	08010208 - Lower Hatchie River									
7-Assessed	yes		no	✓						
8-ETW	yes		no	✓						
9-303 (d) List	yes		siltation		habitat:		other:			
	no	✓								
10-Notes	Located adjacent to septic cleaner company with chemicals and trash outside building/surrounding and within stream. Pipe next to septic company flows into stream.									

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Cane Creek		Date/Time: 8/14/24
Assessors/Affiliation: RF, MM; JMT		Project ID : 102251.01
Site Name/Description: STR-2		
Site Location: ~0.05 miles East of Durhamville Rd on SR-19		
HUC (12 digit): 080102080701	Latitude: 35.716446	
Previous Rainfall (7-days) : < 0.5 inches	Longitude: -89.486744	
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0		
Watershed Size : <0.01 sq. miles	County: Lauderdale	
Soil Type(s) / Geology : Adler Silt Loam	Source: NRCS Web Soil Survey	
Surrounding Land Use : Low Density Residential; Commercial		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = 16

Justification / Notes :

Incipient drought (based on APT).

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 7.75)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2 2.5	3
2. Sinuous channel	0	1 1.5	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0 0.5	1	2	3
7. Braided channel	0 0.5	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0 0.25	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 2.75)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5 1.25	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 5.5)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1 1.5	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 16

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Located adjacent to septic cleaner company--chemicals and trash outside building/surrounding and within stream; pipe located underground but next to company flows into stream

Ecology Field Data Sheet: **Water Resources**

Project: Lauderdale County, SR-19, 102251.01					
Biologist:	RF & MM	**Affiliation:**	JMT	**Date:**	08-14-24

1-Station: from plans	~0.05 miles East of Durhamville Rd on SR-19								
2-Map label and name	WWC-11/EPH-9								
3-Latitude/Longitude	35.716263, -89.486752								
4-Feature description:									
-channel identification	perennial stream ☐	intermittent stream ☐	ephemeral stream ☐	wwc ☑					
-HD score (if applicable)	8.5								
-OHWM indicators	bed & banks ☑	deposition ☐	presence of litter debris ☐	scour ☐	veg absent, bent, matted ☐				
	change in plant community ☐	destruction of terrestrial veg ☐	multiple observe flow events ☐	sediment sorting ☐	water staining ☐				
	change in soil character ☐	leaf litter disturb or absent ☐	natural line impressed on bank ☐	shelving ☐	wracking ☐				
-channel bottom width	2'	-top of bank width	6.5'						
-width and max depth at ordinary high water mark	6" width, 6" max depth								
-width at bankfull	6.5'								
-bank height	LDB - 1.5'	RDB - 1.5'							
-riffle/pool complex or other specialized habitat present?	No								
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Maintained lawn								
	RDB: Maintained lawn								
-particle size distribution %	Silt/Sand: 80	Gravel: 20	Cobble:	Boulder:	Bedrock:				
5-photo numbers	36								
6-HUC -8 Code & Name	08010208 - Lower Hatchie								
7-Assessed	yes ☐	no ☑							
8-ETW	yes ☐	no ☑							
9-303 (d) List	yes ☐	siltation ☐	habitat: ☐	other: ☐					
	no ☑								
10-Notes	Separated from STR-2 by rooted grade control.								

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Cane Creek		Date/Time: 8/14/24
Assessors/Affiliation: RF, MM; JMT		Project ID : 102251.01
Site Name/Description: WWC-11/EPH-9		
Site Location: ~0.05 miles East of Durhamville Rd on SR-19		
HUC (12 digit): 080102080701	Latitude: 35.716263	
Previous Rainfall (7-days) : < 0.5 inches	Longitude: -89.486752	
Precipitation this Season vs. Normal : abnormally wet elevated **average** low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0		
Watershed Size : < 0.01 sq. miles	County: Lauderdale	
Soil Type(s) / Geology : Adler Silt Loam	Source: NRCS Web Soil Survey	
Surrounding Land Use : Agriculture		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe **Moderate** Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 8.5

Justification / Notes :

Incipient drought (based on APT). Flows into STR-2.

Moderately altered around agricultural fields.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 2.5)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	0.5 1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	0.5 1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 3)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1 1.5	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 3)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2 1.5	1	0
21. Rooted plants in the thalweg [1]	3	2 1.5	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants.

[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 8.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Collects upland runoff and feeds into 1-STR-AA

Ecology Field Data Sheet: **Water Resources**

Project: Lauderdale County, SR-19, 102251.01					
Biologist:	RF & MM	**Affiliation:**	JMT	**Date:**	08-14-24

1-Station: from plans	~0.25 miles West of Red Bird Rd on SR-19										
2-Map label and name	STR-3										
3-Latitude/Longitude	35.715969, -89.483943										
4-Feature description:											
-channel identification	perennial stream		intermittent stream	✓	ephemeral stream		wwc				
-HD score (if applicable)	13.5										
-OHWM indicators	bed & banks	✓	deposition		presence of litter debris	✓	scour		veg absent, bent, matted		
	change in plant community		destruction of terrestrial veg		multiple observe flow events		sediment sorting	✓	water staining		
	change in soil character		leaf litter disturb or absent		natural line impressed on bank	✓	shelving		wracking		
-channel bottom width	3'			-top of bank width		4'					
-width and max depth at ordinary high water mark	3' width, 3" max depth										
-width at bankfull	4'										
-bank height	LDB - 1.5'				RDB - 1.5'						
-riffle/pool complex or other specialized habitat present?	No										
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Sweetgum										
	RDB: Sweetgum										
-particle size distribution %	Silt/Sand:	100	Gravel:		Cobble:		Boulder:		Bedrock:		
5-photo numbers	37-38										
6-HUC -8 Code & Name	08010208 - Lower Hatchie River										
7-Assessed	yes			no	✓						
8-ETW	yes			no	✓						
9-303 (d) List	yes		siltation		habitat:		other:				
	no	✓									
10-Notes	WWC-13/EPH-10 and WWC-12/UDF-3 flows into STR-3.										

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Cane Creek		Date/Time: 8/14/24
Assessors/Affiliation: RF, MM; JMT		Project ID : 102251.01
Site Name/Description: STR-3		
Site Location: ~0.25 miles West of Red Bird Rd on SR-19		
HUC (12 digit): 080102080701	Latitude: 35.715969	
Previous Rainfall (7-days) : < 0.5 inches	Longitude: -89.483943	
Precipitation this Season vs. Normal : abnormally wet elevated **average** low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0		
Watershed Size : 0.07 sq. miles	County: Lauderdale	
Soil Type(s) / Geology : Adler Silt Loam	Source: NRCS Web Soil Survey	
Surrounding Land Use : Agricultural		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe **Moderate** Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = 13.5

Justification / Notes :

Incipient drought (based on APT).

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 7.5)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 1.5)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 4.5)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants.

[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 13.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Black willow in streambed.

Ecology Field Data Sheet: **Water Resources**

Project: Lauderdale County, SR-19, 102251.01					
Biologist:	RF & MM	**Affiliation:**	JMT	**Date:**	08-14-24

1-Station: from plans	~0.21 miles East of Durhamville Rd on SR-19									
2-Map label and name	WWC-12/UDF-3									
3-Latitude/Longitude	35.715994, -89.483843									
4-Feature description:										
-channel identification	perennial stream ☐	intermittent stream ☐	ephemeral stream ☐	wwc ☑						
-HD score (if applicable)	9.5									
-OHWM indicators	bed & banks ☑	deposition ☐	presence of litter debris ☐	scour ☐	veg absent, bent, matted ☐					
	change in plant community ☐	destruction of terrestrial veg ☐	multiple observe flow events ☐	sediment sorting ☐	water staining ☐					
	change in soil character ☐	leaf litter disturb or absent ☐	natural line impressed on bank ☐	shelving ☐	wracking ☐					
-channel bottom width	1.5'	-top of bank width	1.5'							
-width and max depth at ordinary high water mark	6" width, 1' max depth									
-width at bankfull	1.5'									
-bank height	LDB - 1'	RDB - 1'								
-riffle/pool complex or other specialized habitat present?	No									
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Giant ragweed									
	RDB: Giant ragweed									
-particle size distribution %	Silt/Sand: 100	Gravel:	Cobble:	Boulder:	Bedrock:					
5-photo numbers	39									
6-HUC -8 Code & Name	08010208 - Lower Hatchie									
7-Assessed	yes ☐	no ☑								
8-ETW	yes ☐	no ☑								
9-303 (d) List	yes ☐	siltation ☐	habitat: ☐	other: ☐						
	no ☑									
10-Notes	Feeds into STR-3, trash present within channel.									

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Cane Creek		Date/Time: 8/14/24
Assessors/Affiliation: RF, MM; JMT		Project ID : 102251.01
Site Name/Description: WWC-12/UDF-3		
Site Location: ~0.21 miles East of Durhamville Rd on SR-19		
HUC (12 digit): 080102080701	Latitude: 35.715994	
Previous Rainfall (7-days) : < 0.5 inches	Longitude: -89.483843	
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0		
Watershed Size : < 0.01 sq. miles	County: Lauderdale	
Soil Type(s) / Geology : Adler Silt Loam	Source: NRCS Web Soil Survey	
Surrounding Land Use : Agriculture		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 9.5

Justification / Notes :

Incipient drought (based on APT). Flows into STR-3.

Moderately altered around agricultural fields.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 2.5)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2 2.5	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 1.5)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 5.5)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3 2.5	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants.

[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 9.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Fed by grass-lined swale collecting roadside/upland runoff

Ecology Field Data Sheet: **Water Resources**

Project: Lauderdale County, SR-19, 102251.01					
Biologist:	PB & BF	**Affiliation:**	JMT	**Date:**	08-15-24

1-Station: from plans	Along south side of SR-19 between 3701 SR-19 and 3635 SR-19								
2-Map label and name	WWC-13/EPH-10								
3-Latitude/Longitude	35.715799, -89.483730								
4-Feature description:									
-channel identification	perennial stream		intermittent stream		ephemeral stream		wwc	✓	
-HD score (if applicable)	6								
-OHWM indicators	bed & banks		deposition		presence of litter debris		scour		veg absent, bent, matted
	change in plant community		destruction of terrestrial veg		multiple observe flow events		sediment sorting		water staining
	change in soil character		leaf litter disturb or absent		natural line impressed on bank		shelving		wracking
-channel bottom width	4'		-top of bank width		4'				
-width and max depth at ordinary high water mark	4' width, 1' max depth								
-width at bankfull	4'								
-bank height	LDB - 1'				RDB - 1'				
-riffle/pool complex or other specialized habitat present?	No								
-dominant riparian species: ----------(LDB /RDB)----------	LDB: johnson grass, elderberry								
	RDB: johnson grass, bermuda grass, slippery elm								
-particle size distribution %	Silt/Sand:	100	Gravel:		Cobble:		Boulder:		Bedrock:
5-photo numbers	40								
6-HUC -8 Code & Name	08010208 - Lower Hatchie								
7-Assessed	yes			no	✓				
8-ETW	yes			no	✓				
9-303 (d) List	yes			siltation		habitat:		other:	
	no	✓							
10-Notes									

Revised July 2022

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Cane Creek	Date/Time: 08/15/24
Assessors/Affiliation: PB, BF; JMT	Project ID : 102251.01
Site Name/Description: WWC-13/EPH-10	
Site Location: Along south side of SR-19 between 3701 SR-19 and 3635 SR-19	
HUC (12 digit): 080102080701	Latitude: 35.715799
Previous Rainfall (7-days) : < 0.5 inches	Longitude: -89.483730
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0	
Watershed Size : 0.04 sq. miles	County: Lauderdale
Soil Type(s) / Geology : Adler Silt Loam	Source: NRCS Web Soil Survey
Surrounding Land Use : Low Density Residential, Agricultural	
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 6

Justification / Notes :

Incipient drought (based on APT).

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 3.5)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	1.5 2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0 0.5	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 2.5)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 0)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 6

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Soils: 1-12" 10YR 4/2+ with 7.5YR 4/6

Filled with johnson grass and bermuda grass. Very little sedge. Sapling slippery elms.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: TN SR-19 City/County: Lauderdale County Sampling Date: 2024-08-14

Applicant/Owner: TDOT State: Tennessee Sampling Point: 1-DPW-5

Investigator(s): Rhiannon Flickinger and Miranda McKiernan Section, Township, Range:

Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): Concave Slope (%):

Subregion (LRR or MLRA): P 134 Lat: 35.71577672 Long: -89.48065707 Datum: NAD83_2011

Soil Map Unit Name: Ad - Adler silt loam, 0 to 2 percent slopes, occasionally flooded NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ____	**Is the Sampled Area within a Wetland?** Yes ✓ No ____
Hydric Soil Present?	Yes ✓	No ____	
Wetland Hydrology Present?	Yes ✓	No ____	

Remarks: WTL-3

Small flat wetland fed by man-made roadside drainage via culvert and agricultural runoff. It is currently dry, with cracked soils, though there is a hydric soil layer located between two non-hydric layers. Sparse vegetation within the northern section of the wetland, likely due to agricultural management.

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)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along 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)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes ____	No ✓	Depth (inches): ____
Water Table Present?	Yes ____	No ✓	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes ____	No ✓	Depth (inches): ____

Wetland Hydrology Present? Yes ✓ No ____

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

Remarks:

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

Sampling Point: 1-DPW-5

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size: 30 ft r)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size: 30 ft r)			
1. Setaria pumila	40	✓	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	40 = Total Cover		
50% of total cover: 20.00	20% of total cover: 8.00		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of 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: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	40	x 3 =	120
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	40 (A)		120 (B)

Prevalence Index = B/A = 3.00

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☑ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four 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 vines, less than 3 in. DBH and greater than 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

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: 1-DPW-5

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 4/4	95	10R 5/6	5	C	M	Silty Clay Loam	
3 - 6	10YR 5/2	90	10YR 5/8	10	C		Silty Clay Loam	
6 - 12	10YR 5/3	90	10YR 5/6	10	C		Clay Loam	
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✓ **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: TN SR-19 City/County: Lauderdale County Sampling Date: 2024-08-14

Applicant/Owner: TDOT State: Tennessee Sampling Point: 1-DPU-4

Investigator(s): Rhiannon Flickinger and Miranda McKiernan Section, Township, Range:

Landform (hillslope, terrace, etc.): Upland Local relief (concave, convex, none): Linear Slope (%): 2

Subregion (LRR or MLRA): P 134 Lat: 35.71575002 Long: -89.48061653 Datum: NAD83_2011

Soil Map Unit Name: Ad - Adler silt loam, 0 to 2 percent slopes, occasionally flooded NWI classification: UPL

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Upland adjacent to WTL-3

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)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along 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)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes _____	No ✓	Depth (inches): _____
Water Table Present?	Yes _____	No ✓	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No ✓	Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

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

Remarks:

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

Sampling Point: 1-DPU-4

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1. Ulmus americana	20	✓	FAC
2. Acer negundo	10	✓	FAC
3. Carya ovata	10	✓	FACU
4. Celtis occidentalis	10	✓	FACU
5. Quercus velutina	5		
6.			
7.			
8.			
	55 = Total Cover		
50% of total cover: 27.50	20% of total cover: 11.00		

Sapling/Shrub Stratum (Plot size: 30 ft r)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Herb Stratum (Plot size: 30 ft r)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Woody Vine Stratum (Plot size: 30 ft r)			
1. Ampelopsis cordata	5	✓	FAC
2.			
3.			
4.			
5.			
	5 = Total Cover		
50% of total cover: 2.50	20% of total cover: 1.00		

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 60.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	35	x 3 =	105
FACU species	20	x 4 =	80
UPL species	0	x 5 =	0
Column Totals:	55 (A)		185 (B)

Prevalence Index = B/A = 3.36

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four 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 vines, less than 3 in. DBH and greater than 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 ☑

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: 1-DPU-4

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 - 12	10YR 5/3	98	10YR 5/6	2	C	M	Clay Loam	
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** ✓

Remarks:

An affirmative response to 1-6 of the Decision Table identifies the wetland per rule as an Outstanding Natural Resource Water (ONRW) or Exceptional Tennessee Waters (ETW). A positive response to 7-13 requires a final determination by the Department.

#	**Wetland Feature Decision Table** PIN 102251.01; WTL-3	**Yes/No**	**Affirmative Result**
1	The wetland has been designated as an **Outstanding Natural Resource Water (ONRW)** by the Department under 0400-40-03-.06(5)(a)**.**	No	**ORNW**
2	The wetland has previously been designated and documented as an Exceptional Tennessee Water (ETW) by the Department under 0400-40-03-.06(4)(a)(7)	No	**ETW**
3	The wetland is within state or national parks, wildlife refuges, forests, wilderness areas, natural areas, or is a designated State Scenic Rivers or Federal Wild and Scenic Rivers.	No	**ETW**
4	The wetland is known to contain a documented non-experimental population of state or federally listed threatened or endangered aquatic or semi-aquatic plants, or aquatic animals.	No	**ETW**
5	The wetland or the area it is in has been designated by the U.S. Fish and Wildlife Service as "**Critical Habitat**" for any threatened or endangered aquatic or semi-aquatic plant or aquatic animal species.	No	**ETW**
6	The wetland falls within an area designated as Lands Unsuitable for Mining pursuant to the federal Surface Mining Control and Reclamation Act where such designation is based in whole or in part on impacts to water resource values	No	**ETW**
7	**The wetland exhibits outstanding ecological or recreational values such as, but not limited to, those as outlined in 8-12**	No	Determination Required by TDEC
8	The wetland fits within the species composition concept for any plant community found in the state of Tennessee **ranked G2, G1, or more imperiled** at the "Association" classification level according to the NatureServe and Natural Heritage Ranking system (e.g. "bog", "fen", and "wet prairie/barren" communities).	No	Determination Required by TDEC
9	The wetland is **an uncommon resource** (e.g. vernal pools, headwater wetlands, sinks, spring/seeps, glades, newly described communities, high recreational or socioeconomic value) in the region and/or is deemed such by concurrence of qualified scientists.	No	Determination Required by TDEC
10	The wetland is an **older aged forested wetland** comprised of overstory trees with an average diameter at breast height (dbh) being **greater than or equal to 30 in** within the WAA.	No	Determination Required by TDEC
11	The wetland is observed and documented to be a **significant waterfowl, songbird, shorebird, amphibian, bat, fish habitat area**. These may include rookeries, migratory congregations, nesting sites, breeding areas, etc.	No	Determination Required by TDEC
12	The wetland is **hydrologically connected** to and/or has significant ecological contribution to an **ETW**	No	Determination Required by TDEC
13	The wetland has High Resource Value as determined by a **score of 75 and above** using the TRAM or non-HGM TRAM (to be determined after completing the quantitative portion of this manual)	No	Determination Required by TDEC

End of Narrative Rating. Begin Quantitative Rating on Next Page.

HGM FUNCTIONAL ASSESSMENT
SLOPE WETLANDS

Date: 08/14/2024 Project Name SR-19, 102251.01

Field Personnel RF, MM Wetland Name/Location WTL-3

Read instructions prior to conducting assessments. If project area is large or highly heterogeneous requiring the designation of several WAAs, a separate assessment should be performed for each WAA. CHECK THE APPROPRIATE BLANK(S) BELOW.

V1: Hydroperiod (HYDRO)

☐ 1. Hydrology not altered (SI = 1.0)
- no fill material or excessive sediment
- no ditches/drainage tiles
- no roads or other impediments to surface or groundwater
- no excavation
- no alteration to overland runoff, groundwater discharge/recharge

☐ 2. Hydrology slightly altered (SI = 0.75)
- portion of site with minimal fill or sediment
- portion of site with drainage ditches/tiles
- roads or other impediments, water flow slightly altered
- minor portion of site excavated
- some alteration to overland runoff, groundwater discharge/recharge

☐ 3. Hydrology moderately altered (SI = 0.5)
- portion of site with moderate fill or sediment
- portion of site with drainage ditches/tiles
- some alteration to overland runoff, groundwater discharge/recharge
- roads or other impediments, water flow moderately altered
- moderate portion of site excavated

☑ 4. Hydrology significantly altered (SI = 0.25)
- portion of site with significant fill or sediment
- portion of site with drainage ditches/tiles
- significant alteration to overland runoff, groundwater discharge/recharge
- roads or other impediments, water flow significantly altered
- significant portion of site excavated

☐ 5. Hydrology severely altered (SI = 0.1)
- entire site impacted by fill or excessive sediment
- entire site with numerous drainage ditches/tiles
- no contributions to or from overland runoff, groundwater discharge/recharge
- roads or other impediments, water flow completely blocked
- entire wetland affected

V2: Wetland Watershed Integrity (WSHEDINT)

Use weighted average as discussed on page 10. Examples of land uses and multipliers listed below

A = Percentage forested with no impervious surfaces 0
B = Percentage permeable land, (e.g., park, golf course, pasture, hay, orchard, tree farm, or similar) 100
C = Percentage low density residential, construction, or similar 0
D = Percentage high density residential, or similar 0
E = Percentage urban, commercial, industrial, or similar 0

V2 = (A x 1.0) + (B x 0.75) + (C x 0.5) + (D x 0.25) + (E x 0.01)/(100) = 0.75

V3: Canopy Tree Size Class (TSIZE)

1. Average size of canopy trees > 3 in. DBH

☐ ≥ 15 in. (SI = 1.0) ☐ 10 – 14 in. (SI = 0.75) ☐ 6 – 9 in. (SI = 0.5) ☐ 3 – 5 in. (SI = 0.25)
☑ < 3 in. or no trees present, go to V5

V4: Canopy Tree Density (TDEN)

1. Average number of canopy trees (> 3 in. DBH) per 30-ft. radius plot

☐ 5 – 10 (SI = 1.0) ☐ 11 – 15 (SI = 0.75) ☐ > 15 (SI = 0.5) ☐ 1 – 4 (SI = 0.5)

V5: Shrub Cover (SCOV)

1. Average percent cover of shrubs (woody stems < 3 in. DBH and taller than 3 ft.) per 30-ft. radius plot

☐ > 20 (SI = 1.0) ☑ < 20, go to V6

V6: Ground Vegetation Cover (GVC)

1. Average percent cover of ground vegetation per 30-ft. radius plot

☐ ≥ 70 (SI = 1.0) ☐ 55 – 69 (SI = 0.75) ☐ 45 – 54 (SI = 0.5) ☐ 30 – 44 (SI = 0.25) ☐ 20 – 29 (SI = 0.1)
☑ < 20 (SI=0.0)

V7: Vegetation Composition and Diversity (COMP)

1. Check the dominant species from Groups 1, 2, and 3 below using the 50/20 rule. If tree cover is < 20%, check the dominants in the next tallest stratum. If a dominant does not appear in lists below, but is a native species, it can be added to Group 1 or 2 species based on the scientific literature or professional judgement. Native shrub and herbaceous species are assigned to Group 2. When using shrub or herbaceous write in the number of dominant species. Dominant invasive species are checked regardless of stratum. *

GROUP 1 (Reference Standard)		GROUP 2 (Native Ubiquitous)		GROUP 3 (Invasive)
☐ Water oak	☐ Pin oak	☐ American elm	☐ Green ash	☐ European/Chinese privet
☐ Bur oak	☐ Shumard oak	☐ Slippery elm	☐ Red maple	☐ Japanese honeysuckle
☐ Willow oak	☐ Bald cypress	☐ Sweetgum	☐ Silver maple	☐ Japanese stiltgrass
☐ Swamp chestnut oak	☐ Water tupelo	☐ Blackgum	☐ Black willow	☐ Purple loosestrife
☐ Cherrybark oak	☐ S. black gum	☐ Silky dogwood	☐ Sycamore	☐ Giant reed
☐ Swamp white oak	☐ Persimmon	☐ Boxelder	☐ _____	☐ Tall fescue
☐ Nuttall oak	☐ Am. hornbeam	☐ Tulip poplar	☐ _____	☐ Phragmites
☐ Overcup oak	☐ _____	____ Number native shrub spp.		☐ _____
☐ _____	☐ _____	3 Number native herbaceous spp.		☐ _____

2. Using the number of dominants in Groups 1, 2, and 3 above, calculate a quality index (Q) using the following formula: [(1.0 x # of checked dominants in Group 1) + (0.66 x # of checked dominants in Group 2) + (0.0 x # of checked dominants in Group 3)]/ total # of checked dominants in all groups = 0.66

3. Multiply Q above by one of the following constants that reflects species richness:[1]

- ○ a) if ≥ 4 species from Groups 1 and/or 2 occur as dominants, multiply Q by 1.0 _____
- ◉ b) if 3 species from Groups 1 and/or 2 occur as dominant, multiply Q by 0.75 0.495
- ○ c) if 2 species from Groups 1 and/or 2 occur as dominants, multiply Q by 0.50 _____
- ○ d) if 1 species from Groups 1 and/or 2 occurs as dominant, multiply Q by 0.25 _____
- ○ e) if no species from Groups 1 and/or 2 occurs as dominant, multiply Q by 0.0 0

4. Calculate the square root of the value from Step 3 above. This value is the SI for **V7**= 0.70

*In some Depression wetlands and in some small WAAs (e.g., <0.5 acres), relatively few species (e.g., overcup oak) may be present. In cases in which this is the normal condition, Q can be multiplied by 1.0 if only 1 or 2 species are dominant.

V8: Soil Organic Matter (ORGANIC)

1. Surface horizons unaltered

☐ 100 percent cover of O and/or A horizon present (SI = 1.0)

2. Surface horizons altered. Estimate the percent of the WAA in which neither an O or A horizon is present. 80

3. Subtract the sum of the values from Step 2 from 100. Convert this value to a decimal. This value is the SI for V8 (e.g., if 75 % of the WAA does not have an O or A horizon due to a significant disturbance, it will have an SI of 0.25).

V9: Buffer (BUFFER)

1. Determine the Connection Index (CI) by estimating the percent of the wetland surrounded by suitable buffer habitat.

☐ 90% – 100% (CI = 1.0) ☐ 75% – 89% (CI = 0.75) ☐ 40% – 74% (CI = 0.5) ☐ 10% – 39% (CI = 0.25)
☑ < 10% (CI = 0.1)

2. Multiply the CI by one if the following values:

- ○ a) if average buffer width is ≥ 492 ft., multiply by 1.0
- ○ b) if average buffer is 98 ft to 491 ft., multiply by 0.66
- ○ c) if average buffer width is 33 ft to 97 ft., multiply by 0.33
- ◉ d) if average buffer width is < 33 ft., multiply by 0.1

3. This value is the SI for **V9** = 0.01 .

VALUES USED TO CALCULATE FUNCTIONAL CAPACITY INDICES (FCIs)

SUBINDEX VALUES:

V1 0.25 (HYDRO) V3 0 (TSIZE) V5 0 (SCOV) V7 0.70 (COMP) V9 0.01 (BUFFER)

V2 0.75 (WSHEDINT) V4 0 (TDEN) V6 0 (GVC) V8 0.2 (ORGANIC)

Slope Wetland

WTL-3

V1: HYDROPERIOD	**0.25**	**Function 1: Maintain Hydrologic Regime**
V2: WETLAND WATERSHED INTEGRITY	**0.75**	(V1 x V2)^(1/2)
V3: CANOPY TREE CLASS	**GOTOV5**	
V4: CANOPY TREE DENSITY	**N/A**	**Function 2: Maintain Biogeochemical Processes**
V5: SHRUB COVER	**GOTOV6**	
V6: GROUND VEGETATION COVER	**0**	
V7: VEGETATION COMPOSITION AND DIVERSITY	**0.70**	
2. Q =	**0.66**	
# of Group 1 Dominants	0	
# of Group 2 Dominants	3	
# of Group 3 Dominants	0	
SPECIES RICHNESS CONSTANT	0.75	
V8: SOIL ORGANIC MATTER	**0.2**	
V9:BUFFER	**0.01**	
1. Connection Index	0.1	
2. Buffer width value (0-1)	0.1	

FCI (trees present)= $\left((V1 \times V2)^{1/2} \times \left(\frac{\frac{V3+V4}{2}+V8}{2}\right)\right)^{1/2}$

FCI (shrubs present)= $\left((V1 \times V2)^{1/2} \times \left(\frac{V5+V8}{3}\right)\right)^{1/2}$

FCI (ground cover)= $\left((V1 \times V2)^{1/2} \times \left(\frac{V6+V8}{5}\right)\right)^{1/2}$

Function 3: Maintain Characteristic Plant Community

FCI (trees present) = $\frac{(V1 \times V2)^{1/2}+2\left(\frac{V3+V4+V7}{3}\right)}{3}$

FCI (shrubs present) = $\frac{(V1 \times V2)^{1/2}+2\left(\frac{V5+V7}{2}\right)}{6}$

FCI (groundcover) = $\frac{(V1 \times V2)^{1/2}+2\left(\frac{V6+V7}{2}\right)}{9}$

Function 4: Maintain Characteristic Wildlife Community:

FCI (trees) = $\frac{(V1 \times V2)^{1/2}+2\left(\frac{V3+V4+V7}{3}\right)+V9}{4}$

FCI (shrubs present) = $\frac{(V1 \times V2)^{1/2}+2\left(\frac{V5+V7}{2}\right)+V9}{6}$

FCI (groundcover) = $\frac{(V1 \times V2)^{1/2}+2\left(\frac{V6+V7}{2}\right)+V9}{9}$

FCI 1 =	**0.43**	**Final Tree =**	**#VALUE!**
FCI 2 trees=	**#VALUE!**	**Final Shrubs=**	**#VALUE!**
		Final Herbaceous =	**0.20**
FCI 2 shrubs=	**#VALUE!**		
FCI 2 ground =	**0.13**		
FCI 3 trees=	**#VALUE!**		
FCI 3 shrubs=	**#VALUE!**		
FCI 3 ground =	**0.13**		
FCI 4 trees=	**#VALUE!**		
FCI 4 shrubs=	**#VALUE!**		
FCI 4 ground =	**0.13**		

TRAM Summary Worksheet

Project: SR-19, PIN 102251.01, WTL-3

Exceptional Status Wetlands		**Check if applicable**
	1. **ONRW**	☐
	2. **ETW**	☐
	3. **Further Review Requested:** Attach Wetland Background and Exceptional Status Wetlands Worksheet	☐
	COMMENTS/NOTES:	
Quantitative Rating scores	Function: Hydrologic Regime	0.43
	Function: Biogeochemical Processes	0.13
	Function: Retain Particulates	n/a
	Function: Plant Community	0.13
	Function: Wildlife Community	0.13
	Quantitative Score (Average of FCIs x 100)	20.50
	Value Added (Significant Size) Total	0
Total of Quantitative and Value Added Scores	**TOTAL SCORE**	20.50

Ecology Field Data Sheet: **Water Resources**

Project: Lauderdale County, SR-19, 102251.01					
Biologist:	RF & MM	**Affiliation:**	JMT	**Date:**	08-14-24

1-Station: from plans	~0.31 miles West of Red Bird Rd on SR-19								
2-Map label and name	WWC-14/EPH-11								
3-Latitude/Longitude	35.715646, -89.480606								
4-Feature description:									
-channel identification	perennial stream		intermittent stream		ephemeral stream		wwc	✓	
-HD score (if applicable)	9.5								
-OHWM indicators	bed & banks	✓	deposition		presence of litter debris	✓	scour		veg absent, bent, matted ✓
	change in plant community		destruction of terrestrial veg		multiple observe flow events		sediment sorting		water staining
	change in soil character		leaf litter disturb or absent		natural line impressed on bank		shelving		wracking
-channel bottom width	3'		-top of bank width		3'				
-width and max depth at ordinary high water mark	6" width, 6" max depth								
-width at bankfull	3'								
-bank height	LDB - 1.5'		RDB - 1.5'						
-riffle/pool complex or other specialized habitat present?	No								
-dominant riparian species: ----------(LDB /RDB)----------	LDB: American elm, box elder								
	RDB: American elm, box elder								
-particle size distribution %	Silt/Sand: 100		Gravel:		Cobble:		Boulder:		Bedrock:
5-photo numbers	43								
6-HUC -8 Code & Name	08010208 - Lower Hatchie								
7-Assessed	yes		no	✓					
8-ETW	yes		no	✓					
9-303 (d) List	yes		siltation		habitat:		other:		
	no	✓							
10-Notes									

Revised July 2022

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Cane Creek		Date/Time: 8/14/24
Assessors/Affiliation: RF, MM; JMT		Project ID : 102251.01
Site Name/Description: WWC-14/EPH-11		
Site Location: ~0.31 miles West of Red Bird Rd on SR-19		
HUC (12 digit): 080102080701	Latitude: 35.715646	
Previous Rainfall (7-days) : < 0.5 inches	Longitude: -89.480606	
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0		
Watershed Size : <0.01 sq. miles	County: Lauderdale	
Soil Type(s) / Geology : Adler Silt Loam	Source: NRCS Web Soil Survey	
Surrounding Land Use : Agriculture		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 9.5

Justification / Notes :

Incipient drought (based on APT). Drains upland runoff into 1-WTL-F.

Slightly altered around agricultural fields.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 6.5)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	1.5 2	3
2. Sinuous channel	0 0.5	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 0)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 3)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants.

[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 9.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Ecology Field Data Sheet: **Water Resources**

Project: Lauderdale County, SR-19, 102251.01					
Biologist:	JC & JG	**Affiliation:**	JMT	**Date:**	08-14-24

1-Station: from plans	Northwest of Red Bird Rd meeting SR-19										
2-Map label and name	STR-4										
3-Latitude/Longitude	35.715461, -89.479659										
4-Feature description:											
-channel identification	perennial stream	✓	intermittent stream		ephemeral stream		wwc				
-HD score (if applicable)	28.5										
-OHWM indicators	bed & banks	✓	deposition	✓	presence of litter debris		scour	✓	veg absent, bent, matted		
	change in plant community	✓	destruction of terrestrial veg	✓	multiple observe flow events		sediment sorting	✓	water staining		
	change in soil character	✓	leaf litter disturb or absent		natural line impressed on bank	✓	shelving	✓	wracking	✓	
-channel bottom width	10'				-top of bank width		20'				
-width and max depth at ordinary high water mark	1' width, 1' max depth										
-width at bankfull	14'										
-bank height	LDB - 12'				RDB - 12'						
-riffle/pool complex or other specialized habitat present?	No										
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Johnson grass, cottonwood, elderberry										
	RDB: Johnson grass, cottonwood, elderberry										
-particle size distribution %	Silt/Sand:	100	Gravel:		Cobble:		Boulder:		Bedrock:		
5-photo numbers	44-46										
6-HUC -8 Code & Name	08010208 - Lower Hatchie										
7-Assessed	yes		no	✓							
8-ETW	yes		no	✓							
9-303 (d) List	yes		siltation		habitat:		other:				
	no	✓									
10-Notes	On north side of SR-19, top of bank width, as well as width at bankfull, was double (~45') and dominant riparian species were similar, including horsetail. It also lacked riffle/pool complex.										

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Cane Creek		Date/Time: 08/12/24
Assessors/Affiliation: JC, JG; JMT		Project ID : 102251.01
Site Name/Description: STR-4		
Site Location: Northwest of Red Bird Rd meeting SR-19		
HUC (12 digit): 080102080701	Latitude: 35.715461	
Previous Rainfall (7-days) : <0.5 inches	Longitude: -89.479659	
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0		
Watershed Size : 2.19 sq. miles	County: Lauderdale	
Soil Type(s) / Geology : Alder Silt Loam	Source: NRCS Web Soil Survey	
Surrounding Land Use : Agricultural		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = 28.5

Justification / Notes :

Incipient drought (based on APT).

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 11.5)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	0.5 1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 9.5)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 7.5)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 28.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Wetland plants: salix spp. Amphibians: frogs (both sides of SR-19)

North side of SR-19 had less alluvial deposits, weaker in-channel structures and sorting, weaker leaf litter, moderate algae and absent of wetland plants in the channel bed. Regardless, both sides scored 28.5.

Ecology Field Data Sheet: **Water Resources**

Project: Lauderdale County, SR-19, 102251.01					
Biologist:	RF & MM	**Affiliation:**	JMT	**Date:**	08-14-24

1-Station: from plans	~0.25 miles West of Red Bird Rd on SR-19								
2-Map label and name	WWC-15/UDF-4								
3-Latitude/Longitude	35.715552, -89.479261								
4-Feature description:									
-channel identification	perennial stream		intermittent stream		ephemeral stream		wwc	✓	
-HD score (if applicable)	8								
-OHWM indicators	bed & banks	✓	deposition		presence of litter debris		scour		veg absent, bent, matted
	change in plant community		destruction of terrestrial veg		multiple observe flow events		sediment sorting		water staining
	change in soil character		leaf litter disturb or absent		natural line impressed on bank		shelving		wracking
-channel bottom width	1'		-top of bank width		1'				
-width and max depth at ordinary high water mark	1' width, 3" max depth"								
-width at bankfull	1'								
-bank height	LDB - 1'				RDB - 1'				
-riffle/pool complex or other specialized habitat present?	No								
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Horsetail								
	RDB: Horsetail								
-particle size distribution %	Silt/Sand:	100	Gravel:		Cobble:		Boulder:		Bedrock:
5-photo numbers	47-48								
6-HUC -8 Code & Name	08010208 - Lower Hatchie								
7-Assessed	yes		no	✓					
8-ETW	yes		no	✓					
9-303 (d) List	yes		siltation		habitat:		other:		
	no	✓							
10-Notes	Drains into STR-4.								

Revised July 2022

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Cane Creek		Date/Time: 8/14/24
Assessors/Affiliation: RF, MM; JMT		Project ID : 102251.01
Site Name/Description: WWC-15/UDF-4		
Site Location: ~0.25 miles West of Red Bird Rd on SR-19		
HUC (12 digit): 080102080701	Latitude: 35.715552	
Previous Rainfall (7-days) : < 0.5 inches	Longitude: -89.479261	
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0		
Watershed Size : 0.08 sq. miles	County: Lauderdale	
Soil Type(s) / Geology : Adler Silt Loam	Source: NRCS Web Soil Survey	
Surrounding Land Use : Agriculture		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 8

Justification / Notes :

Incipient drought (based on APT). Flows into STR-4.

Slightly altered around agricultural fields.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 1.5)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	1.5 2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 3)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 3.5)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1 0.5	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants.

[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 8

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Ecology Field Data Sheet: **Water Resources**

Project: Lauderdale County, SR-19, 102251.01					
Biologist:	RF & MM	**Affiliation:**	JMT	**Date:**	08-14-24

1-Station: from plans	~0.25 miles West of Red Bird Rd on SR-19									
2-Map label and name	WWC-16/UDF-5									
3-Latitude/Longitude	35.716036, -89.479471									
4-Feature description:										
-channel identification	perennial stream		intermittent stream		ephemeral stream		wwc	✓		
-HD score (if applicable)	4.5									
-OHWM indicators	bed & banks	✓	deposition		presence of litter debris		scour		veg absent, bent, matted	
	change in plant community		destruction of terrestrial veg		multiple observe flow events		sediment sorting		water staining	
	change in soil character		leaf litter disturb or absent		natural line impressed on bank		shelving		wracking	
-channel bottom width	2'			-top of bank width		2'				
-width and max depth at ordinary high water mark	1' width, 6" max depth									
-width at bankfull	2'									
-bank height	LDB - 2'				RDB - 2'					
-riffle/pool complex or other specialized habitat present?	No									
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Horsetail									
	RDB: Horsetail									
-particle size distribution %	Silt/Sand:	100	Gravel:		Cobble:		Boulder:		Bedrock:	
5-photo numbers	49									
6-HUC -8 Code & Name	08010208 - Lower Hatchie									
7-Assessed	yes		no	✓						
8-ETW	yes		no	✓						
9-303 (d) List	yes		siltation		habitat:		other:			
	no	✓								
10-Notes	Drains into STR-4.									

Revised July 2022

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Cane Creek		Date/Time: 8/14/24
Assessors/Affiliation: RF, MM; JMT		Project ID : 102251.01
Site Name/Description: WWC-16/UDF-5		
Site Location: ~0.25 miles West of Red Bird Rd on SR-19		
HUC (12 digit): 080102080701	Latitude: 35.716036	
Previous Rainfall (7-days) : < 0.5 inches	Longitude: -89.479471	
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0		
Watershed Size : <0.01 sq. miles	County: Lauderdale	
Soil Type(s) / Geology : Adler Silt Loam	Source: NRCS Web Soil Survey	
Surrounding Land Use : Agriculture		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 4.5

Justification / Notes :

Incipient drought (based on APT). Flows into STR-4.

Slightly altered around agricultural fields.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 4)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 0)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 0.5)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 4.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : small 0.5' ditched channel that meets larger (WWC-17/UDF-6) to drain into STR-4

Ecology Field Data Sheet: **Water Resources**

Project: Lauderdale County, SR-19, 102251.01					
Biologist:	RF & MM	**Affiliation:**	JMT	**Date:**	08-14-24

1-Station: from plans	~0.25 miles West of Red Bird Rd on SR-19									
2-Map label and name	WWC-17/UDF-6									
3-Latitude/Longitude	35.716088, -89.479469									
4-Feature description:										
-channel identification	perennial stream		intermittent stream		ephemeral stream		wwc	✓		
-HD score (if applicable)	4.5									
-OHWM indicators	bed & banks	✓	deposition		presence of litter debris		scour		veg absent, bent, matted	
	change in plant community		destruction of terrestrial veg		multiple observe flow events		sediment sorting		water staining	
	change in soil character		leaf litter disturb or absent		natural line impressed on bank		shelving		wracking	
-channel bottom width	6"			-top of bank width		6"				
-width and max depth at ordinary high water mark	6" width, 3" max depth									
-width at bankfull	6"									
-bank height	LDB - 2'			RDB - 2'						
-riffle/pool complex or other specialized habitat present?	No									
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Horsetail, elderberry									
	RDB: Horsetail, elderberry									
-particle size distribution %	Silt/Sand:	100	Gravel:		Cobble:		Boulder:		Bedrock:	
5-photo numbers	50									
6-HUC -8 Code & Name	08010208 - Lower Hatchie									
7-Assessed	yes		no	✓						
8-ETW	yes		no	✓						
9-303 (d) List	yes		siltation		habitat:		other:			
	no	✓								
10-Notes	Drains into STR-4.									

Revised July 2022

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Cane Creek		Date/Time: 8/14/24
Assessors/Affiliation: RF, MM; JMT		Project ID : 102251.01
Site Name/Description: WWC-17/UDF-6		
Site Location: ~0.25 miles West of Red Bird Rd on SR-19		
HUC (12 digit): 080102080701	Latitude: 35.716088	
Previous Rainfall (7-days) : < 0.5 inches	Longitude: -89.479469	
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0		
Watershed Size : 2.27 sq. miles	County: Lauderdale	
Soil Type(s) / Geology : Adler Silt Loam	Source: NRCS Web Soil Survey	
Surrounding Land Use : Agriculture		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 4.5

Justification / Notes :

Incipient drought (based on APT). Flows into STR-4.

Slightly altered around agricultural fields.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 4)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 0)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 0.5)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 4.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Ditched out ag drainage overgrown with plants; some horsetail growing along banks and within upper extent; drains into STR-4

Ecology Field Data Sheet: **Water Resources**

Project: Lauderdale County, SR-19, 102251.01					
Biologist:	JC & JG	**Affiliation:**	JMT	**Date:**	08-14-24

1-Station: from plans	Southeast of Maple Hill Cir. meeting SR-19								
2-Map label and name	WWC-18/UDF-7								
3-Latitude/Longitude	35.714417, -89.469290								
4-Feature description:									
-channel identification	perennial stream		intermittent stream		ephemeral stream		wwc	✓	
-HD score (if applicable)	9.5								
-OHWM indicators	bed & banks	✓	deposition		presence of litter debris		scour		veg absent, bent, matted
	change in plant community		destruction of terrestrial veg		multiple observe flow events		sediment sorting		water staining
	change in soil character		leaf litter disturb or absent		natural line impressed on bank		shelving		wracking
-channel bottom width	1'		-top of bank width		10'				
-width and max depth at ordinary high water mark	4' width, 6" max depth								
-width at bankfull	4'								
-bank height	LDB - 4'		RDB - 4'						
-riffle/pool complex or other specialized habitat present?	No								
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Cottonwood, Johnson grass, Bermuda grass								
	RDB: Cottonwood, Johnson grass, Bermuda grass								
-particle size distribution %	Silt/Sand:	80	Gravel:	20	Cobble:		Boulder:		Bedrock:
5-photo numbers	51								
6-HUC -8 Code & Name	08010208 - Lower Hatchie								
7-Assessed	yes		no	✓					
8-ETW	yes		no	✓					
9-303 (d) List	yes		siltation		habitat:		other:		
	no	✓							
10-Notes	20% riprap								

Revised July 2022

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Cane Creek	Date/Time: 08/12/24
Assessors/Affiliation: JC, JG; JMT	Project ID : 102251.01
Site Name/Description: WWC-18/UDF-7	
Site Location: Southeast of Maple Hill Cir. meeting SR-19	
HUC (12 digit): 080102080701	Latitude: 35.714417
Previous Rainfall (7-days) : <0.5 inches	Longitude: -89.469290
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0	
Watershed Size : 0.90 sq. miles	County: Lauderdale
Soil Type(s) / Geology : Alder Silt Loam	Source: NRCS Web Soil Survey
Surrounding Land Use : Low Density Residential, Agricultural	
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 9.5

Justification / Notes :

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 4)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 0.5)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 5)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 9.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Channel is lined with riprap, flows into STR-X.

Ecology Field Data Sheet: **Water Resources**

Project: Lauderdale County, SR-19, 102251.01					
Biologist:	RB & BC	**Affiliation:**	JMT	**Date:**	08-14-24

1-Station: from plans	North side of SR-19 ~0.05 miles east of Maple Hill Circle								
2-Map label and name	STR-5								
3-Latitude/Longitude	35.714516, -89.468701								
4-Feature description:									
-channel identification	perennial stream	✓	intermittent stream		ephemeral stream		wwc		
-HD score (if applicable)	35.5								
-OHWM indicators	bed & banks	✓	deposition		presence of litter debris		scour	✓	veg absent, bent, matted ✓
	change in plant community	✓	destruction of terrestrial veg		multiple observe flow events		sediment sorting	✓	water staining ✓
	change in soil character	✓	leaf litter disturb or absent	✓	natural line impressed on bank	✓	shelving		wracking
-channel bottom width	12'		-top of bank width		20'				
-width and max depth at ordinary high water mark	14' width, max depth unknown								
-width at bankfull	15'								
-bank height	LDB - 5'		RDB - 10'						
-riffle/pool complex or other specialized habitat present?	No								
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Green ash								
	RDB: Green ash								
-particle size distribution %	Silt/Sand: unk		Gravel:		Cobble:		Boulder:		Bedrock:
5-photo numbers	52-55								
6-HUC -8 Code & Name	08010205 - South Fork Forked River								
7-Assessed	yes			no	✓				
8-ETW	yes			no	✓				
9-303 (d) List	yes		siltation		habitat:		other:		
	no	✓							
10-Notes	Ditched stream with tall spoil levees. Inaccessible to calculate max depth or particle size distribution %.								

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Cane Creek	Date/Time: 08/14/24
Assessors/Affiliation: RB, BC; JMT	Project ID : 102251.01
Site Name/Description: STR-5	
Site Location: North side of SR-19 ~0.05 miles east of Maple Hill Circle	
HUC (12 digit): 080102080701	Latitude: 35.714516
Previous Rainfall (7-days) : < 0.5 inches	Longitude: -89.468701
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0	
Watershed Size : 0.90 sq. miles	County: Lauderdale
Soil Type(s) / Geology : Adler Silt Loam	Source: NRCS Web Soil Survey
Surrounding Land Use : Low Density Residential, Agricultural	
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = 35.5

Justification / Notes :

Incipient drought (based on APT).

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 14.5)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 10.5)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 11.5)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 36.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Strong Amphibian (Frogs) presence on both sides of SR-19.

South of SR-19 has stronger in-channel structure, weaker sorting and depositional bars/benches, weaker floodplain, more headcuts present, more moderate hydrology indicators, more fibrous roots and rooted plants in channel bed, moderate algae, and less iron oxidizing bacteria/fungus.
There were also moderate macrobenthos including two snail types, black beetles (coleoptera), black soldier flies (Stratiomyidae), >10 odonata (dragonflies and damselflies) only observed in pools, not entire channel.
At the culvert on the south side of SR-19, rip-rap present and corrugated roadside ditch to the east. Two pipes exposed in the bed of the channel. Stream on the south side of SR-19 scored 2 points higher in geomorphology, but overall they're very similar.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: TN SR-19 City/County: Lauderdale County Sampling Date: 2024-09-16

Applicant/Owner: TDOT State: Tennessee Sampling Point: 1-DPW-3

Investigator(s): Rhiannon Flickinger and Miranda McKiernan Section, Township, Range:

Landform (hillslope, terrace, etc.): Slope Local relief (concave, convex, none): Concave Slope (%): 3

Subregion (LRR or MLRA): P 134 Lat: 35.71426433 Long: -89.46201273 Datum: NAD83_2011

Soil Map Unit Name: Ad - Adler silt loam, 0 to 2 percent slopes, occasionally flooded NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓	No _____	
Wetland Hydrology Present?	Yes ✓	No _____	

Remarks:

WTL-5

Form also represents WTL-4 and WTL-1

Large, slope wetland located at the roadside toe-of-slope, connected to a stream. Receives hydrology from upland/roadside runoff and feeds into the stream.

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)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along 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)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes _____	No ✓	Depth (inches): _____
Water Table Present?	Yes _____	No ✓	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No ✓	Depth (inches): _____

Wetland Hydrology Present? Yes ✓ No _____

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

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: 1-DPW-3

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix nigra	15	✓	OBL
2. Liquidambar styraciflua	5	✓	FAC
3.			
4.			
5.			
6.			
7.			
8.			
	20 = Total Cover		
50% of total cover: 10.00	20% of total cover: 4.00		

Sapling/Shrub Stratum (Plot size: 30 ft r)			
1. Platanus occidentalis	5	✓	FACW
2. Salix nigra	5	✓	OBL
3.			
4.			
5.			
6.			
7.			
8.			
	10 = Total Cover		
50% of total cover: 5.00	20% of total cover: 2.00		

Herb Stratum (Plot size: 30 ft r)			
1. Dichanthelium clandestinum	40	✓	FACW
2. Microstegium vimineum	35	✓	FAC
3. Andropogon gerardii	20	✓	FAC
4. Solidago altissima	20	✓	FACU
5. Ambrosia artemisiifolia	15		FACU
6. Scirpus atrovirens	15		OBL
7. Carex frankii	10		OBL
8. Cyperus strigosus	10		FACW
9. Salix nigra	5		OBL
10. Melothria pendula	3		FAC
11. Verbena urticifolia	3		FAC
12.			
	176 = Total Cover		
50% of total cover: 88.00	20% of total cover: 35.20		

Woody Vine Stratum (Plot size: 30 ft r)			
1. Lonicera japonica	10	✓	FACU
2.			
3.			
4.			
5.			
	10 = Total Cover		
50% of total cover: 5.00	20% of total cover: 2.00		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 7 (A)

Total Number of Dominant Species Across All Strata: 9 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 77.77 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	50	x 1 =	50
FACW species	55	x 2 =	110
FAC species	66	x 3 =	198
FACU species	45	x 4 =	180
UPL species	0	x 5 =	0
Column Totals:	216 (A)		538 (B)

Prevalence Index = B/A = 2.49

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☑ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four 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 vines, less than 3 in. DBH and greater than 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 ____

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: 1-DPW-3

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 - 5.5	2.5YR 4/2	98	10YR 5/8	2	C	M	Silty Clay Loam	
5.5 - 12	10YR 5/2	93	10YR 5/8	7	C		Silty Clay Loam	
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✓ **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: TN SR-19 City/County: Lauderdale County Sampling Date: 2024-08-14

Applicant/Owner: TDOT State: Tennessee Sampling Point: 1-DPU-2

Investigator(s): Rhiannon Flickinger and Miranda McKiernan Section, Township, Range:

Landform (hillslope, terrace, etc.): Upland Local relief (concave, convex, none): Linear Slope (%): 2

Subregion (LRR or MLRA): P 134 Lat: 35.7142951 Long: -89.4620578 Datum: NAD83_2011

Soil Map Unit Name: Ad - Adler silt loam, 0 to 2 percent slopes, occasionally flooded NWI classification: UPL

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

WTL-5 upland form
Form also represents uplands adjacent to wetland WTL-4, WTL-1

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)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along 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)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes _____	No ✓	Depth (inches): _____
Water Table Present?	Yes _____	No ✓	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No ✓	Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

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

Remarks:

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

Sampling Point: 1-DPU-2

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size: 30 ft r)			
1. Rubus argutus	30	✓	FAC
2. Diospyros virginiana	5		FAC
3.			
4.			
5.			
6.			
7.			
8.			
	35 = Total Cover		
50% of total cover: 17.50	20% of total cover: 7.00		
Herb Stratum (Plot size: 30 ft r)			
1. Solidago altissima	50	✓	FACU
2. Ambrosia artemisiifolia	25	✓	FACU
3. Andropogon gerardii	25	✓	FAC
4. Rubus allegheniensis	5		UPL
5. Rubus argutus	5		FAC
6. Toxicodendron radicans	5		FAC
7. Ulmus americana	3		FAC
8.			
9.			
10.			
11.			
12.			
	118 = Total Cover		
50% of total cover: 59.00	20% of total cover: 23.60		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of 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: 50.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	73	x 3 =	219
FACU species	75	x 4 =	300
UPL species	5	x 5 =	25
Column Totals:	153 (A)		544 (B)

Prevalence Index = B/A = 3.55

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four 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 vines, less than 3 in. DBH and greater than 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 ✓

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: 1-DPU-2

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 - 12	10YR 5/4	98	10YR 5/8	2	C	M	Clay Loam	
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** ✓

Remarks:

An affirmative response to 1-6 of the Decision Table identifies the wetland per rule as an Outstanding Natural Resource Water (ONRW) or Exceptional Tennessee Waters (ETW). A positive response to 7-13 requires a final determination by the Department.

#	**Wetland Feature Decision Table** PIN 102251.01; WTL-4	**Yes/No**	**Affirmative Result**
1	The wetland has been designated as an **Outstanding Natural Resource Water (ONRW)** by the Department under 0400-40-03-.06(5)(a)**.**	No	**ORNW**
2	The wetland has previously been designated and documented as an Exceptional Tennessee Water (ETW) by the Department under 0400-40-03-.06(4)(a)(7)	No	**ETW**
3	The wetland is within state or national parks, wildlife refuges, forests, wilderness areas, natural areas, or is a designated State Scenic Rivers or Federal Wild and Scenic Rivers.	No	**ETW**
4	The wetland is known to contain a documented non-experimental population of state or federally listed threatened or endangered aquatic or semi-aquatic plants, or aquatic animals.	No	**ETW**
5	The wetland or the area it is in has been designated by the U.S. Fish and Wildlife Service as "**Critical Habitat**" for any threatened or endangered aquatic or semi-aquatic plant or aquatic animal species.	No	**ETW**
6	The wetland falls within an area designated as Lands Unsuitable for Mining pursuant to the federal Surface Mining Control and Reclamation Act where such designation is based in whole or in part on impacts to water resource values	No	**ETW**
7	**The wetland exhibits outstanding ecological or recreational values such as, but not limited to, those as outlined in 8-12**	No	Determination Required by TDEC
8	The wetland fits within the species composition concept for any plant community found in the state of Tennessee **ranked G2, G1, or more imperiled** at the "Association" classification level according to the NatureServe and Natural Heritage Ranking system (e.g. "bog", "fen", and "wet prairie/barren" communities).	No	Determination Required by TDEC
9	The wetland is **an uncommon resource** (e.g. vernal pools, headwater wetlands, sinks, spring/seeps, glades, newly described communities, high recreational or socioeconomic value) in the region and/or is deemed such by concurrence of qualified scientists.	No	Determination Required by TDEC
10	The wetland is an **older aged forested wetland** comprised of overstory trees with an average diameter at breast height (dbh) being **greater than or equal to 30 in** within the WAA.	No	Determination Required by TDEC
11	The wetland is observed and documented to be a **significant waterfowl, songbird, shorebird, amphibian, bat, fish habitat area**. These may include rookeries, migratory congregations, nesting sites, breeding areas, etc.	No	Determination Required by TDEC
12	The wetland is **hydrologically connected** to and/or has significant ecological contribution to an **ETW**	No	Determination Required by TDEC
13	The wetland has High Resource Value as determined by a **score of 75 and above** using the TRAM or non-HGM TRAM (to be determined after completing the quantitative portion of this manual)	No	Determination Required by TDEC

End of Narrative Rating. Begin Quantitative Rating on Next Page.

HGM FUNCTIONAL ASSESSMENT
SLOPE WETLANDS

Date: 08/14/2024 Project Name SR-19, 102251.01

Field Personnel RB, BC Wetland Name/Location WTL-4

Read instructions prior to conducting assessments. If project area is large or highly heterogeneous requiring the designation of several WAAs, a separate assessment should be performed for each WAA. CHECK THE APPROPRIATE BLANK(S) BELOW.

V1: Hydroperiod (HYDRO)

☑ 1. Hydrology not altered (SI = 1.0)
- no fill material or excessive sediment
- no ditches/drainage tiles
- no alteration to overland runoff, groundwater discharge/recharge
- no roads or other impediments to surface or groundwater
- no excavation

☐ 2. Hydrology slightly altered (SI = 0.75)
- portion of site with minimal fill or sediment
- portion of site with drainage ditches/tiles
- some alteration to overland runoff, groundwater discharge/recharge
- roads or other impediments, water flow slightly altered
- minor portion of site excavated

☐ 3. Hydrology moderately altered (SI = 0.5)
- portion of site with moderate fill or sediment
- portion of site with drainage ditches/tiles
- some alteration to overland runoff, groundwater discharge/recharge
- roads or other impediments, water flow moderately altered
- moderate portion of site excavated

☐ 4. Hydrology significantly altered (SI = 0.25)
- portion of site with significant fill or sediment
- portion of site with drainage ditches/tiles
- significant alteration to overland runoff, groundwater discharge/recharge
- roads or other impediments, water flow significantly altered
- significant portion of site excavated

☐ 5. Hydrology severely altered (SI = 0.1)
- entire site impacted by fill or excessive sediment
- entire site with numerous drainage ditches/tiles
- no contributions to or from overland runoff, groundwater discharge/recharge
- roads or other impediments, water flow completely blocked
- entire wetland affected

V2: Wetland Watershed Integrity (WSHEDINT)

Use weighted average as discussed on page 10. Examples of land uses and multipliers listed below

A = Percentage forested with no impervious surfaces _____
B = Percentage permeable land, (e.g., park, golf course, pasture, hay, orchard, tree farm, or similar) 100
C = Percentage low density residential, construction, or similar _____
D = Percentage high density residential, or similar _____
E = Percentage urban, commercial, industrial, or similar _____

V2 = (A x 1.0) + (B x 0.75) + (C x 0.5) + (D x 0.25) + (E x 0.01)/(100) = 0.75

V3: Canopy Tree Size Class (TSIZE)

1. Average size of canopy trees > 3 in. DBH

☐ ≥ 15 in. (SI = 1.0) ☐ 10 – 14 in. (SI = 0.75) ☐ 6 – 9 in. (SI = 0.5) ☐ 3 – 5 in. (SI = 0.25)
☑ < 3 in. or no trees present, go to V5

V4: Canopy Tree Density (TDEN)

1. Average number of canopy trees (> 3 in. DBH) per 30-ft. radius plot

☐ 5 – 10 (SI = 1.0) ☐ 11 – 15 (SI = 0.75) ☐ > 15 (SI = 0.5) ☐ 1 – 4 (SI = 0.5)

V5: Shrub Cover (SCOV)

1. Average percent cover of shrubs (woody stems < 3 in. DBH and taller than 3 ft.) per 30-ft. radius plot

☑ > 20 (SI = 1.0) ☐ < 20, go to V6

V6: Ground Vegetation Cover (GVC)

1. Average percent cover of ground vegetation per 30-ft. radius plot

☐ ≥ 70 (SI = 1.0) ☐ 55 – 69 (SI = 0.75) ☐ 45 – 54 (SI = 0.5) ☐ 30 – 44 (SI = 0.25) ☐ 20 – 29 (SI = 0.1)
☑ < 20 (SI=0.0)

V7: Vegetation Composition and Diversity (COMP)

1. Check the dominant species from Groups 1, 2, and 3 below using the 50/20 rule. If tree cover is < 20%, check the dominants in the next tallest stratum. If a dominant does not appear in lists below, but is a native species, it can be added to Group 1 or 2 species based on the scientific literature or professional judgement. Native shrub and herbaceous species are assigned to Group 2. When using shrub or herbaceous write in the number of dominant species. Dominant invasive species are checked regardless of stratum. *

GROUP 1 (Reference Standard)		GROUP 2 (Native Ubiquitous)		GROUP 3 (Invasive)
☐ Water oak	☐ Pin oak	☐ American elm	☑ Green ash	☐ European/Chinese privet
☐ Bur oak	☐ Shumard oak	☐ Slippery elm	☐ Red maple	☐ Japanese honeysuckle
☐ Willow oak	☐ Bald cypress	☑ Sweetgum	☐ Silver maple	☐ Japanese stiltgrass
☐ Swamp chestnut oak	☐ Water tupelo	☐ Blackgum	☑ Black willow	☐ Purple loosestrife
☐ Cherrybark oak	☐ S. black gum	☐ Silky dogwood	☑ Sycamore	☐ Giant reed
☐ Swamp white oak	☐ Persimmon	☐ Boxelder	☐ _____	☐ Tall fescue
☐ Nuttall oak	☐ Am. hornbeam	☐ Tulip poplar	☐ _____	☐ Phragmites
☐ Overcup oak	☐ _____	____ Number native shrub spp.		☐ _____
☐ _____	☐ _____	____ Number native herbaceous spp.		☐ _____

2. Using the number of dominants in Groups 1, 2, and 3 above, calculate a quality index (Q) using the following formula: [(1.0 x # of checked dominants in Group 1) + (0.66 x # of checked dominants in Group 2) + (0.0 x # of checked dominants in Group 3)]/ total # of checked dominants in all groups = 0.66

3. Multiply Q above by one of the following constants that reflects species richness:[1]

◉ a) if ≥ 4 species from Groups 1 and/or 2 occur as dominants, multiply Q by 1.0 — 0.66
○ b) if 3 species from Groups 1 and/or 2 occur as dominant, multiply Q by 0.75 — _____
○ c) if 2 species from Groups 1 and/or 2 occur as dominants, multiply Q by 0.50 — _____
○ d) if 1 species from Groups 1 and/or 2 occurs as dominant, multiply Q by 0.25 — _____
○ e) if no species from Groups 1 and/or 2 occurs as dominant, multiply Q by 0.0 — _____

4. Calculate the square root of the value from Step 3 above. This value is the SI for **V7**= 0.81

*In some Depression wetlands and in some small WAAs (e.g., <0.5 acres), relatively few species (e.g., overcup oak) may be present. In cases in which this is the normal condition, Q can be multiplied by 1.0 if only 1 or 2 species are dominant.

V8: Soil Organic Matter (ORGANIC)

1. Surface horizons unaltered

☑ 100 percent cover of O and/or A horizon present (SI = 1.0)

2. Surface horizons altered. Estimate the percent of the WAA in which neither an O or A horizon is present.

3. Subtract the sum of the values from Step 2 from 100. Convert this value to a decimal. This value is the SI for V8 (e.g., if 75 % of the WAA does not have an O or A horizon due to a significant disturbance, it will have an SI of 0.25).

V9: Buffer (BUFFER)

1. Determine the Connection Index (CI) by estimating the percent of the wetland surrounded by suitable buffer habitat.

☐ 90% – 100% (CI = 1.0) ☐ 75% – 89% (CI = 0.75) ☐ 40% – 74% (CI = 0.5) ☐ 10% – 39% (CI = 0.25)
☑ < 10% (CI = 0.1)

2. Multiply the CI by one if the following values:

○ a) if average buffer width is ≥ 492 ft., multiply by 1.0
○ b) if average buffer is 98 ft to 491 ft., multiply by 0.66
○ c) if average buffer width is 33 ft to 97 ft., multiply by 0.33
◉ d) if average buffer width is < 33 ft., multiply by 0.1

3. This value is the SI for **V9 =** 0.01 **.**

VALUES USED TO CALCULATE FUNCTIONAL CAPACITY INDICES (FCIs)

SUBINDEX VALUES:

V1 1.00 (HYDRO) V3 _____ (TSIZE) V5 1.00 (SCOV) V7 0.81 (COMP) V9 0.01 (BUFFER)

V2 0.75 (WSHEDINT) V4 _____ (TDEN) V6 0.00 (GVC) V8 1.00 (ORGANIC)

Slope Wetland

WTL-4

V1: HYDROPERIOD	**1**	
V2: WETLAND WATERSHED INTEGRITY	**0.75**	
V3: CANOPY TREE CLASS	**GOTOV5**	
V4: CANOPY TREE DENSITY	**N/A**	
V5: SHRUB COVER	**1**	
V6: GROUND VEGETATION COVER	**n/a**	
V7: VEGETATION COMPOSITION AND DIVERSITY	**0.81**	
2. Q =	**0.66**	
# of Group 1 Dominants	0	
# of Group 2 Dominants	4	
# of Group 3 Dominants	0	
SPECIES RICHNESS CONSTANT	1	
V8: SOIL ORGANIC MATTER	**1**	
V9:BUFFER	**0.01**	
1. Connection Index	0.1	
2. Buffer width value (0-1)	0.1	

Function 1: Maintain Hydrologic Regime

(V1 x V2)^(1/2)

FCI 1 = 0.87 **Final Tree = #VALUE!**

Function 2: Maintain Biogeochemical Processes

$$\text{FCI (trees present)} = \left((V1 \times V2)^{1/2} \times \left(\frac{\frac{V3+V4}{2}+V8}{2}\right)\right)^{1/2}$$

FCI 2 trees= #VALUE! **Final Shrubs= 0.63**

Final Herbaceous = #VALUE!

$$\text{FCI (shrubs present)} = \left((V1 \times V2)^{1/2} \times \left(\frac{V5+V8}{3}\right)\right)^{1/2}$$

FCI 2 shrubs= 0.76

$$\text{FCI (ground cover)} = \left((V1 \times V2)^{1/2} \times \left(\frac{V6+V8}{5}\right)\right)^{1/2}$$

FCI 2 ground = #VALUE!

Function 3: Maintain Characteristic Plant Community

$$\text{FCI (trees present)} = \frac{(V1 \times V2)^{1/2} + 2\left(\frac{V3+V4+V7}{3}\right)}{3}$$

FCI 3 trees= #VALUE!

$$\text{FCI (shrubs present)} = \frac{(V1 \times V2)^{1/2} + 2\left(\frac{V5+V7}{2}\right)}{6}$$

FCI 3 shrubs= 0.45

$$\text{FCI (groundcover)} = \frac{(V1 \times V2)^{1/2} + 2\left(\frac{V6+V7}{2}\right)}{9}$$

FCI 3 ground = #VALUE!

Function 4: Maintain Characteristic Wildlife Community:

FCI 4 trees= #VALUE!

$$\text{FCI (trees)} = \frac{(V1 \times V2)^{1/2} + 2\left(\frac{V3+V4+V7}{3}\right) + V9}{4}$$

FCI 4 shrubs= 0.45

$$\text{FCI (shrubs present)} = \frac{(V1 \times V2)^{1/2} + 2\left(\frac{V5+V7}{2}\right) + V9}{6}$$

FCI 4 ground = #VALUE!

$$\text{FCI (groundcover)} = \frac{(V1 \times V2)^{1/2} + 2\left(\frac{V6+V7}{2}\right) + V9}{9}$$

TRAM Summary Worksheet

Project: SR-19, PIN 102251.01, WTL-4

Exceptional Status Wetlands		**Check if applicable**
	1. **ONRW**	☐
	2. **ETW**	☐
	3. **Further Review Requested:** Attach Wetland Background and Exceptional Status Wetlands Worksheet	☐
	COMMENTS/NOTES:	
Quantitative Rating scores	Function: Hydrologic Regime	0.87
	Function: Biogeochemical Processes	0.76
	Function: Retain Particulates	n/a
	Function: Plant Community	0.45
	Function: Wildlife Community	0.45
	Quantitative Score (Average of FCIs x 100)	63.25
	Value Added (Significant Size) Total	0
Total of Quantitative and Value Added Scores	**TOTAL SCORE**	63.25

Ecology Field Data Sheet: **Water Resources**

Project: Lauderdale County, SR-19, 102251.01					
Biologist:	RB & BC	**Affiliation:**	JMT	**Date:**	08-14-24

1-Station: from plans	East of Maple Hill Cir on SR-19				
2-Map label and name	WWC-19/EPH-12				
3-Latitude/Longitude	35.714515, -89.469008				
4-Feature description:					
-channel identification	perennial stream ☐	intermittent stream ☐	ephemeral stream ☐	wwc ☑	
-HD score (if applicable)	12				
-OHWM indicators	bed & banks ☐	deposition ☐	presence of litter debris ☐	scour ☐	veg absent, bent, matted ☐
	change in plant community ☐	destruction of terrestrial veg ☐	multiple observe flow events ☐	sediment sorting ☐	water staining ☐
	change in soil character ☐	leaf litter disturb or absent ☐	natural line impressed on bank ☐	shelving ☐	wracking ☐
-channel bottom width	1'	-top of bank width	4'		
-width and max depth at ordinary high water mark	2' width, 6" max depth				
-width at bankfull	2'				
-bank height	LDB - 3'	RDB - 3'			
-riffle/pool complex or other specialized habitat present?	No				
-dominant riparian species: ----------(LDB /RDB)----------	LDB: green ash				
	RDB: green ash				
-particle size distribution %	Silt/Sand: 100	Gravel:	Cobble:	Boulder:	Bedrock:
5-photo numbers	Not available				
6-HUC -8 Code & Name	08010208 - Lower Hatchie				
7-Assessed	yes ☐	no ☑			
8-ETW	yes ☐	no ☑			
9-303 (d) List	yes ☐	siltation ☐	habitat: ☐	other: ☐	
	no ☑				
10-Notes					

Revised July 2022

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody:UNT Cane Creek	Date/Time:8/14/24
Assessors/Affiliation:RB, BC; JMT	Project ID :102251.01
Site Name/Description:WWC-19/EPH-12	
Site Location:East of Maple Hill Cir on SR-19	
HUC (12 digit):080102080701	Latitude:35.714515
Previous Rainfall (7-days) :< 0.5 inches	Longitude:-89.469008
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0	
Watershed Size :0.9 sq. miles	County:Lauderdale
Soil Type(s) / Geology :Adler Silt Loam	Source:NRCS Web Soil Survey
Surrounding Land Use :Low Density Residential, Agricultural	
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 12

Justification / Notes :

Incipient drought (based on APT).

Severely altered, roadside ditch.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal =6)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal =2)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal =4)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants.

[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 12

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Rip rap lined roadside.

Ecology Field Data Sheet: **Water Resources**

Project: Lauderdale County, SR-19, 102251.01					
Biologist:	RB & BC	**Affiliation:**	JMT	**Date:**	08-14-24

1-Station: from plans	~0.07 miles East of Maple Hill Circle on SR-19								
2-Map label and name	WWC-20/UDF-8								
3-Latitude/Longitude	35.714965, -89.467815								
4-Feature description:									
-channel identification	perennial stream ☐	intermittent stream ☐	ephemeral stream ☐	wwc ☑					
-HD score (if applicable)	13.5								
-OHWM indicators	bed & banks ☐	deposition ☐	presence of litter debris ☐	scour ☐	veg absent, bent, matted ☐				
	change in plant community ☐	destruction of terrestrial veg ☐	multiple observe flow events ☐	sediment sorting ☐	water staining ☐				
	change in soil character ☐	leaf litter disturb or absent ☐	natural line impressed on bank ☐	shelving ☐	wracking ☐				
-channel bottom width	1'	-top of bank width	4'						
-width and max depth at ordinary high water mark	6" width, 6" max depth								
-width at bankfull	2'								
-bank height	LDB - 3'	RDB - 3'							
-riffle/pool complex or other specialized habitat present?	No								
-dominant riparian species: ----------(LDB /RDB)----------	LDB: green ash								
	RDB: green ash								
-particle size distribution %	Silt/Sand: 100	Gravel:	Cobble:	Boulder:	Bedrock:				
5-photo numbers	Not available								
6-HUC -8 Code & Name	08010208 - Lower Hatchie								
7-Assessed	yes ☐	no ☑							
8-ETW	yes ☐	no ☑							
9-303 (d) List	yes ☐	siltation ☐	habitat: ☐	other: ☐					
	no ☑								
10-Notes									

Revised July 2022

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody:UNT Cane Creek	Date/Time:8/14/24
Assessors/Affiliation:RB, BC; JMT	Project ID :102251.01
Site Name/Description:WWC-20/UDF-8	
Site Location:~0.07 miles East of Maple Hill Circle on SR-19	
HUC (12 digit):080102080701	Latitude:35.714965
Previous Rainfall (7-days) :< 0.5 inches	Longitude:-89.467815
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0	
Watershed Size :0.89 sq. miles	County:Lauderdale
Soil Type(s) / Geology :Adler Silt Loam	Source:NRCS Web Soil Survey
Surrounding Land Use :Low Density Residential, Agricultural	
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 13.5

Justification / Notes :

Incipient drought (based on APT). Flows to STR-5.

Slightly altered around agricultural fields.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal =6.5)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal =3)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal =4)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants.

[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 13.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Ecology Field Data Sheet: **Water Resources**

Project: Lauderdale County, SR-19, 102251.01					
Biologist:	RB & BC	**Affiliation:**	JMT	**Date:**	08-14-24

1-Station: from plans	~0.07 miles East of Maple Hill Cir on SR-19								
2-Map label and name	WWC-21/EPH-13								
3-Latitude/Longitude	35.714764, -89.468077								
4-Feature description:									
-channel identification	perennial stream		intermittent stream		ephemeral stream		wwc	✓	
-HD score (if applicable)	14								
-OHWM indicators	bed & banks		deposition		presence of litter debris		scour		veg absent, bent, matted
	change in plant community		destruction of terrestrial veg		multiple observe flow events		sediment sorting		water staining
	change in soil character		leaf litter disturb or absent		natural line impressed on bank		shelving		wracking
-channel bottom width	1'		-top of bank width		4'				
-width and max depth at ordinary high water mark	6" width, 3" max depth								
-width at bankfull	2'								
-bank height	LDB - 3'				RDB - 3'				
-riffle/pool complex or other specialized habitat present?	No								
-dominant riparian species: ----------(LDB /RDB)----------	LDB: green ash								
	RDB: green ash								
-particle size distribution %	Silt/Sand:	100	Gravel:		Cobble:		Boulder:		Bedrock:
5-photo numbers	Not available								
6-HUC -8 Code & Name	08010208 - Lower Hatchie								
7-Assessed	yes		no	✓					
8-ETW	yes		no	✓					
9-303 (d) List	yes		siltation		habitat:		other:		
	no	✓							
10-Notes									

Revised July 2022

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody:UNT Cane Creek	Date/Time:8/14/24
Assessors/Affiliation:RB, BC; JMT	Project ID :102251.01
Site Name/Description:WWC-21/EPH-13	
Site Location:~0.07 miles East of Maple Hill Circle on SR-19	
HUC (12 digit):080102080701	Latitude:35.714764
Previous Rainfall (7-days) :< 0.5 inches	Longitude:-89.468077
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0	
Watershed Size :0.89 sq. miles	County:Lauderdale
Soil Type(s) / Geology :Adler Silt Loam	Source:NRCS Web Soil Survey
Surrounding Land Use :Low Density Residential, Agricultural	
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 14

Justification / Notes :

Incipient drought (based on APT). Tributary to STR-5.

Slightly altered around agricultural fields.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal =7)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal =3)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal =4)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants.

[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 14

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Ecology Field Data Sheet: **Water Resources**

Project: Lauderdale County, SR-19, 102251.01					
Biologist:	PB & BF	**Affiliation:**	JMT	**Date:**	08-14-2024

1-Station: from plans	South side of SR-19 east 0.25 miles from Sanford Rd								
2-Map label and name	STR-6								
3-Latitude/Longitude	35.713931, -89.461692								
4-Feature description:									
-channel identification	perennial stream		intermittent stream	✓	ephemeral stream		wwc		
-HD score (if applicable)	18								
-OHWM indicators	bed & banks	✓	deposition		presence of litter debris		scour	✓	veg absent, bent, matted ✓
	change in plant community	✓	destruction of terrestrial veg		multiple observe flow events		sediment sorting	✓	water staining
	change in soil character	✓	leaf litter disturb or absent		natural line impressed on bank	✓	shelving	✓	wracking ✓
-channel bottom width	4'		-top of bank width		6'				
-width and max depth at ordinary high water mark	width 3', max depth 1.5'								
-width at bankfull	6'								
-bank height	LDB - 4'		RDB - 4'						
-riffle/pool complex or other specialized habitat present?	No								
-dominant riparian species: ----------(LDB /RDB)----------	LDB: shagbark hickory, mockernut hickory, southern red oak, American elm								
	RDB: same as LDB, including river birch, sweetgum								
-particle size distribution %	Silt/Sand: 100		Gravel:		Cobble:		Boulder:		Bedrock:
5-photo numbers	57-60								
6-HUC -8 Code & Name	08010208 - Lower Hatchie								
7-Assessed	yes		no	✓					
8-ETW	yes		no	✓					
9-303 (d) List	yes		siltation		habitat:		other:		
	no	✓							
10-Notes									

Revised July 2022

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Cane Creek		Date/Time: 08/14/24
Assessors/Affiliation: PB, BF; JMT		Project ID : 102251.01
Site Name/Description: STR-6		
Site Location: South side of SR-19 east 0.25 miles from Sanford Rd		
HUC (12 digit): 080102080701	Latitude: 35.713931	
Previous Rainfall (7-days) : < 0.5 inches	Longitude: -89.461692	
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0		
Watershed Size : 0.05 sq. miles	County: Lauderdale	
Soil Type(s) / Geology : Memphis Silt Loam	Source: NRCS Web Soil Survey	
Surrounding Land Use : Low Density Residential, Agricultural		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = 18

Justification / Notes :

Incipient drought (based on APT).

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 10.5)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	1.5 2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 4)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 3.5)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 18

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Amphibian: 1 frog

STR-6 flows through wetlands (WTL-5 & WTL-6) on both sides of SR-19.

Ecology Field Data Sheet: **Water Resources**

Project: Lauderdale County, SR-19, 102251.01					
Biologist:	PB & BF	**Affiliation:**	JMT	**Date:**	08-14-24

1-Station: from plans	South side of SR-19 0.26 miles east of Sanford Rd									
2-Map label and name	WWC-22/EPH-14									
3-Latitude/Longitude	35.713988, -89.461434									
4-Feature description:										
-channel identification	perennial stream		intermittent stream		ephemeral stream		wwc	✓		
-HD score (if applicable)	13.5									
-OHWM indicators	bed & banks	✓	deposition		presence of litter debris	✓	scour		veg absent, bent, matted	✓
	change in plant community	✓	destruction of terrestrial veg		multiple observe flow events		sediment sorting	✓	water staining	
	change in soil character		leaf litter disturb or absent		natural line impressed on bank		shelving	✓	wracking	✓
-channel bottom width	2'		-top of bank width		3'					
-width and max depth at ordinary high water mark	3' width, 6" max depth									
-width at bankfull	3'									
-bank height	LDB - 5' up to road				RDB - 3'					
-riffle/pool complex or other specialized habitat present?	No									
-dominant riparian species: ----------(LDB /RDB)----------	LDB: giant ragweed									
	RDB: fescue, road									
-particle size distribution %	Silt/Sand:	90	Gravel:	10	Cobble:		Boulder:		Bedrock:	
5-photo numbers	61-62									
6-HUC -8 Code & Name	08010208 - Lower Hatchie									
7-Assessed	yes		no	✓						
8-ETW	yes		no	✓						
9-303 (d) List	yes		siltation		habitat:		other:			
	no	✓								
10-Notes										

Revised July 2022

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Cane Creek		Date/Time: 08/14/24
Assessors/Affiliation: PB, BF; JMT		Project ID : 102251.01
Site Name/Description: WWC-22/EPH-14		
Site Location: South side of SR-19 0.26 miles east of Sanford Rd		
HUC (12 digit): 080102080701	Latitude: 35.713988	
Previous Rainfall (7-days) : < 0.5 inches	Longitude: -89.461434	
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0		
Watershed Size : 0.05 sq. miles	County: Lauderdale	
Soil Type(s) / Geology : Memphis Silt Loam	Source: NRCS Web Soil Survey	
Surrounding Land Use : Low Density Residential, Agricultural		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 13.5

Justification / Notes :

Roadside Ditch

Small benches in reach; couple of small headcuts; hogweed in channel

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 10)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1 1.5	2	3
2. Sinuous channel	0 0.5	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1 1.5	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 2.5)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 1)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 13.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Sorting of soil textures or other substrates likely due to gravel from road

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: TN SR-19 City/County: Lauderdale County Sampling Date: 2024-09-16

Applicant/Owner: TDOT State: Tennessee Sampling Point: 1-DPW-3

Investigator(s): Rhiannon Flickinger and Miranda McKiernan Section, Township, Range:

Landform (hillslope, terrace, etc.): Slope Local relief (concave, convex, none): Concave Slope (%): 3

Subregion (LRR or MLRA): P 134 Lat: 35.71426433 Long: -89.46201273 Datum: NAD83_2011

Soil Map Unit Name: Ad - Adler silt loam, 0 to 2 percent slopes, occasionally flooded NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓	No _____	
Wetland Hydrology Present?	Yes ✓	No _____	

Remarks:

WTL-5

Form also represents WTL-4 and WTL-1

Large, slope wetland located at the roadside toe-of-slope, connected to a stream. Receives hydrology from upland/roadside runoff and feeds into the stream.

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)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along 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)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes _____	No ✓	Depth (inches): _____
Water Table Present?	Yes _____	No ✓	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No ✓	Depth (inches): _____

Wetland Hydrology Present? Yes ✓ No _____

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

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: 1-DPW-3

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix nigra	15	✓	OBL
2. Liquidambar styraciflua	5	✓	FAC
3.			
4.			
5.			
6.			
7.			
8.			
	20 = Total Cover		
50% of total cover: 10.00	20% of total cover: 4.00		

Sapling/Shrub Stratum (Plot size: 30 ft r)			
1. Platanus occidentalis	5	✓	FACW
2. Salix nigra	5	✓	OBL
3.			
4.			
5.			
6.			
7.			
8.			
	10 = Total Cover		
50% of total cover: 5.00	20% of total cover: 2.00		

Herb Stratum (Plot size: 30 ft r)			
1. Dichanthelium clandestinum	40	✓	FACW
2. Microstegium vimineum	35	✓	FAC
3. Andropogon gerardii	20	✓	FAC
4. Solidago altissima	20	✓	FACU
5. Ambrosia artemisiifolia	15		FACU
6. Scirpus atrovirens	15		OBL
7. Carex frankii	10		OBL
8. Cyperus strigosus	10		FACW
9. Salix nigra	5		OBL
10. Melothria pendula	3		FAC
11. Verbena urticifolia	3		FAC
12.			
	176 = Total Cover		
50% of total cover: 88.00	20% of total cover: 35.20		

Woody Vine Stratum (Plot size: 30 ft r)			
1. Lonicera japonica	10	✓	FACU
2.			
3.			
4.			
5.			
	10 = Total Cover		
50% of total cover: 5.00	20% of total cover: 2.00		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 7 (A)

Total Number of Dominant Species Across All Strata: 9 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 77.77 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	50	x 1 =	50
FACW species	55	x 2 =	110
FAC species	66	x 3 =	198
FACU species	45	x 4 =	180
UPL species	0	x 5 =	0
Column Totals:	216 (A)		538 (B)

Prevalence Index = B/A = 2.49

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☑ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four 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 vines, less than 3 in. DBH and greater than 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 ____

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: 1-DPW-3

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 - 5.5	2.5YR 4/2	98	10YR 5/8	2	C	M	Silty Clay Loam	
5.5 - 12	10YR 5/2	93	10YR 5/8	7	C		Silty Clay Loam	
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✓ **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: TN SR-19 City/County: Lauderdale County Sampling Date: 2024-08-14

Applicant/Owner: TDOT State: Tennessee Sampling Point: 1-DPU-2

Investigator(s): Rhiannon Flickinger and Miranda McKiernan Section, Township, Range:

Landform (hillslope, terrace, etc.): Upland Local relief (concave, convex, none): Linear Slope (%): 2

Subregion (LRR or MLRA): P 134 Lat: 35.7142951 Long: -89.4620578 Datum: NAD83_2011

Soil Map Unit Name: Ad - Adler silt loam, 0 to 2 percent slopes, occasionally flooded NWI classification: UPL

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

WTL-5 upland form
Form also represents uplands adjacent to wetland WTL-4, WTL-1

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)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along 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)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes _____	No ✓	Depth (inches): _____
Water Table Present?	Yes _____	No ✓	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No ✓	Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

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

Remarks:

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

Sampling Point: 1-DPU-2

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size: 30 ft r)			
1. Rubus argutus	30	✓	FAC
2. Diospyros virginiana	5		FAC
3.			
4.			
5.			
6.			
7.			
8.			
	35 = Total Cover		
50% of total cover: 17.50	20% of total cover: 7.00		
Herb Stratum (Plot size: 30 ft r)			
1. Solidago altissima	50	✓	FACU
2. Ambrosia artemisiifolia	25	✓	FACU
3. Andropogon gerardii	25	✓	FAC
4. Rubus allegheniensis	5		UPL
5. Rubus argutus	5		FAC
6. Toxicodendron radicans	5		FAC
7. Ulmus americana	3		FAC
8.			
9.			
10.			
11.			
12.			
	118 = Total Cover		
50% of total cover: 59.00	20% of total cover: 23.60		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of 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: 50.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	73	x 3 =	219
FACU species	75	x 4 =	300
UPL species	5	x 5 =	25
Column Totals:	153 (A)		544 (B)

Prevalence Index = B/A = 3.55

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four 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 vines, less than 3 in. DBH and greater than 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 ✓

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: 1-DPU-2

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 - 12	10YR 5/4	98	10YR 5/8	2	C	M	Clay Loam	
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** ✓

Remarks:

An affirmative response to 1-6 of the Decision Table identifies the wetland per rule as an Outstanding Natural Resource Water (ONRW) or Exceptional Tennessee Waters (ETW). A positive response to 7-13 requires a final determination by the Department.

#	**Wetland Feature Decision Table** PIN 102251.01; WTL-5	**Yes/No**	**Affirmative Result**
1	The wetland has been designated as an **Outstanding Natural Resource Water (ONRW)** by the Department under 0400-40-03-.06(5)(a)**.**	No	**ORNW**
2	The wetland has previously been designated and documented as an Exceptional Tennessee Water (ETW) by the Department under 0400-40-03-.06(4)(a)(7)	No	**ETW**
3	The wetland is within state or national parks, wildlife refuges, forests, wilderness areas, natural areas, or is a designated State Scenic Rivers or Federal Wild and Scenic Rivers.	No	**ETW**
4	The wetland is known to contain a documented non-experimental population of state or federally listed threatened or endangered aquatic or semi-aquatic plants, or aquatic animals.	No	**ETW**
5	The wetland or the area it is in has been designated by the U.S. Fish and Wildlife Service as "**Critical Habitat**" for any threatened or endangered aquatic or semi-aquatic plant or aquatic animal species.	No	**ETW**
6	The wetland falls within an area designated as Lands Unsuitable for Mining pursuant to the federal Surface Mining Control and Reclamation Act where such designation is based in whole or in part on impacts to water resource values	No	**ETW**
7	**The wetland exhibits outstanding ecological or recreational values such as, but not limited to, those as outlined in 8-12**	No	Determination Required by TDEC
8	The wetland fits within the species composition concept for any plant community found in the state of Tennessee **ranked G2, G1, or more imperiled** at the "Association" classification level according to the NatureServe and Natural Heritage Ranking system (e.g. "bog", "fen", and "wet prairie/barren" communities).	No	Determination Required by TDEC
9	The wetland is **an uncommon resource** (e.g. vernal pools, headwater wetlands, sinks, spring/seeps, glades, newly described communities, high recreational or socioeconomic value) in the region and/or is deemed such by concurrence of qualified scientists.	No	Determination Required by TDEC
10	The wetland is an **older aged forested wetland** comprised of overstory trees with an average diameter at breast height (dbh) being **greater than or equal to 30 in** within the WAA.	No	Determination Required by TDEC
11	The wetland is observed and documented to be a **significant waterfowl, songbird, shorebird, amphibian, bat, fish habitat area**. These may include rookeries, migratory congregations, nesting sites, breeding areas, etc.	No	Determination Required by TDEC
12	The wetland is **hydrologically connected** to and/or has significant ecological contribution to an **ETW**	No	Determination Required by TDEC
13	The wetland has High Resource Value as determined by a **score of 75 and above** using the TRAM or non-HGM TRAM (to be determined after completing the quantitative portion of this manual)	No	Determination Required by TDEC

End of Narrative Rating. Begin Quantitative Rating on Next Page.

HGM FUNCTIONAL ASSESSMENT
SLOPE WETLANDS

Date: 08/14/2024 Project Name SR-19, 102251.01

Field Personnel RF, MM Wetland Name/Location WTL-5

Read instructions prior to conducting assessments. If project area is large or highly heterogeneous requiring the designation of several WAAs, a separate assessment should be performed for each WAA. CHECK THE APPROPRIATE BLANK(S) BELOW.

V1: Hydroperiod (HYDRO)

☐ 1. Hydrology not altered (SI = 1.0)
- no fill material or excessive sediment
- no ditches/drainage tiles
- no roads or other impediments to surface or groundwater
- no excavation
- no alteration to overland runoff, groundwater discharge/recharge

☑ 2. Hydrology slightly altered (SI = 0.75)
- portion of site with minimal fill or sediment
- portion of site with drainage ditches/tiles
- roads or other impediments, water flow slightly altered
- minor portion of site excavated
- some alteration to overland runoff, groundwater discharge/recharge

☐ 3. Hydrology moderately altered (SI = 0.5)
- portion of site with moderate fill or sediment
- portion of site with drainage ditches/tiles
- some alteration to overland runoff, groundwater discharge/recharge
- roads or other impediments, water flow moderately altered
- moderate portion of site excavated

☐ 4. Hydrology significantly altered (SI = 0.25)
- portion of site with significant fill or sediment
- portion of site with drainage ditches/tiles
- significant alteration to overland runoff, groundwater discharge/recharge
- roads or other impediments, water flow significantly altered
- significant portion of site excavated

☐ 5. Hydrology severely altered (SI = 0.1)
- entire site impacted by fill or excessive sediment
- entire site with numerous drainage ditches/tiles
- no contributions to or from overland runoff, groundwater discharge/recharge
- roads or other impediments, water flow completely blocked
- entire wetland affected

V2: Wetland Watershed Integrity (WSHEDINT)

Use weighted average as discussed on page 10. Examples of land uses and multipliers listed below

A = Percentage forested with no impervious surfaces 0
B = Percentage permeable land, (e.g., park, golf course, pasture, hay, orchard, tree farm, or similar) 100
C = Percentage low density residential, construction, or similar 0
D = Percentage high density residential, or similar 0
E = Percentage urban, commercial, industrial, or similar 0

V2 = (A x 1.0) + (B x 0.75) + (C x 0.5) + (D x 0.25) + (E x 0.01)/(100) = 0.75

V3: Canopy Tree Size Class (TSIZE)

1. Average size of canopy trees > 3 in. DBH

☐ ≥ 15 in. (SI = 1.0) ☐ 10 – 14 in. (SI = 0.75) ☑ 6 – 9 in. (SI = 0.5) ☐ 3 – 5 in. (SI = 0.25)
☐ < 3 in. or no trees present, go to V5

V4: Canopy Tree Density (TDEN)

1. Average number of canopy trees (> 3 in. DBH) per 30-ft. radius plot

☐ 5 – 10 (SI = 1.0) ☐ 11 – 15 (SI = 0.75) ☐ > 15 (SI = 0.5) ☑ 1 – 4 (SI = 0.5)

V5: Shrub Cover (SCOV)

1. Average percent cover of shrubs (woody stems < 3 in. DBH and taller than 3 ft.) per 30-ft. radius plot

☐ > 20 (SI = 1.0) ☑ < 20, go to V6

V6: Ground Vegetation Cover (GVC)

1. Average percent cover of ground vegetation per 30-ft. radius plot

☐ ≥ 70 (SI = 1.0) ☐ 55 – 69 (SI = 0.75) ☐ 45 – 54 (SI = 0.5) ☐ 30 – 44 (SI = 0.25) ☐ 20 – 29 (SI = 0.1)
☑ < 20 (SI=0.0)

V7: Vegetation Composition and Diversity (COMP)

1. Check the dominant species from Groups 1, 2, and 3 below using the 50/20 rule. If tree cover is < 20%, check the dominants in the next tallest stratum. If a dominant does not appear in lists below, but is a native species, it can be added to Group 1 or 2 species based on the scientific literature or professional judgement. Native shrub and herbaceous species are assigned to Group 2. When using shrub or herbaceous write in the number of dominant species. Dominant invasive species are checked regardless of stratum. *

GROUP 1 (Reference Standard)		GROUP 2 (Native Ubiquitous)		GROUP 3 (Invasive)
☐ Water oak	☐ Pin oak	☐ American elm	☐ Green ash	☐ European/Chinese privet
☐ Bur oak	☐ Shumard oak	☐ Slippery elm	☐ Red maple	☑ Japanese honeysuckle
☐ Willow oak	☐ Bald cypress	☐ Sweetgum	☐ Silver maple	☑ Japanese stiltgrass
☐ Swamp chestnut oak	☐ Water tupelo	☐ Blackgum	☑ Black willow	☐ Purple loosestrife
☐ Cherrybark oak	☐ S. black gum	☐ Silky dogwood	☐ Sycamore	☐ Giant reed
☐ Swamp white oak	☐ Persimmon	☐ Boxelder	☐ _____	☐ Tall fescue
☐ Nuttall oak	☐ Am. hornbeam	☐ Tulip poplar	☐ _____	☐ Phragmites
☐ Overcup oak	☐ _____	2 Number native shrub spp.		☐ _____
☐ _____	☐ _____	>12 Number native herbaceous spp.		☐ _____

2. Using the number of dominants in Groups 1, 2, and 3 above, calculate a quality index (Q) using the following formula: [(1.0 x # of checked dominants in Group 1) + (0.66 x # of checked dominants in Group 2) + (0.0 x # of checked dominants in Group 3)]/ total # of checked dominants in all groups = 0.22

3. Multiply Q above by one of the following constants that reflects species richness:[1]

- ○ a) if ≥ 4 species from Groups 1 and/or 2 occur as dominants, multiply Q by 1.0 _____
- ○ b) if 3 species from Groups 1 and/or 2 occur as dominant, multiply Q by 0.75 _____
- ○ c) if 2 species from Groups 1 and/or 2 occur as dominants, multiply Q by 0.50 _____
- ◉ d) if 1 species from Groups 1 and/or 2 occurs as dominant, multiply Q by 0.25 0.055
- ○ e) if no species from Groups 1 and/or 2 occurs as dominant, multiply Q by 0.0 _____

4. Calculate the square root of the value from Step 3 above. This value is the SI for **V7**= 0.23

*In some Depression wetlands and in some small WAAs (e.g., <0.5 acres), relatively few species (e.g., overcup oak) may be present. In cases in which this is the normal condition, Q can be multiplied by 1.0 if only 1 or 2 species are dominant.

V8: Soil Organic Matter (ORGANIC)

1. Surface horizons unaltered

☑ 100 percent cover of O and/or A horizon present (SI = 1.0)

2. Surface horizons altered. Estimate the percent of the WAA in which neither an O or A horizon is present.

3. Subtract the sum of the values from Step 2 from 100. Convert this value to a decimal. This value is the SI for V8 (e.g., if 75 % of the WAA does not have an O or A horizon due to a significant disturbance, it will have an SI of 0.25).

V9: Buffer (BUFFER)

1. Determine the Connection Index (CI) by estimating the percent of the wetland surrounded by suitable buffer habitat.

☐ 90% – 100% (CI = 1.0) ☐ 75% – 89% (CI = 0.75) ☑ 40% – 74% (CI = 0.5) ☐ 10% – 39% (CI = 0.25)
☐ < 10% (CI = 0.1)

2. Multiply the CI by one if the following values:

- ◉ a) if average buffer width is ≥ 492 ft., multiply by 1.0
- ○ b) if average buffer is 98 ft to 491 ft., multiply by 0.66
- ○ c) if average buffer width is 33 ft to 97 ft., multiply by 0.33
- ○ d) if average buffer width is < 33 ft., multiply by 0.1

3. This value is the SI for **V9 =** 0.5 **.**

VALUES USED TO CALCULATE FUNCTIONAL CAPACITY INDICES (FCIs)

SUBINDEX VALUES:

V1 0.75 (HYDRO) V3 0.50 (TSIZE) V5 _____ (SCOV) V7 0.23 (COMP) V9 0.50 (BUFFER)

V2 0.75 (WSHEDINT) V4 0.50 (TDEN) V6 1.00 (GVC) V8 1.00 (ORGANIC)

Slope Wetland

WTL-5

V1: HYDROPERIOD	**0.75**	**Function 1: Maintain Hydrologic Regime**
V2: WETLAND WATERSHED INTEGRITY	**0.75**	(V1 x V2)^(1/2)
V3: CANOPY TREE CLASS	**0.5**	
V4: CANOPY TREE DENSITY	**0.5**	**Function 2: Maintain Biogeochemical Processes**
V5: SHRUB COVER	**GOTOV6**	
V6: GROUND VEGETATION COVER	**n/a**	
V7: VEGETATION COMPOSITION AND DIVERSITY	**0.23**	
2. Q =	**0.22**	
# of Group 1 Dominants	0	
# of Group 2 Dominants	3	
# of Group 3 Dominants	2	
SPECIES RICHNESS CONSTANT	0.25	
V8: SOIL ORGANIC MATTER	**1**	
V9:BUFFER	**0.5**	
1. Connection Index	0.5	
2. Buffer width value (0-1)	1	

$$\text{FCI (trees present)} = \left((V1 \times V2)^{1/2} \times \left(\frac{\frac{V3+V4}{2} + V8}{2} \right) \right)^{1/2}$$

$$\text{FCI (shrubs present)} = \left((V1 \times V2)^{1/2} \times \left(\frac{V5+V8}{3} \right) \right)^{1/2}$$

$$\text{FCI (ground cover)} = \left((V1 \times V2)^{1/2} \times \left(\frac{V6+V8}{5} \right) \right)^{1/2}$$

Function 3: Maintain Characteristic Plant Community

$$\text{FCI (trees present)} = \frac{(V1 \times V2)^{1/2} + 2\left(\frac{V3+V4+V7}{3}\right)}{3}$$

$$\text{FCI (shrubs present)} = \frac{(V1 \times V2)^{1/2} + 2\left(\frac{V5+V7}{2}\right)}{6}$$

$$\text{FCI (groundcover)} = \frac{(V1 \times V2)^{1/2} + 2\left(\frac{V6+V7}{2}\right)}{9}$$

Function 4: Maintain Characteristic Wildlife Community:

$$\text{FCI (trees)} = \frac{(V1 \times V2)^{1/2} + 2\left(\frac{V3+V4+V7}{3}\right) + V9}{4}$$

$$\text{FCI (shrubs present)} = \frac{(V1 \times V2)^{1/2} + 2\left(\frac{V5+V7}{2}\right) + V9}{6}$$

$$\text{FCI (groundcover)} = \frac{(V1 \times V2)^{1/2} + 2\left(\frac{V6+V7}{2}\right) + V9}{9}$$

FCI 1 = **0.75** **Final Tree =** **0.64**

FCI 2 trees= **0.75** **Final Shrubs=** **#VALUE!**

Final Herbaceous = **#VALUE!**

FCI 2 shrubs= **#VALUE!**

FCI 2 ground = **#VALUE!**

FCI 3 trees= **0.52**

FCI 3 shrubs= **#VALUE!**

FCI 3 ground = **#VALUE!**

FCI 4 trees= **0.52**

FCI 4 shrubs= **#VALUE!**

FCI 4 ground = **#VALUE!**

TRAM Summary Worksheet

Project: SR-19, PIN 102251.01, WTL-5

Exceptional Status Wetlands		**Check if applicable**
	1. **ONRW**	☐
	2. **ETW**	☐
	3. **Further Review Requested:** Attach Wetland Background and Exceptional Status Wetlands Worksheet	☐
	COMMENTS/NOTES:	
Quantitative Rating scores	Function: Hydrologic Regime	0.75
	Function: Biogeochemical Processes	0.75
	Function: Retain Particulates	n/a
	Function: Plant Community	0.52
	Function: Wildlife Community	0.52
	Quantitative Score (Average of FCIs x 100)	63.50
	Value Added (Significant Size) Total	0
Total of Quantitative and Value Added Scores	**TOTAL SCORE**	63.50

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: TN SR-19 City/County: Lauderdale County Sampling Date: 2024-08-14

Applicant/Owner: TDOT State: Tennessee Sampling Point: 2-DPW-4

Investigator(s): Preston Butler and Britt Fleming Section, Township, Range:

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Concave Slope (%): 0

Subregion (LRR or MLRA): P 134 Lat: 35.713611 Long: -89.461669 Datum: NAD83_2011

Soil Map Unit Name: MeE3 - Memphis silt loam, 12 to 20 percent slopes, severely eroded, northern phase NWI classification: PFO

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓	No _____	
Wetland Hydrology Present?	Yes ✓	No _____	

Remarks:

WTL-6

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)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☑ Oxidized Rhizospheres along 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)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes _____	No ✓	Depth (inches): _____
Water Table Present?	Yes _____	No ✓	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No ✓	Depth (inches): _____

Wetland Hydrology Present? Yes ✓ No _____

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

Remarks:

Looks to be going further outside the project boundary. Stream starts in wetland.

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

Sampling Point: 2-DPW-4

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1. Platanus occidentalis	40	✓	FACW
2. Salix nigra	30	✓	OBL
3. Liquidambar styraciflua	20	✓	FAC
4.			
5.			
6.			
7.			
8.			
	90	= Total Cover	
50% of total cover: 45.00	20% of total cover: 18.00		
Sapling/Shrub Stratum (Plot size: 30 ft r)			
1. Platanus occidentalis	10	✓	FACW
2. Liquidambar styraciflua	10	✓	FAC
3. Lindera benzoin	10	✓	FACW
4. Aralia spinosa	5		FAC
5.			
6.			
7.			
8.			
	35	= Total Cover	
50% of total cover: 17.50	20% of total cover: 7.00		
Herb Stratum (Plot size: 30 ft r)			
1. Persicaria punctata	40	✓	OBL
2. Microstegium vimineum	30	✓	FAC
3. Boehmeria cylindrica	15		FACW
4. Solidago canadensis	10		FACU
5. Scirpus cyperinus	5		OBL
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100	= Total Cover	
50% of total cover: 50.00	20% of total cover: 20.00		
Woody Vine Stratum (Plot size: 30 ft r)			
1. Parthenocissus quinquefolia	5	✓	FACU
2.			
3.			
4.			
5.			
	5	= Total Cover	
50% of total cover: 2.50	20% of total cover: 1.00		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 8 (A)

Total Number of Dominant Species Across All Strata: 9 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 88.88 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	75	x 1 =	75
FACW species	75	x 2 =	150
FAC species	65	x 3 =	195
FACU species	15	x 4 =	60
UPL species	0	x 5 =	0
Column Totals:	230 (A)		480 (B)

Prevalence Index = B/A = 2.08

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☑ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four 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 vines, less than 3 in. DBH and greater than 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

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: 2-DPW-4

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 - 1	10YR 5/3	95	5YR 4/6	5	C	PL / M	Silty Clay Loam	
1 - 12	10YR 5/1	95	5YR 4/6	5	C	PL / M	Silty Clay Loam	
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✓ **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: TN SR-19 City/County: Lauderdale County Sampling Date: 2024-08-14

Applicant/Owner: TDOT State: Tennessee Sampling Point: 2-DPU-4

Investigator(s): Preston Butler and Britt Fleming Section, Township, Range:

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 0

Subregion (LRR or MLRA): P 134 Lat: 35.713747 Long: -89.461991 Datum: NAD83_2011

Soil Map Unit Name: MeE3 - Memphis silt loam, 12 to 20 percent slopes, severely eroded, northern phase NWI classification: NA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Upland adjacent to WTL-6

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)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along 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)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes _____	No ✓	Depth (inches): _____
Water Table Present?	Yes _____	No ✓	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No ✓	Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

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

Remarks:

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

Sampling Point: 2-DPU-4

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1. Quercus alba	30	✓	FACU
2. Betula nigra	20	✓	FACW
3. Morus rubra	20	✓	FACU
4. Cornus florida	20	✓	FACU
5.			
6.			
7.			
8.			
	90	= Total Cover	

50% of total cover: 45.00 20% of total cover: 18.00

Sapling/Shrub Stratum (Plot size: 30 ft r)			
1. Aralia spinosa	20	✓	FAC
2. Ulmus rubra	20	✓	FAC
3. Liquidambar styraciflua	10	✓	FAC
4.			
5.			
6.			
7.			
8.			
	50	= Total Cover	

50% of total cover: 25.00 20% of total cover: 10.00

Herb Stratum (Plot size: 30 ft r)			
1. Microstegium vimineum	20	✓	FAC
2. Solidago canadensis	5		FACU
3. Eupatorium serotinum	5		FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	30	= Total Cover	

50% of total cover: 15.00 20% of total cover: 6.00

Woody Vine Stratum (Plot size: 30 ft r)			
1. Lonicera japonica	10	✓	FACU
2. Toxicodendron radicans	10	✓	FAC
3.			
4.			
5.			
	20	= Total Cover	

50% of total cover: 10.00 20% of total cover: 4.00

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 10 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 60.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	20	x 2 =	40
FAC species	85	x 3 =	255
FACU species	85	x 4 =	340
UPL species	0	x 5 =	0
Column Totals:	190 (A)		635 (B)

Prevalence Index = B/A = 3.34

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four 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 vines, less than 3 in. DBH and greater than 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

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: 2-DPU-4

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 - 12	10YR 6/4	100					Silt Loam	
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** ✓

Remarks:

An affirmative response to 1-6 of the Decision Table identifies the wetland per rule as an Outstanding Natural Resource Water (ONRW) or Exceptional Tennessee Waters (ETW). A positive response to 7-13 requires a final determination by the Department.

#	**Wetland Feature Decision Table** PIN 102251.01; WTL-6	**Yes/No**	**Affirmative Result**
1	The wetland has been designated as an **Outstanding Natural Resource Water (ONRW)** by the Department under 0400-40-03-.06(5)(a)**.**	No	**ORNW**
2	The wetland has previously been designated and documented as an Exceptional Tennessee Water (ETW) by the Department under 0400-40-03-.06(4)(a)(7)	No	**ETW**
3	The wetland is within state or national parks, wildlife refuges, forests, wilderness areas, natural areas, or is a designated State Scenic Rivers or Federal Wild and Scenic Rivers.	No	**ETW**
4	The wetland is known to contain a documented non-experimental population of state or federally listed threatened or endangered aquatic or semi-aquatic plants, or aquatic animals.	No	**ETW**
5	The wetland or the area it is in has been designated by the U.S. Fish and Wildlife Service as "**Critical Habitat**" for any threatened or endangered aquatic or semi-aquatic plant or aquatic animal species.	No	**ETW**
6	The wetland falls within an area designated as Lands Unsuitable for Mining pursuant to the federal Surface Mining Control and Reclamation Act where such designation is based in whole or in part on impacts to water resource values	No	**ETW**
7	**The wetland exhibits outstanding ecological or recreational values such as, but not limited to, those as outlined in 8-12**	No	Determination Required by TDEC
8	The wetland fits within the species composition concept for any plant community found in the state of Tennessee **ranked G2, G1, or more imperiled** at the "Association" classification level according to the NatureServe and Natural Heritage Ranking system (e.g. "bog", "fen", and "wet prairie/barren" communities).	No	Determination Required by TDEC
9	The wetland is **an uncommon resource** (e.g. vernal pools, headwater wetlands, sinks, spring/seeps, glades, newly described communities, high recreational or socioeconomic value) in the region and/or is deemed such by concurrence of qualified scientists.	No	Determination Required by TDEC
10	The wetland is an **older aged forested wetland** comprised of overstory trees with an average diameter at breast height (dbh) being **greater than or equal to 30 in** within the WAA.	No	Determination Required by TDEC
11	The wetland is observed and documented to be a **significant waterfowl, songbird, shorebird, amphibian, bat, fish habitat area**. These may include rookeries, migratory congregations, nesting sites, breeding areas, etc.	No	Determination Required by TDEC
12	The wetland is **hydrologically connected** to and/or has significant ecological contribution to an **ETW**	No	Determination Required by TDEC
13	The wetland has High Resource Value as determined by a **score of 75 and above** using the TRAM or non-HGM TRAM (to be determined after completing the quantitative portion of this manual)	No	Determination Required by TDEC

End of Narrative Rating. Begin Quantitative Rating on Next Page.

HGM FUNCTIONAL ASSESSMENT
SLOPE WETLANDS

Date: 08/14/2024 Project Name SR-19, 102251.01

Field Personnel PB, BF Wetland Name/Location WTL-6

Read instructions prior to conducting assessments. If project area is large or highly heterogeneous requiring the designation of several WAAs, a separate assessment should be performed for each WAA. CHECK THE APPROPRIATE BLANK(S) BELOW.

V1: Hydroperiod (HYDRO)

☑ 1. Hydrology not altered (SI = 1.0)
- no fill material or excessive sediment
- no ditches/drainage tiles
- no roads or other impediments to surface or groundwater
- no excavation
- no alteration to overland runoff, groundwater discharge/recharge

☐ 2. Hydrology slightly altered (SI = 0.75)
- portion of site with minimal fill or sediment
- portion of site with drainage ditches/tiles
- roads or other impediments, water flow slightly altered
- minor portion of site excavated
- some alteration to overland runoff, groundwater discharge/recharge

☐ 3. Hydrology moderately altered (SI = 0.5)
- portion of site with moderate fill or sediment
- portion of site with drainage ditches/tiles
- some alteration to overland runoff, groundwater discharge/recharge
- roads or other impediments, water flow moderately altered
- moderate portion of site excavated

☐ 4. Hydrology significantly altered (SI = 0.25)
- portion of site with significant fill or sediment
- portion of site with drainage ditches/tiles
- significant alteration to overland runoff, groundwater discharge/recharge
- roads or other impediments, water flow significantly altered
- significant portion of site excavated

☐ 5. Hydrology severely altered (SI = 0.1)
- entire site impacted by fill or excessive sediment
- entire site with numerous drainage ditches/tiles
- no contributions to or from overland runoff, groundwater discharge/recharge
- roads or other impediments, water flow completely blocked
- entire wetland affected

V2: Wetland Watershed Integrity (WSHEDINT)

Use weighted average as discussed on page 10. Examples of land uses and multipliers listed below

A = Percentage forested with no impervious surfaces 90
B = Percentage permeable land, (e.g., park, golf course, pasture, hay, orchard, tree farm, or similar) 10
C = Percentage low density residential, construction, or similar _____
D = Percentage high density residential, or similar _____
E = Percentage urban, commercial, industrial, or similar _____

V2 = (A x 1.0) + (B x 0.75) + (C x 0.5) + (D x 0.25) + (E x 0.01)/(100) = 0.98

V3: Canopy Tree Size Class (TSIZE)

1. Average size of canopy trees > 3 in. DBH

☐ ≥ 15 in. (SI = 1.0) ☑ 10 – 14 in. (SI = 0.75) ☐ 6 – 9 in. (SI = 0.5) ☐ 3 – 5 in. (SI = 0.25)
☐ < 3 in. or no trees present, go to V5

V4: Canopy Tree Density (TDEN)

1. Average number of canopy trees (> 3 in. DBH) per 30-ft. radius plot

☑ 5 – 10 (SI = 1.0) ☐ 11 – 15 (SI = 0.75) ☐ > 15 (SI = 0.5) ☐ 1 – 4 (SI = 0.5)

V5: Shrub Cover (SCOV)

1. Average percent cover of shrubs (woody stems < 3 in. DBH and taller than 3 ft.) per 30-ft. radius plot

☐ > 20 (SI = 1.0) ☑ < 20, go to V6

V6: Ground Vegetation Cover (GVC)

1. Average percent cover of ground vegetation per 30-ft. radius plot

☐ ≥ 70 (SI = 1.0) ☐ 55 – 69 (SI = 0.75) ☐ 45 – 54 (SI = 0.5) ☐ 30 – 44 (SI = 0.25) ☐ 20 – 29 (SI = 0.1)
☑ < 20 (SI=0.0)

V7: Vegetation Composition and Diversity (COMP)

1. Check the dominant species from Groups 1, 2, and 3 below using the 50/20 rule. If tree cover is < 20%, check the dominants in the next tallest stratum. If a dominant does not appear in lists below, but is a native species, it can be added to Group 1 or 2 species based on the scientific literature or professional judgement. Native shrub and herbaceous species are assigned to Group 2. When using shrub or herbaceous write in the number of dominant species. Dominant invasive species are checked regardless of stratum. *

GROUP 1 (Reference Standard)		GROUP 2 (Native Ubiquitous)		GROUP 3 (Invasive)
☐ Water oak	☐ Pin oak	☑ American elm	☐ Green ash	☐ European/Chinese privet
☐ Bur oak	☐ Shumard oak	☐ Slippery elm	☐ Red maple	☐ Japanese honeysuckle
☐ Willow oak	☐ Bald cypress	☑ Sweetgum	☐ Silver maple	☑ Japanese stiltgrass
☐ Swamp chestnut oak	☐ Water tupelo	☐ Blackgum	☑ Black willow	☐ Purple loosestrife
☐ Cherrybark oak	☐ S. black gum	☐ Silky dogwood	☑ Sycamore	☐ Giant reed
☐ Swamp white oak	☐ Persimmon	☐ Boxelder	☐ _____	☐ Tall fescue
☐ Nuttall oak	☐ Am. hornbeam	☐ Tulip poplar	☐ _____	☐ Phragmites
☐ Overcup oak	☐ _____	____ Number native shrub spp.		☐ _____
☐ _____	☐ _____	____ Number native herbaceous spp.		☐ _____

2. Using the number of dominants in Groups 1, 2, and 3 above, calculate a quality index (Q) using the following formula: [(1.0 x # of checked dominants in Group 1) + (0.66 x # of checked dominants in Group 2) + (0.0 x # of checked dominants in Group 3)]/ total # of checked dominants in all groups = 0.528

3. Multiply Q above by one of the following constants that reflects species richness:[1]

◉ a) if ≥ 4 species from Groups 1 and/or 2 occur as dominants, multiply Q by 1.0 — 0.528
○ b) if 3 species from Groups 1 and/or 2 occur as dominant, multiply Q by 0.75 — _____
○ c) if 2 species from Groups 1 and/or 2 occur as dominants, multiply Q by 0.50 — _____
○ d) if 1 species from Groups 1 and/or 2 occurs as dominant, multiply Q by 0.25 — _____
○ e) if no species from Groups 1 and/or 2 occurs as dominant, multiply Q by 0.0 — _____

4. Calculate the square root of the value from Step 3 above. This value is the SI for **V7**= 0.73

*In some Depression wetlands and in some small WAAs (e.g., <0.5 acres), relatively few species (e.g., overcup oak) may be present. In cases in which this is the normal condition, Q can be multiplied by 1.0 if only 1 or 2 species are dominant.

V8: Soil Organic Matter (ORGANIC)

1. Surface horizons unaltered

☑ 100 percent cover of O and/or A horizon present (SI = 1.0)

2. Surface horizons altered. Estimate the percent of the WAA in which neither an O or A horizon is present.

3. Subtract the sum of the values from Step 2 from 100. Convert this value to a decimal. This value is the SI for V8 (e.g., if 75 % of the WAA does not have an O or A horizon due to a significant disturbance, it will have an SI of 0.25).

V9: Buffer (BUFFER)

1. Determine the Connection Index (CI) by estimating the percent of the wetland surrounded by suitable buffer habitat.

☐ 90% – 100% (CI = 1.0) ☐ 75% – 89% (CI = 0.75) ☑ 40% – 74% (CI = 0.5) ☐ 10% – 39% (CI = 0.25)
☐ < 10% (CI = 0.1)

2. Multiply the CI by one if the following values:

○ a) if average buffer width is ≥ 492 ft., multiply by 1.0
◉ b) if average buffer is 98 ft to 491 ft., multiply by 0.66
○ c) if average buffer width is 33 ft to 97 ft., multiply by 0.33
○ d) if average buffer width is < 33 ft., multiply by 0.1

3. This value is the SI for **V9 =** 0.33 **.**

VALUES USED TO CALCULATE FUNCTIONAL CAPACITY INDICES (FCIs)

SUBINDEX VALUES:

V1 1.00 (HYDRO) V3 0.75 (TSIZE) V5 go to V6 (SCOV) V7 0.73 (COMP) V9 0.33 (BUFFER)

V2 0.98 (WSHEDINT) V4 1.00 (TDEN) V6 0.00 (GVC) V8 1.00 (ORGANIC)

Slope Wetland

WTL-6

V1: HYDROPERIOD	**1**	**Function 1: Maintain Hydrologic Regime**
V2: WETLAND WATERSHED INTEGRITY	**0.98**	(V1 x V2)^(1/2)
V3: CANOPY TREE CLASS	**0.75**	
V4: CANOPY TREE DENSITY	**1**	**Function 2: Maintain Biogeochemical Processes**
V5: SHRUB COVER	**GOTOV6**	
V6: GROUND VEGETATION COVER	**n/a**	
V7: VEGETATION COMPOSITION AND DIVERSITY	**0.73**	
2. Q =	**0.53**	
# of Group 1 Dominants	0	
# of Group 2 Dominants	4	
# of Group 3 Dominants	1	
SPECIES RICHNESS CONSTANT	1	
V8: SOIL ORGANIC MATTER	**1**	
V9:BUFFER	**0.33**	
1. Connection Index	0.5	
2. Buffer width value (0-1)	0.66	

$$\text{FCI (trees present)} = \left((V1 \times V2)^{1/2} \times \left(\frac{\frac{V3+V4}{2} + V8}{2} \right) \right)^{1/2}$$

$$\text{FCI (shrubs present)} = \left((V1 \times V2)^{1/2} \times \left(\frac{V5+V8}{3} \right) \right)^{1/2}$$

$$\text{FCI (ground cover)} = \left((V1 \times V2)^{1/2} \times \left(\frac{V6+V8}{5} \right) \right)^{1/2}$$

Function 3: Maintain Characteristic Plant Community

$$\text{FCI (trees present)} = \frac{(V1 \times V2)^{1/2} + 2\left(\frac{V3+V4+V7}{3}\right)}{3}$$

$$\text{FCI (shrubs present)} = \frac{(V1 \times V2)^{1/2} + 2\left(\frac{V5+V7}{2}\right)}{6}$$

$$\text{FCI (groundcover)} = \frac{(V1 \times V2)^{1/2} + 2\left(\frac{V6+V7}{2}\right)}{9}$$

Function 4: Maintain Characteristic Wildlife Community:

$$\text{FCI (trees)} = \frac{(V1 \times V2)^{1/2} + 2\left(\frac{V3+V4+V7}{3}\right) + V9}{4}$$

$$\text{FCI (shrubs present)} = \frac{(V1 \times V2)^{1/2} + 2\left(\frac{V5+V7}{2}\right) + V9}{6}$$

$$\text{FCI (groundcover)} = \frac{(V1 \times V2)^{1/2} + 2\left(\frac{V6+V7}{2}\right) + V9}{9}$$

FCI 1 =	**0.99**	**Final Tree =**	**0.89**
FCI 2 trees=	**0.96**	**Final Shrubs=**	**#VALUE!**
		Final Herbaceous =	**#VALUE!**
FCI 2 shrubs=	**#VALUE!**		
FCI 2 ground =	**#VALUE!**		
FCI 3 trees=	**0.88**		
FCI 3 shrubs=	**#VALUE!**		
FCI 3 ground =	**#VALUE!**		
FCI 4 trees=	**0.74**		
FCI 4 shrubs=	**#VALUE!**		
FCI 4 ground =	**#VALUE!**		

TRAM Summary Worksheet

Project: SR-19, PIN 102251.01, WTL-6

Exceptional Status Wetlands		**Check if applicable**
	1. **ONRW**	☐
	2. **ETW**	☐
	3. **Further Review Requested:** Attach Wetland Background and Exceptional Status Wetlands Worksheet	☐
	COMMENTS/NOTES:	
Quantitative Rating scores	Function: Hydrologic Regime	0.99
	Function: Biogeochemical Processes	0.96
	Function: Retain Particulates	n/a
	Function: Plant Community	0.88
	Function: Wildlife Community	0.74
	Quantitative Score (Average of FCIs x 100)	89.25
	Value Added (Significant Size) Total	0
Total of Quantitative and Value Added Scores	**TOTAL SCORE**	89.25

Ecology Field Data Sheet: **Water Resources**

Project: Lauderdale County, SR-19, 102251.01					
Biologist:	JC & JG	**Affiliation:**	JMT	**Date:**	08-14-24

1-Station: from plans	Northwest of Watson Rd meeting SR-19								
2-Map label and name	WWC-23/EPH-15								
3-Latitude/Longitude	35.713875, -89.454788								
4-Feature description:									
-channel identification	perennial stream		intermittent stream		ephemeral stream		wwc	✓	
-HD score (if applicable)	8								
-OHWM indicators	bed & banks	✓	deposition		presence of litter debris		scour		veg absent, bent, matted
	change in plant community		destruction of terrestrial veg		multiple observe flow events		sediment sorting		water staining
	change in soil character		leaf litter disturb or absent		natural line impressed on bank		shelving		wracking
-channel bottom width	6"		-top of bank width	3'					
-width and max depth at ordinary high water mark	2' width, 6" max depth								
-width at bankfull	3'								
-bank height	LDB - 1'		RDB - 1'						
-riffle/pool complex or other specialized habitat present?	No								
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Sweet gum, slippery elm, red oak, poison ivy								
	RDB: Sweet gum, slippery elm, red oak, poison ivy								
-particle size distribution %	Silt/Sand:	90	Gravel:	10	Cobble:		Boulder:		Bedrock:
5-photo numbers	67-71								
6-HUC -8 Code & Name	08010208 - Lower Hatchie								
7-Assessed	yes		no	✓					
8-ETW	yes		no	✓					
9-303 (d) List	yes		siltation		habitat:		other:		
	no	✓							
10-Notes									

Revised July 2022

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Lagoon Creek		Date/Time: 08/12/24
Assessors/Affiliation: JC, JG; JMT		Project ID : 102251.01
Site Name/Description: WWC-23/EPH-15		
Site Location: Northwest of Watson Rd meeting SR-19		
HUC (12 digit): 080102080701	Latitude: 35.713875	
Previous Rainfall (7-days) : <0.5 inches	Longitude: -89.454788	
Precipitation this Season vs. Normal : abnormally wet elevated **average** low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0		
Watershed Size : <0.02 sq. miles	County: Lauderdale	
Soil Type(s) / Geology : Memphis Silt Loam	Source: NRCS Web Soil Survey	
Surrounding Land Use : Low Density Residential, Agricultural		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate **Slight** Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 8

Justification / Notes :

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 7)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 1)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 0)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 8

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Channel headwaters formed in project area. 4 braided small channels flow into the main channel.

Ecology Field Data Sheet: **Water Resources**

Project: Lauderdale County, SR-19, 102251.01					
Biologist:	RF & MM	**Affiliation:**	JMT	**Date:**	08-13-24

1-Station: from plans	~0.27 miles West of Carney Rd on SR-19								
2-Map label and name	WWC-24/UDF-9								
3-Latitude/Longitude	35.714112, -89.454901								
4-Feature description:									
-channel identification	perennial stream ☐	intermittent stream ☐	ephemeral stream ☐	wwc ☑					
-HD score (if applicable)	8.5								
-OHWM indicators	bed & banks ☑	deposition ☐	presence of litter debris ☐	scour ☐	veg absent, bent, matted ☐				
	change in plant community ☐	destruction of terrestrial veg ☐	multiple observe flow events ☐	sediment sorting ☐	water staining ☐				
	change in soil character ☐	leaf litter disturb or absent ☐	natural line impressed on bank ☐	shelving ☐	wracking ☐				
-channel bottom width	1'	-top of bank width	1'						
-width and max depth at ordinary high water mark	3" width, 3" max depth								
-width at bankfull	1'								
-bank height	LDB - 1'	RDB - 1'							
-riffle/pool complex or other specialized habitat present?	No								
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Box elder, giant ragweed								
	RDB: Giant ragweed								
-particle size distribution %	Silt/Sand: 100	Gravel:	Cobble:	Boulder:	Bedrock:				
5-photo numbers	69								
6-HUC -8 Code & Name	08010208 - Lower Hatchie								
7-Assessed	yes ☐	no ☑							
8-ETW	yes ☐	no ☑							
9-303 (d) List	yes ☐	siltation ☐	habitat: ☐	other: ☐					
	no ☑								
10-Notes	Develops suddenly along slope.								

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody:UNT Cane Creek	Date/Time:8/13/24
Assessors/Affiliation:RF, MM; JMT	Project ID :102251.01
Site Name/Description:WWC-24/UDF-9	
Site Location:~0.27 miles West of Carney Rd on SR-19	
HUC (12 digit):080102080701	Latitude:35.714112
Previous Rainfall (7-days) :< 0.5 inches	Longitude:-89.454901
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0	
Watershed Size :0.01 sq. miles	County:Lauderdale
Soil Type(s) / Geology :Memphis Silt Loam	Source:NRCS Web Soil Survey
Surrounding Land Use :Wooded	
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 8.5

Justification / Notes :

Incipient drought (based on APT). Flows into WWC-23/EPH-15.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 1)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 1.5)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 6)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants.

[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 8.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Ecology Field Data Sheet: **Water Resources**

Project: Lauderdale County, SR-19, 102251.01					
Biologist:	JC & JG	**Affiliation:**	JMT	**Date:**	08-14-24

1-Station: from plans	East of Springhill Rd. on the South side SR-19								
2-Map label and name	PND-3								
3-Latitude/Longitude	35.712692, -89.448074								
4-Feature description:									
-channel identification	perennial stream		intermittent stream		ephemeral stream		wwc		
-HD score (if applicable)	N/A - Pond								
-OHWM indicators	bed & banks	✓	deposition		presence of litter debris		scour		veg absent, bent, matted ✓
	change in plant community	✓	destruction of terrestrial veg	✓	multiple observe flow events		sediment sorting		water staining ✓
	change in soil character	✓	leaf litter disturb or absent	✓	natural line impressed on bank		shelving		wracking
-channel bottom width	N/A		-top of bank width		N/A				
-width and max depth at ordinary high water mark	width 200', max depth undetermined								
-width at bankfull	N/A								
-bank height	LDB - N/A		RDB - N/A						
-riffle/pool complex or other specialized habitat present?	No								
-dominant riparian species: ----------(LDB /RDB)----------	LDB: southern red oak, black willow, pecan								
	RDB: southern red oak, black willow, pecan								
-particle size distribution %	Silt/Sand: 100		Gravel:		Cobble:		Boulder:		Bedrock:
5-photo numbers	72								
6-HUC -8 Code & Name	08010205 - South Fork Forked Deer								
7-Assessed	yes		no	✓					
8-ETW	yes		no	✓					
9-303 (d) List	yes		siltation		habitat:		other:		
	no	✓							
10-Notes	Pond overflows into WTL-7.								

Revised July 2022

Ecology Field Data Sheet: **Water Resources**

Project: Lauderdale County, SR-19, 102251.01					
Biologist:	RB & BC	**Affiliation:**	JMT	**Date:**	08-13-24

1-Station: from plans	North side of SR-19 ~0.15 miles south of Watson Rd								
2-Map label and name	WWC-25/UDF-10								
3-Latitude/Longitude	35.713013, -89.448002								
4-Feature description:									
-channel identification	perennial stream		intermittent stream		ephemeral stream		wwc	✓	
-HD score (if applicable)	18								
-OHWM indicators	bed & banks	✓	deposition		presence of litter debris	✓	scour		veg absent, bent, matted ✓
	change in plant community	✓	destruction of terrestrial veg		multiple observe flow events		sediment sorting	✓	water staining
	change in soil character		leaf litter disturb or absent	✓	natural line impressed on bank		shelving		wracking ✓
-channel bottom width	2'		-top of bank width		4'				
-width and max depth at ordinary high water mark	3' width, 3" max depth								
-width at bankfull	3'								
-bank height	LDB - 4'				RDB - 4'				
-riffle/pool complex or other specialized habitat present?	No								
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Red maple, agriculture field beyond								
	RDB: Fescue								
-particle size distribution %	Silt/Sand: 80		Gravel: 20		Cobble:		Boulder:		Bedrock:
5-photo numbers	74								
6-HUC -8 Code & Name	08010205 - South Fork Forked Deer								
7-Assessed	yes		no	✓					
8-ETW	yes		no	✓					
9-303 (d) List	yes		siltation		habitat:		other:		
	no	✓							
10-Notes	Gravel from nearby road								

Revised July 2022

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Pond Creek		Date/Time: 08/13/24
Assessors/Affiliation: RB, BC; JMT		Project ID : 102251.01
Site Name/Description: WWC-25/UDF-10		
Site Location: North side of SR-19 ~0.15 miles south of Watson Rd		
HUC (12 digit): 080102050403	Latitude: 35.713013	
Previous Rainfall (7-days) : < 0.5 inches	Longitude: -89.448002	
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0		
Watershed Size : < 0.01 sq. miles	County: Lauderdale	
Soil Type(s) / Geology : Loring Silt Loam	Source: NRCS Web Soil Survey	
Surrounding Land Use : Low Density Residential, Agricultural		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 18

Justification / Notes :

Incipient drought (based on APT). Conveyance is artificial, roadside ditch, in nature.

Substrate gravel is from nearby roadway (not natural).

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 11)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 3)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 4)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 18

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

An affirmative response to 1-6 of the Decision Table identifies the wetland per rule as an Outstanding Natural Resource Water (ONRW) or Exceptional Tennessee Waters (ETW). A positive response to 7-13 requires a final determination by the Department.

#	**Wetland Feature Decision Table** PIN 102251.01; WTL-7	**Yes/No**	**Affirmative Result**
1	The wetland has been designated as an **Outstanding Natural Resource Water (ONRW)** by the Department under 0400-40-03-.06(5)(a)**.**	No	**ORNW**
2	The wetland has previously been designated and documented as an Exceptional Tennessee Water (ETW) by the Department under 0400-40-03-.06(4)(a)(7)	No	**ETW**
3	The wetland is within state or national parks, wildlife refuges, forests, wilderness areas, natural areas, or is a designated State Scenic Rivers or Federal Wild and Scenic Rivers.	No	**ETW**
4	The wetland is known to contain a documented non-experimental population of state or federally listed threatened or endangered aquatic or semi-aquatic plants, or aquatic animals.	No	**ETW**
5	The wetland or the area it is in has been designated by the U.S. Fish and Wildlife Service as "**Critical Habitat**" for any threatened or endangered aquatic or semi-aquatic plant or aquatic animal species.	No	**ETW**
6	The wetland falls within an area designated as Lands Unsuitable for Mining pursuant to the federal Surface Mining Control and Reclamation Act where such designation is based in whole or in part on impacts to water resource values	No	**ETW**
7	**The wetland exhibits outstanding ecological or recreational values such as, but not limited to, those as outlined in 8-12**	No	Determination Required by TDEC
8	The wetland fits within the species composition concept for any plant community found in the state of Tennessee **ranked G2, G1, or more imperiled** at the "Association" classification level according to the NatureServe and Natural Heritage Ranking system (e.g. "bog", "fen", and "wet prairie/barren" communities).	No	Determination Required by TDEC
9	The wetland is **an uncommon resource** (e.g. vernal pools, headwater wetlands, sinks, spring/seeps, glades, newly described communities, high recreational or socioeconomic value) in the region and/or is deemed such by concurrence of qualified scientists.	No	Determination Required by TDEC
10	The wetland is an **older aged forested wetland** comprised of overstory trees with an average diameter at breast height (dbh) being **greater than or equal to 30 in** within the WAA.	No	Determination Required by TDEC
11	The wetland is observed and documented to be a **significant waterfowl, songbird, shorebird, amphibian, bat, fish habitat area**. These may include rookeries, migratory congregations, nesting sites, breeding areas, etc.	No	Determination Required by TDEC
12	The wetland is **hydrologically connected** to and/or has significant ecological contribution to an **ETW**	No	Determination Required by TDEC
13	The wetland has High Resource Value as determined by a **score of 75 and above** using the TRAM or non-HGM TRAM (to be determined after completing the quantitative portion of this manual)	No	Determination Required by TDEC

End of Narrative Rating. Begin Quantitative Rating on Next Page.

HGM FUNCTIONAL ASSESSMENT
SLOPE WETLANDS

Date: 08/14/2024 Project Name SR-19, 102251.01

Field Personnel JJ, JG Wetland Name/Location WTL-7

Read instructions prior to conducting assessments. If project area is large or highly heterogeneous requiring the designation of several WAAs, a separate assessment should be performed for each WAA. CHECK THE APPROPRIATE BLANK(S) BELOW.

V1: Hydroperiod (HYDRO)

☑ 1. Hydrology not altered (SI = 1.0)
- no fill material or excessive sediment
- no ditches/drainage tiles
- no roads or other impediments to surface or groundwater
- no excavation
- no alteration to overland runoff, groundwater discharge/recharge

☐ 2. Hydrology slightly altered (SI = 0.75)
- portion of site with minimal fill or sediment
- portion of site with drainage ditches/tiles
- roads or other impediments, water flow slightly altered
- minor portion of site excavated
- some alteration to overland runoff, groundwater discharge/recharge

☐ 3. Hydrology moderately altered (SI = 0.5)
- portion of site with moderate fill or sediment
- portion of site with drainage ditches/tiles
- some alteration to overland runoff, groundwater discharge/recharge
- roads or other impediments, water flow moderately altered
- moderate portion of site excavated

☐ 4. Hydrology significantly altered (SI = 0.25)
- portion of site with significant fill or sediment
- portion of site with drainage ditches/tiles
- significant alteration to overland runoff, groundwater discharge/recharge
- roads or other impediments, water flow significantly altered
- significant portion of site excavated

☐ 5. Hydrology severely altered (SI = 0.1)
- entire site impacted by fill or excessive sediment
- entire site with numerous drainage ditches/tiles
- no contributions to or from overland runoff, groundwater discharge/recharge
- roads or other impediments, water flow completely blocked
- entire wetland affected

V2: Wetland Watershed Integrity (WSHEDINT)

Use weighted average as discussed on page 10. Examples of land uses and multipliers listed below

A = Percentage forested with no impervious surfaces 100
B = Percentage permeable land, (e.g., park, golf course, pasture, hay, orchard, tree farm, or similar) _____
C = Percentage low density residential, construction, or similar _____
D = Percentage high density residential, or similar _____
E = Percentage urban, commercial, industrial, or similar _____

V2 = (A x 1.0) + (B x 0.75) + (C x 0.5) + (D x 0.25) + (E x 0.01)/(100) = 1.00

V3: Canopy Tree Size Class (TSIZE)

1. Average size of canopy trees > 3 in. DBH

☑ ≥ 15 in. (SI = 1.0) ☐ 10 – 14 in. (SI = 0.75) ☐ 6 – 9 in. (SI = 0.5) ☐ 3 – 5 in. (SI = 0.25)
☐ < 3 in. or no trees present, go to V5

V4: Canopy Tree Density (TDEN)

1. Average number of canopy trees (> 3 in. DBH) per 30-ft. radius plot

☐ 5 – 10 (SI = 1.0) ☐ 11 – 15 (SI = 0.75) ☐ > 15 (SI = 0.5) ☑ 1 – 4 (SI = 0.5)

V5: Shrub Cover (SCOV)

1. Average percent cover of shrubs (woody stems < 3 in. DBH and taller than 3 ft.) per 30-ft. radius plot

☐ > 20 (SI = 1.0) ☑ < 20, go to V6

V6: Ground Vegetation Cover (GVC)

1. Average percent cover of ground vegetation per 30-ft. radius plot

☐ ≥ 70 (SI = 1.0) ☐ 55 – 69 (SI = 0.75) ☐ 45 – 54 (SI = 0.5) ☐ 30 – 44 (SI = 0.25) ☐ 20 – 29 (SI = 0.1)
☑ < 20 (SI=0.0)

V7: Vegetation Composition and Diversity (COMP)

1. Check the dominant species from Groups 1, 2, and 3 below using the 50/20 rule. If tree cover is < 20%, check the dominants in the next tallest stratum. If a dominant does not appear in lists below, but is a native species, it can be added to Group 1 or 2 species based on the scientific literature or professional judgement. Native shrub and herbaceous species are assigned to Group 2. When using shrub or herbaceous write in the number of dominant species. Dominant invasive species are checked regardless of stratum. *

GROUP 1 (Reference Standard)		GROUP 2 (Native Ubiquitous)		GROUP 3 (Invasive)
☐ Water oak	☐ Pin oak	☐ American elm	☐ Green ash	☐ European/Chinese privet
☐ Bur oak	☐ Shumard oak	☐ Slippery elm	☐ Red maple	☐ Japanese honeysuckle
☐ Willow oak	☐ Bald cypress	☐ Sweetgum	☐ Silver maple	☐ Japanese stiltgrass
☐ Swamp chestnut oak	☐ Water tupelo	☐ Blackgum	☑ Black willow	☐ Purple loosestrife
☐ Cherrybark oak	☐ S. black gum	☐ Silky dogwood	☐ Sycamore	☐ Giant reed
☐ Swamp white oak	☐ Persimmon	☐ Boxelder	☐ _____	☐ Tall fescue
☐ Nuttall oak	☐ Am. hornbeam	☐ Tulip poplar	☐ _____	☐ Phragmites
☐ Overcup oak	☐ _____	____ Number native shrub spp.		☐ _____
☐ _____	☐ _____	____ Number native herbaceous spp.		☐ _____

2. Using the number of dominants in Groups 1, 2, and 3 above, calculate a quality index (Q) using the following formula: [(1.0 x # of checked dominants in Group 1) + (0.66 x # of checked dominants in Group 2) + (0.0 x # of checked dominants in Group 3)]/ total # of checked dominants in all groups = 0.66

3. Multiply Q above by one of the following constants that reflects species richness:[1]

- ○ a) if ≥ 4 species from Groups 1 and/or 2 occur as dominants, multiply Q by 1.0 _____
- ○ b) if 3 species from Groups 1 and/or 2 occur as dominant, multiply Q by 0.75 _____
- ○ c) if 2 species from Groups 1 and/or 2 occur as dominants, multiply Q by 0.50 _____
- ◉ d) if 1 species from Groups 1 and/or 2 occurs as dominant, multiply Q by 0.25 0.165
- ○ e) if no species from Groups 1 and/or 2 occurs as dominant, multiply Q by 0.0 _____

4. Calculate the square root of the value from Step 3 above. This value is the SI for **V7**= 0.41

*In some Depression wetlands and in some small WAAs (e.g., <0.5 acres), relatively few species (e.g., overcup oak) may be present. In cases in which this is the normal condition, Q can be multiplied by 1.0 if only 1 or 2 species are dominant.

V8: Soil Organic Matter (ORGANIC)

1. Surface horizons unaltered

☑ 100 percent cover of O and/or A horizon present (SI = 1.0)

2. Surface horizons altered. Estimate the percent of the WAA in which neither an O or A horizon is present.

3. Subtract the sum of the values from Step 2 from 100. Convert this value to a decimal. This value is the SI for V8 (e.g., if 75 % of the WAA does not have an O or A horizon due to a significant disturbance, it will have an SI of 0.25).

V9: Buffer (BUFFER)

1. Determine the Connection Index (CI) by estimating the percent of the wetland surrounded by suitable buffer habitat.

☐ 90% – 100% (CI = 1.0) ☑ 75% – 89% (CI = 0.75) ☐ 40% – 74% (CI = 0.5) ☐ 10% – 39% (CI = 0.25)
☐ < 10% (CI = 0.1)

2. Multiply the CI by one if the following values:

- ○ a) if average buffer width is ≥ 492 ft., multiply by 1.0
- ◉ b) if average buffer is 98 ft to 491 ft., multiply by 0.66
- ○ c) if average buffer width is 33 ft to 97 ft., multiply by 0.33
- ○ d) if average buffer width is < 33 ft., multiply by 0.1

3. This value is the SI for **V9 =** 0.5 **.**

VALUES USED TO CALCULATE FUNCTIONAL CAPACITY INDICES (FCIs)

SUBINDEX VALUES:

V1 1.00 (HYDRO) V3 1.00 (TSIZE) V5 0.00 (SCOV) V7 0.41 (COMP) V9 0.50 (BUFFER)

V2 1.00 (WSHEDINT) V4 0.50 (TDEN) V6 0.25 (GVC) V8 1.00 (ORGANIC)

Slope Wetland

WTL-7

V1: HYDROPERIOD	**1**	
V2: WETLAND WATERSHED INTEGRITY	**1**	
V3: CANOPY TREE CLASS	**1**	
V4: CANOPY TREE DENSITY	**0.5**	
V5: SHRUB COVER	**GOTOV6**	
V6: GROUND VEGETATION COVER	**n/a**	
V7: VEGETATION COMPOSITION AND DIVERSITY	**0.41**	
2. Q =	**0.66**	
# of Group 1 Dominants	0	
# of Group 2 Dominants	1	
# of Group 3 Dominants	0	
SPECIES RICHNESS CONSTANT	0.25	
V8: SOIL ORGANIC MATTER	**1**	
V9:BUFFER	**0.5**	
1. Connection Index	0.75	
2. Buffer width value (0-1)	0.66	

Function 1: Maintain Hydrologic Regime

(V1 x V2)^(1/2)

FCI 1 = **1.00** **Final Tree =** **0.85**

Function 2: Maintain Biogeochemical Processes

$$\text{FCI (trees present)} = \left((V1 \times V2)^{1/2} \times \left(\frac{\frac{V3+V4}{2}+V8}{2}\right)\right)^{1/2}$$

FCI 2 trees= **0.94** **Final Shrubs=** **#VALUE!**

Final Herbaceous = **#VALUE!**

$$\text{FCI (shrubs present)} = \left((V1 \times V2)^{1/2} \times \left(\frac{V5+V8}{3}\right)\right)^{1/2}$$

FCI 2 shrubs= **#VALUE!**

$$\text{FCI (ground cover)} = \left((V1 \times V2)^{1/2} \times \left(\frac{V6+V8}{5}\right)\right)^{1/2}$$

FCI 2 ground = **#VALUE!**

Function 3: Maintain Characteristic Plant Community

$$\text{FCI (trees present)} = \frac{(V1 \times V2)^{1/2} + 2\left(\frac{V3+V4+V7}{3}\right)}{3}$$

FCI 3 trees= **0.76**

$$\text{FCI (shrubs present)} = \frac{(V1 \times V2)^{1/2} + 2\left(\frac{V5+V7}{2}\right)}{6}$$

FCI 3 shrubs= **#VALUE!**

$$\text{FCI (groundcover)} = \frac{(V1 \times V2)^{1/2} + 2\left(\frac{V6+V7}{2}\right)}{9}$$

FCI 3 ground = **#VALUE!**

Function 4: Maintain Characteristic Wildlife Community:

$$\text{FCI (trees)} = \frac{(V1 \times V2)^{1/2} + 2\left(\frac{V3+V4+V7}{3}\right) + V9}{4}$$

FCI 4 trees= **0.69**

$$\text{FCI (shrubs present)} = \frac{(V1 \times V2)^{1/2} + 2\left(\frac{V5+V7}{2}\right) + V9}{6}$$

FCI 4 shrubs= **#VALUE!**

$$\text{FCI (groundcover)} = \frac{(V1 \times V2)^{1/2} + 2\left(\frac{V6+V7}{2}\right) + V9}{9}$$

FCI 4 ground = **#VALUE!**

TRAM Summary Worksheet

Project: SR-19, PIN 102251.01, WTL-7

Exceptional Status Wetlands		**Check if applicable**
	1. **ONRW**	☐
	2. **ETW**	☐
	3. **Further Review Requested:** Attach Wetland Background and Exceptional Status Wetlands Worksheet	☐
	COMMENTS/NOTES:	
Quantitative Rating scores	Function: Hydrologic Regime	1.00
	Function: Biogeochemical Processes	0.94
	Function: Retain Particulates	n/a
	Function: Plant Community	0.76
	Function: Wildlife Community	0.69
	Quantitative Score (Average of FCIs x 100)	84.75
	Value Added (Significant Size) Total	0
Total of Quantitative and Value Added Scores	**TOTAL SCORE**	84.75

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: TN SR-19 City/County: Lauderdale County Sampling Date: 2024-08-13

Applicant/Owner: TDOT State: Tennessee Sampling Point: 1-DPW-1

Investigator(s): Ray Bode and Bryan Cardoso Section, Township, Range:

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 0

Subregion (LRR or MLRA): P 134 Lat: 35.712723 Long: -89.446595 Datum: NAD83_2011

Soil Map Unit Name: Ad - Adler silt loam, 0 to 2 percent slopes, occasionally flooded NWI classification: PFO

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓	No _____	
Wetland Hydrology Present?	Yes ✓	No _____	

Remarks:

WTL-8
Form also represents WTL-7 (PIN 102251.01), WTL-2 (PIN 102251.03), and WTL-2 (PIN 102251.02).

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)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along 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)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes _____	No ✓	Depth (inches): _____
Water Table Present?	Yes _____	No ✓	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No ✓	Depth (inches): _____

Wetland Hydrology Present? Yes ✓ No _____

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

Remarks:

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

Sampling Point: 1-DPW-1

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Sapling/Shrub Stratum (Plot size: 30 ft r)			
1. Salix nigra	50	✓	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	50 = Total Cover		

50% of total cover: 25.00 20% of total cover: 10.00

Herb Stratum (Plot size: 30 ft r)			
1. Microstegium vimineum	100	✓	FAC
2. Leersia oryzoides	50	✓	OBL
3. Salix nigra	30		OBL
4. Impatiens capensis	30		FACW
5. Persicaria hydropiper	20		OBL
6. Carex lurida	5		OBL
7.			
8.			
9.			
10.			
11.			
12.			
	235 = Total Cover		

50% of total cover: 117.50 20% of total cover: 47.00

Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		

50% of total cover: _____ 20% of 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: 100.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0505030205	x 1 =	0505030205
FACW species	30	x 2 =	60
FAC species	100	x 3 =	300
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	505030335 (A)		505030565 (B)

Prevalence Index = B/A = 1.00

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four 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 vines, less than 3 in. DBH and greater than 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** _____

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: 1-DPW-1

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 - 4	10YR 6/2	95	10YR 6/8	5	C	M	Silt Loam	
4 - 16	10YR 6/1	90	10YR 5/8	10	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 Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✓ **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: TN SR-19 City/County: Lauderdale County Sampling Date: 2024-08-14

Applicant/Owner: TDOT State: Tennessee Sampling Point: 1-DPU-1

Investigator(s): Rhiannon Flickinger and Miranda McKiernan Section, Township, Range:

Landform (hillslope, terrace, etc.): Upland Local relief (concave, convex, none): Linear Slope (%): 2

Subregion (LRR or MLRA): P 134 Lat: 35.70953707 Long: -89.43681938 Datum: NAD83_2011

Soil Map Unit Name: MeD3 - Memphis silt loam, 8 to 12 percent slopes, severely eroded, northern phase NWI classification: UPL

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

WTL-8 upland form
Form also represents uplands adjacent to wetland WTL-7 [PIN 102251.01], WTL-2 [PIN 102251.02], and WTL-2 [PIN 102251.03]

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)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along 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)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes _____	No ✓	Depth (inches): _____
Water Table Present?	Yes _____	No ✓	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No ✓	Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

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

Remarks:

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

Sampling Point: 1-DPU-1

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Sapling/Shrub Stratum (Plot size: 30 ft r)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Herb Stratum (Plot size: 30 ft r)			
1. Festuca trachyphylla	90	✓	UPL
2. Iva annua	40	✓	FAC
3. Schizachyrium scoparium ssp. scoparium	40	✓	
4. Solanum carolinense	40	✓	FACU
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	210 = Total Cover		

50% of total cover: 105.00 20% of total cover: 42.00

Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		

50% of total cover: _____ 20% of 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: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33.33 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	40	x 3 =	120
FACU species	40	x 4 =	160
UPL species	90	x 5 =	450
Column Totals:	170 (A)		730 (B)

Prevalence Index = B/A = 4.29

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four 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 vines, less than 3 in. DBH and greater than 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 ✓

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: 1-DPU-1

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 %	Type[1]	Loc[2]	Texture	Remarks
0 - 4	10YR 4/4	100					Sandy Clay Loam	
-								
-								
-								
-								
-								
-								

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

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: Compaction

Depth (inches): 4

Hydric Soil Present? Yes _____ No ✓

Remarks:

An affirmative response to 1-6 of the Decision Table identifies the wetland per rule as an Outstanding Natural Resource Water (ONRW) or Exceptional Tennessee Waters (ETW). A positive response to 7-13 requires a final determination by the Department.

#	**Wetland Feature Decision Table** PIN 102251.01; WTL-8	**Yes/No**	**Affirmative Result**
1	The wetland has been designated as an **Outstanding Natural Resource Water (ONRW)** by the Department under 0400-40-03-.06(5)(a)**.**	No	**ORNW**
2	The wetland has previously been designated and documented as an Exceptional Tennessee Water (ETW) by the Department under 0400-40-03-.06(4)(a)(7)	No	**ETW**
3	The wetland is within state or national parks, wildlife refuges, forests, wilderness areas, natural areas, or is a designated State Scenic Rivers or Federal Wild and Scenic Rivers.	No	**ETW**
4	The wetland is known to contain a documented non-experimental population of state or federally listed threatened or endangered aquatic or semi-aquatic plants, or aquatic animals.	No	**ETW**
5	The wetland or the area it is in has been designated by the U.S. Fish and Wildlife Service as "**Critical Habitat**" for any threatened or endangered aquatic or semi-aquatic plant or aquatic animal species.	No	**ETW**
6	The wetland falls within an area designated as Lands Unsuitable for Mining pursuant to the federal Surface Mining Control and Reclamation Act where such designation is based in whole or in part on impacts to water resource values	No	**ETW**
7	**The wetland exhibits outstanding ecological or recreational values such as, but not limited to, those as outlined in 8-12**	No	Determination Required by TDEC
8	The wetland fits within the species composition concept for any plant community found in the state of Tennessee **ranked G2, G1, or more imperiled** at the "Association" classification level according to the NatureServe and Natural Heritage Ranking system (e.g. "bog", "fen", and "wet prairie/barren" communities).	No	Determination Required by TDEC
9	The wetland is **an uncommon resource** (e.g. vernal pools, headwater wetlands, sinks, spring/seeps, glades, newly described communities, high recreational or socioeconomic value) in the region and/or is deemed such by concurrence of qualified scientists.	No	Determination Required by TDEC
10	The wetland is an **older aged forested wetland** comprised of overstory trees with an average diameter at breast height (dbh) being **greater than or equal to 30 in** within the WAA.	No	Determination Required by TDEC
11	The wetland is observed and documented to be a **significant waterfowl, songbird, shorebird, amphibian, bat, fish habitat area**. These may include rookeries, migratory congregations, nesting sites, breeding areas, etc.	No	Determination Required by TDEC
12	The wetland is **hydrologically connected** to and/or has significant ecological contribution to an **ETW**	No	Determination Required by TDEC
13	The wetland has High Resource Value as determined by a **score of 75 and above** using the TRAM or non-HGM TRAM (to be determined after completing the quantitative portion of this manual)	No	Determination Required by TDEC

End of Narrative Rating. Begin Quantitative Rating on Next Page.

HGM FUNCTIONAL ASSESSMENT
SLOPE WETLANDS

Date: 08/13/2024 Project Name SR-19, 102251.01

Field Personnel RB, BC Wetland Name/Location WTL-8

Read instructions prior to conducting assessments. If project area is large or highly heterogeneous requiring the designation of several WAAs, a separate assessment should be performed for each WAA. CHECK THE APPROPRIATE BLANK(S) BELOW.

V1: Hydroperiod (HYDRO)

☐ 1. Hydrology not altered (SI = 1.0)
- no fill material or excessive sediment
- no ditches/drainage tiles
- no roads or other impediments to surface or groundwater
- no excavation
- no alteration to overland runoff, groundwater discharge/recharge

☑ 2. Hydrology slightly altered (SI = 0.75)
- portion of site with minimal fill or sediment
- portion of site with drainage ditches/tiles
- roads or other impediments, water flow slightly altered
- minor portion of site excavated
- some alteration to overland runoff, groundwater discharge/recharge

☐ 3. Hydrology moderately altered (SI = 0.5)
- portion of site with moderate fill or sediment
- portion of site with drainage ditches/tiles
- some alteration to overland runoff, groundwater discharge/recharge
- roads or other impediments, water flow moderately altered
- moderate portion of site excavated

☐ 4. Hydrology significantly altered (SI = 0.25)
- portion of site with significant fill or sediment
- portion of site with drainage ditches/tiles
- significant alteration to overland runoff, groundwater discharge/recharge
- roads or other impediments, water flow significantly altered
- significant portion of site excavated

☐ 5. Hydrology severely altered (SI = 0.1)
- entire site impacted by fill or excessive sediment
- entire site with numerous drainage ditches/tiles
- no contributions to or from overland runoff, groundwater discharge/recharge
- roads or other impediments, water flow completely blocked
- entire wetland affected

V2: Wetland Watershed Integrity (WSHEDINT)

Use weighted average as discussed on page 10. Examples of land uses and multipliers listed below

A = Percentage forested with no impervious surfaces 60
B = Percentage permeable land, (e.g., park, golf course, pasture, hay, orchard, tree farm, or similar) 35
C = Percentage low density residential, construction, or similar 5
D = Percentage high density residential, or similar _____
E = Percentage urban, commercial, industrial, or similar _____

V2 = (A x 1.0) + (B x 0.75) + (C x 0.5) + (D x 0.25) + (E x 0.01)/(100) = 0.89

V3: Canopy Tree Size Class (TSIZE)

1. Average size of canopy trees > 3 in. DBH

☐ ≥ 15 in. (SI = 1.0) ☐ 10 – 14 in. (SI = 0.75) ☐ 6 – 9 in. (SI = 0.5) ☐ 3 – 5 in. (SI = 0.25)
☑ < 3 in. or no trees present, go to V5

V4: Canopy Tree Density (TDEN)

1. Average number of canopy trees (> 3 in. DBH) per 30-ft. radius plot

☐ 5 – 10 (SI = 1.0) ☐ 11 – 15 (SI = 0.75) ☐ > 15 (SI = 0.5) ☐ 1 – 4 (SI = 0.5)

V5: Shrub Cover (SCOV)

1. Average percent cover of shrubs (woody stems < 3 in. DBH and taller than 3 ft.) per 30-ft. radius plot

☑ > 20 (SI = 1.0) ☐ < 20, go to V6

V6: Ground Vegetation Cover (GVC)

1. Average percent cover of ground vegetation per 30-ft. radius plot

☐ ≥ 70 (SI = 1.0) ☐ 55 – 69 (SI = 0.75) ☐ 45 – 54 (SI = 0.5) ☐ 30 – 44 (SI = 0.25) ☐ 20 – 29 (SI = 0.1)
☐ < 20 (SI=0.0)

V7: Vegetation Composition and Diversity (COMP)

1. Check the dominant species from Groups 1, 2, and 3 below using the 50/20 rule. If tree cover is < 20%, check the dominants in the next tallest stratum. If a dominant does not appear in lists below, but is a native species, it can be added to Group 1 or 2 species based on the scientific literature or professional judgement. Native shrub and herbaceous species are assigned to Group 2. When using shrub or herbaceous write in the number of dominant species. Dominant invasive species are checked regardless of stratum. *

GROUP 1 (Reference Standard)		GROUP 2 (Native Ubiquitous)		GROUP 3 (Invasive)
☐ Water oak	☐ Pin oak	☐ American elm	☑ Green ash	☐ European/Chinese privet
☐ Bur oak	☐ Shumard oak	☐ Slippery elm	☐ Red maple	☐ Japanese honeysuckle
☐ Willow oak	☐ Bald cypress	☐ Sweetgum	☐ Silver maple	☐ Japanese stiltgrass
☐ Swamp chestnut oak	☐ Water tupelo	☐ Blackgum	☑ Black willow	☐ Purple loosestrife
☐ Cherrybark oak	☐ S. black gum	☐ Silky dogwood	☐ Sycamore	☐ Giant reed
☐ Swamp white oak	☐ Persimmon	☐ Boxelder	☐ _____	☐ Tall fescue
☐ Nuttall oak	☐ Am. hornbeam	☐ Tulip poplar	☐ _____	☐ Phragmites
☐ Overcup oak	☐ _____	____ Number native shrub spp.		☐ _____
☐ _____	☐ _____	____ Number native herbaceous spp.		☐ _____

2. Using the number of dominants in Groups 1, 2, and 3 above, calculate a quality index (Q) using the following formula: [(1.0 x # of checked dominants in Group 1) + (0.66 x # of checked dominants in Group 2) + (0.0 x # of checked dominants in Group 3)]/ total # of checked dominants in all groups = 0.66

3. Multiply Q above by one of the following constants that reflects species richness:[1]

- ○ a) if ≥ 4 species from Groups 1 and/or 2 occur as dominants, multiply Q by 1.0 _____
- ○ b) if 3 species from Groups 1 and/or 2 occur as dominant, multiply Q by 0.75 _____
- ◉ c) if 2 species from Groups 1 and/or 2 occur as dominants, multiply Q by 0.50 0.30
- ○ d) if 1 species from Groups 1 and/or 2 occurs as dominant, multiply Q by 0.25 _____
- ○ e) if no species from Groups 1 and/or 2 occurs as dominant, multiply Q by 0.0 _____

4. Calculate the square root of the value from Step 3 above. This value is the SI for **V7**= 0.57

*In some Depression wetlands and in some small WAAs (e.g., <0.5 acres), relatively few species (e.g., overcup oak) may be present. In cases in which this is the normal condition, Q can be multiplied by 1.0 if only 1 or 2 species are dominant.

V8: Soil Organic Matter (ORGANIC)

1. Surface horizons unaltered
☐ 100 percent cover of O and/or A horizon present (SI = 1.0)

2. Surface horizons altered. Estimate the percent of the WAA in which neither an O or A horizon is present. 40

3. Subtract the sum of the values from Step 2 from 100. Convert this value to a decimal. This value is the SI for V8 (e.g., if 75 % of the WAA does not have an O or A horizon due to a significant disturbance, it will have an SI of 0.25).

V9: Buffer (BUFFER)

1. Determine the Connection Index (CI) by estimating the percent of the wetland surrounded by suitable buffer habitat.
☐ 90% – 100% (CI = 1.0) ☐ 75% – 89% (CI = 0.75) ☐ 40% – 74% (CI = 0.5) ☐ 10% – 39% (CI = 0.25)
☑ < 10% (CI = 0.1)

2. Multiply the CI by one if the following values:

- ○ a) if average buffer width is ≥ 492 ft., multiply by 1.0
- ○ b) if average buffer is 98 ft to 491 ft., multiply by 0.66
- ◉ c) if average buffer width is 33 ft to 97 ft., multiply by 0.33
- ○ d) if average buffer width is < 33 ft., multiply by 0.1

3. This value is the SI for **V9 =** 0.033.

VALUES USED TO CALCULATE FUNCTIONAL CAPACITY INDICES (FCIs)

SUBINDEX VALUES:

V1 0.75 (HYDRO) V3 _____ (TSIZE) V5 1.00 (SCOV) V7 0.57 (COMP) V9 0.03 (BUFFER)

V2 0.89 (WSHEDINT) V4 _____ (TDEN) V6 _____ (GVC) V8 0.60 (ORGANIC)

Slope Wetland

WTL-8

V1: HYDROPERIOD	**0.75**	**Function 1: Maintain Hydrologic Regime**
V2: WETLAND WATERSHED INTEGRITY	**0.89**	(V1 x V2)^(1/2)
V3: CANOPY TREE CLASS	**GOTOV5**	
V4: CANOPY TREE DENSITY	**N/A**	**Function 2: Maintain Biogeochemical Processes**
V5: SHRUB COVER	**1**	
V6: GROUND VEGETATION COVER	**n/a**	
V7: VEGETATION COMPOSITION AND DIVERSITY	**0.57**	
2. Q =	**0.66**	
# of Group 1 Dominants	0	
# of Group 2 Dominants	2	
# of Group 3 Dominants	0	
SPECIES RICHNESS CONSTANT	0.5	
V8: SOIL ORGANIC MATTER	**0.6**	
V9:BUFFER	**0.033**	
1. Connection Index	0.1	
2. Buffer width value (0-1)	0.33	

$$\text{FCI (trees present)} = \left((V1 \times V2)^{1/2} \times \left(\frac{\frac{V3+V4}{2}+V8}{2}\right)\right)^{1/2}$$

$$\text{FCI (shrubs present)} = \left((V1 \times V2)^{1/2} \times \left(\frac{V5+V8}{3}\right)\right)^{1/2}$$

$$\text{FCI (ground cover)} = \left((V1 \times V2)^{1/2} \times \left(\frac{V6+V8}{5}\right)\right)^{1/2}$$

Function 3: Maintain Characteristic Plant Community

$$\text{FCI (trees present)} = \frac{(V1 \times V2)^{1/2} + 2\left(\frac{V3+V4+V7}{3}\right)}{3}$$

$$\text{FCI (shrubs present)} = \frac{(V1 \times V2)^{1/2} + 2\left(\frac{V5+V7}{2}\right)}{6}$$

$$\text{FCI (groundcover)} = \frac{(V1 \times V2)^{1/2} + 2\left(\frac{V6+V7}{2}\right)}{9}$$

Function 4: Maintain Characteristic Wildlife Community:

$$\text{FCI (trees)} = \frac{(V1 \times V2)^{1/2} + 2\left(\frac{V3+V4+V7}{3}\right)+V9}{4}$$

$$\text{FCI (shrubs present)} = \frac{(V1 \times V2)^{1/2} + 2\left(\frac{V5+V7}{2}\right)+V9}{6}$$

$$\text{FCI (groundcover)} = \frac{(V1 \times V2)^{1/2} + 2\left(\frac{V6+V7}{2}\right)+V9}{9}$$

FCI 1 =	**0.82**	**Final Tree =**	**#VALUE!**
FCI 2 trees=	**#VALUE!**	**Final Shrubs=**	**0.57**
		Final Herbaceous =	**#VALUE!**
FCI 2 shrubs=	**0.66**		
FCI 2 ground =	**#VALUE!**		
FCI 3 trees=	**#VALUE!**		
FCI 3 shrubs=	**0.40**		
FCI 3 ground =	**#VALUE!**		
FCI 4 trees=	**#VALUE!**		
FCI 4 shrubs=	**0.40**		
FCI 4 ground =	**#VALUE!**		

TRAM Summary Worksheet

Project: SR-19, PIN 102251.01, WTL-8

Exceptional Status Wetlands		**Check if applicable**
	1. **ONRW**	☐
	2. **ETW**	☐
	3. **Further Review Requested:** Attach Wetland Background and Exceptional Status Wetlands Worksheet	☐
	COMMENTS/NOTES:	
Quantitative Rating scores	Function: Hydrologic Regime	0.82
	Function: Biogeochemical Processes	0.66
	Function: Retain Particulates	n/a
	Function: Plant Community	0.40
	Function: Wildlife Community	0.40
	Quantitative Score (Average of FCIs x 100)	57.00
	Value Added (Significant Size) Total	0
Total of Quantitative and Value Added Scores	**TOTAL SCORE**	57.00

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.01					
Biologist:	RB & BC	**Affiliation:**	JMT	**Date:**	08-14-24

1-Station: from plans	North of Springfield Rd on SR-19								
2-Map label and name	STR-7								
3-Latitude/Longitude	35.712637, -89.446291								
4-Feature description:									
-channel identification	perennial stream		intermittent stream	✓	ephemeral stream		wwc		
-HD score (if applicable)	25								
-OHWM indicators	bed & banks	✓	deposition		presence of litter debris	✓	scour		veg absent, bent, matted	
	change in plant community		destruction of terrestrial veg		multiple observe flow events		sediment sorting		water staining	
	change in soil character		leaf litter disturb or absent		natural line impressed on bank		shelving		wracking	
-channel bottom width	1'		-top of bank width	2'					
-width and max depth at ordinary high water mark	1' width, 2" max depth								
-width at bankfull	2'								
-bank height	LDB - 1'		RDB - 1'						
-riffle/pool complex or other specialized habitat present?	No								
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Loblolly pine, green ash								
	RDB: Loblolly pine, green ash								
-particle size distribution %	Silt/Sand: 80		Gravel: 20		Cobble:		Boulder:		Bedrock:	
5-photo numbers	81-82								
6-HUC -8 Code & Name	08010205 - South Fork Forked Deer								
7-Assessed	yes		no	✓					
8-ETW	yes		no	✓					
9-303 (d) List	yes		siltation		habitat:		other:		
	no	✓							
10-Notes									

Revised July 2022

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody:UNT Pond Creek		Date/Time:8/14/24
Assessors/Affiliation:RB, BC; JMT		Project ID :102251.01
Site Name/Description:STR-7		
Site Location:North of Springfield Rd on SR-19		
HUC (12 digit):080102050403	Latitude:35.712637	
Previous Rainfall (7-days) :< 0.5 inches	Longitude:-89.446291	
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data :NRCS Antecedent Precipitation Tool V2.0		
Watershed Size :0.03 sq. miles	County:Lauderdale	
Soil Type(s) / Geology :Adler Silt Loam	Source:NRCS Web Soil Survey	
Surrounding Land Use : Agricultural		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination =Stream

Secondary Indicator Score (if applicable) = 25

Justification / Notes :

Incipient drought (based on APT).

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 14.5)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 4.5)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 5)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants.

[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 25

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.01					
Biologist:	PB & BF	**Affiliation:**	JMT	**Date:**	08-14-2024

1-Station: from plans	South side of SR-19 0.44 miles south of Springhill Rd								
2-Map label and name	STR-8								
3-Latitude/Longitude	35.710215, -89.440187								
4-Feature description:									
-channel identification	perennial stream		intermittent stream	✓	ephemeral stream		wwc		
-HD score (if applicable)	-- see HD Form --								
-OHWM indicators	bed & banks	✓	deposition	✓	presence of litter debris	✓	scour	✓	veg absent, bent, matted ✓
	change in plant community	✓	destruction of terrestrial veg	✓	multiple observe flow events		sediment sorting	✓	water staining ✓
	change in soil character	✓	leaf litter disturb or absent	✓	natural line impressed on bank		shelving		wracking ✓
-channel bottom width	4'		-top of bank width		12'				
-width and max depth at ordinary high water mark	5' width, 2' max depth								
-width at bankfull	10'								
-bank height	LDB - 4'		RDB - 4'						
-riffle/pool complex or other specialized habitat present?	No								
-dominant riparian species: ----------(LDB /RDB)----------	LDB: slippery elm, bitter orange, mockernut hickory, persimmon								
	RDB: slippery elm, green ash								
-particle size distribution %	Silt/Sand:	100	Gravel:		Cobble:		Boulder:		Bedrock:
5-photo numbers	83-86								
6-HUC -8 Code & Name	08010205 - South Fork Forked Deer								
7-Assessed	yes		no	✓					
8-ETW	yes		no	✓					
9-303 (d) List	yes		siltation		habitat:		other:		
	no	✓							
10-Notes	This stream is also represented in PIN 102251.02 as STR-1.								

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Pond Creek	Date/Time: 08/14/24
Assessors/Affiliation: PB, BF; JMT	Project ID : 102251.01
Site Name/Description: STR-8	
Site Location: South side of SR-19 0.44 miles south of Springhill Rd	
HUC (12 digit): 080102050403	Latitude: 35.710215
Previous Rainfall (7-days) : < 0.5 inches	Longitude: -89.440187
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0	
Watershed Size : 0.11 sq. miles	County: Haywood
Soil Type(s) / Geology : Adler Silt Loam	Source: NRCS Web Soil Survey
Surrounding Land Use : Low Density Residential, Agricultural	
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) =

Justification / Notes :

Incipient drought (based on APT). USGS mapped stream within a cattle pasture. Cattle have full access to stream, as well as cars (tire ruts present in stream). Soil clearly hydric (0-6 in. 10YR 5/2 with 7.5YR 4/6 redox; 6-12 in. 10YR 5/1 with same redox). Evidence of soil saturation despite incipient drought. Water-stained leaves, cow tracks in channel. Typical HD scoring not possible. Due to historic mapping/contours and current land use, STR-V is considered a stream. See pg.73 of TN HD Guidance

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal =)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal =)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal =)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = _____

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: TN SR-19 City/County: Haywood County Sampling Date: 2024-08-14

Applicant/Owner: TDOT State: Tennessee Sampling Point: 2-DPW-3

Investigator(s): Preston Butler and Britt Fleming Section, Township, Range:

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 2

Subregion (LRR or MLRA): P 134 Lat: 35.708254 Long: -89.436248 Datum: NAD83_2011

Soil Map Unit Name: MeD3 - Memphis silt loam, 8 to 12 percent slopes, severely eroded, northern phase NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓	No _____	
Wetland Hydrology Present?	Yes ✓	No _____	

Remarks: WTL-4 (PIN 102251.02)
Form also represents wetland WTL-9 (PIN 102251.01)

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)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☑ Oxidized Rhizospheres along 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)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes _____	No ✓	Depth (inches): _____
Water Table Present?	Yes _____	No ✓	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No ✓	Depth (inches): _____

Wetland Hydrology Present? Yes ✓ No _____

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

Remarks:

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

Sampling Point: 2-DPW-3

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix nigra	10	✓	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	10 = Total Cover		
50% of total cover: 5.00	20% of total cover: 2.00		
Sapling/Shrub Stratum (Plot size: 30 ft r)			
1. Salix nigra	5	✓	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	5 = Total Cover		
50% of total cover: 2.50	20% of total cover: 1.00		
Herb Stratum (Plot size: 30 ft r)			
1. Typha latifolia	30	✓	OBL
2. Mimulus ringens	30	✓	OBL
3. Eupatorium perfoliatum	30	✓	FACW
4. Juncus effusus	5		OBL
5. Ambrosia artemisiifolia	5		FACU
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
50% of total cover: 50.00	20% of total cover: 20.00		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	80	x 1 =	80
FACW species	30	x 2 =	60
FAC species	0	x 3 =	0
FACU species	5	x 4 =	20
UPL species	0	x 5 =	0
Column Totals:	115 (A)		160 (B)

Prevalence Index = B/A = 1.39

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☑ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four 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 vines, less than 3 in. DBH and greater than 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

Remarks: (If observed, list morphological adaptations below).

Wetland is below a pond in a horse pasture. 100% moderately altered due to pond above wetland.

SOIL

Sampling Point: 2-DPW-3

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 - 4	10YR 5/2	45	5YR 5/6	10	C	PL / M	Silt Loam	
0 - 4	10YR 5/3	45	5YR 5/6	10	C	PL / M	Silt Loam	
4 - 12	10Y 5/1	90	5YR 5/6	10	C	PL / M	Silt Loam	
-								
-								
-								
-								

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

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☑ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✓ **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: TN SR-19 City/County: Haywood County Sampling Date: 2024-08-14

Applicant/Owner: TDOT State: Tennessee Sampling Point: 2-DPU-3

Investigator(s): Preston Butler and Britt Fleming Section, Township, Range:

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 1

Subregion (LRR or MLRA): P 134 Lat: 35.708422 Long: -89.435837 Datum: NAD83_2011

Soil Map Unit Name: MeD3 - Memphis silt loam, 8 to 12 percent slopes, severely eroded, northern phase NWI classification: NA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Uplands adjacent to WTL-4 (PIN 102251.02)

Form also represents uplands adjacent to wetland WTL-9 (PIN 102251.01)

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)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along 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)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes _____	No ✓	Depth (inches): _____
Water Table Present?	Yes _____	No ✓	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No ✓	Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

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

Remarks:

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

Sampling Point: 2-DPU-3

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size: 30 ft r)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size: 30 ft r)			
1. Festuca subverticillata	100	✓	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
50% of total cover: 50.00	20% of total cover: 20.00		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of 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: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.00 (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	100	x 4 =	400
UPL species	0	x 5 =	0
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]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four 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 vines, less than 3 in. DBH and greater than 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 ✓

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: 2-DPU-3

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 - 6	10YR 6/4	99	7.5YR 5/6	1	RM	M	Sandy Loam	Too compacted to go deeper
-								
-								
-								
-								
-								
-								

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

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** ✓

Remarks:

An affirmative response to 1-6 of the Decision Table identifies the wetland per rule as an Outstanding Natural Resource Water (ONRW) or Exceptional Tennessee Waters (ETW). A positive response to 7-13 requires a final determination by the Department.

#	**Wetland Feature Decision Table** PIN 102251.01; WTL-9	**Yes/No**	**Affirmative Result**
1	The wetland has been designated as an **Outstanding Natural Resource Water (ONRW)** by the Department under 0400-40-03-.06(5)(a)**.**	No	**ORNW**
2	The wetland has previously been designated and documented as an Exceptional Tennessee Water (ETW) by the Department under 0400-40-03-.06(4)(a)(7)	No	**ETW**
3	The wetland is within state or national parks, wildlife refuges, forests, wilderness areas, natural areas, or is a designated State Scenic Rivers or Federal Wild and Scenic Rivers.	No	**ETW**
4	The wetland is known to contain a documented non-experimental population of state or federally listed threatened or endangered aquatic or semi-aquatic plants, or aquatic animals.	No	**ETW**
5	The wetland or the area it is in has been designated by the U.S. Fish and Wildlife Service as "**Critical Habitat**" for any threatened or endangered aquatic or semi-aquatic plant or aquatic animal species.	No	**ETW**
6	The wetland falls within an area designated as Lands Unsuitable for Mining pursuant to the federal Surface Mining Control and Reclamation Act where such designation is based in whole or in part on impacts to water resource values	No	**ETW**
7	**The wetland exhibits outstanding ecological or recreational values such as, but not limited to, those as outlined in 8-12**	No	Determination Required by TDEC
8	The wetland fits within the species composition concept for any plant community found in the state of Tennessee **ranked G2, G1, or more imperiled** at the "Association" classification level according to the NatureServe and Natural Heritage Ranking system (e.g. "bog", "fen", and "wet prairie/barren" communities).	No	Determination Required by TDEC
9	The wetland is **an uncommon resource** (e.g. vernal pools, headwater wetlands, sinks, spring/seeps, glades, newly described communities, high recreational or socioeconomic value) in the region and/or is deemed such by concurrence of qualified scientists.	No	Determination Required by TDEC
10	The wetland is an **older aged forested wetland** comprised of overstory trees with an average diameter at breast height (dbh) being **greater than or equal to 30 in** within the WAA.	No	Determination Required by TDEC
11	The wetland is observed and documented to be a **significant waterfowl, songbird, shorebird, amphibian, bat, fish habitat area**. These may include rookeries, migratory congregations, nesting sites, breeding areas, etc.	No	Determination Required by TDEC
12	The wetland is **hydrologically connected** to and/or has significant ecological contribution to an **ETW**	No	Determination Required by TDEC
13	The wetland has High Resource Value as determined by a **score of 75 and above** using the TRAM or non-HGM TRAM (to be determined after completing the quantitative portion of this manual)	No	Determination Required by TDEC

End of Narrative Rating. Begin Quantitative Rating on Next Page.

HGM FUNCTIONAL ASSESSMENT
SLOPE WETLANDS

Date: 08/14/2024 Project Name SR-19, 102251.01

Field Personnel PB, BF Wetland Name/Location WTL-9

Read instructions prior to conducting assessments. If project area is large or highly heterogeneous requiring the designation of several WAAs, a separate assessment should be performed for each WAA. CHECK THE APPROPRIATE BLANK(S) BELOW.

V1: Hydroperiod (HYDRO)

☐ 1. Hydrology not altered (SI = 1.0)
- no fill material or excessive sediment
- no ditches/drainage tiles
- no roads or other impediments to surface or groundwater
- no excavation
- no alteration to overland runoff, groundwater discharge/recharge

☐ 2. Hydrology slightly altered (SI = 0.75)
- portion of site with minimal fill or sediment
- portion of site with drainage ditches/tiles
- roads or other impediments, water flow slightly altered
- minor portion of site excavated
- some alteration to overland runoff, groundwater discharge/recharge

☑ 3. Hydrology moderately altered (SI = 0.5)
- portion of site with moderate fill or sediment
- portion of site with drainage ditches/tiles
- some alteration to overland runoff, groundwater discharge/recharge
- roads or other impediments, water flow moderately altered
- moderate portion of site excavated

☐ 4. Hydrology significantly altered (SI = 0.25)
- portion of site with significant fill or sediment
- portion of site with drainage ditches/tiles
- significant alteration to overland runoff, groundwater discharge/recharge
- roads or other impediments, water flow significantly altered
- significant portion of site excavated

☐ 5. Hydrology severely altered (SI = 0.1)
- entire site impacted by fill or excessive sediment
- entire site with numerous drainage ditches/tiles
- no contributions to or from overland runoff, groundwater discharge/recharge
- roads or other impediments, water flow completely blocked
- entire wetland affected

V2: Wetland Watershed Integrity (WSHEDINT)

Use weighted average as discussed on page 10. Examples of land uses and multipliers listed below

A = Percentage forested with no impervious surfaces 8
B = Percentage permeable land, (e.g., park, golf course, pasture, hay, orchard, tree farm, or similar) 90
C = Percentage low density residential, construction, or similar 2
D = Percentage high density residential, or similar _____
E = Percentage urban, commercial, industrial, or similar _____

V2 = (A x 1.0) + (B x 0.75) + (C x 0.5) + (D x 0.25) + (E x 0.01)/(100) = 0.77

V3: Canopy Tree Size Class (TSIZE)

1. Average size of canopy trees > 3 in. DBH

☐ ≥ 15 in. (SI = 1.0) ☐ 10 – 14 in. (SI = 0.75) ☐ 6 – 9 in. (SI = 0.5) ☐ 3 – 5 in. (SI = 0.25)
☑ < 3 in. or no trees present, go to V5

V4: Canopy Tree Density (TDEN)

1. Average number of canopy trees (> 3 in. DBH) per 30-ft. radius plot

☐ 5 – 10 (SI = 1.0) ☐ 11 – 15 (SI = 0.75) ☐ > 15 (SI = 0.5) ☐ 1 – 4 (SI = 0.5)

V5: Shrub Cover (SCOV)

1. Average percent cover of shrubs (woody stems < 3 in. DBH and taller than 3 ft.) per 30-ft. radius plot

☑ > 20 (SI = 1.0) ☐ < 20, go to V6

V6: Ground Vegetation Cover (GVC)

1. Average percent cover of ground vegetation per 30-ft. radius plot

☐ ≥ 70 (SI = 1.0) ☐ 55 – 69 (SI = 0.75) ☐ 45 – 54 (SI = 0.5) ☐ 30 – 44 (SI = 0.25) ☐ 20 – 29 (SI = 0.1)
☑ < 20 (SI=0.0)

V7: Vegetation Composition and Diversity (COMP)

1. Check the dominant species from Groups 1, 2, and 3 below using the 50/20 rule. If tree cover is < 20%, check the dominants in the next tallest stratum. If a dominant does not appear in lists below, but is a native species, it can be added to Group 1 or 2 species based on the scientific literature or professional judgement. Native shrub and herbaceous species are assigned to Group 2. When using shrub or herbaceous write in the number of dominant species. Dominant invasive species are checked regardless of stratum. *

GROUP 1 (Reference Standard)		GROUP 2 (Native Ubiquitous)		GROUP 3 (Invasive)
☐ Water oak	☐ Pin oak	☐ American elm	☑ Green ash	☐ European/Chinese privet
☐ Bur oak	☐ Shumard oak	☑ Slippery elm	☐ Red maple	☐ Japanese honeysuckle
☐ Willow oak	☐ Bald cypress	☐ Sweetgum	☐ Silver maple	☐ Japanese stiltgrass
☐ Swamp chestnut oak	☐ Water tupelo	☐ Blackgum	☑ Black willow	☐ Purple loosestrife
☐ Cherrybark oak	☐ S. black gum	☐ Silky dogwood	☐ Sycamore	☐ Giant reed
☐ Swamp white oak	☑ Persimmon	☐ Boxelder	☐ _____	☐ Tall fescue
☐ Nuttall oak	☐ Am. hornbeam	☐ Tulip poplar	☐ _____	☐ Phragmites
☐ Overcup oak	☑ Mockernut Hickory	____ Number native shrub spp.		☐ _____
☐ _____	☐ _____	____ Number native herbaceous spp.		☐ _____

2. Using the number of dominants in Groups 1, 2, and 3 above, calculate a quality index (Q) using the following formula: [(1.0 x # of checked dominants in Group 1) + (0.66 x # of checked dominants in Group 2) + (0.0 x # of checked dominants in Group 3)]/ total # of checked dominants in all groups = 0.80

3. Multiply Q above by one of the following constants that reflects species richness:[1]

- ○ a) if ≥ 4 species from Groups 1 and/or 2 occur as dominants, multiply Q by 1.0 _____
- ○ b) if 3 species from Groups 1 and/or 2 occur as dominant, multiply Q by 0.75 _____
- ◉ c) if 2 species from Groups 1 and/or 2 occur as dominants, multiply Q by 0.50 0.40
- ○ d) if 1 species from Groups 1 and/or 2 occurs as dominant, multiply Q by 0.25 _____
- ○ e) if no species from Groups 1 and/or 2 occurs as dominant, multiply Q by 0.0 _____

4. Calculate the square root of the value from Step 3 above. This value is the SI for **V7**= 0.63

*In some Depression wetlands and in some small WAAs (e.g., <0.5 acres), relatively few species (e.g., overcup oak) may be present. In cases in which this is the normal condition, Q can be multiplied by 1.0 if only 1 or 2 species are dominant.

V8: Soil Organic Matter (ORGANIC)

1. Surface horizons unaltered

☑ 100 percent cover of O and/or A horizon present (SI = 1.0)

2. Surface horizons altered. Estimate the percent of the WAA in which neither an O or A horizon is present.

3. Subtract the sum of the values from Step 2 from 100. Convert this value to a decimal. This value is the SI for V8 (e.g., if 75 % of the WAA does not have an O or A horizon due to a significant disturbance, it will have an SI of 0.25).

V9: Buffer (BUFFER)

1. Determine the Connection Index (CI) by estimating the percent of the wetland surrounded by suitable buffer habitat.

☐ 90% – 100% (CI = 1.0) ☐ 75% – 89% (CI = 0.75) ☐ 40% – 74% (CI = 0.5) ☐ 10% – 39% (CI = 0.25)
☑ < 10% (CI = 0.1)

2. Multiply the CI by one if the following values:

- ○ a) if average buffer width is ≥ 492 ft., multiply by 1.0
- ○ b) if average buffer is 98 ft to 491 ft., multiply by 0.66
- ○ c) if average buffer width is 33 ft to 97 ft., multiply by 0.33
- ◉ d) if average buffer width is < 33 ft., multiply by 0.1

3. This value is the SI for **V9 =** 0.01 **.**

VALUES USED TO CALCULATE FUNCTIONAL CAPACITY INDICES (FCIs)

SUBINDEX VALUES:

V1 0.50 (HYDRO) V3 go to V5 (TSIZE) V5 1.00 (SCOV) V7 0.63 (COMP) V9 0.01 (BUFFER)

V2 0.77 (WSHEDINT) V4 0 (TDEN) V6 1.00 (GVC) V8 1.00 (ORGANIC)

Slope Wetland

WTL-9

V1: HYDROPERIOD	**0.5**	**Function 1: Maintain Hydrologic Regime**
V2: WETLAND WATERSHED INTEGRITY	**0.77**	(V1 x V2)^(1/2)
V3: CANOPY TREE CLASS	**GOTOV5**	
V4: CANOPY TREE DENSITY	**N/A**	**Function 2: Maintain Biogeochemical Processes**
V5: SHRUB COVER	**1**	
V6: GROUND VEGETATION COVER	**n/a**	
V7: VEGETATION COMPOSITION AND DIVERSITY	**0.63**	
2. Q =	**0.8**	
# of Group 1 Dominants	2	
# of Group 2 Dominants	3	
# of Group 3 Dominants	0	
SPECIES RICHNESS CONSTANT	0.5	
V8: SOIL ORGANIC MATTER	**1**	
V9:BUFFER	**0.01**	
1. Connection Index	0.1	
2. Buffer width value (0-1)	0.1	

FCI (trees present)= $\left((V1 \times V2)^{1/2} \times \left(\frac{\frac{V3+V4}{2}+V8}{2}\right)\right)^{1/2}$

FCI (shrubs present)= $\left((V1 \times V2)^{1/2} \times \left(\frac{V5+V8}{3}\right)\right)^{1/2}$

FCI (ground cover)= $\left((V1 \times V2)^{1/2} \times \left(\frac{V6+V8}{5}\right)\right)^{1/2}$

Function 3: Maintain Characteristic Plant Community

FCI (trees present) = $\frac{(V1 \times V2)^{1/2}+2\left(\frac{V3+V4+V7}{3}\right)}{3}$

FCI (shrubs present) = $\frac{(V1 \times V2)^{1/2}+2\left(\frac{V5+V7}{2}\right)}{6}$

FCI (groundcover) = $\frac{(V1 \times V2)^{1/2}+2\left(\frac{V6+V7}{2}\right)}{9}$

Function 4: Maintain Characteristic Wildlife Community:

FCI (trees) = $\frac{(V1 \times V2)^{1/2}+2\left(\frac{V3+V4+V7}{3}\right)+V9}{4}$

FCI (shrubs present) = $\frac{(V1 \times V2)^{1/2}+2\left(\frac{V5+V7}{2}\right)+V9}{6}$

FCI (groundcover) = $\frac{(V1 \times V2)^{1/2}+2\left(\frac{V6+V7}{2}\right)+V9}{9}$

FCI 1 =	**0.62**	**Final Tree =**	**#VALUE!**
FCI 2 trees=	**#VALUE!**	**Final Shrubs=**	**0.50**
		Final Herbaceous =	**#VALUE!**
FCI 2 shrubs=	**0.64**		
FCI 2 ground =	**#VALUE!**		
FCI 3 trees=	**#VALUE!**		
FCI 3 shrubs=	**0.38**		
FCI 3 ground =	**#VALUE!**		
FCI 4 trees=	**#VALUE!**		
FCI 4 shrubs=	**0.38**		
FCI 4 ground =	**#VALUE!**		

TRAM Summary Worksheet

Project: SR-19, PIN 102251.01, WTL-9

Exceptional Status Wetlands		**Check if applicable**
	1. **ONRW**	☐
	2. **ETW**	☐
	3. **Further Review Requested:** Attach Wetland Background and Exceptional Status Wetlands Worksheet	☐
	COMMENTS/NOTES:	
Quantitative Rating scores	Function: Hydrologic Regime	0.62
	Function: Biogeochemical Processes	0.64
	Function: Retain Particulates	n/a
	Function: Plant Community	0.38
	Function: Wildlife Community	0.38
	Quantitative Score (Average of FCIs x 100)	50.50
	Value Added (Significant Size) Total	0
Total of Quantitative and Value Added Scores	**TOTAL SCORE**	50.50

Ecology Field Data Sheet: **Other Resource Features**
(Caves/Rock Houses; Potential Sinkholes; Specialized Habitats; Other)

Project: Lauderdale County SR-19 Reconstruction (IA) Section 1 **PIN #:** 102251.01

Date of survey: August 12-16 **Biologist(s):** Ray Bode, Preston Butler **Affiliation:** JMT

1-Station: from plans	No "other resources" were found in study area	
2-Map label		
3-Lat/Long		
4-Potential impact size		
5-Feature name		
6-Feature description:		
what is the feature		
portion affected		
connection to other features		
photo number(s)		
other information		
7- HUC code & name if applicable (12-digit)		
8-Notes		

APPENDIX C: PHOTOGRAPH LOG

TN SR-19, PIN 102251.01	Date: August 13-15, 2024

Photo 1: PND-1 facing northeast across the pond.

Photo 2: PND-2 facing east across the pond.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

TN SR-19, PIN 102251.01	Date: August 13-15, 2024

Photo 3: WWC-1/EPH-1 facing downstream.

Photo 4: WTL-1 facing northeast towards PND-2.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

TN SR-19, PIN 102251.01	Date: August 13-15, 2024

Photo 5: WWC-2/EPH-2 facing upstream.

Photo 6: WWC-3/EPH-3 facing west at culvert. Concrete box culvert 5’ x 5’.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

Photo 7: WWC-3/EPH-3 facing downstream (southwest) towards culvert under SR-19.

Photo 8: WWC-3/EPH-3 facing upstream northeast of SR-19.

TN SR-19, PIN 102251.01	Date: August 13-15, 2024

Photo 9: WTL-2 facing northwest.

Photo 10: WTL-2 facing southwest.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

TN SR-19, PIN 102251.01	Date: August 13-15, 2024

Photo 11: WWC-4/EPH-4 facing southwest upstream at culvert under SR-19. Concrete box culvert. 4 x 4'. Vegetation growing in bank that partially obscures culvert opening.

Photo 12: WWC-4/EPH-4 facing upstream.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

TN SR-19, PIN 102251.01	Date: August 13-15, 2024

Photo 13: WWC-4/EPH-4 facing north downstream at culvert. Concrete box culvert 4 x 4'. Vegetation growing in bank that partially obscures culvert opening.

Photo 14: WWC-4/EPH-4 facing downstream.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

Photo 15: WWC-5/EPH-5 facing downstream.

Photo 16: WWC-5/EPH-5 facing downstream.

TN SR-19, PIN 102251.01	Date: August 13-15, 2024

Photo 17: WWC-5/EPH-5 south of SR-19 facing northwest towards culvert under SR-19. Culvert blocked by debris, litter, and rip-rap.

Photo 18: WWC-5/EPH-5 south of SR-19 facing south.

TN TDOT Department of Transportation

Photo 19: WWC-6/EPH-6 from top of culvert under SR-19. CMP covered in rip-rap.

Photo 20: WWC-6/EPH-6 facing southwest.

TN SR-19, PIN 102251.01	Date: August 13-15, 2024

Photo 21: STR-1 facing downstream at CMP culvert under driveway.

Photo 22: STR-1 facing downstream.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

TN SR-19, PIN 102251.01	Date: August 13-15, 2024

Photo 23: STR-1 facing north at concrete culvert with splash pad 2’ x 4’ that goes under SR-19.

Photo 24: STR-1 facing upstream.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

Photo 25: STR-1 facing upstream at large concrete box culvert under SR-19.

Photo 26: STR-1 facing downstream.

Photo 27: WWC-7/UDF-1 from top of culvert. 24" CPP held in place by 2-4x4s. Sits above stream bed ~1'

Photo 28: WWC-7/UDF-1 facing upstream.

Photo 29: WWC-8/EPH-7 facing downstream.

Photo 30: WWC-8/EPH-7 facing upstream.

TN SR-19, PIN 102251.01	Date: August 13-15, 2024

Photo 31: WWC-9/EPH-8 facing upstream.

Photo 32: WWC-9/EPH-8 facing downstream.

TN TDOT Department of Transportation

Photo 33: WWC-10/UDF-2 facing downstream.

Photo 34: STR-2 facing downstream.

Photo 35: STR-2 facing downstream.

Photo 36: WWC-11/EPH-9 facing downstream from 30” concrete culvert towards STR-2.

Photo 37: STR-3 facing upstream.

Photo 38: STR-3 facing downstream.

TN SR-19, PIN 102251.01	Date: August 13-15, 2024

Photo 39: WWC-12/UDF-3 facing downstream.

Photo 40: WWC-13/EPH-10 facing downstream. Culvert (not in photo) 2-3' concrete pipe flowing under SR-19.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

Photo 41: WTL-3 facing wetland.

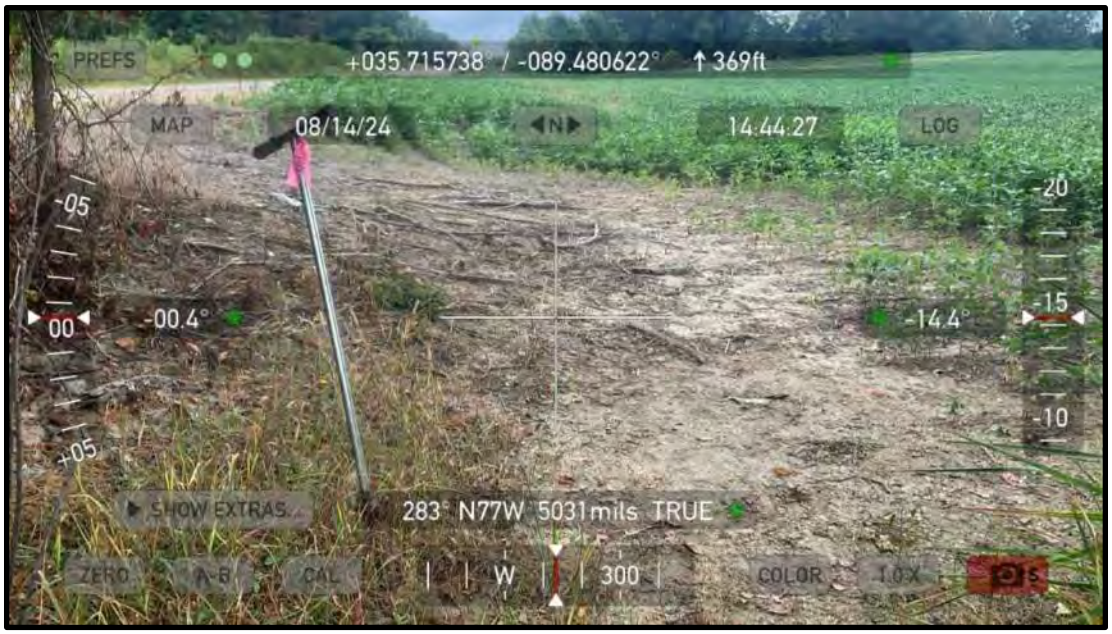


Photo 42: WTL-3 facing upland.

Photo 43: WWC-14/EPH-11 facing downstream.

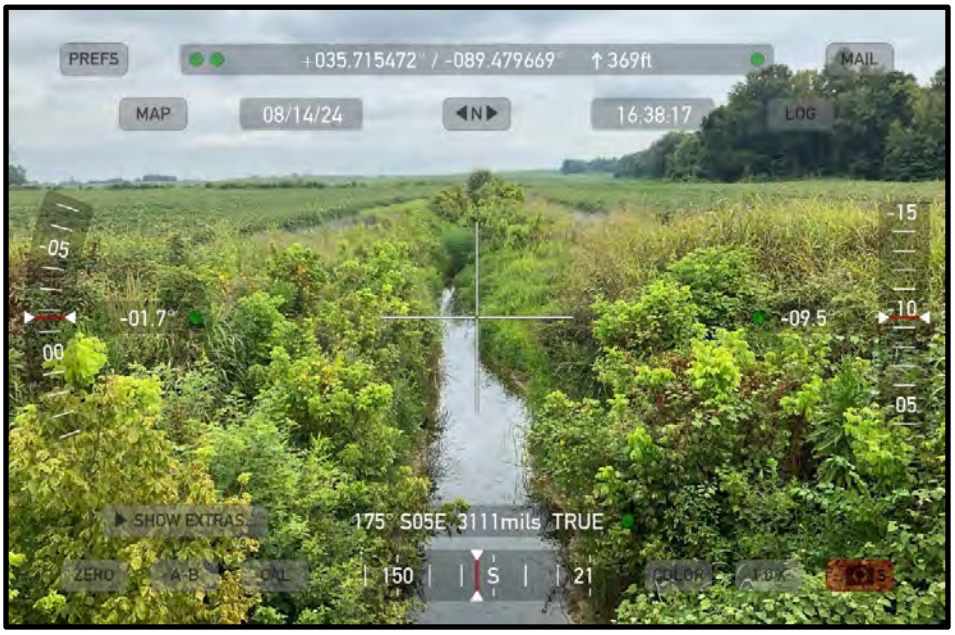


Photo 44: STR-4 facing upstream from bridge on top of large concrete culvert going under SR-19.

TN TDOT Department of Transportation

Photo 45: STR-4 facing downstream.

Photo 46: STR-4 facing downstream from the bridge.

Photo 47: WWC-15/UDF-4 facing upstream.

Photo 48: WWC-15/UDF-4 facing downstream.

Photo 49: WWC-16/UDF-5 facing downstream.

Photo 50: WWC-17/UDF-6 facing downstream.

TN TDOT Department of Transportation

TN SR-19, PIN 102251.01	Date: August 13-15, 2024

Photo 51: WWC-18/UDF-7 facing downstream.

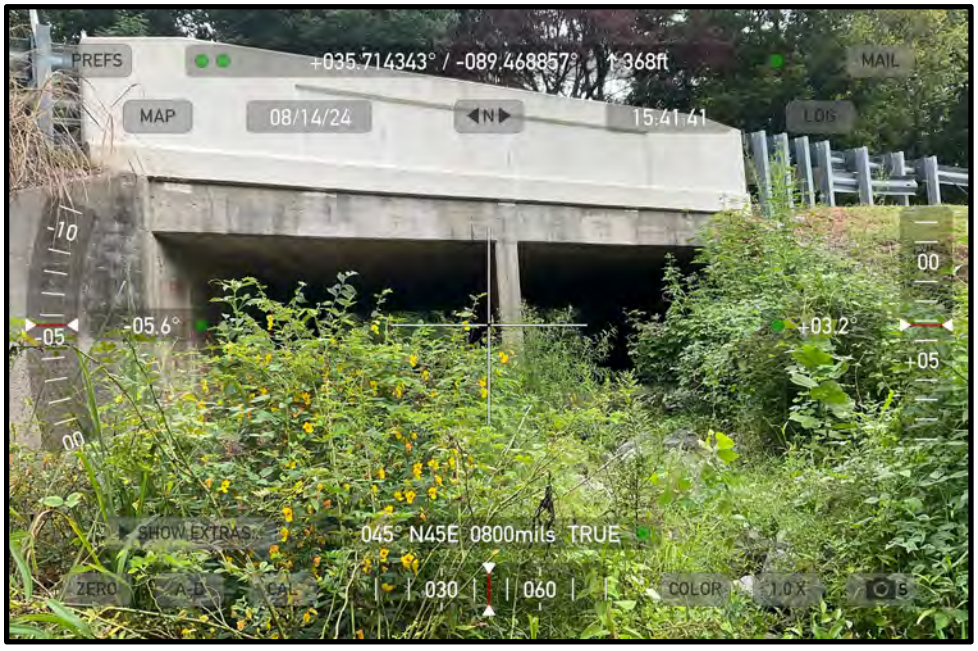


Photo 52: STR-5 (south side of SR-19) facing upstream at culvert. Concrete double box culvert ~6' tall x ~8' wide.

TN TDOT Department of Transportation

TN SR-19, PIN 102251.01	Date: August 13-15, 2024

Photo 53: STR-5 facing downstream (south of SR-19).

Photo 54: STR-5 (north of SR-19) facing downstream at culvert. Concrete double box culvert ~6' tall x ~8' wide.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

TN SR-19, PIN 102251.01	Date: August 13-15, 2024

Photo 55: STR-5 (north of SR-19) facing upstream.

Photo 56: WTL-4 facing wetland.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

TN SR-19, PIN 102251.01	Date: August 13-15, 2024

Photo 57: STR-6 (south of SR-19) facing downstream at culvert. Square concrete culvert, 5' x 5' single. Clear of vegetation and stream bed almost equal height to culvert bottom.

Photo 58: STR-6 (south of SR-19) facing upstream.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

TN SR-19, PIN 102251.01	Date: August 13-15, 2024

Photo 59: STR-6 (north of SR-19) facing upstream at culvert. Square concrete culvert, 5' x 5' single. Clear of vegetation and stream bed almost equal height to culvert bottom.

Photo 60: STR-6 (north of SR-19) facing upstream.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

TN SR-19, PIN 102251.01	Date: August 13-15, 2024

Photo 61: WWC-22/EPH-14 facing upstream.

Photo 62: WWC-22/EPH-14 facing downstream.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

Photo 63: WTL-5 facing wetland.

Photo 64: WTL-5 facing upland.

TN SR-19, PIN 102251.01	Date: August 13-15, 2024

Photo 65: WTL-6 facing wetland.

Photo 66: WTL-6 facing upland.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

TN SR-19, PIN 102251.01	Date: August 13-15, 2024

Photo 67: WWC-23/EPH-15 (south of SR-19) facing downstream at culvert. Square concrete culvert, 5' x 5' single. Clear of vegetation and stream bed equal height to culvert bottom.

Photo 68: WWC-23/EPH-15 (south of SR-19) facing upstream.

TN TDOT Department of Transportation

Photo 69: Confluence of WWC-23/EPH-15 (left) and WWC-24/UDF-9 (right) facing upstream.

Photo 70: WWC-23/EPH-15 (north of SR-19) facing downstream from culvert.

TN SR-19, PIN 102251.01	Date: August 13-15, 2024

Photo 71: WWC-23/EPH-15 (north of SR-19) facing downstream.

Photo 72: PND-3 facing south.

TN TDOT Department of Transportation

TN SR-19, PIN 102251.01	Date: August 13-15, 2024

Photo 73: PND-3 facing southeast.

Photo 74: WWC-25/UDF-10 facing downstream.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

TN SR-19, PIN 102251.01	Date: August 13-15, 2024

Photo 75: WTL-7 facing wetland.

Photo 76: WTL-7 facing wetland.

TN SR-19, PIN 102251.01	Date: August 13-15, 2024

Photo 77: WTL-8 facing wetland.

Photo 78: WTL-8 facing upland.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

TN SR-19, PIN 102251.01	Date: August 13-15, 2024

Photo 79: STR-7 facing downstream.

Photo 80: STR-7 facing downstream.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

TN SR-19, PIN 102251.01	Date: August 13-15, 2024

Photo 81: STR-8 (south of SR-19) facing downstream at culvert. Square concrete culvert, 5' x 5' single. Barbed wire in front of culvert is causing debris to build up and block flow.

Photo 82: STR-8 (south of SR-19) looking downstream.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

TN SR-19, PIN 102251.01	Date: August 13-15, 2024

Photo 83: STR-8 (north of SR-19) facing upstream at culvert.

Photo 84: STR-8 (north of SR-19) facing upstream at culvert. Square concrete culvert, 5' x 5' single.

TN TDOT Department of Transportation

TN SR-19, PIN 102251.01	Date: August 13-15, 2024

Photo 85: WTL-9 facing wetland.

Photo 86: WTL-9 facing wetland.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

TN SR-19, PIN 102251.01	Date: August 13-15, 2024

Photos not available for:

WWC-19/EPH-12

WWC-20/UDF-8

WWC-21/EPH-13

Notes

TN TDOT Department of Transportation

Shawn Wurst

From: Griffith, John <john_griffith@fws.gov>
Sent: Wednesday, September 18, 2024 3:09 PM
To: Shawn Wurst
Cc: rbode@jmt.com
Subject: [EXTERNAL] Re: IPaC delivered Official Species List for project: PIN 102251.01 TDOT SR-19

This Message Is From an External Sender

This message came from outside your organization.

Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security

Shawn,

We received correspondence regarding the proposed State Route (SR-) 19 widening from east of Eastland Avenue to the Haywood County Line in Lauderdale and Haywood counties, Tennessee. The Tennessee Department of Transportation is requesting a list of federally threatened or endangered species that may be present in the project area.

A review of our database does not indicate that any federally listed or proposed species or designated critical habitat would be impacted by the project. Therefore, based on the best information available at this time, we believe that the requirements of the Endangered Species Act (ESA) are fulfilled for all species that currently receive protection under the ESA. Obligations under section 7 of the ESA should be reconsidered if (1) new information reveals impacts of the proposed action that may affect listed species or critical habitat in a manner not previously considered, (2) the proposed action is subsequently modified to include activities which were not considered during this consultation, or (3) new species are listed or critical habitat designated that might be affected by the proposed action.

Our National Wetland Inventory maps indicate that wetlands are present along this portion of SR-19. If wetland impacts would occur, the U.S. Army Corps of Engineers, Memphis District, Regulatory Branch can be reached at 901-544-3682.

Standard construction BMPs should be implemented to ensure that all project-related pollutants are kept out of project area streams. Equipment staging and maintenance areas should be developed an adequate distance away to prevent the introduction of petroleum-based products into the water. If possible, work at stream crossings should be scheduled during a lower flow period.

This email will serve as our official project response. Please let me know if we can offer further assistance. Thanks,

John Griffith
Transportation Biologist
U.S. Fish and Wildlife Service
Tennessee Field Office
931-444-1393 (office)
931-261-3755 (cell)

From: Administrator Email <ecosphere_support@ecosphere.fws.gov>
Sent: Thursday, August 29, 2024 9:50 AM
To: Griffith, John <john_griffith@fws.gov>; Tennessee ES, FWS <tennesseeES@fws.gov>; Sykes, Robbie <robbie_sykes@fws.gov>; Alexander, Steven <steven_alexander@fws.gov>
Subject: IPaC delivered Official Species List for project: PIN 102251.01 TDOT SR-19

To: IPaC point(s) of contact for Tennessee Ecological Services Field Office
Project Location: Haywood and Lauderdale counties, Tennessee

IPaC has delivered an official Section 7 species list on behalf of your office. For your convenience, IPaC has created an ETK project (2024-0137164) with a new associated 'Species List Provided' event. A PDF file of the species list document is attached to the event and contact information for the project can be found on the last page of the PDF.

IPaC has automatically set the consultation status to "Closed". If you need to do any additional work in this project (*e.g.*, add staff, add events, change lead office, etc.), you must first change the status to "active" so that you can edit the project. You

can access the project via the link, above.

Lead FWS Office:
The Tennessee Ecological Services Field Office is currently designated as the lead office for Section 7 on this project. The following additional offices have jurisdiction and have been notified: None. If another office is the lead office on this project, please access the project (via the link above) and update it. IPaC will not reset the Lead Office once it has been updated by a biologist.

*Projects created in ETK by IPaC have not been assigned to an FWS staff member. To identify the staff assigned to this project, please access the project (via the link above) and add their name(s).

Shawn Wurst

From: Casey Parker
Sent: Friday, October 27, 2017 2:16 PM
To: Eric Philipps; Dustin Tucker
Cc: Rob Todd; Vincent Pontello
Subject: Request for Comment Lauderdale-Haywood County SR-19 PIN 102251.00

Mr. Eric Philipps,

I have reviewed the information that you provided as regards to widening of SR-19 from east of Eastland Avenue in Lauderdale County to west of the Brownsville By-Pass in Haywood County, from an existing two-lane roadway to a super two-lane highway. My data concur with the information, therefore the implementation of standard BMP's will be sufficient to satisfy the needs of the Tennessee Wildlife Resources Agency for this proposed project. Thank you for the opportunity to review and comment, please contact me if you need further assistance.

Casey Parker - Wildlife Biologist
Liaison to TDOT & Federal Highway Administration
Tennessee Wildlife Resources Agency
Environmental Services Division
Email: casey.parker@tn.gov

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
ENVIRONMENTAL DIVISION
ENVIRONMENTAL TECHNICAL STUDIES OFFICE
SUITE 900, JAMES K. POLK BUILDING
505 DEADERICK STREET
NASHVILLE, TENNESSEE 37243-1402
(615) 741-3655

BUTCH ELEY
DEPUTY GOVERNOR &
COMMISSIONER OF TRANSPORTATION

BILL LEE
GOVERNOR

MEMORANDUM

To: Benjamin Webb
Project Manager, Region 4 Project Management

From: Shawn Wurst
Ecology Team Lead, Environmental Division

Date: 10/23/2024

Subject: Environmental Boundaries Report for:
SR-19 from Near Lauderdale County Line to East of Binford Lane
Haywood County
PIN Number: 102251.02

An ecological evaluation of the subject project has been conducted in response to an initial evaluation request with the following findings:

STREAMS: Eight (8) perennial/intermittent streams and Eight (8) ephemeral streams were identified within the proposed project limits.

WETLANDS: Five (5) wetland features were identified within the proposed project limits.

OTHER FEATURES: Eleven (11) upland drainage features and three (3) ponds were identified within the proposed project limits.

SPECIES:

- *USFWS:* USFWS coordination resulted in no effect for listed species.
- *TWRA:* TWRA coordination resulted in no concerns for listed species.
- *TDEC DNA:* The project was determined to meet Condition #1 of the MOA between TDOT and TDEC DNA.

COMMITMENTS: No commitments are required for this project.

If you have any questions or comments, please contact me at (615-516-8445) or shawn.wurst@tn.gov.

xc: TDOT.Env.Ecology@tn.gov
TDOT.Env.Permits@tn.gov
TDOT.Env.Mitigation@tn.gov
TDOT.Env.NEPA@tn.gov

ENVIRONMENTAL BOUNDARIES REPORT

Lauderdale and Haywood Counties SR-19 Widening (IA) Section 2
PIN 102251.02

Tennessee Department of Transportation

October 2024

1.0 INTRODUCTION

Tennessee Department of Transportation (TDOT) proposes to improve SR-19 in Haywood County from the Lauderdale County Line to ~0.15 miles south of Jim Binford Lane (Appendix A: Figures 1 and 2). Improvements will involve reconstructing the existing two lane road to a super two lane road with 12 foot lanes, 10 foot shoulders, and improved sight distances. Johnson, Mirmiran and Thompson (JMT) has been contracted to perform an environmental boundaries survey on an approximately 4.1 mile long project (174 acres) of varying widths.

2.0 METHODOLOGY

A delineation of jurisdictional water resources under Sections 401 and 404 of the Clean Water Act of 1972 (CWA) and under the Tennessee Water Quality Control Act of 1977 was conducted August 12-16, 2024, by qualified JMT scientists. The delineation was conducted in accordance with:

- U.S. Army Corps of Engineers (USACE) Wetland Delineation Manual, Technical Report Y- 87-1 (USACE, 1987)
- USACE November 2010 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain (USACE, 2010)
- Current waters of the US (WOTUS) rules
- TDOT guidance related to wetland data collection
- Tennessee Department of Environment and Conservation (TDEC) Division of Water Resources (DWR)
    - Tennessee Rapid Assessment Method for Wetlands (TRAM) (TDEC, 2017)
    - Guidance for Making Hydrologic Determinations, Version 1.5 (TDEC, 2020)
- Subsequent regulatory guidance.

Wetland boundaries were identified and marked with sequentially numbered flagging placed on vegetation at the jurisdictional boundaries at 25-to-50-foot intervals or as necessary to maintain visual reference between flags. Coordinates of each flag were collected with 10-centimeter GPS. Data was collected to support the jurisdictional decision. Data collected included:

- USACE Wetland Determination Data Forms - Atlantic and Gulf Coastal Plain
- TRAM Wetland Assessment Forms

Streams and wet weather conveyances (WWCs) were identified and marked on the ordinary high water mark (OHWM) on each bank. GPS was collected on the centerline of channels less than 10 feet wide at the OHWM. Channels greater than 10 feet wide at OHWM were GPS located on both sides of the channel at the OHWM. Coordinates were collected along each bend, or as necessary to maintain visual reference, with 10-centimeter GPS. Environmental data was collected to support the determination. All watercourse identifications were reviewed and approved by a TDEC certified Qualified Hydrologic

Professional - In Training (QHP-IT), Preston Butler, PWS. QHP-IT certification allows practitioners to conduct hydrologic determinations (HDs) as the lead investigator. Data collected included:

- Tennessee Hydrologic Determination Field Data Sheets
- Tennessee Water Resource Forms

3.0 Water Resource Results

Water resources within the study area are located within the Lower Hatchie River Basin and South Fork Forked Deer River Basin (USGS 8-digit HUCs 08010208 and 08010205, respectively). The locations of the streams, ponds, wetlands, and WWCs within the study area are shown on Figures 4 and 5 (Appendix A).

Eight streams and 19 WWCs were identified within the study area (Appendix B). A total of approximately 2,288 linear feet of stream channel was identified within the study area (1,958 linear feet of intermittent stream and 330 linear feet of perennial stream). A total of approximately 2,827 linear feet of WWC was identified within the study area. Tennessee Hydrologic Determination (TN HD) Field Data Sheets and Water Resource forms for each of these identified features are included in Appendix B. Site photos showing these features are included in Appendix C.

Three open surface waters (ponds) were identified within the study area and are detailed in the Water Resource Table (Appendix B). The three ponds' surface area totals approximately 0.04 acres within the study area. Other Resource Features forms for each of these identified features are included in Appendix B. Site photos showing the delineated features are included in Appendix C. All three ponds identified within the study area do not appear to be connected to jurisdictional features by surface flow, and therefore were considered non- jurisdictional.

Five wetlands totaling approximately 1.73 acres were identified within the study area (Appendix C). All wetlands in the study area were classified as Slope wetlands based on the *Hydrogeomorphic (HGM) Classification and Description of Wetlands in Tennessee* described in the 2017 TRAM Manual. They either occurred at the base of slopes, above headwater streams, or adjacent to a developed stream channel. USACE Wetland Determination forms and TRAM Wetland Assessment forms for each wetland feature are included in Appendix B. Site photos showing the delineated features are included in Appendix C.

The TRAM manual defines Exceptional Status Wetlands as wetlands with features or characteristics that merit special attention and consideration. A determination of Exceptional Status Wetland is derived based on 13 criteria listed in the TRAM manual which includes designations of Outstanding Natural Resource Waters (ONRW) and Exceptional Tennessee Waters (ETW), as defined in the TDEC General Water Quality Criteria; ecological value; vegetative species age and composition; wildlife habitat;

hydrologic connectivity; and overall TRAM value. No Exceptional Status Wetlands were found in the study area.

4.0 REFERENCES

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

Environmental Laboratory. 2012. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region (Version 2.0). U.S. Army Engineer Research and Development Center. Vicksburg, Mississippi.

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TDEC. Division of Water Resources. Data Viewer. https://tdec.maps.arcgis.com/apps/webappviewer/index.html?id=79599b983a8a4c43945f5a6a368764e6. (Accessed July 5, 2024).

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U.S. Geological Survey (USGS). The National Map. https://apps.nationalmap.gov/viewer/. (Accessed October 17, 2024).

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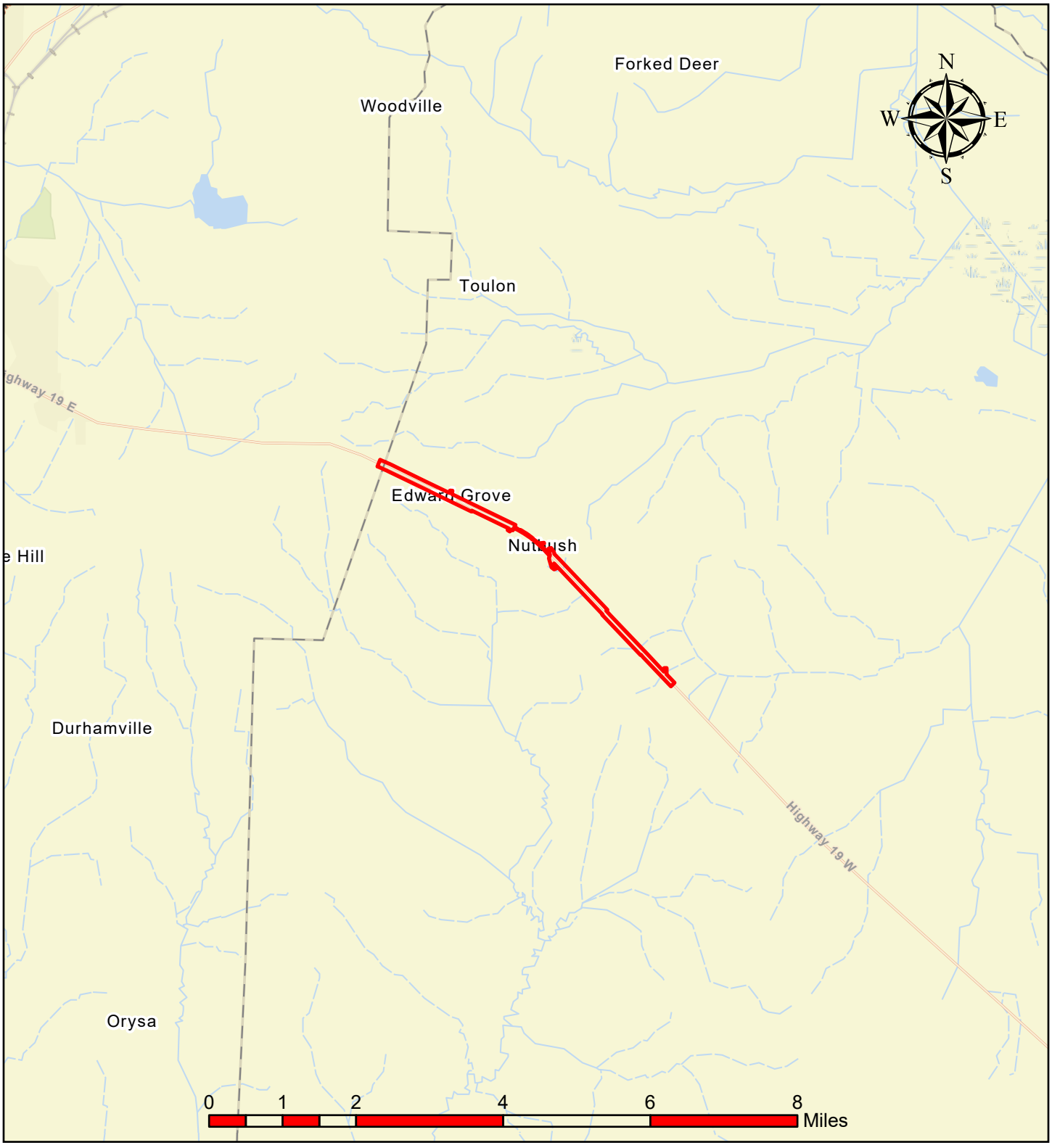
USGS. Tennessee StreamStats. https://streamstats.usgs.gov/ss/. (Accessed October 17, 2024).

APPENDIX A: FIGURES



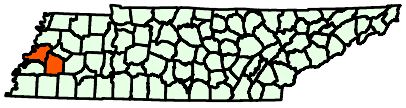
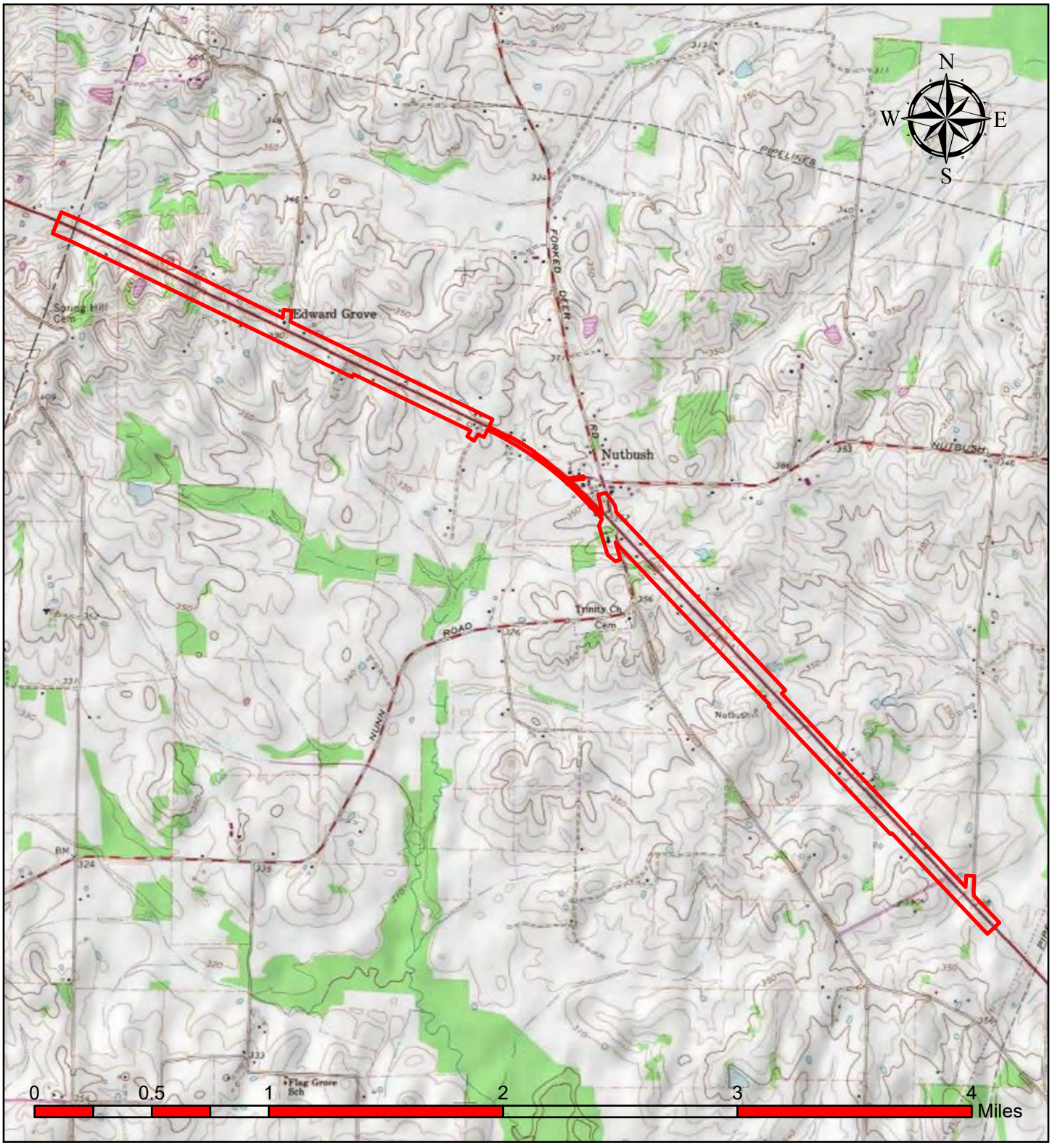


Figure 1: Vicinity Map
Lauderdale and Haywood Counties SR-19 Widening (IA)~ Section 2

ESRI World Street Map Basemap
September 2024

PIN 102251.02

TN TDOT Department of Transportation



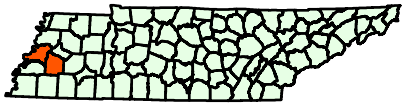
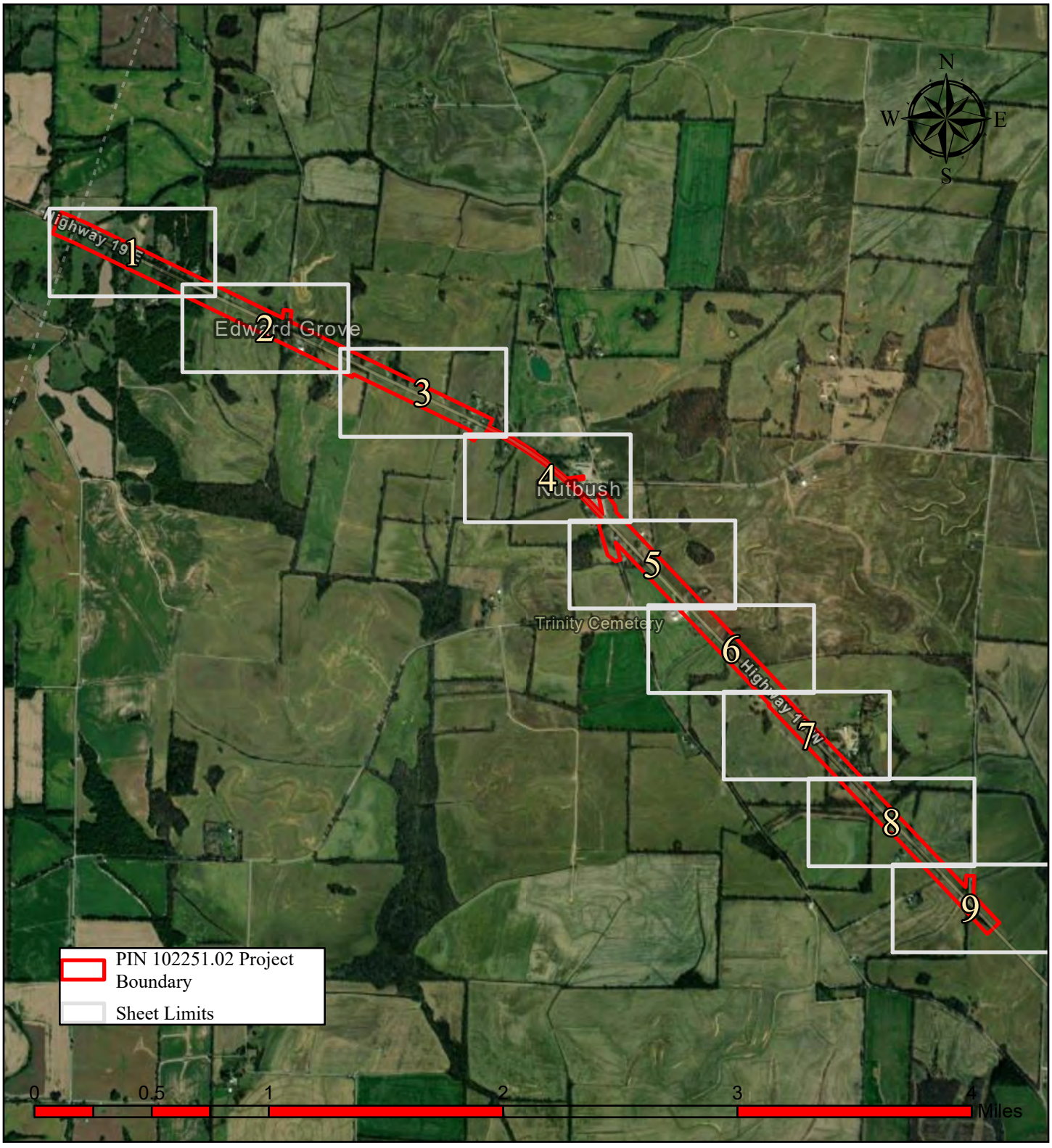


Figure 2: Topographic Map
Lauderdale and Haywood Counties SR-19 Widening (IA)~ Section 2

Nutbush and Tibbs, TN USGS Quadrangle
September 2024

PIN 102251.02

TN TDOT Department of Transportation



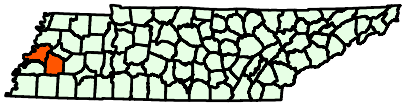
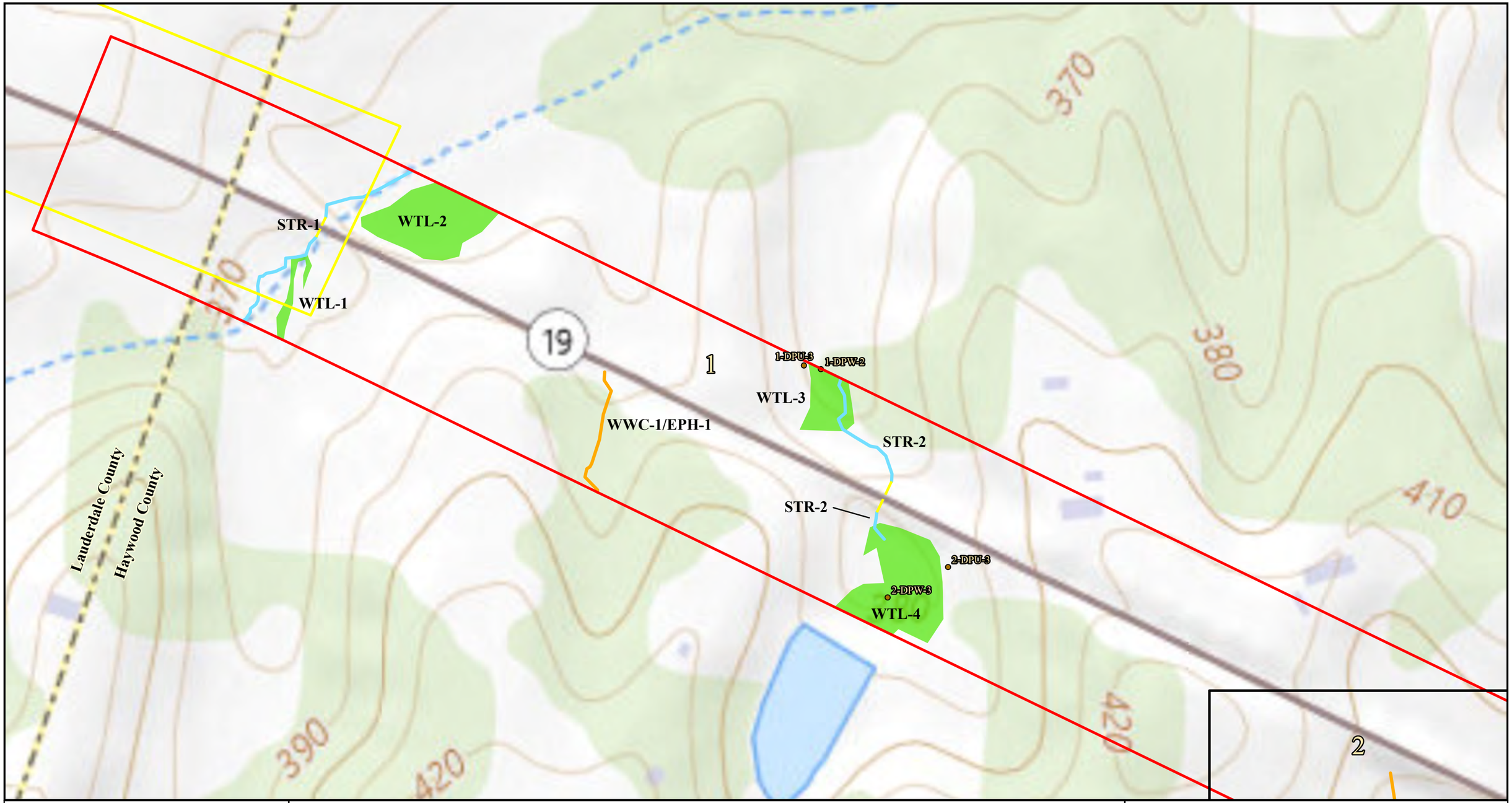


Figure 3: Aerial Map
Lauderdale and Haywood Counties SR-19 Widening (IA)~ Section 2

2016 Maxar Vivid Standard Imagery
September 2024

PIN 102251.02

TN TDOT Department of Transportation



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0 150 300 US Feet

Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere

TN TDOT Department of Transportation

- PIN 102251.02 Project Boundary
- PIN 102251.01 Project Boundary
- Sheet Limits
- Wetland Data Form Locations
- Potential Pond (PND)
- Potential Wetland (WTL)
- Potential Stream (Intermittent) (STR)
- Potential Stream (Perennial) (STR)
- Wet Weather Conveyance (WWC)
- Culverts

USGS The National Map

Lauderdale and Haywood Counties SR-19 Widening (IA)~ Section 2; PIN 102251.02 TDOT

Figure 4: Topographic Map
Sheet 1 of 9
October 2024

N

0 150 300 US Feet

Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere

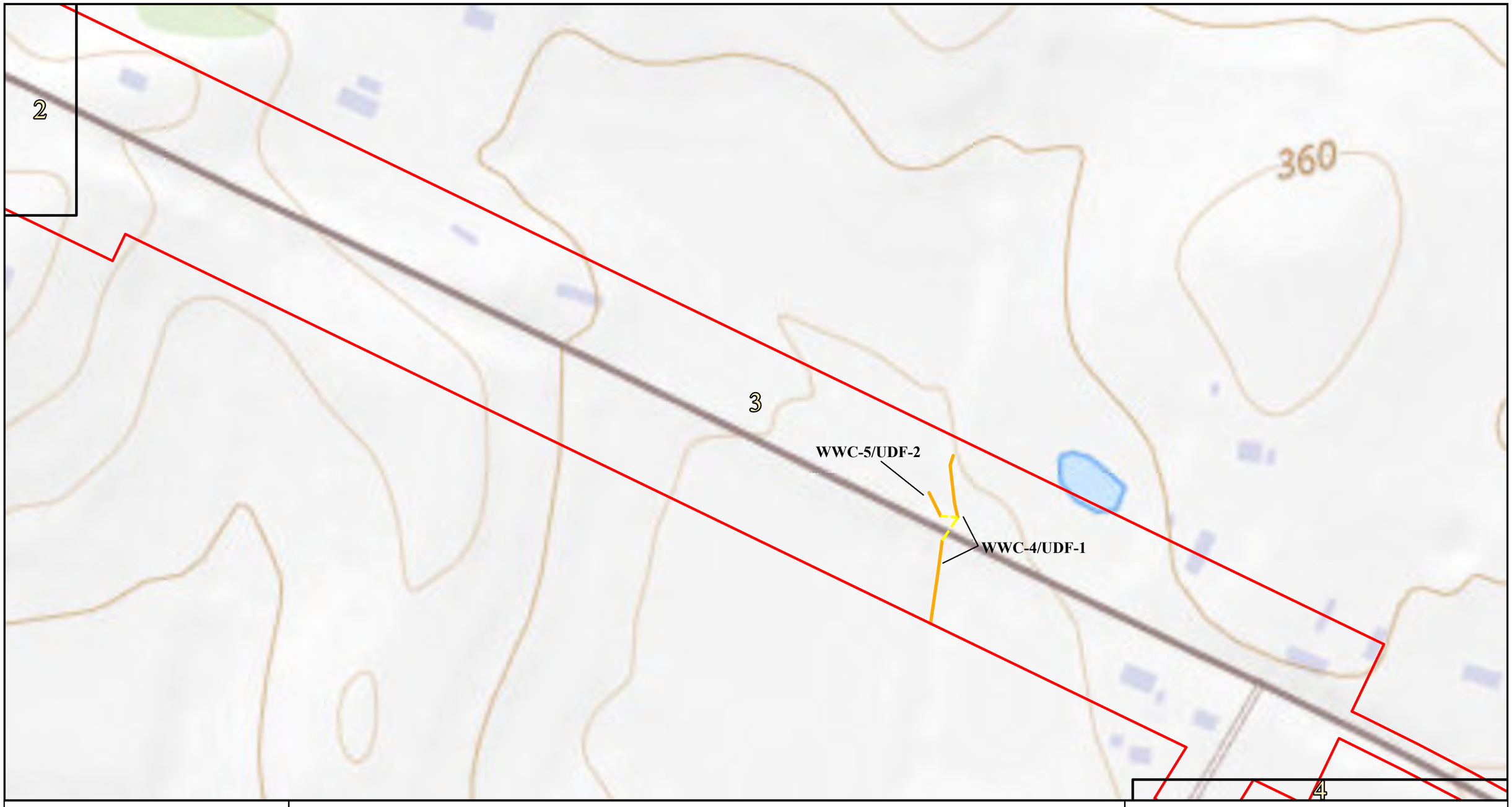
TN TDOT Department of Transportation

PIN 102251.02 Project Boundary
Sheet Limits
Wetland Data Form Locations
Potential Pond (PND)
Potential Wetland (WTL)
Potential Stream (Intermittent) (STR)
Potential Stream (Perennial) (STR)
Wet Weather Conveyance (WWC)
Culverts

USGS The National Map

Lauderdale and Haywood Counties SR-19 Widening (IA)~ Section 2; PIN 102251.02 TDOT

Figure 4: Topographic Map
Sheet 2 of 9
October 2024



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Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere

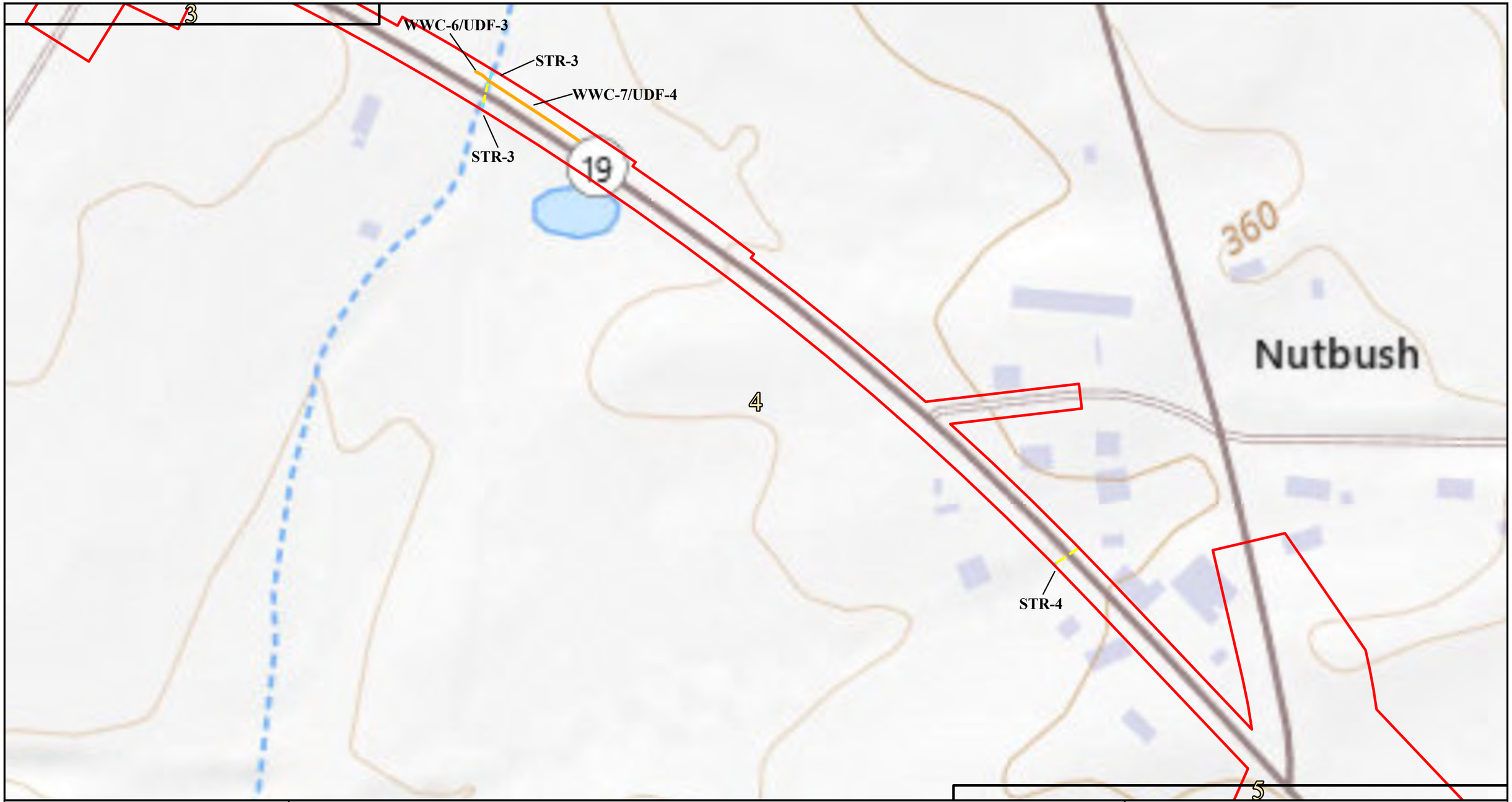
TN TDOT Department of Transportation

PIN 102251.02 Project Boundary
Sheet Limits
Wetland Data Form Locations
Potential Pond (PND)
Potential Wetland (WTL)
Potential Stream (Intermittent) (STR)
Potential Stream (Perennial) (STR)
Wet Weather Conveyance (WWC)
Culverts

USGS The National Map

Lauderdale and Haywood Counties SR-19 Widening (IA)~ Section 2; PIN 102251.02 TDOT

Figure 4: Topographic Map
Sheet 3 of 9
October 2024



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0 150 300 US Feet

Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere

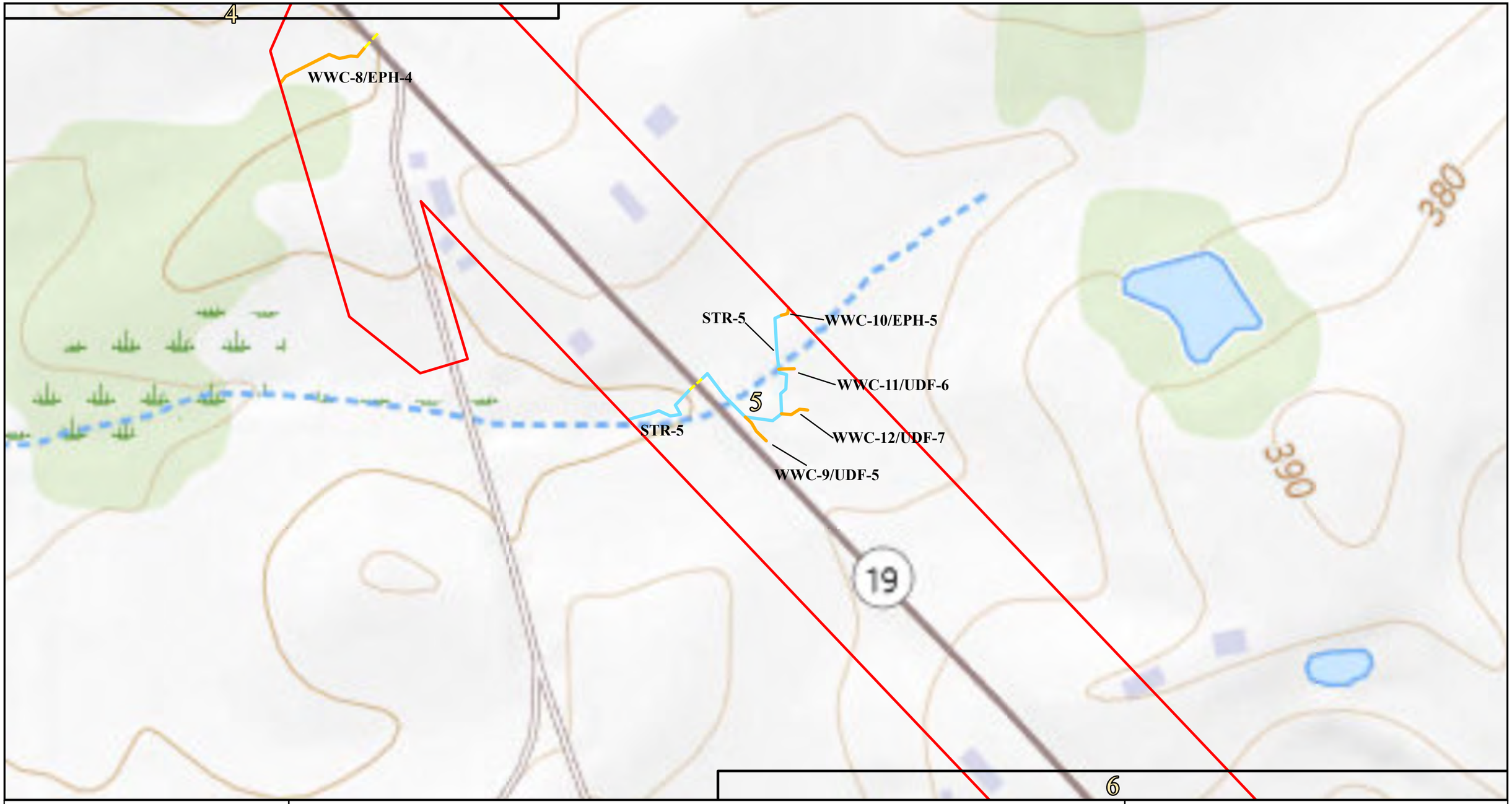
TN TDOT Department of Transportation

- PIN 102251.02 Project Boundary
- Sheet Limits
- Wetland Data Form Locations
- Potential Pond (PND)
- Potential Wetland (WTL)
- Potential Stream (Intermittent) (STR)
- Potential Stream (Perennial) (STR)
- Wet Weather Conveyance (WWC)
- Culverts

USGS The National Map

Lauderdale and Haywood Counties SR-19 Widening (IA)~ Section 2; PIN 102251.02
TDOT

Figure 4: Topographic Map
Sheet 4 of 9
October 2024



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TN TDOT Department of Transportation

PIN 102251.02 Project Boundary
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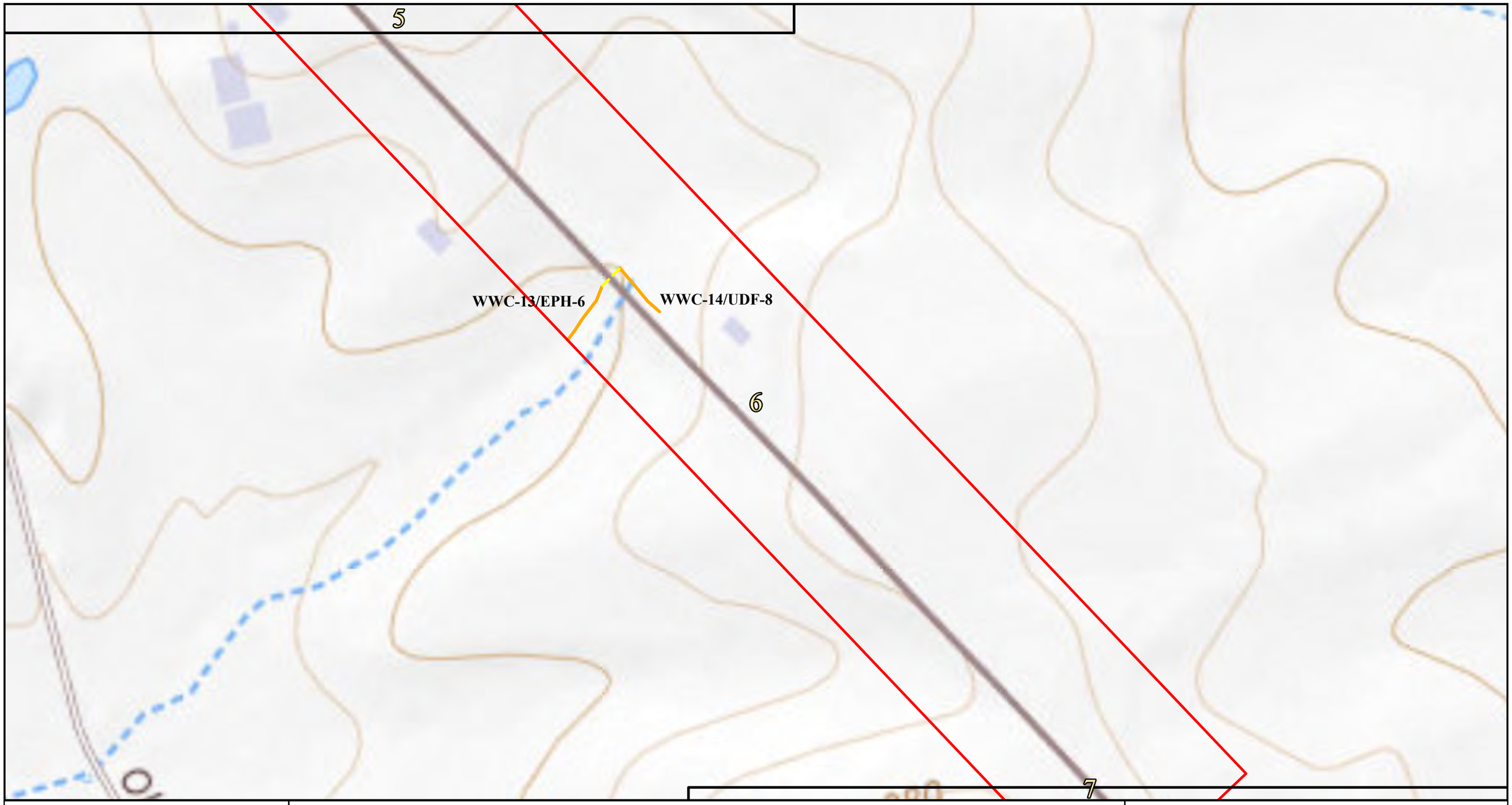
USGS The National Map

Lauderdale and Haywood Counties SR-19 Widening (IA)~ Section 2; PIN 102251.02 TDOT

Figure 4: Topographic Map
Sheet 5 of 9
October 2024



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TN TDOT Department of Transportation

PIN 102251.02 Project Boundary
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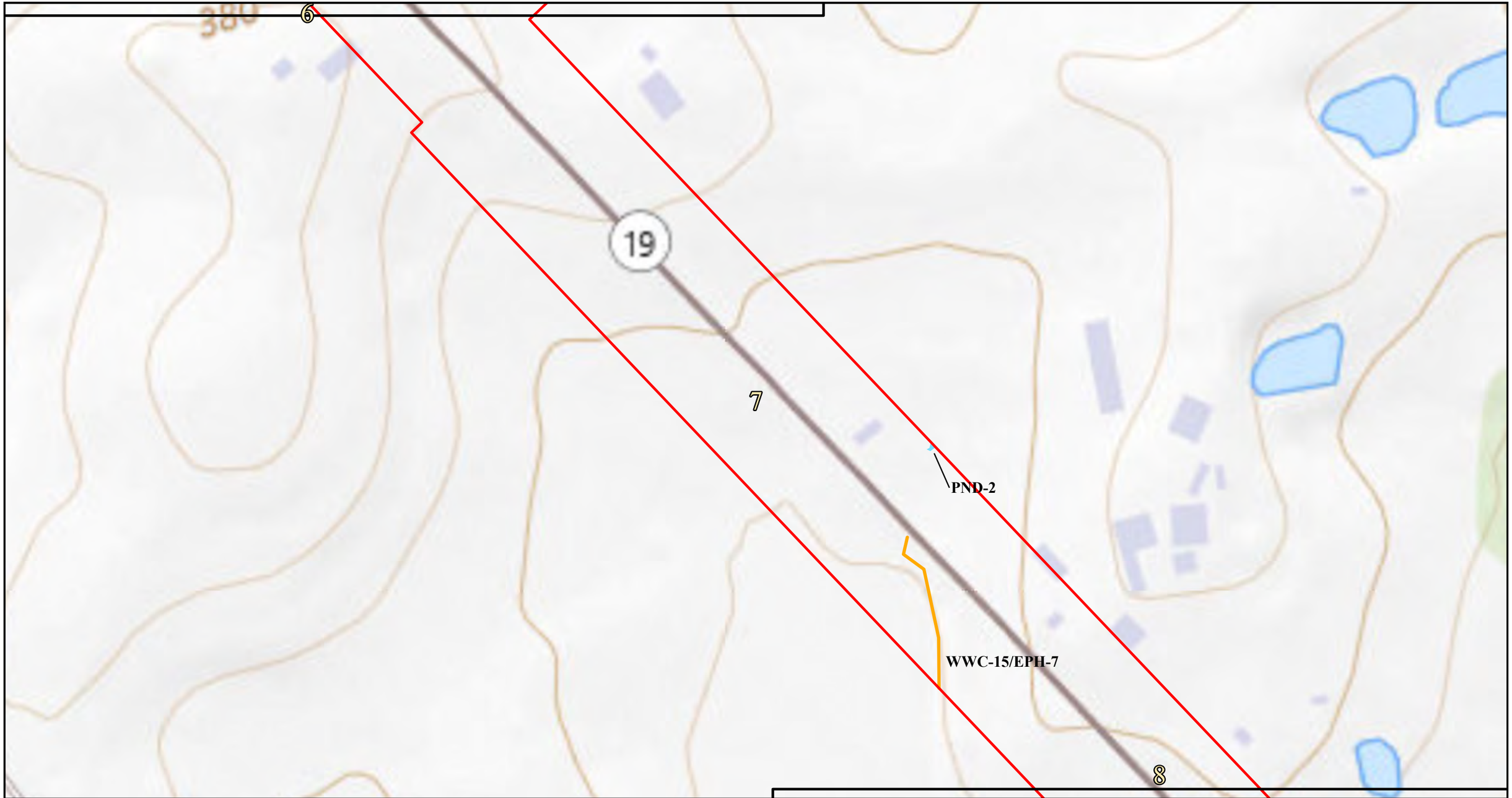
Potential Stream (Perennial) (STR)
Wet Weather Conveyance (WWC)
Culverts

USGS The National Map

Lauderdale and Haywood Counties SR-19 Widening (IA)~ Section 2; PIN 102251.02 TDOT

Figure 4: Topographic Map
Sheet 6 of 9
October 2024



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Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere

TN TDOT Department of Transportation

PIN 102251.02 Project Boundary
Sheet Limits
Wetland Data Form Locations
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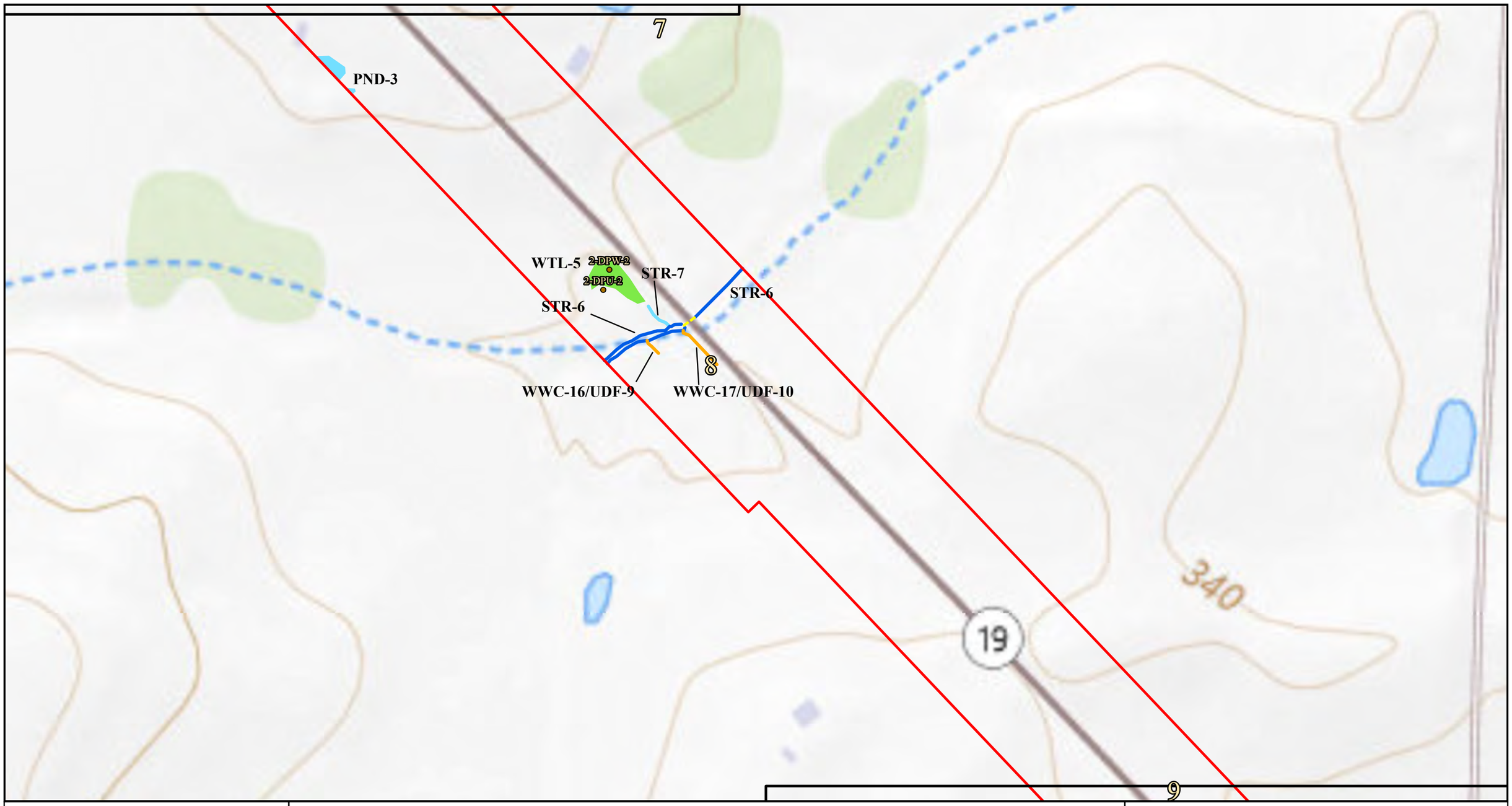
Potential Stream (Intermittent) (STR)
Potential Stream (Perennial) (STR)
Wet Weather Conveyance (WWC)
Culverts

USGS The National Map

Lauderdale and Haywood Counties SR-19 Widening (IA)~ Section 2; PIN 102251.02 TDOT

Figure 4: Topographic Map
Sheet 7 of 9
October 2024



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TN TDOT Department of Transportation

PIN 102251.02 Project Boundary
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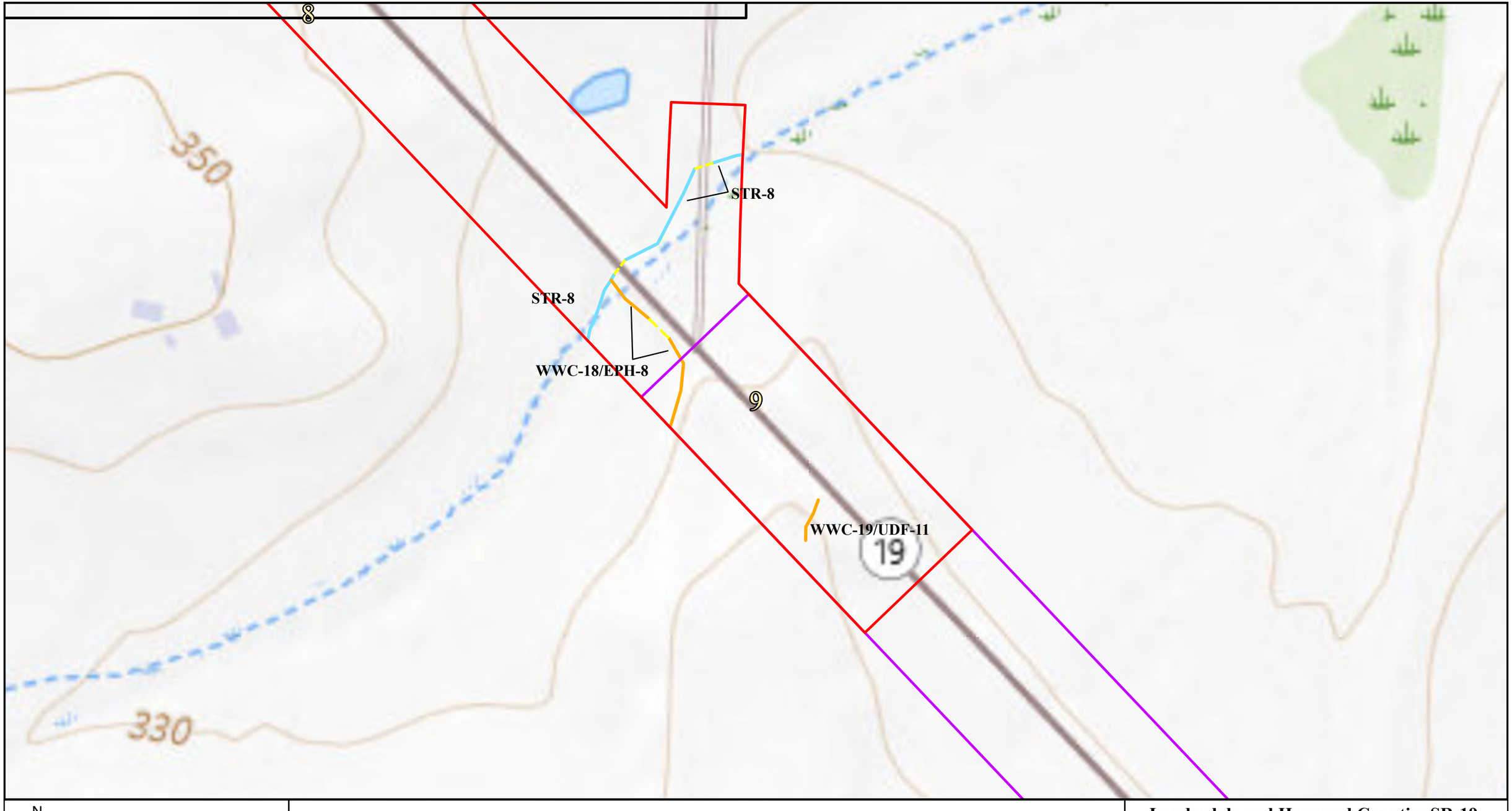
Culverts

USGS The National Map

Lauderdale and Haywood Counties SR-19 Widening (IA)~ Section 2; PIN 102251.02
TDOT

Figure 4: Topographic Map
Sheet 8 of 9
October 2024



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Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere

TN TDOT Department of Transportation

PIN 102251.02 Project Boundary
PIN 102251.03 Project Boundary
Sheet Limits
Wetland Data Form Locations
Potential Pond (PND)
Potential Wetland (WTL)
Potential Stream (Intermittent) (STR)
Potential Stream (Perennial) (STR)
Wet Weather Conveyance (WWC)
Culverts

USGS The National Map

Lauderdale and Haywood Counties SR-19 Widening (IA)~ Section 2; PIN 102251.02
TDOT

Figure 4: Topographic Map
Sheet 9 of 9
October 2024

N

0 150 300 US Feet

Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere

TN TDOT Department of Transportation

- PIN 102251.02 Project Boundary
- PIN 102251.01 Project Boundary
- Sheet Limits
- Wetland Data Form Locations
- Potential Pond (PND)
- Potential Wetland (WTL)
- Potential Stream (Intermittent) (STR)
- Potential Stream (Perennial) (STR)
- Wet Weather Conveyance (WWC)
- Culverts

2016 Maxar Vivid Standard Imagery / ESRI Hybrid Reference Layer

Lauderdale and Haywood Counties SR-19 Widening (IA)~ Section 2; PIN 102251.02 TDOT

Figure 5: Aerial Map
Sheet 1 of 9
October 2024

N

0 150 300 US Feet

Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere

TN TDOT Department of Transportation

PIN 102251.02 Project Boundary
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Potential Stream (Perennial) (STR)
Wet Weather Conveyance (WWC)
Culverts

2016 Maxar Vivid Standard Imagery / ESRI Hybrid Reference Layer

Lauderdale and Haywood Counties SR-19 Widening (IA)~ Section 2; PIN 102251.02 TDOT

Figure 5: Aerial Map
Sheet 2 of 9
October 2024

N

0 150 300 US Feet

Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere

TN TDOT Department of Transportation

PIN 102251.02 Project Boundary
Sheet Limits
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Culverts

2016 Maxar Vivid Standard Imagery / ESRI Hybrid Reference Layer

Lauderdale and Haywood Counties SR-19 Widening (IA)~ Section 2; PIN 102251.02 TDOT

Figure 5: Aerial Map
Sheet 3 of 9
October 2024

N

0 150 300 US Feet

Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere

TN TDOT Department of Transportation

PIN 102251.02 Project Boundary
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Potential Stream (Perennial) (STR)
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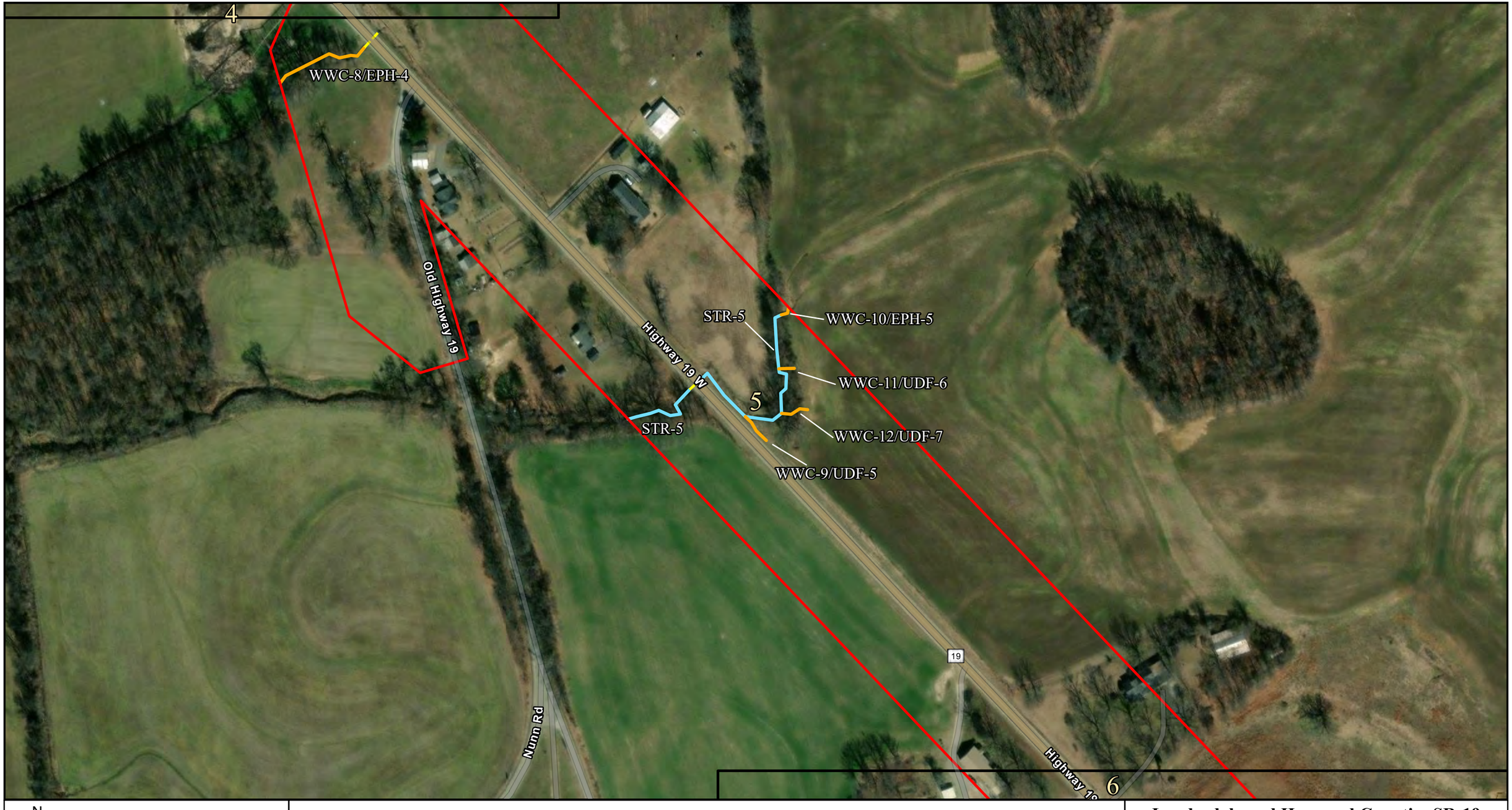
Culverts

2016 Maxar Vivid Standard Imagery / ESRI Hybrid Reference Layer

Lauderdale and Haywood Counties SR-19 Widening (IA)~ Section 2; PIN 102251.02 TDOT

Figure 5: Aerial Map
Sheet 4 of 9
October 2024



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2016 Maxar Vivid Standard Imagery / ESRI Hybrid Reference Layer

Lauderdale and Haywood Counties SR-19 Widening (IA)~ Section 2; PIN 102251.02 TDOT

Figure 5: Aerial Map
Sheet 5 of 9
October 2024

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0 150 300 US Feet

Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere

TN TDOT Department of Transportation

PIN 102251.02 Project Boundary
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Culverts

2016 Maxar Vivid Standard Imagery / ESRI Hybrid Reference Layer

Lauderdale and Haywood Counties SR-19 Widening (IA)~ Section 2; PIN 102251.02 TDOT

Figure 5: Aerial Map
Sheet 6 of 9
October 2024

N

0 150 300 US Feet

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TN TDOT Department of Transportation

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2016 Maxar Vivid Standard Imagery / ESRI Hybrid Reference Layer

Lauderdale and Haywood Counties SR-19 Widening (IA)~ Section 2; PIN 102251.02 TDOT

Figure 5: Aerial Map
Sheet 7 of 9
October 2024

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TN TDOT Department of Transportation

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2016 Maxar Vivid Standard Imagery / ESRI Hybrid Reference Layer

Lauderdale and Haywood Counties SR-19 Widening (IA)~ Section 2; PIN 102251.02 TDOT

Figure 5: Aerial Map
Sheet 8 of 9
October 2024

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Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere

TN TDOT Department of Transportation

PIN 102251.02 Project Boundary
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Sheet Limits
Wetland Data Form Locations
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2016 Maxar Vivid Standard Imagery / ESRI Hybrid Reference Layer

Lauderdale and Haywood Counties SR-19 Widening (IA)~ Section 2; PIN 102251.02 TDOT

Figure 5: Aerial Map
Sheet 9 of 9
October 2024

APPENDIX B: WATER RESOURCE TABLE ANTECEDENT PRECIPITATION TOOL (APT) DATA COLLECTION FORMS

Project Name: Haywood SR-19 Widening (IA) Section 2

PIN: 102251.02

Water Resource Table for EBR Report

Date: 08/12-16/2024

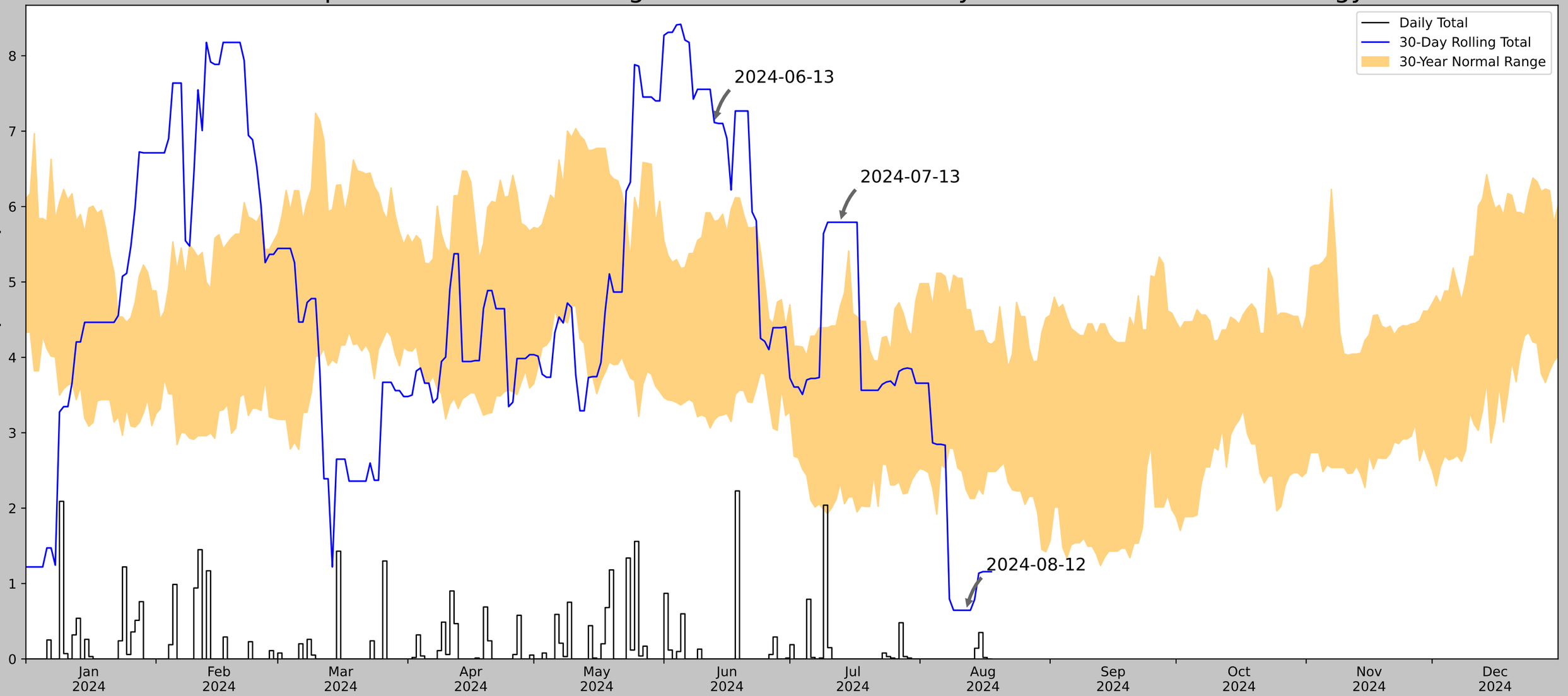
Table Amounts are based on (choose only one): Estimated extent of resource within ETSA

Water Resources (Non-Wetland)					
Label	**Type**	**Latitude**	**Longitude**	**Receiving Waters**	**Quality**
STR-1	Intermittent Stream	35.710194	-89.440174	Pond Creek	Not Applicable
WWC-1/EPH-1	Wet Weather Conveyance/Ephemeral	35.708982	-89.438280	Lagoon Creek	Not Applicable
STR-2	Intermittent Stream	35.708684	-89.436332	Pond Creek	Not Applicable
WWC-2/EPH-2	Wet Weather Conveyance/Ephemeral	35.707291	-89.432831	Lagoon Creek	Not Applicable
WWC-3/EPH-3	Wet Weather Conveyance/Ephemeral	35.705954	-89.429181	Lagoon Creek	Not Applicable
PND-1	Pond	35.705230	-89.425781	Not Applicable	Not Applicable
WWC-4/UDF-1	Wet Weather Conveyance/Ephemeral	35.701681	-89.417946	Lagoon Creek	Not Applicable
WWC-5/UDF-2	Wet Weather Conveyance/Ephemeral	35.702008	-89.417854	Lagoon Creek	Not Applicable
WWC-6/UDF-3	Wet Weather Conveyance/Ephemeral	35.699845	-89.413428	Lagoon Creek	Not Applicable
STR-3	Intermittent Stream	35.699760	-89.413300	Lagoon Creek	Not Applicable
WWC-7/UDF-4	Wet Weather Conveyance/Ephemeral	35.699463	-89.412725	Lagoon Creek	Not Applicable
STR-4	Intermittent Stream	35.697112	-89.409504	Lagoon Creek	Not Applicable
WWC-8/EPH-4	Wet Weather Conveyance/Ephemeral	35.695649	-89.407717	Lagoon Creek	Not Applicable
STR-5	Intermittent Stream	35.693625	-89.405601	Lagoon Creek	Unassessed
WWC-9/UDF-5	Wet Weather Conveyance/Ephemeral	35.693483	-89.404989	Lagoon Creek	Not Applicable
WWC-10/EPH-5	Wet Weather Conveyance/Ephemeral	35.694160	-89.404931	Lagoon Creek	Not Applicable
WWC-11/UDF-6	Wet Weather Conveyance/Ephemeral	35.693880	-89.404883	Lagoon Creek	Not Applicable
WWC-12/UDF-7	Wet Weather Conveyance/Ephemeral	35.693653	-89.404708	Lagoon Creek	Not Applicable
WWC-13/EPH-6	Wet Weather Conveyance/Ephemeral	35.689843	-89.401402	Lagoon Creek	Unassessed
WWC-14/UDF-8	Wet Weather Conveyance/Ephemeral	35.690100	-89.401026	Lagoon Creek	Not Applicable
PND-2	Pond	35.684867	-89.394345	Not Applicable	Not Applicable
WWC-15/EPH-7	Wet Weather Conveyance/Ephemeral	35.684368	-89.394512	Meridian Creek	Not Applicable
PND-3	Pond	35.682620	-89.393180	Meridian Creek	Not Applicable
STR-6	Perennial Stream	35.681182	-89.390789	Meridian Creek	Not Supporting
STR-7	Intermittent Stream	35.681222	-89.390963	Meridian Creek	Not Applicable
WWC-16/UDF-9	Wet Weather Conveyance/Ephemeral	35.681040	-89.390969	Meridian Creek	Not Applicable
WWC-17/UDF-10	Wet Weather Conveyance/Ephemeral	35.681139	-89.390760	Meridian Creek	Not Applicable
STR-8	Intermittent Stream	35.677151	-89.386091	Meridian Creek	Not Supporting
WWC-18/EPH-8	Wet Weather Conveyance/Ephemeral	35.676798	-89.385718	Meridian Creek	Not Applicable
WWC-19/UDF-11	Wet Weather Conveyance/Ephemeral	35.675681	-89.384788	Meridian Creek	Not Applicable

Water Resources (Wetland)					
Label	**Type**	**Latitude**	**Longitude**	**Receiving Waters**	**Quality**
WTL-1	Emergent	35.709929	-89.440314	Pond Creek	Moderate Resource Value
WTL-2	Forested	35.710336	-89.439365	Pond Creek	Moderate Resource Value
WTL-3	Emergent	35.709336	-89.436656	Pond Creek	Moderate Resource Value
WTL-4	Emergent	35.708328	-89.436165	Pond Creek	Low Resource Value
WTL-5	Emergent	35.681455	-89.391276	Meridian Creek	Moderate Resource Value

Note- Features and estimated amounts referenced in this table are based on information available and may change as the project is further refined throughout project development.

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



Coordinates	35.695414, -89.407375
Observation Date	2024-08-12
Elevation (ft)	355.583
Drought Index (PDSI)	Incipient drought (2024-07)
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2024-08-12	2.239764	4.63189	0.645669	Dry	1	3	3
2024-07-13	2.333071	4.67874	5.791339	Wet	3	2	6
2024-06-13	3.169291	5.801969	7.114173	Wet	3	1	3
Result							Normal Conditions - 12

US Army Corps of Engineers

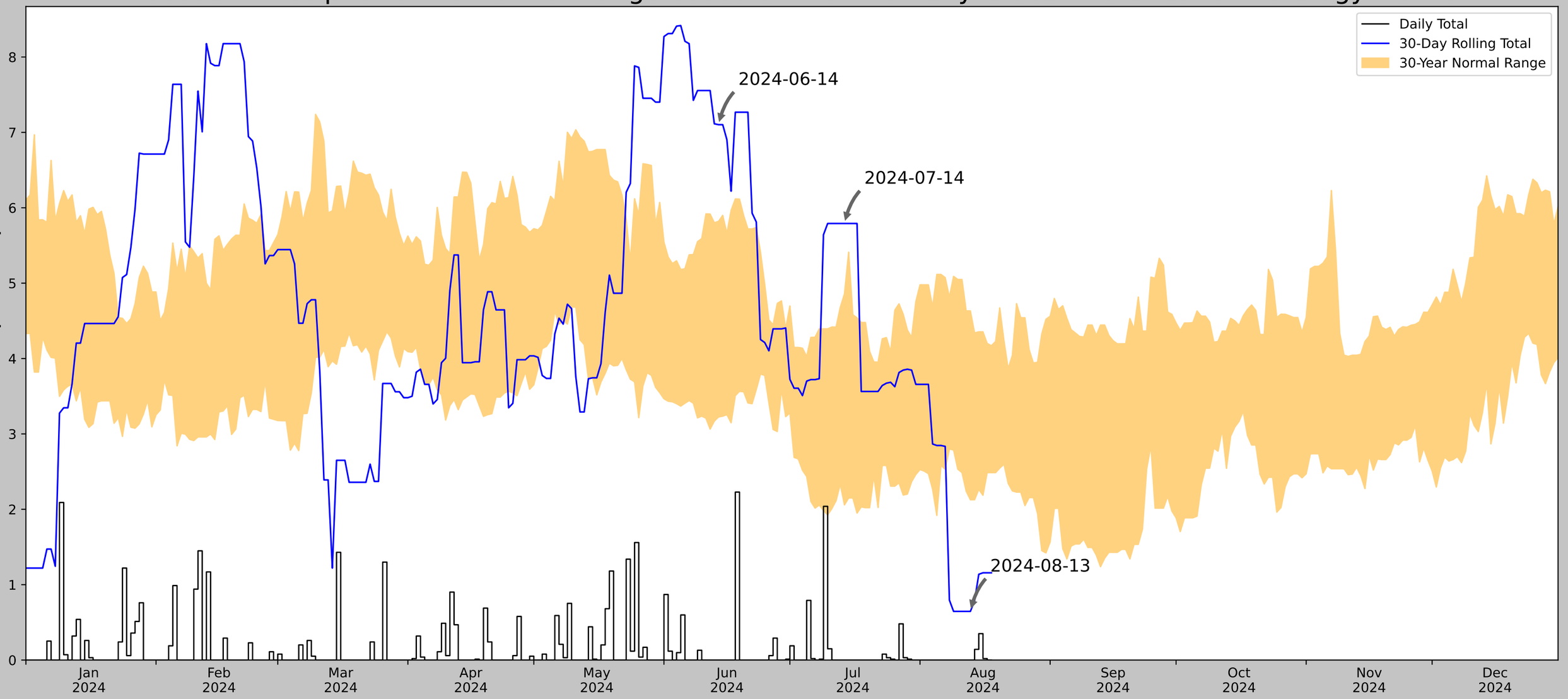
ERDC

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
BROWNSVILLE 1.0 SE	35.5841, -89.2423	348.097	12.045	7.486	5.51	5741	90
BROWNSVILLE	35.5908, -89.2597	374.016	1.082	25.919	0.515	5451	0
ALAMO 1 N	35.7978, -89.1175	348.097	16.342	0.0	7.354	95	0
SOMERVILLE 10N	35.365, -89.3475	342.848	16.255	5.249	7.4	23	0
RIPLEY	35.7178, -89.4986	399.934	17.1	51.837	8.581	41	0
JACKSON MCKELLAR- SIPES AP	35.5933, -88.9169	423.885	18.295	75.788	9.619	1	0

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



Coordinates	35.695414, -89.407375
Observation Date	2024-08-13
Elevation (ft)	355.583
Drought Index (PDSI)	Incipient drought (2024-07)
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2024-08-13	2.125984	4.63189	0.645669	Dry	1	3	3
2024-07-14	2.057874	4.857087	5.791339	Wet	3	2	6
2024-06-14	3.22441	5.819685	7.102362	Wet	3	1	3
Result							Normal Conditions - 12

US Army Corps of Engineers

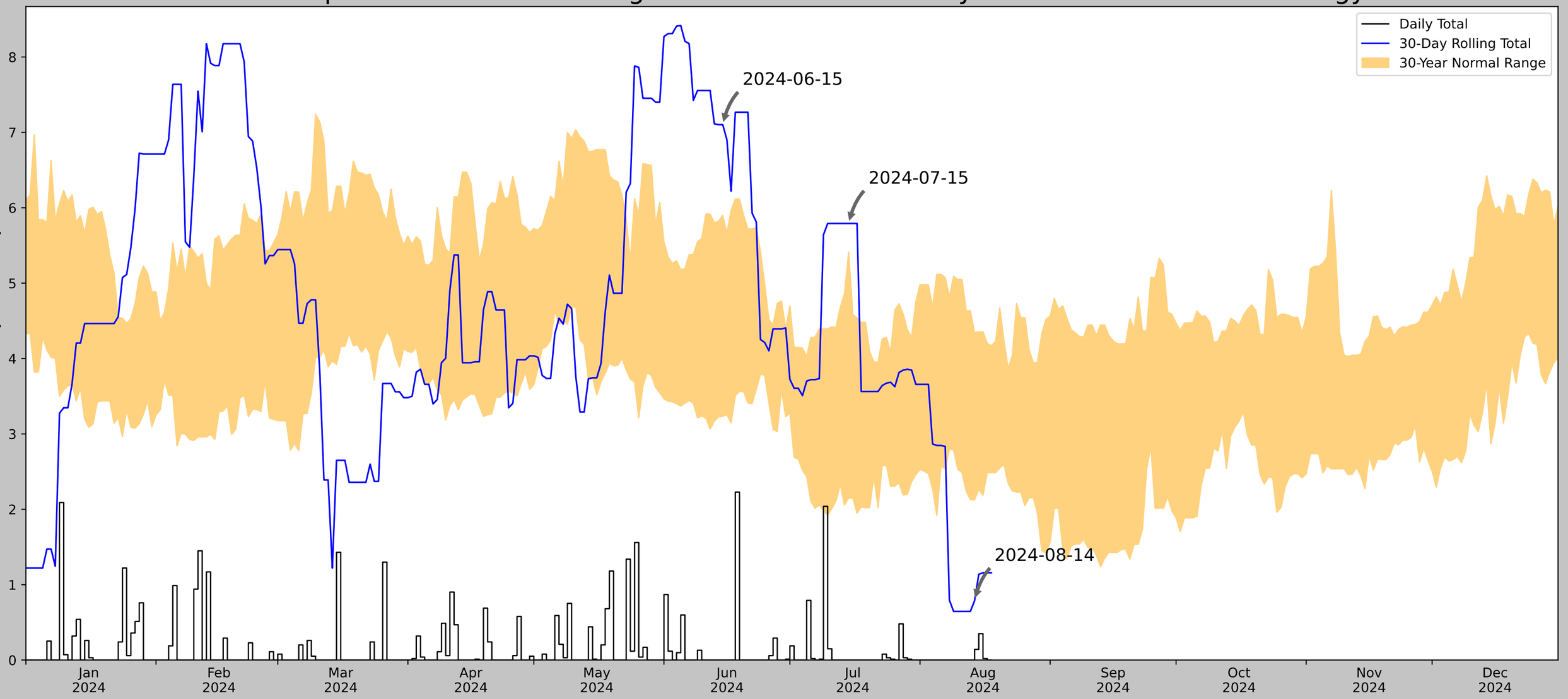
ERDC

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
BROWNSVILLE 1.0 SE	35.5841, -89.2423	348.097	12.045	7.486	5.51	5741	90
BROWNSVILLE	35.5908, -89.2597	374.016	1.082	25.919	0.515	5451	0
ALAMO 1 N	35.7978, -89.1175	348.097	16.342	0.0	7.354	95	0
SOMERVILLE 10N	35.365, -89.3475	342.848	16.255	5.249	7.4	23	0
RIPLEY	35.7178, -89.4986	399.934	17.1	51.837	8.581	41	0
JACKSON MCKELLAR- SIPES AP	35.5933, -88.9169	423.885	18.295	75.788	9.619	1	0

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



Coordinates	35.695414, -89.407375
Observation Date	2024-08-14
Elevation (ft)	355.583
Drought Index (PDSI)	Incipient drought (2024-07)
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2024-08-14	2.125984	4.340551	0.787402	Dry	1	3	3
2024-07-15	2.15	5.411417	5.791339	Wet	3	2	6
2024-06-15	3.235039	5.899606	7.102362	Wet	3	1	3
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
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BROWNSVILLE	35.5908, -89.2597	374.016	1.082	25.919	0.515	5451	0
ALAMO 1 N	35.7978, -89.1175	348.097	16.342	0.0	7.354	95	0
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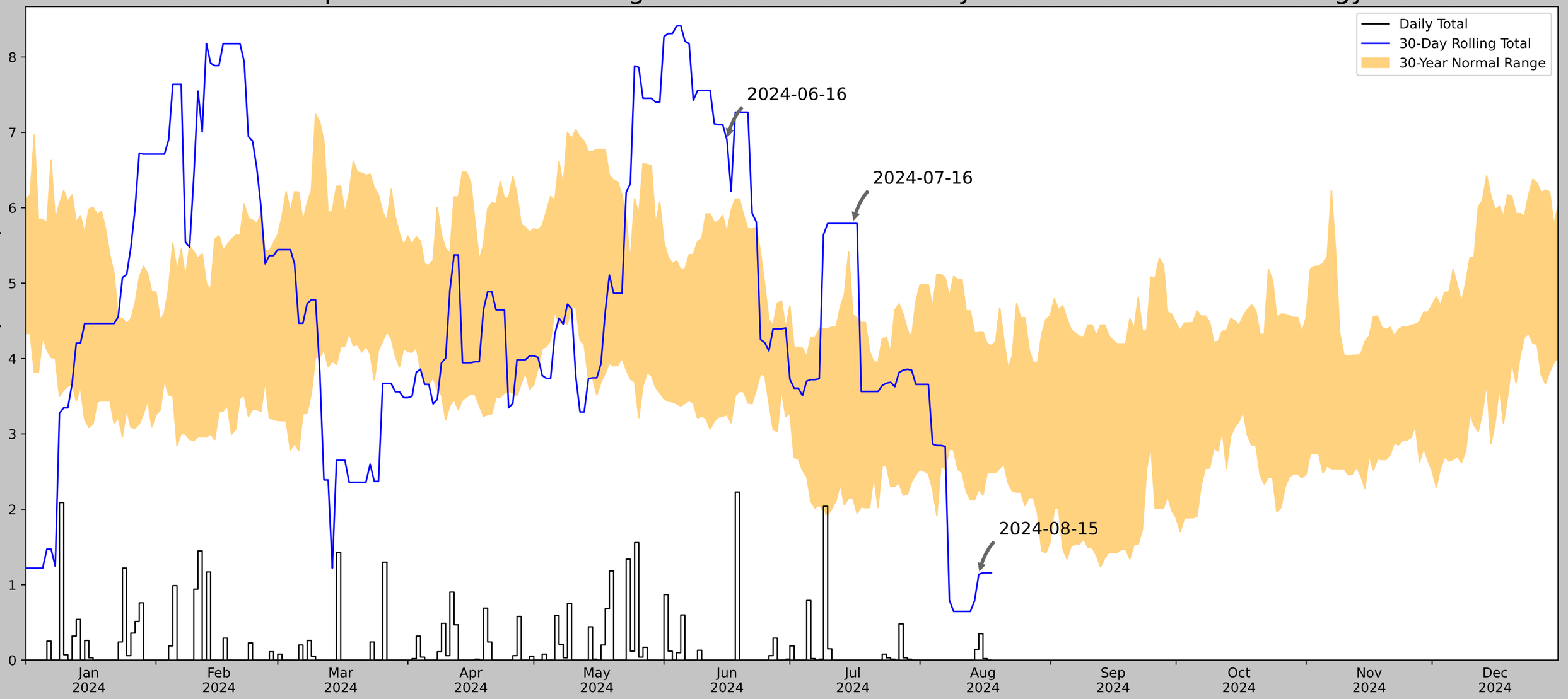
RIPLEY	35.7178, -89.4986	399.934	17.1	51.837	8.581	41	0
JACKSON MCKELLAR- SIPES AP	35.5933, -88.9169	423.885	18.295	75.788	9.619	1	0

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



Coordinates	35.695414, -89.407375
Observation Date	2024-08-15
Elevation (ft)	355.583
Drought Index (PDSI)	Incipient drought (2024-07)
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2024-08-15	2.264567	4.354331	1.137795	Dry	1	3	3
2024-07-16	2.15	4.581103	5.791339	Wet	3	2	6
2024-06-16	3.255118	5.661418	6.901575	Wet	3	1	3
Result							Normal Conditions - 12

US Army Corps of Engineers

ERDC

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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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JACKSON MCKELLAR- SIPES AP	35.5933, -88.9169	423.885	18.295	75.788	9.619	1	0

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.02					
Biologist:	PB & BF	**Affiliation:**	JMT	**Date:**	08-14-2024

1-Station: from plans	South side of SR-19 0.44 miles south of Springhill Rd								
2-Map label and name	STR-1								
3-Latitude/Longitude	35.710194, -89.440174								
4-Feature description:									
-channel identification	perennial stream		intermittent stream	✓	ephemeral stream		wwc		
-HD score (if applicable)	-- see HD Form --								
-OHWM indicators	bed & banks	✓	deposition	✓	presence of litter debris	✓	scour	✓	veg absent, bent, matted ✓
	change in plant community	✓	destruction of terrestrial veg	✓	multiple observe flow events		sediment sorting	✓	water staining ✓
	change in soil character	✓	leaf litter disturb or absent	✓	natural line impressed on bank		shelving		wracking ✓
-channel bottom width	4'		-top of bank width		12'				
-width and max depth at ordinary high water mark	5' width, 2' max depth								
-width at bankfull	10'								
-bank height	LDB - 4'				RDB - 4'				
-riffle/pool complex or other specialized habitat present?	No								
-dominant riparian species: ----------(LDB /RDB)----------	LDB: slippery elm, bitter orange, mockernut hickory, persimmon								
	RDB: slippery elm, green ash								
-particle size distribution %	Silt/Sand: 100		Gravel:		Cobble:		Boulder:		Bedrock:
5-photo numbers	1-4								
6-HUC -8 Code & Name	08010205 - South Fork Forked Deer								
7-Assessed	yes		no	✓					
8-ETW	yes		no	✓					
9-303 (d) List	yes		siltation		habitat:		other:		
	no	✓							
10-Notes									

Revised July 2022

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Pond Creek	Date/Time: 08/14/24
Assessors/Affiliation: PB, BF; JMT	Project ID : 102251.02
Site Name/Description: STR-1	
Site Location: South side of SR-19 0.44 miles south of Springhill Rd	
HUC (12 digit): 080102050403	Latitude: 35.710194
Previous Rainfall (7-days) : < 0.5 inches	Longitude: -89.440174
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0	
Watershed Size : 0.11 sq. miles	County: Haywood
Soil Type(s) / Geology : Adler Silt Loam	Source: NRCS Web Soil Survey
Surrounding Land Use : Low Density Residential, Agricultural	
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) =

Justification / Notes :

Incipient drought (based on APT). USGS mapped stream within a cattle pasture. Cattle have full access to stream, as well as cars (tire ruts present in stream). Soil clearly hydric (0-6 in. 10YR 5/2 with 7.5YR 4/6 redox; 6-12 in. 10YR 5/1 with same redox). Evidence of soil saturation despite incipient drought. Water-stained leaves, cow tracks in channel. **Typical HD scoring not possible.** Due to historic mapping/contours and current land use, STR-1 is considered a stream. See pg.73 of TN HD Guidance

See figures and photograph log for visual details

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal =)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal =)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal =)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = _____

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Typical HD scoring not possible.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: TN SR-19 City/County: Haywood County Sampling Date: 2024-08-14

Applicant/Owner: TDOT State: Tennessee Sampling Point: 2-DPW-3

Investigator(s): Preston Butler and Britt Fleming Section, Township, Range:

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 2

Subregion (LRR or MLRA): P 134 Lat: 35.708254 Long: -89.436248 Datum: NAD83_2011

Soil Map Unit Name: MeD3 - Memphis silt loam, 8 to 12 percent slopes, severely eroded, northern phase NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓	No _____	
Wetland Hydrology Present?	Yes ✓	No _____	

Remarks: WTL-4

Form also represents wetland WTL-1

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)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☑ Oxidized Rhizospheres along 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)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes _____	No ✓	Depth (inches): _____
Water Table Present?	Yes _____	No ✓	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No ✓	Depth (inches): _____

Wetland Hydrology Present? Yes ✓ No _____

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

Remarks:

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

Sampling Point: 2-DPW-3

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix nigra	10	✓	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	10 = Total Cover		
50% of total cover: 5.00	20% of total cover: 2.00		
Sapling/Shrub Stratum (Plot size: 30 ft r)			
1. Salix nigra	5	✓	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	5 = Total Cover		
50% of total cover: 2.50	20% of total cover: 1.00		
Herb Stratum (Plot size: 30 ft r)			
1. Typha latifolia	30	✓	OBL
2. Mimulus ringens	30	✓	OBL
3. Eupatorium perfoliatum	30	✓	FACW
4. Juncus effusus	5		OBL
5. Ambrosia artemisiifolia	5		FACU
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
50% of total cover: 50.00	20% of total cover: 20.00		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	80	x 1 =	80
FACW species	30	x 2 =	60
FAC species	0	x 3 =	0
FACU species	5	x 4 =	20
UPL species	0	x 5 =	0
Column Totals:	115 (A)		160 (B)

Prevalence Index = B/A = 1.39

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☑ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four 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 vines, less than 3 in. DBH and greater than 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

Remarks: (If observed, list morphological adaptations below).

Wetland is below a pond in a horse pasture. 100% moderately altered due to pond above wetland.

SOIL

Sampling Point: 2-DPW-3

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 - 4	10YR 5/2	45	5YR 5/6	10	C	PL / M	Silt Loam	
0 - 4	10YR 5/3	45	5YR 5/6	10	C	PL / M	Silt Loam	
4 - 12	10Y 5/1	90	5YR 5/6	10	C	PL / M	Silt Loam	
-								
-								
-								
-								

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

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☑ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✓ **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: TN SR-19 City/County: Haywood County Sampling Date: 2024-08-14

Applicant/Owner: TDOT State: Tennessee Sampling Point: 2-DPU-3

Investigator(s): Preston Butler and Britt Fleming Section, Township, Range:

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 1

Subregion (LRR or MLRA): P 134 Lat: 35.708422 Long: -89.435837 Datum: NAD83_2011

Soil Map Unit Name: MeD3 - Memphis silt loam, 8 to 12 percent slopes, severely eroded, northern phase NWI classification: NA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks: Uplands adjacent to WTL-4
Form also represents uplands adjacent to wetland WTL-1

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)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along 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)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes _____	No ✓	Depth (inches): _____
Water Table Present?	Yes _____	No ✓	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No ✓	Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

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

Remarks:

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

Sampling Point: 2-DPU-3

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size: 30 ft r)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size: 30 ft r)			
1. Festuca subverticillata	100	✓	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
50% of total cover: 50.00	20% of total cover: 20.00		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of 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: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.00 (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	100	x 4 =	400
UPL species	0	x 5 =	0
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]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four 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 vines, less than 3 in. DBH and greater than 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 ✓

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: 2-DPU-3

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 - 6	10YR 6/4	99	7.5YR 5/6	1	RM	M	Sandy Loam	
-								
-								
-								
-								
-								
-								

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

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: Compaction

Depth (inches): 6

Hydric Soil Present? **Yes** _____ **No** ✓

Remarks:

An affirmative response to 1-6 of the Decision Table identifies the wetland per rule as an Outstanding Natural Resource Water (ONRW) or Exceptional Tennessee Waters (ETW). A positive response to 7-13 requires a final determination by the Department.

#	**Wetland Feature Decision Table** PIN 102251.02; WTL-1	**Yes/No**	**Affirmative Result**
1	The wetland has been designated as an **Outstanding Natural Resource Water (ONRW)** by the Department under 0400-40-03-.06(5)(a)**.**	No	**ORNW**
2	The wetland has previously been designated and documented as an Exceptional Tennessee Water (ETW) by the Department under 0400-40-03-.06(4)(a)(7)	No	**ETW**
3	The wetland is within state or national parks, wildlife refuges, forests, wilderness areas, natural areas, or is a designated State Scenic Rivers or Federal Wild and Scenic Rivers.	No	**ETW**
4	The wetland is known to contain a documented non-experimental population of state or federally listed threatened or endangered aquatic or semi-aquatic plants, or aquatic animals.	No	**ETW**
5	The wetland or the area it is in has been designated by the U.S. Fish and Wildlife Service as "**Critical Habitat**" for any threatened or endangered aquatic or semi-aquatic plant or aquatic animal species.	No	**ETW**
6	The wetland falls within an area designated as Lands Unsuitable for Mining pursuant to the federal Surface Mining Control and Reclamation Act where such designation is based in whole or in part on impacts to water resource values	No	**ETW**
7	**The wetland exhibits outstanding ecological or recreational values such as, but not limited to, those as outlined in 8-12**	No	Determination Required by TDEC
8	The wetland fits within the species composition concept for any plant community found in the state of Tennessee **ranked G2, G1, or more imperiled** at the "Association" classification level according to the NatureServe and Natural Heritage Ranking system (e.g. "bog", "fen", and "wet prairie/barren" communities).	No	Determination Required by TDEC
9	The wetland is **an uncommon resource** (e.g. vernal pools, headwater wetlands, sinks, spring/seeps, glades, newly described communities, high recreational or socioeconomic value) in the region and/or is deemed such by concurrence of qualified scientists.	No	Determination Required by TDEC
10	The wetland is an **older aged forested wetland** comprised of overstory trees with an average diameter at breast height (dbh) being **greater than or equal to 30 in** within the WAA.	No	Determination Required by TDEC
11	The wetland is observed and documented to be a **significant waterfowl, songbird, shorebird, amphibian, bat, fish habitat area**. These may include rookeries, migratory congregations, nesting sites, breeding areas, etc.	No	Determination Required by TDEC
12	The wetland is **hydrologically connected** to and/or has significant ecological contribution to an **ETW**	No	Determination Required by TDEC
13	The wetland has High Resource Value as determined by a **score of 75 and above** using the TRAM or non-HGM TRAM (to be determined after completing the quantitative portion of this manual)	No	Determination Required by TDEC

End of Narrative Rating. Begin Quantitative Rating on Next Page.

HGM FUNCTIONAL ASSESSMENT
SLOPE WETLANDS

Date: 08/14/2024 Project Name SR-19, 102251.02

Field Personnel PB, BF Wetland Name/Location WTL-1

Read instructions prior to conducting assessments. If project area is large or highly heterogeneous requiring the designation of several WAAs, a separate assessment should be performed for each WAA. CHECK THE APPROPRIATE BLANK(S) BELOW.

V1: Hydroperiod (HYDRO)

☐ 1. Hydrology not altered (SI = 1.0)
- no fill material or excessive sediment
- no ditches/drainage tiles
- no roads or other impediments to surface or groundwater
- no excavation
- no alteration to overland runoff, groundwater discharge/recharge

☐ 2. Hydrology slightly altered (SI = 0.75)
- portion of site with minimal fill or sediment
- portion of site with drainage ditches/tiles
- roads or other impediments, water flow slightly altered
- minor portion of site excavated
- some alteration to overland runoff, groundwater discharge/recharge

☑ 3. Hydrology moderately altered (SI = 0.5)
- portion of site with moderate fill or sediment
- portion of site with drainage ditches/tiles
- some alteration to overland runoff, groundwater discharge/recharge
- roads or other impediments, water flow moderately altered
- moderate portion of site excavated

☐ 4. Hydrology significantly altered (SI = 0.25)
- portion of site with significant fill or sediment
- portion of site with drainage ditches/tiles
- significant alteration to overland runoff, groundwater discharge/recharge
- roads or other impediments, water flow significantly altered
- significant portion of site excavated

☐ 5. Hydrology severely altered (SI = 0.1)
- entire site impacted by fill or excessive sediment
- entire site with numerous drainage ditches/tiles
- no contributions to or from overland runoff, groundwater discharge/recharge
- roads or other impediments, water flow completely blocked
- entire wetland affected

V2: Wetland Watershed Integrity (WSHEDINT)

Use weighted average as discussed on page 10. Examples of land uses and multipliers listed below

A = Percentage forested with no impervious surfaces 8
B = Percentage permeable land, (e.g., park, golf course, pasture, hay, orchard, tree farm, or similar) 90
C = Percentage low density residential, construction, or similar 2
D = Percentage high density residential, or similar _____
E = Percentage urban, commercial, industrial, or similar _____

V2 = (A x 1.0) + (B x 0.75) + (C x 0.5) + (D x 0.25) + (E x 0.01)/(100) = 0.77

V3: Canopy Tree Size Class (TSIZE)

1. Average size of canopy trees > 3 in. DBH

☐ ≥ 15 in. (SI = 1.0) ☐ 10 – 14 in. (SI = 0.75) ☐ 6 – 9 in. (SI = 0.5) ☐ 3 – 5 in. (SI = 0.25)
☑ < 3 in. or no trees present, go to V5

V4: Canopy Tree Density (TDEN)

1. Average number of canopy trees (> 3 in. DBH) per 30-ft. radius plot

☐ 5 – 10 (SI = 1.0) ☐ 11 – 15 (SI = 0.75) ☐ > 15 (SI = 0.5) ☐ 1 – 4 (SI = 0.5)

V5: Shrub Cover (SCOV)

1. Average percent cover of shrubs (woody stems < 3 in. DBH and taller than 3 ft.) per 30-ft. radius plot

☑ > 20 (SI = 1.0) ☐ < 20, go to V6

V6: Ground Vegetation Cover (GVC)

1. Average percent cover of ground vegetation per 30-ft. radius plot

☐ ≥ 70 (SI = 1.0) ☐ 55 – 69 (SI = 0.75) ☐ 45 – 54 (SI = 0.5) ☐ 30 – 44 (SI = 0.25) ☐ 20 – 29 (SI = 0.1)
☑ < 20 (SI=0.0)

V7: Vegetation Composition and Diversity (COMP)

1. Check the dominant species from Groups 1, 2, and 3 below using the 50/20 rule. If tree cover is < 20%, check the dominants in the next tallest stratum. If a dominant does not appear in lists below, but is a native species, it can be added to Group 1 or 2 species based on the scientific literature or professional judgement. Native shrub and herbaceous species are assigned to Group 2. When using shrub or herbaceous write in the number of dominant species. Dominant invasive species are checked regardless of stratum. *

GROUP 1 (Reference Standard)		GROUP 2 (Native Ubiquitous)		GROUP 3 (Invasive)
☐ Water oak	☐ Pin oak	☐ American elm	☑ Green ash	☐ European/Chinese privet
☐ Bur oak	☐ Shumard oak	☑ Slippery elm	☐ Red maple	☐ Japanese honeysuckle
☐ Willow oak	☐ Bald cypress	☐ Sweetgum	☐ Silver maple	☐ Japanese stiltgrass
☐ Swamp chestnut oak	☐ Water tupelo	☐ Blackgum	☑ Black willow	☐ Purple loosestrife
☐ Cherrybark oak	☐ S. black gum	☐ Silky dogwood	☐ Sycamore	☐ Giant reed
☐ Swamp white oak	☑ Persimmon	☐ Boxelder	☐ _____	☐ Tall fescue
☐ Nuttall oak	☐ Am. hornbeam	☐ Tulip poplar	☐ _____	☐ Phragmites
☐ Overcup oak	☑ Mockernut Hickory	____ Number native shrub spp.		☐ _____
☐ _____	☐ _____	____ Number native herbaceous spp.		☐ _____

2. Using the number of dominants in Groups 1, 2, and 3 above, calculate a quality index (Q) using the following formula: [(1.0 x # of checked dominants in Group 1) + (0.66 x # of checked dominants in Group 2) + (0.0 x # of checked dominants in Group 3)]/ total # of checked dominants in all groups = 0.80

3. Multiply Q above by one of the following constants that reflects species richness:[1]

- ○ a) if ≥ 4 species from Groups 1 and/or 2 occur as dominants, multiply Q by 1.0 _____
- ○ b) if 3 species from Groups 1 and/or 2 occur as dominant, multiply Q by 0.75 _____
- ◉ c) if 2 species from Groups 1 and/or 2 occur as dominants, multiply Q by 0.50 0.40
- ○ d) if 1 species from Groups 1 and/or 2 occurs as dominant, multiply Q by 0.25 _____
- ○ e) if no species from Groups 1 and/or 2 occurs as dominant, multiply Q by 0.0 _____

4. Calculate the square root of the value from Step 3 above. This value is the SI for **V7**= 0.63

*In some Depression wetlands and in some small WAAs (e.g., <0.5 acres), relatively few species (e.g., overcup oak) may be present. In cases in which this is the normal condition, Q can be multiplied by 1.0 if only 1 or 2 species are dominant.

V8: Soil Organic Matter (ORGANIC)

1. Surface horizons unaltered

☑ 100 percent cover of O and/or A horizon present (SI = 1.0)

2. Surface horizons altered. Estimate the percent of the WAA in which neither an O or A horizon is present.

3. Subtract the sum of the values from Step 2 from 100. Convert this value to a decimal. This value is the SI for V8 (e.g., if 75 % of the WAA does not have an O or A horizon due to a significant disturbance, it will have an SI of 0.25).

V9: Buffer (BUFFER)

1. Determine the Connection Index (CI) by estimating the percent of the wetland surrounded by suitable buffer habitat.

☐ 90% – 100% (CI = 1.0) ☐ 75% – 89% (CI = 0.75) ☐ 40% – 74% (CI = 0.5) ☐ 10% – 39% (CI = 0.25)
☑ < 10% (CI = 0.1)

2. Multiply the CI by one if the following values:

- ○ a) if average buffer width is ≥ 492 ft., multiply by 1.0
- ○ b) if average buffer is 98 ft to 491 ft., multiply by 0.66
- ○ c) if average buffer width is 33 ft to 97 ft., multiply by 0.33
- ◉ d) if average buffer width is < 33 ft., multiply by 0.1

3. This value is the SI for **V9 =** 0.01 **.**

VALUES USED TO CALCULATE FUNCTIONAL CAPACITY INDICES (FCIs)

SUBINDEX VALUES:

V1 0.50 (HYDRO) V3 go to V5 (TSIZE) V5 1.00 (SCOV) V7 0.63 (COMP) V9 0.01 (BUFFER)

V2 0.77 (WSHEDINT) V4 0 (TDEN) V6 _____ (GVC) V8 1.00 (ORGANIC)

Slope Wetland

WTL-1

V1: HYDROPERIOD	**0.5**	
V2: WETLAND WATERSHED INTEGRITY	**0.77**	(V1 x V2)^(1/2)
V3: CANOPY TREE CLASS	**GOTOV5**	
V4: CANOPY TREE DENSITY	**N/A**	
V5: SHRUB COVER	**1**	
V6: GROUND VEGETATION COVER	**n/a**	
V7: VEGETATION COMPOSITION AND DIVERSITY	**0.63**	
2. Q =	**0.8**	
# of Group 1 Dominants	2	
# of Group 2 Dominants	3	
# of Group 3 Dominants	0	
SPECIES RICHNESS CONSTANT	0.5	
V8: SOIL ORGANIC MATTER	**1**	
V9:BUFFER	**0.01**	
1. Connection Index	0.1	
2. Buffer width value (0-1)	0.1	

Function 1: Matintain Hydrologic Regime

FCI 1 = **0.62** **Final Tree =** **#VALUE!**

Function 2: Maintain Biogeochemical Processes

$$\text{FCI (trees present)} = \left((V1 \times V2)^{1/2} \times \left(\frac{\frac{V3+V4}{2}+V8}{2}\right)\right)^{1/2}$$

FCI 2 trees= **#VALUE!** **Final Shrubs=** **0.50**

Final Herbaceous = **#VALUE!**

$$\text{FCI (shrubs present)} = \left((V1 \times V2)^{1/2} \times \left(\frac{V5+V8}{3}\right)\right)^{1/2}$$

FCI 2 shrubs= **0.64**

$$\text{FCI (ground cover)} = \left((V1 \times V2)^{1/2} \times \left(\frac{V6+V8}{5}\right)\right)^{1/2}$$

FCI 2 ground = **#VALUE!**

Function 3: Maintain Characteristic Plant Community

$$\text{FCI (trees present)} = \frac{(V1 \times V2)^{1/2} + 2\left(\frac{V3+V4+V7}{3}\right)}{3}$$

FCI 3 trees= **#VALUE!**

$$\text{FCI (shrubs present)} = \frac{(V1 \times V2)^{1/2} + 2\left(\frac{V5+V7}{2}\right)}{6}$$

FCI 3 shrubs= **0.38**

$$\text{FCI (groundcover)} = \frac{(V1 \times V2)^{1/2} + 2\left(\frac{V6+V7}{2}\right)}{9}$$

FCI 3 ground = **#VALUE!**

Function 4: Maintain Characteristic Wildlife Community:

$$\text{FCI (trees)} = \frac{(V1 \times V2)^{1/2} + 2\left(\frac{V3+V4+V7}{3}\right) + V9}{4}$$

FCI 4 trees= **#VALUE!**

$$\text{FCI (shrubs present)} = \frac{(V1 \times V2)^{1/2} + 2\left(\frac{V5+V7}{2}\right) + V9}{6}$$

FCI 4 shrubs= **0.38**

$$\text{FCI (groundcover)} = \frac{(V1 \times V2)^{1/2} + 2\left(\frac{V6+V7}{2}\right) + V9}{9}$$

FCI 4 ground = **#VALUE!**

TRAM Summary Worksheet

Project: SR-19, PIN 102251.02, WTL-1

Exceptional Status Wetlands		**Check if applicable**
	1. **ONRW**	☐
	2. **ETW**	☐
	3. **Further Review Requested:** Attach Wetland Background and Exceptional Status Wetlands Worksheet	☐
	COMMENTS/NOTES:	
Quantitative Rating scores	Function: Hydrologic Regime	0.62
	Function: Biogeochemical Processes	0.64
	Function: Retain Particulates	n/a
	Function: Plant Community	0.38
	Function: Wildlife Community	0.38
	Quantitative Score (Average of FCIs x 100)	50.00
	Value Added (Significant Size) Total	0
Total of Quantitative and Value Added Scores	**TOTAL SCORE**	50.00

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: TN SR-19 City/County: Lauderdale County Sampling Date: 2024-08-13

Applicant/Owner: TDOT State: Tennessee Sampling Point: 1-DPW-1

Investigator(s): Ray Bode and Bryan Cardoso Section, Township, Range:

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 0

Subregion (LRR or MLRA): P 134 Lat: 35.712723 Long: -89.446595 Datum: NAD83_2011

Soil Map Unit Name: Ad - Adler silt loam, 0 to 2 percent slopes, occasionally flooded NWI classification: PFO

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓	No _____	
Wetland Hydrology Present?	Yes ✓	No _____	

Remarks:

WTL-8 (PIN 102251.01)

Form also represents WTL-2 (PIN 102251.02), WTL-2 (PIN 102251.03), and WTL-7 (PIN 102251.01).

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)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along 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)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes _____	No ✓	Depth (inches): _____
Water Table Present?	Yes _____	No ✓	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No ✓	Depth (inches): _____

Wetland Hydrology Present? Yes ✓ No _____

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

Remarks:

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

Sampling Point: 1-DPW-1

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Sapling/Shrub Stratum (Plot size: 30 ft r)			
1. Salix nigra	50	✓	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	50 = Total Cover		

50% of total cover: 25.00 20% of total cover: 10.00

Herb Stratum (Plot size: 30 ft r)			
1. Microstegium vimineum	100	✓	FAC
2. Leersia oryzoides	50	✓	OBL
3. Salix nigra	30		OBL
4. Impatiens capensis	30		FACW
5. Persicaria hydropiper	20		OBL
6. Carex lurida	5		OBL
7.			
8.			
9.			
10.			
11.			
12.			
	235 = Total Cover		

50% of total cover: 117.50 20% of total cover: 47.00

Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		

50% of total cover: _____ 20% of 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: 100.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0505030205	x 1 =	0505030205
FACW species	30	x 2 =	60
FAC species	100	x 3 =	300
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	505030335 (A)		505030565 (B)

Prevalence Index = B/A = 1.00

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☑ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four 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 vines, less than 3 in. DBH and greater than 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 _____

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: 1-DPW-1

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 - 4	10YR 6/2	95	10YR 6/8	5	C	M	Silt Loam	
4 - 16	10YR 6/1	90	10YR 5/8	10	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 Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✓ **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: TN SR-19 City/County: Lauderdale County Sampling Date: 2024-08-14

Applicant/Owner: TDOT State: Tennessee Sampling Point: 1-DPU-1

Investigator(s): Rhiannon Flickinger and Miranda McKiernan Section, Township, Range:

Landform (hillslope, terrace, etc.): Upland Local relief (concave, convex, none): Linear Slope (%): 2

Subregion (LRR or MLRA): P 134 Lat: 35.70953707 Long: -89.43681938 Datum: NAD83_2011

Soil Map Unit Name: MeD3 - Memphis silt loam, 8 to 12 percent slopes, severely eroded, northern phase NWI classification: UPL

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

WTL-8 (PIN 102251.01) upland form
Form also represents uplands adjacent to wetland WTL-2 (PIN 102251.02), WTL-2 (PIN 102251.03), and WTL-7 (PIN 102251.01)

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)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along 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)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes _____	No ✓	Depth (inches): _____
Water Table Present?	Yes _____	No ✓	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No ✓	Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

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

Remarks:

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

Sampling Point: 1-DPU-1

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Sapling/Shrub Stratum (Plot size: 30 ft r)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Herb Stratum (Plot size: 30 ft r)			
1. Festuca trachyphylla	90	✓	UPL
2. Iva annua	40	✓	FAC
3. Schizachyrium scoparium ssp. scoparium	40	✓	
4. Solanum carolinense	40	✓	FACU
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	210 = Total Cover		

50% of total cover: 105.00 20% of total cover: 42.00

Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		

50% of total cover: _____ 20% of 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: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33.33 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	40	x 3 =	120
FACU species	40	x 4 =	160
UPL species	90	x 5 =	450
Column Totals:	170 (A)		730 (B)

Prevalence Index = B/A = 4.29

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four 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 vines, less than 3 in. DBH and greater than 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 ✓

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: 1-DPU-1

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 %	Type[1]	Loc[2]	Texture	Remarks
0 - 4	10YR 4/4	100					Sandy Clay Loam	
-								
-								
-								
-								
-								
-								

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

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: Compaction

Depth (inches): 4

Hydric Soil Present? Yes _____ No ✓

Remarks:

An affirmative response to 1-6 of the Decision Table identifies the wetland per rule as an Outstanding Natural Resource Water (ONRW) or Exceptional Tennessee Waters (ETW). A positive response to 7-13 requires a final determination by the Department.

#	**Wetland Feature Decision Table** PIN 102251.02; WTL-2	**Yes/No**	**Affirmative Result**
1	The wetland has been designated as an **Outstanding Natural Resource Water (ONRW)** by the Department under 0400-40-03-.06(5)(a)**.**	No	**ORNW**
2	The wetland has previously been designated and documented as an Exceptional Tennessee Water (ETW) by the Department under 0400-40-03-.06(4)(a)(7)	No	**ETW**
3	The wetland is within state or national parks, wildlife refuges, forests, wilderness areas, natural areas, or is a designated State Scenic Rivers or Federal Wild and Scenic Rivers.	No	**ETW**
4	The wetland is known to contain a documented non-experimental population of state or federally listed threatened or endangered aquatic or semi-aquatic plants, or aquatic animals.	No	**ETW**
5	The wetland or the area it is in has been designated by the U.S. Fish and Wildlife Service as "**Critical Habitat**" for any threatened or endangered aquatic or semi-aquatic plant or aquatic animal species.	No	**ETW**
6	The wetland falls within an area designated as Lands Unsuitable for Mining pursuant to the federal Surface Mining Control and Reclamation Act where such designation is based in whole or in part on impacts to water resource values	No	**ETW**
7	**The wetland exhibits outstanding ecological or recreational values such as, but not limited to, those as outlined in 8-12**	No	Determination Required by TDEC
8	The wetland fits within the species composition concept for any plant community found in the state of Tennessee **ranked G2, G1, or more imperiled** at the "Association" classification level according to the NatureServe and Natural Heritage Ranking system (e.g. "bog", "fen", and "wet prairie/barren" communities).	No	Determination Required by TDEC
9	The wetland is **an uncommon resource** (e.g. vernal pools, headwater wetlands, sinks, spring/seeps, glades, newly described communities, high recreational or socioeconomic value) in the region and/or is deemed such by concurrence of qualified scientists.	No	Determination Required by TDEC
10	The wetland is an **older aged forested wetland** comprised of overstory trees with an average diameter at breast height (dbh) being **greater than or equal to 30 in** within the WAA.	No	Determination Required by TDEC
11	The wetland is observed and documented to be a **significant waterfowl, songbird, shorebird, amphibian, bat, fish habitat area**. These may include rookeries, migratory congregations, nesting sites, breeding areas, etc.	No	Determination Required by TDEC
12	The wetland is **hydrologically connected** to and/or has significant ecological contribution to an **ETW**	No	Determination Required by TDEC
13	The wetland has High Resource Value as determined by a **score of 75 and above** using the TRAM or non-HGM TRAM (to be determined after completing the quantitative portion of this manual)	No	Determination Required by TDEC

End of Narrative Rating. Begin Quantitative Rating on Next Page.

HGM FUNCTIONAL ASSESSMENT
SLOPE WETLANDS

Date: 08/14/2024 Project Name SR-19, 102251.02

Field Personnel RB, BC Wetland Name/Location WTL-2

Read instructions prior to conducting assessments. If project area is large or highly heterogeneous requiring the designation of several WAAs, a separate assessment should be performed for each WAA. CHECK THE APPROPRIATE BLANK(S) BELOW.

V1: Hydroperiod (HYDRO)

☐ 1. Hydrology not altered (SI = 1.0)
- no fill material or excessive sediment
- no ditches/drainage tiles
- no alteration to overland runoff, groundwater discharge/recharge
- no roads or other impediments to surface or groundwater
- no excavation

☑ 2. Hydrology slightly altered (SI = 0.75)
- portion of site with minimal fill or sediment
- portion of site with drainage ditches/tiles
- some alteration to overland runoff, groundwater discharge/recharge
- roads or other impediments, water flow slightly altered
- minor portion of site excavated

☐ 3. Hydrology moderately altered (SI = 0.5)
- portion of site with moderate fill or sediment
- portion of site with drainage ditches/tiles
- some alteration to overland runoff, groundwater discharge/recharge
- roads or other impediments, water flow moderately altered
- moderate portion of site excavated

☐ 4. Hydrology significantly altered (SI = 0.25)
- portion of site with significant fill or sediment
- portion of site with drainage ditches/tiles
- significant alteration to overland runoff, groundwater discharge/recharge
- roads or other impediments, water flow significantly altered
- significant portion of site excavated

☐ 5. Hydrology severely altered (SI = 0.1)
- entire site impacted by fill or excessive sediment
- entire site with numerous drainage ditches/tiles
- no contributions to or from overland runoff, groundwater discharge/recharge
- roads or other impediments, water flow completely blocked
- entire wetland affected

V2: Wetland Watershed Integrity (WSHEDINT)

Use weighted average as discussed on page 10. Examples of land uses and multipliers listed below

A = Percentage forested with no impervious surfaces 15
B = Percentage permeable land, (e.g., park, golf course, pasture, hay, orchard, tree farm, or similar) 80
C = Percentage low density residential, construction, or similar 5
D = Percentage high density residential, or similar _____
E = Percentage urban, commercial, industrial, or similar _____

V2 = (A x 1.0) + (B x 0.75) + (C x 0.5) + (D x 0.25) + (E x 0.01)/(100) = 0.78

V3: Canopy Tree Size Class (TSIZE)

1. Average size of canopy trees > 3 in. DBH

☐ ≥ 15 in. (SI = 1.0) ☐ 10 – 14 in. (SI = 0.75) ☐ 6 – 9 in. (SI = 0.5) ☐ 3 – 5 in. (SI = 0.25)
☑ < 3 in. or no trees present, go to V5

V4: Canopy Tree Density (TDEN)

1. Average number of canopy trees (> 3 in. DBH) per 30-ft. radius plot

☐ 5 – 10 (SI = 1.0) ☐ 11 – 15 (SI = 0.75) ☐ > 15 (SI = 0.5) ☐ 1 – 4 (SI = 0.5)

V5: Shrub Cover (SCOV)

1. Average percent cover of shrubs (woody stems < 3 in. DBH and taller than 3 ft.) per 30-ft. radius plot

☐ > 20 (SI = 1.0) ☑ < 20, go to V6

V6: Ground Vegetation Cover (GVC)

1. Average percent cover of ground vegetation per 30-ft. radius plot

☑ ≥ 70 (SI = 1.0) ☐ 55 – 69 (SI = 0.75) ☐ 45 – 54 (SI = 0.5) ☐ 30 – 44 (SI = 0.25) ☐ 20 – 29 (SI = 0.1)
☐ < 20 (SI=0.0)

V7: Vegetation Composition and Diversity (COMP)

1. Check the dominant species from Groups 1, 2, and 3 below using the 50/20 rule. If tree cover is < 20%, check the dominants in the next tallest stratum. If a dominant does not appear in lists below, but is a native species, it can be added to Group 1 or 2 species based on the scientific literature or professional judgement. Native shrub and herbaceous species are assigned to Group 2. When using shrub or herbaceous write in the number of dominant species. Dominant invasive species are checked regardless of stratum. *

GROUP 1 (Reference Standard)		GROUP 2 (Native Ubiquitous)		GROUP 3 (Invasive)
☐ Water oak	☐ Pin oak	☐ American elm	☑ Green ash	☐ European/Chinese privet
☐ Bur oak	☐ Shumard oak	☐ Slippery elm	☐ Red maple	☐ Japanese honeysuckle
☐ Willow oak	☐ Bald cypress	☑ Sweetgum	☐ Silver maple	☐ Japanese stiltgrass
☐ Swamp chestnut oak	☐ Water tupelo	☐ Blackgum	☑ Black willow	☐ Purple loosestrife
☐ Cherrybark oak	☐ S. black gum	☐ Silky dogwood	☐ Sycamore	☐ Giant reed
☐ Swamp white oak	☐ Persimmon	☐ Boxelder	☐ _____	☑ Tall fescue
☐ Nuttall oak	☐ Am. hornbeam	☐ Tulip poplar	☐ _____	☐ Phragmites
☐ Overcup oak	☐ _____	____ Number native shrub spp.		☐ _____
☐ _____	☐ _____	____ Number native herbaceous spp.		☐ _____

2. Using the number of dominants in Groups 1, 2, and 3 above, calculate a quality index (Q) using the following formula: [(1.0 x # of checked dominants in Group 1) + (0.66 x # of checked dominants in Group 2) + (0.0 x # of checked dominants in Group 3)]/ total # of checked dominants in all groups = 0.495

3. Multiply Q above by one of the following constants that reflects species richness:[1]

- ○ a) if ≥ 4 species from Groups 1 and/or 2 occur as dominants, multiply Q by 1.0 _____
- ◉ b) if 3 species from Groups 1 and/or 2 occur as dominant, multiply Q by 0.75 0.37
- ○ c) if 2 species from Groups 1 and/or 2 occur as dominants, multiply Q by 0.50 _____
- ○ d) if 1 species from Groups 1 and/or 2 occurs as dominant, multiply Q by 0.25 _____
- ○ e) if no species from Groups 1 and/or 2 occurs as dominant, multiply Q by 0.0 _____

4. Calculate the square root of the value from Step 3 above. This value is the SI for **V7**= 0.61

*In some Depression wetlands and in some small WAAs (e.g., <0.5 acres), relatively few species (e.g., overcup oak) may be present. In cases in which this is the normal condition, Q can be multiplied by 1.0 if only 1 or 2 species are dominant.

V8: Soil Organic Matter (ORGANIC)

1. Surface horizons unaltered
☐ 100 percent cover of O and/or A horizon present (SI = 1.0)

2. Surface horizons altered. Estimate the percent of the WAA in which neither an O or A horizon is present. 45

3. Subtract the sum of the values from Step 2 from 100. Convert this value to a decimal. This value is the SI for V8 (e.g., if 75 % of the WAA does not have an O or A horizon due to a significant disturbance, it will have an SI of 0.25).

V9: Buffer (BUFFER)

1. Determine the Connection Index (CI) by estimating the percent of the wetland surrounded by suitable buffer habitat.
☐ 90% – 100% (CI = 1.0) ☐ 75% – 89% (CI = 0.75) ☐ 40% – 74% (CI = 0.5) ☐ 10% – 39% (CI = 0.25)
☑ < 10% (CI = 0.1)

2. Multiply the CI by one if the following values:

- ○ a) if average buffer width is ≥ 492 ft., multiply by 1.0
- ○ b) if average buffer is 98 ft to 491 ft., multiply by 0.66
- ○ c) if average buffer width is 33 ft to 97 ft., multiply by 0.33
- ◉ d) if average buffer width is < 33 ft., multiply by 0.1

3. This value is the SI for **V9 =** 0.01 **.**

VALUES USED TO CALCULATE FUNCTIONAL CAPACITY INDICES (FCIs)

SUBINDEX VALUES:

V1 0.75 (HYDRO) V3_____ (TSIZE) V5_____ (SCOV) V7 0.61 (COMP) V9 0.01 (BUFFER)

V2 0.78 (WSHEDINT) V4_____ (TDEN) V6_____ (GVC) V8 0.55 (ORGANIC)

Slope Wetland

WTL-2

V1: HYDROPERIOD	**0.75**
V2: WETLAND WATERSHED INTEGRITY	**0.78**
V3: CANOPY TREE CLASS	**GOTOV5**
V4: CANOPY TREE DENSITY	**N/A**
V5: SHRUB COVER	**GOTOV6**
V6: GROUND VEGETATION COVER	**1**
V7: VEGETATION COMPOSITION AND DIVERSITY	**0.61**
2. Q =	**0.495**
# of Group 1 Dominants	0
# of Group 2 Dominants	3
# of Group 3 Dominants	1
SPECIES RICHNESS CONSTANT	0.75
V8: SOIL ORGANIC MATTER	**0.55**
V9:BUFFER	**0.01**
1. Connection Index	0.1
2. Buffer width value (0-1)	0.1

Function 1: Maintain Hydrologic Regime

(V1 x V2)^(1/2)

FCI 1 = 0.76 **Final Tree = #VALUE!**

Function 2: Maintain Biogeochemical Processes

$$\text{FCI (trees present)} = \left((V1 \times V2)^{1/2} \times \left(\frac{\frac{V3+V4}{2}+V8}{2}\right)\right)^{1/2}$$

FCI 2 trees= #VALUE! **Final Shrubs= #VALUE!**

Final Herbaceous = 0.45

$$\text{FCI (shrubs present)} = \left((V1 \times V2)^{1/2} \times \left(\frac{V5+V8}{3}\right)\right)^{1/2}$$

FCI 2 shrubs= #VALUE!

$$\text{FCI (ground cover)} = \left((V1 \times V2)^{1/2} \times \left(\frac{V6+V8}{5}\right)\right)^{1/2}$$

FCI 2 ground = 0.49

Function 3: Maintain Characteristic Plant Community

$$\text{FCI (trees present)} = \frac{(V1 \times V2)^{1/2} + 2\left(\frac{V3+V4+V7}{3}\right)}{3}$$

FCI 3 trees= #VALUE!

$$\text{FCI (shrubs present)} = \frac{(V1 \times V2)^{1/2} + 2\left(\frac{V5+V7}{2}\right)}{6}$$

FCI 3 shrubs= #VALUE!

$$\text{FCI (groundcover)} = \frac{(V1 \times V2)^{1/2} + 2\left(\frac{V6+V7}{2}\right)}{9}$$

FCI 3 ground = 0.26

Function 4: Maintain Characteristic Wildlife Community:

$$\text{FCI (trees)} = \frac{(V1 \times V2)^{1/2} + 2\left(\frac{V3+V4+V7}{3}\right)+V9}{4}$$

FCI 4 trees= #VALUE!

$$\text{FCI (shrubs present)} = \frac{(V1 \times V2)^{1/2} + 2\left(\frac{V5+V7}{2}\right)+V9}{6}$$

FCI 4 shrubs= #VALUE!

$$\text{FCI (groundcover)} = \frac{(V1 \times V2)^{1/2} + 2\left(\frac{V6+V7}{2}\right)+V9}{9}$$

FCI 4 ground = 0.26

TRAM Summary Worksheet

Project: SR-19, PIN 102251.02, WTL-2

Exceptional Status Wetlands		**Check if applicable**
	1. **ONRW**	☐
	2. **ETW**	☐
	3. **Further Review Requested:** Attach Wetland Background and Exceptional Status Wetlands Worksheet	☐
	COMMENTS/NOTES:	
Quantitative Rating scores	Function: Hydrologic Regime	0.76
	Function: Biogeochemical Processes	0.49
	Function: Retain Particulates	n/a
	Function: Plant Community	0.26
	Function: Wildlife Community	0.26
	Quantitative Score (Average of FCIs x 100)	45.00
	Value Added (Significant Size) Total	0
Total of Quantitative and Value Added Scores	**TOTAL SCORE**	45.00

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.02					
Biologist:	PB, BF	**Affiliation:**	JMT	**Date:**	08-14-24

1-Station: from plans	South side of SR-19 directly west of 12998 SR-19								
2-Map label and name	WWC-1/EPH-1								
3-Latitude/Longitude	35.708982, -89.438280								
4-Feature description:									
-channel identification	perennial stream		intermittent stream		ephemeral stream		wwc	✓	
-HD score (if applicable)	13								
-OHWM indicators	bed & banks	✓	deposition	✓	presence of litter debris	✓	scour	✓	veg absent, bent, matted ✓
	change in plant community	✓	destruction of terrestrial veg	✓	multiple observe flow events		sediment sorting		water staining
	change in soil character	✓	leaf litter disturb or absent		natural line impressed on bank		shelving		wracking ✓
-channel bottom width	4'		-top of bank width		7'				
-width and max depth at ordinary high water mark	4' width, 2' max depth								
-width at bankfull	6'								
-bank height	LDB - 4.5'				RDB - 4.5'				
-riffle/pool complex or other specialized habitat present?	No								
-dominant riparian species: ----------(LDB /RDB)----------	LDB: southern white oak, pecan, mockernut hickory, slippery elm								
	RDB: southern white oak, pecan, mockernut hickory, slippery elm								
-particle size distribution %	Silt/Sand: 100		Gravel:		Cobble:		Boulder:		Bedrock:
5-photo numbers	8-9								
6-HUC -8 Code & Name	08010205 - South Fork Forked Deer								
7-Assessed	yes		no	✓					
8-ETW	yes		no	✓					
9-303 (d) List	yes		siltation		habitat:		other:		
	no	✓							
10-Notes									

Revised July 2022

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Lagoon Creek		Date/Time: 08/14/24
Assessors/Affiliation: PB, BF; JMT		Project ID : 102251.02
Site Name/Description: WWC-1/EPH-1		
Site Location: South side of SR-19 directly west of 12998 SR-19		
HUC (12 digit): 080102050403	Latitude: 35.708982	
Previous Rainfall (7-days) : < 0.5 inches	Longitude: -89.438280	
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0		
Watershed Size : 0.01 sq. miles	County: Haywood	
Soil Type(s) / Geology : Adler and Loring Silt Loam	Source: NRCS Web Soil Survey	
Surrounding Land Use : Low Density Residential, Agricultural		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 13

Justification / Notes :

Incipient drought (based on APT).

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 9.5)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	1.5 2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 1.5)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 2)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1.5 1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants.

[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 13

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Wetland Plant: persicaria spp.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: TN SR-19 City/County: Haywood County Sampling Date: 2024-08-14

Applicant/Owner: TDOT State: Tennessee Sampling Point: 1-DPW-2

Investigator(s): Ray Bode and Bryan Cardoso Section, Township, Range:

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 1

Subregion (LRR or MLRA): P 134 Lat: 35.70952932 Long: -89.43671707 Datum: NAD83_2011

Soil Map Unit Name: MeD3 - Memphis silt loam, 8 to 12 percent slopes, severely eroded, northern phase NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓	No _____	
Wetland Hydrology Present?	Yes ✓	No _____	

Remarks:

WTL-3

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)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☑ Oxidized Rhizospheres along 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)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes _____	No ✓	Depth (inches): _____
Water Table Present?	Yes _____	No ✓	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No ✓	Depth (inches): _____

Wetland Hydrology Present? Yes ✓ No _____

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

Remarks:

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

Sampling Point: 1-DPW-2

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size: 30 ft r)			
1. Liquidambar styraciflua	10	✓	FAC
2. Ulmus alata	5	✓	FACU
3. Carex vulpinoidea			FACW
4.			
5.			
6.			
7.			
8.			
	15 = Total Cover		
50% of total cover: 7.50	20% of total cover: 3.00		
Herb Stratum (Plot size: 30 ft r)			
1. Dichanthelium clandestinum	100	✓	FACW
2. Festuca trachyphylla	50	✓	UPL
3. Juncus effusus	50	✓	OBL
4. Eupatorium perfoliatum	20		FACW
5. Carex vulpinoidea	15		FACW
6. Ambrosia artemisiifolia	10		FACU
7. Cyperus strigosus	10		FACW
8. Iva annua	10		FAC
9. Mimulus ringens	10		OBL
10.			
11.			
12.			
	275 = Total Cover		
50% of total cover: 137.50	20% of total cover: 55.00		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of 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: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 60.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	60	x 1 =	60
FACW species	0100201510	x 2 =	200403020
FAC species	20	x 3 =	60
FACU species	15	x 4 =	60
UPL species	50	x 5 =	250
Column Totals:	100201655 (A)		200403450 (B)

Prevalence Index = B/A = 2.00

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☑ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four 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 vines, less than 3 in. DBH and greater than 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

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: 1-DPW-2

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 - 5	10YR 5/2	100					Silty Clay Loam	
5 - 16	10YR 6/1	80	10YR 6/8	5	C	M	Sandy Clay	
5 - 16			10YR 4/6	15	C	PL	Sandy Clay	
-								
-								
-								
-								

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

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✓ **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: TN SR-19 City/County: Haywood County Sampling Date: 2024-08-14

Applicant/Owner: TDOT State: Tennessee Sampling Point: 1-DPU-3

Investigator(s): Ray Bode and Bryan Cardoso Section, Township, Range:

Landform (hillslope, terrace, etc.): Upland Local relief (concave, convex, none): Convex Slope (%): 2

Subregion (LRR or MLRA): P 134 Lat: 35.709536 Long: -89.436818 Datum: NAD83_2011

Soil Map Unit Name: MeD3 - Memphis silt loam, 8 to 12 percent slopes, severely eroded, northern phase NWI classification: NA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Upland adjacent to WTL-3

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)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along 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)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes _____	No ✓	Depth (inches): _____
Water Table Present?	Yes _____	No ✓	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No ✓	Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

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

Remarks:

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

Sampling Point: 1-DPU-3

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size: 30 ft r)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size: 30 ft r)			
1. Festuca trachyphylla	90	✓	UPL
2. Iva annua	40	✓	FAC
3. Schizachyrium scoparium	40	✓	FACU
4. Solanum carolinense	40	✓	FACU
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	210 = Total Cover		
50% of total cover: 105.00	20% of total cover: 42.00		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of 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: 25.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	40	x 3 =	120
FACU species	80	x 4 =	320
UPL species	90	x 5 =	450
Column Totals:	210 (A)		890 (B)

Prevalence Index = B/A = 4.23

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four 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 vines, less than 3 in. DBH and greater than 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 ✓

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: 1-DPU-3

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 - 4	10YR 4/4	100					Sandy Clay Loam	
-								
-								
-								
-								
-								
-								

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

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: Compaction

Depth (inches): 4

Hydric Soil Present? **Yes** _____ **No** ✓

Remarks:

An affirmative response to 1-6 of the Decision Table identifies the wetland per rule as an Outstanding Natural Resource Water (ONRW) or Exceptional Tennessee Waters (ETW). A positive response to 7-13 requires a final determination by the Department.

#	**Wetland Feature Decision Table** PIN 102251.02; WTL-3	**Yes/No**	**Affirmative Result**
1	The wetland has been designated as an **Outstanding Natural Resource Water (ONRW)** by the Department under 0400-40-03-.06(5)(a)**.**	No	**ORNW**
2	The wetland has previously been designated and documented as an Exceptional Tennessee Water (ETW) by the Department under 0400-40-03-.06(4)(a)(7)	No	**ETW**
3	The wetland is within state or national parks, wildlife refuges, forests, wilderness areas, natural areas, or is a designated State Scenic Rivers or Federal Wild and Scenic Rivers.	No	**ETW**
4	The wetland is known to contain a documented non-experimental population of state or federally listed threatened or endangered aquatic or semi-aquatic plants, or aquatic animals.	No	**ETW**
5	The wetland or the area it is in has been designated by the U.S. Fish and Wildlife Service as "**Critical Habitat**" for any threatened or endangered aquatic or semi-aquatic plant or aquatic animal species.	No	**ETW**
6	The wetland falls within an area designated as Lands Unsuitable for Mining pursuant to the federal Surface Mining Control and Reclamation Act where such designation is based in whole or in part on impacts to water resource values	No	**ETW**
7	**The wetland exhibits outstanding ecological or recreational values such as, but not limited to, those as outlined in 8-12**	No	Determination Required by TDEC
8	The wetland fits within the species composition concept for any plant community found in the state of Tennessee **ranked G2, G1, or more imperiled** at the "Association" classification level according to the NatureServe and Natural Heritage Ranking system (e.g. "bog", "fen", and "wet prairie/barren" communities).	No	Determination Required by TDEC
9	The wetland is **an uncommon resource** (e.g. vernal pools, headwater wetlands, sinks, spring/seeps, glades, newly described communities, high recreational or socioeconomic value) in the region and/or is deemed such by concurrence of qualified scientists.	No	Determination Required by TDEC
10	The wetland is an **older aged forested wetland** comprised of overstory trees with an average diameter at breast height (dbh) being **greater than or equal to 30 in** within the WAA.	No	Determination Required by TDEC
11	The wetland is observed and documented to be a **significant waterfowl, songbird, shorebird, amphibian, bat, fish habitat area**. These may include rookeries, migratory congregations, nesting sites, breeding areas, etc.	No	Determination Required by TDEC
12	The wetland is **hydrologically connected** to and/or has significant ecological contribution to an **ETW**	No	Determination Required by TDEC
13	The wetland has High Resource Value as determined by a **score of 75 and above** using the TRAM or non-HGM TRAM (to be determined after completing the quantitative portion of this manual)	No	Determination Required by TDEC

End of Narrative Rating. Begin Quantitative Rating on Next Page.

HGM FUNCTIONAL ASSESSMENT
SLOPE WETLANDS

Date: 08/14/2024 Project Name SR-19, 102251.02

Field Personnel RB, BC Wetland Name/Location WTL-3

Read instructions prior to conducting assessments. If project area is large or highly heterogeneous requiring the designation of several WAAs, a separate assessment should be performed for each WAA. CHECK THE APPROPRIATE BLANK(S) BELOW.

V1: Hydroperiod (HYDRO)

☐ 1. Hydrology not altered (SI = 1.0)
- no fill material or excessive sediment
- no ditches/drainage tiles
- no roads or other impediments to surface or groundwater
- no excavation
- no alteration to overland runoff, groundwater discharge/recharge

☑ 2. Hydrology slightly altered (SI = 0.75)
- portion of site with minimal fill or sediment
- portion of site with drainage ditches/tiles
- roads or other impediments, water flow slightly altered
- minor portion of site excavated
- some alteration to overland runoff, groundwater discharge/recharge

☐ 3. Hydrology moderately altered (SI = 0.5)
- portion of site with moderate fill or sediment
- portion of site with drainage ditches/tiles
- some alteration to overland runoff, groundwater discharge/recharge
- roads or other impediments, water flow moderately altered
- moderate portion of site excavated

☐ 4. Hydrology significantly altered (SI = 0.25)
- portion of site with significant fill or sediment
- portion of site with drainage ditches/tiles
- significant alteration to overland runoff, groundwater discharge/recharge
- roads or other impediments, water flow significantly altered
- significant portion of site excavated

☐ 5. Hydrology severely altered (SI = 0.1)
- entire site impacted by fill or excessive sediment
- entire site with numerous drainage ditches/tiles
- no contributions to or from overland runoff, groundwater discharge/recharge
- roads or other impediments, water flow completely blocked
- entire wetland affected

V2: Wetland Watershed Integrity (WSHEDINT)

Use weighted average as discussed on page 10. Examples of land uses and multipliers listed below

A = Percentage forested with no impervious surfaces 40
B = Percentage permeable land, (e.g., park, golf course, pasture, hay, orchard, tree farm, or similar) 55
C = Percentage low density residential, construction, or similar 5
D = Percentage high density residential, or similar _____
E = Percentage urban, commercial, industrial, or similar _____

V2 = (A x 1.0) + (B x 0.75) + (C x 0.5) + (D x 0.25) + (E x 0.01)/(100) = 0.84

V3: Canopy Tree Size Class (TSIZE)

1. Average size of canopy trees > 3 in. DBH

☐ ≥ 15 in. (SI = 1.0) ☐ 10 – 14 in. (SI = 0.75) ☐ 6 – 9 in. (SI = 0.5) ☐ 3 – 5 in. (SI = 0.25)
☑ < 3 in. or no trees present, go to V5

V4: Canopy Tree Density (TDEN)

1. Average number of canopy trees (> 3 in. DBH) per 30-ft. radius plot

☐ 5 – 10 (SI = 1.0) ☐ 11 – 15 (SI = 0.75) ☐ > 15 (SI = 0.5) ☐ 1 – 4 (SI = 0.5)

V5: Shrub Cover (SCOV)

1. Average percent cover of shrubs (woody stems < 3 in. DBH and taller than 3 ft.) per 30-ft. radius plot

☐ > 20 (SI = 1.0) ☑ < 20, go to V6

V6: Ground Vegetation Cover (GVC)

1. Average percent cover of ground vegetation per 30-ft. radius plot

☑ ≥ 70 (SI = 1.0) ☐ 55 – 69 (SI = 0.75) ☐ 45 – 54 (SI = 0.5) ☐ 30 – 44 (SI = 0.25) ☐ 20 – 29 (SI = 0.1)
☐ < 20 (SI=0.0)

V7: Vegetation Composition and Diversity (COMP)

1. Check the dominant species from Groups 1, 2, and 3 below using the 50/20 rule. If tree cover is < 20%, check the dominants in the next tallest stratum. If a dominant does not appear in lists below, but is a native species, it can be added to Group 1 or 2 species based on the scientific literature or professional judgement. Native shrub and herbaceous species are assigned to Group 2. When using shrub or herbaceous write in the number of dominant species. Dominant invasive species are checked regardless of stratum. *

GROUP 1 (Reference Standard)		GROUP 2 (Native Ubiquitous)		GROUP 3 (Invasive)
☐ Water oak	☐ Pin oak	☐ American elm	☑ Green ash	☐ European/Chinese privet
☐ Bur oak	☐ Shumard oak	☐ Slippery elm	☐ Red maple	☐ Japanese honeysuckle
☐ Willow oak	☐ Bald cypress	☑ Sweetgum	☐ Silver maple	☐ Japanese stiltgrass
☐ Swamp chestnut oak	☐ Water tupelo	☐ Blackgum	☑ Black willow	☐ Purple loosestrife
☐ Cherrybark oak	☐ S. black gum	☐ Silky dogwood	☐ Sycamore	☐ Giant reed
☐ Swamp white oak	☐ Persimmon	☐ Boxelder	☐ _____	☑ Tall fescue
☐ Nuttall oak	☐ Am. hornbeam	☐ Tulip poplar	☐ _____	☐ Phragmites
☐ Overcup oak	☐ _____	____ Number native shrub spp.		☐ _____
☐ _____	☐ _____	____ Number native herbaceous spp.		☐ _____

2. Using the number of dominants in Groups 1, 2, and 3 above, calculate a quality index (Q) using the following formula: [(1.0 x # of checked dominants in Group 1) + (0.66 x # of checked dominants in Group 2) + (0.0 x # of checked dominants in Group 3)]/ total # of checked dominants in all groups = 0.495

3. Multiply Q above by one of the following constants that reflects species richness:[1]

- ○ a) if ≥ 4 species from Groups 1 and/or 2 occur as dominants, multiply Q by 1.0 _____
- ◉ b) if 3 species from Groups 1 and/or 2 occur as dominant, multiply Q by 0.75 0.37
- ○ c) if 2 species from Groups 1 and/or 2 occur as dominants, multiply Q by 0.50 _____
- ○ d) if 1 species from Groups 1 and/or 2 occurs as dominant, multiply Q by 0.25 _____
- ○ e) if no species from Groups 1 and/or 2 occurs as dominant, multiply Q by 0.0 _____

4. Calculate the square root of the value from Step 3 above. This value is the SI for **V7**= 0.61

*In some Depression wetlands and in some small WAAs (e.g., <0.5 acres), relatively few species (e.g., overcup oak) may be present. In cases in which this is the normal condition, Q can be multiplied by 1.0 if only 1 or 2 species are dominant.

V8: Soil Organic Matter (ORGANIC)

1. Surface horizons unaltered

☐ 100 percent cover of O and/or A horizon present (SI = 1.0)

2. Surface horizons altered. Estimate the percent of the WAA in which neither an O or A horizon is present. 45

3. Subtract the sum of the values from Step 2 from 100. Convert this value to a decimal. This value is the SI for V8 (e.g., if 75 % of the WAA does not have an O or A horizon due to a significant disturbance, it will have an SI of 0.25).

V9: Buffer (BUFFER)

1. Determine the Connection Index (CI) by estimating the percent of the wetland surrounded by suitable buffer habitat.

☐ 90% – 100% (CI = 1.0) ☐ 75% – 89% (CI = 0.75) ☐ 40% – 74% (CI = 0.5) ☐ 10% – 39% (CI = 0.25)
☑ < 10% (CI = 0.1)

2. Multiply the CI by one if the following values:

- ○ a) if average buffer width is ≥ 492 ft., multiply by 1.0
- ○ b) if average buffer is 98 ft to 491 ft., multiply by 0.66
- ○ c) if average buffer width is 33 ft to 97 ft., multiply by 0.33
- ◉ d) if average buffer width is < 33 ft., multiply by 0.1

3. This value is the SI for **V9 =** 0.01 **.**

VALUES USED TO CALCULATE FUNCTIONAL CAPACITY INDICES (FCIs)

SUBINDEX VALUES:

V1 0.75 (HYDRO) V3_____ (TSIZE) V5_____ (SCOV) V7 0.61 (COMP) V9 0.01 (BUFFER)

V2 0.84 (WSHEDINT) V4_____ (TDEN) V6_____ (GVC) V8 0.55 (ORGANIC)

Slope Wetland

WTL-3

V1: HYDROPERIOD	**0.75**
V2: WETLAND WATERSHED INTEGRITY	**0.84**
V3: CANOPY TREE CLASS	**GOTOV5**
V4: CANOPY TREE DENSITY	**N/A**
V5: SHRUB COVER	**GOTOV6**
V6: GROUND VEGETATION COVER	**1**
V7: VEGETATION COMPOSITION AND DIVERSITY	**0.61**
2. Q =	**0.495**
# of Group 1 Dominants	0
# of Group 2 Dominants	3
# of Group 3 Dominants	1
SPECIES RICHNESS CONSTANT	0.75
V8: SOIL ORGANIC MATTER	**0.55**
V9:BUFFER	**0.01**
1. Connection Index	0.1
2. Buffer width value (0-1)	0.1

Function 1: Maintain Hydrologic Regime

$(V1 \times V2)^{\wedge}(1/2)$

FCI 1 = 0.79 **Final Tree = #VALUE!**

Function 2: Maintain Biogeochemical Processes

$$\text{FCI (trees present)} = \left((V1 \times V2)^{1/2} \times \left(\frac{\frac{V3+V4}{2}+V8}{2}\right)\right)^{1/2}$$

FCI 2 trees= #VALUE! **Final Shrubs= #VALUE!**

Final Herbaceous = 0.46

$$\text{FCI (shrubs present)} = \left((V1 \times V2)^{1/2} \times \left(\frac{V5+V8}{3}\right)\right)^{1/2}$$

FCI 2 shrubs= #VALUE!

$$\text{FCI (ground cover)} = \left((V1 \times V2)^{1/2} \times \left(\frac{V6+V8}{5}\right)\right)^{1/2}$$

FCI 2 ground = 0.50

Function 3: Maintain Characteristic Plant Community

$$\text{FCI (trees present)} = \frac{(V1 \times V2)^{1/2} + 2\left(\frac{V3+V4+V7}{3}\right)}{3}$$

FCI 3 trees= #VALUE!

$$\text{FCI (shrubs present)} = \frac{(V1 \times V2)^{1/2} + 2\left(\frac{V5+V7}{2}\right)}{6}$$

FCI 3 shrubs= #VALUE!

$$\text{FCI (groundcover)} = \frac{(V1 \times V2)^{1/2} + 2\left(\frac{V6+V7}{2}\right)}{9}$$

FCI 3 ground = 0.27

Function 4: Maintain Characteristic Wildlife Community:

$$\text{FCI (trees)} = \frac{(V1 \times V2)^{1/2} + 2\left(\frac{V3+V4+V7}{3}\right)+V9}{4}$$

FCI 4 trees= #VALUE!

$$\text{FCI (shrubs present)} = \frac{(V1 \times V2)^{1/2} + 2\left(\frac{V5+V7}{2}\right)+V9}{6}$$

FCI 4 shrubs= #VALUE!

$$\text{FCI (groundcover)} = \frac{(V1 \times V2)^{1/2} + 2\left(\frac{V6+V7}{2}\right)+V9}{9}$$

FCI 4 ground = 0.27

TRAM Summary Worksheet

Project: SR-19, PIN 102251.02, WTL-3

Exceptional Status Wetlands		**Check if applicable**
	1. **ONRW**	☐
	2. **ETW**	☐
	3. **Further Review Requested:** Attach Wetland Background and Exceptional Status Wetlands Worksheet	☐
	COMMENTS/NOTES:	
Quantitative Rating scores	Function: Hydrologic Regime	0.79
	Function: Biogeochemical Processes	0.50
	Function: Retain Particulates	n/a
	Function: Plant Community	0.27
	Function: Wildlife Community	0.27
	Quantitative Score (Average of FCIs x 100)	46.00
	Value Added (Significant Size) Total	0
Total of Quantitative and Value Added Scores	**TOTAL SCORE**	46.00

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: TN SR-19 City/County: Haywood County Sampling Date: 2024-08-14

Applicant/Owner: TDOT State: Tennessee Sampling Point: 2-DPW-3

Investigator(s): Preston Butler and Britt Fleming Section, Township, Range:

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 2

Subregion (LRR or MLRA): P 134 Lat: 35.708254 Long: -89.436248 Datum: NAD83_2011

Soil Map Unit Name: MeD3 - Memphis silt loam, 8 to 12 percent slopes, severely eroded, northern phase NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓	No _____	
Wetland Hydrology Present?	Yes ✓	No _____	

Remarks: WTL-4

Form also represents wetland WTL-1

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)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☑ Oxidized Rhizospheres along 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)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes _____	No ✓	Depth (inches): _____
Water Table Present?	Yes _____	No ✓	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No ✓	Depth (inches): _____

Wetland Hydrology Present? Yes ✓ No _____

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

Remarks:

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

Sampling Point: 2-DPW-3

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix nigra	10	✓	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	10 = Total Cover		
50% of total cover: 5.00	20% of total cover: 2.00		
Sapling/Shrub Stratum (Plot size: 30 ft r)			
1. Salix nigra	5	✓	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	5 = Total Cover		
50% of total cover: 2.50	20% of total cover: 1.00		
Herb Stratum (Plot size: 30 ft r)			
1. Typha latifolia	30	✓	OBL
2. Mimulus ringens	30	✓	OBL
3. Eupatorium perfoliatum	30	✓	FACW
4. Juncus effusus	5		OBL
5. Ambrosia artemisiifolia	5		FACU
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
50% of total cover: 50.00	20% of total cover: 20.00		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	80	x 1 =	80
FACW species	30	x 2 =	60
FAC species	0	x 3 =	0
FACU species	5	x 4 =	20
UPL species	0	x 5 =	0
Column Totals:	115 (A)		160 (B)

Prevalence Index = B/A = 1.39

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☑ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four 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 vines, less than 3 in. DBH and greater than 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

Remarks: (If observed, list morphological adaptations below).

Wetland is below a pond in a horse pasture. 100% moderately altered due to pond above wetland.

SOIL

Sampling Point: 2-DPW-3

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 - 4	10YR 5/2	45	5YR 5/6	10	C	PL / M	Silt Loam	
0 - 4	10YR 5/3	45	5YR 5/6	10	C	PL / M	Silt Loam	
4 - 12	10Y 5/1	90	5YR 5/6	10	C	PL / M	Silt Loam	
-								
-								
-								
-								

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

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☑ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✓ **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: TN SR-19 City/County: Haywood County Sampling Date: 2024-08-14

Applicant/Owner: TDOT State: Tennessee Sampling Point: 2-DPU-3

Investigator(s): Preston Butler and Britt Fleming Section, Township, Range:

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 1

Subregion (LRR or MLRA): P 134 Lat: 35.708422 Long: -89.435837 Datum: NAD83_2011

Soil Map Unit Name: MeD3 - Memphis silt loam, 8 to 12 percent slopes, severely eroded, northern phase NWI classification: NA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks: Uplands adjacent to WTL-4
Form also represents uplands adjacent to wetland WTL-1

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)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along 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)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes _____	No ✓	Depth (inches): _____
Water Table Present?	Yes _____	No ✓	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No ✓	Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

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

Remarks:

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

Sampling Point: 2-DPU-3

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size: 30 ft r)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size: 30 ft r)			
1. Festuca subverticillata	100	✓	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
50% of total cover: 50.00	20% of total cover: 20.00		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of 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: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.00 (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	100	x 4 =	400
UPL species	0	x 5 =	0
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]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four 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 vines, less than 3 in. DBH and greater than 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 ✓

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: 2-DPU-3

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 - 6	10YR 6/4	99	7.5YR 5/6	1	RM	M	Sandy Loam	
-								
-								
-								
-								
-								
-								

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

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: Compaction

Depth (inches): 6

Hydric Soil Present? **Yes** _____ **No** ✓

Remarks:

An affirmative response to 1-6 of the Decision Table identifies the wetland per rule as an Outstanding Natural Resource Water (ONRW) or Exceptional Tennessee Waters (ETW). A positive response to 7-13 requires a final determination by the Department.

#	**Wetland Feature Decision Table** PIN 102251.02; WTL-4	**Yes/No**	**Affirmative Result**
1	The wetland has been designated as an **Outstanding Natural Resource Water (ONRW)** by the Department under 0400-40-03-.06(5)(a)**.**	No	**ORNW**
2	The wetland has previously been designated and documented as an Exceptional Tennessee Water (ETW) by the Department under 0400-40-03-.06(4)(a)(7)	No	**ETW**
3	The wetland is within state or national parks, wildlife refuges, forests, wilderness areas, natural areas, or is a designated State Scenic Rivers or Federal Wild and Scenic Rivers.	No	**ETW**
4	The wetland is known to contain a documented non-experimental population of state or federally listed threatened or endangered aquatic or semi-aquatic plants, or aquatic animals.	No	**ETW**
5	The wetland or the area it is in has been designated by the U.S. Fish and Wildlife Service as "**Critical Habitat**" for any threatened or endangered aquatic or semi-aquatic plant or aquatic animal species.	No	**ETW**
6	The wetland falls within an area designated as Lands Unsuitable for Mining pursuant to the federal Surface Mining Control and Reclamation Act where such designation is based in whole or in part on impacts to water resource values	No	**ETW**
7	**The wetland exhibits outstanding ecological or recreational values such as, but not limited to, those as outlined in 8-12**	No	Determination Required by TDEC
8	The wetland fits within the species composition concept for any plant community found in the state of Tennessee **ranked G2, G1, or more imperiled** at the "Association" classification level according to the NatureServe and Natural Heritage Ranking system (e.g. "bog", "fen", and "wet prairie/barren" communities).	No	Determination Required by TDEC
9	The wetland is **an uncommon resource** (e.g. vernal pools, headwater wetlands, sinks, spring/seeps, glades, newly described communities, high recreational or socioeconomic value) in the region and/or is deemed such by concurrence of qualified scientists.	No	Determination Required by TDEC
10	The wetland is an **older aged forested wetland** comprised of overstory trees with an average diameter at breast height (dbh) being **greater than or equal to 30 in** within the WAA.	No	Determination Required by TDEC
11	The wetland is observed and documented to be a **significant waterfowl, songbird, shorebird, amphibian, bat, fish habitat area**. These may include rookeries, migratory congregations, nesting sites, breeding areas, etc.	No	Determination Required by TDEC
12	The wetland is **hydrologically connected** to and/or has significant ecological contribution to an **ETW**	No	Determination Required by TDEC
13	The wetland has High Resource Value as determined by a **score of 75 and above** using the TRAM or non-HGM TRAM (to be determined after completing the quantitative portion of this manual)	No	Determination Required by TDEC

End of Narrative Rating. Begin Quantitative Rating on Next Page.

HGM FUNCTIONAL ASSESSMENT
SLOPE WETLANDS

Date: 08/14/2024 Project Name SR-19, 102251.02

Field Personnel PB, BF Wetland Name/Location 2-WTL-4

Read instructions prior to conducting assessments. If project area is large or highly heterogeneous requiring the designation of several WAAs, a separate assessment should be performed for each WAA. CHECK THE APPROPRIATE BLANK(S) BELOW.

V1: Hydroperiod (HYDRO)

☐ 1. Hydrology not altered (SI = 1.0)
- no fill material or excessive sediment
- no ditches/drainage tiles
- no roads or other impediments to surface or groundwater
- no excavation
- no alteration to overland runoff, groundwater discharge/recharge

☐ 2. Hydrology slightly altered (SI = 0.75)
- portion of site with minimal fill or sediment
- portion of site with drainage ditches/tiles
- roads or other impediments, water flow slightly altered
- minor portion of site excavated
- some alteration to overland runoff, groundwater discharge/recharge

☑ 3. Hydrology moderately altered (SI = 0.5)
- portion of site with moderate fill or sediment
- portion of site with drainage ditches/tiles
- some alteration to overland runoff, groundwater discharge/recharge
- roads or other impediments, water flow moderately altered
- moderate portion of site excavated

☐ 4. Hydrology significantly altered (SI = 0.25)
- portion of site with significant fill or sediment
- portion of site with drainage ditches/tiles
- significant alteration to overland runoff, groundwater discharge/recharge
- roads or other impediments, water flow significantly altered
- significant portion of site excavated

☐ 5. Hydrology severely altered (SI = 0.1)
- entire site impacted by fill or excessive sediment
- entire site with numerous drainage ditches/tiles
- no contributions to or from overland runoff, groundwater discharge/recharge
- roads or other impediments, water flow completely blocked
- entire wetland affected

V2: Wetland Watershed Integrity (WSHEDINT)

Use weighted average as discussed on page 10. Examples of land uses and multipliers listed below

A = Percentage forested with no impervious surfaces 20
B = Percentage permeable land, (e.g., park, golf course, pasture, hay, orchard, tree farm, or similar) 80
C = Percentage low density residential, construction, or similar _____
D = Percentage high density residential, or similar _____
E = Percentage urban, commercial, industrial, or similar _____

V2 = (A x 1.0) + (B x 0.75) + (C x 0.5) + (D x 0.25) + (E x 0.01)/(100) = 0.80

V3: Canopy Tree Size Class (TSIZE)

1. Average size of canopy trees > 3 in. DBH

☐ ≥ 15 in. (SI = 1.0) ☐ 10 – 14 in. (SI = 0.75) ☐ 6 – 9 in. (SI = 0.5) ☐ 3 – 5 in. (SI = 0.25)
☑ < 3 in. or no trees present, go to V5

V4: Canopy Tree Density (TDEN)

1. Average number of canopy trees (> 3 in. DBH) per 30-ft. radius plot

☐ 5 – 10 (SI = 1.0) ☐ 11 – 15 (SI = 0.75) ☐ > 15 (SI = 0.5) ☐ 1 – 4 (SI = 0.5)

V5: Shrub Cover (SCOV)

1. Average percent cover of shrubs (woody stems < 3 in. DBH and taller than 3 ft.) per 30-ft. radius plot

☐ > 20 (SI = 1.0) ☑ < 20, go to V6

V6: Ground Vegetation Cover (GVC)

1. Average percent cover of ground vegetation per 30-ft. radius plot

☑ ≥ 70 (SI = 1.0) ☐ 55 – 69 (SI = 0.75) ☐ 45 – 54 (SI = 0.5) ☐ 30 – 44 (SI = 0.25) ☐ 20 – 29 (SI = 0.1)
☐ < 20 (SI=0.0)

V7: Vegetation Composition and Diversity (COMP)

1. Check the dominant species from Groups 1, 2, and 3 below using the 50/20 rule. If tree cover is < 20%, check the dominants in the next tallest stratum. If a dominant does not appear in lists below, but is a native species, it can be added to Group 1 or 2 species based on the scientific literature or professional judgement. Native shrub and herbaceous species are assigned to Group 2. When using shrub or herbaceous write in the number of dominant species. Dominant invasive species are checked regardless of stratum. *

GROUP 1 (Reference Standard)		GROUP 2 (Native Ubiquitous)		GROUP 3 (Invasive)
☐ Water oak	☐ Pin oak	☐ American elm	☐ Green ash	☐ European/Chinese privet
☐ Bur oak	☐ Shumard oak	☐ Slippery elm	☐ Red maple	☐ Japanese honeysuckle
☐ Willow oak	☐ Bald cypress	☐ Sweetgum	☐ Silver maple	☐ Japanese stiltgrass
☐ Swamp chestnut oak	☐ Water tupelo	☐ Blackgum	☑ Black willow	☐ Purple loosestrife
☐ Cherrybark oak	☐ S. black gum	☐ Silky dogwood	☐ Sycamore	☐ Giant reed
☐ Swamp white oak	☐ Persimmon	☐ Boxelder	☐ _____	☐ Tall fescue
☐ Nuttall oak	☐ Am. hornbeam	☐ Tulip poplar	☐ _____	☐ Phragmites
☐ Overcup oak	☐ _____	____ Number native shrub spp.		☐ _____
☐ _____	☐ _____	____ Number native herbaceous spp.		☐ _____

2. Using the number of dominants in Groups 1, 2, and 3 above, calculate a quality index (Q) using the following formula: [(1.0 x # of checked dominants in Group 1) + (0.66 x # of checked dominants in Group 2) + (0.0 x # of checked dominants in Group 3)]/ total # of checked dominants in all groups = 0.66

3. Multiply Q above by one of the following constants that reflects species richness:[1]

- ○ a) if ≥ 4 species from Groups 1 and/or 2 occur as dominants, multiply Q by 1.0 _____
- ○ b) if 3 species from Groups 1 and/or 2 occur as dominant, multiply Q by 0.75 _____
- ○ c) if 2 species from Groups 1 and/or 2 occur as dominants, multiply Q by 0.50 _____
- ◉ d) if 1 species from Groups 1 and/or 2 occurs as dominant, multiply Q by 0.25 0.165
- ○ e) if no species from Groups 1 and/or 2 occurs as dominant, multiply Q by 0.0 _____

4. Calculate the square root of the value from Step 3 above. This value is the SI for **V7**= 0.406

*In some Depression wetlands and in some small WAAs (e.g., <0.5 acres), relatively few species (e.g., overcup oak) may be present. In cases in which this is the normal condition, Q can be multiplied by 1.0 if only 1 or 2 species are dominant.

V8: Soil Organic Matter (ORGANIC)

1. Surface horizons unaltered

☑ 100 percent cover of O and/or A horizon present (SI = 1.0)

2. Surface horizons altered. Estimate the percent of the WAA in which neither an O or A horizon is present.

3. Subtract the sum of the values from Step 2 from 100. Convert this value to a decimal. This value is the SI for V8 (e.g., if 75 % of the WAA does not have an O or A horizon due to a significant disturbance, it will have an SI of 0.25).

V9: Buffer (BUFFER)

1. Determine the Connection Index (CI) by estimating the percent of the wetland surrounded by suitable buffer habitat.

☐ 90% – 100% (CI = 1.0) ☐ 75% – 89% (CI = 0.75) ☐ 40% – 74% (CI = 0.5) ☐ 10% – 39% (CI = 0.25)
☑ < 10% (CI = 0.1)

2. Multiply the CI by one if the following values:

- ○ a) if average buffer width is ≥ 492 ft., multiply by 1.0
- ○ b) if average buffer is 98 ft to 491 ft., multiply by 0.66
- ○ c) if average buffer width is 33 ft to 97 ft., multiply by 0.33
- ◉ d) if average buffer width is < 33 ft., multiply by 0.1

3. This value is the SI for **V9 =** 0.01 **.**

VALUES USED TO CALCULATE FUNCTIONAL CAPACITY INDICES (FCIs)

SUBINDEX VALUES:

V1 0.50 (HYDRO) V3 go to V5 (TSIZE) V5 0.00 (SCOV) V7 0.41 (COMP) V9 0.01 (BUFFER)

V2 0.80 (WSHEDINT) V4 0 (TDEN) V6 1.00 (GVC) V8 1.00 (ORGANIC)

Slope Wetland

WTL-4

V1: HYDROPERIOD	**0.5**	
V2: WETLAND WATERSHED INTEGRITY	**0.8**	
V3: CANOPY TREE CLASS	**GOTOV5**	
V4: CANOPY TREE DENSITY	**N/A**	
V5: SHRUB COVER	**GOTOV6**	
V6: GROUND VEGETATION COVER	**1**	
V7: VEGETATION COMPOSITION AND DIVERSITY	**0.41**	
2. Q =	**0.66**	
# of Group 1 Dominants	0	
# of Group 2 Dominants	1	
# of Group 3 Dominants	0	
SPECIES RICHNESS CONSTANT	0.25	
V8: SOIL ORGANIC MATTER	**1**	
V9:BUFFER	**0.01**	
1. Connection Index	0.1	
2. Buffer width value (0-1)	0.1	

Function 1: Maintain Hydrologic Regime

$(V1 \times V2)^{\wedge}(1/2)$

FCI 1 = **0.63** **Final Tree =** **#VALUE!**

Function 2: Maintain Biogeochemical Processes

$$\text{FCI (trees present)} = \left((V1 \times V2)^{1/2} \times \left(\frac{\frac{V3+V4}{2}+V8}{2}\right)\right)^{1/2}$$

FCI 2 trees= **#VALUE!** **Final Shrubs=** **#VALUE!**

Final Herbaceous = **0.40**

$$\text{FCI (shrubs present)} = \left((V1 \times V2)^{1/2} \times \left(\frac{V5+V8}{3}\right)\right)^{1/2}$$

FCI 2 shrubs= **#VALUE!**

$$\text{FCI (ground cover)} = \left((V1 \times V2)^{1/2} \times \left(\frac{V6+V8}{5}\right)\right)^{1/2}$$

FCI 2 ground = **0.50**

Function 3: Maintain Characteristic Plant Community

$$\text{FCI (trees present)} = \frac{(V1 \times V2)^{1/2}+2\left(\frac{V3+V4+V7}{3}\right)}{3}$$

FCI 3 trees= **#VALUE!**

$$\text{FCI (shrubs present)} = \frac{(V1 \times V2)^{1/2}+2\left(\frac{V5+V7}{2}\right)}{6}$$

FCI 3 shrubs= **#VALUE!**

$$\text{FCI (groundcover)} = \frac{(V1 \times V2)^{1/2}+2\left(\frac{V6+V7}{2}\right)}{9}$$

FCI 3 ground = **0.23**

Function 4: Maintain Characteristic Wildlife Community:

$$\text{FCI (trees)} = \frac{(V1 \times V2)^{1/2}+2\left(\frac{V3+V4+V7}{3}\right)+V9}{4}$$

FCI 4 trees= **#VALUE!**

$$\text{FCI (shrubs present)} = \frac{(V1 \times V2)^{1/2}+2\left(\frac{V5+V7}{2}\right)+V9}{6}$$

FCI 4 shrubs= **#VALUE!**

$$\text{FCI (groundcover)} = \frac{(V1 \times V2)^{1/2}+2\left(\frac{V6+V7}{2}\right)+V9}{9}$$

FCI 4 ground = **0.23**

TRAM Summary Worksheet

Project: SR-19, PIN 102251.02, WTL-4

Exceptional Status Wetlands		**Check if applicable**
	1. **ONRW**	☐
	2. **ETW**	☐
	3. **Further Review Requested:** Attach Wetland Background and Exceptional Status Wetlands Worksheet	☐
	COMMENTS/NOTES:	
Quantitative Rating scores	Function: Hydrologic Regime	0.63
	Function: Biogeochemical Processes	0.50
	Function: Retain Particulates	n/a
	Function: Plant Community	0.23
	Function: Wildlife Community	0.23
	Quantitative Score (Average of FCIs x 100)	40.00
	Value Added (Significant Size) Total	0
Total of Quantitative and Value Added Scores	**TOTAL SCORE**	40.00

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.02					
Biologist:	PB, BF	**Affiliation:**	JMT	**Date:**	08-14-24

1-Station: from plans	Perpendicular to SR-19 at 12838 SR-19								
2-Map label and name	STR-2								
3-Latitude/Longitude	35.708684, -89.436322								
4-Feature description:									
-channel identification	perennial stream		intermittent stream	✓	ephemeral stream		wwc		
-HD score (if applicable)	18								
-OHWM indicators	bed & banks	✓	deposition	✓	presence of litter debris	✓	scour	✓	veg absent, bent, matted ✓
	change in plant community	✓	destruction of terrestrial veg	✓	multiple observe flow events		sediment sorting	✓	water staining ✓
	change in soil character	✓	leaf litter disturb or absent	✓	natural line impressed on bank		shelving		wracking ✓
-channel bottom width	2'		-top of bank width		8'				
-width and max depth at ordinary high water mark	3' width, 1.5' max depth								
-width at bankfull	4'								
-bank height	LDB - 2'				RDB - 3'				
-riffle/pool complex or other specialized habitat present?	No								
-dominant riparian species: ----------(LDB /RDB)----------	LDB: boxelder, sweet-gum, willow oak, goldenrod								
	RDB: boxelder, sweet-gum, willow oak, goldenrod								
-particle size distribution %	Silt/Sand: 100		Gravel:		Cobble:		Boulder:		Bedrock:
5-photo numbers	14-17								
6-HUC -8 Code & Name	08010205 - South Fork Forked Deer								
7-Assessed	yes			no	✓				
8-ETW	yes			no	✓				
9-303 (d) List	yes			siltation		habitat:		other:	
	no	✓							
10-Notes									

Revised July 2022

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Pond Creek		Date/Time: 08/14/24
Assessors/Affiliation: PB, BF; JMT		Project ID : 102251.02
Site Name/Description: STR-2		
Site Location: Perpendicular to SR-19 at 12838 SR-19		
HUC (12 digit): 080102050403	Latitude: 35.708684	
Previous Rainfall (7-days) : < 0.5 inches	Longitude: -89.436322	
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0		
Watershed Size : 0.01 sq. miles	County: Haywood	
Soil Type(s) / Geology : Memphis Silt Loam	Source: NRCS Web Soil Survey	
Surrounding Land Use : Low Density Residential, Agricultural		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = 18

Justification / Notes :

Incipient drought (based on APT). Drains WTL-4 north into culvert under SR-19

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 10)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 3)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 5)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2 1.5	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 18

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Hydric soils with origin in 2-WTL-C. A couple of small alluvial sand bars.

Wetland plants: juncus spp. in channel

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.02					
Biologist:	JC, JG	**Affiliation:**	JMT	**Date:**	08-14-24

1-Station: from plans	~0.05 miles southwest of 12704 SR-19 on south side of SR-19								
2-Map label and name	WWC-2/EPH-2								
3-Latitude/Longitude	35.707291, -89.432831								
4-Feature description:									
-channel identification	perennial stream		intermittent stream		ephemeral stream		wwc	✓	
-HD score (if applicable)	17								
-OHWM indicators	bed & banks	✓	deposition	✓	presence of litter debris		scour		veg absent, bent, matted
	change in plant community		destruction of terrestrial veg		multiple observe flow events		sediment sorting		water staining
	change in soil character		leaf litter disturb or absent		natural line impressed on bank		shelving		wracking
-channel bottom width	2'		-top of bank width		10'				
-width and max depth at ordinary high water mark	3' width, 1' max depth								
-width at bankfull	10'								
-bank height	LDB - 2'		RDB - 2'						
-riffle/pool complex or other specialized habitat present?	No								
-dominant riparian species: ----------(LDB /RDB)----------	LDB: White oak, slippery elm, sweet gum, elderberry, greenbrier								
	RDB: White oak, slippery elm, sweet gum, elderberry, greenbrier								
-particle size distribution %	Silt/Sand:	100	Gravel:		Cobble:		Boulder:		Bedrock:
5-photo numbers	18-20								
6-HUC -8 Code & Name	08010205 - South Fork Forked Deer								
7-Assessed	yes		no	✓					
8-ETW	yes		no	✓					
9-303 (d) List	yes		siltation		habitat:		other:		
	no	✓							
10-Notes									

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Lagoon Creek	Date/Time: 08/12/24
Assessors/Affiliation: JC, JG; JMT	Project ID : 102251.02
Site Name/Description: WWC-2/EPH-2	
Site Location: ~0.05 miles southwest of 12704 SR-19 on south side of SR-19	
HUC (12 digit): 080102050403	Latitude: 35.707291
Previous Rainfall (7-days) : <0.5 inches	Longitude: -89.432831
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0	
Watershed Size : <0.02 sq. miles	County: Haywood
Soil Type(s) / Geology : Memphis Silt Loam	Source: NRCS Web Soil Survey
Surrounding Land Use : Low Density Residential, Agricultural	
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 17

Justification / Notes :

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 7.5)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 5)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 4.5)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 17

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Water pool observed at culvert outfall next to the road, the remainder of the channel was dry.

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.02					
Biologist:	JC, JG	**Affiliation:**	JMT	**Date:**	08-14-24

1-Station: from plans	West of Edward Grove Rd meeting SR-19								
2-Map label and name	WWC-3/EPH-3								
3-Latitude/Longitude	35.705954, -89.429181								
4-Feature description:									
-channel identification	perennial stream		intermittent stream		ephemeral stream		wwc	✓	
-HD score (if applicable)	8.5								
-OHWM indicators	bed & banks	✓	deposition		presence of litter debris		scour	✓	veg absent, bent, matted
	change in plant community		destruction of terrestrial veg		multiple observe flow events		sediment sorting		water staining
	change in soil character		leaf litter disturb or absent		natural line impressed on bank		shelving		wracking
-channel bottom width	2'		-top of bank width	6'					
-width and max depth at ordinary high water mark	6' width, 5' max depth								
-width at bankfull	6'								
-bank height	LDB - 5'		RDB - 5'						
-riffle/pool complex or other specialized habitat present?	No								
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Black willow, sweet gum, elder berry, Johnson grass								
	RDB: Black willow, sweet gum, elder berry, Johnson grass								
-particle size distribution %	Silt/Sand:	60	Gravel:		Cobble:		Boulder:		Bedrock:
5-photo numbers	21-22								
6-HUC -8 Code & Name	08010205 - South Fork Forked Deer								
7-Assessed	yes		no	✓					
8-ETW	yes		no	✓					
9-303 (d) List	yes		siltation		habitat:		other:		
	no	✓							
10-Notes	40% riprap								

Revised July 2022

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Lagoon Creek		Date/Time: 08/12/24
Assessors/Affiliation: JC, JG; JMT		Project ID : 102251.02
Site Name/Description: WWC-3/EPH-3		
Site Location: West of Edward Grove Rd meeting SR-19		
HUC (12 digit): 080102080801	Latitude: 35.705969	
Previous Rainfall (7-days) : <0.5 inches	Longitude: -89.429187	
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0		
Watershed Size : <0.02 sq. miles	County: Haywood	
Soil Type(s) / Geology : Loring Silt Loam	Source: NRCS Web Soil Survey	
Surrounding Land Use : Low Density Residential, Agricultural		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 8.5

Justification / Notes :

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 5)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 1)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 2.5)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 8.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Riprap observed at culvert outfall and wooded section, herbaceous area between ag fields and appears to have active erosion along banks.

Ecology Field Data Sheet: **Other Resource Features**

(Caves/Rock Houses; Potential Sinkholes; Specialized Habitats; Other)

Project: Haywood County, SR-19 **PIN #:** 102251.02

Date of survey: 08-13-24 **Biologist(s):** RB and BC **Affiliation:** JMT

1-Station: from plans	Just east of Edward Grove Rd. on SR-19	
2-Map label	PND-1	
3-Lat/Long	35.705230, -89.425781	
4-Potential impact size	Total area within Study Area: 0.006 acres	
5-Feature name	PND-1	
6-Feature description:		
what is the feature	Pond	
portion affected	Undetermined	
connection to other features	No connection to downstream waters identified	
photo number(s)	23-24	
other information	Pond likely dug in upland in association with agricultural land use	
7- HUC code & name if applicable (12-digit)	Lagoon Creek (080102080801)	
8-Notes		

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.02					
Biologist:	RB & BC	**Affiliation:**	JMT	**Date:**	08-13-24

1-Station: from plans	~0.13 miles North West of Gill Brackin Rd on SR-19								
2-Map label and name	WWC-4/UDF-1								
3-Latitude/Longitude	35.701681, -89.417946								
4-Feature description:									
-channel identification	perennial stream		intermittent stream		ephemeral stream		wwc	✓	
-HD score (if applicable)	11								
-OHWM indicators	bed & banks		deposition		presence of litter debris		scour		veg absent, bent, matted
	change in plant community		destruction of terrestrial veg		multiple observe flow events		sediment sorting		water staining
	change in soil character		leaf litter disturb or absent		natural line impressed on bank		shelving		wracking
-channel bottom width	2'		-top of bank width		4'				
-width and max depth at ordinary high water mark	3' width, 1' max depth								
-width at bankfull	3'								
-bank height	LDB - 3'		RDB - 3'						
-riffle/pool complex or other specialized habitat present?	No								
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Grasses sp.								
	RDB: Access road								
-particle size distribution %	Silt/Sand:	100	Gravel:		Cobble:		Boulder:		Bedrock:
5-photo numbers	25-28								
6-HUC -8 Code & Name	08010208 - Lower Hatchie								
7-Assessed	yes		no	✓					
8-ETW	yes		no	✓					
9-303 (d) List	yes		siltation		habitat:		other:		
	no	✓							
10-Notes									

Revised July 2022

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody:UNT Lagoon Creek		Date/Time:8/13/24
Assessors/Affiliation:RB, BC; JMT		Project ID :102251.02
Site Name/Description:WWC-4/UDF-1		
Site Location:~ 0.13 miles North West of Gill Brackin Rd on SR-19		
HUC (12 digit):080102080801	Latitude:35.701681	
Previous Rainfall (7-days) :< 0.5 inches	Longitude:-89.417946	
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0		
Watershed Size :0.03 sq. miles	County:Haywood	
Soil Type(s) / Geology :Adler Silt Loam	Source:NRCS Web Soil Survey	
Surrounding Land Use :Agricultural		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination =Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 11

Justification / Notes :

Incipient drought (based on APT).

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal =4)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal =3)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal =4)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants.

[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 11

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.02					
Biologist:	RB & BC	**Affiliation:**	JMT	**Date:**	08-13-24

1-Station: from plans	~0.13 miles North West of Gill Brackin Rd on SR-19								
2-Map label and name	WWC-5/UDF-2								
3-Latitude/Longitude	35.702008, -89.417854								
4-Feature description:									
-channel identification	perennial stream		intermittent stream		ephemeral stream		wwc	✓	
-HD score (if applicable)	11								
-OHWM indicators	bed & banks		deposition		presence of litter debris		scour		veg absent, bent, matted
	change in plant community		destruction of terrestrial veg		multiple observe flow events		sediment sorting		water staining
	change in soil character		leaf litter disturb or absent		natural line impressed on bank		shelving		wracking
-channel bottom width	2'		-top of bank width		4'				
-width and max depth at ordinary high water mark	N/A								
-width at bankfull	3'								
-bank height	LDB - 3'				RDB - 3'				
-riffle/pool complex or other specialized habitat present?	No								
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Grasses sp.								
	RDB: Access road								
-particle size distribution %	Silt/Sand:	100	Gravel:		Cobble:		Boulder:		Bedrock:
5-photo numbers	29								
6-HUC -8 Code & Name	08010208 - Lower Hatchie								
7-Assessed	yes		no	✓					
8-ETW	yes		no	✓					
9-303 (d) List	yes		siltation		habitat:		other:		
	no	✓							
10-Notes									

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Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody:UNT Lagoon Creek		Date/Time:8/13/24
Assessors/Affiliation:RB, BC; JMT		Project ID :102251.02
Site Name/Description:WWC-5/UDF-2		
Site Location:~ 0.13 miles North West of Gill Brackin Rd on SR-19		
HUC (12 digit):080102080801	Latitude:35.702008	
Previous Rainfall (7-days) :< 0.5 inches	Longitude:-89.417854	
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data :NRCS Antecedent Precipitation Tool V2.0		
Watershed Size :0.03 sq. miles	County:Haywood	
Soil Type(s) / Geology :Adler Silt Loam	Source:NRCS Web Soil Survey	
Surrounding Land Use :Agricultural		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination =Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 11

Justification / Notes :

Incipient drought (based on APT).

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal =4)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal =3)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal =4)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants.

[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 11

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.02					
Biologist:	RB & BC	**Affiliation:**	JMT	**Date:**	08-13-24

1-Station: from plans	~0.04 miles southeast of 11459 SR-19								
2-Map label and name	WWC-6/UDF-3								
3-Latitude/Longitude	35.699845, -89.413428								
4-Feature description:									
-channel identification	perennial stream ☐	intermittent stream ☐	ephemeral stream ☐	wwc ☑					
-HD score (if applicable)	16								
-OHWM indicators	bed & banks ☐	deposition ☐	presence of litter debris ☐	scour ☐	veg absent, bent, matted ☐				
	change in plant community ☐	destruction of terrestrial veg ☐	multiple observe flow events ☐	sediment sorting ☐	water staining ☐				
	change in soil character ☐	leaf litter disturb or absent ☐	natural line impressed on bank ☐	shelving ☐	wracking ☐				
-channel bottom width	1'	-top of bank width	1'						
-width and max depth at ordinary high water mark	N/A								
-width at bankfull	1'								
-bank height	LDB - 6"	RDB - 6"							
-riffle/pool complex or other specialized habitat present?	No								
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Grass sp.								
	RDB: Grass sp.								
-particle size distribution %	Silt/Sand: 95	Gravel: 5	Cobble:	Boulder:	Bedrock:				
5-photo numbers	30								
6-HUC -8 Code & Name	08010208 - Lower Hatchie								
7-Assessed	yes ☐	no ☑							
8-ETW	yes ☐	no ☑							
9-303 (d) List	yes ☐	siltation ☐	habitat: ☐	other: ☐					
	no ☑								
10-Notes									

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Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody:UNT Lagoon Creek		Date/Time:8/13/24
Assessors/Affiliation:RB, BC; JMT		Project ID :102251.02
Site Name/Description:WWC-6/UDF-3		
Site Location:~0.04 miles southeast of 11459 SR-19		
HUC (12 digit):080102080801	Latitude:35.699845	
Previous Rainfall (7-days) :< 0.5 inches	Longitude:-89.413428	
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0		
Watershed Size :0.11 sq. miles	County:Haywood	
Soil Type(s) / Geology :Adler Silt Loam	Source:NRCS Web Soil Survey	
Surrounding Land Use :Agricultural		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 16

Justification / Notes :

Incipient drought (based on APT). Flows into STR-3.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal =9.5)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal =1.5)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal =5)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants.

[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 16

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.02					
Biologist:	RB & BC	**Affiliation:**	JMT	**Date:**	08-13-24

1-Station: from plans	At SR-19 crossing with Jim Binford Ln								
2-Map label and name	STR-3								
3-Latitude/Longitude	35.69976, -89.41330								
4-Feature description:									
-channel identification	perennial stream		intermittent stream	✓	ephemeral stream		wwc		
-HD score (if applicable)	17.5								
-OHWM indicators	bed & banks	✓	deposition		presence of litter debris		scour	✓	veg absent, bent, matted
	change in plant community	✓	destruction of terrestrial veg		multiple observe flow events		sediment sorting		water staining ✓
	change in soil character		leaf litter disturb or absent		natural line impressed on bank		shelving		wracking
-channel bottom width	4'		-top of bank width		6'				
-width and max depth at ordinary high water mark	4' width, 3" max depth								
-width at bankfull	3'								
-bank height	LDB - '2		RDB - 3'						
-riffle/pool complex or other specialized habitat present?	No								
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Giant ragweed								
	RDB: Giant ragweed								
-particle size distribution %	Silt/Sand:	95	Gravel:	5	Cobble:		Boulder:		Bedrock:
5-photo numbers	31-34								
6-HUC -8 Code & Name	08010208 - Lower Hatchie								
7-Assessed	yes		no	✓					
8-ETW	yes		no	✓					
9-303 (d) List	yes		siltation		habitat:		other:		
	no	✓							
10-Notes									

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Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody:UNT Lagoon Creek		Date/Time:8/13/24
Assessors/Affiliation:RB, BC; JMT		Project ID :102251.02
Site Name/Description:STR-3		
Site Location:At SR-19 crossing with Jim Binford Ln		
HUC (12 digit):080102080801	Latitude:35.69976	
Previous Rainfall (7-days) :< 0.5 inches	Longitude:-89.41330	
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0		
Watershed Size :0.11 sq. miles	County:Haywood	
Soil Type(s) / Geology :Adler Silt Loam	Source:NRCS Web Soil Survey	
Surrounding Land Use :Agricultural		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination =Stream

Secondary Indicator Score (if applicable) =17.5

Justification / Notes :

Incipient drought (based on APT). NHD stream also shows up on USGS Topo (unnamed).

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal =8)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	0.5 1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal =4.5)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal =5)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants.

[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 17.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.02					
Biologist:	RB & BC	**Affiliation:**	JMT	**Date:**	08-13-24

1-Station: from plans	~0.10 miles southeast of 11459 SR-19									
2-Map label and name	WWC-7/UDF-4									
3-Latitude/Longitude	35.699463, -89.412725									
4-Feature description:										
-channel identification	perennial stream		intermittent stream		ephemeral stream		wwc	✓		
-HD score (if applicable)	16									
-OHWM indicators	bed & banks		deposition		presence of litter debris		scour		veg absent, bent, matted	
	change in plant community		destruction of terrestrial veg		multiple observe flow events		sediment sorting		water staining	
	change in soil character		leaf litter disturb or absent		natural line impressed on bank		shelving		wracking	
-channel bottom width	1'		-top of bank width	1'						
-width and max depth at ordinary high water mark	N/A									
-width at bankfull	1'									
-bank height	LDB - 6"		RDB - 6"							
-riffle/pool complex or other specialized habitat present?	No									
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Grass sp.									
	RDB: Grass sp.									
-particle size distribution %	Silt/Sand:	95	Gravel:	5	Cobble:		Boulder:		Bedrock:	
5-photo numbers	Not Available									
6-HUC -8 Code & Name	08010208 - Lower Hatchie									
7-Assessed	yes		no	✓						
8-ETW	yes		no	✓						
9-303 (d) List	yes		siltation		habitat:		other:			
	no	✓								
10-Notes										

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Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody:UNT Lagoon Creek	Date/Time:8/13/24
Assessors/Affiliation:RB, BC; JMT	Project ID :102251.02
Site Name/Description:WWC-7/UDF-4	
Site Location:~0.10 miles southeast of 11459 SR-19	
HUC (12 digit):080102080801	Latitude:35.699463
Previous Rainfall (7-days) :< 0.5 inches	Longitude:-89.412725
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0	
Watershed Size :0.04 sq. miles	County:Haywood
Soil Type(s) / Geology :Adler Silt Loam	Source:NRCS Web Soil Survey
Surrounding Land Use :Agricultural	
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination =Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 16

Justification / Notes :

Incipient drought (based on APT). Flows into STR-3.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal =9.5)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal =1.5)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal =5)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants.

[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 16

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.02					
Biologist:	PB, BF	**Affiliation:**	JMT	**Date:**	08-14-24

1-Station: from plans	Directly south of 11108 SR-19									
2-Map label and name	STR-4									
3-Latitude/Longitude	35.697112, -89.409504									
4-Feature description:										
-channel identification	perennial stream		intermittent stream	✓	ephemeral stream		wwc			
-HD score (if applicable)	18.5									
-OHWM indicators	bed & banks	✓	deposition		presence of litter debris	✓	scour	✓	veg absent, bent, matted	✓
	change in plant community	✓	destruction of terrestrial veg		multiple observe flow events		sediment sorting		water staining	
	change in soil character	✓	leaf litter disturb or absent	✓	natural line impressed on bank	✓	shelving		wracking	✓
-channel bottom width	4'		-top of bank width		20'					
-width and max depth at ordinary high water mark	6' width, 3' max depth									
-width at bankfull	20'									
-bank height	LDB - 10'				RDB - 10'					
-riffle/pool complex or other specialized habitat present?	No									
-dominant riparian species: ----------(LDB /RDB)----------	LDB: grass, agricultural field									
	RDB: hogweed, slippery elm, sweet-gum, pecan									
-particle size distribution %	Silt/Sand:	100	Gravel:		Cobble:		Boulder:		Bedrock:	
5-photo numbers	35-36									
6-HUC -8 Code & Name	08010208 - Lower Hatchie									
7-Assessed	yes		no	✓						
8-ETW	yes		no	✓						
9-303 (d) List	yes		siltation		habitat:		other:			
	no	✓								
10-Notes										

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Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Lagoon Creek		Date/Time: 08/14/24
Assessors/Affiliation: PB, BF; JMT		Project ID : 102251.02
Site Name/Description: STR-4		
Site Location: Directly south of 11108 SR-19		
HUC (12 digit): 080102080801	Latitude: 35.697112	
Previous Rainfall (7-days) : < 0.5 inches	Longitude: -89.409504	
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0		
Watershed Size : 0.07 sq. miles	County: Haywood	
Soil Type(s) / Geology : Loring Silt Loam	Source: NRCS Web Soil Survey	
Surrounding Land Use : Low Density Residential, Agricultural		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = 18.5

Justification / Notes :

Incipient drought (based on APT).

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 9.5)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	1.5	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 2.5)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 6.5)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants.

[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 18.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Amphibians: frogs in channel

Slight rain during HD assessment, therefore B.14 and B.15 are assumed absent.

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.02					
Biologist:	PB, BF	**Affiliation:**	JMT	**Date:**	08-14-24

1-Station: from plans	North of Nunn Rd and SR-19 intersection 0.03 miles									
2-Map label and name	WWC-8/EPH-4									
3-Latitude/Longitude	35.695649, -89.407717									
4-Feature description:										
-channel identification	perennial stream		intermittent stream		ephemeral stream		wwc	✓		
-HD score (if applicable)	14.5									
-OHWM indicators	bed & banks	✓	deposition		presence of litter debris	✓	scour	✓	veg absent, bent, matted	
	change in plant community		destruction of terrestrial veg	✓	multiple observe flow events		sediment sorting		water staining	
	change in soil character		leaf litter disturb or absent		natural line impressed on bank		shelving	✓	wracking	✓
-channel bottom width	3'		-top of bank width		6'					
-width and max depth at ordinary high water mark	5' width, 1' max depth									
-width at bankfull	8'									
-bank height	LDB - 3.5'				RDB - 4'					
-riffle/pool complex or other specialized habitat present?	No									
-dominant riparian species: ----------(LDB /RDB)----------	LDB: sweet-gum									
	RDB: sweet-gum									
-particle size distribution %	Silt/Sand:	100	Gravel:		Cobble:		Boulder:		Bedrock:	
5-photo numbers	37-38									
6-HUC -8 Code & Name	08010208 - Lower Hatchie									
7-Assessed	yes		no	✓						
8-ETW	yes		no	✓						
9-303 (d) List	yes		siltation		habitat:		other:			
	no	✓								
10-Notes										

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Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Lagoon Creek		Date/Time: 08/14/24
Assessors/Affiliation: PB, BF; JMT		Project ID : 102251.02
Site Name/Description: WWC-8/EPH-4		
Site Location: North of Nunn Rd and SR-19 intersection ~0.03 miles		
HUC (12 digit): 080102080801	Latitude: 35.695649	
Previous Rainfall (7-days) : < 0.5 inches	Longitude: -89.407717	
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0		
Watershed Size : 0.03 sq. miles	County: Haywood	
Soil Type(s) / Geology : Loring and Adler Silt Loam	Source: NRCS Web Soil Survey	
Surrounding Land Use : Low Density Residential, Agricultural		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 14.5

Justification / Notes :

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 10.5)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2 2.5	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1 1.5	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 2)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 2)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 14.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Moderate sorting due to gravel in stream channel, although likely from roadway.

No hydric soils. Soils for 4 plugs were 10YR 6/4

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.02					
Biologist:	PB, BF	**Affiliation:**	JMT	**Date:**	08-13-24

1-Station: from plans	West side of SR-19 ~0.2 miles south of Nunn Road									
2-Map label and name	STR-5									
3-Latitude/Longitude	35.693625, -89.405601									
4-Feature description:										
-channel identification	perennial stream		intermittent stream	✓	ephemeral stream		wwc			
-HD score (if applicable)	21.25									
-OHWM indicators	bed & banks	✓	deposition	✓	presence of litter debris	✓	scour	✓	veg absent, bent, matted	✓
	change in plant community	✓	destruction of terrestrial veg	✓	multiple observe flow events		sediment sorting	✓	water staining	✓
	change in soil character	✓	leaf litter disturb or absent	✓	natural line impressed on bank		shelving	✓	wracking	✓
-channel bottom width	4'		-top of bank width		12'					
-width and max depth at ordinary high water mark	6-7' width, 2.5' max depth									
-width at bankfull	12'									
-bank height	LDB - 4'				RDB - 4'					
-riffle/pool complex or other specialized habitat present?	No									
-dominant riparian species: ----------(LDB /RDB)----------	LDB: southern red oak, pecan, willow oak									
	RDB: pecan, boxelder, poison ivy									
-particle size distribution %	Silt/Sand:	100	Gravel:		Cobble:		Boulder:		Bedrock:	
5-photo numbers	39-42									
6-HUC -8 Code & Name	08010208 - Lower Hatchie									
7-Assessed	yes		no	✓						
8-ETW	yes		no	✓						
9-303 (d) List	yes		siltation		habitat:		other:			
	no	✓								
10-Notes	Incipient drought (based on APT)									

Revised July 2022

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Lagoon Creek		Date/Time: 08/13/24
Assessors/Affiliation: PB, BF; JMT		Project ID : 102251.02
Site Name/Description: STR-5		
Site Location: West side of TN-19 ~0.2 miles south of Nunn Road		
HUC (12 digit): 080102080801	Latitude: 35.693625	
Previous Rainfall (7-days) : < 0.5 inches	Longitude: -89.405601	
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0		
Watershed Size : 0.07 sq. miles	County: Haywood	
Soil Type(s) / Geology : Adler Silt Loam	Source: NRCS Web Soil Survey	
Surrounding Land Use : Low Density Residential, Agricultural		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = 21.25

Justification / Notes :

Incipient drought (based on APT)

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 12.5)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 5.25)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0 0.5	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1 0.75	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 3.5)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2 1.5	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants.

[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 21.25

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.02					
Biologist:	RF & MM	**Affiliation:**	JMT	**Date:**	08-13-24

1-Station: from plans	~0.24 miles South East from Forked Deer Rd on SR-19										
2-Map label and name	WWC-9/UDF-5										
3-Latitude/Longitude	35.693483, -89.404989										
4-Feature description:											
-channel identification	perennial stream		intermittent stream		ephemeral stream		wwc	✓			
-HD score (if applicable)	6.5										
-OHWM indicators	bed & banks	✓	deposition		presence of litter debris	✓	scour		veg absent, bent, matted		
	change in plant community		destruction of terrestrial veg		multiple observe flow events		sediment sorting		water staining		
	change in soil character		leaf litter disturb or absent		natural line impressed on bank		shelving		wracking		
-channel bottom width	1'			-top of bank width		2'					
-width and max depth at ordinary high water mark	2' width, 1' max depth										
-width at bankfull	2'										
-bank height	LDB - 1'			RDB - 1'							
-riffle/pool complex or other specialized habitat present?	No										
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Maintained lawn										
	RDB: Giant ragweed										
-particle size distribution %	Silt/Sand:	100	Gravel:		Cobble:		Boulder:		Bedrock:		
5-photo numbers	43										
6-HUC -8 Code & Name	08010208 - Lower Hatchie										
7-Assessed	yes			no	✓						
8-ETW	yes			no	✓						
9-303 (d) List	yes			siltation			habitat:		other:		
	no	✓									
10-Notes	Flows into STR-5. Fed by roadside swale.										

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody:UNT Lagoon Creek	Date/Time:8/13/24
Assessors/Affiliation:RF, MM; JMT	Project ID :102251.02
Site Name/Description:WWC-9/UDF-5	
Site Location:~0.24 miles South East from Forked Deer Rd on SR-19	
HUC (12 digit):080102080801	Latitude:35.693483
Previous Rainfall (7-days) :< 0.5 inches	Longitude:-89.404989
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data :NRCS Antecedent Precipitation Tool V2.0	
Watershed Size :< 0.01 sq. miles	County:Haywood
Soil Type(s) / Geology :Adler Silt Loam	Source:NRCS Web Soil Survey
Surrounding Land Use :Low Density Residential, Agricultural	
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 6.5

Justification / Notes :

Incipient drought (based on APT).

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal =1.5)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1 1.5	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal =1)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal =4)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants.

[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 6.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.02					
Biologist:	RF & MM	**Affiliation:**	JMT	**Date:**	08-13-24

1-Station: from plans	~0.24 miles South East from Forked Deer Rd on SR-19								
2-Map label and name	WWC-10/EPH-5								
3-Latitude/Longitude	35.694160, -89.404931								
4-Feature description:									
-channel identification	perennial stream		intermittent stream		ephemeral stream		wwc	✓	
-HD score (if applicable)	9.5								
-OHWM indicators	bed & banks	✓	deposition	✓	presence of litter debris		scour		veg absent, bent, matted
	change in plant community		destruction of terrestrial veg		multiple observe flow events		sediment sorting		water staining
	change in soil character		leaf litter disturb or absent		natural line impressed on bank		shelving		wracking
-channel bottom width	2'		-top of bank width		2.5'				
-width and max depth at ordinary high water mark	N/A								
-width at bankfull	2.5'								
-bank height	LDB - 1.5'				RDB - 1.5'				
-riffle/pool complex or other specialized habitat present?	No								
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Fescue sp.								
	RDB: Giant ragweed								
-particle size distribution %	Silt/Sand:	100	Gravel:		Cobble:		Boulder:		Bedrock:
5-photo numbers	44								
6-HUC -8 Code & Name	08010208 - Lower Hatchie								
7-Assessed	yes		no	✓					
8-ETW	yes		no	✓					
9-303 (d) List	yes		siltation		habitat:		other:		
	no	✓							
10-Notes	Drift deposits throughout. Drains agricultural field.								

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody:UNT Lagoon Creek		Date/Time:8/13/24
Assessors/Affiliation:RF, MM; JMT		Project ID :102251.02
Site Name/Description:WWC-10/EPH-5		
Site Location:~0.24 miles South East from Forked Deer Rd on SR-19		
HUC (12 digit):080102080801	Latitude:35.694160	
Previous Rainfall (7-days) :< 0.5 inches	Longitude:-89.404931	
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0		
Watershed Size :0.04 sq. miles	County:Haywood	
Soil Type(s) / Geology :Adler Silt Loam	Source:NRCS Web Soil Survey	
Surrounding Land Use :Low Density Residential, Agricultural		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 9.5

Justification / Notes :

Incipient drought (based on APT). Flows to STR-5.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 2)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 1.5)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 6)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants.

[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 9.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.02					
Biologist:	RF & MM	**Affiliation:**	JMT	**Date:**	08-13-24

1-Station: from plans	~0.24 miles South East from Forked Deer Rd on SR-19				
2-Map label and name	WWC-11/UDF-6				
3-Latitude/Longitude	35.693880, -89.404883				
4-Feature description:					
-channel identification	perennial stream ☐	intermittent stream ☐	ephemeral stream ☐	wwc ☑	
-HD score (if applicable)	11				
-OHWM indicators	bed & banks ☑	deposition ☐	presence of litter debris ☑	scour ☐	veg absent, bent, matted ☑
	change in plant community ☐	destruction of terrestrial veg ☐	multiple observe flow events ☐	sediment sorting ☐	water staining ☐
	change in soil character ☐	leaf litter disturb or absent ☐	natural line impressed on bank ☐	shelving ☐	wracking ☐
-channel bottom width	3'	-top of bank width	3'		
-width and max depth at ordinary high water mark	3' width, 1' max depth				
-width at bankfull	3'				
-bank height	LDB - 3' to 5'	RDB - 3' to 5'			
-riffle/pool complex or other specialized habitat present?	No				
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Eastern poison ivy				
	RDB: Eastern poison ivy				
-particle size distribution %	Silt/Sand: 100	Gravel:	Cobble:	Boulder:	Bedrock:
5-photo numbers	45				
6-HUC -8 Code & Name	08010208 - Lower Hatchie				
7-Assessed	yes ☐	no ☑			
8-ETW	yes ☐	no ☑			
9-303 (d) List	yes ☐	siltation ☐	habitat: ☐	other: ☐	
	no ☑				
10-Notes	Flows into STR-5.				

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody:UNT Lagoon Creek	Date/Time:8/13/24
Assessors/Affiliation:RF, MM; JMT	Project ID :102251.02
Site Name/Description:WWC-11/UDF-6	
Site Location:~0.24 miles South East from Forked Deer Rd on SR-19	
HUC (12 digit):080102080801	Latitude:35.693880
Previous Rainfall (7-days) :< 0.5 inches	Longitude:-89.404883
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0	
Watershed Size :0.05 sq. miles	County:Haywood
Soil Type(s) / Geology :Adler Silt Loam	Source:NRCS Web Soil Survey
Surrounding Land Use :Low Density Residential, Agricultural	
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination =Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 11

Justification / Notes :

Incipient drought (based on APT). Flows to 1-STR-Q.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal =4)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal =1)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal =6)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants.

[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 11

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.02					
Biologist:	RF & MM	**Affiliation:**	JMT	**Date:**	08-13-24

1-Station: from plans	~0.24 miles South East from Forked Deer Rd on SR-19										
2-Map label and name	WWC-12/UDF-7										
3-Latitude/Longitude	35.693653, -89.404708										
4-Feature description:											
-channel identification	perennial stream		intermittent stream		ephemeral stream		wwc	✓			
-HD score (if applicable)	11										
-OHWM indicators	bed & banks	✓	deposition		presence of litter debris	✓	scour		veg absent, bent, matted	✓	
	change in plant community		destruction of terrestrial veg		multiple observe flow events		sediment sorting		water staining		
	change in soil character		leaf litter disturb or absent		natural line impressed on bank		shelving		wracking		
-channel bottom width	3'			-top of bank width		6'					
-width and max depth at ordinary high water mark	5' width, 1' max depth										
-width at bankfull	3'										
-bank height	LDB - 3' to 5'				RDB - 3' to 5'						
-riffle/pool complex or other specialized habitat present?	No										
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Virginia creeper										
	RDB: Virginia creeper										
-particle size distribution %	Silt/Sand:	100	Gravel:		Cobble:		Boulder:		Bedrock:		
5-photo numbers	46										
6-HUC -8 Code & Name	08010208 - Lower Hatchie River										
7-Assessed	yes			no	✓						
8-ETW	yes			no	✓						
9-303 (d) List	yes			siltation			habitat:		other:		
	no	✓									
10-Notes	Fed by agricultural culvert. Flows into STR-5.										

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody:UNT Lagoon Creek		Date/Time:8/13/24
Assessors/Affiliation:RF, MM; JMT		Project ID :102251.02
Site Name/Description:WWC-12/UDF-7		
Site Location:~0.24 miles South East from Forked Deer Rd on SR-19		
HUC (12 digit):080102080801	Latitude:35.693653	
Previous Rainfall (7-days) :< 0.5 inches	Longitude:-89.404708	
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data :NRCS Antecedent Precipitation Tool V2.0		
Watershed Size :0.02 sq. miles	County:Haywood	
Soil Type(s) / Geology :Adler Silt Loam	Source:NRCS Web Soil Survey	
Surrounding Land Use :Low Density Residential, Agricultural		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination =Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 11

Justification / Notes :

Incipient drought (based on APT). Flows to STR-5.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 4)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 1)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 6)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants.

[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 11

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.02					
Biologist:	JC, JG	**Affiliation:**	JMT	**Date:**	08-13-24

1-Station: from plans	Southeast of Old Highway 19 meeting SR-19								
2-Map label and name	WWC-13/EPH-6								
3-Latitude/Longitude	35.689843, -89.401402								
4-Feature description:									
-channel identification	perennial stream ☐	intermittent stream ☐	ephemeral stream ☐	wwc ☑					
-HD score (if applicable)	13.5								
-OHWM indicators	bed & banks ☑	deposition ☐	presence of litter debris ☐	scour ☑	veg absent, bent, matted ☐				
	change in plant community ☐	destruction of terrestrial veg ☐	multiple observe flow events ☐	sediment sorting ☐	water staining ☐				
	change in soil character ☐	leaf litter disturb or absent ☐	natural line impressed on bank ☐	shelving ☐	wracking ☐				
-channel bottom width	10'	-top of bank width	40'						
-width and max depth at ordinary high water mark	10' width, 6" max depth								
-width at bankfull	NA								
-bank height	LDB - 25'	RDB - 25'							
-riffle/pool complex or other specialized habitat present?	No								
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Cottonwood, Bermuda grass, slippery elm, ragweed, elder berry								
	RDB: Cottonwood, Bermuda grass, slippery elm, ragweed, elder berry								
-particle size distribution %	Silt/Sand: 50	Gravel:	Cobble:	Boulder:	Bedrock:				
5-photo numbers	47-48								
6-HUC -8 Code & Name	08010205 - South Fork Forked Deer								
7-Assessed	yes ☐	no ☑							
8-ETW	yes ☐	no ☑							
9-303 (d) List	yes ☐	siltation ☐	habitat: ☐	other: ☐					
	no ☑								
10-Notes	50% riprap								

Revised July 2022

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Lagoon Creek		Date/Time: 08/12/24
Assessors/Affiliation: JC, JG; JMT		Project ID : 102251.02
Site Name/Description: WWC-13/EPH-6		
Site Location: Southeast of Old Highway 19 meeting SR-19		
HUC (12 digit): 080102080801	Latitude: 35.689843	
Previous Rainfall (7-days) : 0 inches	Longitude: -89.401402	
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0		
Watershed Size : 0.04 sq. miles	County: Haywood	
Soil Type(s) / Geology : Loring Silt Loam	Source: NRCS Web Soil Survey	
Surrounding Land Use : Low Density Residential, Agricultural		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 13.5

Justification / Notes :

Incipient drought (based on APT). Flows into WWC-14/UDF-8 under SR-19 (culvert).

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 3)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 3.5)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 7)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 13.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Channel bed was not well defined, Bermuda grass growing throughout. Beneath the road culvert there was pooling water observed but the rest of the channel was dry. Both banks are actively eroding and highly unstable. The culvert on the opposite side of the road has a very steep elevation drop and seemed to be dry, indicating the road embankment may be failing.

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.02					
Biologist:	RB & BC	**Affiliation:**	JMT	**Date:**	08-13-24

1-Station: from plans	~0.03 miles northwest of 10413 SR-19				
2-Map label and name	WWC-14/UDF-8				
3-Latitude/Longitude	35.690100, -89.401026				
4-Feature description:					
-channel identification	perennial stream ☐	intermittent stream ☐	ephemeral stream ☐	wwc ☑	
-HD score (if applicable)	16				
-OHWM indicators	bed & banks ☐	deposition ☐	presence of litter debris ☐	scour ☐	veg absent, bent, matted ☐
	change in plant community ☐	destruction of terrestrial veg ☐	multiple observe flow events ☐	sediment sorting ☐	water staining ☐
	change in soil character ☐	leaf litter disturb or absent ☐	natural line impressed on bank ☐	shelving ☐	wracking ☐
-channel bottom width	1'	-top of bank width	1'		
-width and max depth at ordinary high water mark	1' width, 6" max depth				
-width at bankfull	1'				
-bank height	LDB - 6"	RDB - 6"			
-riffle/pool complex or other specialized habitat present?	No				
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Grass sp.				
	RDB: Grass sp.				
-particle size distribution %	Silt/Sand: 95	Gravel: 5	Cobble:	Boulder:	Bedrock:
5-photo numbers	49-50				
6-HUC -8 Code & Name	08010208 - Lower Hatchie				
7-Assessed	yes ☐	no ☑			
8-ETW	yes ☐	no ☑			
9-303 (d) List	yes ☐	siltation ☐	habitat: ☐	other: ☐	
	no ☑				
10-Notes					

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Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody:UNT Lagoon Creek	Date/Time:8/13/24
Assessors/Affiliation:RB, BC; JMT	Project ID :102251.02
Site Name/Description:WWC-14/UDF-8	
Site Location:~0.03 miles northwest of 10413 SR-19	
HUC (12 digit):080102080801	Latitude:35.690100
Previous Rainfall (7-days) :< 0.5 inches	Longitude:-89.401026
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0	
Watershed Size :0.03 sq. miles	County:Haywood
Soil Type(s) / Geology :Loring Silt Loam	Source:NRCS Web Soil Survey
Surrounding Land Use :Agricultural	
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination =Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 16

Justification / Notes :

Incipient drought (based on APT). Flows into WWC-13/EPH-6 under SR-19 (culvert)

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal =9.5)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal =1.5)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal =5)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants.

[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 16

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Ecology Field Data Sheet: **Other Resource Features**

(Caves/Rock Houses; Potential Sinkholes; Specialized Habitats; Other)

Project: Haywood County, SR-19 **PIN #:** 102251.02

Date of survey: 08-15-24 **Biologist(s):** RB and BC **Affiliation:** JMT

1-Station: from plans	0.9 miles west of Jim Binford Ln. on SR-19	
2-Map label	PND-2	
3-Lat/Long	35.684867, -89.394345	
4-Potential impact size	Total area within Study Area: 0.003 acres	
5-Feature name	PND-2	
6-Feature description:		
what is the feature	Pond	
portion affected	Undetermined	
connection to other features	No connection to downstream waters identified	
photo number(s)	51	
other information	Pond likely dug in upland in association with agricultural land use	
7- HUC code & name if applicable (12-digit)	Meridian Creek (080102050402)	
8-Notes		

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.02					
Biologist:	JC, JG	**Affiliation:**	JMT	**Date:**	08-13-24

1-Station: from plans	Northwest of Jim Binford Rd meeting SR-19										
2-Map label and name	WWC-15/EPH-7										
3-Latitude/Longitude	35.684368, -89.394512										
4-Feature description:											
-channel identification	perennial stream		intermittent stream		ephemeral stream		wwc	✓			
-HD score (if applicable)	13										
-OHWM indicators	bed & banks	✓	deposition		presence of litter debris	✓	scour		veg absent, bent, matted		
	change in plant community		destruction of terrestrial veg		multiple observe flow events		sediment sorting		water staining		
	change in soil character		leaf litter disturb or absent		natural line impressed on bank		shelving		wracking		
-channel bottom width	3'			-top of bank width		35'					
-width and max depth at ordinary high water mark	4' width, 1' max depth										
-width at bankfull	NA										
-bank height	LDB - 2'			RDB - 2'							
-riffle/pool complex or other specialized habitat present?	No										
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Cottonwood, pecan, sweet-gum, grapevine, poison ivy										
	RDB: Cottonwood, pecan, sweet-gum, grapevine, poison ivy										
-particle size distribution %	Silt/Sand:	100	Gravel:		Cobble:		Boulder:		Bedrock:		
5-photo numbers	52										
6-HUC -8 Code & Name	08010205 - South Fork Forked Deer										
7-Assessed	yes			no	✓						
8-ETW	yes			no	✓						
9-303 (d) List	yes			siltation			habitat:		other:		
	no	✓									
10-Notes											

Revised July 2022

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Meridian Creek	Date/Time: 08/12/24
Assessors/Affiliation: JC, JG; JMT	Project ID : 102251.02
Site Name/Description: WWC-15/EPH-7	
Site Location: Northwest of Jim Binford Rd meeting SR-19	
HUC (12 digit): 080102050402	Latitude: 35.683500
Previous Rainfall (7-days) : 0 inches	Longitude: -89.394293
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0	
Watershed Size : <0.02 sq. miles	County: Haywood
Soil Type(s) / Geology : Grenada Silt Loam	Source: NRCS Web Soil Survey
Surrounding Land Use : Low Density Residential, Agricultural	
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 11

Justification / Notes :

Incipient drought (based on APT).

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 10.5)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 0.5)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 0)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 11

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Old trees line the bed, tree size were >50in DBH.

Ecology Field Data Sheet: **Other Resource Features**

(Caves/Rock Houses; Potential Sinkholes; Specialized Habitats; Other)

Project: Haywood County, SR-19 **PIN #:** 102251.02

Date of survey: 08-15-24 **Biologist(s):** PB and BF **Affiliation:** JMT

1-Station: from plans	0.7 miles west of Jim Binford Ln. on SR-19	
2-Map label	PND-3	
3-Lat/Long	35.682620, -89.393180	
4-Potential impact size	Total area within Study Area: 0.035 acres	
5-Feature name	PND-3	
6-Feature description:		
what is the feature	Pond	
portion affected	Undetermined	
connection to other features	No connection to downstream waters identified	
photo number(s)	N/A	
other information	Pond likely dug in upland in association with agricultural land use	
7- HUC code & name if applicable (12-digit)	Meridian Creek (080102050402)	
8-Notes		

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: TN SR-19 City/County: Haywood County Sampling Date: 2024-08-13

Applicant/Owner: TDOT State: Tennessee Sampling Point: 2-DPW-2

Investigator(s): Preston Butler and Britt Fleming Section, Township, Range:

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): Concave Slope (%): 1

Subregion (LRR or MLRA): P 134 Lat: 35.6815024 Long: -89.391304 Datum: NAD83_2011

Soil Map Unit Name: Ad - Adler silt loam, 0 to 2 percent slopes, frequently flooded NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓	No _____	
Wetland Hydrology Present?	Yes ✓	No _____	

Remarks:

WTL-5

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)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☑ Oxidized Rhizospheres along 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)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes _____	No ✓	Depth (inches): _____
Water Table Present?	Yes _____	No ✓	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No ✓	Depth (inches): _____

Wetland Hydrology Present? Yes ✓ No _____

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

Remarks:

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

Sampling Point: 2-DPW-2

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size: 30 ft r)			
1. Salix nigra	20	✓	OBL
2. Fraxinus pennsylvanica	10	✓	FACW
3. Acer negundo	5		FAC
4.			
5.			
6.			
7.			
8.			
	35 = Total Cover		
50% of total cover: 17.50	20% of total cover: 7.00		
Herb Stratum (Plot size: 30 ft r)			
1. Diodia virginiana	60	✓	FACW
2. Cyperus strigosus	25	✓	FACW
3. Rumex crispus	5		FAC
4. Setaria pumila	5		FAC
5. Juncus marginatus	5		FACW
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
50% of total cover: 50.00	20% of total cover: 20.00		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	20	x 1 =	20
FACW species	100	x 2 =	200
FAC species	15	x 3 =	45
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	135 (A)		265 (B)

Prevalence Index = B/A = 1.96

Hydrophytic Vegetation Indicators:

- ☑ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☑ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four 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 vines, less than 3 in. DBH and greater than 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

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: 2-DPW-2

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 - 12	10YR 5/1	90	7.5YR 4/6	10	C	PL / M	Sandy Loam	
-								
-								
-								
-								
-								
-								

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

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✓ **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: TN SR-19 City/County: Haywood County Sampling Date: 2024-08-13

Applicant/Owner: TDOT State: Tennessee Sampling Point: 2-DPU-2

Investigator(s): Preston Butler and Britt Fleming Section, Township, Range:

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): Convex Slope (%): 1

Subregion (LRR or MLRA): P 134 Lat: 35.6813915 Long: -89.3929713 Datum: NAD83_2011

Soil Map Unit Name: Ad - Adler silt loam, 0 to 2 percent slopes, frequently flooded NWI classification: NA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

This form represents upland adjacent to WTL-5

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)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along 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)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes _____	No ✓	Depth (inches): _____
Water Table Present?	Yes _____	No ✓	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No ✓	Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

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

Remarks:

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

Sampling Point: 2-DPU-2

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size: 30 ft r)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size: 30 ft r)			
1. Solidago canadensis	30	✓	FACU
2. Tripsacum dactyloides	20	✓	FAC
3. Cyperus strigosus	18	✓	FACW
4. Sorghum halepense	2		FACU
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	70 = Total Cover		
50% of total cover: 35.00	20% of total cover: 14.00		
Woody Vine Stratum (Plot size: 30 ft r)			
1. Campsis radicans	40	✓	FAC
2.			
3.			
4.			
5.			
	40 = Total Cover		
50% of total cover: 20.00	20% of total cover: 8.00		

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 75.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	18	x 2 =	36
FAC species	60	x 3 =	180
FACU species	32	x 4 =	128
UPL species	0	x 5 =	0
Column Totals:	110 (A)		344 (B)

Prevalence Index = B/A = 3.12

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four 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 vines, less than 3 in. DBH and greater than 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 ☐

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: 2-DPU-2

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 - 6	10YR 5/6	97	7.5YR 4/6	1	C	M	Sandy Loam	
0 - 6	10YR 5/6	97	10YR 5/1	2	D	M	Sandy Loam	
6 - 12	10YR 6/6	97	7.5YR 4/6	1	C	M	Sandy Loam	
6 - 12	10YR 6/6	97	10YR 5/1	2	D	M	Sandy Loam	
-								
-								
-								

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

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** ✓

Remarks:

An affirmative response to 1-6 of the Decision Table identifies the wetland per rule as an Outstanding Natural Resource Water (ONRW) or Exceptional Tennessee Waters (ETW). A positive response to 7-13 requires a final determination by the Department.

#	**Wetland Feature Decision Table** PIN 102251.02; WTL-5	**Yes/No**	**Affirmative Result**
1	The wetland has been designated as an **Outstanding Natural Resource Water (ONRW)** by the Department under 0400-40-03-.06(5)(a)**.**	No	**ORNW**
2	The wetland has previously been designated and documented as an Exceptional Tennessee Water (ETW) by the Department under 0400-40-03-.06(4)(a)(7)	No	**ETW**
3	The wetland is within state or national parks, wildlife refuges, forests, wilderness areas, natural areas, or is a designated State Scenic Rivers or Federal Wild and Scenic Rivers.	No	**ETW**
4	The wetland is known to contain a documented non-experimental population of state or federally listed threatened or endangered aquatic or semi-aquatic plants, or aquatic animals.	No	**ETW**
5	The wetland or the area it is in has been designated by the U.S. Fish and Wildlife Service as "**Critical Habitat**" for any threatened or endangered aquatic or semi-aquatic plant or aquatic animal species.	No	**ETW**
6	The wetland falls within an area designated as Lands Unsuitable for Mining pursuant to the federal Surface Mining Control and Reclamation Act where such designation is based in whole or in part on impacts to water resource values	No	**ETW**
7	**The wetland exhibits outstanding ecological or recreational values such as, but not limited to, those as outlined in 8-12**	No	Determination Required by TDEC
8	The wetland fits within the species composition concept for any plant community found in the state of Tennessee **ranked G2, G1, or more imperiled** at the "Association" classification level according to the NatureServe and Natural Heritage Ranking system (e.g. "bog", "fen", and "wet prairie/barren" communities).	No	Determination Required by TDEC
9	The wetland is **an uncommon resource** (e.g. vernal pools, headwater wetlands, sinks, spring/seeps, glades, newly described communities, high recreational or socioeconomic value) in the region and/or is deemed such by concurrence of qualified scientists.	No	Determination Required by TDEC
10	The wetland is an **older aged forested wetland** comprised of overstory trees with an average diameter at breast height (dbh) being **greater than or equal to 30 in** within the WAA.	No	Determination Required by TDEC
11	The wetland is observed and documented to be a **significant waterfowl, songbird, shorebird, amphibian, bat, fish habitat area**. These may include rookeries, migratory congregations, nesting sites, breeding areas, etc.	No	Determination Required by TDEC
12	The wetland is **hydrologically connected** to and/or has significant ecological contribution to an **ETW**	No	Determination Required by TDEC
13	The wetland has High Resource Value as determined by a **score of 75 and above** using the TRAM or non-HGM TRAM (to be determined after completing the quantitative portion of this manual)	No	Determination Required by TDEC

End of Narrative Rating. Begin Quantitative Rating on Next Page.

HGM FUNCTIONAL ASSESSMENT
SLOPE WETLANDS

Date: 08/13/2024 Project Name SR-19, 102251.02

Field Personnel PB, BF Wetland Name/Location WTL-5

Read instructions prior to conducting assessments. If project area is large or highly heterogeneous requiring the designation of several WAAs, a separate assessment should be performed for each WAA. CHECK THE APPROPRIATE BLANK(S) BELOW.

V1: Hydroperiod (HYDRO)

☐ 1. Hydrology not altered (SI = 1.0)
- no fill material or excessive sediment
- no ditches/drainage tiles
- no roads or other impediments to surface or groundwater
- no excavation
- no alteration to overland runoff, groundwater discharge/recharge

☑ 2. Hydrology slightly altered (SI = 0.75)
- portion of site with minimal fill or sediment
- portion of site with drainage ditches/tiles
- roads or other impediments, water flow slightly altered
- minor portion of site excavated
- some alteration to overland runoff, groundwater discharge/recharge

☐ 3. Hydrology moderately altered (SI = 0.5)
- portion of site with moderate fill or sediment
- portion of site with drainage ditches/tiles
- some alteration to overland runoff, groundwater discharge/recharge
- roads or other impediments, water flow moderately altered
- moderate portion of site excavated

☐ 4. Hydrology significantly altered (SI = 0.25)
- portion of site with significant fill or sediment
- portion of site with drainage ditches/tiles
- significant alteration to overland runoff, groundwater discharge/recharge
- roads or other impediments, water flow significantly altered
- significant portion of site excavated

☐ 5. Hydrology severely altered (SI = 0.1)
- entire site impacted by fill or excessive sediment
- entire site with numerous drainage ditches/tiles
- no contributions to or from overland runoff, groundwater discharge/recharge
- roads or other impediments, water flow completely blocked
- entire wetland affected

V2: Wetland Watershed Integrity (WSHEDINT)

Use weighted average as discussed on page 10. Examples of land uses and multipliers listed below

A = Percentage forested with no impervious surfaces 2
B = Percentage permeable land, (e.g., park, golf course, pasture, hay, orchard, tree farm, or similar) 93
C = Percentage low density residential, construction, or similar 5
D = Percentage high density residential, or similar _____
E = Percentage urban, commercial, industrial, or similar _____

V2 = (A x 1.0) + (B x 0.75) + (C x 0.5) + (D x 0.25) + (E x 0.01)/(100) = 0.74

V3: Canopy Tree Size Class (TSIZE)

1. Average size of canopy trees > 3 in. DBH

☐ ≥ 15 in. (SI = 1.0) ☐ 10 – 14 in. (SI = 0.75) ☐ 6 – 9 in. (SI = 0.5) ☐ 3 – 5 in. (SI = 0.25)
☑ < 3 in. or no trees present, go to V5

V4: Canopy Tree Density (TDEN)

1. Average number of canopy trees (> 3 in. DBH) per 30-ft. radius plot

☐ 5 – 10 (SI = 1.0) ☐ 11 – 15 (SI = 0.75) ☐ > 15 (SI = 0.5) ☐ 1 – 4 (SI = 0.5)

V5: Shrub Cover (SCOV)

1. Average percent cover of shrubs (woody stems < 3 in. DBH and taller than 3 ft.) per 30-ft. radius plot

☐ > 20 (SI = 1.0) ☑ < 20, go to V6

V6: Ground Vegetation Cover (GVC)

1. Average percent cover of ground vegetation per 30-ft. radius plot

☑ ≥ 70 (SI = 1.0) ☐ 55 – 69 (SI = 0.75) ☐ 45 – 54 (SI = 0.5) ☐ 30 – 44 (SI = 0.25) ☐ 20 – 29 (SI = 0.1)
☐ < 20 (SI=0.0)

V7: Vegetation Composition and Diversity (COMP)

1. Check the dominant species from Groups 1, 2, and 3 below using the 50/20 rule. If tree cover is < 20%, check the dominants in the next tallest stratum. If a dominant does not appear in lists below, but is a native species, it can be added to Group 1 or 2 species based on the scientific literature or professional judgement. Native shrub and herbaceous species are assigned to Group 2. When using shrub or herbaceous write in the number of dominant species. Dominant invasive species are checked regardless of stratum. *

GROUP 1 (Reference Standard)		GROUP 2 (Native Ubiquitous)		GROUP 3 (Invasive)
☐ Water oak	☐ Pin oak	☐ American elm	☑ Green ash	☐ European/Chinese privet
☐ Bur oak	☐ Shumard oak	☐ Slippery elm	☐ Red maple	☐ Japanese honeysuckle
☐ Willow oak	☐ Bald cypress	☐ Sweetgum	☐ Silver maple	☐ Japanese stiltgrass
☐ Swamp chestnut oak	☐ Water tupelo	☐ Blackgum	☑ Black willow	☐ Purple loosestrife
☐ Cherrybark oak	☐ S. black gum	☐ Silky dogwood	☐ Sycamore	☐ Giant reed
☐ Swamp white oak	☐ Persimmon	☑ Boxelder	☐ _____	☐ Tall fescue
☐ Nuttall oak	☐ Am. hornbeam	☐ Tulip poplar	☐ _____	☐ Phragmites
☐ Overcup oak	☐ _____	____ Number native shrub spp.		☐ _____
☐ _____	☐ _____	____ Number native herbaceous spp.		☐ _____

2. Using the number of dominants in Groups 1, 2, and 3 above, calculate a quality index (Q) using the following formula: [(1.0 x # of checked dominants in Group 1) + (0.66 x # of checked dominants in Group 2) + (0.0 x # of checked dominants in Group 3)]/ total # of checked dominants in all groups = 0.66

3. Multiply Q above by one of the following constants that reflects species richness:[1]

- ○ a) if ≥ 4 species from Groups 1 and/or 2 occur as dominants, multiply Q by 1.0 _____
- ◉ b) if 3 species from Groups 1 and/or 2 occur as dominant, multiply Q by 0.75 0.495
- ○ c) if 2 species from Groups 1 and/or 2 occur as dominants, multiply Q by 0.50 _____
- ○ d) if 1 species from Groups 1 and/or 2 occurs as dominant, multiply Q by 0.25 _____
- ○ e) if no species from Groups 1 and/or 2 occurs as dominant, multiply Q by 0.0 _____

4. Calculate the square root of the value from Step 3 above. This value is the SI for **V7**= 0.70

*In some Depression wetlands and in some small WAAs (e.g., <0.5 acres), relatively few species (e.g., overcup oak) may be present. In cases in which this is the normal condition, Q can be multiplied by 1.0 if only 1 or 2 species are dominant.

V8: Soil Organic Matter (ORGANIC)

1. Surface horizons unaltered

☑ 100 percent cover of O and/or A horizon present (SI = 1.0)

2. Surface horizons altered. Estimate the percent of the WAA in which neither an O or A horizon is present.

3. Subtract the sum of the values from Step 2 from 100. Convert this value to a decimal. This value is the SI for V8 (e.g., if 75 % of the WAA does not have an O or A horizon due to a significant disturbance, it will have an SI of 0.25).

V9: Buffer (BUFFER)

1. Determine the Connection Index (CI) by estimating the percent of the wetland surrounded by suitable buffer habitat.

☐ 90% – 100% (CI = 1.0) ☐ 75% – 89% (CI = 0.75) ☐ 40% – 74% (CI = 0.5) ☑ 10% – 39% (CI = 0.25)
☐ < 10% (CI = 0.1)

2. Multiply the CI by one if the following values:

- ○ a) if average buffer width is ≥ 492 ft., multiply by 1.0
- ○ b) if average buffer is 98 ft to 491 ft., multiply by 0.66
- ◉ c) if average buffer width is 33 ft to 97 ft., multiply by 0.33
- ○ d) if average buffer width is < 33 ft., multiply by 0.1

3. This value is the SI for **V9 =** 0.08 **.**

VALUES USED TO CALCULATE FUNCTIONAL CAPACITY INDICES (FCIs)

SUBINDEX VALUES:

V1 0.75 (HYDRO) V3 go to V5 (TSIZE) V5 go to V6 (SCOV) V7 0.70 (COMP) V9 0.08 (BUFFER)

V2 0.74 (WSHEDINT) V4 0 (TDEN) V6 1.00 (GVC) V8 1.00 (ORGANIC)

Slope Wetland

WTL-5

V1: HYDROPERIOD	**0.75**
V2: WETLAND WATERSHED INTEGRITY	**0.74**
V3: CANOPY TREE CLASS	**GOTOV5**
V4: CANOPY TREE DENSITY	**N/A**
V5: SHRUB COVER	**GOTOV6**
V6: GROUND VEGETATION COVER	**1**
V7: VEGETATION COMPOSITION AND DIVERSITY	**0.70**
2. Q =	**0.66**
# of Group 1 Dominants	0
# of Group 2 Dominants	3
# of Group 3 Dominants	0
SPECIES RICHNESS CONSTANT	0.75
V8: SOIL ORGANIC MATTER	**1**
V9:BUFFER	**0.08**
1. Connection Index	0.25
2. Buffer width value (0-1)	0.33

Function 1: Maintain Hydrologic Regime

$(V1 \times V2)^{\wedge}(1/2)$

FCI 1 = **0.74** **Final Tree =** **#VALUE!**

Function 2: Maintain Biogeochemical Processes

$$\text{FCI (trees present)} = \left((V1 \times V2)^{1/2} \times \left(\frac{\frac{V3+V4}{2}+V8}{2}\right)\right)^{1/2}$$

FCI 2 trees= **#VALUE!** **Final Shrubs=** **#VALUE!**

Final Herbaceous = **0.46**

$$\text{FCI (shrubs present)} = \left((V1 \times V2)^{1/2} \times \left(\frac{V5+V8}{3}\right)\right)^{1/2}$$

FCI 2 shrubs= **#VALUE!**

$$\text{FCI (ground cover)} = \left((V1 \times V2)^{1/2} \times \left(\frac{V6+V8}{5}\right)\right)^{1/2}$$

FCI 2 ground = **0.55**

Function 3: Maintain Characteristic Plant Community

$$\text{FCI (trees present)} = \frac{(V1 \times V2)^{1/2} + 2\left(\frac{V3+V4+V7}{3}\right)}{3}$$

FCI 3 trees= **#VALUE!**

$$\text{FCI (shrubs present)} = \frac{(V1 \times V2)^{1/2} + 2\left(\frac{V5+V7}{2}\right)}{6}$$

FCI 3 shrubs= **#VALUE!**

$$\text{FCI (groundcover)} = \frac{(V1 \times V2)^{1/2} + 2\left(\frac{V6+V7}{2}\right)}{9}$$

FCI 3 ground = **0.27**

Function 4: Maintain Characteristic Wildlife Community:

$$\text{FCI (trees)} = \frac{(V1 \times V2)^{1/2} + 2\left(\frac{V3+V4+V7}{3}\right)+V9}{4}$$

FCI 4 trees= **#VALUE!**

$$\text{FCI (shrubs present)} = \frac{(V1 \times V2)^{1/2} + 2\left(\frac{V5+V7}{2}\right)+V9}{6}$$

FCI 4 shrubs= **#VALUE!**

$$\text{FCI (groundcover)} = \frac{(V1 \times V2)^{1/2} + 2\left(\frac{V6+V7}{2}\right)+V9}{9}$$

FCI 4 ground = **0.28**

TRAM Summary Worksheet

Project: SR-19, PIN 102251.02, WTL-5

Exceptional Status Wetlands		**Check if applicable**
	1. **ONRW**	☐
	2. **ETW**	☐
	3. **Further Review Requested:** Attach Wetland Background and Exceptional Status Wetlands Worksheet	☐
	COMMENTS/NOTES:	
Quantitative Rating scores	Function: Hydrologic Regime	0.74
	Function: Biogeochemical Processes	0.55
	Function: Retain Particulates	n/a
	Function: Plant Community	0.27
	Function: Wildlife Community	0.28
	Quantitative Score (Average of FCIs x 100)	46.00
	Value Added (Significant Size) Total	0
Total of Quantitative and Value Added Scores	**TOTAL SCORE**	46.00

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.02					
Biologist:	PB, BF	**Affiliation:**	JMT	**Date:**	08-13-24

1-Station: from plans	West side of SR-19 ~0.50 miles north of Jim Binford Ln								
2-Map label and name	STR-6								
3-Latitude/Longitude	35.681182, -89.390789								
4-Feature description:									
-channel identification	perennial stream	✓	intermittent stream		ephemeral stream		wwc		
-HD score (if applicable)	31								
-OHWM indicators	bed & banks	✓	deposition		presence of litter debris		scour		veg absent, bent, matted	✓
	change in plant community	✓	destruction of terrestrial veg	✓	multiple observe flow events		sediment sorting		water staining	✓
	change in soil character	✓	leaf litter disturb or absent	✓	natural line impressed on bank	✓	shelving		wracking	✓
-channel bottom width	10'		-top of bank width		10'					
-width and max depth at ordinary high water mark	10' width, 3' max depth									
-width at bankfull	10'									
-bank height	LDB - 5'				RDB - 5'					
-riffle/pool complex or other specialized habitat present?	No									
-dominant riparian species: ----------(LDB /RDB)----------	LDB: slippery elm, green ash, sweet-gum									
	RDB: slippery elm, green ash, sweet-gum									
-particle size distribution %	Silt/Sand:	100	Gravel:		Cobble:		Boulder:		Bedrock:	
5-photo numbers	55-58									
6-HUC -8 Code & Name	08010205 - South Fork Forked Deer									
7-Assessed	yes		no	✓						
8-ETW	yes		no	✓						
9-303 (d) List	yes		siltation		habitat:		other:			
	no	✓								
10-Notes										

Revised July 2022

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Meridian Creek	Date/Time: 08/13/24
Assessors/Affiliation: PB, BF; JMT	Project ID : 102251.02
Site Name/Description: STR-6	
Site Location: West side of SR-19 ~0.50 miles north of Jim Binford Ln	
HUC (12 digit): 080102050402	Latitude: 35.681182
Previous Rainfall (7-days) : < 0.5 inches	Longitude: -89.390789
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0	
Watershed Size : 0.35 sq. miles	County: Haywood
Soil Type(s) / Geology : Adler Silt Loam	Source: NRCS Web Soil Survey
Surrounding Land Use : Low Density Residential, Agricultural	
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = 31

Justification / Notes :

Incipient drought (based on APT).

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 14.5)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 8)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 8.5)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants.

[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 31

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : 30-50 southern leopard frogs and tadpoles

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.02					
Biologist:	PB, BF	**Affiliation:**	JMT	**Date:**	08-13-24

1-Station: from plans	North of 9466 SR-19 ~0.22 mi on west side of SR-19								
2-Map label and name	STR-7								
3-Latitude/Longitude	35.681222, -89.390963								
4-Feature description:									
-channel identification	perennial stream ☐	intermittent stream ☑	ephemeral stream ☐	wwc ☐					
-HD score (if applicable)	14								
-OHWM indicators	bed & banks ☑	deposition ☐	presence of litter debris ☐	scour ☑	veg absent, bent, matted ☐				
	change in plant community ☐	destruction of terrestrial veg ☐	multiple observe flow events ☐	sediment sorting ☐	water staining ☐				
	change in soil character ☐	leaf litter disturb or absent ☑	natural line impressed on bank ☐	shelving ☐	wracking ☑				
-channel bottom width	1'	-top of bank width	4'						
-width and max depth at ordinary high water mark	2' width, 0.5' max depth								
-width at bankfull	2'								
-bank height	LDB - 3'	RDB - 3'							
-riffle/pool complex or other specialized habitat present?	No								
-dominant riparian species: ----------(LDB /RDB)----------	LDB: slippery elm, green ash, sweet-gum								
	RDB: slippery elm, green ash, sweet-gum								
-particle size distribution %	Silt/Sand: 100	Gravel:	Cobble:	Boulder:	Bedrock:				
5-photo numbers	59-60								
6-HUC -8 Code & Name	08010205 - South Fork Forked Deer								
7-Assessed	yes ☐	no ☑							
8-ETW	yes ☐	no ☑							
9-303 (d) List	yes ☐	siltation ☐	habitat: ☐	other: ☐					
	no ☑								
10-Notes									

Revised July 2022

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Meridian Creek		Date/Time: 08/13/24
Assessors/Affiliation: PB, BF; JMT		Project ID : 102251.02
Site Name/Description: STR-7		
Site Location: North of 9466 SR-19 ~0.22 mi on west side of SR-19		
HUC (12 digit): 080102050402	Latitude: 35.681222	
Previous Rainfall (7-days) : < 0.5 inches	Longitude: -89.390963	
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0		
Watershed Size : 0.36 sq. miles	County: Haywood	
Soil Type(s) / Geology : Alder Silt Loam	Source: NRCS Web Soil Survey	
Surrounding Land Use : Low Density Residential, Agricultural		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = 14

Justification / Notes :

Connecting a jurisdictional feature. Has OHWM, active down cutting, active migrating headcuts into the wetland.

Incipient drought (based on APT).

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 7.5)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	0.5 1	2	3
3. In-channel structure: riffle-pool sequences	0	0.5 1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 3.5)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 3)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants.

[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 14

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Amphibians: frogs

Wetland plants: juncus spp.

Wetland soils same as adjacent wetland (2-WTL-B)

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.02					
Biologist:	PB, BF	**Affiliation:**	JMT	**Date:**	08-13-24

1-Station: from plans	South side of SR-19 ~0.22 miles northwest of 9466 SR-19									
2-Map label and name	WWC-16/UDF-9									
3-Latitude/Longitude	35.68104, -89.390969									
4-Feature description:										
-channel identification	perennial stream		intermittent stream		ephemeral stream		wwc	✓		
-HD score (if applicable)	8.5									
-OHWM indicators	bed & banks	✓	deposition		presence of litter debris		scour	✓	veg absent, bent, matted	
	change in plant community		destruction of terrestrial veg	✓	multiple observe flow events		sediment sorting		water staining	
	change in soil character		leaf litter disturb or absent		natural line impressed on bank		shelving		wracking	
-channel bottom width	2'		-top of bank width		5'					
-width and max depth at ordinary high water mark	2' width, 1' max depth									
-width at bankfull	2'									
-bank height	LDB - 4'				RDB - 4'					
-riffle/pool complex or other specialized habitat present?	No									
-dominant riparian species: ----------(LDB /RDB)----------	LDB: sweet-gum, green ash, slippery elm									
	RDB: sweet-gum, green ash, slippery elm									
-particle size distribution %	Silt/Sand:	100	Gravel:		Cobble:		Boulder:		Bedrock:	
5-photo numbers	61-62									
6-HUC -8 Code & Name	08010205 - South Fork Forked Deer									
7-Assessed	yes		no	✓						
8-ETW	yes		no	✓						
9-303 (d) List	yes		siltation		habitat:		other:			
	no	✓								
10-Notes										

Revised July 2022

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Meridian Creek	Date/Time: 08/13/24
Assessors/Affiliation: PB, BF; JMT	Project ID : 102251.02
Site Name/Description: WWC-16/UDF-9	
Site Location: South side of SR-19 ~0.22 miles northwest of 9466 SR-19	
HUC (12 digit): 080102050402	Latitude: 35.68104
Previous Rainfall (7-days) : < 0.5 inches	Longitude: -89.390969
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0	
Watershed Size : 0.06 sq. miles	County: Haywood
Soil Type(s) / Geology : Adler Silt Loam	Source: NRCS Web Soil Survey
Surrounding Land Use : Low Density Residential, Agricultural	
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 8.5

Justification / Notes :

Incipient drought (based on APT).

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 4.5)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 2)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 2)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants.

[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 8.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.02					
Biologist:	PB, BF	**Affiliation:**	JMT	**Date:**	08-13-24

1-Station: from plans	West side of SR-19 ~0.50 miles north of Jim Binford Ln									
2-Map label and name	WWC-17/UDF-10									
3-Latitude/Longitude	35.681139, -89.39076									
4-Feature description:										
-channel identification	perennial stream		intermittent stream		ephemeral stream		wwc	✓		
-HD score (if applicable)	9									
-OHWM indicators	bed & banks	✓	deposition		presence of litter debris		scour	✓	veg absent, bent, matted	
	change in plant community		destruction of terrestrial veg		multiple observe flow events		sediment sorting		water staining	
	change in soil character		leaf litter disturb or absent		natural line impressed on bank		shelving		wracking	
-channel bottom width	1'		-top of bank width	6'						
-width and max depth at ordinary high water mark	2' width, 1' max depth									
-width at bankfull	2'									
-bank height	LDB - 4' farm edge				RDB - 6' road fill					
-riffle/pool complex or other specialized habitat present?	No									
-dominant riparian species: ----------(LDB /RDB)----------	LDB: sweet-gum, slippery elm, boxelder									
	RDB: fescue									
-particle size distribution %	Silt/Sand:	95	Gravel:	5	Cobble:		Boulder:		Bedrock:	
5-photo numbers	63-64									
6-HUC -8 Code & Name	08010205 - South Fork Forked Deer									
7-Assessed	yes		no	✓						
8-ETW	yes		no	✓						
9-303 (d) List	yes		siltation		habitat:		other:			
	no	✓								
10-Notes	Flows into STR-6									

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Meridian Creek	Date/Time: 08/13/24
Assessors/Affiliation: PB, BF; JMT	Project ID : 102251.02
Site Name/Description: WWC-17/UDF-10	
Site Location: West side of SR-19 ~0.50 miles north of Jim Binford Ln	
HUC (12 digit): 080102050402	Latitude: 35.681139
Previous Rainfall (7-days) : < 0.5 inches	Longitude: -89.39076
Precipitation this Season vs. Normal : abnormally wet elevated **average** low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0	
Watershed Size : 0.36 sq. miles	County: Haywood
Soil Type(s) / Geology : Adler Silt Loam	Source: NRCS Web Soil Survey
Surrounding Land Use : Low Density Residential, Agricultural	
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe **Moderate** Slight Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 9

Justification / Notes :

Incipient drought (based on APT). Flows into STR-6

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 6)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	0.5 1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	1.5 2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 2)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 1)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants.

[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 9

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : 1 small headcut

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.02					
Biologist:	RB & BC	**Affiliation:**	JMT	**Date:**	08-13-24

1-Station: from plans	At SR-19 crossing with Jim Binford Ln									
2-Map label and name	STR-8									
3-Latitude/Longitude	35.677151, -89.386091									
4-Feature description:										
-channel identification	perennial stream		intermittent stream	✓	ephemeral stream		wwc			
-HD score (if applicable)	16									
-OHWM indicators	bed & banks	✓	deposition		presence of litter debris		scour	✓	veg absent, bent, matted	
	change in plant community	✓	destruction of terrestrial veg		multiple observe flow events		sediment sorting		water staining	✓
	change in soil character		leaf litter disturb or absent		natural line impressed on bank		shelving		wracking	
-channel bottom width	4'		-top of bank width		12'					
-width and max depth at ordinary high water mark	4.5' width, 4" max depth									
-width at bankfull	3'									
-bank height	LDB - 4'				RDB - 5'					
-riffle/pool complex or other specialized habitat present?	No									
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Muscadine									
	RDB: Muscadine									
-particle size distribution %	Silt/Sand:	100	Gravel:		Cobble:		Boulder:		Bedrock:	
5-photo numbers	65-69									
6-HUC -8 Code & Name	08010205 - South Fork Forked Deer									
7-Assessed	yes		no	✓						
8-ETW	yes		no	✓						
9-303 (d) List	yes		siltation		habitat:		other:			
	no	✓								
10-Notes										

Revised July 2022

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody:UNT Meridian Creek	Date/Time:8/13/24
Assessors/Affiliation:RB, BC; JMT	Project ID :102251.02
Site Name/Description:STR-8	
Site Location:At SR-19 crossing with Jim Binford Ln	
HUC (12 digit):080102050402	Latitude:35.677151
Previous Rainfall (7-days) :< 0.5 inches	Longitude:-89.386091
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0	
Watershed Size :0.23 sq. miles	County:Haywood
Soil Type(s) / Geology :Adler Silt Loam	Source:NRCS Web Soil Survey
Surrounding Land Use :Agricultural	
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination =Stream

Secondary Indicator Score (if applicable) = 16

Justification / Notes :

Incipient drought (based on APT). NHD stream also shows up on USGS Topo (unnamed).

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal =6)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal =4)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal =6)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants.

[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 16

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.02					
Biologist:	JC, JG	**Affiliation:**	JMT	**Date:**	08-13-24

1-Station: from plans	Across the intersection of Jim Binford Ln and SR-19								
2-Map label and name	WWC-18/EPH-8								
3-Latitude/Longitude	35.676798, -89.385718								
4-Feature description:									
-channel identification	perennial stream ☐	intermittent stream ☐	ephemeral stream ☐	wwc ☑					
-HD score (if applicable)	6								
-OHWM indicators	bed & banks ☑	deposition ☐	presence of litter debris ☐	scour ☐	veg absent, bent, matted ☐				
	change in plant community ☐	destruction of terrestrial veg ☐	multiple observe flow events ☐	sediment sorting ☐	water staining ☐				
	change in soil character ☐	leaf litter disturb or absent ☐	natural line impressed on bank ☐	shelving ☐	wracking ☐				
-channel bottom width	6'	-top of bank width	20'						
-width and max depth at ordinary high water mark	6' width, <1" max depth								
-width at bankfull	NA								
-bank height	LDB - 3'	RDB - 3'							
-riffle/pool complex or other specialized habitat present?	No								
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Cottonwood, black willow, rubrus, Johnson grass, Bermuda grass								
	RDB: Cottonwood, black willow, rubrus, Johnson grass, Bermuda grass								
-particle size distribution %	Silt/Sand: 90	Gravel:	Cobble:	Boulder:	Bedrock:				
5-photo numbers	70								
6-HUC -8 Code & Name	08010205 - South Fork Forked Deer								
7-Assessed	yes ☐	no ☑							
8-ETW	yes ☐	no ☑							
9-303 (d) List	yes ☐	siltation ☐	habitat: ☐	other: ☐					
	no ☑								
10-Notes	10% riprap								

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Meridian Creek	Date/Time: 08/12/24
Assessors/Affiliation: JC, JG; JMT	Project ID : 102251.02
Site Name/Description: WWC-18/EPH-8	
Site Location: Across the intersection of Jim Binford Ln and SR-19	
HUC (12 digit): 080102050402	Latitude: 35.676798
Previous Rainfall (7-days) : < 0.5 inches	Longitude: -89.385718
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0	
Watershed Size : <0.02 sq. miles	County: Haywood
Soil Type(s) / Geology : Loring Silt Loam	Source: NRCS Web Soil Survey
Surrounding Land Use : Low Density Residential, Agricultural	
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 6

Justification / Notes :

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 4.5)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 0.5)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 1)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants.

[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 6

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Channel is routed under a driveway via culvert, flows into 2-STR-P.

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.02					
Biologist:	JC, JG	**Affiliation:**	JMT	**Date:**	08-13-24

1-Station: from plans	Southeast of Jim Binford Ln meeting SR-19								
2-Map label and name	WWC-19/UDF-11								
3-Latitude/Longitude	35.675681, -89.384788								
4-Feature description:									
-channel identification	perennial stream		intermittent stream		ephemeral stream		wwc	✓	
-HD score (if applicable)	12								
-OHWM indicators	bed & banks	✓	deposition	✓	presence of litter debris	✓	scour	✓	veg absent, bent, matted
	change in plant community	✓	destruction of terrestrial veg	✓	multiple observe flow events		sediment sorting	✓	water staining
	change in soil character		leaf litter disturb or absent	✓	natural line impressed on bank		shelving		wracking ✓
-channel bottom width	5'		-top of bank width		30'				
-width and max depth at ordinary high water mark	5' width, 3" max depth								
-width at bankfull	8'								
-bank height	LDB - 8'		RDB - 8'						
-riffle/pool complex or other specialized habitat present?	No								
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Pokeweed, sweet gum, American elm, red oak								
	RDB: Pokeweed, sweet gum, American elm, red oak								
-particle size distribution %	Silt/Sand: 100		Gravel:		Cobble:		Boulder:		Bedrock:
5-photo numbers	71-72								
6-HUC -8 Code & Name	08010205 - South Fork Forked Deer								
7-Assessed	yes		no	✓					
8-ETW	yes		no	✓					
9-303 (d) List	yes		siltation		habitat:		other:		
	no	✓							
10-Notes									

Revised July 2022

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Meridian Creek	Date/Time: 08/12/24
Assessors/Affiliation: JC, JG; JMT	Project ID : 102251.02
Site Name/Description: WWC-19/UDF-11	
Site Location: Southeast of Jim Binford Ln meeting SR-19	
HUC (12 digit): 080102050402	Latitude: 35.675681
Previous Rainfall (7-days) : <0.5 inches	Longitude: -89.384788
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0	
Watershed Size : <0.02 sq. miles	County: Haywood
Soil Type(s) / Geology : Loring Silt Loam	Source: NRCS Web Soil Survey
Surrounding Land Use : Low Density Residential, Agricultural	
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 12

Justification / Notes :

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 9.5)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 0.5)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 2)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 12

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Head cutting into ag field, channel flows into weeds with natural grade controls, dissipates into grass lined ditch by roadway.

APPENDIX C: PHOTOGRAPH LOG

TN SR-19, PIN 102251.02	Date: August 13-15, 2024

Photo 1: STR-1 (south of SR-19) facing downstream at culvert. 5’ x 5’ box single culvert. Barbed wire in front of culvert is causing debris to build up and block flow.

Photo 2: STR-1 (south of SR-19) facing downstream. (STR-1 is also in PIN 102251.01 as STR-8).

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

TN SR-19, PIN 102251.02	Date: August 13-15, 2024

Photo 3: STR-1 (north of SR-19) facing upstream at culvert. Concrete culvert, 5' x 5' single barrel box. No barbed wire on this end.

Photo 4: STR-1 (north of SR-19) at culvert facing upstream.

TN TDOT Department of Transportation

TN SR-19, PIN 102251.02	Date: August 13-15, 2024

Photo 5: WTL-1 facing wetland. (WTL-1 is also in PIN 102251.01 as WTL-9)

Photo 6: WTL-1 facing wetland.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

TN SR-19, PIN 102251.02	Date: August 13-15, 2024

Photo 7: STR-1 (north of SR-19) at culvert facing upstream with WTL-2 in the background.

Photo 8: WWC-1/EPH-1 facing west at culvert. 4’ x 4’ single barrel box culvert.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

TN SR-19, PIN 102251.02	Date: August 13-15, 2024

Photo 9: WWC-1/EPH-1 facing upstream (mislabeled).

Photo 10: WTL-3 facing wetland.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

TN SR-19, PIN 102251.02	Date: August 13-15, 2024

Photo 11: WTL-3 facing wetland.

Photo 12: WTL-4 facing wetland.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

TN SR-19, PIN 102251.02	Date: August 13-15, 2024

Photo 13: WTL-4 facing upland.

Photo 14: STR-2 (north of SR-19) facing upstream at culvert. Culvert is 4’ x 4’ single barrel concrete box.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

TN SR-19, PIN 102251.02	Date: August 13-15, 2024

Photo 15: STR-2 (north of SR-19) facing downstream.

Photo 16: STR-2 (south of SR-19) facing downstream at culvert near WTL-4. 4’ x 4’ single barrel box concrete culvert.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

TN SR-19, PIN 102251.02	Date: August 13-15, 2024

Photo 17: STR-2 (south of SR-19) facing upstream.

Photo 18: WWC-2/EPH-2 facing north at culvert.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

TN SR-19, PIN 102251.02	Date: August 13-15, 2024

Photo 19: WWC-2/EPH-2 facing upstream.

Photo 20: WWC-2/EPH-2 facing north at culvert. 18-24” Single barrel plastic drainage culvert.

TN TDOT Department of Transportation

Photo 21: WWC-3/EPH-3 facing upstream at 36” CMP culvert.

Photo 22: WWC-3/EPH-3 facing downstream.

Photo 23: PND-1 facing northeast.

Photo 24: PND-1 facing north.

TN SR-19, PIN 102251.02	Date: August 13-15, 2024

Photo 25: WWC-4/UDF-1 (north of SR-19) facing downstream at culvert. Culvert is a 4’ x 4’ concrete box single barrel.

Photo 26: WWC-4/UDF-1 (south of SR-19) facing downstream from top culvert.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

TN SR-19, PIN 102251.02	Date: August 13-15, 2024

Photo 27: WWC-4/UDF-1 facing downstream.

Photo 28: WWC-4/UDF-1 (south of SR-19) from top culvert facing directly below. 4’ x 4’ concrete box single barrel culvert completely blocked by vegetation.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

TN SR-19, PIN 102251.02	Date: August 13-15, 2024

Photo 29: WWC-5/UDF-2 facing downstream.

Photo 30: WWC-6/UDF-3 facing downstream.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

TN SR-19, PIN 102251.02	Date: August 13-15, 2024

Photo 31: STR-3 (north of SR-19) facing downstream.

Photo 32: STR-3 (north of SR-19) facing upstream from culvert.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

TN SR-19, PIN 102251.02	Date: August 13-15, 2024

Photo 33: STR-3 (south of SR-19) facing downstream on top of culvert looking down. Concrete box single barrel culvert obscured by vegetation.

Photo 34: STR-3 (south of SR-19) facing downstream from culvert.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

TN SR-19, PIN 102251.02	Date: August 13-15, 2024

Photo 35: STR-4 facing upstream at culvert. Culvert is concrete single barrel box.

Photo 36: STR-4 facing downstream from culvert with sprayed vegetation on the left bank.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

TN SR-19, PIN 102251.02	Date: August 13-15, 2024

Photo 37: WWC-8/EPH-4 facing downstream. 4’ x 4’ single barrel concrete box culvert, base sits lower than stream bed and is blocked by vegetation (and Tina Turner Hwy sign).

Photo 38: WWC-8/EPH-4 facing upstream.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

TN SR-19, PIN 102251.02	Date: August 13-15, 2024

Photo 39: STR-5 (southwest of SR-19) facing downstream.

Photo 40: STR-5 (southwest of SR-19) facing backflow channel.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

TN SR-19, PIN 102251.02	Date: August 13-15, 2024

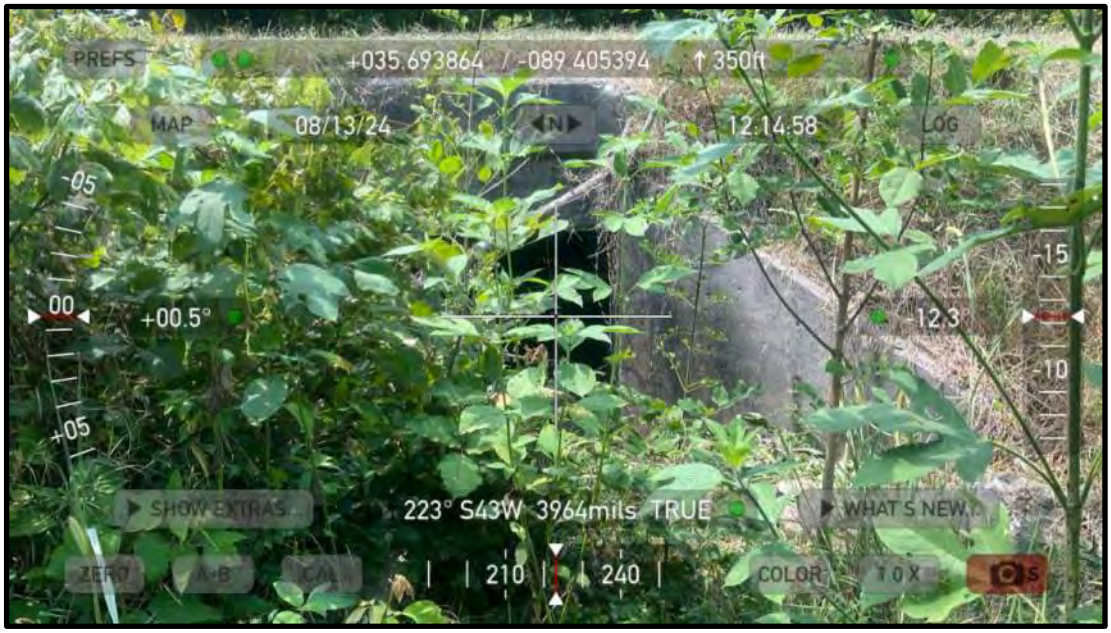

Photo 41: STR-5 (northeast of SR-19) facing downstream at culvert. Single barrel concrete box culvert.

Photo 42: STR-5 (northeast of SR-19) facing downstream.

TN TDOT Department of Transportation

Photo 43: WWC-9/UDF-5 facing downstream.

Photo 44: WWC-10/EPH-5 facing upstream.

Photo 45: WWC-11/UDF-6 facing upstream.

Photo 46: WWC-12/UDF-7 facing upstream.

Photo 47: WWC-13/EPH-6 facing downstream.

Photo 48: WWC-13/EPH-6 facing upstream.

TN SR-19, PIN 102251.02	Date: August 13-15, 2024

Photo 49: WWC-14/UDF-8 facing downstream at culvert.

Photo 50: WWC-14/UDF-8 facing washout.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

TN SR-19, PIN 102251.02	Date: August 13-15, 2024

Photo 51: PND-2 facing north.

Photo 52: WWC-15/EPH-7 facing downstream.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

TN SR-19, PIN 102251.02	Date: August 13-15, 2024

Photo 53: WTL-5 facing wetland.

Photo 54: WTL-5 facing wetland.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

TN SR-19, PIN 102251.02	Date: August 13-15, 2024

Photo 55: STR-6 (southwest of SR-19) facing downstream at culvert. Single barrel concrete box culvert ~ 4' x ~12'.

Photo 56: STR-6 (southwest of SR-19) facing upstream.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

TN SR-19, PIN 102251.02	Date: August 13-15, 2024

Photo 57: STR-6 (northeast of SR-19) facing downstream at culvert. Single barrel concrete box culvert ~ 4' x ~12'.

Photo 58: STR-6 (northeast of SR-19) facing upstream.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

TN SR-19, PIN 102251.02	Date: August 13-15, 2024

Photo 59: STR-7 facing upstream.

Photo 60: STR-7 facing downstream to confluence with STR-6.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

TN SR-19, PIN 102251.02	Date: August 13-15, 2024

Photo 61: WWC-16/UDF-9 facing upstream.

Photo 62: WWC-16/UDF-9 facing downstream.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

TN SR-19, PIN 102251.02	Date: August 13-15, 2024

Photo 63: WWC-17/UDF-10 facing downstream.

Photo 64: WWC-17/UDF-10 facing upstream.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

TN SR-19, PIN 102251.02	Date: August 13-15, 2024

Photo 65: STR-8 (northeast of SR-19) facing downstream at culvert.

Photo 66: STR-8 (northeast of SR-19) facing upstream.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

Photo 67: STR-8 (southwest of SR-19) facing upstream.

Photo 68: STR-8 (southwest of SR-19) facing upstream.

Photo 69: STR-8 (southwest of SR-19) facing downstream into single barrel concrete culvert under SR-19.

Photo 70: WWC-18/EPH-8 facing downstream at CMP culvert under driveway. (This feature also appears in PIN 102251.03 as WWC-1/EPH-1)

Photo 71: WWC-19/UDF-11 facing upstream at head cut.

Photo 72: WWC-19/UDF-11 facing downstream.

TN SR-19, PIN 102251.02	Date: August 13-15, 2024

Photos not available for:

WWC-7/UDF-4

PND-3 (inaccessible)

TN TDOT Department of Transportation

Shawn Wurst

From: Griffith, John <john_griffith@fws.gov>
Sent: Wednesday, September 18, 2024 3:14 PM
To: Shawn Wurst
Cc: rbode@jmt.com
Subject: [EXTERNAL] Re: IPaC delivered Official Species List for project: PIN 102251.02 TDOT SR-19

This Message Is From an External Sender

This message came from outside your organization.

Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security

Shawn,

We received correspondence regarding the proposed State Route (SR-) 19 widening from near the Lauderdale County Line to east of Binford Lane in Lauderdale and Haywood counties, Tennessee. The Tennessee Department of Transportation is requesting a list of federally threatened or endangered species that may be present in the project area.

A review of our database does not indicate that any federally listed or proposed species or designated critical habitat would be impacted by the project. Therefore, based on the best information available at this time, we believe that the requirements of the Endangered Species Act (ESA) are fulfilled for all species that currently receive protection under the ESA. Obligations under section 7 of the ESA should be reconsidered if (1) new information reveals impacts of the proposed action that may affect listed species or critical habitat in a manner not previously considered, (2) the proposed action is subsequently modified to include activities which were not considered during this consultation, or (3) new species are listed or critical habitat designated that might be affected by the proposed action.

Standard construction BMPs should be implemented to ensure that all project-related pollutants are kept out of project area streams. Equipment staging and maintenance areas should be developed an adequate distance away to prevent the introduction of petroleum-based products into the water. If possible, work at stream crossings should be scheduled during a lower flow period.

This email will serve as our official project response. Please let me know if we can offer further assistance. Thanks,

John Griffith
Transportation Biologist
U.S. Fish and Wildlife Service
Tennessee Field Office
931-444-1393 (office)
931-261-3755 (cell)

From: Administrator Email <ecosphere_support@ecosphere.fws.gov>
Sent: Thursday, August 29, 2024 9:46 AM
To: Griffith, John <john_griffith@fws.gov>; Tennessee ES, FWS <tennesseeES@fws.gov>; Sykes, Robbie <robbie_sykes@fws.gov>; Alexander, Steven <steven_alexander@fws.gov>
Subject: IPaC delivered Official Species List for project: PIN 102251.02 TDOT SR-19

To: IPaC point(s) of contact for Tennessee Ecological Services Field Office
Project Location: Haywood and Lauderdale counties, Tennessee

IPaC has delivered an official Section 7 species list on behalf of your office. For your convenience, IPaC has created an ETK project (2024-0137149) with a new associated 'Species List Provided' event. A PDF file of the species list document is attached to the event and contact information for the project can be found on the last page of the PDF.

IPaC has automatically set the consultation status to "Closed". If you need to do any additional work in this project (*e.g.*, add staff, add events, change lead office, etc.), you must first change the status to "active" so that you can edit the project. You can access the project via the link, above.

Lead FWS Office:
The Tennessee Ecological Services Field Office is currently designated as the lead office for Section 7 on this project. The following additional offices have jurisdiction and have been notified: None. If another office is the lead office on this project, please access the project (via the link above) and update it. IPaC will not reset the Lead Office once it has been updated by a biologist.

*Projects created in ETK by IPaC have not been assigned to an FWS staff member. To identify the staff assigned to this project, please access the project (via the link above) and add their name(s).

Shawn Wurst

From: Casey Parker
Sent: Friday, October 27, 2017 2:16 PM
To: Eric Philipps; Dustin Tucker
Cc: Rob Todd; Vincent Pontello
Subject: Request for Comment Lauderdale-Haywood County SR-19 PIN 102251.00

Mr. Eric Philipps,

I have reviewed the information that you provided as regards to widening of SR-19 from east of Eastland Avenue in Lauderdale County to west of the Brownsville By-Pass in Haywood County, from an existing two-lane roadway to a super two-lane highway. My data concur with the information, therefore the implementation of standard BMP's will be sufficient to satisfy the needs of the Tennessee Wildlife Resources Agency for this proposed project. Thank you for the opportunity to review and comment, please contact me if you need further assistance.

Casey Parker - Wildlife Biologist
Liaison to TDOT & Federal Highway Administration
Tennessee Wildlife Resources Agency
Environmental Services Division
Email: casey.parker@tn.gov

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
ENVIRONMENTAL DIVISION
ENVIRONMENTAL TECHNICAL STUDIES OFFICE
SUITE 900, JAMES K. POLK BUILDING
505 DEADERICK STREET
NASHVILLE, TENNESSEE 37243-1402
(615) 741-3655

BUTCH ELEY
DEPUTY GOVERNOR &
COMMISSIONER OF TRANSPORTATION

BILL LEE
GOVERNOR

MEMORANDUM

To: Benjamin Webb
Project Manager, Region 4 Project Management

From: Shawn Wurst
Ecology Team Lead, Environmental Division

Date: 10/25/2024

Subject: Environmental Boundaries Report for:
SR-19 from East of Binford Lane to East of SR-87
Haywood County
PIN Number: 102251.03

An ecological evaluation of the subject project has been conducted in response to an initial evaluation request with the following findings:

STREAMS: Seventeen (17) perennial/intermittent streams and Fourteen (14) ephemeral streams were identified within the proposed project limits.

WETLANDS: Two (2) wetland features were identified within the proposed project limits.

OTHER FEATURES: Twenty-four (24) upland drainage features and two (2) ponds were identified within the proposed project limits.

SPECIES:

- *USFWS:* USFWS coordination resulted in a Not Likely to Adversely Affect determination and a commitment for listed species.
- *TWRA:* TWRA coordination resulted in no concerns for listed species.
- *TDEC DNA:* The project was determined to meet Condition #1 of the MOA between TDOT and TDEC DNA.

COMMITMENTS: The following commitment has been uploaded into PPRM and needs to be made active by the POA.

TDOT commits to perform all tree clearing during the winter season between October 1st and March 31st.

Your assistance is appreciated. If you have any questions or comments, please contact me at (615-516-8445) or shawn.wurst@tn.gov.

xc: TDOT.Env.Ecology@tn.gov
TDOT.Env.Permits@tn.gov
TDOT.Env.Mitigation@tn.gov
TDOT.Env.NEPA@tn.gov

ENVIRONMENTAL BOUNDARIES REPORT

Haywood County SR-19 Widening (IA) Section 3
PIN 102251.03

Tennessee Department of Transportation

October 2024

1.0 INTRODUCTION

Tennessee Department of Transportation (TDOT) proposes to improve SR-19 in Haywood County from Jim Binford Lane to ~0.14 miles south of Summerhill Drive (Appendix A: Figures 1 and 2). Improvements will involve reconstructing the existing two lane road to a super two lane road with 12 foot lanes, 10 foot shoulders, and improved sight distances. Johnson, Mirmiran and Thompson (JMT) has been contracted to perform an environmental boundaries survey on an approximately 8.8-mile-long project (356 acres) of varying widths.

2.0 METHODOLOGY

A delineation of jurisdictional water resources under Sections 401 and 404 of the Clean Water Act of 1972 (CWA) and under the Tennessee Water Quality Control Act of 1977 was conducted August 12-16, 2024, by qualified JMT scientists. The delineation was conducted in accordance with:

- U.S. Army Corps of Engineers (USACE) Wetland Delineation Manual, Technical Report Y- 87-1 (USACE, 1987)
- USACE November 2010 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain (USACE, 2010)
- Current waters of the US (WOTUS) rules
- TDOT guidance related to wetland data collection
- Tennessee Department of Environment and Conservation (TDEC) Division of Water Resources (DWR)
    - Tennessee Rapid Assessment Method for Wetlands (TRAM) (TDEC, 2017)
    - Guidance for Making Hydrologic Determinations, Version 1.5 (TDEC, 2020)
- Subsequent regulatory guidance.

Wetland boundaries were identified and marked with sequentially numbered flagging placed on vegetation at the jurisdictional boundaries at 25-to-50-foot intervals or as necessary to maintain visual reference between flags. Coordinates of each flag were collected with 10-centimeter GPS. Data was collected to support the jurisdictional decision. Data collected included:

- USACE Wetland Determination Data Forms - Atlantic and Gulf Coastal Plain
- TRAM Wetland Assessment Forms

Streams and wet weather conveyances (WWCs) were identified and marked on the ordinary high water mark (OHWM) on each bank. GPS was collected on centerline of channels less than 10 feet wide at the OHWM. Channels greater than 10 feet wide at OHWM were GPS located on both sides of the channel at the OHWM. Coordinates were collected along each bend, or as necessary to maintain visual reference, with 10-centimeter GPS. Environmental data was collected to support the determination. All watercourse identifications were reviewed and approved by a TDEC certified Qualified Hydrologic

Professional - In Training (QHP-IT), Preston Butler, PWS. QHP-IT certification allows practitioners to conduct hydrologic determinations (HDs) as the lead investigator. Data collected included:

- Tennessee Hydrologic Determination Field Data Sheets
- Tennessee Water Resource Forms

3.0 Water Resource Results

Water resources within the study area are located within the South Fork Forked Deer River Basin (USGS 8-digit HUC 08010205). The locations of the streams, ponds, wetlands, and WWCs within the study area are shown on Figures 4 and 5 (Appendix A).

Seventeen streams and 38 WWCs were identified within the study area (Appendix B). A total of approximately 12,945 linear feet of stream channel was identified within the study area (10,784 linear feet of intermittent stream and 2,161 linear feet of perennial stream). A total of approximately 9,510 linear feet of WWC was identified within the study area. Tennessee Hydrologic Determination (TN HD) Field Data Sheets and Water Resource forms for each of these identified features are included in Appendix B. Site photos showing these features are included in Appendix C.

Two open surface waters (ponds) were identified within the study area and are detailed in the Water Resource Table (Appendix B). The two ponds' surface area totals approximately 0.21 acres within the study area. Other Resource Features forms for each of these identified features are included in Appendix B. Site photos showing the delineated features are included in Appendix C. Both ponds identified within the study area do not appear to be connected to jurisdictional features by surface flow, and therefore were considered non-jurisdictional.

Two wetlands totaling approximately 0.23 acres were identified within the study area (Appendix C). All wetlands in the study area were classified as Slope wetlands based on the *Hydrogeomorphic (HGM) Classification and Description of Wetlands in Tennessee* described in the 2017 TRAM Manual. They either occurred at the base of slopes, above headwater streams, or adjacent to a developed stream channel. USACE Wetland Determination forms and TRAM Wetland Assessment forms for each wetland feature are included in Appendix B. Site photos showing the delineated features are included in Appendix C.

The TRAM manual defines Exceptional Status Wetlands as wetlands with features or characteristics that merit special attention and consideration. A determination of Exceptional Status Wetland is derived based on 13 criteria listed in the TRAM manual which includes designations of Outstanding Natural Resource Waters (ONRW) and Exceptional Tennessee Waters (ETW), as defined in the TDEC General Water Quality Criteria; ecological value; vegetative species age and composition; wildlife habitat; hydrologic connectivity; and overall TRAM value. No Exceptional Status Wetlands were found in the study area.

4.0 REFERENCES

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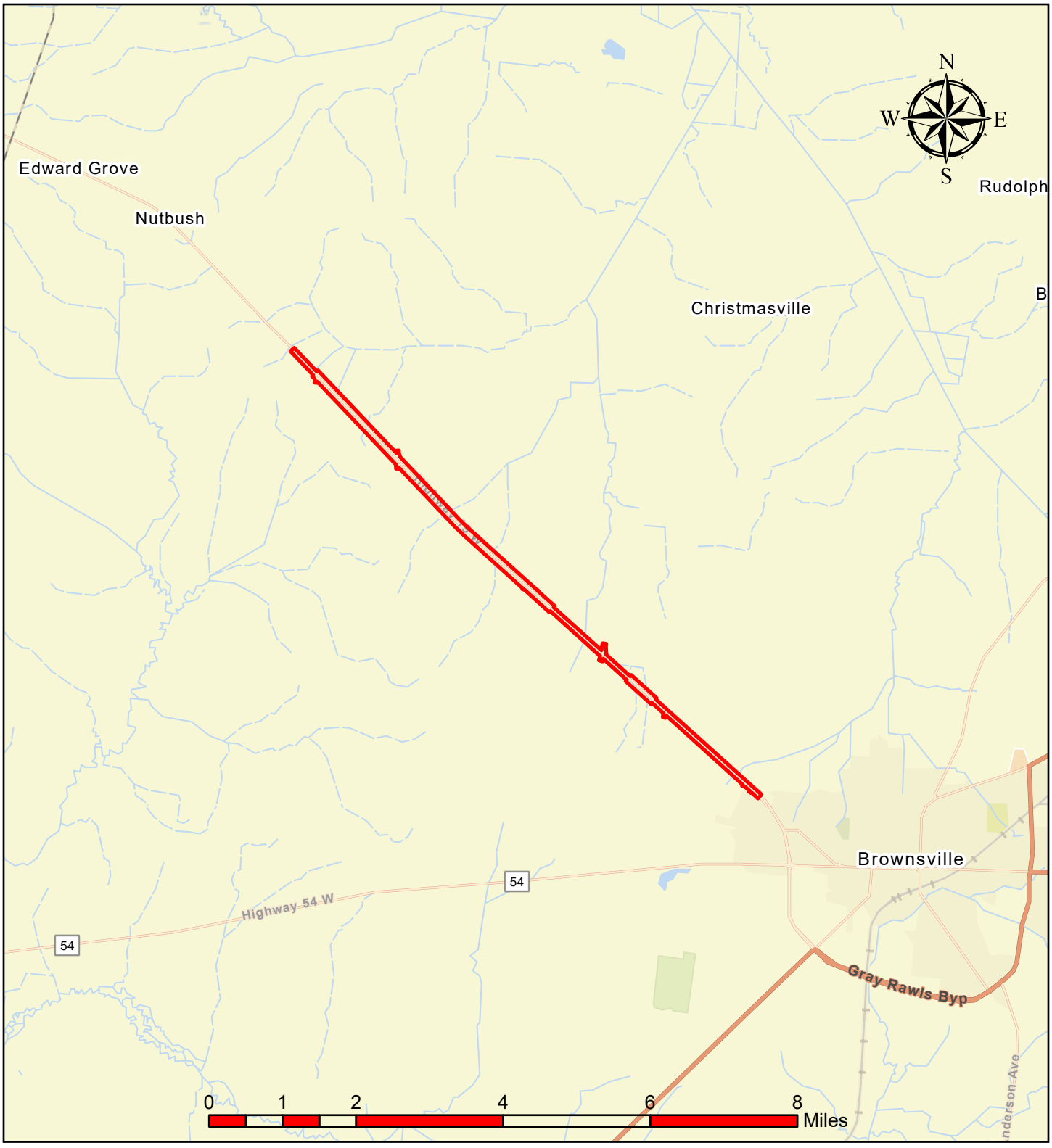
APPENDIX A: FIGURES



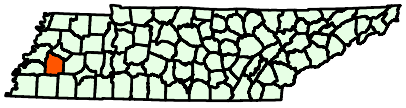


Figure 1: Vicinity Map
Haywood County SR-19 Widening (IA)~ Section 3

ESRI World Street Map Basemap
September 2024

PIN 102251.03

TN TDOT Department of Transportation

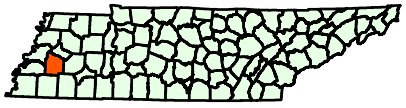
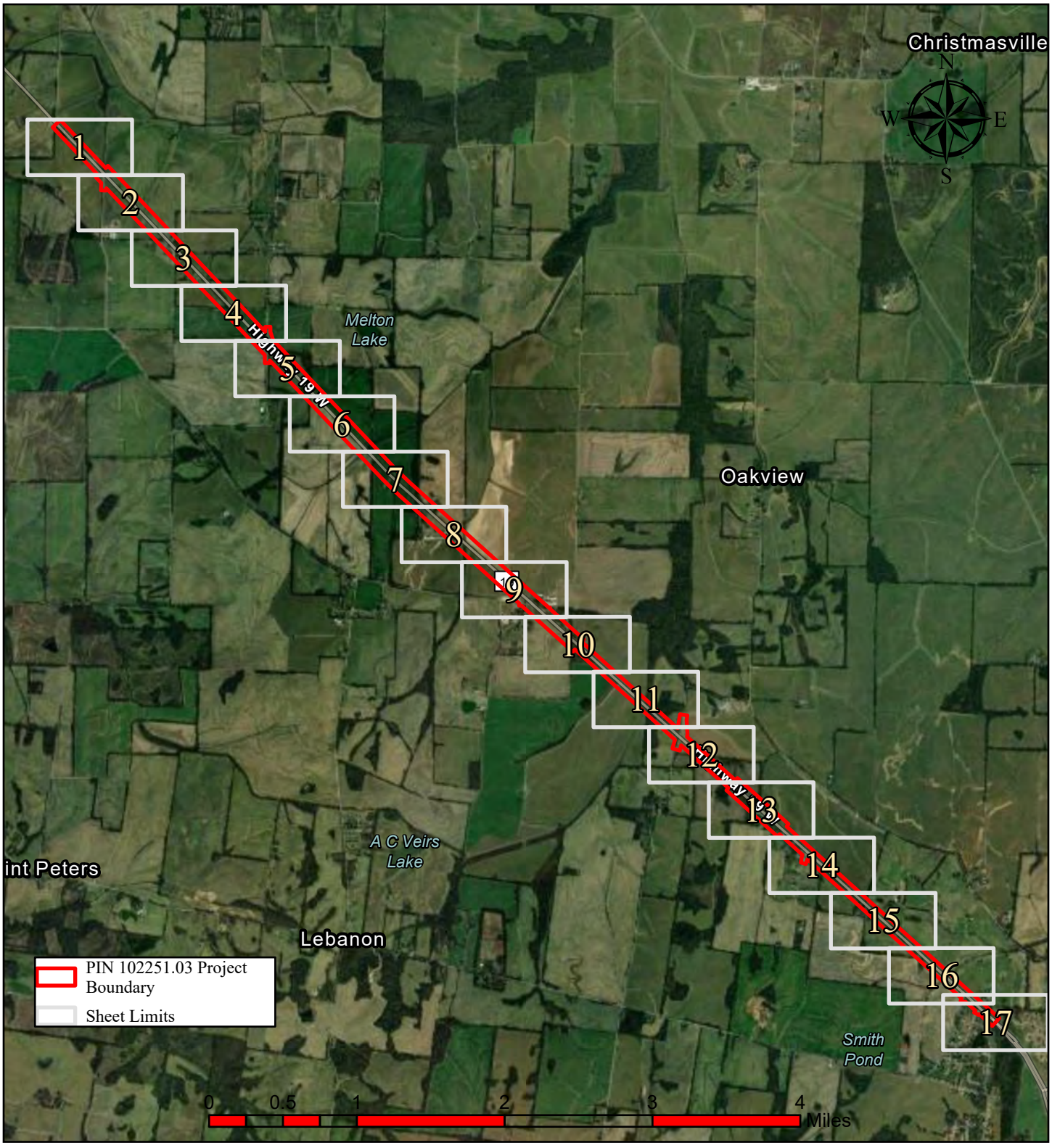


Figure 2: Topographic Map
Haywood County SR-19 Widening (IA)~ Section 3

Tibbs and Brownsville, TN USGS Quadrangle
September 2024

PIN 102251.03

TN TDOT Department of Transportation



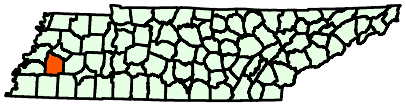
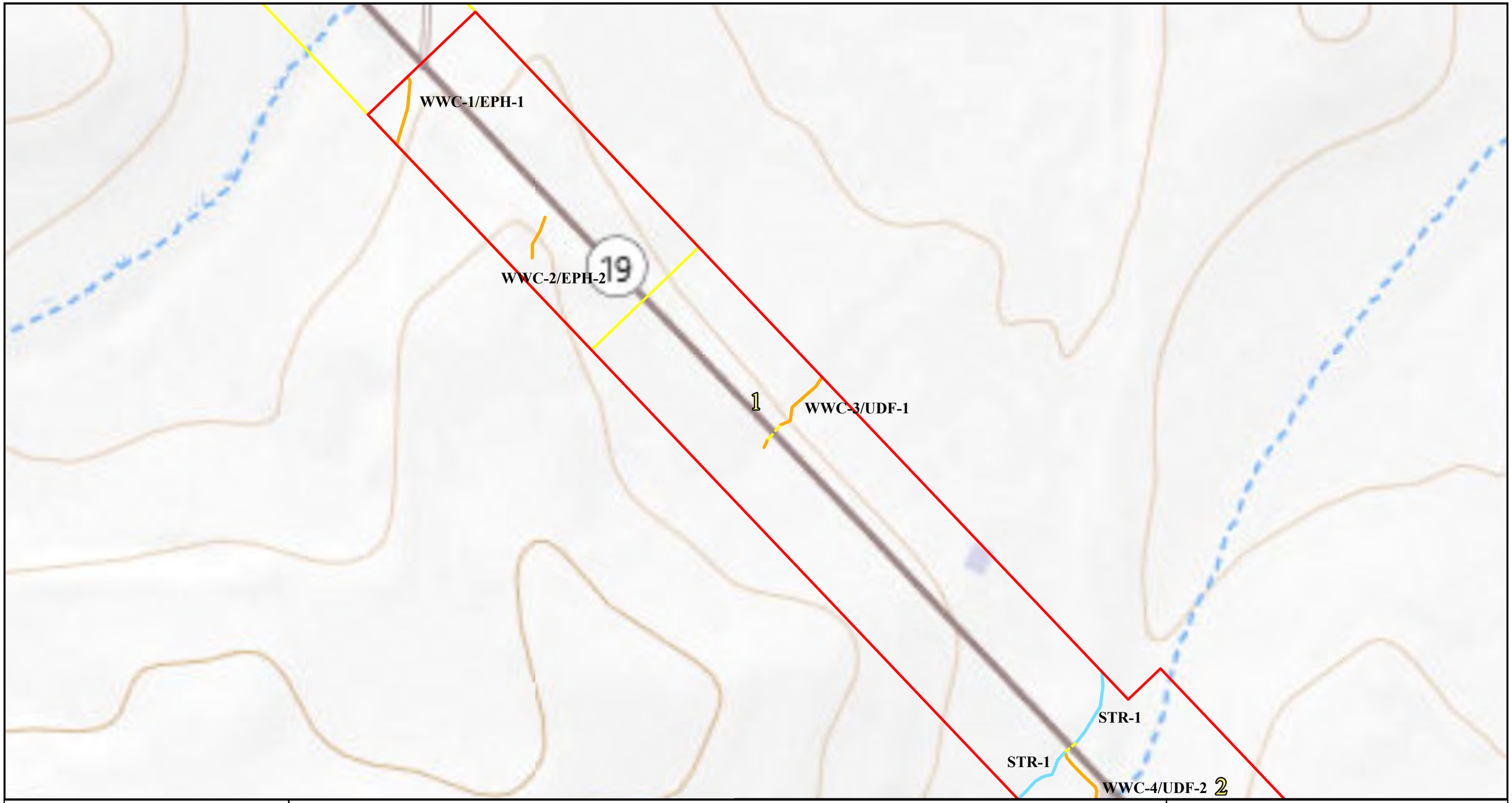


Figure 3: Aerial Map
Haywood County SR-19 Widening (IA)~ Section 3

2016 Maxar Vivid Standard Imagery
September 2024

PIN 102251.03

TN TDOT Department of Transportation



N

0 150 300 US Feet

Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere

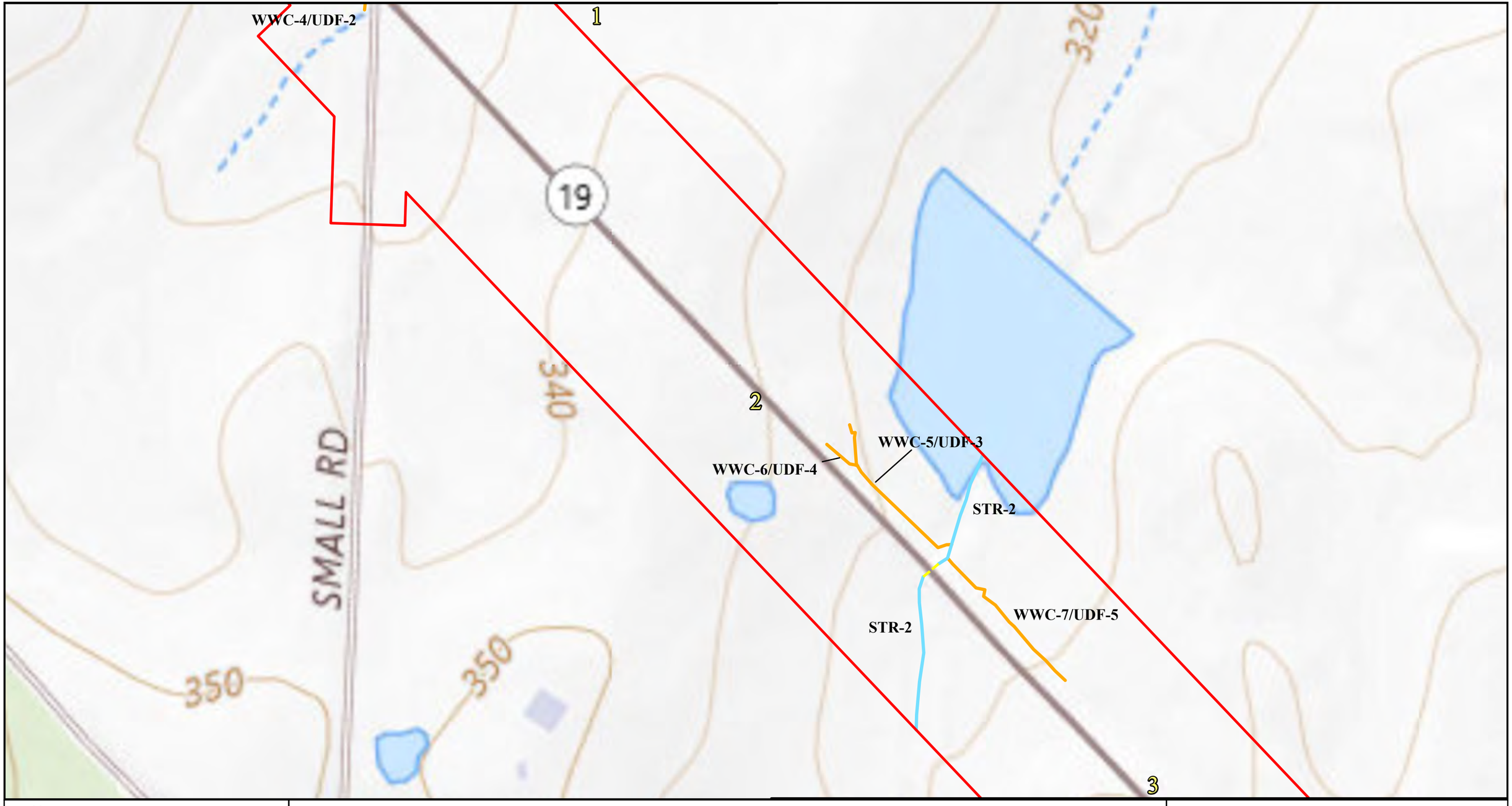
TN TDOT Department of Transportation

- PIN 102251.03 Project Boundary
- PIN 102251.02 Project Boundary
- Sheet Limits
- Wetland Data Form Location
- Potential Wetland (WTL)
- Potential Pond (PND)
- Potential Stream (Intermittent) (STR)
- Potential Stream (Perennial) (STR)
- Wet Weather Conveyance (WWC)
- Culverts

USGS The National Map

Haywood County SR-19 Widening (IA)~ Section 3; PIN 102251.03 TDOT

Figure 4: Topographic Map
Sheet 1 of 17
October 2024



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Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere

TN TDOT Department of Transportation

PIN 102251.03 Project Boundary
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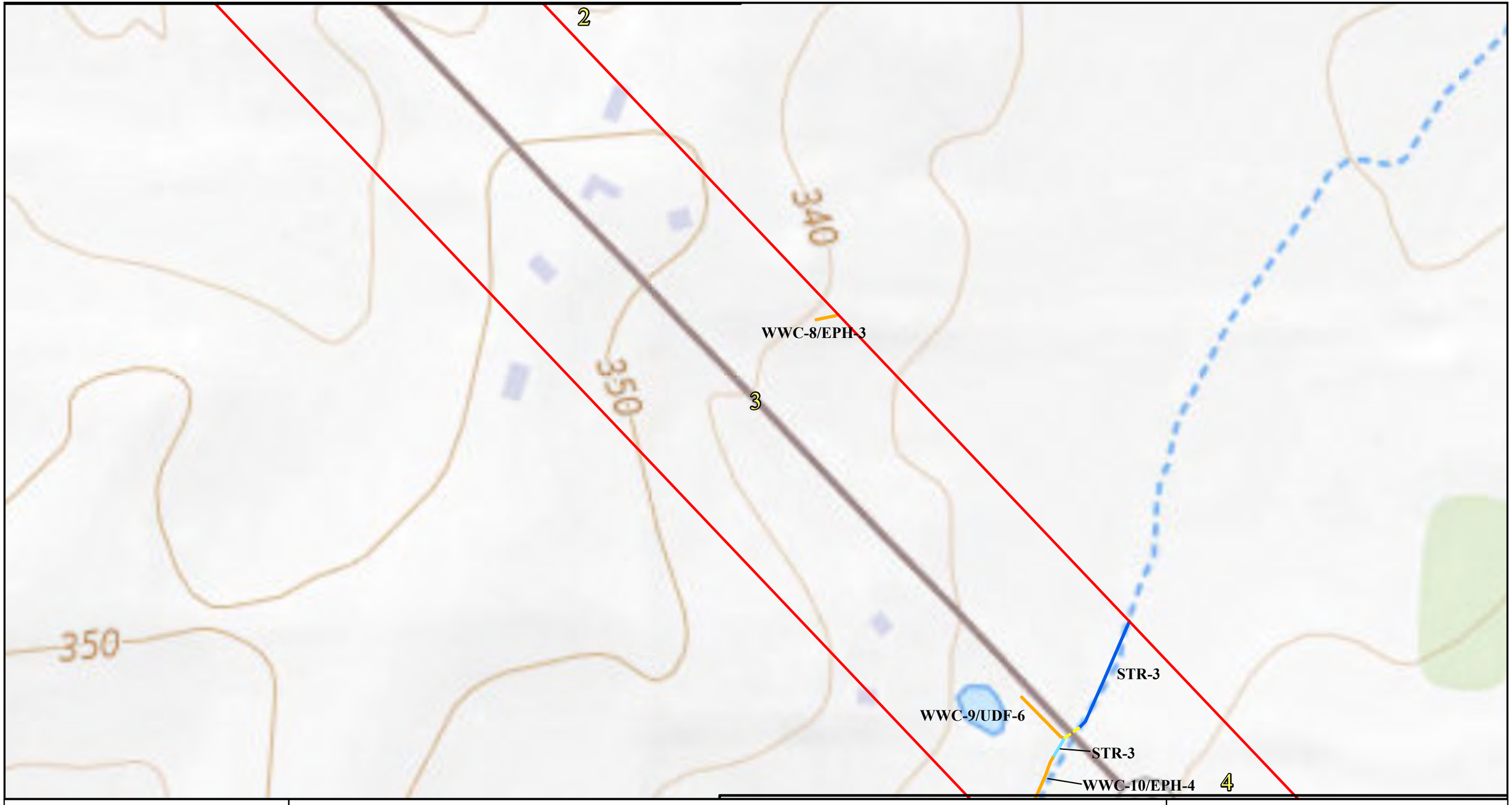
Culverts

USGS The National Map

Haywood County SR-19 Widening (IA)~ Section 3; PIN 102251.03 TDOT

Figure 4: Topographic Map
Sheet 2 of 17
October 2024



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Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere

TN TDOT Department of Transportation

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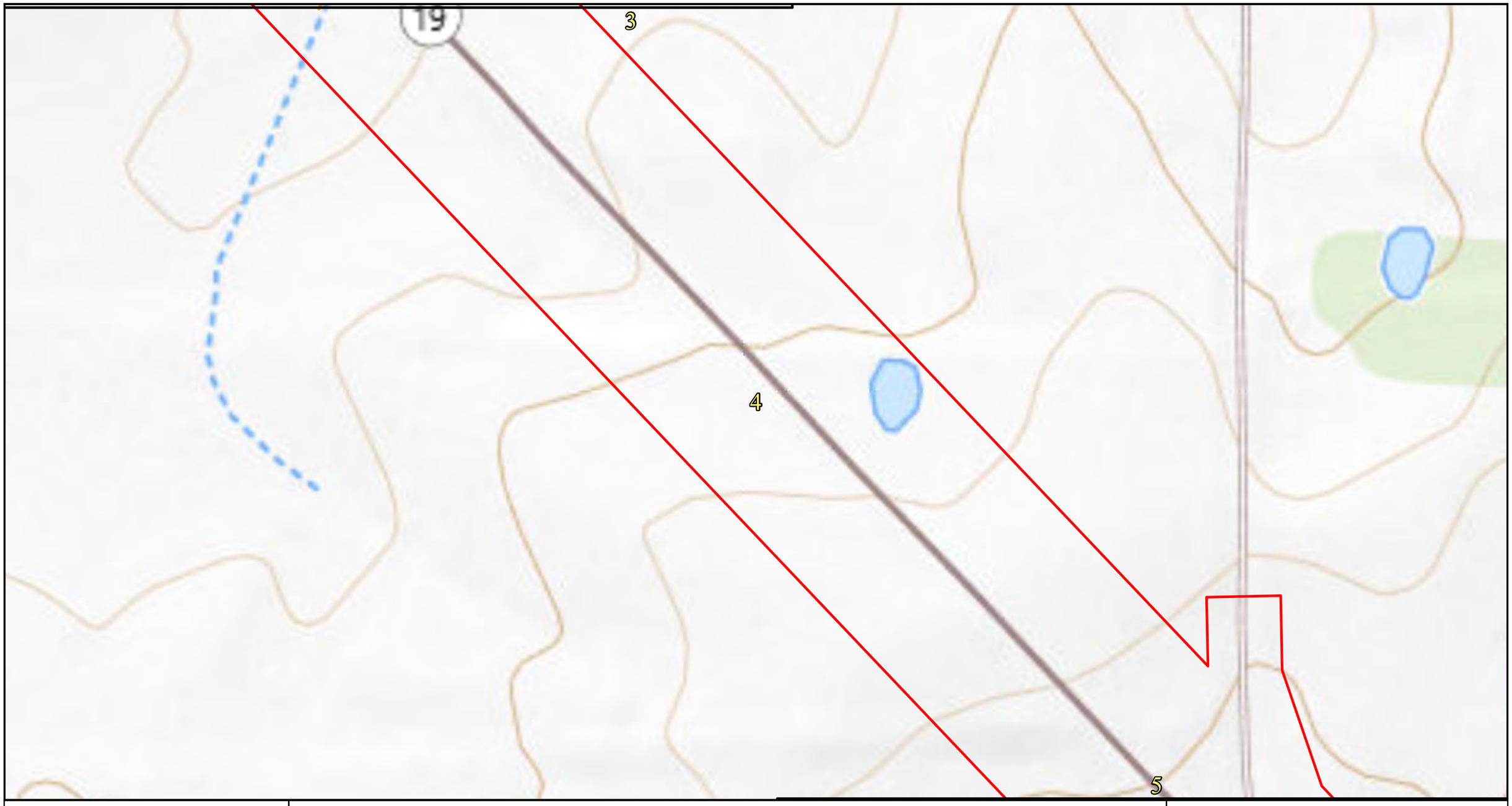
USGS The National Map

Haywood County SR-19 Widening (IA)~ Section 3; PIN 102251.03
TDOT

Figure 4: Topographic Map
Sheet 3 of 17
October 2024



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Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere

TN TDOT Department of Transportation

PIN 102251.03 Project Boundary
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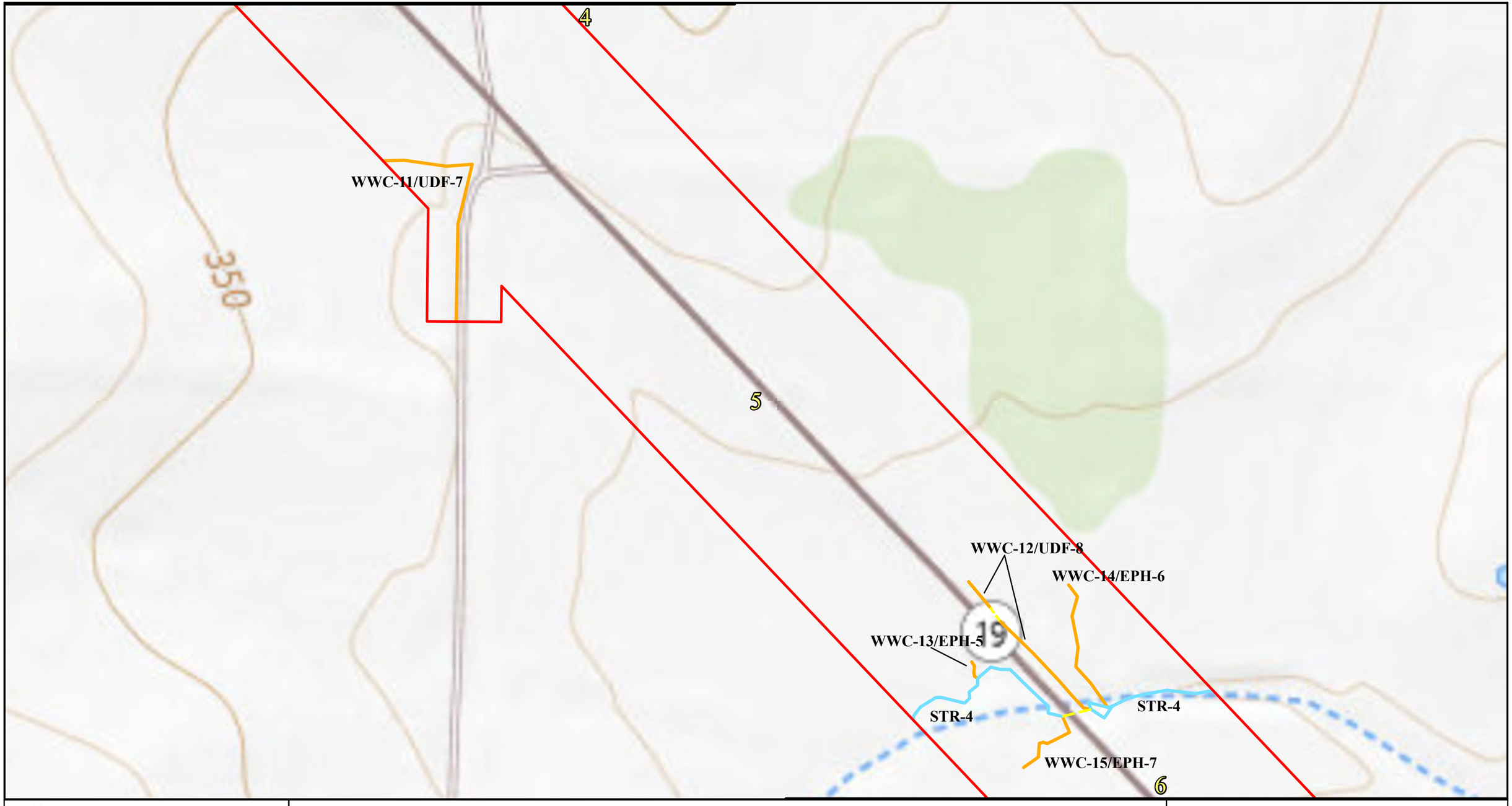
Culverts

USGS The National Map

Haywood County SR-19 Widening (IA)~
Section 3; PIN 102251.03
TDOT

Figure 4: Topographic Map
Sheet 4 of 17
October 2024



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Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere

TN TDOT Department of Transportation

PIN 102251.03 Project Boundary
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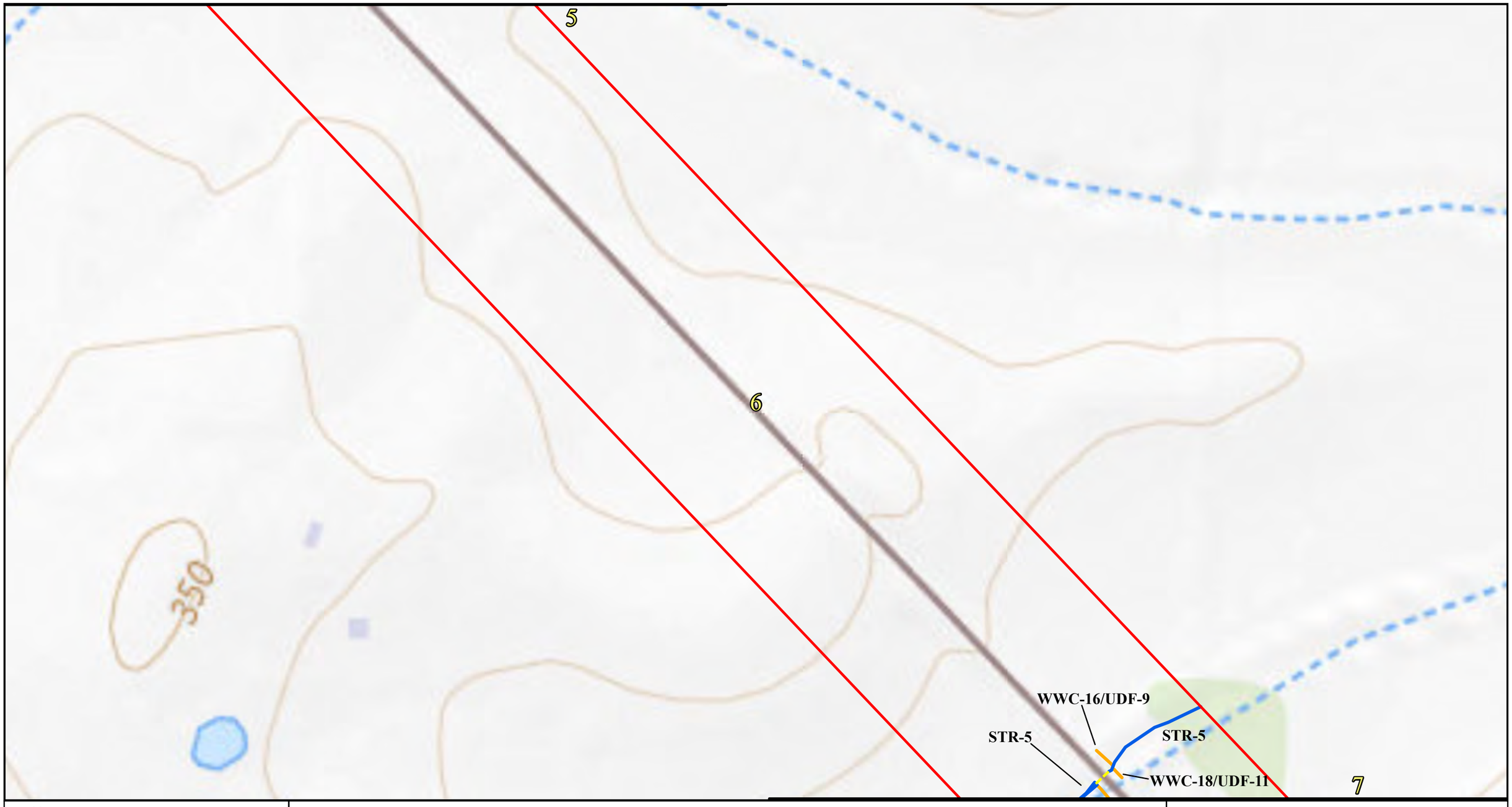
Culverts

USGS The National Map

Haywood County SR-19 Widening (IA)~
Section 3; PIN 102251.03
TDOT

Figure 4: Topographic Map
Sheet 5 of 17
October 2024



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Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere

TN TDOT Department of Transportation

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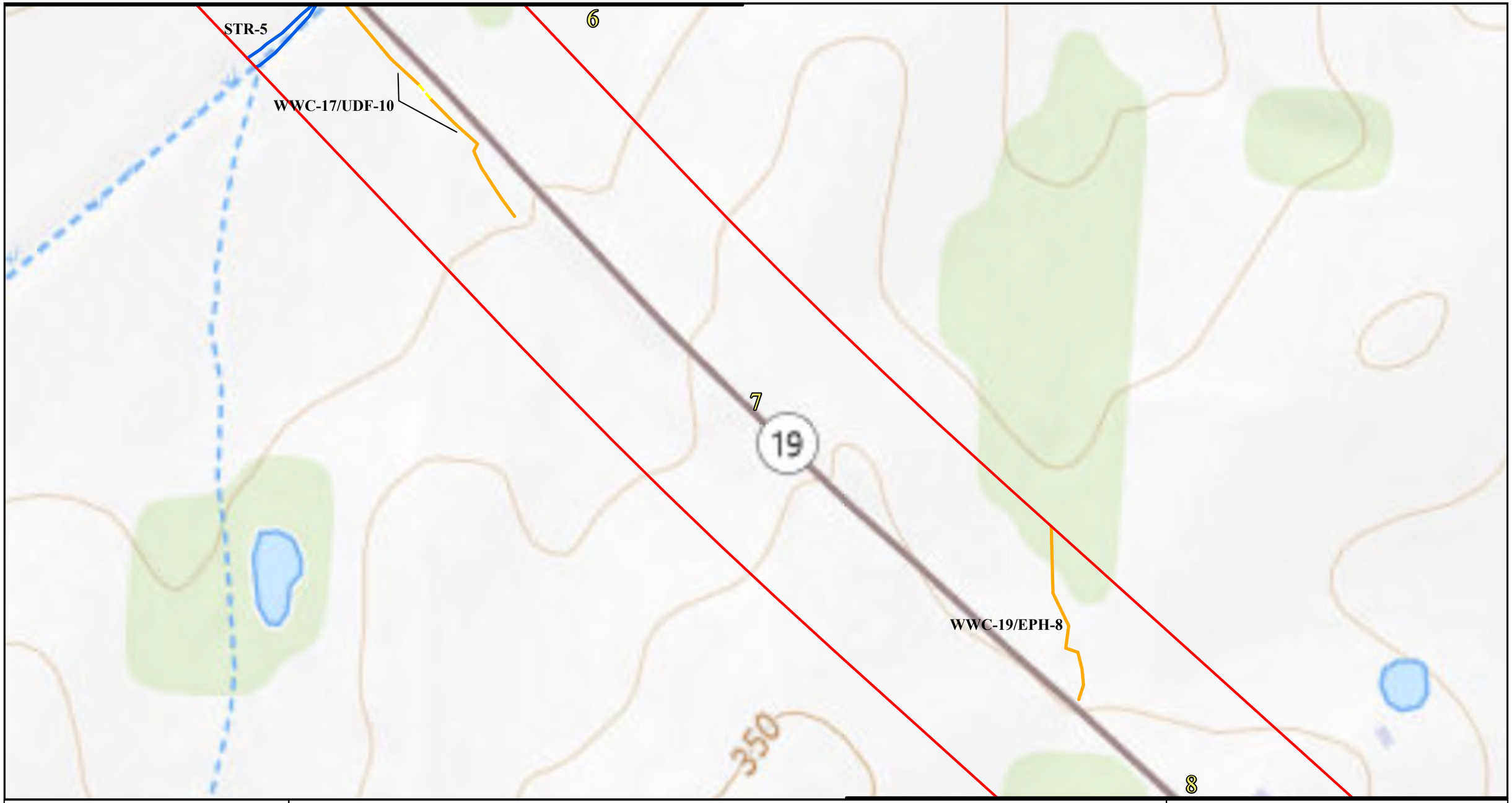
USGS The National Map

Haywood County SR-19 Widening (IA)~ Section 3; PIN 102251.03 TDOT

Figure 4: Topographic Map
Sheet 6 of 17
October 2024



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Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere

TN TDOT Department of Transportation

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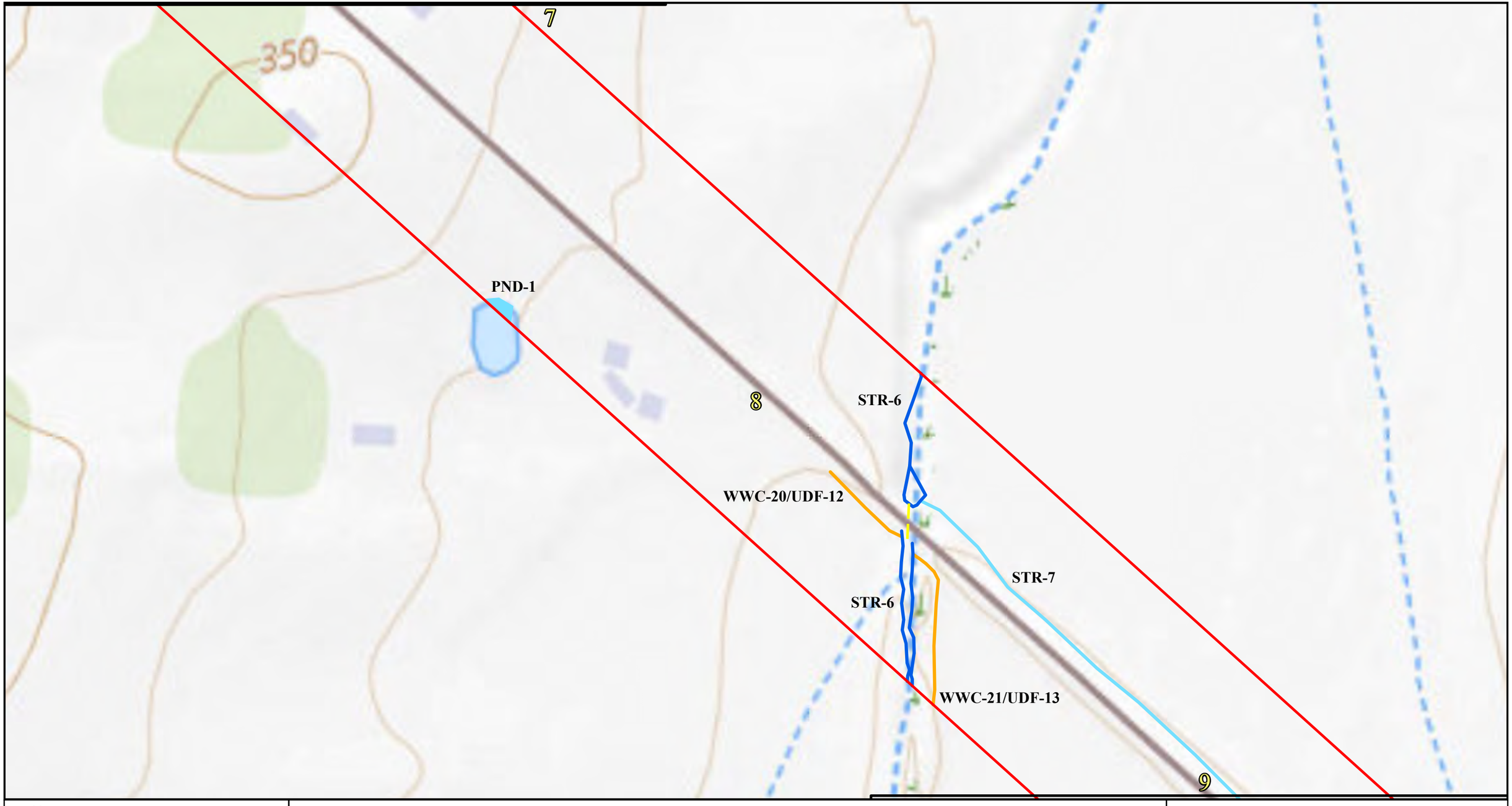
USGS The National Map

Haywood County SR-19 Widening (IA)~
Section 3; PIN 102251.03
TDOT

Figure 4: Topographic Map
Sheet 7 of 17
October 2024



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Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere

TN TDOT Department of Transportation

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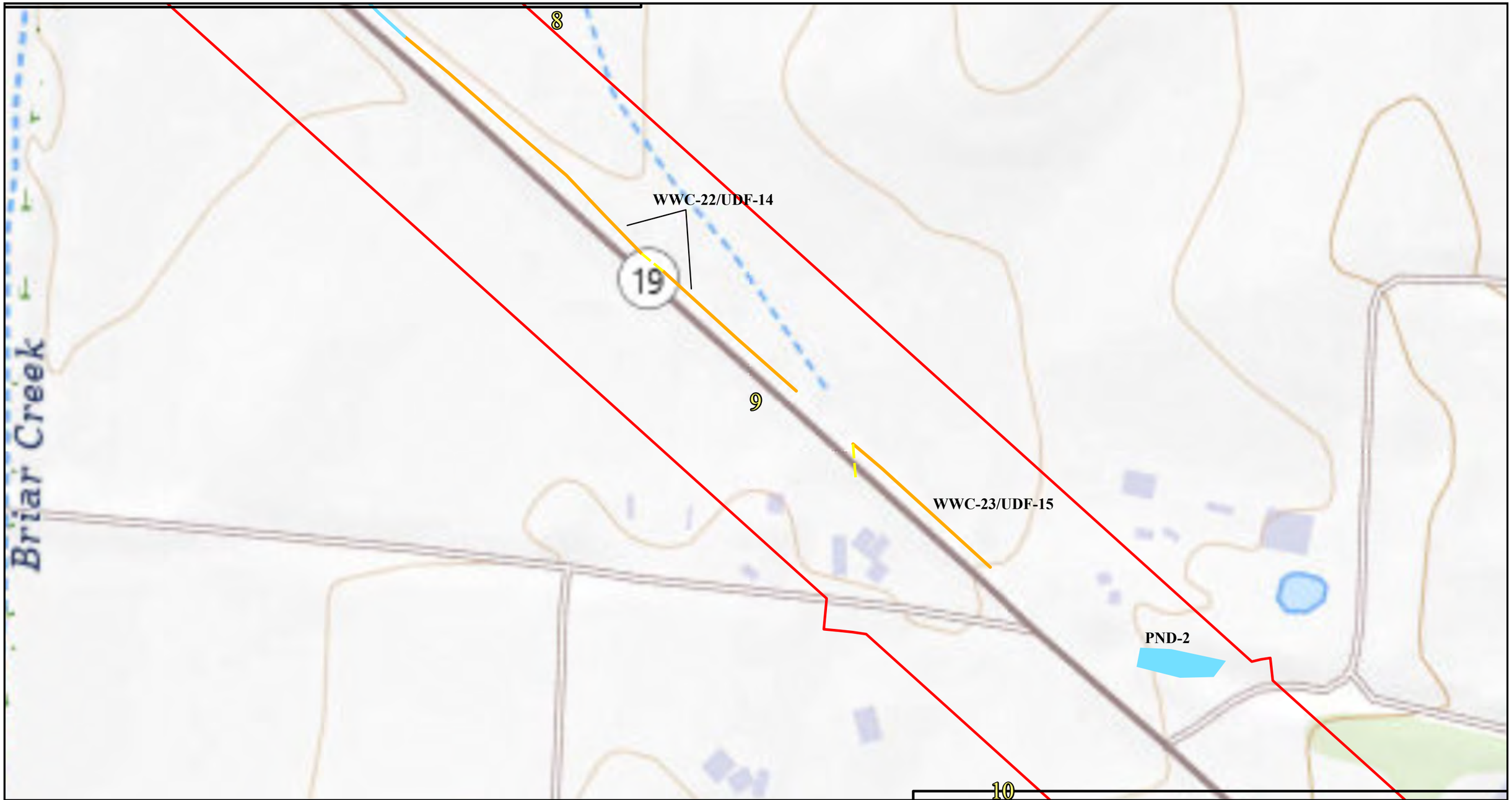
USGS The National Map

Haywood County SR-19 Widening (IA)~ Section 3; PIN 102251.03 TDOT

Figure 4: Topographic Map
Sheet 8 of 17
October 2024



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Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere

TN TDOT Department of Transportation

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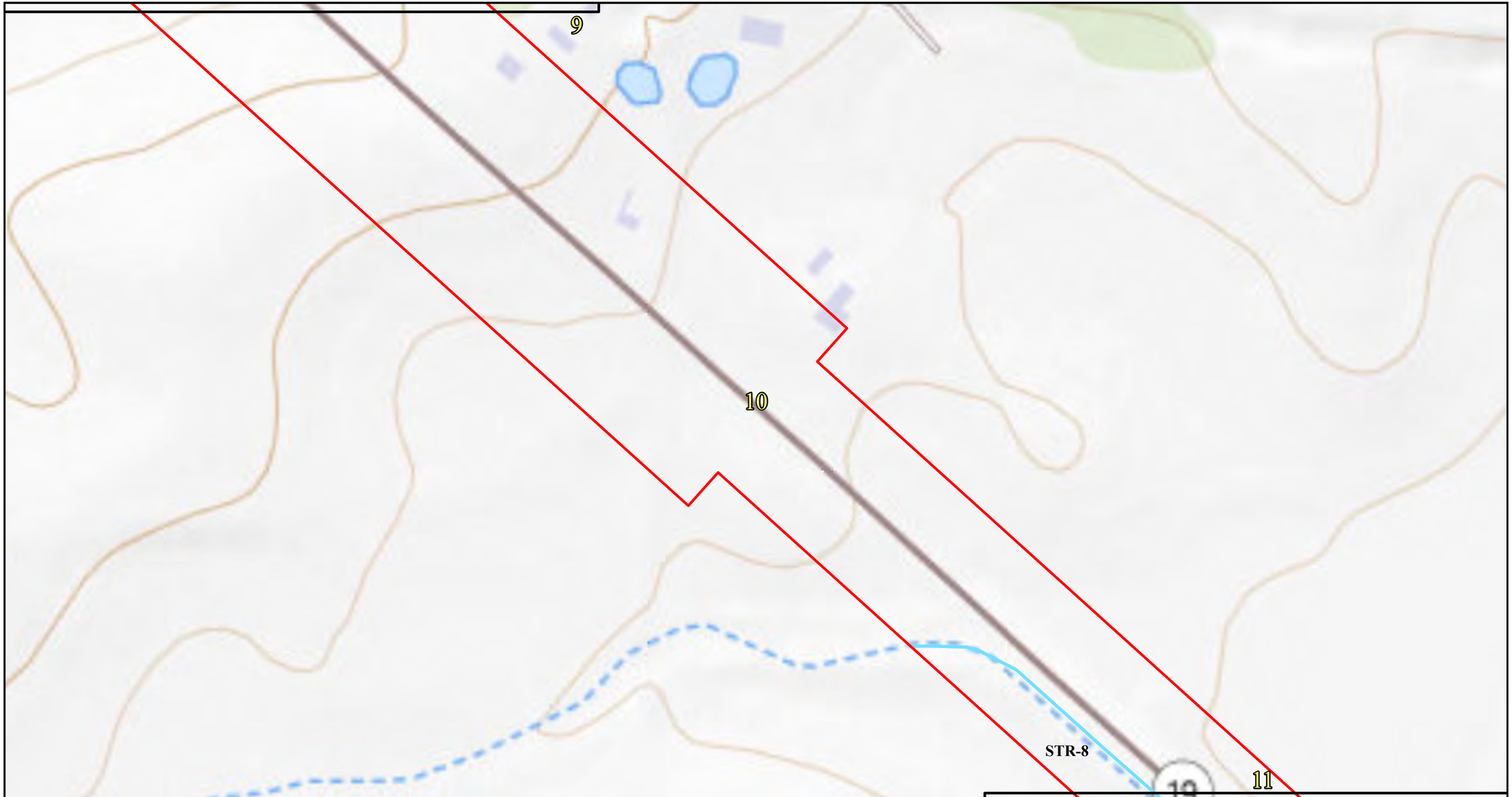
USGS The National Map

Haywood County SR-19 Widening (IA)~ Section 3; PIN 102251.03 TDOT

Figure 4: Topographic Map
Sheet 9 of 17
October 2024



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TN TDOT Department of Transportation

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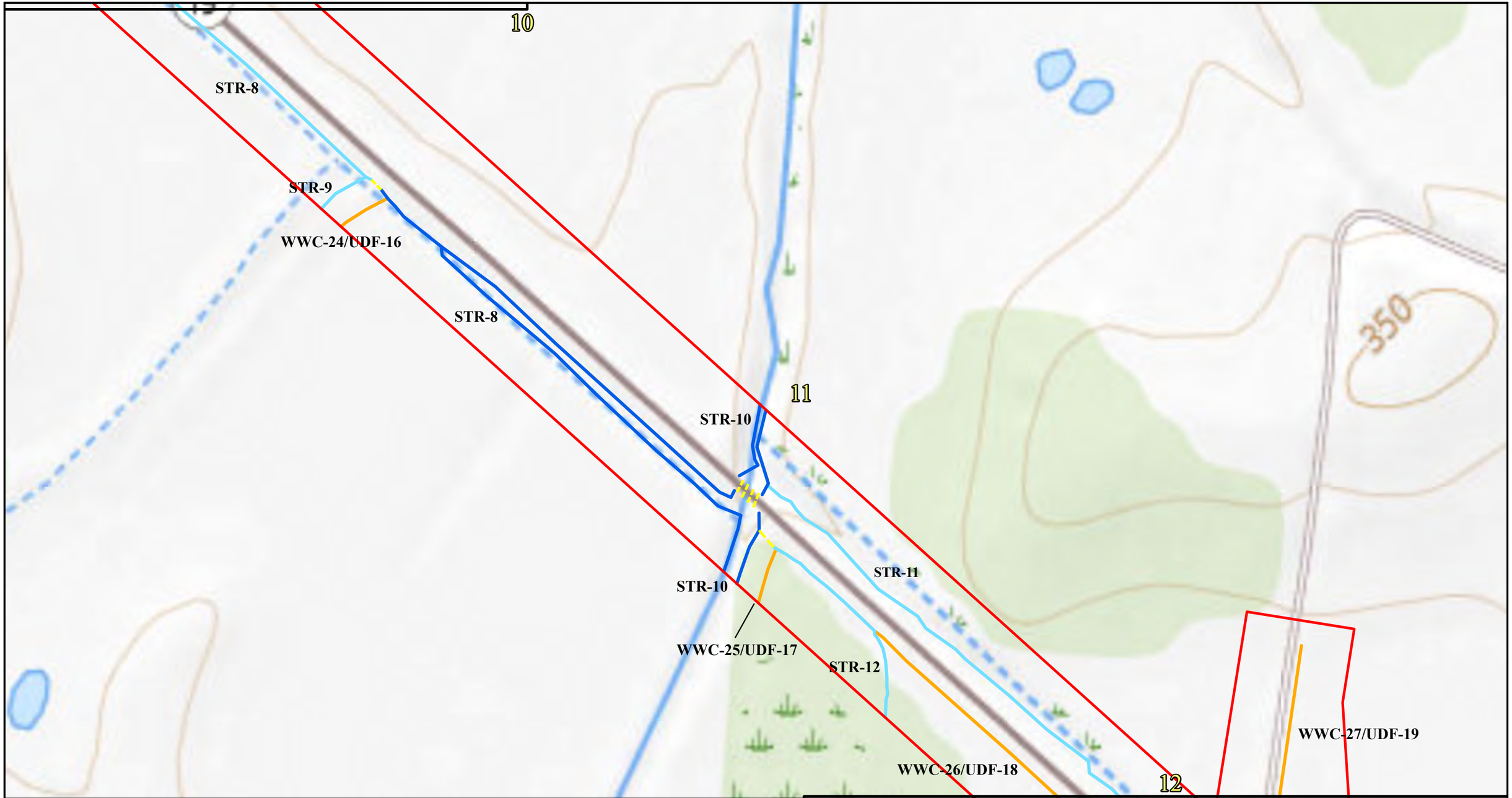
USGS The National Map

Haywood County SR-19 Widening (IA)~
Section 3; PIN 102251.03
TDOT

Figure 4: Topographic Map
Sheet 10 of 17
October 2024



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Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere

TN TDOT Department of Transportation

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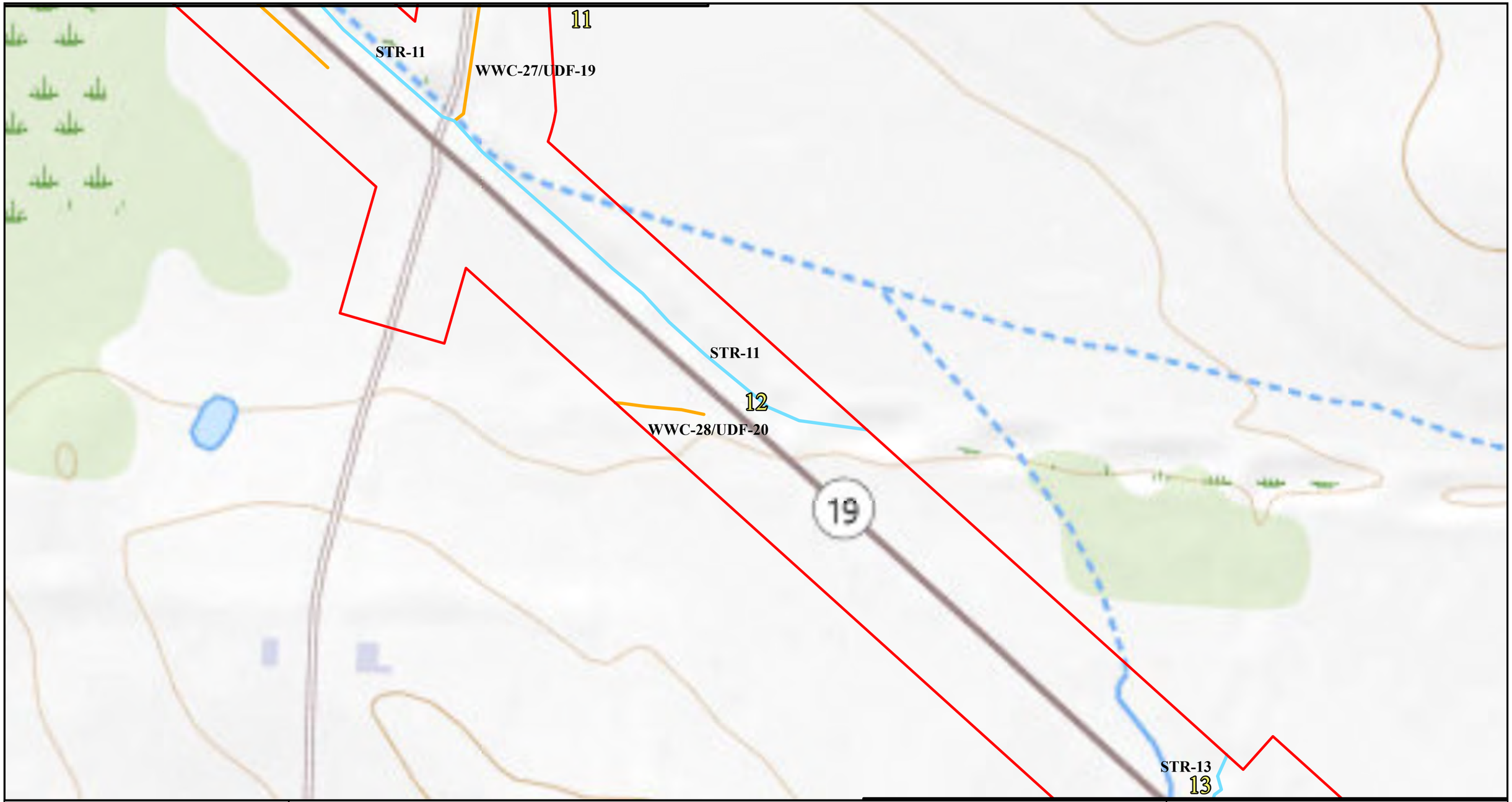
USGS The National Map

Haywood County SR-19 Widening (IA)~
Section 3; PIN 102251.03
TDOT

Figure 4: Topographic Map
Sheet 11 of 17
October 2024



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Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere

TN TDOT Department of Transportation

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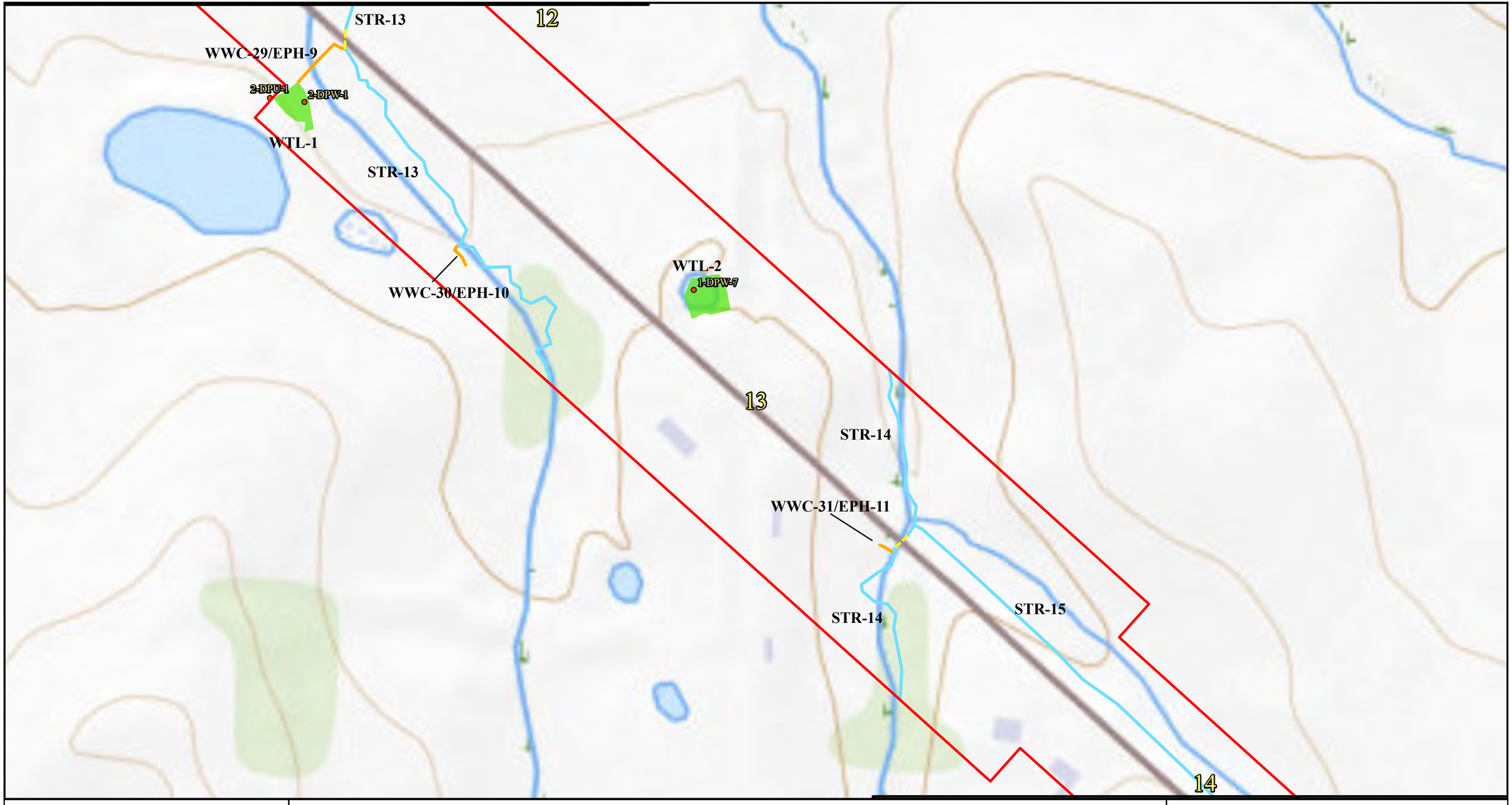
USGS The National Map

Haywood County SR-19 Widening (IA)~ Section 3; PIN 102251.03 TDOT

Figure 4: Topographic Map
Sheet 12 of 17
October 2024



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Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere

TN TDOT Department of Transportation

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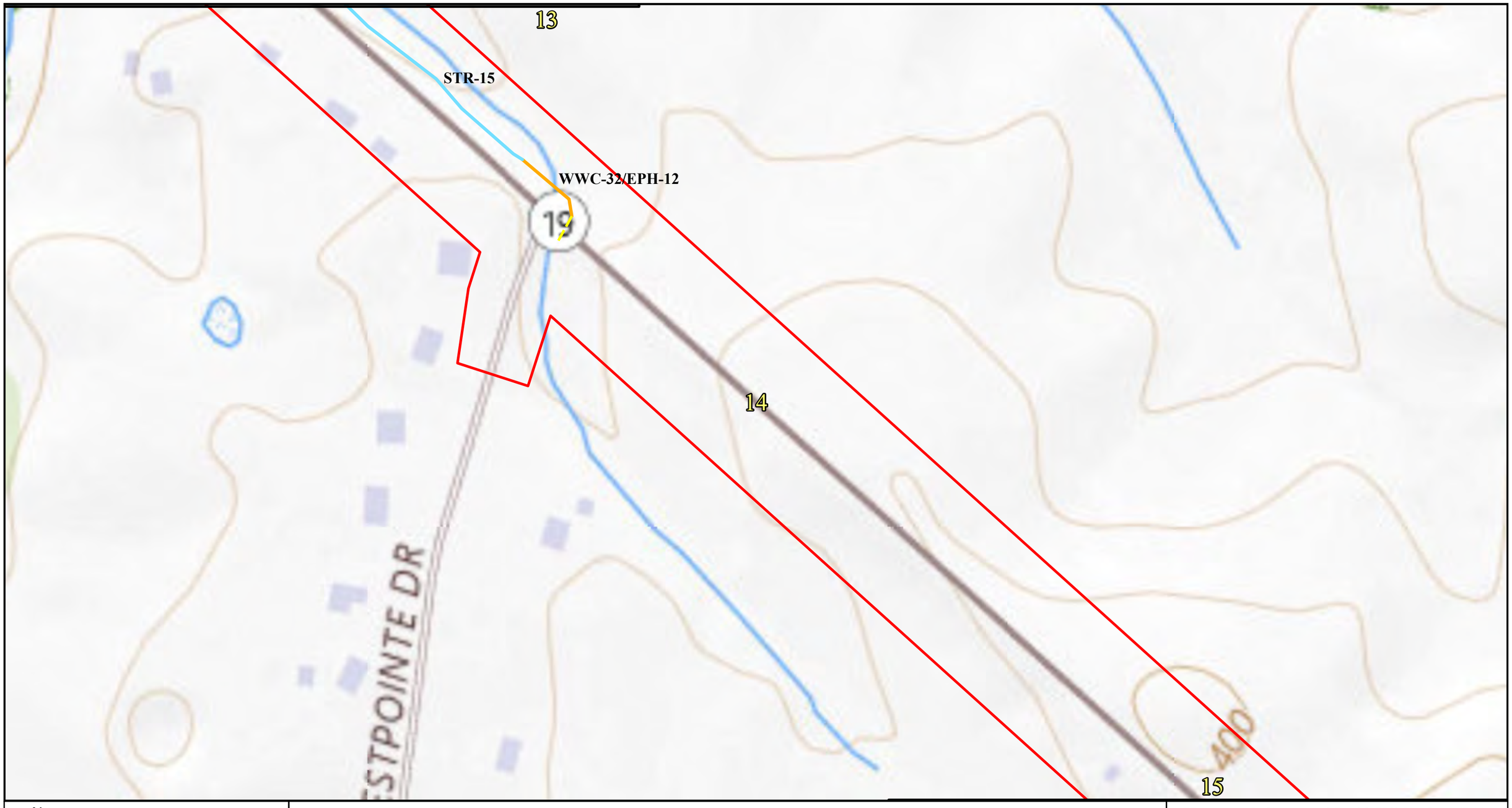
USGS The National Map

Haywood County SR-19 Widening (IA)~
Section 3; PIN 102251.03
TDOT

Figure 4: Topographic Map
Sheet 13 of 17
October 2024



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Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere

TN TDOT Department of Transportation

PIN 102251.03 Project Boundary
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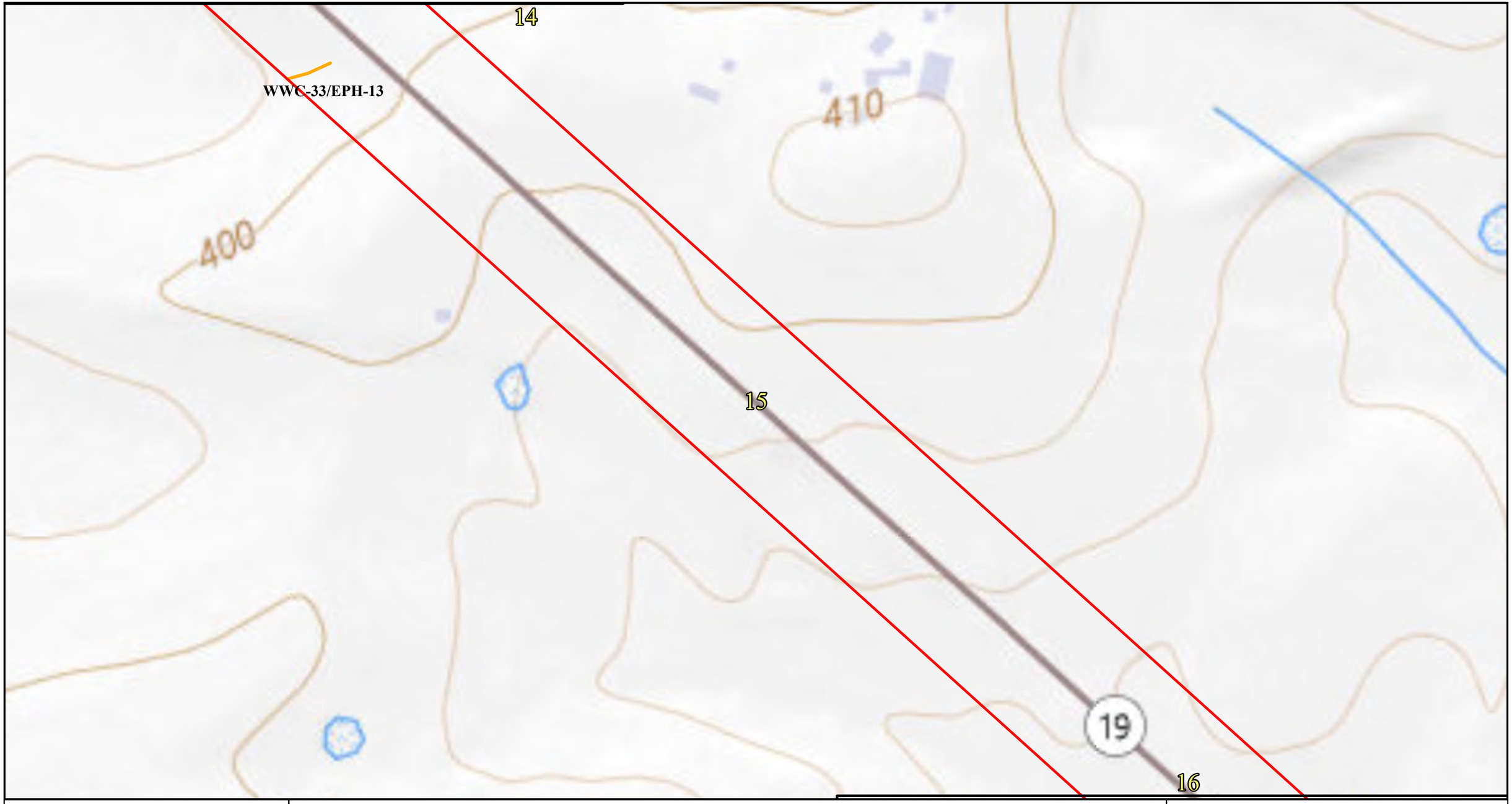
USGS The National Map

Haywood County SR-19 Widening (IA)~ Section 3; PIN 102251.03 TDOT

Figure 4: Topographic Map
Sheet 14 of 17
October 2024



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Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere

TN TDOT Department of Transportation

PIN 102251.03 Project Boundary
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Wetland Data Form Location
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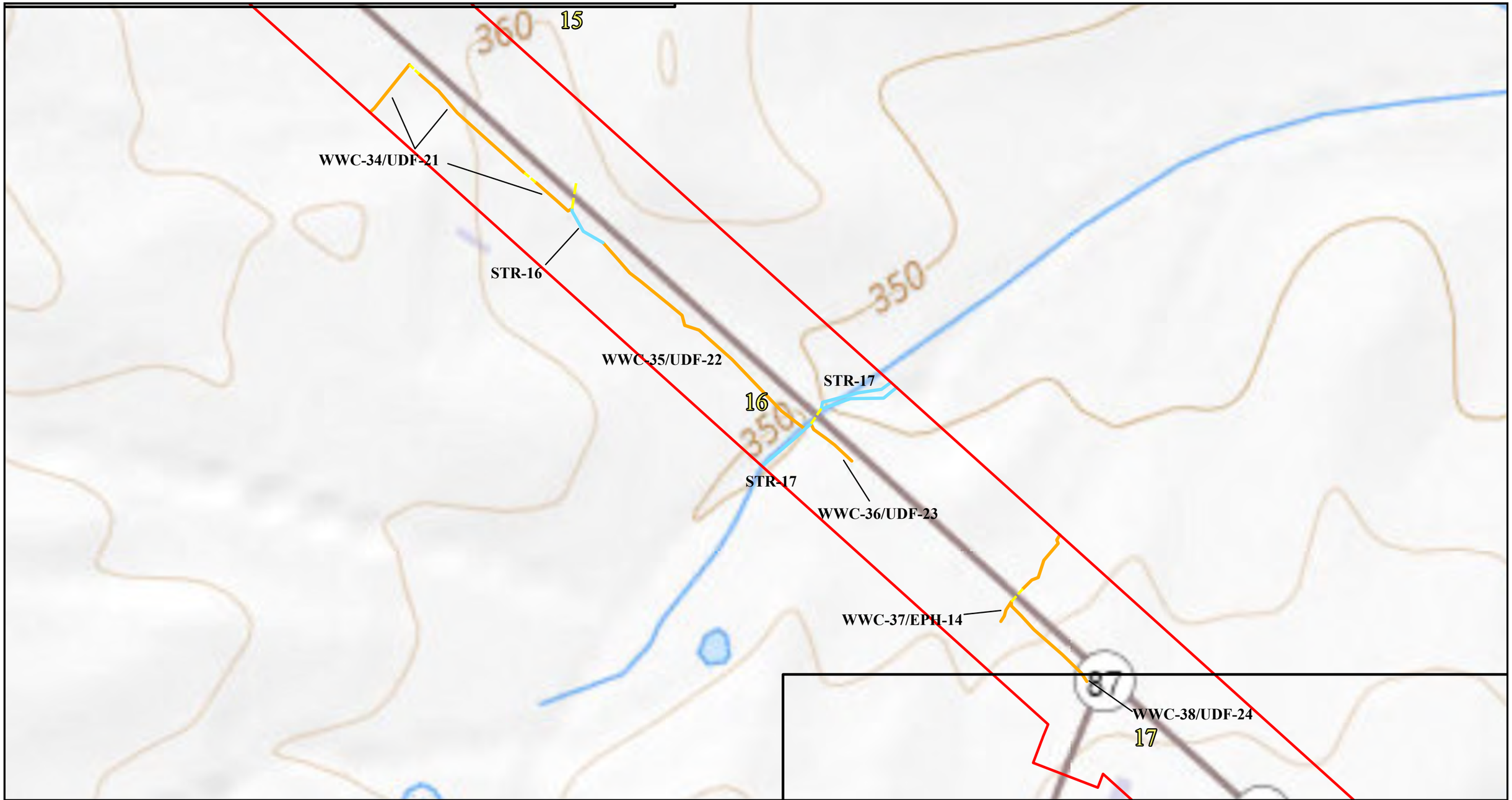
Culverts

USGS The National Map

Haywood County SR-19 Widening (IA)~ Section 3; PIN 102251.03 TDOT

Figure 4: Topographic Map
Sheet 15 of 17
October 2024



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Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere

TN TDOT Department of Transportation

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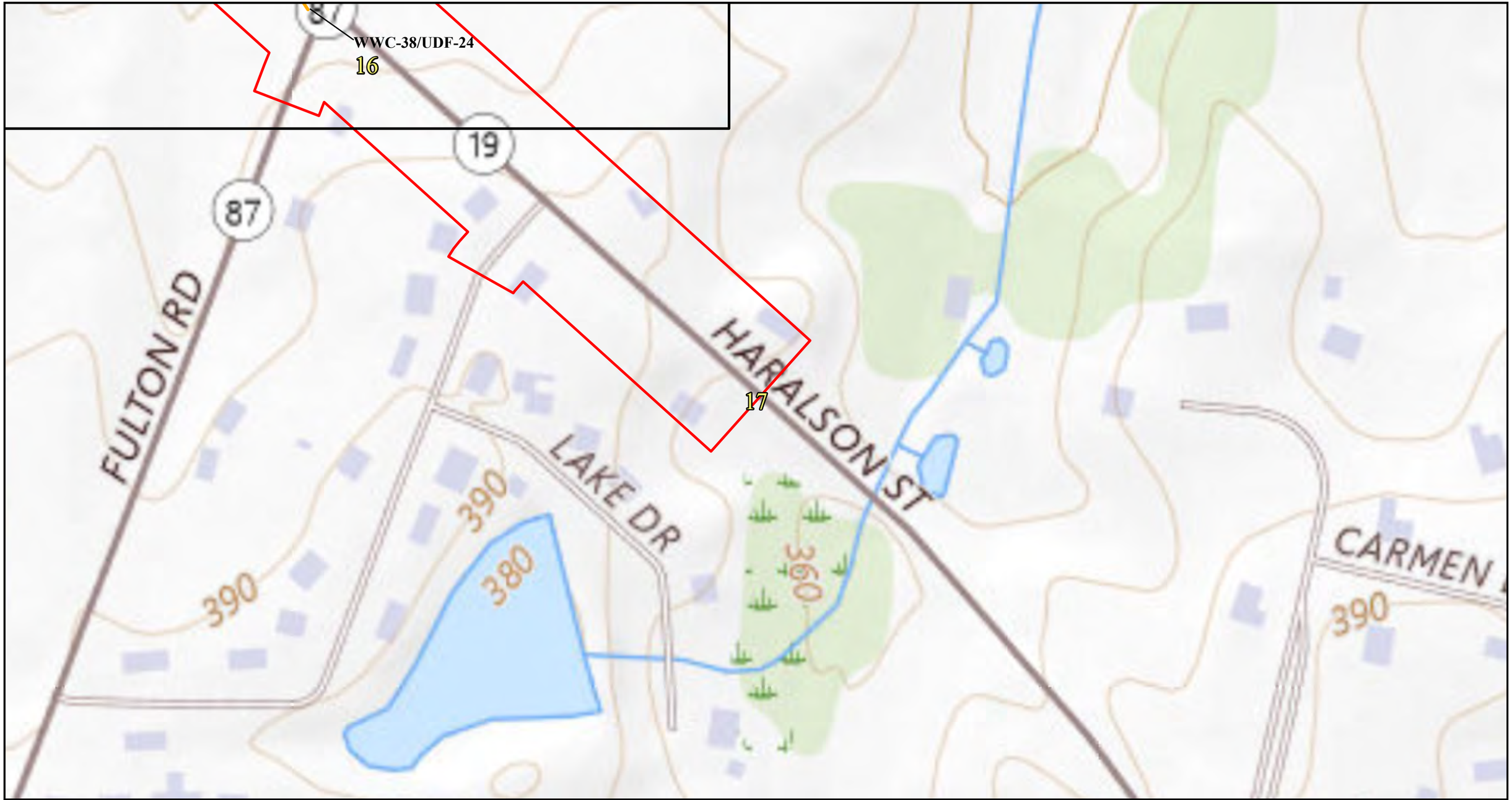
Culverts

USGS The National Map

Haywood County SR-19 Widening (IA)~ Section 3; PIN 102251.03 TDOT

Figure 4: Topographic Map
Sheet 16 of 17
October 2024



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TN TDOT Department of Transportation

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USGS The National Map

Haywood County SR-19 Widening (IA)~
Section 3; PIN 102251.03
TDOT

Figure 4: Topographic Map
Sheet 17 of 17
October 2024

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0 150 300 US Feet

Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere

TN TDOT Department of Transportation

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2016 Maxar Vivid Standard Imagery / ESRI Hybrid Reference Layer

Haywood County SR-19 Widening (IA)~ Section 3; PIN 102251.03 TDOT

Figure 5: Aerial Map
Sheet 1 of 17
October 2024

N

0 150 300 US Feet

Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere

TN TDOT Department of Transportation

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2016 Maxar Vivid Standard Imagery / ESRI Hybrid Reference Layer

Haywood County SR-19 Widening (IA)~
Section 3; PIN 102251.03
TDOT

Figure 5: Aerial Map
Sheet 2 of 17
October 2024

N

0 150 300 US Feet

Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere

TN TDOT Department of Transportation

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2016 Maxar Vivid Standard Imagery / ESRI Hybrid Reference Layer

Haywood County SR-19 Widening (IA)~ Section 3; PIN 102251.03 TDOT

Figure 5: Aerial Map
Sheet 3 of 17
October 2024

N

0 150 300 US Feet

Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere

TN TDOT Department of Transportation

PIN 102251.03 Project Boundary
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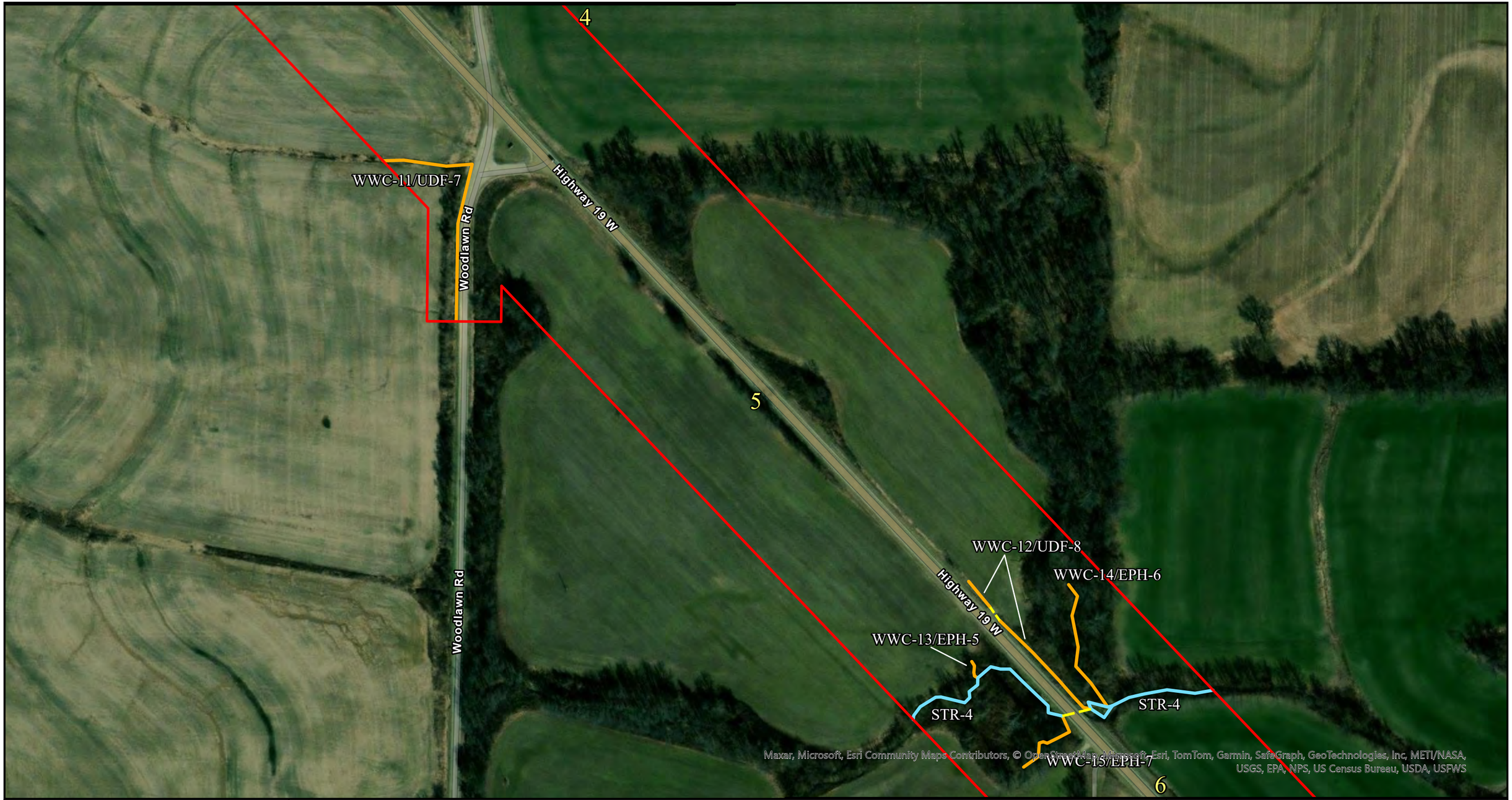
Culverts

2016 Maxar Vivid Standard Imagery / ESRI Hybrid Reference Layer

Haywood County SR-19 Widening (IA)~ Section 3; PIN 102251.03 TDOT

Figure 5: Aerial Map
Sheet 4 of 17
October 2024



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TN TDOT Department of Transportation

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2016 Maxar Vivid Standard Imagery / ESRI Hybrid Reference Layer

Haywood County SR-19 Widening (IA)~ Section 3; PIN 102251.03 TDOT

Figure 5: Aerial Map
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October 2024

N

0 150 300 US Feet

Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere

TN TDOT Department of Transportation

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2016 Maxar Vivid Standard Imagery / ESRI Hybrid Reference Layer

Haywood County SR-19 Widening (IA)~
Section 3; PIN 102251.03
TDOT

Figure 5: Aerial Map
Sheet 6 of 17
October 2024

N

0 150 300 US Feet

Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere

TN TDOT Department of Transportation

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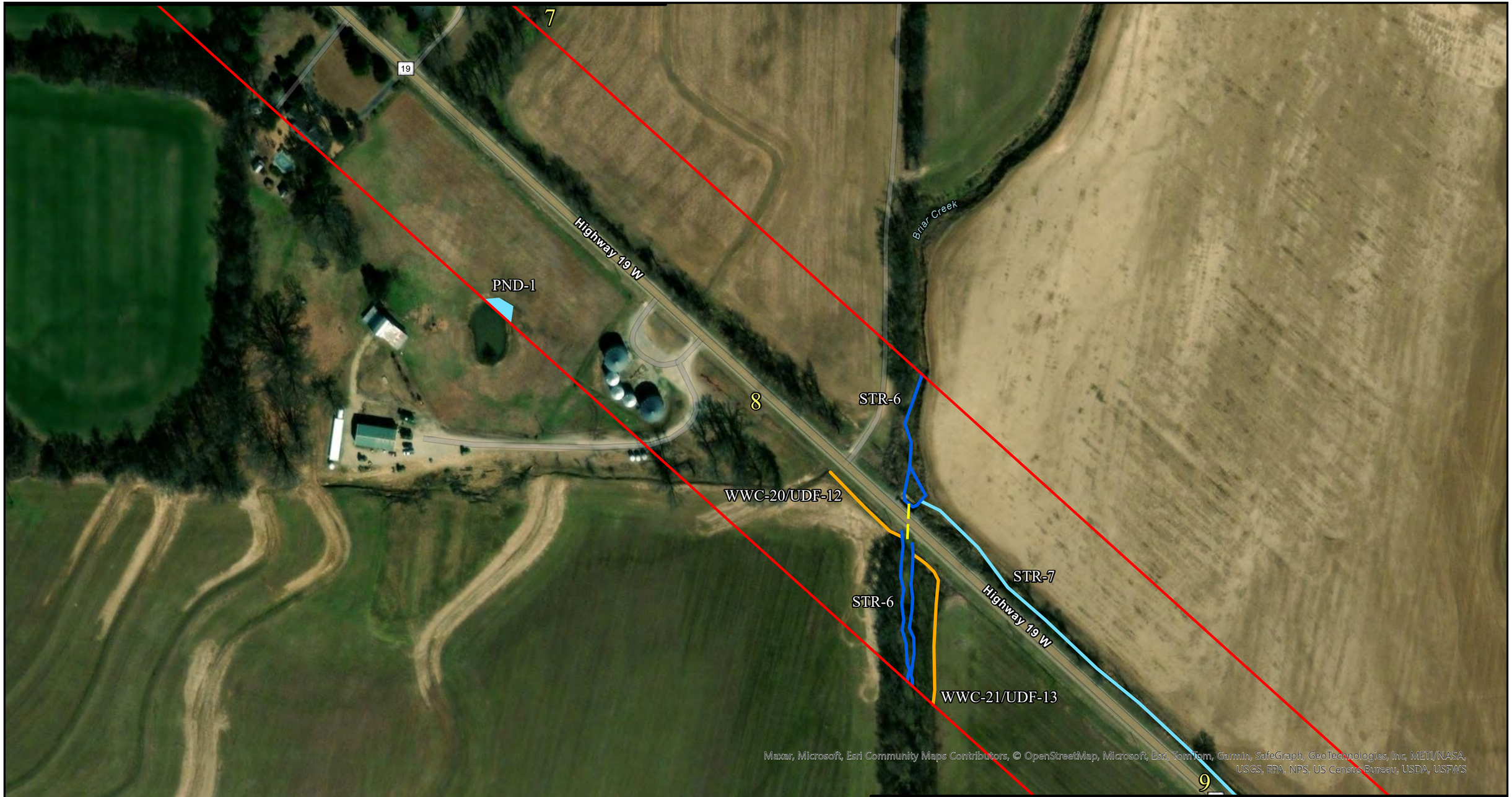
2016 Maxar Vivid Standard Imagery / ESRI Hybrid Reference Layer

Haywood County SR-19 Widening (IA)~ Section 3; PIN 102251.03 TDOT

Figure 5: Aerial Map
Sheet 7 of 17
October 2024



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TN TDOT Department of Transportation

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2016 Maxar Vivid Standard Imagery / ESRI Hybrid Reference Layer

Haywood County SR-19 Widening (IA)~
Section 3; PIN 102251.03
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Figure 5: Aerial Map
Sheet 8 of 17
October 2024

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0 150 300 US Feet

Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere

TN TDOT Department of Transportation

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2016 Maxar Vivid Standard Imagery / ESRI Hybrid Reference Layer

Haywood County SR-19 Widening (IA)~
Section 3; PIN 102251.03
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Figure 5: Aerial Map
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October 2024

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0 150 300 US Feet

Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere

TN TDOT Department of Transportation

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2016 Maxar Vivid Standard Imagery / ESRI Hybrid Reference Layer

Haywood County SR-19 Widening (IA)~ Section 3; PIN 102251.03 TDOT

Figure 5: Aerial Map
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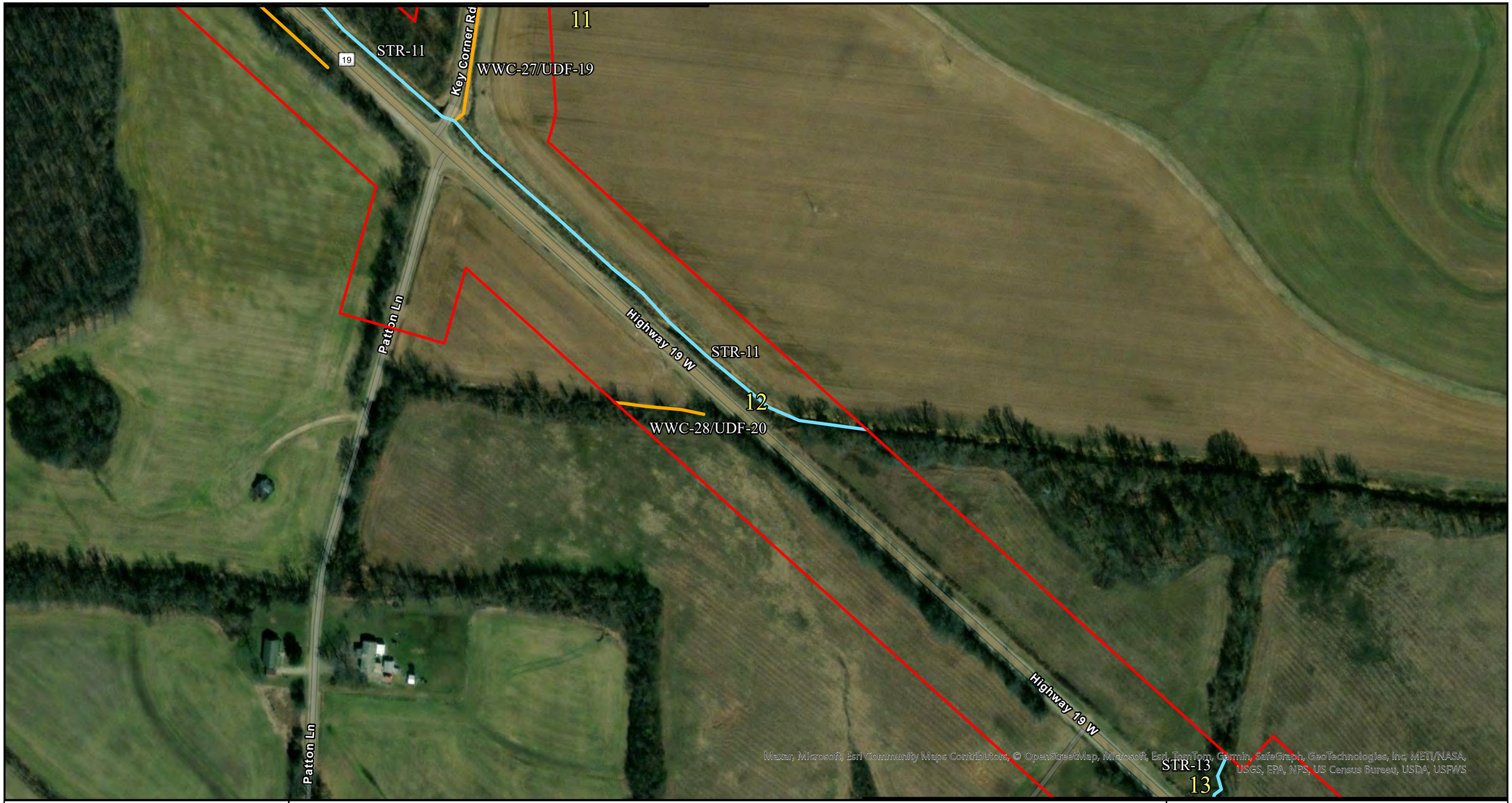
2016 Maxar Vivid Standard Imagery / ESRI Hybrid Reference Layer

Haywood County SR-19 Widening (IA)~ Section 3; PIN 102251.03 TDOT

Figure 5: Aerial Map
Sheet 11 of 17
October 2024



N

0 150 300 US Feet

Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere

TN TDOT Department of Transportation

- PIN 102251.03 Project Boundary
- Sheet Limits
- Wetland Data Form Location
- Potential Wetland (WTL)
- Potential Pond (PND)
- Potential Stream (Intermittent) (STR)
- Potential Stream (Perennial) (STR)
- Wet Weather Conveyance (WWC)
- Culverts

2016 Maxar Vivid Standard Imagery / ESRI Hybrid Reference Layer

Haywood County SR-19 Widening (IA)~
Section 3; PIN 102251.03
TDOT

Figure 5: Aerial Map
Sheet 12 of 17
October 2024

N

0 150 300 US Feet

Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere

TN TDOT Department of Transportation

- PIN 102251.03 Project Boundary
- Sheet Limits
- Wetland Data Form Location
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Haywood County SR-19 Widening (IA)~
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TDOT

Figure 5: Aerial Map
Sheet 13 of 17
October 2024

N

0 150 300 US Feet

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- Culverts

2016 Maxar Vivid Standard Imagery / ESRI Hybrid Reference Layer

Haywood County SR-19 Widening (IA)~
Section 3; PIN 102251.03
TDOT

Figure 5: Aerial Map
Sheet 14 of 17
October 2024

N

0 150 300 US Feet

Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere

TN TDOT Department of Transportation

- PIN 102251.03 Project Boundary
- Sheet Limits
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- Culverts

2016 Maxar Vivid Standard Imagery / ESRI Hybrid Reference Layer

Haywood County SR-19 Widening (IA)~ Section 3; PIN 102251.03 TDOT

Figure 5: Aerial Map
Sheet 15 of 17
October 2024

N

0 150 300 US Feet

Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere

TN TDOT Department of Transportation

- PIN 102251.03 Project Boundary
- Sheet Limits
- Wetland Data Form Location
- Potential Wetland (WTL)
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- Wet Weather Conveyance (WWC)
- Culverts

2016 Maxar Vivid Standard Imagery / ESRI Hybrid Reference Layer

Haywood County SR-19 Widening (IA)~ Section 3; PIN 102251.03 TDOT

Figure 5: Aerial Map
Sheet 16 of 17
October 2024

N

0 150 300 US Feet

Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere

TN TDOT Department of Transportation

- PIN 102251.03 Project Boundary
- Sheet Limits
- Wetland Data Form Location
- Potential Wetland (WTL)
- Potential Pond (PND)
- Potential Stream (Intermittent) (STR)
- Potential Stream (Perennial) (STR)
- Wet Weather Conveyance (WWC)
- Culverts

2016 Maxar Vivid Standard Imagery / ESRI Hybrid Reference Layer

Haywood County SR-19 Widening (IA)~
Section 3; PIN 102251.03
TDOT

Figure 5: Aerial Map
Sheet 17 of 17
October 2024

APPENDIX B: WATER RESOURCE TABLE ANTECEDENT PRECIPITATION TOOL (APT) DATA COLLECTION FORMS

Project Name: Haywood County SR-19 Widening (IA) Section 3

PIN: 102251.03

Water Resource Table for EBR Report

Date: 08/12-16/2024

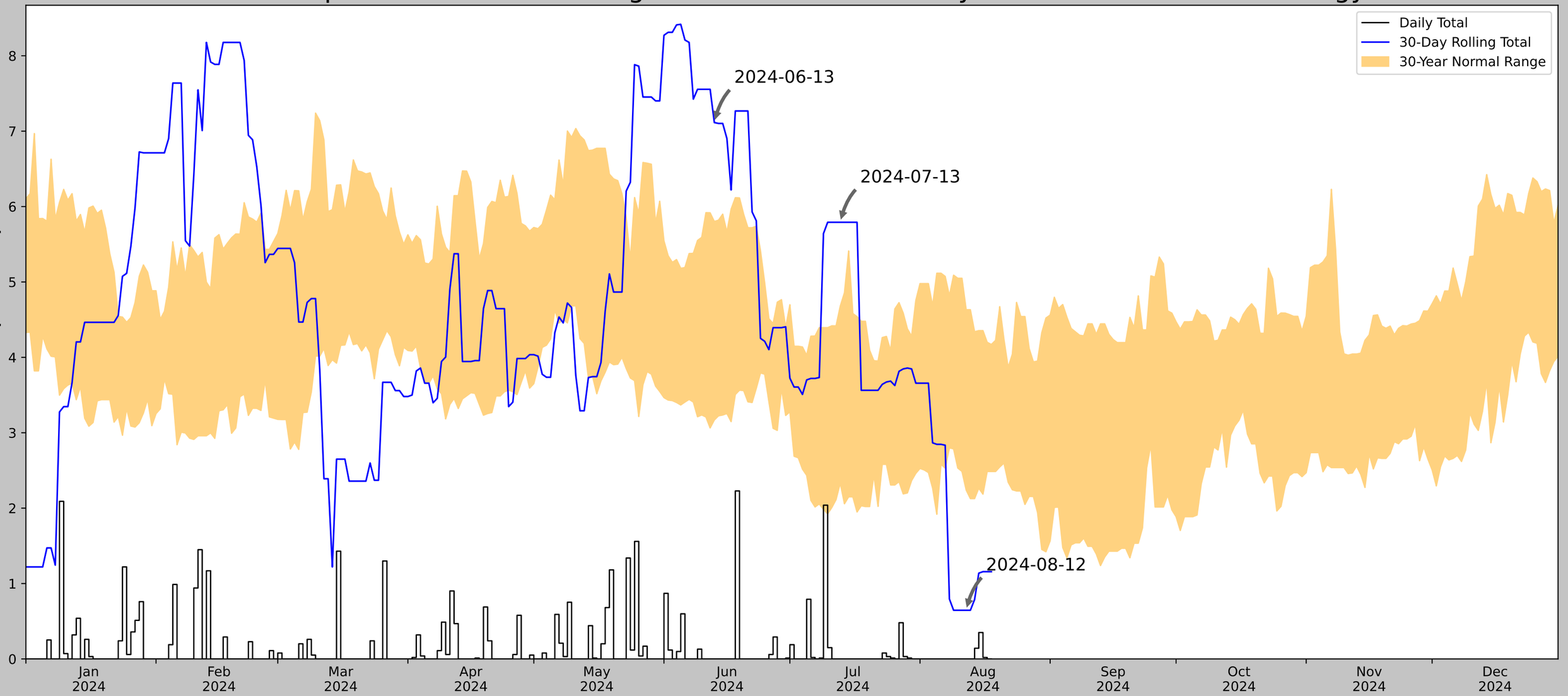
Table Amounts are based on (choose only one): Estimated extent of resource within ETSA

Water Resources (Non-Wetland)					
Label	**Type**	**Latitude**	**Longitude**	**Receiving Waters**	**Quality**
WWC-1/EPH-1	Wet Weather Conveyance/Ephemeral	35.676787	-89.385710	Meridian Creek	Not Applicable
WWC-2/EPH-2	Wet Weather Conveyance/Ephemeral	35.675799	-89.384757	Meridian Creek	Not Applicable
WWC-3/UDF-1	Wet Weather Conveyance/Ephemeral	35.674894	-89.382964	Meridian Creek	Not Applicable
STR-1	Intermittent Stream	35.673170	-89.380944	Briar Creek	Not Applicable
WWC-4/UDF-2	Wet Weather Conveyance/Ephemeral	35.672813	-89.381034	Meridian Creek	Not Applicable
WWC-5/UDF-3	Wet Weather Conveyance/Ephemeral	35.669937	-89.377395	Meridian Creek	Not Applicable
WWC-6/UDF-4	Wet Weather Conveyance/Ephemeral	35.670176	-89.377714	Meridian Creek	Not Applicable
STR-2	Intermittent Stream	35.669881	-89.376887	Meridian Creek	Not Applicable
WWC-7/UDF-5	Wet Weather Conveyance/Ephemeral	35.669278	-89.376585	Meridian Creek	Not Applicable
WWC-8/EPH-3	Wet Weather Conveyance/Ephemeral	35.666542	-89.372586	Meridian Creek	Not Applicable
WWC-9/UDF-6	Wet Weather Conveyance/Ephemeral	35.664326	-89.371121	Meridian Creek	Not Applicable
STR-3	Perennial Stream	35.664565	-89.370687	Meridian Creek	Not Supporting
WWC-10/EPH-4	Wet Weather Conveyance/Ephemeral	35.663995	-89.371108	Meridian Creek	Not Applicable
WWC-11/UDF-7	Wet Weather Conveyance/Ephemeral	35.658180	-89.364970	Briar Creek	Not Applicable
WWC-12/UDF-8	Wet Weather Conveyance/Ephemeral	35.655932	-89.361089	Briar Creek	Not Applicable
WWC-13/EPH-5	Wet Weather Conveyance/Ephemeral	35.655810	-89.361453	Briar Creek	Not Applicable
STR-4	Intermittent Stream	35.655680	-89.360265	Briar Creek	Not Supporting
WWC-14/EPH-6	Wet Weather Conveyance/Ephemeral	35.655935	-89.360745	Briar Creek	Not Applicable
WWC-15/EPH-7	Wet Weather Conveyance/Ephemeral	35.655405	-89.360963	Briar Creek	Not Applicable
WWC-16/UDF-9	Wet Weather Conveyance/Ephemeral	35.650926	-89.355243	Briar Creek	Not Applicable
STR-5	Perennial Stream	35.651076	-89.354941	Briar Creek	Not Supporting
WWC-17/UDF-10	Wet Weather Conveyance/Ephemeral	35.650172	-89.354623	Briar Creek	Not Applicable
WWC-18/UDF-11	Wet Weather Conveyance/Ephemeral	35.650846	-89.355159	Briar Creek	Not Applicable
WWC-19/EPH-8	Wet Weather Conveyance/Ephemeral	35.647318	-89.350317	Briar Creek	Not Applicable
PND-1	Pond	35.644619	-89.348408	Briar Creek	Not Applicable
WWC-20/UDF-12	Wet Weather Conveyance/Ephemeral	35.643520	-89.345941	Briar Creek	Not Applicable
STR-6	Perennial Stream	35.642967	-89.345683	Briar Creek	Not Supporting
STR-7	Intermittent Stream	35.642637	-89.344372	Briar Creek	Not Applicable
WWC-21/UDF-13	Wet Weather Conveyance/Ephemeral	35.642837	-89.345460	Meridian Creek	Not Applicable
WWC-22/UDF-14	Wet Weather Conveyance/Ephemeral	35.640764	-89.341827	Briar Creek	Not Applicable
WWC-23/UDF-15	Wet Weather Conveyance/Ephemeral	35.639146	-89.339646	Briar Creek	Not Applicable
PND-2	Pond	35.638271	-89.337902	Briar Creek	Not Applicable
STR-8	Perennial Stream	35.633048	-89.331668	Meridian Creek	Not Applicable
STR-9	Intermittent Stream	35.632156	-89.330733	Meridian Creek	Not Applicable
WWC-24/UDF-16	Wet Weather Conveyance/Ephemeral	35.632039	-89.330586	Meridian Creek	Not Applicable
STR-10	Perennial Stream	35.630698	-89.327894	Meridian Creek	Not Supporting
STR-11	Intermittent Stream	35.628376	-89.324891	Meridian Creek	Not Supporting
STR-12	Intermittent Stream	35.629833	-89.327260	Meridian Creek	Not Applicable
WWC-25/UDF-17	Wet Weather Conveyance/Ephemeral	35.630022	-89.327846	Meridian Creek	Not Applicable
WWC-26/UDF-18	Wet Weather Conveyance/Ephemeral	35.629082	-89.326244	Meridian Creek	Not Applicable
WWC-27/UDF-19	Wet Weather Conveyance/Ephemeral	35.628889	-89.324336	Meridian Creek	Not Applicable
WWC-28/UDF-20	Wet Weather Conveyance/Ephemeral	35.626564	-89.323127	Meridian Creek	Not Applicable
STR-13	Intermittent Stream	35.624437	-89.319329	Meridian Creek	Not Supporting
WWC-29/EPH-9	Wet Weather Conveyance/Ephemeral	35.624086	-89.319600	Meridian Creek	Not Applicable
WWC-30/EPH-10	Wet Weather Conveyance/Ephemeral	35.623004	-89.318635	Meridian Creek	Not Applicable
STR-14	Intermittent Stream	35.621913	-89.315612	Meridian Creek	Not Supporting
WWC-31/EPH-11	Wet Weather Conveyance/Ephemeral	35.621381	-89.315729	Meridian Creek	Not Applicable
STR-15	Intermittent Stream	35.620333	-89.313919	Meridian Creek	Not Applicable
WWC-32/EPH-12	Wet Weather Conveyance/Ephemeral	35.619015	-89.312107	Meridian Creek	Not Applicable
WWC-33/EPH-13	Wet Weather Conveyance/Ephemeral	35.615219	-89.307727	Meridian Creek	Not Applicable
WWC-34/UDF-21	Wet Weather Conveyance/Ephemeral	35.610511	-89.300916	Bucks Creek	Not Applicable
STR-16	Intermittent Stream	35.609968	-89.300204	Bucks Creek	Not Applicable
WWC-35/UDF-22	Wet Weather Conveyance/Ephemeral	35.609381	-89.299368	Meridian Creek	Not Applicable
STR-17	Intermittent Stream	35.609030	-89.298315	Bucks Creek	Not Applicable
WWC-36/UDF-23	Wet Weather Conveyance/Ephemeral	35.608787	-89.298505	Bucks Creek	Not Applicable
WWC-37/EPH-14	Wet Weather Conveyance/Ephemeral	35.608123	-89.297064	Bucks Creek	Not Applicable
WWC-38/UDF-24	Wet Weather Conveyance/Ephemeral	35.607681	-89.297029	Bucks Creek	Not Applicable

Water Resources (Wetland)					
Label	**Type**	**Latitude**	**Longitude**	**Receiving Waters**	**Quality**
WTL-1	Forested	35.623834	-89.319750	Meridian Creek	Moderate Resource Value
WTL-2	Forested	35.622779	-89.316955	Meridian Creek	Moderate Resource Value

Note- Features and estimated amounts referenced in this table are based on information available and may change as the project is further refined througout project development.

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



Coordinates	35.695414, -89.407375
Observation Date	2024-08-12
Elevation (ft)	355.583
Drought Index (PDSI)	Incipient drought (2024-07)
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2024-08-12	2.239764	4.63189	0.645669	Dry	1	3	3
2024-07-13	2.333071	4.67874	5.791339	Wet	3	2	6
2024-06-13	3.169291	5.801969	7.114173	Wet	3	1	3
Result							Normal Conditions - 12

US Army Corps of Engineers

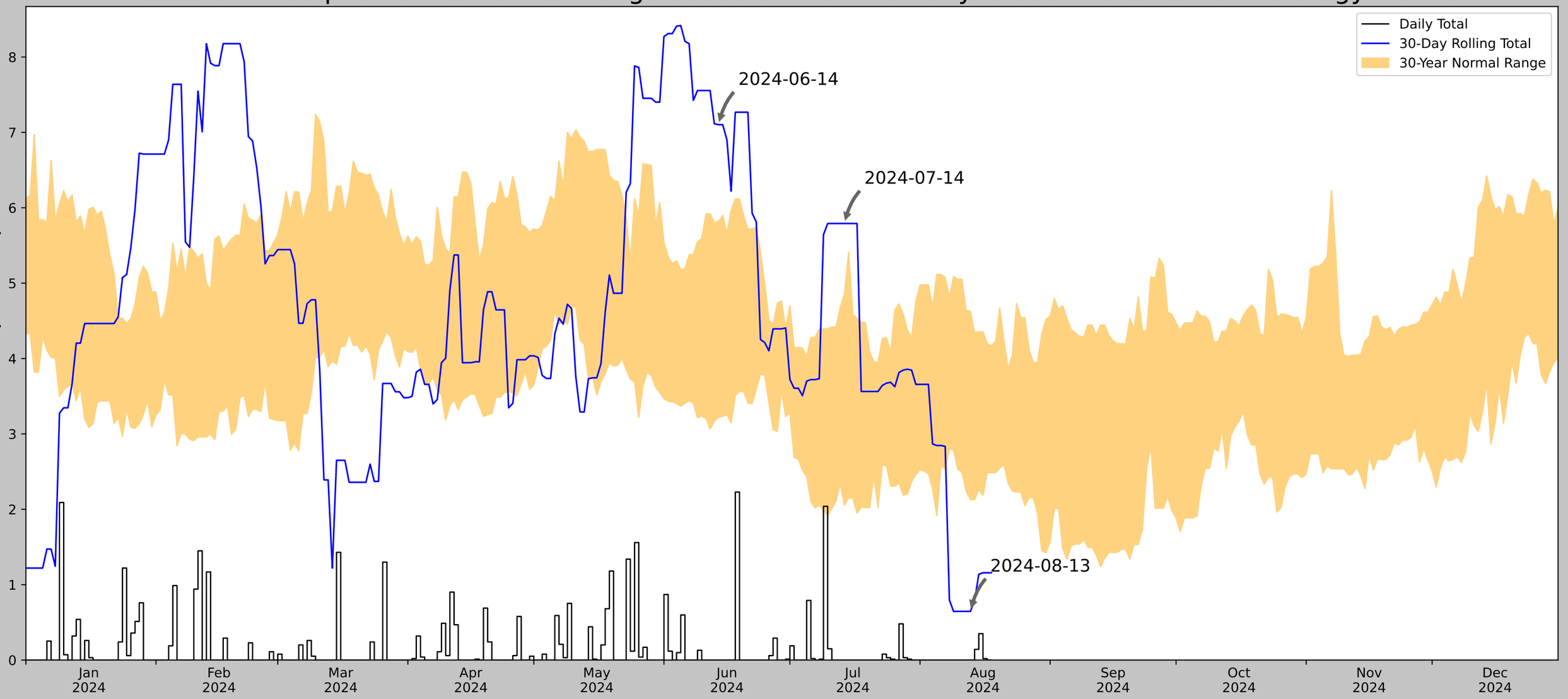
ERDC

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
BROWNSVILLE 1.0 SE	35.5841, -89.2423	348.097	12.045	7.486	5.51	5741	90
BROWNSVILLE	35.5908, -89.2597	374.016	1.082	25.919	0.515	5451	0
ALAMO 1 N	35.7978, -89.1175	348.097	16.342	0.0	7.354	95	0
SOMERVILLE 10N	35.365, -89.3475	342.848	16.255	5.249	7.4	23	0
RIPLEY	35.7178, -89.4986	399.934	17.1	51.837	8.581	41	0
JACKSON MCKELLAR- SIPES AP	35.5933, -88.9169	423.885	18.295	75.788	9.619	1	0

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



Coordinates	35.695414, -89.407375
Observation Date	2024-08-13
Elevation (ft)	355.583
Drought Index (PDSI)	Incipient drought (2024-07)
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2024-08-13	2.125984	4.63189	0.645669	Dry	1	3	3
2024-07-14	2.057874	4.857087	5.791339	Wet	3	2	6
2024-06-14	3.22441	5.819685	7.102362	Wet	3	1	3
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

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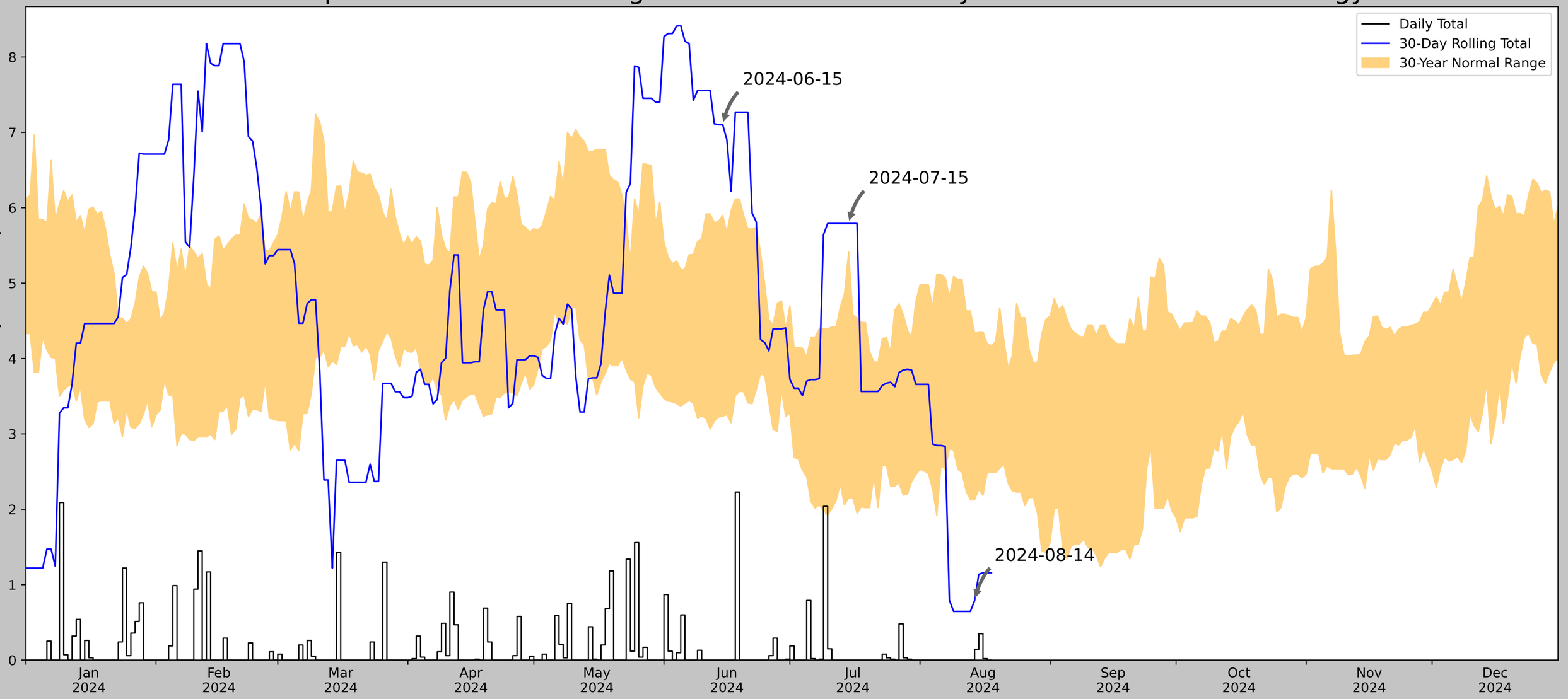
BROWNSVILLE	35.5908, -89.2597	374.016	1.082	25.919	0.515	5451	0
ALAMO 1 N	35.7978, -89.1175	348.097	16.342	0.0	7.354	95	0
SOMERVILLE 10N	35.365, -89.3475	342.848	16.255	5.249	7.4	23	0
RIPLEY	35.7178, -89.4986	399.934	17.1	51.837	8.581	41	0
JACKSON MCKELLAR- SIPES AP	35.5933, -88.9169	423.885	18.295	75.788	9.619	1	0

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



Coordinates	35.695414, -89.407375
Observation Date	2024-08-14
Elevation (ft)	355.583
Drought Index (PDSI)	Incipient drought (2024-07)
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2024-08-14	2.125984	4.340551	0.787402	Dry	1	3	3
2024-07-15	2.15	5.411417	5.791339	Wet	3	2	6
2024-06-15	3.235039	5.899606	7.102362	Wet	3	1	3
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
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ALAMO 1 N	35.7978, -89.1175	348.097	16.342	0.0	7.354	95	0
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RIPLEY	35.7178, -89.4986	399.934	17.1	51.837	8.581	41	0
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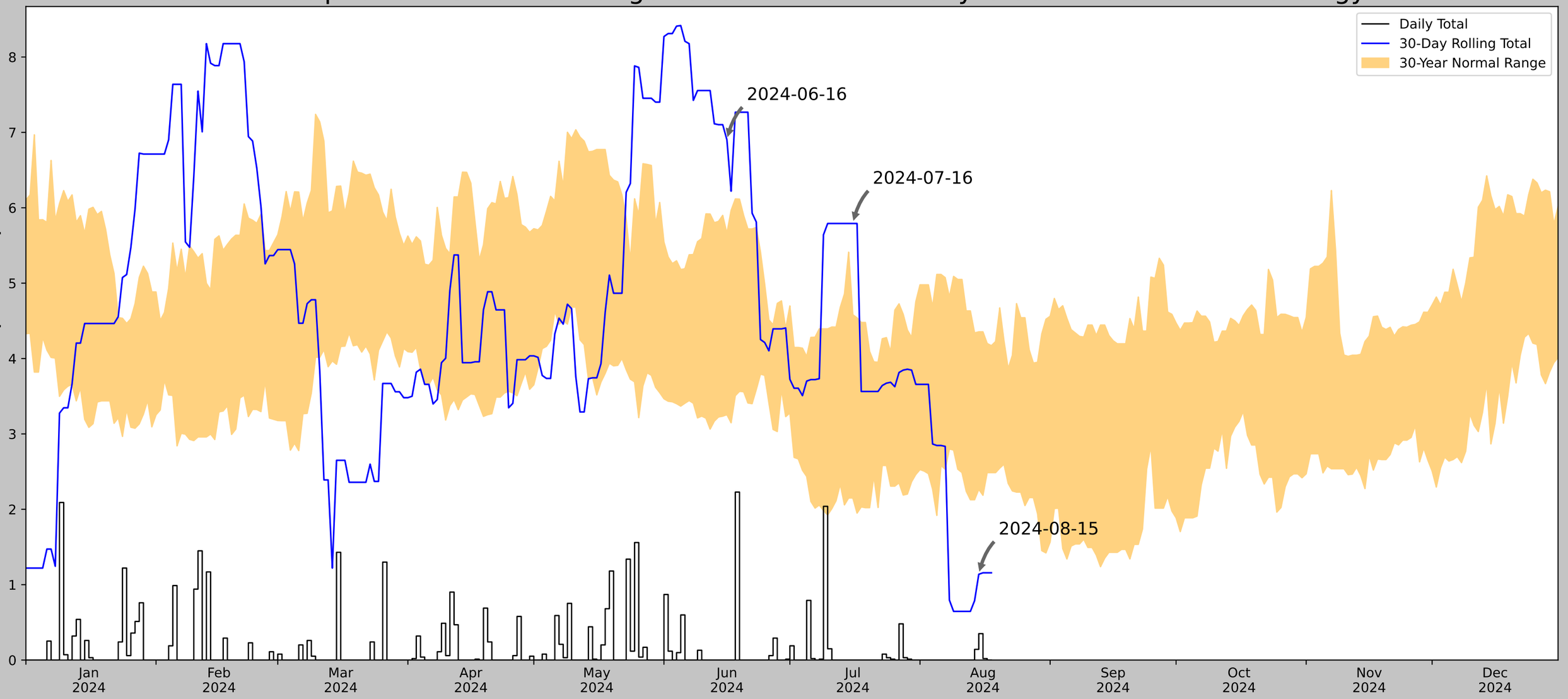

Coordinates	35.695414, -89.407375
Observation Date	2024-08-15
Elevation (ft)	355.583
Drought Index (PDSI)	Incipient drought (2024-07)
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2024-08-15	2.264567	4.354331	1.137795	Dry	1	3	3
2024-07-16	2.15	4.581103	5.791339	Wet	3	2	6
2024-06-16	3.255118	5.661418	6.901575	Wet	3	1	3
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

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JACKSON MCKELLAR- SIPES AP	35.5933, -88.9169	423.885	18.295	75.788	9.619	1	0

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.03					
Biologist:	JC, JG	**Affiliation:**	JMT	**Date:**	08-13-24

1-Station: from plans	Across the intersection of Jim Binford Ln and SR-19								
2-Map label and name	WWC-1/EPH-1								
3-Latitude/Longitude	35.676798, -89.385718								
4-Feature description:									
-channel identification	perennial stream ☐	intermittent stream ☐	ephemeral stream ☑	wwc ☑					
-HD score (if applicable)	6								
-OHWM indicators	bed & banks ☑	deposition ☐	presence of litter debris ☐	scour ☐	veg absent, bent, matted ☐				
	change in plant community ☐	destruction of terrestrial veg ☐	multiple observe flow events ☐	sediment sorting ☐	water staining ☐				
	change in soil character ☐	leaf litter disturb or absent ☐	natural line impressed on bank ☐	shelving ☐	wracking ☐				
-channel bottom width	6'	-top of bank width	20'						
-width and max depth at ordinary high water mark	4' width, <1' max depth								
-width at bankfull	N/A								
-bank height	LDB - 3'	RDB - 3'							
-riffle/pool complex or other specialized habitat present?	No								
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Cottonwood, black willow, rubrus, Johnson grass, Bermuda grass								
	RDB: Cottonwood, black willow, rubrus, Johnson grass, Bermuda grass								
-particle size distribution %	Silt/Sand: 90	Gravel:	Cobble:	Boulder:	Bedrock:				
5-photo numbers	1								
6-HUC -8 Code & Name	08010205 - South Fork Forked Deer								
7-Assessed	yes ☐	no ☑							
8-ETW	yes ☐	no ☑							
9-303 (d) List	yes ☐	siltation ☐	habitat: ☐	other: ☐					
	no ☑								
10-Notes	10% riprap								

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Meridian Creek		Date/Time: 08/12/24
Assessors/Affiliation: JC, JG; JMT		Project ID : 102251.03
Site Name/Description: WWC-1/EPH-1		
Site Location: Across the intersection of Jim Binford Ln and SR-19		
HUC (12 digit): 080102050402	Latitude: 35.676798	
Previous Rainfall (7-days) : 0 inches	Longitude: -89.385718	
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0		
Watershed Size : <0.02 sq. miles	County: Haywood	
Soil Type(s) / Geology : Loring Silt Loam	Source: NRCS Web Soil Survey	
Surrounding Land Use : Low Density Residential, Agricultural		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 6

Justification / Notes :

Incipient drought (based on APT).

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 4.5)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 0.5)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 1)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants.

[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 6

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.03					
Biologist:	JC, JG	**Affiliation:**	JMT	**Date:**	08-13-24

1-Station: from plans	Southeast of Jim Binford Ln and SR-19 intersection								
2-Map label and name	WWC-2/EPH-2								
3-Latitude/Longitude	35.675681, -89.384788								
4-Feature description:									
-channel identification	perennial stream ☐	intermittent stream ☐	ephemeral stream ☑	wwc ☑					
-HD score (if applicable)	11								
-OHWM indicators	bed & banks ☑	deposition ☐	presence of litter debris ☐	scour ☐	veg absent, bent, matted ☐				
	change in plant community ☐	destruction of terrestrial veg ☐	multiple observe flow events ☐	sediment sorting ☐	water staining ☐				
	change in soil character ☑	leaf litter disturb or absent ☐	natural line impressed on bank ☐	shelving ☐	wracking ☐				
-channel bottom width	5'	-top of bank width	30'						
-width and max depth at ordinary high water mark	width 5', max depth <1'								
-width at bankfull	8'								
-bank height	LDB - 8'	RDB - 8'							
-riffle/pool complex or other specialized habitat present?	No								
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Pokeweed, sweet-gum, American elm, red oak								
	RDB: Pokeweed, sweet-gum, American elm, red oak								
-particle size distribution %	Silt/Sand: 100	Gravel:	Cobble:	Boulder:	Bedrock:				
5-photo numbers	2, 3								
6-HUC -8 Code & Name	08010205 - South Fork Forked Deer								
7-Assessed	yes ☐	no ☑							
8-ETW	yes ☐	no ☑							
9-303 (d) List	yes ☐	siltation ☐	habitat: ☐	other: ☐					
	no ☑								
10-Notes									

Revised July 2022

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Meridian Creek		Date/Time: 08/12/24
Assessors/Affiliation: JC, JG; JMT		Project ID : 102251.03
Site Name/Description: WWC-2/EPH-2		
Site Location: Southeast of Jim Binford Lane and SR-19 intersection		
HUC (12 digit): 080102050402	Latitude: 35.675681	
Previous Rainfall (7-days) : 0 inches	Longitude: -89.384788	
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0		
Watershed Size : <0.02 sq. miles	County: Haywood	
Soil Type(s) / Geology : Loring Silt Loam	Source: NRCS Web Soil Survey	
Surrounding Land Use : Low Density Residential, Agricultural		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 11

Justification / Notes :

Incipient drought (based on APT).

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 8.5)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 0.5)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 2)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 11

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Head cutting into ag field, channel flows into weeds with natural grade controls, dissipates into grass lined ditch by roadway.

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.03					
Biologist:	RB & BC	**Affiliation:**	JMT	**Date:**	08-13-24

1-Station: from plans	~ 0.19 miles Southeast of Jim Binford Ln on SR-19										
2-Map label and name	WWC-3/UDF-1										
3-Latitude/Longitude	35.674755, -89.383100										
4-Feature description:											
-channel identification	perennial stream		intermittent stream		ephemeral stream		wwc	✓			
-HD score (if applicable)	15.5										
-OHWM indicators	bed & banks	✓	deposition		presence of litter debris		scour	✓	veg absent, bent, matted		
	change in plant community	✓	destruction of terrestrial veg		multiple observe flow events		sediment sorting		water staining	✓	
	change in soil character		leaf litter disturb or absent		natural line impressed on bank		shelving		wracking		
-channel bottom width	3'			-top of bank width		3'					
-width and max depth at ordinary high water mark	width 3', max depth 2"										
-width at bankfull	3'										
-bank height	LDB - 2'				RDB - 2'						
-riffle/pool complex or other specialized habitat present?	No										
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Japanese honeysuckle										
	RDB: Japanese honeysuckle										
-particle size distribution %	Silt/Sand:	98	Gravel:	2	Cobble:		Boulder:		Bedrock:		
5-photo numbers	4-7										
6-HUC -8 Code & Name	08010205 - South Fork Forked Deer										
7-Assessed	yes		no	✓							
8-ETW	yes		no	✓							
9-303 (d) List	yes		siltation		habitat:		other:				
	no	✓									
10-Notes											

Revised July 2022

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody:UNT Meridian Creek	Date/Time:8/13/24
Assessors/Affiliation:RB, BC; JMT	Project ID :102251.03
Site Name/Description:WWC-3/UDF-1	
Site Location:~ 0.19 miles Southeast of Jim Binford Ln on SR-19	
HUC (12 digit):080102050402	Latitude:35.674755
Previous Rainfall (7-days) :< 0.5 inches	Longitude:-89.383100
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0	
Watershed Size :< 0.01 sq. miles	County:Haywood
Soil Type(s) / Geology :Adler Silt Loam	Source:NRCS Web Soil Survey
Surrounding Land Use :Agricultural	
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 15.5

Justification / Notes :

Incipient drought (based on APT).

Channel historically straightened and deepened due to agricultural land use.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 7.5)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 3)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 5)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants.

[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 15.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.03					
Biologist:	PB, BF	**Affiliation:**	JMT	**Date:**	08-13-24

1-Station: from plans	Northwest corner of intersection Small Road and SR-19									
2-Map label and name	STR-1									
3-Latitude/Longitude	35.672801, -89.381313									
4-Feature description:										
-channel identification	perennial stream		intermittent stream	✓	ephemeral stream		wwc			
-HD score (if applicable)	16.5									
-OHWM indicators	bed & banks	✓	deposition		presence of litter debris		scour	✓	veg absent, bent, matted	✓
	change in plant community		destruction of terrestrial veg	✓	multiple observe flow events		sediment sorting		water staining	
	change in soil character	✓	leaf litter disturb or absent		natural line impressed on bank	✓	shelving		wracking	
-channel bottom width	1'			-top of bank width		4'				
-width and max depth at ordinary high water mark	width 1', max depth 1'									
-width at bankfull	1'									
-bank height	LDB - 4'				RDB - 4'					
-riffle/pool complex or other specialized habitat present?	No									
-dominant riparian species: ----------(LDB /RDB)----------	LDB: nutsedge, sweet-gum, woodwardia, juncus spp.									
	RDB: nutsedge, sweet-gum, woodwardia, juncus spp.									
-particle size distribution %	Silt/Sand:	100	Gravel:		Cobble:		Boulder:		Bedrock:	
5-photo numbers	8-12									
6-HUC -8 Code & Name	08010205 - South Fork Forked Deer									
7-Assessed	yes			no	✓					
8-ETW	yes			no	✓					
9-303 (d) List	yes			siltation			habitat:		other:	
	no	✓								
10-Notes										

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Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Briar Creek	Date/Time: 08/13/24
Assessors/Affiliation: PB, BF; JMT	Project ID : 102251.03
Site Name/Description: STR-1	
Site Location: Northwest corner of intersection Small Road and SR-19	
HUC (12 digit): 080102050402	Latitude: 35.672801
Previous Rainfall (7-days) : < 0.5 inches	Longitude: -89.381313
Precipitation this Season vs. Normal : abnormally wet elevated **average** low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0	
Watershed Size : 0.08 sq. miles	County: Haywood
Soil Type(s) / Geology : Calloway Silt Loam	Source: NRCS Web Soil Survey
Surrounding Land Use : Low Density Residential, Agricultural	
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : **Severe** Moderate Slight Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = 16.5

Justification / Notes :

Incipient drought (based on APT).

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 7)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 4)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 5.5)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3 2.5	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants.

[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 16.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Wetland plants in channel bed: sedges, juncus, marsh seedbox

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.03					
Biologist:	PB, BF	**Affiliation:**	JMT	**Date:**	08-13-24

1-Station: from plans	Directly northwest of Small Road and SR-19 intersection									
2-Map label and name	WWC-4/UDF-2									
3-Latitude/Longitude	35.672731, -89.380946									
4-Feature description:										
-channel identification	perennial stream		intermittent stream		ephemeral stream		wwc	✓		
-HD score (if applicable)	13									
-OHWM indicators	bed & banks	✓	deposition		presence of litter debris		scour	✓	veg absent, bent, matted	
	change in plant community		destruction of terrestrial veg		multiple observe flow events		sediment sorting		water staining	
	change in soil character	✓	leaf litter disturb or absent	✓	natural line impressed on bank	✓	shelving		wracking	
-channel bottom width	1'		-top of bank width		4'					
-width and max depth at ordinary high water mark	Width 1', max depth 1'									
-width at bankfull	1'									
-bank height	LDB - 4'				RDB - 4'					
-riffle/pool complex or other specialized habitat present?	No									
-dominant riparian species: ----------(LDB /RDB)----------	LDB: fescue, sweet-gum, johnson grass									
	RDB: fescue									
-particle size distribution %	Silt/Sand:	90	Gravel:	10	Cobble:		Boulder:		Bedrock:	
5-photo numbers	13-14									
6-HUC -8 Code & Name	08010205 - South Fork Forked Deer									
7-Assessed	yes		no	✓						
8-ETW	yes		no	✓						
9-303 (d) List	yes		siltation		habitat:		other:			
	no	✓								
10-Notes	10% gravel from road									

Revised July 2022

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Meridian Creek	Date/Time: 08/13/24
Assessors/Affiliation: PB, BF; JMT	Project ID : 102251.03
Site Name/Description: WWC-4/UDF-2	
Site Location: Directly northwest of Small Road and SR-19 intersection	
HUC (12 digit): 080102050402	Latitude: 35.672731
Previous Rainfall (7-days) : < 0.5 inches	Longitude: -89.380946
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0	
Watershed Size : 0.08 sq. miles	County: Haywood
Soil Type(s) / Geology : Calloway Silt Loam	Source: NRCS Web Soil Survey
Surrounding Land Use : Low Density Residential, Agricultural	
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 13

Justification / Notes :

Incipient drought (based on APT).

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 7)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1 1.5	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1 1.5	2	3
4. Sorting of soil textures or other substrate	0	1 1.5	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 3.5)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 3)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2 1.5	1	0
21. Rooted plants in the thalweg [1]	3	2 1.5	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants.

[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 13.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.03					
Biologist:	RF & MM	**Affiliation:**	JMT	**Date:**	08-13-24

1-Station: from plans	~0.24 miles Southeast of Small Road on SR-19									
2-Map label and name	WWC-5/UDF-3									
3-Latitude/Longitude	35.670351, -89.377655									
4-Feature description:										
-channel identification	perennial stream		intermittent stream		ephemeral stream		wwc	✓		
-HD score (if applicable)	13									
-OHWM indicators	bed & banks	✓	deposition		presence of litter debris		scour		veg absent, bent, matted	
	change in plant community		destruction of terrestrial veg		multiple observe flow events		sediment sorting		water staining	
	change in soil character		leaf litter disturb or absent		natural line impressed on bank		shelving		wracking	
-channel bottom width	1'		-top of bank width	1'						
-width and max depth at ordinary high water mark	N/A									
-width at bankfull	1'									
-bank height	LDB - 3'		RDB - 3'							
-riffle/pool complex or other specialized habitat present?	No									
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Flat sedges, grasses, partridge pea									
	RDB: Flat sedges, grasses, partridge pea									
-particle size distribution %	Silt/Sand:	85	Gravel:	15	Cobble:		Boulder:		Bedrock:	
5-photo numbers	15-16									
6-HUC -8 Code & Name	08010205 - South Fork Forked Deer									
7-Assessed	yes		no	✓						
8-ETW	yes		no	✓						
9-303 (d) List	yes		siltation		habitat:		other:			
	no	✓								
10-Notes										

Revised July 2022

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody:UNT Meridian Creek	Date/Time:8/13/24
Assessors/Affiliation:RF, MM; JMT	Project ID :102251.03
Site Name/Description:WWC-5/UDF-3	
Site Location:~0.24 miles Southeast of Small Road on SR-19	
HUC (12 digit):080102050402	Latitude:35.670351
Previous Rainfall (7-days) :< 0.5 inches	Longitude:-89.377655
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0	
Watershed Size :< 0.01 sq. miles	County:Haywood
Soil Type(s) / Geology :Loring Silt Loam	Source:NRCS Web Soil Survey
Surrounding Land Use :Agricultural	
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 13.5

Justification / Notes :

Incipient drought (based on APT). Flows to STR-2.

Dug along road and field edge.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal =5.5)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2 2.5	3
2. Sinuous channel	0 0.5	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal =4.5)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal =3)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2 1.5	1	0
21. Rooted plants in the thalweg [1]	3	2 1.5	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants.

[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 13

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.03					
Biologist:	RF & MM	**Affiliation:**	JMT	**Date:**	08-13-24

1-Station: from plans	~0.24 miles Southeast of Small Road on SR-19								
2-Map label and name	WWC-6/UDF-4								
3-Latitude/Longitude	35.670243, -89.377810								
4-Feature description:									
-channel identification	perennial stream		intermittent stream		ephemeral stream		wwc	✓	
-HD score (if applicable)	11								
-OHWM indicators	bed & banks	✓	deposition		presence of litter debris		scour		veg absent, bent, matted	
	change in plant community		destruction of terrestrial veg		multiple observe flow events		sediment sorting		water staining	
	change in soil character		leaf litter disturb or absent		natural line impressed on bank		shelving		wracking	
-channel bottom width	1'		-top of bank width	1'						
-width and max depth at ordinary high water mark	N/A									
-width at bankfull	1'									
-bank height	LDB - 1.5'		RDB - 1.5'							
-riffle/pool complex or other specialized habitat present?	No									
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Partridge pea									
	RDB: Partridge pea									
-particle size distribution %	Silt/Sand:	85	Gravel:	10	Cobble:	5	Boulder:		Bedrock:	
5-photo numbers	17									
6-HUC -8 Code & Name	08010205 - South Fork Forked Deer									
7-Assessed	yes		no	✓						
8-ETW	yes		no	✓						
9-303 (d) List	yes		siltation		habitat:		other:			
	no	✓								
10-Notes										

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody:UNT Meridian Creek		Date/Time:8/13/24
Assessors/Affiliation:RF, MM; JMT		Project ID :102251.03
Site Name/Description:WWC-6/UDF-4		
Site Location: ~0.24 miles Southeast of Small Road on SR-19		
HUC (12 digit): 080102050402	Latitude:35.670243	
Previous Rainfall (7-days) :< 0.5 inches	Longitude:-89.377810	
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0		
Watershed Size :< 0.01 sq. miles	County:Haywood	
Soil Type(s) / Geology :Loring Silt Loam	Source:NRCS Web Soil Survey	
Surrounding Land Use :Agricultural		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 11

Justification / Notes :

Incipient drought (based on APT). Flows to WWC-5/UDF-3.

Dug along roadside.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 3)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 3)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 5)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants.

[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 11

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.03					
Biologist:	PB, BF	**Affiliation:**	JMT	**Date:**	08-13-24

1-Station: from plans	0.17 miles east of 76 Small Rd on the southwest side of SR-19									
2-Map label and name	STR-2									
3-Latitude/Longitude	35.669444, -89.377182									
4-Feature description:										
-channel identification	perennial stream		intermittent stream	✓	ephemeral stream		wwc			
-HD score (if applicable)	18.5									
-OHWM indicators	bed & banks	✓	deposition		presence of litter debris		scour	✓	veg absent, bent, matted	✓
	change in plant community		destruction of terrestrial veg		multiple observe flow events		sediment sorting		water staining	
	change in soil character	✓	leaf litter disturb or absent		natural line impressed on bank	✓	shelving		wracking	
-channel bottom width	4'			-top of bank width		12'				
-width and max depth at ordinary high water mark	width 6', max depth 2'									
-width at bankfull	6'									
-bank height	LDB - 6'			RDB - 5'						
-riffle/pool complex or other specialized habitat present?	No									
-dominant riparian species: ----------(LDB /RDB)----------	LDB: black willow, lonicera, cottonwood									
	RDB: boxelder, muscadine, black willow									
-particle size distribution %	Silt/Sand:	100	Gravel:		Cobble:		Boulder:		Bedrock:	
5-photo numbers	18-22									
6-HUC -8 Code & Name	08010205 - South Fork Forked Deer									
7-Assessed	yes			no	✓					
8-ETW	yes			no	✓					
9-303 (d) List	yes			siltation			habitat:		other:	
	no	✓								
10-Notes										

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Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Meridian Creek	Date/Time: 08/13/24
Assessors/Affiliation: PB, BF; JMT	Project ID : 102251.03
Site Name/Description: STR-2	
Site Location: 0.17 miles east of 76 Small Rd on the southwest side of SR-19	
HUC (12 digit): 080102050402	Latitude: 35.669444
Previous Rainfall (7-days) : < 0.5 inches	Longitude: -89.377182
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0	
Watershed Size : 0.07 sq. miles	County: Haywood
Soil Type(s) / Geology : Loring Silt Loam	Source: NRCS Web Soil Survey
Surrounding Land Use : Low Density Residential, Agricultural	
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = 18.5

Justification / Notes :

Incipient drought (based on APT).

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 7.5)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2 2.5	3
2. Sinuous channel	0 0.5	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 5)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 6)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 18.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Saturated hyporheic zone in some areas within the stream channel.

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.03					
Biologist:	RB & BC	**Affiliation:**	JMT	**Date:**	08-13-24

1-Station: from plans	~ 0.34 miles Southeast of Small Rd on SR-19										
2-Map label and name	WWC-7/UDF-5										
3-Latitude/Longitude	35.669236, -89.376534										
4-Feature description:											
-channel identification	perennial stream		intermittent stream		ephemeral stream		wwc	✓			
-HD score (if applicable)	18										
-OHWM indicators	bed & banks	✓	deposition		presence of litter debris		scour	✓	veg absent, bent, matted		
	change in plant community	✓	destruction of terrestrial veg		multiple observe flow events		sediment sorting		water staining	✓	
	change in soil character		leaf litter disturb or absent		natural line impressed on bank		shelving		wracking		
-channel bottom width	2'		-top of bank width	3'							
-width and max depth at ordinary high water mark	width 2', max depth 3"										
-width at bankfull	3'										
-bank height	LDB - 3'				RDB - 3'						
-riffle/pool complex or other specialized habitat present?	No										
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Japanese honeysuckle										
	RDB: Festuca sp., Johnson grass										
-particle size distribution %	Silt/Sand:	80	Gravel:	20	Cobble:		Boulder:		Bedrock:		
5-photo numbers	23-26										
6-HUC -8 Code & Name	08010205 - South Fork Forked Deer										
7-Assessed	yes		no	✓							
8-ETW	yes		no	✓							
9-303 (d) List	yes		siltation		habitat:		other:				
	no	✓									
10-Notes											

Revised July 2022

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody:UNT Meridian	Date/Time:8/13/24
Assessors/Affiliation:RB, BC; JMT	Project ID :102251.03
Site Name/Description:WWC-7/UDF-5	
Site Location:~ 0.34 miles Southeast of Small Rd on SR-19	
HUC (12 digit):080102050402	Latitude:35.669236
Previous Rainfall (7-days) :< 0.5 inches	Longitude:-89.376534
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0	
Watershed Size :< 0.01 sq. miles	County:Haywood
Soil Type(s) / Geology :Loring Silt Loam	Source:NRCS Web Soil Survey
Surrounding Land Use :Agricultural	
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination =Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 18

Justification / Notes :

Incipient drought (based on APT). Flows into STR-2.

Ditch along the roadside.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal =10)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2 2.5	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal =3.5)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal =4.5)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2 1.5	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 18

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.03					
Biologist:	RB & BC	**Affiliation:**	JMT	**Date:**	08-13-24

1-Station: from plans	~ 0.60 miles Southeast of Small Rd on SR-19									
2-Map label and name	WWC-8/EPH-3									
3-Latitude/Longitude	35.666530, -89.372661									
4-Feature description:										
-channel identification	perennial stream ☐	intermittent stream ☐	ephemeral stream ☑	wwc ☑						
-HD score (if applicable)	15									
-OHWM indicators	bed & banks ☑	deposition ☐	presence of litter debris ☐	scour ☐	veg absent, bent, matted ☐					
	change in plant community ☐	destruction of terrestrial veg ☐	multiple observe flow events ☐	sediment sorting ☐	water staining ☐					
	change in soil character ☐	leaf litter disturb or absent ☐	natural line impressed on bank ☐	shelving ☐	wracking ☐					
-channel bottom width	1.5'	-top of bank width	2'							
-width and max depth at ordinary high water mark	N/A									
-width at bankfull	2'									
-bank height	LDB - 4'	RDB - 4'								
-riffle/pool complex or other specialized habitat present?	No									
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Japanese honeysuckle									
	RDB: Japanese honeysuckle									
-particle size distribution %	Silt/Sand: 80	Gravel: 20	Cobble:		Boulder:		Bedrock:			
5-photo numbers	27									
6-HUC -8 Code & Name	08010205 - South Fork Forked Deer									
7-Assessed	yes ☐		no ☑							
8-ETW	yes ☐		no ☑							
9-303 (d) List	yes ☐		siltation ☐		habitat: ☐		other: ☐			
	no ☑									
10-Notes										

Revised July 2022

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Meridian Creek	Date/Time:8/13/24
Assessors/Affiliation:RB, BC; JMT	Project ID :102251.03
Site Name/Description:WWC-8/EPH-3	
Site Location:~ 0.60 miles Southeast of Small Rd on SR-19	
HUC (12 digit): 080102050402	Latitude:35.666530
Previous Rainfall (7-days) :< 0.5 inches	Longitude:-89.372661
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0	
Watershed Size :< 0.01 sq. miles	County:Haywood
Soil Type(s) / Geology :Loring Silt Loam	Source:NRCS Web Soil Survey
Surrounding Land Use :Low Density Residential, Agricultural	
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 15

Justification / Notes :

Incipient drought (based on APT).

Field edge feature.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal =10)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal =1)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal =4)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants.

[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 15

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.03					
Biologist:	JC, JG	**Affiliation:**	JMT	**Date:**	08-13-24

1-Station: from plans	Northwest of Briarcreek Rd and SR-19 intersection								
2-Map label and name	WWC-9/UDF-6								
3-Latitude/Longitude	35.664442, -89.371262								
4-Feature description:									
-channel identification	perennial stream ☐	intermittent stream ☐	ephemeral stream ☐	wwc ☑					
-HD score (if applicable)	6								
-OHWM indicators	bed & banks ☑	deposition ☐	presence of litter debris ☐	scour ☐	veg absent, bent, matted ☐				
	change in plant community ☐	destruction of terrestrial veg ☐	multiple observe flow events ☐	sediment sorting ☐	water staining ☐				
	change in soil character ☐	leaf litter disturb or absent ☐	natural line impressed on bank ☐	shelving ☐	wracking ☐				
-channel bottom width	4'	-top of bank width	16'						
-width and max depth at ordinary high water mark	N/A								
-width at bankfull	8'								
-bank height	LDB - 6'	RDB - 6'							
-riffle/pool complex or other specialized habitat present?	No								
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Pecan, sweet-gum, greenbrier, rubrus, maple								
	RDB: Pecan, sweet-gum, greenbrier, rubrus, maple								
-particle size distribution %	Silt/Sand: 100	Gravel:	Cobble:	Boulder:	Bedrock:				
5-photo numbers	28								
6-HUC -8 Code & Name	08010205 - South Fork Forked Deer								
7-Assessed	yes ☐	no ☑							
8-ETW	yes ☐	no ☑							
9-303 (d) List	yes ☐	siltation ☐	habitat: ☐	other: ☐					
	no ☑								
10-Notes									

Revised July 2022

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Meridian Creek		Date/Time: 08/12/24
Assessors/Affiliation: JC, JG; JMT		Project ID : 102251.03
Site Name/Description: WWC-9/UDF-6		
Site Location: Northwest of Briarcreek Rd and SR-19 intersection		
HUC (12 digit): 080102050402	Latitude: 35.664442	
Previous Rainfall (7-days) : < 0.5 inches	Longitude: -89.371262	
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0		
Watershed Size : 0.16 sq. miles	County: Haywood	
Soil Type(s) / Geology : Alder Silt Loam	Source: NRCS Web Soil Survey	
Surrounding Land Use : Low Density Residential, Agricultural		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 6

Justification / Notes :

Incipient drought (based on APT).

Roadside ditch.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 5.5)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2 2.5	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 0.5)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 0)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants.

[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 6

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Roadside ditch

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.03					
Biologist:	RB & BC	**Affiliation:**	JMT	**Date:**	08-12-24

1-Station: from plans	~ 0.50 miles North West of Briar Creek Rd on SR-19										
2-Map label and name	STR-3										
3-Latitude/Longitude	35.664276, -89.370867										
4-Feature description:											
-channel identification	perennial stream	✓	intermittent stream	✓	ephemeral stream		wwc				
-HD score (if applicable)	17.5										
-OHWM indicators	bed & banks	✓	deposition		presence of litter debris		scour	✓	veg absent, bent, matted	✓	
	change in plant community		destruction of terrestrial veg		multiple observe flow events		sediment sorting		water staining		
	change in soil character		leaf litter disturb or absent		natural line impressed on bank	✓	shelving		wracking		
-channel bottom width	4'			-top of bank width		4'					
-width and max depth at ordinary high water mark	width 4', max depth 2"										
-width at bankfull	4'										
-bank height	LDB - 3'			RDB - 3'							
-riffle/pool complex or other specialized habitat present?	No										
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Agricultural Land										
	RDB: Agricultural Land										
-particle size distribution %	Silt/Sand:	100	Gravel:		Cobble:		Boulder:		Bedrock:		
5-photo numbers	29-30										
6-HUC -8 Code & Name	08010205 - South Fork Forked Deer										
7-Assessed	yes		no	✓							
8-ETW	yes		no	✓							
9-303 (d) List	yes		siltation		habitat:		other:				
	no	✓									
10-Notes											

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Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody:UNT Meridian Creek	Date/Time:8/12/24
Assessors/Affiliation:RB, BC; JMT	Project ID :102251.03
Site Name/Description:STR-3	
Site Location:~ 0.50 miles North West of Briar Creek Rd on SR-19	
HUC (12 digit):080102050402	Latitude:35.664276
Previous Rainfall (7-days) :< 0.5 inches	Longitude:-89.370867
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0	
Watershed Size :0.16 sq. miles	County:Haywood
Soil Type(s) / Geology :Adler Silt Loam	Source:NRCS Web Soil Survey
Surrounding Land Use :Low Density Residential, Agricultural	
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination =Stream

Secondary Indicator Score (if applicable) = 17.5

Justification / Notes :

Incipient drought (based on APT). NHD stream also shows up on USGS Topo (unnamed).

Stream historically altered by agricultural activity.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal =10)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal =2.5)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal =5)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants.

[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 17.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.03					
Biologist:	JC, JG	**Affiliation:**	JMT	**Date:**	08-13-24

1-Station: from plans	Northwest of Briar Creek Rd and SR-19 intersection, along the south side of the road.								
2-Map label and name	WWC-10/EPH-4								
3-Latitude/Longitude	35.663871, -89.371175								
4-Feature description:									
-channel identification	perennial stream		intermittent stream		ephemeral stream	✓	wwc	✓	
-HD score (if applicable)	8.5								
-OHWM indicators	bed & banks	✓	deposition		presence of litter debris		scour	✓	veg absent, bent, matted
	change in plant community		destruction of terrestrial veg		multiple observe flow events		sediment sorting		water staining
	change in soil character		leaf litter disturb or absent		natural line impressed on bank		shelving		wracking
-channel bottom width	1'		-top of bank width	6ft					
-width and max depth at ordinary high water mark	N/A								
-width at bankfull	6'								
-bank height	LDB - 1.5'		RDB - 1.5'						
-riffle/pool complex or other specialized habitat present?	No								
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Johnson grass, carex sp,								
	RDB: Johnson grass, carex sp,								
-particle size distribution %	Silt/Sand:	100	Gravel:		Cobble:		Boulder:		Bedrock:
5-photo numbers	31								
6-HUC -8 Code & Name	08010205 - South Fork Forked Deer								
7-Assessed	yes		no	✓					
8-ETW	yes		no	✓					
9-303 (d) List	yes		siltation		habitat:		other:		
	no	✓							
10-Notes									

Revised July 2022

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Meridian Creek		Date/Time: 08/12/24
Assessors/Affiliation: JC, JG; JMT		Project ID : 102251.03
Site Name/Description: WWC-10/EPH-4		
Site Location: Northwest of Briar Creek Rd and SR-19 intersection		
HUC (12 digit): 080102050402	Latitude: 35.663871	
Previous Rainfall (7-days) : 0 inches	Longitude: -89.371175	
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0		
Watershed Size : 0.13 sq. miles	County: Haywood	
Soil Type(s) / Geology : Alder Silt Loam	Source: NRCS Web Soil Survey	
Surrounding Land Use : Low Density Residential, Agricultural		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 8.5

Justification / Notes :

Incipient drought (based on APT).

Farm field drainage.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 3.5)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 0.5)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 4.5)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 8.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Area appears to have been graded during crop planting, channel has been recently formed recently.

Frogs noted in the channel.

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.03					
Biologist:	JC, JG	**Affiliation:**	JMT	**Date:**	08-13-24

1-Station: from plans	Intersection of Woodlawn Rd and SR-19										
2-Map label and name	WWC-11/UDF-7										
3-Latitude/Longitude	35.658606, -89.364870										
4-Feature description:											
-channel identification	perennial stream		intermittent stream		ephemeral stream		wwc	✓			
-HD score (if applicable)	6.5										
-OHWM indicators	bed & banks	✓	deposition		presence of litter debris	✓	scour		veg absent, bent, matted		
	change in plant community		destruction of terrestrial veg		multiple observe flow events		sediment sorting		water staining		
	change in soil character		leaf litter disturb or absent		natural line impressed on bank		shelving		wracking		
-channel bottom width	1'			-top of bank width		5'					
-width and max depth at ordinary high water mark	N/A										
-width at bankfull	2'										
-bank height	LDB - 2'			RDB - 2'							
-riffle/pool complex or other specialized habitat present?	No										
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Ragweed, broom weed, black willow, johnson grass, Bermuda grass, elderberry										
	RDB: Ragweed, broom weed, black willow, johnson grass, Bermuda grass, elderberry										
-particle size distribution %	Silt/Sand:	100	Gravel:		Cobble:		Boulder:		Bedrock:		
5-photo numbers	32										
6-HUC -8 Code & Name	08010205 - South Fork Forked Deer										
7-Assessed	yes			no	✓						
8-ETW	yes			no	✓						
9-303 (d) List	yes			siltation			habitat:		other:		
	no	✓									
10-Notes											

Revised July 2022

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Briar Creek		Date/Time: 08/12/24
Assessors/Affiliation: JC, JG; JMT		Project ID : 102251.03
Site Name/Description: WWC-11/UDF-7		
Site Location: Intersection of Woodlawn Rd and SR-19		
HUC (12 digit): 080102050402	Latitude: 35.658606	
Previous Rainfall (7-days) : < 0.5 inches	Longitude: -89.364870	
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0		
Watershed Size : 0.03 sq. miles	County: Haywood	
Soil Type(s) / Geology : Loring Silt Loam	Source: NRCS Web Soil Survey	
Surrounding Land Use : Low Density Residential, Agricultural		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 6.5

Justification / Notes :

Incipient drought (based on APT).

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 2)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	0.5	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 2)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	0.5	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 2.5)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 6.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Area appears to start in ag field and is routed along road. Culvert at the south end of project area diverts east across the road.

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.03					
Biologist:	RB & BC	**Affiliation:**	JMT	**Date:**	08-12-24

1-Station: from plans	~0.23 miles Southeast of Woodlawn Rd on SR-19									
2-Map label and name	WWC-12/UDF-8									
3-Latitude/Longitude	35.656291, -89.361485									
4-Feature description:										
-channel identification	perennial stream		intermittent stream		ephemeral stream		wwc	✓		
-HD score (if applicable)	9.5									
-OHWM indicators	bed & banks		deposition		presence of litter debris		scour		veg absent, bent, matted	
	change in plant community		destruction of terrestrial veg		multiple observe flow events		sediment sorting		water staining	
	change in soil character		leaf litter disturb or absent		natural line impressed on bank		shelving		wracking	
-channel bottom width	4'		-top of bank width		4'					
-width and max depth at ordinary high water mark	N/A									
-width at bankfull	4"									
-bank height	LDB - 18"				RDB - 18"					
-riffle/pool complex or other specialized habitat present?	No									
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Grass sp.									
	RDB: Giant ragweed									
-particle size distribution %	Silt/Sand:	100	Gravel:		Cobble:		Boulder:		Bedrock:	
5-photo numbers	33									
6-HUC -8 Code & Name	08010205 - South Fork Forked Deer									
7-Assessed	yes			no	✓					
8-ETW	yes			no	✓					
9-303 (d) List	yes			siltation			habitat:		other:	
	no	✓								
10-Notes	Drains into STR-4 at culvert outlet.									

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Briar Creek		Date/Time:8/12/24
Assessors/Affiliation:RB, BC; JMT		Project ID :102251.03
Site Name/Description:WWC-12/UDF-8		
Site Location:~0.23 miles Southeast of Woodlawn Rd on SR-19		
HUC (12 digit):080102050402	Latitude:35.656291	
Previous Rainfall (7-days) :< 0.5 inches	Longitude:-89.361485	
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0		
Watershed Size :< 0.01 sq. miles	County:Haywood	
Soil Type(s) / Geology :Adler Silt Loam	Source:NRCS Web Soil Survey	
Surrounding Land Use :Agricultural		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 9.5

Justification / Notes :

Incipient drought (based on APT). Feeds into STR-4.

Roadside ditch.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal =4)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal =0.5)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal =5)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants.

[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 9.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.03					
Biologist:	PB, BF	**Affiliation:**	JMT	**Date:**	08-13-24

1-Station: from plans	0.31 mile south of Woodlawn Road on the south side of SR-19								
2-Map label and name	WWC-13/EPH-5								
3-Latitude/Longitude	35.655855, -89.361469								
4-Feature description:									
-channel identification	perennial stream		intermittent stream		ephemeral stream	✓	wwc	✓	
-HD score (if applicable)	9								
-OHWM indicators	bed & banks	✓	deposition		presence of litter debris		scour		veg absent, bent, matted
	change in plant community		destruction of terrestrial veg		multiple observe flow events		sediment sorting		water staining
	change in soil character		leaf litter disturb or absent		natural line impressed on bank		shelving		wracking
-channel bottom width	1.5'		-top of bank width	12'					
-width and max depth at ordinary high water mark	Width 4', max depth 1'								
-width at bankfull	4'								
-bank height	LDB - 2'		RDB - 2'						
-riffle/pool complex or other specialized habitat present?	No								
-dominant riparian species: ----------(LDB /RDB)----------	LDB: slippery elm, black willow, sweet-gum								
	RDB: slippery elm, black willow, sweet-gum, white oak								
-particle size distribution %	Silt/Sand:	100	Gravel:		Cobble:		Boulder:		Bedrock:
5-photo numbers	34								
6-HUC -8 Code & Name	08010205 - South Fork Forked Deer								
7-Assessed	yes			no	✓				
8-ETW	yes			no	✓				
9-303 (d) List	yes			siltation		habitat:		other:	
	no	✓							
10-Notes									

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Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Briar Creek	Date/Time: 08/13/24
Assessors/Affiliation: PB, BF; JMT	Project ID : 102251.03
Site Name/Description: WWC-13/EPH-5	
Site Location: 0.31 mile south of Woodlawn Road on the south side of TN-19	
HUC (12 digit): 080102050402	Latitude: 35.655855
Previous Rainfall (7-days) : < 0.5 inches	Longitude: -89.361469
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0	
Watershed Size : 0.23 sq. miles	County: Haywood
Soil Type(s) / Geology : Adler Silt Loam	Source: NRCS Web Soil Survey
Surrounding Land Use : Low Density Residential, Agricultural	
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 9

Justification / Notes :

Incipient drought (based on APT).

Created by agricultural field runoff.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 6.5)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	0.5 1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 1.5)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 1)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants.

[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 9

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.03					
Biologist:	PB, BF	**Affiliation:**	JMT	**Date:**	08-13-24

1-Station: from plans	0.33 miles south of Woodlawn Rd on the south side of SR-19									
2-Map label and name	STR-4									
3-Latitude/Longitude	35.655659, -89.361676									
4-Feature description:										
-channel identification	perennial stream		intermittent stream	✓	ephemeral stream		wwc			
-HD score (if applicable)	19.5									
-OHWM indicators	bed & banks	✓	deposition		presence of litter debris		scour		veg absent, bent, matted	
	change in plant community		destruction of terrestrial veg		multiple observe flow events		sediment sorting		water staining	
	change in soil character		leaf litter disturb or absent		natural line impressed on bank		shelving		wracking	
-channel bottom width	4'		-top of bank width		15'					
-width and max depth at ordinary high water mark	8' width , max depth 4'									
-width at bankfull	10'									
-bank height	LDB - 6'				RDB - 7'					
-riffle/pool complex or other specialized habitat present?	No									
-dominant riparian species: ----------(LDB /RDB)----------	LDB: sweet-gum, boxelder, black willow, trumpet creeper									
	RDB: sweet-gum, boxelder, black willow, trumpet creeper									
-particle size distribution %	Silt/Sand:	90	Gravel:	10	Cobble:		Boulder:		Bedrock:	
5-photo numbers	35-38									
6-HUC -8 Code & Name	08010205 - South Fork Forked Deer									
7-Assessed	yes		no	✓						
8-ETW	yes		no	✓						
9-303 (d) List	yes		siltation		habitat:		other:			
	no	✓								
10-Notes										

Revised July 2022

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Briar Creek	Date/Time: 08/13/24
Assessors/Affiliation: PB, BF; JMT	Project ID : 102251.03
Site Name/Description: STR-4	
Site Location: 0.33 miles south of Woodlawn Rd on the south side of SR-19	
HUC (12 digit): 080102050402	Latitude: 35.655659
Previous Rainfall (7-days) : < 0.5 inches	Longitude: -89.361676
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0	
Watershed Size : 0.23 sq. miles	County: Haywood
Soil Type(s) / Geology : Adler Silt Loam	Source: NRCS Web Soil Survey
Surrounding Land Use : Low Density Residential, Agricultural	
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = 19.5

Justification / Notes :

Incipient drought (based on APT). Some reaches of the stream are impacted by agricultural runoff.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 13)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	1.5 2	3
3. In-channel structure: riffle-pool sequences	0	1	2 2.5	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 4.5)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 2)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 19.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Water present at the upstream side of the culvert. 4 moderately sized grade controls noted.

Ecology Field Data Sheet: **Water Resources**

Project: Lauderdale County, SR-19, 102251.03					
Biologist:	RB, BC	**Affiliation:**	JMT	**Date:**	08-14-24

1-Station: from plans	North side of SR-19 south ~0.4 miles SE of Briarcreek Rd								
2-Map label and name	WWC-14/EPH-6								
3-Latitude/Longitude	35.655603, -89.360544								
4-Feature description:									
-channel identification	perennial stream		intermittent stream		ephemeral stream	✓	wwc	✓	
-HD score (if applicable)	14								
-OHWM indicators	bed & banks	✓	deposition		presence of litter debris	✓	scour		veg absent, bent, matted	
	change in plant community		destruction of terrestrial veg		multiple observe flow events		sediment sorting		water staining	
	change in soil character		leaf litter disturb or absent		natural line impressed on bank		shelving		wracking	✓
-channel bottom width	3'		-top of bank width	8'						
-width and max depth at ordinary high water mark	N/A									
-width at bankfull	5'									
-bank height	LDB - 4'		RDB - 4'							
-riffle/pool complex or other specialized habitat present?	No									
-dominant riparian species: ----------(LDB /RDB)----------	LDB: loblolly pine, sweet-gum, virginia creeper, muscadine									
	RDB: loblolly pine, sweet-gum, virginia creeper, muscadine									
-particle size distribution %	Silt/Sand: 95		Gravel: 5		Cobble:		Boulder:		Bedrock:	
5-photo numbers	Not Available									
6-HUC -8 Code & Name	08010208 - Lower Hatchie									
7-Assessed	yes			no	✓					
8-ETW	yes			no	✓					
9-303 (d) List	yes			siltation		habitat:		other:		
	no	✓								
10-Notes										

Revised July 2022

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Briar Creek		Date/Time: 08/14/24
Assessors/Affiliation: RB, BC; JMT		Project ID : 102251.03
Site Name/Description: WWC-14/EPH-6		
Site Location: North side of SR-19 south ~0.4 miles SE of Briarcreek Rd		
HUC (12 digit): 080102080402	Latitude: 35.655603	
Previous Rainfall (7-days) : < 0.5 inches	Longitude: -89.360544	
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0		
Watershed Size : < 0.01 sq. miles	County: Lauderdale	
Soil Type(s) / Geology : Loring Silt Loam	Source: NRCS Web Soil Survey	
Surrounding Land Use : Low Density Residential, Agricultural		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Wet Water Conveyance

Secondary Indicator Score (if applicable) = 14

Justification / Notes :

Incipient drought (based on APT).

Incised channel.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 8.5)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 1.5)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 4)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants.

[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 14

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.03					
Biologist:	PB, BF	**Affiliation:**	JMT	**Date:**	08-13-24

1-Station: from plans	0.37 miles south of Woodlawn Road on the south side of SR-19 (south of STR-4)								
2-Map label and name	WWC-15/EPH-7								
3-Latitude/Longitude	35.655271, -89.361116								
4-Feature description:									
-channel identification	perennial stream		intermittent stream		ephemeral stream	✓	wwc	✓	
-HD score (if applicable)	15.5								
-OHWM indicators	bed & banks	✓	deposition	✓	presence of litter debris		scour	✓	veg absent, bent, matted ✓
	change in plant community		destruction of terrestrial veg	✓	multiple observe flow events		sediment sorting	✓	water staining ✓
	change in soil character		leaf litter disturb or absent		natural line impressed on bank	✓	shelving		wracking ✓
-channel bottom width	3'		-top of bank width		12'				
-width and max depth at ordinary high water mark	Width 2.5', max depth 0.5'								
-width at bankfull	6'								
-bank height	LDB - 5'		RDB - 5'						
-riffle/pool complex or other specialized habitat present?	No								
-dominant riparian species: ----------(LDB /RDB)----------	LDB: slippery elm, sweet-gum, trumpet creeper								
	RDB: slippery elm, sweet-gum, trumpet creeper								
-particle size distribution %	Silt/Sand: 90		Gravel: 10		Cobble:		Boulder:		Bedrock:
5-photo numbers	39								
6-HUC -8 Code & Name	08010205 - South Fork Forked Deer								
7-Assessed	yes				no	✓			
8-ETW	yes				no	✓			
9-303 (d) List	yes				siltation		habitat:		other:
	no	✓							
10-Notes									

Revised July 2022

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Briar Creek	Date/Time: 08/13/24
Assessors/Affiliation: PB, BF; JMT	Project ID : 102251.03
Site Name/Description: WWC-15/EPH-7	
Site Location: 0.37 miles south of Woodlawn Road on the south side of SR-19 (south of STR-4)	
HUC (12 digit): 080102050402	Latitude: 35.655271
Previous Rainfall (7-days) : < 0.5 inches	Longitude: -89.361116
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0	
Watershed Size : 0.24 sq. miles	County: Haywood
Soil Type(s) / Geology : Adler Silt Loam	Source: NRCS Web Soil Survey
Surrounding Land Use : Low Density Residential, Agricultural	
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 15.5

Justification / Notes :

Incipient drought (based on APT).

Agricultural runoff feature.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 10.5)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2 2.5	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1 1.5	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 2.5)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 2.5)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2 1.5	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants.

[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 15.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.03					
Biologist:	RB & BC	**Affiliation:**	JMT	**Date:**	08-12-24

1-Station: from plans	~0.23 miles Southeast of Woodlawn Rd on SR-19								
2-Map label and name	WWC-16/UDF-9								
3-Latitude/Longitude	35.656291, -89.361485								
4-Feature description:									
-channel identification	perennial stream ☐	intermittent stream ☐	ephemeral stream ☐	wwc ☑					
-HD score (if applicable)	9.5								
-OHWM indicators	bed & banks ☐	deposition ☐	presence of litter debris ☐	scour ☐	veg absent, bent, matted ☐				
	change in plant community ☐	destruction of terrestrial veg ☐	multiple observe flow events ☐	sediment sorting ☐	water staining ☐				
	change in soil character ☐	leaf litter disturb or absent ☐	natural line impressed on bank ☐	shelving ☐	wracking ☐				
-channel bottom width	4'	-top of bank width	4'						
-width and max depth at ordinary high water mark	N/A								
-width at bankfull	4"								
-bank height	LDB - 18"	RDB - 18"							
-riffle/pool complex or other specialized habitat present?	No								
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Giant ragweed								
	RDB: Giant ragweed								
-particle size distribution %	Silt/Sand: 100	Gravel:	Cobble:	Boulder:	Bedrock:				
5-photo numbers	40								
6-HUC -8 Code & Name	08010205 - South Fork Forked Deer								
7-Assessed	yes ☐	no ☑							
8-ETW	yes ☐	no ☑							
9-303 (d) List	yes ☐	siltation ☐	habitat: ☐	other: ☐					
	no ☑								
10-Notes	Drains into STR-5 at culvert.								

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Briar Creek	Date/Time:8/12/24
Assessors/Affiliation:RB, BC; JMT	Project ID :102251.03
Site Name/Description:WWC-16/UDF-9	
Site Location:~0.23 miles Southeast of Woodlawn Rd on SR-19	
HUC (12 digit):080102050402	Latitude:35.656291
Previous Rainfall (7-days) :< 0.5 inches	Longitude:-89.361485
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0	
Watershed Size :< 0.01 sq. miles	County:Haywood
Soil Type(s) / Geology :Adler Silt Loam	Source:NRCS Web Soil Survey
Surrounding Land Use :Agricultural	
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 9.5

Justification / Notes :

Incipient drought (based on APT). Feeds into STR-5.

Roadside ditch.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal =4)	**Absent**	**Weak**	**Moderate**	**Strong**	
1. Continuous bed and bank	0	1	2	3	3
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	1
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
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
13. At least second order channel on existing USGS or NRCS map	0	1	2	3	0

B. Hydrology (Subtotal =0.5)	**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
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5		0

C. Biology (Subtotal =5)	**Absent**	**Weak**	**Moderate**	**Strong**	
20. Fibrous roots in channel bed [1]	3	2	1	0	2.0
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
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 = 9.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.03					
Biologist:	JC, JG; JMT	**Affiliation:**	JMT	**Date:**	08-12-24

1-Station: from plans	~0.74 miles South East of Woodlawn Rd on SR-19								
2-Map label and name	STR-5								
3-Latitude/Longitude	35.650778, -89.355297								
4-Feature description:									
-channel identification	perennial stream	✓	intermittent stream		ephemeral stream		wwc		
-HD score (if applicable)	33.5								
-OHWM indicators	bed & banks	✓	deposition	✓	presence of litter debris	✓	scour	✓	veg absent, bent, matted ✓
	change in plant community	✓	destruction of terrestrial veg	✓	multiple observe flow events		sediment sorting	✓	water staining ✓
	change in soil character	✓	leaf litter disturb or absent	✓	natural line impressed on bank	✓	shelving	✓	wracking ✓
-channel bottom width	12'		-top of bank width		3.5' to 20'				
-width and max depth at ordinary high water mark	width 1' to 10', max depth 3'								
-width at bankfull	varies from 3.5' to 10'								
-bank height	LDB - 4' to 8'		RDB - 4' to 8'						
-riffle/pool complex or other specialized habitat present?	No								
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Giant ragweed, microstegium								
	RDB: Giant ragweed, microstegium								
-particle size distribution %	Silt/Sand: 90		Gravel: 10		Cobble:		Boulder:		Bedrock:
5-photo numbers	41-43								
6-HUC -8 Code & Name	08010205 - South Fork Forked Deer								
7-Assessed	yes	✓	no						
8-ETW	yes		no	✓					
9-303 (d) List	yes		siltation		habitat:		other:		
	no	✓							
10-Notes	South section of stream had a beaver dam, water present throughout the channel but no flow observed.								

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT to Briar Creek		Date/Time: 08/12/24
Assessors/Affiliation: JC, JG; JMT		Project ID : 102251.03
Site Name/Description: STR-5		
Site Location: Southeast of Woodlawn Rd meeting SR-19		
HUC (12 digit): 080102050402	Latitude: 35.650778	
Previous Rainfall (7-days) : < 0.5 inches	Longitude: -89.355297	
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0		
Watershed Size : 0.81 sq. miles	County: Haywood	
Soil Type(s) / Geology : Convent Silt Loam	Source: NRCS Web Soil Survey	
Surrounding Land Use : Low Density Residential, Agricultural		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = 33.5

Justification / Notes :

APT noted an incipient drought.

Evidence of historic straightening on the channel.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 14.5)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	0.5 1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	1.5 2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 9)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 10)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 33.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : South section of stream had a beaver dam, water present throughout the channel but no flow observed.

Wetland plants include black willow, and persicaria sp.. Tadpoles and algea were also located within the channel.

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.03					
Biologist:	JC, JG	**Affiliation:**	JMT	**Date:**	08-13-24

1-Station: from plans	Southeast of Woodlawn Rd meeting SR-19, along southside of road.									
2-Map label and name	WWC-17/UDF-10									
3-Latitude/Longitude	35.650039, -89.354463									
4-Feature description:										
-channel identification	perennial stream		intermittent stream		ephemeral stream		wwc	✓		
-HD score (if applicable)	10									
-OHWM indicators	bed & banks	✓	deposition	✓	presence of litter debris	✓	scour		veg absent, bent, matted	
	change in plant community		destruction of terrestrial veg		multiple observe flow events		sediment sorting		water staining	
	change in soil character		leaf litter disturb or absent		natural line impressed on bank		shelving		wracking	
-channel bottom width	2'		-top of bank width		8'					
-width and max depth at ordinary high water mark	width 2', max depth 0.5'									
-width at bankfull	1'									
-bank height	LDB - 3.5'				RDB - 3.5'					
-riffle/pool complex or other specialized habitat present?	No									
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Ragweed, Bermuda grass, Johnson grass, maple, sweet gum, black walnut									
	RDB: Ragweed, Bermuda grass, Johnson grass, maple, sweet gum, black walnut									
-particle size distribution %	Silt/Sand:	100	Gravel:		Cobble:		Boulder:		Bedrock:	
5-photo numbers	44-45									
6-HUC -8 Code & Name	08010205 - South Fork Forked Deer									
7-Assessed	yes			no	✓					
8-ETW	yes			no	✓					
9-303 (d) List	yes			siltation			habitat:		other:	
	no	✓								
10-Notes										

Revised July 2022

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Briar Creek	Date/Time: 08/12/24
Assessors/Affiliation: JC, JG; JMT	Project ID : 102251.03
Site Name/Description: WWC-17/UDF-10	
Site Location: One mile southeast of Woodlawn Rd and SR-19 intersection	
HUC (12 digit): 080102050402	Latitude: 35.650039
Previous Rainfall (7-days) : < 0.5 inches	Longitude: -89.354463
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0	
Watershed Size : <0.02 sq. miles	County: Haywood
Soil Type(s) / Geology : Loring Silt Loam	Source: NRCS Web Soil Survey
Surrounding Land Use : Low Density Residential, Agricultural	
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 10

Justification / Notes :

Incipient drought (based on APT).

Feature appears to have been created by agricultural runoff and roadside ditching.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 6.5)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 1.5)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 2)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants.

[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 10

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.03					
Biologist:	RF & MM	**Affiliation:**	JMT	**Date:**	08-12-24

1-Station: from plans	Southeast of STR-5, of the roadside of the north side of SR-19								
2-Map label and name	WWC-18/UDF-11								
3-Latitude/Longitude	35.650818, -89.355127								
4-Feature description:									
-channel identification	perennial stream		intermittent stream		ephemeral stream		wwc	✓	
-HD score (if applicable)	9.5								
-OHWM indicators	bed & banks	✓	deposition		presence of litter debris		scour		veg absent, bent, matted
	change in plant community		destruction of terrestrial veg		multiple observe flow events		sediment sorting		water staining
	change in soil character		leaf litter disturb or absent		natural line impressed on bank		shelving		wracking
-channel bottom width	1'		-top of bank width	1'					
-width and max depth at ordinary high water mark	N/A								
-width at bankfull	1'								
-bank height	LDB - 1.5'		RDB - 1.5'						
-riffle/pool complex or other specialized habitat present?	No								
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Giant ragweed								
	RDB: Giant ragweed								
-particle size distribution %	Silt/Sand:	100	Gravel:		Cobble:		Boulder:		Bedrock:
5-photo numbers	46								
6-HUC -8 Code & Name	08010205 - South Fork Forked Deer								
7-Assessed	yes		no	✓					
8-ETW	yes		no	✓					
9-303 (d) List	yes		siltation		habitat:		other:		
	no	✓							
10-Notes									

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Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody:UNT Briar Creek	Date/Time:8/12/24
Assessors/Affiliation:RF, MM; JMT	Project ID :102251.03
Site Name/Description:WWC-18/UDF-11	
Site Location:Southeast of STR-5, of the roadside of the north side of SR-19	
HUC (12 digit):080102050402	Latitude:35.650818
Previous Rainfall (7-days) :< 0.5 inches	Longitude:-89.355127
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0	
Watershed Size :0.83 sq. miles	County:Haywood
Soil Type(s) / Geology :Convent Silt Loam	Source:NRCS Web Soil Survey
Surrounding Land Use :Agricultural	
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 9.5

Justification / Notes :

Incipient drought (based on APT).

Roadside and Agricultural drainage.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 2)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 1.5)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 6)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants.

[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 9.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : drains storm water runoff into STR-5

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.03					
Biologist:	RF & MM	**Affiliation:**	JMT	**Date:**	08-12-24

1-Station: from plans	~0.86 miles northwest of Old Highway 19 on SR-19								
2-Map label and name	WWC-19/EPH-8								
3-Latitude/Longitude	35.646850, -89.350212								
4-Feature description:									
-channel identification	perennial stream		intermittent stream		ephemeral stream	✓	wwc	✓	
-HD score (if applicable)	6								
-OHWM indicators	bed & banks	✓	deposition		presence of litter debris		scour		veg absent, bent, matted	
	change in plant community		destruction of terrestrial veg		multiple observe flow events		sediment sorting		water staining	
	change in soil character		leaf litter disturb or absent		natural line impressed on bank		shelving		wracking	
-channel bottom width	1'		-top of bank width	1'						
-width and max depth at ordinary high water mark	N/A									
-width at bankfull	1'									
-bank height	LDB - 1.5'		RDB - 1.5'							
-riffle/pool complex or other specialized habitat present?	No									
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Giant ragweed									
	RDB: Giant ragweed									
-particle size distribution %	Silt/Sand:	100	Gravel:		Cobble:		Boulder:		Bedrock:	
5-photo numbers	47									
6-HUC -8 Code & Name	08010205 - South Fork Forked Deer									
7-Assessed	yes			no	✓					
8-ETW	yes			no	✓					
9-303 (d) List	yes		siltation		habitat:		other:			
	no	✓								
10-Notes										

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Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody:UNT Briar Creek	Date/Time:8/12/24
Assessors/Affiliation:RF, MM; JMT	Project ID :102251.03
Site Name/Description:WWC-19/EPH-8	
Site Location:~0.86 miles northwest of Old Highway 19 on SR-19	
HUC (12 digit):080102050402	Latitude:35.646850
Previous Rainfall (7-days) :< 0.5 inches	Longitude:-89.350212
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0	
Watershed Size :< 0.01 sq. miles	County:Haywood
Soil Type(s) / Geology :Loring Silt Loam	Source:NRCS Web Soil Survey
Surrounding Land Use :Low Density Residential, Agricultural	
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination =Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 6

Justification / Notes :

Incipient drought (based on APT).

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 1)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 1)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 4)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants.

[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 6

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Ecology Field Data Sheet: **Other Resource Features**

(Caves/Rock Houses; Potential Sinkholes; Specialized Habitats; Other)

Project: Haywood County, SR-19 **PIN #:** 102251.03

Date of survey: 08-15-24 **Biologist(s):** PB and BF **Affiliation:** JMT

1-Station: from plans	0.8 miles west of Old SR-19 on SR-19	
2-Map label	PND-1	
3-Lat/Long	35.644620, -89.348410	
4-Potential impact size	Total area within Study Area: 0.032 acres	
5-Feature name	PND-1	
6-Feature description:		
what is the feature	Pond	
portion affected	Undetermined	
connection to other features	No connection to downstream waters identified	
photo number(s)	48	
other information	Pond likely dug in upland in association with agricultural land use	
7- HUC code & name if applicable (12-digit)	Meridian Creek (080102050402)	
8-Notes	Located within an active pasture.	

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.03					
Biologist:	JC, JG	**Affiliation:**	JMT	**Date:**	08-13-24

1-Station: from plans	Along south side of SR-19 northwest of Briar Creek										
2-Map label and name	WWC-20/UDF-12										
3-Latitude/Longitude	35.643711, -89.346171										
4-Feature description:											
-channel identification	perennial stream		intermittent stream		ephemeral stream		wwc	✓			
-HD score (if applicable)	12										
-OHWM indicators	bed & banks	✓	deposition		presence of litter debris	✓	scour		veg absent, bent, matted		
	change in plant community		destruction of terrestrial veg		multiple observe flow events		sediment sorting		water staining		
	change in soil character		leaf litter disturb or absent		natural line impressed on bank		shelving		wracking		
-channel bottom width	2'		-top of bank width		6'						
-width and max depth at ordinary high water mark	Width 3', max depth 1'										
-width at bankfull	3.5'										
-bank height	LDB - 3.5'				RDB - 3.5'						
-riffle/pool complex or other specialized habitat present?	No										
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Johnson grass, Bermuda grass, poison ivy, pigweed, persicaria										
	RDB: Johnson grass, Bermuda grass, poison ivy, pigweed, persicaria										
-particle size distribution %	Silt/Sand:	100	Gravel:		Cobble:		Boulder:		Bedrock:		
5-photo numbers	49										
6-HUC -8 Code & Name	08010205 - South Fork Forked Deer										
7-Assessed	yes			no	✓						
8-ETW	yes			no	✓						
9-303 (d) List	yes			siltation			habitat:		other:		
	no	✓									
10-Notes											

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Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Meridian Creek		Date/Time: 08/12/24
Assessors/Affiliation: JC, JG; JMT		Project ID : 102251.03
Site Name/Description: WWC-20/UDF-12		
Site Location: Along south side of SR-19 northwest of Briar Creek		
HUC (12 digit): 080102050402	Latitude: 35.643711	
Previous Rainfall (7-days) : < 0.5 inches	Longitude: -89.346171	
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0		
Watershed Size : <0.02 sq. miles	County: Haywood	
Soil Type(s) / Geology : Calloway Silt Loam	Source: NRCS Web Soil Survey	
Surrounding Land Use : Low Density Residential, Agricultural		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 12

Justification / Notes :

Incipient drought (based on APT).

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 5)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 3)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 4)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 12

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Area appears to be fed by ag field and roadway sheetflow. Area closest to the stream has standing water present. Evidence of periodic mowing or shredding present. Frogs noted in channel.

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.03					
Biologist:	RB & BC	**Affiliation:**	JMT	**Date:**	08-12-24

1-Station: from plans	~ 0.51 miles North West of Old Highway 19 on SR-19									
2-Map label and name	STR-6 / Briar Creek									
3-Latitude/Longitude	35.643503, -89.345656									
4-Feature description:										
-channel identification	perennial stream	✓	intermittent stream		ephemeral stream		wwc			
-HD score (if applicable)	N/A : STR-6 is a named USGS stream. No HD form is provided.									
-OHWM indicators	bed & banks	✓	deposition	✓	presence of litter debris	✓	scour	✓	veg absent, bent, matted	✓
	change in plant community		destruction of terrestrial veg	✓	multiple observe flow events		sediment sorting	✓	water staining	✓
	change in soil character	✓	leaf litter disturb or absent	✓	natural line impressed on bank	✓	shelving	✓	wracking	✓
-channel bottom width	8'		-top of bank width		9'					
-width and max depth at ordinary high water mark	width 9', max depth 1-2'									
-width at bankfull	9'									
-bank height	LDB - 5'				RDB - 8'					
-riffle/pool complex or other specialized habitat present?	No									
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Elderberry									
	RDB: Giant ragweed									
-particle size distribution %	Silt/Sand:	100	Gravel:		Cobble:		Boulder:		Bedrock:	
5-photo numbers	50-53									
6-HUC -8 Code & Name	08010205 - South Fork Forked Deer									
7-Assessed	yes		no	✓						
8-ETW	yes		no	✓						
9-303 (d) List	yes		siltation		habitat:		other:			
	no	✓								
10-Notes	Many aquatic snails present									

Revised July 2022

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.03					
Biologist:	RB & BC	**Affiliation:**	JMT	**Date:**	08-12-24

1-Station: from plans	~ 0.51 miles North West of Old Highway 19 on SR-19									
2-Map label and name	STR-7									
3-Latitude/Longitude	35.643067, -89.344958									
4-Feature description:										
-channel identification	perennial stream		intermittent stream	✓	ephemeral stream		wwc			
-HD score (if applicable)	14									
-OHWM indicators	bed & banks	✓	deposition		presence of litter debris		scour	✓	veg absent, bent, matted	
	change in plant community	✓	destruction of terrestrial veg		multiple observe flow events		sediment sorting		water staining	✓
	change in soil character		leaf litter disturb or absent	✓	natural line impressed on bank		shelving		wracking	
-channel bottom width	4'		-top of bank width		5'					
-width and max depth at ordinary high water mark	width 5', max depth 0.5-2"									
-width at bankfull	5'									
-bank height	LDB - 2'				RDB - 2'					
-riffle/pool complex or other specialized habitat present?	No									
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Elderberry									
	RDB: Elderberry									
-particle size distribution %	Silt/Sand:	100	Gravel:		Cobble:		Boulder:		Bedrock:	
5-photo numbers	54-55									
6-HUC -8 Code & Name	08010205 - South Fork Forked Deer									
7-Assessed	yes		no	✓						
8-ETW	yes		no	✓						
9-303 (d) List	yes		siltation		habitat:		other:			
	no	✓								
10-Notes	Fed by WWC-22/UDF-13, feeds into Briar Creek.									

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody:UNT Briar Creek		Date/Time:8/12/24
Assessors/Affiliation:RB, BC; JMT		Project ID :102251.03
Site Name/Description:STR-7		
Site Location:~ 0.51 miles North West of Old Highway 19 on SR-19		
HUC (12 digit):080102050402	Latitude:35.643067	
Previous Rainfall (7-days) :< 0.5 inches	Longitude:-89.344958	
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0		
Watershed Size :0.17 sq. miles	County:Haywood	
Soil Type(s) / Geology :Adler Silt Loam	Source:NRCS Web Soil Survey	
Surrounding Land Use :Agricultural		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination =Stream

Secondary Indicator Score (if applicable) = 14

Justification / Notes :

Incipient drought (based on APT). NHD stream also shows up on USGS Topo (unnamed).

Moderately altered around agricultural fields.

Fed by WWC-22/UDF-14, feeds into Briar Creek.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal =8.5)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal =2.5)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal =3)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants.

[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 14

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.03					
Biologist:	JC, JG	**Affiliation:**	JMT	**Date:**	08-13-24

1-Station: from plans	0.6 miles northwest of the intersection of SR-19 and old SR-19										
2-Map label and name	WWC-21/UDF-13										
3-Latitude/Longitude	35.642505, -89.345461										
4-Feature description:											
-channel identification	perennial stream		intermittent stream		ephemeral stream		wwc	✓			
-HD score (if applicable)	16.5										
-OHWM indicators	bed & banks	✓	deposition		presence of litter debris	✓	scour		veg absent, bent, matted		
	change in plant community	✓	destruction of terrestrial veg		multiple observe flow events		sediment sorting		water staining		
	change in soil character	✓	leaf litter disturb or absent		natural line impressed on bank		shelving		wracking	✓	
-channel bottom width	3'			-top of bank width		8'					
-width and max depth at ordinary high water mark	N/A										
-width at bankfull	N/A										
-bank height	LDB - 5'			RDB - 5'							
-riffle/pool complex or other specialized habitat present?	No										
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Johnson grass, pokeweed, elder berry, greenbrier, ragweed										
	RDB: Johnson grass, pokeweed, elder berry, greenbrier, ragweed										
-particle size distribution %	Silt/Sand:	100	Gravel:		Cobble:		Boulder:		Bedrock:		
5-photo numbers	56-57										
6-HUC -8 Code & Name	08010205 - South Fork Forked Deer										
7-Assessed	yes		no	✓							
8-ETW	yes		no	✓							
9-303 (d) List	yes		siltation		habitat:		other:				
	no	✓									
10-Notes											

Revised July 2022

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Meridian Creek	Date/Time: 08/12/24
Assessors/Affiliation: JC, JG; JMT	Project ID : 102251.03
Site Name/Description: WWC-21/UDF-13	
Site Location: 0.6 miles northwest of the intersection of SR-19 and old SR-19	
HUC (12 digit): 080102050402	Latitude: 35.642505
Previous Rainfall (7-days) : < 0.5 inches	Longitude: -89.345461
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0	
Watershed Size : 0.74 sq. miles	County: Haywood
Soil Type(s) / Geology : Alder Silt Loam	Source: NRCS Web Soil Survey
Surrounding Land Use : Low Density Residential, Agricultural	
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 16.5

Justification / Notes :

Incipient drought (based on APT).

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 7.5)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 3.5)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 5.5)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 16.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Area near stream STR-6, had surface water present. Area appears to be fed by sheetflow from ag field.

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.03					
Biologist:	RB & BC	**Affiliation:**	JMT	**Date:**	08-12-24

1-Station: from plans	Northwest of the intersection of Old Highway 19 and SR-19										
2-Map label and name	WWC-22/UDF-14										
3-Latitude/Longitude	35.641533, -89.342867										
4-Feature description:											
-channel identification	perennial stream		intermittent stream		ephemeral stream		wwc	✓			
-HD score (if applicable)	16										
-OHWM indicators	bed & banks	✓	deposition		presence of litter debris		scour		veg absent, bent, matted		
	change in plant community		destruction of terrestrial veg		multiple observe flow events		sediment sorting		water staining		
	change in soil character		leaf litter disturb or absent		natural line impressed on bank		shelving		wracking		
-channel bottom width	3'			-top of bank width		3'					
-width and max depth at ordinary high water mark	N/A										
-width at bankfull	3'										
-bank height	LDB - 2'			RDB - 2'							
-riffle/pool complex or other specialized habitat present?	No										
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Elderberry										
	RDB: Elderberry										
-particle size distribution %	Silt/Sand:	100	Gravel:		Cobble:		Boulder:		Bedrock:		
5-photo numbers	58-59										
6-HUC -8 Code & Name	08010205 - South Fork Forked Deer										
7-Assessed	yes		no	✓							
8-ETW	yes		no	✓							
9-303 (d) List	yes		siltation		habitat:		other:				
	no	✓									
10-Notes	Tributary to STR-7.										

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody:UNT Briar Creek	Date/Time:8/12/24
Assessors/Affiliation:RB, BC; JMT	Project ID :102251.03
Site Name/Description:WWC-22/UDF-14	
Site Location:Northwest of the intersection of Old Highway 19 and SR-19	
HUC (12 digit):080102050402	Latitude:35.641533
Previous Rainfall (7-days) :< 0.5 inches	Longitude:-89.342867
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0	
Watershed Size :< 0.01 sq. miles	County:Haywood
Soil Type(s) / Geology :Adler Silt Loam, Loring Silt Loam	Source:NRCS Web Soil Survey
Surrounding Land Use :Agricultural	
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination =Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 16

Justification / Notes :

Incipient drought (based on APT). Tributary to STR-7.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal =8.5)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal =4.5)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal =3)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants.

[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 16

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.03					
Biologist:	RB & BC	**Affiliation:**	JMT	**Date:**	08-12-24

1-Station: from plans	Northwest of the intersection of Old Highway 19 and SR-19								
2-Map label and name	WWC-23/UDF-15								
3-Latitude/Longitude	35.638802, -89.339182								
4-Feature description:									
-channel identification	perennial stream ☐	intermittent stream ☐	ephemeral stream ☐	wwc ☑					
-HD score (if applicable)	12								
-OHWM indicators	bed & banks ☑	deposition ☐	presence of litter debris ☐	scour ☐	veg absent, bent, matted ☐				
	change in plant community ☐	destruction of terrestrial veg ☐	multiple observe flow events ☐	sediment sorting ☐	water staining ☐				
	change in soil character ☐	leaf litter disturb or absent ☐	natural line impressed on bank ☐	shelving ☐	wracking ☐				
-channel bottom width	1'	-top of bank width	3'						
-width and max depth at ordinary high water mark	N/A								
-width at bankfull	3'								
-bank height	LDB - 3'	RDB - 3'							
-riffle/pool complex or other specialized habitat present?	No								
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Giant ragweed								
	RDB: Giant ragweed								
-particle size distribution %	Silt/Sand: 100	Gravel:	Cobble:	Boulder:	Bedrock:				
5-photo numbers	60-61								
6-HUC -8 Code & Name	08010205 - South Fork Forked Deer								
7-Assessed	yes ☐	no ☑							
8-ETW	yes ☐	no ☑							
9-303 (d) List	yes ☐	siltation ☐	habitat: ☐	other: ☐					
	no ☑								
10-Notes									

Revised July 2022

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody:UNT Briar Creek	Date/Time:8/12/24
Assessors/Affiliation:RB, BC; JMT	Project ID :102251.03
Site Name/Description:WWC-23/UDF-15	
Site Location:Northwest of the intersection of Old Highway 19 and SR-19	
HUC (12 digit):080102050402	Latitude:35.638802
Previous Rainfall (7-days) :< 0.5 inches	Longitude:-89.339182
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0	
Watershed Size :< 0.01 sq. miles	County:Haywood
Soil Type(s) / Geology :Loring Silt Loam	Source:NRCS Web Soil Survey
Surrounding Land Use :Commercial, Agricultural	
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 12

Justification / Notes :

Incipient drought (based on APT).

Roadside ditch.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal =6.5)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal =2.5)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal =3)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants.

[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 12

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Ecology Field Data Sheet: **Other Resource Features**

(Caves/Rock Houses; Potential Sinkholes; Specialized Habitats; Other)

Project: Haywood County, SR-19 **PIN #:** 102251.03

Date of survey: 08-15-24 **Biologist(s):** PB and BF **Affiliation:** JMT

1-Station: from plans	Next to Dixon Rd on SR-19	
2-Map label	PND-2	
3-Lat/Long	35.638270, -89.337925	
4-Potential impact size	Total area within Study Area: 0.175 acres	
5-Feature name	PND-2	
6-Feature description:		
what is the feature	Pond	
portion affected	Undetermined	
connection to other features	No connection to downstream waters identified	
photo number(s)	62-63	
other information	Pond likely dug in upland in association with agricultural land use	
7- HUC code & name if applicable (12-digit)	Meridian Creek (080102050402)	
8-Notes		

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.03					
Biologist:	PB, BF	**Affiliation:**	JMT	**Date:**	08-13-24

1-Station: from plans	Flows along SR-19 at Wilson Livingston Rd									
2-Map label and name	STR-8									
3-Latitude/Longitude	35.631837, -89.330052									
4-Feature description:										
-channel identification	perennial stream		intermittent stream	✓	ephemeral stream		wwc			
-HD score (if applicable)	25									
-OHWM indicators	bed & banks	✓	deposition		presence of litter debris		scour	✓	veg absent, bent, matted	✓
	change in plant community	✓	destruction of terrestrial veg		multiple observe flow events		sediment sorting		water staining	✓
	change in soil character	✓	leaf litter disturb or absent	✓	natural line impressed on bank	✓	shelving	✓	wracking	✓
-channel bottom width	3'		-top of bank width		15'					
-width and max depth at ordinary high water mark	5' width , max depth 2'									
-width at bankfull	8'									
-bank height	LDB - 8'				RDB - 8'					
-riffle/pool complex or other specialized habitat present?	No									
-dominant riparian species: ----------(LDB /RDB)----------	LDB: sorghum, sambucus, blackberry									
	RDB: sorghum, sambucus, blackberry									
-particle size distribution %	Silt/Sand:	70	Gravel:	30	Cobble:		Boulder:		Bedrock:	
5-photo numbers	64-65									
6-HUC -8 Code & Name	08010205 - South Fork Forked Deer									
7-Assessed	yes		no	✓						
8-ETW	yes		no	✓						
9-303 (d) List	yes		siltation		habitat:		other:			
	no	✓								
10-Notes										

Revised July 2022

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Meridian Creek	Date/Time: 08/13/24
Assessors/Affiliation: PB, BF; JMT	Project ID : 102251.03
Site Name/Description: STR-8	
Site Location: Flows along SR-19 at Wilson Livingston Rd	
HUC (12 digit): 080102050402	Latitude: 35.631837
Previous Rainfall (7-days) : < 0.5 inches	Longitude: -89.330052
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0	
Watershed Size : 0.67 sq. miles	County: Haywood
Soil Type(s) / Geology : Convent and Adler Silt Loam	Source: NRCS Web Soil Survey
Surrounding Land Use : Low Density Residential, Agricultural	
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = 25

Justification / Notes :

Incipient drought (based on APT). NHD stream also shows up on USGS Topo (unnamed).

Moderately altered around agricultural fields and roadside.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 10)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2 2.5	3
2. Sinuous channel	0 0.5	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1 1.5	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 9)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 6)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants.

[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 25

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.03					
Biologist:	PB, BF	**Affiliation:**	JMT	**Date:**	08-13-24

1-Station: from plans	Along north side of Wilson Livingston Road, south side of SR-19									
2-Map label and name	STR-9									
3-Latitude/Longitude	35.632228, -89.330571									
4-Feature description:										
-channel identification	perennial stream		intermittent stream	✓	ephemeral stream		wwc			
-HD score (if applicable)	16.5									
-OHWM indicators	bed & banks	✓	deposition	✓	presence of litter debris		scour		veg absent, bent, matted	✓
	change in plant community		destruction of terrestrial veg		multiple observe flow events		sediment sorting	✓	water staining	
	change in soil character	✓	leaf litter disturb or absent		natural line impressed on bank	✓	shelving		wracking	✓
-channel bottom width	1'		-top of bank width		4'					
-width and max depth at ordinary high water mark	3' width , max depth 2'									
-width at bankfull	15'									
-bank height	LDB - 4'				RDB - 8'					
-riffle/pool complex or other specialized habitat present?	No									
-dominant riparian species: ----------(LDB /RDB)----------	LDB: blackberry, hogweed, slippery elm, sorghum, passion vine									
	RDB: sorghum, hogweed, blackberry									
-particle size distribution %	Silt/Sand:	80/10	Gravel:	10	Cobble:		Boulder:		Bedrock:	
5-photo numbers	66-67									
6-HUC -8 Code & Name	08010205 - South Fork Forked Deer									
7-Assessed	yes		no	✓						
8-ETW	yes		no	✓						
9-303 (d) List	yes		siltation		habitat:		other:			
	no	✓								
10-Notes										

Revised July 2022

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Meridian Creek	Date/Time: 08/13/24
Assessors/Affiliation: PB, BF; JMT	Project ID : 102251.03
Site Name/Description: STR-9	
Site Location: Along north side of Wilson Livingston Road, south side of SR-19	
HUC (12 digit): 080102050402	Latitude: 35.632228
Previous Rainfall (7-days) : < 0.5 inches	Longitude: -89.330571
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0	
Watershed Size : 0.47 sq. miles	County: Haywood
Soil Type(s) / Geology : Convent and Adler Silt Loam	Source: NRCS Web Soil Survey
Surrounding Land Use : Low Density Residential, Agricultural	
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = 16.5

Justification / Notes :

Incipient drought (based on APT).

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 8)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	0.5 1	2	3
3. In-channel structure: riffle-pool sequences	0	1	1.5 2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 3.5)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 5)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants.

[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 16.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.03					
Biologist:	PB, BF	**Affiliation:**	JMT	**Date:**	08-13-24

1-Station: from plans	South side of Wilson Livingston Road at SR-19									
2-Map label and name	WWC-24/UDF-16									
3-Latitude/Longitude	35.631977, -89.330706									
4-Feature description:										
-channel identification	perennial stream		intermittent stream		ephemeral stream		wwc	✓		
-HD score (if applicable)	12.25									
-OHWM indicators	bed & banks	✓	deposition		presence of litter debris		scour		veg absent, bent, matted	
	change in plant community		destruction of terrestrial veg		multiple observe flow events		sediment sorting		water staining	
	change in soil character		leaf litter disturb or absent	✓	natural line impressed on bank		shelving		wracking	✓
-channel bottom width	1'		-top of bank width		10'					
-width and max depth at ordinary high water mark	Width 1', max depth 1'									
-width at bankfull	5'									
-bank height	LDB - 8'				RDB - 8'					
-riffle/pool complex or other specialized habitat present?	No									
-dominant riparian species: ----------(LDB /RDB)----------	LDB: fescue									
	RDB: soybean agriculture									
-particle size distribution %	Silt/Sand:	100	Gravel:		Cobble:		Boulder:		Bedrock:	
5-photo numbers	68									
6-HUC -8 Code & Name	08010205 - South Fork Forked Deer									
7-Assessed	yes		no	✓						
8-ETW	yes		no	✓						
9-303 (d) List	yes		siltation		habitat:		other:			
	no	✓								
10-Notes										

Revised July 2022

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Meridian Creek	Date/Time: 08/13/24
Assessors/Affiliation: PB, BF; JMT	Project ID : 102251.03
Site Name/Description: WWC-24/UDF-16	
Site Location: South side of Wilson Livingston Road at SR-19	
HUC (12 digit): 080102050402	Latitude: 35.631977
Previous Rainfall (7-days) : < 0.5 inches	Longitude: -89.330706
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0	
Watershed Size : 0.65 sq. miles	County: Haywood
Soil Type(s) / Geology : Convent Silt Loam	Source: NRCS Web Soil Survey
Surrounding Land Use : Low Density Residential, Agricultural	
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 12.25

Justification / Notes :

Incipient drought (based on APT).

Agricultural ditch. Regularly mowed/maintained.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 3.5)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	0.5 1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 3.25)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0	0.75	Yes = 1.5	

C. Biology (Subtotal = 5.5)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants.

[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 12.25

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Wetland plants in channel bed: persicaria sp.

Only one plug of six in the channel found hydric soils.

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.03					
Biologist:	PB, BF	**Affiliation:**	JMT	**Date:**	08-12-24

1-Station: from plans	Meridian Creek southeast of Wilson Livingston Rd. on SR-19									
2-Map label and name	STR-10									
3-Latitude/Longitude	35.629820, -89.328101									
4-Feature description:										
-channel identification	perennial stream	✓	intermittent stream		ephemeral stream		wwc			
-HD score (if applicable)	N/A: STR-10 is a named USGS stream. No HD form is provided.									
-OHWM indicators	bed & banks	✓	deposition	✓	presence of litter debris	✓	scour	✓	veg absent, bent, matted	✓
	change in plant community	✓	destruction of terrestrial veg	✓	multiple observe flow events		sediment sorting	✓	water staining	✓
	change in soil character	✓	leaf litter disturb or absent	✓	natural line impressed on bank	✓	shelving	✓	wracking	✓
-channel bottom width	20'				-top of bank width		25''			
-width and max depth at ordinary high water mark	20', max depth unknown									
-width at bankfull	20'									
-bank height	LDB - ~15'				RDB - ~15'					
-riffle/pool complex or other specialized habitat present?	No									
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Elderberry, sweet-gum, agriculture field									
	RDB: Elderberry, sweet-gum, agriculture field									
-particle size distribution %	Silt/Sand: 75		Gravel: 10		Cobble: 10		Boulder: 5		Bedrock:	
5-photo numbers	69-72									
6-HUC -8 Code & Name	08010205 - South Fork Forked Deer									
7-Assessed	yes	✓	no							
8-ETW	yes		no	✓						
9-303 (d) List	yes		siltation		habitat:		other:			
	no	✓								
10-Notes	Deep water with >10' vertical sides; inaccessible from bank									

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.03					
Biologist:	RB & BC	**Affiliation:**	JMT	**Date:**	08-12-24

1-Station: from plans	~ 0.19 miles South East of Key Corner Rd on SR-19				
2-Map label and name	STR-11				
3-Latitude/Longitude	35.626439, -89.321687				
4-Feature description:					
-channel identification	perennial stream ☐	intermittent stream ☑	ephemeral stream ☐	wwc ☐	
-HD score (if applicable)	14				
-OHWM indicators	bed & banks ☑	deposition ☐	presence of litter debris ☐	scour ☑	veg absent, bent, matted ☐
	change in plant community ☐	destruction of terrestrial veg ☐	multiple observe flow events ☐	sediment sorting ☐	water staining ☐
	change in soil character ☐	leaf litter disturb or absent ☐	natural line impressed on bank ☐	shelving ☐	wracking ☐
-channel bottom width	3'	-top of bank width	15'		
-width and max depth at ordinary high water mark	width 4', max depth 1'				
-width at bankfull	5'				
-bank height	LDB - 15'	RDB - 15'			
-riffle/pool complex or other specialized habitat present?	No				
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Microstegium, goldenrod, giant ragweed				
	RDB: Microstegium, goldenrod, giant ragweed				
-particle size distribution %	Silt/Sand: 100	Gravel:	Cobble:	Boulder:	Bedrock:
5-photo numbers	73-75				
6-HUC -8 Code & Name	08010205 - South Fork Forked Deer				
7-Assessed	yes ☐	no ☑			
8-ETW	yes ☐	no ☑			
9-303 (d) List	yes ☐	siltation ☐	habitat: ☐	other: ☐	
	no ☑				
10-Notes	Water in scour holes with fish (bluegill, dace, black madtom, snails).				

Revised July 2022

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody:UNT Meridian Creek		Date/Time:8/12/24
Assessors/Affiliation:RB, BC; JMT		Project ID :102251.03
Site Name/Description:STR-11		
Site Location:~ 0.19 miles South East of Key Corner Rd on SR-19		
HUC (12 digit):080102050402	Latitude:35.626439	
Previous Rainfall (7-days) :< 0.5 inches	Longitude:-89.321687	
Precipitation this Season vs. Normal : abnormally wet elevated **average** low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0		
Watershed Size :0.07 sq. miles	County:Haywood	
Soil Type(s) / Geology :Adler Silt Loam, Loring Silt Loam	Source:NRCS Web Soil Survey	
Surrounding Land Use :Agricultural		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe **Moderate** Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)		Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination =Stream

Secondary Indicator Score (if applicable) = 14

Justification / Notes :

Incipient drought (based on APT). NHD stream also shows up on USGS Topo (unnamed).

Moderately altered around agricultural fields.

Water in scour holes with fish (bluegill, dace, black madtom, snails).

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal =6.5)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal =3.5)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal =4)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 14

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Secondary field indicator evaluation performed at uppermost portion of stream within the study area.

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.03					
Biologist:	JC, JG	**Affiliation:**	JMT	**Date:**	08-12-24

1-Station: from plans	Southeast of Meridian Creek along southside of SR-19								
2-Map label and name	STR-12								
3-Latitude/Longitude	35.630138, -89.327706								
4-Feature description:									
-channel identification	perennial stream		intermittent stream	✓	ephemeral stream		wwc		
-HD score (if applicable)	19.5								
-OHWM indicators	bed & banks	✓	deposition	✓	presence of litter debris	✓	scour		veg absent, bent, matted	
	change in plant community		destruction of terrestrial veg		multiple observe flow events		sediment sorting		water staining	
	change in soil character		leaf litter disturb or absent		natural line impressed on bank		shelving		wracking	
-channel bottom width	5'			-top of bank width		10'			
-width and max depth at ordinary high water mark	width 5', max depth 1'								
-width at bankfull	7'								
-bank height	LDB - 3'			RDB - 3'					
-riffle/pool complex or other specialized habitat present?	No								
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Sycamore, sweet gum, grapevine, poison ivy, American elm								
	RDB: Sycamore, sweet gum, grapevine, poison ivy, American elm								
-particle size distribution %	Silt/Sand:	100	Gravel:		Cobble:		Boulder:		Bedrock:	
5-photo numbers	76-77								
6-HUC -8 Code & Name	08010205 - South Fork Forked Deer								
7-Assessed	yes		no	✓					
8-ETW	yes		no	✓					
9-303 (d) List	yes		siltation		habitat:		other:		
	no	✓							
10-Notes									

Revised July 2022

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Meridian Creek	Date/Time: 08/12/24
Assessors/Affiliation: JC, JG; JMT	Project ID : 102251.03
Site Name/Description: STR-12	
Site Location: Southeast of Meridian Creek along southside of SR-19	
HUC (12 digit): 080102050402	Latitude: 35.630138
Previous Rainfall (7-days) : < 0.5 inches	Longitude: -89.327706
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0	
Watershed Size : 2.68 sq. miles	County: Haywood
Soil Type(s) / Geology : Alder Silt Loam	Source: NRCS Web Soil Survey
Surrounding Land Use : Low Density Residential, Agricultural	
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = 19.5

Justification / Notes :

Incipient drought (based on APT).

Levees observed on both banks, they appear to be artificially created to straighten the channel.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 12.5)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 4.5)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 2.5)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 19.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : OHWM was not flagged due to inaccessibility from bank steepness and water depth, gps points were estimated. Frogs noted in channel.

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.03					
Biologist:	PB, BF	**Affiliation:**	JMT	**Date:**	08-12-24

1-Station: from plans	~0.29 miles northwest of Patton Lane on south side of SR-19								
2-Map label and name	WWC-25/UDF-17								
3-Latitude/Longitude	35.629954, -89.327870								
4-Feature description:									
-channel identification	perennial stream ☐	intermittent stream ☐	ephemeral stream ☐	wwc ☑					
-HD score (if applicable)	4.5								
-OHWM indicators	bed & banks ☐	deposition ☐	presence of litter debris ☐	scour ☐	veg absent, bent, matted ☐				
	change in plant community ☐	destruction of terrestrial veg ☐	multiple observe flow events ☐	sediment sorting ☐	water staining ☐				
	change in soil character ☐	leaf litter disturb or absent ☐	natural line impressed on bank ☐	shelving ☐	wracking ☐				
-channel bottom width	8'	-top of bank width	15'						
-width and max depth at ordinary high water mark	N/A								
-width at bankfull	8'								
-bank height	LDB - 4'	RDB - 4'							
-riffle/pool complex or other specialized habitat present?	No								
-dominant riparian species: ----------(LDB /RDB)----------	LDB: agriculture field (soybean)								
	RDB: sweet-gum, american sycamore, boxelder								
-particle size distribution %	Silt/Sand: 100	Gravel:	Cobble:	Boulder:	Bedrock:				
5-photo numbers	78								
6-HUC -8 Code & Name	08010205 - South Fork Forked Deer								
7-Assessed	yes ☐	no ☑							
8-ETW	yes ☐	no ☑							
9-303 (d) List	yes ☐	siltation ☐	habitat: ☐	other: ☐					
	no ☑								
10-Notes									

Revised July 2022

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Meridian Creek	Date/Time: 08/12/24
Assessors/Affiliation: PB, BF; JMT	Project ID : 102251.03
Site Name/Description: WWC-25/UDF-17	
Site Location: ~0.29 miles northwest of Patton Lane on south side of SR-19	
HUC (12 digit): 080102050402	Latitude: 35.629954
Previous Rainfall (7-days) : < 0.5 inches	Longitude: -89.327870
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0	
Watershed Size : 2.68 sq. miles	County: Haywood
Soil Type(s) / Geology : Adler and Rosebloom Silt Loam	Source: NRCS Web Soil Survey
Surrounding Land Use : Low Density Residential, Agricultural	
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 4.5

Justification / Notes :

Incipient drought (based on APT). Flows into STR-12.

Agricultural drainage ditch.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 1)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	0.5 1	2	3
2. Sinuous channel	0	0.5 1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 3)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 0.5)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants.

[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 4.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Farm ditch that flows into STR-12

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.03					
Biologist:	JC, JG	**Affiliation:**	JMT	**Date:**	08-12-24

1-Station: from plans	Northwest of Patton Ln and SR-19 intersection										
2-Map label and name	WWC-26/UDF-18										
3-Latitude/Longitude	35.628444, -89.325386										
4-Feature description:											
-channel identification	perennial stream		intermittent stream		ephemeral stream		wwc	✓			
-HD score (if applicable)	14										
-OHWM indicators	bed & banks	✓	deposition		presence of litter debris	✓	scour		veg absent, bent, matted		
	change in plant community		destruction of terrestrial veg		multiple observe flow events		sediment sorting		water staining		
	change in soil character		leaf litter disturb or absent		natural line impressed on bank		shelving		wracking	✓	
-channel bottom width	3'			-top of bank width		30'					
-width and max depth at ordinary high water mark	width 3', max depth 0.5'										
-width at bankfull	8'										
-bank height	LDB - 3'			RDB - 3'							
-riffle/pool complex or other specialized habitat present?	No										
-dominant riparian species: ----------(LDB /RDB)----------	LDB: American elm, cottonwood, sweet-gum, box elder, bodark, black willow										
	RDB: American elm, cottonwood, sweet gum, box elder, bodark, black willow										
-particle size distribution %	Silt/Sand:	100	Gravel:		Cobble:		Boulder:		Bedrock:		
5-photo numbers	79										
6-HUC -8 Code & Name	08010205 - South Fork Forked Deer										
7-Assessed	yes			no	✓						
8-ETW	yes			no	✓						
9-303 (d) List	yes			siltation			habitat:		other:		
	no	✓									
10-Notes	Old driveway pull-in has a culvert on each side.										

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Meridian Creek	Date/Time: 08/12/24
Assessors/Affiliation: JC, JG; JMT	Project ID : 102251.03
Site Name/Description: WWC-26/UDF-18	
Site Location: Northwest of Patton Ln and SR-19 intersection	
HUC (12 digit): 080102050402	Latitude: 35.628444
Previous Rainfall (7-days) : < 0.5 inches	Longitude: -89.325386
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0	
Watershed Size : 1.39 sq. miles	County: Haywood
Soil Type(s) / Geology : Alder Silt Loam	Source: NRCS Web Soil Survey
Surrounding Land Use : Low Density Residential, Agricultural	
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 14

Justification / Notes :

Incipient drought (based on APT).

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 9)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 2.5)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 2.5)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants.

[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 14

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Sheetflow from road way and active ag land.

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.03					
Biologist:	RB & BC	**Affiliation:**	JMT	**Date:**	08-12-24

1-Station: from plans	East of Key Corner Rd on SR-19										
2-Map label and name	WWC-27/UDF-19										
3-Latitude/Longitude	35.629709, -89.324185										
4-Feature description:											
-channel identification	perennial stream		intermittent stream		ephemeral stream		wwc	✓			
-HD score (if applicable)	5.5										
-OHWM indicators	bed & banks	✓	deposition		presence of litter debris		scour		veg absent, bent, matted		
	change in plant community		destruction of terrestrial veg		multiple observe flow events		sediment sorting		water staining		
	change in soil character		leaf litter disturb or absent		natural line impressed on bank		shelving		wracking		
-channel bottom width	1'			-top of bank width		5'					
-width and max depth at ordinary high water mark	N/A										
-width at bankfull	5'										
-bank height	LDB - 5'				RDB - 5'						
-riffle/pool complex or other specialized habitat present?	No										
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Johnson grass, Kudzu										
	RDB: Festuca sp.										
-particle size distribution %	Silt/Sand:	80	Gravel:	10	Cobble:	10	Boulder:		Bedrock:		
5-photo numbers	80										
6-HUC -8 Code & Name	08010205 - South Fork Forked Deer										
7-Assessed	yes		no	✓							
8-ETW	yes		no	✓							
9-303 (d) List	yes		siltation		habitat:		other:				
	no	✓									
10-Notes	Feeds into STR-11										

Revised July 2022

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody:UNT Meridian Creek		Date/Time:8/12/24
Assessors/Affiliation:RB, BC; JMT		Project ID :102251.03
Site Name/Description:WWC-27/UDF-19		
Site Location:East of Key Corner Rd on SR-19		
HUC (12 digit):080102050402	Latitude:35.629709	
Previous Rainfall (7-days) :< 0.5 inches	Longitude:-89.324185	
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0		
Watershed Size :< 0.01 sq. miles	County:Haywood	
Soil Type(s) / Geology :Adler, Loring, & Routon Silt Loams	Source:NRCS Web Soil Survey	
Surrounding Land Use :Low Density Residential, Agricultural		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 5.5

Justification / Notes :

Incipient drought (based on APT).

Roadside ditch.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 1)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 1.5)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 3)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants.

[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 5.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.03					
Biologist:	JC, JG	**Affiliation:**	JMT	**Date:**	08-12-24

1-Station: from plans	Southeast of Patton Ln and SR-19 intersection										
2-Map label and name	WWC-28/UDF-20										
3-Latitude/Longitude	35.626527, -89.322826										
4-Feature description:											
-channel identification	perennial stream		intermittent stream		ephemeral stream		wwc	✓			
-HD score (if applicable)	4										
-OHWM indicators	bed & banks	✓	deposition		presence of litter debris	✓	scour		veg absent, bent, matted		
	change in plant community		destruction of terrestrial veg		multiple observe flow events		sediment sorting		water staining		
	change in soil character		leaf litter disturb or absent		natural line impressed on bank		shelving		wracking		
-channel bottom width	6'			-top of bank width		20'					
-width and max depth at ordinary high water mark	N/A										
-width at bankfull	3'										
-bank height	LDB - 6'			RDB - 6'							
-riffle/pool complex or other specialized habitat present?	No										
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Elderberry, poison ivy, rubrus sp., slippery elm										
	RDB: Elderberry, poison ivy, rubrus sp., slippery elm										
-particle size distribution %	Silt/Sand:	100	Gravel:		Cobble:		Boulder:		Bedrock:		
5-photo numbers	Not Available										
6-HUC -8 Code & Name	08010205 - South Fork Forked Deer										
7-Assessed	yes		no	✓							
8-ETW	yes		no	✓							
9-303 (d) List	yes		siltation		habitat:		other:				
	no	✓									
10-Notes	Ag ditch appeared to be excavated from the nearby field.										

Revised July 2022

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Meridian Creek		Date/Time: 08/12/24
Assessors/Affiliation: JC, JG; JMT		Project ID : 102251.03
Site Name/Description: WWC-28/UDF-20		
Site Location: Southeast of Patton Lane and SR-19 intersection		
HUC (12 digit): 080102050402	Latitude: 35.626527	
Previous Rainfall (7-days) : < 0.5 inches	Longitude: -89.322826	
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0		
Watershed Size : <0.02 sq. miles	County: Haywood	
Soil Type(s) / Geology : Alder Silt Loam	Source: NRCS Web Soil Survey	
Surrounding Land Use : Low Density Residential, Agricultural		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 4

Justification / Notes :

Incipient drought (based on APT).

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 2)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	1.5 2	3
2. Sinuous channel	0 0.5	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 0)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 2)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants.

[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 4

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Drainage channel connecting to ag field

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.03					
Biologist:	PB, BF	**Affiliation:**	JMT	**Date:**	08-12-24

1-Station: from plans	0.13 miles northwest of 3630 SR-19									
2-Map label and name	STR-13									
3-Latitude/Longitude	35.622705, -89.317989									
4-Feature description:										
-channel identification	perennial stream		intermittent stream	✓	ephemeral stream		wwc			
-HD score (if applicable)	21.5									
-OHWM indicators	bed & banks	✓	deposition	✓	presence of litter debris	✓	scour	✓	veg absent, bent, matted	✓
	change in plant community	✓	destruction of terrestrial veg	✓	multiple observe flow events		sediment sorting	✓	water staining	✓
	change in soil character	✓	leaf litter disturb or absent	✓	natural line impressed on bank	✓	shelving	✓	wracking	✓
-channel bottom width	4'		-top of bank width		9'					
-width and max depth at ordinary high water mark	width 2', max depth 4'									
-width at bankfull	9'									
-bank height	LDB - 4'				RDB - 4'					
-riffle/pool complex or other specialized habitat present?	No									
-dominant riparian species: ----------(LDB /RDB)----------	LDB: elderberry, boxelder									
	RDB: boxelder, elderberry, willow oak									
-particle size distribution %	Silt/Sand:	70	Gravel:	30	Cobble:		Boulder:		Bedrock:	
5-photo numbers	81-83									
6-HUC -8 Code & Name	08010205 - South Fork Forked Deer									
7-Assessed	yes		no	✓						
8-ETW	yes		no	✓						
9-303 (d) List	yes		siltation		habitat:		other:			
	no	✓								
10-Notes										

Revised July 2022

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Meridian Creek		Date/Time: 08/12/24
Assessors/Affiliation: PB, BF; JMT		Project ID : 102251.03
Site Name/Description: STR-13		
Site Location: 0.13 miles northwest of 3630 SR-19		
HUC (12 digit): 080102050402	Latitude: 35.622705	
Previous Rainfall (7-days) : < 0.5 inches	Longitude: -89.317989	
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0		
Watershed Size : 0.26 sq. miles	County: Haywood	
Soil Type(s) / Geology : Adler Silt Loam	Source: NRCS Web Soil Survey	
Surrounding Land Use : Low Density Residential, Agricultural		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = 21.5

Justification / Notes :

Incipient drought (based on APT).

Alternation, in the form of concrete and rip rap stabilization, noted near culvert.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 14)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 3)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 4.5)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 21.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : 0/4 soil plugs in channel hydric. Several spots in channel have sediment. Wrack lines almost into relict floodplain. Boehmeria cylindrica noted in channel.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: TN SR-19 City/County: Haywood County Sampling Date: 2024-08-12

Applicant/Owner: TDOT State: Tennessee Sampling Point: 2-DPW-1

Investigator(s): Preston Butler and Britt Fleming Section, Township, Range:

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 2

Subregion (LRR or MLRA): P 134 Lat: 35.623847 Long: -89.31969 Datum: NAD83_2011

Soil Map Unit Name: Ad - Adler silt loam, 0 to 2 percent slopes, frequently flooded NWI classification: PFO

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓	No _____	
Wetland Hydrology Present?	Yes ✓	No _____	

Remarks:

WTL-1

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)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☑ Oxidized Rhizospheres along 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)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes _____	No ✓	Depth (inches): _____
Water Table Present?	Yes _____	No ✓	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No ✓	Depth (inches): _____

Wetland Hydrology Present? Yes ✓ No _____

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

Remarks:

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

Sampling Point: 2-DPW-1

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix nigra	40	✓	OBL
2. Liquidambar styraciflua	30	✓	FAC
3. Ulmus rubra	20	✓	FAC
4.			
5.			
6.			
7.			
8.			
	90 = Total Cover		
50% of total cover: 45.00	20% of total cover: 18.00		
Sapling/Shrub Stratum (Plot size: 30 ft r)			
1. Ulmus rubra	20	✓	FAC
2. Ligustrum sinense	5		FAC
3. Quercus phellos	5		FACW
4.			
5.			
6.			
7.			
8.			
	30 = Total Cover		
50% of total cover: 15.00	20% of total cover: 6.00		
Herb Stratum (Plot size: 30 ft r)			
1. Microstegium vimineum	30	✓	FAC
2. Carex lupulina	20	✓	OBL
3. Rubus argutus	10		FAC
4. Symphyotrichum lateriflorum	5		FAC
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	65 = Total Cover		
50% of total cover: 32.50	20% of total cover: 13.00		
Woody Vine Stratum (Plot size: 30 ft r)			
1. Toxicodendron radicans	10	✓	FAC
2. Lonicera japonica	5	✓	FACU
3.			
4.			
5.			
	15 = Total Cover		
50% of total cover: 7.50	20% of total cover: 3.00		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 7 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 87.50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	60	x 1 =	60
FACW species	5	x 2 =	10
FAC species	130	x 3 =	390
FACU species	5	x 4 =	20
UPL species	0	x 5 =	0
Column Totals:	200 (A)		480 (B)

Prevalence Index = B/A = 2.40

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☑ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four 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 vines, less than 3 in. DBH and greater than 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

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: 2-DPW-1

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 - 12	10YR 6/2	95	7.5YR 5/6	5	C	PL / M	Clay Loam	Had to moisten soil to get color; very dry conditions
-								
-								
-								
-								
-								
-								

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

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✓ **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: TN SR-19 City/County: Haywood County Sampling Date: 2024-08-12

Applicant/Owner: TDOT State: Tennessee Sampling Point: 2-DPU-1

Investigator(s): Preston Butler and Britt Fleming Section, Township, Range:

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 1

Subregion (LRR or MLRA): P 134 Lat: 35.623869 Long: -89.319925 Datum: NAD83_2011

Soil Map Unit Name: Ad - Adler silt loam, 0 to 2 percent slopes, frequently flooded NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Form represents upland adjacent to WTL-1

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)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along 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)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes _____	No ✓	Depth (inches): _____
Water Table Present?	Yes _____	No ✓	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No ✓	Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

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

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: 2-DPU-1

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1. Liquidambar styraciflua	50	✓	FAC
2. Ulmus rubra	25	✓	FAC
3. Salix nigra	15		OBL
4.			
5.			
6.			
7.			
8.			
	90	= Total Cover	
50% of total cover: 45.00	20% of total cover: 18.00		

Sapling/Shrub Stratum (Plot size: 30 ft r)			
1. Ulmus rubra	15	✓	FAC
2. Liquidambar styraciflua	10	✓	FAC
3. Diospyros virginiana	5		FAC
4.			
5.			
6.			
7.			
8.			
	30	= Total Cover	
50% of total cover: 15.00	20% of total cover: 6.00		

Herb Stratum (Plot size: 30 ft r)			
1. Microstegium vimineum	80	✓	FAC
2. Boehmeria cylindrica	5		FACW
3. Solidago canadensis	5		FACU
4. Cirsium discolor	5		UPL
5.			FAC
6.			FACU
7.			
8.			
9.			
10.			
11.			
12.			
	95	= Total Cover	
50% of total cover: 47.50	20% of total cover: 19.00		

Woody Vine Stratum (Plot size: 30 ft r)			
1. Lonicera japonica	5	✓	FACU
2. Vitis rotundifolia	5	✓	FAC
3.			
4.			
5.			
	10	= Total Cover	
50% of total cover: 5.00	20% of total cover: 2.00		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 85.71 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	15	x 1 =	15
FACW species	5	x 2 =	10
FAC species	1855	x 3 =	5565
FACU species	55	x 4 =	220
UPL species	5	x 5 =	25
Column Totals:	1935 (A)		5835 (B)

Prevalence Index = B/A = 3.01

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four 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 vines, less than 3 in. DBH and greater than 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

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: 2-DPU-1

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 - 12	10YR 6/4	100					Clay Loam	Bone dry
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** ✓

Remarks:

An affirmative response to 1-6 of the Decision Table identifies the wetland per rule as an Outstanding Natural Resource Water (ONRW) or Exceptional Tennessee Waters (ETW). A positive response to 7-13 requires a final determination by the Department.

#	**Wetland Feature Decision Table** PIN 102251.03; WTL-1	**Yes/No**	**Affirmative Result**
1	The wetland has been designated as an **Outstanding Natural Resource Water (ONRW)** by the Department under 0400-40-03-.06(5)(a)**.**	No	**ORNW**
2	The wetland has previously been designated and documented as an Exceptional Tennessee Water (ETW) by the Department under 0400-40-03-.06(4)(a)(7)	No	**ETW**
3	The wetland is within state or national parks, wildlife refuges, forests, wilderness areas, natural areas, or is a designated State Scenic Rivers or Federal Wild and Scenic Rivers.	No	**ETW**
4	The wetland is known to contain a documented non-experimental population of state or federally listed threatened or endangered aquatic or semi-aquatic plants, or aquatic animals.	No	**ETW**
5	The wetland or the area it is in has been designated by the U.S. Fish and Wildlife Service as "**Critical Habitat**" for any threatened or endangered aquatic or semi-aquatic plant or aquatic animal species.	No	**ETW**
6	The wetland falls within an area designated as Lands Unsuitable for Mining pursuant to the federal Surface Mining Control and Reclamation Act where such designation is based in whole or in part on impacts to water resource values	No	**ETW**
7	**The wetland exhibits outstanding ecological or recreational values such as, but not limited to, those as outlined in 8-12**	No	Determination Required by TDEC
8	The wetland fits within the species composition concept for any plant community found in the state of Tennessee **ranked G2, G1, or more imperiled** at the "Association" classification level according to the NatureServe and Natural Heritage Ranking system (e.g. "bog", "fen", and "wet prairie/barren" communities).	No	Determination Required by TDEC
9	The wetland is **an uncommon resource** (e.g. vernal pools, headwater wetlands, sinks, spring/seeps, glades, newly described communities, high recreational or socioeconomic value) in the region and/or is deemed such by concurrence of qualified scientists.	No	Determination Required by TDEC
10	The wetland is an **older aged forested wetland** comprised of overstory trees with an average diameter at breast height (dbh) being **greater than or equal to 30 in** within the WAA.	No	Determination Required by TDEC
11	The wetland is observed and documented to be a **significant waterfowl, songbird, shorebird, amphibian, bat, fish habitat area**. These may include rookeries, migratory congregations, nesting sites, breeding areas, etc.	No	Determination Required by TDEC
12	The wetland is **hydrologically connected** to and/or has significant ecological contribution to an **ETW**	No	Determination Required by TDEC
13	The wetland has High Resource Value as determined by a **score of 75 and above** using the TRAM or non-HGM TRAM (to be determined after completing the quantitative portion of this manual)	No	Determination Required by TDEC

End of Narrative Rating. Begin Quantitative Rating on Next Page.

HGM FUNCTIONAL ASSESSMENT
SLOPE WETLANDS

Date: 08/12/2024 Project Name SR-19, 102251.03

Field Personnel PB, BF Wetland Name/Location WTL-1

Read instructions prior to conducting assessments. If project area is large or highly heterogeneous requiring the designation of several WAAs, a separate assessment should be performed for each WAA. CHECK THE APPROPRIATE BLANK(S) BELOW.

V1: Hydroperiod (HYDRO)

80% ☑ 1. Hydrology not altered (SI = 1.0)
- no fill material or excessive sediment
- no ditches/drainage tiles
- no roads or other impediments to surface or groundwater
- no excavation
- no alteration to overland runoff, groundwater discharge/recharge

☐ 2. Hydrology slightly altered (SI = 0.75)
- portion of site with minimal fill or sediment
- portion of site with drainage ditches/tiles
- roads or other impediments, water flow slightly altered
- minor portion of site excavated
- some alteration to overland runoff, groundwater discharge/recharge

20% ☑ 3. Hydrology moderately altered (SI = 0.5)
- portion of site with moderate fill or sediment
- portion of site with drainage ditches/tiles
- some alteration to overland runoff, groundwater discharge/recharge
- roads or other impediments, water flow moderately altered
- moderate portion of site excavated

☐ 4. Hydrology significantly altered (SI = 0.25)
- portion of site with significant fill or sediment
- portion of site with drainage ditches/tiles
- significant alteration to overland runoff, groundwater discharge/recharge
- roads or other impediments, water flow significantly altered
- significant portion of site excavated

☐ 5. Hydrology severely altered (SI = 0.1)
- entire site impacted by fill or excessive sediment
- entire site with numerous drainage ditches/tiles
- no contributions to or from overland runoff, groundwater discharge/recharge
- roads or other impediments, water flow completely blocked
- entire wetland affected

V2: Wetland Watershed Integrity (WSHEDINT)

Use weighted average as discussed on page 10. Examples of land uses and multipliers listed below

A = Percentage forested with no impervious surfaces 25
B = Percentage permeable land, (e.g., park, golf course, pasture, hay, orchard, tree farm, or similar) 74
C = Percentage low density residential, construction, or similar 1
D = Percentage high density residential, or similar _____
E = Percentage urban, commercial, industrial, or similar _____

V2 = (A x 1.0) + (B x 0.75) + (C x 0.5) + (D x 0.25) + (E x 0.01)/(100) = 0.81

V3: Canopy Tree Size Class (TSIZE)

1. Average size of canopy trees > 3 in. DBH

☐ ≥ 15 in. (SI = 1.0) ☐ 10 – 14 in. (SI = 0.75) ☑ 6 – 9 in. (SI = 0.5) ☐ 3 – 5 in. (SI = 0.25)
☐ < 3 in. or no trees present, go to V5

V4: Canopy Tree Density (TDEN)

1. Average number of canopy trees (> 3 in. DBH) per 30-ft. radius plot

☐ 5 – 10 (SI = 1.0) ☑ 11 – 15 (SI = 0.75) ☐ > 15 (SI = 0.5) ☐ 1 – 4 (SI = 0.5)

V5: Shrub Cover (SCOV)

1. Average percent cover of shrubs (woody stems < 3 in. DBH and taller than 3 ft.) per 30-ft. radius plot

☐ > 20 (SI = 1.0) ☑ < 20, go to V6

V6: Ground Vegetation Cover (GVC)

1. Average percent cover of ground vegetation per 30-ft. radius plot

☐ ≥ 70 (SI = 1.0) ☐ 55 – 69 (SI = 0.75) ☐ 45 – 54 (SI = 0.5) ☐ 30 – 44 (SI = 0.25) ☐ 20 – 29 (SI = 0.1)
☑ < 20 (SI=0.0)

V7: Vegetation Composition and Diversity (COMP)

1. Check the dominant species from Groups 1, 2, and 3 below using the 50/20 rule. If tree cover is < 20%, check the dominants in the next tallest stratum. If a dominant does not appear in lists below, but is a native species, it can be added to Group 1 or 2 species based on the scientific literature or professional judgement. Native shrub and herbaceous species are assigned to Group 2. When using shrub or herbaceous write in the number of dominant species. Dominant invasive species are checked regardless of stratum. *

GROUP 1 (Reference Standard)		GROUP 2 (Native Ubiquitous)		GROUP 3 (Invasive)
☐ Water oak	☐ Pin oak	☐ American elm	☐ Green ash	☑ European/Chinese privet
☐ Bur oak	☐ Shumard oak	☑ Slippery elm	☐ Red maple	☑ Japanese honeysuckle
☑ Willow oak	☐ Bald cypress	☑ Sweetgum	☐ Silver maple	☑ Japanese stiltgrass
☐ Swamp chestnut oak	☐ Water tupelo	☐ Blackgum	☑ Black willow	☐ Purple loosestrife
☐ Cherrybark oak	☐ S. black gum	☐ Silky dogwood	☐ Sycamore	☐ Giant reed
☐ Swamp white oak	☐ Persimmon	☐ Boxelder	☐ _____	☐ Tall fescue
☐ Nuttall oak	☐ Am. hornbeam	☐ Tulip poplar	☐ _____	☐ Phragmites
☐ Overcup oak	☐ _____	____ Number native shrub spp.		☐ _____
☐ _____	☐ _____	____ Number native herbaceous spp.		☐ _____

2. Using the number of dominants in Groups 1, 2, and 3 above, calculate a quality index (Q) using the following formula: [(1.0 x # of checked dominants in Group 1) + (0.66 x # of checked dominants in Group 2) + (0.0 x # of checked dominants in Group 3)]/ total # of checked dominants in all groups = 0.28

3. Multiply Q above by one of the following constants that reflects species richness:[1]

◉ a) if ≥ 4 species from Groups 1 and/or 2 occur as dominants, multiply Q by 1.0 — 0.28
○ b) if 3 species from Groups 1 and/or 2 occur as dominant, multiply Q by 0.75 — _____
○ c) if 2 species from Groups 1 and/or 2 occur as dominants, multiply Q by 0.50 — _____
○ d) if 1 species from Groups 1 and/or 2 occurs as dominant, multiply Q by 0.25 — _____
○ e) if no species from Groups 1 and/or 2 occurs as dominant, multiply Q by 0.0 — _____

4. Calculate the square root of the value from Step 3 above. This value is the SI for **V7**= 0.53

*In some Depression wetlands and in some small WAAs (e.g., <0.5 acres), relatively few species (e.g., overcup oak) may be present. In cases in which this is the normal condition, Q can be multiplied by 1.0 if only 1 or 2 species are dominant.

V8: Soil Organic Matter (ORGANIC)

1. Surface horizons unaltered
☑ 100 percent cover of O and/or A horizon present (SI = 1.0)

2. Surface horizons altered. Estimate the percent of the WAA in which neither an O or A horizon is present.

3. Subtract the sum of the values from Step 2 from 100. Convert this value to a decimal. This value is the SI for V8 (e.g., if 75 % of the WAA does not have an O or A horizon due to a significant disturbance, it will have an SI of 0.25).

V9: Buffer (BUFFER)

1. Determine the Connection Index (CI) by estimating the percent of the wetland surrounded by suitable buffer habitat.
☐ 90% – 100% (CI = 1.0) ☐ 75% – 89% (CI = 0.75) ☐ 40% – 74% (CI = 0.5) ☑ 10% – 39% (CI = 0.25)
☐ < 10% (CI = 0.1)

2. Multiply the CI by one if the following values:
○ a) if average buffer width is ≥ 492 ft., multiply by 1.0
◉ b) if average buffer is 98 ft to 491 ft., multiply by 0.66
○ c) if average buffer width is 33 ft to 97 ft., multiply by 0.33
○ d) if average buffer width is < 33 ft., multiply by 0.1

3. This value is the SI for **V9 =** 0.17 **.**

VALUES USED TO CALCULATE FUNCTIONAL CAPACITY INDICES (FCIs)

SUBINDEX VALUES:

V1 0.9 (HYDRO) V3 0.50 (TSIZE) V5 0.00 (SCOV) V7 0.53 (COMP) V9 0.17 (BUFFER)

V2 0.81 (WSHEDINT) V4 0.75 (TDEN) V6 0.00 (GVC) V8 1.00 (ORGANIC)

Slope Wetland

WTL-1

V1: HYDROPERIOD	**0.9**	
V2: WETLAND WATERSHED INTEGRITY	**0.81**	(V1 x V2)^(1/2)
V3: CANOPY TREE CLASS	**0.5**	
V4: CANOPY TREE DENSITY	**0.75**	
V5: SHRUB COVER	**GOTOV6**	
V6: GROUND VEGETATION COVER	**n/a**	
V7: VEGETATION COMPOSITION AND DIVERSITY	**0.53**	
2. Q =	**0.28**	
# of Group 1 Dominants	1	
# of Group 2 Dominants	3	
# of Group 3 Dominants	3	
SPECIES RICHNESS CONSTANT	1	
V8: SOIL ORGANIC MATTER	**1**	
V9:BUFFER	**0.17**	
1. Connection Index	0.25	
2. Buffer width value (0-1)	0.66	

Function 1: Maintain Hydrologic Regime

FCI 1 = **0.85** **Final Tree =** **0.73**

Function 2: Maintain Biogeochemical Processes

$$\text{FCI (trees present)} = \left((V1 \times V2)^{1/2} \times \left(\frac{\frac{V3+V4}{2}+V8}{2}\right)\right)^{1/2}$$

FCI 2 trees= **0.83** **Final Shrubs=** **#VALUE!**

Final Herbaceous = **#VALUE!**

$$\text{FCI (shrubs present)} = \left((V1 \times V2)^{1/2} \times \left(\frac{V5+V8}{3}\right)\right)^{1/2}$$

FCI 2 shrubs= **#VALUE!**

$$\text{FCI (ground cover)} = \left((V1 \times V2)^{1/2} \times \left(\frac{V6+V8}{5}\right)\right)^{1/2}$$

FCI 2 ground = **#VALUE!**

Function 3: Maintain Characteristic Plant Community

$$\text{FCI (trees present)} = \frac{(V1 \times V2)^{1/2} + 2\left(\frac{V3+V4+V7}{3}\right)}{3}$$

FCI 3 trees= **0.68**

$$\text{FCI (shrubs present)} = \frac{(V1 \times V2)^{1/2} + 2\left(\frac{V5+V7}{2}\right)}{6}$$

FCI 3 shrubs= **#VALUE!**

$$\text{FCI (groundcover)} = \frac{(V1 \times V2)^{1/2} + 2\left(\frac{V6+V7}{2}\right)}{9}$$

FCI 3 ground = **#VALUE!**

Function 4: Maintain Characteristic Wildlife Community:

$$\text{FCI (trees)} = \frac{(V1 \times V2)^{1/2} + 2\left(\frac{V3+V4+V7}{3}\right)+V9}{4}$$

FCI 4 trees= **0.55**

$$\text{FCI (shrubs present)} = \frac{(V1 \times V2)^{1/2} + 2\left(\frac{V5+V7}{2}\right)+V9}{6}$$

FCI 4 shrubs= **#VALUE!**

$$\text{FCI (groundcover)} = \frac{(V1 \times V2)^{1/2} + 2\left(\frac{V6+V7}{2}\right)+V9}{9}$$

FCI 4 ground = **#VALUE!**

TRAM Summary Worksheet

Project: SR-19, PIN 102251.03, WTL-1

Exceptional Status Wetlands		**Check if applicable**
	1. **ONRW**	☐
	2. **ETW**	☐
	3. **Further Review Requested:** Attach Wetland Background and Exceptional Status Wetlands Worksheet	☐
	COMMENTS/NOTES:	
Quantitative Rating scores	Function: Hydrologic Regime	0.85
	Function: Biogeochemical Processes	0.83
	Function: Retain Particulates	n/a
	Function: Plant Community	0.68
	Function: Wildlife Community	0.55
	Quantitative Score (Average of FCIs x 100)	73.00
	Value Added (Significant Size) Total	0
Total of Quantitative and Value Added Scores	**TOTAL SCORE**	73.00

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: TN SR-19 City/County: Lauderdale County Sampling Date: 2024-08-13

Applicant/Owner: TDOT State: Tennessee Sampling Point: 1-DPW-1

Investigator(s): Ray Bode and Bryan Cardoso Section, Township, Range:

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 0

Subregion (LRR or MLRA): P 134 Lat: 35.712723 Long: -89.446595 Datum: NAD83_2011

Soil Map Unit Name: Ad - Adler silt loam, 0 to 2 percent slopes, occasionally flooded NWI classification: PFO

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓	No _____	
Wetland Hydrology Present?	Yes ✓	No _____	

Remarks:

WTL-8
Form also represents WTL-7 (PIN 102251.01), WTL-2 (PIN 102251.03), and WTL-2 (PIN 102251.02).

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)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along 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)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes _____	No ✓	Depth (inches): _____
Water Table Present?	Yes _____	No ✓	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No ✓	Depth (inches): _____

Wetland Hydrology Present? Yes ✓ No _____

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

Remarks:

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

Sampling Point: 1-DPW-1

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Sapling/Shrub Stratum (Plot size: 30 ft r)			
1. Salix nigra	50	✓	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	50 = Total Cover		

50% of total cover: 25.00 20% of total cover: 10.00

Herb Stratum (Plot size: 30 ft r)			
1. Microstegium vimineum	100	✓	FAC
2. Leersia oryzoides	50	✓	OBL
3. Salix nigra	30		OBL
4. Impatiens capensis	30		FACW
5. Persicaria hydropiper	20		OBL
6. Carex lurida	5		OBL
7.			
8.			
9.			
10.			
11.			
12.			
	235 = Total Cover		

50% of total cover: 117.50 20% of total cover: 47.00

Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		

50% of total cover: _____ 20% of 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: 100.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0505030205	x 1 =	0505030205
FACW species	30	x 2 =	60
FAC species	100	x 3 =	300
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	505030335 (A)		505030565 (B)

Prevalence Index = B/A = 1.00

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four 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 vines, less than 3 in. DBH and greater than 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** _____

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: 1-DPW-1

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 - 4	10YR 6/2	95	10YR 6/8	5	C	M	Silt Loam	
4 - 16	10YR 6/1	90	10YR 5/8	10	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 Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✓ **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: TN SR-19 City/County: Lauderdale County Sampling Date: 2024-08-14

Applicant/Owner: TDOT State: Tennessee Sampling Point: 1-DPU-1

Investigator(s): Rhiannon Flickinger and Miranda McKiernan Section, Township, Range:

Landform (hillslope, terrace, etc.): Upland Local relief (concave, convex, none): Linear Slope (%): 2

Subregion (LRR or MLRA): P 134 Lat: 35.70953707 Long: -89.43681938 Datum: NAD83_2011

Soil Map Unit Name: MeD3 - Memphis silt loam, 8 to 12 percent slopes, severely eroded, northern phase NWI classification: UPL

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

WTL-8 upland form
Form also represents uplands adjacent to wetland WTL-7 [PIN 102251.01], WTL-2 [PIN 102251.02], and WTL-2 [PIN 102251.03]

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)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along 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)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes _____	No ✓	Depth (inches): _____
Water Table Present?	Yes _____	No ✓	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No ✓	Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

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

Remarks:

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

Sampling Point: 1-DPU-1

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size: 30 ft r)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size: 30 ft r)			
1. Festuca trachyphylla	90	✓	UPL
2. Iva annua	40	✓	FAC
3. Schizachyrium scoparium ssp. scoparium	40	✓	
4. Solanum carolinense	40	✓	FACU
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	210 = Total Cover		
50% of total cover: 105.00	20% of total cover: 42.00		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of 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: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33.33 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	40	x 3 =	120
FACU species	40	x 4 =	160
UPL species	90	x 5 =	450
Column Totals:	170 (A)		730 (B)

Prevalence Index = B/A = 4.29

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four 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 vines, less than 3 in. DBH and greater than 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 ✓

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: 1-DPU-1

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 - 4	10YR 4/4	100					Sandy Clay Loam	
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: Compaction

Depth (inches): 4

Hydric Soil Present? Yes _____ No ✓

Remarks:

An affirmative response to 1-6 of the Decision Table identifies the wetland per rule as an Outstanding Natural Resource Water (ONRW) or Exceptional Tennessee Waters (ETW). A positive response to 7-13 requires a final determination by the Department.

#	**Wetland Feature Decision Table** PIN 102251.03; WTL-2	**Yes/No**	**Affirmative Result**
1	The wetland has been designated as an **Outstanding Natural Resource Water (ONRW)** by the Department under 0400-40-03-.06(5)(a)**.**	No	**ORNW**
2	The wetland has previously been designated and documented as an Exceptional Tennessee Water (ETW) by the Department under 0400-40-03-.06(4)(a)(7)	No	**ETW**
3	The wetland is within state or national parks, wildlife refuges, forests, wilderness areas, natural areas, or is a designated State Scenic Rivers or Federal Wild and Scenic Rivers.	No	**ETW**
4	The wetland is known to contain a documented non-experimental population of state or federally listed threatened or endangered aquatic or semi-aquatic plants, or aquatic animals.	No	**ETW**
5	The wetland or the area it is in has been designated by the U.S. Fish and Wildlife Service as "**Critical Habitat**" for any threatened or endangered aquatic or semi-aquatic plant or aquatic animal species.	No	**ETW**
6	The wetland falls within an area designated as Lands Unsuitable for Mining pursuant to the federal Surface Mining Control and Reclamation Act where such designation is based in whole or in part on impacts to water resource values	No	**ETW**
7	**The wetland exhibits outstanding ecological or recreational values such as, but not limited to, those as outlined in 8-12**	No	Determination Required by TDEC
8	The wetland fits within the species composition concept for any plant community found in the state of Tennessee **ranked G2, G1, or more imperiled** at the "Association" classification level according to the NatureServe and Natural Heritage Ranking system (e.g. "bog", "fen", and "wet prairie/barren" communities).	No	Determination Required by TDEC
9	The wetland is **an uncommon resource** (e.g. vernal pools, headwater wetlands, sinks, spring/seeps, glades, newly described communities, high recreational or socioeconomic value) in the region and/or is deemed such by concurrence of qualified scientists.	No	Determination Required by TDEC
10	The wetland is an **older aged forested wetland** comprised of overstory trees with an average diameter at breast height (dbh) being **greater than or equal to 30 in** within the WAA.	No	Determination Required by TDEC
11	The wetland is observed and documented to be a **significant waterfowl, songbird, shorebird, amphibian, bat, fish habitat area**. These may include rookeries, migratory congregations, nesting sites, breeding areas, etc.	No	Determination Required by TDEC
12	The wetland is **hydrologically connected** to and/or has significant ecological contribution to an **ETW**	No	Determination Required by TDEC
13	The wetland has High Resource Value as determined by a **score of 75 and above** using the TRAM or non-HGM TRAM (to be determined after completing the quantitative portion of this manual)	No	Determination Required by TDEC

End of Narrative Rating. Begin Quantitative Rating on Next Page.

HGM FUNCTIONAL ASSESSMENT
SLOPE WETLANDS

Date: 08/15/2024 Project Name SR-19, 102251.03

Field Personnel RB, BC Wetland Name/Location WTL-2

Read instructions prior to conducting assessments. If project area is large or highly heterogeneous requiring the designation of several WAAs, a separate assessment should be performed for each WAA. CHECK THE APPROPRIATE BLANK(S) BELOW.

V1: Hydroperiod (HYDRO)

☑ 1. Hydrology not altered (SI = 1.0)
- no fill material or excessive sediment
- no ditches/drainage tiles
- no roads or other impediments to surface or groundwater
- no excavation
- no alteration to overland runoff, groundwater discharge/recharge

☐ 2. Hydrology slightly altered (SI = 0.75)
- portion of site with minimal fill or sediment
- portion of site with drainage ditches/tiles
- roads or other impediments, water flow slightly altered
- minor portion of site excavated
- some alteration to overland runoff, groundwater discharge/recharge

☐ 3. Hydrology moderately altered (SI = 0.5)
- portion of site with moderate fill or sediment
- portion of site with drainage ditches/tiles
- some alteration to overland runoff, groundwater discharge/recharge
- roads or other impediments, water flow moderately altered
- moderate portion of site excavated

☐ 4. Hydrology significantly altered (SI = 0.25)
- portion of site with significant fill or sediment
- portion of site with drainage ditches/tiles
- significant alteration to overland runoff, groundwater discharge/recharge
- roads or other impediments, water flow significantly altered
- significant portion of site excavated

☐ 5. Hydrology severely altered (SI = 0.1)
- entire site impacted by fill or excessive sediment
- entire site with numerous drainage ditches/tiles
- no contributions to or from overland runoff, groundwater discharge/recharge
- roads or other impediments, water flow completely blocked
- entire wetland affected

V2: Wetland Watershed Integrity (WSHEDINT)

Use weighted average as discussed on page 10. Examples of land uses and multipliers listed below

A = Percentage forested with no impervious surfaces 100
B = Percentage permeable land, (e.g., park, golf course, pasture, hay, orchard, tree farm, or similar) _____
C = Percentage low density residential, construction, or similar _____
D = Percentage high density residential, or similar _____
E = Percentage urban, commercial, industrial, or similar _____

V2 = (A x 1.0) + (B x 0.75) + (C x 0.5) + (D x 0.25) + (E x 0.01)/(100) = 1.00

V3: Canopy Tree Size Class (TSIZE)

1. Average size of canopy trees > 3 in. DBH

☐ ≥ 15 in. (SI = 1.0) ☐ 10 – 14 in. (SI = 0.75) ☐ 6 – 9 in. (SI = 0.5) ☐ 3 – 5 in. (SI = 0.25)
☑ < 3 in. or no trees present, go to V5

V4: Canopy Tree Density (TDEN)

1. Average number of canopy trees (> 3 in. DBH) per 30-ft. radius plot

☐ 5 – 10 (SI = 1.0) ☐ 11 – 15 (SI = 0.75) ☐ > 15 (SI = 0.5) ☐ 1 – 4 (SI = 0.5)

V5: Shrub Cover (SCOV)

1. Average percent cover of shrubs (woody stems < 3 in. DBH and taller than 3 ft.) per 30-ft. radius plot

☐ > 20 (SI = 1.0) ☑ < 20, go to V6

V6: Ground Vegetation Cover (GVC)

1. Average percent cover of ground vegetation per 30-ft. radius plot

☐ ≥ 70 (SI = 1.0) ☐ 55 – 69 (SI = 0.75) ☑ 45 – 54 (SI = 0.5) ☐ 30 – 44 (SI = 0.25) ☐ 20 – 29 (SI = 0.1)
☐ < 20 (SI=0.0)

V7: Vegetation Composition and Diversity (COMP)

1. Check the dominant species from Groups 1, 2, and 3 below using the 50/20 rule. If tree cover is < 20%, check the dominants in the next tallest stratum. If a dominant does not appear in lists below, but is a native species, it can be added to Group 1 or 2 species based on the scientific literature or professional judgement. Native shrub and herbaceous species are assigned to Group 2. When using shrub or herbaceous write in the number of dominant species. Dominant invasive species are checked regardless of stratum. *

GROUP 1 (Reference Standard)		GROUP 2 (Native Ubiquitous)		GROUP 3 (Invasive)
☐ Water oak	☐ Pin oak	☑ American elm	☐ Green ash	☐ European/Chinese privet
☐ Bur oak	☐ Shumard oak	☐ Slippery elm	☐ Red maple	☐ Japanese honeysuckle
☐ Willow oak	☐ Bald cypress	☑ Sweetgum	☐ Silver maple	☐ Japanese stiltgrass
☐ Swamp chestnut oak	☐ Water tupelo	☐ Blackgum	☑ Black willow	☐ Purple loosestrife
☐ Cherrybark oak	☐ S. black gum	☐ Silky dogwood	☐ Sycamore	☐ Giant reed
☐ Swamp white oak	☐ Persimmon	☐ Boxelder	☐ _____	☐ Tall fescue
☐ Nuttall oak	☐ Am. hornbeam	☐ Tulip poplar	☐ _____	☐ Phragmites
☐ Overcup oak	☐ _____	____ Number native shrub spp.		☐ _____
☐ _____	☐ _____	1 Number native herbaceous spp.		☐ _____

2. Using the number of dominants in Groups 1, 2, and 3 above, calculate a quality index (Q) using the following formula: [(1.0 x # of checked dominants in Group 1) + (0.66 x # of checked dominants in Group 2) + (0.0 x # of checked dominants in Group 3)]/ total # of checked dominants in all groups = 0.66

3. Multiply Q above by one of the following constants that reflects species richness:[1]

- ○ a) if ≥ 4 species from Groups 1 and/or 2 occur as dominants, multiply Q by 1.0 _____
- ◉ b) if 3 species from Groups 1 and/or 2 occur as dominant, multiply Q by 0.75 0.495
- ○ c) if 2 species from Groups 1 and/or 2 occur as dominants, multiply Q by 0.50 _____
- ○ d) if 1 species from Groups 1 and/or 2 occurs as dominant, multiply Q by 0.25 _____
- ○ e) if no species from Groups 1 and/or 2 occurs as dominant, multiply Q by 0.0 _____

4. Calculate the square root of the value from Step 3 above. This value is the SI for **V7**= 0.70

*In some Depression wetlands and in some small WAAs (e.g., <0.5 acres), relatively few species (e.g., overcup oak) may be present. In cases in which this is the normal condition, Q can be multiplied by 1.0 if only 1 or 2 species are dominant.

V8: Soil Organic Matter (ORGANIC)

1. Surface horizons unaltered
☐ 100 percent cover of O and/or A horizon present (SI = 1.0)

2. Surface horizons altered. Estimate the percent of the WAA in which neither an O or A horizon is present. 45

3. Subtract the sum of the values from Step 2 from 100. Convert this value to a decimal. This value is the SI for V8 (e.g., if 75 % of the WAA does not have an O or A horizon due to a significant disturbance, it will have an SI of 0.25).

V9: Buffer (BUFFER)

1. Determine the Connection Index (CI) by estimating the percent of the wetland surrounded by suitable buffer habitat.
☐ 90% – 100% (CI = 1.0) ☐ 75% – 89% (CI = 0.75) ☐ 40% – 74% (CI = 0.5) ☑ 10% – 39% (CI = 0.25)
☐ < 10% (CI = 0.1)

2. Multiply the CI by one if the following values:

- ○ a) if average buffer width is ≥ 492 ft., multiply by 1.0
- ◉ b) if average buffer is 98 ft to 491 ft., multiply by 0.66
- ○ c) if average buffer width is 33 ft to 97 ft., multiply by 0.33
- ○ d) if average buffer width is < 33 ft., multiply by 0.1

3. This value is the SI for **V9 =** 0.17 **.**

VALUES USED TO CALCULATE FUNCTIONAL CAPACITY INDICES (FCIs)

SUBINDEX VALUES:

V1 0.75 (HYDRO) V3 _____ (TSIZE) V5 _____ (SCOV) V7 0.70 (COMP) V9 0.17 (BUFFER)

V2 1.00 (WSHEDINT) V4 _____ (TDEN) V6 0.50 (GVC) V8 0.55 (ORGANIC)

Slope Wetland

WTL-2

V1: HYDROPERIOD	**1**	
V2: WETLAND WATERSHED INTEGRITY	**1**	
V3: CANOPY TREE CLASS	**GOTOV5**	
V4: CANOPY TREE DENSITY	**N/A**	
V5: SHRUB COVER	**GOTOV6**	
V6: GROUND VEGETATION COVER	**0.5**	
V7: VEGETATION COMPOSITION AND DIVERSITY	**0.70**	
2. Q =	**0.66**	
# of Group 1 Dominants	0	
# of Group 2 Dominants	3	
# of Group 3 Dominants	0	
SPECIES RICHNESS CONSTANT	0.75	
V8: SOIL ORGANIC MATTER	**0.55**	
V9:BUFFER	**0.17**	
1. Connection Index	0.25	
2. Buffer width value (0-1)	0.66	

Function 1: Maintain Hydrologic Regime

(V1 x V2)^(1/2)

FCI 1 = **1.00** **Final Tree =** **#VALUE!**

Function 2: Maintain Biogeochemical Processes

$$\text{FCI (trees present)} = \left((V1 \times V2)^{1/2} \times \left(\frac{\frac{V3+V4}{2}+V8}{2}\right)\right)^{1/2}$$

FCI 2 trees= **#VALUE!** **Final Shrubs=** **#VALUE!**

Final Herbaceous = **0.49**

$$\text{FCI (shrubs present)} = \left((V1 \times V2)^{1/2} \times \left(\frac{V5+V8}{3}\right)\right)^{1/2}$$

FCI 2 shrubs= **#VALUE!**

$$\text{FCI (ground cover)} = \left((V1 \times V2)^{1/2} \times \left(\frac{V6+V8}{5}\right)\right)^{1/2}$$

FCI 2 ground = **0.46**

Function 3: Maintain Characteristic Plant Community

$$\text{FCI (trees present)} = \frac{(V1 \times V2)^{1/2} + 2\left(\frac{V3+V4+V7}{3}\right)}{3}$$

FCI 3 trees= **#VALUE!**

$$\text{FCI (shrubs present)} = \frac{(V1 \times V2)^{1/2} + 2\left(\frac{V5+V7}{2}\right)}{6}$$

FCI 3 shrubs= **#VALUE!**

$$\text{FCI (groundcover)} = \frac{(V1 \times V2)^{1/2} + 2\left(\frac{V6+V7}{2}\right)}{9}$$

FCI 3 ground = **0.24**

Function 4: Maintain Characteristic Wildlife Community:

$$\text{FCI (trees)} = \frac{(V1 \times V2)^{1/2} + 2\left(\frac{V3+V4+V7}{3}\right)+V9}{4}$$

FCI 4 trees= **#VALUE!**

$$\text{FCI (shrubs present)} = \frac{(V1 \times V2)^{1/2} + 2\left(\frac{V5+V7}{2}\right)+V9}{6}$$

FCI 4 shrubs= **#VALUE!**

$$\text{FCI (groundcover)} = \frac{(V1 \times V2)^{1/2} + 2\left(\frac{V6+V7}{2}\right)+V9}{9}$$

FCI 4 ground = **0.26**

TRAM Summary Worksheet

Project: SR-19, PIN 102251.03, WTL-2

Exceptional Status Wetlands		**Check if applicable**
	1. **ONRW**	☐
	2. **ETW**	☐
	3. **Further Review Requested:** Attach Wetland Background and Exceptional Status Wetlands Worksheet	☐
	COMMENTS/NOTES:	
Quantitative Rating scores	Function: Hydrologic Regime	1.00
	Function: Biogeochemical Processes	0.46
	Function: Retain Particulates	n/a
	Function: Plant Community	0.24
	Function: Wildlife Community	0.26
	Quantitative Score (Average of FCIs x 100)	0.49
	Value Added (Significant Size) Total	0
Total of Quantitative and Value Added Scores	**TOTAL SCORE**	0.49

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.03					
Biologist:	PB, BF	**Affiliation:**	JMT	**Date:**	08-12-24

1-Station: from plans	South side of SR-19 ~0.48 miles south of Patton Lane								
2-Map label and name	WWC-29/EPH-9								
3-Latitude/Longitude	35.623964, -89.319737								
4-Feature description:									
-channel identification	perennial stream		intermittent stream		ephemeral stream	✓	wwc	✓	
-HD score (if applicable)	12								
-OHWM indicators	bed & banks	✓	deposition	✓	presence of litter debris	✓	scour		veg absent, bent, matted	
	change in plant community		destruction of terrestrial veg		multiple observe flow events		sediment sorting		water staining	
	change in soil character		leaf litter disturb or absent		natural line impressed on bank		shelving		wracking	
-channel bottom width	4'		-top of bank width	1'						
-width and max depth at ordinary high water mark	Width 4', max depth 0.5'									
-width at bankfull	4'									
-bank height	LDB - 1'		RDB - 1'							
-riffle/pool complex or other specialized habitat present?	No									
-dominant riparian species: ----------(LDB /RDB)----------	LDB: slippery elm, black willow, sweet-gum									
	RDB: slippery elm, black willow, sweet-gum, microstegium									
-particle size distribution %	Silt/Sand:	100	Gravel:		Cobble:		Boulder:		Bedrock:	
5-photo numbers	86									
6-HUC -8 Code & Name	08010205 - South Fork Forked Deer									
7-Assessed	yes			no	✓					
8-ETW	yes			no	✓					
9-303 (d) List	yes			siltation			habitat:		other:	
	no	✓								
10-Notes										

Revised July 2022

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Meridian Creek		Date/Time: 08/12/24
Assessors/Affiliation: PB, BF; JMT		Project ID : 102251.03
Site Name/Description: WWC-29/EPH-9		
Site Location: South side of SR-19 ~0.48 miles south of Patton Lane		
HUC (12 digit): 080102050402	Latitude: 35.623964	
Previous Rainfall (7-days) : < 0.5 inches	Longitude: -89.319737	
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0		
Watershed Size : 0.25 sq. miles	County: Haywood	
Soil Type(s) / Geology : Adler Silt Loam	Source: NRCS Web Soil Survey	
Surrounding Land Use : Low Density Residential, Agricultural		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 12

Justification / Notes :

Incipient drought (based on APT).

Straightened channel for most of its reach.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 7)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1 1.5	2	3
2. Sinuous channel	0 0.5	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 3.5)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 1.5)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants.

[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 12

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.03					
Biologist:	PB, BF	**Affiliation:**	JMT	**Date:**	08-12-24

1-Station: from plans	0.13 miles northwest of 3630 SR-19									
2-Map label and name	WWC-30/EPH-10									
3-Latitude/Longitude	35.622951, -89.318598									
4-Feature description:										
-channel identification	perennial stream		intermittent stream		ephemeral stream	✓	wwc	✓		
-HD score (if applicable)	9									
-OHWM indicators	bed & banks	✓	deposition		presence of litter debris		scour		veg absent, bent, matted	
	change in plant community		destruction of terrestrial veg		multiple observe flow events		sediment sorting		water staining	
	change in soil character		leaf litter disturb or absent	✓	natural line impressed on bank	✓	shelving		wracking	✓
-channel bottom width	2'		-top of bank width	4'						
-width and max depth at ordinary high water mark	Width 2', max depth 0.5'									
-width at bankfull	5'									
-bank height	LDB - 3'		RDB - 3'							
-riffle/pool complex or other specialized habitat present?	No									
-dominant riparian species: ----------(LDB /RDB)----------	LDB: slippery elm, sweet-gum, poison ivy									
	RDB: mockernut hickory, cottonwood									
-particle size distribution %	Silt/Sand:	100	Gravel:		Cobble:		Boulder:		Bedrock:	
5-photo numbers	87									
6-HUC -8 Code & Name	08010205 - South Fork Forked Deer									
7-Assessed	yes			no	✓					
8-ETW	yes			no	✓					
9-303 (d) List	yes			siltation			habitat:		other:	
	no	✓								
10-Notes										

Revised July 2022

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Meridian Creek		Date/Time: 08/12/24
Assessors/Affiliation: PB, BF; JMT		Project ID : 102251.03
Site Name/Description: WWC-30/EPH-10		
Site Location: 0.13 miles northwest of 3630 SR-19		
HUC (12 digit): 080102050402	Latitude: 35.622951	
Previous Rainfall (7-days) : < 0.5 inches	Longitude: -89.318598	
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0		
Watershed Size : 0.24 sq. miles	County: Haywood	
Soil Type(s) / Geology : Adler Silt Loam	Source: NRCS Web Soil Survey	
Surrounding Land Use : Low Density Residential, Agricultural		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 9

Justification / Notes :

Incipient drought (based on APT). Flows into STR-13.

Agricultural field runoff channel.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 6)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	0.5 1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 2)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 1)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants.

[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 9

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.03					
Biologist:	PB, BF	**Affiliation:**	JMT	**Date:**	08-12-24

1-Station: from plans	East of Westpointe Dr. on SR-19								
2-Map label and name	STR-14								
3-Latitude/Longitude	35.621283, -89.315693								
4-Feature description:									
-channel identification	perennial stream		intermittent stream	✓	ephemeral stream		wwc		
-HD score (if applicable)	25.25								
-OHWM indicators	bed & banks	✓	deposition	✓	presence of litter debris	✓	scour	✓	veg absent, bent, matted ✓
	change in plant community		destruction of terrestrial veg		multiple observe flow events		sediment sorting		water staining
	change in soil character	✓	leaf litter disturb or absent	✓	natural line impressed on bank	✓	shelving	✓	wracking ✓
-channel bottom width	9'		-top of bank width		16'				
-width and max depth at ordinary high water mark	Width 9', max depth 3'								
-width at bankfull	10'								
-bank height	LDB - 8'		RDB - 8'						
-riffle/pool complex or other specialized habitat present?	No								
-dominant riparian species: ----------(LDB /RDB)----------	LDB: southern red oak, multiflora rose, elderberry								
	RDB: sweet-gum, american sycamore, pecan, red maple								
-particle size distribution %	Silt/Sand: 100		Gravel:		Cobble:		Boulder:		Bedrock:
5-photo numbers	88-93								
6-HUC -8 Code & Name	08010205 - South Fork Forked Deer								
7-Assessed	yes		no	✓					
8-ETW	yes		no	✓					
9-303 (d) List	yes		siltation		habitat:		other:		
	no	✓							
10-Notes									

Revised July 2022

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Meridian Creek	Date/Time: 08/12/24
Assessors/Affiliation: PB, BF; JMT	Project ID : 102251.03
Site Name/Description: STR-14	
Site Location: East of Westpointe Dr. on SR-19	
HUC (12 digit): 080102050402	Latitude: 35.621283
Previous Rainfall (7-days) : < 0.5 inches	Longitude: -89.315693
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0	
Watershed Size : 0.36 sq. miles	County: Haywood
Soil Type(s) / Geology : Feliciana Silt Loam	Source: NRCS Web Soil Survey
Surrounding Land Use : Low Density Residential, Agricultural	
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = 25.25

Justification / Notes :

Incipient drought (based on APT).

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 14)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2 2.5	3
2. Sinuous channel	0	1 1.5	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 5.25)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0	0.75	Yes = 1.5	

C. Biology (Subtotal = 6)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 25.25

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : #19: 1 hydric plug of 5 attempts. Well defined common benches with lots of sediment. No water or invertebrates. Hyporheic zone saturated in some sports. Too incised for floodplain, yet relatively large drainage area.

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.03					
Biologist:	PB, BF	**Affiliation:**	JMT	**Date:**	08-12-24

1-Station: from plans	East of 3704 SR-19								
2-Map label and name	WWC-31/EPH-11								
3-Latitude/Longitude	35.621402, -89.315778								
4-Feature description:									
-channel identification	perennial stream ☐	intermittent stream ☐	ephemeral stream ☑	wwc ☑					
-HD score (if applicable)	6.25								
-OHWM indicators	bed & banks ☐	deposition ☐	presence of litter debris ☐	scour ☐	veg absent, bent, matted ☐				
	change in plant community ☐	destruction of terrestrial veg ☐	multiple observe flow events ☐	sediment sorting ☐	water staining ☐				
	change in soil character ☐	leaf litter disturb or absent ☐	natural line impressed on bank ☐	shelving ☐	wracking ☐				
-channel bottom width	1'	-top of bank width	4'						
-width and max depth at ordinary high water mark	width 4', max depth 1.5'								
-width at bankfull	4'								
-bank height	LDB - 5'	RDB - 4'							
-riffle/pool complex or other specialized habitat present?	No								
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Northern catalpa, giant ragweed								
	RDB: Japanese honeysuckle, American elm								
-particle size distribution %	Silt/Sand: 100	Gravel:	Cobble:	Boulder:	Bedrock:				
5-photo numbers	94-95								
6-HUC -8 Code & Name	08010205 - South Fork Forked Deer								
7-Assessed	yes ☐	no ☑							
8-ETW	yes ☐	no ☑							
9-303 (d) List	yes ☐	siltation ☐	habitat: ☐	other: ☐					
	no ☑								
10-Notes	Flows into STR-14								

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Meridian Creek		Date/Time: 08/12/24
Assessors/Affiliation: PB, BF; JMT		Project ID : 102251.03
Site Name/Description: WWC-31/EPH-11		
Site Location: East of 3704 SR-19		
HUC (12 digit): 080102050402	Latitude: 35.621402	
Previous Rainfall (7-days) : < 0.5 inches	Longitude: -89.315778	
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0		
Watershed Size : 0.36 sq. miles	County: Haywood	
Soil Type(s) / Geology : Feliciana Silt Loam	Source: NRCS Web Soil Survey	
Surrounding Land Use : Low Density Residential, Agricultural		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 6.25

Justification / Notes :

Incipient drought (based on APT). Flows into STR-14

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 3.5)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	1.5 2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0 0.5	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 1.75)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5 0.25	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 1)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants.

[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 6.25

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.03					
Biologist:	RB & BC	**Affiliation:**	JMT	**Date:**	08-12-24

1-Station: from plans	Opposite Westpointe Dr on SR-19								
2-Map label and name	STR-15								
3-Latitude/Longitude	35.619148, -89.312299								
4-Feature description:									
-channel identification	perennial stream		intermittent stream	✓	ephemeral stream		wwc		
-HD score (if applicable)	17								
-OHWM indicators	bed & banks	✓	deposition		presence of litter debris		scour		veg absent, bent, matted	
	change in plant community		destruction of terrestrial veg		multiple observe flow events		sediment sorting		water staining	
	change in soil character		leaf litter disturb or absent		natural line impressed on bank		shelving		wracking	
-channel bottom width	3'		-top of bank width		20'					
-width and max depth at ordinary high water mark	width 4', max depth 8"									
-width at bankfull	5'									
-bank height	LDB - 15'		RDB - 15'							
-riffle/pool complex or other specialized habitat present?	No									
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Dogfennel, giant ragweed, sweetgum									
	RDB: Dogfennel, giant ragweed, sweetgum, Corn field									
-particle size distribution %	Silt/Sand: 100		Gravel:		Cobble:		Boulder:		Bedrock:	
5-photo numbers	96-98									
6-HUC -8 Code & Name	08010205 - South Fork Forked Deer									
7-Assessed	yes			no	✓					
8-ETW	yes			no	✓					
9-303 (d) List	yes			siltation			habitat:		other:	
	no	✓								
10-Notes										

Revised July 2022

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Meridian Creek	Date/Time: 08/12/24
Assessors/Affiliation: RB, BC; JMT	Project ID : 102251.03
Site Name/Description: STR-15	
Site Location: Opposite Westpointe Dr on SR-19	
HUC (12 digit): 080102050402	Latitude: 35.619148
Previous Rainfall (7-days) : < 0.5 inches	Longitude: -89.312299
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0	
Watershed Size : 0.07 sq. miles	County: Haywood
Soil Type(s) / Geology : Feliciana Silt Loam	Source: NRCS Web Soil Survey
Surrounding Land Use : Low Density Residential, Agricultural	
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = 17

Justification / Notes :

Incipient drought (based on APT). NHD stream also shows up on USGS Topo (unnamed).

Altered around agricultural fields and roads. Severe incision of the channel.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 10)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	1.5 2	3
3. In-channel structure: riffle-pool sequences	0	1	1.5 2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 1)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 6)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 17

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.03					
Biologist:	RB & BC	**Affiliation:**	JMT	**Date:**	08-12-24

1-Station: from plans	Opposite Westpointe Dr on SR-19								
2-Map label and name	WWC-32/EPH-12								
3-Latitude/Longitude	35.618835, -89.311963								
4-Feature description:									
-channel identification	perennial stream		intermittent stream		ephemeral stream	✓	wwc	✓	
-HD score (if applicable)	10.5								
-OHWM indicators	bed & banks		deposition		presence of litter debris		scour		veg absent, bent, matted
	change in plant community		destruction of terrestrial veg		multiple observe flow events		sediment sorting		water staining
	change in soil character		leaf litter disturb or absent		natural line impressed on bank		shelving		wracking
-channel bottom width	3'		-top of bank width	20'					
-width and max depth at ordinary high water mark	N/A								
-width at bankfull	N/A								
-bank height	LDB - 15'		RDB - 15'						
-riffle/pool complex or other specialized habitat present?	No								
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Dogfennel, giant ragweed, sweetgum								
	RDB: Dogfennel, giant ragweed, sweetgum, Corn field								
-particle size distribution %	Silt/Sand:	100	Gravel:		Cobble:		Boulder:		Bedrock:
5-photo numbers	99								
6-HUC -8 Code & Name	08010205 - South Fork Forked Deer								
7-Assessed	yes		no	✓					
8-ETW	yes		no	✓					
9-303 (d) List	yes		siltation		habitat:		other:		
	no	✓							
10-Notes									

Revised July 2022

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Meridian Creek	Date/Time: 08/12/24
Assessors/Affiliation: RB, BC; JMT	Project ID : 102251.03
Site Name/Description: WWC-32/EPH-12	
Site Location: Opposite Westpointe Dr on SR-19	
HUC (12 digit): 080102050402	Latitude: 35.618835
Previous Rainfall (7-days) : < 0.5 inches	Longitude: -89.311963
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0	
Watershed Size : 0.06 sq. miles	County: Haywood
Soil Type(s) / Geology : Feliciana Silt Loam	Source: NRCS Web Soil Survey
Surrounding Land Use : Low Density Residential, Agricultural	
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 10.5

Justification / Notes :

Incipient drought (based on APT).

Incised channel between road and farm field.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 4.5)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	1.5 2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 0)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 6)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 10.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Flows into STR-15

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.03					
Biologist:	JC, JG	**Affiliation:**	JMT	**Date:**	08-12-24

1-Station: from plans	Southeast of Westpointe Dr meeting SR-19								
2-Map label and name	WWC-33/EPH-13								
3-Latitude/Longitude	35.615271, -89.307585								
4-Feature description:									
-channel identification	perennial stream		intermittent stream		ephemeral stream	✓	wwc	✓	
-HD score (if applicable)	9								
-OHWM indicators	bed & banks	✓	deposition		presence of litter debris	✓	scour		veg absent, bent, matted
	change in plant community		destruction of terrestrial veg		multiple observe flow events		sediment sorting		water staining
	change in soil character		leaf litter disturb or absent		natural line impressed on bank		shelving		wracking
-channel bottom width	2'		-top of bank width	12'					
-width and max depth at ordinary high water mark	width 1', max depth 0.5'								
-width at bankfull	6'								
-bank height	LDB - 6'		RDB - 6'						
-riffle/pool complex or other specialized habitat present?	No								
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Slippery elm, poison ivy, sweet gum, Bermuda grass								
	RDB: Slippery elm, poison ivy, sweet gum, Bermuda grass								
-particle size distribution %	Silt/Sand:	100	Gravel:		Cobble:		Boulder:		Bedrock:
5-photo numbers	100								
6-HUC -8 Code & Name	08010205 - South Fork Forked Deer								
7-Assessed	yes			no	✓				
8-ETW	yes			no	✓				
9-303 (d) List	yes		siltation		habitat:		other:		
	no	✓							
10-Notes									

Revised July 2022

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Meridian Creek		Date/Time: 08/12/24
Assessors/Affiliation: JC, JG; JMT		Project ID : 102251.03
Site Name/Description: WWC-33/EPH-13		
Site Location: Southeast of Westpointe Dr meets SR-19		
HUC (12 digit): 080102050402	Latitude: 35.615271	
Previous Rainfall (7-days) : 0 inches	Longitude: -89.307585	
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0		
Watershed Size : <0.02 sq. miles	County: Haywood	
Soil Type(s) / Geology : Feliciana Silt Loam	Source: NRCS Web Soil Survey	
Surrounding Land Use : Low Density Residential, Agricultural		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 9

Justification / Notes :

Incipient drought (based on APT).

Agricultural field drainage.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 4.5)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 2)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 2.5)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 9

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Area appears to be fed by adjoining sheetflows from various ag fields, banks are deeply sized, plants noted at some parts of the channel, no culvert connection to the road.

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.03					
Biologist:	PB, BF	**Affiliation:**	JMT	**Date:**	08-12-24

1-Station: from plans	Roadside in front of 2560 SR-19								
2-Map label and name	WWC-34/UDF-21								
3-Latitude/Longitude	35.610419, -89.300298								
4-Feature description:									
-channel identification	perennial stream ☐	intermittent stream ☐	ephemeral stream ☐	wwc ☑					
-HD score (if applicable)	7.5								
-OHWM indicators	bed & banks ☐	deposition ☐	presence of litter debris ☐	scour ☐	veg absent, bent, matted ☐				
	change in plant community ☐	destruction of terrestrial veg ☐	multiple observe flow events ☐	sediment sorting ☐	water staining ☐				
	change in soil character ☐	leaf litter disturb or absent ☐	natural line impressed on bank ☐	shelving ☐	wracking ☐				
-channel bottom width	3'	-top of bank width	8'						
-width and max depth at ordinary high water mark	Width 5', max depth 2'								
-width at bankfull	5'								
-bank height	LDB - 5'	RDB - 5'							
-riffle/pool complex or other specialized habitat present?	No								
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Festuca sp.								
	RDB: Festuca sp.								
-particle size distribution %	Silt/Sand: 10	Gravel:	Cobble:	Boulder: 90	Bedrock:				
5-photo numbers	101-102								
6-HUC -8 Code & Name	08010205 - South Fork Forked Deer								
7-Assessed	yes ☐	no ☑							
8-ETW	yes ☐	no ☑							
9-303 (d) List	yes ☐	siltation ☐	habitat: ☐	other: ☐					
	no ☑								
10-Notes									

Revised July 2022

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Bucks Creek		Date/Time: 08/12/24
Assessors/Affiliation: PB, BF; JMT		Project ID : 102251.03
Site Name/Description: WWC-34/UDF-21		
Site Location: Roadside in front of 2560 SR-19		
HUC (12 digit): 080102050401	Latitude: 35.610419	
Previous Rainfall (7-days) : < 0.5 inches	Longitude: -89.300298	
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0		
Watershed Size : 0.11 sq. miles	County: Haywood	
Soil Type(s) / Geology : Loring Silt Loam	Source: NRCS Web Soil Survey	
Surrounding Land Use : Low Density Residential, Agricultural		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 7.5

Justification / Notes :

Incipient drought (based on APT).

Agricultural field drainage.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 4)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	0.5 1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 1.5)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 2)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants.

[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 7.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.03					
Biologist:	PB, BF	**Affiliation:**	JMT	**Date:**	08-12-24

1-Station: from plans	Northeast of Fulton Rd. on the south side of SR-19									
2-Map label and name	STR-16									
3-Latitude/Longitude	35.610080, -89.300271									
4-Feature description:										
-channel identification	perennial stream		intermittent stream	✓	ephemeral stream		wwc			
-HD score (if applicable)	22.25									
-OHWM indicators	bed & banks		deposition		presence of litter debris		scour		veg absent, bent, matted	
	change in plant community		destruction of terrestrial veg		multiple observe flow events		sediment sorting		water staining	
	change in soil character		leaf litter disturb or absent		natural line impressed on bank	✓	shelving		wracking	✓
-channel bottom width	1'		-top of bank width		3'					
-width and max depth at ordinary high water mark	width 3' , max depth 1'									
-width at bankfull	4'									
-bank height	LDB - 3'				RDB - 3'					
-riffle/pool complex or other specialized habitat present?	No									
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Persicaria spp., johnson grass, honeyvine									
	RDB: Poison ivy, grasses									
-particle size distribution %	Silt/Sand:	100	Gravel:		Cobble:		Boulder:		Bedrock:	
5-photo numbers	103-104									
6-HUC -8 Code & Name	08010205 - South Fork Forked Deer									
7-Assessed	yes			no	✓					
8-ETW	yes			no	✓					
9-303 (d) List	yes			siltation			habitat:		other:	
	no	✓								
10-Notes										

Revised July 2022

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Bucks Creek	Date/Time: 08/12/24
Assessors/Affiliation: PB, BF; JMT	Project ID : 102251 .03
Site Name/Description: STR-16	
Site Location: Northeast of Fulton Rd. on the south side of SR-19	
HUC (12 digit): 080102050401	Latitude: 35.610080
Previous Rainfall (7-days) : < 0.5 inches	Longitude: -89.300271
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0	
Watershed Size : 0.09 sq. miles	County: Haywood
Soil Type(s) / Geology : Loring Silt Loam	Source: NRCS Web Soil Survey
Surrounding Land Use : Low Density Residential, Agricultural	
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = 22.25

Justification / Notes :

Incipient drought (based on APT).

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 6)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 5.75)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.25 0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 10.5)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2 1.5	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 22.25

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Persicaria sp. (Aquatic species) noted in channel.

Fed by culvert under road and WWC-34/UDF-21. Flows into WWC-35/UDF-22.
Several aquatic snails located. Frogs noted in channel.

Macrobenthos found in channel: 2 odonates, 1 crane fly

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.03					
Biologist:	JC, JG	**Affiliation:**	JMT	**Date:**	08-12-24

1-Station: from plans	Northwest of Fulton Rd meeting SR-19								
2-Map label and name	WWC-35/UDF-22								
3-Latitude/Longitude	35.609435, -89.299505								
4-Feature description:									
-channel identification	perennial stream ☐	intermittent stream ☐	ephemeral stream ☐	wwc ☑					
-HD score (if applicable)	17.75								
-OHWM indicators	bed & banks ☑	deposition ☑	presence of litter debris ☑	scour ☐	veg absent, bent, matted ☐				
	change in plant community ☐	destruction of terrestrial veg ☐	multiple observe flow events ☐	sediment sorting ☑	water staining ☐				
	change in soil character ☐	leaf litter disturb or absent ☐	natural line impressed on bank ☐	shelving ☐	wracking ☐				
-channel bottom width	4'	-top of bank width	30'						
-width and max depth at ordinary high water mark	Width 4', max depth 1'								
-width at bankfull	8'								
-bank height	LDB - 6'	RDB - 6'							
-riffle/pool complex or other specialized habitat present?	No								
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Kudzu, pecan, slippery elm, sweet-gum, sycamore, elderberry								
	RDB: Kudzu, pecan, slippery elm, sweet-gum, sycamore, elderberry								
-particle size distribution %	Silt/Sand: 60	Gravel: 20	Cobble:	Boulder:	Bedrock:				
5-photo numbers	105-106								
6-HUC -8 Code & Name	08010205 - South Fork Forked Deer								
7-Assessed	yes ☐	no ☑							
8-ETW	yes ☐	no ☑							
9-303 (d) List	yes ☐	siltation ☐	habitat: ☐	other: ☐					
	no ☑								
10-Notes	20% riprap								

Revised July 2022

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Meridian Creek		Date/Time: 08/12/24
Assessors/Affiliation: JC, JG; JMT		Project ID : 102251.03
Site Name/Description: WWC-35/UDF-22		
Site Location: Northwest of Fulton Rd meeting SR-19		
HUC (12 digit): 080102050401	Latitude: 35.609435	
Previous Rainfall (7-days) : < 0.5 inches	Longitude: -89.299505	
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0		
Watershed Size : 0.13 sq. miles	County: Haywood	
Soil Type(s) / Geology : Alder Silt Loam	Source: NRCS Web Soil Survey	
Surrounding Land Use : Low Density Residential, Agricultural		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 17.75

Justification / Notes :

Incipient drought (based on APT).

Ditch between roadside and agricultural field.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 8.5)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 5.5)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 3.75)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	0.5 1	2	3
27. Iron oxidizing bacteria/fungus	0	0.25 0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants.

[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 17.75

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.03					
Biologist:	PB, BF	**Affiliation:**	JMT	**Date:**	08-12-24

1-Station: from plans	Northeast of the intersection of Fulton Road and SR-19 along SR-19									
2-Map label and name	STR-17									
3-Latitude/Longitude	35.608813, -89.298734									
4-Feature description:										
-channel identification	perennial stream		intermittent stream	✓	ephemeral stream		wwc			
-HD score (if applicable)	20									
-OHWM indicators	bed & banks	✓	deposition		presence of litter debris	✓	scour	✓	veg absent, bent, matted	✓
	change in plant community		destruction of terrestrial veg		multiple observe flow events		sediment sorting		water staining	✓
	change in soil character	✓	leaf litter disturb or absent		natural line impressed on bank		shelving		wracking	
-channel bottom width	6'		-top of bank width		10'					
-width and max depth at ordinary high water mark	width 6', max depth 1-2'									
-width at bankfull	10'									
-bank height	LDB - 5'				RDB - 5'					
-riffle/pool complex or other specialized habitat present?	No									
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Kudzu									
	RDB: Kudzu, Blackberry									
-particle size distribution %	Silt/Sand: 100		Gravel:		Cobble:		Boulder:		Bedrock:	
5-photo numbers	107-109									
6-HUC -8 Code & Name	08010205 - South Fork Forked Deer									
7-Assessed	yes		no	✓						
8-ETW	yes		no	✓						
9-303 (d) List	yes		siltation		habitat:		other:			
	no	✓								
10-Notes										

Revised July 2022

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Bucks Creek	Date/Time: 08/12/24
Assessors/Affiliation: PB, BF; JMT	Project ID : 102251.03
Site Name/Description: STR-17	
Site Location: Northeast of the intersection of Fulton Road and SR-19 along SR-19	
HUC (12 digit): 080102050401	Latitude: 35.608813
Previous Rainfall (7-days) : < 0.5 inches	Longitude: -89.298734
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0	
Watershed Size : 0.24 sq. miles	County: Haywood
Soil Type(s) / Geology : Alder Silt Loam	Source: NRCS Web Soil Survey
Surrounding Land Use : Low Density Residential, Agricultural	
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = 20

Justification / Notes :

Culvert is set above stream substrate, acting as grade control. Water was pooled near the culvert allowing for filam
algae to grow and amphibians to thrive. Culvert preventing AOP. Stream appears to be artificially straightened
historically on the south side of SR-19.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 7.5)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 6)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 6.5)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1.5 1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants.

[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 20

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Innumerable tadpoles present within channel.

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.03					
Biologist:	JC, JG	**Affiliation:**	JMT	**Date:**	08-12-24

1-Station: from plans	South of Buck's creek along SR-19										
2-Map label and name	WWC-36/UDF-23										
3-Latitude/Longitude	35.608684, -89.298366										
4-Feature description:											
-channel identification	perennial stream		intermittent stream		ephemeral stream		wwc	✓			
-HD score (if applicable)	7.5										
-OHWM indicators	bed & banks	✓	deposition		presence of litter debris	✓	scour		veg absent, bent, matted		
	change in plant community		destruction of terrestrial veg		multiple observe flow events		sediment sorting		water staining		
	change in soil character		leaf litter disturb or absent		natural line impressed on bank		shelving		wracking		
-channel bottom width	2'		-top of bank width		20'						
-width and max depth at ordinary high water mark	Width 1', max depth 0.5'										
-width at bankfull	7-8'										
-bank height	LDB - 4.5'				RDB - 4.5'						
-riffle/pool complex or other specialized habitat present?	No										
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Sweet-gum, tree of heaven, slippery elm, pecan, American elm, grapevine										
	RDB: Sweet gum, tree of heaven, slippery elm, pecan, American elm, grapevine										
-particle size distribution %	Silt/Sand:	95	Gravel:		Cobble:		Boulder:		Bedrock:		
5-photo numbers	110										
6-HUC -8 Code & Name	08010205 - South Fork Forked Deer										
7-Assessed	yes			no	✓						
8-ETW	yes			no	✓						
9-303 (d) List	yes			siltation			habitat:		other:		
	no	✓									
10-Notes	5% riprap										

Revised July 2022

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Bucks Creek		Date/Time: 08/12/24
Assessors/Affiliation: JC, JG; JMT		Project ID : 102251 .03
Site Name/Description: WWC-36/UDF-23		
Site Location: South of Buck's creek along SR-19		
HUC (12 digit): 080102050401	Latitude: 35.608684	
Previous Rainfall (7-days) : < 0.5 inches	Longitude: -89.298366	
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0		
Watershed Size : 0.39 sq. miles	County: Haywood	
Soil Type(s) / Geology : Alder Silt Loam	Source: NRCS Web Soil Survey	
Surrounding Land Use : Low Density Residential, Agricultural		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 7.5

Justification / Notes :

Incipient drought (based on APT).

Ditch between roadside and agricultural field.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 5.5)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 2)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 0)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 7.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Area appears to be roadside ditch, sheet flow from road and surrounding ag field. Some sections have riprap, pvc pipe about 6in diameter lines ditch and appears to come from the proximate ag field.

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.03					
Biologist:	PB, BF	**Affiliation:**	JMT	**Date:**	08-12-24

1-Station: from plans	South of 2560 SR-19								
2-Map label and name	WWC-37/EPH-14								
3-Latitude/Longitude	35.607797, -89.297352								
4-Feature description:									
-channel identification	perennial stream		intermittent stream		ephemeral stream	✓	wwc	✓	
-HD score (if applicable)	12.75								
-OHWM indicators	bed & banks	✓	deposition		presence of litter debris		scour		veg absent, bent, matted
	change in plant community		destruction of terrestrial veg		multiple observe flow events		sediment sorting		water staining
	change in soil character		leaf litter disturb or absent		natural line impressed on bank		shelving		wracking
-channel bottom width	2.5		-top of bank width	3					
-width and max depth at ordinary high water mark	N/A								
-width at bankfull	3								
-bank height	LDB - 1.5		RDB - 2						
-riffle/pool complex or other specialized habitat present?	No								
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Sweet-gum, poison ivy, crop field								
	RDB: Sweet-gum, Eastern white cedar, white oak, trumpet creeper								
-particle size distribution %	Silt/Sand: 90		Gravel: 10		Cobble:		Boulder:		Bedrock:
5-photo numbers	111-114								
6-HUC -8 Code & Name	08010205 - South Fork Forked Deer								
7-Assessed	yes		no	✓					
8-ETW	yes		no	✓					
9-303 (d) List	yes		siltation		habitat:		other:		
	no	✓							
10-Notes									

Revised July 2022

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Bucks Creek		Date/Time: 08/12/24
Assessors/Affiliation: PB, BF; JMT		Project ID : 102251.03
Site Name/Description: WWC-37/EPH-14		
Site Location: South of 2560 SR-19		
HUC (12 digit): 080102050401	Latitude: 35.607797	
Previous Rainfall (7-days) : < 0.5 inches	Longitude: -89.297352	
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0		
Watershed Size : < 0.01 sq. miles	County: Haywood	
Soil Type(s) / Geology : Adler Silt Loam	Source: NRCS Web Soil Survey	
Surrounding Land Use : Low Density Residential, Agricultural		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 12.75

Justification / Notes :

Incipient drought (based on APT).

Agricultural field ditch.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 5.25)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	0.5	1	2	3
11. Grade controls	0	0.25	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 1.5)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 6)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 12.75

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Crop field drainage to roadside ditch/culvert confluence

Ecology Field Data Sheet: **Water Resources**

Project: Haywood County, SR-19, 102251.03					
Biologist:	JC, JG	**Affiliation:**	JMT	**Date:**	08-12-24

1-Station: from plans	Fulton Rd meets SR-19, South of Bucks Creek								
2-Map label and name	WWC-38/UDF-24								
3-Latitude/Longitude	35.607380, -89.296651								
4-Feature description:									
-channel identification	perennial stream ☐	intermittent stream ☐	ephemeral stream ☐	wwc ☑					
-HD score (if applicable)	7.5								
-OHWM indicators	bed & banks ☑	deposition ☐	presence of litter debris ☑	scour ☐	veg absent, bent, matted ☐				
	change in plant community ☐	destruction of terrestrial veg ☐	multiple observe flow events ☐	sediment sorting ☐	water staining ☐				
	change in soil character ☐	leaf litter disturb or absent ☐	natural line impressed on bank ☐	shelving ☐	wracking ☐				
-channel bottom width	3'	-top of bank width	10'						
-width and max depth at ordinary high water mark	Width 1', max depth 0.5'								
-width at bankfull	5'								
-bank height	LDB - 4.5'	RDB - 4.5'							
-riffle/pool complex or other specialized habitat present?	No								
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Sweet-gum, willow, slippery elm, sumac, sycamore								
	RDB: Sweet-gum, willow, slippery elm, sumac, sycamore								
-particle size distribution %	Silt/Sand: 90	Gravel:	Cobble:	Boulder:	Bedrock:				
5-photo numbers	115								
6-HUC -8 Code & Name	08010205 - South Fork Forked Deer								
7-Assessed	yes ☐	no ☑							
8-ETW	yes ☐	no ☑							
9-303 (d) List	yes ☐	siltation ☐	habitat: ☐	other: ☐					
	no ☑								
10-Notes	10% riprap								

Revised July 2022

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: UNT Bucks Creek	Date/Time: 08/12/24
Assessors/Affiliation: JC, JG; JMT	Project ID : 102251.03
Site Name/Description: WWC-38/UDF-24	
Site Location: Fulton Rd meets SR-19, South of Bucks Creek	
HUC (12 digit): 080102050401	Latitude: 35.607380
Previous Rainfall (7-days) : < 0.5 inches	Longitude: -89.296651
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : NRCS Antecedent Precipitation Tool V2.0	
Watershed Size : <0.02 sq. miles	County: Haywood
Soil Type(s) / Geology : Alder Silt Loam	Source: NRCS Web Soil Survey
Surrounding Land Use : Low density residential, Agricultural	
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	x	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	x	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	x	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	x	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	x	Stream
6. Presence of fish (except *Gambusia*)	x	Stream
7. Presence of naturally occurring ground water table connection	x	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	x	Stream
9. Evidence watercourse has been used as a supply of drinking water	x	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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 7.5

Justification / Notes :

Incipient drought (based on APT).

Ditch between roadside and agricultural field.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 5.5)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 2)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 0)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 7.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Area appears to be a roadside ditch, grass lined ditches, and road sheetflow. Several sections had riprap.

APPENDIX C: PHOTOGRAPH LOG

TN SR-19, PIN 102251.03	Date: August 13-15, 2024

Photo 1: WWC-1/EPH-1 facing downstream at CMP culvert. Pipe covered in large rip-rap.

Photo 2: WWC-2/EPH-2 facing upstream at head cut.

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Photo 3: WWC-2/EPH-2 facing downstream.

Photo 4: WWC-3/UDF-1 (southwest of SR-19) facing upstream at culvert.

TN TDOT Department of Transportation

TN SR-19, PIN 102251.03	Date: August 13-15, 2024

Photo 5: WWC-3/UDF-1 facing swale draining to feature.

Photo 6: WWC-3/UDF-1 (northeast of SR-19) facing upstream at culvert. Single barrel concrete culvert with vegetation obscuring opening.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

TN SR-19, PIN 102251.03	Date: August 13-15, 2024

Photo 7: WWC-3/UDF-1 (northeast of SR-19) facing downstream.

Photo 8: STR-1 (southwest of SR-19) facing upstream.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

TN SR-19, PIN 102251.03	Date: August 13-15, 2024

Photo 9: STR-1 (southwest of SR-19) facing downstream.

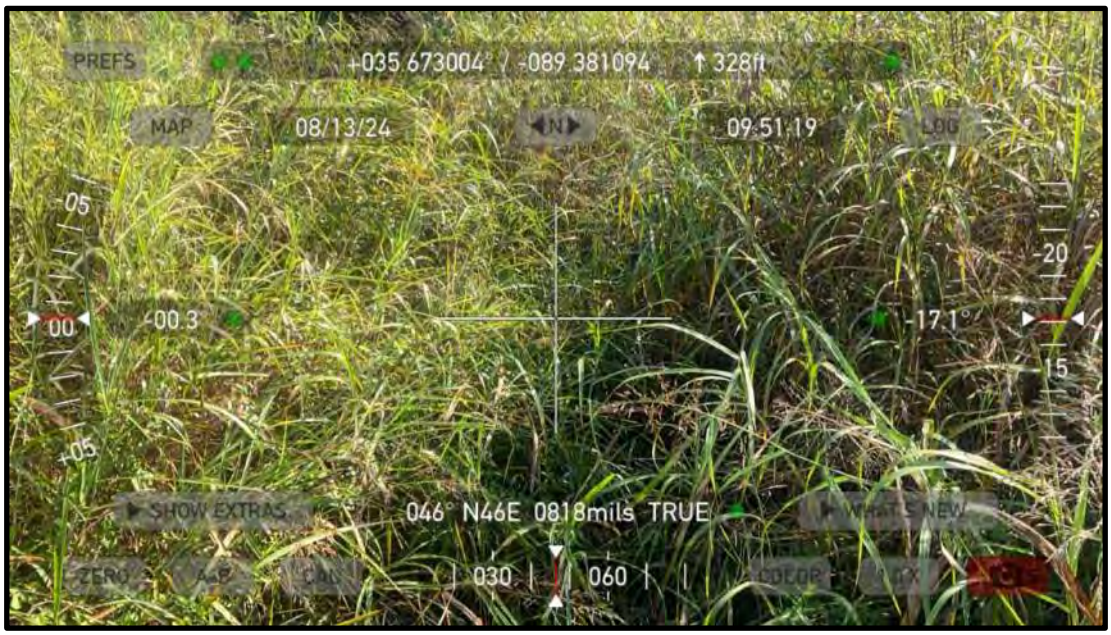

Photo 10: STR-1 (northeast of SR-19) facing downstream from culvert.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

TN SR-19, PIN 102251.03	Date: August 13-15, 2024

Photo 11: STR-1 (northeast of SR-19) facing upstream.

Photo 12: STR-1 (southwest of SR-19) facing downstream.

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TN SR-19, PIN 102251.03	Date: August 13-15, 2024

Photo 13: WWC-4/UDF-2 facing downstream.

Photo 14: WWC-4/UDF-2 facing upstream.

Feature names indicated on photos have been changed to the name indicated in captions

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Photo 15: WWC-5/UDF-3 facing downstream.

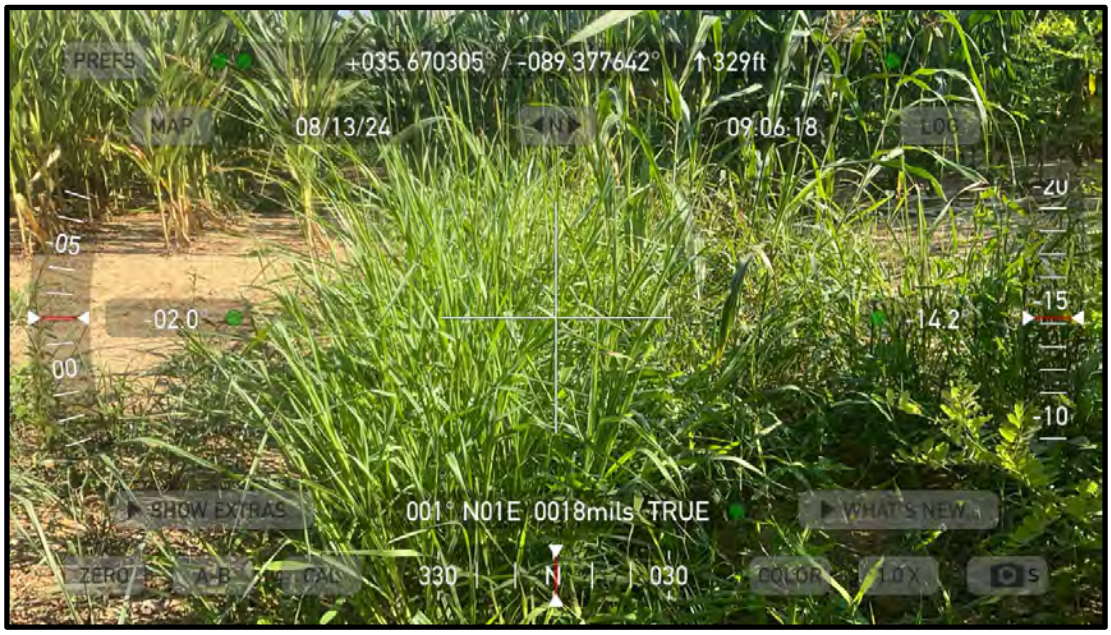


Photo 16: WWC-5/UDF-3 facing upstream.

TN SR-19, PIN 102251.03	Date: August 13-15, 2024

Photo 17: WWC-6/UDF-4 facing downstream.

Photo 18: STR-2 (south of SR-19) facing downstream at culvert. 4’ x 4’ single barrel box concrete culvert. Bottom of culvert ~4” higher than stream bed.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

TN SR-19, PIN 102251.03	Date: August 13-15, 2024

Photo 19: STR-2 (south of SR-19) facing downstream at culvert. 4’ x 4’ single barrel box concrete culvert. Bottom of culvert ~4” higher than stream bed.

Photo 20: STR-2 (south of SR-19) facing upstream.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

TN SR-19, PIN 102251.03	Date: August 13-15, 2024

Photo 21: STR-2 (north of SR-19) facing upstream at culvert. ~4’ x 8’ concrete box culvert that is ~5’ above stream bed.

Photo 22: STR-2 (north of SR-19) facing upstream.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

TN SR-19, PIN 102251.03	Date: August 13-15, 2024

Photo 23: WWC-7/UDF-5 facing upstream at first head cut.

Photo 24: WWC-7/UDF-5 facing upstream after first head cut.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

TN SR-19, PIN 102251.03	Date: August 13-15, 2024

Photo 25: WWC-7/UDF-5 facing upstream at second head cut.

Photo 26: WWC-7/UDF-5 facing downstream after second head cut.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

TN SR-19, PIN 102251.03	Date: August 13-15, 2024

Photo 27: WWC-8/EPH-3 facing upstream.

Photo 28: WWC-9/UDF-6 facing downstream.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

TN SR-19, PIN 102251.03	Date: August 13-15, 2024

Photo 29: STR-3 (south of SR-19) facing downstream.

Photo 30: STR-3 (north of SR-19) facing downstream.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

Photo 31: WWC-10/EPH-4 facing upstream.

Photo 32: WWC-11/UDF-7 facing upstream.

TN SR-19, PIN 102251.03	Date: August 13-15, 2024

Photo 33: WWC-12/UDF-8 facing upstream.

Photo 34: WWC-13/EPH-5 facing downstream.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

TN SR-19, PIN 102251.03	Date: August 13-15, 2024

Photo 35: STR-4 (south of SR-19) facing downstream.

Photo 36: STR-4 (south of SR-19) facing upstream.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

TN SR-19, PIN 102251.03	Date: August 13-15, 2024

Photo 37: STR-4 (north of SR-19) facing upstream at culvert. ~4’ x ~12’ concrete box culvert.

Photo 38: STR-4 (north of SR-19) facing downstream.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

TN SR-19, PIN 102251.03	Date: August 13-15, 2024

Photo 39: WWC-15/EPH-7 facing upstream.

Photo 40: WWC-16/UDF-9 facing downstream.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

Photo 41: STR-5 (north of SR-19) facing upstream at culvert.

Photo 42: STR-5 (north of SR-19) facing downstream at culvert.

Photo 43: STR-5 (south of SR-19) facing upstream.

Photo 44: WWC-17/UDF-10 facing downstream.

TN TDOT Department of Transportation

Photo 45: WWC-17/UDF-10 facing upstream.

Photo 46: WWC-18/UDF-11 facing upstream.

TN SR-19, PIN 102251.03	Date: August 13-15, 2024

Photo 47: WWC-19/EPH-8 facing downstream.

Photo 48: PND-1 facing southwest.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

TN SR-19, PIN 102251.03	Date: August 13-15, 2024

Photo 49: WWC-20/UDF-12 facing downstream.

Photo 50: STR-6 (north of SR-19) facing upstream.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

TN SR-19, PIN 102251.03	Date: August 13-15, 2024

Photo 51: STR-6 (north of SR-19) facing downstream.

Photo 52: STR-6 (south of SR-19) facing upstream from culvert.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

TN SR-19, PIN 102251.03	Date: August 13-15, 2024

Photo 53: STR-6 (south of SR-19 facing downstream.

Photo 54: STR-7 facing upstream at confluence with STR-6 (bottom left).

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

Photo 55: STR-7 facing downstream

Photo 56: WWC-21/UDF-13 facing upstream.

TN SR-19, PIN 102251.03	Date: August 13-15, 2024

Photo 57: WWC-21/UDF-13 facing upstream.

Photo 58: WWC-22/UDF-14 facing downstream at CMP culvert pipe under driveway.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

TN SR-19, PIN 102251.03	Date: August 13-15, 2024

Photo 59: WWC-22/UDF-14 facing downstream.

Photo 60: WWC-23/UDF-15 facing upstream.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

TN SR-19, PIN 102251.03	Date: August 13-15, 2024

Photo 61: WWC-23/UDF-15 facing downstream.

Photo 62: PND-2 facing east.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

TN SR-19, PIN 102251.03	Date: August 13-15, 2024

Photo 63: PND-2 facing southwest.

Photo 64: STR-8 facing downstream near WWC-24/UDF-16.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

TN SR-19, PIN 102251.03	Date: August 13-15, 2024

Photo 65: STR-8 facing confluence with STR-10 (south of SR-19). Large concrete box culvert with 4 barrels, water flow dammed by large debris piles.

Photo 66: STR-9 facing upstream.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

TN SR-19, PIN 102251.03	Date: August 13-15, 2024

Photo 67: STR-9 facing downstream towards STR-8 confluence.

Photo 68: WWC-24/UDF-16 facing downstream.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

Photo 69: STR-10 (north of SR-19) facing upstream at culvert.

Photo 70: STR-10 (north of SR-19) facing downstream from culvert.

TN SR-19, PIN 102251.03	Date: August 13-15, 2024

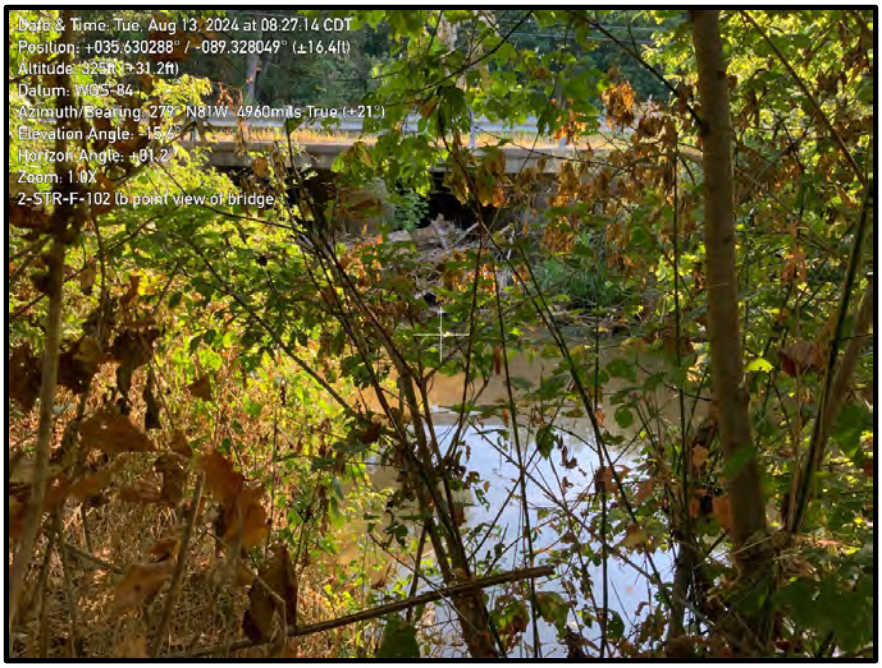


Photo 71: STR-10 (south of SR-19) facing downstream at culvert.

Photo 72: STR-10 (south of SR-19) facing upstream.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

TN SR-19, PIN 102251.03	Date: August 13-15, 2024

Photo 73: STR-11 facing upstream.

Photo 74: STR-11 facing upstream.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

TN SR-19, PIN 102251.03	Date: August 13-15, 2024

Photo 75: STR-11 facing upstream at exposed powerline.

Photo 76: STR-12 facing upstream.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

TN SR-19, PIN 102251.03	Date: August 13-15, 2024

Photo 77: STR-12 facing downstream.

Photo 78: WWC-25/UDF-17 facing downstream.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

TN SR-19, PIN 102251.03	Date: August 13-15, 2024

Photo 79: WWC-26/UDF-18 facing downstream.

Photo 80: WWC-27/UDF-19 facing downstream.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

Photo 81: STR-13 (north of SR-19) facing upstream origin.

Photo 82: STR-13 (north of SR-19) facing downstream.

TN SR-19, PIN 102251.03	Date: August 13-15, 2024

Photo 83: STR-13 (south of SR-19) facing downstream at culvert. Concrete box culvert approximately 5’ x 15’.

Photo 84: WTL-1.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

TN SR-19, PIN 102251.03	Date: August 13-15, 2024

Photo 85: WTL-2.

Photo 86: WWC-29/EPH-9 facing upstream.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

TN SR-19, PIN 102251.03	Date: August 13-15, 2024

Photo 87: WWC-30/EPH-10 facing upstream.

Photo 88: STR-14 (north of SR-19) facing upstream at culvert.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

TN SR-19, PIN 102251.03	Date: August 13-15, 2024

Photo 89: STR-14 (north of SR-19) facing downstream.

Photo 90: STR-14 (south of SR-19) facing downstream at culvert.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

TN SR-19, PIN 102251.03	Date: August 13-15, 2024

Photo 91: STR-14 (north of SR-19) HDPE.

Photo 92: STR-14 (north of SR-19) facing upstream.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

TN SR-19, PIN 102251.03	Date: August 13-15, 2024

Photo 93: STR-14 (south of SR-19) facing upstream, standing in the middle of the large bend.

Photo 94: WWC-31/EPH-11 facing downstream at riprap.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

TN SR-19, PIN 102251.03	Date: August 13-15, 2024

Photo 95: WWC-31/EPH-11 facing upstream.

Photo 96: STR-15 facing upstream.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

TN SR-19, PIN 102251.03	Date: August 13-15, 2024

Photo 97: STR-15 facing upstream at culvert and exposed powerline. Plastic drainage pipe through concrete box culvert ~15' above stream bed.

Photo 98: STR-15 facing downstream.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

TN SR-19, PIN 102251.03	Date: August 13-15, 2024

Photo 99: WWC-32/EPH-12 facing downstream at culvert.

Photo 100: WWC-33/EPH-13 facing upstream.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

TN SR-19, PIN 102251.03	Date: August 13-15, 2024

Photo 101: WWC-34/UDF-21 facing downstream.

Photo 102: WWC-34/UDF-21 facing downstream along SR-19.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

TN SR-19, PIN 102251.03	Date: August 13-15, 2024

Photo 103: STR-16 facing downstream.

Photo 104: STR-16 facing upstream.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

TN SR-19, PIN 102251.03	Date: August 13-15, 2024

Photo 105: WWC-35/UDF-22 facing downstream.

Photo 106: WWC-35/UDF-22 facing upstream.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

TN SR-19, PIN 102251.03	Date: August 13-15, 2024

Photo 107: STR-17 (north of SR-19) facing downstream from culvert.

Photo 108: STR-17 (north of SR-19) facing upstream.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

TN SR-19, PIN 102251.03	Date: August 13-15, 2024

Photo 109: STR-17 (south of SR-19) facing downstream at culvert. Single barrel box culvert ~6' x ~6' with culvert bottom 1' above stream bed.

Photo 110: WWC-36/UDF-23 facing upstream.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

TN SR-19, PIN 102251.03	Date: August 13-15, 2024

Photo 111: WWC-37/EPH-14 (south of SR-19) facing upstream.

Photo 112: WWC-37/EPH-14 (south of SR-19) facing upstream at culvert. Single barrel concrete box culvert, ~4' x 4'.

Feature names indicated on photos have been changed to the name indicated in captions

TN TDOT Department of Transportation

Photo 113: WWC-37/EPH-14 (north of SR-19) facing downstream.

Photo 114: WWC-37/EPH-14 (south of SR-19) facing downstream.

TN SR-19, PIN 102251.03	Date: August 13-15, 2024

Photo 115: WWC-38/UDF-24 facing downstream from culvert.

Photos not available for:

WWC-14/EPH-6

WWC-28/UDF-20

Notes

TN TDOT Department of Transportation

Tennessee Ecological Services Field Office

FWS Log No: 2024-0137162

The Service concurs with your effect determination(s) for resources protected by the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.). This finding fulfills the requirements of the Act. If project design changes are made or new information becomes available, please submit new plans for review.

Field Supervisor Date

Outlook

[EXTERNAL] RE: IPaC delivered Official Species List for project: PIN 102251.03 TDOT SR-19

From Shawn Wurst <Shawn.Wurst@tn.gov>
Date Mon 10/14/2024 11:13 AM
To Griffith, John <john_griffith@fws.gov>

This email has been received from outside of DOI - Use caution before clicking on links, opening attachments, or responding.

Hey John,

I have talked with the project team about the 102251.03 project (SR-19, Haywood county) and they have confirmed that we can adhere to a tree clearing restriction of only clearing from October 1st through March 31st. With this commitment TDOT has determined the project to be Not Likely to Adversely Affect for Tricolored Bat. TDOT requests USFWS to review this determination.

Let me know if you have any questions.

Thank You,

TN TDOT Department of Transportation

Shawn Wurst | Ecology Team Lead
Environmental Division / Tech Studies Office
James K. Polk Building, 9th Floor
505 Deaderick Street, Nashville, TN 37243
p. 615-532-3880 m. 615-516-8445
shawn.wurst@tn.gov
tn.gov/tdot

From: Griffith, John <john_griffith@fws.gov>
Sent: Wednesday, September 18, 2024 3:22 PM
To: Shawn Wurst <Shawn.Wurst@tn.gov>
Cc: rbode@jmt.com
Subject: [EXTERNAL] Re: IPaC delivered Official Species List for project: PIN 102251.03 TDOT SR-19

This Message Is From an External Sender

This message came from outside your organization.

Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security

Shawn,

We received the following correspondence regarding the proposed State Route (SR-) 19 widening from east of Binford Lane to east of State Route 87 in Haywood County, Tennessee. The Tennessee Department of Transportation is requesting a list of federally threatened or endangered species that may be present in the project area.

Our database indicates that the eastern portion of the project lies within a summer buffer area for the proposed endangered tricolored bat (*Perimyotis subflavus*). If tree clearing would be required in this area, A qualified individual should assess potential impacts to this species as a result of the project. As a designated representative for the Federal Highway Administration (FHWA), the Tennessee Department of Transportation may submit its assessment and findings directly to this office for review and concurrence. A finding of "may affect" can be addressed through formal consultation by the FHWA, except when the Service concurs, in writing, that a proposed action “is not likely to adversely affect” listed species.

Our National Wetland Inventory maps indicate that wetlands are present along this section of SR-19. If wetland impacts would occur, the U.S. Army Corps of Engineers, Memphis District, Regulatory Branch can be reached at 901-544-3682.

Standard construction BMPs should be implemented to ensure that all project-related pollutants are kept out of project area streams. Equipment staging and maintenance areas should be developed an adequate distance away to prevent the introduction of petroleum-based products into the water. If possible, work at stream crossings should be scheduled during a lower flow period.

This email will serve as our official project response. Please let me know if we can offer further assistance. Thanks,

John Griffith

Transportation Biologist

U.S. Fish and Wildlife Service

Tennessee Field Office

931-444-1393 (office)

931-261-3755 (cell)

From: Administrator Email <ecosphere_support@ecosphere.fws.gov>
Sent: Thursday, August 29, 2024 9:49 AM
To: Griffith, John <john_griffith@fws.gov>; Tennessee ES, FWS <tennesseeES@fws.gov>; Sykes, Robbie <robbie_sykes@fws.gov>; Alexander, Steven <steven_alexander@fws.gov>
Subject: IPaC delivered Official Species List for project: PIN 102251.03 TDOT SR-19

To: IPaC point(s) of contact for Tennessee Ecological Services Field Office
Project Location: Haywood County, Tennessee

IPaC has delivered an official Section 7 species list on behalf of your office. For your convenience, IPaC has created an ETK project (2024-0137162) with a new associated 'Species List Provided' event. A PDF file of the species list document is attached to the event and contact information for the project can be found on the last page of the PDF.

IPaC has automatically set the consultation status to "Closed". If you need to do any additional work in this project (*e.g.*, add staff, add events, change lead office, etc.), you must first change the status to "active" so that you can edit the project. You can access the project via the link, above.

Lead FWS Office:
The Tennessee Ecological Services Field Office is currently designated as the lead office for Section 7 on this project. The following additional offices have jurisdiction and have been notified: None. If another office is the lead office on this project, please access the project (via the link above) and update it. IPaC will not reset the Lead Office once it has been updated by a biologist.

*Projects created in ETK by IPaC have not been assigned to an FWS staff member. To identify the staff assigned to this project, please access the project (via the link above) and add their name(s).

Re: IPaC delivered Official Species List for project: PIN 102251.03 TDOT SR-19

Griffith, John <john_griffith@fws.gov>

Wed 9/18/2024 3:22 PM

To:Shawn Wurst <Shawn.Wurst@tn.gov>
Cc:rbode@jmt.com <rbode@jmt.com>

Shawn,

We received the following correspondence regarding the proposed State Route (SR-) 19 widening from east of Binford Lane to east of State Route 87 in Haywood County, Tennessee. The Tennessee Department of Transportation is requesting a list of federally threatened or endangered species that may be present in the project area.

Our database indicates that the eastern portion of the project lies within a summer buffer area for the proposed endangered tricolored bat (*Perimyotis subflavus*). If tree clearing would be required in this area, A qualified individual should assess potential impacts to this species as a result of the project. As a designated representative for the Federal Highway Administration (FHWA), the Tennessee Department of Transportation may submit its assessment and findings directly to this office for review and concurrence. A finding of "may affect" can be addressed through formal consultation by the FHWA, except when the Service concurs, in writing, that a proposed action “is not likely to adversely affect” listed species.

Our National Wetland Inventory maps indicate that wetlands are present along this section of SR-19. If wetland impacts would occur, the U.S. Army Corps of Engineers, Memphis District, Regulatory Branch can be reached at 901-544-3682.

Standard construction BMPs should be implemented to ensure that all project-related pollutants are kept out of project area streams. Equipment staging and maintenance areas should be developed an adequate distance away to prevent the introduction of petroleum-based products into the water. If possible, work at stream crossings should be scheduled during a lower flow period.

This email will serve as our official project response. Please let me know if we can offer further assistance. Thanks,

John Griffith
Transportation Biologist
U.S. Fish and Wildlife Service
Tennessee Field Office
931-444-1393 (office)
931-261-3755 (cell)

From: Administrator Email <ecosphere_support@ecosphere.fws.gov>
Sent: Thursday, August 29, 2024 9:49 AM
To: Griffith, John <john_griffith@fws.gov>; Tennessee ES, FWS <tennesseeES@fws.gov>; Sykes, Robbie <robbie_sykes@fws.gov>; Alexander, Steven <steven_alexander@fws.gov>
Subject: IPaC delivered Official Species List for project: PIN 102251.03 TDOT SR-19

To: IPaC point(s) of contact for Tennessee Ecological Services Field Office
Project Location: Haywood County, Tennessee

IPaC has delivered an official Section 7 species list on behalf of your office. For your convenience, IPaC has created an ETK project (2024-0137162) with a new associated 'Species List Provided' event. A PDF file of the species list document is attached to the event and contact information for the project can

be found on the last page of the PDF.

IPaC has automatically set the consultation status to "Closed". If you need to do any additional work in this project (*e.g.*, add staff, add events, change lead office, etc.), you must first change the status to "active" so that you can edit the project. You can access the project via the link, above.

Lead FWS Office:
The Tennessee Ecological Services Field Office is currently designated as the lead office for Section 7 on this project. The following additional offices have jurisdiction and have been notified: None. If another office is the lead office on this project, please access the project (via the link above) and update it. IPaC will not reset the Lead Office once it has been updated by a biologist.

*Projects created in ETK by IPaC have not been assigned to an FWS staff member. To identify the staff assigned to this project, please access the project (via the link above) and add their name(s).

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: 08/29/2024 14:48:40 UTC
Project Code: 2024-0137162
Project Name: PIN 102251.03 TDOT SR-19

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 IPaC 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 Migratory Bird Permit | What We Do | U.S. Fish & Wildlife Service (fws.gov).

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

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: 2024-0137162
Project Name: PIN 102251.03 TDOT SR-19
Project Type: Road/Hwy - Maintenance/Modification
Project Description: Improvements to SR-19
Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@35.6428551,-89.34485167077561,14z

Counties: Haywood County, Tennessee

ENDANGERED SPECIES ACT SPECIES

There is a total of 3 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.

---

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
Tricolored Bat *Perimyotis subflavus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/10515	Proposed Endangered

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

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.

IPAC USER CONTACT INFORMATION

Agency: Tennessee Department of Transportation
Name: Ray Bode
Address: 4700 Falls of Neuse Road, Suite 100
City: Raleigh
State: NC
Zip: 27609
Email rbode@jmt.com
Phone: 9842694923

LEAD AGENCY CONTACT INFORMATION

Lead Agency: Army Corps of Engineers

Shawn Wurst

From: Casey Parker
Sent: Friday, October 27, 2017 2:16 PM
To: Eric Philipps; Dustin Tucker
Cc: Rob Todd; Vincent Pontello
Subject: Request for Comment Lauderdale-Haywood County SR-19 PIN 102251.00

Mr. Eric Philipps,

I have reviewed the information that you provided as regards to widening of SR-19 from east of Eastland Avenue in Lauderdale County to west of the Brownsville By-Pass in Haywood County, from an existing two-lane roadway to a super two-lane highway. My data concur with the information, therefore the implementation of standard BMP's will be sufficient to satisfy the needs of the Tennessee Wildlife Resources Agency for this proposed project. Thank you for the opportunity to review and comment, please contact me if you need further assistance.

Casey Parker - Wildlife Biologist
Liaison to TDOT & Federal Highway Administration
Tennessee Wildlife Resources Agency
Environmental Services Division
Email: casey.parker@tn.gov

MEMORANDUM OF AGREEMENT

BETWEEN

TENNESSEE DEPARTMENT OF TRANSPORTATION

AND

FEDERAL HIGHWAY ADMINISTRATION
TENNESSEE DIVISION OFFICE

AND

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF NATURAL AREAS

March 2023

SUBJECT:

This Memorandum of Agreement (MOA) is being instituted between the Tennessee Department of Environment and Conservation Division of Natural Areas (TDEC DNA), the Tennessee Department of Transportation (TDOT), and the Federal Highway Administration, Tennessee Division Office (FHWA) to streamline TDOT projects and activities which typically result in no adverse effects to state listed plant species or their habitats in Tennessee.

PURPOSE:

FHWA is required, pursuant to the Fish and Wildlife Coordination Act, (Title 16 United States Code (U.S.C) 662(a)) to consult with the head of the State agency exercising administration over wildlife resources if any stream or water body is "controlled or modified for any purpose whatever." "Wildlife resources" includes animals as well as "all types of aquatic and land vegetation upon which wildlife is dependent" (16 U.S.C. 666b). TDOT, on behalf of FHWA, coordinates these projects, in part, with TDEC DNA.

TDEC DNA is charged with conserving rare plant species and their habitats as well as administering a system of state natural areas within Tennessee. In this role, TDEC DNA maintains data on the location and status of rare species and natural communities within the state and maintains a list of rare plants classified as endangered, threatened, or as a species of concern. TDEC DNA provides technical

support regarding the use and interpretation of such data and provides written comments (as needed) regarding potential effects to rare plants (sometimes animals), natural communities, and conservation sites for federally funded and state funded projects.

This MOA applies to both State- and Federally funded projects and is intended to define conditions and provide example categories of projects and activities for which project-specific consultation with TDEC DNA is not required. Documentation for projects covered under this MOA will include a copy of this agreement and a statement from the TDOT Ecology staff citing the applicability of this agreement, rather than written correspondence to and from TDEC DNA. This documentation will be included in the Appendices of all applicable environmental documents (e.g., NEPA, TEER) and in the documentation for all applicable permit applications.

SCOPE:

The following conditions and example projects and activities have been evaluated and a conclusion reached by TDEC DNA, FHWA and TDOT that specific work meeting these conditions within these categories will not result in adverse effects to state listed plant species or their habitats. As a result, this MOA constitutes programmatic consultation/coordination between TDEC DNA, FHWA and TDOT.

CONDITIONS FOR COVERAGE UNDER THIS MEMORANDUM

1. Based on a review of the project study area and the TDEC Natural Heritage Database, both of the following criteria must be met:

    - TDOT ecology project review staff have determined that there are no known records of State- or Federally listed plant species within the project study area; and

    - TDOT ecology project review staff or qualified consultants have determined the project area does not contain habitat for State-listed plant species documented within four miles, or if potential habitat is present, an appropriately timed presence/absence survey has been conducted for State-listed plant species with negative results.

OR

2. TDOT ecology project review staff have determined that proposed activity is such

that it would not impact undeveloped areas or natural vegetation outside the current developed footprint. Examples of such projects are listed below as a project type covered under this MOA which can be completed without regard to proximity of known or potential occurrences of rare plant species.

A. Typical bridge repair projects confined to the structure above the waterline and not requiring disturbance of waterways, provided construction debris or other construction-related materials can be prevented from entering the waterway by implementing Best Management Practices (BMP's) or properly installed erosion controls. Activities in this category include the following:

    - Bridge deck repair (scarification, patching, replacement, etc.)
    - Installation and repair of expansion joints
    - Removal and resurfacing of bridge and approach roadway pavement
    - Patching of substructures
    - Removal, replacement, and repair of beams
    - Removal and replacement of bridge deck cantilevers
    - Modification of piers and abutments above the surface of the water
    - Repair and replacement of bridge and approach guardrails
    - Sand blasting, painting, and sealing

B. Installation of impact attenuators on bridge piers, providing substrate work is not involved, and they do not affect flow downstream

C. Bridge inspections, including the portions of the piers under the surface of the water, if no soil or substrate is disturbed

D. Addition of intersection turning lanes provided new lanes are within the developed footprint of the roadway.

E. Installation, replacement, or addition of traffic control signals or information signs. Included are Intelligent Transportation Systems (ITS), fog detection systems, traffic information systems, flashing lights, reflectors, striping, rumble

strips and stripes, signs, and sidewalks provided such work is in the current developed footprint.

F. Turning radius improvement at intersections

G. Removal and replacement of existing pavement, provided that all old pavement is properly disposed of according to current regulations.

H. Installation and repair of guardrails, cable barriers, and jersey barriers

I. Installation of railroad signals, signs, and other improvements at crossings

J. Maintenance of roadway ditches and catch basins, provided that the original size and dimensions are not increased. This category is confined to sloped ditches which only convey water for a short period during storm events. No work under this exception can occur within 50 feet of any stream.

K. Replacement of overpasses which span roadways or railways

L. Placement of riprap adjacent to existing bridge abutments to repair/prevent scour and protect the integrity of the structure. Work may not extend past the top of bank and no equipment or material is allowed in the stream channel.

M. Enhancement of Rest Areas (e.g., repaving, landscaping, sprinkler system installation, lighting, building replacement or additions, sidewalk refurbishing)

N. Addition of intersection lighting

O. Installation of noise walls

P. Removal of vegetation along roads or under bridges provided such work is within the current developed footprint

Q. Items deemed eligible for Transportation Alternatives Set-Aside (or other) funding, including:

- Construction, planning, and design of on-road and off-road trail facilities for pedestrians, bicyclists, and other non-motorized forms of transportation, including sidewalks, bicycle infrastructure, pedestrian and bicycle signals, traffic calming techniques, lighting and other

safety-related infrastructure, and transportation projects to achieve compliance with the Americans with Disabilities Act of 1990.

- Inventory, control, and removal of outdoor advertising

- Construction of turnouts, overlooks, and viewing areas provided such work is within the current developed footprint

- Historic preservation and rehabilitation of historic transportation facilities

- Any environmental mitigation activity, including pollution prevention and pollution abatement activities and mitigation to (1) address stormwater management, control, and water pollution prevention or abatement related to highway construction or due to highway runoff and (2) to reduce vehicle-caused wildlife mortality or to restore and maintain connectivity among terrestrial or aquatic habitats

GENERAL PROVISIONS:

Any signatory agency may unilaterally withdraw from this agreement with 30 days written notice. This MOA will be reviewed every five years and revised as appropriate. Revisions may be requested at any time by any signatory agency. All revisions will be made in writing and require the concurrence of the signatory agencies.

AGREEMENT BY:

Tennessee Department of Environment and Conservation, Division of Natural Areas

Roger McCoy (Mar 1, 2023 13:33 CST)

Date: Mar 1, 2023

Roger McCoy, Director TDEC DNA

Tennessee Department of Transportation

Date: Mar 6, 2023

Howard H. Eley, Deputy Governor and Commissioner

Federal Highway Administration, Tennessee Division Office

Date: Mar 20, 2023

Pamela M. Kordenbrock, Division Administrator

ATTACHMENT B

Custom Soil Resource Report for Haywood County, Tennessee and Lauderdale County, Tennessee, SR-19
(US Department of Agriculture, Natural Resources Conservation Service, October 30, 2025)

United States Department of Agriculture

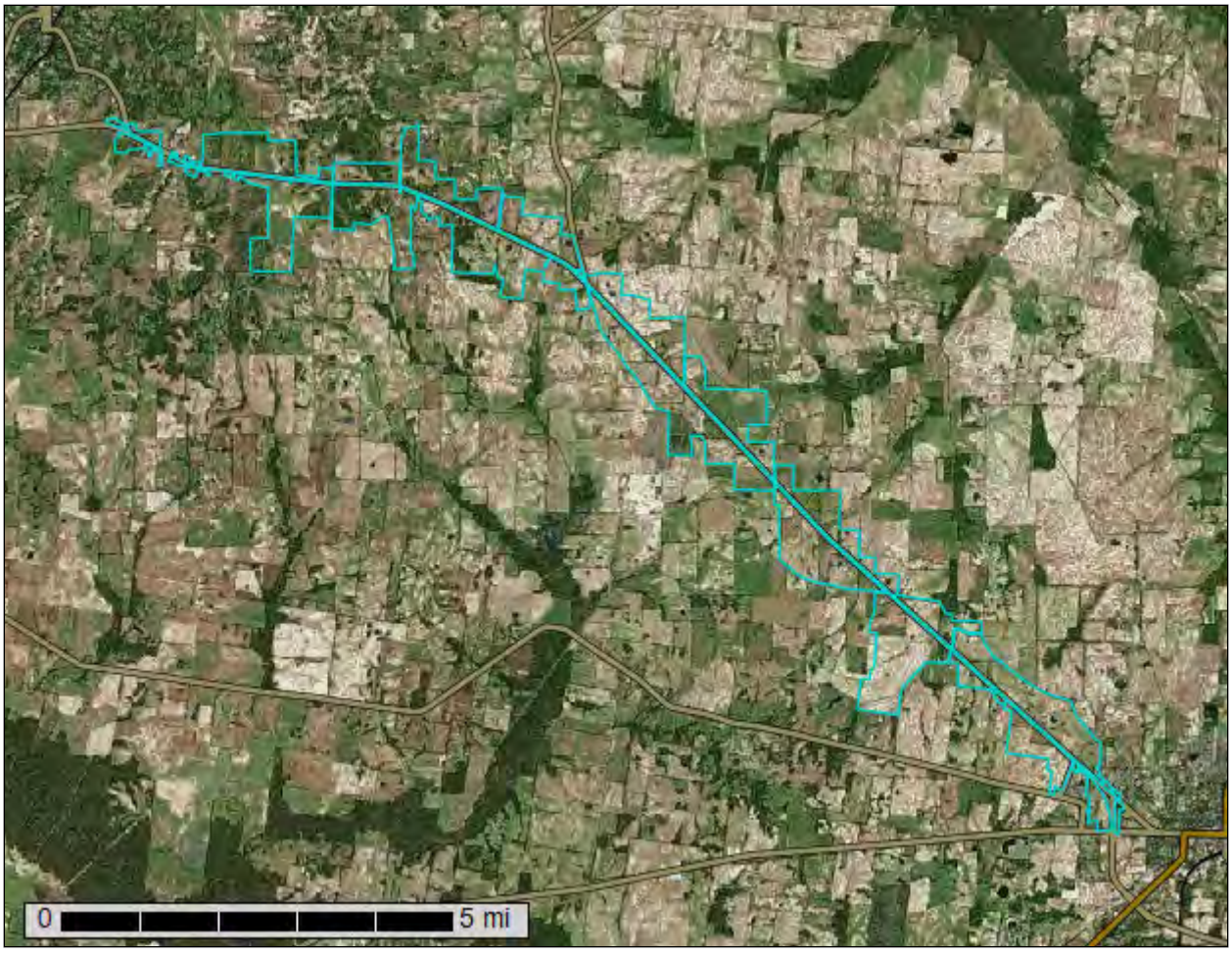
NRCS

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 Haywood County, Tennessee, and Lauderdale County, Tennessee

SR-19



October 30, 2025

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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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.

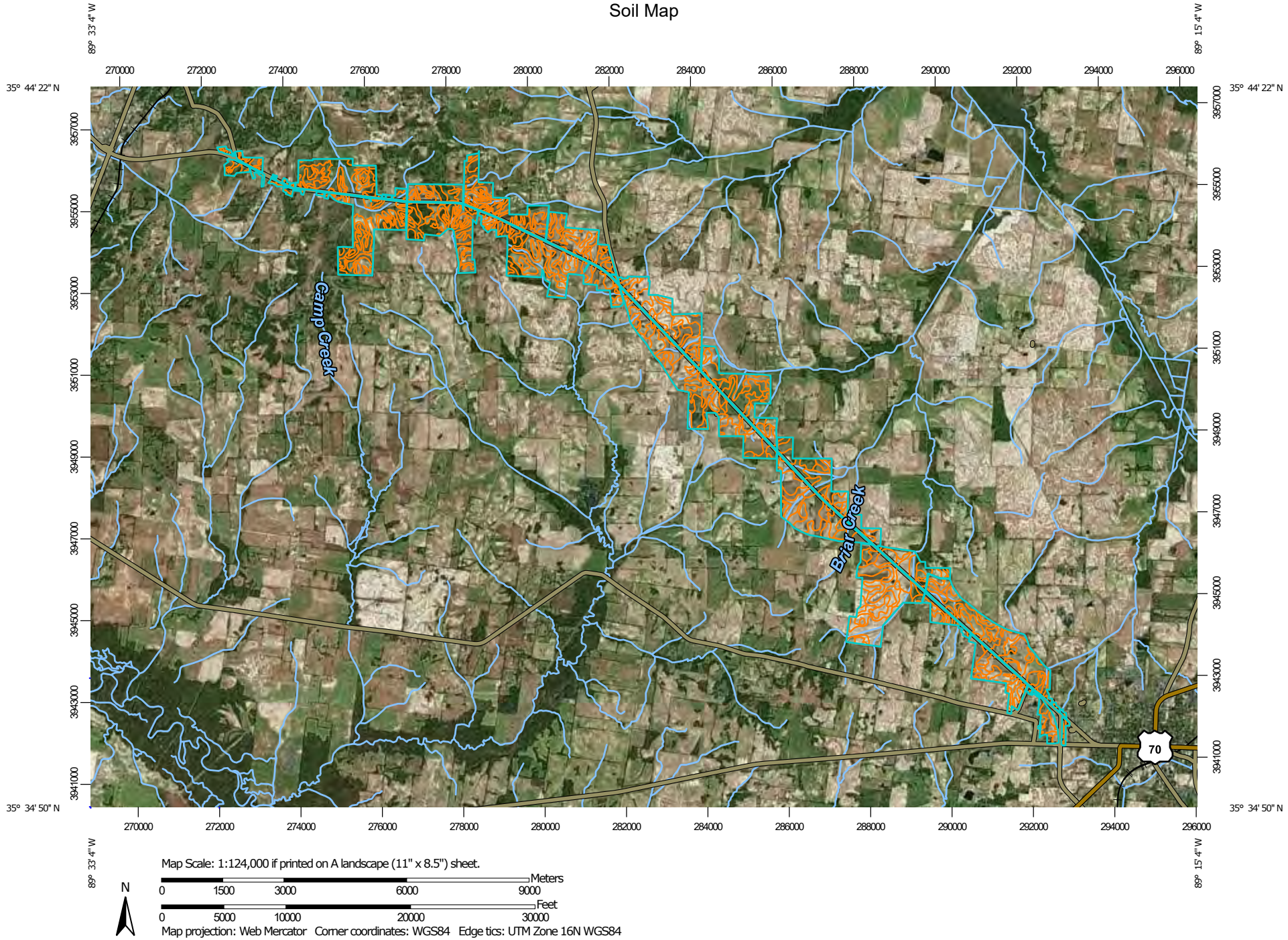
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

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 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.

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: Haywood County, Tennessee
Survey Area Data: Version 25, Aug 28, 2025

Soil Survey Area: Lauderdale County, Tennessee
Survey Area Data: Version 26, Aug 28, 2025

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.

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

Date(s) aerial images were photographed: Feb 13, 2023—Mar 5, 2023

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND

MAP INFORMATION

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
Ad	Adler silt loam, 0 to 2 percent slopes, frequently flooded	1,052.6	14.9%
Ca	Calloway silt loam	215.0	3.1%
Ce	Center silt loam, 0 to 2 percent slopes	2.7	0.0%
Cv	Convent silt loam, frequently flooded	175.4	2.5%
FcB2	Feliciana silt loam, 2 to 5 percent slopes, moderately eroded, northern phase	377.7	5.4%
FcC3	Feliciana silt loam, 5 to 8 percent slopes, severely eroded, northern phase	242.0	3.4%
FcD3	Feliciana silt loam, 8 to 12 percent slopes, severely eroded, northern phase	194.6	2.8%
GrB2	Grenada silt loam, 1 to 5 percent slopes, eroded	193.5	2.7%
GrB3	Grenada silt loam, 1 to 5 percent slopes, severely eroded	0.0	0.0%
LoB2	Loring silt loam, 1 to 5 percent slopes, eroded	293.4	4.2%
LoB3	Loring silt loam, 1 to 5 percent slopes, severely eroded	812.6	11.5%
LoC3	Loring silt loam, 5 to 8 percent slopes, severely eroded	1,276.0	18.1%
LoD3	Loring silt loam, 8 to 12 percent slopes, severely eroded	38.7	0.5%
LPD	Loring and Memphis soils, 5 to 12 percent slopes, gullied	23.5	0.3%
LPE	Loring and Memphis soils, 12 to 30 percent slopes, gullied	0.9	0.0%
MeB2	Memphis silt loam, 2 to 5 percent slopes, moderately eroded, northern phase	60.0	0.9%
MeC3	Memphis silt loam, 5 to 8 percent slopes, severely eroded, northern phase	150.8	2.1%
MeD3	Memphis silt loam, 8 to 12 percent slopes, severely eroded, northern phase	45.3	0.6%
MeE3	Memphis silt loam, 12 to 20 percent slopes, severely eroded, northern phase	11.5	0.2%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Re	Rosebloom silt loam, frequently flooded	12.3	0.2%
Ro	Routon silt loam	45.4	0.6%
W	Water	4.8	0.1%
Subtotals for Soil Survey Area		**5,228.5**	**74.3%**
Totals for Area of Interest		**7,041.6**	**100.0%**

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Ad	Adler silt loam, 0 to 2 percent slopes, occasionally flooded	426.4	6.1%
Ca	Calloway silt loam, 0 to 2 percent slopes, north	0.8	0.0%
Ce	Center silt loam, 0 to 3 percent slopes	0.1	0.0%
GrB2	Grenada silt loam, 2 to 5 percent slopes, moderately eroded	10.3	0.1%
GrB3	Grenada silt loam, 2 to 5 percent slopes, severely eroded	2.6	0.0%
LoB2	Loring silt loam, 2 to 5 percent slopes, moderately eroded	20.2	0.3%
LoC3	Loring silt loam, 5 to 8 percent slopes, severely eroded	209.5	3.0%
LoD3	Loring silt loam, 8 to 12 percent slopes, severely eroded	212.9	3.0%
MeB2	Memphis silt loam, 2 to 5 percent slopes, moderately eroded, northern phase	239.5	3.4%
MeC2	Memphis silt loam, 5 to 8 percent slopes, moderately eroded, northern phase	212.3	3.0%
MeD3	Memphis silt loam, 8 to 12 percent slopes, severely eroded, northern phase	138.1	2.0%
MeE3	Memphis silt loam, 12 to 20 percent slopes, severely eroded, northern phase	301.9	4.3%
MeF	Memphis silt loam, 20 to 40 percent slopes, northern phase	10.0	0.1%
Rt	Routon silt loam, 0 to 2 percent slopes	8.3	0.1%
W	Water	19.9	0.3%
Subtotals for Soil Survey Area		**1,813.1**	**25.7%**
Totals for Area of Interest		**7,041.6**	**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.

Haywood County, Tennessee

Ad—Adler silt loam, 0 to 2 percent slopes, frequently flooded

Map Unit Setting

National map unit symbol: 2zdd9
Elevation: 180 to 500 feet
Mean annual precipitation: 50 to 53 inches
Mean annual air temperature: 47 to 71 degrees F
Frost-free period: 175 to 303 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Adler, frequently flooded, and similar soils: 89 percent
Minor components: 11 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Adler, Frequently Flooded

Setting

Landform: Alluvial fans, flood plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Silty alluvium

Typical profile

Ap - 0 to 5 inches: silt loam
Bw - 5 to 23 inches: silt loam
C - 23 to 80 inches: silt loam

Properties and qualities

Slope: 0 to 2 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 to high (0.57 to 1.98 in/hr)
Depth to water table: About 8 to 36 inches
Frequency of flooding: Frequent
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: Very high (about 13.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F134XY014AL - Northern Non-Acid Floodplain - PROVISIONAL
Hydric soil rating: No

Minor Components

Morganfield, frequently flooded

Percent of map unit: 7 percent
Landform: Alluvial fans, flood plains

Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Rise
Down-slope shape: Convex, linear
Across-slope shape: Convex, linear
Ecological site: F134XY014AL - Northern Non-Acid Floodplain - PROVISIONAL
Hydric soil rating: No

Convent, frequently flooded

Percent of map unit: 4 percent
Landform: Natural levees
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F134XY015AL - Northern Non-Acid Moderately Wet Floodplain - PROVISIONAL
Hydric soil rating: No

Ca—Calloway silt loam

Map Unit Setting

National map unit symbol: m12j
Elevation: 280 to 440 feet
Mean annual precipitation: 45 to 61 inches
Mean annual air temperature: 50 to 70 degrees F
Frost-free period: 206 to 220 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Calloway and similar soils: 91 percent
Minor components: 9 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Calloway

Setting

Landform: Loess hills
Landform position (three-dimensional): Base slope
Parent material: Loess

Typical profile

H1 - 0 to 30 inches: silt loam
H2 - 30 to 60 inches: silt loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: 14 to 38 inches to fragipan
Drainage class: Somewhat 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 10 to 32 inches
Frequency of flooding: None

Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: D
Ecological site: F134XY004AL - Northern Moderately Wet Loess Interfluve
Hydric soil rating: No

Minor Components

Routon

Percent of map unit: 9 percent
Landform: Stream terraces
Ecological site: F134XY005AL - Northern Wet Loess Interfluve
Hydric soil rating: Yes

Ce—Center silt loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2wn5g
Elevation: 230 to 460 feet
Mean annual precipitation: 50 to 53 inches
Mean annual air temperature: 47 to 69 degrees F
Frost-free period: 195 to 220 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Center and similar soils: 92 percent
Minor components: 8 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Center

Setting

Landform: Flats, stream terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Riser, talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loess

Typical profile

Ap - 0 to 9 inches: silt loam
Bt - 9 to 51 inches: silty clay loam
C - 51 to 80 inches: silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches

Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 12 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: High (about 11.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F134XY008AL - Northern Moderately Wet Loess Terrace - PROVISIONAL
Hydric soil rating: No

Minor Components

Routon

Percent of map unit: 8 percent
Landform: Depressions, stream terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: F134XY010AL - Northern Wet Loess Terrace - PROVISIONAL
Hydric soil rating: Yes

Cv—Convent silt loam, frequently flooded

Map Unit Setting

National map unit symbol: m12n
Elevation: 20 to 150 feet
Mean annual precipitation: 45 to 61 inches
Mean annual air temperature: 50 to 70 degrees F
Frost-free period: 206 to 220 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Convent

Setting

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

Typical profile

H1 - 0 to 11 inches: silt loam
H2 - 11 to 60 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 (0.57 to 1.98 in/hr)
Depth to water table: About 18 to 48 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very high (about 13.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: C
Ecological site: F134XY015AL - Northern Non-Acid Moderately Wet Floodplain - PROVISIONAL
Hydric soil rating: No

FcB2—Feliciana silt loam, 2 to 5 percent slopes, moderately eroded, northern phase

Map Unit Setting

National map unit symbol: 2y71v
Elevation: 300 to 540 feet
Mean annual precipitation: 49 to 55 inches
Mean annual air temperature: 46 to 72 degrees F
Frost-free period: 190 to 245 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Feliciana, northern phase, and similar soils: 94 percent
Minor components: 6 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Feliciana, Northern Phase

Setting

Landform: Divides
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Fine-silty noncalcareous loess

Typical profile

Ap - 0 to 6 inches: silt loam

Bt1 - 6 to 25 inches: silty clay loam
Bt2 - 25 to 41 inches: silt loam
Bt3 - 41 to 60 inches: silt loam

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 (0.60 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 11.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F134XY003AL - Northern Loess Interfluve
Hydric soil rating: No

Minor Components

Loring, northern phase

Percent of map unit: 6 percent
Landform: Loess hills
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F134XY012AL - Northern Loess Fragipan Upland - PROVISIONAL
Hydric soil rating: No

FcC3—Feliciana silt loam, 5 to 8 percent slopes, severely eroded, northern phase

Map Unit Setting

National map unit symbol: 2y729
Elevation: 300 to 540 feet
Mean annual precipitation: 50 to 54 inches
Mean annual air temperature: 47 to 71 degrees F
Frost-free period: 182 to 220 days
Farmland classification: Not prime farmland

Map Unit Composition

Feliciana, northern phase, and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Feliciana, Northern Phase

Setting

Landform: Divides
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Fine-silty noncalcareous loess

Typical profile

Ap - 0 to 4 inches: silt loam
Bt1 - 4 to 27 inches: silty clay loam
Bt2 - 27 to 60 inches: silt loam
Bt3 - 60 to 78 inches: silt loam

Properties and qualities

Slope: 5 to 8 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 (0.60 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 10.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: F134XY003AL - Northern Loess Interfluve
Hydric soil rating: No

Minor Components

Loring

Percent of map unit: 5 percent
Landform: Loess hills
Landform position (two-dimensional): Summit
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F134XY012AL - Northern Loess Fragipan Upland - PROVISIONAL
Hydric soil rating: No

FcD3—Feliciana silt loam, 8 to 12 percent slopes, severely eroded, northern phase

Map Unit Setting

National map unit symbol: 2y724
Elevation: 300 to 540 feet
Mean annual precipitation: 50 to 54 inches
Mean annual air temperature: 47 to 71 degrees F
Frost-free period: 182 to 220 days
Farmland classification: Not prime farmland

Map Unit Composition

Feliciana, northern phase, and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Feliciana, Northern Phase

Setting

Landform: Divides
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Fine-silty noncalcareous loess

Typical profile

Ap - 0 to 4 inches: silt loam
Bt1 - 4 to 27 inches: silty clay loam
Bt2 - 27 to 60 inches: silt loam
Bt3 - 60 to 78 inches: silt loam

Properties and qualities

Slope: 8 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 (0.60 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 10.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Ecological site: F134XY003AL - Northern Loess Interfluve
Hydric soil rating: No

Minor Components

Loring, northern phase

Percent of map unit: 5 percent
Landform: Loess hills
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F134XY012AL - Northern Loess Fragipan Upland - PROVISIONAL
Hydric soil rating: No

GrB2—Grenada silt loam, 1 to 5 percent slopes, eroded

Map Unit Setting

National map unit symbol: m12r
Elevation: 260 to 430 feet
Mean annual precipitation: 45 to 61 inches
Mean annual air temperature: 50 to 70 degrees F
Frost-free period: 206 to 220 days
Farmland classification: All areas are prime farmland

Map Unit Composition

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

Description of Grenada

Setting

Landform: Loess hills
Landform position (three-dimensional): Base slope
Parent material: Loess

Typical profile

H1 - 0 to 9 inches: silt loam
H2 - 9 to 18 inches: silt loam
H3 - 18 to 22 inches: silt loam
H4 - 22 to 60 inches: silt loam

Properties and qualities

Slope: 1 to 5 percent
Depth to restrictive feature: 18 to 36 inches to fragipan
Drainage class: Moderately well 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 12 to 29 inches
Frequency of flooding: None
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): 2e
Hydrologic Soil Group: D
Ecological site: F134XY012AL - Northern Loess Fragipan Upland - PROVISIONAL
Hydric soil rating: No

GrB3—Grenada silt loam, 1 to 5 percent slopes, severely eroded

Map Unit Setting

National map unit symbol: m12s
Elevation: 300 to 380 feet
Mean annual precipitation: 45 to 61 inches
Mean annual air temperature: 50 to 70 degrees F
Frost-free period: 206 to 220 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Grenada

Setting

Landform: Loess hills
Landform position (three-dimensional): Base slope
Parent material: Loess

Typical profile

H1 - 0 to 4 inches: silt loam
H2 - 4 to 13 inches: silt loam
H3 - 13 to 17 inches: silt loam
H4 - 17 to 60 inches: silt loam

Properties and qualities

Slope: 1 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 low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 12 to 29 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: D
Ecological site: F134XY012AL - Northern Loess Fragipan Upland - PROVISIONAL

Hydric soil rating: No

LoB2—Loring silt loam, 1 to 5 percent slopes, eroded

Map Unit Setting

National map unit symbol: m136
Elevation: 280 to 460 feet
Mean annual precipitation: 45 to 61 inches
Mean annual air temperature: 50 to 70 degrees F
Frost-free period: 206 to 220 days
Farmland classification: All areas are prime farmland

Map Unit Composition

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

Description of Loring

Setting

Landform: Loess hills
Landform position (three-dimensional): Crest
Parent material: Loess

Typical profile

H1 - 0 to 6 inches: silt loam
H2 - 6 to 26 inches: silt loam
H3 - 26 to 57 inches: silt loam
H4 - 57 to 60 inches: silt loam

Properties and qualities

Slope: 1 to 5 percent
Depth to restrictive feature: 14 to 35 inches to fragipan
Drainage class: Moderately well 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 11 to 29 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): 2e
Hydrologic Soil Group: C/D
Ecological site: F134XY012AL - Northern Loess Fragipan Upland - PROVISIONAL
Hydric soil rating: No

LoB3—Loring silt loam, 1 to 5 percent slopes, severely eroded

Map Unit Setting

National map unit symbol: m137
Elevation: 280 to 460 feet
Mean annual precipitation: 45 to 61 inches
Mean annual air temperature: 50 to 70 degrees F
Frost-free period: 206 to 220 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Loring

Setting

Landform: Loess hills
Landform position (three-dimensional): Crest
Parent material: Loess

Typical profile

H1 - 0 to 4 inches: silt loam
H2 - 4 to 14 inches: silt loam
H3 - 14 to 44 inches: silt loam
H4 - 44 to 60 inches: silt loam

Properties and qualities

Slope: 1 to 5 percent
Depth to restrictive feature: 14 to 35 inches to fragipan
Drainage class: Moderately well 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 11 to 29 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: D
Ecological site: F134XY012AL - Northern Loess Fragipan Upland - PROVISIONAL
Hydric soil rating: No

LoC3—Loring silt loam, 5 to 8 percent slopes, severely eroded

Map Unit Setting

National map unit symbol: 2v7sk
Elevation: 280 to 490 feet
Mean annual precipitation: 35 to 63 inches
Mean annual air temperature: 47 to 71 degrees F
Frost-free period: 189 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Loring

Setting

Landform: Loess hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Loess

Typical profile

Ap - 0 to 5 inches: silt loam
Bt - 5 to 20 inches: silt loam
Btx - 20 to 65 inches: silt loam

Properties and qualities

Slope: 5 to 8 percent
Depth to restrictive feature: 14 to 30 inches to fragipan
Drainage class: Moderately well 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 11 to 14 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: D
Ecological site: F134XY012AL - Northern Loess Fragipan Upland - PROVISIONAL
Hydric soil rating: No

LoD3—Loring silt loam, 8 to 12 percent slopes, severely eroded

Map Unit Setting

National map unit symbol: 2v7sl
Elevation: 280 to 490 feet
Mean annual precipitation: 35 to 63 inches
Mean annual air temperature: 47 to 71 degrees F
Frost-free period: 189 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Loring

Setting

Landform: Loess hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loess

Typical profile

Ap - 0 to 4 inches: silt loam
Bt - 4 to 20 inches: silt loam
Btx - 20 to 60 inches: silt loam
C - 60 to 79 inches: silt loam

Properties and qualities

Slope: 8 to 12 percent
Depth to restrictive feature: 14 to 30 inches to fragipan
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: About 12 to 33 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): 6e
Hydrologic Soil Group: D
Ecological site: F134XY012AL - Northern Loess Fragipan Upland - PROVISIONAL
Hydric soil rating: No

LPD—Loring and Memphis soils, 5 to 12 percent slopes, gullied

Map Unit Setting

National map unit symbol: m12t
Elevation: 280 to 440 feet
Mean annual precipitation: 45 to 61 inches
Mean annual air temperature: 50 to 70 degrees F
Frost-free period: 206 to 220 days
Farmland classification: Not prime farmland

Map Unit Composition

Loring and similar soils: 51 percent
Memphis and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Loring

Setting

Landform: Loess hills
Landform position (three-dimensional): Side slope
Parent material: Loess

Typical profile

H1 - 0 to 4 inches: silt loam
H2 - 4 to 14 inches: silt loam
H3 - 14 to 44 inches: silt loam
H4 - 44 to 60 inches: silt loam

Properties and qualities

Slope: 5 to 12 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 low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 11 to 29 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: D
Ecological site: F134XY012AL - Northern Loess Fragipan Upland - PROVISIONAL
Hydric soil rating: No

Description of Memphis

Setting

Landform: Loess hills
Landform position (three-dimensional): Side slope

Parent material: Loess

Typical profile

H1 - 0 to 4 inches: silt loam
H2 - 4 to 35 inches: silt loam
H3 - 35 to 60 inches: silt loam

Properties and qualities

Slope: 5 to 12 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 (0.57 to 1.98 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 high (about 12.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Ecological site: F134XY003AL - Northern Loess Interfluve
Hydric soil rating: No

LPE—Loring and Memphis soils, 12 to 30 percent slopes, gullied

Map Unit Setting

National map unit symbol: m12v
Elevation: 300 to 480 feet
Mean annual precipitation: 45 to 61 inches
Mean annual air temperature: 50 to 70 degrees F
Frost-free period: 206 to 220 days
Farmland classification: Not prime farmland

Map Unit Composition

Loring and similar soils: 51 percent
Memphis and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Loring

Setting

Landform: Loess hills
Landform position (three-dimensional): Side slope
Parent material: Loess

Typical profile

H1 - 0 to 4 inches: silt loam
H2 - 4 to 14 inches: silt loam
H3 - 14 to 44 inches: silt loam

H4 - 44 to 60 inches: silt loam

Properties and qualities

Slope: 12 to 20 percent
Depth to restrictive feature: 14 to 35 inches to fragipan
Drainage class: Moderately well 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 11 to 29 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: D
Ecological site: F134XY012AL - Northern Loess Fragipan Upland - PROVISIONAL
Hydric soil rating: No

Description of Memphis

Setting

Landform: Loess hills
Landform position (three-dimensional): Side slope
Parent material: Loess

Typical profile

H1 - 0 to 4 inches: silt loam
H2 - 4 to 35 inches: silt loam
H3 - 35 to 60 inches: silt loam

Properties and qualities

Slope: 12 to 30 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 (0.57 to 1.98 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 high (about 12.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Ecological site: F134XY001TN - Northern Deep Loess Backslope Mesophytic Forest, F134XY006AL - Northern Loess Sideslope
Hydric soil rating: No

MeB2—Memphis silt loam, 2 to 5 percent slopes, moderately eroded, northern phase

Map Unit Setting

National map unit symbol: 2t23z
Elevation: 260 to 540 feet
Mean annual precipitation: 50 to 54 inches
Mean annual air temperature: 47 to 71 degrees F
Frost-free period: 182 to 220 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Memphis, eroded, north, and similar soils: 88 percent
Minor components: 12 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Memphis, Eroded, North

Setting

Landform: Loess hills
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Fine-silty noncalcareous loess

Typical profile

Ap - 0 to 6 inches: silt loam
Bt1 - 6 to 18 inches: silty clay loam
Bt2 - 18 to 74 inches: silt loam
C - 74 to 80 inches: silt loam

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 (0.57 to 1.98 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 high (about 13.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F134XY002TN - Northern Deep Loess Summit
Hydric soil rating: No

Minor Components

Lexington

Percent of map unit: 6 percent
Landform: Loess hills
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: F134XY003AL - Northern Loess Interfluve
Hydric soil rating: No

Loring

Percent of map unit: 4 percent
Landform: Loess hills
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F134XY012AL - Northern Loess Fragipan Upland - PROVISIONAL
Hydric soil rating: No

Grenada

Percent of map unit: 2 percent
Landform: Loess hills
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Base slope
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F134XY012AL - Northern Loess Fragipan Upland - PROVISIONAL
Hydric soil rating: No

MeC3—Memphis silt loam, 5 to 8 percent slopes, severely eroded, northern phase

Map Unit Setting

National map unit symbol: 2t240
Elevation: 210 to 600 feet
Mean annual precipitation: 50 to 54 inches
Mean annual air temperature: 47 to 71 degrees F
Frost-free period: 182 to 220 days
Farmland classification: Not prime farmland

Map Unit Composition

Memphis and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Memphis

Setting

Landform: Loess hills
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Fine-silty noncalcareous loess

Typical profile

Ap - 0 to 5 inches: silt loam
Bt - 5 to 38 inches: silt loam
C - 38 to 80 inches: silt loam

Properties and qualities

Slope: 5 to 8 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 (0.57 to 1.98 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 high (about 13.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: F134XY002TN - Northern Deep Loess Summit
Hydric soil rating: No

Minor Components

Loring

Percent of map unit: 5 percent
Landform: Loess hills
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: F134XY012AL - Northern Loess Fragipan Upland - PROVISIONAL
Hydric soil rating: No

MeD3—Memphis silt loam, 8 to 12 percent slopes, severely eroded, northern phase

Map Unit Setting

National map unit symbol: 2y722
Elevation: 210 to 600 feet
Mean annual precipitation: 50 to 54 inches
Mean annual air temperature: 47 to 71 degrees F
Frost-free period: 182 to 220 days
Farmland classification: Not prime farmland

Map Unit Composition

Memphis, northern phase, and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Memphis, Northern Phase

Setting

Landform: Loess hills
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Fine-silty noncalcareous loess

Typical profile

Ap - 0 to 5 inches: silt loam
Bt - 5 to 38 inches: silt loam
C - 38 to 80 inches: silt loam

Properties and qualities

Slope: 8 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 (0.57 to 1.98 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 high (about 13.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Ecological site: F134XY002TN - Northern Deep Loess Summit
Hydric soil rating: No

Minor Components

Loring

Percent of map unit: 5 percent
Landform: Loess hills
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: F134XY012AL - Northern Loess Fragipan Upland - PROVISIONAL
Hydric soil rating: No

MeE3—Memphis silt loam, 12 to 20 percent slopes, severely eroded, northern phase

Map Unit Setting

National map unit symbol: 2y721
Elevation: 210 to 600 feet
Mean annual precipitation: 35 to 63 inches
Mean annual air temperature: 59 to 72 degrees F
Frost-free period: 195 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Memphis, northern phase, and similar soils: 91 percent
Minor components: 9 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Memphis, Northern Phase

Setting

Landform: Loess hills
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex, linear
Parent material: Fine-silty noncalcareous loess

Typical profile

Ap - 0 to 5 inches: silt loam
Bt - 5 to 38 inches: silt loam
C - 38 to 80 inches: silt loam

Properties and qualities

Slope: 5 to 8 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 (0.57 to 1.98 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 high (about 13.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Ecological site: F134XY001TN - Northern Deep Loess Backslope Mesophytic Forest
Hydric soil rating: No

Minor Components

Loring

Percent of map unit: 5 percent
Landform: Loess hills
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Lexington

Percent of map unit: 4 percent
Landform: Hillslopes
Landform position (two-dimensional): Shoulder, summit
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Re—Rosebloom silt loam, frequently flooded

Map Unit Setting

National map unit symbol: m13q
Elevation: 280 to 340 feet
Mean annual precipitation: 45 to 61 inches
Mean annual air temperature: 50 to 70 degrees F
Frost-free period: 206 to 220 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Rosebloom

Setting

Landform: Flood plains

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

Typical profile
H1 - 0 to 26 inches: silt loam
H2 - 26 to 60 inches: silty clay loam

Properties and qualities
Slope: 0 to 2 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 (0.57 to 1.98 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very high (about 12.2 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B/D
Ecological site: F134XY020AL - Northern Wet Alluvial Flat - PROVISIONAL
Hydric soil rating: Yes

Ro—Routon silt loam

Map Unit Setting
National map unit symbol: m13v
Elevation: 260 to 460 feet
Mean annual precipitation: 45 to 61 inches
Mean annual air temperature: 50 to 70 degrees F
Frost-free period: 206 to 220 days
Farmland classification: Prime farmland if drained

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

Description of Routon

Setting
Landform: Stream terraces
Landform position (three-dimensional): Tread
Parent material: Loess over silty alluvium

Typical profile
H1 - 0 to 18 inches: silt loam
H2 - 18 to 60 inches: silt loam

Properties and qualities
Slope: 0 to 2 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: None
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: C/D
Ecological site: F134XY005AL - Northern Wet Loess Interfluve, F134XY010AL - Northern Wet Loess Terrace - PROVISIONAL
Hydric soil rating: Yes

W—Water

Map Unit Setting
National map unit symbol: m142
Mean annual precipitation: 45 to 61 inches
Mean annual air temperature: 50 to 70 degrees F
Frost-free period: 206 to 220 days
Farmland classification: Not prime farmland

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

Lauderdale County, Tennessee

Ad—Adler silt loam, 0 to 2 percent slopes, occasionally flooded

Map Unit Setting

National map unit symbol: 2wn57
Elevation: 200 to 500 feet
Mean annual precipitation: 50 to 53 inches
Mean annual air temperature: 47 to 71 degrees F
Frost-free period: 175 to 214 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Adler, occasionally flooded, and similar soils: 89 percent
Minor components: 11 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Adler, Occasionally Flooded

Setting

Landform: Alluvial fans, natural levees
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Coarse-silty alluvium

Typical profile

Ap - 0 to 5 inches: silt loam
Bw - 5 to 23 inches: silt loam
Cg - 23 to 80 inches: silt loam

Properties and qualities

Slope: 0 to 2 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 to high (0.60 to 2.00 in/hr)
Depth to water table: About 18 to 36 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Calcium carbonate, maximum content: 3 percent
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
Ecological site: F134XY014AL - Northern Non-Acid Floodplain - PROVISIONAL
Hydric soil rating: No

Minor Components

Morganfield, occasionally flooded

Percent of map unit: 7 percent

Landform: Alluvial fans, natural levees
Landform position (three-dimensional): Rise
Down-slope shape: Convex, linear
Across-slope shape: Convex, linear
Ecological site: F134XY014AL - Northern Non-Acid Floodplain - PROVISIONAL
Hydric soil rating: No

Convent, occasionally flooded
Percent of map unit: 4 percent
Landform: — error in exists on —
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F134XY015AL - Northern Non-Acid Moderately Wet Floodplain - PROVISIONAL
Hydric soil rating: No

Ca—Calloway silt loam, 0 to 2 percent slopes, north

Map Unit Setting
National map unit symbol: 2t239
Elevation: 200 to 520 feet
Mean annual precipitation: 50 to 56 inches
Mean annual air temperature: 50 to 70 degrees F
Frost-free period: 196 to 224 days
Farmland classification: All areas are prime farmland

Map Unit Composition
Calloway and similar soils: 89 percent
Minor components: 11 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Calloway

Setting
Landform: Loess hills
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Loess

Typical profile
Ap - 0 to 7 inches: silt loam
Bw - 7 to 19 inches: silt loam
Eg - 19 to 27 inches: silt loam
Btx/E - 27 to 62 inches: silt loam
C - 62 to 80 inches: silt loam

Properties and qualities
Slope: 0 to 2 percent

Depth to restrictive feature: 15 to 30 inches to fragipan
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.01 in/hr)
Depth to water table: About 12 to 21 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 5.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: D
Ecological site: F134XY004AL - Northern Moderately Wet Loess Interfluve, F134XY008AL - Northern Moderately Wet Loess Terrace - PROVISIONAL
Hydric soil rating: No

Minor Components

Grenada

Percent of map unit: 7 percent
Landform: Loess hills
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Base slope
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F134XY012AL - Northern Loess Fragipan Upland - PROVISIONAL, F134XY013AL - Northern Loess Fragipan Terrace - PROVISIONAL
Hydric soil rating: No

Routon

Percent of map unit: 4 percent
Landform: Stream terraces
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: F134XY005AL - Northern Wet Loess Interfluve, F134XY010AL - Northern Wet Loess Terrace - PROVISIONAL
Hydric soil rating: Yes

Ce—Center silt loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2wn5h
Elevation: 230 to 460 feet
Mean annual precipitation: 50 to 53 inches
Mean annual air temperature: 46 to 70 degrees F

Frost-free period: 192 to 228 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Center and similar soils: 91 percent
Minor components: 9 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Center

Setting

Landform: Stream terraces, flats
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Riser, talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loess

Typical profile

Ap - 0 to 9 inches: silt loam
Bt - 9 to 35 inches: silty clay loam
C - 35 to 80 inches: silt loam

Properties and qualities

Slope: 0 to 3 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 (0.20 to 0.57 in/hr)
Depth to water table: About 12 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: High (about 11.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F134XY008AL - Northern Moderately Wet Loess Terrace - PROVISIONAL
Hydric soil rating: No

Minor Components

Routon

Percent of map unit: 9 percent
Landform: Depressions, stream terraces
Landform position (two-dimensional): Summit, toeslope
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: F134XY010AL - Northern Wet Loess Terrace - PROVISIONAL
Hydric soil rating: Yes

GrB2—Grenada silt loam, 2 to 5 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 2v7sd
Elevation: 200 to 520 feet
Mean annual precipitation: 50 to 55 inches
Mean annual air temperature: 49 to 70 degrees F
Frost-free period: 194 to 229 days
Farmland classification: All areas are prime farmland

Map Unit Composition

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

Description of Grenada

Setting

Landform: Loess hills
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Base slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Fine-silty noncalcareous loess

Typical profile

Ap - 0 to 6 inches: silt loam
Bw - 6 to 24 inches: silt loam
Eg - 24 to 28 inches: silt loam
Btx - 28 to 80 inches: silt loam

Properties and qualities

Slope: 2 to 5 percent
Depth to restrictive feature: 17 to 36 inches to fragipan
Drainage class: Moderately well drained
Runoff class: Low
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 16 to 28 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 6.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F134XY012AL - Northern Loess Fragipan Upland - PROVISIONAL, F134XY013AL - Northern Loess Fragipan Terrace - PROVISIONAL

Hydric soil rating: No

Minor Components

Calloway

Percent of map unit: 6 percent
Landform: Loess hills
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F134XY004AL - Northern Moderately Wet Loess Interfluve, F134XY008AL - Northern Moderately Wet Loess Terrace - PROVISIONAL
Hydric soil rating: No

Loring

Percent of map unit: 4 percent
Landform: Loess hills
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: F134XY012AL - Northern Loess Fragipan Upland - PROVISIONAL, F134XY013AL - Northern Loess Fragipan Terrace - PROVISIONAL
Hydric soil rating: No

GrB3—Grenada silt loam, 2 to 5 percent slopes, severely eroded

Map Unit Setting

National map unit symbol: 2v7sg
Elevation: 260 to 480 feet
Mean annual precipitation: 45 to 61 inches
Mean annual air temperature: 50 to 70 degrees F
Frost-free period: 206 to 220 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Grenada

Setting

Landform: Loess hills
Landform position (two-dimensional): Summit, footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Fine-silty noncalcareous loess

Typical profile

Ap - 0 to 5 inches: silt loam
Bw - 5 to 14 inches: silt loam
E - 14 to 18 inches: silt loam
Btx - 18 to 79 inches: silt loam

Properties and qualities

Slope: 2 to 5 percent
Depth to restrictive feature: 10 to 20 inches to fragipan
Drainage class: Moderately well drained
Runoff class: Medium
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 8 to 17 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: D
Ecological site: F134XY012AL - Northern Loess Fragipan Upland - PROVISIONAL
Hydric soil rating: No

LoB2—Loring silt loam, 2 to 5 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 2v7sm
Elevation: 200 to 520 feet
Mean annual precipitation: 49 to 55 inches
Mean annual air temperature: 47 to 71 degrees F
Frost-free period: 194 to 229 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Loring and similar soils: 89 percent
Minor components: 11 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Loring

Setting

Landform: Loess hills
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Loess

Typical profile

Ap - 0 to 6 inches: silt loam
Bt - 6 to 24 inches: silt loam
Btx - 24 to 48 inches: silt loam
C - 48 to 80 inches: silt loam

Properties and qualities

Slope: 2 to 5 percent
Depth to restrictive feature: 17 to 32 inches to fragipan
Drainage class: Moderately well 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 12 to 28 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 5.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C/D
Ecological site: F134XY012AL - Northern Loess Fragipan Upland - PROVISIONAL
Hydric soil rating: No

Minor Components

Grenada

Percent of map unit: 8 percent
Landform: Loess hills
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Base slope
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F134XY012AL - Northern Loess Fragipan Upland - PROVISIONAL
Hydric soil rating: No

Calloway

Percent of map unit: 3 percent
Landform: Loess hills
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F134XY004AL - Northern Moderately Wet Loess Interfluve
Hydric soil rating: No

LoC3—Loring silt loam, 5 to 8 percent slopes, severely eroded

Map Unit Setting

National map unit symbol: 2v7sk
Elevation: 280 to 490 feet
Mean annual precipitation: 35 to 63 inches
Mean annual air temperature: 47 to 71 degrees F
Frost-free period: 189 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Loring

Setting

Landform: Loess hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Loess

Typical profile

Ap - 0 to 5 inches: silt loam
Bt - 5 to 20 inches: silt loam
Btx - 20 to 65 inches: silt loam

Properties and qualities

Slope: 5 to 8 percent
Depth to restrictive feature: 14 to 30 inches to fragipan
Drainage class: Moderately well 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 11 to 14 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: D
Ecological site: F134XY012AL - Northern Loess Fragipan Upland - PROVISIONAL
Hydric soil rating: No

LoD3—Loring silt loam, 8 to 12 percent slopes, severely eroded

Map Unit Setting

National map unit symbol: 2v7sl
Elevation: 280 to 490 feet
Mean annual precipitation: 35 to 63 inches
Mean annual air temperature: 47 to 71 degrees F
Frost-free period: 189 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Loring

Setting

Landform: Loess hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loess

Typical profile

Ap - 0 to 4 inches: silt loam
Bt - 4 to 20 inches: silt loam
Btx - 20 to 60 inches: silt loam
C - 60 to 79 inches: silt loam

Properties and qualities

Slope: 8 to 12 percent
Depth to restrictive feature: 14 to 30 inches to fragipan
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: About 12 to 33 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): 6e
Hydrologic Soil Group: D
Ecological site: F134XY012AL - Northern Loess Fragipan Upland - PROVISIONAL
Hydric soil rating: No

MeB2—Memphis silt loam, 2 to 5 percent slopes, moderately eroded, northern phase

Map Unit Setting

National map unit symbol: 2t23z
Elevation: 260 to 540 feet
Mean annual precipitation: 50 to 54 inches
Mean annual air temperature: 47 to 71 degrees F
Frost-free period: 182 to 220 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Memphis, eroded, north, and similar soils: 88 percent
Minor components: 12 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Memphis, Eroded, North

Setting

Landform: Loess hills
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Fine-silty noncalcareous loess

Typical profile

Ap - 0 to 6 inches: silt loam
Bt1 - 6 to 18 inches: silty clay loam
Bt2 - 18 to 74 inches: silt loam
C - 74 to 80 inches: silt loam

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 (0.57 to 1.98 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 high (about 13.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F134XY002TN - Northern Deep Loess Summit
Hydric soil rating: No

Minor Components

Lexington

Percent of map unit: 6 percent
Landform: Loess hills
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: F134XY003AL - Northern Loess Interfluve
Hydric soil rating: No

Loring

Percent of map unit: 4 percent
Landform: Loess hills
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F134XY012AL - Northern Loess Fragipan Upland - PROVISIONAL
Hydric soil rating: No

Grenada

Percent of map unit: 2 percent
Landform: Loess hills
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Base slope
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F134XY012AL - Northern Loess Fragipan Upland - PROVISIONAL
Hydric soil rating: No

MeC2—Memphis silt loam, 5 to 8 percent slopes, moderately eroded, northern phase

Map Unit Setting

National map unit symbol: 2y70s
Elevation: 300 to 540 feet
Mean annual precipitation: 50 to 54 inches
Mean annual air temperature: 47 to 71 degrees F
Frost-free period: 182 to 220 days
Farmland classification: Not prime farmland

Map Unit Composition

Memphis, northern phase, and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Memphis, Northern Phase

Setting

Landform: Loess hills
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Fine-silty noncalcareous loess

Typical profile

Ap - 0 to 6 inches: silt loam
Bt1 - 6 to 18 inches: silty clay loam
Bt2 - 18 to 74 inches: silt loam
C - 74 to 80 inches: silt loam

Properties and qualities

Slope: 5 to 8 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 (0.57 to 1.98 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 high (about 13.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: F134XY002TN - Northern Deep Loess Summit
Hydric soil rating: No

Minor Components

Loring, northern phase

Percent of map unit: 5 percent
Landform: Loess hills
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F134XY012AL - Northern Loess Fragipan Upland - PROVISIONAL
Hydric soil rating: No

MeD3—Memphis silt loam, 8 to 12 percent slopes, severely eroded, northern phase

Map Unit Setting

National map unit symbol: 2y722
Elevation: 210 to 600 feet
Mean annual precipitation: 50 to 54 inches
Mean annual air temperature: 47 to 71 degrees F
Frost-free period: 182 to 220 days
Farmland classification: Not prime farmland

Map Unit Composition

Memphis, northern phase, and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Memphis, Northern Phase

Setting

Landform: Loess hills
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Fine-silty noncalcareous loess

Typical profile

Ap - 0 to 5 inches: silt loam
Bt - 5 to 38 inches: silt loam
C - 38 to 80 inches: silt loam

Properties and qualities

Slope: 8 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 (0.57 to 1.98 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 high (about 13.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Ecological site: F134XY002TN - Northern Deep Loess Summit
Hydric soil rating: No

Minor Components

Loring

Percent of map unit: 5 percent
Landform: Loess hills
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: F134XY012AL - Northern Loess Fragipan Upland - PROVISIONAL
Hydric soil rating: No

MeE3—Memphis silt loam, 12 to 20 percent slopes, severely eroded, northern phase

Map Unit Setting

National map unit symbol: 2y721
Elevation: 210 to 600 feet
Mean annual precipitation: 35 to 63 inches
Mean annual air temperature: 59 to 72 degrees F
Frost-free period: 195 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Memphis, northern phase, and similar soils: 91 percent
Minor components: 9 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Memphis, Northern Phase

Setting

Landform: Loess hills
Landform position (two-dimensional): Shoulder, backslope, summit
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear, convex
Parent material: Fine-silty noncalcareous loess

Typical profile

Ap - 0 to 5 inches: silt loam
Bt - 5 to 38 inches: silt loam
C - 38 to 80 inches: silt loam

Properties and qualities

Slope: 5 to 8 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 (0.57 to 1.98 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 high (about 13.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Ecological site: F134XY001TN - Northern Deep Loess Backslope Mesophytic Forest
Hydric soil rating: No

Minor Components

Loring

Percent of map unit: 5 percent
Landform: Loess hills
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Lexington

Percent of map unit: 4 percent
Landform: Hillslopes
Landform position (two-dimensional): Shoulder, summit
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

MeF—Memphis silt loam, 20 to 40 percent slopes, northern phase

Map Unit Setting

National map unit symbol: 2t23x
Elevation: 200 to 540 feet
Mean annual precipitation: 50 to 54 inches
Mean annual air temperature: 47 to 71 degrees F
Frost-free period: 182 to 220 days
Farmland classification: Not prime farmland

Map Unit Composition

Memphis, northern phase, and similar soils: 91 percent
Minor components: 9 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Memphis, Northern Phase

Setting

Landform: Loess hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Fine-silty noncalcareous loess

Typical profile

A - 0 to 7 inches: silt loam
Bt1 - 7 to 18 inches: silty clay loam
Bt2 - 18 to 74 inches: silt loam
C - 74 to 108 inches: silt loam

Properties and qualities

Slope: 20 to 40 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 (0.57 to 1.98 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 high (about 13.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: B
Ecological site: F134XY001TN - Northern Deep Loess Backslope Mesophytic Forest
Hydric soil rating: No

Minor Components

Natchez

Percent of map unit: 9 percent
Landform: Loess bluffs
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Rt—Routon silt loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2v7sp

Elevation: 230 to 460 feet
Mean annual precipitation: 50 to 53 inches
Mean annual air temperature: 46 to 72 degrees F
Frost-free period: 193 to 207 days
Farmland classification: Not prime farmland

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

Description of Routon

Setting
Landform: Stream terraces
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Silty alluvium derived from loess

Typical profile
Ap - 0 to 18 inches: silt loam
Btg - 18 to 51 inches: silty clay loam
C - 51 to 72 inches: silt loam

Properties and qualities
Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Low
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: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very high (about 12.5 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: F134XY010AL - Northern Wet Loess Terrace - PROVISIONAL, F134XY005AL - Northern Wet Loess Interfluve
Hydric soil rating: Yes

W—Water

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

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Glossary

Many of the terms relating to landforms, geology, and geomorphology are defined in more detail in the following National Soil Survey Handbook link: “National Soil Survey Handbook.”

ABC soil

A soil having an A, a B, and a C horizon.

Ablation till

Loose, relatively permeable earthy material deposited during the downwasting of nearly static glacial ice, either contained within or accumulated on the surface of the glacier.

AC soil

A soil having only an A and a C horizon. Commonly, such soil formed in recent alluvium or on steep, rocky slopes.

Aeration, soil

The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil

Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alkali (sodic) soil

A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Alluvial cone

A semiconical type of alluvial fan having very steep slopes. It is higher, narrower, and steeper than a fan and is composed of coarser and thicker layers of material deposited by a combination of alluvial episodes and (to a much lesser degree) landslides (debris flow). The coarsest materials tend to be concentrated at the apex of the cone.

Alluvial fan

A low, outspread mass of loose materials and/or rock material, commonly with gentle slopes. It is shaped like an open fan or a segment of a cone. The material was deposited by a stream at the place where it issues from a narrow mountain valley or upland valley or where a tributary stream is near or at its junction with the main stream. The fan is steepest near its apex, which points upstream, and slopes gently and convexly outward (downstream) with a gradual decrease in gradient.

Alluvium

Unconsolidated material, such as gravel, sand, silt, clay, and various mixtures of these, deposited on land by running water.

Alpha,alpha-dipyridyl

A compound that when dissolved in ammonium acetate is used to detect the presence of reduced iron (Fe II) in the soil. A positive reaction implies reducing conditions and the likely presence of redoximorphic features.

Animal unit month (AUM)

The amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.

Aquic conditions

Current soil wetness characterized by saturation, reduction, and redoximorphic features.

Argillic horizon

A subsoil horizon characterized by an accumulation of illuvial clay.

Arroyo

The flat-floored channel of an ephemeral stream, commonly with very steep to vertical banks cut in unconsolidated material. It is usually dry but can be transformed into a temporary watercourse or short-lived torrent after heavy rain within the watershed.

Aspect

The direction toward which a slope faces. Also called slope aspect.

Association, soil

A group of soils or miscellaneous areas geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Available water capacity (available moisture capacity)

The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as:

Very low: 0 to 3
Low: 3 to 6
Moderate: 6 to 9
High: 9 to 12
Very high: More than 12

Backslope

The position that forms the steepest and generally linear, middle portion of a hillslope. In profile, backslopes are commonly bounded by a convex shoulder above and a concave footslope below.

Backswamp

A flood-plain landform. Extensive, marshy or swampy, depressed areas of flood plains between natural levees and valley sides or terraces.

Badland

A landscape that is intricately dissected and characterized by a very fine drainage network with high drainage densities and short, steep slopes and narrow interfluves. Badlands develop on surfaces that have little or no vegetative cover overlying unconsolidated or poorly cemented materials (clays, silts, or sandstones) with, in some cases, soluble minerals, such as gypsum or halite.

Bajada

A broad, gently inclined alluvial piedmont slope extending from the base of a mountain range out into a basin and formed by the lateral coalescence of a series of alluvial fans. Typically, it has a broadly undulating transverse profile, parallel to the mountain front, resulting from the convexities of component fans. The term is generally restricted to constructional slopes of intermontane basins.

Basal area

The area of a cross section of a tree, generally referring to the section at breast height and measured outside the bark. It is a measure of stand density, commonly expressed in square feet.

Base saturation

The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, and K), expressed as a percentage of the total cation-exchange capacity.

Base slope (geomorphology)

A geomorphic component of hills consisting of the concave to linear (perpendicular to the contour) slope that, regardless of the lateral shape, forms an apron or wedge at the bottom of a hillside dominated by colluvium and slope-wash sediments (for example, slope alluvium).

Bedding plane

A planar or nearly planar bedding surface that visibly separates each successive layer of stratified sediment or rock (of the same or different lithology)

from the preceding or following layer; a plane of deposition. It commonly marks a change in the circumstances of deposition and may show a parting, a color difference, a change in particle size, or various combinations of these. The term is commonly applied to any bedding surface, even one that is conspicuously bent or deformed by folding.

Bedding system

A drainage system made by plowing, grading, or otherwise shaping the surface of a flat field. It consists of a series of low ridges separated by shallow, parallel dead furrows.

Bedrock

The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bedrock-controlled topography

A landscape where the configuration and relief of the landforms are determined or strongly influenced by the underlying bedrock.

Bench terrace

A raised, level or nearly level strip of earth constructed on or nearly on a contour, supported by a barrier of rocks or similar material, and designed to make the soil suitable for tillage and to prevent accelerated erosion.

Bisequum

Two sequences of soil horizons, each of which consists of an illuvial horizon and the overlying eluvial horizons.

Blowout (map symbol)

A saucer-, cup-, or trough-shaped depression formed by wind erosion on a preexisting dune or other sand deposit, especially in an area of shifting sand or loose soil or where protective vegetation is disturbed or destroyed. The adjoining accumulation of sand derived from the depression, where recognizable, is commonly included. Blowouts are commonly small.

Borrow pit (map symbol)

An open excavation from which soil and underlying material have been removed, usually for construction purposes.

Bottom land

An informal term loosely applied to various portions of a flood plain.

Boulders

Rock fragments larger than 2 feet (60 centimeters) in diameter.

Breaks

A landscape or tract of steep, rough or broken land dissected by ravines and gullies and marking a sudden change in topography.

Breast height

An average height of 4.5 feet above the ground surface; the point on a tree where diameter measurements are ordinarily taken.

Brush management

Use of mechanical, chemical, or biological methods to make conditions favorable for reseeding or to reduce or eliminate competition from woody vegetation and thus allow understory grasses and forbs to recover. Brush management increases forage production and thus reduces the hazard of erosion. It can improve the habitat for some species of wildlife.

Butte

An isolated, generally flat-topped hill or mountain with relatively steep slopes and talus or precipitous cliffs and characterized by summit width that is less than the height of bounding escarpments; commonly topped by a caprock of resistant material and representing an erosion remnant carved from flat-lying rocks.

Cable yarding

A method of moving felled trees to a nearby central area for transport to a processing facility. Most cable yarding systems involve use of a drum, a pole, and wire cables in an arrangement similar to that of a rod and reel used for fishing. To reduce friction and soil disturbance, felled trees generally are reeled in while one end is lifted or the entire log is suspended.

Calcareous soil

A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

Caliche

A general term for a prominent zone of secondary carbonate accumulation in surficial materials in warm, subhumid to arid areas. Caliche is formed by both geologic and pedologic processes. Finely crystalline calcium carbonate forms a nearly continuous surface-coating and void-filling medium in geologic (parent) materials. Cementation ranges from weak in nonindurated forms to very strong in indurated forms. Other minerals (e.g., carbonates, silicate, and sulfate) may occur as accessory cements. Most petrocalcic horizons and some calcic horizons are caliche.

California bearing ratio (CBR)

The load-supporting capacity of a soil as compared to that of standard crushed limestone, expressed as a ratio. First standardized in California. A soil having a CBR of 16 supports 16 percent of the load that would be supported by standard crushed limestone, per unit area, with the same degree of distortion.

Canopy

The leafy crown of trees or shrubs. (See Crown.)

Canyon

A long, deep, narrow valley with high, precipitous walls in an area of high local relief.

Capillary water

Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

Catena

A sequence, or “chain,” of soils on a landscape that formed in similar kinds of parent material and under similar climatic conditions but that have different characteristics as a result of differences in relief and drainage.

Cation

An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity

The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.

Catsteps

See Terracettes.

Cement rock

Shaly limestone used in the manufacture of cement.

Channery soil material

Soil material that has, by volume, 15 to 35 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches (15 centimeters) along the longest axis. A single piece is called a channer.

Chemical treatment

Control of unwanted vegetation through the use of chemicals.

Chiseling

Tillage with an implement having one or more soil-penetrating points that shatter or loosen hard, compacted layers to a depth below normal plow depth.

Cirque

A steep-walled, semicircular or crescent-shaped, half-bowl-like recess or hollow, commonly situated at the head of a glaciated mountain valley or high on the side of a mountain. It was produced by the erosive activity of a mountain glacier. It commonly contains a small round lake (tarn).

Clay

As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay depletions

See Redoximorphic features.

Clay film

A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Clay spot (map symbol)

A spot where the surface texture is silty clay or clay in areas where the surface layer of the soils in the surrounding map unit is sandy loam, loam, silt loam, or coarser.

Claypan

A dense, compact subsoil layer that contains much more clay than the overlying materials, from which it is separated by a sharply defined boundary. The layer restricts the downward movement of water through the soil. A claypan is commonly hard when dry and plastic and sticky when wet.

Climax plant community

The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.

Coarse textured soil

Sand or loamy sand.

Cobble (or cobblestone)

A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.

Cobbly soil material

Material that has 15 to 35 percent, by volume, rounded or partially rounded rock fragments 3 to 10 inches (7.6 to 25 centimeters) in diameter. Very cobbly soil material has 35 to 60 percent of these rock fragments, and extremely cobbly soil material has more than 60 percent.

COLE (coefficient of linear extensibility)

See Linear extensibility.

Colluvium

Unconsolidated, unsorted earth material being transported or deposited on side slopes and/or at the base of slopes by mass movement (e.g., direct gravitational action) and by local, unconcentrated runoff.

Complex slope

Irregular or variable slope. Planning or establishing terraces, diversions, and other water-control structures on a complex slope is difficult.

Complex, soil

A map unit of two or more kinds of soil or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.

Concretions

See Redoximorphic features.

Conglomerate

A coarse grained, clastic sedimentary rock composed of rounded or subangular rock fragments more than 2 millimeters in diameter. It commonly has a matrix of sand and finer textured material. Conglomerate is the consolidated equivalent of gravel.

Conservation cropping system

Growing crops in combination with needed cultural and management practices. In a good conservation cropping system, the soil-improving crops and practices more than offset the effects of the soil-depleting crops and practices. Cropping systems are needed on all tilled soils. Soil-improving practices in a conservation cropping system include the use of rotations that contain grasses and legumes and the return of crop residue to the soil. Other practices include the use of green manure crops of grasses and legumes, proper tillage, adequate fertilization, and weed and pest control.

Conservation tillage

A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

Consistence, soil

Refers to the degree of cohesion and adhesion of soil material and its resistance to deformation when ruptured. Consistence includes resistance of soil material to rupture and to penetration; plasticity, toughness, and stickiness of puddled soil material; and the manner in which the soil material behaves when subject to compression. Terms describing consistence are defined in the “Soil Survey Manual.”

Contour stripcropping

Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Control section

The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Coprogenous earth (sedimentary peat)

A type of limnic layer composed predominantly of fecal material derived from aquatic animals.

Corrosion (geomorphology)

A process of erosion whereby rocks and soil are removed or worn away by natural chemical processes, especially by the solvent action of running water, but also by other reactions, such as hydrolysis, hydration, carbonation, and oxidation.

Corrosion (soil survey interpretations)

Soil-induced electrochemical or chemical action that dissolves or weakens concrete or uncoated steel.

Cover crop

A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Crop residue management

Returning crop residue to the soil, which helps to maintain soil structure, organic matter content, and fertility and helps to control erosion.

Cropping system

Growing crops according to a planned system of rotation and management practices.

Cross-slope farming

Deliberately conducting farming operations on sloping farmland in such a way that tillage is across the general slope.

Crown

The upper part of a tree or shrub, including the living branches and their foliage.

Cryoturbate

A mass of soil or other unconsolidated earthy material moved or disturbed by frost action. It is typically coarser than the underlying material.

Cuesta

An asymmetric ridge capped by resistant rock layers of slight or moderate dip (commonly less than 15 percent slopes); a type of homocline produced by differential erosion of interbedded resistant and weak rocks. A cuesta has a long, gentle slope on one side (dip slope) that roughly parallels the inclined beds; on the other side, it has a relatively short and steep or clifflike slope (scarp) that cuts through the tilted rocks.

Culmination of the mean annual increment (CMAI)

The average annual increase per acre in the volume of a stand. Computed by dividing the total volume of the stand by its age. As the stand increases in age, the mean annual increment continues to increase until mortality begins to reduce the rate of increase. The point where the stand reaches its maximum annual rate of growth is called the culmination of the mean annual increment.

Cutbanks cave

The walls of excavations tend to cave in or slough.

Decreasers

The most heavily grazed climax range plants. Because they are the most palatable, they are the first to be destroyed by overgrazing.

Deferred grazing

Postponing grazing or resting grazing land for a prescribed period.

Delta

A body of alluvium having a surface that is fan shaped and nearly flat; deposited at or near the mouth of a river or stream where it enters a body of relatively quiet water, generally a sea or lake.

Dense layer

A very firm, massive layer that has a bulk density of more than 1.8 grams per cubic centimeter. Such a layer affects the ease of digging and can affect filling and compacting.

Depression, closed (map symbol)

A shallow, saucer-shaped area that is slightly lower on the landscape than the surrounding area and that does not have a natural outlet for surface drainage.

Depth, soil

Generally, the thickness of the soil over bedrock. Very deep soils are more than 60 inches deep over bedrock; deep soils, 40 to 60 inches; moderately deep, 20 to 40 inches; shallow, 10 to 20 inches; and very shallow, less than 10 inches.

Desert pavement

A natural, residual concentration or layer of wind-polished, closely packed gravel, boulders, and other rock fragments mantling a desert surface. It forms where wind action and sheetwash have removed all smaller particles or where rock fragments have migrated upward through sediments to the surface. It typically protects the finer grained underlying material from further erosion.

Diatomaceous earth

A geologic deposit of fine, grayish siliceous material composed chiefly or entirely of the remains of diatoms.

Dip slope

A slope of the land surface, roughly determined by and approximately conforming to the dip of the underlying bedrock.

Diversion (or diversion terrace)

A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Divided-slope farming

A form of field stripcropping in which crops are grown in a systematic arrangement of two strips, or bands, across the slope to reduce the hazard of water erosion. One strip is in a close-growing crop that provides protection from erosion, and the other strip is in a crop that provides less protection from erosion. This practice is used where slopes are not long enough to permit a full stripcropping pattern to be used.

Drainage class (natural)

Refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized—*excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained,* and *very poorly drained*. These classes are defined in the “Soil Survey Manual.”

Drainage, surface

Runoff, or surface flow of water, from an area.

Drainageway

A general term for a course or channel along which water moves in draining an area. A term restricted to relatively small, linear depressions that at some time move concentrated water and either do not have a defined channel or have only a small defined channel.

Draw

A small stream valley that generally is shallower and more open than a ravine or gulch and that has a broader bottom. The present stream channel may appear inadequate to have cut the drainageway that it occupies.

Drift

A general term applied to all mineral material (clay, silt, sand, gravel, and boulders) transported by a glacier and deposited directly by or from the ice or transported by running water emanating from a glacier. Drift includes unstratified material (till) that forms moraines and stratified deposits that form outwash plains, eskers, kames, varves, and glaciofluvial sediments. The term is generally applied to Pleistocene glacial deposits in areas that no longer contain glaciers.

Drumlin

A low, smooth, elongated oval hill, mound, or ridge of compact till that has a core of bedrock or drift. It commonly has a blunt nose facing the direction from which the ice approached and a gentler slope tapering in the other direction. The longer axis is parallel to the general direction of glacier flow. Drumlins are products of streamline (laminar) flow of glaciers, which molded the subglacial floor through a combination of erosion and deposition.

Duff

A generally firm organic layer on the surface of mineral soils. It consists of fallen plant material that is in the process of decomposition and includes everything from the litter on the surface to underlying pure humus.

Dune

A low mound, ridge, bank, or hill of loose, windblown granular material (generally sand), either barren and capable of movement from place to place or covered and stabilized with vegetation but retaining its characteristic shape.

Earthy fill

See Mine spoil.

Ecological site

An area where climate, soil, and relief are sufficiently uniform to produce a distinct natural plant community. An ecological site is the product of all the environmental factors responsible for its development. It is typified by an association of species that differ from those on other ecological sites in kind and/or proportion of species or in total production.

Eluviation

The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

Endosaturation

A type of saturation of the soil in which all horizons between the upper boundary of saturation and a depth of 2 meters are saturated.

Eolian deposit

Sand-, silt-, or clay-sized clastic material transported and deposited primarily by wind, commonly in the form of a dune or a sheet of sand or loess.

Ephemeral stream

A stream, or reach of a stream, that flows only in direct response to precipitation. It receives no long-continued supply from melting snow or other source, and its channel is above the water table at all times.

Episaturation

A type of saturation indicating a perched water table in a soil in which saturated layers are underlain by one or more unsaturated layers within 2 meters of the surface.

Erosion

The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (accelerated)

Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, such as a fire, that exposes the surface.

Erosion (geologic)

Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion pavement

A surficial lag concentration or layer of gravel and other rock fragments that remains on the soil surface after sheet or rill erosion or wind has removed the finer soil particles and that tends to protect the underlying soil from further erosion.

Erosion surface

A land surface shaped by the action of erosion, especially by running water.

Escarpment

A relatively continuous and steep slope or cliff breaking the general continuity of more gently sloping land surfaces and resulting from erosion or faulting. Most commonly applied to cliffs produced by differential erosion. Synonym: scarp.

Escarpment, bedrock (map symbol)

A relatively continuous and steep slope or cliff, produced by erosion or faulting, that breaks the general continuity of more gently sloping land surfaces. Exposed material is hard or soft bedrock.

Escarpment, nonbedrock (map symbol)

A relatively continuous and steep slope or cliff, generally produced by erosion but in some places produced by faulting, that breaks the continuity of more gently sloping land surfaces. Exposed earthy material is nonsoil or very shallow soil.

Esker

A long, narrow, sinuous, steep-sided ridge of stratified sand and gravel deposited as the bed of a stream flowing in an ice tunnel within or below the ice (subglacial) or between ice walls on top of the ice of a wasting glacier and left

behind as high ground when the ice melted. Eskers range in length from less than a kilometer to more than 160 kilometers and in height from 3 to 30 meters.

Extrusive rock

Igneous rock derived from deep-seated molten matter (magma) deposited and cooled on the earth's surface.

Fallow

Cropland left idle in order to restore productivity through accumulation of moisture. Summer fallow is common in regions of limited rainfall where cereal grain is grown. The soil is tilled for at least one growing season for weed control and decomposition of plant residue.

Fan remnant

A general term for landforms that are the remaining parts of older fan landforms, such as alluvial fans, that have been either dissected or partially buried.

Fertility, soil

The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Fibric soil material (peat)

The least decomposed of all organic soil material. Peat contains a large amount of well preserved fiber that is readily identifiable according to botanical origin. Peat has the lowest bulk density and the highest water content at saturation of all organic soil material.

Field moisture capacity

The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity,* or *capillary capacity*.

Fill slope

A sloping surface consisting of excavated soil material from a road cut. It commonly is on the downhill side of the road.

Fine textured soil

Sandy clay, silty clay, or clay.

Firebreak

An area cleared of flammable material to stop or help control creeping or running fires. It also serves as a line from which to work and to facilitate the movement of firefighters and equipment. Designated roads also serve as firebreaks.

First bottom

An obsolete, informal term loosely applied to the lowest flood-plain steps that are subject to regular flooding.

Flaggy soil material

Material that has, by volume, 15 to 35 percent flagstones. Very flaggy soil material has 35 to 60 percent flagstones, and extremely flaggy soil material has more than 60 percent flagstones.

Flagstone

A thin fragment of sandstone, limestone, slate, shale, or (rarely) schist 6 to 15 inches (15 to 38 centimeters) long.

Flood plain

The nearly level plain that borders a stream and is subject to flooding unless protected artificially.

Flood-plain landforms

A variety of constructional and erosional features produced by stream channel migration and flooding. Examples include backswamps, flood-plain splays, meanders, meander belts, meander scrolls, oxbow lakes, and natural levees.

Flood-plain splay

A fan-shaped deposit or other outspread deposit formed where an overloaded stream breaks through a levee (natural or artificial) and deposits its material (commonly coarse grained) on the flood plain.

Flood-plain step

An essentially flat, terrace-like alluvial surface within a valley that is frequently covered by floodwater from the present stream; any approximately horizontal surface still actively modified by fluvial scour and/or deposition. May occur individually or as a series of steps.

Fluvial

Of or pertaining to rivers or streams; produced by stream or river action.

Foothills

A region of steeply sloping hills that fringes a mountain range or high-plateau escarpment. The hills have relief of as much as 1,000 feet (300 meters).

Footslope

The concave surface at the base of a hillslope. A footslope is a transition zone between upslope sites of erosion and transport (shoulders and backslopes) and downslope sites of deposition (toeslopes).

Forb

Any herbaceous plant not a grass or a sedge.

Forest cover

All trees and other woody plants (underbrush) covering the ground in a forest.

Forest type

A stand of trees similar in composition and development because of given physical and biological factors by which it may be differentiated from other stands.

Fragipan

A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

Genesis, soil

The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Gilgai

Commonly, a succession of microbasins and microknolls in nearly level areas or of microvalleys and microridges parallel with the slope. Typically, the microrelief of clayey soils that shrink and swell considerably with changes in moisture content.

Glaciofluvial deposits

Material moved by glaciers and subsequently sorted and deposited by streams flowing from the melting ice. The deposits are stratified and occur in the form of outwash plains, valley trains, deltas, kames, eskers, and kame terraces.

Glaciolacustrine deposits

Material ranging from fine clay to sand derived from glaciers and deposited in glacial lakes mainly by glacial meltwater. Many deposits are bedded or laminated.

Gleyed soil

Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors.

Graded stripcropping

Growing crops in strips that grade toward a protected waterway.

Grassed waterway

A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel

Rounded or angular fragments of rock as much as 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Gravel pit (map symbol)

An open excavation from which soil and underlying material have been removed and used, without crushing, as a source of sand or gravel.

Gravelly soil material

Material that has 15 to 35 percent, by volume, rounded or angular rock fragments, not prominently flattened, as much as 3 inches (7.6 centimeters) in diameter.

Gravelly spot (map symbol)

A spot where the surface layer has more than 35 percent, by volume, rock fragments that are mostly less than 3 inches in diameter in an area that has less than 15 percent rock fragments.

Green manure crop (agronomy)

A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.

Ground water

Water filling all the unblocked pores of the material below the water table.

Gully (map symbol)

A small, steep-sided channel caused by erosion and cut in unconsolidated materials by concentrated but intermittent flow of water. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage whereas a rill is of lesser depth and can be smoothed over by ordinary tillage.

Hard bedrock

Bedrock that cannot be excavated except by blasting or by the use of special equipment that is not commonly used in construction.

Hard to reclaim

Reclamation is difficult after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Hardpan

A hardened or cemented soil horizon, or layer. The soil material is sandy, loamy, or clayey and is cemented by iron oxide, silica, calcium carbonate, or other substance.

Head slope (geomorphology)

A geomorphic component of hills consisting of a laterally concave area of a hillside, especially at the head of a drainageway. The overland waterflow is converging.

Hemic soil material (mucky peat)

Organic soil material intermediate in degree of decomposition between the less decomposed fibric material and the more decomposed sapric material.

High-residue crops

Such crops as small grain and corn used for grain. If properly managed, residue from these crops can be used to control erosion until the next crop in the rotation is established. These crops return large amounts of organic matter to the soil.

Hill

A generic term for an elevated area of the land surface, rising as much as 1,000 feet above surrounding lowlands, commonly of limited summit area and having a well defined outline. Slopes are generally more than 15 percent. The distinction between a hill and a mountain is arbitrary and may depend on local usage.

Hillslope

A generic term for the steeper part of a hill between its summit and the drainage line, valley flat, or depression floor at the base of a hill.

Horizon, soil

A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the “Soil Survey Manual.” The major horizons of mineral soil are as follows:

O horizon: An organic layer of fresh and decaying plant residue.

L horizon: A layer of organic and mineral limnic materials, including coprogenous earth (sedimentary peat), diatomaceous earth, and marl.

A horizon: The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

E horizon: The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon: The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

C horizon: The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying soil material. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

Cr horizon: Soft, consolidated bedrock beneath the soil.

R layer: Consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon, but it can be directly below an A or a B horizon.

M layer: A root-limiting subsoil layer consisting of nearly continuous, horizontally oriented, human-manufactured materials.

W layer: A layer of water within or beneath the soil.

Humus

The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups

Refers to soils grouped according to their runoff potential. The soil properties that influence this potential are those that affect the minimum rate of water infiltration on a bare soil during periods after prolonged wetting when the soil is not frozen. These properties include depth to a seasonal high water table, the infiltration rate, and depth to a layer that significantly restricts the downward movement of water. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff.

Igneous rock

Rock that was formed by cooling and solidification of magma and that has not been changed appreciably by weathering since its formation. Major varieties include plutonic and volcanic rock (e.g., andesite, basalt, and granite).

Illuviation

The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Impervious soil

A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Increasers

Species in the climax vegetation that increase in amount as the more desirable plants are reduced by close grazing. Increasers commonly are the shorter plants and the less palatable to livestock.

Infiltration

The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration capacity

The maximum rate at which water can infiltrate into a soil under a given set of conditions.

Infiltration rate

The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intake rate

The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake, in inches per hour, is expressed as follows:

Very low: Less than 0.2
Low: 0.2 to 0.4
Moderately low: 0.4 to 0.75
Moderate: 0.75 to 1.25
Moderately high: 1.25 to 1.75
High: 1.75 to 2.5
Very high: More than 2.5

Interfluve

A landform composed of the relatively undissected upland or ridge between two adjacent valleys containing streams flowing in the same general direction. An elevated area between two drainageways that sheds water to those drainageways.

Interfluve (geomorphology)

A geomorphic component of hills consisting of the uppermost, comparatively level or gently sloping area of a hill; shoulders of backwearing hillslopes can narrow the upland or can merge, resulting in a strongly convex shape.

Intermittent stream

A stream, or reach of a stream, that does not flow year-round but that is commonly dry for 3 or more months out of 12 and whose channel is generally below the local water table. It flows only during wet periods or when it receives ground-water discharge or long, continued contributions from melting snow or other surface and shallow subsurface sources.

Invaders

On range, plants that encroach into an area and grow after the climax vegetation has been reduced by grazing. Generally, plants invade following disturbance of the surface.

Iron depletions

See Redoximorphic features.

Irrigation

Application of water to soils to assist in production of crops. Methods of irrigation are:

Basin: Water is applied rapidly to nearly level plains surrounded by levees or dikes.

Border: Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.

Controlled flooding: Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.

Corrugation: Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.

Drip (or trickle): Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.

Furrow: Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.

Sprinkler: Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

Subirrigation: Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.

Wild flooding: Water, released at high points, is allowed to flow onto an area without controlled distribution.

Kame

A low mound, knob, hummock, or short irregular ridge composed of stratified sand and gravel deposited by a subglacial stream as a fan or delta at the margin of a melting glacier; by a supraglacial stream in a low place or hole on the surface of the glacier; or as a ponded deposit on the surface or at the margin of stagnant ice.

Karst (topography)

A kind of topography that formed in limestone, gypsum, or other soluble rocks by dissolution and that is characterized by closed depressions, sinkholes, caves, and underground drainage.

Knoll

A small, low, rounded hill rising above adjacent landforms.

Ksat

See Saturated hydraulic conductivity.

Lacustrine deposit

Material deposited in lake water and exposed when the water level is lowered or the elevation of the land is raised.

Lake plain

A nearly level surface marking the floor of an extinct lake filled by well sorted, generally fine textured, stratified deposits, commonly containing varves.

Lake terrace

A narrow shelf, partly cut and partly built, produced along a lakeshore in front of a scarp line of low cliffs and later exposed when the water level falls.

Landfill (map symbol)

An area of accumulated waste products of human habitation, either above or below natural ground level.

Landslide

A general, encompassing term for most types of mass movement landforms and processes involving the downslope transport and outward deposition of soil and rock materials caused by gravitational forces; the movement may or may not involve saturated materials. The speed and distance of movement, as well as the amount of soil and rock material, vary greatly.

Large stones

Rock fragments 3 inches (7.6 centimeters) or more across. Large stones adversely affect the specified use of the soil.

Lava flow (map symbol)

A solidified, commonly lobate body of rock formed through lateral, surface outpouring of molten lava from a vent or fissure.

Leaching

The removal of soluble material from soil or other material by percolating water.

Levee (map symbol)

An embankment that confines or controls water, especially one built along the banks of a river to prevent overflow onto lowlands.

Linear extensibility

Refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. Linear extensibility is used to determine the shrink-swell potential of soils. It is an expression of the volume change between the water content of the clod at $^{1}/_{3}$- or $^{1}/_{10}$-bar tension (33kPa or 10kPa tension) and oven dryness. Volume change is influenced by the amount and type of clay minerals in the soil. The volume change is the percent change for the whole soil. If it is expressed as a fraction, the resulting value is COLE, coefficient of linear extensibility.

Liquid limit

The moisture content at which the soil passes from a plastic to a liquid state.

Loam

Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Loess

Material transported and deposited by wind and consisting dominantly of silt-sized particles.

Low strength

The soil is not strong enough to support loads.

Low-residue crops

Such crops as corn used for silage, peas, beans, and potatoes. Residue from these crops is not adequate to control erosion until the next crop in the rotation is established. These crops return little organic matter to the soil.

Marl

An earthy, unconsolidated deposit consisting chiefly of calcium carbonate mixed with clay in approximately equal proportions; formed primarily under freshwater lacustrine conditions but also formed in more saline environments.

Marsh or swamp (map symbol)

A water-saturated, very poorly drained area that is intermittently or permanently covered by water. Sedges, cattails, and rushes are the dominant vegetation in marshes, and trees or shrubs are the dominant vegetation in swamps. Not used in map units where the named soils are poorly drained or very poorly drained.

Mass movement

A generic term for the dislodgment and downslope transport of soil and rock material as a unit under direct gravitational stress.

Masses

See Redoximorphic features.

Meander belt

The zone within which migration of a meandering channel occurs; the flood-plain area included between two imaginary lines drawn tangential to the outer bends of active channel loops.

Meander scar

A crescent-shaped, concave or linear mark on the face of a bluff or valley wall, produced by the lateral erosion of a meandering stream that impinged upon and undercut the bluff.

Meander scroll

One of a series of long, parallel, close-fitting, crescent-shaped ridges and troughs formed along the inner bank of a stream meander as the channel migrated laterally down-valley and toward the outer bank.

Mechanical treatment

Use of mechanical equipment for seeding, brush management, and other management practices.

Medium textured soil

Very fine sandy loam, loam, silt loam, or silt.

Mesa

A broad, nearly flat topped and commonly isolated landmass bounded by steep slopes or precipitous cliffs and capped by layers of resistant, nearly horizontal rocky material. The summit width is characteristically greater than the height of the bounding escarpments.

Metamorphic rock

Rock of any origin altered in mineralogical composition, chemical composition, or structure by heat, pressure, and movement at depth in the earth’s crust. Nearly all such rocks are crystalline.

Mine or quarry (map symbol)

An open excavation from which soil and underlying material have been removed and in which bedrock is exposed. Also denotes surface openings to underground mines.

Mine spoil

An accumulation of displaced earthy material, rock, or other waste material removed during mining or excavation. Also called earthy fill.

Mineral soil

Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minimum tillage

Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous area

A kind of map unit that has little or no natural soil and supports little or no vegetation.

Miscellaneous water (map symbol)

Small, constructed bodies of water that are used for industrial, sanitary, or mining applications and that contain water most of the year.

Moderately coarse textured soil

Coarse sandy loam, sandy loam, or fine sandy loam.

Moderately fine textured soil

Clay loam, sandy clay loam, or silty clay loam.

Mollic epipedon

A thick, dark, humus-rich surface horizon (or horizons) that has high base saturation and pedogenic soil structure. It may include the upper part of the subsoil.

Moraine

In terms of glacial geology, a mound, ridge, or other topographically distinct accumulation of unsorted, unstratified drift, predominantly till, deposited primarily by the direct action of glacial ice in a variety of landforms. Also, a general term for a landform composed mainly of till (except for kame moraines, which are composed mainly of stratified outwash) that has been deposited by a glacier. Some types of moraines are disintegration, end, ground, kame, lateral, recessional, and terminal.

Morphology, soil

The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil

Irregular spots of different colors that vary in number and size. Descriptive terms are as follows: abundance—*few, common,* and *many;* size—*fine, medium,* and *coarse;* and contrast—*faint, distinct,* and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium,* from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse,* more than 15 millimeters (about 0.6 inch).

Mountain

A generic term for an elevated area of the land surface, rising more than 1,000 feet (300 meters) above surrounding lowlands, commonly of restricted summit area (relative to a plateau) and generally having steep sides. A mountain can

occur as a single, isolated mass or in a group forming a chain or range. Mountains are formed primarily by tectonic activity and/or volcanic action but can also be formed by differential erosion.

Muck

Dark, finely divided, well decomposed organic soil material. (See Sapric soil material.)

Mucky peat

See Hemic soil material.

Mudstone

A blocky or massive, fine grained sedimentary rock in which the proportions of clay and silt are approximately equal. Also, a general term for such material as clay, silt, claystone, siltstone, shale, and argillite and that should be used only when the amounts of clay and silt are not known or cannot be precisely identified.

Munsell notation

A designation of color by degrees of three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with hue of 10YR, value of 6, and chroma of 4.

Natric horizon

A special kind of argillic horizon that contains enough exchangeable sodium to have an adverse effect on the physical condition of the subsoil.

Neutral soil

A soil having a pH value of 6.6 to 7.3. (See Reaction, soil.)

Nodules

See Redoximorphic features.

Nose slope (geomorphology)

A geomorphic component of hills consisting of the projecting end (laterally convex area) of a hillside. The overland waterflow is predominantly divergent. Nose slopes consist dominantly of colluvium and slope-wash sediments (for example, slope alluvium).

Nutrient, plant

Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter

Plant and animal residue in the soil in various stages of decomposition. The content of organic matter in the surface layer is described as follows:

Very low: Less than 0.5 percent
Low: 0.5 to 1.0 percent
Moderately low: 1.0 to 2.0 percent
Moderate: 2.0 to 4.0 percent
High: 4.0 to 8.0 percent
Very high: More than 8.0 percent

Outwash

Stratified and sorted sediments (chiefly sand and gravel) removed or “washed out” from a glacier by meltwater streams and deposited in front of or beyond the end moraine or the margin of a glacier. The coarser material is deposited nearer to the ice.

Outwash plain

An extensive lowland area of coarse textured glaciofluvial material. An outwash plain is commonly smooth; where pitted, it generally is low in relief.

Paleoterrace

An erosional remnant of a terrace that retains the surface form and alluvial deposits of its origin but was not emplaced by, and commonly does not grade to, a present-day stream or drainage network.

Pan

A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan, fragipan, claypan, plowpan,* and *traffic pan*.

Parent material

The unconsolidated organic and mineral material in which soil forms.

Peat

Unconsolidated material, largely undecomposed organic matter, that has accumulated under excess moisture. (See Fibric soil material.)

Ped

An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedisediment

A layer of sediment, eroded from the shoulder and backslope of an erosional slope, that lies on and is being (or was) transported across a gently sloping erosional surface at the foot of a receding hill or mountain slope.

Pedon

The smallest volume that can be called “a soil.” A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation

The movement of water through the soil.

Perennial water (map symbol)

Small, natural or constructed lakes, ponds, or pits that contain water most of the year.

Permafrost

Ground, soil, or rock that remains at or below 0 degrees C for at least 2 years. It is defined on the basis of temperature and is not necessarily frozen.

pH value

A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Phase, soil

A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and flooding.

Piping

Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Pitting

Pits caused by melting around ice. They form on the soil after plant cover is removed.

Plastic limit

The moisture content at which a soil changes from semisolid to plastic.

Plasticity index

The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plateau (geomorphology)

A comparatively flat area of great extent and elevation; specifically, an extensive land region that is considerably elevated (more than 100 meters) above the adjacent lower lying terrain, is commonly limited on at least one side by an abrupt descent, and has a flat or nearly level surface. A comparatively large part of a plateau surface is near summit level.

Playa

The generally dry and nearly level lake plain that occupies the lowest parts of closed depressions, such as those on intermontane basin floors. Temporary flooding occurs primarily in response to precipitation and runoff. Playa deposits are fine grained and may or may not have a high water table and saline conditions.

Plinthite

The sesquioxide-rich, humus-poor, highly weathered mixture of clay with quartz and other diluents. It commonly appears as red mottles, usually in platy, polygonal, or reticulate patterns. Plinthite changes irreversibly to an ironstone hardpan or to irregular aggregates on repeated wetting and drying, especially if it is exposed also to heat from the sun. In a moist soil, plinthite can be cut with a spade. It is a form of laterite.

Plowpan

A compacted layer formed in the soil directly below the plowed layer.

Ponding

Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poorly graded

Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Pore linings

See Redoximorphic features.

Potential native plant community

See Climax plant community.

Potential rooting depth (effective rooting depth)

Depth to which roots could penetrate if the content of moisture in the soil were adequate. The soil has no properties restricting the penetration of roots to this depth.

Prescribed burning

Deliberately burning an area for specific management purposes, under the appropriate conditions of weather and soil moisture and at the proper time of day.

Productivity, soil

The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil

A vertical section of the soil extending through all its horizons and into the parent material.

Proper grazing use

Grazing at an intensity that maintains enough cover to protect the soil and maintain or improve the quantity and quality of the desirable vegetation. This practice increases the vigor and reproduction capacity of the key plants and

promotes the accumulation of litter and mulch necessary to conserve soil and water.

Rangeland

Land on which the potential natural vegetation is predominantly grasses, grasslike plants, forbs, or shrubs suitable for grazing or browsing. It includes natural grasslands, savannas, many wetlands, some deserts, tundras, and areas that support certain forb and shrub communities.

Reaction, soil

A measure of acidity or alkalinity of a soil, expressed as pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are:

Ultra acid: Less than 3.5
Extremely acid: 3.5 to 4.4
Very strongly acid: 4.5 to 5.0
Strongly acid: 5.1 to 5.5
Moderately acid: 5.6 to 6.0
Slightly acid: 6.1 to 6.5
Neutral: 6.6 to 7.3
Slightly alkaline: 7.4 to 7.8
Moderately alkaline: 7.9 to 8.4
Strongly alkaline: 8.5 to 9.0
Very strongly alkaline: 9.1 and higher

Red beds

Sedimentary strata that are mainly red and are made up largely of sandstone and shale.

Redoximorphic concentrations

See Redoximorphic features.

Redoximorphic depletions

See Redoximorphic features.

Redoximorphic features

Redoximorphic features are associated with wetness and result from alternating periods of reduction and oxidation of iron and manganese compounds in the soil. Reduction occurs during saturation with water, and oxidation occurs when the soil is not saturated. Characteristic color patterns are created by these processes. The reduced iron and manganese ions may be removed from a soil if vertical or lateral fluxes of water occur, in which case there is no iron or manganese precipitation in that soil. Wherever the iron and manganese are oxidized and precipitated, they form either soft masses or hard concretions or nodules. Movement of iron and manganese as a result of redoximorphic processes in a soil may result in redoximorphic features that are defined as follows:

1. Redoximorphic concentrations.—These are zones of apparent accumulation of iron-manganese oxides, including:
   A. Nodules and concretions, which are cemented bodies that can be removed from the soil intact. Concretions are distinguished from nodules on the basis of internal organization. A concretion typically has concentric layers that are visible to the naked eye. Nodules do not have visible organized internal structure; *and*
   B. Masses, which are noncemented concentrations of substances within the soil matrix; *and*
   C. Pore linings, i.e., zones of accumulation along pores that may be either coatings on pore surfaces or impregnations from the matrix adjacent to the pores.
2. Redoximorphic depletions.—These are zones of low chroma (chromas less than those in the matrix) where either iron-manganese oxides alone or both iron-manganese oxides and clay have been stripped out, including:
   A. Iron depletions, i.e., zones that contain low amounts of iron and manganese oxides but have a clay content similar to that of the adjacent matrix; *and*
   B. Clay depletions, i.e., zones that contain low amounts of iron, manganese, and clay (often referred to as silt coatings or skeletans).
3. Reduced matrix.—This is a soil matrix that has low chroma *in situ* but undergoes a change in hue or chroma within 30 minutes after the soil material has been exposed to air.

Reduced matrix

See Redoximorphic features.

Regolith

All unconsolidated earth materials above the solid bedrock. It includes material weathered in place from all kinds of bedrock and alluvial, glacial, eolian, lacustrine, and pyroclastic deposits.

Relief

The relative difference in elevation between the upland summits and the lowlands or valleys of a given region.

Residuum (residual soil material)

Unconsolidated, weathered or partly weathered mineral material that accumulated as bedrock disintegrated in place.

Rill

A very small, steep-sided channel resulting from erosion and cut in unconsolidated materials by concentrated but intermittent flow of water. A rill generally is not an obstacle to wheeled vehicles and is shallow enough to be smoothed over by ordinary tillage.

Riser

The vertical or steep side slope (e.g., escarpment) of terraces, flood-plain steps, or other stepped landforms; commonly a recurring part of a series of natural, steplike landforms, such as successive stream terraces.

Road cut

A sloping surface produced by mechanical means during road construction. It is commonly on the uphill side of the road.

Rock fragments

Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Rock outcrop (map symbol)

An exposure of bedrock at the surface of the earth. Not used where the named soils of the surrounding map unit are shallow over bedrock or where “Rock outcrop” is a named component of the map unit.

Root zone

The part of the soil that can be penetrated by plant roots.

Runoff

The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Saline soil

A soil containing soluble salts in an amount that impairs growth of plants. A saline soil does not contain excess exchangeable sodium.

Saline spot (map symbol)

An area where the surface layer has an electrical conductivity of 8 mmhos/cm more than the surface layer of the named soils in the surrounding map unit. The surface layer of the surrounding soils has an electrical conductivity of 2 mmhos/cm or less.

Sand

As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sandstone

Sedimentary rock containing dominantly sand-sized particles.

Sandy spot (map symbol)

A spot where the surface layer is loamy fine sand or coarser in areas where the surface layer of the named soils in the surrounding map unit is very fine sandy loam or finer.

Sapric soil material (muck)

The most highly decomposed of all organic soil material. Muck has the least amount of plant fiber, the highest bulk density, and the lowest water content at saturation of all organic soil material.

Saturated hydraulic conductivity (Ksat)

The ease with which pores of a saturated soil transmit water. Formally, the proportionality coefficient that expresses the relationship of the rate of water movement to hydraulic gradient in Darcy's Law, a law that describes the rate of water movement through porous media. Commonly abbreviated as "Ksat." Terms describing saturated hydraulic conductivity are:

Very high: 100 or more micrometers per second (14.17 or more inches per hour)

High: 10 to 100 micrometers per second (1.417 to 14.17 inches per hour)

Moderately high: 1 to 10 micrometers per second (0.1417 inch to 1.417 inches per hour)

Moderately low: 0.1 to 1 micrometer per second (0.01417 to 0.1417 inch per hour)

Low: 0.01 to 0.1 micrometer per second (0.001417 to 0.01417 inch per hour)

Very low: Less than 0.01 micrometer per second (less than 0.001417 inch per hour).

To convert inches per hour to micrometers per second, multiply inches per hour by 7.0572. To convert micrometers per second to inches per hour, multiply micrometers per second by 0.1417.

Saturation

Wetness characterized by zero or positive pressure of the soil water. Under conditions of saturation, the water will flow from the soil matrix into an unlined auger hole.

Scarification

The act of abrading, scratching, loosening, crushing, or modifying the surface to increase water absorption or to provide a more tillable soil.

Sedimentary rock

A consolidated deposit of clastic particles, chemical precipitates, or organic remains accumulated at or near the surface of the earth under normal low temperature and pressure conditions. Sedimentary rocks include consolidated equivalents of alluvium, colluvium, drift, and eolian, lacustrine, and marine deposits. Examples are sandstone, siltstone, mudstone, claystone, shale, conglomerate, limestone, dolomite, and coal.

Sequum

A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

Series, soil

A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Severely eroded spot (map symbol)

An area where, on the average, 75 percent or more of the original surface layer has been lost because of accelerated erosion. Not used in map units in which “severely eroded,” “very severely eroded,” or “gullied” is part of the map unit name.

Shale

Sedimentary rock that formed by the hardening of a deposit of clay, silty clay, or silty clay loam and that has a tendency to split into thin layers.

Sheet erosion

The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

Short, steep slope (map symbol)

A narrow area of soil having slopes that are at least two slope classes steeper than the slope class of the surrounding map unit.

Shoulder

The convex, erosional surface near the top of a hillslope. A shoulder is a transition from summit to backslope.

Shrink-swell

The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Shrub-coppice dune

A small, streamlined dune that forms around brush and clump vegetation.

Side slope (geomorphology)

A geomorphic component of hills consisting of a laterally planar area of a hillside. The overland waterflow is predominantly parallel. Side slopes are dominantly colluvium and slope-wash sediments.

Silica

A combination of silicon and oxygen. The mineral form is called quartz.

Silica-sesquioxide ratio

The ratio of the number of molecules of silica to the number of molecules of alumina and iron oxide. The more highly weathered soils or their clay fractions in warm-temperate, humid regions, and especially those in the tropics, generally have a low ratio.

Silt

As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Siltstone

An indurated silt having the texture and composition of shale but lacking its fine lamination or fissility; a massive mudstone in which silt predominates over clay.

Similar soils

Soils that share limits of diagnostic criteria, behave and perform in a similar manner, and have similar conservation needs or management requirements for the major land uses in the survey area.

Sinkhole (map symbol)

A closed, circular or elliptical depression, commonly funnel shaped, characterized by subsurface drainage and formed either by dissolution of the surface of underlying bedrock (e.g., limestone, gypsum, or salt) or by collapse of underlying caves within bedrock. Complexes of sinkholes in carbonate-rock terrain are the main components of karst topography.

Site index

A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75.

Slickensides (pedogenic)

Grooved, striated, and/or glossy (shiny) slip faces on structural peds, such as wedges; produced by shrink-swell processes, most commonly in soils that have a high content of expansive clays.

Slide or slip (map symbol)

A prominent landform scar or ridge caused by fairly recent mass movement or descent of earthy material resulting from failure of earth or rock under shear stress along one or several surfaces.

Slope

The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

Slope alluvium

Sediment gradually transported down the slopes of mountains or hills primarily by nonchannel alluvial processes (i.e., slope-wash processes) and characterized by particle sorting. Lateral particle sorting is evident on long slopes. In a profile sequence, sediments may be distinguished by differences in size and/or specific gravity of rock fragments and may be separated by stone lines. Burnished peds and sorting of rounded or subrounded pebbles or cobbles distinguish these materials from unsorted colluvial deposits.

Slow refill

The slow filling of ponds, resulting from restricted water transmission in the soil.

Slow water movement

Restricted downward movement of water through the soil. See Saturated hydraulic conductivity.

Sodic (alkali) soil

A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Sodic spot (map symbol)

An area where the surface layer has a sodium adsorption ratio that is at least 10 more than that of the surface layer of the named soils in the surrounding map unit. The surface layer of the surrounding soils has a sodium adsorption ratio of 5 or less.

Sodicity

The degree to which a soil is affected by exchangeable sodium. Sodicity is expressed as a sodium adsorption ratio (SAR) of a saturation extract, or the ratio of Na^{+} to $Ca^{++} + Mg^{++}$. The degrees of sodicity and their respective ratios are:

Slight: Less than 13:1
Moderate: 13-30:1
Strong: More than 30:1

Sodium adsorption ratio (SAR)

A measure of the amount of sodium (Na) relative to calcium (Ca) and magnesium (Mg) in the water extract from saturated soil paste. It is the ratio of the Na concentration divided by the square root of one-half of the Ca + Mg concentration.

Soft bedrock

Bedrock that can be excavated with trenching machines, backhoes, small rippers, and other equipment commonly used in construction.

Soil

A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief and by the passage of time.

Soil separates

Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand: 2.0 to 1.0
Coarse sand: 1.0 to 0.5
Medium sand: 0.5 to 0.25
Fine sand: 0.25 to 0.10
Very fine sand: 0.10 to 0.05
Silt: 0.05 to 0.002
Clay: Less than 0.002

Solum

The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the material below the solum. The living roots and plant and animal activities are largely confined to the solum.

Spoil area (map symbol)

A pile of earthy materials, either smoothed or uneven, resulting from human activity.

Stone line

In a vertical cross section, a line formed by scattered fragments or a discrete layer of angular and subangular rock fragments (commonly a gravel- or cobble-sized lag concentration) that formerly was draped across a topographic surface and was later buried by additional sediments. A stone line generally caps material that was subject to weathering, soil formation, and erosion before burial. Many stone lines seem to be buried erosion pavements, originally formed by sheet and rill erosion across the land surface.

Stones

Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter if rounded or 15 to 24 inches (38 to 60 centimeters) in length if flat.

Stony

Refers to a soil containing stones in numbers that interfere with or prevent tillage.

Stony spot (map symbol)

A spot where 0.01 to 0.1 percent of the soil surface is covered by rock fragments that are more than 10 inches in diameter in areas where the surrounding soil has no surface stones.

Strath terrace

A type of stream terrace; formed as an erosional surface cut on bedrock and thinly mantled with stream deposits (alluvium).

Stream terrace

One of a series of platforms in a stream valley, flanking and more or less parallel to the stream channel, originally formed near the level of the stream; represents the remnants of an abandoned flood plain, stream bed, or valley floor produced during a former state of fluvial erosion or deposition.

Stripcropping

Growing crops in a systematic arrangement of strips or bands that provide vegetative barriers to wind erosion and water erosion.

Structure, soil

The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are:

Platy: Flat and laminated

Prismatic: Vertically elongated and having flat tops

Columnar: Vertically elongated and having rounded tops

Angular blocky: Having faces that intersect at sharp angles (planes)

Subangular blocky: Having subrounded and planar faces (no sharp angles)

Granular: Small structural units with curved or very irregular faces

Structureless soil horizons are defined as follows:

Single grained: Entirely noncoherent (each grain by itself), as in loose sand

Massive: Occurring as a coherent mass

Stubble mulch

Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from wind erosion and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

Subsoil

Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsoiling

Tilling a soil below normal plow depth, ordinarily to shatter a hardpan or claypan.

Substratum

The part of the soil below the solum.

Subsurface layer

Any surface soil horizon (A, E, AB, or EB) below the surface layer.

Summer fallow

The tillage of uncropped land during the summer to control weeds and allow storage of moisture in the soil for the growth of a later crop. A practice common in semiarid regions, where annual precipitation is not enough to produce a crop every year. Summer fallow is frequently practiced before planting winter grain.

Summit

The topographically highest position of a hillslope. It has a nearly level (planar or only slightly convex) surface.

Surface layer

The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the “plow layer,” or the “Ap horizon.”

Surface soil

The A, E, AB, and EB horizons, considered collectively. It includes all subdivisions of these horizons.

Talus

Rock fragments of any size or shape (commonly coarse and angular) derived from and lying at the base of a cliff or very steep rock slope. The accumulated mass of such loose broken rock formed chiefly by falling, rolling, or sliding.

Taxadjuncts

Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior. Soils are recognized as taxadjuncts only when one or more of their characteristics are slightly outside the range defined for the family of the series for which the soils are named.

Terminal moraine

An end moraine that marks the farthest advance of a glacier. It typically has the form of a massive arcuate or concentric ridge, or complex of ridges, and is underlain by till and other types of drift.

Terrace (conservation)

An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet. A terrace in a field

generally is built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

Terrace (geomorphology)

A steplike surface, bordering a valley floor or shoreline, that represents the former position of a flood plain, lake, or seashore. The term is usually applied both to the relatively flat summit surface (tread) that was cut or built by stream or wave action and to the steeper descending slope (scarp or riser) that has graded to a lower base level of erosion.

Terracettes

Small, irregular steplike forms on steep hillslopes, especially in pasture, formed by creep or erosion of surficial materials that may be induced or enhanced by trampling of livestock, such as sheep or cattle.

Texture, soil

The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying “coarse,” “fine,” or “very fine.”

Thin layer

Otherwise suitable soil material that is too thin for the specified use.

Till

Dominantly unsorted and nonstratified drift, generally unconsolidated and deposited directly by a glacier without subsequent reworking by meltwater, and consisting of a heterogeneous mixture of clay, silt, sand, gravel, stones, and boulders; rock fragments of various lithologies are embedded within a finer matrix that can range from clay to sandy loam.

Till plain

An extensive area of level to gently undulating soils underlain predominantly by till and bounded at the distal end by subordinate recessional or end moraines.

Tilth, soil

The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Toeslope

The gently inclined surface at the base of a hillslope. Toeslopes in profile are commonly gentle and linear and are constructional surfaces forming the lower part of a hillslope continuum that grades to valley or closed-depression floors.

Topsoil

The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Trace elements

Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, in soils in extremely small amounts. They are essential to plant growth.

Tread

The flat to gently sloping, topmost, laterally extensive slope of terraces, flood-plain steps, or other stepped landforms; commonly a recurring part of a series of natural steplike landforms, such as successive stream terraces.

Tuff

A generic term for any consolidated or cemented deposit that is 50 percent or more volcanic ash.

Upland

An informal, general term for the higher ground of a region, in contrast with a low-lying adjacent area, such as a valley or plain, or for land at a higher elevation than the flood plain or low stream terrace; land above the footslope zone of the hillslope continuum.

Valley fill

The unconsolidated sediment deposited by any agent (water, wind, ice, or mass wasting) so as to fill or partly fill a valley.

Variegation

Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.

Varve

A sedimentary layer or a lamina or sequence of laminae deposited in a body of still water within a year. Specifically, a thin pair of graded glaciolacustrine layers seasonally deposited, usually by meltwater streams, in a glacial lake or other body of still water in front of a glacier.

Very stony spot (map symbol)

A spot where 0.1 to 3.0 percent of the soil surface is covered by rock fragments that are more than 10 inches in diameter in areas where the surface of the surrounding soil is covered by less than 0.01 percent stones.

Water bars

Smooth, shallow ditches or depressional areas that are excavated at an angle across a sloping road. They are used to reduce the downward velocity of water and divert it off and away from the road surface. Water bars can easily be driven over if constructed properly.

Weathering

All physical disintegration, chemical decomposition, and biologically induced changes in rocks or other deposits at or near the earth’s surface by atmospheric or biologic agents or by circulating surface waters but involving essentially no transport of the altered material.

Well graded

Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Wet spot (map symbol)

A somewhat poorly drained to very poorly drained area that is at least two drainage classes wetter than the named soils in the surrounding map unit.

Wilting point (or permanent wilting point)

The moisture content of soil, on an ovendry basis, at which a plant (specifically a sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

Windthrow

The uprooting and tipping over of trees by the wind.

ATTACHMENT C

FEMA Flood Insurance Rate Maps

89°31'52.95"W 35°45'6.61"N

Begin Project
Town Of Ripley
470100
AREA OF MINIMAL FLOOD HAZARD
Zone X
Lauderdale County
470133
Zone AE
Zone AE
Zone AE

89°30'W 35°45'13.2"N

Zone AE
Zone AH
Zone AO
Zone A
Zone X
Zone D
Zone VE
Zone AE
Zone AE
Zone A

89°29'4.68"W 35°45'26.41"N

89°21'31.26"W 35°37'3.7"N

FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR DRAFT FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) Zone A, V, 499
- With BFE or Depth Zone AE, AO, AH, VE, AR
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
- Future Conditions 1% Annual Chance Flood Hazard Zone X
- Area with Reduced Flood Risk due to Levee See Notes Zone X
- Area with Flood Risk due to Levee Zone D

LINK><a> </CLR>for official maps and additional

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard Zone X
- Effective LOMRs
- Area of Undetermined Flood Hazard Zone D

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary

NOTES TO USERS

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For community and countywide map dates, refer to the Flood Insurance Study Report for this jurisdiction.

To determine if flood insurance is available in this community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

Basemap information shown on this FIRM was provided in digital format by USDA, Farm Service Agency (FSA). This information was derived from NAIP, dated April 11, 2018.

This map was exported from FEMA's National Flood Hazard Layer (NFHL) on **10/28/2025 8:38 PM** and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time. For additional information, please see the Flood Hazard Mapping Updates Overview Fact Sheet at https://www.fema.gov/media-library/assets/documents/118418

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SCALE

Map Projection:
GCS, Geodetic Reference System 1980;
Vertical Datum: No elevation features on this FIRM
For information about the specific vertical datum for elevation features, datum conversions, or vertical monuments used to create this map, please see the Flood Insurance Study (FIS) Report for your community at https://msc.fema.gov

1 inch = 2,000 feet 1:24,000

0 1,000 2,000 4,000 6,000 8,000 Feet

N

0 210 420 840 1,260 1,680 Meters

National Flood Insurance Program

FEMA

NATIONAL FLOOD INSURANCE PROGRAM

FLOOD INSURANCE RATE MAP

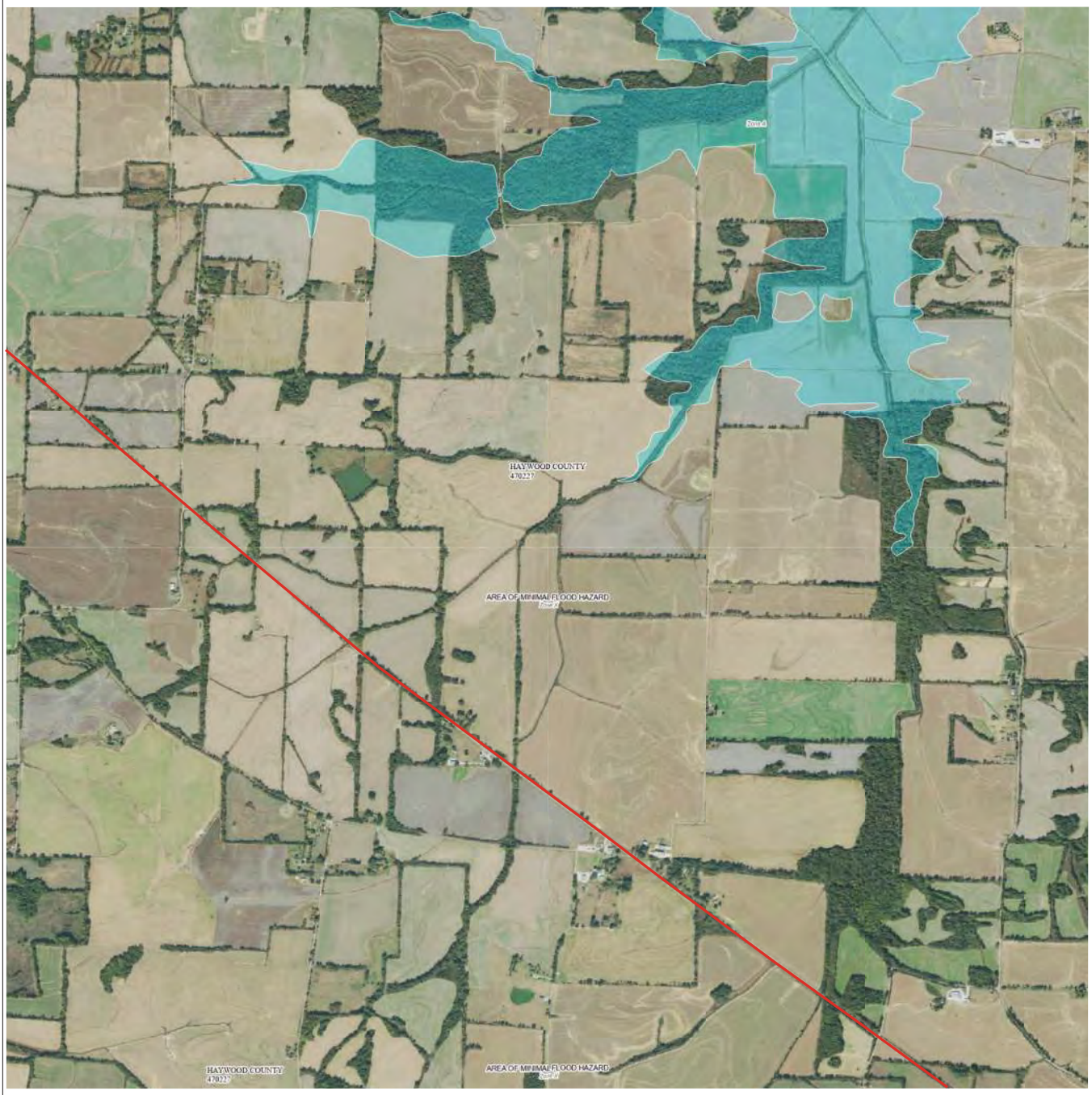
PANEL 100 OF 400

Panel Contains:

COMMUNITY	NUMBER	PANEL
HAYWOOD COUNTY	470333	0100
LAUDERDALE COUNTY		

MAP NUMBER
47075C0100D
EFFECTIVE DATE
April 16, 2008

89°22'30.79"W 35°41'28.24"N



89°18'44.08"W 35°37'16.88"N

FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR DRAFT FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) Zone A, V, A99
- With BFE or Depth Zone AE, AO, AH, VE, AR
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
- Future Conditions 1% Annual Chance Flood Hazard Zone X
- Area with Reduced Flood Risk due to Levee See Notes Zone X
- Area with Flood Risk due to Levee Zone D

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OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard Zone X
- Effective LOMRs
- Area of Undetermined Flood Hazard Zone D

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary

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SCALE

Map Projection:
GCS, Geodetic Reference System 1980;
Vertical Datum: No elevation features on this FIRM
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1 inch = 1,000 feet 1:12,000

0 500 1,000 2,000 3,000 4,000 Feet

N

0 105 210 420 630 840 Meters

FEMA National Flood Insurance Program

NATIONAL FLOOD INSURANCE PROGRAM

FLOOD INSURANCE RATE MAP

PANEL **115** OF **400**

Panel Contains:

COMMUNITY	NUMBER	PANEL
HAYWOOD COUNTY	470227	0115

MAP NUMBER
47075C0115D
EFFECTIVE DATE
April 16, 2008

89°22'30.79"W 35°37'43.24"N

89°18'44.08"W 35°33'31.88"N

FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR DRAFT FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee See Notes *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary

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For community and countywide map dates, refer to the Flood Insurance Study Report for this jurisdiction.

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SCALE

Map Projection:
GCS, Geodetic Reference System 1980;
Vertical Datum: No elevation features on this FIRM
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1 inch = 1,000 feet 1:12,000

0 500 1,000 2,000 3,000 4,000 Feet

N

0 105 210 420 630 840 Meters

FEMA National Flood Insurance Program

NATIONAL FLOOD INSURANCE PROGRAM

FLOOD INSURANCE RATE MAP

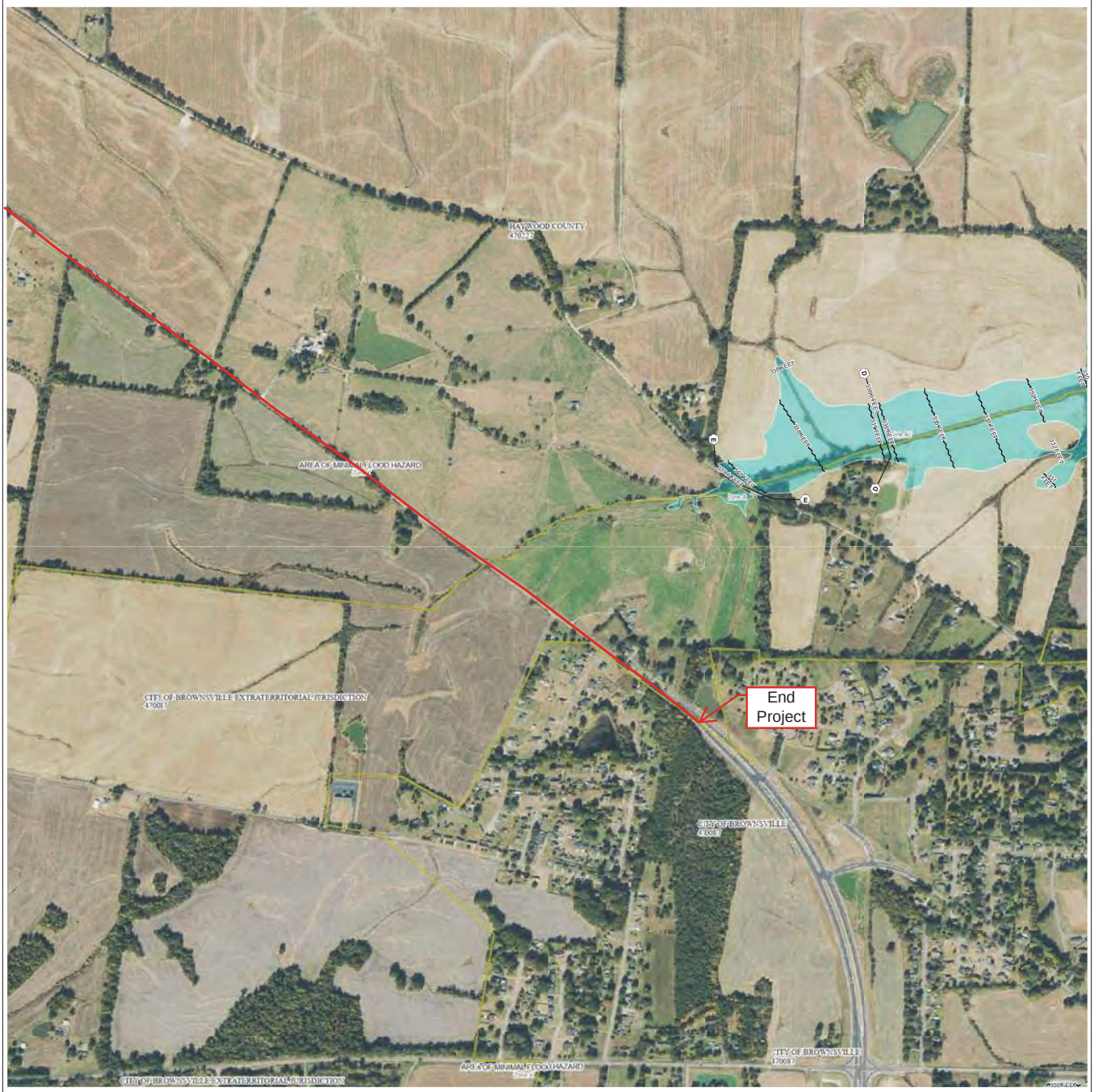
PANEL **230** OF **400**

Panel Contains:

COMMUNITY	NUMBER	PANEL
HAYWOOD COUNTY	470087	0230
CITY OF BROWNSVILLE		
EXTRATERRITORIAL JURISDICTION		

MAP NUMBER
47075C0230D
EFFECTIVE DATE
April 16, 2008

89°18'45.43"W 35°37'36.67"N



89°16'52.07"W 35°35'30.99"N

FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR DRAFT FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) Zone A, V, A99
- With BFE or Depth Zone AE, AO, AH, VE, AR
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
- Future Conditions 1% Annual Chance Flood Hazard Zone X
- Area with Reduced Flood Risk due to Levee See Notes Zone X
- Area with Flood Risk due to Levee Zone D

LINK><la> </CLR>for official maps and additional

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard Zone X
- Effective LOMRs
- Area of Undetermined Flood Hazard Zone D

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary

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For community and countywide map dates, refer to the Flood Insurance Study Report for this jurisdiction.

To determine if flood insurance is available in this community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

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This map was exported from FEMA's National Flood Hazard Layer (NFHL) on **10/28/2025 3:06 PM** and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time. For additional information, please see the Flood Hazard Mapping Updates Overview Fact Sheet at https://www.fema.gov/media-library/assets/documents/118418

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SCALE

Map Projection:
GCS, Geodetic Reference System 1980;
Vertical Datum: NAVD88
For information about the specific vertical datum for elevation features, datum conversions, or vertical monuments used to create this map, please see the Flood Insurance Study (FIS) Report for your community at https://msc.fema.gov

1 inch = 500 feet 1:6,000

0 250 500 1,000 1,500 2,000 Feet

N

0 50 100 200 300 400 Meters

FEMA National Flood Insurance Program

NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP
PANEL **231** OF **400**

Panel Contains:

COMMUNITY	NUMBER	PANEL
HAYWOOD COUNTY	470227	0231
CITY OF BROWNSVILLE	470087	0231
EXTRATERRITORIAL JURISDICTION		
CITY OF BROWNSVILLE	470087	0231

MAP NUMBER
47075C0231D
EFFECTIVE DATE
April 16, 2008

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
STRUCTURES DIVISION
SUITE 1100, JAMES K. POLK BUILDING
NASHVILLE, TENNESSEE 37243-1402
(615) 741-0339

BUTCH ELEY
DEPUTY GOVERNOR &
COMMISSIONER OF TRANSPORTATION

BILL LEE
GOVERNOR

January 14, 2025

Mr. Ben Webb, P.E.
Region 4 Project Management
300 Benchmark Place
Jackson, TN 38301

Subject: PIN: 102251.01
Project: 49005-1228-14
State Route 19: West of Eastland Ave. (L.M. 21.95) to Haywood County Line (L.M. 26.14) Lauderdale County

Dear Mr. Webb:

This office has completed the hydraulic analysis of the subject project and is forwarding the following hydraulic information for your use in completing plans. The proposed grade received July 16, 2024 is satisfactory for final design.

The proposed structure at station 279+75 over a branch will be a 18' x 9', 45° skew concrete box bridge with inlet and outlet rip-rap protection. The following information must be included in the plans on the profile sheet.

Station 279+75----------	18' x 9', 45° skew, RCB	
Drainage Area ----------	0.37	mi2
Design Discharge (100 YR) ----------	610	cfs
100 YR Backwater ----------	1.20	ft. at El. 368.26
100 YR Velocity ----------	5.31	fps
500 YR Discharge ----------	732	cfs at El. 368.59
Inlet Invert Elevation ----------	359.42	
Outlet Invert Elevation ----------	359.22	
Approach Overtopping Elevation ------	370.49	
Standard Drawing Numbers ----------	STD-17-66	

The proposed structure at station 304+00 over a branch will be a 3 @ 18' x 12', 90° skew concrete box bridge with inlet and outlet rip-rap protection. The following information must be included in the plans on the profile sheet.

Station 304+00----------	3 @ 18' x 12', 90° skew, RCB	
Drainage Area ----------	2.19	mi2
Design Discharge (100 YR) ----------	1700	cfs
100 YR Backwater ----------	0.83	ft. at El. 364.41
100 YR Velocity ----------	3.26	fps
500 YR Discharge ----------	2070	cfs at El. 365.12
Inlet Invert Elevation ----------	351.68	
Outlet Invert Elevation ----------	351.09	

Approach Overtopping Elevation ------	364.51
Standard Drawing Numbers ----------	STD-17-107

The proposed structure at station 337+50 over a branch will be a 18' x 10', 45° skew concrete box culvert with inlet and outlet rip-rap protection. The following information must be included in the plans on the profile sheet.

Station 337+50----------	18' x 10', 45° skew, RCB	
Drainage Area ----------	0.90	mi^2
Design Discharge (100 YR) ----------	1020	cfs
100 YR Backwater ----------	0.57	ft. at El. 375.30
100 YR Velocity ----------	10.14	fps
500 YR Discharge ----------	1230	cfs at El. 375.99
Inlet Invert Elevation ----------	365.55	
Outlet Invert Elevation ----------	363.84	
Approach Overtopping Elevation ------	379.77	
Standard Drawing Numbers ----------	STD-17-66	

Comments:

- Adequate ROW should be provided for rip-rap slope protection at culvert headwalls.
- The size of the box culvert includes the necessary height to account for required AOP embedment, which is to be 2 feet or 20% of the culvert height, whichever is greater.
- Traffic is to be maintained utilizing phased construction.
- Channel dredging and removal of existing road fill will be required between stations 279+50 and 280+00, 303+50 and 304+50, & 337+00 and 338+00.
- This project is in a designated FEMA floodplain, but no detailed study has been done. Our office has determined that we have not increased the base flood elevation by more than one foot and that we are in compliance with FEMA standards.

If you have any questions or if we can be of any further assistance, you may contact this office at (615) 741-3351.

Sincerely,

Jason Randolph

(for)
Ted Kniazewycz, P.E.
Engineering Director, Structures

cc: Mr. Gary Scruggs, P.E.
Mr. Ryan Philpott, P.E.
R4 EnvTechOffice
Mr. Robbie Stephens, P.E.
Ms. Traci Smith, P.E.
TDOT.Env Permits
TDOT.Env NEPA
TDOT.Env Ecology
Mr. Dan Shike, P.E.
Ms. DJ Wiseman, P.E.
Mr. Adam Price, P.E.
Mr. Wesley Peck, P.E.