Appendix M:
Ecology

Environmental Studies

Ecology

Environmental Studies Request

Project Information

Route: State Route (SR) 162 Extension (Pellissippi Parkway)

Termini: From SR-33 to SR-73 (US-321)

County: Blount

PIN: 101423.00

Request

Request Type: Environmental Study Reevaluation

Project Plans: Right-of-Way Field Review

Date of Plans: 09/09/2022

Location: FTP

Link: https://tncloud.tn.gov/owncloud/index.php/s/H8A1M8oj87rz0MO
Password: tdot

Certification

Requestor: Katie McKeel

Title: Environmental Planner

Signature: Katherine McKeel

Digitally signed by Katherine McKeel
Date: 2022.10.24 14:16:48 -05'00'

Environmental Study

Technical Section

Section: Ecology

Study Results

The updated ecology information can be found in the EBR dated 5-25-23. A copy has been placed on FileNet.

Commitments

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

To minimize to potential of adversely affecting the federally endangered marbled darter (Etheostoma marmorpinnum), fine-rayed pigtoe (Fusconaia cuneolus), and the former federally threatened snail darter (Percina tanasi) the following commitments have been added to PPRM and need to be included in the project plans:

1. Clearing and grubbing will be limited to the minimum amount necessary to accommodate roadway cut and fill slopes and operation of construction equipment. All disturbed areas will be stabilized, seeded, and mulched as soon as practicable to reduce the potential for soil erosion.

2. Canopy removal along any streams located within the project limits will be kept to the absolute minimum necessary to accommodate project construction.

3. Silt fence with backing will be installed along the toe of all fills and along all streambanks to minimize the potential of sediment from the project entering area streams. A minimum ten (10) foot vegetated buffer or “green belt” will be left between silt fences and the stream edges where possible.

4. Erosion and sediment control measures will be installed concurrent with clearing and grubbing activities and will be functional prior to commencement of earthmoving activities. Measures may include, but are not limited to, silt fence with backing, clean shot rock checkdams, sandbags, sediment ponds, sediment filter bags, sediment wattles, slope drains, or other suitable methods.

5. Erosion control structures will be inspected regularly and maintained throughout the life of the project so that they are not rendered ineffective. Sediment will be removed from structures as necessary and must be removed when design capacity has been reduced by 50% to insure maximum effectiveness. Material removed from these structures will not be disposed of in any area streams or wetlands.

6. Maintenance needs for erosion and sediment control structures identified during inspections or by other means will be accomplished within twenty-four (24) hours, if possible. If maintenance prior to the next anticipated storm event is impractical, it will be accomplished as soon as practicable.

7. Waste and borrow areas will be developed in accordance with the procedures outlined in the TDOT Statewide Stormwater Management Program for Construction Projects. These sites will be located in non-wetland areas and are to be a sufficient distance from area streams and/or wetlands so that no soil material is allowed to enter them.

These areas will be stabilized as soon as practicable. Appropriate erosion and sediment control measures will be used in these areas as needed to minimize soil loss.

8. Stockpiled topsoil or fill material will be treated in such a manner that is not allowed to enter any area streams or wetlands.

9. Equipment staging areas will be located a sufficient distance from streams and wetlands so that no oils, coolants, fuels, or other petroleum products are allowed to enter these features.

10. Drainage structures required at stream crossings will be constructed “in the dry”. Stream flows will be diverted through work areas using flexible pipes or berms or channels lined with plastic, clean shot rock, or other non-erodible material. All water from dewatering areas will be pumped into filter bags or sediment ponds prior to release back into a stream.

11. No motorized equipment will be operated in any streams or wetlands in the project limits except as specified in the project water quality permits.

12. A Stormwater Pollution Prevention Plan (SWPPP) will be prepared for the proposed project and will contain a detailed erosion and sediment control plan based on a five year storm event as requested by the USFWS. A copy of the SWPPP will be available on-site.

13. Weekly stormwater inspections will be conducted for the proposed project as per National Pollutant Discharge Elimination System (NPDES) guidelines.

Additional Information

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

Type: Environmental Boundaries Report (EBR)

Location: FileNet

Certification

Responder: Keven Brown

Title: Env. Supv.

Signature: Keven Brown

Digitally signed by Keven Brown
Date: 2023.05.25 12:32:38 -04'00'

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
ENVIRONMENTAL DIVISION – REGION ONE
ENVIRONMENTAL TECHNICAL STUDIES OFFICE
7345 REGION LANE
KNOXVILLE, TENNESSEE 37914
(865) 594-2400

BUTCH ELEY
DEPUTY GOVERNOR &
COMMISSIONER OF TRANSPORTATION

BILL LEE
GOVERNOR

MEMORANDUM

To: Stacy Weaver
Region 1 Project Development

From: Keven Brown
Region 1 ETO

Date: 5-25-23

Subject: Modified Environmental Boundaries Report for:
Blount County, SR-162 EXT (Pellissippi Pkwy) from SR-33 to SR-73 (US 321)
PIN: 101423.00

An ecological evaluation of the subject project has been conducted in response to a change in project scope and ROW field review plans dated 9-9-22 with the following results:

STREAMS: *Seven (7) perennial streams, one (1) spring, three (3) intermittent streams, nine (9) ephemeral streams, and two (2) WWC's were identified within proposed project limits.*

WETLANDS: *Eight (8) wetlands were identified within proposed project limits.*

OTHER FEATURES: *Three (3) ponds were identified within proposed project limits.*

SPECIES:

- *USFWS: USFWS coordination was completed on 2-11-2020. A finding of "not likely to adversely affect" was provided for five federally listed species.*
- *TWRA: TWRA coordination was completed on 2-28-2020. There were no species concerns.*
- *TDEC DNA: The proposed project will be covered under the March 2023 MOA between TDOT, FHWA and TDEC/DNH.*

COMMITMENTS: *To minimize to potential of adversely affecting the federally endangered marbled darter (Etheostoma marmorpinnum), fine-rayed pigtoe (Fusconaia cuneolus), and the former federally threatened snail darter (Percina tanasi) the following commitments have been added to PPRM and need to be included in the project plans:*

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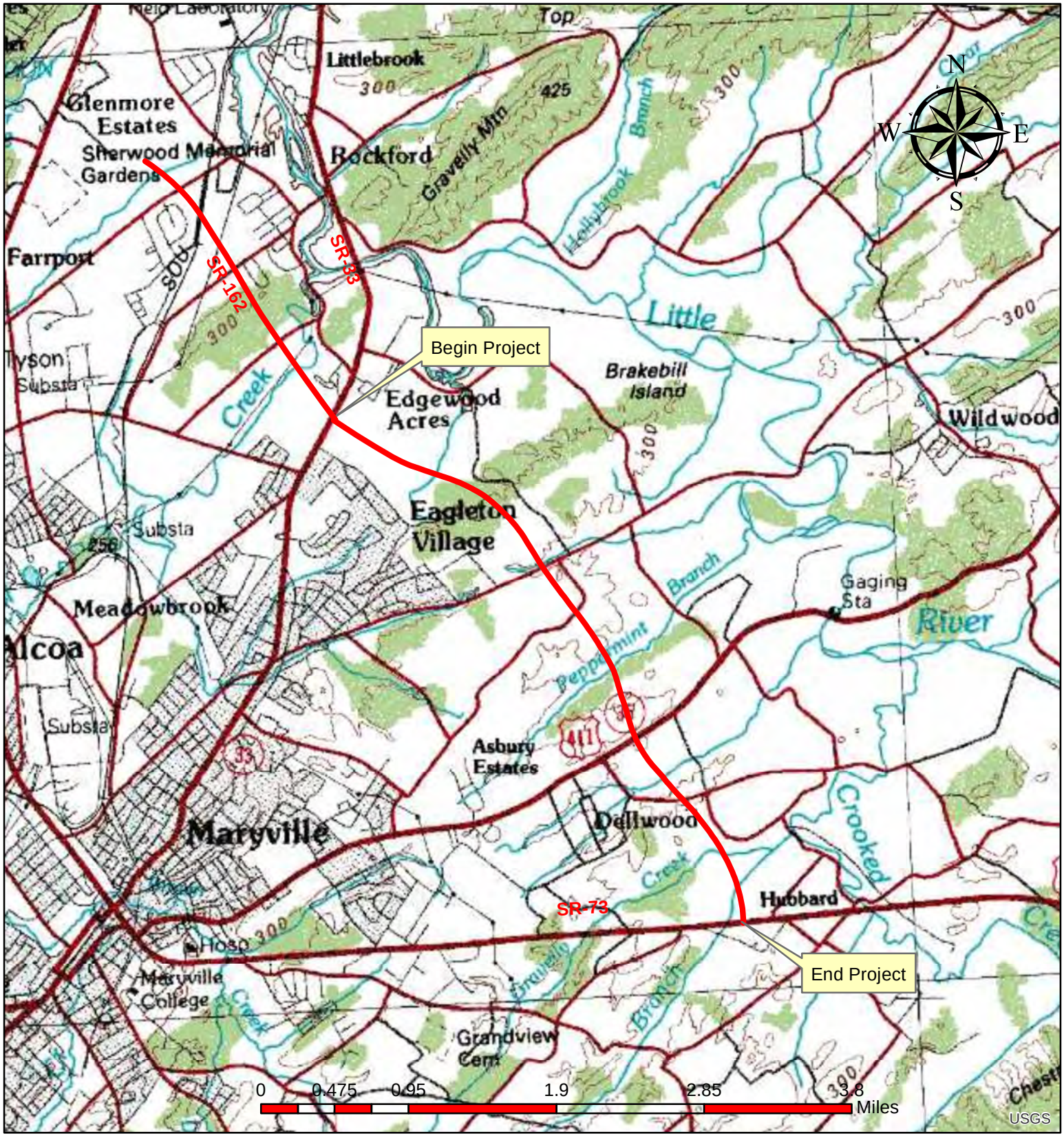
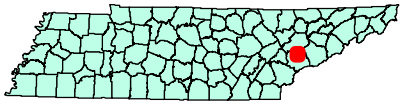
13. Weekly stormwater inspections will be conducted for the proposed project as per National Pollutant Discharge Elimination System (NPDES) guidelines.

Thank you for your assistance with this project. If you have any questions or comments please contact Keven Brown in the Region 1 Ecology Section at 865-594-2437 or Keven.Brown@tn.gov.

xc: *Region 1 Project Development:* Dexter Justis, John Barrett, Michael Palmer
Design Lead: Stacy Weaver
HQ Ecology: Shawn Wurst, Dennis Crumby
HQ Permits: Kristen Taylor, Claire Sichko
HQ Structures: Wesley Peck
Region 1 Survey Office: Kent Fox
Region 1 Permits: Ethan Saturday
TDOT.Env.Ecology@tn.gov
TDOT.Env.Permits@tn.gov
TDOT.Env.Mitigation@tn.gov
TDOT.Env.NEPA@tn.gov

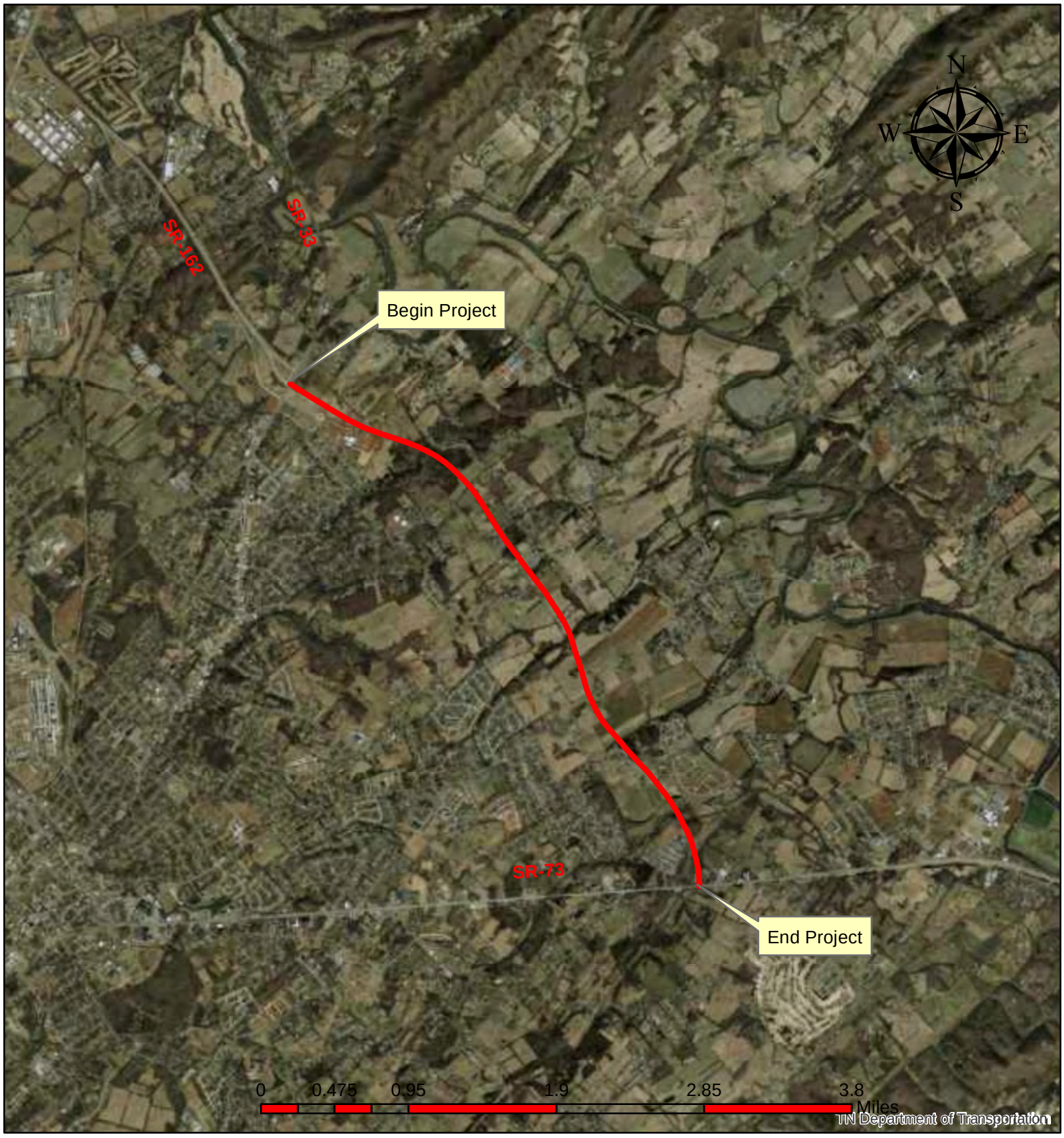


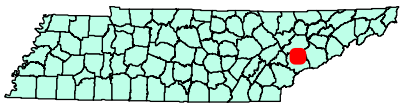


Project Location Map - topo
SR-162EXT from SR-33 to SR-73
Blount County

Maryville 147-SW, Wildwood 147-SE,
Blockhouse 148-NW, Kinzel Springs 148-NE

1-29-2020
PIN 101423.00 P.E. No. 05097-0229-14

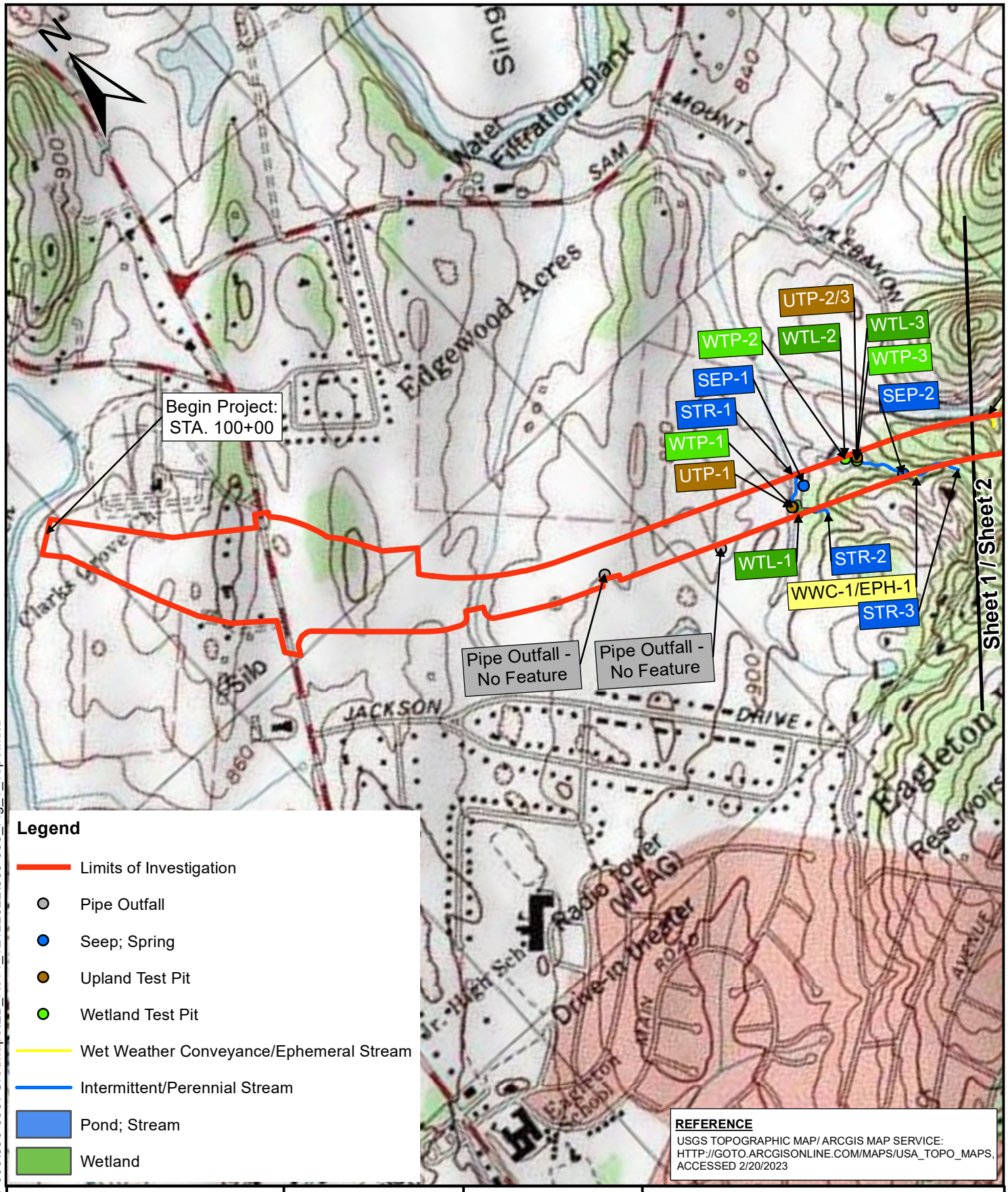




Project Location Map - aerial
SR-162EXT from SR-33 to SR-73
Blount County

Maryville 147-SW, Wildwood 147-SE,
Blockhouse 148-NW, Kinzel Springs 148-NE

1-29-2020
PIN 101423.00 P.E. No. 05097-0229-14



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SCALE: 1:12,000

DATE: 2/20/2023

USGS TOPOGRAPHIC MAP
SR-162EXT (PELLISSIPPI PKWY)
FROM SR-33 TO SR-73
BLOUNT COUNTY, TENNESSEE
TDOT PROJ. NO. 05097-0229-14; PIN 101423.00

ISSUED FOR: TDOT

TN TDOT Department of Transportation

ISSUED BY:

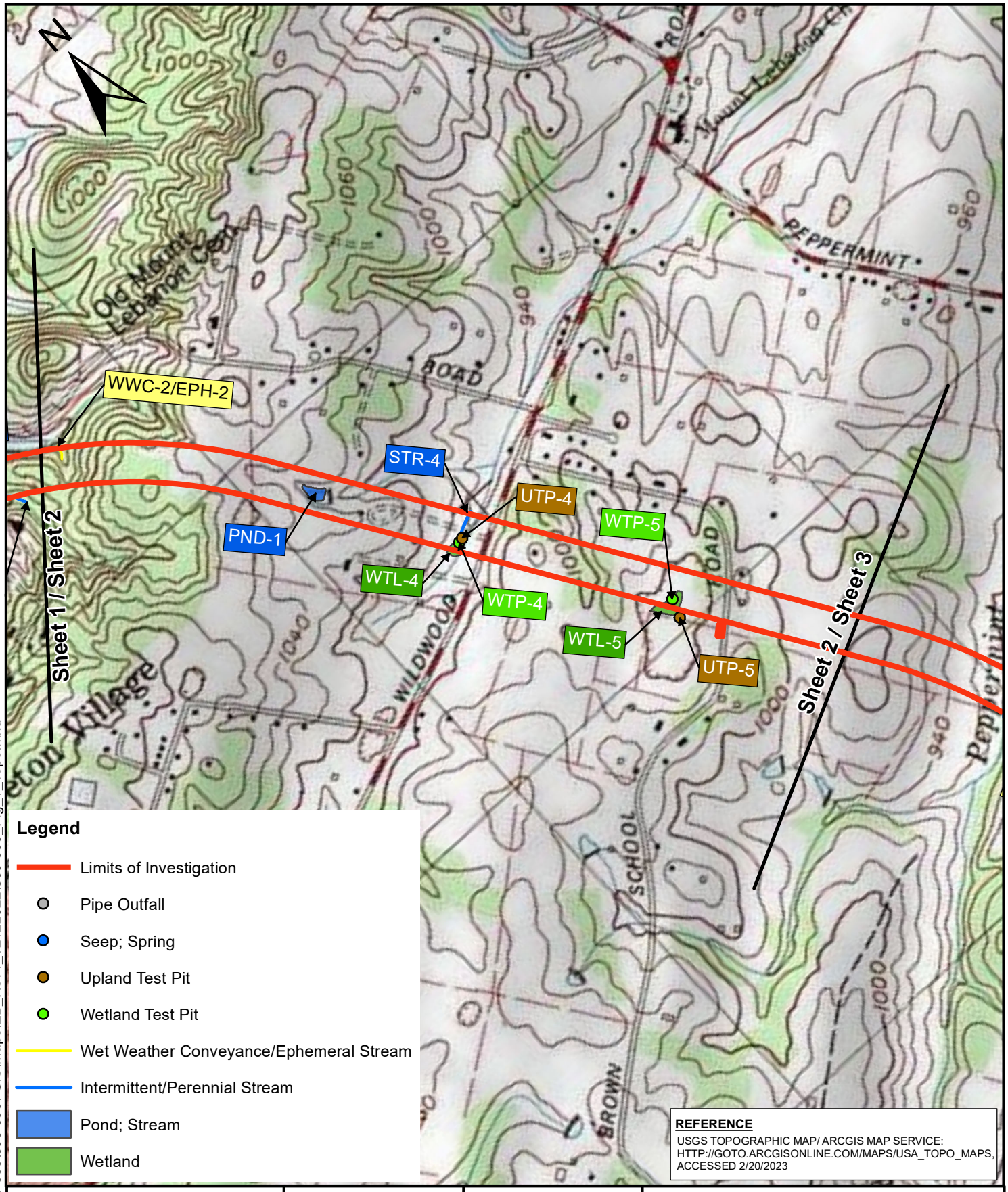
CIVIL & ENVIRONMENTAL CONSULTANTS, INC.
117 Seaboard Lane, Ste E100, Franklin, TN 37067
615-333-7797 800-763-2326
www.cecinc.com

DRAWN BY: DRS | CHECKED BY: TJN | APPRVD BY: TJN * Hand signature on file

PROJECT NO.: 300-999

FIGURE: 1 SHEET: 1 of 4

Document Path: P:\300-000\300-999\-GIS\Maps\EB_Rev1_12122022\300-999_Fig_1_Topo.mxd



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PROJECT NO.: 300-999

FIGURE: 1 SHEET: 2 of 4

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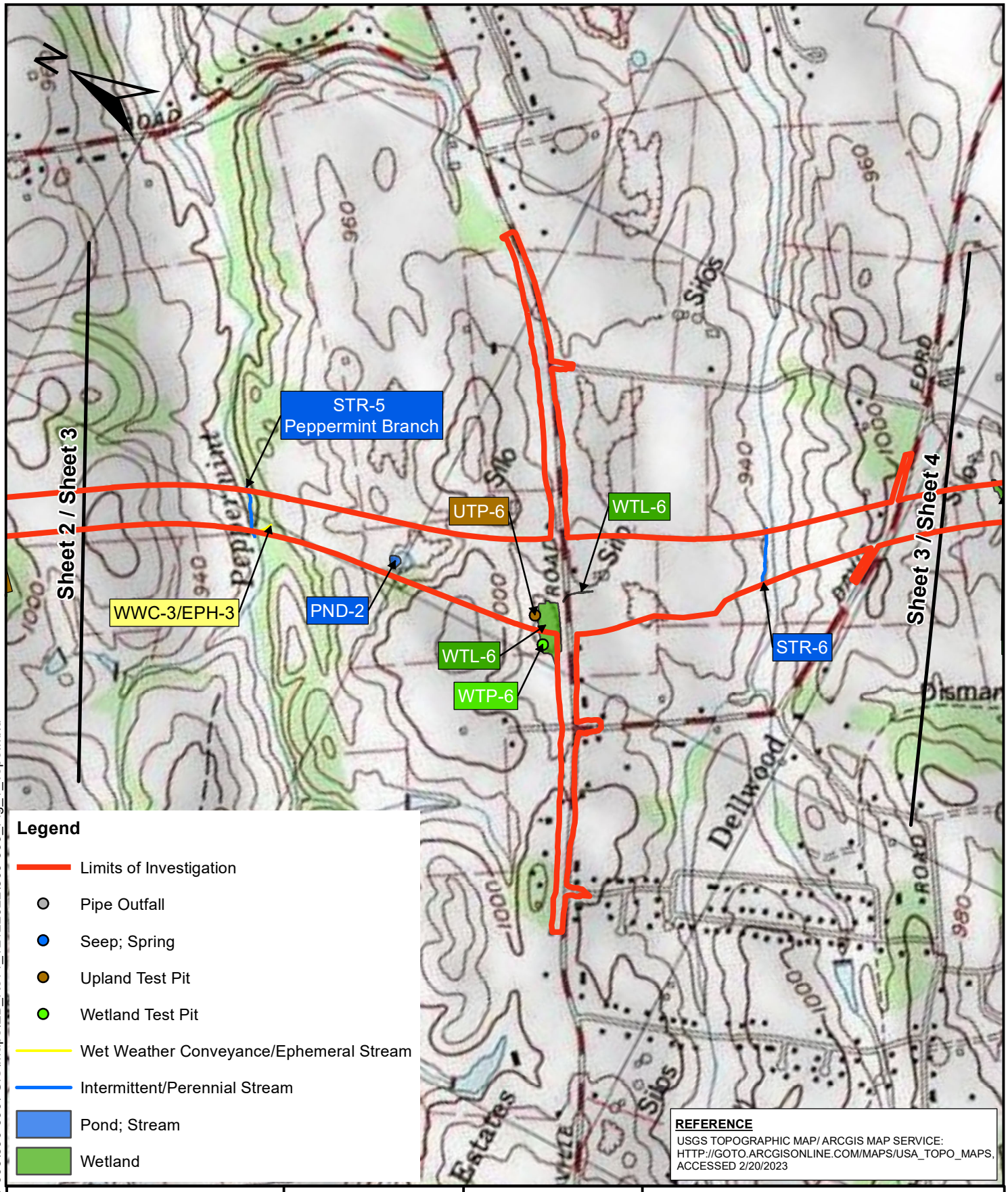

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PROJECT NO.: 300-999

FIGURE: 1 SHEET: 3 of 4

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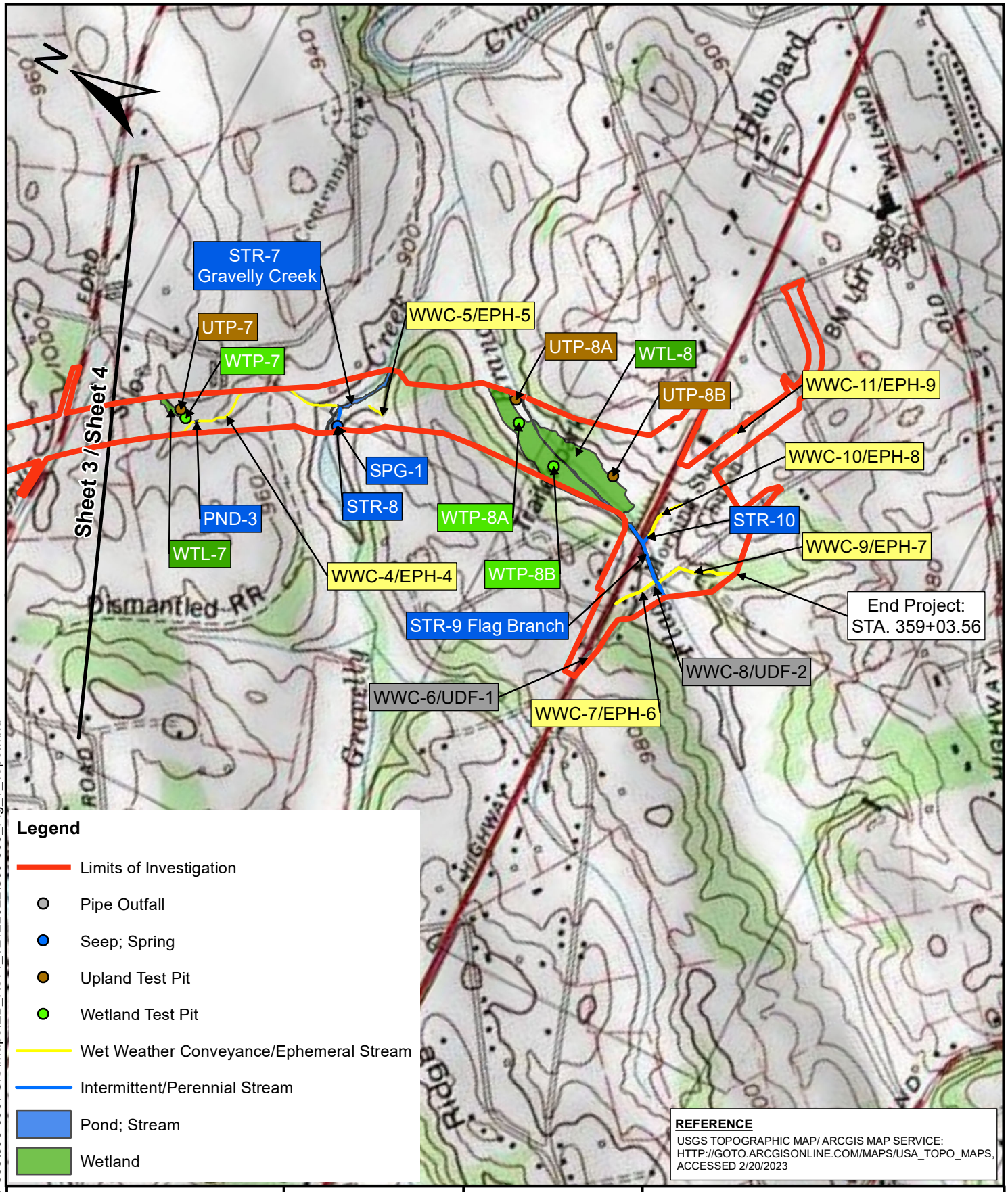

Legend

- Limits of Investigation
- Pipe Outfall
- Seep; Spring
- Upland Test Pit
- Wetland Test Pit
- Wet Weather Conveyance/Ephemeral Stream
- Intermittent/Perennial Stream
- Pond; Stream
- Wetland

REFERENCE

USGS TOPOGRAPHIC MAP/ ARCGIS MAP SERVICE: HTTP://GOTO.ARCGISONLINE.COM/MAPS/USA_TOPO_MAPS, ACCESSED 2/20/2023

0 0.05 0.1 0.2 Miles

SCALE: 1:12,000

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USGS TOPOGRAPHIC MAP
SR-162EXT (PELLISSIPPI PKWY)
FROM SR-33 TO SR-73
BLOUNT COUNTY, TENNESSEE
TDOT PROJ. NO. 05097-0229-14; PIN 101423.00

DRAWN BY: DRS | CHECKED BY: TJN | APPRVD BY: TJN * Hand signature on file | PROJECT NO.: 300-999 | FIGURE: 1 SHEET: 4 of 4

Document Path: P:\300-000\300-999\-GIS\Maps\EB_Rev1_12122022\300-999_Fig_1_Topo.mxd

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Feet

DRAWN BY: DRS | CHECKED BY: TJN

APPROVED BY: TJN *Hand signature on file

DATE: 02/08/2023

TN TDOT Department of Transportation

ISSUED FOR: TDOT ENVIRONMENTAL DIVISION, NATURAL RESOURCES OFFICE

ISSUED BY:

CIVIL & ENVIRONMENTAL CONSULTANTS, INC.
325 Seaboard Lane, Suite 170
Franklin, TN 37067
615-333-7797

AERIAL MAP
SR-162EXT (PELLISSIPPI PKWY)
FROM SR-33 TO SR-73
BLOUNT COUNTY, TENNESSEE
TDOT PROJECT# 05097-0229-14; PIN 101423.00

PROJECT NO.: 300-999

FIGURE: 2 SHEET: 1 of 4

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Feet

DRAWN BY: DRS | CHECKED BY: TJN

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FROM SR-33 TO SR-73
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TDOT PROJECT# 05097-0229-14; PIN 101423.00

PROJECT NO.: 300-999

FIGURE: 2 SHEET: 2 of 4

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Feet

DRAWN BY: DRS | CHECKED BY: TJN

APPROVED BY: TJN *Hand signature on file

DATE: 02/08/2023

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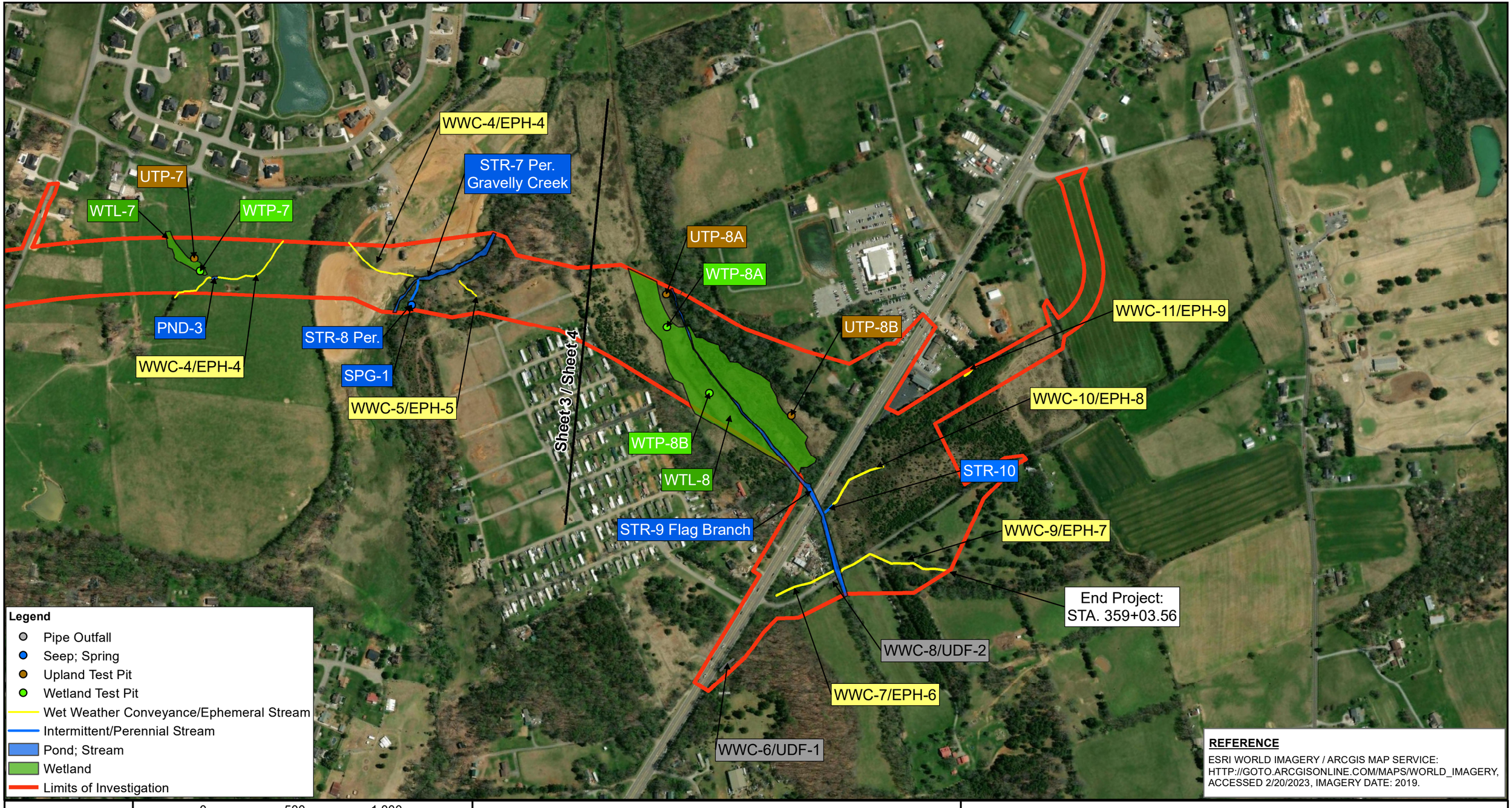
BLOUNT COUNTY, TENNESSEE
TDOT PROJECT# 05097-0229-14; PIN 101423.00

PROJECT NO.: 300-999

FIGURE: 2 SHEET: 3 of 4



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PROJECT NO.: 300-999

FIGURE: 2 SHEET: 4 of 4

Project Name: SR-162EXT (Pellissippi Pkwy), from SR-33 to SR-73, Blount Co. **PIN:** 101423.00

Water Resource Table

Based on: Plans

Date: 9-9-22

Water Resources (Non-Wetland)					
Label	**Type**	**Latitude**	**Longitude**	**Receiving Waters**	**Quality**
STR-1 (Little River)	Perennial Stream	35.799804	-83.9288	Fort Loudon Lake	Not Supporting
STR-2	Intermittent Stream	35.79908	-83.928666	Little River	Unassessed
STR-3	Perennial Stream	35.798605	-83.926485	Little River	Unassessed
WWC-1/EPH-1	Wet Weather Conveyance/Ephemeral	35.798325	-83.926281	Little River	Not Applicable
WWC-2/EPH-2	Wet Weather Conveyance/Ephemeral	35.79814	-83.923818	Little River	Not Applicable
PND-1	Pond	35.793956	-83.919551	Peppermint Br.	Not Applicable
STR-4	Intermittent Stream	35.791379	-83.917162	Peppermint Br.	Unassessed
STR-5 (Peppermint Branch)	Perennial Stream	35.781098	-83.909443	Little River	Not Supporting/Impaired (303(d))
WWC-3/EPH-3	Wet Weather Conveyance/Ephemeral	35.780695	-83.909693	Peppermint Br.	Not Applicable
PND-2	Pond	35.777928	-83.908763	Peppermint Br.	Not Applicable
STR-6	Perennial Stream	35.771102	-83.904057	Peppermint Br.	Unassessed
STR-7 (Gravelly Creek)	Perennial Stream	35.764001	-83.897296	Little River	Not Supporting/Impaired (303(d))
PND-3	Pond	35.766699	-83.899656	Gravelly Cr.	Not Applicable
WWC-4/EPH-4	Wet Weather Conveyance/Ephemeral	35.766186	-83.899102	Gravelly Cr.	Not Applicable
SPR-1/STR-8	Perennial Stream	35.764105	-83.897791	Gravelly Cr.	Unassessed
WWC-5/EPH-5	Wet Weather Conveyance/Ephemeral	35.763496	-83.897791	Gravelly Cr.	Not Applicable
STR-9 (Flag Branch)	Perennial Stream	35.758568	-83.896265	Little River	Not Supporting/Impaired (303(d))
STR-10	Intermittent Stream	35.757165	-83.896688	Flag Branch	Unassessed
WWC-6/UDF-1	Wet Weather Conveyance	35.757102	-83.900126	Flag Branch	Not Applicable
WWC-7/EPH-6	Wet Weather Conveyance/Ephemeral	35.756814	-83.898076	Flag Branch	Not Applicable
WWC-8/UDF-2	Wet Weather Conveyance	35.756507	-83.897697	Flag Branch	Not Applicable
WWC-9/EPH-7	Wet Weather Conveyance/Ephemeral	35.755962	-83.896882	Flag Branch	Not Applicable
WWC-10/EPH-8	Wet Weather Conveyance/Ephemeral	35.757146	-83.896006	Flag Branch	Not Applicable
WWC-11/EPH-9	Wet Weather Conveyance/Ephemeral	35.756606	-83.893151	Flag Branch	Not Applicable

Water Resources (Wetland)

Label	Type	Latitude	Longitude	Receiving Waters	Quality
WTL-1	Emergent	35.799418	-83.929094	Little river	Low Resource Value
WTL-2	Emergent	35.79963	-83.927324	Little River	Low Resource Value
WTL-3	Forested	35.799389	-83.927169	Little River	Moderate Resource Value
WTL-4	Emergent	35.791129	-83.917747	Peppermint Br.	Moderate Resource Value
WTL-5	Emergent	35.787216	-83.914535	Peppermint Br.	Low Resource Value
WTL-6	Emergent	35.77436	-83.90838	Peppermint Br.	Low Resource Value
WTL-7	Emergent	35.767268	-83.899646	Gravelly Cr.	Low Resource Value
WTL-8	Emergent	35.759458	-83.895975	Flag Branch	Moderate Resource Value

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: SR-162 (Pellissippi Pkwy.) PIN 101423.00 City/County: Maryville/Blount Sampling Date: May 5, 2020
Applicant/Owner: TDOT State: TN Sampling Point: WTL-1
Investigator(s): Caleb Duke, Casey Hertwig Section, Township, Range: N/A
Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): Concave Slope (%): 0-2
Subregion (LRR or MLRA): LRR N Lat: 35.79952 Long: -83.92916 Datum: NAD 83
Soil Map Unit Name: Hamblen silt loam, drainageway, 0 to 2 percent slopes, occasionally flooded NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)
Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐
Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks:
Size: > 0.22 ac.

Photos: 4, 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)
- ☐ True Aquatic Plants (B14)
- ☑ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☑ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☑ No ☐ Depth (inches): .5
Water Table Present? Yes ☑ No ☐ Depth (inches): 4
Saturation Present? (includes capillary fringe) Yes ☑ No ☐ Depth (inches): 0

Wetland Hydrology Present? Yes ☑ No ☐

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

Remarks:

VEGETATION (Five Strata) – Use scientific names of plants. Sampling Point: WTL-1

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 0.1)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Sapling Stratum (Plot size: 0.1)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Shrub Stratum (Plot size: 0.1)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Herb Stratum (Plot size: 0.1)			
1. *Nasturtium officinale*	25	Yes	OBL
2. *Juncus effusus*	15	Yes	FACW
3. *Leersia oryzoides*	15	Yes	OBL
4. *Panicum phyladelphicum*	10	No	FAC
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	65 = Total Cover		
50% of total cover: 32.5	20% of total cover: 13		
Woody Vine Stratum (Plot size: 0.1)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

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

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

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ☑ No ☐

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

SOIL Sampling Point: WTL-1

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	2.5Y 4/2	95	10YR 4/4	5	C	M	Clay Loam	
6-12	2.5Y 5/2	70	10YR 4/6	30	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:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ☑ **No** ☐

Remarks:

Wetland Background Information

Name(s) of Field Personnel: C. Hertwig/C. Duke	
Assessment Date: 5-5-2020	
Agency/Organization: CEC, Inc.	
Office Address: 117 Seaboard Ln., Suite E 100, Franklin, TN 37067	
Phone Number: 615-333-7797	
E-mail Address: chertwig@cecinc.com	
Wetland Name(s): WTL-1	
Wetland Location: Include drawing or map of project area limits or attach map showing location and project area limits, county, nearest street address, and narrative description of location, etc. Wetland is located at 35.79952; -83.92916 within a cattle pasture. See Figure 2.	
Watershed (12-Digit HUC): 060102010110	
Lat/Long (dd.dddd, -dd.dddd) or UTM Coordinates (m easting, m northing): 35.79952; -83.92916	
Circle coordinate system used: **NAD83** **WGS84** **UTM** **NAD27**	
USGS Quad Name: Maryville	
Depicted on National Wetland Inventory Map: (Y/N) N	
Soil Survey Map Units, Hydric Rating: Hamblen silt loam, drainageway, 0 to 2 percent slopes, occasionally flooded	
Cowardin Wetland Type(s): PEM	
HGM Classification: Depression	
Final Score:	29.75

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	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
SEASONALLY INUNDATED DEPRESSION WETLANDS

Date: 5-5-2020 Project Name SR-162EXT Pellissippi Pkwy

Field Personnel C. Hertwig/C. Duke 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: Wetland Depth (WETDEPTH)

1. Wetland Depth not impacted (SI = 1.0)
   - no fill material or sediment - outlet unaltered - no excavation
   - no ditches/drainage tiles - runoff/input unaltered
2. Wetland depth slightly impacted (SI = 0.75)
   - portion of site with minimal fill material or sediment - outlet lowered/raised - minor excavation
   - portion of site with ditches/drainage tiles - runoff/input increased
3. Wetland depth moderately impacted (SI = 0.5)
   - portion of site with moderate fill material or sediment - outlet lowered/raised - moderate excavation
   - portion of site with ditches/drainage tiles - increased hydroperiod
4. Wetland depth significantly impacted (SI = 0.25)
   - portion of site with significant fill material or sediment - outlet lowered/raised - significant excavation
   - portion of site with ditches/drainage tiles - increased hydroperiod
5. Wetland depth severely impacted (SI = 0.1)
   - excessive fill material or sediment - outlet removed/blocked - entire wetland affected
   - numerous ditches/drainage tiles - increased hydroperiod - recovery potential lost

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 30
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 _____
D = Percentage high density residential, or similar 30
E = Percentage urban, commercial, industrial, or similar 5

V2 = (A x 1.0) + (B x 0.75) + (C x 0.5) + (D x 0.25) + (E x 0.01)/(100) = 0.64

V3: Canopy Tree Size Class (TSIZE)

1. Average size of canopy trees > 3 in. DBH
   __ ≥ 13 in. (SI = 1.0) __ 10 – 12 in. (SI = 0.75) __ 6 – 9 in. (SI = 0.5) __ 4 – 5 in. (SI = 0.25)
   __ < 4 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
   __ 3 – 7 (SI = 1.0) __ 8 – 11 (SI = 0.75) __ > 11 (SI = 0.5) __ 1 – 2 (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 as a Group 2 species. 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 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 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).
   V8= 0.75

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 of 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**
2. This value is the SI for **V9**= 0.03

VALUES USED TO CALCULATE FUNCTIONAL CAPACITY INDICES (FCIs)

SUBINDEX VALUES:

V1 0.25 (WETDEPTH) V3 0 (TSIZE) V5 0 (SCOV) V7 0.70 (COMP) V9 0.03 (BUFFER)

V2 0.64 (WSHEDINT) V4 0 (TDEN) V6 0.75 (GVC) V8 0.75 (ORGANIC)

TRAM Summary Worksheet

Exceptional Status Wetlands		**Check if applicable**
	1. **ONRW**	NA
	2. **ETW**	NA
	3. **Further Review Requested:** Attach Wetland Background and Exceptional Status Wetlands Worksheet	NA
	COMMENTS/NOTES:	
Quantitative Rating scores	Function: Hydrologic Regime	0.4
	Function: Biogeochemical Processes	0.35
	Function: Retain Particulates	
	Function: Plant Community	0.23
	Function: Wildlife Community	0.21
	Quantitative Score (Average of FCIs x 100)	29.75
	Value Added (Significant Size) Total	
Total of Quantitative and Value Added Scores	**TOTAL SCORE**	29.75

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: SR-162 (Pellissippi Pkwy.) PIN 101423.00 City/County: Maryville/Blount Sampling Date: May 5, 2020
Applicant/Owner: TDOT State: TN Sampling Point: UTP-1
Investigator(s): Caleb Duke, Casey Hertwig Section, Township, Range: N/A
Landform (hillslope, terrace, etc.): Pasture Local relief (concave, convex, none): Convex Slope (%): 0-2
Subregion (LRR or MLRA): LRR N Lat: 35.79957 Long: -83.92928 Datum: NAD 83
Soil Map Unit Name: Litz Silt Loam NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)
Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐
Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks:
Photo: 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)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ☐ No ☑	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 (Five Strata) – Use scientific names of plants. Sampling Point: UTP-1

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 0.1)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Sapling Stratum (Plot size: 0.1)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Shrub Stratum (Plot size: 0.1)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Herb Stratum (Plot size: 0.1)			
1. *Festuca rubra*	70	Yes	NL
2. *Andropogon virginicus*	25	Yes	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	95 = Total Cover		
50% of total cover: 47.5	20% of total cover: 19		
Woody Vine Stratum (Plot size: 0.1)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	25	x 3 =	75
FACU species	0	x 4 =	0
UPL species	70	x 5 =	350
Column Totals:	95 (A)		425 (B)

Prevalence Index = B/A = 4.47

Hydrophytic Vegetation Indicators:

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

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

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ☐ No ☑

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

SOIL Sampling Point: UTP-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
12	10YR 4/4	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:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ☐ **No** ☑

Remarks:

Ecology Field Data Sheet: **Water Resources**

Project: SR-162 (Pellissippi Pkwy.) PIN 101423.00					
Biologist:	C. Duke, C. Hertwig	**Affiliation:**	CEC, Inc.	**Date:**	May 5, 2020

1-Station: from plans	158+10 R to 159+00 L				
2-Map label and name	STR-1				
3-Latitude/Longitude	35.79981; -83.92886				
4-Feature description:					
-channel identification	perennial stream ☑	intermittent stream ☐	ephemeral stream ☐	wwc ☐	
-HD score (if applicable)	Primary; Fish, Benthics, GW Connection				
-OHWM indicators	bed & banks ☑	deposition ☐	presence of litter / debris ☑	scour ☐	veg absent, bent, matted ☑
	change in plant community ☐	destruction of terrestrial veg ☐	multiple observed flow events ☐	sediment sorting ☑	water staining ☑
	change in soil character ☐	leaf litter disturbed or absent ☐	natural line impressed on bank ☐	shelving ☐	wracking ☑
-channel bottom width	1-2'	-top of bank width	3-4'		
-width at ordinary high water mark	3-4'				
-bank height	LDB - 3'	RDB - 3'			
-riffle/pool complex or other specialized habitat present?	No				
-dominant riparian species: ----------(LDB /RDB)----------	LDB: fescue, bluestem, Autumn olive, little leaf buttercup				
	RDB: fescue, bluestem, Autumn olive, little leaf buttercup				
-date of PJD request					
5-photo numbers	7, 8 , 11 SEP-1				
6-HUC -8 Code & Name	06010201; Ft. Loudoun/Watts Bar				
7-Assessed	yes ☑	no ☐			
8-ETW	yes ☐	no ☑			
9-303 (d) List	yes ☑	siltation ☐	habitat: ☐	other: ☑	
	no ☐	The Little River is listed for Mercury (atmospheric deposition)			
10-Notes	STR-1 drains through WTL-1 and is located in a cattle pasture. Degradation from cattle grazing is evident. SEP-1 is in proximity to STR-1.				
Substrate	gravel				

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Blount	Named Waterbody: N/A	Date/Time: 05/05/2020 2:42 PM
Assessors/Affiliation: Caleb Duke, CEC Inc., Casey Hertwig, CEC Inc.		Project ID: STR-1
Site Name/Description: SR-162 (Pellissippi Pkwy.) PIN 101423.00		
Site Location: Maryville, TN		
USGS quad: Maryville	HUC (12 digit): 060102010110	Lat/Long: 35.79973; -83.92899
Previous Rainfall (7-days) : 0.10" Previous 48 hours; 0.85" previous 7-days		
Precipitation this Season vs. Normal : ☐ very wet ☑ wet ☐ average ☐ dry ☐ drought ☐ unknown Source of recent & seasonal precip data : https://lakeinfo.tva.gov/web/precip.htm		
Watershed Size : 0.19 sqmi	Photos: Y or N (circle) Number : 7, 8	
Soil Type(s) / Geology : Litz silt loam, moderately steep phase		
Surrounding Land Use : Pasture		
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	☑	WWC ☐
2. Defined bed and bank absent, dominated by upland vegetation / grass	☑	WWC ☐
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	☑	WWC ☐
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	☑	WWC ☐
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	☐	Stream ☑
6. Presence of fish (except *Gambusia*)	☐	Stream ☑
7. Presence of naturally occurring ground water table connection	☐	Stream ☑
8. Flowing water in channel and 7 days since last precipitation in local watershed	☑	Stream ☐
9. Evidence watercourse has been used as a supply of drinking water	☑	Stream ☐

NOTE : If any Primary Indicators 1-9 = "Yes", then STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = N/A

Justification / Notes :

Two Species of Caddisflies, one stone fly and fish were observed in the stream.

Ecology Field Data Sheet: **Water Resources**

Project: SR-162 (Pellissippi Pkwy.) PIN 101423.00					
Biologist:	C. Duke, C. Hertwig	**Affiliation:**	CEC, Inc.	**Date:**	May 5, 2020

1-Station: from plans	161+50R to 160+50R				
2-Map label and name	STR-2				
3-Latitude/Longitude	35.79922; -83.92899				
4-Feature description:					
-channel identification	perennial stream ☐	intermittent stream ☑	ephemeral stream ☐	wwc ☐	
-HD score (if applicable)	24.5				
-OHWM indicators	bed & banks ☑	deposition ☐	presence of litter / debris ☑	scour ☐	veg absent, bent, matted ☑
	change in plant community ☑	destruction of terrestrial veg ☐	multiple observed flow events ☐	sediment sorting ☑	water staining ☑
	change in soil character ☐	leaf litter disturbed or absent ☐	natural line impressed on bank ☐	shelving ☐	wracking ☑
-channel bottom width	2-3'	-top of bank width	8-10'		
-width at ordinary high water mark	4-5'				
-bank height	LDB - 2-4'	RDB - 2-4'			
-riffle/pool complex or other specialized habitat present?	No				
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Tulip poplar, multiflora rose, American beech, hackberry, privet				
	RDB: Tulip poplar, multiflora rose, American beech, hackberry, privet				
-date of PJD request					
5-photo numbers	9, 10				
6-HUC -8 Code & Name	06010201; Ft. Loudoun/Watts Bar				
7-Assessed	yes ☐	no ☑			
8-ETW	yes ☐	no ☑			
9-303 (d) List	yes ☐	siltation ☐	habitat: ☐	other: ☐	
	no ☑				
10-Notes	STR-2 is located in a cattle pasture and drains into WTL-1.				
Substrate	silt, muck, some gravel				

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Blount	Named Waterbody: N/A	Date/Time: 05/05/2020 2:42 PM
Assessors/Affiliation: Caleb Duke, CEC Inc., Casey Hertwig, CEC Inc.		Project ID: STR-2
Site Name/Description: SR-162 (Pellissippi Pkwy.) PIN 101423.00		
Site Location: Maryville, TN		
USGS quad: Maryville	HUC (12 digit): 060102010110	Lat/Long: 35.79951; -83.92837
Previous Rainfall (7-days) : 0.10" Previous 48 hours; 0.85" previous 7-days		
Precipitation this Season vs. Normal : ☐ very wet ☑ wet ☐ average ☐ dry ☐ drought ☐ unknown Source of recent & seasonal precip data : https://lakeinfo.tva.gov/web/precip.htm		
Watershed Size : 0.01 sqmi	Photos: Y or N (circle) Number : 9, 10	
Soil Type(s) / Geology : Litz silt loam, moderately steep phase		
Surrounding Land Use : Forested, Pasture		
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	☑	WWC ☐
2. Defined bed and bank absent, dominated by upland vegetation / grass	☑	WWC ☐
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	☑	WWC ☐
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	☑	WWC ☐
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	☑	Stream ☐
6. Presence of fish (except *Gambusia*)	☑	Stream ☐
7. Presence of naturally occurring ground water table connection	☑	Stream ☐
8. Flowing water in channel and 7 days since last precipitation in local watershed	☑	Stream ☐
9. Evidence watercourse has been used as a supply of drinking water	☑	Stream ☐

NOTE : If any Primary Indicators 1-9 = "Yes", then STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = 24.5

Justification / Notes :

Secondary Field Indicator Evaluation

Project ID: STR-2

A. Geomorphology (Subtotal = 11)		**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	**2.5**	0	1	2	3
2. Sinuous channel	**1**	0	1	2	3
3. In-channel structure: riffle-pool sequences	**1**	0	1	2	3
4. Sorting of soil textures or other substrate	**1**	0	1	2	3
5. Active/relic floodplain	**0**	0	1	2	3
6. Depositional bars or benches	**2**	0	1	2	3
7. Braided channel	**0**	0	1	2	3
8. Recent alluvial deposits	**1**	0	0.5	1	1.5
9. Natural levees	**0**	0	1	2	3
10. Headcuts	**1**	0	1	2	3
11. Grade controls	**0.5**	0	0.5	1	1.5
12. Natural valley or drainageway	**1**	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map		**No = 0**			

B. Hydrology (Subtotal = 5.5)		**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	**1.5**	0	1	2	3
15. Water in channel and >48 hours since sig. rain	**NA**	0	1	2	3
16. Leaf litter in channel (January – September)	**1.5**	1.5	1	0.5	0
17. Sediment on plants or on debris	**0.5**	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	**0.5**	0	0.5	1	1.5
19. Hydric soils in stream bed or sides of channel		**Yes = 1.5**			

C. Biology (Subtotal = 8)		**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1]	**2**	3	2	1	0
21. Rooted plants in channel [1]	**3**	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	**0**	0	0.5	1	1.5
23. Bivalves/mussels	**0**	0	1	2	3
24. Amphibians	**0.5**	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	**1**	0	1	2	3
26. Filamentous algae; periphyton	**1**	0	1	2	3
27. Iron oxidizing bacteria/fungus	**0**	0	0.5	1	1.5
28.Wetland plants in channel [2]	**0.5**	0	0.5	1	2

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

Total Points = 24.5

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

Notes :

Flows to confluence with STR-1 and WTL-1.

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: SR-162 (Pellissippi Pkwy.) PIN 101423.00 City/County: Maryville/Blount Sampling Date: May 5, 2020
Applicant/Owner: TDOT State: TN Sampling Point: WTL-2
Investigator(s): Caleb Duke, Casey Hertwig Section, Township, Range: N/A
Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): Concave Slope (%): 0-2
Subregion (LRR or MLRA): LRR N Lat: 35.79952 Long: -83.92916 Datum: NAD 83
Soil Map Unit Name: Litz silt loam, moderately steep phase NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)
Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐
Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks:
Size: > 0.1 ac.

Photos: 12, 13

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ☐	No ☑	Depth (inches):
Water Table Present?	Yes ☑	No ☐	Depth (inches): 6
Saturation Present? (includes capillary fringe)	Yes ☑	No ☐	Depth (inches): 0

Wetland Hydrology Present? Yes ☑ No ☐

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

Remarks:

VEGETATION (Five Strata) – Use scientific names of plants. Sampling Point: WTL-2

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 0.1)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Sapling Stratum (Plot size: 0.1)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Shrub Stratum (Plot size: 0.1)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Herb Stratum (Plot size: 0.1)			
1. *Carex frankii*	40	Yes	OBL
2. *Ranunculus abortivus*	20	Yes	FACW
3. *Poa trivialis*	15	Yes	FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	65 = Total Cover		
50% of total cover: 32.5	20% of total cover: 13		
Woody Vine Stratum (Plot size: 0.1)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

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

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

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ☑ No ☐

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

SOIL Sampling Point: WTL-2

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	2.5Y 4/2	90	7.5YR 4/6	10	C	PL/ 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:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ☑ **No** ☐

Remarks:

Wetland Background Information

Name(s) of Field Personnel: C. Hertwig/C. Duke	
Assessment Date: 5-5-2020	
Agency/Organization: CEC, Inc.	
Office Address: 117 Seaboard Ln., Suite E 100, Franklin, TN 37067	
Phone Number: 615-333-7797	
E-mail Address: chertwig@cecinc.com	
Wetland Name(s): WTL-2	
Wetland Location: Include drawing or map of project area limits or attach map showing location and project area limits, county, nearest street address, and narrative description of location, etc. Wetland is located at 35.79952; -83.92916 within a cattle pasture. See Figure 2.	
Watershed (12-Digit HUC): 060102010110	
Lat/Long (dd.dddd, -dd.dddd) or UTM Coordinates (m easting, m northing): 35.79952; -83.92916	
Circle coordinate system used: **NAD83** **WGS84** **UTM** **NAD27**	
USGS Quad Name: Maryville	
Depicted on National Wetland Inventory Map: (Y/N) N	
Soil Survey Map Units, Hydric Rating: Litz silt loam, moderately steep phase	
Cowardin Wetland Type(s): PEM	
HGM Classification: Depression	
Final Score:	32.25

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	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
SEASONALLY INUNDATED DEPRESSION WETLANDS

Date: 5-5-2020 Project Name SR-162EXT Pellissippi Pkwy

Field Personnel C. Hertwig/C. Duke 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: Wetland Depth (WETDEPTH)

1. Wetland Depth not impacted (SI = 1.0)
   - no fill material or sediment - outlet unaltered - no excavation
   - no ditches/drainage tiles - runoff/input unaltered
2. Wetland depth slightly impacted (SI = 0.75)
   - portion of site with minimal fill material or sediment - outlet lowered/raised - minor excavation
   - portion of site with ditches/drainage tiles - runoff/input increased
3. Wetland depth moderately impacted (SI = 0.5)
   - portion of site with moderate fill material or sediment - outlet lowered/raised - moderate excavation
   - portion of site with ditches/drainage tiles - increased hydroperiod
4. Wetland depth significantly impacted (SI = 0.25)
   - portion of site with significant fill material or sediment - outlet lowered/raised - significant excavation
   - portion of site with ditches/drainage tiles - increased hydroperiod
5. Wetland depth severely impacted (SI = 0.1)
   - excessive fill material or sediment - outlet removed/blocked - entire wetland affected
   - numerous ditches/drainage tiles - increased hydroperiod - recovery potential lost

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 85
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 5

V2 = (A x 1.0) + (B x 0.75) + (C x 0.5) + (D x 0.25) + (E x 0.01)/(100) = 0.93

V3: Canopy Tree Size Class (TSIZE)

1. Average size of canopy trees > 3 in. DBH
   __ ≥ 13 in. (SI = 1.0) __ 10 – 12 in. (SI = 0.75) __ 6 – 9 in. (SI = 0.5) __ 4 – 5 in. (SI = 0.25)
   __ < 4 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
   __ 3 – 7 (SI = 1.0) __ 8 – 11 (SI = 0.75) __ > 11 (SI = 0.5) __ 1 – 2 (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 as a Group 2 species. 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.		X Bluegrass
__ _____	__ _____	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 = 0.44

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 0.22

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 is the SI for **V7**= 0.47

*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 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).
   V8= 0.75

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 of 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**
2. This value is the SI for **V9**= 0.1

VALUES USED TO CALCULATE FUNCTIONAL CAPACITY INDICES (FCIs)

SUBINDEX VALUES:

V1 0.25 (WETDEPTH) V3 0 (TSIZE) V5 0 (SCOV) V7 0.47 (COMP) V9 0.1 (BUFFER)

V2 0.93 (WSHEDINT) V4 0 (TDEN) V6 1 (GVC) V8 0.75 (ORGANIC)

TRAM Summary Worksheet

Exceptional Status Wetlands		**Check if applicable**
	1. **ONRW**	NA
	2. **ETW**	NA
	3. **Further Review Requested:** Attach Wetland Background and Exceptional Status Wetlands Worksheet	NA
	COMMENTS/NOTES:	
Quantitative Rating scores	Function: Hydrologic Regime	0.48
	Function: Biogeochemical Processes	0.39
	Function: Retain Particulates	
	Function: Plant Community	0.21
	Function: Wildlife Community	0.21
	Quantitative Score (Average of FCIs x 100)	32.25
	Value Added (Significant Size) Total	
Total of Quantitative and Value Added Scores	**TOTAL SCORE**	32.25

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: SR-162 (Pellissippi Pkwy.) PIN 101423.00 City/County: Maryville/Blount Sampling Date: May 6, 2020
Applicant/Owner: TDOT State: TN Sampling Point: WTL-3
Investigator(s): Caleb Duke, Casey Hertwig Section, Township, Range: N/A
Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): None Slope (%): 0-2
Subregion (LRR or MLRA): LRR N Lat: 35.79942 Long: -83.92715 Datum: NAD 83
Soil Map Unit Name: Litz silt loam, moderately steep phase NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)
Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐
Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks:
Size: 0.008 ac.

Photos: 14, 15

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☑ Depth (inches):
Water Table Present? Yes ☑ No ☐ Depth (inches): 8
Saturation Present? (includes capillary fringe) Yes ☑ No ☐ Depth (inches): 4

Wetland Hydrology Present? Yes ☑ No ☐

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

Remarks:

VEGETATION (Five Strata) – Use scientific names of plants. Sampling Point: WTL-3

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 0.1)			
1. *Liriodendron tulipifera*	25	Yes	FAC
2.			
3.			
4.			
5.			
6.			
	25 = Total Cover		
50% of total cover: 12.5	20% of total cover: 5		
Sapling Stratum (Plot size: 0.1)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Shrub Stratum (Plot size: 0.1)			
1. *Ligustrum sinense*	25	Yes	FACU
2.			
3.			
4.			
5.			
6.			
	25 = Total Cover		
50% of total cover: 12.5	20% of total cover: 5		
Herb Stratum (Plot size: 0.1)			
1. *Carex frankii*	10	Yes	OBL
2. *Juncus effusus*	1	No	FACW
3. *Glyceria striata*	10	Yes	OBL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	21 = Total Cover		
50% of total cover: 10.5	20% of total cover: 4.2		
Woody Vine Stratum (Plot size: 0.1)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

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 (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

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

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

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ☑ No ☐

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

SOIL Sampling Point: WTL-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
12	2.5Y 4/2	90	7.5YR 4/6	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:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ☑ **No** ☐

Remarks:

Wetland Background Information

Name(s) of Field Personnel: C. Hertwig/C. Duke	
Assessment Date: 5-5-2020	
Agency/Organization: CEC, Inc.	
Office Address: 117 Seaboard Ln., Suite E 100, Franklin, TN 37067	
Phone Number: 615-333-7797	
E-mail Address: chertwig@cecinc.com	
Wetland Name(s): WTL-3	
Wetland Location: Include drawing or map of project area limits or attach map showing location and project area limits, county, nearest street address, and narrative description of location, etc. Wetland is located at 35.79942; -83.92715 along the floodplain of STR-3. See Figure 2.	
Watershed (12-Digit HUC): 060102010110	
Lat/Long (dd.dddd, -dd.dddd) or UTM Coordinates (m easting, m northing): 35.79942; -83.92715	
Circle coordinate system used: **NAD83** **WGS84** **UTM** **NAD27**	
USGS Quad Name: Maryville	
Depicted on National Wetland Inventory Map: (Y/N) N	
Soil Survey Map Units, Hydric Rating: Litz silt loam, moderately steep phase	
Cowardin Wetland Type(s): PFO	
HGM Classification: Riverine	
Final Score:	42.6

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	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
RIVERINE WETLANDS

Date: 5-6-2020 Project Name SR-162EXT Pellissippi Pkwy

Field Personnel C. Hertwig/C. Duke 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: River Connection (RIVCON)

1. Overbank flooding has not been impacted (SI = 1.0)
   - no artificial levee(s), spoil piles, roads, or other obstructions
   - no channelization; channel is naturally meandering
   - no channel downcutting
   - no lateral cutting and no bank failure
   - flood frequency < 2 years
   - local knowledge
   - gauge data
2. Overbank flooding slightly impacted (SI = 0.75)
   -levee(s) etc. present but most overbank flooding occurs
   - channelization
   - slight channel downcutting
   - slight lateral cutting and bank failure
   - flooding frequency < 2 years
   - local knowledge
   - gauge data
3. Overbank flooding moderately impacted (SI = 0.5)
   - levee (s) etc. present but some overbank flow occurs
   - channelization
   - moderate channel downcutting
   - moderate lateral cutting and bank failure
   - local knowledge
   - gauge data
4. Overbank flooding significantly impacted (SI = 0.25)
   - levee (s) etc. present but some overbank flow occurs
   - channelization
   - significant channel downcutting
   - significant lateral cutting and bank failure
   - local knowledge
   - gauge data
5. Overbank flooding severely impacted (SI = 0.1)
   - levee(s) etc. have eliminated overbank flooding
   - channelization
   - severe channel downcutting
   - severe lateral cutting and bank failure
   - natural flood regime no longer occurs
   - local knowledge
   - gauge data

V2: Hydroperiod (HYDRO)

1. Hydrologic storage not altered (SI = 1.0)
   - no fill material or excessive sediment
   - no ditches/drainage tiles
   - no artificial levees or other structures that cause prolonged ponding
   - no land leveling
2. Hydrologic storage slightly impacted (SI = 0.75)
   - portion of site impacted by fill or excessive sediment
   - ditches/drainage tiles present over portion of site
   - portion of the site impacted by dikes or other structures that cause prolonged ponding
   - land leveling of portion of site
3. Hydrologic storage moderately impacted (SI = 0.50)
   - portion of site impacted by fill or excessive sediment
   -widely spaced ditches/drainage tiles present over entire site
   -portion of the site impacted by dikes or other structures that cause prolonged ponding
   - land leveling of portion of site
4. Hydrologic storage significantly impacted (SI = 0.25)
   - portion of site impacted by fill or excessive sediment
   -moderately spaced ditches/drainage tiles present over entire site
   -portion of the site impacted by dikes or other structures that cause prolonged ponding
   - land leveling of portion of site
5. Hydrologic storage severely impacted (SI = 0.1)
   - entire site impacted by fill, excessive sediment, or leveling
   - closely spaced ditches/tiles present over entire site
   - entire site impacted by dikes or other structures that cause prolonged ponding
   - land leveling of entire site

V3: Canopy Tree Size Class (TSIZE)

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

__ > 16 in. (SI = 1.0) __ 10 – 16 in. (SI = 0.75) __ 5 – 9 in. (SI = 0.5) __ 3 – 4 in. (SI = 0.25)

__ < 4 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

__ 8 – 16 (SI = 1.0) __ 17 – 50 (SI = 0.75) __ > 50 (SI = 0.5) __ 3 – 7 (SI = 0.5) __ 1– 2 (SI = 0.25)

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 as a Group 2 species. 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	__ Shumard oak	__ American elm	__ River birch	European/Chinese privet
__ Willow oak	__ Overcup oak	__ Slippery elm	__ Boxelder	X Japanese honeysuckle
__ Cherrybark oak	__ Water hickory	__ Silver maple	__ Deciduous holly	__ Japanese stiltgrass
__ Pin oak	__ Honey locust	__ Red maple	__ Sugarberry	__ Giant reed
__ Swamp chestnut oak	__ Water tupelo	__ Black willow	__ Silky dogwood	__ Tall fescue
__ Bur oak	__ Bald cypress	__ Sweetgum	X Tulip poplar	__ Purple loosestrife
__ Nuttall oak	__ Am. hornbeam	__ Green ash	__ _____	__ _____
__ Swamp white oak	__ _____	Number native shrub spp.		
__ _____	__ _____	2 Number native herbaceous spp.		

2. Using the checked 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 is the SI for V7 0.61

* In some Riverine wetlands and in some small WAAs (e.g., <0.5 acres), relatively few species (e.g., overcup oak) may be present. In cases where 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

X 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 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: Tract Size (TRACT)

1. Area (acres) of adjacent wetland and upland forest that is contiguous with the WAA. These values are for western Tennessee are negligible unless greater than the value added section limits for the remainder of the state.

__ > 7,000 (SI = 1.0) __ >200 – 1,000 (SI = 0.5) __ < 1(SI = 0.00)

__ >1,000 – 7,000 (SI = 0.75) __ 1 – 200 (SI = 0.25) X In Eastern or Central Tennessee (SI=1.0)

VALUES USED TO CALCULATE FUNCTIONAL CAPACITY INDICES (FCIs)

SUBINDEX VALUES:

V1 0.5 (RIVCON) V3 0.5 (TSIZE) V5 0 (SCOV) V7 0.61 (COMP) V9 1 (TRACT)

V2 0.75 (HYDRO) V4 0.25 (TDEN) V6 0.1 (GCV) V8 1 (ORGANIC)

WETLAND FUNCTIONS

FUNCITION 1: MAINTAIN HYDROLOGIC REGIME

FCI 1: $(V1 \times V2)^{1/2} \Rightarrow (____ \times ____)^{1/2}$ = _____

FUNCTION 2: RETAIN PARTICULATES

FCI 2: (trees present) = $\frac{(V1 \times V2)^{1/2} + V4}{2} \Rightarrow \frac{(FCI\ 1) + ____}{2}$ = _____

FCI 2: (shrubs present) = $\frac{(V1 \times V2)^{1/2} + V5}{2} \Rightarrow \frac{(FCI\ 1) + ____}{2}$ = _____

FCI 2: (ground cover) = $\frac{(V1 \times V2)^{1/2} + V6}{3} \Rightarrow \frac{(FCI\ 1) + ____}{3}$ = _____

FUNCTION 3: MAINTAIN BIOGEOCHEMICAL PROCESSES

FCI 3: (trees present)= $\left((V1 \times V2)^{1/2} \times \left(\frac{\frac{V3+V4}{2} + V8}{2}\right)\right)^{1/2} \Rightarrow \left((FCI\ 1) \times \left(\frac{\frac{____ + ____}{2} + ____}{2}\right)\right)^{1/2}$ = _____

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

FCI 3: (ground cover)= $\left((V1 \times V2)^{1/2} \times \frac{V6+V8}{5}\right)^{1/2} \Rightarrow \left((FCI\ 1) \times \frac{____ + ____}{5}\right)^{1/2}$ = _____

FUNCTION 4: MAINTAIN CHARACTERISTIC PLANT COMMUNITY

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

FCI 4: (shrubs present) = $\frac{(V1 \times V2)^{1/2} + 2\left(\frac{V5+V7}{2}\right)}{6} \Rightarrow \frac{(FCI\ 1) + (____ + ____)}{6}$ = _____

FCI 4: (groundcover) = $\frac{(V1 \times V2)^{1/2} + 2\left(\frac{V6+V7}{2}\right)}{9} \Rightarrow \frac{(FCI\ 1) + (____ + ____)}{9}$ = _____

FUNCTION 5: MAINTAIN CHARACTERISTIC WILDILFE COMMUNITY

FCI 5: (trees) = $\frac{(V1 \times V2)^{1/2} + 2\left(\frac{V3+V4+V7}{3}\right) + V9}{4} \Rightarrow \frac{(FCI\ 1) + 2\left(\frac{____ + ____ + ____}{3}\right) + ____}{4}$ = _____

FCI 5: (shrubs present) = $\frac{(V1 \times V2)^{1/2} + 2\left(\frac{V5+V7}{2}\right) + V9}{6} \Rightarrow \frac{(FCI\ 1) + (____ + ____) + ____}{6}$ = _____

FCI 5: (groundcover) = $\frac{(V1 \times V2)^{1/2} + 2\left(\frac{V6+V7}{2}\right) + V9}{9} \Rightarrow \frac{(FCI\ 1) + (____ + ____) + ____}{9}$ = _____

TRAM Summary Worksheet

Exceptional Status Wetlands		**Check if applicable**
	1. **ONRW**	NA
	2. **ETW**	NA
	3. **Further Review Requested:** Attach Wetland Background and Exceptional Status Wetlands Worksheet	NA
	COMMENTS/NOTES:	
Quantitative Rating scores	Function: Hydrologic Regime	0.61
	Function: Biogeochemical Processes	0.49
	Function: Retain Particulates	0.32
	Function: Plant Community	0.29
	Function: Wildlife Community	0.42
	Quantitative Score (Average of FCIs x 100)	42.6
	Value Added (Significant Size) Total	
Total of Quantitative and Value Added Scores	**TOTAL SCORE**	42.6

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: SR-162 (Pellissippi Pkwy.) PIN 101423.00 City/County: Maryville/Blount Sampling Date: May 5, 2020
Applicant/Owner: TDOT State: TN Sampling Point: UTP-2/3
Investigator(s): Caleb Duke, Casey Hertwig Section, Township, Range: N/A
Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): Convex Slope (%): 0-2
Subregion (LRR or MLRA): LRR N Lat: 35.79952 Long: -83.92732 Datum: NAD 83
Soil Map Unit Name: Litz Silt Loam NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)
Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐
Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks:
Photo: 16

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ☐ No ☑	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 (Five Strata) – Use scientific names of plants. Sampling Point: UTP-3

Tree Stratum (Plot size: 0.1)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Liriodendron tulipifera*	25	Yes	FAC
2. *Fagus grandifolia*	20	Yes	FACU
3.			
4.			
5.			
6.			
	45 = Total Cover		
50% of total cover: 22.5	20% of total cover: 9		
Sapling Stratum (Plot size: 0.1)			
1. *Rhus glabra*	25	Yes	FACU
2.			
3.			
4.			
5.			
6.			
	25 = Total Cover		
50% of total cover: 12.5	20% of total cover: 5		
Shrub Stratum (Plot size: 0.1)			
1. *Elaeagnus umbellata*	10	Yes	FACU
2.			
3.			
4.			
5.			
6.			
	10 = Total Cover		
50% of total cover: 5	20% of total cover: 2		
Herb Stratum (Plot size: 0.1)			
1. *Microstegium vimineum*	70	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	70 = Total Cover		
50% of total cover: 35	20% of total cover: 14		
Woody Vine Stratum (Plot size: 0.1)			
1. *Toxicodendron radicans*	10	Yes	FAC
2.			
3.			
4.			
5.			
	10 = Total Cover		
50% of total cover: 5	20% of total cover: 2		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	105	x 3 =	315
FACU species	55	x 4 =	220
UPL species	0	x 5 =	0
Column Totals:	160 (A)		535 (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]
- ☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ☐ No ☑

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

SOIL Sampling Point: UTP-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
3	10YR 4/4	100					Silt Loam	
3-12	10 YR 5/3	90	7.5YR 4/6	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:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ☐ **No** ☑

Remarks:

Ecology Field Data Sheet: **Water Resources**

Project: SR-162 (Pellissippi Pkwy.) PIN 101423.00					
Biologist:	C. Duke, C. Hertwig	**Affiliation:**	CEC, Inc.	**Date:**	May 6, 2020

1-Station: from plans	172+20R to 163+50L				
2-Map label and name	STR-3				
3-Latitude/Longitude	35.79973; -83.92736				
4-Feature description:					
-channel identification	perennial stream ☑	intermittent stream ☐	ephemeral stream ☐	wwc ☐	
-HD score (if applicable)	Primary: Bentics, Fish				
-OHWM indicators	bed & banks ☑	deposition ☐	presence of litter / debris ☑	scour ☐	veg absent, bent, matted ☑
	change in plant community ☑	destruction of terrestrial veg ☐	multiple observed flow events ☐	sediment sorting ☑	water staining ☑
	change in soil character ☐	leaf litter disturbed or absent ☐	natural line impressed on bank ☐	shelving ☐	wracking ☑
-channel bottom width	6-8'	-top of bank width	15'		
-width at ordinary high water mark	10-12'				
-bank height	LDB - 2-4'	RDB - 2-4'			
-riffle/pool complex or other specialized habitat present?	Yes				
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Autumn olive, hackberry, sycamore, honeysuckel				
	RDB: Autumn olive, hackberry, sycamore, honeysuckel				
-date of PJD request					
5-photo numbers	17, 18, SEP-2 19				
6-HUC -8 Code & Name	06010201; Ft. Loudoun/Watts Bar				
7-Assessed	yes ☐	no ☑			
8-ETW	yes ☐	no ☑			
9-303 (d) List	yes ☐	siltation ☐	habitat: ☐	other: ☐	
	no ☑				
10-Notes	STR-3 is a forested perennial stream with several benthic macro-invertebrates and fish observed in the channel. SEP-2 is in proximity to STR-3				
Substrate	gravel, cobble, bedrock				

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Blount	Named Waterbody: N/A	Date/Time: 05/05/2020 2:42 PM
Assessors/Affiliation: Caleb Duke, CEC Inc., Casey Hertwig, CEC Inc.		Project ID: STR-3
Site Name/Description: SR-162 (Pellissippi Pkwy.) PIN 101423.00		
Site Location: Maryville, TN		
USGS quad: Maryville	HUC (12 digit): 060102010110	Lat/Long: 35.79972; -83.9274
Previous Rainfall (7-days) : 0.10" Previous 48 hours; 0.85" previous 7-days		
Precipitation this Season vs. Normal : ☐ very wet ☑ wet ☐ average ☐ dry ☐ drought ☐ unknown Source of recent & seasonal precip data : https://lakeinfo.tva.gov/web/precip.htm		
Watershed Size : 0.11 sqmi	Photos: Y or N (circle) Number : 17, 18	
Soil Type(s) / Geology : Litz silt loam, moderately steep phase		
Surrounding Land Use : Forested, Pasture		
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	☑	WWC ☐
2. Defined bed and bank absent, dominated by upland vegetation / grass	☑	WWC ☐
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	☑	WWC ☐
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	☑	WWC ☐
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	☐	Stream ☑
6. Presence of fish (except *Gambusia*)	☐	Stream ☑
7. Presence of naturally occurring ground water table connection	☑	Stream ☐
8. Flowing water in channel and 7 days since last precipitation in local watershed	☑	Stream ☐
9. Evidence watercourse has been used as a supply of drinking water	☑	Stream ☐

NOTE : If any Primary Indicators 1-9 = "Yes", then STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = N/A

Justification / Notes :

Caddis fly, snails and fish were observed in the stream.

Ecology Field Data Sheet: **Water Resources**

Project: SR-162 (Pellissippi Pkwy.) PIN 101423.00					
Biologist:	C. Duke, C. Hertwig	**Affiliation:**	CEC, Inc.	**Date:**	May 6, 2020

1-Station: from plans	168.80R to 168.70R				
2-Map label and name	WWC-1/EPH-1				
3-Latitude/Longitude	35.79789; -83.9264				
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 observed flow events ☐	sediment sorting ☐	water staining ☐
	change in soil character ☐	leaf litter disturbed or absent ☐	natural line impressed on bank ☑	shelving ☐	wracking ☐
-channel bottom width	6"-1'	-top of bank width	3'		
-width at ordinary high water mark	1.5'				
-bank height	LDB - 2'	RDB - 2'			
-riffle/pool complex or other specialized habitat present?	No				
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Autumn olive, hackberry, honeysuckel				
	RDB: Autumn olive, hackberry, honeysuckel				
-date of PJD request					
5-photo numbers	20, 21				
6-HUC -8 Code & Name	06010201; Ft. Loudoun/Watts Bar				
7-Assessed	yes ☐	no ☑			
8-ETW	yes ☐	no ☑			
9-303 (d) List	yes ☐	siltation ☐	habitat: ☐	other: ☐	
	no ☑				
10-Notes	WWC-1/EPH-1 is located on the hillside and drains stormwater from residential property on top of the hill.				
Substrate	silt				

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Blount	Named Waterbody: N/A	Date/Time: 05/05/2020 2:42 PM
Assessors/Affiliation: Caleb Duke, CEC Inc., Casey Hertwig, CEC Inc.		Project ID: WWC-1/EPH-1
Site Name/Description: SR-162 (Pellissippi Pkwy.) PIN 101423.00		
Site Location: Maryville, TN		
USGS quad: Maryville	HUC (12 digit): 060102010110	Lat/Long: 35.79816; -83.9263
Previous Rainfall (7-days) : 0.10" Previous 48 hours; 0.85" previous 7-days		
Precipitation this Season vs. Normal : ☐ very wet ☑ wet ☐ average ☐ dry ☐ drought ☐ unknown Source of recent & seasonal precip data : https://lakeinfo.tva.gov/web/precip.htm		
Watershed Size : 0.01 sqmi	Photos: Y or N (circle) Number :	
Soil Type(s) / Geology : Litz silt loam, moderately steep phase		
Surrounding Land Use : Forested, Pasture		
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	☑	WWC ☐
2. Defined bed and bank absent, dominated by upland vegetation / grass	☑	WWC ☐
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	☑	WWC ☐
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	☑	WWC ☐
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	☑	Stream ☐
6. Presence of fish (except *Gambusia*)	☑	Stream ☐
7. Presence of naturally occurring ground water table connection	☑	Stream ☐
8. Flowing water in channel and 7 days since last precipitation in local watershed	☑	Stream ☐
9. Evidence watercourse has been used as a supply of drinking water	☑	Stream ☐

NOTE : If any Primary Indicators 1-9 = "Yes", then STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 9

Justification / Notes :

Caddis fly, snails and fish were observed in the stream.

Secondary Field Indicator Evaluation Project ID: WWC-1/EPH-1

A. Geomorphology (Subtotal = 5)		**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	**2**	0	1	2	3
2. Sinuous channel	**0**	0	1	2	3
3. In-channel structure: riffle-pool sequences	**0.5**	0	1	2	3
4. Sorting of soil textures or other substrate	**0**	0	1	2	3
5. Active/relic floodplain	**0**	0	1	2	3
6. Depositional bars or benches	**0**	0	1	2	3
7. Braided channel	**0**	0	1	2	3
8. Recent alluvial deposits	**0.5**	0	0.5	1	1.5
9. Natural levees	**0**	0	1	2	3
10. Headcuts	**1**	0	1	2	3
11. Grade controls	**0**	0	0.5	1	1.5
12. Natural valley or drainageway	**1**	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map		**No = 0**			

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

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

[1] Focus is on the presence of upland 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 :

Dry during the site visit, drains to STR-3.

Ecology Field Data Sheet: **Water Resources**

Project: SR-162 (Pellissippi Pkwy.) PIN 101423.00					
Biologist:	C. Duke, C. Hertwig	**Affiliation:**	CEC, Inc.	**Date:**	May 6, 2020

1-Station: from plans	175+50L to 175+10L				
2-Map label and name	WWC-2/EPH-2				
3-Latitude/Longitude	35.79783; -83.92396				
4-Feature description:					
-channel identification	perennial stream ☐	intermittent stream ☐	ephemeral stream ☑	wwc ☑	
-HD score (if applicable)	14.25				
-OHWM indicators	bed & banks ☑	deposition ☐	presence of litter / debris ☐	scour ☐	veg absent, bent, matted ☑
	change in plant community ☑	destruction of terrestrial veg ☐	multiple observed flow events ☐	sediment sorting ☑	water staining ☐
	change in soil character ☐	leaf litter disturbed or absent ☐	natural line impressed on bank ☑	shelving ☐	wracking ☑
-channel bottom width	6"-1'	-top of bank width	3'		
-width at ordinary high water mark	1.5'				
-bank height	LDB - .5"	RDB - .6"			
-riffle/pool complex or other specialized habitat present?	No				
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Autumn olive, Tulip poplar, American elm, sumac, privet				
	RDB: Autumn olive, Tulip poplar, American elm, sumac, privet				
-date of PJD request					
5-photo numbers	22, 23				
6-HUC -8 Code & Name	06010201; Ft. Loudoun/Watts Bar				
7-Assessed	yes ☐	no ☑			
8-ETW	yes ☐	no ☑			
9-303 (d) List	yes ☐	siltation ☐	habitat: ☐	other: ☐	
	no ☑				
10-Notes	WWC-2/EPH-2 is located in a topographical draw. This channel intercepts groundwater and becomes more stream-like approximately 50 feet beyond ROW.				
Substrate	silt, gravel				

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Blount	Named Waterbody: N/A	Date/Time: 05/05/2020 2:42 PM
Assessors/Affiliation: Caleb Duke, CEC Inc., Casey Hertwig, CEC Inc.		Project ID: WWC-2/EPH-2
Site Name/Description: SR-162 (Pellissippi Pkwy.) PIN 101423.00		
Site Location: Maryville, TN		
USGS quad: Maryville	HUC (12 digit): 060102010110	Lat/Long: 35.79774; -83.92399
Previous Rainfall (7-days) : 0.10" Previous 48 hours; 0.85" previous 7-days		
Precipitation this Season vs. Normal : ☐ very wet ☑ wet ☐ average ☐ dry ☐ drought ☐ unknown Source of recent & seasonal precip data : https://lakeinfo.tva.gov/web/precip.htm		
Watershed Size : 0.01 sqmi	Photos: Y or N (circle) Number : 22, 23	
Soil Type(s) / Geology : Dandridge silt loam, steep phase		
Surrounding Land Use : Forested, Pasture		
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	☑	WWC ☐
2. Defined bed and bank absent, dominated by upland vegetation / grass	☑	WWC ☐
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	☑	WWC ☐
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	☑	WWC ☐
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	☑	Stream ☐
6. Presence of fish (except *Gambusia*)	☑	Stream ☐
7. Presence of naturally occurring ground water table connection	☑	Stream ☐
8. Flowing water in channel and 7 days since last precipitation in local watershed	☑	Stream ☐
9. Evidence watercourse has been used as a supply of drinking water	☑	Stream ☐

NOTE : If any Primary Indicators 1-9 = "Yes", then STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 14.25

Justification / Notes :

Secondary Field Indicator Evaluation Project ID: WWC-2/EPH-2

A. Geomorphology (Subtotal = 6.75)		**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	**1**	0	1	2	3
2. Sinuous channel	**0**	0	1	2	3
3. In-channel structure: riffle-pool sequences	**1**	0	1	2	3
4. Sorting of soil textures or other substrate	**0.5**	0	1	2	3
5. Active/relic floodplain	**0**	0	1	2	3
6. Depositional bars or benches	**1**	0	1	2	3
7. Braided channel	**0**	0	1	2	3
8. Recent alluvial deposits	**0.75**	0	0.5	1	1.5
9. Natural levees	**0**	0	1	2	3
10. Headcuts	**1**	0	1	2	3
11. Grade controls	**0**	0	0.5	1	1.5
12. Natural valley or drainageway	**1.5**	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map		**No = 0**			

B. Hydrology (Subtotal = 3.5)		**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	**1**	0	1	2	3
15. Water in channel and >48 hours since sig. rain	**0**	0	1	2	3
16. Leaf litter in channel (January – September)	**1.5**	1.5	1	0.5	0
17. Sediment on plants or on debris	**0.5**	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	**0.5**	0	0.5	1	1.5
19. Hydric soils in stream bed or sides of channel		**No = 0**			

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

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

Total Points = 14.25

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

Notes :

Some water in channel, channel is poorly defined.

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: SR-162 (Pellissippi Pkwy.) PIN 101423.00 City/County: Maryville/Blount Sampling Date: May 6, 2020
Applicant/Owner: TDOT State: TN Sampling Point: WTL-4
Investigator(s): Caleb Duke, Casey Hertwig Section, Township, Range: N/A
Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): Convex Slope (%): 0-2
Subregion (LRR or MLRA): LRR N Lat: 35.79116 Long: -83.91758 Datum: NAD 83
Soil Map Unit Name: Greendale silt loam, 0 to 6 percent slopes, occasionally flooded NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)
Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐
Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks:
Size: > 0.22 ac.

Photos: 25, 26

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☑ No ☐ Depth (inches): 2
Water Table Present? Yes ☑ No ☐ Depth (inches): 12
Saturation Present? (includes capillary fringe) Yes ☑ No ☐ Depth (inches): 0

Wetland Hydrology Present? Yes ☑ No ☐

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

Remarks:

VEGETATION (Five Strata) – Use scientific names of plants. Sampling Point: WTL-4

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 0.1)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Sapling Stratum (Plot size: 0.1)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Shrub Stratum (Plot size: 0.1)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Herb Stratum (Plot size: 0.1)			
1. *Carex frankii*	25	Yes	OBL
2. *Panicum capillare*	20	Yes	FAC
3. *Juncus effusus*	20	Yes	FACW
4. *Scirpus atrovirens*	15	No	OBL
5. *Cynodon dactylon*	10	No	FACU
6.			
7.			
8.			
9.			
10.			
11.			
	90 = Total Cover		
50% of total cover: 45	20% of total cover: 18		
Woody Vine Stratum (Plot size: 0.1)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

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

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

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ☑ No ☐

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

SOIL Sampling Point: WTL-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
6	2.5Y 4/2	95	7.5YR 4/6	5	C	M	Silt Loam	
6-15	2.5Y 5/3	80	7.5YR 4/6	20	C	M,PL	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:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ☑ **No** ☐

Remarks:

Wetland Background Information

Name(s) of Field Personnel: C. Hertwig/C. Duke	
Assessment Date: 5-5-2020	
Agency/Organization: CEC, Inc.	
Office Address: 117 Seaboard Ln., Suite E 100, Franklin, TN 37067	
Phone Number: 615-333-7797	
E-mail Address: chertwig@cecinc.com	
Wetland Name(s): WTL-4	
Wetland Location: Include drawing or map of project area limits or attach map showing location and project area limits, county, nearest street address, and narrative description of location, etc. Wetland is located at 35.79116; -83.91758. STR-4 drains through the wetland. See Figure 2.	
Watershed (12-Digit HUC): 060102010107	
Lat/Long (dd.dddd, -dd.dddd) or UTM Coordinates (m easting, m northing): 35.79116; -83.91758	
Circle coordinate system used: **NAD83** **WGS84** **UTM** **NAD27**	
USGS Quad Name: Maryville	
Depicted on National Wetland Inventory Map: (Y/N) N	
Soil Survey Map Units, Hydric Rating: Greendale silt loam, 0 to 6 percent slopes, occasionally flooded	
Cowardin Wetland Type(s): PEM	
HGM Classification: Slope	
Final Score:	40.5

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	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: 5-6-2020 Project Name SR-162EXT Pellissippi Pkwy

Field Personnel C. Hertwig/C. Duke 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 roads or other impediments to surface ground water
   - 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 5
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 10
D = Percentage high density residential, or similar 5
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) = 0.71

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) __ 4 – 5 in. (SI = 0.25)
   __< 4 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 as a Group 2 species. 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 is the SI for **V7**= 0.7

*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

X 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 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 0.5 (HYDRO) V3 0 (TSIZE) V5 0 (SCOV) V7 0.7 (COMP) V9 0.01 (BUFFER)

V2 0.71 (WSHEDINT) V4 0 (TDEN) V6 1 (GVC) V8 1 (ORGANIC)

TRAM Summary Worksheet

Exceptional Status Wetlands		**Check if applicable**
	1. **ONRW**	NA
	2. **ETW**	NA
	3. **Further Review Requested:** Attach Wetland Background and Exceptional Status Wetlands Worksheet	NA
	COMMENTS/NOTES:	
Quantitative Rating scores	Function: Hydrologic Regime	0.60
	Function: Biogeochemical Processes	0.49
	Function: Retain Particulates	
	Function: Plant Community	0.28
	Function: Wildlife Community	0.25
	Quantitative Score (Average of FCIs x 100)	40.5
	Value Added (Significant Size) Total	
Total of Quantitative and Value Added Scores	**TOTAL SCORE**	40.5

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: SR-162 (Pellissippi Pkwy.) PIN 101423.00 City/County: Maryville/Blount Sampling Date: May 6, 2020
Applicant/Owner: TDOT State: TN Sampling Point: UTP-4
Investigator(s): Caleb Duke, Casey Hertwig Section, Township, Range: N/A
Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): Convex Slope (%): 0-2
Subregion (LRR or MLRA): LRR N Lat: 35.79112 Long: -83.91746 Datum: NAD 83
Soil Map Unit Name: Greendale Silt Loam NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)
Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐
Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks:
Photo: 27

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ☐ No ☑	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 (Five Strata) – Use scientific names of plants. Sampling Point: UTP-4

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 0.1)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Sapling Stratum (Plot size: 0.1)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Shrub Stratum (Plot size: 0.1)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Herb Stratum (Plot size: 0.1)			
1. *Panicum philadelphicum*	25	Yes	FAC
2. *Festuca rubra*	25	Yes	FACU
3. *Poa annua*	15	Yes	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	65 = Total Cover		
50% of total cover: 32.5	20% of total cover: 13		
Woody Vine Stratum (Plot size: 0.1)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

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: 33.3 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	25	x 3 =	75
FACU species	40	x 4 =	160
UPL species	0	x 5 =	0
Column Totals:	65 (A)		235 (B)

Prevalence Index = B/A = 3.62

Hydrophytic Vegetation Indicators:

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

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

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ☐ No ☑

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

SOIL Sampling Point: UTP-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
4	10YR 4/3	100					Silt Loam	
4-12	10 YR 4/3	90	7.5YR 4/6	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:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ☐ **No** ☑

Remarks:

Ecology Field Data Sheet: **Water Resources**

Project: SR-162 (Pellissippi Pkwy.) PIN 101423.00					
Biologist:	C. Duke, C. Hertwig	**Affiliation:**	CEC, Inc.	**Date:**	May 6, 2020

1-Station: from plans	206+80R to 206+80L				
2-Map label and name	STR-4				
3-Latitude/Longitude	35.79136; -83.91716				
4-Feature description:					
-channel identification	perennial stream ☐	intermittent stream ☑	ephemeral stream ☐	wwc ☐	
-HD score (if applicable)	Primary: GW connection				
-OHWM indicators	bed & banks ☑	deposition ☐	presence of litter / debris ☑	scour ☐	veg absent, bent, matted ☑
	change in plant community ☑	destruction of terrestrial veg ☐	multiple observed flow events ☐	sediment sorting ☑	water staining ☑
	change in soil character ☐	leaf litter disturbed or absent ☐	natural line impressed on bank ☐	shelving ☐	wracking ☑
-channel bottom width	3-4'	-top of bank width	6-8'		
-width at ordinary high water mark	5-6'				
-bank height	LDB - 3-4'	RDB - 2-3'			
-riffle/pool complex or other specialized habitat present?	No				
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Eastern redcedar, privet, hackberry, black willow, boxelder				
	RDB: Eastern redcedar, privet, hackberry, black willow, boxelder				
-date of PJD request					
5-photo numbers	28, 29				
6-HUC -8 Code & Name	06010201; Ft. Loudoun/Watts Bar				
7-Assessed	yes ☐	no ☑			
8-ETW	yes ☐	no ☑			
9-303 (d) List	yes ☐	siltation ☐	habitat: ☐	other: ☐	
	no ☑				
10-Notes	STR-4 drains through WTL-4 and is encapsulated under a gravel driveway.				
Substrate	gravel, silt, cobble				

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Blount	Named Waterbody: N/A	Date/Time: 05/05/2020 2:42 PM
Assessors/Affiliation: Caleb Duke, CEC Inc., Casey Hertwig, CEC Inc.		Project ID: STR-4
Site Name/Description: SR-162 (Pellissippi Pkwy.) PIN 101423.00		
Site Location: Maryville, TN		
USGS quad: Maryville	HUC (12 digit): 060102010110	Lat/Long: 35.79132; -83.91734
Previous Rainfall (7-days) : 0.10" Previous 48 hours; 0.85" previous 7-days		
Precipitation this Season vs. Normal : ☐ very wet ☑ wet ☐ average ☐ dry ☐ drought ☐ unknown Source of recent & seasonal precip data : https://lakeinfo.tva.gov/web/precip.htm		
Watershed Size : 0.13 sqmi	Photos: Y or N (circle) Number : 28, 29	
Soil Type(s) / Geology : Litz silt loam, moderately steep phase		
Surrounding Land Use : Forested, Pasture		
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	☑	WWC ☐
2. Defined bed and bank absent, dominated by upland vegetation / grass	☑	WWC ☐
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	☑	WWC ☐
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	☑	WWC ☐
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	☑	Stream ☐
6. Presence of fish (except *Gambusia*)	☑	Stream ☐
7. Presence of naturally occurring ground water table connection	☐	Stream ☑
8. Flowing water in channel and 7 days since last precipitation in local watershed	☑	Stream ☐
9. Evidence watercourse has been used as a supply of drinking water	☑	Stream ☐

NOTE : If any Primary Indicators 1-9 = "Yes", then STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = N/A

Justification / Notes :

Hydrology for STR-4 is provided by the groundwater connection in WTL-4.

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: SR-162 (Pellissippi Pkwy.) PIN 101423.00 City/County: Maryville/Blount Sampling Date: May 6, 2020
Applicant/Owner: TDOT State: TN Sampling Point: WTL-5
Investigator(s): Caleb Duke, Casey Hertwig Section, Township, Range: N/A
Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): Concave Slope (%): 0-2
Subregion (LRR or MLRA): LRR N Lat: 35.78726 Long: -83.91441 Datum: NAD 83
Soil Map Unit Name: Pace silt loam, gently sloping phase (tasso) NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)
Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐
Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks:
Size:

Photos: 30, 31

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

- ☑ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☑ No ☐ Depth (inches): 1
Water Table Present? Yes ☐ No ☑ Depth (inches):
Saturation Present? (includes capillary fringe) Yes ☑ No ☐ Depth (inches): 6

Wetland Hydrology Present? Yes ☑ No ☐

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

Remarks:

VEGETATION (Five Strata) – Use scientific names of plants. Sampling Point: WTL-5

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 0.1)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Sapling Stratum (Plot size: 0.1)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Shrub Stratum (Plot size: 0.1)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Herb Stratum (Plot size: 0.1)			
1. *Glyceria striata*	25	Yes	OBL
2. *Rumex crispus*	5	No	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	30 = Total Cover		
50% of total cover: 15	20% of total cover: 6		
Woody Vine Stratum (Plot size: 0.1)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

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 (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A = 3

Hydrophytic Vegetation Indicators:

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

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

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ☑ No ☐

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

SOIL Sampling Point: WTL-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
14	2.5Y6/2	95	10YR 4/6	5	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:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ☑ **No** ☐

Remarks:

Wetland Background Information

Name(s) of Field Personnel: C. Hertwig/C. Duke	
Assessment Date: 5-5-2020	
Agency/Organization: CEC, Inc.	
Office Address: 117 Seaboard Ln., Suite E 100, Franklin, TN 37067	
Phone Number: 615-333-7797	
E-mail Address: chertwig@cecinc.com	
Wetland Name(s): WTL-5	
Wetland Location: Include drawing or map of project area limits or attach map showing location and project area limits, county, nearest street address, and narrative description of location, etc. Wetland is located at 35.78726; -83.91441 in an ag field. See Figure 2.	
Watershed (12-Digit HUC): 060102010107	
Lat/Long (dd.dddd, -dd.dddd) or UTM Coordinates (m easting, m northing): 35.78726 -83.91441	
Circle coordinate system used: **NAD83** **WGS84** **UTM** **NAD27**	
USGS Quad Name: Maryville	
Depicted on National Wetland Inventory Map: (Y/N) N	
Soil Survey Map Units, Hydric Rating: Pace silt loam, gently sloping phase (tasso)	
Cowardin Wetland Type(s): PEM	
HGM Classification: Slope	
Final Score:	25.00

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	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: 5-6-2020 Project Name SR-162EXT Pellissippi Pkwy

Field Personnel C. Hertwig/C. Duke 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 ground water
   - 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 5
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 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) = 0.75

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) __ 4 – 5 in. (SI = 0.25)
   __< 4 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 as a Group 2 species. 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 _____
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 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 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). 0.50

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 0.41 (COMP) V9 0.01 (BUFFER)

V2 0.75 (WSHEDINT) V4 0 (TDEN) V6 0 (GVC) V8 0.5 (ORGANIC)

TRAM Summary Worksheet

Exceptional Status Wetlands		**Check if applicable**
	1. **ONRW**	NA
	2. **ETW**	NA
	3. **Further Review Requested:** Attach Wetland Background and Exceptional Status Wetlands Worksheet	NA
	COMMENTS/NOTES:	
Quantitative Rating scores	Function: Hydrologic Regime	0.43
	Function: Biogeochemical Processes	0.27
	Function: Retain Particulates	
	Function: Plant Community	0.16
	Function: Wildlife Community	0.14
	Quantitative Score (Average of FCIs x 100)	25.00
	Value Added (Significant Size) Total	
Total of Quantitative and Value Added Scores	**TOTAL SCORE**	25.00

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: SR-162 (Pellissippi Pkwy.) PIN 101423.00 City/County: Maryville/Blount Sampling Date: May 5, 2020
Applicant/Owner: TDOT State: TN Sampling Point: UTP-5
Investigator(s): Caleb Duke, Casey Hertwig Section, Township, Range: N/A
Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): Convex Slope (%): 0-2
Subregion (LRR or MLRA): LRR N Lat: 35.78696 Long: -83.91447 Datum: NAD 83
Soil Map Unit Name: Pace Silt Loam NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)
Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐
Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks:
Photo: 32

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ☐ No ☑	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 (Five Strata) – Use scientific names of plants. Sampling Point: UTP-5

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 0.1)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Sapling Stratum (Plot size: 0.1)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Shrub Stratum (Plot size: 0.1)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Herb Stratum (Plot size: 0.1)			
1. *Festuca rubra*	40	Yes	FACU
2. *Panicum philadelphicum*	15	Yes	FAC
3. *Rumex crispus*	10	No	FAC
4. *Trifolium repens*	10	No	FACU
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	75 = Total Cover		
50% of total cover: 37.5	20% of total cover: 15		
Woody Vine Stratum (Plot size: 0.1)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	25	x 3 =	75
FACU species	50	x 4 =	200
UPL species	0	x 5 =	0
Column Totals:	75 (A)		275 (B)

Prevalence Index = B/A = 3.67

Hydrophytic Vegetation Indicators:

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

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

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ☐ No ☑

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

SOIL Sampling Point: UTP-5

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
8	10YR 3/3	100					Silt Loam	
8-12	10 YR 5/4	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:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ☐ **No** ☑

Remarks:

Ecology Field Data Sheet: **Water Resources**

Project: SR-162 (Pellissippi Pkwy.) PIN 101423.00					
Biologist:	C. Duke, C. Hertwig	**Affiliation:**	CEC, Inc.	**Date:**	May 6, 2020

1-Station: from plans	251+00R to 250+10L				
2-Map label and name	STR-5 (Peppermint Branch)				
3-Latitude/Longitude	35.78122; -83.90881				
4-Feature description:					
-channel identification	perennial stream ☑	intermittent stream ☐	ephemeral stream ☐	wwc ☐	
-HD score (if applicable)	Primary: Fish, Benthics				
-OHWM indicators	bed & banks ☑	deposition ☑	presence of litter / debris ☑	scour ☑	veg absent, bent, matted ☑
	change in plant community ☑	destruction of terrestrial veg ☐	multiple observed flow events ☐	sediment sorting ☑	water staining ☑
	change in soil character ☐	leaf litter disturbed or absent ☑	natural line impressed on bank ☑	shelving ☐	wracking ☑
-channel bottom width	8-10'	-top of bank width	15-20'		
-width at ordinary high water mark	10-12’				
-bank height	LDB - 3-6'	RDB - 3-4'			
-riffle/pool complex or other specialized habitat present?	No				
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Eastern redcedar, privet, hackberry, black willow, boxelder				
	RDB: American Elm, American beech, privet				
-date of PJD request					
5-photo numbers	33, 34				
6-HUC -8 Code & Name	06010201; Ft. Loudoun/Watts Bar				
7-Assessed	yes ☑	no ☐			
8-ETW	yes ☐	no ☑			
9-303 (d) List	yes ☑	siltation ☑	habitat: ☐	other: ☐	
	no ☐	Also listed for *E. coli*			
10-Notes	STR-5 has a 1 square mile drainage area. Several benthic macro-invertebrate species and fish were observed in the stream.				
Substrate	gravel, silt, cobble				

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Blount	Named Waterbody: Peppermint Branch	Date/Time: 05/05/2020 2:42 PM
Assessors/Affiliation: Caleb Duke, CEC Inc., Casey Hertwig, CEC Inc.		Project ID: STR-5
Site Name/Description: SR-162 (Pellissippi Pkwy.) PIN 101423.00		
Site Location: Maryville, TN		
USGS quad: Maryville	HUC (12 digit): 060102010110	Lat/Long: 35.78107; -83.90902
Previous Rainfall (7-days) : 0.10" Previous 48 hours; 0.85" previous 7-days		
Precipitation this Season vs. Normal : ☐ very wet ☑ wet ☐ average ☐ dry ☐ drought ☐ unknown Source of recent & seasonal precip data : https://lakeinfo.tva.gov/web/precip.htm		
Watershed Size : 1.11 sqmi	Photos: Y or N (circle) Number : 33, 34	
Soil Type(s) / Geology : Lindside silt loam, 0 to 3 percent slopes, occasionally flooded		
Surrounding Land Use : Forested, Pasture		
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	☑	WWC ☐
2. Defined bed and bank absent, dominated by upland vegetation / grass	☑	WWC ☐
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	☑	WWC ☐
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	☑	WWC ☐
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	☐	Stream ☑
6. Presence of fish (except *Gambusia*)	☐	Stream ☑
7. Presence of naturally occurring ground water table connection	☑	Stream ☐
8. Flowing water in channel and 7 days since last precipitation in local watershed	☑	Stream ☐
9. Evidence watercourse has been used as a supply of drinking water	☑	Stream ☐

NOTE : If any Primary Indicators 1-9 = "Yes", then STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = N/A

Justification / Notes :

Peppermint Branch contained benthic organisms and fish.

Ecology Field Data Sheet: **Water Resources**

Project: SR-162 (Pellissippi Pkwy.) PIN 101423.00					
Biologist:	C. Duke, C. Hertwig	**Affiliation:**	CEC, Inc.	**Date:**	May 6, 2020

1-Station: from plans	252+50R to 251+00R				
2-Map label and name	WWC-3/EPH-3				
3-Latitude/Longitude	35.78048; -83.90945				
4-Feature description:					
-channel identification	perennial stream ☐	intermittent stream ☐	ephemeral stream ☑	wwc ☑	
-HD score (if applicable)	13.75				
-OHWM indicators	bed & banks ☑	deposition ☑	presence of litter / debris ☑	scour ☑	veg absent, bent, matted ☑
	change in plant community ☐	destruction of terrestrial veg ☐	multiple observed flow events ☐	sediment sorting ☑	water staining ☐
	change in soil character ☐	leaf litter disturbed or absent ☑	natural line impressed on bank ☐	shelving ☐	wracking ☑
-channel bottom width	1-2'	-top of bank width	3-6'		
-width at ordinary high water mark	2-4'				
-bank height	LDB – 2-4'	RDB – 2-4’			
-riffle/pool complex or other specialized habitat present?	No				
-dominant riparian species: ----------(LDB /RDB)----------	LDB: hackberry, tulip poplar, privet, cherry, red maple				
	RDB: hackberry, tulip poplar, privet, cherry, red maple				
-date of PJD request					
5-photo numbers	35, 36				
6-HUC -8 Code & Name	06010201; Ft. Loudoun/Watts Bar				
7-Assessed	yes ☐	no ☑			
8-ETW	yes ☐	no ☑			
9-303 (d) List	yes ☐	siltation ☐	habitat: ☐	other: ☐	
	no ☑				
10-Notes	This channel drains stormwater to STR-5.				
Substrate	gravel, silt				

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Blount	Named Waterbody: N/A	Date/Time: 05/05/2020 2:42 PM
Assessors/Affiliation: Caleb Duke, CEC Inc., Casey Hertwig, CEC Inc.		Project ID: WWC-3/EPH-3
Site Name/Description: SR-162 (Pellissippi Pkwy.) PIN 101423.00		
Site Location: Maryville, TN		
USGS quad: Maryville	HUC (12 digit): 060102010110	Lat/Long: 35.78049; -83.90951
Previous Rainfall (7-days) : 0.10" Previous 48 hours; 0.85" previous 7-days		
Precipitation this Season vs. Normal : ☐ very wet ☑ wet ☐ average ☐ dry ☐ drought ☐ unknown Source of recent & seasonal precip data : https://lakeinfo.tva.gov/web/precip.htm		
Watershed Size : 0.01 sqmi	Photos: Y or N (circle) Number : 35, 36	
Soil Type(s) / Geology : Litz silt loam, moderately steep phase		
Surrounding Land Use : Forested		
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	☑	WWC ☐
2. Defined bed and bank absent, dominated by upland vegetation / grass	☑	WWC ☐
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	☑	WWC ☐
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	☑	WWC ☐
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	☑	Stream ☐
6. Presence of fish (except *Gambusia*)	☑	Stream ☐
7. Presence of naturally occurring ground water table connection	☑	Stream ☐
8. Flowing water in channel and 7 days since last precipitation in local watershed	☑	Stream ☐
9. Evidence watercourse has been used as a supply of drinking water	☑	Stream ☐

NOTE : If any Primary Indicators 1-9 = "Yes", then STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 13.75

Justification / Notes :

Secondary Field Indicator Evaluation Project ID: WWC-3/EPH-3

A. Geomorphology (Subtotal = 8.25)		**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	**2**	0	1	2	3
2. Sinuous channel	**0**	0	1	2	3
3. In-channel structure: riffle-pool sequences	**1**	0	1	2	3
4. Sorting of soil textures or other substrate	**1**	0	1	2	3
5. Active/relic floodplain	**0**	0	1	2	3
6. Depositional bars or benches	**1**	0	1	2	3
7. Braided channel	**0**	0	1	2	3
8. Recent alluvial deposits	**0.75**	0	0.5	1	1.5
9. Natural levees	**0**	0	1	2	3
10. Headcuts	**1.5**	0	1	2	3
11. Grade controls	**0**	0	0.5	1	1.5
12. Natural valley or drainageway	**1**	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map		**No = 0**			

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

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

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

Total Points = 13.75

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

Notes :

Drains to STR-5, looses definition near confluence.

Ecology Field Data Sheet: **Water Resources**

Project: SR-162 (Pellissippi Pkwy.) PIN 101423.00					
Biologist:	C. Duke, C. Hertwig	**Affiliation:**	CEC, Inc.	**Date:**	May 6, 2020

1-Station: from plans	262+50 R				
2-Map label and name	PND-2				
3-Latitude/Longitude	35.777928; -83.908763				
4-Feature description:					
-channel identification	perennial stream ☐	intermittent stream ☐	ephemeral stream ☐	wwc ☐	
-HD score (if applicable)	NA				
-OHWM indicators	bed & banks ☐	deposition ☐	presence of litter / debris ☐	scour ☐	veg absent, bent, matted ☐
	change in plant community ☐	destruction of terrestrial veg ☐	multiple observed flow events ☐	sediment sorting ☐	water staining ☐
	change in soil character ☐	leaf litter disturbed or absent ☐	natural line impressed on bank ☐	shelving ☐	wracking ☐
-channel bottom width	NA	-top of bank width	NA		
-width at ordinary high water mark	100’ x 75’				
-bank height	LDB – 2-4’	RDB – 2-4’			
-riffle/pool complex or other specialized habitat present?	No				
-dominant riparian species: ----------(LDB /RDB)----------	LDB: hackberry, black willow, autumn olive				
	RDB: hackberry, black willow, autumn olive				
-date of PJD request					
5-photo numbers	37				
6-HUC -8 Code & Name	06010201; Ft. Loudoun/Watts Bar				
7-Assessed	yes ☐	no ☑			
8-ETW	yes ☐	no ☑			
9-303 (d) List	yes ☐	siltation ☐	habitat: ☐	other: ☐	
	no ☑				
10-Notes	Excavated pond located in a topographical depression. This area is heavily impacted by cattle.				
Substrate	Silt/clay/muck				

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: SR-162 (Pellissippi Pkwy.) PIN 101423.00 City/County: Maryville/Blount Sampling Date: May 6, 2020
Applicant/Owner: TDOT State: TN Sampling Point: WTL-6
Investigator(s): Caleb Duke, Casey Hertwig Section, Township, Range: N/A
Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): Concave Slope (%): 0-2
Subregion (LRR or MLRA): LRR N Lat: 35.77468 Long: -83.9082 Datum: NAD 83
Soil Map Unit Name: Lindside silt loam, 0 to 3 percent slopes, occasionally flooded, warm NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)
Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐
Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks:
Size: > 1.02 ac.

Photos: 38, 39, 40

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ☑ No ☐	Depth (inches): 3
Water Table Present?	Yes ☑ No ☐	Depth (inches): 1
Saturation Present? (includes capillary fringe)	Yes ☑ No ☐	Depth (inches): 0

Wetland Hydrology Present? Yes ☑ No ☐

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

Remarks:

VEGETATION (Five Strata) – Use scientific names of plants. Sampling Point: WTL-6

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 0.1)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Sapling Stratum (Plot size: 0.1)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Shrub Stratum (Plot size: 0.1)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Herb Stratum (Plot size: 0.1)			
1. *Panicum philadelphicum*	30	Yes	OBL
2. *Carex vulpinoidea*	25	Yes	OBL
3. *Hydrocotyle ranunculoides*	20	Yes	OBL
4. *Rumex crispus*	10	No	FAC
5. *Ranunculus abortivus*	15	No	FACW
6.			
7.			
8.			
9.			
10.			
11.			
	100 = Total Cover		
50% of total cover: 50	20% of total cover: 20		
Woody Vine Stratum (Plot size: 0.1)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

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

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

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ☑ No ☐

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

SOIL Sampling Point: WTL-6

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
2	2.5Y 4/2	95	7.5YR 4/4	5	C	M	Silt Loam	
2-12	7.5YR 4/4	100						

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ☑ **No** ☐

Remarks:

Wetland Background Information

Name(s) of Field Personnel: C. Hertwig/C. Duke	
Assessment Date: 5-5-2020	
Agency/Organization: CEC, Inc.	
Office Address: 117 Seaboard Ln., Suite E 100, Franklin, TN 37067	
Phone Number: 615-333-7797	
E-mail Address: chertwig@cecinc.com	
Wetland Name(s): WTL-6	
Wetland Location: Include drawing or map of project area limits or attach map showing location and project area limits, county, nearest street address, and narrative description of location, etc. Wetland is located at 35.77468; -83.9082 in a depression near Sevierville Rd. See Figure 2.	
Watershed (12-Digit HUC): 060102010106	
Lat/Long (dd.dddd, -dd.dddd) or UTM Coordinates (m easting, m northing): 35.77468; -83.9082	
Circle coordinate system used: **NAD83** **WGS84** **UTM** **NAD27**	
USGS Quad Name: Maryville	
Depicted on National Wetland Inventory Map: (Y/N) N	
Soil Survey Map Units, Hydric Rating: Lindside silt loam, 0 to 3 percent slopes, occasionally flooded, warm	
Cowardin Wetland Type(s): PEM	
HGM Classification: Depression	
Final Score:	27.5

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	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
SEASONALLY INUNDATED DEPRESSION WETLANDS

Date: 5-5-2020 Project Name SR-162EXT Pellissippi Pkwy

Field Personnel C. Hertwig/C. Duke 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: Wetland Depth (WETDEPTH)

1. Wetland Depth not impacted (SI = 1.0)
   - no fill material or sediment - outlet unaltered - no excavation
   - no ditches/drainage tiles - runoff/input unaltered
2. Wetland depth slightly impacted (SI = 0.75)
   - portion of site with minimal fill material or sediment - outlet lowered/raised - minor excavation
   - portion of site with ditches/drainage tiles - runoff/input increased
3. Wetland depth moderately impacted (SI = 0.5)
   - portion of site with moderate fill material or sediment - outlet lowered/raised - moderate excavation
   - portion of site with ditches/drainage tiles - increased hydroperiod
4. Wetland depth significantly impacted (SI = 0.25)
   - portion of site with significant fill material or sediment - outlet lowered/raised - significant excavation
   - portion of site with ditches/drainage tiles - increased hydroperiod
5. Wetland depth severely impacted (SI = 0.1)
   - excessive fill material or sediment - outlet removed/blocked - entire wetland affected
   - numerous ditches/drainage tiles - increased hydroperiod - recovery potential lost

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
   __ ≥ 13 in. (SI = 1.0) __ 10 – 12 in. (SI = 0.75) __ 6 – 9 in. (SI = 0.5) __ 4 – 5 in. (SI = 0.25)
   __ < 4 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
   __ 3 – 7 (SI = 1.0) __ 8 – 11 (SI = 0.75) __ > 11 (SI = 0.5) __ 1 – 2 (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 as a Group 2 species. 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.		__ _____
__ _____	__ _____	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 = 0.66

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 0.33

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 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)
3. Subtract the sum of the values from Step 2 from 100. Convert this value to a decimal. This 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).
   V8= 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 of 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**
2. This value is the SI for **V9**= 0.01

VALUES USED TO CALCULATE FUNCTIONAL CAPACITY INDICES (FCIs)

SUBINDEX VALUES:

V1 0.25 (WETDEPTH) V3 0 (TSIZE) V5 0 (SCOV) V7 0.57 (COMP) V9 0.01 (BUFFER)

V2 0.75 (WSHEDINT) V4 0 (TDEN) V6 1 (GVC) V8 0.25 (ORGANIC)

TRAM Summary Worksheet

Exceptional Status Wetlands		**Check if applicable**
	1. **ONRW**	NA
	2. **ETW**	NA
	3. **Further Review Requested:** Attach Wetland Background and Exceptional Status Wetlands Worksheet	NA
	COMMENTS/NOTES:	
Quantitative Rating scores	Function: Hydrologic Regime	0.43
	Function: Biogeochemical Processes	0.25
	Function: Retain Particulates	
	Function: Plant Community	0.22
	Function: Wildlife Community	0.20
	Quantitative Score (Average of FCIs x 100)	27.5
	Value Added (Significant Size) Total	
Total of Quantitative and Value Added Scores	**TOTAL SCORE**	27.5

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: SR-162 (Pellissippi Pkwy.) PIN 101423.00 City/County: Maryville/Blount Sampling Date: May 5, 2020
Applicant/Owner: TDOT State: TN Sampling Point: UTP-6
Investigator(s): Caleb Duke, Casey Hertwig Section, Township, Range: N/A
Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): Convex Slope (%): 0-2
Subregion (LRR or MLRA): LRR N Lat: 35.77465 Long: -83.90837 Datum: NAD 83
Soil Map Unit Name: Emory Silt Loam NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)
Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐
Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks:
Photo: 41

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☑ 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 (Five Strata) – Use scientific names of plants. Sampling Point: UTP-6

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 0.1)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Sapling Stratum (Plot size: 0.1)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Shrub Stratum (Plot size: 0.1)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Herb Stratum (Plot size: 0.1)			
1. *Festuca rubra*	60	Yes	FACU
2. *Panicum philadelphicum*	15	No	FACW
3. *Ranunculus sp.*	15	No	FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	90 = Total Cover		
50% of total cover: 45	20% of total cover: 18		
Woody Vine Stratum (Plot size: 0.1)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

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 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	30	x 2 =	60
FAC species	0	x 3 =	0
FACU species	60	x 4 =	240
UPL species	0	x 5 =	0
Column Totals:	90 (A)		300 (B)

Prevalence Index = B/A = 3.33

Hydrophytic Vegetation Indicators:

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

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

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ☐ No ☑

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

SOIL Sampling Point: UTP-6

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
8	7.5YR 4/4	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:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ☐ **No** ☑

Remarks:

Ecology Field Data Sheet: **Water Resources**

Project: SR-162 (Pellissippi Pkwy.) PIN 101423.00					
Biologist:	C. Duke, C. Hertwig	**Affiliation:**	CEC, Inc.	**Date:**	May 6, 2020

1-Station: from plans	290+40R to 291+10L				
2-Map label and name	STR-6				
3-Latitude/Longitude	35.77064; -83.90498				
4-Feature description:					
-channel identification	perennial stream ☑	intermittent stream ☐	ephemeral stream ☐	wwc ☐	
-HD score (if applicable)	Primary: Fish, Benthics				
-OHWM indicators	bed & banks ☑	deposition ☑	presence of litter / debris ☑	scour ☑	veg absent, bent, matted ☑
	change in plant community ☑	destruction of terrestrial veg ☐	multiple observed flow events ☐	sediment sorting ☑	water staining ☑
	change in soil character ☐	leaf litter disturbed or absent ☑	natural line impressed on bank ☑	shelving ☐	wracking ☑
-channel bottom width	8'	-top of bank width	15-20'		
-width at ordinary high water mark	10-12'				
-bank height	LDB - 6-8'	RDB - 2-8'			
-riffle/pool complex or other specialized habitat present?	No				
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Privet, red oak, honeysuckel, hackberry, sycamore				
	RDB: Privet, red oak, honeysuckel, hackberry, sycamore				
-date of PJD request					
5-photo numbers	42, 43				
6-HUC -8 Code & Name	06010201; Ft. Loudoun/Watts Bar				
7-Assessed	yes ☐	no ☑			
8-ETW	yes ☐	no ☑			
9-303 (d) List	yes ☐	siltation ☐	habitat: ☐	other: ☐	
	no ☑				
10-Notes	STR-6 appears heavily impacted by sedimentation but it has not been assessed by TDEC.				
Substrate	gravel, silt				

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Blount	Named Waterbody: Peppermint Branch	Date/Time: 05/05/2020 2:42 PM
Assessors/Affiliation: Caleb Duke, CEC Inc., Casey Hertwig, CEC Inc.		Project ID: STR-6
Site Name/Description: SR-162 (Pellissippi Pkwy.) PIN 101423.00		
Site Location: Maryville, TN		
USGS quad: Maryville	HUC (12 digit): 060102010110	Lat/Long: 35.77163; -83.90279
Previous Rainfall (7-days) : 0.10" Previous 48 hours; 0.85" previous 7-days		
Precipitation this Season vs. Normal : ☐ very wet ☑ wet ☐ average ☐ dry ☐ drought ☐ unknown Source of recent & seasonal precip data : https://lakeinfo.tva.gov/web/precip.htm		
Watershed Size : 0.84 sqmi	Photos: Y or N (circle) Number : 42, 43	
Soil Type(s) / Geology : Lindside silt loam, 0 to 3 percent slopes, occasionally flooded		
Surrounding Land Use : Forested, Pasture		
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	☑	WWC ☐
2. Defined bed and bank absent, dominated by upland vegetation / grass	☑	WWC ☐
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	☑	WWC ☐
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	☑	WWC ☐
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	☐	Stream ☑
6. Presence of fish (except *Gambusia*)	☐	Stream ☑
7. Presence of naturally occurring ground water table connection	☑	Stream ☐
8. Flowing water in channel and 7 days since last precipitation in local watershed	☑	Stream ☐
9. Evidence watercourse has been used as a supply of drinking water	☑	Stream ☐

NOTE : If any Primary Indicators 1-9 = "Yes", then STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = N/A

Justification / Notes :

Stream had multiple benthic organisms and fish.

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: SR-162 (Pellissippi Pkwy.) PIN 101423.00 City/County: Maryville/Blount Sampling Date: May 6, 2020
Applicant/Owner: TDOT State: TN Sampling Point: WTL-7
Investigator(s): Caleb Duke, Casey Hertwig Section, Township, Range: N/A
Landform (hillslope, terrace, etc.): deprssion Local relief (concave, convex, none): Concave Slope (%): 0-2
Subregion (LRR or MLRA): LRR N Lat: 35.76693 Long: -83.8997 Datum: NAD 83
Soil Map Unit Name: Emory silt loam, gently sloping phase NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)
Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐
Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks:
Size: > 0.32 ac.

Photos: 47, 48

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☑ No ☐ Depth (inches): .5
Water Table Present? Yes ☐ No ☑ Depth (inches):
Saturation Present? (includes capillary fringe) Yes ☑ No ☐ Depth (inches): 6

Wetland Hydrology Present? Yes ☑ No ☐

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

Remarks:

VEGETATION (Five Strata) – Use scientific names of plants. Sampling Point: WTL-7

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 0.1)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Sapling Stratum (Plot size: 0.1)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Shrub Stratum (Plot size: 0.1)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Herb Stratum (Plot size: 0.1)			
1. *Ranunculus abortivus*	25	Yes	FACW
2. *Panicum philadelphicum*	20	Yes	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	45 = Total Cover		
50% of total cover: 22.5	20% of total cover: 9		
Woody Vine Stratum (Plot size: 0.1)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

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

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

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ☑ No ☐

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

SOIL Sampling Point: WTL-7

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
4	10YR 4/2	90	7.5YR 4/6	10	C	M	Silty Clay	
4-12	10YR 4/3	85	7.5YR 4/6	15	C	M	Silty Clay	

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ☑ **No** ☐

Remarks:

Wetland Background Information

Name(s) of Field Personnel: C. Hertwig/C. Duke	
Assessment Date: 5-5-2020	
Agency/Organization: CEC, Inc.	
Office Address: 117 Seaboard Ln., Suite E 100, Franklin, TN 37067	
Phone Number: 615-333-7797	
E-mail Address: chertwig@cecinc.com	
Wetland Name(s): WTL-7	
Wetland Location: Include drawing or map of project area limits or attach map showing location and project area limits, county, nearest street address, and narrative description of location, etc. Wetland is located at 35.76693; -83.8997 in a livestock pasture field. See Figure 2.	
Watershed (12-Digit HUC): 060102010106	
Lat/Long (dd.dddd, -dd.dddd) or UTM Coordinates (m easting, m northing): 35.76693 -83.8997	
Circle coordinate system used: **NAD83** **WGS84** **UTM** **NAD27**	
USGS Quad Name: Maryville	
Depicted on National Wetland Inventory Map: (Y/N) N	
Soil Survey Map Units, Hydric Rating: Emory silt loam, gently sloping phase	
Cowardin Wetland Type(s): PEM	
HGM Classification: Slope	
Final Score:	28.25

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	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: 5-6-2020 Project Name SR-162EXT Pellissippi Pkwy

Field Personnel C. Hertwig/C. Duke 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 ground water
   - 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 _____
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) __ 4 – 5 in. (SI = 0.25)
   __< 4 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 as a Group 2 species. 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.		__ _____
__ _____	__ _____	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 = 0.66

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 0.33
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 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.

3. Subtract the sum of the values from Step 2 from 100. Convert this value to a decimal. This 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). 0.75

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 0.57 (COMP) V9 0.01 (BUFFER)

V2 0.75 (WSHEDINT) V4 0 (TDEN) V6 0.25 (GVC) V8 0.75 (ORGANIC)

TRAM Summary Worksheet

Exceptional Status Wetlands		**Check if applicable**
	1. **ONRW**	NA
	2. **ETW**	NA
	3. **Further Review Requested:** Attach Wetland Background and Exceptional Status Wetlands Worksheet	NA
	COMMENTS/NOTES:	
Quantitative Rating scores	Function: Hydrologic Regime	0.43
	Function: Biogeochemical Processes	0.34
	Function: Retain Particulates	
	Function: Plant Community	0.19
	Function: Wildlife Community	0.17
	Quantitative Score (Average of FCIs x 100)	28.25
	Value Added (Significant Size) Total	
Total of Quantitative and Value Added Scores	**TOTAL SCORE**	28.25

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: SR-162 (Pellissippi Pkwy.) PIN 101423.00 City/County: Maryville/Blount Sampling Date: May 5, 2020
Applicant/Owner: TDOT State: TN Sampling Point: UTP-7
Investigator(s): Caleb Duke, Casey Hertwig Section, Township, Range: N/A
Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): Convex Slope (%): 0-2
Subregion (LRR or MLRA): LRR N Lat: 35.76732 Long: -83.89944 Datum: NAD 83
Soil Map Unit Name: Dewey Silty Clay loam NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)
Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐
Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks:
Photo: 49

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ☐ No ☑	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 (Five Strata) – Use scientific names of plants. Sampling Point: UTP-7

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 0.1)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Sapling Stratum (Plot size: 0.1)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Shrub Stratum (Plot size: 0.1)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Herb Stratum (Plot size: 0.1)			
1. *Festuca rubra*	60	Yes	FACU
2.			
3. *Ranunculus sp.*	15	Yes	FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	75 = Total Cover		
50% of total cover: 37.5	20% of total cover: 15		
Woody Vine Stratum (Plot size: 0.1)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	15	x 2 =	30
FAC species	0	x 3 =	0
FACU species	60	x 4 =	240
UPL species	0	x 5 =	0
Column Totals:	75 (A)		270 (B)

Prevalence Index = B/A = 3.6

Hydrophytic Vegetation Indicators:

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

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

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ☐ No ☑

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

SOIL Sampling Point: UTP-7

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
8	10YR 4/3	100					Silt Loam	
8+							Silt Loam	Chrit, Gravel

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ☐ **No** ☑

Remarks:

Ecology Field Data Sheet: **Water Resources**

Project: SR-162 (Pellissippi Pkwy.) PIN 101423.00					
Biologist:	C. Duke, C. Hertwig	**Affiliation:**	CEC, Inc.	**Date:**	May 6, 2020

1-Station: from plans	3309+10R to 315+10L to 322+40CL				
2-Map label and name	WWC-4/EPH-4				
3-Latitude/Longitude	35.76641; -83.89938				
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 observed flow events ☐	sediment sorting ☐	water staining ☑
	change in soil character ☑	leaf litter disturbed or absent ☐	natural line impressed on bank ☐	shelving ☐	wracking ☐
-channel bottom width	1'	-top of bank width	2-3'		
-width at ordinary high water mark	2-3'				
-bank height	LDB - 6"	RDB - 6"			
-riffle/pool complex or other specialized habitat present?	No				
-dominant riparian species: ----------(LDB /RDB)----------	LDB: fescue, panic grass, buttercup species, privet				
	RDB: fescue, panic grass, buttercup species, privet				
-date of PJD request					
5-photo numbers	44, 45, 50, 51				
6-HUC -8 Code & Name	06010201; Ft. Loudoun/Watts Bar				
7-Assessed	yes ☐	no ☑			
8-ETW	yes ☐	no ☑			
9-303 (d) List	yes ☐	siltation ☐	habitat: ☐	other: ☐	
	no ☑				
10-Notes	This channel has been severely impacted by cattle grazing. Up-gradient from ROW this channel appears more stream-like but hydrology appears to drain sub-surface near the fence at STA. 309+80R. Between STA. 319+00 L and 322+60 R, this conveyance becomes more swale-like due to livestock impacts.				
Substrate	Silt				

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Blount	Named Waterbody: N/A	Date/Time: 05/05/2020 2:42 PM
Assessors/Affiliation: Caleb Duke, CEC Inc., Casey Hertwig, CEC Inc.		Project ID: WWC-4/EPH-4
Site Name/Description: SR-162 (Pellissippi Pkwy.) PIN 101423.00		
Site Location: Maryville, TN		
USGS quad: Maryville	HUC (12 digit): 060102010110	Lat/Long: 35.76629; -83.8992
Previous Rainfall (7-days) : 0.10" Previous 48 hours; 0.85" previous 7-days		
Precipitation this Season vs. Normal : ☐ very wet ☑ wet ☐ average ☐ dry ☐ drought ☐ unknown Source of recent & seasonal precip data : https://lakeinfo.tva.gov/web/precip.htm		
Watershed Size : 0.13 sqmi	Photos: Y or N (circle) Number : 44, 45, 50, 51	
Soil Type(s) / Geology : Dewey silty clay loam, 6 to 15 percent slopes, eroded		
Surrounding Land Use : Pasture		
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	☑	WWC ☐
2. Defined bed and bank absent, dominated by upland vegetation / grass	☑	WWC ☐
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	☑	WWC ☐
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	☑	WWC ☐
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	☑	Stream ☐
6. Presence of fish (except *Gambusia*)	☑	Stream ☐
7. Presence of naturally occurring ground water table connection	☑	Stream ☐
8. Flowing water in channel and 7 days since last precipitation in local watershed	☑	Stream ☐
9. Evidence watercourse has been used as a supply of drinking water	☑	Stream ☐

NOTE : If any Primary Indicators 1-9 = "Yes", then STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 17

Justification / Notes :

Secondary Field Indicator Evaluation Project ID: WWC-4/EPH-4

A. Geomorphology (Subtotal = 9)		**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	**1**	0	1	2	3
2. Sinuous channel	**0.5**	0	1	2	3
3. In-channel structure: riffle-pool sequences	**1**	0	1	2	3
4. Sorting of soil textures or other substrate	**1**	0	1	2	3
5. Active/relic floodplain	**1**	0	1	2	3
6. Depositional bars or benches	**1**	0	1	2	3
7. Braided channel	**1**	0	1	2	3
8. Recent alluvial deposits	**0.5**	0	0.5	1	1.5
9. Natural levees	**0**	0	1	2	3
10. Headcuts	**1**	0	1	2	3
11. Grade controls	**0**	0	0.5	1	1.5
12. Natural valley or drainageway	**1**	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map		**No = 0**			

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

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

[1] Focus is on the presence of upland 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 :

Drains to STR-7.

Ecology Field Data Sheet: **Water Resources**

Project: SR-162 (Pellissippi Pkwy.) PIN 101423.00					
Biologist:	C. Duke, C. Hertwig	**Affiliation:**	CEC, Inc.	**Date:**	May 6, 2020

1-Station: from plans	311+80 R				
2-Map label and name	PND-3				
3-Latitude/Longitude	35.766699; -83.899656				
4-Feature description:					
-channel identification	perennial stream ☐	intermittent stream ☐	ephemeral stream ☐	wwc ☐	
-HD score (if applicable)	NA				
-OHWM indicators	bed & banks ☐	deposition ☐	presence of litter / debris ☐	scour ☐	veg absent, bent, matted ☐
	change in plant community ☐	destruction of terrestrial veg ☐	multiple observed flow events ☐	sediment sorting ☐	water staining ☐
	change in soil character ☐	leaf litter disturbed or absent ☐	natural line impressed on bank ☐	shelving ☐	wracking ☐
-channel bottom width	NA	-top of bank width	NA		
-width at ordinary high water mark	30’ x 15’				
-bank height	LDB – 6”-1’	RDB – 6”-1’			
-riffle/pool complex or other specialized habitat present?	No				
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Ranunculus sp., fescue				
	RDB: Ranunculus sp., fescue				
-date of PJD request					
5-photo numbers	46				
6-HUC -8 Code & Name	06010201; Ft. Loudoun/Watts Bar				
7-Assessed	yes ☐	no ☑			
8-ETW	yes ☐	no ☑			
9-303 (d) List	yes ☐	siltation ☐	habitat: ☐	other: ☐	
	no ☑				
10-Notes	This is a cattle pond or depression that intermittently holds water for livestock.				
Substrate	Silt/clay/muck				

Ecology Field Data Sheet: **Water Resources**

Project: SR-162 (Pellissippi Pkwy.) PIN 101423.00					
Biologist:	C. Duke, C. Hertwig	**Affiliation:**	CEC, Inc.	**Date:**	May 6, 2020

1-Station: from plans	326+00L to 322+00R				
2-Map label and name	STR-7 (Gravelly Creek)				
3-Latitude/Longitude	35.764; -83.89707				
4-Feature description:					
-channel identification	perennial stream ☑	intermittent stream ☐	ephemeral stream ☐	wwc ☐	
-HD score (if applicable)	Primary: Fish, Benthics, GW connection				
-OHWM indicators	bed & banks ☑	deposition ☑	presence of litter / debris ☑	scour ☑	veg absent, bent, matted ☑
	change in plant community ☑	destruction of terrestrial veg ☑	multiple observed flow events ☑	sediment sorting ☑	water staining ☑
	change in soil character ☐	leaf litter disturbed or absent ☑	natural line impressed on bank ☑	shelving ☑	wracking ☑
-channel bottom width	20-25'	-top of bank width	35-40'		
-width at ordinary high water mark	25-30'				
-bank height	LDB - 2-3'	RDB - 2-3'			
-riffle/pool complex or other specialized habitat present?	Yes				
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Sumac, hackberry, autumn olive, redbud				
	RDB: Hackberry, sycamore, black willow, privet				
-date of PJD request					
5-photo numbers	52, 53				
6-HUC -8 Code & Name	06010201; Ft. Loudoun/Watts Bar				
7-Assessed	yes ☑	no ☐			
8-ETW	yes ☐	no ☑			
9-303 (d) List	yes ☑	siltation ☑	habitat: ☐	other: ☑	
	no ☐				
10-Notes	STR-7 is a large stream that drains through livestock pasture fields.				
Substrate	bedrock, cobble, boulder, silt, gravel				

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Blount	Named Waterbody: Gravelly Creek	Date/Time: 05/05/2020 2:42 PM
Assessors/Affiliation: Caleb Duke, CEC Inc., Casey Hertwig, CEC Inc.		Project ID: STR-7
Site Name/Description: SR-162 (Pellissippi Pkwy.) PIN 101423.00		
Site Location: Maryville, TN		
USGS quad: Maryville	HUC (12 digit): 060102010110	Lat/Long: 35.76382; -83.89485
Previous Rainfall (7-days) : 0.10" Previous 48 hours; 0.85" previous 7-days		
Precipitation this Season vs. Normal : ☐ very wet ☑ wet ☐ average ☐ dry ☐ drought ☐ unknown Source of recent & seasonal precip data : https://lakeinfo.tva.gov/web/precip.htm		
Watershed Size : 2.33 sqmi	Photos: Y or N (circle) Number : 52, 53	
Soil Type(s) / Geology : Greendale silt loam, 0 to 6 percent slopes, occasionally flooded		
Surrounding Land Use : Agricultural, Forested, Pasture		
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	☑	WWC ☐
2. Defined bed and bank absent, dominated by upland vegetation / grass	☑	WWC ☐
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	☑	WWC ☐
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	☑	WWC ☐
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	☐	Stream ☑
6. Presence of fish (except *Gambusia*)	☐	Stream ☑
7. Presence of naturally occurring ground water table connection	☐	Stream ☑
8. Flowing water in channel and 7 days since last precipitation in local watershed	☑	Stream ☐
9. Evidence watercourse has been used as a supply of drinking water	☑	Stream ☐

NOTE : If any Primary Indicators 1-9 = "Yes", then STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = N/A

Justification / Notes :

Stream had multiple benthic organisms and fish.

Ecology Field Data Sheet: **Water Resources**

Project: SR-162 (Pellissippi Pkwy.) PIN 101423.00					
Biologist:	C. Duke, C. Hertwig	**Affiliation:**	CEC, Inc.	**Date:**	May 6, 2020

1-Station: from plans	322+90R to 322+95CL				
2-Map label and name	STR-8				
3-Latitude/Longitude	35.76399; -83.89775				
4-Feature description:					
-channel identification	perennial stream ☑	intermittent stream ☐	ephemeral stream ☐	wwc ☐	
-HD score (if applicable)	Primary: GW connection				
-OHWM indicators	bed & banks ☑	deposition ☐	presence of litter / debris ☑	scour ☐	veg absent, bent, matted ☑
	change in plant community ☑	destruction of terrestrial veg ☑	multiple observed flow events ☐	sediment sorting ☑	water staining ☑
	change in soil character ☐	leaf litter disturbed or absent ☑	natural line impressed on bank ☑	shelving ☐	wracking ☑
-channel bottom width	6-8'	-top of bank width	8-12'		
-width at ordinary high water mark	8-10'				
-bank height	LDB - 1'	RDB - 1'			
-riffle/pool complex or other specialized habitat present?	No				
-dominant riparian species: ----------(LDB /RDB)----------	LDB: honeysuckle, hackberry, redbud				
	RDB: honeysuckle, hackberry, redbud				
-date of PJD request					
5-photo numbers	54, 55, 56 SPG-1				
6-HUC -8 Code & Name	06010201; Ft. Loudoun/Watts Bar				
7-Assessed	yes ☐	no ☑			
8-ETW	yes ☐	no ☑			
9-303 (d) List	yes ☑	siltation ☑	habitat: ☐	other: ☐	
	no ☐				
10-Notes	STR-8 begins at SPG-1 which flows to the surface from under an opening in the bedrock.				
Substrate	Cobble, silt, gravel				

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Blount	Named Waterbody: Gravelly Creek	Date/Time: 05/05/2020 2:42 PM
Assessors/Affiliation: Caleb Duke, CEC Inc., Casey Hertwig, CEC Inc.		Project ID: STR-8
Site Name/Description: SR-162 (Pellissippi Pkwy.) PIN 101423.00		
Site Location: Maryville, TN		
USGS quad: Maryville	HUC (12 digit): 060102010110	Lat/Long: 35.76352; -83.89663
Previous Rainfall (7-days) : 0.10" Previous 48 hours; 0.85" previous 7-days		
Precipitation this Season vs. Normal : ☐ very wet ☑ wet ☐ average ☐ dry ☐ drought ☐ unknown Source of recent & seasonal precip data : https://lakeinfo.tva.gov/web/precip.htm		
Watershed Size : 0.05 sqmi	Photos: Y or N (circle) Number : 54, 55	
Soil Type(s) / Geology : Greendale silt loam, 0 to 6 percent slopes, occasionally flooded		
Surrounding Land Use : Forested		
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	☑	WWC ☐
2. Defined bed and bank absent, dominated by upland vegetation / grass	☑	WWC ☐
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	☑	WWC ☐
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	☑	WWC ☐
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	☑	Stream ☐
6. Presence of fish (except *Gambusia*)	☑	Stream ☐
7. Presence of naturally occurring ground water table connection	☐	Stream ☑
8. Flowing water in channel and 7 days since last precipitation in local watershed	☑	Stream ☐
9. Evidence watercourse has been used as a supply of drinking water	☑	Stream ☐

NOTE : If any Primary Indicators 1-9 = "Yes", then STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = N/A

Justification / Notes :

Stream begins at a spring underneath bedrock.

Ecology Field Data Sheet: **Water Resources**

Project: SR-162 (Pellissippi Pkwy.) PIN 101423.00					
Biologist:	C. Duke, C. Hertwig	**Affiliation:**	CEC, Inc.	**Date:**	May 6, 2020

1-Station: from plans	326+20R to 325+10 CL				
2-Map label and name	WWC-5/EPH-5				
3-Latitude/Longitude	35.76316; -83.89727				
4-Feature description:					
-channel identification	perennial stream ☐	intermittent stream ☐	ephemeral stream ☑	wwc ☑	
-HD score (if applicable)	13.75				
-OHWM indicators	bed & banks ☑	deposition ☐	presence of litter / debris ☐	scour ☐	veg absent, bent, matted ☑
	change in plant community ☐	destruction of terrestrial veg ☐	multiple observed flow events ☐	sediment sorting ☐	water staining ☐
	change in soil character ☐	leaf litter disturbed or absent ☐	natural line impressed on bank ☐	shelving ☐	wracking ☐
-channel bottom width	1-2'	-top of bank width	6-8'		
-width at ordinary high water mark	2-3'				
-bank height	LDB - 3-4'	RDB - 3-4'			
-riffle/pool complex or other specialized habitat present?	No				
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Hackberry, redcedar, boxelder, honeysuckel, sumac				
	RDB: Hackberry, redcedar, boxelder, honeysuckel, sumac				
-date of PJD request					
5-photo numbers	57, 58				
6-HUC -8 Code & Name	06010201; Ft. Loudoun/Watts Bar				
7-Assessed	yes ☐	no ☑			
8-ETW	yes ☐	no ☑			
9-303 (d) List	yes ☐	siltation ☐	habitat: ☐	other: ☐	
	no ☑				
10-Notes	This conveyance begins at a culvert outlet underneath a farm access road. The channel ends prior to reaching STR-7 where bed and bank and ordinary high water marks become discontinuous.				
Substrate	gravel, silt, rip rap				

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Blount	Named Waterbody: N/A	Date/Time: 05/05/2020 2:42 PM
Assessors/Affiliation: Caleb Duke, CEC Inc., Casey Hertwig, CEC Inc.		Project ID: WWC-5/EPH-5
Site Name/Description: SR-162 (Pellissippi Pkwy.) PIN 101423.00		
Site Location: Maryville, TN		
USGS quad: Maryville	HUC (12 digit): 060102010110	Lat/Long: 35.76357; -83.88727
Previous Rainfall (7-days) : 0.10" Previous 48 hours; 0.85" previous 7-days		
Precipitation this Season vs. Normal : ☐ very wet ☑ wet ☐ average ☐ dry ☐ drought ☐ unknown Source of recent & seasonal precip data : https://lakeinfo.tva.gov/web/precip.htm		
Watershed Size : 0.01 sqmi	Photos: Y or N (circle) Number : 57, 58	
Soil Type(s) / Geology : Dewey silty clay loam, 6 to 15 percent slopes, eroded		
Surrounding Land Use : Pasture		
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	☑	WWC ☐
2. Defined bed and bank absent, dominated by upland vegetation / grass	☑	WWC ☐
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	☑	WWC ☐
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	☑	WWC ☐
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	☑	Stream ☐
6. Presence of fish (except *Gambusia*)	☑	Stream ☐
7. Presence of naturally occurring ground water table connection	☑	Stream ☐
8. Flowing water in channel and 7 days since last precipitation in local watershed	☑	Stream ☐
9. Evidence watercourse has been used as a supply of drinking water	☑	Stream ☐

NOTE : If any Primary Indicators 1-9 = "Yes", then STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 13.75

Justification / Notes :

Secondary Field Indicator Evaluation Project ID: WWC-5/EPH-5

A. Geomorphology (Subtotal = 8.75)		**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	**1.5**	0	1	2	3
2. Sinuous channel	**1**	0	1	2	3
3. In-channel structure: riffle-pool sequences	**1**	0	1	2	3
4. Sorting of soil textures or other substrate	**1**	0	1	2	3
5. Active/relic floodplain	**1**	0	1	2	3
6. Depositional bars or benches	**1**	0	1	2	3
7. Braided channel	**0.5**	0	1	2	3
8. Recent alluvial deposits	**0.5**	0	0.5	1	1.5
9. Natural levees	**0**	0	1	2	3
10. Headcuts	**0.5**	0	1	2	3
11. Grade controls	**0.5**	0	0.5	1	1.5
12. Natural valley or drainageway	**0.25**	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map		**No = 0**			

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

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

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

Total Points = 13.75

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

Notes :

Drains to STR-7. Poorly defined majority erosional and sheet flows to STR-7.

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: SR-162 (Pellissippi Pkwy.) PIN 101423.00 City/County: Maryville/Blount Sampling Date: May 6, 2020
Applicant/Owner: TDOT State: TN Sampling Point: WTL-8A
Investigator(s): Caleb Duke, Casey Hertwig Section, Township, Range: N/A
Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): Concave Slope (%): 0-2
Subregion (LRR or MLRA): LRR N Lat: 35.760712 Long: -83.895657 Datum: NAD 83
Soil Map Unit Name: Melvin silt loam, 0 to 2 percent slopes, occasionally flooded, warm NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)
Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐
Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks:
Size: > 7.3 ac.

Photos: 59, 60, 61

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☑ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ☐ No ☑	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 (Five Strata) – Use scientific names of plants. Sampling Point: WTL-8A

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 0.1)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Sapling Stratum (Plot size: 0.1)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Shrub Stratum (Plot size: 0.1)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Herb Stratum (Plot size: 0.1)			
1. *Panicum philadelphicum*	40	Yes	FAC
2. *Juncus effusus*	25	Yes	FACW
3. *Ranunculus abortivus*	20	Yes	FACW
4. *Poa palustris*	15	No	FACW
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	100 = Total Cover		
50% of total cover: 50	20% of total cover: 20		
Woody Vine Stratum (Plot size: 0.1)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

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

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

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ☑ No ☐

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

SOIL Sampling Point: WTL-8A

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
4	2.5Y 5/2	90	7.5YR 3/4	10	C	M,PL	Silt Loam	
4-14	2.5Y 5/3	90	7.5YR 4/6	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:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ☑ **No** ☐

Remarks:

Wetland Background Information

Name(s) of Field Personnel: C. Hertwig/C. Duke	
Assessment Date: 5-5-2020	
Agency/Organization: CEC, Inc.	
Office Address: 117 Seaboard Ln., Suite E 100, Franklin, TN 37067	
Phone Number: 615-333-7797	
E-mail Address: chertwig@cecinc.com	

Wetland Name(s): WTL-8A

Wetland Location:

Include drawing or map of project area limits or attach map showing location and project area limits, county, nearest street address, and narrative description of location, etc.

Wetland is located at 35.760712; -83.895657 along the floodplain of STR-9. See Figure 2.

Watershed (12-Digit HUC): 060102010106	
Lat/Long (dd.dddd, -dd.dddd) or UTM Coordinates (m easting, m northing): 35.760712 -83.895657	
Circle coordinate system used: **NAD83** **WGS84** **UTM** **NAD27**	
USGS Quad Name: Maryville	
Depicted on National Wetland Inventory Map: (Y/N) N	
Soil Survey Map Units, Hydric Rating: Melvin silt loam, 0 to 2 percent slopes, occasionally flooded, warm	
Cowardin Wetland Type(s): PEM/PSS	
HGM Classification: Riverine	
Final Score:	30.4

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	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
RIVERINE WETLANDS

Date: 5-6-2020 Project Name SR-162EXT Pellissippi Pkwy

Field Personnel C. Hertwig/C. Duke Wetland Name/Location WTL-8A

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: River Connection (RIVCON)

1. Overbank flooding has not been impacted (SI = 1.0)
   - no artificial levee(s), spoil piles, roads, or other obstructions
   - no channelization; channel is naturally meandering
   - no channel downcutting
   - no lateral cutting and no bank failure
   - flood frequency < 2 years
   - local knowledge
   - gauge data
2. Overbank flooding slightly impacted (SI = 0.75)
   -levee(s) etc. present but most overbank flooding occurs
   - channelization
   - slight channel downcutting
   - slight lateral cutting and bank failure
   - flooding frequency < 2 years
   - local knowledge
   - gauge data
3. Overbank flooding moderately impacted (SI = 0.5)
   - levee (s) etc. present but some overbank flow occurs
   - channelization
   - moderate channel downcutting
   - moderate lateral cutting and bank failure
   - local knowledge
   - gauge data
4. Overbank flooding significantly impacted (SI = 0.25)
   - levee (s) etc. present but some overbank flow occurs
   - channelization
   - significant channel downcutting
   - significant lateral cutting and bank failure
   - local knowledge
   - gauge data
5. Overbank flooding severely impacted (SI = 0.1)
   - levee(s) etc. have eliminated overbank flooding
   - channelization
   - severe channel downcutting
   - severe lateral cutting and bank failure
   - natural flood regime no longer occurs
   - local knowledge
   - gauge data

V2: Hydroperiod (HYDRO)

1. Hydrologic storage not altered (SI = 1.0)
   - no fill material or excessive sediment
   - no ditches/drainage tiles
   - no artificial levees or other structures that cause prolonged ponding
   - no land leveling
2. Hydrologic storage slightly impacted (SI = 0.75)
   - portion of site impacted by fill or excessive sediment
   - ditches/drainage tiles present over portion of site
   - portion of the site impacted by dikes or other structures that cause prolonged ponding
   - land leveling of portion of site
3. Hydrologic storage moderately impacted (SI = 0.50)
   - portion of site impacted by fill or excessive sediment
   -widely spaced ditches/drainage tiles present over entire site
   -portion of the site impacted by dikes or other structures that cause prolonged ponding
   - land leveling of portion of site
4. Hydrologic storage significantly impacted (SI = 0.25)
   - portion of site impacted by fill or excessive sediment
   -moderately spaced ditches/drainage tiles present over entire site
   -portion of the site impacted by dikes or other structures that cause prolonged ponding
   - land leveling of portion of site
5. Hydrologic storage severely impacted (SI = 0.1)
   - entire site impacted by fill, excessive sediment, or leveling
   - closely spaced ditches/tiles present over entire site
   - entire site impacted by dikes or other structures that cause prolonged ponding
   - land leveling of entire site

V3: Canopy Tree Size Class (TSIZE)

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

__ > 16 in. (SI = 1.0) __ 10 – 16 in. (SI = 0.75) __ 5 – 9 in. (SI = 0.5) __ 3 – 4 in. (SI = 0.25)

__ < 4 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

__ 8 – 16 (SI = 1.0) __ 17 – 50 (SI = 0.75) __ > 50 (SI = 0.5) __ 3 – 7 (SI = 0.5) __ 1– 2 (SI = 0.25)

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 as a Group 2 species. 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	__ Shumard oak	__ American elm	__ River birch	__ European/Chinese privet
__ Willow oak	__ Overcup oak	__ Slippery elm	__ Boxelder	__ Japanese honeysuckle
__ Cherrybark oak	__ Water hickory	__ Silver maple	__ Deciduous holly	__ Japanese stiltgrass
__ Pin oak	__ Honey locust	__ Red maple	__ Sugarberry	__ Giant reed
__ Swamp chestnut oak	__ Water tupelo	__ Black willow	__ Silky dogwood	__ Tall fescue
__ Bur oak	__ Bald cypress	__ Sweetgum	__ _____	__ Purple loosestrife
__ Nuttall oak	__ Am. hornbeam	__ Green ash	__ _____	__ _____
__ Swamp white oak	__ _____	Number native shrub spp.		
__ _____	__ _____	3 Number native herbaceous spp.		

2. Using the checked 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 is the SI for V7 0.70

* In some Riverine wetlands and in some small WAAs (e.g., <0.5 acres), relatively few species (e.g., overcup oak) may be present. In cases where 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 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). .50

V9: Tract Size (TRACT)

1. Area (acres) of adjacent wetland and upland forest that is contiguous with the WAA. These values are for western Tennessee are negligible unless greater than the value added section limits for the remainder of the state.

__ > 7,000 (SI = 1.0) __ >200 – 1,000 (SI = 0.5) __ < 1(SI = 0.00)
__ >1,000 – 7,000 (SI = 0.75) __ 1 – 200 (SI = 0.25) X In Eastern or Central Tennessee (SI=1.0)

VALUES USED TO CALCULATE FUNCTIONAL CAPACITY INDICES (FCIs)

SUBINDEX VALUES:

V1 0.25 (RIVCON) V3 0 (TSIZE) V5 0 (SCOV) V7 0.70 (COMP) V9 1 (TRACT)

V2 0.50 (HYDRO) V4 0 (TDEN) V6 1 (GCV) V8 0.5 (ORGANIC)

WETLAND FUNCTIONS

FUNCITION 1: MAINTAIN HYDROLOGIC REGIME

FCI 1: $(V1 \times V2)^{1/2} \Rightarrow (____ \times ____)^{1/2}$ = _____

FUNCTION 2: RETAIN PARTICULATES

FCI 2: (trees present) = $\frac{(V1 \times V2)^{1/2} + V4}{2} \Rightarrow \frac{(FCI\ 1) + ____}{2}$ = _____

FCI 2: (shrubs present) = $\frac{(V1 \times V2)^{1/2} + V5}{2} \Rightarrow \frac{(FCI\ 1) + ____}{2}$ = _____

FCI 2: (ground cover) = $\frac{(V1 \times V2)^{1/2} + V6}{3} \Rightarrow \frac{(FCI\ 1) + ____}{3}$ = _____

FUNCTION 3: MAINTAIN BIOGEOCHEMICAL PROCESSES

FCI 3: (trees present)= $\left((V1 \times V2)^{1/2} \times \left(\frac{\frac{V3+V4}{2} + V8}{2}\right)\right)^{1/2} \Rightarrow \left((FCI\ 1) \times \left(\frac{\frac{____ + ____}{2} + ____}{2}\right)\right)^{1/2}$ = _____

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

FCI 3: (ground cover)= $\left((V1 \times V2)^{1/2} \times \frac{V6+V8}{5}\right)^{1/2} \Rightarrow \left((FCI\ 1) \times \frac{____ + ____}{5}\right)^{1/2}$ = _____

FUNCTION 4: MAINTAIN CHARACTERISTIC PLANT COMMUNITY

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

FCI 4: (shrubs present) = $\frac{(V1 \times V2)^{1/2} + 2\left(\frac{V5+V7}{2}\right)}{6} \Rightarrow \frac{(FCI\ 1) + (____ + ____)}{6}$ = _____

FCI 4: (groundcover) = $\frac{(V1 \times V2)^{1/2} + 2\left(\frac{V6+V7}{2}\right)}{9} \Rightarrow \frac{(FCI\ 1) + (____ + ____)}{9}$ = _____

FUNCTION 5: MAINTAIN CHARACTERISTIC WILDILFE COMMUNITY

FCI 5: (trees) = $\frac{(V1 \times V2)^{1/2} + 2\left(\frac{V3+V4+V7}{3}\right) + V9}{4} \Rightarrow \frac{(FCI\ 1) + 2\left(\frac{____ + ____ + ____}{3}\right) + ____}{4}$ = _____

FCI 5: (shrubs present) = $\frac{(V1 \times V2)^{1/2} + 2\left(\frac{V5+V7}{2}\right) + V9}{6} \Rightarrow \frac{(FCI\ 1) + (____ + ____) + ____}{6}$ = _____

FCI 5: (groundcover) = $\frac{(V1 \times V2)^{1/2} + 2\left(\frac{V6+V7}{2}\right) + V9}{9} \Rightarrow \frac{(FCI\ 1) + (____ + ____) + ____}{9}$ = _____

TRAM Summary Worksheet

Exceptional Status Wetlands		**Check if applicable**
	1. **ONRW**	NA
	2. **ETW**	NA
	3. **Further Review Requested:** Attach Wetland Background and Exceptional Status Wetlands Worksheet	NA
	COMMENTS/NOTES:	
Quantitative Rating scores	Function: Hydrologic Regime	0.35
	Function: Biogeochemical Processes	0.29
	Function: Retain Particulates	0.27
	Function: Plant Community	0.23
	Function: Wildlife Community	0.38
	Quantitative Score (Average of FCIs x 100)	30.4
	Value Added (Significant Size) Total	
Total of Quantitative and Value Added Scores	**TOTAL SCORE**	30.4

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: SR-162 (Pellissippi Pkwy.) PIN 101423.00 City/County: Maryville/Blount Sampling Date: May 5, 2020
Applicant/Owner: TDOT State: TN Sampling Point: UTP-8A
Investigator(s): Caleb Duke, Casey Hertwig Section, Township, Range: N/A
Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): Concave Slope (%): 0-2
Subregion (LRR or MLRA): LRR N Lat: 35.761 Long: -83.895167 Datum: NAD 83
Soil Map Unit Name: Lindside Silt Loam NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)
Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐
Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks:
Photo: 62

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☑ 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 (Five Strata) – Use scientific names of plants. Sampling Point: UTP-8A

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 0.1)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Sapling Stratum (Plot size: 0.1)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Shrub Stratum (Plot size: 0.1)			
1.			FACU
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Herb Stratum (Plot size: 0.1)			
1. *Festuca rubra*	60	Yes	FACU
2. *Panicum capillare*	40	Yes	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	100 = Total Cover		
50% of total cover: 50	20% of total cover: 20		
Woody Vine Stratum (Plot size: 0.1)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species 40	x 3 =	120
FACU species 60	x 4 =	240
UPL species	x 5 =	360
Column Totals: 100 (A)		(B)

Prevalence Index = B/A = 3.6

Hydrophytic Vegetation Indicators:

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

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

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ☐ No ☑

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

SOIL Sampling Point: UTP-8A

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
12	7.5YR 4/4	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:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ☐ **No** ☑

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: SR-162 (Pellissippi Pkwy.) PIN 101423.00 City/County: Maryville/Blount Sampling Date: May 7, 2020
Applicant/Owner: TDOT State: TN Sampling Point: WTL-8b
Investigator(s): Caleb Duke, Casey Hertwig Section, Township, Range: N/A
Landform (hillslope, terrace, etc.): dpression Local relief (concave, convex, none): Concave Slope (%): 0-2
Subregion (LRR or MLRA): LRR N Lat: 35.759623 Long: -83.896208 Datum: NAD 83
Soil Map Unit Name: Melvin silt loam, 0 to 2 percent slopes, occasionally flooded, warm NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)
Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐
Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks:
Size: > 7.3 ac.

Photos: 63, 64, 65

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☑ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☑ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ☑ No ☐	Depth (inches): 2
Water Table Present?	Yes ☑ No ☐	Depth (inches): 0
Saturation Present? (includes capillary fringe)	Yes ☑ No ☐	Depth (inches): 0

Wetland Hydrology Present? Yes ☑ No ☐

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

Remarks:

VEGETATION (Five Strata) – Use scientific names of plants. Sampling Point: WTL-8b

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 0.1)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Sapling Stratum (Plot size: 0.1)			
1. *Salix nigra*	15	Yes	OBL
2. *Acer negundo*	15	Yes	FACW
3. *Acer rubrum*	10	Yes	FAC
4.			
5.			
6.			
	40 = Total Cover		
50% of total cover: 20	20% of total cover: 8		
Shrub Stratum (Plot size: 0.1)			
1. *Cornus amomum*	15	Yes	FACW
2.			
3.			
4.			
5.			
6.			
	15 = Total Cover		
50% of total cover: 7.5	20% of total cover: 3		
Herb Stratum (Plot size: 0.1)			
1. *Carex vulpinoidea*	15	No	OBL
2. *Juncus effusus*	15	No	FACW
3. *Agrostis gigantea*	10	No	FACW
4. *Leersia oryzoides*	5	No	OBL
5. *Eupatorium perfoliatum*	10	No	FACW
6. *Peltandra virginica*	10	No	OBL
7. *Mentha spicata*	10	No	FACW
8. *Scirpus atrovirens*	10	No	OBL
9. *Alisma subcordatum*	5	No	OBL
10. *Glyceria striata*	10	No	OBL
11.			
	100 = Total Cover		
50% of total cover: 50	20% of total cover: 20		
Woody Vine Stratum (Plot size: 0.1)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

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 (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

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

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

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ☑ No ☐

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

SOIL Sampling Point: WTL-8b

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
12	10YR 4/2	85	7.5YR 4/4	15				

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ☑ **No** ☐

Remarks:

Positive reaction to alpha alpha dipyridyl

Wetland Background Information

Name(s) of Field Personnel:	C. Hertwig/C. Duke
Assessment Date:	5-5-2020
Agency/Organization:	CEC, Inc.
Office Address:	117 Seaboard Ln., Suite E 100, Franklin, TN 37067
Phone Number:	615-333-7797
E-mail Address:	chertwig@cecinc.com

Wetland Name(s): WTL-8A

Wetland Location:

Include drawing or map of project area limits or attach map showing location and project area limits, county, nearest street address, and narrative description of location, etc.

Wetland is located at 35.759623; -83.896208 along the floodplain of STR-9. See Figure 2.

Watershed (12-Digit HUC):	060102010106
Lat/Long (dd.dddd, -dd.dddd) or UTM Coordinates (m easting, m northing):	35.759623; -83.896208
Circle coordinate system used:	**NAD83** **WGS84** **UTM** **NAD27**
USGS Quad Name:	Maryville
Depicted on National Wetland Inventory Map: (Y/N)	N
Soil Survey Map Units, Hydric Rating:	Melvin silt loam, 0 to 2 percent slopes, occasionally flooded, warm
Cowardin Wetland Type(s):	PEM/PSS
HGM Classification:	Riverine
Final Score:	52.6

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	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
RIVERINE WETLANDS

Date: 5-6-2020 Project Name SR-162EXT Pellissippi Pkwy

Field Personnel C. Hertwig/C. Duke Wetland Name/Location WTL-8B

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: River Connection (RIVCON)

1. Overbank flooding has not been impacted (SI = 1.0)
   - no artificial levee(s), spoil piles, roads, or other obstructions
   - no channelization; channel is naturally meandering
   - no channel downcutting
   - no lateral cutting and no bank failure
   - flood frequency < 2 years
   - local knowledge
   - gauge data

2. Overbank flooding slightly impacted (SI = 0.75)
   -levee(s) etc. present but most overbank flooding occurs
   - channelization
   - slight channel downcutting
   - slight lateral cutting and bank failure
   - flooding frequency < 2 years
   - local knowledge
   - gauge data

3. Overbank flooding moderately impacted (SI = 0.5)
   - levee (s) etc. present but some overbank flow occurs
   - channelization
   - moderate channel downcutting
   - moderate lateral cutting and bank failure
   - local knowledge
   - gauge data

4. Overbank flooding significantly impacted (SI = 0.25)
   - levee (s) etc. present but some overbank flow occurs
   - channelization
   - significant channel downcutting
   - significant lateral cutting and bank failure
   - local knowledge
   - gauge data

5. Overbank flooding severely impacted (SI = 0.1)
   - levee(s) etc. have eliminated overbank flooding
   - channelization
   - severe channel downcutting
   - severe lateral cutting and bank failure
   - natural flood regime no longer occurs
   - local knowledge
   - gauge data

V2: Hydroperiod (HYDRO)

1. Hydrologic storage not altered (SI = 1.0)
   - no fill material or excessive sediment
   - no ditches/drainage tiles
   - no artificial levees or other structures that cause prolonged ponding
   - no land leveling

2. Hydrologic storage slightly impacted (SI = 0.75)
   - portion of site impacted by fill or excessive sediment
   - ditches/drainage tiles present over portion of site
   - portion of the site impacted by dikes or other structures that cause prolonged ponding
   - land leveling of portion of site

3. Hydrologic storage moderately impacted (SI = 0.50)
   - portion of site impacted by fill or excessive sediment
   -widely spaced ditches/drainage tiles present over entire site
   -portion of the site impacted by dikes or other structures that cause prolonged ponding
   - land leveling of portion of site

4. Hydrologic storage significantly impacted (SI = 0.25)
   - portion of site impacted by fill or excessive sediment
   -moderately spaced ditches/drainage tiles present over entire site
   -portion of the site impacted by dikes or other structures that cause prolonged ponding
   - land leveling of portion of site

5. Hydrologic storage severely impacted (SI = 0.1)
   - entire site impacted by fill, excessive sediment, or leveling
   - closely spaced ditches/tiles present over entire site
   - entire site impacted by dikes or other structures that cause prolonged ponding
   - land leveling of entire site

V3: Canopy Tree Size Class (TSIZE)

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

__ > 16 in. (SI = 1.0) __ 10 – 16 in. (SI = 0.75) __ 5 – 9 in. (SI = 0.5) __ 3 – 4 in. (SI = 0.25)

__ < 4 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

__ 8 – 16 (SI = 1.0) __ 17 – 50 (SI = 0.75) __ > 50 (SI = 0.5) __ 3 – 7 (SI = 0.5) __ 1– 2 (SI = 0.25)

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 as a Group 2 species. 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	__ Shumard oak	__ American elm	River birch	__ European/Chinese privet
__ Willow oak	__ Overcup oak	__ Slippery elm	X Boxelder	__ Japanese honeysuckle
__ Cherrybark oak	__ Water hickory	X Silver maple	__ Deciduous holly	__ Japanese stiltgrass
__ Pin oak	__ Honey locust	__ Red maple	__ Sugarberry	__ Giant reed
__ Swamp chestnut oak	__ Water tupelo	X Black willow	X Silky dogwood	__ Tall fescue
__ Bur oak	__ Bald cypress	__ Sweetgum	__ _____	__ Purple loosestrife
__ Nuttall oak	__ Am. hornbeam	__ Green ash	__ _____	__ _____
__ Swamp white oak	__ _____	Number native shrub spp.		
__ _____	__ _____	4 Number native herbaceous spp.		

2. Using the checked 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 is the SI for V7 0.81

* In some Riverine wetlands and in some small WAAs (e.g., <0.5 acres), relatively few species (e.g., overcup oak) may be present. In cases where 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

X 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 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: Tract Size (TRACT)

1. Area (acres) of adjacent wetland and upland forest that is contiguous with the WAA. These values are for western Tennessee are negligible unless greater than the value added section limits for the remainder of the state.

__ > 7,000 (SI = 1.0) __ >200 – 1,000 (SI = 0.5) __ < 1(SI = 0.00)
__ >1,000 – 7,000 (SI = 0.75) __ 1 – 200 (SI = 0.25) X In Eastern or Central Tennessee (SI=1.0)

VALUES USED TO CALCULATE FUNCTIONAL CAPACITY INDICES (FCIs)

SUBINDEX VALUES:

V1 0.75 (RIVCON) V3 0 (TSIZE) V5 0 (SCOV) V7 0.81 (COMP) V9 1 (TRACT)

V2 0.75 (HYDRO) V4 0.25 (TDEN) V6 1 (GCV) V8 1 (ORGANIC)

WETLAND FUNCTIONS

FUNCITION 1: MAINTAIN HYDROLOGIC REGIME

FCI 1: $(V1 \times V2)^{1/2} \Rightarrow (____ \times ____)^{1/2}$ = _____

FUNCTION 2: RETAIN PARTICULATES

FCI 2: (trees present) = $\frac{(V1 \times V2)^{1/2} + V4}{2} \Rightarrow \frac{(FCI\ 1) + ____}{2}$ = _____

FCI 2: (shrubs present) = $\frac{(V1 \times V2)^{1/2} + V5}{2} \Rightarrow \frac{(FCI\ 1) + ____}{2}$ = _____

FCI 2: (ground cover) = $\frac{(V1 \times V2)^{1/2} + V6}{3} \Rightarrow \frac{(FCI\ 1) + ____}{3}$ = _____

FUNCTION 3: MAINTAIN BIOGEOCHEMICAL PROCESSES

FCI 3: (trees present)= $\left((V1 \times V2)^{1/2} \times \left(\frac{\frac{V3+V4}{2} + V8}{2}\right)\right)^{1/2} \Rightarrow \left((FCI\ 1) \times \left(\frac{\frac{____ + ____}{2} + ____}{2}\right)\right)^{1/2}$ = _____

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

FCI 3: (ground cover)= $\left((V1 \times V2)^{1/2} \times \frac{V6+V8}{5}\right)^{1/2} \Rightarrow \left((FCI\ 1) \times \frac{____ + ____}{5}\right)^{1/2}$ = _____

FUNCTION 4: MAINTAIN CHARACTERISTIC PLANT COMMUNITY

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

FCI 4: (shrubs present) = $\frac{(V1 \times V2)^{1/2} + 2\left(\frac{V5+V7}{2}\right)}{6} \Rightarrow \frac{(FCI\ 1) + (____ + ____)}{6}$ = _____

FCI 4: (groundcover) = $\frac{(V1 \times V2)^{1/2} + 2\left(\frac{V6+V7}{2}\right)}{9} \Rightarrow \frac{(FCI\ 1) + (____ + ____)}{9}$ = _____

FUNCTION 5: MAINTAIN CHARACTERISTIC WILDILFE COMMUNITY

FCI 5: (trees) = $\frac{(V1 \times V2)^{1/2} + 2\left(\frac{V3+V4+V7}{3}\right) + V9}{4} \Rightarrow \frac{(FCI\ 1) + 2\left(\frac{____ + ____ + ____}{3}\right) + ____}{4}$ = _____

FCI 5: (shrubs present) = $\frac{(V1 \times V2)^{1/2} + 2\left(\frac{V5+V7}{2}\right) + V9}{6} \Rightarrow \frac{(FCI\ 1) + (____ + ____) + ____}{6}$ = _____

FCI 5: (groundcover) = $\frac{(V1 \times V2)^{1/2} + 2\left(\frac{V6+V7}{2}\right) + V9}{9} \Rightarrow \frac{(FCI\ 1) + (____ + ____) + ____}{9}$ = _____

TRAM Summary Worksheet

Exceptional Status Wetlands		**Check if applicable**
	1. **ONRW**	NA
	2. **ETW**	NA
	3. **Further Review Requested:** Attach Wetland Background and Exceptional Status Wetlands Worksheet	NA
	COMMENTS/NOTES:	
Quantitative Rating scores	Function: Hydrologic Regime	0.75
	Function: Biogeochemical Processes	0.57
	Function: Retain Particulates	0.49
	Function: Plant Community	0.34
	Function: Wildlife Community	0.48
	Quantitative Score (Average of FCIs x 100)	52.6
	Value Added (Significant Size) Total	
Total of Quantitative and Value Added Scores	**TOTAL SCORE**	52.6

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: SR-162 (Pellissippi Pkwy.) PIN 101423.00 City/County: Maryville/Blount Sampling Date: May 5, 2020
Applicant/Owner: TDOT State: TN Sampling Point: UTP-8B
Investigator(s): Caleb Duke, Casey Hertwig Section, Township, Range: N/A
Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): Concave Slope (%): 0-2
Subregion (LRR or MLRA): LRR N Lat: 35.758429 Long: -83.895688 Datum: NAD 83
Soil Map Unit Name: Emory Silt Loam NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)
Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐
Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks:
Photo: 66

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☑ 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 (Five Strata) – Use scientific names of plants. Sampling Point: UTP-8B

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 0.1)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Sapling Stratum (Plot size: 0.1)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Shrub Stratum (Plot size: 0.1)			
1.			FACU
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Herb Stratum (Plot size: 0.1)			
1. *Festuca rubra*	60	Yes	FACU
2. *Panicum philadelphicum*	40	Yes	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	100 = Total Cover		
50% of total cover: 50	20% of total cover: 20		
Woody Vine Stratum (Plot size: 0.1)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species 40	x 3 =	120
FACU species 60	x 4 =	240
UPL species	x 5 =	
Column Totals: 100 (A)		360 (B)

Prevalence Index = B/A = 3.6

Hydrophytic Vegetation Indicators:

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

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

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ☐ No ☑

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

SOIL Sampling Point: UTP-8B

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 4/2	100					Silt Loam	
4-12	7.5YR 4/4	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:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ☐ **No** ☑

Remarks:

Negative alpha alpha dipyridyl reaction

Ecology Field Data Sheet: **Water Resources**

Project: SR-162 (Pellissippi Pkwy.) PIN 101423.00					
Biologist:	C. Duke, C. Hertwig	**Affiliation:**	CEC, Inc.	**Date:**	May 6, 2020

1-Station: from plans	511+50R to 306+90L				
2-Map label and name	STR-9 (Flag Branch)				
3-Latitude/Longitude	35.75821; -83.89638				
4-Feature description:					
-channel identification	perennial stream ☑	intermittent stream ☐	ephemeral stream ☐	wwc ☐	
-HD score (if applicable)	Primary: Fish, Benthics, GW connection				
-OHWM indicators	bed & banks ☑	deposition ☑	presence of litter / debris ☑	scour ☑	veg absent, bent, matted ☑
	change in plant community ☑	destruction of terrestrial veg ☑	multiple observed flow events ☑	sediment sorting ☑	water staining ☑
	change in soil character ☐	leaf litter disturbed or absent ☑	natural line impressed on bank ☑	shelving ☑	wracking ☑
-channel bottom width	8-10'	-top of bank width	15-20'		
-width at ordinary high water mark	12-15'				
-bank height	LDB - 2-3'	RDB - 2-3'			
-riffle/pool complex or other specialized habitat present?	No				
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Privet, hackberry, redcedar, boxelder, multifloral rose				
	RDB: River cane, boxelder, redcedar, hickory				
-date of PJD request					
5-photo numbers	67, 68, 69, 70				
6-HUC -8 Code & Name	06010201; Ft. Loudoun/Watts Bar				
7-Assessed	yes ☑	no ☐			
8-ETW	yes ☐	no ☑			
9-303 (d) List	yes ☑	siltation ☑	habitat: ☐	other: ☐	
	no ☐				
10-Notes	Flag Branch is listed on the 303(d) list for siltation, *E. coli*, and alteration in stream-side or littoral vegetative covers. This stream has several beaver dams impounding flow and creating spillways in the adjacent buffer area. These spillways are providing hydrology for the adjacent riparian wetlands (WTL-8).				
Substrate	silt, sand, gravel				

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Blount	Named Waterbody: Flag Branch	Date/Time: 05/05/2020 2:42 PM
Assessors/Affiliation: Caleb Duke, CEC Inc., Casey Hertwig, CEC Inc.		Project ID: STR-9
Site Name/Description: SR-162 (Pellissippi Pkwy.) PIN 101423.00		
Site Location: Maryville, TN		
USGS quad: Maryville	HUC (12 digit): 060102010110	Lat/Long: 35.75816; -83.89638
Previous Rainfall (7-days) : 0.10" Previous 48 hours; 0.85" previous 7-days		
Precipitation this Season vs. Normal : ☐ very wet ☑ wet ☐ average ☐ dry ☐ drought ☐ unknown Source of recent & seasonal precip data : https://lakeinfo.tva.gov/web/precip.htm		
Watershed Size : 2.71 sqmi	Photos: Y or N (circle) Number : 67 - 70	
Soil Type(s) / Geology : Melvin silt loam, 0 to 2 percent slopes, occasionally flooded,		
Surrounding Land Use : Agricultural, Forested, Pasture		
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	☑	WWC ☐
2. Defined bed and bank absent, dominated by upland vegetation / grass	☑	WWC ☐
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	☑	WWC ☐
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	☑	WWC ☐
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	☐	Stream ☑
6. Presence of fish (except *Gambusia*)	☐	Stream ☑
7. Presence of naturally occurring ground water table connection	☐	Stream ☑
8. Flowing water in channel and 7 days since last precipitation in local watershed	☑	Stream ☐
9. Evidence watercourse has been used as a supply of drinking water	☑	Stream ☐

NOTE : If any Primary Indicators 1-9 = "Yes", then STOP; absent directly contradictory evidence, determination is complete.

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 1.4*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = N/A

Justification / Notes :

Stream had multiple benthic organisms and fish.

Tennessee Department of Environment and Conservation - Division of Water Resources
312 Rosa L. Parks Ave. 11th Floor. Nashville, TN 37243

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5 (Fillable Form)

Named Waterbody: N/A	Date/Time: 12/20/2022
Assessors/Affiliation: D. Spradlin/J. Wilhide/ CEC, Inc.	Project ID : STR-10
Site Name/Description: SR-162EXT	
Site Location: SR-321/SR-162EXT	
HUC (12 digit): Little River Middle Prong (060102010106)	Latitude: BEG: 35.757155 END: 35.757187
Previous Rainfall (7-days) : 3.45	Longitude: BEG: -83.896582 END: -83.896804
Precipitation this Season vs. Normal : average Source of recent & seasonal precip. data : APT, NOAA KNOXVILLE AP	
Watershed Size : 0.08 sq mi	County: Blount
Soil Type(s) / Geology : Lindside/Bloomingdale	Source: NRCS
Surrounding Land Use : Forest, Roadway	
Degree of historical alteration to natural channel morphology & hydrology (select one & describe fully in Notes) : Moderate	

Primary Field Indicators Observed

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

NOTE: If any Primary Indicators 1-9 = "Yes", then no further investigation is necessary. However, assessors may choose to score secondary indicators as supporting evidence.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-DWR Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = STREAM

Secondary Indicator Score (if applicable) = 22.75

Justification / Notes :

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 11.50)	**Absent**	**Weak**	**Moderate**	**Strong**	
1. Continuous bed and bank	0	1	2	3	2.5
2. Sinuous channel	0	1	2	3	1
3. In-channel structure: riffle-pool sequences	0	1	2	3	1.5
4. Sorting of soil textures or other substrate	0	1	2	3	1.5
5. Active/relic floodplain	0	0.5	1	1.5	0.5
6. Depositional bars or benches	0	1	2	3	1
7. Braided channel	0	1	2	3	0
8. Recent alluvial deposits	0	0.5	1	1.5	1
9. Natural levees	0	1	2	3	0
10. Headcuts	0	1	2	3	1
11. Grade controls	0	0.5	1	1.5	1
12. Natural valley or drainageway	0	0.5	1	1.5	0.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3	0

B. Hydrology (Subtotal = 6.75)	**Absent**	**Weak**	**Moderate**	**Strong**		
14. Subsurface flow/discharge into channel	0	1	2	3	1.5	
15. Water in channel and >48 hours since sig. rain	0	1	2	3	2	
16. Leaf litter in channel (January – September)	1.5	1	0.5	0	0	N/A
17. Sediment on plants or on debris	0	0.5	1	1.5	0.75	
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5	1	
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5		1.5	

C. Biology (Subtotal = 4.50)	**Absent**	**Weak**	**Moderate**	**Strong**		
20. Fibrous roots in channel bed [1]	3	2	1	0	1.5	N/A
21. Rooted plants in the thalweg [1]	3	2	1	0	2	N/A
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	0.5	
28. Wetland plants in channel bed [2]	0	0.5	1	1.5	0.5	

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

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

Total Points = 22.75

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

Notes :

Ecology Field Data Sheet: **Water Resources**

Project: SR-162 (Pellissippi Pkwy.) PIN 101423.00					
Biologist:	D. Spradlin/J. Wilhide	**Affiliation:**	CEC, Inc.	**Date:**	Dec 20, 2022

1-Station: from plans					
2-Map label and name	STR-10				
3-Latitude/Longitude	35.757155, -83.896582				
4-Feature description:					
-channel identification	perennial stream ☐	intermittent stream ☑	ephemeral stream ☐	wwc ☐	
-HD score (if applicable)	22.75				
-OHWM indicators	bed & banks ☑	deposition ☑	presence of litter / debris ☑	scour ☑	veg absent, bent, matted ☑
	change in plant community ☑	destruction of terrestrial veg ☑	multiple observed flow events ☑	sediment sorting ☑	water staining ☑
	change in soil character ☐	leaf litter disturbed or absent ☑	natural line impressed on bank ☑	shelving ☑	wracking ☑
-channel bottom width	3-4’	-top of bank width	5-6’		
-width at ordinary high water mark	5-6’				
-bank height	LDB - 2-3'	RDB - 2-3'			
-riffle/pool complex or other specialized habitat present?	No				
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Privet, hackberry, sycamore				
	RDB: hackberry, green ash, sycamore				
-date of PJD request					
5-photo numbers	75, 76				
6-HUC -8 Code & Name	06010201; Ft. Loudoun/Watts Bar				
7-Assessed	yes ☐	no ☑			
8-ETW	yes ☐	no ☑			
9-303 (d) List	yes ☑	siltation ☑	habitat: ☐	other: ☐	
	no ☐				
10-Notes	The stream begins at point of intermittency at end of WWC-10/EPH-8 at headcut and continues before ending at the confluence with STR9 (Flag Branch)				
Substrate	silt, sand, gravel				

Tennessee Department of Environment and Conservation - Division of Water Resources
312 Rosa L. Parks Ave. 11th Floor. Nashville, TN 37243

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5 (Fillable Form)

Named Waterbody: N/A	Date/Time: 12/20/2022
Assessors/Affiliation: D. Spradlin/J. Wilhide/ CEC, Inc.	Project ID : WWC-6/UDF-1
Site Name/Description: SR-162EXT	
Site Location: SR-321/SR-162EXT	
HUC (12 digit): Little River Middle Prong (060102010106)	Latitude: BEG: 35.757121 END: 35.757059
Previous Rainfall (7-days) : 3.45	Longitude: BEG: -83.900285 END: -83.899968
Precipitation this Season vs. Normal : average Source of recent & seasonal precip. data : APT, NOAA KNOXVILLE AP	
Watershed Size : 0.01	County: Blount
Soil Type(s) / Geology : Dewey	Source: NRCS
Surrounding Land Use : Forest, Roadway	
Degree of historical alteration to natural channel morphology & hydrology (select one & describe fully in Notes) : Moderate	

Primary Field Indicators Observed

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

NOTE: If any Primary Indicators 1-9 = "Yes", then no further investigation is necessary. However, assessors may choose to score secondary indicators as supporting evidence.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-DWR Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = WET WEATHER CONVEYANCE

Secondary Indicator Score (if applicable) =

Justification / Notes :

Defined bed/bank absent, conveyance with no channel forming discharge

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 0.00)	**Absent**	**Weak**	**Moderate**	**Strong**	
1. Continuous bed and bank	0	1	2	3	0
2. Sinuous channel	0	1	2	3	0
3. In-channel structure: riffle-pool sequences	0	1	2	3	0
4. Sorting of soil textures or other substrate	0	1	2	3	0
5. Active/relic floodplain	0	0.5	1	1.5	0
6. Depositional bars or benches	0	1	2	3	0
7. Braided channel	0	1	2	3	0
8. Recent alluvial deposits	0	0.5	1	1.5	0
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 = 0.00)	**Absent**	**Weak**	**Moderate**	**Strong**		
14. Subsurface flow/discharge into channel	0	1	2	3	0	
15. Water in channel and >48 hours since sig. rain	0	1	2	3	0	N/A
16. Leaf litter in channel (January – September)	1.5	1	0.5	0	0	N/A
17. Sediment on plants or on debris	0	0.5	1	1.5	0	
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 = 0.00)	**Absent**	**Weak**	**Moderate**	**Strong**		
20. Fibrous roots in channel bed [1]	3	2	1	0	0	N/A
21. Rooted plants in the thalweg [1]	3	2	1	0	0	N/A
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 = 0.00

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

Notes :

Tennessee Department of Environment and Conservation - Division of Water Resources
312 Rosa L. Parks Ave. 11th Floor. Nashville, TN 37243

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5 (Fillable Form)

Named Waterbody: N/A	Date/Time: 12/20/2022
Assessors/Affiliation: D. Spradlin/J. Wilhide/ CEC, Inc.	Project ID : WWC-7/EPH-6
Site Name/Description: SR-162EXT	
Site Location: SR-321/SR-162EXT	
HUC (12 digit): Little River Middle Prong (060102010106)	Latitude: BEG: 35.757061 END: 35.756578
Previous Rainfall (7-days) : 3.45	Longitude: BEG: -83.89853 END: -83.897557
Precipitation this Season vs. Normal : average Source of recent & seasonal precip. data : APT, NOAA KNOXVILLE AP	
Watershed Size : 0.015	County: Blount
Soil Type(s) / Geology : Dewey/Emory	Source: NRCS
Surrounding Land Use : Forest, Roadway	
Degree of historical alteration to natural channel morphology & hydrology (select one & describe fully in Notes) : Severe	

Primary Field Indicators Observed

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

NOTE: If any Primary Indicators 1-9 = "Yes", then no further investigation is necessary. However, assessors may choose to score secondary indicators as supporting evidence.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-DWR Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = WET WEATHER CONVEYANCE

Secondary Indicator Score (if applicable) = 13.5

Justification / Notes :

Channelized, concrete bed into roadside ditch before ending at confluence with STR-9

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 8.50)	**Absent**	**Weak**	**Moderate**	**Strong**	
1. Continuous bed and bank	0	1	2	3	1.5
2. Sinuous channel	0	1	2	3	1
3. In-channel structure: riffle-pool sequences	0	1	2	3	1
4. Sorting of soil textures or other substrate	0	1	2	3	1
5. Active/relic floodplain	0	0.5	1	1.5	0.5
6. Depositional bars or benches	0	1	2	3	0.5
7. Braided channel	0	1	2	3	0
8. Recent alluvial deposits	0	0.5	1	1.5	1
9. Natural levees	0	1	2	3	0
10. Headcuts	0	1	2	3	0.5
11. Grade controls	0	0.5	1	1.5	1
12. Natural valley or drainageway	0	0.5	1	1.5	0.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3	0

B. Hydrology (Subtotal = 3.00)	**Absent**	**Weak**	**Moderate**	**Strong**		
14. Subsurface flow/discharge into channel	0	1	2	3	0.5	
15. Water in channel and >48 hours since sig. rain	0	1	2	3	1	
16. Leaf litter in channel (January – September)	1.5	1	0.5	0	0	N/A
17. Sediment on plants or on debris	0	0.5	1	1.5	0.5	
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5	1	
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5		0	

C. Biology (Subtotal = 2.00)	**Absent**	**Weak**	**Moderate**	**Strong**		
20. Fibrous roots in channel bed [1]	3	2	1	0	1	N/A
21. Rooted plants in the thalweg [1]	3	2	1	0	1	N/A
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 = 13.50

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

Notes :

Ecology Field Data Sheet: **Water Resources**

Project: SR-162 (Pellissippi Pkwy.) PIN 101423.00					
Biologist:	D. Spradlin, J. Wilhide	**Affiliation:**	CEC, Inc.	**Date:**	Dec 20, 2023

1-Station: from plans					
2-Map label and name	WWC-7/EPH-6				
3-Latitude/Longitude	35.757061, -83.89853				
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 observed flow events ☐	sediment sorting ☐	water staining ☐
	change in soil character ☐	leaf litter disturbed or absent ☐	natural line impressed on bank ☐	shelving ☐	wracking ☐
-channel bottom width	1-2'	-top of bank width	3-4’		
-width at ordinary high water mark	1’				
-bank height	LDB – 1-2’	RDB – 1-2’			
-riffle/pool complex or other specialized habitat present?	No				
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Hackberry, redcedar, boxelder				
	RDB: Hackberry, redcedar, boxelder				
-date of PJD request					
5-photo numbers	77, 78				
6-HUC -8 Code & Name	06010201; Ft. Loudoun/Watts Bar				
7-Assessed	yes ☐	no ☑			
8-ETW	yes ☐	no ☑			
9-303 (d) List	yes ☐	siltation ☐	habitat: ☐	other: ☐	
	no ☑				
10-Notes	This conveyance begins at a culvert outlet underneath 321. The channel ends at confluence with STR-9.				
Substrate	gravel, silt, concrete				

Tennessee Department of Environment and Conservation - Division of Water Resources
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Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5 (Fillable Form)

Named Waterbody: N/A	Date/Time: 12/20/2022
Assessors/Affiliation: D. Spradlin/J. Wilhide/ CEC, Inc.	Project ID : WWC-8/UDF-2
Site Name/Description: SR-162EXT	
Site Location: SR-321/SR-162EXT	
HUC (12 digit): Little River Middle Prong (060102010106)	Latitude: BEG: 35.756536 END: 35.756479
Previous Rainfall (7-days) : 3.45	Longitude: BEG: -83.897797 END: -83.897592
Precipitation this Season vs. Normal : average Source of recent & seasonal precip. data : APT, NOAA KNOXVILLE AP	
Watershed Size : 0.02 sq mi	County: Blount
Soil Type(s) / Geology : Emory/Lindside	Source: NRCS
Surrounding Land Use : Agriculture/Roadway	
Degree of historical alteration to natural channel morphology & hydrology (select one & describe fully in Notes) : Severe	

Primary Field Indicators Observed

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

NOTE: If any Primary Indicators 1-9 = "Yes", then no further investigation is necessary. However, assessors may choose to score secondary indicators as supporting evidence.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-DWR Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = WET WEATHER CONVEYANCE

Secondary Indicator Score (if applicable) = 4.0

Justification / Notes :

Bed/bank defined by roadside ditch, channelized with concrete bed

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 3.50)	**Absent**	**Weak**	**Moderate**	**Strong**	
1. Continuous bed and bank	0	1	2	3	1
2. Sinuous channel	0	1	2	3	0
3. In-channel structure: riffle-pool sequences	0	1	2	3	0
4. Sorting of soil textures or other substrate	0	1	2	3	0.5
5. Active/relic floodplain	0	0.5	1	1.5	0
6. Depositional bars or benches	0	1	2	3	0
7. Braided channel	0	1	2	3	0
8. Recent alluvial deposits	0	0.5	1	1.5	0.5
9. Natural levees	0	1	2	3	0
10. Headcuts	0	1	2	3	0
11. Grade controls	0	0.5	1	1.5	1
12. Natural valley or drainageway	0	0.5	1	1.5	0.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3	0

B. Hydrology (Subtotal = 0.50)	**Absent**	**Weak**	**Moderate**	**Strong**		
14. Subsurface flow/discharge into channel	0	1	2	3	0	
15. Water in channel and >48 hours since sig. rain	0	1	2	3	0	
16. Leaf litter in channel (January – September)	1.5	1	0.5	0	0	N/A
17. Sediment on plants or on debris	0	0.5	1	1.5	0	
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5	0.5	
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5		0	

C. Biology (Subtotal = 0.00)	**Absent**	**Weak**	**Moderate**	**Strong**		
20. Fibrous roots in channel bed [1]	3	2	1	0	0	N/A
21. Rooted plants in the thalweg [1]	3	2	1	0	0	N/A
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 = 4.00

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

Notes :

Tennessee Department of Environment and Conservation - Division of Water Resources
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Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5 (Fillable Form)

Named Waterbody: N/A	Date/Time: 12/20/2022
Assessors/Affiliation: D. Spradlin/J. Wilhide/ CEC, Inc.	Project ID : WWC-9/EPH-7
Site Name/Description: SR-162EXT	
Site Location: SR-321/SR-162EXT	
HUC (12 digit): Little River Middle Prong (060102010106)	Latitude: BEG: 35.755167 END: 35.756489
Previous Rainfall (7-days) : 3.45	Longitude: BEG: -83.896395 END: -83.897553
Precipitation this Season vs. Normal : average Source of recent & seasonal precip. data : APT, NOAA KNOXVILLE AP	
Watershed Size : 0.04 sq mi	County: Blount
Soil Type(s) / Geology : Emory	Source: NRCS
Surrounding Land Use : Forest, Agriculture, Roadway	
Degree of historical alteration to natural channel morphology & hydrology (select one & describe fully in Notes) : Moderate	

Primary Field Indicators Observed

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

NOTE: If any Primary Indicators 1-9 = "Yes", then no further investigation is necessary. However, assessors may choose to score secondary indicators as supporting evidence.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-DWR Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = WET WEATHER CONVEYANCE

Secondary Indicator Score (if applicable) = 14.5

Justification / Notes :

Defined bed and bank begins in ag. field at limits of investigation, continues down valley into roadside ditch before ending at confluence with STR-9

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 10.50)	**Absent**	**Weak**	**Moderate**	**Strong**	
1. Continuous bed and bank	0	1	2	3	2
2. Sinuous channel	0	1	2	3	1.5
3. In-channel structure: riffle-pool sequences	0	1	2	3	1
4. Sorting of soil textures or other substrate	0	1	2	3	1
5. Active/relic floodplain	0	0.5	1	1.5	0.5
6. Depositional bars or benches	0	1	2	3	0.5
7. Braided channel	0	1	2	3	0
8. Recent alluvial deposits	0	0.5	1	1.5	0.5
9. Natural levees	0	1	2	3	0
10. Headcuts	0	1	2	3	2
11. Grade controls	0	0.5	1	1.5	0.5
12. Natural valley or drainageway	0	0.5	1	1.5	1
13. At least second order channel on existing USGS or NRCS map	0	1	2	3	0

B. Hydrology (Subtotal = 1.00)	**Absent**	**Weak**	**Moderate**	**Strong**		
14. Subsurface flow/discharge into channel	0	1	2	3	0	
15. Water in channel and >48 hours since sig. rain	0	1	2	3	0	
16. Leaf litter in channel (January – September)	1.5	1	0.5	0	0	N/A
17. Sediment on plants or on debris	0	0.5	1	1.5	0.5	
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5	0.5	
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5		0	

C. Biology (Subtotal = 3.00)	**Absent**	**Weak**	**Moderate**	**Strong**		
20. Fibrous roots in channel bed [1]	3	2	1	0	1.5	N/A
21. Rooted plants in the thalweg [1]	3	2	1	0	1.5	N/A
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 = 14.50

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

Notes :

Ecology Field Data Sheet: **Water Resources**

Project: SR-162 (Pellissippi Pkwy.) PIN 101423.00					
Biologist:	D. Spradlin, J. Wilhide	**Affiliation:**	CEC, Inc.	**Date:**	Dec 20, 2023

1-Station: from plans					
2-Map label and name	WWC-9/EPH-7				
3-Latitude/Longitude	35.756489, -83.897553				
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 observed flow events ☐	sediment sorting ☐	water staining ☐
	change in soil character ☐	leaf litter disturbed or absent ☐	natural line impressed on bank ☐	shelving ☐	wracking ☐
-channel bottom width	1-2'	-top of bank width	3-4’		
-width at ordinary high water mark	1’				
-bank height	LDB – 1-2’	RDB – 1-2’			
-riffle/pool complex or other specialized habitat present?	No				
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Hackberry, redcedar				
	RDB: road				
-date of PJD request					
5-photo numbers	79, 80				
6-HUC -8 Code & Name	06010201; Ft. Loudoun/Watts Bar				
7-Assessed	yes ☐	no ☑			
8-ETW	yes ☐	no ☑			
9-303 (d) List	yes ☐	siltation ☐	habitat: ☐	other: ☐	
	no ☑				
10-Notes	This conveyance begins at limits of investigation in a pasture and continues down valley into a roadside ditch before ending at the confluence with STR-9 (Flag Branch)				
Substrate	gravel, silt				

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Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5 (Fillable Form)

Named Waterbody: N/A	Date/Time: 12/20/2022
Assessors/Affiliation: D. Spradlin/J. Wilhide/ CEC, Inc.	Project ID : WWC-10/EPH-8
Site Name/Description: SR-162EXT	
Site Location: SR-321/SR-162EXT	
HUC (12 digit): Little River Middle Prong (060102010106)	Latitude: BEG: 35.756864 END: 35.757155
Previous Rainfall (7-days) : 3.45	Longitude: BEG: -83.895494 END: -83.896582
Precipitation this Season vs. Normal : average Source of recent & seasonal precip. data : APT, NOAA KNOXVILLE AP	
Watershed Size : 0.05	County: Blount
Soil Type(s) / Geology : Emory/Dewey	Source: NRCS
Surrounding Land Use : Forest, Roadway	
Degree of historical alteration to natural channel morphology & hydrology (select one & describe fully in Notes) : Moderate	

Primary Field Indicators Observed

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

NOTE: If any Primary Indicators 1-9 = "Yes", then no further investigation is necessary. However, assessors may choose to score secondary indicators as supporting evidence.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-DWR Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = WET WEATHER CONVEYANCE

Secondary Indicator Score (if applicable) = 15.5

Justification / Notes :

Channel bed/bank begins downstream of old pond outfall, continues down valley before ending at start of STR-10 (point of intermittency).

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 11.00)	**Absent**	**Weak**	**Moderate**	**Strong**	
1. Continuous bed and bank	0	1	2	3	2.5
2. Sinuous channel	0	1	2	3	1
3. In-channel structure: riffle-pool sequences	0	1	2	3	1
4. Sorting of soil textures or other substrate	0	1	2	3	2
5. Active/relic floodplain	0	0.5	1	1.5	0.5
6. Depositional bars or benches	0	1	2	3	0.5
7. Braided channel	0	1	2	3	0
8. Recent alluvial deposits	0	0.5	1	1.5	0.75
9. Natural levees	0	1	2	3	0
10. Headcuts	0	1	2	3	1
11. Grade controls	0	0.5	1	1.5	0.75
12. Natural valley or drainageway	0	0.5	1	1.5	1
13. At least second order channel on existing USGS or NRCS map	0	1	2	3	0

B. Hydrology (Subtotal = 1.50)	**Absent**	**Weak**	**Moderate**	**Strong**		
14. Subsurface flow/discharge into channel	0	1	2	3	0	
15. Water in channel and >48 hours since sig. rain	0	1	2	3	0	
16. Leaf litter in channel (January – September)	1.5	1	0.5	0	0	N/A
17. Sediment on plants or on debris	0	0.5	1	1.5	0.75	
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5	0.75	
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5		0	

C. Biology (Subtotal = 3.00)	**Absent**	**Weak**	**Moderate**	**Strong**		
20. Fibrous roots in channel bed [1]	3	2	1	0	1.5	N/A
21. Rooted plants in the thalweg [1]	3	2	1	0	1.5	N/A
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 = 15.50

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

Notes :

Ecology Field Data Sheet: **Water Resources**

Project: SR-162 (Pellissippi Pkwy.) PIN 101423.00					
Biologist:	D. Spradlin, J. Wilhide	**Affiliation:**	CEC, Inc.	**Date:**	Dec 20, 2023

1-Station: from plans					
2-Map label and name	WWC-10/EPH-8				
3-Latitude/Longitude	35.756864, -83.895494				
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 observed flow events ☐	sediment sorting ☐	water staining ☐
	change in soil character ☐	leaf litter disturbed or absent ☐	natural line impressed on bank ☐	shelving ☐	wracking ☐
-channel bottom width	1-2'	-top of bank width	3-4’		
-width at ordinary high water mark	1-2’				
-bank height	LDB – 2-3	RDB – 2-3			
-riffle/pool complex or other specialized habitat present?	No				
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Hackberry, redcedar, privet				
	RDB: red cedar, green ash				
-date of PJD request					
5-photo numbers	81, 82				
6-HUC -8 Code & Name	06010201; Ft. Loudoun/Watts Bar				
7-Assessed	yes ☐	no ☑			
8-ETW	yes ☐	no ☑			
9-303 (d) List	yes ☐	siltation ☐	habitat: ☐	other: ☐	
	no ☑				
10-Notes	This conveyance begins at a culvert outlet of old farm pond. The channel ends at the point of intermittency to start STR-10.				
Substrate	gravel, silt				

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Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5 (Fillable Form)

Named Waterbody: N/A	Date/Time: 12/20/2022
Assessors/Affiliation: D. Spradlin/J. Wilhide/ CEC, Inc.	Project ID : WWC-11/EPH-9
Site Name/Description: SR-162EXT	
Site Location: SR-321/SR-162EXT	
HUC (12 digit): Little River Middle Prong (060102010106)	Latitude: BEG: 35.756593 END: 35.756637
Previous Rainfall (7-days) : 3.45	Longitude: BEG: -83.893029 END: -83.893266
Precipitation this Season vs. Normal : average Source of recent & seasonal precip. data : APT, NOAA KNOXVILLE AP	
Watershed Size : 0.03 sq mi	County: Blount
Soil Type(s) / Geology : Dewey	Source: NRCS
Surrounding Land Use : Forest	
Degree of historical alteration to natural channel morphology & hydrology (select one & describe fully in Notes) : Slight	

Primary Field Indicators Observed

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

NOTE: If any Primary Indicators 1-9 = "Yes", then no further investigation is necessary. However, assessors may choose to score secondary indicators as supporting evidence.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-DWR Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = WET WEATHER CONVEYANCE

Secondary Indicator Score (if applicable) = 9.25

Justification / Notes :

defined bed and bank near limits of investigation/property line, continues down valley before losing bed/bank and defined channel

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 6.00)	**Absent**	**Weak**	**Moderate**	**Strong**	
1. Continuous bed and bank	0	1	2	3	1
2. Sinuous channel	0	1	2	3	1
3. In-channel structure: riffle-pool sequences	0	1	2	3	0.5
4. Sorting of soil textures or other substrate	0	1	2	3	1
5. Active/relic floodplain	0	0.5	1	1.5	0.5
6. Depositional bars or benches	0	1	2	3	0
7. Braided channel	0	1	2	3	0
8. Recent alluvial deposits	0	0.5	1	1.5	0.5
9. Natural levees	0	1	2	3	0
10. Headcuts	0	1	2	3	0.5
11. Grade controls	0	0.5	1	1.5	0.5
12. Natural valley or drainageway	0	0.5	1	1.5	0.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3	0

B. Hydrology (Subtotal = 0.75)	**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 (January – September)	1.5	1	0.5	0	0	N/A
17. Sediment on plants or on debris	0	0.5	1	1.5	0.25	
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5	0.5	
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5		0	

C. Biology (Subtotal = 2.50)	**Absent**	**Weak**	**Moderate**	**Strong**	
20. Fibrous roots in channel bed [1]	3	2	1	0	1
21. Rooted plants in the thalweg [1]	3	2	1	0	1.5
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 = 9.25

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

Notes :

Ecology Field Data Sheet: **Water Resources**

Project: SR-162 (Pellissippi Pkwy.) PIN 101423.00					
Biologist:	D. Spradlin, J. Wilhide	**Affiliation:**	CEC, Inc.	**Date:**	Dec 20, 2023

1-Station: from plans					
2-Map label and name	WWC-11/EPH-9				
3-Latitude/Longitude	35.756637, -83.893266				
4-Feature description:					
-channel identification	perennial stream ☐	intermittent stream ☐	ephemeral stream ☑	wwc ☑	
-HD score (if applicable)	9.25				
-OHWM indicators	bed & banks ☑	deposition ☐	presence of litter / debris ☐	scour ☐	veg absent, bent, matted ☑
	change in plant community ☐	destruction of terrestrial veg ☐	multiple observed flow events ☐	sediment sorting ☐	water staining ☐
	change in soil character ☐	leaf litter disturbed or absent ☐	natural line impressed on bank ☐	shelving ☐	wracking ☐
-channel bottom width	1-2'	-top of bank width	0.5-1’		
-width at ordinary high water mark	0.5-1’				
-bank height	LDB – 1-2’	RDB – 1-2’			
-riffle/pool complex or other specialized habitat present?	No				
-dominant riparian species: ----------(LDB /RDB)----------	LDB: Sycamore, poplar				
	RDB: Poplar, red cedar				
-date of PJD request					
5-photo numbers	83, 84				
6-HUC -8 Code & Name	06010201; Ft. Loudoun/Watts Bar				
7-Assessed	yes ☐	no ☑			
8-ETW	yes ☐	no ☑			
9-303 (d) List	yes ☐	siltation ☐	habitat: ☐	other: ☐	
	no ☑				
10-Notes	Conveyance begins near limits of investigation and property line, continues briefly before losing defined channel and bed/bank.				
Substrate	gravel, silt				

Photo 1. View of Pipe Outfall located at 35.801085; -83.93402. There is no feature located below the outfall.

Photo 2. View of Pipe Outfall located at 35.799877; -83.93131.

Photo 3. View looking down-gradient below the pipe outfall located at 35.799877; -83.93131. No feature.

Photo 4. View of WTL-1 looking southeast.

Photo 5. View of wetland test pit (WTP-1) for WTL-1 located at 35.799535; -83.929199.

Photo 6. View of upland test pit (UTP-1) located at 35.79955; -83.929222.

Photo 7. View of STR-1 looking upstream, standing at 35.799704; -83.929018.

Photo 8. View of STR-1 looking downstream, standing at 35.799704; -83.929018.

Photo 9. View of STR-2 looking upstream, standing at 35.799112; -83.928747.

Photo 10. View of STR-2 looking downstream, standing at 35.799112; -83.928747.

Photo 11. View of SEP-1 located at 35.799728; -83.928615.

Photo 12. View of wetland test pit (WTP-2) for WTL-2 located at 35.799579; -83.927352.

Photo 13. View of WTL-2 looking north, standing at 35.799588; -83.927316.

Photo 14. View of wetland test pit (WTP-3) for WTL-3 located at 35.799385; -83.927145.

Photo 15. View of STR-3 and WTL-3 (red line) looking northwest (downstream), standing at 35.799346; -83.927169.

Photo 16. View of upland test pit (UTP-2/3) located between WTL-2 and WTL-3 at 35.799434; -83.927103

Photo 17 View of STR-3 looking upstream, standing at 35.799126; -83.926929.

Photo 18. View of STR-3 looking downstream, standing at 35.799126; -83.926929.

Photo 19. View of SEP-2 located at 35.798529; -83.92648.

Photo 20. View of WWC-1/EPH-1 looking up-gradient, standing at 35.798339; -83.926286.

Photo 21. View of WWC-1/EPH-1 looking down-gradient, standing at 35.798339; -83.926286.

Photo 22. View of WWC-2/EPH-2 looking up-gradient, standing at 35.798171; -83.923812.

Photo 23. View of WWC-2/EPH-2 looking down-gradient, standing at 35.798171; -83.923812.

Photo 24. View of PND-1 looking northwest, standing at 35.793819; -83.919324.

Photo 25. View of WTL-4 looking southwest, standing at 35.791234; -83.917524.

Photo 26. View of wetland test pit (WTP-4) located in WTL-4 at 35.791161; -83.917576.

Photo 27. View of upland test pit (UTP-4) located outside WTL-4 at 35.791191; -83.917448.

Photo 28. View of STR-4 looking upstream, standing at 35.791408; -83.917084.

Photo 29. View of STR-4 looking downstream, standing at 35.791408; -83.917084.

Photo 30. View of WTL-5 looking southwest, standing at 35.787314; -83.914128.

Photo 31. View of wetland test pit (WTP-5) located within WTL-5 at 35.787282; -83.914392.

Photo 32. View of upland test pit (UTP-5) located outside WTL-5 at 35.786893; -83.914563.

Photo 33. View of STR-5 (Peppermint Branch) looking upstream, standing at 35.780992; -83.909642.

Photo 34. View of STR-5 (Peppermint Branch) looking downstream, standing at 35.780992; -83.909642.

Photo 35. View of WWC-3/EPH-3 looking up-gradient, standing at 35.780674; -83.909665.

Photo 36. View of WWC-3/EPH-3 looking down-gradient, standing at 35.780674; -83.909665.

Photo 37. View of PND-2 looking south, standing at 35.777991; -83.908711.

Photo 38. View of WTL-6 looking southwest, standing at 35.774703; -83.907897.

Photo 39. View of wetland test pit (WTP-6) located within WTL-6 at 35.774338; -83.908815.

Photo 40. View of linear portion of WTL-6 standing at 35.774386; -83.907485.

Photo 41. View of upland test pit (UTP-6) located outside the WTL-6 boundary at 35.774772; -83.90825.

Photo 42. View of STR-6 looking upstream, standing at 35.771012; -83.904270.

Photo 43. View of STR-6 looking downstream, standing at 35.771012; -83.904270.

Photo 44. View of WWC-4/EPH-4 looking up-gradient, standing at 35.766987; -83.900209.

Photo 45. View of WWC-4/EPH-4 looking down-gradient, standing at 35.766820; -83.900034.

Photo 46. View of PND-3 looking north, standing at 35.766664; -83.899643.

Photo 47. View of WTL-7 looking northeast, standing at 35.766993; -83.899682.

Photo 48. View of wetland test pit (WTP-7) located within WTL-7 at 35.766934; -83.899705.

Photo 49. View of upland test pit (UTP-7) located just outside the WTL-7 boundary at 35.767118; -83.89957.

Photo 50. View of WWC-4/EPH-4 looking down-gradient, standing at 35.766243; -83.898917.

Photo 51. View of WWC-4/EPH-4 looking up-gradient, standing at 35.764604; -83.897764.

Photo 52. View of STR-7 (Gravelly Creek) looking upstream, standing at 35.764254; -83.897847.

Photo 53. View of STR-7 (Gravelly Creek) looking downstream, standing at 35.764169; -83.897542.

Photo 54. View of STR-8 looking upstream, standing at 35.764013; -83.897833.

Photo 55. View of STR-8 looking downstream, standing at 35.763969; -83.897917.

Photo 56. View of SPG-1 located at 35.764042; -83.898002 where STR-8 begins.

Photo 57. View of WWC-5/EPH-5 looking up-gradient, standing at 35.763381; -83.897164.

Photo 58. View of WWC-5/EPH-5 looking down-gradient, standing at 35.763542; -83.897158.

Photo 59. View of WTL-8 looking northeast, standing at 35.759555; -83.896555.

Photo 60. View of WTL-8 looking northeast, standing at 35.758996; -83.896474.

Photo 61. View of wetland test pit (WTP-8A) located within WTL-8 at 35.760712; -83.895657.

Photo 62. View of upland test pit (UTP-8A) located just outside WTL-8 at 35.761; -83.895167.

Photo 63. View of WTL-8 looking southeast, standing at 35.759358; -83.895530.

Photo 64. View of WTL-8 looking northwest, standing at 35.759561; -83.895521.

Photo 65. View of wetland test pit (WTP-8B) located within WTL-8 at 35.759623; -83.896208.

Photo 66. View of upland test pit (UTP-8B) located just outside the WTL-8 boundary at 35.758429; -83.895688.

Photo 67. View of STR-9 looking upstream at the culvert under E Lamar Alexander Parkway, standing at 35.757603; -83.896618.

Photo 68. View of STR-9 looking downstream, standing at 35.757603; -83.896618.

Photo 69. View of STR-9 looking upstream, standing at 35.760377; -83.895562.

Photo 70. View of STR-9 looking downstream, standing at 35.760377; -83.895562.

Photo 71. View of STR-9 looking upstream, standing at 35.757187, -83.896804.

Photo 72. View of STR-9 looking downstream, standing at 35.757187, -83.896804.

Photo 73. View of STR-9 looking upstream, standing at 35.756169, -83.897868.

Photo 74. View of STR-9 looking downstream, standing at 35.756169, -83.897868.

Photo 75. View of STR-10 looking upstream, standing at 35.757155, -83.896582.

Photo 76. View of STR-10 looking downstream, standing at 35.757155, -83.896582.

Photo 77. View of WWC-7/EPH-6 looking downstream, standing at 35.757061, -83.89853.

Photo 78. View of WWC-7/EPH-6 looking upstream, standing at 35.756578, -83.897557.

Photo 79. View of WWC-9/EPH-7 looking upstream, standing at 35.756489, -83.897553.

Photo 80. View of WWC-9/EPH-7 looking downstream, standing at 35.755167, -83.896395.

Photo 81. View of WWC-10/EPH-8 looking downstream, standing 35.756864, -83.895494.

Photo 82. View of WWC-10/EPH-8 looking upstream, standing at 35.757155, -83.896582.

Photo 83. View of WWC-11/EPH-9 looking upstream, standing at 35.756637, -83.893266.

Photo 84. View of WWC-11/EPH-9 looking downstream, standing at 35.756593, -83.893029.

Photo 85. View of WWC-6/UDF-1 looking upstream, standing at 35.757059, -83.899968.

Photo 86. View of WWC-6/UDF-1 looking downstream, standing at 35.757121, -83.900285.

Photo 87. View of WWC-8/UDF-2 looking upstream, standing at 35.756536, -83.897797.

Photo 88. View of WWC-8/UDF-2 looking downstream, standing at 35.756479, -83.897592.

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

CLAY BRIGHT
COMMISSIONER

BILL LEE
GOVERNOR

January 30, 2020

Mr. John Griffith
US Dept. of Interior
Fish and Wildlife Service
446 Neal St.
Cookeville, TN 38501

Subject: SR-162EXT (Pellissippi Pkwy) from SR-33 to SR-73
Blount County, TN
PIN: 101423.00 PE No. 05097-0229-14

Dear Mr. Griffith:

The Tennessee Department of Transportation proposes to construct the remaining section of SR-162 (Pellissippi Pkwy.) from SR-33 to SR-73 in Blount County, Tennessee. The attached maps identify the location of the subject project. It is requested that you provide us with a list of threatened or endangered species that may be present in the vicinity of the proposed project.

The above coordination and request for endangered species information is in compliance with the U.S. Fish and Wildlife Coordination Act of 1958, and the Endangered Species Act of 1973, as amended. Thank you for your assistance with this project. This project is being expedited due to the emergency nature of the slide. If you have any questions or need additional information, please do not hesitate to contact me at Keven.Brown@tn.gov or (865) 594-2437.

Sincerely,

Keven Brown

Digitally signed by Keven Brown
DN: cn=Keven Brown, o=TDOT, ou=Region 1 Ecology Section, email=keven.brown@tn.gov, c=US
Date: 2020.01.30 09:01:54 -05'00'

Keven Brown
Biologist, TDOT Region 1
Ecology Section

Copies: *Region 1 Project Development* – John Barrett, Michael Palmer
TDOT HQ Ecology – Matt Richards, Dennis Crumby
TWRA – Rob Todd, Vince Pontello
FileNet

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Tennessee ES Office
446 Neal Street
Cookeville, Tennessee 38501

February 11, 2020

Mr. Keven Brown
T.E.S.S. Supervisor
Region 1 Project Development
Environmental Technical Office
7345 Region Lane, Knoxville, Tennessee 37914

Subject: FWS# 20-I-0610. Proposal to construct the State Route 162 Extension (Pellissippi Parkway) from State Route 33 to State Route 73; PIN 101423.00, P.E. 05097-0229-14, Blount County, Tennessee.

Dear Mr. Brown:

Thank you for the correspondence dated January 30, 2020, requesting project recoordination for the proposal to construct the State Route (SR) 162 Extension from SR 33 to SR 73 in Blount County, Tennessee. The Tennessee Department of Transportation (TDOT) requests a list of threatened or endangered species that may be present within the vicinity of the project. Personnel of the U.S. Fish and Wildlife Service have reviewed the subject proposal and offer the following comments.

Because of its proximity to the Little River, this project was coordinated for potential impacts to the federally endangered marbled darter (*Etheostoma marmorpinnum*), fine-rayed pigtoe (*Fusconaia cuneolus*), and the federally threatened snail darter (*Percina tanasi*). Due to TDOT's commitment to stringent water quality measures, we concurred with the determination of "not likely to adversely affect" for these species in a letter to the Federal Highway Administration dated July 25, 2013. This determination is still in effect.

A mist netting survey was performed during the period of July 27 through August 3, 2018, at three sites that could potentially be used as a travel corridors or foraging areas by bats. Efforts resulted in the capture of 27 individual bats, representing three non-listed species. Due to negative survey results for the federally endangered Indiana bat (*Myotis sodalis*) and threatened northern long-eared bat (*Myotis septentrionalis*), we concurred with TDOT's determinations of "not likely to adversely affect" for these species in a letter dated October 17, 2018. The results of this survey will be valid until April 1, 2024.

We would not anticipate impacts to any federally listed or proposed species as a result of the project. Therefore, based on the best information available at this time, we believe that the requirements of section 7 of the Endangered Species Act (Act) of 1973, as amended, are fulfilled for all species that currently receive protection under the Act. Obligations under section 7 of the Act 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.

The 2013 Biological Assessment Addendum indicated that several wetlands could be impacted by the project. To address concerns, the U.S. Army Corps of Engineers, Nashville District, Regulatory Branch can be reached at 615-369-7500.

If you have any questions regarding our comments, please contact John Griffith of my staff at 931/525-4995 or by email at *john_griffith@fws.gov*.

Sincerely,

Virgil Lee Andrews, Jr
Field Supervisor

xc: Vincent Pontello, TWRA, Crossville, TN

Keven Brown

From: Vincent Pontello
Sent: Friday, February 28, 2020 9:07 AM
To: Keven Brown
Subject: Fw: SR-162EXT (Pellissippi Pkwy) from SR-33 to SR-73, Blount Co. PIN 101423.00

FYI

Vincent L. Pontello
Wildlife Biologist
Liaison to Federal Highway Admin. & TDOT
Tennessee Wildlife Resources Agency
Environmental Services Division

From: Bart Carter
Sent: Tuesday, February 18, 2020 3:38 PM
To: Vincent Pontello <Vincent.Pontello@tn.gov>
Subject: RE: SR-162EXT (Pellissippi Pkwy) from SR-33 to SR-73, Blount Co. PIN 101423.00

Vincent

We have samples from Peppermint Branch, Gravelly Branch and an unnamed trib. downstream of Peppermint Branch. We did not find any listed species in any of these streams. I don't have any concerns about the proposed footprint of the extension as described.

Thanks
Bart

From: Vincent Pontello
Sent: Tuesday, February 18, 2020 11:21 AM
To: Bart Carter
Subject: Fw: SR-162EXT (Pellissippi Pkwy) from SR-33 to SR-73, Blount Co. PIN 101423.00

Bart,

Could you look at the topo location when you get a chance. I do not have aquatic occurrences in the immediate vicinity, however, I wanted your input if you are concerned about anything. This will be a new extension and new construction of pellissippi parkway.

Vincent L. Pontello
Wildlife Biologist
Liaison to Federal Highway Admin. & TDOT
Tennessee Wildlife Resources Agency
Environmental Services Division

From: Keven Brown <Keven.Brown@tn.gov>
Sent: Thursday, January 30, 2020 9:18 AM
To: Vincent Pontello <Vincent.Pontello@tn.gov>
Cc: John Barrett <John.Barrett@tn.gov>; Michael W. Palmer <Michael.W.Palmer@tn.gov>; Ethan Saturday <Ethan.Saturday@tn.gov>; B M. Richards <B.M.Richards@tn.gov>; Dennis Crumby <Dennis.Crumby@tn.gov>; Rob Todd <Rob.Todd@tn.gov>
Subject: SR-162EXT (Pellissippi Pkwy) from SR-33 to SR-73, Blount Co. PIN 101423.00

Vince,

A request for species information on the subject project is attached. If you have any questions, or need any additional information, please let me know.

Keven Brown | TESS Sup.
Region 1 Project Development
Environmental Technical Office
Admin. Building, 2nd Floor
7345 Region Lane, Knoxville, TN 37914
p. 865-594-2437 c. 865-469-7348
keven.brown@tn.gov
tn.gov/tdot

Keven Brown

From: Vincent Pontello
Sent: Friday, February 28, 2020 9:09 AM
To: Keven Brown
Subject: Re: SR-162EXT (Pellissippi Pkwy) from SR-33 to SR-73, Blount Co. PIN 101423.00

Keven,

Thank you for the detailed information you have provided. My data concur with the information you have sent me. I do not have specific specie request, therefore, the implementation of BMPs will be sufficient to satisfy the needs of the TWRA. Please contact me if you need further assistance.

Vincent L. Pontello
Wildlife Biologist
Liaison to Federal Highway Admin. & TDOT
Tennessee Wildlife Resources Agency
Environmental Services Division

From: Keven Brown <Keven.Brown@tn.gov>
Sent: Thursday, January 30, 2020 9:18 AM
To: Vincent Pontello <Vincent.Pontello@tn.gov>
Cc: John Barrett <John.Barrett@tn.gov>; Michael W. Palmer <Michael.W.Palmer@tn.gov>; Ethan Saturday <Ethan.Saturday@tn.gov>; B M. Richards <B.M.Richards@tn.gov>; Dennis Crumby <Dennis.Crumby@tn.gov>; Rob Todd <Rob.Todd@tn.gov>
Subject: SR-162EXT (Pellissippi Pkwy) from SR-33 to SR-73, Blount Co. PIN 101423.00

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R.O.W. INDEX OF SHEETS

TITLE SHEET	1
TYPICAL SECTIONS AND PAVEMENT SCHEDULE	2B – 2B5
ENVIRONMENTAL NOTES	2E
TABULATED QUANTITIES	2F, 2F1 - 2F4
DETAIL SHEETS	2G – 2G11
RIGHT-OF-WAY NOTES, UTILITY NOTES AND UTILITY OWNERS	3
PROPERTY MAP(S) AND RIGHT-OF-WAY ACQUISITION TABLE(S)	3A – 3H
PRESENT LAYOUT(S)	4 - 31
RIGHT-OF-WAY DETAILS	4A - 31A
PROPOSED LAYOUT(S)	4B - 31B
PROPOSED PROFILE(S)	4C-9C,9C1, 10C,10C1,11C-19C, 19C1, 20C-22C, 22C1 23C-24D
RAMP PROFILE(S)	32 – 41B
SIDE ROADS PROFILE(S)	42 – 52D
GREENWAY PROFILE(S)	52E – 52K
PRIVATE DRIVE, BUSINESS, AND FIELD ENTRANCE PROFILE(S)	53 - 56
DRAINAGE MAP(S)	57 - 69
CULVERT SECTION(S)	70 – 87B
EROSION PREVENTION AND SEDIMENT CONTROL PLANS	88 - 92AC
SIGNING AND PAVEMENT MARKING PLANS	93 – 118B
SIGN SCHEDULE	119 – 125A
ROADWAY CROSS SECTIONS	126 - 363
RAMP CROSS-SECTIONS	364 - 399
SIDE ROAD CROSS SECTIONS	400 - 531
SIGNAL PLANS	SIG-1 – SIG-4

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING

DOES THIS PROJECT QUALIFY FOR UTILITY CHAPTER 86	(YES)	NO
WORK ZONE SIGNIFICANCE DETERMINATION		
SIGNIFICANT	YES	NO

TENN.	YEAR	SHEET NO.
	2022	1
FED. AID PROJ. NO.	HPP/NH - 162(7)	
STATE PROJ. NO.	05097-1233-14	

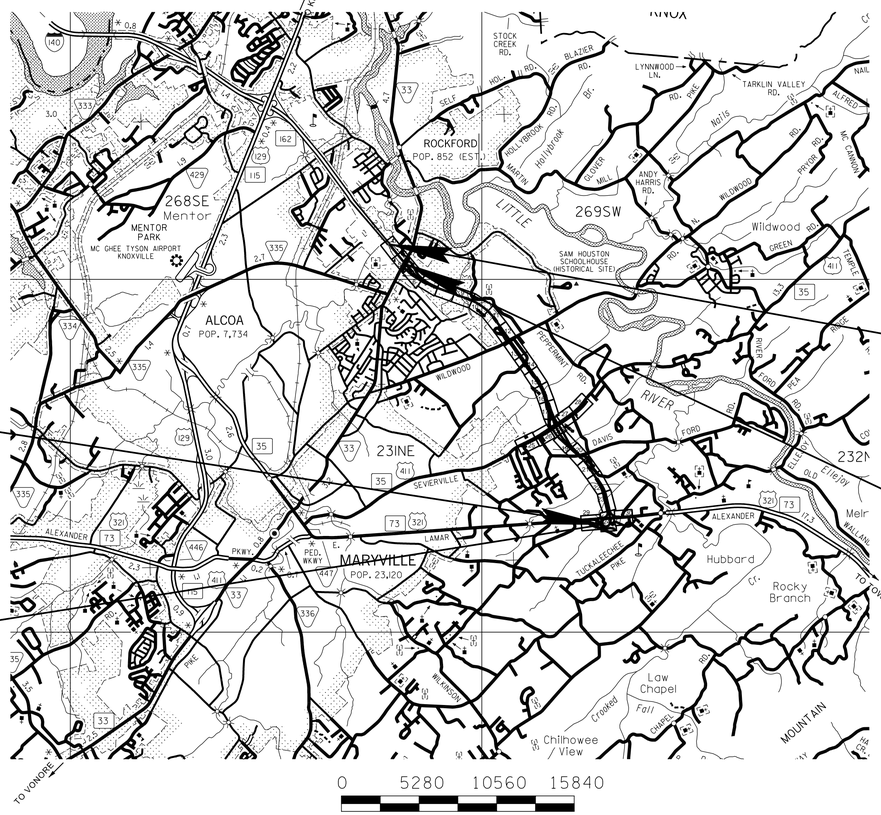
BLOUNT COUNTY

SR - 162 EXT, (PELLISSIPPI PARKWAY)
FROM SR - 33 TO SR - 73 (US - 321)

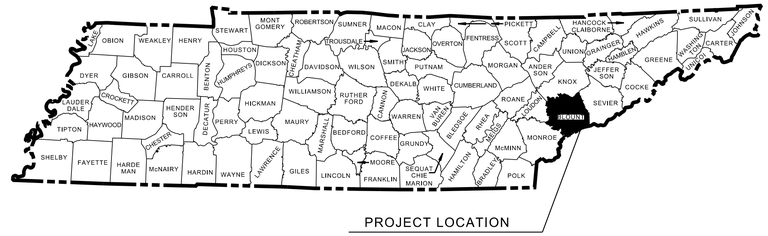
RIGHT-OF-WAY

GRADE, DRAIN, BASE, BRIDGE, PAVE, RETAINING WALL, SIGN & SIGNALS

STATE HIGHWAY NO. 162 F.A.H.S. NO.



SCALE: 1"= 5,280'



N

NO EXCLUSIONS
ROAD CLOSURE

R.O.W. FIELD REVIEW

05097-1233-14
BEGIN PROJECT NO. HPP/NH - 162(7) CONST.
STA. 100+00.00
N 543775.1364 E 2578227.6700

05097-1233-14
END PROJECT NO. HPP/NH - 162(7) CONSTRUCTION
STA. 359+03.56
N 524678.1792 E 2592697.0271

05097-1233-14
BEGIN PROJECT NO. HPP/NH - 162(7) R.O.W.
STA. 116+84.00
N 542459.2818 E 2579278.2480

05097-1233-14
END PROJECT NO. HPP/NH - 162(7) R.O.W.
STA. 359+03.56
N 524678.1792 E 2592697.0271

SEALED BY

APPROVED: Paul D. Degges
PAUL D. DEGGES, CHIEF ENGINEER

DATE:

APPROVED:
JOSEPH GALBATO, III, COMMISSIONER

SPECIAL NOTES

PROPOSALS MAY BE REJECTED BY THE COMMISSIONER IF ANY OF THE UNIT PRICES CONTAINED THEREIN ARE OBVIOUSLY UNBALANCED, EITHER EXCESSIVE OR BELOW THE REASONABLE COST ANALYSIS VALUE.

THIS PROJECT TO BE CONSTRUCTED UNDER THE STANDARD SPECIFICATIONS OF THE TENNESSEE DEPARTMENT OF TRANSPORTATION DATED JANUARY 1, 2021 AND ADDITIONAL SPECIFICATIONS AND SPECIAL PROVISIONS CONTAINED IN THE PLANS AND IN THE PROPOSAL CONTRACT.

TDOT C.E. MANAGER 1: STACY WEAVER, P.E.
DESIGNED BY : CDM SMITH
DESIGNER : KASSIE HOLMES, P.E. CHECKED BY DAN HIDEN, P.E.; JEFF MIZE, P.E.
P.E. NO. 05097-1233-14 (DESIGN)
PIN NO. 101423.00

R.O.W. LENGTH	4.587	MILES
ROADWAY LENGTH	4.906	MILES
BRIDGE LENGTH		MILES
BOX BRIDGE LENGTH		MILES
BOX BRIDGE LENGTH		MILES ▲
PROJECT LENGTH	4.906	MILES

▲ Not included in the project length. (Non Riding Surface)

SURVEY 08-13-2018	TRAFFIC DATA	
	ADT (2022)	15,770
	ADT (2042)	29,540
	DHV (2020)	3,542
	D	52 - 48
	T (ADT)	3 %
	T (DHV)	2 %
	V	70 MPH

COORDINATE VALUES ARE TENNESSEESTATE PLANE NAD/83 (CORS96) AND ARE DATUM ADJUSTED BY THE FACTOR OF 1.00009, AND ARE TIED TO THE GEODETIC REFERENCE NETWORK. ALL ELEVATIONS ARE REFERENCED TO THE NAVD 1988 USING THE GEOID 12B MODEL, OBTAINED ON 05-07-18.

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED:
DIVISION ADMINISTRATOR DATE

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CONTROL POINTS							
POINT	NORTHING	EASTING	ELEV.	FEATURE	GPS POINT	STATION	OFFSET
S06	543362.8910	2578350.7650	876.58	XCP	GPS05-162-06	104+01.40	154.8475

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2022	HPP/NH - 162(7)	4

SR - 162 BLOUNT COUNTY

N

WOODS
CHAIN LINK
N 544000 E 2578500
CLARK'S GROVE CEMETERY
GRASS
N 543500 E 2579000
CHAIN LINK
WOODS
EIP
CLAYTON EDUCATION CORP.
WOODS

BEGIN CONTROLLED ACCESS FENCE
TIE TO EXIST. CA FENCE
STA. 100+02.76
OFF. 126.95' LT

100
105

05097-1233-14
BEGIN PROJECT - HPP/NH-162 (7) CONSTRUCTION
STA. 100+00.00
N 543775.1364
E 2578227.6700

STA. 100+00.00
N 543775.1364
E 2578227.6700

PRES. & PROP. R.O.W.
REPLACE EXISTING C.A. FENCE
CHAIN LINK
XX
CUT
CATCH BASIN
TOP-870.25
INV-855.30
INV-855.15
BOT-855.15
PC 105+76.21
CUT
ASP.
CONC.
I-140 ENTRANCE RAMP
N 543500 E 2578600
MATCH LINE STA. 109+00
SEE SHEET NO. 5
S 37° 43' 14" E
SR-162 (PELLISSIPPI PKWY)
GRASS
Curve PELL_1-1
CUT
I-140 EXIT RAMP
Limits of Investigation
EXISTING CA FENCE TO REMAIN
PRES. & PROP. R.O.W.
CP-S06
05-162-06
CP # S06
N 543362.8910
E 2578350.7650
EL. 876.58
XCP
N 543000 E 2578500
CONC. DITCH
F (UG)
BIKE PATH
WOODS
GRASS

1
CMH SERVICES, INC.

2
CMH SERVICES, INC.

CURVE PELL_1-1
PI 110+33.75
N 542,957.4333
E 2,578,860.1312
Δ 2° 17' 15" (LT)
D 0° 15' 00"
R 22,918.00
L 914.96
T 457.54
SE N.C.
DESIGN SPEED 70 MPH

R.O.W.
FIELD
REVIEW

SEALED BY

COORDINATE VALUES ARE TENNESSEESTATE PLANE NAD/83 (CORS96) AND ARE DATUM ADJUSTED BY THE FACTOR OF 1.00009, AND ARE TIED TO THE GEODETIC REFERENCE NETWORK. ALL ELEVATIONS ARE REFERENCED TO THE NAVD 1988 USING THE GEOID 12B MODEL, OBTAINED ON 05-07-18.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PRESENT LAYOUT

STA.100+00 TO STA.109+00
SCALE: 1"=50'

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TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2022	HPP/NH - 162(7)	5

SR - 162 BLOUNT COUNTY

R.O.W. FIELD REVIEW

CMH HOMES, INC.

CLAYTON EDUCATION CORP.

CMH HOMES, INC.

INDUSTRIAL DEVELOPMENT BOARD OF BLOUNT COUNTY

PROP. R.O.W. AND C.A. FENCE

PC STA. 10+00.00
N 542842.4524
E 2579600.7462

CUT

RAMP 1-B

Curve RAMP 1B-3

MATCH LINE STA. 44+00 RAMP 1-B

PT 46+82.88

N 55° 38' 07" W

FILL

45

CP " S09
N 542490.0840
E 2579472.1980
EL. 874.85
XCP

05097-1233-14
BEGIN PROJECT - HPP/NH-162 (7) R.OW.
STA. 116+84.00
N 542459.2818
E 2579278.2480

110

115

120

I-140 ENTRANCE RAMP

STA. 12+13.19 SR-33 (OLD KNOXVILLE HWY.)=
STA. 48+13.13 RAMP 1B
N 542658.3357
E 2579493.2880

OLD KNOXVILLE HWY./S.R.33(ASP.)

Curve OLDKNOX-1

PT 114+99.78

S 40° 00' 29" E

CUT

FILL

CATCH BASIN
TOP-883.00
INV-857.35
INV-857.20
BOT-857.20

PT 114+91.17

TS 120+52.37

Curve PELL_1-1

SR-162 (PELLISSIPPI PKWY)

Spiral PELL_1-2B

MATCH LINE STA. 109+00 SEE SHEET NO. 4

MATCH LINE STA. 121+00 SEE SHEET NO. 6

CONTROL POINTS							
POINT	NORTHING	EASTING	ELEV.	FEATURE	GPS POINT	STATION	OFFSET
S07	542606.5630	2579016.7640	890.46	XCP	GPS05-162-07	114+03.49	105.7673
S09	542490.0840	2579472.1980	874.85	XCP	GPS05-162-09	294+37.68	-168.3595

CP-S07
05-162-07

CP = S07
N 542606.5630
E 2579016.7640
EL. 890.46
XCP

N 542500

STA. 117+89.44 SR-162 (PELLISSIPPI PKWY.)=
STA. 15+29.43 SR-33 (OLD KNOX HIGHWAY)
N 542378.5172
E 2579346.0367

I-140 EXIT RAMP

16.36'

STA. 17+71.58 SR-33 (OLD KNOXVILLE HWY.)=
STA. 10+00.00 RAMP 1A
N 542161.8333
E 2579237.9313

S 44° 39' 33" E

RAMP 1-A

S 26° 30' 54" W

PROP. R.O.W. AND C.A. FENCE

CP-S10
05-162-10

INDUSTRIAL DEVELOPMENT BOARD OF BLOUNT CO.

EXIST. C.A. FENCE TO REMAIN

BEGIN CONTROLLED ACCESS FENCE
TIE TO EXIST. CA FENCE
STA. 100+02.76
OFF. 367.41' RT

CMH SERVICES, INC.

CMH SERVICES, INC.

BARBED WIRE

END CA FENCE
STA. 20+97.62
OFF. 50.90' RT

BEGIN CA FENCE
STA. 20+97.62
OFF. 62.32' LT

STA. 20+97.62
N 541870.0892
E 2579092.3777

CURVE PELL_1-1
PI 110+33.75
N 542,957.4333
E 2,578,860.1312
Δ 2° 17' 15" (LT)
D 0° 15' 00"
R 22,918.00
L 914.96
T 457.54
SE N.C.
DESIGN SPEED 70 MPH

CURVE RAMP1B-3
PI 44+67.66
N 542,454.9037
E 2,579,790.7863
Δ 35° 38' 23" (LT)
D 8° 00' 08"
R 716.00
L 445.38
T 230.16
SE 0.070 FT/FT
DESIGN SPEED 40 MPH
TRANS. LENGTH 235'

CURVE OLDKNOX-1
PI 12+50.03
N 542,628.7800
E 2,579,470.8950
Δ 4° 46' 21" (LT)
D 0° 57' 18"
T 250.03
SE MATCH EXIST.
DESIGN SPEED 45 MPH

Limits of Investigation

SPIRAL PELL_1-2B
Pls 123+52.43
Ns 541,947.2967
Es 2,579,707.9759
θs 3° 22' 29"
LT 300.05
ST 150.05
Ls 450.00

COORDINATE VALUES ARE TENNESSEESTATE PLANE NAD/83 (CORS96) AND ARE DATUM ADJUSTED BY THE FACTOR OF 1.00009, AND ARE TIED TO THE GEODETIC REFERENCE NETWORK. ALL ELEVATIONS ARE REFERENCED TO THE NAVD 1988 USING THE GEOID 12B MODEL, OBTAINED ON 05-07-18.

SEALED BY

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PRESENT LAYOUT

STA.109+00 TO STA.121+00
SCALE: 1"=50'

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TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2022	HPP/NH - 162(7)	6
SR - 162		BLOUNT COUNTY	

CURVE RAMP1B-2
PI 37+01.56
N 541,705.1278
E 2,580,063.6160
Δ 33° 06' 27" (RT)
D 2° 59' 59"
R 1,910.00
L 1,103.66
T 567.72
SE 0.038 FT/FT
DESIGN SPEED 40 MPH
TRANS. LENGTH 145'

CURVE RAMP1B-3
PI 44+67.66
N 542,454.9037
E 2,579,790.7863
Δ 35° 38' 23" (LT)
D 8° 00' 08"
R 716.00
L 445.38
T 230.16
SE 0.070 FT/FT
DESIGN SPEED 40 MPH
TRANS. LENGTH 235'

SPIRAL PELL_1-2B
PIs 123+52.43
Ns 541,947.2967
Es 2,579,707.9759
θs 3° 22' 29"
LT 300.05
ST 150.05
Ls 450.00

CURVE RAMP1A-1
PI 16+25.94
N 541,716.5980
E 2,579,677.8998
Δ 13° 20' 42" (LT)
D 2° 29' 59"
R 2,292.00
L 533.84
T 268.13
SE 0.034 FT/FT
DESIGN SPEED 40 MPH
TRANS. LENGTH 135'

CURVE PELL_1-2
PI 133+05.13
N 541,217.5701
E 2,580,320.4622
θs 30° 06' 05" (LT)
`s 3° 22' 29"
Δc 23° 21' 07" (LT)
Dc 1° 30' 00"
Rc 3,820.00
Lc 1,556.91
Ts 1,252.76
Ls 450.00
SE 0.052 FT/FT
DESIGN SPEED 70 MPH
TRANS. LENGTH 450'

MATCH LINE STA. 44+00 RAMP 1-B
PROP. R.O.W.
"A"
END RET. WALL 1 STA. 44+00.00 OFF. 9.50' (RT.)
PROP. RET. WALL NO. 1
PRC 42+37.51
Curve RAMP 1B-3
BEGIN RET. WALL 1 STA. 41+80.00 OFF. 9.50' (RT.)
WOVEN WIRE
PRES. & PROP. R.O.W.
E1P
PRES. & PROP. R.O.W.
N
CUT
2580000 N 542000
Curve RAMP 1B-2
RAMP 1-B
WOODS
40
PASTURE
BARBED WIRE
20' W
9
INDUSTRIAL DEVELOPMENT BOARD OF BLOUNT COUNTY
2580500 N 541500
GRASS
PROP. R.O.W.
"C"
PROP. RET. WALL NO. 2
MATCH LINE STA. 32+00 RAMP 1-B
FILL
BEGIN RET. WALL 2 STA. 32+15.54 OFF. 9.50' (RT.)
R 875.63'
35
130
GRAPHICALLY LOCATED
24" W
W.V.
MATCH LINE STA. 133+00 SEE SHEET NO. 7
SEE SHEET NO. 5
MATCH LINE STA. 121+00
125
SC 125+02.37
PRES. R.O.W.
SR-162 (PELLISSIPPI PKWY)
Spiral PELL_1-2B
Curve PELL_1-2
S 58° 00' 15" E
CP " S11
N 541233.2110
E 2580215.2830
EL. 880.10
XCP
MATCH LINE STA. 24+50 RAMP 1-A
FILL
CATCH BASIN TOP-883.38 INV-881.28 INV-861.18 BOT-861.18
CATCH BASIN TOP-880.43 INV-860.23 BOT-860.23
STONE WALL
UTILITY VAULT
CABLE TELE
CP-S11 05-162-11
MARKERSTONE
WOVEN WIRE
20
2580000 N 541500
15
RAMP 1-A
Curve RAMP 1A-1
PT 18+91.85
MATCH LINE STA. 112+00 RAMP 1-A
PC 13+57.69
PROP. R.O.W.
FILL
"A"
Limits of Investigation
10
INDUSTRIAL DEVELOPMENT BOARD OF BLOUNT CO.
9
INDUSTRIAL DEVELOPMENT BOARD OF BLOUNT COUNTY
8
~~INDUSTRIAL DEVELOPMENT BOARD OF BLOUNT COUNTY~~
CLAYTON RD.(ASP.)
STONE WALLS(2)
CURB
C&G
SIDEWALK
TRAFFIC SIGNAL
ELECT CABLE
ELECT VAULT
ELECT MANHOLE
ICV(2)
WELL
MANHOLE TOP-880.69
MANHOLE TOP-880.42 INV-858.7 BOT-858.07
CATCH BASIN TOP-879.09 INV-874.19 BOT-874.19
CATCH BASIN TOP-879.11 INV-874.13 BOT-874.13
CATCH BASIN TOP-877.64 INV-873.10 INV-872.07 INV-871.64 BOT-871.64
MANHOLE TOP-877.66 INV-869.66 BOT-869.66
CATCH BASIN TOP-877.41 INV-862.34 BOT-862.34
CATCH BASIN TOP-874.96 INV-862.93 BOT-862.93
CATCH BASIN TOP-871.67 INV-863.94 BOT-863.94
CATCH BASIN TOP-868.31 INV-864.94 BOT-864.94
MANHOLE TOP-869.12 INV-861.12 BOT-861.12
CATCH BASIN TOP-864.48 INV-861.45 BOT-861.45
CATCH BASIN TOP-866.20 INV-861.96 BOT-861.96
CATCH BASIN TOP-863.59 INV-859.33 BOT-859.33
CATCH BASIN TOP-863.06 INV-857.56 INV-857.42 BOT-857.42
CATCH BASIN TOP-862.31 INV-858.21 BOT-858.21
MANHOLE TOP-869.40 INV-857.95 BOT-857.75
CATCH BASIN TOP-874.58 INV-863.68 INV-863.58
CATCH BASIN TOP-879.15 INV-862.49 BOT-862.49
CATCH BASIN TOP-877.16 INV-862.96 INV-862.91
CATCH BASIN TOP-880.42 INV-858.7 BOT-858.07
CATCH BASIN TOP-879.09 INV-874.19 BOT-874.19
CATCH BASIN TOP-879.11 INV-874.13 BOT-874.13
CATCH BASIN TOP-877.64 INV-873.10 INV-872.07 INV-871.64 BOT-871.64
CATCH BASIN TOP-880.43 INV-860.23 BOT-860.23
CATCH BASIN TOP-880.59 INV-860.48 BOT-860.48
CATCH BASIN TOP-879.33 INV-861.13 INV-861.03 BOT-861.03
MANHOLE TOP-880.69
CATCH BASIN TOP-877.41 INV-862.34 BOT-862.34
CATCH BASIN TOP-874.96 INV-862.93 BOT-862.93
CATCH BASIN TOP-871.67 INV-863.94 BOT-863.94
CATCH BASIN TOP-868.31 INV-864.94 BOT-864.94
MANHOLE TOP-869.12 INV-861.12 BOT-861.12
CATCH BASIN TOP-864.48 INV-861.45 BOT-861.45
CATCH BASIN TOP-866.20 INV-861.96 BOT-861.96
CATCH BASIN TOP-863.59 INV-859.33 BOT-859.33
CATCH BASIN TOP-863.06 INV-857.56 INV-857.42 BOT-857.42
CATCH BASIN TOP-862.31 INV-858.21 BOT-858.21
MANHOLE TOP-869.40 INV-857.95 BOT-857.75
CATCH BASIN TOP-874.58 INV-863.68 INV-863.58
CATCH BASIN TOP-879.15 INV-862.49 BOT-862.49
CATCH BASIN TOP-877.16 INV-862.96 INV-862.91

R.O.W. FIELD REVIEW

SEALED BY

COORDINATE VALUES ARE TENNESSEESTATE PLANE NAD/83 (CORS96) AND ARE DATUM ADJUSTED BY THE FACTOR OF 1.00009, AND ARE TIED TO THE GEODETIC REFERENCE NETWORK. ALL ELEVATIONS ARE REFERENCED TO THE NAVD 1988 USING THE GEOID 12B MODEL, OBTAINED ON 05-07-18.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PRESENT LAYOUT

STA.121+00 TO STA.133+00
SCALE: 1"=50'

CONTROL POINTS

POINT	NORTHING	EASTING	ELEV.	FEATURE	GPS POINT	STATION	OFFSET
S11	541233.2110	2580215.2830	880.10	XCP	GPS05-162-11	131+90.07	186.5303

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CURVE RAMP1B-1
PI 25+71.12
N 541,021.3931
E 2,580,974.3612
Δ 17° 00' 23" (RT)
D 1° 30' 00"
R 3,820.00
L 1,133.85
T 571.12
SE 0.052 FT/FT
DESIGN SPEED 70 MPH
TRANS. LENGTH 270'

CURVE RAMP1B-2
PI 37+01.56
N 541,705.1278
E 2,580,063.6160
Δ 33° 06' 27" (RT)
D 2° 59' 59"
R 1,910.00
L 1,103.66
T 567.72
SE 0.038 FT/FT
DESIGN SPEED 40 MPH
TRANS. LENGTH 145'

SPIRAL PELL_1-2A
PIs 142+09.33
Ns 540,893.4358
Es 2,581,216.3291
θs 3° 22' 29"
LT 300.05
ST 150.05
Ls 450.00

CURVE RAMP1A-2
PI 27+81.03
N 541,103.2826
E 2,580,659.5677
Δ 4° 17' 04" (LT)
D 1° 28' 50"
R 3,870.00
L 289.39
T 144.76
SE 0.052 FT/FT
DESIGN SPEED 70 MPH
TRANS. LENGTH 270'

CURVE PELL_1-2
PI 133+05.13
N 541,217.5701
E 2,580,320.4622
θs 30° 06' 05" (LT)
`s 3° 22' 29"
Δc 23° 21' 07" (LT)
Dc 1° 30' 00"
Rc 3,820.00
Lc 1,556.91
Ts 1,252.76
Ls 450.00
SE 0.052 FT/FT
DESIGN SPEED 70 MPH
TRANS. LENGTH 450'

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2022	HPP/NH - 162(7)	7

SR - 162 BLOUNT COUNTY

R.O.W.
FIELD
REVIEW

Limits of Investigation

9
INDUSTRIAL DEVELOPMENT BOARD
OF BLOUNT COUNTY

PROP. R.O.W.
PROP. RET. WALL NO. 2
END RET. WALL 2
STA. 28+64.17
OFF. 9.50' (RT.)
PCC 31+33.85
8' SA GRAPHICALLY LOCATED
INV-853.20
FILL
CUT
"A"
"B"
GRASS
GRAVEL
WOODS

MATCH LINE
STA. 32+00
RAMP 1-B

MATCH LINE
STA. 133+00
SEE SHEET NO. 6

MATCH LINE
STA. 145+00
SEE SHEET NO. 8

MATCH LINE
STA. 24+50
RAMP 1-A

Curve RAMP 1B-2
Curve RAMP 1B-1
RAMP 1-B
Curve PELL_1-2
Curve RAMP 1A-2
RAMP 1-A
Spiral PELL_1-2A

SR-162 (PELLISSIPPI PKWY)

PC 26+36.27

STA. 137+62.85 SR-162 (PELLISSIPPI PKWY) =
STA. 29+25.65 RAMP 1A
N 541035.9555
E 2580787.7258

CP # S12
N 540731.5520
E 2581153.6059
EL. 890.56
XCP

CS 140+59.28

PRES. AND PROP. R.O.W.
CUT
CP-S12
05-162-12

PELLISSIPPI PL.(ASP.)
24.49'
24.55'
23.36'
CROSSWALK
STONE WALL
UTILITY VAULT
CABLE TELE
ELECT
TRAFFIC
LIGHTING
GRAPHICALLY LOCATED
CANOPY

CATCH BASIN TOP-878.39 INV-854.39 INV-851.09
CATCH BASIN TOP-879.86 INV-856.91 INV-856.76
CATCH BASIN TOP-880.19 INV-859.74
CATCH BASIN TOP-878.90 INV-858.77 INV-860.04 INV-860.00
CATCH BASIN TOP-877.01 INV-869.61
CATCH BASIN TOP-876.28 INV-871.53 INV-862.43 INV-862.38
CATCH BASIN TOP-876.27 INV-862.38 INV-862.33
CATCH BASIN TOP-879.38 INV-869.93 INV-868.48
MANHOLE TOP-881.70 INV-868.90
CATCH BASIN TOP-884.01 INV-878.56
CATCH BASIN TOP-886.68 INV-882.98 INV-879.13
CATCH BASIN TOP-888.74 INV-884.02 INV-884.00
CATCH BASIN TOP-889.69 INV-884.91 INV-884.84
CATCH BASIN TOP-884.14 INV-884.06
CATCH BASIN TOP-882.63
CATCH BASIN TOP-890.23 INV-885.28 INV-885.12
CATCH BASIN TOP-889.2 INV-885.
CATCH BASIN TOP-879.77 INV-862.57 INV-862.27
CATCH BASIN TOP-879.65 INV-871.90
CATCH BASIN TOP-876.38 INV-872.23
CATCH BASIN TOP-879.55 INV-870.42 INV-870.33
MANHOLE TOP-881.48 INV-867.93 INV-867.88 INV-867.83
CATCH BASIN TOP-883.70 INV-879.15 INV-871.55 INV-871.45
CATCH BASIN TOP-876.89 INV-869.67
CATCH BASIN TOP-884.76 INV-879.96
CATCH BASIN TOP-886.82 INV-879.72 INV-879.67
CATCH BASIN TOP-883.85 INV-879.35
MANHOLE TOP-887.01 INV-869.16 INV-869.06
CATCH BASIN TOP-888.63 INV-884.51
MANHOLE TOP-890.70 INV-871.60 INV-871.50
CATCH BASIN TOP-889.73 INV-885.55 INV-885.53
CATCH BASIN TOP-890.32 INV-886.36
CATCH BASIN TOP-891.32 INV-885.82 24"RCP
CATCH BASIN TOP-890.32 INV-885.12 INV-885.05
CATCH BASIN TOP-877.73 INV-867.88 INV-861.31 INV-861.28
MANHOLE TOP-878.36 INV-865.38 INV-865.36
CATCH BASIN TOP-876.20 INV-862.35 INV-861.98 INV-861.83
CATCH BASIN TOP-881.93 INV-872.48 INV-872.43

N 541500 E 2581000
N 541000 E 2581500
N 540500 E 2582000

CONTROL POINTS							
POINT	NORTHING	EASTING	ELEV.	FEATURE	GPS POINT	STATION	OFFSET
S12	540731.5520	2581153.6059	890.56	XCP	GPS05-162-12	142+09.89	176.2283

SEALED BY

COORDINATE VALUES ARE TENNESSEESTATE PLANE NAD/83 (CORS96) AND ARE DATUM ADJUSTED BY THE FACTOR OF 1.00009, AND ARE TIED TO THE GEODETIC REFERENCE NETWORK. ALL ELEVATIONS ARE REFERENCED TO THE NAVD 1988 USING THE GEOID 12B MODEL, OBTAINED ON 05-07-18.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PRESENT LAYOUT

STA.133+00 TO STA.145+00
SCALE: 1"=50'

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TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2022	HPP/NH - 162(7)	8

SR - 162 BLOUNT COUNTY

CONTROL POINTS							
POINT	NORTHING	EASTING	ELEV.	FEATURE	GPS POINT	STATION	OFFSET
S13	540274.5000	2582090.3920	886.52	XCP	GPS05-162-13	152+41.72	284.6330

SPIRAL PELL_1-2A
PIs 142+09.33
Ns 540,893.4358
Es 2,581,216.3291
θs 3° 22' 29"
LT 300.05
ST 150.05
Ls 450.00

N

CONC.

Limits of Investigation

9
INDUSTRIAL DEVELOPMENT BOARD
OF BLOUNT COUNTY

WOODS

PROP. R.O.W.

GRASS

FILL

150

155

STA. 145+09.28 SR-162 (PELLISSIPPI PKWY.)=
STA. 20+00.00 RAMP 1B
N 540827.0823
E 2581511.4120

120
145
Spiral PELL_1-2A

SR-162 (PELLISSIPPI PKWY)

S 70° 06' 34" E

BARBED WIRE

E 2582500
N 540500

E 2582000
N 540500

E 2581500
N 540500

E 2582000
N 541000

SEE SHEET NO. 7

SEE SHEET NO. 9

STA. 145+00

STA. 157+00

MATCH LINE

ST 143+09.26

CUT

"A"

CP = S13
N 540274.5000
E 2582090.3920
EL. 886.52
XCP

05-162-13

EIP

CATCH BASIN
MANHOLE
DROP INLET
BACK FLOW PREVENTER
ICV
GRAPHICALLY LOCATED
C&G
CURB
SIDEWALK
LIGHTING
STONE WALL
8"PVC
ASP.
CROSSWALK
STGN

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R.O.W.
FIELD
REVIEW

SEALED BY

COORDINATE VALUES ARE TENNESSEESTATE PLANE NAD/83 (CORS96) AND ARE DATUM ADJUSTED BY THE FACTOR OF 1.00009, AND ARE TIED TO THE GEODETIC REFERENCE NETWORK. ALL ELEVATIONS ARE REFERENCED TO THE NAVD 1988 USING THE GEOID 12B MODEL, OBTAINED ON 05-07-18.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PRESENT LAYOUT

STA.145+00 TO STA.157+00

SCALE: 1"=50'

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2022	HPP/NH - 162(7)	9

SR - 162 BLOUNT COUNTY

LEGEND	WETLAND IMPACTS (WTL-2)	
	AREA OF PERMANENT IMPACT =	0.04 AC.
	VOLUME OF PERMANENT IMPACT =	31 C.Y.

CURVE PELL_1-3
PI 179+31.52
N 539,627.0103
E 2,584,716.5718
Δs 34° 51' 18" (RT)
θs 3° 22' 29"
Δc 28° 06' 19" (RT)
Dc 1° 30' 00"
Rc 3,820.00
Lc 1,873.83
Ts 1,424.79
Ls 450.00
SE 0.052 FT/FT
DESIGN SPEED 70 MPH
TRANS. LENGTH 450'

SPIRAL PELL_1-3B
PIs 168+06.79
Ns 540,009.6757
Es 2,583,658.9321
θs 3° 22' 29"
LT 300.05
ST 150.05
Ls 450.00

LEGEND	WETLAND IMPACTS (WTL-3)	
	AREA OF PERMANENT IMPACT =	0.01 AC.
	VOLUME OF PERMANENT IMPACT =	6 C.Y.

9
INDUSTRIAL DEVELOPMENT BOARD OF BLOUNT COUNTY

N
24" W
16" W
PASTURE
STR-1 PER.
UNNAMED BRANCH OF LITTLE RIVER
N 540500 E 2583500
CP " S15
N 540325.8500
E 2583226.2380
EL. 891.90
XCP
WOODS
BARBED WIRE
160
170
CP-S15
05-162-15
PROP. RET. WALL NO. 3
PROP. R.O.W.
FILL
GRAPHICALLY LOCATED
BEGIN RET. WALL 3
STA. 158+85.00
OFF. 130.00' (LT.)
SEP-1
STR-1
165
STR-3 PER.
UTP-2/3
WTP-3
STR-3
END RET. WALL 3
STA. 167+20.00
OFF. 130.52' (LT.)
SEE SHEET NO. 8
SEE SHEET NO. 10
STA. 157+00
STA. 170+00
MATCH LINE
SR-162 (PELLISSIPPI PKWY)
Spiral PELL_1-3B
Curve PELL_1-3
SC 169+56.73
TS 165+06.73
UTP-1
WTP-1
WTL-1
CP-S14
05-162-14
PROP. RET. WALL NO. 4
BEGIN RET. WALL 4
STA. 166+75.00
OFF. 107.91' (RT.)
"A"
SEP-2
STR-3 PER.
WWC-1/EPH-1
DIST.
EPH
STR-2
STR-2 INT.
CP " S14
N 540273.4400
E 2582579.2220
EL. 904.91
XCP
STR-1 PER.
Limits of Investigation
SEPTIC FIELD
1-STY. FR. RES.
S.W.
GRASS
CONC.

LEGEND	WETLAND IMPACTS (WTL-1)	
	AREA OF PERMANENT IMPACT =	0.19 AC.
	VOLUME OF PERMANENT IMPACT =	155 C.Y.

CONTROL POINTS

POINT	NORTHING	EASTING	ELEV.	FEATURE	GPS POINT	STATION	OFFSET
S14	540273.4400	2582579.2220	904.91	XCP	GPS05-162-14	157+01.75	119.3169
S15	540325.8500	2583226.2380	891.90	XCP	GPS05-162-15	162+92.33	-150.0985

R.O.W. FIELD REVIEW

SEALED BY

COORDINATE VALUES ARE TENNESSEESTATE PLANE NAD/83 (CORS96) AND ARE DATUM ADJUSTED BY THE FACTOR OF 1.00009, AND ARE TIED TO THE GEODETIC REFERENCE NETWORK. ALL ELEVATIONS ARE REFERENCED TO THE NAVD 1988 USING THE GEOID 12B MODEL, OBTAINED ON 05-07-18.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PRESENT LAYOUT

STA.157+00 TO STA.170+00
SCALE: 1"=50'

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TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2022	HPP/NH - 162(7)	10

SR - 162 BLOUNT COUNTY

WOODS

WOODEN

GRAPHICALLY LOCATED

GRASS

POND

GW-2

UNNAMED BRANCH OF LITTL

BARBED WIRE

N 540000 E 2586000

N 539500 E 2586000

N 539000 E 2584500

N

13

INDUSTRIAL DEVELOPMENT BOARD OF BLOUNT COUNTY

BEGIN RET. WALL 5 STA. 174+20.00 OFF. 130.00' (LT.)

END RET. WALL 5 STA. 176+66.18 OFF. 130.00' (LT.)

WWC-2/EPH-2

PROP. RET. WALL NO. 5

PROP. R.O.W.

170

175

180

CUT

FILL

MATCH LINE STA. 170+00

SEE SHEET NO. 9

SR-162 (PELLISSIPPI PKWY)

Curve PELL_1-3

SEE SHEET NO. 11

STA. 183+00

MATCH LINE

BEGIN RET. WALL 6 STA. 178+25.00 OFF. 51.50' (RT.)

PROP. RET. WALL NO. 6

PROP. RET. WALL NO. 4

STR-3 PER.

ALCOA CITY LIMITS

END RET. WALL 4 STA. 177+35.00 OFF. 120.00' (RT.)

12

JUDITH A. COMER

9

INDUSTRIAL DEVELOPMENT BOARD OF BLOUNT COUNTY

SEPTIC FIELD

CONC. PAD

CONC. S.W.

2-S-BR. RES.

Limits of Investigation

CURVE PELL_1-3
PI 179+31.52
N 539,627.0103
E 2,584,716.5718
Δs 34° 51' 18" (RT)
θs 3° 22' 29"
Δc 28° 06' 19" (RT)
Dc 1° 30' 00"
Rc 3,820.00
Lc 1,873.83
Ts 1,424.79
Ls 450.00
SE 0.052 FT/FT
DESIGN SPEED 70 MPH
TRANS. LENGTH 450'

R.O.W. FIELD REVIEW

SEALED BY

COORDINATE VALUES ARE TENNESSEESTATE PLANE NAD/83 (CORS96) AND ARE DATUM ADJUSTED BY THE FACTOR OF 1.00009, AND ARE TIED TO THE GEODETIC REFERENCE NETWORK. ALL ELEVATIONS ARE REFERENCED TO THE NAVD 1988 USING THE GEOID 12B MODEL, OBTAINED ON 05-07-18.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PRESENT LAYOUT

STA.170+00 TO STA.183+00

SCALE: 1"=50'

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TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2022	HPP/NH - 162(7)	11

SR - 162 BLOUNT COUNTY

R.O.W. FIELD REVIEW

13
INDUSTRIAL DEVELOPMENT BOARD
OF BLOUNT COUNTY

14
NANCY LOUISE IRWIN MCCLANAHAN
AND
MARILYN JOAN IRWIN HICKS

CONTROL POINTS							
POINT	NORTHING	EASTING	ELEV.	FEATURE	GPS POINT	STATION	OFFSET
S16	538971.7720	2584986.0560	1057.86	XCP	GPS05-162-16	185+28.06	120.7273
S17	538575.1840	2585283.6380	1067.15	XCP	GPS05-162-17	190+39.59	142.7225

MATCH LINE STA. 183+00

SEE SHEET NO. 10

SEE SHEET NO. 12

STA. 196+00

MATCH LINE

PROP. R.O.W.

"A"

CUT

FILL

185

190

195

CS 188+30.56

SR-162 (PELLISSIPPI PKWY)

Curve PELL_1-3

Spiral PELL_1-3A

S 35° 15' 16" E

ST 192+80.56

POND-1

CP-S16
05-162-16

CP-S17
05-162-17

CP # S16
N 538971.7720
E 2584986.0560
EL. 1057.86
XCP

CP # S17
N 538575.1840
E 2585283.6380
EL. 1067.15
XCP

Limits of Investigation

ALCOA CITY LIMITS

CURVE PELL_1-3
PI 179+31.52
N 539,627.0103
E 2,584,716.5718
Δs 34° 51' 18" (RT)
θs 3° 22' 29"
Δc 28° 06' 19" (RT)
Dc 1° 30' 00"
Rc 3,820.00
Lc 1,873.83
Ts 1,424.79
Ls 450.00
SE 0.052 FT/FT
DESIGN SPEED 70 MPH
TRANS. LENGTH 450'

SPIRAL PELL_1-3A
PIs 189+80.61
Ns 538,708.5532
Es 2,585,365.7801
θs 3° 22' 29"
LT 300.05
ST 150.05
Ls 450.00

DENOTES LOSS OF ACCESS

WOODS
PASTURE
BARN
SHED
EIP
BARBED WIRE
GRAPHICALLY LOCATED W

SEALED BY

COORDINATE VALUES ARE TENNESSEESTATE PLANE NAD/83 (CORS96) AND ARE DATUM ADJUSTED BY THE FACTOR OF 1.00009, AND ARE TIED TO THE GEODETIC REFERENCE NETWORK. ALL ELEVATIONS ARE REFERENCED TO THE NAVD 1988 USING THE GEOID 12B MODEL, OBTAINED ON 05-07-18.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PRESENT LAYOUT

STA.183+00 TO STA.196+00

SCALE: 1"=50'

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CONTROL POINTS							
POINT	NORTHING	EASTING	ELEV.	FEATURE	GPS POINT	STATION	OFFSET
S18	537814.1120	2585546.9060	1028.57	XCP	GPS05-162-18	198+15.45	368.3723
S19	536982.0060	2586060.4160	981.37	XCP	GPS05-162-19	207+91.35	429.3405
S20	537225.4060	2586475.1790	972.59	XCP	GPS05-162-20	208+31.99	-49.8462

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2022	HPP/NH - 162(7)	12

SR - 162 BLOUNT COUNTY

(14)

NANCY LOUISE IRWIN MCCLANAHAN
AND
MARILYN JOAN IRWIN HICKS

CP = S20
N 537225.4060
E 2586475.1790
EL. 972.59
XCP

LEGEND	WETLAND IMPACTS (WTL-4)	
	AREA OF PERMANENT IMPACT =	0.15 AC.
	VOLUME OF PERMANENT IMPACT =	117 C.Y.

Limits of Investigation

SEE SHEET NO. 11

MATCH LINE STA. 196+00

SEE SHEET NO. 13

MATCH LINE STA. 208+00

SR-162 (PELLISS|PPI PKWY)

PROP. R.O.W

200

205

FILL

CUT

WALL 33

S 35^ 15' 16" E

STR-4 INT.

PROP. RET. WALL NO. 7

SARATOGA DR. (ASP.)

PROP. RET. WALL NO. 8

UTP-4

WTP-4

WTL-4

(17)

CHARLES TEDFORD WILSON AND WIFE, KRISTIE WILSON

(18)

CHARLES TEDFORD WILSON AND WIFE, KRISTIE WILSON

(14)

NANCY LOUISE IRWIN MCCLANAHAN
AND
MARILYN JOAN IRWIN HICKS

CP = S18
N 537814.1120
E 2585546.9060
EL. 1028.57
XCP

CP-S18
05-162-18

CP = S19
N 536982.0060
E 2586060.4160
EL. 981.37
XCP

(16)

~~SANDRA GAYLE PAYNE AND HUSBAND, REUBEN B. PAYNE~~

(15)

~~DONALD L. RICKETTS AND WIFE, GINGER R. RICKETTS~~

CP-S19
05-162-19

R.O.W.
FIELD
REVIEW

SEALED BY

COORDINATE VALUES ARE TENNESSEESTATE PLANE NAD/83 (CORS96) AND ARE DATUM ADJUSTED BY THE FACTOR OF 1.00009, AND ARE TIED TO THE GEODETIC REFERENCE NETWORK. ALL ELEVATIONS ARE REFERENCED TO THE NAVD 1988 USING THE GEOID 12B MODEL, OBTAINED ON 05-07-18.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PRESENT LAYOUT

STA.196+00 TO STA.208+00

SCALE: 1"=50'

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TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2022	HPP/NH - 162(7)	13

SR - 162 BLOUNT COUNTY

CONTROL POINTS							
POINT	NORTHING	EASTING	ELEV.	FEATURE	GPS POINT	STATION	OFFSET
S22	536981.2840	2586249.5250	980.87	XCP	GPS05-162-22	209+01.09	275.3314
S23	536606.9610	2586495.4830	1004.38	XCP	GPS05-162-23	213+48.73	290.5454

CURVE GW-1
PI 11+22.84
N 537,017.4839
E 2,586,415.2989
Δ 19° 56' 01" (LT)
D 28° 38' 52"
R 200.00
L 69.58
T 35.15

CURVE GW-2
PI 11+97.75
N 536,969.9778
E 2,586,474.1327
Δ 16° 23' 07" (RT)
D 28° 38' 52"
R 200.00
L 57.20
T 28.79

R.O.W. FIELD REVIEW

SEE SHEET NO. 12

MATCH LINE STA. 208+00

SEE SHEET NO. 14

MATCH LINE STA. 221+00

23 — JOE KELS PROPERTIES, LLC. — 22

PT 12+00.00
N 537357.1606
E 2586746.8534

S 59° 53' 24" W

S 58° 51' 12" W

Limits of Investigation

PROP. R.O.W.

STA. 208+52.62 SR-162 (PELLISSIPPI PKWY.)=
STA. 15+48.93 WILDWOOD RD.
N 537179.7953
E 2586446.3774

SR-162 (PELLISSIPPI PKWY)

S 35° 15' 16" E

STA. 10+00.00 GREENWAY=
STA. 16+59.48 WILDWOOD RD.
N 537122.6148
E 2586351.7628

Curve GW-1

PC 10+87.69

S 31° 08' 48" E

S 51° 04' 49" E

PT 11+57.27

PC 11+68.95

Curve GW-2

PT 12+26.15

GREENWAY

S 34° 41' 43" E

PT 18+71.00
N 537014.7929
E 2586169.7890

CP = S22
N 536981.2840
E 2586249.5250
EL. 980.87
XCP

CP-S22
05-162-22

CP-S23
05-162-23

CP = S23
N 536606.9610
E 2586495.4830
EL. 1004.38
XCP

21 — JACK AMMONS AND WIFE, SANDRA AMMONS

20 — ~~CHAD WILLIAMS AND WIFE, NIKKI WILLIAMS~~

19 — ~~CHAD S. WILLIAMS AND WIFE, NIKKI R. WILLIAMS~~

24 — JOHN O. HOWARD AND WIFE, BEULAH MAE HOWARD

26 — ~~ALLEN L. BRYANT AND WIFE, CATHY C. BRYANT~~

WOODS, CROP, PASTURE, GRASS, BARBED WIRE, WOVEN WIRE, FENCE, EIP, SHED, BARN, 2-S-BR. RES., 1-S.FR. RES., SEPTIC FIELD, POOL, CONC. PAD, CONC., GR., S.W., METAL, CABLE TV, GUY WIRE, POWER POLE, FILL, CUT

SEALED BY

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STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PRESENT LAYOUT

STA.208+00 TO STA.221+00
SCALE: 1"=50'

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TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2022	HPP/NH - 162(7)	14

SR - 162 BLOUNT COUNTY

CURVE BROWN_SCHOOL-1
PI 17+06.58
N 535,532.1587
E 2,587,464.5006
Δ 1° 29' 09" (RT)
D 0° 30' 00"
R 11,459.00
L 297.16
T 148.59

CURVE GW-3
PI 25+65.50
N 535,846.8891
E 2,587,255.4397
Δ 8° 24' 25" (RT)
D 6° 44' 26"
R 850.00
L 124.72
T 62.47

CURVE GW-4
PI 26+88.00
N 535,737.6799
E 2,587,311.4327
Δ 8° 06' 35" (LT)
D 6° 44' 26"
R 850.00
L 120.31
T 60.25

R.O.W. FIELD REVIEW

LEGEND	WETLAND IMPACTS (WTL-5)	
	AREA OF PERMANENT IMPACT =	0.27 AC.
	VOLUME OF PERMANENT IMPACT =	215 C.Y.

CONTROL POINTS							
POINT	NORTHING	EASTING	ELEV.	FEATURE	GPS POINT	STATION	OFFSET
S24	535971.5910	2587055.1610	995.40	XCP	GPS05-162-24	221+90.63	200.2552
SKENNY1	535538.0970	2587453.4540	1000.77	XCP	GPSKENNY	227+74.51	125.2269
SZACK1	535248.5660	2587160.3910	1005.41	XCP	GPSZACK	228+41.79	531.6610

SEALED BY

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STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PRESENT LAYOUT

STA.221+00 TO STA.233+00

SCALE: 1"=50'

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TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2022	HPP/NH - 162(7)	15

SR - 162 BLOUNT COUNTY

SPIRAL PELL_1-4B
PIs 241+66.36
Ns 534,473.8034
Es 2,588,359.0984
θs 3° 22' 29"
LT 300.05
ST 150.05
Ls 450.00

CURVE PELL_1-4
PI 246+79.89
N 534,054.4563
E 2,588,655.5125
Δs 17° 30' 33" (RT)
θs 3° 22' 29"
Δc 10° 45' 35" (RT)
Dc 1° 30' 00"
Rc 3,820.00
Lc 717.37
Ts 813.58
Ls 450.00
SE 0.052 FT/FT
DESIGN SPEED 70 MPH
TRANS. LENGTH 450'

N

Limits of Investigation

PASTURE

29

HOWARD PLACE PARTNERS

WOODS

MATCH LINE STA. 233+00 SEE SHEET NO. 14

SR-162 (PELLISSIPPI PKWY)

S 35° 15' 16" E

S 41° 38' 54" E

S 32° 02' 51" E

GREENWAY

CUT

FILL

PROP. R.O.W.

PROP. RET. WALL NO. 9

PROP. RET. WALL NO. 10

BEGIN RET. WALL 9 STA. 244+24.76 OFF. 130.00' (LT.)

BEGIN RET. WALL 10 STA. 242+96.34 OFF. 130.00' (RT.)

TS 238+66.30

SC 243+16.30

Spiral PELL_1-4B

Curve PELL_1-4

Curve GW-5

Curve GW-6

Curve GW-7

PC 37+78.69

PT 38+34.79

PC 40+49.97

PT 42+17.53

PC 44+59.76

BARBED WIRE

WOODEN

BARN

PASTURE

WOODS

MATCH LINE STA. 245+00 SEE SHEET NO. 16

CURVE GW-5
PI 38+06.92
N 534,823.8125
E 2,587,957.3968
Δ 6° 23' 38" (LT)
D 11° 27' 33"
R 500.00
L 55.80
T 27.93

CURVE GW-6
PI 41+33.95
N 534,579.4021
E 2,588,174.7640
Δ 9° 36' 03" (RT)
D 5° 43' 46"
R 1,000.00
L 167.57
T 83.98

CURVE GW-7
PI 50+18.50
N 533,829.3154
E 2,588,644.3373
Δ 17° 05' 02" (RT)
D 1° 32' 25"
R 3,720.00
L 1,109.19
T 558.74

R.O.W. FIELD REVIEW

SEALED BY

COORDINATE VALUES ARE TENNESSEESTATE PLANE NAD/83 (CORS96) AND ARE DATUM ADJUSTED BY THE FACTOR OF 1.00009, AND ARE TIED TO THE GEODETIC REFERENCE NETWORK. ALL ELEVATIONS ARE REFERENCED TO THE NAVD 1988 USING THE GEOID 12B MODEL, OBTAINED ON 05-07-18.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PRESENT LAYOUT

STA.233+00 TO STA.245+00

SCALE: 1"=50'

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TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2022	HPP/NH - 162(7)	16

SR - 162 BLOUNT COUNTY

CURVE PELL_1-4
PI 246+79.89
N 534,054.4563
E 2,588,655.5125
Δs 17° 30' 33" (RT)
θs 3° 22' 29"
Δc 10° 45' 35" (RT)
Dc 1° 30' 00"
Rc 3,820.00
Lc 717.37
Ts 813.58
Ls 450.00
SE 0.052 FT/FT
DESIGN SPEED 70 MPH
TRANS. LENGTH 450'

SPIRAL PELL_1-4A
PIs 251+83.72
Ns 533,565.3590
Es 2,588,812.0284
θs 3° 22' 29"
LT 300.05
ST 150.05
Ls 450.00

N

29
HOWARD PLACE PARTNERS

31
ROBERT L. DELOZIER
AND
BETTY W. DELOZIER

30
DANIEL KEITH WATERS

STR-5 PER. PEPPERMINT BRANCH

END RET. WALL 9
STA. 251+35.79
OFF. 130.24' (LT.)

PROP. R.O.W.

245 50 250 55 255

PROP. RET. WALL NO. 9

FILL

CUT

ST 254+83.68

PASTURE

WOODS

MATCH LINE STA. 245+00

SEE SHEET NO. 15

SR-162 (PELLISSIPPI PKWY)

Curve PELL_1-4

Spiral PELL_1-4A

CS 250+33.68

PT 55+68.95

BARBED WIRE

SEE SHEET NO. 17

STA. 257+00 MATCH LINE

PROP. RET. WALL NO. 10

Curve GW-7

GREENWAY

S 14° 57' 49" E

PROP. R.O.W.

Curve GW-8

PO 57+95.04

WWC-3/EPH-3

END RET. WALL 10
STA. 253+50.00
OFF. 133.13' (RT.)

STR-5 PER. PEPPERMINT BRANCH

Limits of Investigation

DENOTES LOSS OF ACCESS

CURVE GW-7
PI 50+18.50
N 533,829.3154
E 2,588,644.3373
Δ 17° 05' 02" (RT)
D 1° 32' 25"
R 3,720.00
L 1,109.19
T 558.74

CURVE GW-8
PI 58+57.31
N 533,010.9405
E 2,588,863.0652
Δ 7° 07' 33" (RT)
D 5° 43' 46"
R 1,000.00
L 124.37
T 62.26

N 534000 E 2588000
N 533500 E 2588500
N 533000 E 2588500

R.O.W. FIELD REVIEW

SEALED BY

COORDINATE VALUES ARE TENNESSEESTATE PLANE NAD/83 (CORS96) AND ARE DATUM ADJUSTED BY THE FACTOR OF 1.00009, AND ARE TIED TO THE GEODETIC REFERENCE NETWORK. ALL ELEVATIONS ARE REFERENCED TO THE NAVD 1988 USING THE GEOID 12B MODEL, OBTAINED ON 05-07-18.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PRESENT LAYOUT

STA.245+00 TO STA.257+00
SCALE: 1"=50'

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TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2022	HPP/NH - 162(7)	17

SR - 162 BLOUNT COUNTY

CONTROL POINTS							
POINT	NORTHING	EASTING	ELEV.	FEATURE	GPS POINT	STATION	OFFSET
S25	532751.6640	2589148.0740	982.11	XCP	GPS05-162-25	260+61.02	-72.0558
S26	532225.4720	2589542.1910	997.27	XCP	GPS05-162-26	266+82.30	-287.0463

CP = S26
N 532225.4720
E 2589542.1910
EL. 997.27
XCP

CP = S25
N 532751.6640
E 2589148.0740
EL. 982.11
XCP

CURVE RAMP2A-1
PI 37+02.05
N 532,048.7096
E 2,589,349.8686
Δ 15° 29' 43" (RT)
D 1° 30' 00"
R 3,820.00
L 1,033.09
T 519.71
SE 0.030 FT/FT
DESIGN SPEED 70 MPH
TRANS. LENGTH 145'

SPIRAL PELL_1-5B
PIs 271+82.35
Ns 531,661.7231
Es 2,589,421.2103
θs 3° 22' 29"
LT 300.05
ST 150.05
Ls 450.00

CURVE RAMP2B-1
PI 49+07.01
N 532,162.0703
E 2,589,208.5967
Δ 27° 49' 25" (RT)
D 3° 01' 53"
R 1,890.00
L 917.81
T 468.14
SE 0.038 FT/FT
DESIGN SPEED 70 MPH
TRANS. LENGTH 145'

CURVE GW-8
PI 58+57.31
N 533,010.9405
E 2,588,863.0652
Δ 7° 07' 33" (RT)
D 5° 43' 46"
R 1,000.00
L 124.37
T 62.26

CURVE GW-9
PI 62+48.90
N 532,622.8498
E 2,588,916.4887
Δ 22° 52' 18" (LT)
D 19° 05' 55"
R 300.00
L 119.76
T 60.69

CURVE GW-11
PI 64+90.07
N 532,414.1040
E 2,589,040.4795
Δ 30° 01' 02" (RT)
D 19° 05' 55"
R 300.00
L 157.17
T 80.43

STA.257+93.30 SR-162 (PELLISSIPPI PKWY.)=
STA. 46+94.44 RAMP 2A
N 532999.9276
E 2589045.4696

STA. 257+34.00 SR-162 (PELLISSIPPI PKWY.)=
STA. 40+00.00 RAMP 2B
N 533025.9267
E 2588932.1543

31 ROBERT L. DELOZIER AND BETTY W. DELOZIER

32 LISA D. OVERLY

SEE SHEET NO. 16

MATCH LINE STA. 269+00 SEE SHEET NO. 18

MATCH LINE STA. 52+00 RAMP 2-B

MATCH LINE STA. 36+00 RAMP 2-A

STA. 257+00

SR-162 (PELLISSIPPI PKWY)

RAMP 2-A

RAMP 2-B

PROP. R.O.W.

Limits of Investigation

DENOTES LOSS OF ACCESS

CP-S25 05-162-25

CP-S26 05-162-26

PT 42+15.42

TS 268+82.30

Spiral PELL_1-5B

PC 44+38.87

PC 61+88.21

PT 59+19.41

PT 63+07.97

PC 64+09.64

PT 65+68.67

Curve GW-8

Curve GW-9

Curve GW-11

Curve RAMP 2A-1

Curve RAMP 2B-1

PND-2

WOODS

PASTURE

CUT

FILL

GREENWAY

GATE

BARBED WIRE

S 17° 44' 43" E

S 7° 50' 17" E

S 30° 42' 34" E

S 0° 41' 33" E

N 533000 E 2589000

N 532500 E 2589500

R.O.W. FIELD REVIEW

SEALED BY

COORDINATE VALUES ARE TENNESSEESTATE PLANE NAD/83 (CORS96) AND ARE DATUM ADJUSTED BY THE FACTOR OF 1.00009, AND ARE TIED TO THE GEODETIC REFERENCE NETWORK. ALL ELEVATIONS ARE REFERENCED TO THE NAVD 1988 USING THE GEOID 12B MODEL, OBTAINED ON 05-07-18.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PRESENT LAYOUT

STA.257+00 TO STA.269+00
SCALE: 1"=50'

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CURVE PELL_1-5
PI 280+19.97
N 530,863.9577
E 2,589,676.5030
Δs 26° 51' 37" (LT)
θs 3° 22' 29"
Δc 20° 06' 38" (LT)
Dc 1° 30' 00"
Rc 3,820.00
Lc 1,340.81
Ts 1,137.67
Ls 450.00
SE 0.052 FT/FT
DESIGN SPEED 70 MPH
TRANS. LENGTH 450'

CURVE RAMP2A-1
PI 37+02.05
N 532,048.7096
E 2,589,349.8686
Δ 15° 29' 43" (RT)
D 1° 30' 00"
R 3,820.00
L 1,033.09
T 519.71
SE 0.030 FT/FT
DESIGN SPEED 70 MPH
TRANS. LENGTH 145'

CONTROL POINTS							
POINT	NORTHING	EASTING	ELEV.	FEATURE	GPS POINT	STATION	OFFSET
S27	531519.5340	2589713.9180	983.22	XCP	GPS05-162-27	274+25.77	-220.7349
S29	531128.3220	2589213.3090	968.12	XCP	GPS05-162-29	275+79.54	394.9571

LEGEND	WETLAND IMPACTS (WTL-6)	
	AREA OF PERMANENT IMPACT =	0.98 AC.
	VOLUME OF PERMANENT IMPACT =	791 C.Y.
	AREA OF TEMPORARY IMPACT =	0.04 AC.
	VOLUME OF TEMPORARY IMPACT =	33 C.Y.

SEE SHEET 26 FOR TEMPORARY IMPACTS TO WTL-6

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2022	HPP/NH - 162(7)	18
SR - 162		BLOUNT COUNTY	

CURVE RAMP2D-2
PI 80+92.75
N 531,239.1235
E 2,589,880.4610
Δ 4° 11' 36" (LT)
D 1° 46' 06"
R 3,240.00
L 237.12
T 118.61
SE NORMAL CROWN
DESIGN SPEED 30 MPH

CURVE RAMP2B-1
PI 49+07.01
N 532,162.0703
E 2,589,208.5967
Δ 27° 49' 25" (RT)
D 3° 01' 53"
R 1,890.00
L 917.81
T 468.14
SE 0.038 FT/FT
DESIGN SPEED 70 MPH
TRANS. LENGTH 145'

CURVE RAMP2B-2
PI 55+64.15
N 531,496.8859
E 2,589,090.3676
Δ 44° 35' 20" (LT)
D 11° 19' 24"
R 506.00
L 393.78
T 207.47
SE 0.060 FT/FT
DESIGN SPEED 30 MPH
TRANS. LENGTH 180'

SPIRAL PELL_1-5B
PIs 271+82.35
Ns 531,661.7231
Es 2,589,421.2103
θs 3° 22' 29"
LT 300.05
ST 150.05
Ls 450.00

CURVE RAMP2C-1
PI 56+24.39
N 530,660.3027
E 2,589,665.5609
Δ 13° 15' 55" (LT)
D 2° 36' 16"
R 2,200.00
L 509.35
T 255.82
SE 0.046 FT/FT
DESIGN SPEED 50 MPH
TRANS. LENGTH 195'

CURVE GW-12
PI 74+79.60
N 531,420.9553
E 2,589,052.4816
Δ 32° 05' 00" (LT)
D 9° 32' 57"
R 600.00
L 335.98
T 172.52

CURVE SEVIER-2
PI 27+52.46
N 530,758.4039
E 2,588,728.9397
Δ 9° 26' 16" (LT)
D 0° 24' 13"
R 14,200.00
L 2,339.01
T 1,172.16
SE N.C.
DESIGN SPEED 45 MPH

MATCH LINE STA. 42+00 SEE SHEET NO. 27
MATCH LINE STA. 36+00 RAMP 2-A
MATCH LINE STA. 269+00 SEE SHEET NO. 17
MATCH LINE STA. 52+00 RAMP 2-B
MATCH LINE STA. 78+00 RAMP 2-D
MATCH LINE STA. 281+00 SEE SHEET NO. 19
MATCH LINE STA. 56+00 RAMP 2-C
MATCH LINE STA. 33+00 SEE SHEET NO. 26

PROP. SLOPE ESM'T
PROP. 10' CONST. ESM'T
PROP. R.O.W.
PRES. R.O.W.
CUT
FILL
CUT "C"
"A"
"C"
END CONTROLLED ACCESS FENCE STA. 41+78.99 OFF. 59.15' LT
STA. 39+74.32 US 411/SR-35 (SEVIERVILLE RD.)=
STA. 30+00.00 RAMP 2A
STA. 83+58.57 RAMP 2D
N 531461.5308
E 2589734.6980

RAMP 2-A
RAMP 2-B
RAMP 2-C
RAMP 2-D
Curve RAMP 2A-1
Curve RAMP 2B-1
Curve RAMP 2B-2
Curve RAMP 2C-1
Curve RAMP 2D-2
Curve PELL_1-5
Curve GW-12
PC 31+82.33
PT 82+11.26
PC 79+74.14
PT 39+19.31
PRC 53+56.68
PC 73+07.08
S 33° 14' 25" E
N 33° 14' 25" W
S 0° 41' 33" E
S 34° 30' 38" E
S 32° 46' 32" E

CP # S27
N 531519.5340
E 2589713.9180
EL. 983.22
XCP

CP # S29
N 531128.3220
E 2589213.3090
EL. 968.12
XCP

STA. 275+34.00 SR-162 (PELLISSIPPI PKWY.)=
STA. 37+53.16 US 411/SR-35 (SEVIERVILLE RD.)
N 531335.6104
E 2589552.8840

STA. 34+63.37 US 411/SR-35 (SEVIERVILLE RD.)=
STA. 59+33.84 RAMP 2B
STA. 50+00.00 RAMP 2C
N 531174.8170
E 2589311.8063

STA. 78+29.36 GREENWAY=
STA. 33+78.96 SEVIERVILLE RD.
N 531128.7016
E 2589240.8583

SR-162 (PELLISSIPPI PKWY)
US 411/SR-35 (SEVIERVILLE RD.)
GREENWAY
PRES. R.O.W.
ETP
CROP
WTL-6
DENOTES LOSS OF ACCESS

LISA D. OVERLY
PEARL R. DELOZIER
WPD FARM
ROBERT L. DELOZIER AND BETTY W. DELOZIER
Limits of Investigation

R.O.W. FIELD REVIEW

SEALED BY

COORDINATE VALUES ARE TENNESSEESTATE PLANE NAD/83 (CORS96) AND ARE DATUM ADJUSTED BY THE FACTOR OF 1.00009, AND ARE TIED TO THE GEODETIC REFERENCE NETWORK. ALL ELEVATIONS ARE REFERENCED TO THE NAVD 1988 USING THE GEOID 12B MODEL, OBTAINED ON 05-07-18.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PRESENT LAYOUT
STA.269+00 TO STA.281+00
SCALE: 1"=50'

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TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2022	HPP/NH - 162(7)	19

SR - 162 BLOUNT COUNTY

CURVE PELL_1-5
PI 280+19.97
N 530,863.9577
E 2,589,676.5030
Δs 26° 51' 37" (LT)
θs 3° 22' 29"
Δc 20° 06' 38" (LT)
Dc 1° 30' 00"
Rc 3,820.00
Lc 1,340.81
Ts 1,137.67
Ls 450.00
SE 0.052 FT/FT
DESIGN SPEED 70 MPH
TRANS. LENGTH 450'

SPIRAL PELL_1-5A
PIs 288+23.16
Ns 530,267.6064
Es 2,590,264.6944
θs 3° 22' 29"
LT 300.05
ST 150.05
Ls 450.00

CURVE RAMP2C-1
PI 56+24.39
N 530,660.3027
E 2,589,665.5609
Δ 13° 15' 55" (LT)
D 2° 36' 16"
R 2,200.00
L 509.35
T 255.82
SE 0.046 FT/FT
DESIGN SPEED 50 MPH
TRANS. LENGTH 195'

CURVE RAMP2D-1
PI 67+58.96
N 530,070.1203
E 2,590,529.7067
Δ 15° 33' 30" (RT)
D 2° 50' 11"
R 2,020.00
L 548.52
T 275.96
SE 0.036 FT/FT
DESIGN SPEED 70 MPH
TRANS. LENGTH 140'

N

BEGIN RET. WALL 11
STA. 77+44.89
OFF. 43.38' (RT.)

MATCH LINE
STA. 78+00
RAMP 2-D

MATCH LINE
SEE SHEET NO. 19

MATCH LINE
STA. 281+00

N 29° 02' 50" W

PROP. R.O.W.

PROP. RET.
WALL NO. 11

Limits of Investigation

RAMP 2-D

PT 70+31.52

CROP

37
WPD FARM

2590500 N, 530500 E

2590000 N, 530000 E

75

285

70

290

65

60

Curve PELL_1-5

CS 286+73.11

SR-162 (PELLISSIPPI PKWY)

Spiral PELL_1-5A

ST 291+23.11

S 47° 46' 32" E

RAMP 2-C

Curve RAMP 2C-1

PT 58+77.92

PROP. RET.
WALL NO. 12

BEGIN RET. WALL 12
STA. 61+18.17
OFF. 72.64' (RT.)

CUT

PROP. R.O.W.

WOVEN WIRE

BARBED WIRE

WOODS

GRASS

FILL

STR-6 PER.

MARSTON V. LEININGER AND WIFE, EDNA GAYLE LEININGER
42

END RET. WALL 11
STA. 85+38.31
OFF. 38.46' (RT.)

TERRY L. NICHOLS
41

Curve RAMP 2D-1

MATCH LINE
STA. 66+50
RAMP 2-D

MATCH LINE
SEE SHEET NO. 20

MATCH LINE
STA. 293+00

JOHN W. ROBINETTE AND WIFE, MELISSA R. ROBINETTE

MANHOLE
TOP-935.34
INV-926.84
INV-926.79
BOT-926.79

40

MATCH LINE
STA. 68+00
RAMP 2-C

END RET. WALL 12
STA. 67+74.08
OFF. 77.23' (RT.)

39
SCOTT M. MOORE AND WIFE, CYNTHIA M. MOORE

UNNAMED BRANCH OF LITTLE RIVER

SEPTIC FIELD

DENOTES LOSS OF ACCESS

R.O.W.
FIELD
REVIEW

SEALED BY

COORDINATE VALUES ARE TENNESSEESTATE PLANE NAD/83 (CORS96) AND ARE DATUM ADJUSTED BY THE FACTOR OF 1.00009, AND ARE TIED TO THE GEODETIC REFERENCE NETWORK. ALL ELEVATIONS ARE REFERENCED TO THE NAVD 1988 USING THE GEOID 12B MODEL, OBTAINED ON 05-07-18.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PRESENT LAYOUT

STA.281+00 TO STA.293+00

SCALE: 1"=50'

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TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2022	HPP/NH - 162(7)	20

SR - 162 BLOUNT COUNTY

R.O.W. FIELD REVIEW

CURVE RAMP2D-1
PI 67+58.96
N 530,070.1203
E 2,590,529.7067
Δ 15° 33' 30" (RT)
D 2° 50' 11"
R 2,020.00
L 548.52
T 275.96
SE 0.036 FT/FT
DESIGN SPEED 70 MPH
TRANS. LENGTH 140'

CURVE DAVIS_FORD-2
PI 21+00.00
N 529,503.8899
E 2,591,713.1628
Δ 3° 40' 26" (LT)
D 5° 43' 46"
R 1,000.00
L 64.12
T 32.07
SE MATCH EXIST.
DESIGN SPEED 40 MPH

CURVE DAVIS_FORD-1
PI 14+63.70
N 529,358.9907
E 2,591,092.2019
Δ 14° 26' 38" (LT)
D 5° 43' 46"
R 1,000.00
L 252.09
T 126.72
SE 0.060 FT/FT
DESIGN SPEED 40 MPH
TRANS. LENGTH 170'

CURVE RAMP2C-2
PI 75+15.49
N 529,387.8835
E 2,591,067.6468
Δ 4° 55' 13" (RT)
D 1° 00' 31"
R 5,680.00
L 487.77
T 244.03
SE 0.036 FT/FT
DESIGN SPEED 70 MPH
TRANS. LENGTH 205'

CURVE PELL_1-6
PI 306+33.93
N 528,978.3295
E 2,591,536.3300
Δs 10° 58' 07" (RT)
θs 1° 45' 00"
Δc 7° 28' 08" (RT)
Dc 1° 00' 00"
Rc 5,730.00
Lc 746.93
Ts 725.23
Ls 350.00
SE 0.036 FT/FT
DESIGN SPEED 70 MPH
TRANS. LENGTH 350'

LEGEND

DENOTES TEMPORARY CONSTRUCTION EASEMENT

DENOTES PROPOSED SLOPE EASEMENT

DENOTES LOSS OF ACCESS

CONTROL POINTS							
POINT	NORTHING	EASTING	ELEV.	FEATURE	GPS POINT	STATION	OFFSET
S31	529382.9130	2590883.1170	1002.83	XCP	GPS05-162-31	294+37.68	180.9559

SEALED BY

COORDINATE VALUES ARE TENNESSEESTATE PLANE NAD/83 (CORS96) AND ARE DATUM ADJUSTED BY THE FACTOR OF 1.00009, AND ARE TIED TO THE GEODETIC REFERENCE NETWORK. ALL ELEVATIONS ARE REFERENCED TO THE NAVD 1988 USING THE GEOID 12B MODEL, OBTAINED ON 05-07-18.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PRESENT LAYOUT

STA.293+00 TO STA.305+00

SCALE: 1"=50'

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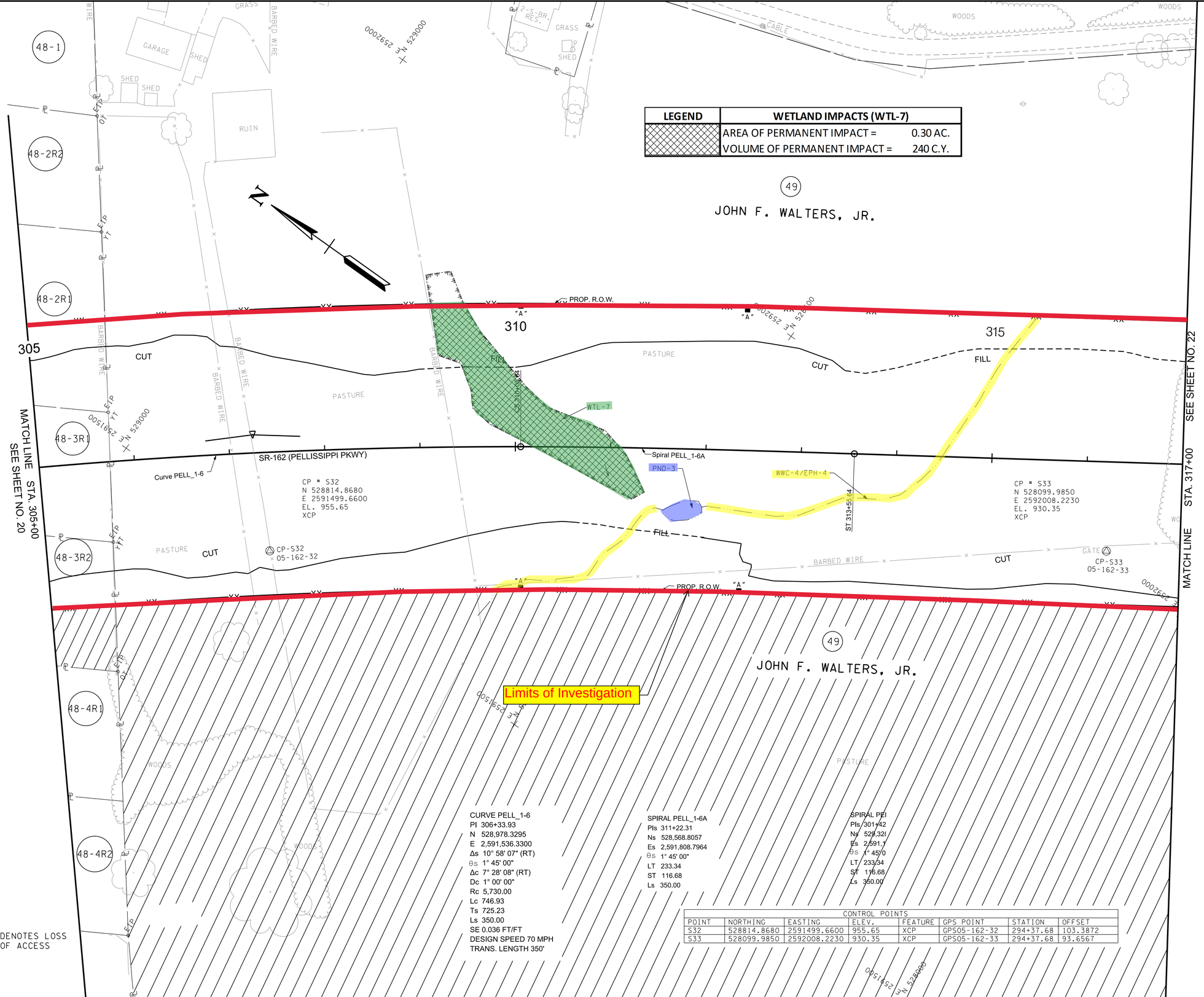
TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2022	HPP/NH - 162(7)	21

SR - 162 BLOUNT COUNTY

LEGEND	WETLAND IMPACTS (WTL-7)	
	AREA OF PERMANENT IMPACT =	0.30 AC.
	VOLUME OF PERMANENT IMPACT =	240 C.Y.

R.O.W.
FIELD
REVIEW



CP * S32
N 528814.8680
E 2591499.6600
EL. 955.65
XCP

CP * S33
N 528099.9850
E 2592008.2230
EL. 930.35
XCP

CURVE PELL_1-6
PI 306+33.93
N 528,978.3295
E 2,591,536.3300
Δs 10° 58' 07" (RT)
θs 1° 45' 00"
Δc 7° 28' 08" (RT)
Dc 1° 00' 00"
Rc 5,730.00
Lc 746.93
Ts 725.23
Ls 350.00
SE 0.036 FT/FT
DESIGN SPEED 70 MPH
TRANS. LENGTH 350'

SPIRAL PELL_1-6A
PIs 311+22.31
Ns 528,568.8057
Es 2,591,808.7964
θs 1° 45' 00"
LT 233.34
ST 116.68
Ls 350.00

SPIRAL PEI
PIs 301+42
Ns 529,32(
Es 2,591,1
θs 1° 45'0
LT 233.34
ST 116.68
Ls 350.00

CONTROL POINTS

POINT	NORTHING	EASTING	ELEV.	FEATURE	GPS POINT	STATION	OFFSET
S32	528814.8680	2591499.6600	955.65	XCP	GPS05-162-32	294+37.68	103.3872
S33	528099.9850	2592008.2230	930.35	XCP	GPS05-162-33	294+37.68	93.6567

DENOTES LOSS OF ACCESS

SEALED BY

COORDINATE VALUES ARE TENNESSEESTATE PLANE NAD/83 (CORS96) AND ARE DATUM ADJUSTED BY THE FACTOR OF 1.00009, AND ARE TIED TO THE GEODETIC REFERENCE NETWORK. ALL ELEVATIONS ARE REFERENCED TO THE NAVD 1988 USING THE GEOID 12B MODEL, OBTAINED ON 05-07-18.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PRESENT
LAYOUT
STA.305+00 TO STA.317+00
SCALE: 1"=50'

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TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2022	HPP/NH - 162(7)	22

SR - 162 BLOUNT COUNTY

CURVE RAMP3C-1
PI 92+53.82
N 527,198.5054
E 2,592,660.4363
Δ 20° 02' 26" (RT)
D 2° 05' 14"
R 2,745.00
L 960.13
T 485.02
SE 0.054 FT/FT
DESIGN SPEED 60 MPH
TRANS. LENGTH 250

CURVE RAMP3D-2
PI 143+72.33
N 527,093.4157
E 2,592,850.4658
Δ 20° 02' 26" (LT)
D 2° 23' 14"
R 2,400.00
L 839.46
T 424.06
SE 0.052 FT/FT
DESIGN SPEED 55 MPH
TRANS. LENGTH 230

SPIRAL PELL_1-11AB
Pls 325+19.93
Ns 527,405.1803
Es 2,592,582.9856
θs 5° 25' 00"
LT 270.13
ST 135.12
Ls 405.00

CURVE PELL_1-11
PI 328+27.28
N 527,134.1482
E 2,592,728.4347
Δs 20° 02' 26" (RT)
θs 5° 25' 00"
Δc 9° 12' 26" (RT)
Dc 2° 40' 30"
Rc 2,141.99
Lc 344.21
Ts 581.48
Ls 405.00
SE 0.056 FT/FT
DESIGN SPEED 55 MPH
TRANS. LENGTH 405

SPIRAL PELL_1-11AA
Pls 331+34.13
Ns 526,843.3351
Es 2,592,828.6425
θs 5° 25' 00"
LT 270.13
ST 135.12
Ls 405.00

CONTROL POINTS							
POINT	NORTHING	EASTING	ELEV.	FEATURE	GPS POINT	STATION	OFFSET
S34	527245.4270	2592300.9900	930.33	XCP	GPS05-162-34	294+37.68	308.0993
S35	527026.6820	2592572.7270	929.94	XCP	GPS05-162-35	294+37.68	153.6205

CP = S34
N 527245.4270
E 2592300.9900
EL. 930.33
XCP

CP = S35
N 527026.6820
E 2592572.7270
EL. 929.93
XCP

STA. 320+00.00 PELLISSIPPI PKWY.=
STA. 152+91.32 RAMP 3D
N 527865.7535
E 2592336.6101

STA. 319+81.09 SR-162 (PELLISSIPPI PKWY)
STA. 85+00.00 RAMP 3C
N 527826.1077
E 2592242.8767

MATCH LINE STA. 317+00 SEE SHEET NO. 21

MATCH LINE STA. 142+00 SEE SHEET NO. 23

MATCH LINE STA. 331+00 SEE SHEET NO. 23

Limits of Investigation

R.O.W. FIELD REVIEW

SEALED BY

COORDINATE VALUES ARE TENNESSEESTATE PLANE NAD/83 (CORS96) AND ARE DATUM ADJUSTED BY THE FACTOR OF 1.00009, AND ARE TIED TO THE GEODETIC REFERENCE NETWORK. ALL ELEVATIONS ARE REFERENCED TO THE NAVD 1988 USING THE GEOID 12B MODEL, OBTAINED ON 05-07-18.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PRESENT LAYOUT
STA.317+00 TO STA.331+00
SCALE: 1"=50'

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TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2022	HPP/NH - 162(7)	23

SR - 162 BLOUNT COUNTY

LEGEND	WETLAND IMPACTS (WTL-8)	
	AREA OF PERMANENT IMPACT =	7.03 AC.
	VOLUME OF PERMANENT IMPACT =	5669 C.Y.

DENOTES LOSS OF ACCESS

N

50
SUGARLAND CREEK LLC

58
RIO REVOLUTION CHURCH, INC.

56
ELMO HILL AND HIS WIFE, JULIA HILL

51
KENSINGTON PLACE MHP, LLC.

Limits of Investigation

PROP. R.O.W.

FILL

GRASS

WOODS

BARBED WIRE

WIRE

SOUTH BLOUNT COUNTY

CONTROL POINTS

POINT	NORTHING	EASTING	ELEV.	FEATURE	GPS POINT	STATION	OFFSET
S36	526747.8890	2592873.7920	927.04	XCP	GPS05-162-36	294+37.68	-42.5666

MATCH LINE STA. 142+00 SEE SHEET NO. 22

MATCH LINE STA. 331+00 SEE SHEET NO. 22

MATCH LINE STA. 96+00 SEE SHEET NO. 22

MATCH LINE STA. 128+50 SEE SHEET NO. 24

MATCH LINE STA. 344+00 SEE SHEET NO. 24

MATCH LINE STA. 109+00 SEE SHEET NO. 24

STR-9 PER: FLAG BRANCH

RAMP 3D

Curve RAMP 3D-2

PC 139+48.27

CP-S36 05-162-36

CP # S36
N 526747.8890
E 2592873.7920
EL. 927.04
XCP

N 13° 35' 46" W

Curve RAMP 3D-1

PT 128+75.76

Spiral PELL_1-11A

SR-162 (PELLISSIPPI PKWY)

ST 334+04.02

S 13° 35' 46" E

Curve RAMP 3C-1

RAMP 3C

PT 97+28.89

WTL-8

MANHOLE
TOP=927.98
INV=921.50
INV=921.48
INV=921.47
BOT=921.47

MANHOLE
TOP=925.84
INV=919.34
INV=919.24
BOT=919.24

MANHOLE
TOP=926.92
INV=917.67
BOT=

"A"

TRAILER

SHED

CONC. PAD

GR

CURVE RAMP3D-1
PI 125+86.15
N 525,237.8304
E 2,593,299.2484
Δ 75° 28' 32" (RT)
D 10° 44' 59"
R 533.00
L 702.12
T 412.51
SE 0.080 FT/FT
DESIGN SPEED 40 MPH
TRANS. LENGTH 260

CURVE RAMP3D-2
PI 143+72.33
N 527,093.4157
E 2,592,850.4658
Δ 20° 02' 26" (LT)
D 2° 23' 14"
R 2,400.00
L 839.46
T 424.06
SE 0.052 FT/FT
DESIGN SPEED 55 MPH
TRANS. LENGTH 230

SPIRAL PELL_1-11AA
PIs 331+34.13
Ns 526,843.3351
Es 2,592,828.6425
θs 5° 25' 00"
LT 270.13
ST 135.12
Ls 405.00

CURVE RAMP3C-1
PI 92+53.82
N 527,198.5054
E 2,592,660.4363
Δ 20° 02' 26" (RT)
D 2° 05' 14"
R 2,745.00
L 960.13
T 485.02
SE 0.054 FT/FT
DESIGN SPEED 60 MPH
TRANS. LENGTH 250

R.O.W. FIELD REVIEW

SEALED BY

COORDINATE VALUES ARE TENNESSEESTATE PLANE NAD/83 (CORS96) AND ARE DATUM ADJUSTED BY THE FACTOR OF 1.00009, AND ARE TIED TO THE GEODETIC REFERENCE NETWORK. ALL ELEVATIONS ARE REFERENCED TO THE NAVD 1988 USING THE GEOID 12B MODEL, OBTAINED ON 05-07-18.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PRESENT LAYOUT

STA.331+00 TO STA.344+00

SCALE: 1"=50'

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CONTROL POINTS							
POINT	NORTHING	EASTING	ELEV.	FEATURE	GPS POINT	STATION	OFFSET
S37	525056.3400	2592378.3120	915.42	XCP	GPS05-162-37	Off Chain	Off Chain
S38	525185.2940	2593186.6440	919.30	XCP	GPS05-162-38	294+37.68	-37.1169
S39	525222.4830	2593695.2070	947.3800	XCP	GPS05-162-39	294+37.68	-547.0368

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2022	HPP/NH - 162(7)	24

SR - 162 BLOUNT COUNTY

AND HIS WIFE,
JULIA HILL

MATCH LINE STA. 125+00 SEE SHEET NO. 30

PROP. R.O.W. AND C.A. FENCE

CUT

MATCH LINE STA. 529+00 SEE SHEET NO. 30

PROP. R.O.W. AND C.A. FENCE

PROP. R.O.W.

CATCH BASIN
TOP-935.38
INV-930.18
INV-930.03
BOT-930.03

STA. 349+15.67 SR-162 (PELLISSIPPI PKWY)=
STA. 78+38.82 RAMP 3A
N 525111.4890
E 2593247.4982

CATCH BASIN
TOP-922.03
INV-917.33
INV-917.18
BOT-917.18

Curve PELL_1-13

PC 349+50.71

CP = S38
N 525185.2940
E 2593186.6440
EL. 919.30
XCP

CURVE PELL_1-13
PI 351+86.
N 524,838.2800
E 2,593,313.5752
Δ 55° 46' 11" (RT)
D 12° 19' 18"
R 465.00
L 452.61
T 246.05
SE 0.080 FT/FT
DESIGN SPEED 40 MPH
TRANS. LENGTH 305

CURVE PELL_1-14
PI 355+39.
N 524,392.5337
E 2,592,909.7726
Δ 104° 53' 28" (RT)
D 20° 58' 06"
R 273.25
L 500.24
T 355.41
SE 0.080 FT/FT
DESIGN SPEED 30 MPH
TRANS. LENGTH 180

Limits of Investigation

MATCH LINE STA. 24+00 SEE BELOW

PROP. R.O.W. AND C.A. FENCE

CUT

PROP. R.O.W.

CURVE BUCHANAN-3
PI 22+54.66
N 524,486.0589
E 2,593,314.0414
Δ 42° 26' 14" (RT)
D 11° 27' 33"
R 500.00
L 370.34
T 194.12
SE 0.062 FT/FT
DESIGN SPEED 30 MPH
TRANS. LENGTH 150

R.O.W.
FIELD
REVIEW

MATCH LINE STA. 344+00 SEE SHEET NO. 23

SR-162 (PELLISSIPPI PARKWAY)

END PROP. RET. WALL

Curve RAMP 3D-1

RAMP 3D

FILL

CUT

CATCH BASIN
TOP-924.93
INV-918.48
INV-918.46
BOT-918.46

CATCH BASIN
TOP-922.03
INV-917.33
INV-917.18
BOT-917.18

CATCH BASIN
TOP-913.52
INV-907.14
INV-906.96
BOT-906.96

CATCH BASIN
TOP-913.71
INV-908.51
INV-908.41
BOT-908.41

CATCH BASIN
TOP-909.26
INV-904.91
INV-902.96
BOT-902.96

CATCH BASIN
TOP-908.50
INV-902.30
INV-902.15
BOT-902.15

CATCH BASIN(2)
TOP-908.51
INV-896.86
INV-896.81
BOT-896.81

Curve RAMP 3C-2

RAMP 3C

MATCH LINE STA. 109+00 SEE SHEET NO. 23

WTL-8

ELMO HILL
AND HIS WIFE,
JULIA HILL

PROP. R.O.W. AND C.A. FENCE

SUGARLAND CREEK LLC

MATCH LINE STA. 521+00 SEE SHEET 29

US-321/SR-73 (LAMAR ALEXANDER PKWY.)

N 85° 55' 41" E

WOODS

BARBED WIRE

GRASS

MARY KATE KEEBLE O'KAIN
AND HUSBAND,
DAVID U. O'KAIN

WWC-10/EPH-8

PT 75+18.64

05097-1233-14
END PROJECT - HPP/NH-162 (7) CONSTRUCTION
STA. 359+03.56
N 524678.1792
E 2592697.0271

STR-10

STA. 359+03.56 SR-162 (PELLISSIPPI PKWY)=
STA. 70+00.00 RAMP 3A
STA. 92+04.94 RAMP 3B
N 524678.1792
E 2592697.0271

PCC 70+00.00
N 525173.4490
E 2593736.0598

Curve RAMP 3A-1

RAMP 3A

Curve RAMP 3B-1

RAMP 3B

PCC 354+03.22

PRC 20+60.54

Curve PELL_1-14

Curve BUCHANAN-3

BUCHANAN RD.

EXIST. BUCHANAN RD.

PROP. C.A. FENCE

WWC-9/EPH-7

Curve BUCHANAN-2

MATCH LINE STA. 91+00 SEE SHEET NO. 29

PROP. R.O.W.

S61° 08' 39" E

BUCHANAN RD.

JOYCE GROSKO

MATCH LINE SEE ABOVE STA. 24+00

CUT

FILL

PI 1+30.87

65
MARY KATE KEEBLE O'KAIN
AND HUSBAND,
DAVID U. O'KAIN

106
BOBBY W. FRENCH
AND WIFE,
WENDY K. ATCHLEY
FRENCH

107
JOYCE GROSKO

56
ELMO HILL
AND HIS WIFE,
JULIA HILL

50
SUGARLAND CREEK LLC

55

05097-1233-14
END PROJECT - HPP/NH-162 (7) R.O.W.
STA. 359+03.56
N 524678.1792
E 2592697.0271

CURVE RAMP3A-1
PI 74+23.26
N 525,058.6985
E 2,592,505.9283
Δ 118° 51' 49" (RT)
D 22° 55' 06"
R 250.00
L 518.64
T 423.26
SE 0.080 FT/FT
DESIGN SPEED 30 MPH
TRANS. LENGTH 230

CURVE RAMP3C-2
PI 113+11.85
N 525,188.5162
E 2,593,146.5623
Δ 99° 31' 28" (RT)
D 18° 14' 49"
R 314.00
L 545.43
T 371.07
SE 0.080 FT/FT
DESIGN SPEED 35 MPH
TRANS. LENGTH 275

CURVE RAMP3D-1
PI 125+86.15
N 525,237.8304
E 2,593,299.2484
Δ 75° 28' 32" (RT)
D 10° 44' 59"
R 533.00
L 702.12
T 412.51
SE 0.080 FT/FT
DESIGN SPEED 40 MPH
TRANS. LENGTH 260

CURVE BUCHANAN-2
PI 17+95.43
N 524,355.0745
E 2,592,772.0475
Δ 72° 01' 48" (LT)
D 11° 27' 33"
R 500.00
L 628.56
T 363.47
SE 0.062 FT/FT
DESIGN SPEED 30 MPH
TRANS. LENGTH 150

CURVE RAMP3B-1
PI 88+78.89
N 525,054.9283
E 2,592,452.9663
Δ 61° 08' 11" (RT)
D 7° 32' 20"
R 760.00
L 810.94
T 448.89
SE 0.050 FT/FT
DESIGN SPEED 30 MPH
TRANS. LENGTH 160

LEGEND	WETLAND IMPACTS (WTL-8)	
	AREA OF PERMANENT IMPACT =	7.03 AC.
	VOLUME OF PERMANENT IMPACT =	5669 C.Y.

DENOTES LOSS OF ACCESS

SEALED BY

COORDINATE VALUES ARE TENNESSEESTATE PLANE NAD/83 (CORS96) AND ARE DATUM ADJUSTED BY THE FACTOR OF 1.00009, AND ARE TIED TO THE GEODETIC REFERENCE NETWORK. ALL ELEVATIONS ARE REFERENCED TO THE NAVD 1988 USING THE GEOID 12B MODEL, OBTAINED ON 05-07-18.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PRESENT
LAYOUT

STA.344+00 TO END PROJ.

SCALE: 1"=50'

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TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2022	HPP/NH - 162(7)	25

SR - 162 BLOUNT COUNTY

R.O.W. FIELD REVIEW

CARL E. HEADRICK AND WIFE, SHARON D. HEADRICK (95)

CARL E. HEADRICK AND WIFE, SHARON D. HEADRICK (72)

JOHNNY A. HEADRICK AND WIFE, MARY E. HEADRICK (74)

TOMMIE DORSEY AND WIFE, BARBARA L. SPANGLER (76)

GEORGIA-CUMBERLAND ASSOCIATION OF SEVENTH-DAY ADVENTISTS (79)

DANIEL KEITH WATERS (82)

ERIC FENSTEMAKER AND WIFE, JANET I. KEITH-FENSTEMAKER (96)

SCOTTY G BUILDERS, INC. (71)

DAVID M. ERVIN AND WIFE, BETTY L. ERVIN (73)

WAYNE R. CHAMBERS AND LORA A. SPANGLER (75)

DEBORAH DIANE SIMPSON AND GRADY DOUGLAS SIMPSON JR. (77)

WESLEY C. BEAVER AND WIFE, HELEN R. BEAVER (78)

LILLIAN V. HENRY AND JAMA D. HURST (80)

JOHN TAMEZ AND PATRICIA TAMEZ (81)

ADVENTIST CHRISTIAN SCHOOL

US 411/SR-35 (SEVIERVILLE RD.)

STA. 13+21.84 US 411/SR-35 (SEVIERVILLE RD.)
STA. 500+00.00 DELL RD.
N 530142.0613
E 2587437.8958

STA 10+00.00
N 529999.9605
E 2587149.2268

STA 502+40.35
N 529922.8455
E 2587535.7869

Curve SEVIER-1

Curve SEVIER-2

Curve DELLRD-1

PROP. R.O.W.

Limits of Investigation

MATCH LINE STA. 21+50

SEE SHEET NO. 26

CURVE SEVIER-1
PI 10+58.93
N 530,028.7897
E 2,587,200.6275
Δ 3° 46' 02" (RT)
D 7° 50' 55"
R 730.00
L 48.00
T 24.01
SE 0.0394 FT/FT
DESIGN SPEED 45 MPH
TRANS. LENGTH 137.5'

CURVE SEVIER-2
PI 27+52.46
N 530,758.4039
E 2,588,728.9397
Δ 9° 26' 16" (LT)
D 0° 24' 13"
R 14,200.00
L 2,339.01
T 1,172.16
SE N.C.
DESIGN SPEED 45 MPH

CURVE DELLRD-1
PI 501+83.00
N 529,972.4237
E 2,587,506.5298
Δ 8° 31' 05" (LT)
D 7° 24' 43"
R 773.02
L 114.92
T 57.57
SE N.C.
DESIGN SPEED 25 MPH

LEGEND

DENOTES TEMPORARY CONSTRUCTION EASEMENT

DENOTES PROPOSED SLOPE EASEMENT

SEALED BY

COORDINATE VALUES ARE TENNESSEESTATE PLANE NAD/83 (CORS96) AND ARE DATUM ADJUSTED BY THE FACTOR OF 1.00009, AND ARE TIED TO THE GEODETIC REFERENCE NETWORK. ALL ELEVATIONS ARE REFERENCED TO THE NAVD 1988 USING THE GEOID 12B MODEL, OBTAINED ON 05-07-18.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PRESENT LAYOUT

BEGIN PROJ.TO STA.21+50

SCALE: 1"=50'

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TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2022	HPP/NH - 162(7)	26

SR - 162 BLOUNT COUNTY

CURVE SEVIER-2
PI 27+52.46
N 530,758.4039
E 2,588,728.9397
Δ 9° 26' 16" (LT)
D 0° 24' 13"
R 14,200.00
L 2,339.01
T 1,172.16
SE N.C.
DESIGN SPEED 45 MPH

LEGEND	WETLAND IMPACTS (WTL-6)	
	AREA OF PERMANENT IMPACT =	0.98 AC.
	VOLUME OF PERMANENT IMPACT =	791 C.Y.
	AREA OF TEMPORARY IMPACT =	0.04 AC.
	VOLUME OF TEMPORARY IMPACT =	33 C.Y.

R.O.W. FIELD REVIEW

SEE SHEET NO. 25

MATCH LINE STA. 21+50

MATCH LINE STA. 33+00

SEE SHEET NO. 18

LELAND S. GAMBLE

JAMES W. BUCKLEY AND WIFE, ANGELA MULLINS

LOUISE E. LYONS

DANIEL KEITH WATERS

ROBERT L. DELOZIER AND BETTY W. DELOZIER

MICHAEL DELOZIER

STEVEN D. REAGAN AND WIFE, BETTY D. REAGAN

MARK W LEBRUN AND LISA K LEBRUN

JOEL B. LAW

DAVID D. ROBERTSON, JR. AND WIFE, ASHLEY A. ROBERTSON

PAUL EUGENE EAKENS, JR.

WPD FARM

Limits of Investigation

Curve SEVIER-2

STA. 25+70.96 US-411/SR-35 (SEVIERVILLE RD)=
STA. 550+00.00 W. DAVIS FORD RD
N 530711.0404
E 2588549.5489

END CA FENCE
STA. 31+13.30
OFF. 45.86' LT

END CA FENCE
STA. 31+16.31
OFF. 47.00' RT

STA 554+53.10
N 530335.1057
E 2588802.4710

E 2588500 N 530500

E 2588500 N 531000

E 2589000 N 530500

S 33° 55' 55" E

DAVIS FORD RD.

US 411/SR-35 (SEVIERVILLE RD.)

SEVIERVILLE RD./U.S.411/S.R.35(A.P.)

PROP. R.O.W.

PRES. & PROP. R.O.W.

CUT

FILL

WOVEN WIRE

BARBWIRE

EIP PIPE

CONCRETE PAD

AXLE

BARN

GARAGE

SEPTIC FIELD

PASTURE

METAL

GRASS

CROP

LEGEND

DENOTES TEMPORARY CONSTRUCTION EASEMENT

DENOTES PROPOSED SLOPE EASEMENT

DENOTES LOSS OF ACCESS

SEALED BY

COORDINATE VALUES ARE TENNESSEESTATE PLANE NAD/83 (CORS96) AND ARE DATUM ADJUSTED BY THE FACTOR OF 1.00009, AND ARE TIED TO THE GEODETIC REFERENCE NETWORK. ALL ELEVATIONS ARE REFERENCED TO THE NAVD 1988 USING THE GEOID 12B MODEL, OBTAINED ON 05-07-18.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PRESENT LAYOUT

STA.21+50 TO STA.33+00

SCALE: 1"=50'

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TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2022	HPP/NH - 162(7)	27

SR - 162 BLOUNT COUNTY

R.O.W. FIELD REVIEW

32 LISA D. OVERLY

31 ROBERT L. DELOZIER AND BETTY W. DELOZIER

33 JEFFERY L. MCCALL AND WIFE, LAURA M. MCCALL

88 JEFFREY L MCCALL AND WIFE, LAURA M MCCALL

37 WPD FARM

BARN, SILO, SHED, METAL, WOODEN, WOVEN WIRE, BARBED WIRE, GATE, GRASS, CROP, PASTURE, 1-S-BR. RES., SEPTIC FIELD (GRAPHICALLY LOCATED, OWNER REQUESTED NO FLAGS)

N E 2590500 N 532500

N E 2590000 N 531500

SEE SHEET NO. 18

MATCH LINE

STA. 42+00

STA. 53+00

SEE SHEET NO. 28

MATCH LINE

45

50

PROP. R.O.W.

CUT

FILL

DIST.

ETP

INV-962.22

N 55° 02' 33" E

721.38

PC 48+89.24

P/T/TV8

BRICK WALL

INV-962.13 15"CMP

INV-961.87

SOUTH 41

WELCOME TO MARYVILLE

SEVIERVILLE RD./U.S.411/S.R.35(ASP.)

US 411/SR-35 (SEVIERVILLE RD.)

05-162-28

CP-S28

GRAPHICALLY LOCATED

Curve SEVIER-3

END CONTROLLED ACCESS FENCE
STA. 43+21.94
OFF. 39.50' RT

CP # S28
N 531642.0620
E 2590025.7740
EL. 980.35
XCP

Limits of Investigation

CURVE SEVIER-3
PI 52+13.92
N 532,171.7830
E 2,590,750.6484
Δ 3° 13' 39" (LT)
D 0° 29' 50"
R 11,525.00
L 649.19
T 324.68
SE N.C.
DESIGN SPEED 45 MPH

CONTROL POINTS

POINT	NORTHING	EASTING	ELEV.	FEATURE	GPS POINT	STATION	OFFSET
S28	531642.0620	2590025.7740	980.35	XCP	GPS05-162-28	274+33.10	-555.7333

LEGEND

DENOTES TEMPORARY CONSTRUCTION EASEMENT

DENOTES PROPOSED SLOPE EASEMENT

DENOTES LOSS OF ACCESS

SEALED BY

COORDINATE VALUES ARE TENNESSEESTATE PLANE NAD/83 (CORS96) AND ARE DATUM ADJUSTED BY THE FACTOR OF 1.00009. AND ARE TIED TO THE GEODETIC REFERENCE NETWORK. ALL ELEVATIONS ARE REFERENCED TO THE NAVD 1988 USING THE GEOID 12B MODEL, OBTAINED ON 05-07-18.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PRESENT LAYOUT

STA.42+00 TO STA.53+00

SCALE: 1"=50'

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TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2022	HPP/NH - 162(7)	28

SR - 162 BLOUNT COUNTY

LEGEND

DENOTES TEMPORARY CONSTRUCTION EASEMENT

DENOTES PROPOSED SLOPE EASEMENT

R.O.W. FIELD REVIEW

N

SEE SHEET NO. 27

MATCH LINE

STA. 53+00

88 JEFFREY L MCCALL AND WIFE, LAURA M MCCALL

89 JOHN DOUGLAS MCCALL AND WIFE SHERRI BEST MCCALL

91 GORDON L. COLLINS AND WIFE, LINDA S. COLLINS

102 LYNN F. DELOZIER AND WIFE, MARY G. DELOZIER

37 CAROLYN DELOZIER FORSTER

90 GORDON L. COLLINS AND WIFE, LINDA S. COLLINS

92 BRAD DELOZIER AND WIFE, TABATHA L. DELOZIER

101 CLYDE THOMAS AND WIFE, NAOMI C. THOMAS

103

Limits of Investigation

55 60 65

PROP. R.O.W.

PRES. R.O.W.

PRES. & PROP. R.O.W.

US 411/SR-35 (SEVIERVILLE RD.)

CUT FILL

Curve SEVIER-3

Curve SEVIER-4

Curve SEVIER-5

PC 600+42.81

PT 600+98.82

PCC 55+38.43

PCC 59+53.84

PT 63+93.57

55+34.99 29.73

53+78.05 30.39

53+95.74 30.08

53+65.98 16.24

55+42.10 34.14

56+53.28 30.37

59+33.53 31.06

63+57.15 30.67

63+11.74 14.54

63+03.31 29.54

64+94.75 19.49

61+05.35 31.20

N 35° 56' 41" E

S 3° 20' 25" E

STA. 53+67.50 US 411/SR-35 (SEVIERVILLE RD.)=
STA. 600+00.00 NINA DELOZIER RD.
N 532267.8326
E 2590870.7217

POT 602+17.52
N 532075.5613
E 2590969.5894

STA 65+46.69
N 533108.2961
E 2591689.2402

N 532500 E 2591000

N 532500 E 2591500

N 533000 E 2591500

CURVE SEVIER-3
PI 52+13.92
N 532,171.7830
E 2,590,750.6484
Δ 3° 13' 39" (LT)
D 0° 29' 50"
R 11,525.00
L 649.19
T 324.68
SE N.C.
DESIGN SPEED 45 MPH

CURVE SEVIER-4
PI 57+46.41
N 532,501.0738
E 2,591,169.3301
Δ 7° 12' 45" (LT)
D 1° 44' 10"
R 3,300.00
L 415.41
T 207.98
SE 0.0234 FT/FT
DESIGN SPEED 45 MPH
TRANS. LENGTH 149.5'

CURVE SEVIER-5
PI 61+74.12
N 532,805.9957
E 2,591,470.0519
Δ 8° 39' 29" (LT)
D 1° 58' 08"
R 2,910.00
L 439.73
T 220.29
SE 0.0245 FT/FT
DESIGN SPEED 45 MPH
TRANS. LENGTH 148'

CURVE NINADELOZIER-1
PI 600+70.97
N 532,211.4004
E 2,590,913.7662
Δ 14° 59' 41" (RT)
D 26° 46' 25"
R 214.00
L 56.01
T 28.16
SE 0.072 FT/FT
DESIGN SPEED 30 MPH
TRANS. LENGTH 160'

SEALED BY

COORDINATE VALUES ARE TENNESSEESTATE PLANE NAD/83 (CORS96) AND ARE DATUM ADJUSTED BY THE FACTOR OF 1.00009, AND ARE TIED TO THE GEODETIC REFERENCE NETWORK. ALL ELEVATIONS ARE REFERENCED TO THE NAVD 1988 USING THE GEOID 12B MODEL, OBTAINED ON 05-07-18.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PRESENT LAYOUT

STA.53+00 TO END PROJ.

SCALE: 1"=50'

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TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2022	HPP/NH - 162(7)	29

SR - 162 BLOUNT COUNTY

D C. TIPTON, SR.

N

GLENDA J. DENTON A/K/A GLENDA JUNE DENTON

RHONDA S. DENTON F/K/A RHONDA SHERRY WALRAVEN

JEFFREY L. FOXX

END CONTROLLED ACCESS FENCE
STA. 514+82.85
OFF. 52.55'LT

STA. 519+22.20 US-321/SR-73=
STA. 117+42.63 RAMP 5C
N 525143.9590
E 2592520.6487

PROP. R.O.W. & C.A. FENCE

PRES. & PROP. R.O.W.

PRES. R.O.W.

WWC-6/UDF-1

N 85° 55' 41" E

S 85° 55' 41" W

CUT

RAMP 3B N 85° 55' 41" E

FILL

PROP. R.O.W. AND C.A. FENCE

STA. 511+19.47 US-321/SR-73=
STA. 81+50.00 RAMP 3B
N 525003.1711
E2591725.9125

END CONTROLLED ACCESS FENCE
STA. 509+40.00
OFF. 47.76'RT

GERALD C. TIPTON AND WIFE, BARBARA TIPTON

Limits of Investigation

JUDITH SUE HILL AND HUSBAND, JAMES HILL

CURVE RAMP3B-1
PI 88+78.89
N 525,054.9283
E 2,592,452.9663
Δ 61° 08' 11" (RT)
D 7° 32' 20"
R 760.00
L 810.94
T 448.89
SE 0.050 FT/FT
DESIGN SPEED 30 MPH
TRANS. LENGTH 160

CURVE BUCHANAN-1
PI 12+99.40
N 524,787.6258
E 2,592,506.3966
Δ 39° 38' 01" (RT)
D 14° 19' 26"
R 400.00
L 276.69
T 144.14
SE 0.068 FT/FT
DESIGN SPEED 30 MPH
TRANS. LENGTH 165

05-162-37 CP-S37

WWC-7/EPH-6

NTRUST GREAT LAKES, LLC.

Curve RAMP 3B-1

PROP. C.A. FENCE

CP = S37
N 525056.3400
E 2592378.3120
EL. 915.42
XCP

WWC-9/ EPH-7

S 71° 11' 23" E

PROP. R.O.W.

WWC-8/UDF-2

BOBBY W. FRENCH AND WIFE, WENDY K. ATCHLEY FRENCH

Curve BUCHANAN-1

BUCHANAN RD.

MATCH LINE STA. 521+00 SEE SHEET 24

MATCH LINE STA. 521+00 SEE SHEET 24

DENOTES LOSS OF ACCESS

R.O.W. FIELD REVIEW

SEALED BY

COORDINATE VALUES ARE TENNESSEESTATE PLANE NAD/83 (CORS96) AND ARE DATUM ADJUSTED BY THE FACTOR OF 1.00009, AND ARE TIED TO THE GEODETIC REFERENCE NETWORK. ALL ELEVATIONS ARE REFERENCED TO THE NAVD 1988 USING THE GEOID 12B MODEL, OBTAINED ON 05-07-18.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PRESENT LAYOUT

STA.509+00 TO 520+00

SCALE: 1"=50'

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TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2022	HPP/NH - 162(7)	30

SR - 162 BLOUNT COUNTY

R.O.W. FIELD REVIEW

MATCH LINE STA. 125+00 SEE SHEET NO. 24

SEE SHEET NO. 24 STA. 528+00 MATCH LINE

WILLIAM D. COOPER AND WIFE, MARY B. COOPER

RIO REVOLUTION CHURCH, INC.

PROP. R.O.W. AND CA FENCE

PROP. CONST. ESM'T

PRES. R.O.W.

PRES. & PROP. R.O.W.

STA. 532+89.41 US-321/SR-73=
STA. 120+00.00 RAMP 3D
N 525228.3359
E 2593885.3187

N 89° 04' 19" W

END CONTROLLED ACCESS FENCE
STA. 534+28.88
OFF. 46' LT

N 85° 55' 41" E

E LAMAR ALEXANDER PKWY/U.S.321/S.R.73(ASP.)

US-321/SR-73 (LAMAR ALEXANDER PKWY.)

END CONTROLLED ACCESS FENCE
STA. 534+28.88
OFF. 49.75' RT

PROP. CA FENCE

PRES. & PROP. R.O.W. AND PROP CA FENCE

POT 537+29.48
N 525230.3956
E 2594426.3467

WILLIAM D. KEELEY AND WIFE, KATHY D. KEELEY

GARY NEACE AND WIFE, DEBORAH J. NEACE

EDWARD L. EVERHART AND WIFE, BRENDA T. EVERHART

Limits of Investigation

STA. 529+09.72 US-321/SR-73=
STA. 81+03.64 RAMP 3A
N 525130.2931
E 2593511.6460

PROP. 10' CONST. ESM'T

MORNING STAR BAPTIST CHURCH

TENENTAT THIS TRACT SAID HE BELIEVES SEPTIC TANK TO BE UNDERNEATH AN ADDITION TO THE BUILDING, COULD NOT LOCATE LINES

CHARLES RANDY HICKS AND WIFE, JUDY HICKS

CP " S39
N 525222.4830
E 2593695.2070
EL. 947.38

CHARLES RANDY HICKS AND HIS WIFE, JUDY M. HICKS

S 86° 44' 20" E

WWC-11/EPH-9

MARY KATE KEEBLE O'KAIN AND HUSBAND, DAVID U. O'KAIN

SEE SHEET NO. 31

STA. 17+00

MATCH LINE

PROP. R.O.W.

CUT

FILL

DENOTES LOSS OF ACCESS

N

SEALED BY

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STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PRESENT LAYOUT

STA.529+00 TO 537+29.48
SCALE: 1"=50'

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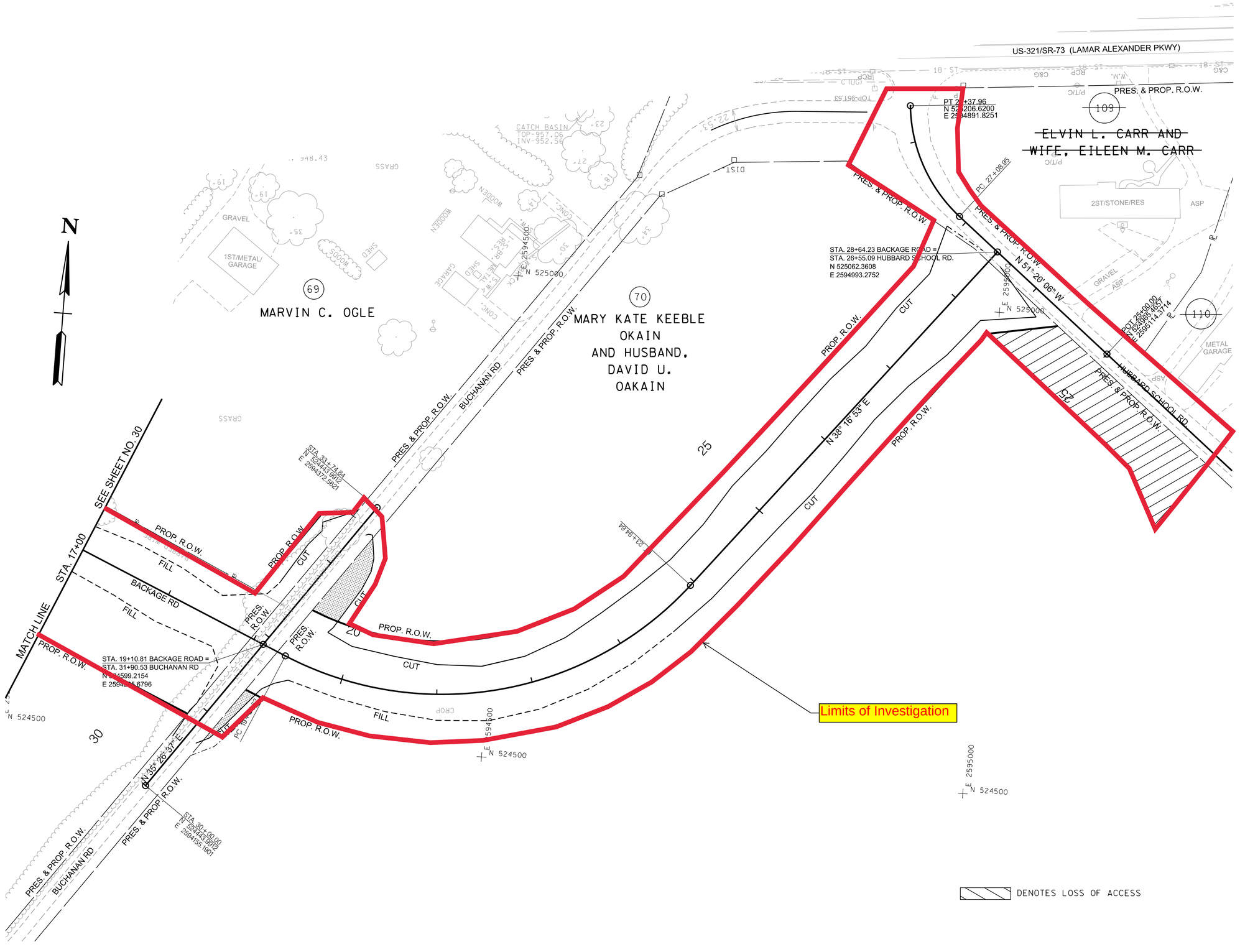
TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2022	HPP/NH - 162(7)	31

SR - 162 BLOUNT COUNTY



R.O.W.
FIELD
REVIEW

SEALED BY

COORDINATE VALUES ARE TENNESSEESTATE PLANE NAD/83 (CORS96) AND ARE DATUM ADJUSTED BY THE FACTOR OF 1.00009, AND ARE TIED TO THE GEODETIC REFERENCE NETWORK. ALL ELEVATIONS ARE REFERENCED TO THE NAVD 1988 USING THE GEOID 12B MODEL, OBTAINED ON 05-07-18.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PRESENT LAYOUT

STA.17+00 TO 28+64.23

SCALE: 1"=50'

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