STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
ENVIRONMENTAL DIVISION
SUITE 900 - JAMES K. POLK BUILDING
505 DEADERICK STREET
NASHVILLE, TENNESSEE 37243-0334

MEMORANDUM

To: Shane Hester
CEM2 (Project Teams)

From: Dennis Crumby
TDOT Ecology Section

Dennis Crumby
Digitally signed by Dennis Crumby
DN: cn=Dennis Crumby, o, ou, email=Dennis.Crumby@tn.gov, c=US
Date: 2015.08.12 11:47:52 -05'00'

Date: August 12, 2015

Subject: ENVIRONMENTAL BOUNDARIES REPORT FOR:
Davidson County; SR-112, From SR-12 to SR-155
P.E. 19046-1214-14 PIN 103764.00

An ecological evaluation of the subject project has been conducted with the following results:

- No wetlands identified.

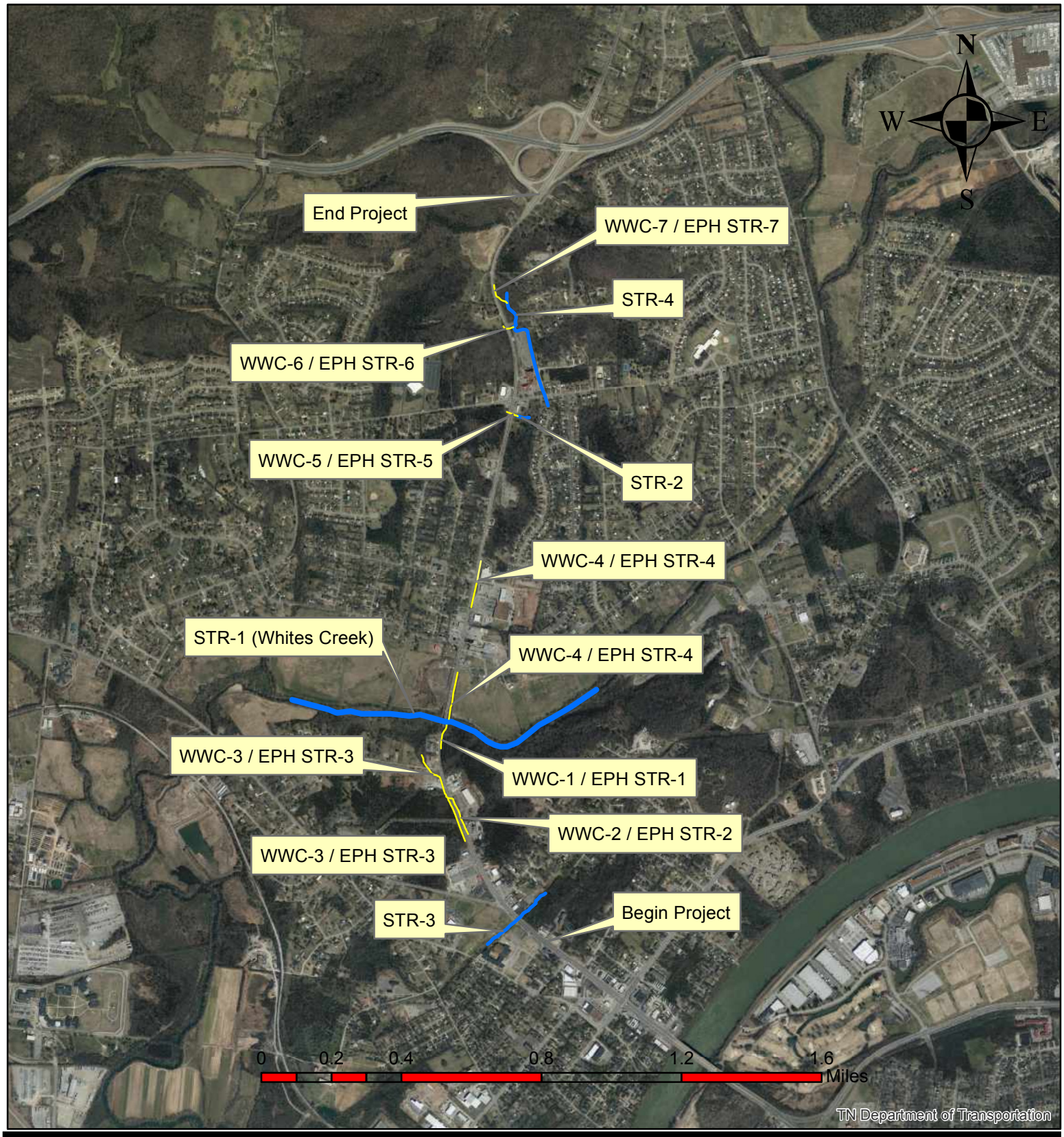
- 4 streams present. STR-2 and STR-3 will not be affected by construction. *The upper end of STR-4 and its spring source will likely need to be surveyed.

- Seven wet-weather conveyances (ephemeral streams) identified.

- No protected species were identified within project impact area. The project was previously coordinated with the USFWS and TWRA. Response letters are attached. The TDEC Endangered Species Database was reviewed on 8-12-2015. A number of species records existed within 4 miles of the project but all were considered historic. A bat survey was completed for the project in 2015 and final concurrence was received from the USFWS on 6-23-2015.

If you have any questions or comments, please contact me at Dennis.Crumby@tn.gov, 615-253-2465.

Copy: Lori Lange – Director - Project Delivery
Jon Zirkle – CEM2 (Technical Groups)
John Hewitt – Environmental Division
Melissa Portell – Survey
Anthony Myers – Permits Section
FileNet – Environmental Division Files



Davidson County SR-112, From SR-12 to SR-155
Ecological Features affected by the Project

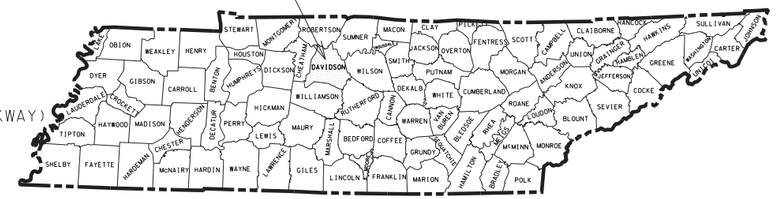
Index Of Sheets

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING

DAVIDSON COUNTY

TENN.	YEAR	SHEET NO.
	2015	1
FED. AID PROJ. NO.	STP-112 (6)	
STATE PROJ. NO.	19046-2214-14	

PROJECT LOCATION

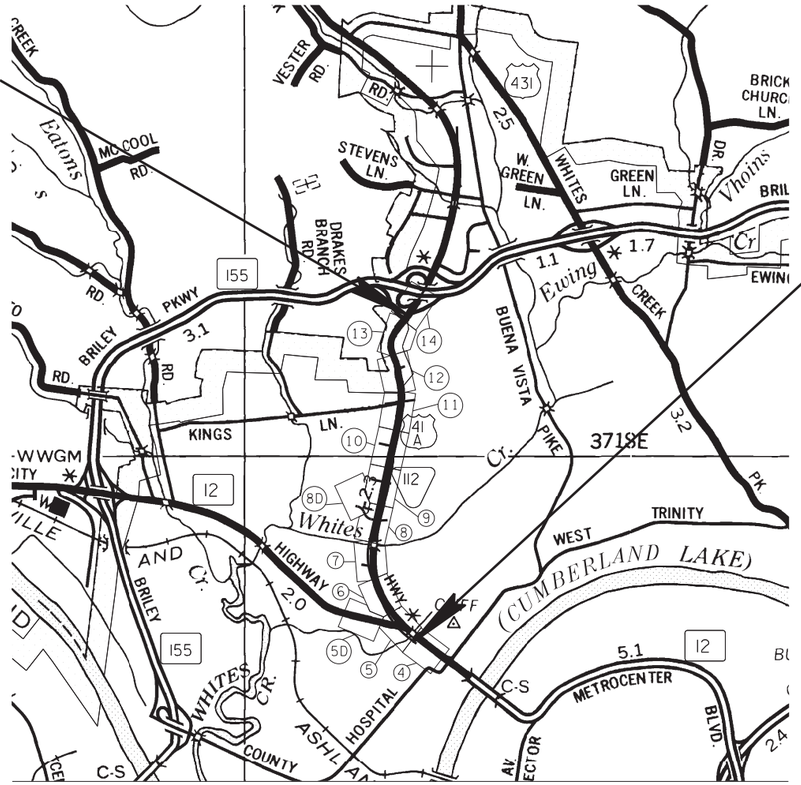


SR 112 (US 41A/CLARKSVILLE PIKE) FROM SR 12 (ASHLAND CITY HIGHWAY) TO SR 155 (BRILEY PARKWAY)

RIGHT-OF-WAY

STATE HIGHWAY NO. 112 F.A.H.S. NO. 41A

END PROJ. NO. STP-112(6), 19046-2214-14 R.O.W.
STA. 213+38.96



SCALE: 1"= ½MILE

0 1 2 3

NO EXCLUSIONS
NO EQUATIONS

SURVEY DATE: 2006
UPDATED: 2008

BEGIN PROJ. NO. STP-112(6), 19046-2214-14 R.O.W.
STA. 94+12.75

R.O.W. FIELD REVIEW

SEALED BY

APPROVED: Paul D. Degges
PAUL D. DEGGES, CHIEF ENGINEER

DATE:

APPROVED:
JOHN SCHROER, COMMISSIONER

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED:

DIVISION ADMINISTRATOR DATE

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, 2015 AND ADDITIONAL SPECIFICATIONS AND SPECIAL PROVISIONS CONTAINED IN THE PLANS AND IN THE PROPOSAL CONTRACT.

TDOT C.E. MANAGER 1 OR
TDOT DESIGN MANAGER 1 SHANE HESTER, P.E.

DESIGNED BY DBS & ASSOCIATES ENGINEERING
DESIGNER MICHAEL W. MORRIS, P.E. CHECKED BY JACQUELYN A. SMITH, P.E.

P.E. NO. 19046-2214-14

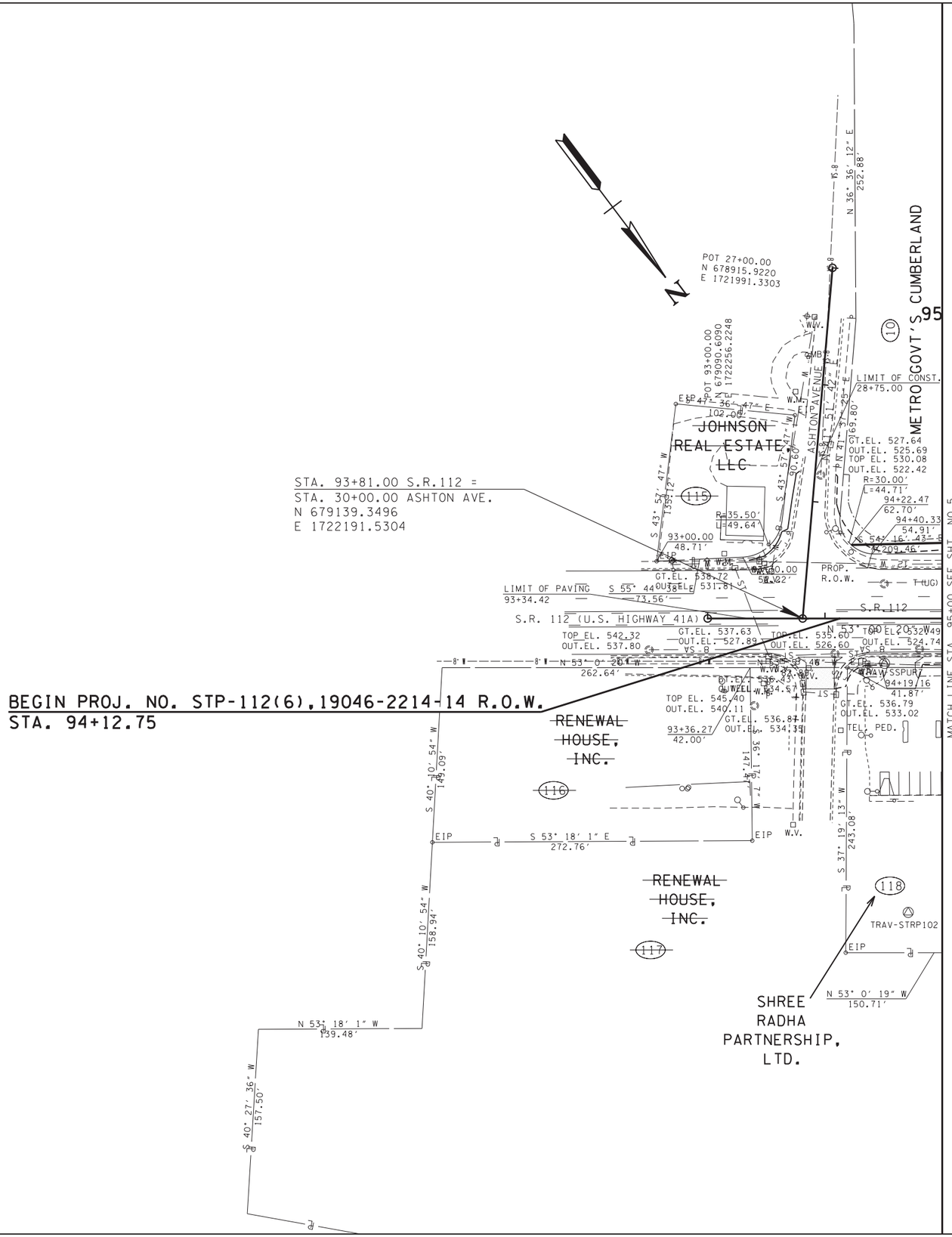
PIN NO. 103764.00

R.O.W. LENGTH 2.259 MILES

TRAFFIC DATA	
ADT (2012)	21,640
ADT (2032)	29,420
DHV (2032)	2,942
D	65 - 35
T (ADT)	5 %
T (DHV)	3 %
V	40 MPH

1/29/2015 5:44:48 PM
P:\7458\Techprod\Plan\SHTOL_TitleSheet.dgn

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2015	STP-112 (6)	4



R.O.W. FIELD REVIEW

SEALED BY

COORDINATES ARE NAD/83(1995), ARE DATUM ADJUSTED BY THE FACTOR OF 1.00006 AND TIED TO THE TGRN. ALL ELEVATIONS ARE REFERENCED TO THE NAVD 1988.

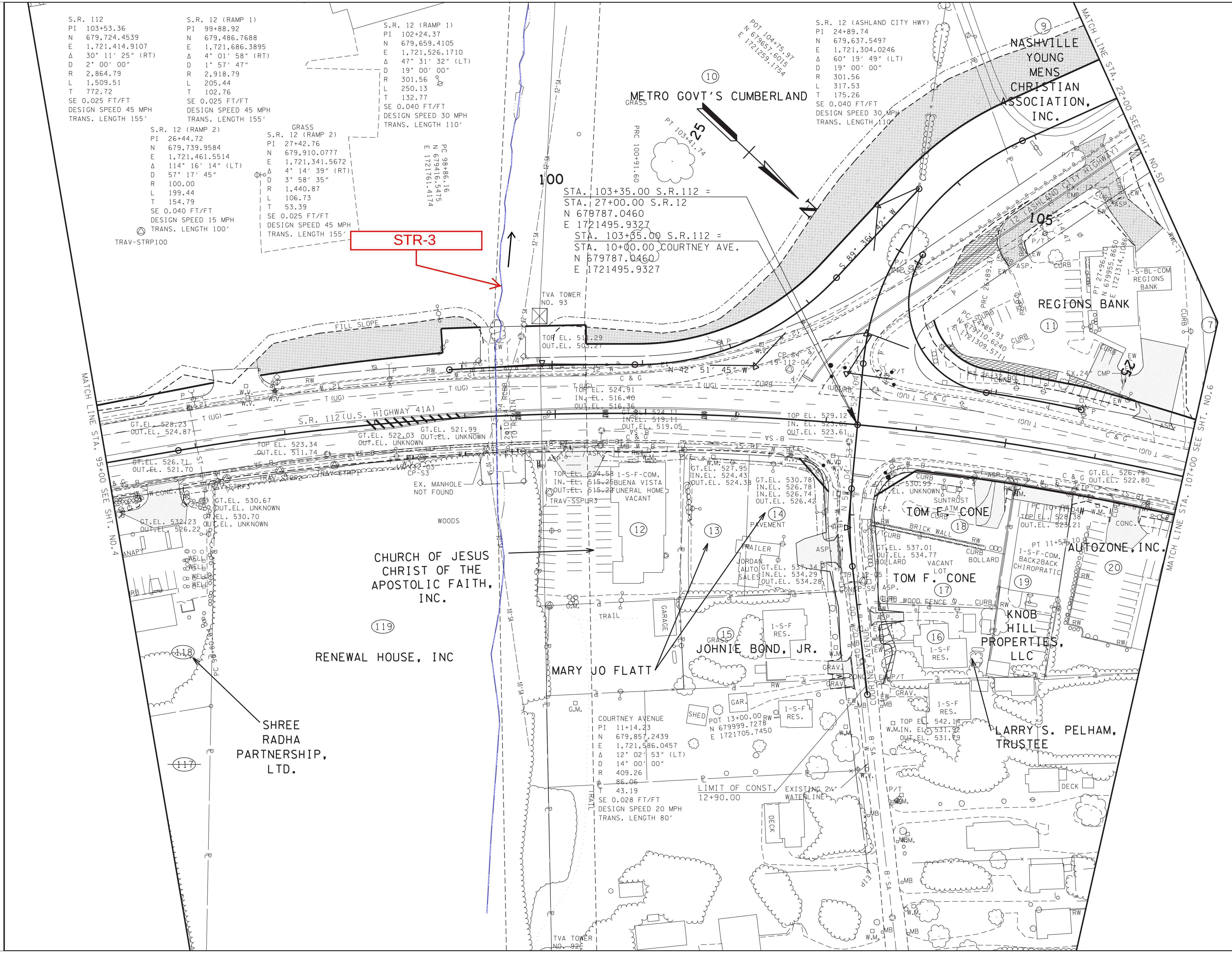
STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PRESENT LAYOUT

BEG. OF PROJ. TO STA.95+00

SCALE: 1" = 50'

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2015	STP-112 (6)	5



S.R. 112
PI 103+53.36
N 679,724.4539
E 1,721,414.9107
Δ 30° 11' 25" (RT)
D 2° 00' 00"
R 2,864.79
L 1,509.51
T 772.72
SE 0.025 FT/FT
DESIGN SPEED 45 MPH
TRANS. LENGTH 155'
S.R. 12 (RAMP 1)
PI 99+88.92
N 679,486.7688
E 1,721,686.3895
Δ 4° 01' 58" (RT)
D 1° 57' 47"
R 2,918.79
L 205.44
T 102.76
SE 0.025 FT/FT
DESIGN SPEED 45 MPH
TRANS. LENGTH 155'
S.R. 12 (RAMP 1)
PI 102+24.37
N 679,659.4105
E 1,721,526.1710
Δ 47° 31' 32" (LT)
D 19° 00' 00"
R 301.56
L 250.13
T 132.77
SE 0.040 FT/FT
DESIGN SPEED 30 MPH
TRANS. LENGTH 110'
S.R. 12 (RAMP 2)
PI 26+44.72
N 679,739.9584
E 1,721,461.5514
Δ 114° 16' 14" (LT)
D 57° 17' 45"
R 100.00
L 199.44
T 154.79
SE 0.040 FT/FT
DESIGN SPEED 15 MPH
TRANS. LENGTH 100'
S.R. 12 (RAMP 2)
PI 27+42.76
N 679,910.0777
E 1,721,341.5672
Δ 4° 14' 39" (RT)
D 3° 58' 35"
R 1,440.87
L 106.73
T 53.39
SE 0.025 FT/FT
DESIGN SPEED 45 MPH
TRANS. LENGTH 155'
TRAV-STRP100
STR-3
S.R. 12 (ASHLAND CITY HWY)
PI 24+89.74
N 679,637.5497
E 1,721,304.0246
Δ 60° 19' 49" (LT)
D 19° 00' 00"
R 301.56
L 317.53
T 175.26
SE 0.040 FT/FT
DESIGN SPEED 30 MPH
TRANS. LENGTH 110'
METRO GOVT'S CUMBERLAND
NASHVILLE YOUNG MENS CHRISTIAN ASSOCIATION, INC.
MATCH LINE STA. 22+00 SEE SHT. NO.5D
STA. 103+35.00 S.R.112 =
STA. 27+00.00 S.R.12
N 679787.0460
E 1721495.9327
STA. 103+35.00 S.R.112 =
STA. 10+00.00 COURTNEY AVE.
N 679787.0460
E 1721495.9327
TVA TOWER NO. 93
S.R. 112 (U.S. HIGHWAY 41A)
REGIONS BANK
1-S-BL-COM REGIONS BANK
MATCH LINE STA. 95+00 SEE SHT. NO.4
MATCH LINE STA. 107+00 SEE SHT. NO.6
CHURCH OF JESUS CHRIST OF THE APOSTOLIC FAITH, INC.
1-S-F-COM. BUENA VISTA FUNERAL HOME VACANT
TOM F. CONE
AUTOZONE, INC.
RENEWAL HOUSE, INC
MARY JO FLATT
JOHNIE BOND, JR.
KNOB HILL PROPERTIES, LLC
SHREE RADHA PARTNERSHIP, LTD.
LARRY S. PELHAM, TRUSTEE
COURTNEY AVENUE
PI 11+14.23
N 679,857.2439
E 1,721,586.0457
Δ 12° 02' 53" (LT)
D 14° 00' 00"
R 409.26
86.06
43.19
SE 0.028 FT/FT
DESIGN SPEED 20 MPH
TRANS. LENGTH 80'
LIMIT OF CONST. 12+90.00
EXISTING 2¼" WATERLINE
TVA TOWER NO. 92

R.O.W. FIELD REVIEW

SEALED BY

COORDINATES ARE NAD/83(1995), ARE DATUM ADJUSTED BY THE FACTOR OF 1.00006 AND TIED TO THE TGRN. ALL ELEVATIONS ARE REFERENCED TO THE NAVD 1988.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

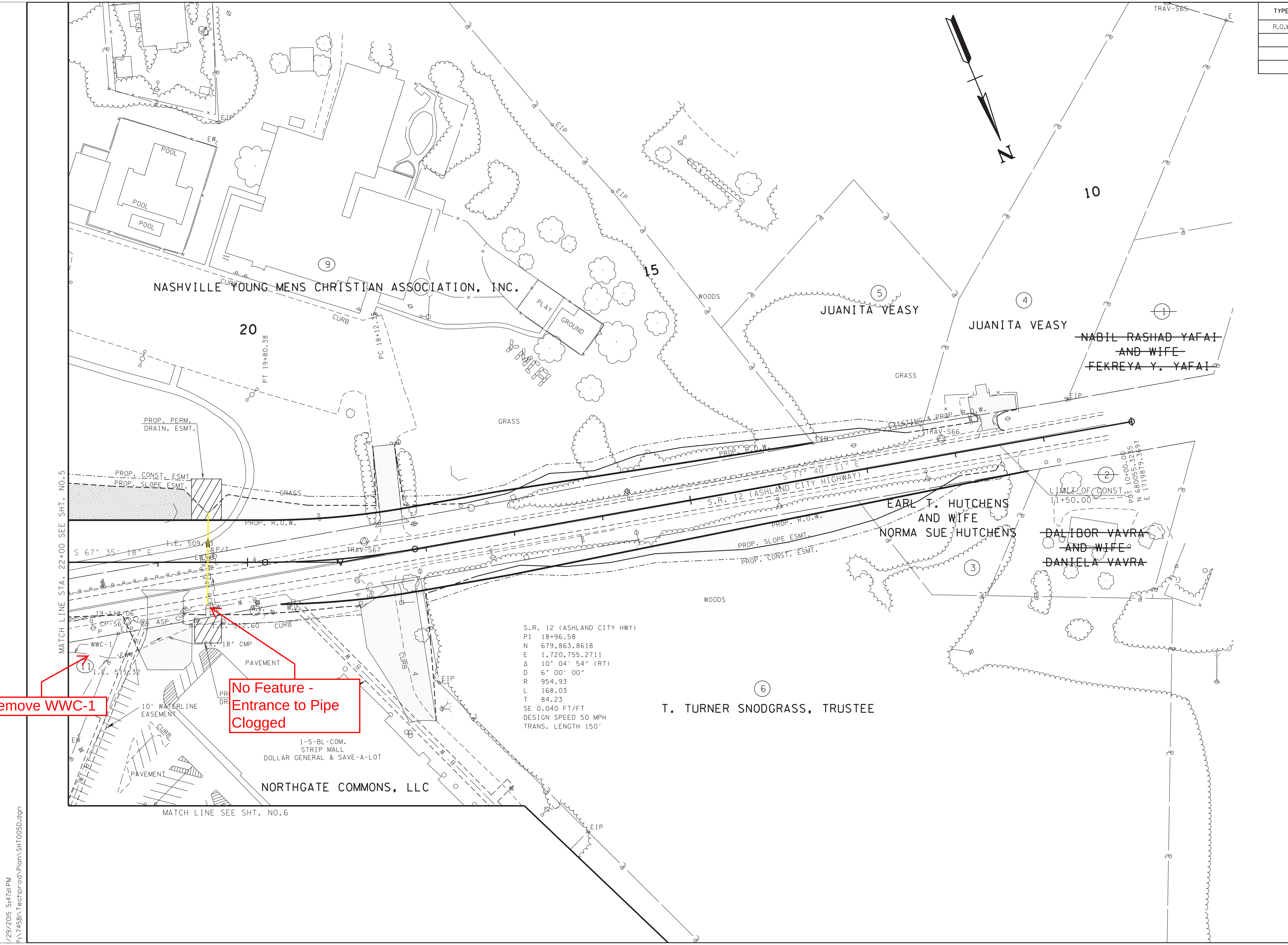
PRESENT LAYOUT

STA. 95+00 TO STA. 107+00

SCALE: 1" = 50'

1/29/2015 5:47:00 PM
P:\7458\Techprod\Plan\SHT005.dgn

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2015	STP-112 (6)	5D



R.O.W. FIELD REVIEW

SEALED BY

COORDINATES ARE NAD/83(1995), ARE DATUM ADJUSTED BY THE FACTOR OF 1.00006 AND TIED TO THE TGRN. ALL ELEVATIONS ARE REFERENCED TO THE NAVD 1988.

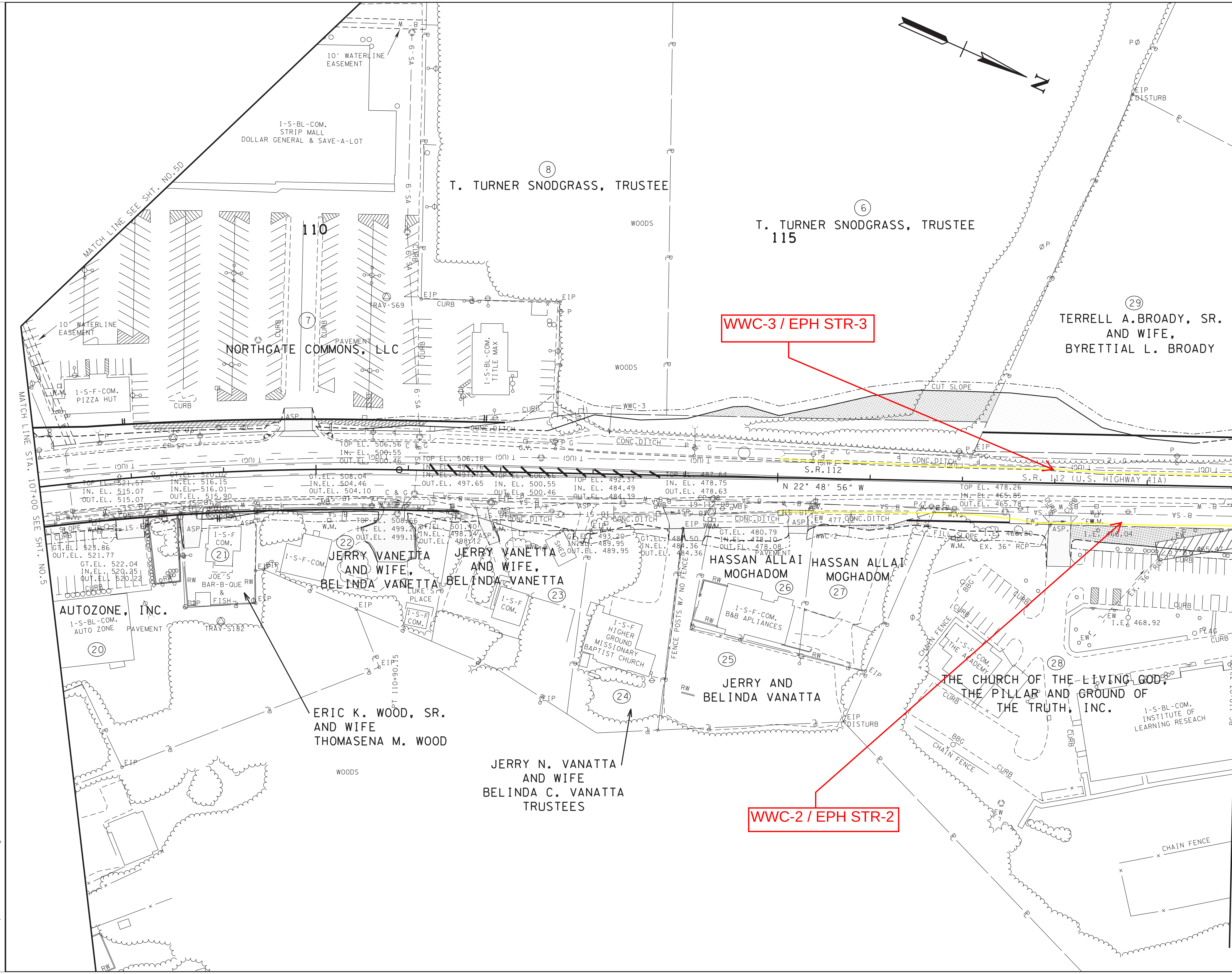
STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PRESENT LAYOUT

STA. 11+50 TO STA. 22+00

SCALE: 1″ = 50′

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2015	STP-112 (6)	6



MATCH LINE SEE SHT. NO.5D
10' WATERLINE EASEMENT
1-S-BL-COM. STRIP MALL DOLLAR GENERAL & SAVE-A-LOT
T. TURNER SNODGRASS, TRUSTEE
T. TURNER SNODGRASS, TRUSTEE
110
115
WOODS
NORTHGATE COMMONS, LLC
1-S-F-COM. PIZZA HUT
1-S-BL-COM. TITLE MAX
TERRELL A.BROADY, SR. AND WIFE, BYRETTIAL L. BROADY
WWC-3 / EPH STR-3
CUT SLOPE
CONC.DITCH
S.R.112
S.R. 112 (U.S. HIGHWAY 41A)
N 22° 48' 56" W
MATCH LINE STA. 107+00 SEE SHT. NO.5
MATCH LINE STA. 120+00 SEE SHT. NO.7
AUTOZONE, INC.
1-S-BL-COM. AUTO ZONE
JOE'S BAR-B-QUE & FISH
JERRY VANETTA AND WIFE, BELINDA VANETTA
JERRY VANETTA AND WIFE, BELINDA VANETTA
LUKE'S PLACE
HASSAN ALLAI MOGHADOM
HASSAN ALLAI MOGHADOM
1-S-F-COM. B&B APLIANCES
1-S-F HIGHER GROUND MISSIONARY BAPTIST CHURCH
JERRY AND BELINDA VANATTA
1-S-COM. THE ACADEMY
THE CHURCH OF THE LIVING GOD, THE PILLAR AND GROUND OF THE TRUTH, INC.
1-S-BL-COM. INSTITUTE OF LEARNING RESEACH
ERIC K. WOOD, SR. AND WIFE THOMASENA M. WOOD
JERRY N. VANATTA AND WIFE BELINDA C. VANATTA TRUSTEES
WWC-2 / EPH STR-2
CHAIN FENCE
WOODS

R.O.W. FIELD REVIEW

SEALED BY

COORDINATES ARE NAD/83(1995), ARE DATUM ADJUSTED BY THE FACTOR OF 1.00006 AND TIED TO THE TGRN. ALL ELEVATIONS ARE REFERENCED TO THE NAVD 1988.

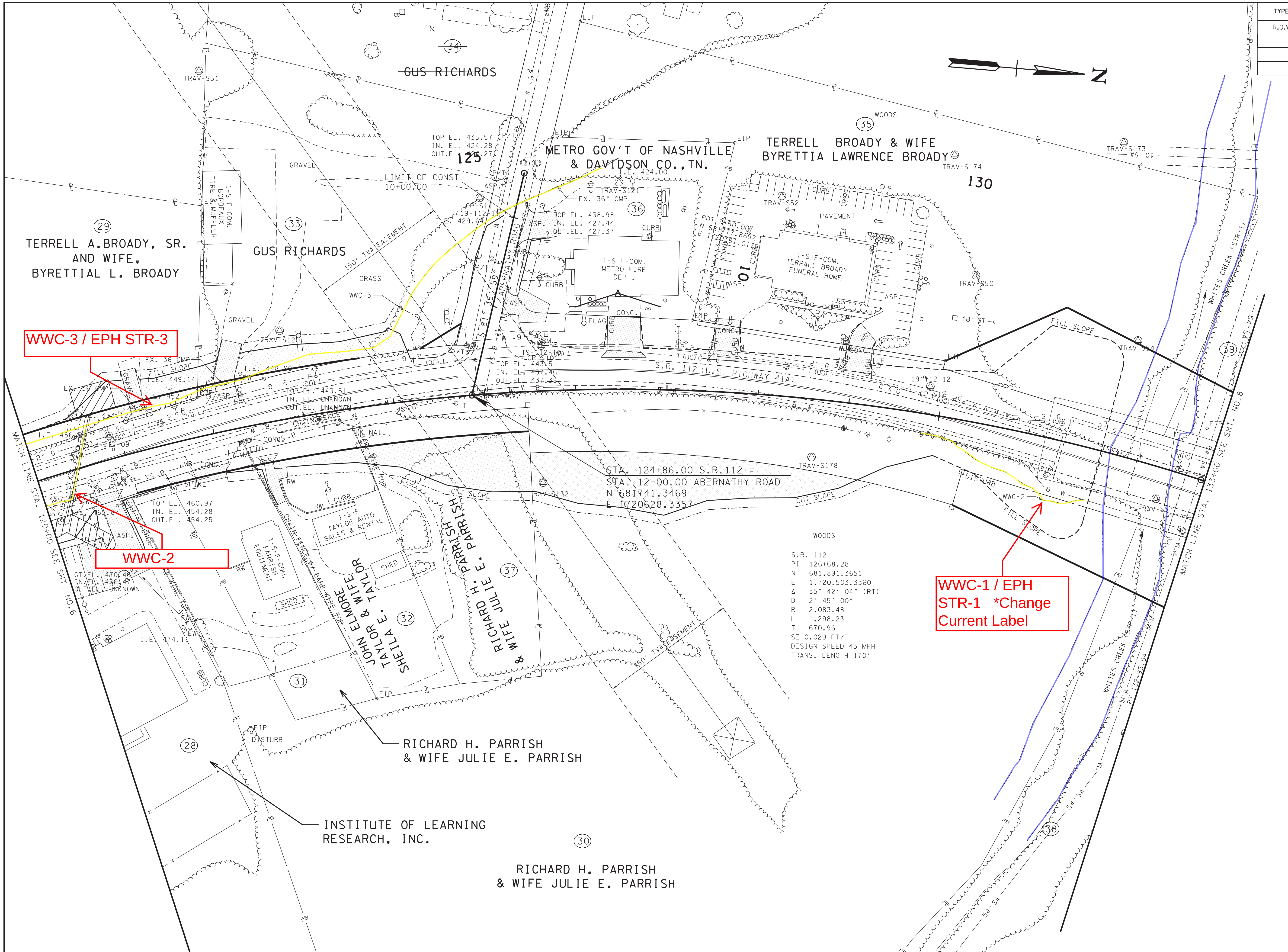
STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PRESENT LAYOUT

STA.107+00 TO STA.120+00

SCALE: 1" = 50'

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2015	STP-112 (6)	7



R.O.W. FIELD REVIEW

SEALED BY

COORDINATES ARE NAD/83(1995), ARE DATUM ADJUSTED BY THE FACTOR OF 1.00006 AND TIED TO THE TGRN. ALL ELEVATIONS ARE REFERENCED TO THE NAVD 1988.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

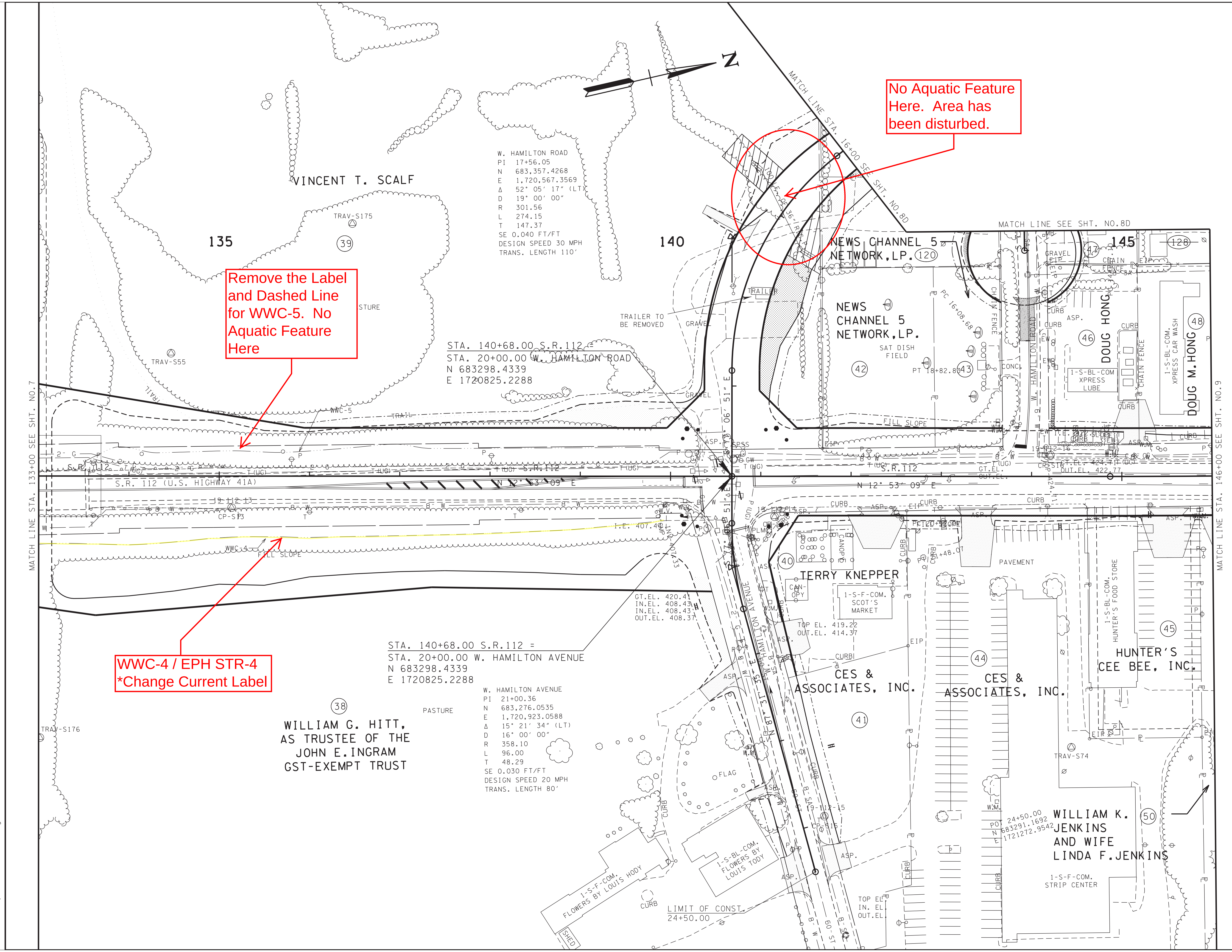
PRESENT LAYOUT

STA.120+00 TO STA.133+00

SCALE: 1" = 50'

/29/2015 5:47:23 PM
P:\7458\Techprod\Plan\SHT007.dgn

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2015	STP-112 (6)	8


No Aquatic Feature Here. Area has been disturbed.
Remove the Label and Dashed Line for WWC-5. No Aquatic Feature Here
WWC-4 / EPH STR-4
*Change Current Label
VINCENT T. SCALF
135
140
145
W. HAMILTON ROAD
PI 17+56.05
N 683,357.4268
E 1,720,567.3569
Δ 52° 05' 17" (LT)
D 19° 00' 00"
R 301.56
L 274.15
T 147.37
SE 0.040 FT/FT
DESIGN SPEED 30 MPH
TRANS. LENGTH 110'
STA. 140+68.00 S.R.112 =
STA. 20+00.00 W. HAMILTON ROAD
N 683298.4339
E 1720825.2288
TRAILER TO BE REMOVED
NEWS CHANNEL 5 NETWORK, LP.
DOUG HONG
DOUG M. HONG
1-S-BL-COM. XPRESS CAR WASH
1-S-BL-COM XPRESS LUBE
S.R. 112 (U.S. HIGHWAY 41A)
N 12° 53' 09" E
TERRY KNEPPER
1-S-F-COM. SCOT'S MARKET
CES & ASSOCIATES, INC.
HUNTER'S CEE BEE, INC.
1-S-BL-COM. HUNTER'S FOOD STORE
STA. 140+68.00 S.R.112 =
STA. 20+00.00 W. HAMILTON AVENUE
N 683298.4339
E 1720825.2288
W. HAMILTON AVENUE
PI 21+00.36
N 683,276.0535
E 1,720,923.0588
Δ 15° 21' 34" (LT)
D 16° 00' 00"
R 358.10
L 96.00
T 48.29
SE 0.030 FT/FT
DESIGN SPEED 20 MPH
TRANS. LENGTH 80'
WILLIAM G. HITT, AS TRUSTEE OF THE JOHN E. INGRAM GST-EXEMPT TRUST
PASTURE
1-S-F-COM. FLOWERS BY LOUIS HODY
1-S-BL-COM. FLOWERS BY LOUIS TODY
LIMIT OF CONST. 24+50.00
WILLIAM K. JENKINS AND WIFE LINDA F. JENKINS
1-S-F-COM. STRIP CENTER
MATCH LINE STA. 133+00 SEE SHT. NO.7
MATCH LINE STA. 146+00 SEE SHT. NO.9
MATCH LINE STA. 16+00 SEE SHT. NO.8D
MATCH LINE SEE SHT. NO.8D

R.O.W. FIELD REVIEW

SEALED BY

COORDINATES ARE NAD/83(1995), ARE DATUM ADJUSTED BY THE FACTOR OF 1.00006 AND TIED TO THE TGRN. ALL ELEVATIONS ARE REFERENCED TO THE NAVD 1988.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PRESENT LAYOUT

STA. 133+00 TO STA. 146+00

SCALE: 1" = 50'

1/29/2015 5:47:31 PM
P:\7458\Techprod\Plan\SHT008.dgn

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2015	STP-112 (6)	8D

W. HAMILTON ROAD
PI 13+72.69
N 683,723.0096
E 1,720,396.6793
Δ 51° 41' 52" (RT)
D 19° 00' 00"
R 301.56
L 272.09
T 146.10
SE 0.040 FT/FT
DESIGN SPEED 30 MPH
TRANS. LENGTH 110'

MEADOW ROAD
PI 10+98.49
N 683,735.9773
E 1,720,477.7373
Δ 34° 23' 03" (LT)
D 28° 38' 52"
R 200.00
L 120.02
T 61.88
SE NC
DESIGN SPEED 20 MPH
TRANS. LENGTH 0'

W. HAMILTON COURT
PI 50+75.14
N 683,696.6556
E 1,720,530.9007
Δ 19° 10' 44" (LT)
D 28° 38' 52"
R 200.00
L 66.95
T 33.79
SE NC
DESIGN SPEED 15 MPH
TRANS. LENGTH 0'

STA. 14+04.00 W. HAMILTON ROAD =
STA. 10+00.00 MEADOW ROAD
N 683668.7855
E 1720405.7239

STA. 10+91.02 MEADOW ROAD =
STA. 50+00.00 W. HAMILTON CT.
N 683735.7996
E 1720466.7664

MATCH LINE STA. 16+00 SEE SHT. NO.8

MATCH LINE SEE SHT. NO.8

MATCH LINE SEE SHT. NO.9

MATCH LINE SEE SHT. NO.9

R.O.W. FIELD REVIEW

SEALED BY

COORDINATES ARE NAD/83(1995), ARE DATUM ADJUSTED BY THE FACTOR OF 1.00006 AND TIED TO THE TGRN. ALL ELEVATIONS ARE REFERENCED TO THE NAVD 1988.

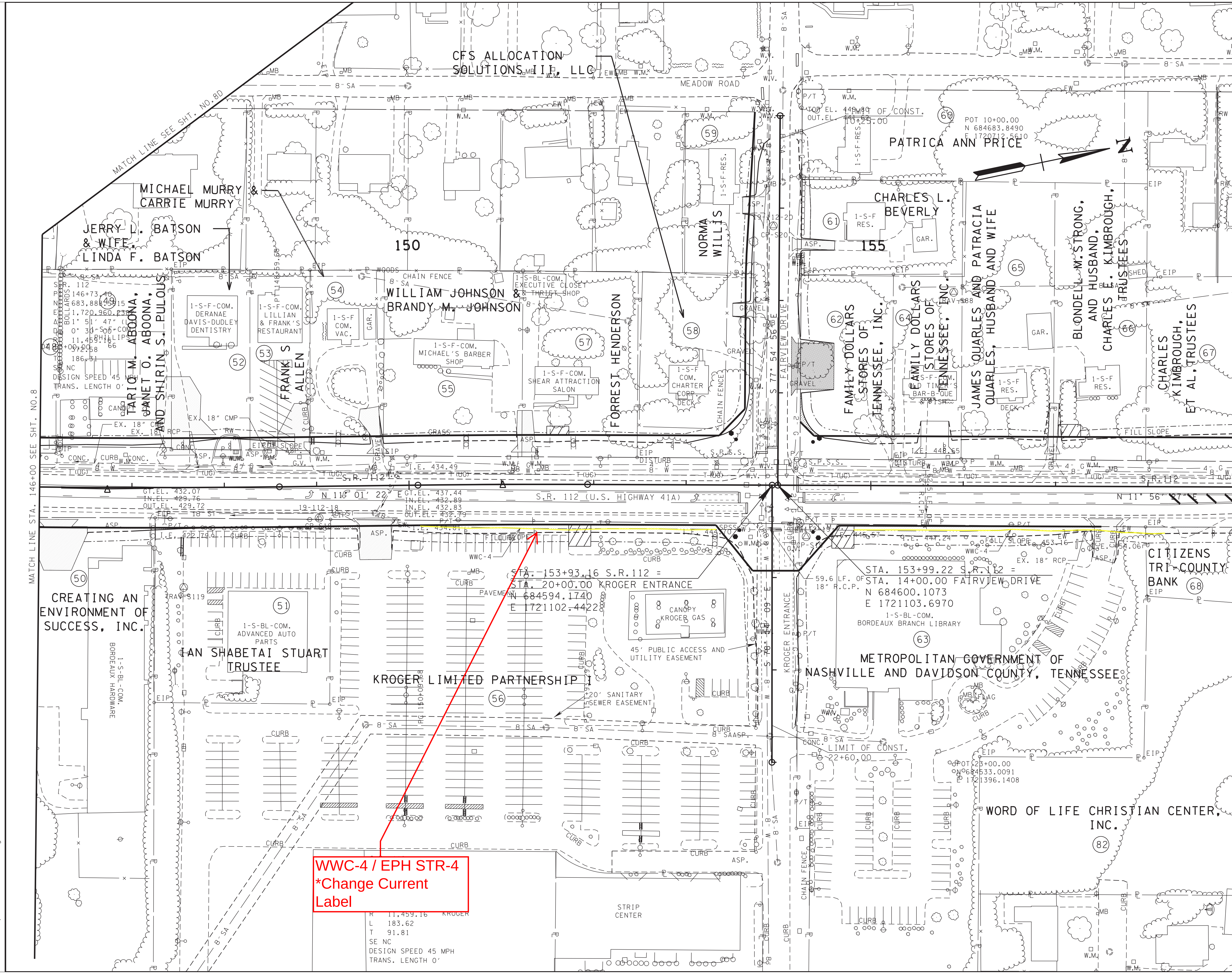
STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PRESENT LAYOUT

STA. 11+50 TO STA. 16+00

SCALE: 1" = 50'

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2015	STP-112 (6)	9



CFS ALLOCATION SOLUTIONS III, LLC
MEADOW ROAD
MATCH LINE SEE SHT. NO.8
MICHAEL MURRY & CARRIE MURRY
JERRY L. BATSON & WIFE, LINDA F. BATSON
150
WILLIAM JOHNSON & BRANDY M. JOHNSON
NORMA WILLIS
PATRICA ANN PRICE
CHARLES L. BEVERLY
155
FAMILY DOLLARS STORES OF TENNESSEE, INC.
JAMES QUARLES AND PATRACIA QUARLES, HUSBAND AND WIFE
BLONDELL M. STRONG, AND HUSBAND, CHARLES E. KIMBROUGH, TRUSTEES
CHARLES KIMBROUGH, ET AL, TRUSTEES
TARIQ M. ABOONA, JANET O. ABOONA, AND SHIRIN S. PULOUS
FRANK S ALLEN
FORREST HENDERSON
FAIRVIEW DRIVE
S.R. 112 (U.S. HIGHWAY 41A)
CREATING AN ENVIRONMENT OF SUCCESS, INC.
IAN SHABETAI STUART TRUSTEE
KROGER LIMITED PARTNERSHIP I
KROGER ENTRANCE
STA. 153+93.16 S.R.112 = STA. 20+00.00 KROGER ENTRANCE
N 684594.1740
E 1721102.4422
STA. 153+99.22 S.R.112 = STA. 14+00.00 FAIRVIEW DRIVE
N 684600.1073
E 1721103.6970
METROPOLITAN GOVERNMENT OF NASHVILLE AND DAVIDSON COUNTY, TENNESSEE
CITIZENS TRI-COUNTY BANK
WORD OF LIFE CHRISTIAN CENTER, INC.
STRIP CENTER
45' PUBLIC ACCESS AND UTILITY EASEMENT
20' SANITARY SEWER EASEMENT
WWC-4 / EPH STR-4
*Change Current Label
MATCH LINE STA. 146+00 SEE SHT. NO.8
MATCH LINE STA. 159+00 SEE SHT. NO.10

R.O.W. FIELD REVIEW

SEALED BY

COORDINATES ARE NAD/83(1995), ARE DATUM ADJUSTED BY THE FACTOR OF 1.00006 AND TIED TO THE TGRN. ALL ELEVATIONS ARE REFERENCED TO THE NAVD 1988.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PRESENT LAYOUT

STA. 146+00 TO STA. 159+00

SCALE: 1" = 50'

1/29/2015 5:47:43 PM
P:\745B\Techprod\Plan\SHT009.dgn

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2015	STP-112 (6)	10

MATCH LINE STA. 159+00 SEE SHT. NO.9

MATCH LINE STA. 172+00 SEE SHT. NO.11

MEADOW ROAD

30" ST

CEDAR CIRCLE

S.R. 112 (U.S. HIGHWAY 41A)

ROBERT J. MILLER AND WIFE, VERNICE L. MILLER

DOROTHY ELLIS UWAIFO

MELVIN J. SMITH AND WIFE, LINDA B. SMITH

MELVIN J. SMITH AND WIFE, LINDA B. SMITH

MELVIN RAY CRUTCHER

NANCY RYANS

MARY RODGERS

ASSET MANAGEMENT, LLC, A TENNESSEE LIMITED LIABILITY COMPANY

WORD OF LIFE CHRISTIAN CENTER, INC.

OLD HICKORY CREDIT UNION

TEMPLE BAPTIST CHURCH, INC.

CITIZENS TRI-COUNTY BANK

CHRISTIAN BROTHERS USED AUTO DEALER

CLARKSVILLE HIGHWAY MEMORIALS

BRUCE HOWARD, JR. AND WIFE GLADYS S. HOWARD

RONALD L. MOSELEY

JOHN K. WRIGHT AND WIFE NORMA JEANNE WRIGHT

WORD OF LIFE CHRISTIAN CENTER, INC.

STA. 166+47.73 S.R.112 = STA. 13+00.00 CEDAR CIRCLE
N 685820.3294
E 1721367.7620

POT 8+50.00
N 685915.6806
E 1720927.9800

POT 9+00.00
N 685905.0861
E 1720976.8447

POT 13+00.00

S.R. 112
PI 163+48.74
N 685,529.0748
E 1,721,300.1534
Δ 1° 07' 40" (RT)
D 0° 30' 00"
R 11,459.16
L 225.53
T 112.77
SE NC
DESIGN SPEED 45 MPH
TRANS. LENGTH 0'

PC 162+35.97

PT 164+61.50

N 13° 04' 07" E

R.O.W. FIELD REVIEW

SEALED BY

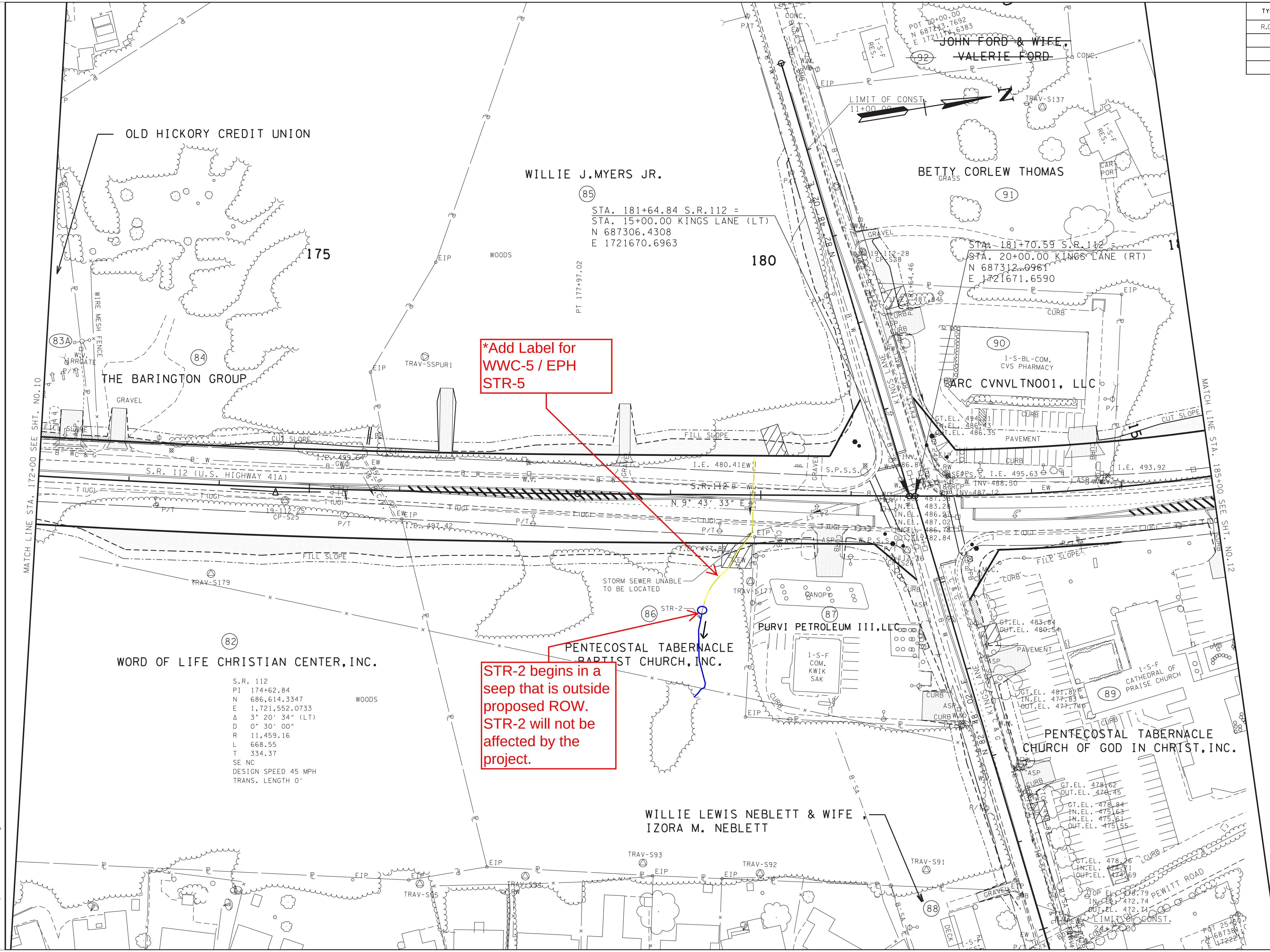
COORDINATES ARE NAD/83(1995), ARE DATUM ADJUSTED BY THE FACTOR OF 1.00006 AND TIED TO THE TGRN. ALL ELEVATIONS ARE REFERENCED TO THE NAVD 1988.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PRESENT LAYOUT

STA.159+00 TO STA.172+00

SCALE: 1" = 50'


OLD HICKORY CREDIT UNION
WILLIE J.MYERS JR.
85
STA. 181+64.84 S.R.112 =
STA. 15+00.00 KINGS LANE (LT)
N 687306.4308
E 1721670.6963
175
180
WOODS
JOHN FORD & WIFE,
VALERIE FORD
92
LIMIT OF CONST.
11+00.00
BETTY CORLEW THOMAS
91
STA. 181+70.59 S.R.112 =
STA. 20+00.00 KINGS LANE (RT)
N 687312.0961
E 1721671.6590
90
I-S-BL-COM.
CVS PHARMACY
ARC CVNVLTNOO1, LLC
83A
84
THE BARINGTON GROUP
WIRE MESH FENCE
GRAVEL
CUT SLOPE
FILL SLOPE
S.R. 112 (U.S. HIGHWAY 41A)
N 9° 43′ 33″ E
MATCH LINE STA. 172+00 SEE SHT. NO.10
MATCH LINE STA. 185+00 SEE SHT. NO.12
*Add Label for
WWC-5 / EPH
STR-5
STORM SEWER UNABLE
TO BE LOCATED
STR-2
86
87
PURVI PETROLEUM III,LLC
I-S-F
COM.
KWIK
SAK
CANOPY
PENTECOSTAL TABERNACLE
BAPTIST CHURCH,INC.
82
WORD OF LIFE CHRISTIAN CENTER,INC.
S.R. 112
PI 174+62.84
N 686,614.3347
E 1,721,552.0733
Δ 3° 20′ 34″ (LT)
D 0° 30′ 00″
R 11,459.16
L 668.55
T 334.37
SE NC
DESIGN SPEED 45 MPH
TRANS. LENGTH 0′
STR-2 begins in a
seep that is outside
proposed ROW.
STR-2 will not be
affected by the
project.
89
I-S-F
CATHEDRAL OF
PRAISE CHURCH
PENTECOSTAL TABERNACLE
CHURCH OF GOD IN CHRIST,INC.
WILLIE LEWIS NEBLETT & WIFE
IZORA M. NEBLETT
88
PEWITT ROAD
LIMIT OF CONST.
KINGS LANE
TRAV-S179
TRAV-S93
TRAV-S92
TRAV-S91
TRAV-S137
TRAV-SSPUR1

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2015	STP-112 (6)	11

R.O.W. FIELD REVIEW

SEALED BY

COORDINATES ARE NAD/83(1995), ARE DATUM ADJUSTED BY THE FACTOR OF 1.00006 AND TIED TO THE TGRN. ALL ELEVATIONS ARE REFERENCED TO THE NAVD 1988.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PRESENT LAYOUT

STA. 172+00 TO STA. 185+00

SCALE: 1″ = 50′

/29/2015 5:48:01 PM
P:\7458\Techprod\Plan\SHT011.dgn

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2015	STP-112 (6)	12

S.R. 112
PI 187+35.50
N 687,868.8842
E 1,721,767.0990
Δ 27° 58' 55" (LT)
D 2° 30' 00"
R 2,291.83
L 1,119.28
T 571.04
SE 0.028 FT/FT
DESIGN SPEED 45 MPH
TRANS. LENGTH 165'

STA. 193+18.58 S.R.112 =
STA. 10+00.00 FAIRMEADE DRIVE
N 688444.2604
E 1721577.2988

WWC-6 / EPH STR-6

WWC-7 / EPH STR-7

*Change Label to STR-4

*Change Label to STR-4

STR-4

~~FRANK E. DAVIS AND WIFE, ELEANOR KILCREASE DAVIS~~

PENTECOSTAL TABERNACLE CHURCH OF GOD IN CHRIST, INC.

PENTECOSTAL TABERNACLE CHURCH, INCORPORATED

BETTY CORLEY THOMAS

BETTYE C. TRICE AND HUSBAND, ARDIE TRICE

LARRY D. JONES, SR. & WIFE, ANITA L. JONES

WILLIAM D. MASON AND WIFE, MARGARET MASON

SHEILAGH JAMISON

BEREAN BAPTIST CHURCH

BEREAN BAPTIST CHURCH

BEREAN BAPTIST CHURCH

BEREAN BAPTIST CHURCH

1-S-F CATHEDRAL OF PRAISE CHURCH

2-S-F RES.

1-S-F RES.

SLT.-LVL.-F RES.

S.R. 112 (U.S. HIGHWAY 41A)

FAIRMEADE DRIVE

CUT SLOPE

FILL SLOPE

WOODS

GRASS

PAVEMENT

CHAIN FENCE

PUMP STATION

EX. 15" RCP

MATCH LINE STA. 185+00 SEE SHT. NO.11

MATCH LINE STA. 198+00 SEE SHT. NO.13

R.O.W. FIELD REVIEW

SEALED BY

COORDINATES ARE NAD/83(1995), ARE DATUM ADJUSTED BY THE FACTOR OF 1.00006 AND TIED TO THE TGRN. ALL ELEVATIONS ARE REFERENCED TO THE NAVD 1988.

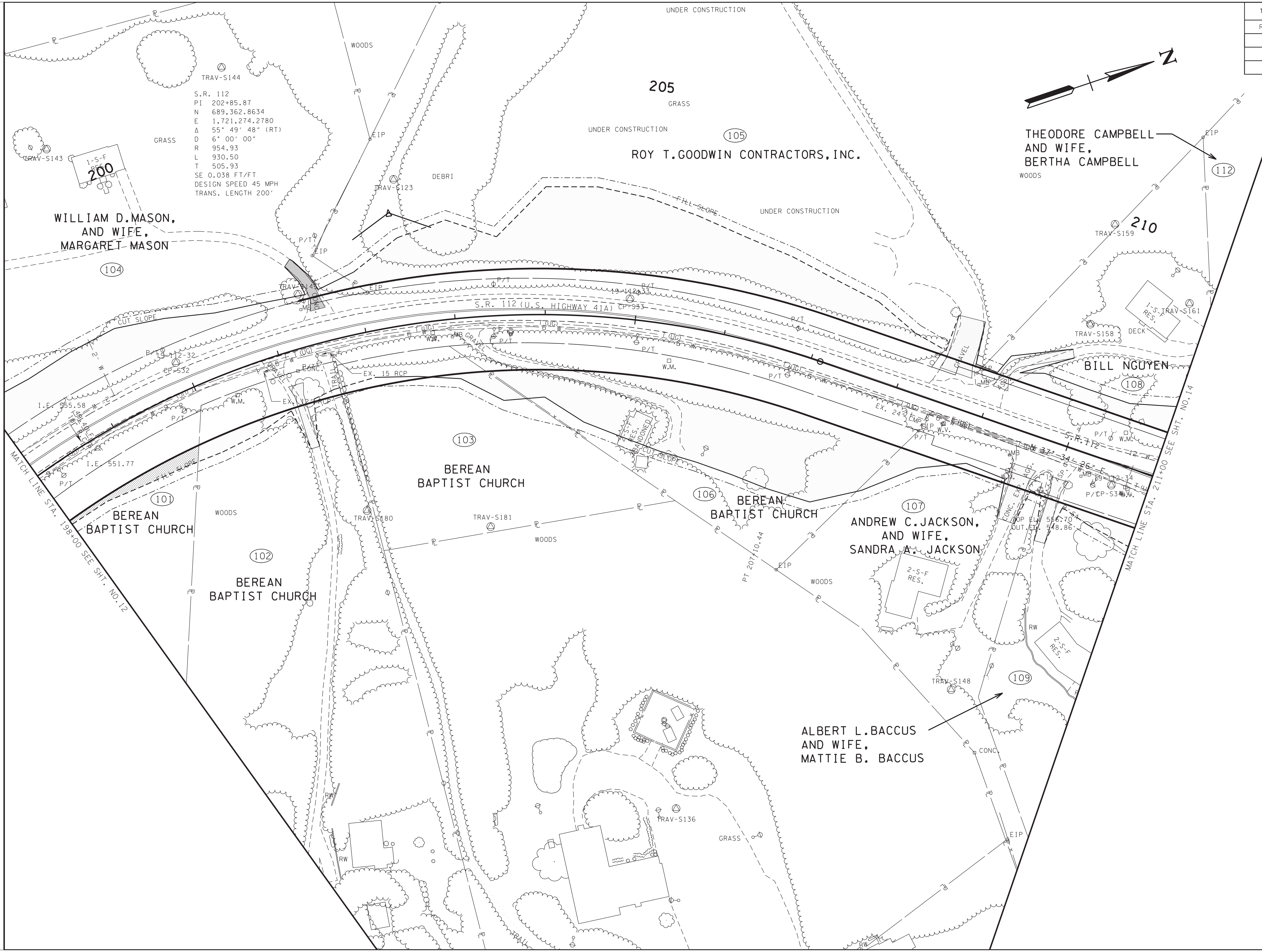
STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PRESENT LAYOUT

STA. 185+00 TO STA. 198+00

SCALE: 1" = 50'

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2015	STP-112 (6)	13



R.O.W. FIELD REVIEW

SEALED BY

COORDINATES ARE NAD/83(1995), ARE DATUM ADJUSTED BY THE FACTOR OF 1.00006 AND TIED TO THE TGRN. ALL ELEVATIONS ARE REFERENCED TO THE NAVD 1988.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PRESENT LAYOUT

STA.198+00 TO STA.211+00

SCALE: 1" = 50'

1/29/2015 5:48:14 PM
P:\7458\Techprod\Plan\SHT013.dgn

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	2015	STP-112 (6)	14

WOODS

TRAV-S135

THEODORE CAMPBELL
AND WIFE,
BERTHA CAMPBELL

(113) ~~DELORES MONTGOMERY~~

UNDER CONSTRUCTION

PC 211+84.83

N-S-E RES.

CHAIN FENCE

215

220

STA. 214+22.85 S.R.112 =
STA. 30+00.00 CLARKSVILLE PIKE
N 690330.4652
E 1722014.5676

GRASS

(112)

BILL NGUYEN

(108)

CUT SLOPE

EX. 24" CMP

EX. 24" RCP

EIP

FILL SLOPE

I.E. 528.01

GT.EL. 538.63
OUT.EL. 535.54

GT.EL. 527.62
OUT.EL. 525.42

19-112-35

CP-S35

GT.EL. 524.47
IN.EL. 519.70
OUT.EL. 519.60

GT.EL. 523.92
IN.EL. 519.99
OUT.EL. 519.94

19-112-36

CP-S36

TOP EL. 564.74
OUT.EL. 549.51

TOP EL. 549.43
OUT.EL. UNKNOWN

MATCH LINE STA. 211+00 SEE SHT. NO.13

S.R. 112 (U.S. HIGHWAY 41A)

S.R.112

CURB

TRAV-S134

P/T

LIMIT OF PAVING
214+06.00

POT 30+80.00
N 690283.4571
E 1722079.2997

CLARKSVILLE PIKE

END PROJ. NO. STP-112(6),19046-2214-14 R.O.W.
STA. 213+38.96

TOP EL. 541.01
IN. EL. 537.66
IN. EL. 537.58
OUT.EL. 537.56

(109) HERMAN BEASLEY

TOP EL. 531.59
IN. EL. 526.93
OUT.EL. 526.85

(110)

(114) ~~MARCELLE R.HAMBURG,~~
~~M.D. AND WIFE,~~
~~CHERYL J. HAMBURG~~

2-S-F RES.

DECK

(111) DR. HERMAN BEASLEY

ALBERT L. BACCUS
AND WIFE,
MATTIE B. BACCUS

1-S-F RES.

POOL

CONC. DITCH

GRAVEL

TRAV-S149

TRAV-S155

WOODS

R.O.W. FIELD REVIEW

SEALED BY

COORDINATES ARE NAD/83(1995), ARE DATUM ADJUSTED BY THE FACTOR OF 1.00006 AND TIED TO THE TGRN. ALL ELEVATIONS ARE REFERENCED TO THE NAVD 1988.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PRESENT LAYOUT

STA.211+00 TO END OF PROJ.

SCALE: 1" = 50'

9/29/2015 5:48:22 PM
P:\7458\Techprod\Plan\SHT014.dgn

Ecology Field Data Sheet: **Water Resources**

Project: Davidson Co. SR-112, From SR-12 to SR-155 PIN 103764.00

Date of survey: 3/24/2015 **Biologist:** D. Crumby **Affiliation:** TDOT - ED

1-Station: from plans	99+45 (approx.)
2-Map label and name	STR-3 (Emerald Creek)
3-Latitude/Longitude	36.197178N -86.836392W
4-Potential impact	None - No culvert extension shown. Apply all BMP's for erosion prevention and sediment control.
5-Feature description:	
what is it	Perennial Stream
blue-line on topo? (y/n)	No ☑ Yes ☐
defined channel (y/n)	No ☐ Yes ☑
straight or meandering	Straight ☑ Meandering ☐
channel bottom width	6-10' (upstream side of SR-112)
top of bank width	6-10' (upstream side of SR-112)
bank height and slope ratio	2-3'
avg. gradient of stream (%)	
substratum	Bedrock/boulder/cobble/gravel/sediment (upstream side of SR-112)
riffle/run/pool	normal riffle/run/pool characters in upstream section. Downstream section straightened. Riffle/run/pool segments mostly pool/slow run
width of buffer zone	LDB: at least 30m RDB: 3m
water flow	Yes
water depth	up to 8" in pools
water width	4-10'
general water quality	Clear flow but draining heavily urbanized area
OHWM indicators	Drift lines
groundwater connection	Yes, seepage into channel noted in several places
bank stability: LDB, RDB	LDB: Stable ☐ Eroding ☑ Undercutting ☐ Slumping/Sloughing ☐ Roots Exposed ☐ RDB: Stable ☐ Eroding ☑ Undercutting ☐ Slumping/Sloughing ☐ Roots Exposed ☐
dominant species: LDB, RDB	LDB: black willow and low-growing herbaceous plants and woody shrubs along both banks RDB:
overhead canopy (%)	40% upstream of SR-112. 0% downstream of SR-112
benthos	Limited isopods/amphopods. Several mayfly individuals observed.
fish	None observed
algae or other aquatic life	Crayfish, algae
habitat assessment score	**No habitat assessment form or hydrologic determination forms completed - the project will not affect this watercourse
photo number (s)	1-3
rainfall information	CoCoRaHS Data - Nashville Stations 3/23 - 0.0" 3/22 - 0.0" 3/21 - Trace 3/20 - Trace 3/19 - 0.10"
6-HUC code & name (12-digit)	051302020303 (Whites Creek)
7-Confirmed by:	
8-Mitigation	No ☑ Yes ☐ *(include on Mitigation Form)*
9-ETW	No ☑ Yes ☐
10-303 (d) List	No ☑ Yes ☐ Habitat ☐ Siltation ☐ Other ☐
11-Assessed	No ☐ Yes ☐
12-Notes Estimate size (acres) of lake or pond if applicable; provide any pertinent information needed to better describe feature; indicate if hydrologic determination form was completed.	**All parameters on this form were evaluated in the section of STR-3 that is upstream of SR-112. The downstream section is channelized, in a narrower stream bed and is totally devoid of riparian canopy.

Ecology Field Data Sheet: **Water Resources**

Project: Davidson Co.: SR-112, From SR-12 to SR-155 PIN 103764.00

Date of survey: 3/24/2015 **Biologist:** D. Crumby **Affiliation:** TDOT - ED

1-Station: from plans	115+00R to 120+70L
2-Map label and name	WWC-2 / EPH STR-2
3-Latitude/Longitude	36.201947N -86.839947W
4-Potential impact	Eliminate/Relocate
5-Feature description:	
what is it	Roadside conveyance
blue-line on topo? (y/n)	No ☑ Yes ☐
defined channel (y/n)	No ☐ Yes ☑
straight or meandering	Straight ☑ Meandering ☐
channel bottom width	2-4 ft
top of bank width	4 ft ft
bank height and slope ratio	1 ft
avg. gradient of stream (%)	
substratum	concrete, riprap, grass at lower end before crossing under road
riffle/run/pool	NO
width of buffer zone	LDB: 0 RDB: 0
water flow	No
water depth	NA
water width	NA
general water quality	NA
OHWM indicators	None
groundwater connection	None apparent
bank stability: LDB, RDB	LDB: Stable ☑ Eroding ☐ Undercutting ☐ Slumping/Sloughing ☐ Roots Exposed ☐ RDB: Stable ☑ Eroding ☐ Undercutting ☐ Slumping/Sloughing ☐ Roots Exposed ☐
dominant species: LDB, RDB	LDB: RDB: Fescue dominates both banks, maintained by mowing
overhead canopy (%)	0
benthos	NA
fish	NA
algae or other aquatic life	NA
habitat assessment score	25
photo number (s)	32 and 33
rainfall information	CoCoRaHS Data - Nashville Stations 3/23 - 0.0" 3/22 - 0.0" 3/21 - Trace 3/20 - Trace 3/19 - 0.10"
6-HUC code & name (12-digit)	051302020303 Whites Creek
7-Confirmed by:	NA
8-Mitigation	No ☑ Yes ☐ *(include on Mitigation Form)*
9-ETW	No ☑ Yes ☐
10-303 (d) List	No ☑ Yes ☐ Habitat ☐ Siltation ☐ Other ☐
11-Assessed	No ☑ Yes ☐
12-Notes Estimate size (acres) of lake or pond if applicable; provide any pertinent information needed to better describe feature; indicate if hydrologic determination form was completed.	Photo #'s 32 and 33 Habitat assessment score is too high. Only real points were for bank stability (18).

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Davidson	Named Waterbody: NA	Date/Time: 3/24/2015 11:45AM
Assessors/Affiliation: Dennis Crumby - TDOT Env. Division		Project ID: SR-112, From SR-12 to SR-155 TDOT PIN 103764.00
Site Name/Description: WWC-2 / EPH STR-2		
Site Location: Station 115+50R to Station 120+70L		
USGS quad: 308-NE Nashville West	HUC (12 digit): 051302020303	Lat/Long: 36.201947N -86.839908W
Previous Rainfall (7-days) : 0.10" on March 19,2015		
Precipitation this Season vs. Normal : very wet wet average dry drought unknown Source of recent & seasonal precip data : CoCoRahHS Data Nashville Stations		
Watershed Size :	Photos: Yes	Number : 32&33
Soil Type(s) / Geology :		
Surrounding Land Use : Urban Highway Corridor / Businesses and Parking Lots / 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, 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) = 7

Justification / Notes :

Photo 32 (view up-channel) and Photo 33 (View down-channel)

Secondary Field Indicator Evaluation

A. **Geomorphology** (Subtotal =) 3.5		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	0	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	1	0	0.5	1	1.5
12. Natural valley or drainageway	0	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	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	1	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	1	0	0.5	1	1.5
19. Hydric soils in stream bed or sides of channel		No = 0			

C. **Biology** (Subtotal =) 0		Absent	Weak	Moderate	Strong
20. Fibrous roots in channel [1]	0	3	2	1	0
21. Rooted plants in channel [1]	0	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 = 7

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

Notes :

#11 Pipes under driveways

#16 No leaf litter (no tree canopy)

#21 Grass and riprap channel

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

STREAM NAME WWC-2 / EPH-STR-2	LOCATION STation 115+00R to 120+70L
STATION #_____ RIVERMILE_____	STREAM CLASS Ephemeral
LAT 36.201947N LONG -86.839947W	RIVER BASIN Whites Creek (Cumberland River)
STORET #	AGENCY : TDOT
INVESTIGATORS Dennis Crumby - TDOT	
FORM COMPLETED BY D. Crumby - TDOT	DATE 03/24/2015 TIME 11:35 AM PM — REASON FOR SURVEY Road Widening

Parameters to be evaluated in sampling reach	Habitat Parameter	Condition Category: Optimal	Suboptimal	Marginal	Poor
	1. Epifaunal Substrate/ Available Cover	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
	SCORE 0	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 ✓0
	2. Embeddedness	Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment.	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment.
	SCORE 0	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 ✓0
	3. Velocity/Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/ depth regime (usually slow-deep).
	SCORE 1	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 ✓1 0
	4. Sediment Deposition	Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
	SCORE 0	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 ✓0
	5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
	SCORE 0	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 ✓0

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

Parameters to be evaluated broader than sampling reach

Habitat Parameter	Condition Category			
	Optimal	**Suboptimal**	**Marginal**	**Poor**
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE 1	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 ✓1 0
7. Frequency of Riffles (or bends)	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.
SCORE 3	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 ✓3 2 1 0
8. Bank Stability (score each bank) Note: determine left or right side by facing downstream.	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE 9 (LB)	Left Bank 10 ✓9	8 7 6	5 4 3	2 1 0
SCORE 9 (RB)	Right Bank 10 ✓9	8 7 6	5 4 3	2 1 0
9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE 1 (LB)	Left Bank 10 9	8 7 6	5 4 3	2 ✓1 0
SCORE 1 (RB)	Right Bank 10 9	8 7 6	5 4 3	2 ✓1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
SCORE 0 (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 ✓0
SCORE 0 (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 ✓0

Total Score 25

Ecology Field Data Sheet: **Water Resources**

Project: Davidson Co. SR-112, From SR-12 to SR-155 PIN 103764.00

Date of survey: 3/24/2015 **Biologist:** D. Crumby **Affiliation:** TDOT - ED

1-Station: from plans	112+50L to 126+00L
2-Map label and name	WWC-3 / EPH STR-3
3-Latitude/Longitude	36.202114N -86.840275W
4-Potential impact	Eliminate/Relocate
5-Feature description:	
what is it	Roadside Drainage channel
blue-line on topo? (y/n)	No ☑ Yes ☐
defined channel (y/n)	No ☐ Yes ☑
straight or meandering	Straight ☑ Meandering ☐
channel bottom width	2-4 ft
top of bank width	4 ft
bank height and slope ratio	1-3 ft
avg. gradient of stream (%)	
substratum	concrete ditch upper end / lower end rock/woody debris / garbage
riffle/run/pool	No
width of buffer zone	LDB: 20 ft RDB: 0
water flow	No
water depth	NA
water width	NA
general water quality	NA
OHWM indicators	Wrack lines / garbage
groundwater connection	None apparent
bank stability: LDB, RDB	LDB: Stable ☐ Eroding ☑ Undercutting ☐ Slumping/Sloughing ☐ Roots Exposed ☐ RDB: Stable ☐ Eroding ☑ Undercutting ☐ Slumping/Sloughing ☐ Roots Exposed ☐
dominant species: LDB, RDB	LDB: fescue, bush honeysuckle, small maple saplings RDB: fescue - mowed
overhead canopy (%)	0
benthos	No
fish	No
algae or other aquatic life	No
habitat assessment score	34
photo number (s)	30 and 31
rainfall information	CoCoRaHS Data - Nashville Stations 3/23 - 0.0" 3/22 - 0.0" 3/21 - Trace 3/20 - Trace 3/19 - 0.10"
6-HUC code & name (12-digit)	051302020303 (Whites Creek)
7-Confirmed by:	NA
8-Mitigation	No ☑ Yes ☐ *(include on Mitigation Form)*
9-ETW	No ☑ Yes ☐
10-303 (d) List	No ☑ Yes ☐ Habitat ☐ Siltation ☐ Other ☐
11-Assessed	No ☑ Yes ☐
12-Notes Estimate size (acres) of lake or pond if applicable; provide any pertinent information needed to better describe feature; indicate if hydrologic determination form was completed.	Photo 30 view up-channel Photo 31 view down-channel

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Davidson	Named Waterbody:	Date/Time: 3/24/2015 11:55 AM
Assessors/Affiliation: Dennis Crumby - TDOT Env. Division		Project ID: SR-112, From SR-12 to SR-155 TDOT PIN 103764.00
Site Name/Description: WWC-3 EPH STR-3		
Site Location: 112+50L to 126+00L		
USGS quad: 308-NE Nashville West	HUC (12 digit): 051302020303	Lat/Long: 36.202114N -86.840275W
Previous Rainfall (7-days) : 0.10" on March 19, 2015		
Precipitation this Season vs. Normal : very wet wet average dry drought unknown Source of recent & seasonal precip data : CoCoRaHS Data - Nashville Stations		
Watershed Size :	Photos: Yes	Number : 30 and 31
Soil Type(s) / Geology :		
Surrounding Land Use : Urban Highway Corridor / Businesses and Parking Lots / 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, 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) = 11.5

Justification / Notes :

Photo 30 view up-channel Photo 31 view down-channel

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal =) 8		**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	2.5	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	1.5	0	1	2	3
5. Active/relic floodplain	0	0	1	2	3
6. Depositional bars or benches	1.5	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	0	0	1	2	3
11. Grade controls	0.5	0	0.5	1	1.5
12. Natural valley or drainageway	0	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map		No = 0			

B. Hydrology (Subtotal =) 2		**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	1	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	1	0	0.5	1	1.5
19. Hydric soils in stream bed or sides of channel		No = 0			

C. Biology (Subtotal =) 1.5		**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1]	0	3	2	1	0
21. Rooted plants in channel [1]	1.5	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 = 11.5

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

Notes :

Concrete ditch - upper Roadside ditch - lower

#3 Very little pool potential; all a downhill run/riffle during rain

#20 Rock predominates in channel

#21 Grass growing in sections toward lower end

#16 No canopy to provide leaves

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

STREAM NAME WWC-3 EPH STR-3	LOCATION 112+50L to 126+00L
STATION # _____ RIVERMILE _____	STREAM CLASS Ephemeral
LAT 36.202114N LONG -86.840275	RIVER BASIN Whites Creek (Cumberland River)
STORET #	AGENCY : TDOT
INVESTIGATORS Dennis Crumby - TDOT	
FORM COMPLETED BY D. Crumby - TDOT	DATE 03/24/2015 TIME 11:45 AM PM — REASON FOR SURVEY Road Widening

Parameters to be evaluated in sampling reach

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/ Available Cover	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE 2	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 ✓2 1 0
2. Embeddedness	Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment.	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment.
SCORE 3	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 ✓3 2 1 0
3. Velocity/Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/ depth regime (usually slow-deep).
SCORE 2	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 ✓2 1 0
4. Sediment Deposition	Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE 3	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 ✓3 2 1 0
5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE 0	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 ✓0

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

Parameters to be evaluated broader than sampling reach

Habitat Parameter	Condition Category			
	Optimal	**Suboptimal**	**Marginal**	**Poor**
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE 1	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 ✓1 0
7. Frequency of Riffles (or bends)	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.
SCORE 4	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 ✓4 3 2 1 0
8. Bank Stability (score each bank) Note: determine left or right side by facing downstream.	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE 3 (LB)	Left Bank 10 9	8 7 6	5 4 ✓3	2 1 0
SCORE 3 (RB)	Right Bank 10 9	8 7 6	5 4 ✓3	2 1 0
9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE 2 (LB)	Left Bank 10 9	8 7 6	5 4 3	✓2 1 0
SCORE 2 (RB)	Right Bank 10 9	8 7 6	5 4 3	✓2 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
SCORE 9 (LB)	Left Bank 10 ✓9	8 7 6	5 4 3	2 1 0
SCORE 0 (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 ✓0

Total Score 34

Ecology Field Data Sheet: **Water Resources**

Project: Davidson Co. SR-112, From SR-12 to SR-155 PIN 103764.00

Date of survey: 3/24/2015 **Biologist:** D. Crumby **Affiliation:** TDOT - ED

1-Station: from plans	129+75R to 132+25R (junction with Whites Creek)
2-Map label and name	WWC-1 / EPH STR-1
3-Latitude/Longitude	36.205092N -86.84035W
4-Potential impact	Eliminate/Relocate
5-Feature description:	
what is it	Roadside conveyance
blue-line on topo? (y/n)	No ☑ Yes ☐
defined channel (y/n)	No ☐ Yes ☑
straight or meandering	Straight ☑ Meandering ☐
channel bottom width	1-3 ft
top of bank width	2-5 ft
bank height and slope ratio	2-4 ft
avg. gradient of stream (%)	
substratum	bedrock/gravel/boulder, woody debris
riffle/run/pool	No
width of buffer zone	LDB: 0 RDB: >10 m
water flow	No
water depth	NA
water width	NA
general water quality	NA
OHWM indicators	wrack lines (leaves)
groundwater connection	None apparent
bank stability: LDB, RDB	LDB: Stable ☑ Eroding ☐ Undercutting ☐ Slumping/Sloughing ☐ Roots Exposed ☐ RDB: Stable ☑ Eroding ☐ Undercutting ☐ Slumping/Sloughing ☐ Roots Exposed ☐
dominant species: LDB, RDB	LDB: NA RDB: bush honeysuckle, cedar
overhead canopy (%)	20%
benthos	NA
fish	NA
algae or other aquatic life	NA
habitat assessment score	25
photo number (s)	28 (view up-channel) 29 (view down-channel)
rainfall information	CoCoRaHS Data - Nashville Stations 3/23 - 0.0" 3/22 - 0.0" 3/21 - Trace 3/20 - Trace 3/19 - 0.10"
6-HUC code & name (12-digit)	051302020303 (Whites Creek)
7-Confirmed by:	NA
8-Mitigation	No ☑ Yes ☐ *(include on Mitigation Form)*
9-ETW	No ☑ Yes ☐
10-303 (d) List	No ☑ Yes ☐ Habitat ☐ Siltation ☐ Other ☐
11-Assessed	No ☑ Yes ☐
12-Notes Estimate size (acres) of lake or pond if applicable; provide any pertinent information needed to better describe feature; indicate if hydrologic determination form was completed.	Channel deepens and widens as it leaves the section near the roadway and drops down towards Whites Creek.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Davidson	Named Waterbody:	Date/Time: 3/24/2015 12:15 PM
Assessors/Affiliation: Dennis Crumby - TDOT Env. Division		Project ID: SR-112, From SR-12 to SR-155 TDOT PIN 103764.00
Site Name/Description: WWC-1 / EPH STR-1		
Site Location: 129+75R to 132+25R		
USGS quad: 308-NE Nashville West	HUC (12 digit): 051302020303	Lat/Long: 36.205092N -86.84035W
Previous Rainfall (7-days) : 0.10" on March 19, 2015		
Precipitation this Season vs. Normal : very wet wet average dry drought unknown Source of recent & seasonal precip data : CoCoRaHS Data - Nashville Stations		
Watershed Size :	Photos: Yes	Number : 28 and 29
Soil Type(s) / Geology :		
Surrounding Land Use : Urban Highway Corridor / Businesses and Parking Lots / 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, 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) = 11

Justification / Notes :

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal =) 7.5		**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	1	0	1	2	3
4. Sorting of soil textures or other substrate	1.5	0	1	2	3
5. Active/relic floodplain	0	0	1	2	3
6. Depositional bars or benches	1.5	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	0	0	1	2	3
11. Grade controls	0.5	0	0.5	1	1.5
12. Natural valley or drainageway	0	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	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	1	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	1	0	0.5	1	1.5
19. Hydric soils in stream bed or sides of channel		No = 0			

C. Biology (Subtotal =) 0		**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1]	0	3	2	1	0
21. Rooted plants in channel [1]	0	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 = 11

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

Notes :

#20 Rock channel (NA)

#21 Rock channel (NA)

Photo 28 (view up-channel)

Photo 29 (view down-channel)

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

STREAM NAME WWC-1 / EPH STR-1	LOCATION 129+75R to 132+25R
STATION # _____ RIVERMILE _____	STREAM CLASS Ephemeral
LAT 36.205092N LONG -86.84035	RIVER BASIN Whites Creek (Cumberland River)
STORET #	AGENCY : TDOT
INVESTIGATORS Dennis Crumby - TDOT Mike Williams - Barge Waggoner Consultants	
FORM COMPLETED BY D. Crumby - TDOT	DATE 03/24/2015 TIME 12:15 AM PM
REASON FOR SURVEY Road Widening	

Parameters to be evaluated in sampling reach

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/ Available Cover	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE 1	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 ✓1 0
2. Embeddedness	Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment.	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment.
SCORE 1	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 ✓1 0
3. Velocity/Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/ depth regime (usually slow-deep).
SCORE 1	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 ✓1 0
4. Sediment Deposition	Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE 2	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 ✓2 1 0
5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE 0	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 ✓0

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

Parameters to be evaluated broader than sampling reach

Habitat Parameter	Condition Category			
	Optimal	**Suboptimal**	**Marginal**	**Poor**
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE 1	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1✓ 0
7. Frequency of Riffles (or bends)	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.
SCORE 3	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3✓ 2 1 0
8. Bank Stability (score each bank) Note: determine left or right side by facing downstream.	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE 1 (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1✓ 0
SCORE 1 (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1✓ 0
9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE 0 (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0✓
SCORE 4 (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
SCORE 0 (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0✓
SCORE 10 (RB)	Right Bank 10✓ 9	8 7 6	5 4 3	2 1 0

Total Score 25

Ecology Field Data Sheet: **Water Resources**

Project: Davidson Co. SR-112, From SR-12 to SR-155 PIN 103764.00

Date of survey: 3/24/2015 **Biologist:** D. Crumby **Affiliation:** TDOT - ED

1-Station: from plans	132+50
2-Map label and name	STR-1 (Whites Creek)
3-Latitude/Longitude	36.205275N -86.840376W
4-Potential impact	Crossing - Bridge
5-Feature description:	
what is it	Perennial Stream
blue-line on topo? (y/n)	No ☐ Yes ☑
defined channel (y/n)	No ☐ Yes ☑
straight or meandering	Straight ☐ Meandering ☑
channel bottom width	50-60 ft
top of bank width	70 ft
bank height and slope ratio	6 ft
avg. gradient of stream (%)	
substratum	bedock/cobble/boulder/gravel
riffle/run/pool	25/25/50
width of buffer zone	LDB: 100 ft RDB: 20 ft
water flow	Yes
water depth	6" to 3'
water width	50 ft
general water quality	clear/good
OHWM indicators	litter and debris lines / bent vegetation
groundwater connection	Yes
bank stability: LDB, RDB	LDB: Stable ☑ Eroding ☐ Undercutting ☐ Slumping/Sloughing ☐ Roots Exposed ☐ RDB: Stable ☐ Eroding ☑ Undercutting ☐ Slumping/Sloughing ☐ Roots Exposed ☐
dominant species: LDB, RDB	LDB: Sycamore, Silver Maple RDB: Sycamore, Silver Maple
overhead canopy (%)	75%
benthos	Cheumatopsyche, Heptageniidae, Isonychia, Asellidae, Elmidae, Elimia, Hydropsychidae
fish	Cyprinidae, other species likely (Centrarchidae)
algae or other aquatic life	Diatoms, Green filamentous
habitat assessment score	145
photo number (s)	#22 view upstream, #23 view downstream
rainfall information	CoCoRaHS Data - Nashville Stations 3/23 - 0.0" 3/22 - 0.0" 3/21 - Trace 3/20 - Trace 3/19 - 0.10"
6-HUC code & name (12-digit)	051302020303 Whites Creek (Cumberland River)
7-Confirmed by:	NA
8-Mitigation	No ☑ Yes ☐ *(include on Mitigation Form)*
9-ETW	No ☑ Yes ☐
10-303 (d) List	No ☐ Yes ☑ Habitat ☐ Siltation ☐ Other ☑
11-Assessed	No ☐ Yes ☐
12-Notes Estimate size (acres) of lake or pond if applicable; provide any pertinent information needed to better describe feature; indicate if hydrologic determination form was completed.	303(d) E. coli and nutrients due to collection system failure

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

STREAM NAME STR-1 Whites Creek	LOCATION Station 132+50
STATION # _____ RIVERMILE _____	STREAM CLASS Perennial
LAT 36.205275 LONG -86.840376	RIVER BASIN Whites Creek (Cumberland River)
STORET #	AGENCY : TDOT
INVESTIGATORS Dennis Crumby - TDOT	
FORM COMPLETED BY D. Crumby - TDOT	DATE 03/24/2015 TIME 01:55 AM PM
REASON FOR SURVEY Road Widening	

Parameters to be evaluated in sampling reach

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/ Available Cover	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE 13	20 19 18 17 16	15 14 ✓13 12 11	10 9 8 7 6	5 4 3 2 1 0
2. Embeddedness	Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment.	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment.
SCORE 13	20 19 18 17 16	15 14 ✓13 12 11	10 9 8 7 6	5 4 3 2 1 0
3. Velocity/Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/ depth regime (usually slow-deep).
SCORE 16	20 19 18 17 ✓16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
4. Sediment Deposition	Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE 13	20 19 18 17 16	15 14 ✓13 12 11	10 9 8 7 6	5 4 3 2 1 0
5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE 18	20 19 ✓18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

Parameters to be evaluated broader than sampling reach

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE 15	20 19 18 17 16	15 ✓ 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
7. Frequency of Riffles (or bends)	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.
SCORE 15	20 19 18 17 16	15 ✓ 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
8. Bank Stability (score each bank) Note: determine left or right side by facing downstream.	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE 8 (LB)	Left Bank 10 9	8 ✓ 7 6	5 4 3	2 1 0
SCORE 8 (RB)	Right Bank 10 9	8 ✓ 7 6	5 4 3	2 1 0
9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE 8 (LB)	Left Bank 10 9	8 ✓ 7 6	5 4 3	2 1 0
SCORE 7 (RB)	Right Bank 10 9	8 7 ✓ 6	5 4 3	2 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
SCORE 9 (LB)	Left Bank 10 ✓ 9	8 7 6	5 4 3	2 1 0
SCORE 2 (RB)	Right Bank 10 9	8 7 6	5 4 3	2 ✓ 1 0

Total Score 145

Ecology Field Data Sheet: **Water Resources**

Project: Davidson Co. SR-112, From SR-12 to SR-155 PIN 103764.00

Date of survey: 3/24/2015 **Biologist:** D. Crumby **Affiliation:** TDOT - ED

1-Station: from plans	133+00R to 140+00R, 150+00R to 157+50R
2-Map label and name	WWC-4 EPH-STR-4
3-Latitude/Longitude	36.206000N -86.840000W
4-Potential impact	Eliminate / Relocate
5-Feature description:	
what is it	Roadside Conveyance
blue-line on topo? (y/n)	No ☑ Yes ☐
defined channel (y/n)	No ☐ Yes ☑
straight or meandering	Straight ☑ Meandering ☐
channel bottom width	2-3 ft
top of bank width	3-4 ft
bank height and slope ratio	3-4 ft
avg. gradient of stream (%)	
substratum	mud, grass, garbage
riffle/run/pool	No
width of buffer zone	LDB: 0 to 10 ft RDB: 0 to 10 ft
water flow	No
water depth	NA
water width	NA
general water quality	NA
OHWM indicators	debris lines
groundwater connection	None apparent
bank stability: LDB, RDB	LDB: Stable ☑ Eroding ☐ Undercutting ☐ Slumping/Sloughing ☐ Roots Exposed ☐ RDB: Stable ☑ Eroding ☐ Undercutting ☐ Slumping/Sloughing ☐ Roots Exposed ☐
dominant species: LDB, RDB	LDB: Both Banks: Lower sections small box elder saplings and bush honeysuckle. Upper sections mowed fescue RDB:
overhead canopy (%)	Lower section 75%, Upper section 0%
benthos	None
fish	None
algae or other aquatic life	None
habitat assessment score	30
photo number (s)	#36 view up-channel, #37 view down-channel
rainfall information	CoCoRaHS Data - Nashville Stations 3/23 - 0.0" 3/22 - 0.0" 3/21 - Trace 3/20 - Trace 3/19 - 0.10"
6-HUC code & name (12-digit)	051302020303 Whites Creek
7-Confirmed by:	NA
8-Mitigation	No ☑ Yes ☐ *(include on Mitigation Form)*
9-ETW	No ☑ Yes ☐
10-303 (d) List	No ☑ Yes ☐ Habitat ☐ Siltation ☐ Other ☐
11-Assessed	No ☑ Yes ☐
12-Notes Estimate size (acres) of lake or pond if applicable; provide any pertinent information needed to better describe feature; indicate if hydrologic determination form was completed.	150+00 to 157+50 is a grassy swale 133+00 to 140+00 has a thin strip of brushy vegetation on both sides Photos 38 and 39 taken in upper section (ST. 150+00R to 157+50R) #38 view down-channel, #39 view up-channel.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Davidson	Named Waterbody:	Date/Time: 3/24/2015 2:05 PM
Assessors/Affiliation: Dennis Crumby - TDOT Env. Div		Project ID: SR-112, From SR-12 to SR-155 TDOT PIN 103764.00
Site Name/Description: WWC-4 / EPH STR-4		
Site Location: Station 140+00R to 157+50R		
USGS quad: 308-NE Nashville West	HUC (12 digit): 051302020303	Lat/Long: 36.060000N -86.840000W
Previous Rainfall (7-days) : 0.10" on March 19, 2015		
Precipitation this Season vs. Normal : very wet wet average dry drought unknown Source of recent & seasonal precip data : CoCoRaHS Data - Nashville Stations		
Watershed Size :	Photos: Yes	Number : #36 and #37
Soil Type(s) / Geology :		
Surrounding Land Use : Urban Highway Corridor / Businesses and Parking Lots / 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, 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) = 16

Justification / Notes :

Secondary Field Indicator Evaluation

A. **Geomorphology** (Subtotal =) 9		Absent	Weak	Moderate	Strong
1. Continuous bed and bank	3	0	1	2	3
2. Sinuous channel	0	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	0	1	2	3
4. Sorting of soil textures or other substrate	2	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	1.5	0	0.5	1	1.5
9. Natural levees	0	0	1	2	3
10. Headcuts	0	0	1	2	3
11. Grade controls	0.5	0	0.5	1	1.5
12. Natural valley or drainageway	0	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	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	1.5	1	0.5	0
17. Sediment on plants or on debris	1.5	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	1	0	0.5	1	1.5
19. Hydric soils in stream bed or sides of channel		No = 0			

C. **Biology** (Subtotal =) 3.5		Absent	Weak	Moderate	Strong
20. Fibrous roots in channel [1]	2	3	2	1	0
21. Rooted plants in channel [1]	1.5	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 = 16

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

Notes :

4. Rock channel with heavy sediment deposits

11. Rock drops

Photos #36 View down-channel and #37 View up-channel

Photos #38 and #39 taken in upper section of WWC (ST. 150+00R to 157+50R)
#38 view down-channel, #39 view up-channel

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

STREAM NAME WWC-4 / EPH STR-4	LOCATION Station 133+00R to 140+00R
STATION # _____ RIVERMILE _____	STREAM CLASS Ephemeral
LAT 36.060000 LONG -86.840000	RIVER BASIN Whites Creek (Cumberland River)
STORET #	AGENCY : TDOT
INVESTIGATORS Dennis Crumby - TDOT	
FORM COMPLETED BY D. Crumby - TDOT	DATE 03/24/2015 TIME 02:12 AM PM — REASON FOR SURVEY Road Widening

Parameters to be evaluated in sampling reach

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/ Available Cover	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE 1	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 ✓1 0
2. Embeddedness	Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment.	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment.
SCORE 2	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 ✓2 1 0
3. Velocity/Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/ depth regime (usually slow-deep).
SCORE 1	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 ✓1 0
4. Sediment Deposition	Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE 1	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 ✓1 0
5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE 1	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 ✓1 0

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

Parameters to be evaluated broader than sampling reach

Habitat Parameter	Condition Category			
	Optimal	**Suboptimal**	**Marginal**	**Poor**
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE 2	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 ✓2 1 0
7. Frequency of Riffles (or bends)	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.
SCORE 1	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 ✓1 0
8. Bank Stability (score each bank) Note: determine left or right side by facing downstream.	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE 7 (LB)	Left Bank 10 9	8 ✓7 6	5 4 3	2 1 0
SCORE 7 (RB)	Right Bank 10 9	8 ✓7 6	5 4 3	2 1 0
9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE 2 (LB)	Left Bank 10 9	8 7 6	5 4 3	✓2 1 0
SCORE 3 (RB)	Right Bank 10 9	8 7 6	5 4 ✓3	2 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
SCORE 1 (LB)	Left Bank 10 9	8 7 6	5 4 3	2 ✓1 0
SCORE 1 (RB)	Right Bank 10 9	8 7 6	5 4 3	2 ✓1 0

Total Score 30

Ecology Field Data Sheet: **Water Resources**

Project: Davidson Co. SR-112, From SR-12 to SR-155 PIN 103764.00

Date of survey: 3/25/2015 **Biologist:** D. Crumby **Affiliation:** TDOT - ED

1-Station: from plans	179+40R (Outside Proposed R.O.W.)
2-Map label and name	STR-2 (Intermittent Stream)
3-Latitude/Longitude	36.217872N -86.836786W
4-Potential impact	No Impact
5-Feature description:	
what is it	Intermittent Stream
blue-line on topo? (y/n)	No ✓ Yes
defined channel (y/n)	No Yes ✓
straight or meandering	Straight Meandering ✓
channel bottom width	1 ft
top of bank width	2 ft
bank height and slope ratio	6 inch.
avg. gradient of stream (%)	
substratum	soil
riffle/run/pool	No, very slow, seeping flow
width of buffer zone	LDB: 20 ft RDB: 30 ft
water flow	Yes
water depth	1 inch
water width	6-12 inches
general water quality	Clear - good
OHWM indicators	No
groundwater connection	Yes, seep source
bank stability: LDB, RDB	LDB: Stable ✓ Eroding Undercutting Slumping/Sloughing Roots Exposed RDB: Stable ✓ Eroding Undercutting Slumping/Sloughing Roots Exposed
dominant species: LDB, RDB	LDB: blackberry, black willow, RDB: blackberry, black willow
overhead canopy (%)	50%
benthos	isopods
fish	No
algae or other aquatic life	Hydrophytic vegetation - black willow, crayfish
habitat assessment score	N/A - feature not affected by project
photo number (s)	# No Photos - STR-2 unaffected by project
rainfall information	CoCoRaHS Data - Nashville Stations 3/24 - 0.00" 3/23 - 0.00" 3/22 - 0.0" 3/21 - Trace 3/20 - Trace 3/19 - 0.10"
6-HUC code & name (12-digit)	051302020303 Whites Creek
7-Confirmed by:	NA
8-Mitigation	No ✓ Yes *(include on Mitigation Form)*
9-ETW	No ✓ Yes
10-303 (d) List	No ✓ Yes Habitat Siltation Other
11-Assessed	No ✓ Yes
12-Notes Estimate size (acres) of lake or pond if applicable; provide any pertinent information needed to better describe feature; indicate if hydrologic determination form was completed.	*Feature will not be affected by project.

Ecology Field Data Sheet: **Water Resources**

Project: Davidson Co. SR-112, From SR-12 to SR-155 PIN 103764.00

Date of survey: 3/25/2015 **Biologist:** D. Crumby **Affiliation:** TDOT - ED

1-Station: from plans	179+90
2-Map label and name	WWC-5 / EPH STR-5
3-Latitude/Longitude	36.217917N -86.836958W
4-Potential impact	Possible pipe extension
5-Feature description:	
what is it	Conveyance
blue-line on topo? (y/n)	No ☑ Yes ☐
defined channel (y/n)	No ☑ Yes ☐
straight or meandering	Straight ☑ Meandering ☐
channel bottom width	not defined enough to obtain a width
top of bank width	NA
bank height and slope ratio	NA
avg. gradient of stream (%)	
substratum	Grass, sediment, vegetation,
riffle/run/pool	NA
width of buffer zone	LDB: 20 ft RDB: 30 ft
water flow	No
water depth	NA
water width	NA
general water quality	NA
OHWM indicators	No
groundwater connection	None apparent
bank stability: LDB, RDB	LDB: Stable ☑ Eroding ☐ Undercutting ☐ Slumping/Sloughing ☐ Roots Exposed ☐ RDB: Stable ☑ Eroding ☐ Undercutting ☐ Slumping/Sloughing ☐ Roots Exposed ☐
dominant species: LDB, RDB	LDB: upland grasses RDB: upland grasses
overhead canopy (%)	0%
benthos	No
fish	No
algae or other aquatic life	No
habitat assessment score	32
photo number (s)	# 40 view down-gradient towards pipe under SR-112, #41 view down-gradient from existing pipe outlet
rainfall information	CoCoRaHS Data - Nashville Stations 3/24 - 0.0" 3/23 - 0.0" 3/22 - 0.0" 3/21 - Trace 3/20 - Trace 3/19 - 0.10"
6-HUC code & name (12-digit)	051302020303 Whites Creek
7-Confirmed by:	NA
8-Mitigation	No ☑ Yes ☐ *(include on Mitigation Form)*
9-ETW	No ☑ Yes ☐
10-303 (d) List	No ☑ Yes ☐ Habitat ☐ Siltation ☐ Other ☐
11-Assessed	No ☑ Yes ☐
12-Notes Estimate size (acres) of lake or pond if applicable; provide any pertinent information needed to better describe feature; indicate if hydrologic determination form was completed.	

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Davidson	Named Waterbody:	Date/Time: 3/25/2015 8:20 AM
Assessors/Affiliation: Dennis Crumby - TDOT Env. Division		Project ID: SR-112, From SR-12 to SR-155 TDOT PIN 103764.00
Site Name/Description: WWC-5 / EPH STR-5		
Site Location: Station 179+90		
USGS quad: 308-NE Nashville West	HUC (12 digit): 051302020303	Lat/Long: 36.217917N -86.836958W
Previous Rainfall (7-days) : 0.10" on March 19, 2015		
Precipitation this Season vs. Normal : very wet wet average dry drought unknown Source of recent & seasonal precip data : CoCoRaHS Data - Nashville Stations		
Watershed Size :	Photos: Yes	Number : #40 and #41
Soil Type(s) / Geology :		
Surrounding Land Use : Urban Highway Corridor / Businesses and Parking Lots / 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, 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) = 6

Justification / Notes :

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal =) [1]		**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0.5	0	1	2	3
2. Sinuous channel	0	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	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	0	0	1	2	3
11. Grade controls	0	0	0.5	1	1.5
12. Natural valley or drainageway	0	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	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)	1	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]	1.5	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 = 6

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

Notes :

#4 Only mud bottom with light woody and organic debris washed down channel

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

STREAM NAME WWC-5 / EPH STR-5	LOCATION 179+90
STATION # _____ RIVERMILE _____	STREAM CLASS Ephemeral
LAT 36.217917N LONG -86.836958W	RIVER BASIN Whites Creek (Cumberland River)
STORET #	AGENCY : TDOT
INVESTIGATORS Dennis Crumby - TDOT	
FORM COMPLETED BY D. Crumby - TDOT	DATE 03/25/2015 TIME 08:45 AM PM — REASON FOR SURVEY Road Widening

Parameters to be evaluated in sampling reach

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/ Available Cover	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE 1	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 ✓1 0
2. Embeddedness	Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment.	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment.
SCORE 0	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 ✓0
3. Velocity/Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/ depth regime (usually slow-deep).
SCORE 1	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 ✓1 0
4. Sediment Deposition	Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE 0	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 ✓0
5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE 0	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 ✓0

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

Parameters to be evaluated broader than sampling reach

Habitat Parameter	Condition Category			
	Optimal	**Suboptimal**	**Marginal**	**Poor**
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE 5	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 ✓ 4 3 2 1 0
7. Frequency of Riffles (or bends)	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.
SCORE 1	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 ✓ 0
8. Bank Stability (score each bank) Note: determine left or right side by facing downstream.	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE 9 (LB)	Left Bank 10 ✓9	8 7 6	5 4 3	2 1 0
SCORE 9 (RB)	Right Bank 10 ✓9	8 7 6	5 4 3	2 1 0
9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE 2 (LB)	Left Bank 10 9	8 7 6	5 4 3	2 ✓1 0
SCORE 2 (RB)	Right Bank 10 9	8 7 6	5 4 3	2 ✓1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
SCORE 1 (LB)	Left Bank 10 9	8 7 6	5 4 3	2 ✓1 0
SCORE 1 (RB)	Right Bank 10 9	8 7 6	5 4 3	2 ✓1 0

Total Score 32

Ecology Field Data Sheet: **Water Resources**

Project: Davidson Co. SR-112, from SR-12 to SR-155 PIN 103764.00

Date of survey: 3/25/2015 **Biologist:** D. Crumby **Affiliation:** TDOT - ED

1-Station: from plans	192+50R to 197+00R (approx.)
2-Map label and name	STR-4
3-Latitude/Longitude	36.221856N -86.837019W
4-Potential impact	Encapsulation at Fairmeade Road, possible relocation along proposed fill slope of SR-112
5-Feature description:	
what is it	Intermittent Stream
blue-line on topo? (y/n)	No ☐ Yes ☐
defined channel (y/n)	No ☐ Yes ☑
straight or meandering	Straight ☐ Meandering ☑
channel bottom width	2 ft.
top of bank width	3-4 ft.
bank height and slope ratio	1-2 ft.
avg. gradient of stream (%)	
substratum	sediment, gravel, scattered cobble, leaf and woody debris
riffle/run/pool	30/40/30 shallow flow
width of buffer zone	LDB: > 100 ft. RDB: 50 ft.
water flow	Yes
water depth	Up to 3 inch.
water width	1-2 ft.
general water quality	clear, fair
OHWM indicators	minor drift/debris lines
groundwater connection	Yes, seep source near Station 197+00R (approx.). Seep source will not likely be affected by project.
bank stability: LDB, RDB	LDB: Stable ☑ Eroding ☐ Undercutting ☐ Slumping/Sloughing ☐ Roots Exposed ☐ RDB: Stable ☑ Eroding ☐ Undercutting ☐ Slumping/Sloughing ☐ Roots Exposed ☐
dominant species: LDB, RDB	LDB: Bush honeysuckle, hackberry RDB: Bush honeysuckle, hackberry
overhead canopy (%)	40% downstream side of Fairmeade Drive, 100% upstream of Fairmead Drive in wooded plot
benthos	limited isopods and leeches
fish	No
algae or other aquatic life	
habitat assessment score	103
photo number (s)	#44 View Upstream, #45 View Downstream (Photos taken just below junction with WWC-7)
rainfall information	CoCoRaHS Data - Nashville Stations 3/24 - 0.0" 3/23 - 0.0" 3/22 - 0.0" 3/21 - Trace 3/20 - Trace 3/19 - 0.10"
6-HUC code & name (12-digit)	051302020303 (Whites Creek)
7-Confirmed by:	
8-Mitigation	No ☐ Yes ☑ *(include on Mitigation Form)*
9-ETW	No ☑ Yes ☐
10-303 (d) List	No ☑ Yes ☐ Habitat ☐ Siltation ☐ Other ☐
11-Assessed	No ☑ Yes ☐
12-Notes Estimate size (acres) of lake or pond if applicable; provide any pertinent information needed to better describe feature; indicate if hydrologic determination form was completed.	Photo 48, view downstream from outlet of existing pipe under Fairmeade Dr. Station 193+00R

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Davidson	Named Waterbody:	Date/Time: 3/25/2015 10:10AM
Assessors/Affiliation: Dennis Crumby - TDOT Env. Division		Project ID: SR-112, From SR-12 to SR-155 TDOT PIN 103764.00
Site Name/Description: STR-4		
Site Location: Station 192+50R tp 197+00R (Approx.)		
USGS quad: 308-NE Nashville West	HUC (12 digit): 051302020303	Lat/Long: 36.221856 -86.837019
Previous Rainfall (7-days) : 0.10" on March 19, 2015		
Precipitation this Season vs. Normal : very wet wet average dry drought unknown Source of recent & seasonal precip data : CoCoRaHS Data - Nashville Stations		
Watershed Size :	Photos: Yes	Number : #44 and #45
Soil Type(s) / Geology :		
Surrounding Land Use : Urban Highway Corridor / Businesses and Parking Lots / 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, 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 = Intermittent Stream (Has been observed not flowing on previous occasions)

Secondary Indicator Score (if applicable) = 25.5

Justification / Notes :

Secondary Field Indicator Evaluation

A. **Geomorphology** (Subtotal =) 12		Absent	Weak	Moderate	Strong
1. Continuous bed and bank	3	0	1	2	3
2. Sinuous channel	2	0	1	2	3
3. In-channel structure: riffle-pool sequences	1.5	0	1	2	3
4. Sorting of soil textures or other substrate	2	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	0	0	1	2	3
11. Grade controls	0.5	0	0.5	1	1.5
12. Natural valley or drainageway	0	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map		No = 0			

B. **Hydrology** (Subtotal =) 6		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	2.5	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	1	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	1	0	0.5	1	1.5
19. Hydric soils in stream bed or sides of channel		No = 0			

C. **Biology** (Subtotal =) 7.5		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	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	1	0	1	2	3
26. Filamentous algae; periphyton	1.5	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 = 25.5

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

Notes :

#11 Fairly permanent logjam blockage. Stream drops almost 3' at this point

#3 Flow is slight and rock/gravel is not overly abundant, but small riffles exist

#25 Isopods, leeches, scattered individuals

Photos: #44 View downstream #45 View upstream. Photos taken just downstream from junction with WWC-7

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

STREAM NAME STR-4	LOCATION Station 192+50R to 197+00R (Approx.)	
STATION # _____ RIVERMILE _____	STREAM CLASS Intermittent	
LAT 36.221856N LONG -86.837019W	RIVER BASIN Whites Creek (Cumberland River)	
STORET #	AGENCY : TDOT	
INVESTIGATORS Dennis Crumby - TDOT		
FORM COMPLETED BY D. Crumby - TDOT	DATE 03/25/2015 TIME 10:00 (●) AM ( ) PM	REASON FOR SURVEY Road Widening SR-112, From SR-12 to SR-155

	Habitat Parameter	Condition Category			
		Optimal	Suboptimal	Marginal	Poor
Parameters to be evaluated in sampling reach	**1. Epifaunal Substrate/ Available Cover**	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
	SCORE 5	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	✓5 4 3 2 1 0
	2. Embeddedness	Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment.	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment.
	SCORE 8	20 19 18 17 16	15 14 13 12 11	10 9 ✓8 7 6	5 4 3 2 1 0
	3. Velocity/Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/ depth regime (usually slow-deep).
	SCORE 6	20 19 18 17 16	15 14 13 12 11	10 9 8 7 ✓6	5 4 3 2 1 0
	4. Sediment Deposition	Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
	SCORE 5	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	✓5 4 3 2 1 0
	5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
	SCORE 9	20 19 18 17 16	15 14 13 12 11	10 ✓9 8 7 6	5 4 3 2 1 0

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

Parameters to be evaluated broader than sampling reach

Habitat Parameter	Condition Category			
	Optimal	**Suboptimal**	**Marginal**	**Poor**
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE 14	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
7. Frequency of Riffles (or bends)	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.
SCORE 11	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
8. Bank Stability (score each bank) Note: determine left or right side by facing downstream.	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE 8 (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE 8 (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE 8 (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE 8 (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
SCORE 8 (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE 5 (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0

Total Score 103

Ecology Field Data Sheet: **Water Resources**

Project: Davidson Co. SR-112, from SR-12 to SR-155 PIN 103764.00

Date of survey: 3/25/2015 **Biologist:** D. Crumby **Affiliation:** TDOT - ED

1-Station: from plans	192+75R to 193+50L
2-Map label and name	WWC-6 / EPH STR-6
3-Latitude/Longitude	36.221506N -86.837475
4-Potential impact	Encapsulation
5-Feature description:	
what is it	Conveyance
blue-line on topo? (y/n)	No ☑ Yes ☐
defined channel (y/n)	No ☐ Yes ☑
straight or meandering	Straight ☑ Meandering ☐
channel bottom width	2-3'
top of bank width	2-3'
bank height and slope ratio	Upstream of pipe, approx. 6 inch. Downtream of pipe, up to 1 ft.
avg. gradient of stream (%)	
substratum	Gravel, sediment,*garbage, BIG garbage.
riffle/run/pool	NA
width of buffer zone	LDB: 5 ft. RDB: > 10m
water flow	No
water depth	NA
water width	NA
general water quality	NA
OHWM indicators	Small drift lines, gravel accumulations
groundwater connection	None apparent
bank stability: LDB, RDB	LDB: Stable ☑ Eroding ☐ Undercutting ☐ Slumping/Sloughing ☐ Roots Exposed ☐ RDB: Stable ☑ Eroding ☐ Undercutting ☐ Slumping/Sloughing ☐ Roots Exposed ☐
dominant species: LDB, RDB	LDB: Up-channel from pipe - No canopy. No canopy down-channel from pipe RDB: Up-channel from pipe - bush honeysuckle, osage orange, cedar, box elder. No canopy down-channel from pipe.
overhead canopy (%)	Up-channel side of pipe - 30%. Down channel side of pipe - no canopy
benthos	NA
fish	NA
algae or other aquatic life	NA
habitat assessment score	
photo number (s)	42 and 43, both on up-channel side of pipe. Both are views down the channel toward the pipe inlet.
rainfall information	CoCoRaHS Data - Nashville Stations 3/24 - 0.0" 3/23 - 0.0" 3/22 - 0.0" 3/21 - Trace 3/20 - Trace 3/19 - 0.10"
6-HUC code & name (12-digit)	051302020303 (Whites Creek)
7-Confirmed by:	NA
8-Mitigation	No ☑ Yes ☐ *(include on Mitigation Form)*
9-ETW	No ☑ Yes ☐
10-303 (d) List	No ☑ Yes ☐ Habitat ☐ Siltation ☐ Other ☐
11-Assessed	No ☑ Yes ☐
12-Notes Estimate size (acres) of lake or pond if applicable; provide any pertinent information needed to better describe feature; indicate if hydrologic determination form was completed.	

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Davidson	Named Waterbody:	Date/Time: 3/25/2015 9:15 AM
Assessors/Affiliation: Dennis Crumby - TDOT Env. Division		Project ID: SR-112, From SR-12 to SR-155 TDOT PIN 103764.00
Site Name/Description: WWC-6 / EPH STR-6		
Site Location: Station 192+75R to 193+50L		
USGS quad: 308-NE Nashville West	HUC (12 digit): 051302020303	Lat/Long: 36.221506N -86.837475
Previous Rainfall (7-days) : 0.10" on March 19, 2015		
Precipitation this Season vs. Normal : very wet wet average dry drought unknown Source of recent & seasonal precip data : CoCoRaHS Data - Nashville Stations		
Watershed Size :	Photos: Yes	Number : #42 and #43
Soil Type(s) / Geology :		
Surrounding Land Use : Urban Highway Corridor / Businesses and Parking Lots / 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, 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) = 6

Justification / Notes :

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal =) 2		**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	1.5	0	1	2	3
2. Sinuous channel	0	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	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	0	0	1	2	3
7. Braided channel	0	0	1	2	3
8. Recent alluvial deposits	0	0	0.5	1	1.5
9. Natural levees	0	0	1	2	3
10. Headcuts	0	0	1	2	3
11. Grade controls	0	0	0.5	1	1.5
12. Natural valley or drainageway	0	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map		No = 0			

B. Hydrology (Subtotal =) 2		**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)	0.5	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)	1	0	0.5	1	1.5
19. Hydric soils in stream bed or sides of channel		No = 0			

C. Biology (Subtotal =) 2		**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	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 = 6

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

Notes : Drains from grass swale in front yard of residence. Some bed and bank as gradient steepens near entrance to pipe.

*Large pile of household garbage in channel, approx. 10' up channel from the pipe entrance.

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

STREAM NAME WWC-6 / EPH STR-6	LOCATION Station 192+75R to 193+50L
STATION #_____ RIVERMILE_____	STREAM CLASS Ephemeral
LAT _____ LONG _____	RIVER BASIN Whites Creek (Cumberland River)
STORET #	AGENCY : TDOT
INVESTIGATORS Dennis Crumby - TDOT	
FORM COMPLETED BY D. Crumby - TDOT	DATE 03/25/2015 TIME 09:27 AM PM
REASON FOR SURVEY Road Widening - SR-112, From SR-12 to SR-155	

Parameters to be evaluated in sampling reach

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/ Available Cover	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE 1	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 ✓1 0
2. Embeddedness	Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment.	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment.
SCORE 0	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 ✓0
3. Velocity/Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/ depth regime (usually slow-deep).
SCORE 1	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 ✓1 0
4. Sediment Deposition	Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE 0	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 ✓0
5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE 0	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 ✓0

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

Parameters to be evaluated broader than sampling reach

Habitat Parameter	Condition Category			
	Optimal	**Suboptimal**	**Marginal**	**Poor**
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE 2	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 ✓2 1 0
7. Frequency of Riffles (or bends)	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.
SCORE 1	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 ✓1 0
8. Bank Stability (score each bank) Note: determine left or right side by facing downstream.	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE 9 (LB)	Left Bank 10 ✓9	8 7 6	5 4 3	2 1 0
SCORE 9 (RB)	Right Bank 10 ✓9	8 7 6	5 4 3	2 1 0
9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE 3 (LB)	Left Bank 10 9	8 7 6	5 4 ✓3	2 1 0
SCORE 3 (RB)	Right Bank 10 9	8 7 6	5 4 ✓3	2 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
SCORE 1 (LB)	Left Bank 10 9	8 7 6	5 4 3	2 ✓1 0
SCORE 1 (RB)	Right Bank 10 9	8 7 6	5 4 3	2 ✓1 0

Total Score 31

Ecology Field Data Sheet: **Water Resources**

Project: Davidson Co. SR-112, From SR-12 to SR-155 PIN 103764

Date of survey: 3/25/2015 **Biologist:** D. Crumby **Affiliation:** TDOT - ED

1-Station: from plans	196+00R (approx.) to 201+00R
2-Map label and name	WWC-7 / EPH STR-7
3-Latitude/Longitude	36.222364N -86.837644W
4-Potential impact	Fill/Relocation
5-Feature description:	
what is it	Roadside Conveyance
blue-line on topo? (y/n)	No ☑ Yes ☐
defined channel (y/n)	No ☐ Yes ☑
straight or meandering	Straight ☑ Meandering ☐
channel bottom width	1-2 ft.
top of bank width	2-3 ft.
bank height and slope ratio	3-6" in roadside section. Heavily eroding near Station 198+00, as channel turns away from roadside, up to 3-4 ft deep
avg. gradient of stream (%)	
substratum	Soil and grass/riprap; Exposed dirt and rock in eroding section
riffle/run/pool	NA
width of buffer zone	LDB: > 100 feet RDB: 0 in roadside ditch section, 80% in forested section
water flow	No
water depth	NA
water width	NA
general water quality	NA
OHWM indicators	No
groundwater connection	None apparent
bank stability: LDB, RDB	LDB: Stable ☐ Eroding ☑ Undercutting ☐ Slumping/Sloughing ☐ Roots Exposed ☐ RDB: Stable ☐ Eroding ☑ Undercutting ☐ Slumping/Sloughing ☐ Roots Exposed ☐
dominant species: LDB, RDB	LDB: Roadside section bush honeysuckle, goldenrod, redbud, and hackberry RDB: Roadside section mowed fescue,
overhead canopy (%)	25 to 50% from 196+00 to 201+00, wooded section is 100%
benthos	NA
fish	NA
algae or other aquatic life	NA
habitat assessment score	35
photo number (s)	#46 view up channel in roadside section; #47 view down channel in roadside section, at location of heavily eroding area.
rainfall information	CoCoRaHS Data - Nashville Stations 3/24 - 0.0" 3/23 - 0.0" 3/22 - 0.0" 3/21 - Trace 3/20 - Trace 3/19 - 0.10"
6-HUC code & name (12-digit)	051302020303 (Whites Creek)
7-Confirmed by:	
8-Mitigation	No ☐ Yes ☐ *(include on Mitigation Form)*
9-ETW	No ☑ Yes ☐
10-303 (d) List	No ☑ Yes ☐ Habitat ☐ Siltation ☐ Other ☐
11-Assessed	No ☑ Yes ☐
12-Notes Estimate size (acres) of lake or pond if applicable; provide any pertinent information needed to better describe feature; indicate if hydrologic determination form was completed.	Conveyance runs southward along SR-112 before turning away from the road and entering a heavily eroded channel. Near Station 196+00R, WWC-7 runs into the channel of STR-4, an intermittent stream.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Davidson	Named Waterbody:	Date/Time: 3/25/2015 10:25 AM
Assessors/Affiliation: Dennis Crumby - TDOT Env. Division		Project ID: SR-112, From SR-12 to SR-155 TDOT PIN 103764.00
Site Name/Description: WWC-7 / EPH STR-7		
Site Location:		
USGS quad:	HUC (12 digit):	Lat/Long: 36.222364N -86.837644W
Previous Rainfall (7-days) : 0.10" on March 19, 2015		
Precipitation this Season vs. Normal : very wet wet average dry drought unknown Source of recent & seasonal precip data : CoCoRaHS Data - Nashville Stations		
Watershed Size :	Photos: Yes	Number : #46 & #47
Soil Type(s) / Geology :		
Surrounding Land Use : Urban Highway Corridor / Businesses and Parking Lots / 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, 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

Justification / Notes :

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal =) 8		**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	3	0	1	2	3
2. Sinuous channel	2	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	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	0.5	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	0.5	0	1	2	3
11. Grade controls	0.5	0	0.5	1	1.5
12. Natural valley or drainageway	0	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	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	1	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	1	0	0.5	1	1.5
19. Hydric soils in stream bed or sides of channel		No = 0			

C. Biology (Subtotal =) 1.5		**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1]	1	3	2	1	0
21. Rooted plants in channel [1]	0.5	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 = 13

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

Notes :

#11 One rock jumble appears to be stable, long term grade control

#10 Headcut forming where channel turns away from roadway towards the wooded section

#20 Upper section predominately

#21 Upper section of WWC-7 along SR-112 is heavily grassed (in channel)

Photo #46 - View up-channel

Photo #47 - View down-channel

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

STREAM NAME WWC-7 / EPH STR-7	LOCATION 196+00R (Approx.) to 201+00R
STATION # _____ RIVERMILE _____	STREAM CLASS Ephemeral
LAT 36.222364N LONG -86.837644W	RIVER BASIN Whites Creek (Cumberland River)
STORET #	AGENCY : TDOT
INVESTIGATORS Dennis Crumby - TDOT	
FORM COMPLETED BY D. Crumby - TDOT	DATE 03/25/2015 TIME 10:40 AM PM
REASON FOR SURVEY Road Widening SR-112, From SR-12 to SR-155	

Parameters to be evaluated in sampling reach	Habitat Parameter	Condition Category: Optimal	Suboptimal	Marginal	Poor
	1. Epifaunal Substrate/ Available Cover	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
	SCORE 0	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 ✓0
	2. Embeddedness	Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment.	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment.
	SCORE 1	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 ✓1 0
	3. Velocity/Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/ depth regime (usually slow-deep).
	SCORE 1	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 ✓1 0
	4. Sediment Deposition	Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
	SCORE 13	20 19 18 17 16	15 14 ✓13 12 11	10 9 8 7 6	5 4 3 2 1 0
	5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
	SCORE 0	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 ✓0

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

Parameters to be evaluated broader than sampling reach

Habitat Parameter	Condition Category			
	Optimal	**Suboptimal**	**Marginal**	**Poor**
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE 6	20 19 18 17 16	15 14 13 12 11	10 9 8 7 ✓6	5 4 3 2 1 0
7. Frequency of Riffles (or bends)	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.
SCORE 1	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 ✓1 0
8. Bank Stability (score each bank) Note: determine left or right side by facing downstream.	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE 2 (LB)	Left Bank 10 9	8 7 6	5 4 3	✓2 1 0
SCORE 2 (RB)	Right Bank 10 9	8 7 6	5 4 3	✓2 1 0
9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE 2 (LB)	Left Bank 10 9	8 7 6	5 4 3	✓2 1 0
SCORE 2 (RB)	Right Bank 10 9	8 7 6	5 4 3	✓2 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
SCORE 6 (LB)	Left Bank 10 9	8 7 ✓6	5 4 3	2 1 0
SCORE 0 (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 ✓0

Total Score 36

Davidson County: SR-12, From SR-155
Photos of Water Resources 3/24-25/2015

	Photo 1: STR-3 Upstream of SR-112, looking downstream towards the entrance to the box culvert. Approx. Station # 99+45
	Photo 2: STR-3 Upstream of SR-112, looking upstream from entrance to box culvert. Approx. Station # 99+45

	Photo 3: STR-3 Downstream of SR-112, looking downstream from box culvert outlet. STR-3 will be unaffected by the project. Approx. Station # 99+45
	Photo 32: WWC-2/EPH STR-2 View looking down-channel at inlet to box culvert under SR-112. Approx. Station # 119+80R
	Photo 33: WWC-2/EPH STR-2 View looking up-channel from box culvert under SR-112. Approx. Station # 119+80R

	Photo 30: WWC-3/EPH STR-3 View looking up channel towards junction with WWC-2/EPH STR-2. Approx. Station # 121+75L
	Photo 31: WWC-3/EPH STR-3 View down-channel from Driveway Crossing at Station 122+25L Approx. Station # 122+40L
	Photo 28: WWC-1/EPH STR-1 View looking up-channel at approximate Station # 130+30R

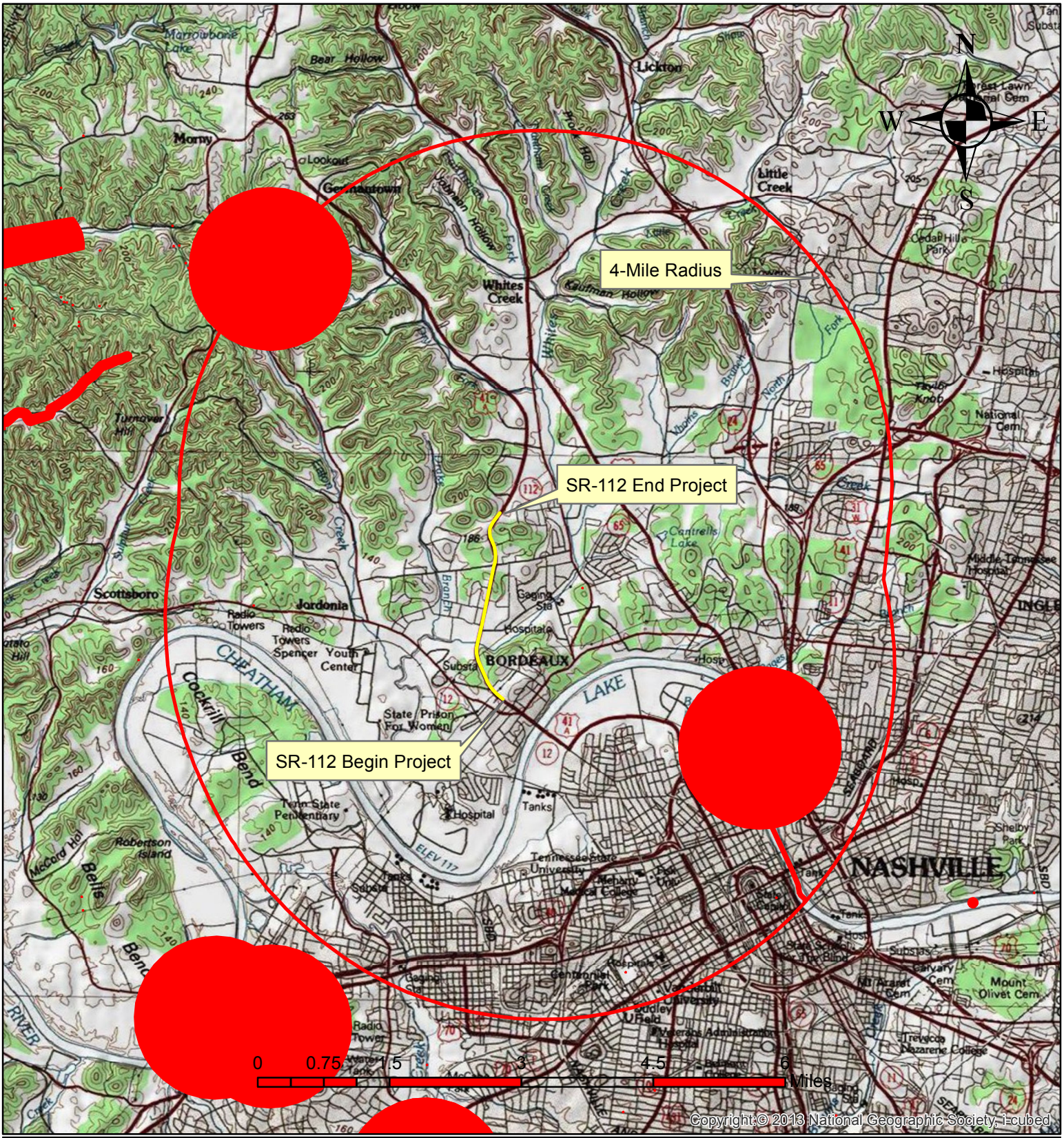
	Photo 29: WWC-1/EPH STR-1 View looking down channel towards STR-1 (Whites Creek). Approximate Station # 130+60R
	Photo 22: STR-1 (Whites Creek) View looking upstream from the SR-112 bridge. Approximate Station # 132+50

	Photo 23: STR-1 (Whites Creek) View looking downstream from the SR-112 bridge. Approx. Station # 132+50
	Photo 36: WWC-4/EPH STR-4 View looking up-channel, just up-channel from junction with Whites Creek. Approx. Station # 133+15R
	Photo 37: WWC-4/EPH STR-4 View looking down-channel towards Whites Creek. Approx. Station # 136+50R

	Photo 40: WWC-5/EPH STR-5 View down-gradient towards entrance to existing pipe under SR-112. Approx. Station # 179+90L
	Photo 41: WWC-5/EPH STR-5 View down-gradient, from outlet of existing pipe under SR-112. Approx. Station # 179+90R
	Photo 48: STR-4 View looking downstream from outlet of existing pipe underneath Fairmeade Drive. Approx. Station # 193+00R

	Photo 42 WWC-6/EPH STR-6 View down-gradient towards inlet of existing pipe under SR-112. Approximate Station # 193+15L
	Photo 43 WWC-6/EPH STR-6 View at inlet of existing pipe underneath SR-112 Approximate Station # 193+00L
	Photo 44 STR-4 View Upstream at Approximate Station # 195+00R

	Photo 45 STR-4 View Downstream at Approximate Station # 195+00
	Photo 46 WWC-7/EPH STR-7 View Up-channel at Approximate Station # 197+20R
	Photo 47 WWC-7/EPH STR-7 View Down-channel at Approximate Station # 198+00R



Davidson County SR-112, From SR-12 to SR-155
Species Records within a 4-Mile Radius of project

All records shown within 4 miles are historic.
No current records shown for listed plants or animals within 4 miles of the proposed project.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Tennessee ES Office
446 Neal Street
Cookeville, Tennessee 38501

June 23, 2015

Mr. Dennis Crumby
Tennessee Department of Transportation
Environmental Planning and Permits
James K. Polk Building, Suite 900
505 Deaderick Street
Nashville, Tennessee 37243-0334

Subject: FWS# 12-I-0527. State Route 112 construction from State Route 12 to State Route 155; PIN# 103764.00, P.E. Number: 19046-1214-14, Davidson County, Tennessee.

Dear Mr. Crumby:

Thank you for your email dated June 4, 2015, transmitting survey results for the proposed construction of State Route (SR) 112 from SR 12 to SR 155 in Davidson County, Tennessee. The Tennessee Department of Transportation (TDOT) has determined that the project is "not likely to adversely affect" the federally endangered Indiana bat (*Myotis sodalis*) or the threatened northern long-eared bat (NLEB) (*Myotis septentrionalis*) based on negative survey results for these species. Personnel of the U.S. Fish and Wildlife Service have reviewed the subject proposal and offer the following comments.

A mist netting survey was performed between May 15 and May 28, 2015, at three sites determined to be suitable netting locations. Efforts resulted in the capture of 10 bats, representing four non-listed species. Due to negative survey results for the Indiana bat and the NLEB, we concur with TDOT's determinations of "not likely to adversely affect" for these species. Unless new information otherwise indicates species use of the area, this survey will be valid until April 1, 2018. Although there is no requirement to implement a winter tree cutting timeframe restriction on this project, we would appreciate consideration given to the removal of trees with a DBH (diameter at breast height) of three inches or greater from October 15 through March 31 to further minimize potential for harm.

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,

Mary E. Jennings
Field Supervisor

From: Rob Todd
To: Jennifer.Thompson@state.tn.us
Date: 2/28/2007 4:04:14 PM
Subject: Re: Davidson Co., SR-112 from SR-12 to SR-155

Jennifer:

Based upon the information that you have provided me, BMP's would be sufficient to minimize impacts to rare species for this project.

Thank you for the opportunity to review and comment.

Robert M. Todd
Tennessee Wildlife Resources Agency
Environmental Services Division
Ellington Agricultural Center
P.O. Box 40747
Nashville, TN 37204
Phone: 615-781-6572
Fax: 615-781-6667
E-mail address: Rob.Todd@state.tn.us
>>> Jennifer Thompson 02/09/07 3:22 PM >>>
Robb,

I have attached project location maps (there are no ROW plans yet), a project description and species map. There were no species within one mile. Please review and respond with your comments. Thank you for your assistance.

Jennifer