Tracy Meggs

1135 Arrowhead Rd.
Monterey, TN 38574
tmeggs.pe@gmail.com

July 9, 2021

A Hydrologic Determination was preformed for Lauren Engineering on behalf of the Kevin and Thomas Mack Property.

Contact information for the current owners is:

Kevin and Thomas Mack Property
240 Mill Dr.
Cookeville, TN 38501

The Determination is submitted by Tracy Meggs, TN-QHP 1085-TN12.

The property has an industrial building and parking lot and this determination was conducted in expectation of enlarging the facilities.

Coordinates of the southern most portion of channel are: 36.1697N/-85.5455E.

No record of a previous determination at this site could be located.

Included in this package are:

- Hydrologic Determination Field Data Sheets
- Aerial vicinity map with photo locations
- Photographs
- Weather Conditions Worksheet
- NRCS Soils map
- Topographic Survey

Sincerely,

Tracy Meggs
TN-QHP 1085-TN12

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.5

Named Waterbody: UNNAMED TRIBUTARY TO CANE CREEK	Date/Time: 6/17/21 9:40AM
Assessors/Affiliation: TRACY MEGGS	Project ID : SITE 1
Site Name/Description: AUTOMATION TOOL POSSIBLE EXPANSION	
Site Location: 101 MILL DR, COOKEVILLE, TN	
HUC (12 digit): 051301080 45_0150	Lat/Long: 36.1697 85.5455
Previous Rainfall (7-days) : 0.74" LAST RAIN 7/11/21	
Precipitation this Season vs. Normal : abnormally wet elevated (average) low abnormally dry unknown Source of recent & seasonal precip data : NOAA & TTU WEATHER STATION	
Watershed Size : < 1 SQ MILE	County: PUTNAM
Soil Type(s) / Geology : CHRISTIAN SILTY LOAM & LANDISBURG SILT LOAM Source: WEB SOIL SURVEY	
Surrounding Land Use : INDUSTRIAL / RESIDENTIAL	
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, vegetation composed of upland and FACU species	✓	WWC	
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions		WWC	N/A
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	N/A
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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = STREAM

Secondary Indicator Score (if applicable) = 19.5

Justification / Notes :

HISTORIC ALTERATION TO CHANNEL - INDUSTRIAL BUILDING GRADING, CHANNEL ENCAPSULATED AT DOWNSTREAM END OF DETERMINATION

PHOTO 1 - LOOKING SOUTHEAST AT HEADWALL - DOWNSTREAM
PHOTO 2 - LOOKING NORTHWEST AT DEBRIS IN CHANNEL

Secondary Field Indicator Evaluation

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

B. **Hydrology** (Subtotal = 4.5)	Absent	Weak	Moderate	Strong
14. Subsurface flow/discharge into channel	(0)	1	2	3
15. Water in channel and >48 hours since sig. rain	0	(1)	2	3
16. Leaf litter in channel (January – September)	(1.5)	1	0.5	0
17. Sediment on plants or on debris	(0)	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	(0.5)	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = (1.5)	

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

N/A

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

Total Points = 19.5

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

Notes : 3" down 10YR 4/3

10" down 10YR 3/1

Arrowhead in Channel

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.5

Named Waterbody: UNNAMED TRIBUTARY TO CANE CREEK	Date/Time: 6/17/21 11:00 AM
Assessors/Affiliation: TRACY MEGGS	Project ID : SITE 2
Site Name/Description: AUTOMATION TOOL POSSIBLE EXPANSION	
Site Location: 101 MILL DR, COOKEVILLE, TN	
HUC (12 digit): 051301080 45 – 0150	Lat/Long: 36.1710 -85.5462
Previous Rainfall (7-days) : 0.74" LAST RAIN 7/11/21	
Precipitation this Season vs. Normal : abnormally wet elevated (average) low abnormally dry unknown Source of recent & seasonal precip data : NOAA & TTU WEATHER STATION	
Watershed Size : < 1 SQ MILE	County: PUTNAM
Soil Type(s) / Geology : CHRISTIAN SILTY LOAM & LANDISBURG SILT LOAM	Source: WEB SOIL SURVEY
Surrounding Land Use : INDUSTRIAL / RESIDENTIAL	
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, vegetation composed of upland and FACU species	✓	WWC	
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions		WWC	N/A
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	N/A
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-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = STREAM

Secondary Indicator Score (if applicable) = 24

Justification / Notes :

HISTORIC ALTERATION TO CHANNEL - INDUSTRIAL BUILDING GRADING
CHANNEL ENCAPSULATION AT DOWNSTREAM END OF DETERMINATION

PHOTO 3 - LOOKING NORTH-NORTHWEST UPSTREAM FROM DATA SITE
PHOTO 4 - ADDITIONAL PHOTO LOOKING EAST INTO STREAM

Secondary Field Indicator Evaluation

A. **Geomorphology** (Subtotal = 10.75)	Absent	Weak	Moderate	Strong
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	No = 0		Yes = 3	

4.75 5.5

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

1.75 3

C. **Biology** (Subtotal = 7)	Absent	Weak	Moderate	Strong
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

N/A

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

7

Total Points = 24

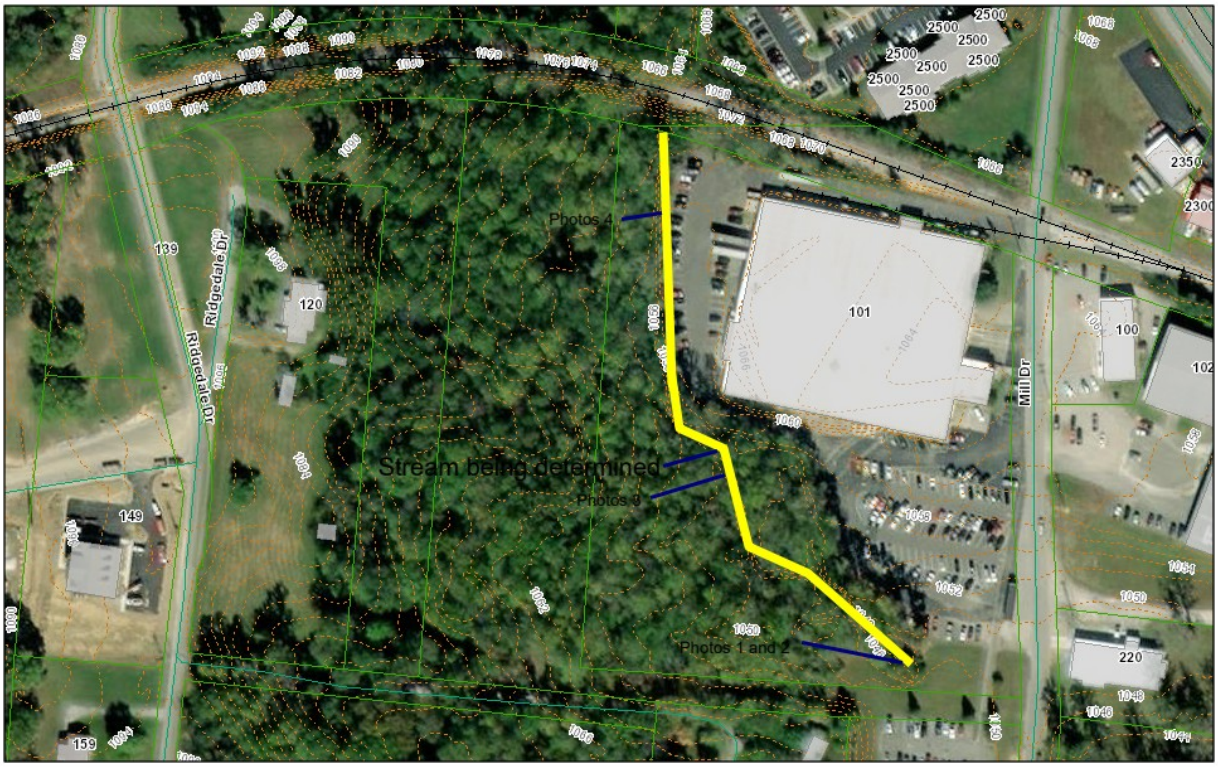
Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

8" down 10YR 3/2

mid stream photo w/ Riffle @ 36.0702 -85.5459

ATC Photo locations



7/8/2021, 2:48:05 PM

Parcels_71
CookevillePublication.SDE.CountyBoundary
Municipal Boundaries
Site Address Points
Railroads
TTU
Road Centerlines Bottom
MajorRoads_24k
Local Road

1:2,257

0 0.01 0.03 0.06 mi
0 0.02 0.04 0.09 km

Maxar, Microsoft, Ben Drury

Maxar, Microsoft | Ben Drury |

Photo 1 – Looking southeast at headwall of culverted segment of channel – downstream.

Photo 2 – Looking northwest at debris in the channel – upstream.

Photo 3 – Looking north-northwest upstream from site 2

Photo 4 – Additional photo looking east into stream – no data sheet for this site.

Normal Weather Conditions Calculations Table

			Long-term rainfall records							
	Month	**Standard Deviation**	**Minus One Std. Dev. (DRY)**	**Normal (Mean inches)**	**Plus One Std. Dev. (WET)**	**Actual Rainfall**	**Condition (elevated, low, average)**	**Condition value**	**Month weight value**	**Product of previous two columns**
1st prior month*	MAY	2.39	2.56	4.95	7.34	5.05	A	2	3	6
2nd prior month*	APRIL	2.04	2.91	4.95	6.99	2.37	L	1	2	2
3rd prior month*	MARCH	2.85	3.25	6.10	8.95	4.81	A	2	1	2
									Sum =	10

Note:

If sum is:	
6-9	then prior period has been abnormally dry
10-14	then prior period has been normal (average)
15-18	Then prior period has been abnormally wet

Condition value:	
Low =	1
Average =	2
Elevated =	3

ATC - MILL DR COOKEVILLE

NORMAL WEATHER CONDITIONS

Soil Map—Putnam County and Parts of White County, Tennessee
(ATC)

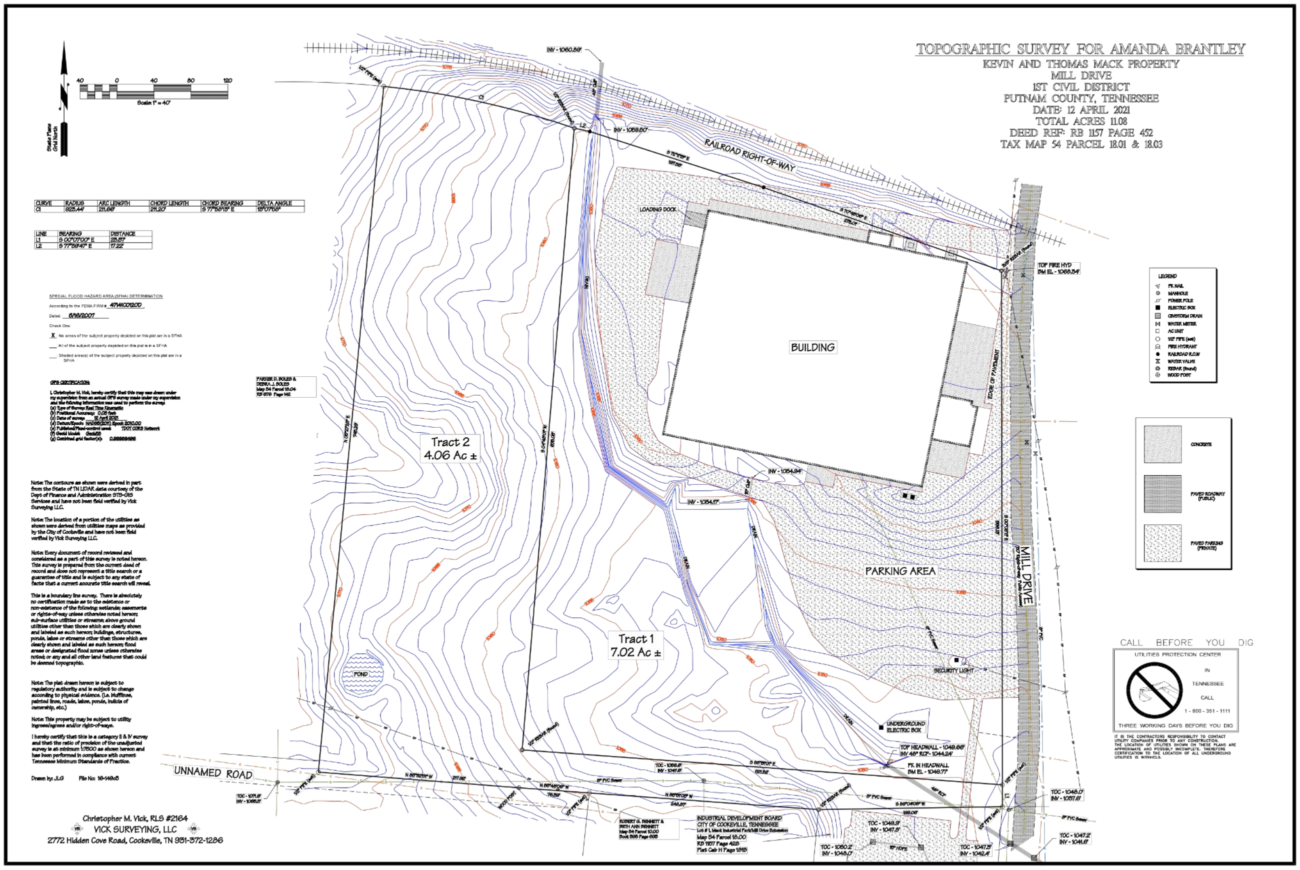
Map Scale: 1:1,430 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 20 40 80 120

Feet
0 50 100 200 300

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



TOPOGRAPHIC SURVEY FOR AMANDA BRANTLEY
KEVIN AND THOMAS MACK PROPERTY
MILL DRIVE
1ST CIVIL DISTRICT
PUTNAM COUNTY, TENNESSEE
DATE: 12 APRIL 2021
TOTAL ACRES 11.08
DEED REF: RB 1157 PAGE 452
TAX MAP 54 PARCEL 18.01 & 18.03
State Plane Grid North
Scale: 1" = 40'
CURVE | RADIUS | ARC LENGTH | CHORD LENGTH | CHORD BEARING | DELTA ANGLE
C1 | 923.44' | 211.66' | 211.20' | S 77°58'13" E | 13°07'58"
LINE | BEARING | DISTANCE
L1 | S 00°07'00" E | 23.57'
L2 | S 77°39'47" E | 17.22'
SPECIAL FLOOD HAZARD AREA (SFHA) DETERMINATION
According to the FEMA FIRM #: 47141C0120D
Dated: 5/16/2007
Check One:
X: No areas of the subject property depicted on this plat are in a SFHA
___: All of the subject property depicted on this plat is in a SFHA
___: Shaded area(s) of the subject property depicted on this plat are in a SFHA
GPS CERTIFICATION:
I, Christopher M. Vick, hereby certify that this map was drawn under my supervision from an actual GPS survey made under my supervision and the following information was used to perform the survey:
(a) Type of Survey: Real Time Kinematic
(b) Positional Accuracy: 0.05 feet
(c) Date of survey: 12 April 2021
(d) Datum/Epoch: NAD83(2011) Epoch 2010.00
(e) Published/Fixed-control used: TDOT CORS Network
(f) Geoid Model: Geoid18
(g) Combined grid factor(s): 0.99989496
Note: The contours as shown were derived in part from the State of TN LIDAR data courtesy of the Dept of Finance and Administration STS-GIS Services and have not been field verified by Vick Surveying LLC.
Note: The location of a portion of the utilities as shown were derived from utilities maps as provided by the City of Cookeville and have not been field verified by Vick Surveying LLC.
Note: Every document of record reviewed and considered as a part of this survey is noted hereon. This survey is prepared from the current deed of record and does not represent a title search or a guarantee of title and is subject to any state of facts that a current accurate title search will reveal.
This is a boundary line survey. There is absolutely no certification made as to the existence or non-existence of the following: wetlands; easements or rights-of-way unless otherwise noted hereon; sub-surface utilities or streams; above ground utilities other than those which are clearly shown and labeled as such hereon; buildings, structures, ponds, lakes or streams other than those which are clearly shown and labeled as such hereon; flood areas or designated flood zones unless otherwise noted; or any and all other land features that could be deemed topographic.
Note: The plat drawn hereon is subject to regulatory authority and is subject to change according to physical evidence. (i.e. blufflines, painted lines, roads, lakes, ponds, indicia of ownership, etc.)
Note: This property may be subject to utility ingress/egress and/or right-of-ways.
I hereby certify that this is a category II & IV survey and that the ratio of precision of the unadjusted survey is at minimum 1:7500 as shown hereon and has been performed in compliance with current Tennessee Minimum Standards of Practice.
Drawn by: JLG File No: 16-149c5
Christopher M. Vick, RLS #2164
VICK SURVEYING, LLC
2772 Hidden Cove Road, Cookeville, TN 931-372-1286
PARKER D. BOLES & DEBRA J. BOLES
Map 54 Parcel 18.04
RB 676 Page 142
RAILROAD RIGHT-OF-WAY
LOADING DOCK
BUILDING
Tract 2
4.06 Ac ±
Tract 1
7.02 Ac ±
PARKING AREA
POND
SECURITY LIGHT
UNDERGROUND ELECTRIC BOX
TOP FIRE HYD
MILL DRIVE
EDGE OF PAVEMENT
UNNAMED ROAD
TOC - 1071.6'
INV - 1066.5'
INDUSTRIAL DEVELOPMENT BOARD
CITY OF COOKEVILLE, TENNESSEE
Map 54 Parcel 18.00
RB 1107 Page 423
Plat Cab H Page 1313
CONCRETE
PAVED ROADWAY (PUBLIC)
PAVED PARKING (PRIVATE)
LEGEND
CALL BEFORE YOU DIG
UTILITIES PROTECTION CENTER
IN TENNESSEE
CALL
1 - 800 - 351 - 1111
THREE WORKING DAYS BEFORE YOU DIG