



Water Resources Technical Report

STATE HIGHWAY 5 (SH 5)

FROM SOUTH OF FARM-TO-MARKET ROAD
1378 TO SOUTH OF MELISSA ROAD

CSJs: 0047-05-054, etc.
City of McKinney, Collin County
Dallas District

Date: December 2019

The environmental review, consultation, and other actions required by applicable Federal environmental laws for this project are being, or have been, carried-out by TxDOT pursuant to 23 U.S.C. 327 and a Memorandum of Understanding dated December 9, 2019, and executed by FHWA and TxDOT.

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1.0 INTRODUCTION

The Texas Department of Transportation (TxDOT) proposes improvements to State Highway (SH) 5 from south of FM 1378 (Country Club Road) to south of Melissa Road (**Figure 1: Project Location Map**). The project is located in unincorporated Collin County, Texas and the Cities of McKinney, Melissa, and Fairview, and extends for approximately 9.7 miles. Please refer to ECOS WPD I for the complete project description.

2.0 WATER RESOURCES

2.1 Section 404 of the Clean Water Act: Waters of the U.S. Nationwide Permits

The proposed project crosses nine streams and one wetland. These streams consist of Barksdale Creek, two connected tributaries to Wilson Creek, Wilson Creek, five tributaries to East Fork Trinity River, and East Fork Trinity River (**Figure 1**). The identified potential wetland is associated with the southern floodplain of Wilson Creek. The placement of temporary or permanent dredge or fill material into potentially jurisdictional Waters of the U.S. would be authorized under Nationwide Permit (NWP) 14. Pre-Construction Notifications (PCN) would be required for the proposed project.

An analysis of USGS topographic maps, Federal Emergency Management Agency (FEMA) maps, field reconnaissance, and the presence of an ordinary high water mark (OHWM) reveals potentially jurisdictional wetlands and Waters of the U.S. that could be impacted by the proposed project. **Table 1** lists the wetlands and Waters of the U.S. in the proposed project area, the amount of impacts to wetlands that would result from the implementation of proposed improvements, amount of potential impacts to the water bodies that occur within the proposed project area, and the applicable U.S. Army Corps of Engineers (USACE) permit. Stream data forms for the waters listed in **Table 1** are located in **Appendix C**.

Table 1. Summary of Potential Impacts to Waters of the U.S. in Project Area

Crossing No.	Name of Water Body or Other Location Indicator	Approx. OHWM (feet)	Existing Structure	Proposed Work or Structure	Potential Permanent Fill		Potential Temporary Fill		NWP	PCN (Y/N)
					Open Waters (acres and linear feet)	Wetlands or Other Special Aquatic Sites (acres)	Open Waters (acres and linear feet)	Wetlands or Other Special Aquatic Sites (acres)		
S-1	Barksdale Creek (Intermittent)	10	Box culvert	Culvert extension, expansion	0.027 acres, 243.33 linear feet	-	-	-	14	N
S-2a	Tributary to Wilson Creek (Perennial)	4	Box culverts	Bridge construction, pilings, culvert extension	0.071 acres, 628.3 linear feet	-	-	-	14	Y
S-2b	Tributary to Wilson Creek (Intermittent)	4	Box culverts	Culvert expansion	0.042 acres, 153.48 linear feet	-	-	-	14	N
S-3	Wilson Creek (Perennial)	57	Mainlane bridges	Bridge expansion	0.347 acres, 265.3 linear feet	0.154 acres	-	-	14	Y
S-4	Unnamed Tributary to East Fork Trinity River (Intermittent)	19	Box culverts, pipe culverts	Culvert extension, expansion	0.028 acres, 59.65 linear feet	-	-	-	14	N

Table 1. Summary of Potential Impacts to Waters of the U.S. in Project Area

Crossing No.	Name of Water Body or Other Location Indicator	Approx. OHWM (feet)	Existing Structure	Proposed Work or Structure	Potential Permanent Fill		Potential Temporary Fill		NWP	PCN (Y/N)
					Open Waters (acres and linear feet)	Wetlands or Other Special Aquatic Sites (acres)	Open Waters (acres and linear feet)	Wetlands or Other Special Aquatic Sites (acres)		
S-5	Unnamed Tributary to East Fork Trinity River (Intermittent)	36	Box culverts	Culvert extension, expansion	0.068 acres, 99.19 linear feet	-	-	-	14	N
S-6	Unnamed Tributary to East Fork Trinity River (Intermittent)	23	Box culvert	Culvert extension, expansion	0.094 acres, 215.06 linear feet	-	-	-	14	N
S-7	Unnamed Tributary to East Fork Trinity River (Perennial)	25	Box culvert	Culvert extension, expansion	0.074 acres, 122.67 linear feet	-	-	-	14	N
S-8	East Fork Trinity River (Perennial)	42	Mainlane bridge	Northbound bridge addition	0.293 acres, 303.14 linear feet	-	-	-	14	Y
S-9	Unnamed Tributary to East Fork Trinity River (Intermittent)	16	Box culverts, pipe culverts	Culvert extension, expansion	0.077 acres, 404.22 linear feet	-	-	-	14	Y

The purpose of the proposed activity is to widen SH 5 at the water crossings along the length of the project. The impacts of the proposed project to the nine water crossings are presented in **Table 1**. Appropriate measures would be taken to maintain normal downstream flows and minimize flooding. Temporary fills would consist of clean materials and be placed in a manner that would not be eroded by expected high flows. Temporary fills would be removed in their entirety and the affected area returned to pre-construction elevations and revegetated as appropriate. If the project involves stream modification, stream channel modifications, including bank stabilization, would be limited to the minimum necessary to construct or protect the structure and the immediate vicinity of the project. The activity would comply with all general and regional conditions applicable to NWP 14.

PCNs for NWP 14 would be required due to potential impacts from proposed improvements that would occur within Wetland Area 1 and stream crossings S-2a, S-3, S-8, and S-9. No additional PCNs for NWP 14 at the remaining water crossings would be required, since the impacts to identified Waters of the U.S. are less than 0.1 acre and/or 300 linear feet per crossing and no additional wetlands or other special aquatic sites would be impacted.

The activities at water crossings S-1 to S-9 have been identified as single and complete projects as defined in the NWPs because each crossing occurs at a separate and distant location.

2.2 Section 401 of the Clean Water Act: Water Quality Certification

General Condition 25 of the NWP Program requires applicants using NWP 14 to comply with Section 401 of the Clean Water Act (CWA). Compliance with Section 401 requires the use of best management practices (BMPs) to manage water quality on construction sites. General Condition 12 also requires applicants using NWP 14 to use appropriate soil erosion and sedimentation controls. The Storm Water Pollution Prevention Plan (SW3P) would include at least one BMP from the 401 Water Quality Certification Conditions for NWPs as published by the Texas Commission on Environmental Quality (TCEQ). These BMPs would address each of the following categories:

- Category I Erosion Control would be addressed by using temporary vegetation, blankets/matting, permanent seeding/sodding, and stone outlet structures.
- Category II Sedimentation Control would be addressed by installing silt fence, rock berms, and mulch filter socks.
- Category III Post-Construction Total Suspended Solids control would be addressed by installing vegetation lined drainage ditches.

Other approved methods would be substituted if necessary using one of the BMPs from the same category.

2.3 Executive Order 11990, Wetlands

Pursuant to Executive Order 11990 (Protection of Wetlands) and Section 404 of the CWA, a field reconnaissance was conducted to identify Waters of the U.S., including wetlands, within the proposed project limits on June 18 and 19, 2019. During the field investigation, one potential wetland area was identified within the project area within the floodplain region associated with Wilson Creek. Wetland Area 1 at Wilson Creek is described as a depressional forested wetland, with minor prior vegetation disturbance due to gas transmission line corridors. Two sample points, WL-1 and WL-2, were collected within Wetland Area 1. Primary hydrology indicators observed included: surface water, high water table, saturation, drift deposits, and water-stained leaves. Secondary hydrology indicators included: drainage patterns and crayfish burrows. The majority of the vegetation observed was facultative, with species in the potential wetland area consisting of american elm (*Ulmus Americana*), boxelder maple (*Acer negundo*), giant ragweed (*Ambrosia trifida*), hackberry (*Celtis laevigata*), virginia wildrye (*Elymus virginicus*), and roundleaf greenbrier (*Smilax rotundifolia*). The soil sample at WL-1 was recorded to have a value of 3 and a chroma of 1 throughout the 12-inch sample, which meets the hydric condition for Thick Dark Surface (A12). The soil sample at WL-2 was recorded to have a value of 3 and a chroma of 2 throughout the 8-inch sample, with a restrictive layer of bedrock observed during sampling at greater than 8 inches. This meets problematic hydric condition for Very Shallow Dark Surface (TF12).

Appendix C includes the associated wetland determination data forms. Wetland Area 1 is approximately 2.10 acres and occurs within the project area. However, based upon the current schematic design, approximately 0.154 acres of the wetland area lies within the construction footprint. Therefore, an NWP 14 with a PCN would be required due to anticipated impacts. In addition, a PCN would be required since wetlands are considered special aquatic sites.

2.4 Rivers and Harbors Act of 1899, Section 10

This project does not involve work in or over a navigable water of the U.S., therefore Section 10 of the Rivers and Harbors Act does not apply.

2.5 Section 303(d) of the Clean Water Act

Runoff from this project would discharge directly into or within five linear miles upstream of streams that are listed as threatened/impaired on the 2014 303(d) list. See **Table 2** for a description and location of the project impacts.

Table 2. 303 (d) Threatened and Impaired Waters

Segment ID	Segment Name	Description	Constituent of Concern	Directly Into or Within 5 Steam Miles Upstream	Will Project Contribute to Constitute of Concern
0821C_01	Wilson Creek	From the confluence with Lake Lavon in Collin County up to West FM 455 (NHD RC 12030106000086), just east of Celina, Collin Co., TX.	Bacteria	Yes	No
0821D_01	East Fork Trinity River above Lake Lavon	A portion of the East Fork Trinity River extending from the confluence with Lake Lavon (segment 0821) to the upper end of the water body (NHD RC 12030106000074) in Grayson Co., TX.	Bacteria	Yes	No

2.6 Section 402 of the Clean Water Act: Texas Pollution Discharge Elimination System, Construction General Permit

The project would include five or more acres of earth disturbance. TxDOT would comply with TCEQ's Texas Pollutant Discharge Elimination System Construction General Permit. A SW3P would be implemented, and a construction site notice would be posted on the construction site. A Notice of Intent would be required and submitted to TCEQ.

2.7 Section 402 of the Clean Water Act: Texas Pollution Discharge Elimination System, Municipal Separate Storm Sewer System

Sections of the proposed project are located within the boundaries of the City of Melissa, City of McKinney, and Collin County (Phase II) Municipal Separate Storm Sewer Systems (MS4) and would comply with the applicable MS4 requirements.

2.8 Floodplains

Collin County is a participant in the National Flood Insurance Program. The study area is located on Flood Insurance Rate Map, Map Numbers 48085C0270K dated June 7, 2017; -0290J dated June 2, 2009; -0280J dated June 2, 2009; and -0165J dated June 2, 2009. Crossings 2a and 2b - tributaries to Wilson Creek are located in Zone A. Zone A is the approximate 100-year floodplain for which base flood elevations have not been determined. Crossings 3 and 8 – Wilson Creek and East Fork Trinity are located in Zone AE. Zone AE is the approximate 100-year floodplain for which the base flood elevations have been determined. The 100-year floodplain is identified on **Figure 4**.

The hydraulic design for this project would be in accordance with current FHWA and TxDOT design policies. The facility would permit the conveyance of the 100-year flood, inundation of the roadway being acceptable, without causing significant damage to the facility, stream or other property. The proposed project would not increase the base flood elevation to a level that would violate applicable floodplain regulations and ordinances. Coordination with the local Floodplain Administrator would be required.

2.9 Trinity River Corridor Development Criteria

The project is not within the Trinity River Corridor Development Regulatory Zone; therefore, a Corridor Development Certificate permit would not be required.

2.10 General Bridge Act/Section 9 of the Rivers and Harbors Act

This project does not involve work in or over a navigable water of the U.S., therefore Section 9 of the Rivers and Harbors Act does not apply.

2.11 Groundwater

The proposed project is located in the Trinity River Basin (Hydrologic Unit Code 12030106) and the Trinity Aquifer. Registered water wells were not identified within the proposed project.

2.12 Wild and Scenic Rivers

The proposed project would not impact any present, proposed, or potential unit of the National Wild and Scenic Rivers System.

2.13 Edwards Aquifer Recharge Zone

The project is not located within the Edwards Aquifer Recharge or Contributing Zone; therefore no coordination would be required.

2.14 Coastal Barrier Resources/Coastal Zone Management

The Coastal Zone Management Program, approved by NOAA in 1996, is administered by the Texas General Land Office in conjunction with the Coastal Coordination Advisory Committee. The project area is not located within a coastal zone boundary area or coastal barrier/system unit; therefore, no coordination with the Texas General Land Office or U.S. Fish and Wildlife would be required.

2.15 International Boundary and Water Commission

The project and proposed improvements do not cross or encroach upon the floodplains of International Boundary and Water Commission (IBWC) flood control projects or ROW; therefore no coordination or licensing with the IBWC would be required.

Appendix A: Figures

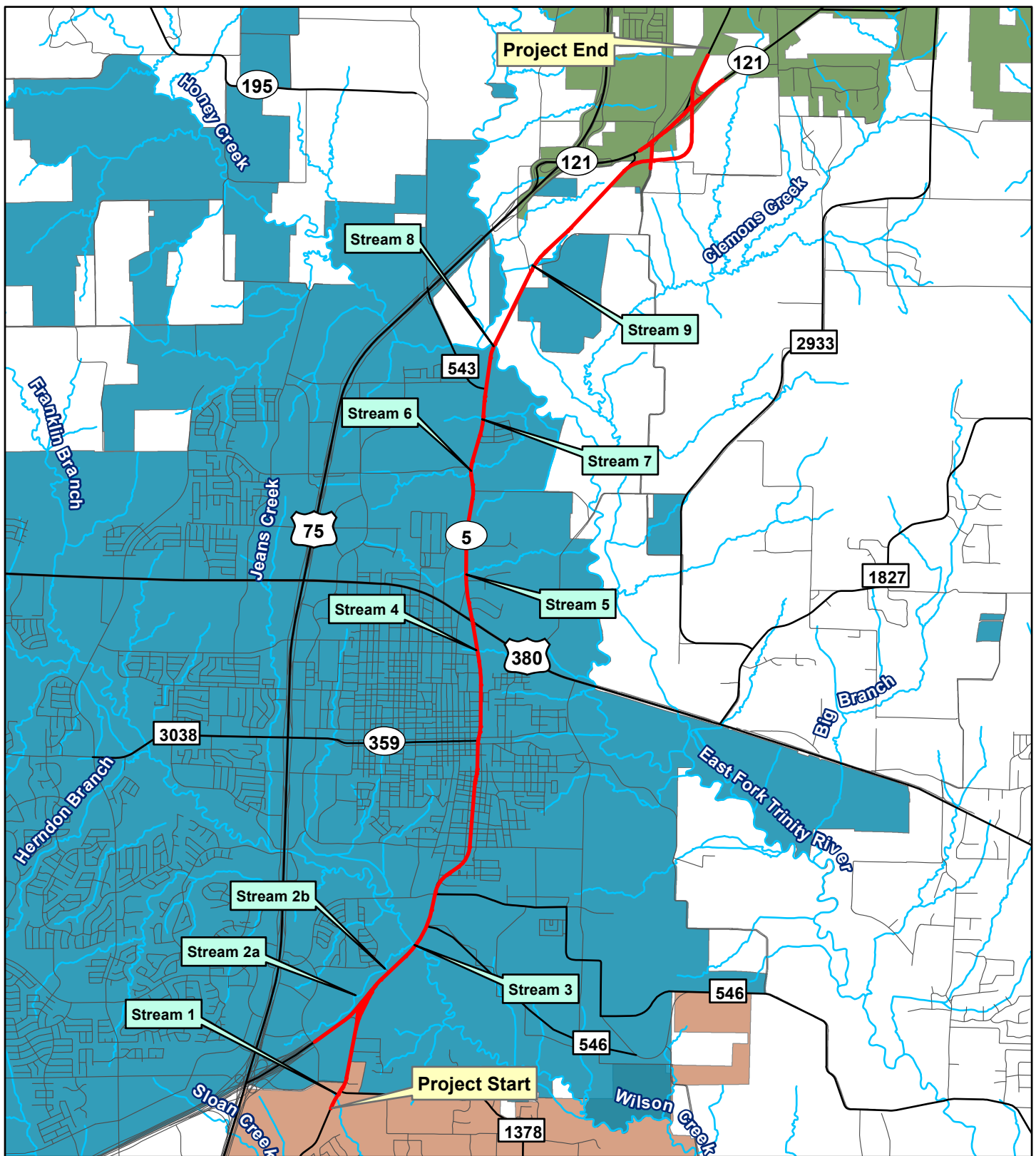
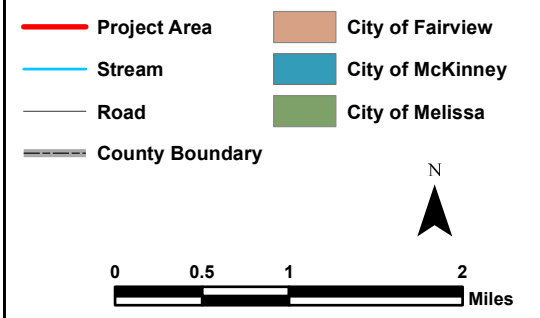


Figure 1
Project Location Map

SH 5
South of FM 1378
to South of Melissa Road

Collin County, Texas



Sources: USGS Orthophoto Quarter Quad Imagery, Collin County GIS database, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), Mapmy India, OpenStreetMap contributors, and the GIS User Community, 2015.

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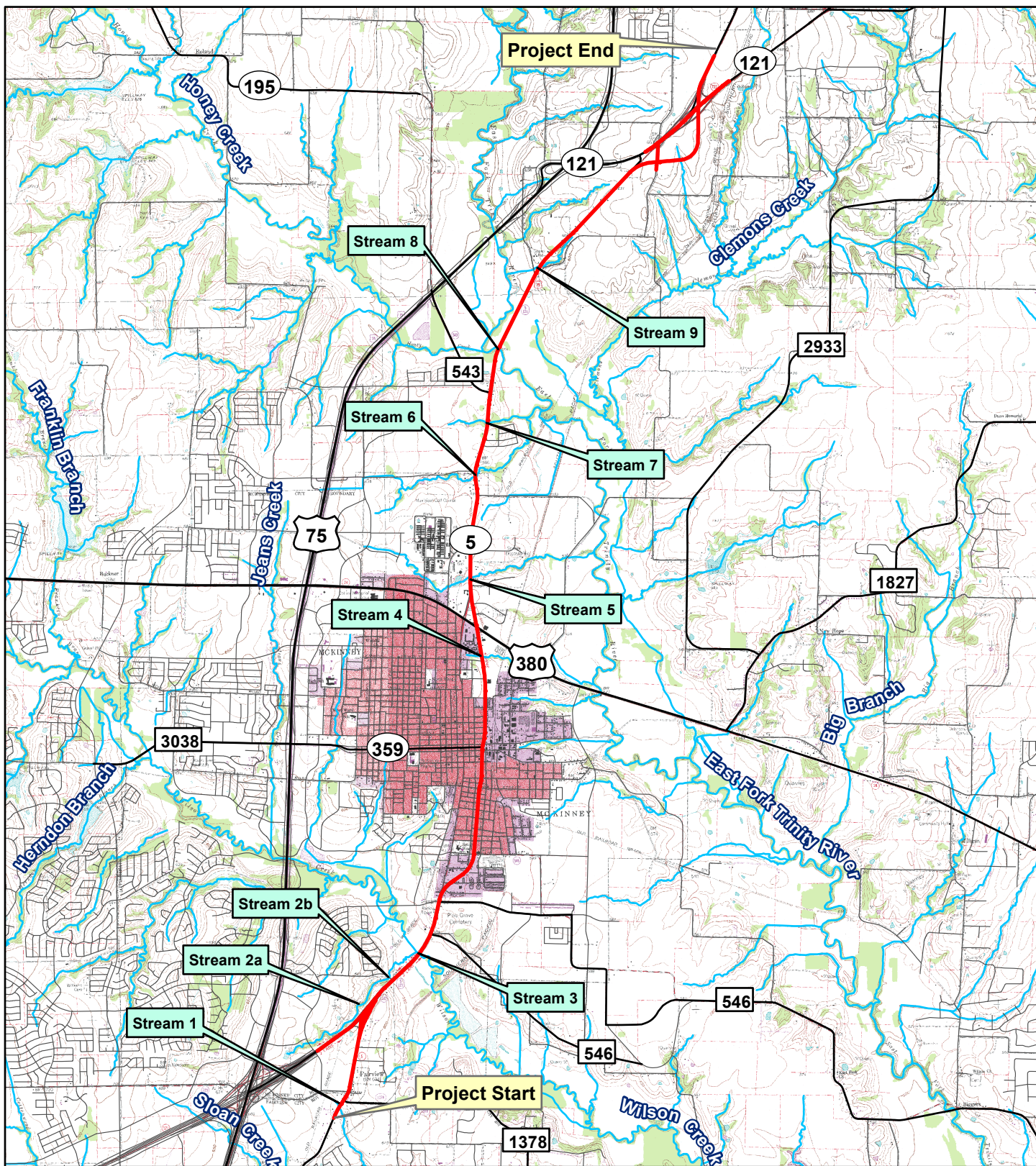
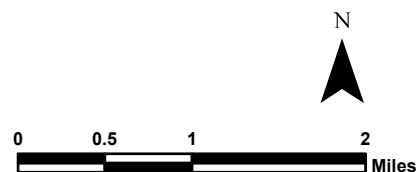


Figure 2
USGS Topographic Map

SH 5
South of FM 1378
to South of Melissa Road
Collin County, Texas

— Project Area — County Boundary
— Stream — Road



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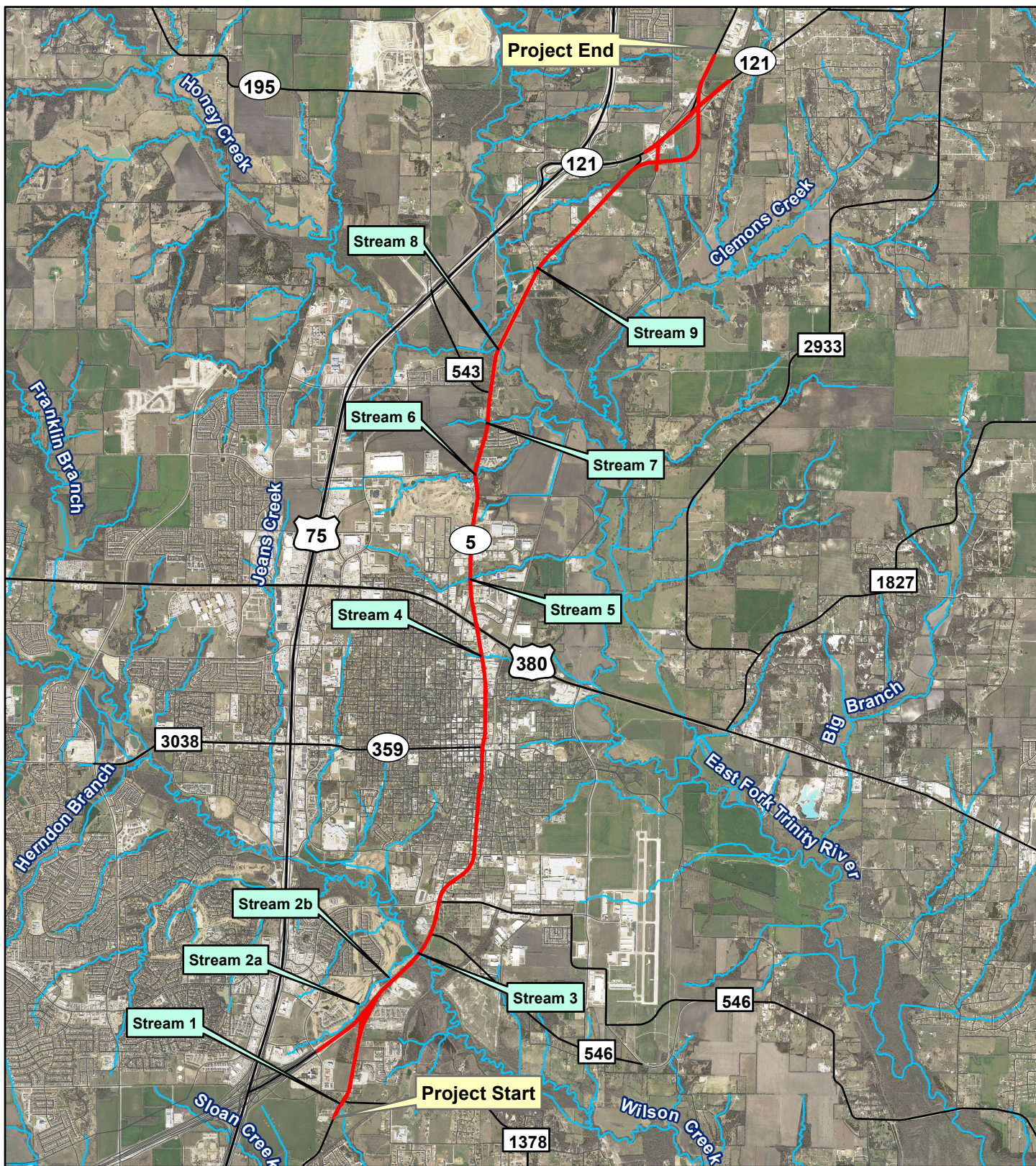
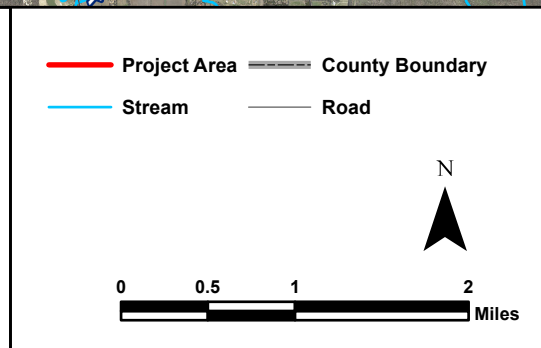


Figure 3
Aerial Map

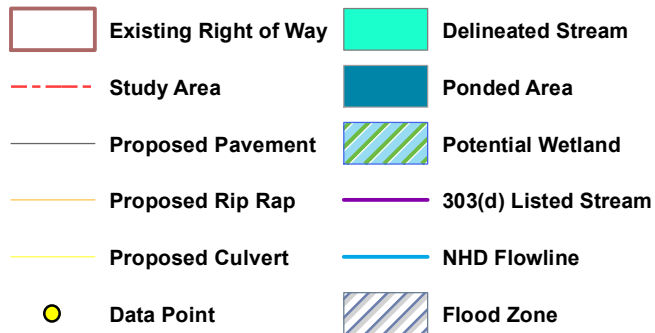
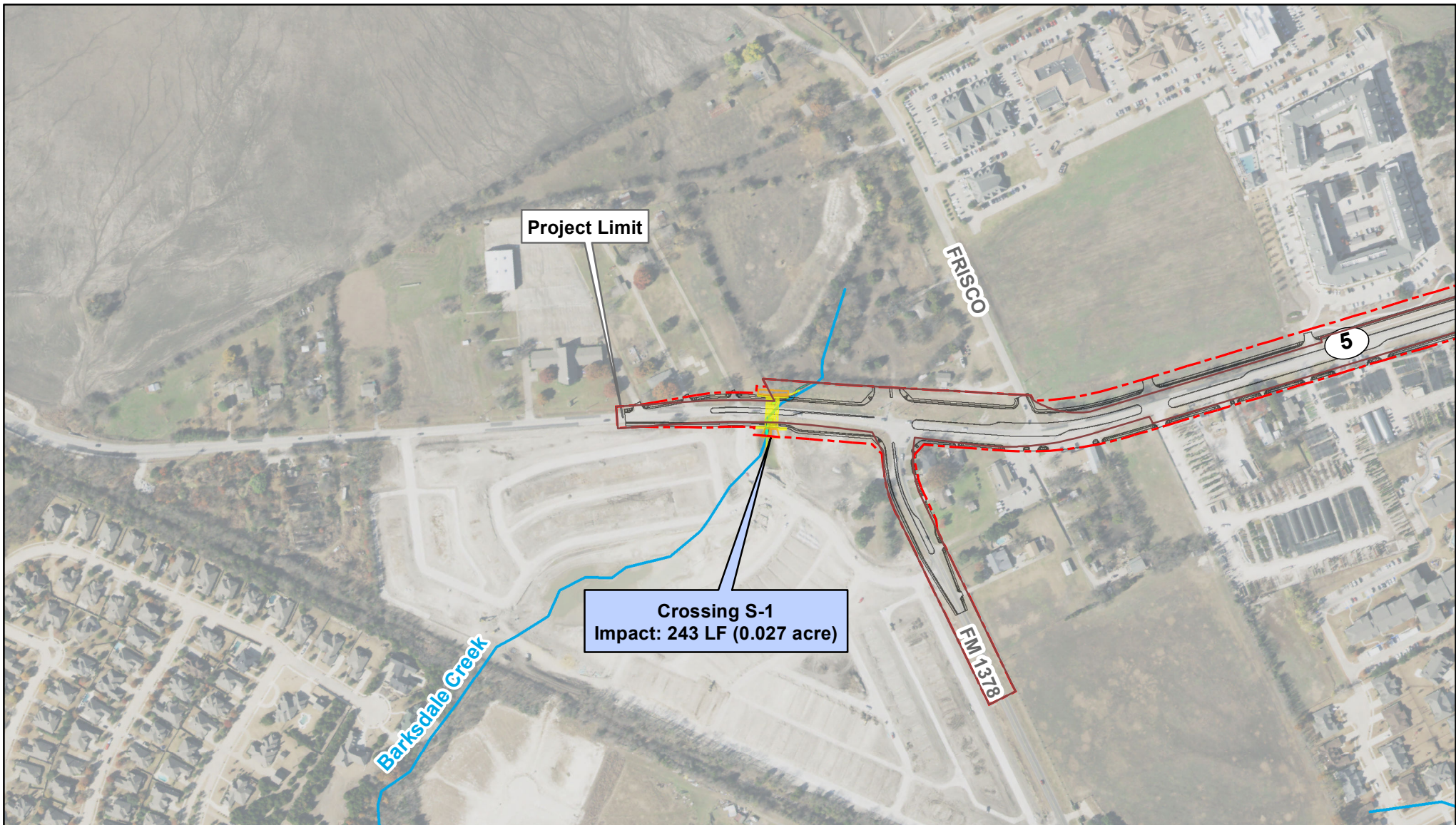
SH 5
South of FM 1378
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Collin County, Texas



Sources: 2015 Texas TOP Imagery, Collin County GIS database, TNIRIS, TxDOT, and USGS NHD
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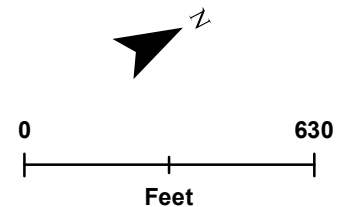


Figure 4
Wetland and Waters of the U.S. Map
(Map 1 of 22)

SH 5
South of FM 1378
to South of Melissa Road
CSJ: 0047-05-054, etc.
Collin County, Texas

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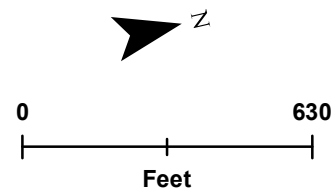
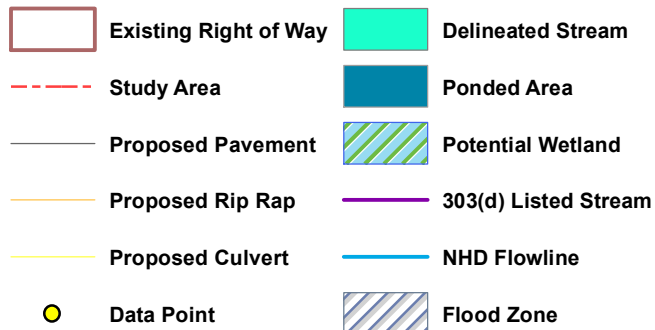
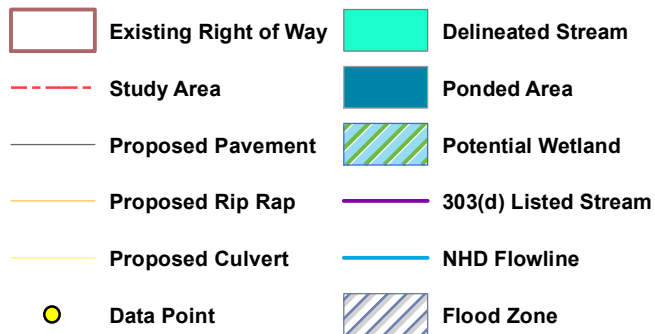
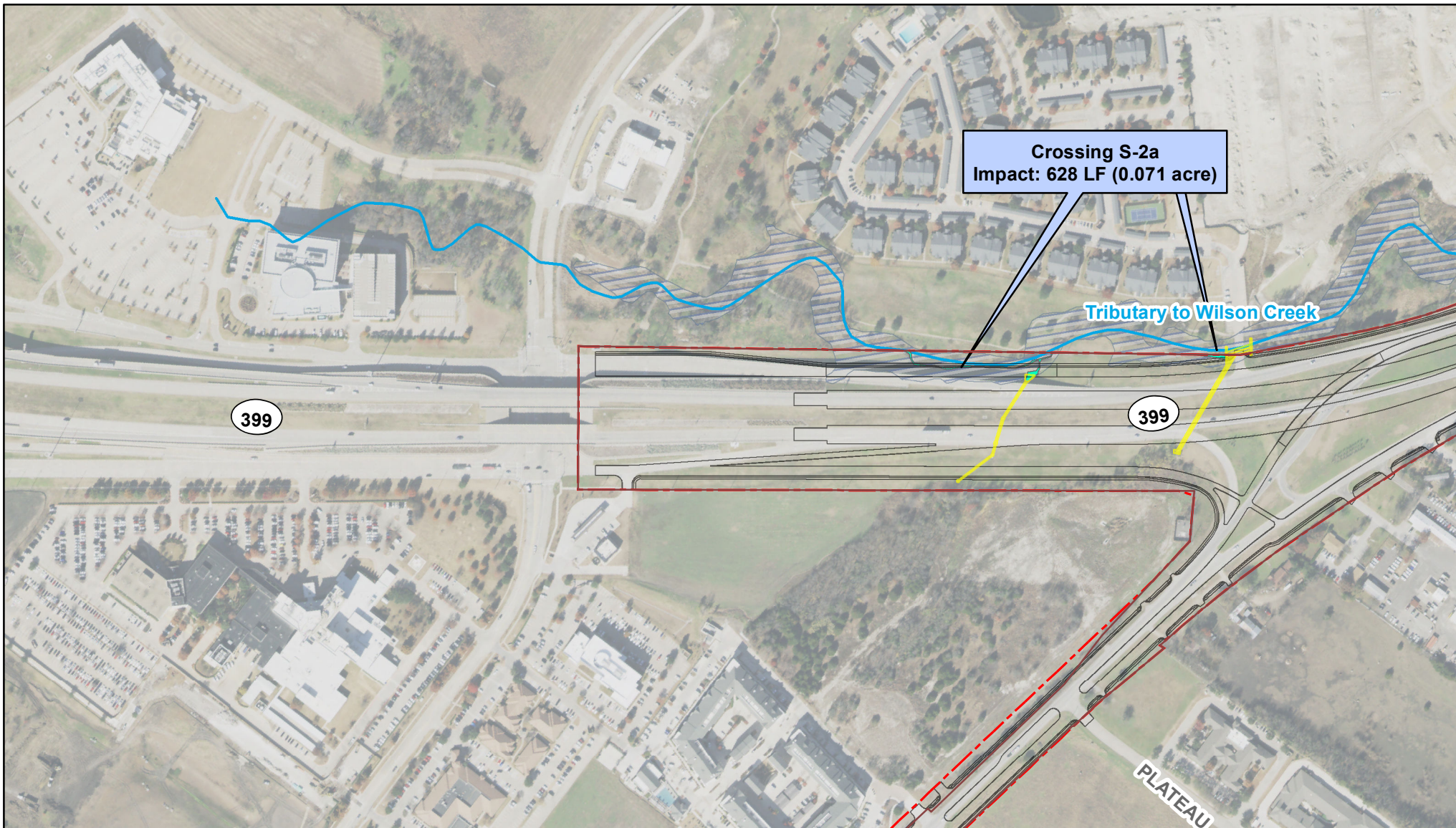


Figure 4
Wetland and Waters of the U.S. Map
 (Map 2 of 22)

SH 5
South of FM 1378
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Collin County, Texas

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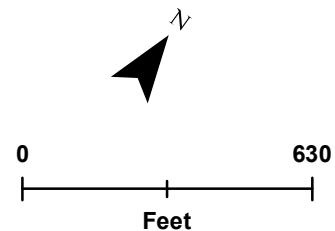
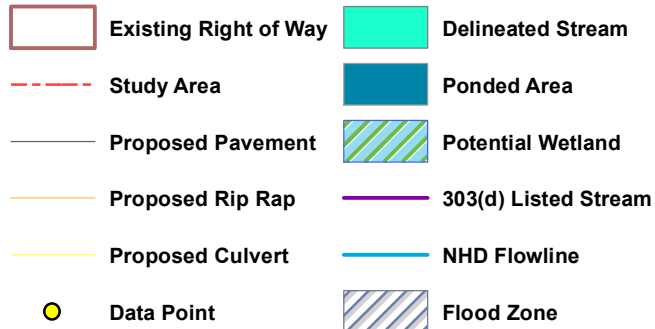
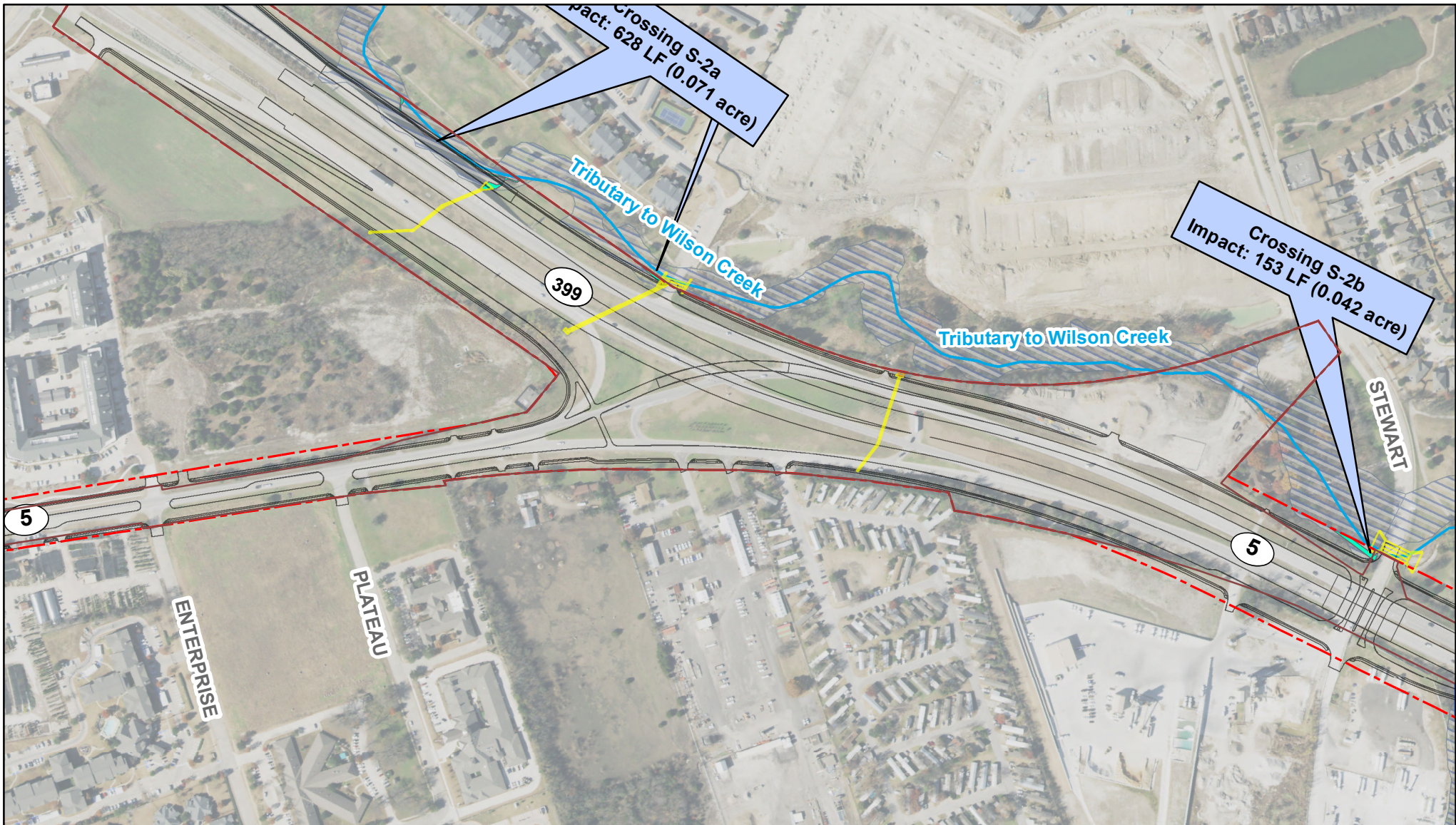


Figure 4
Wetland and Waters of the U.S. Map
(Map 3 of 22)

SH 5
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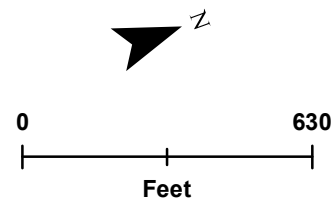
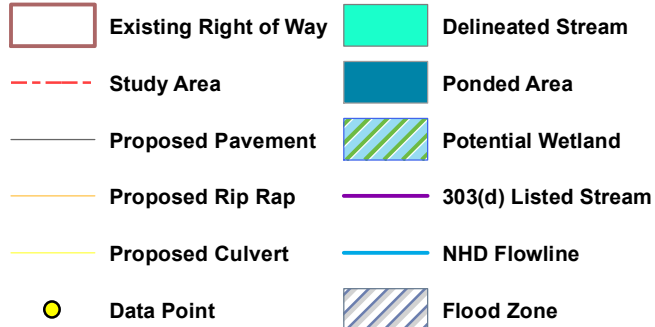
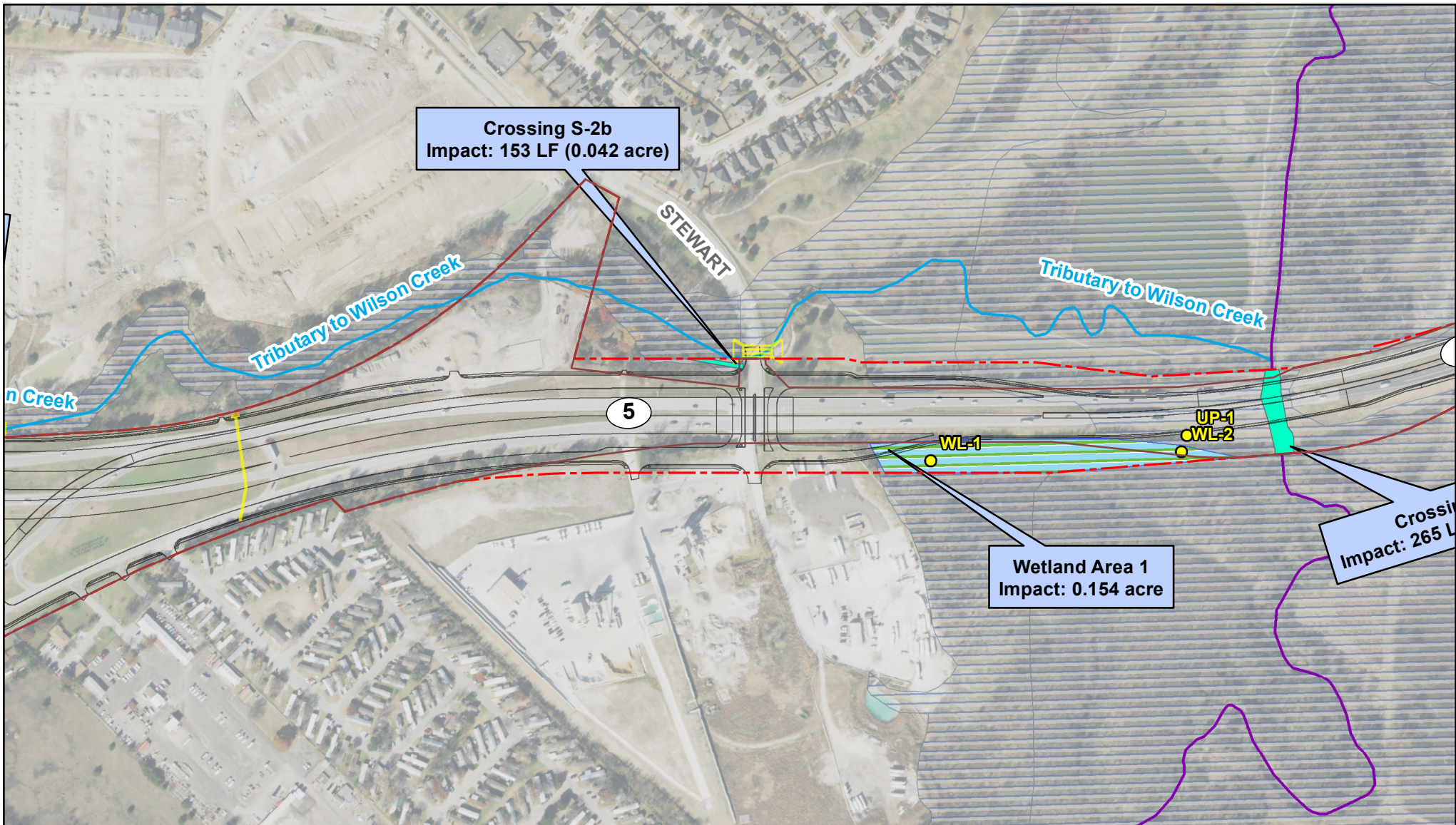


Figure 4
Wetland and Waters of the U.S. Map
(Map 4 of 22)

SH 5
South of FM 1378
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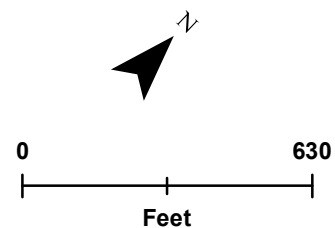
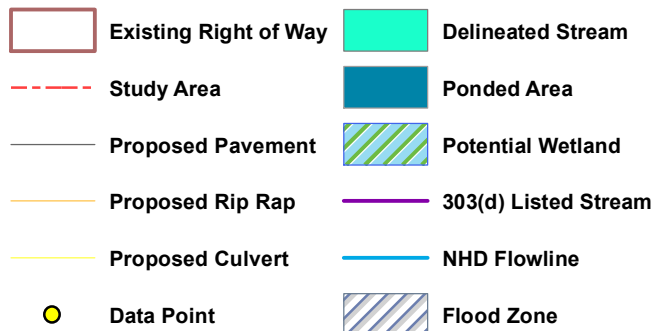
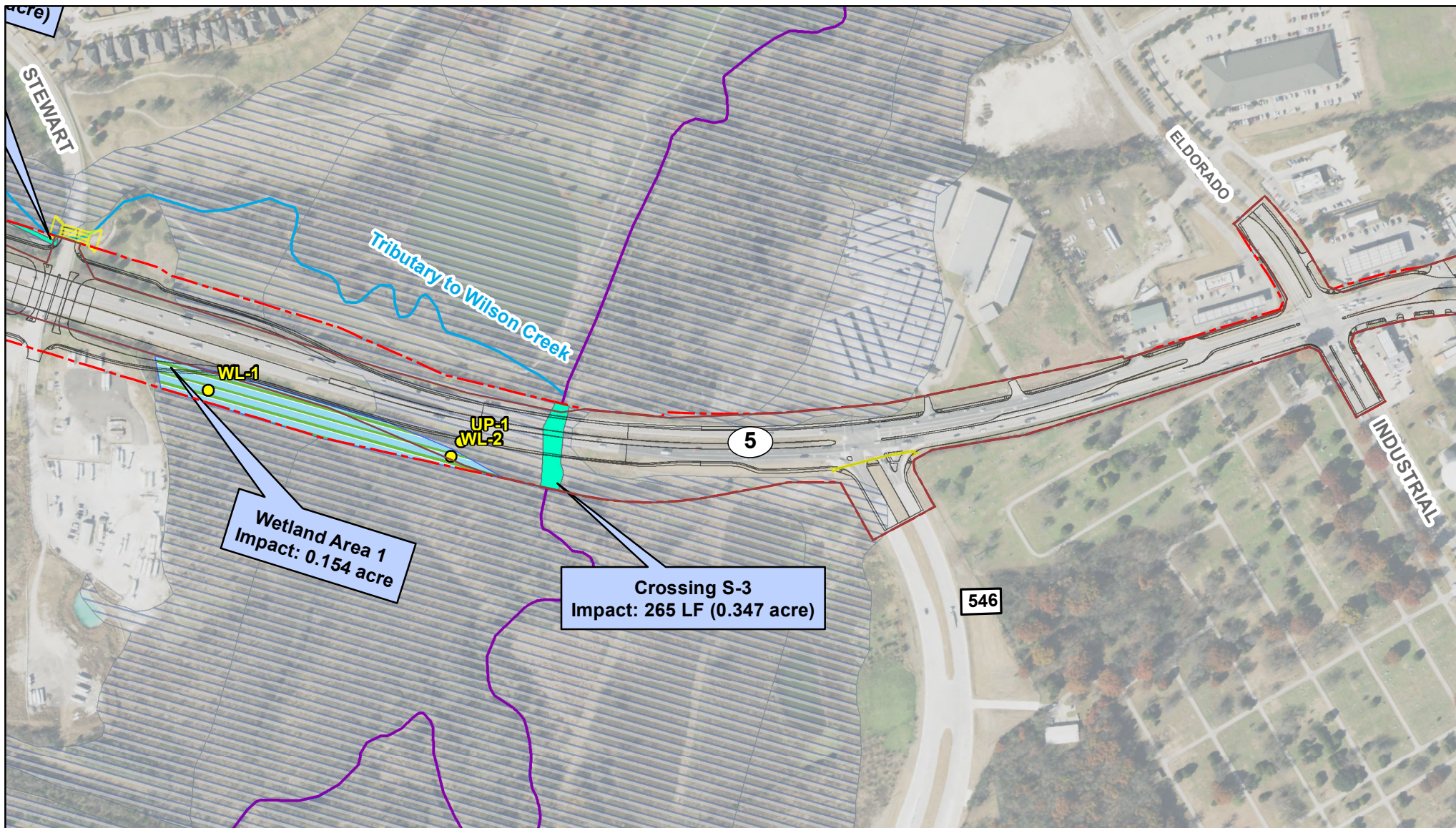


Figure 4
Wetland and Waters of the U.S. Map
(Map 5 of 22)

SH 5
South of FM 1378
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Collin County, Texas

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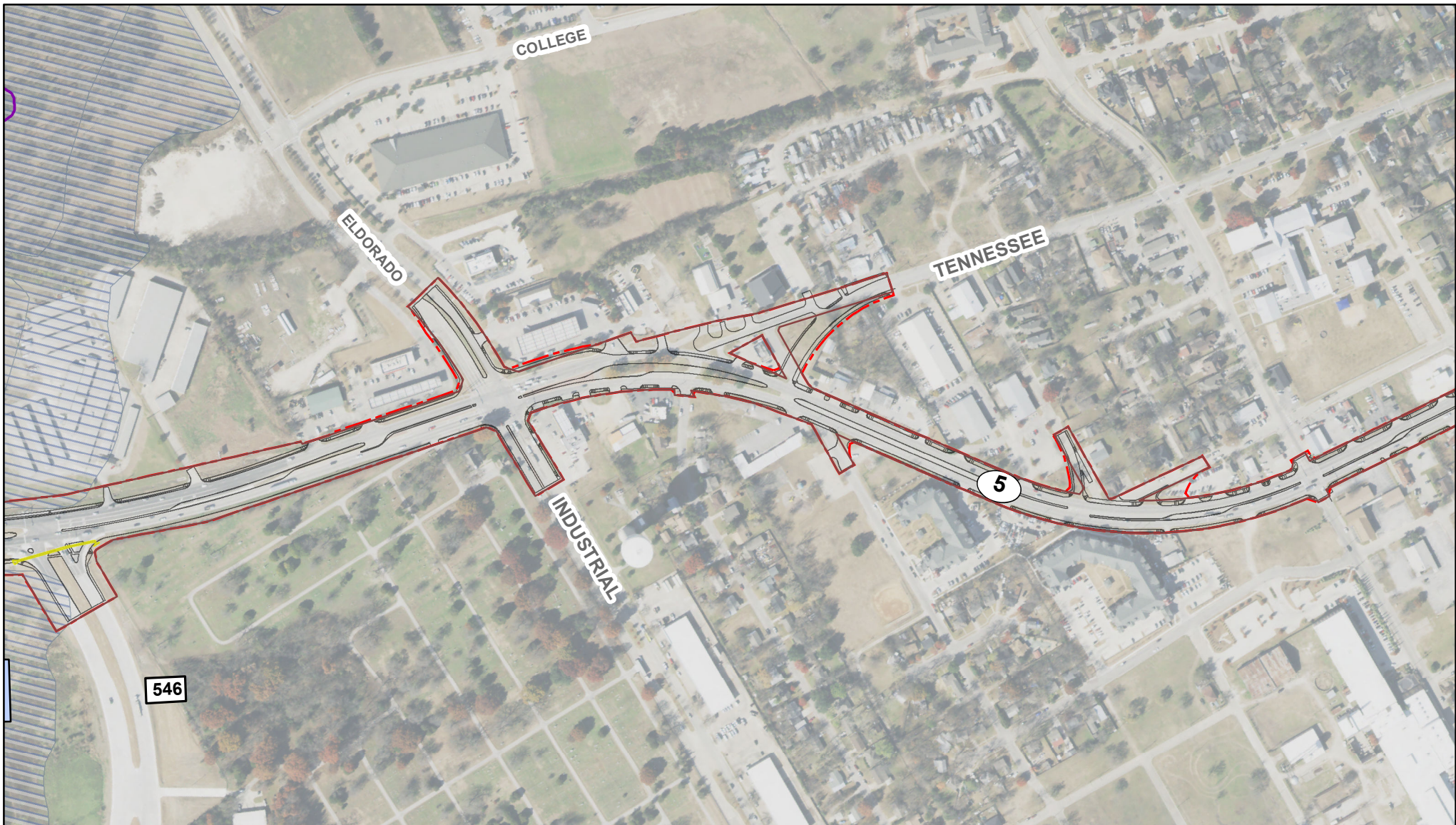














Sources: 2015 Texas TOP Imagery, TNIRIS, TxDOT, USGS NHD, TCEQ

Figure 4
Wetland and Waters of the U.S. Map
(Map 6 of 22)

SH 5
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- | | |
|---|--|
|  Existing Right of Way |  Delineated Stream |
|  Study Area |  Ponded Area |
|  Proposed Pavement |  Potential Wetland |
|  Proposed Rip Rap |  303(d) Listed Stream |
|  Proposed Culvert |  NHD Flowline |
|  Data Point |  Flood Zone |

Sources: 2015 Texas TOP Imagery, TNIRIS, TxDOT, USGS NHD, TCEQ

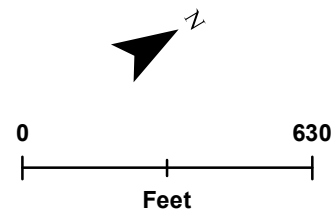
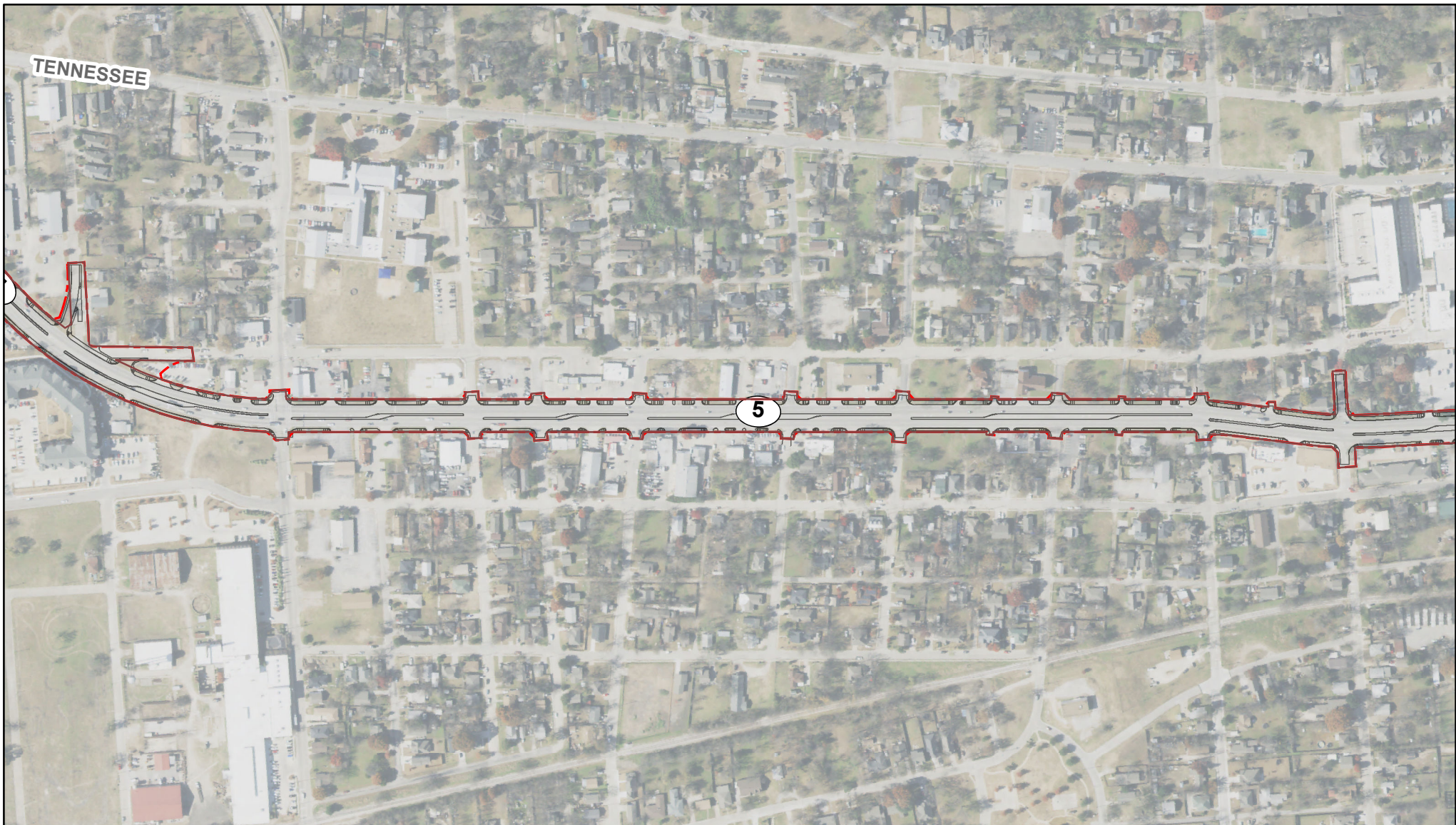














Figure 4
Wetland and Waters of the U.S. Map
(Map 7 of 22)

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- | | | | |
|---|-----------------------|---|----------------------|
|  | Existing Right of Way |  | Delineated Stream |
|  | Study Area |  | Ponded Area |
|  | Proposed Pavement |  | Potential Wetland |
|  | Proposed Rip Rap |  | 303(d) Listed Stream |
|  | Proposed Culvert |  | NHD Flowline |
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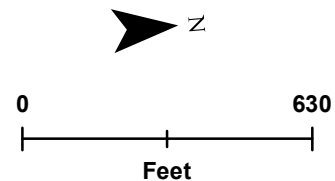
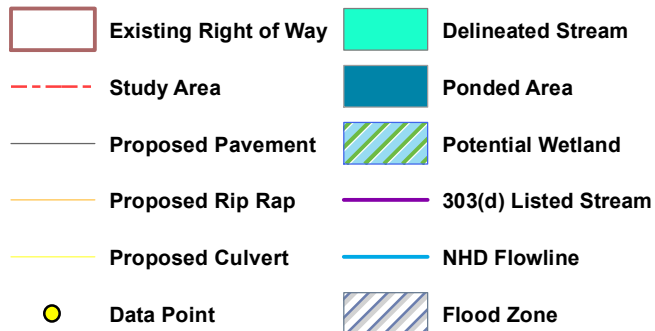
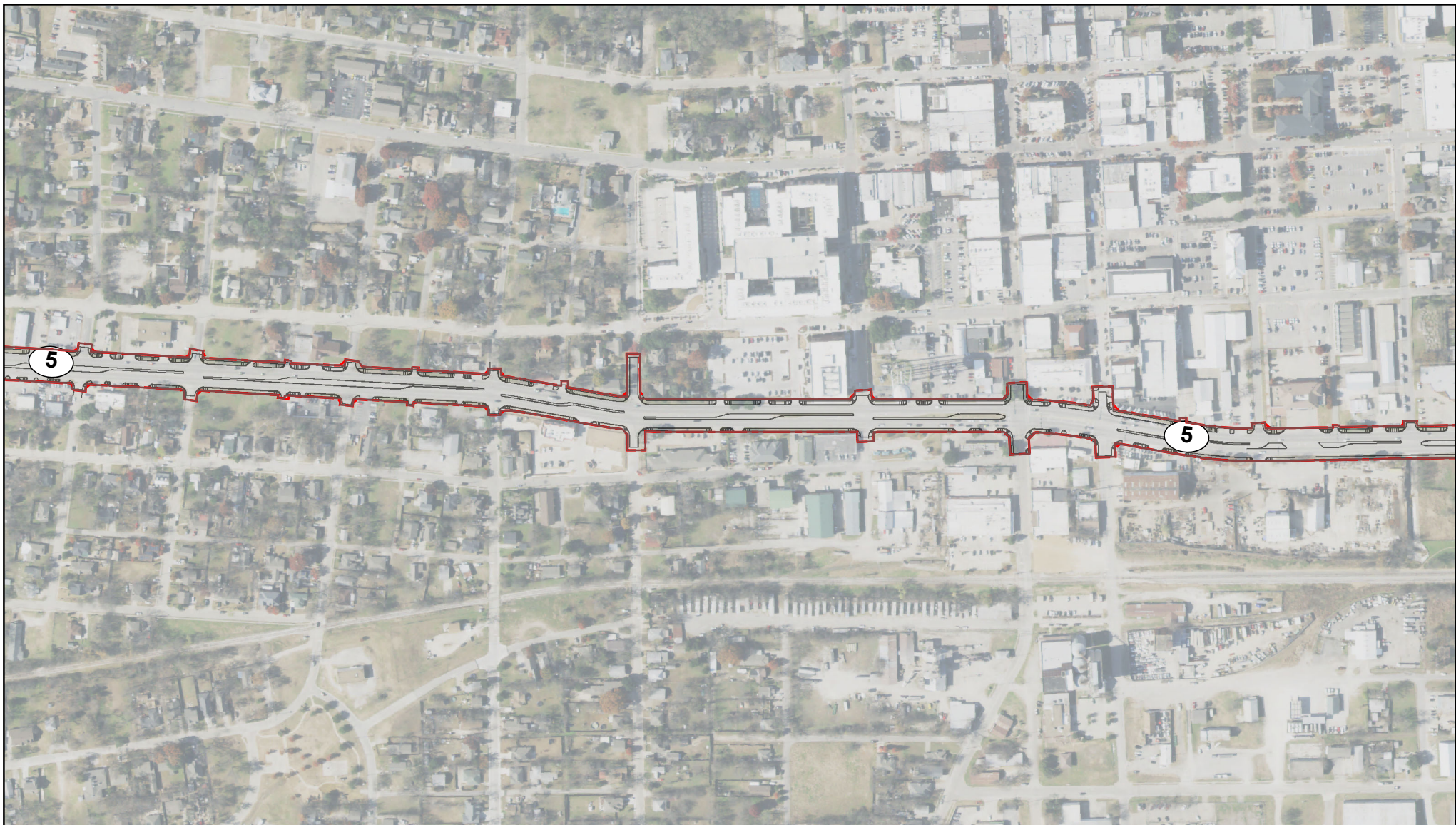


Figure 4
Wetland and Waters of the U.S. Map
(Map 8 of 22)

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Collin County, Texas

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Sources: 2015 Texas TOP Imagery, TNIRIS, TxDOT, USGS NHD, TCEQ

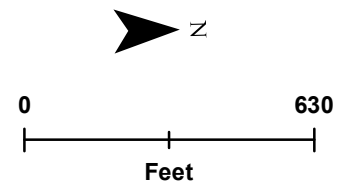
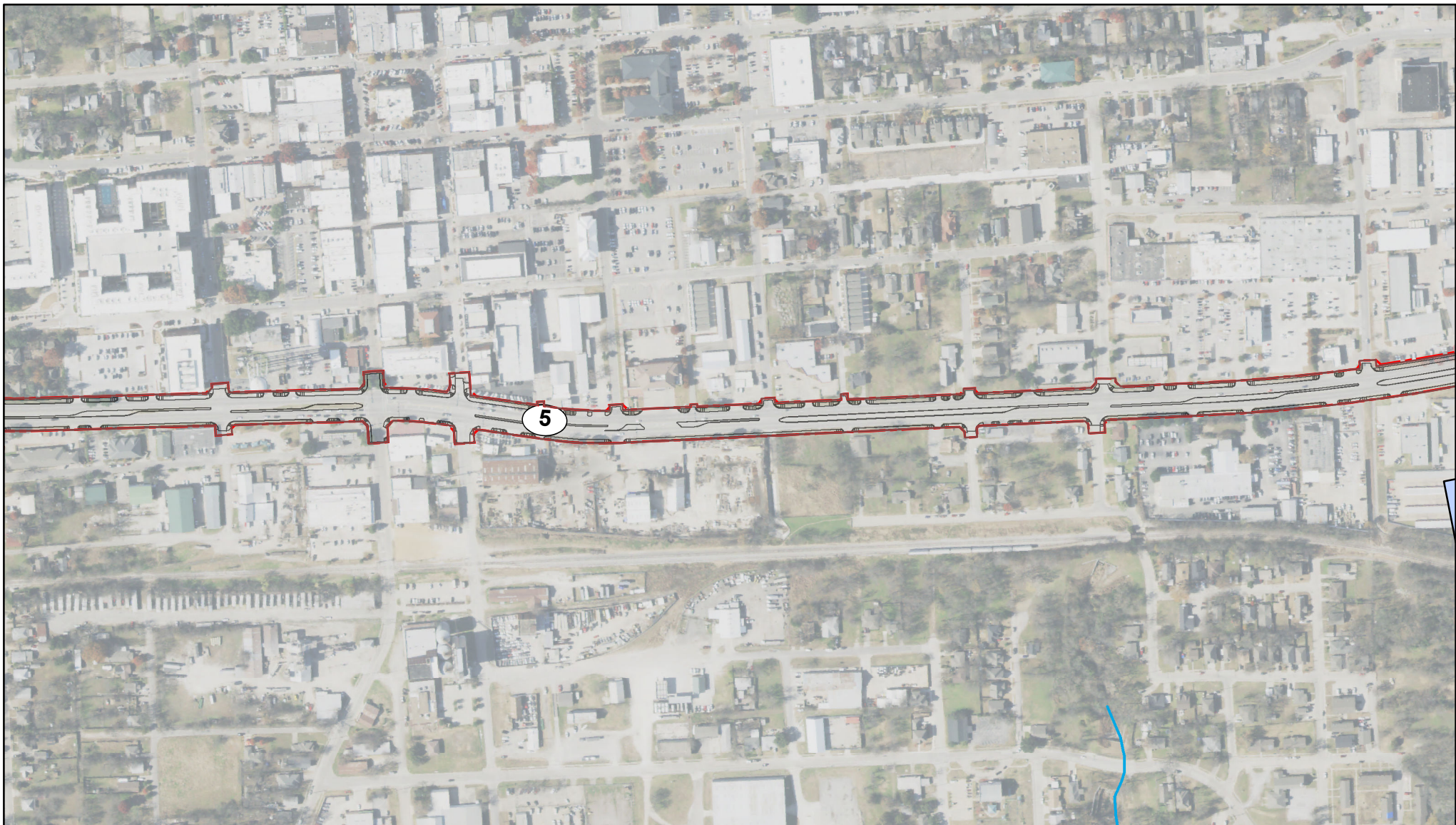














Figure 4
Wetland and Waters of the U.S. Map
(Map 9 of 22)

SH 5
South of FM 1378
to South of Melissa Road
CSJ: 0047-05-054, etc.
Collin County, Texas

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- | | | | |
|---|-----------------------|---|----------------------|
|  | Existing Right of Way |  | Delineated Stream |
|  | Study Area |  | Ponded Area |
|  | Proposed Pavement |  | Potential Wetland |
|  | Proposed Rip Rap |  | 303(d) Listed Stream |
|  | Proposed Culvert |  | NHD Flowline |
|  | Data Point |  | Flood Zone |

Sources: 2015 Texas TOP Imagery, TNRIS, TxDOT, USGS NHD, TCEQ

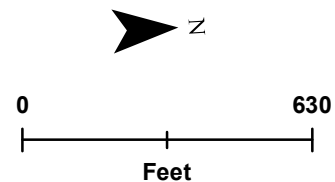
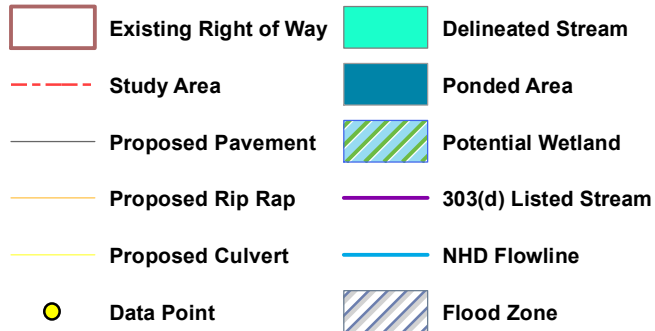
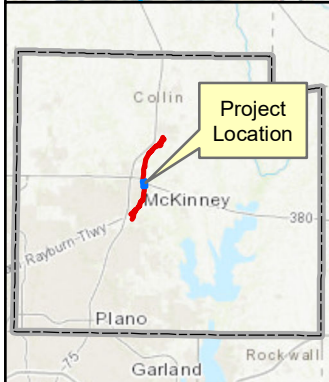
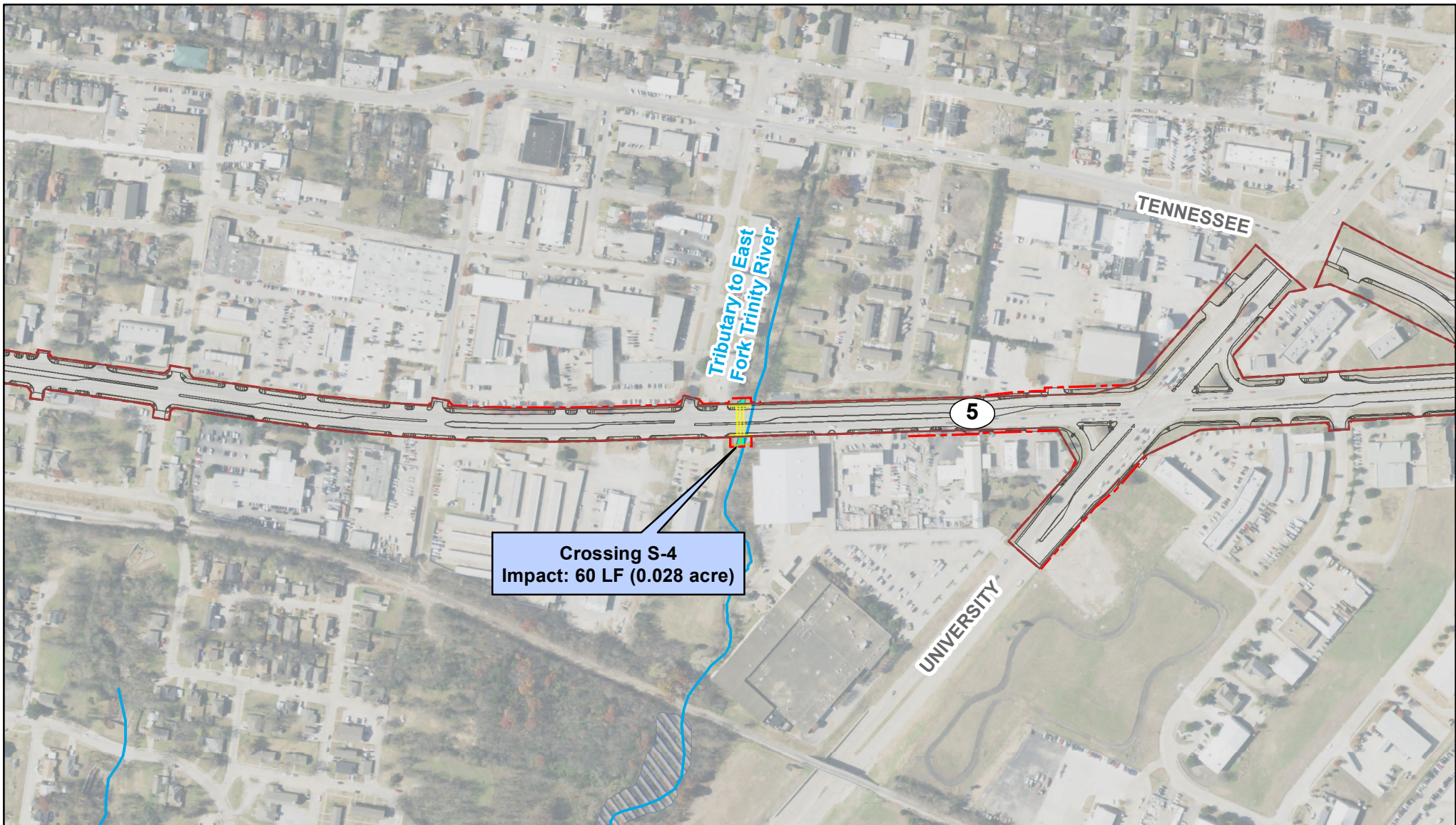


Figure 4
Wetland and Waters of the U.S. Map
(Map 10 of 22)

SH 5
South of FM 1378
to South of Melissa Road
CSJ: 0047-05-054, etc.
Collin County, Texas

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Sources: 2015 Texas TOP Imagery, TNRIS, TxDOT, USGS NHD, TCEQ

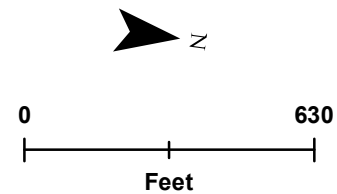
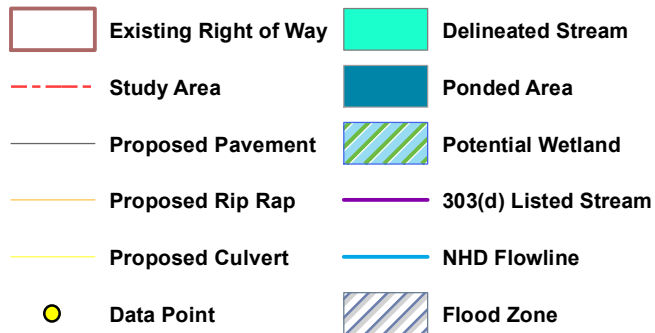
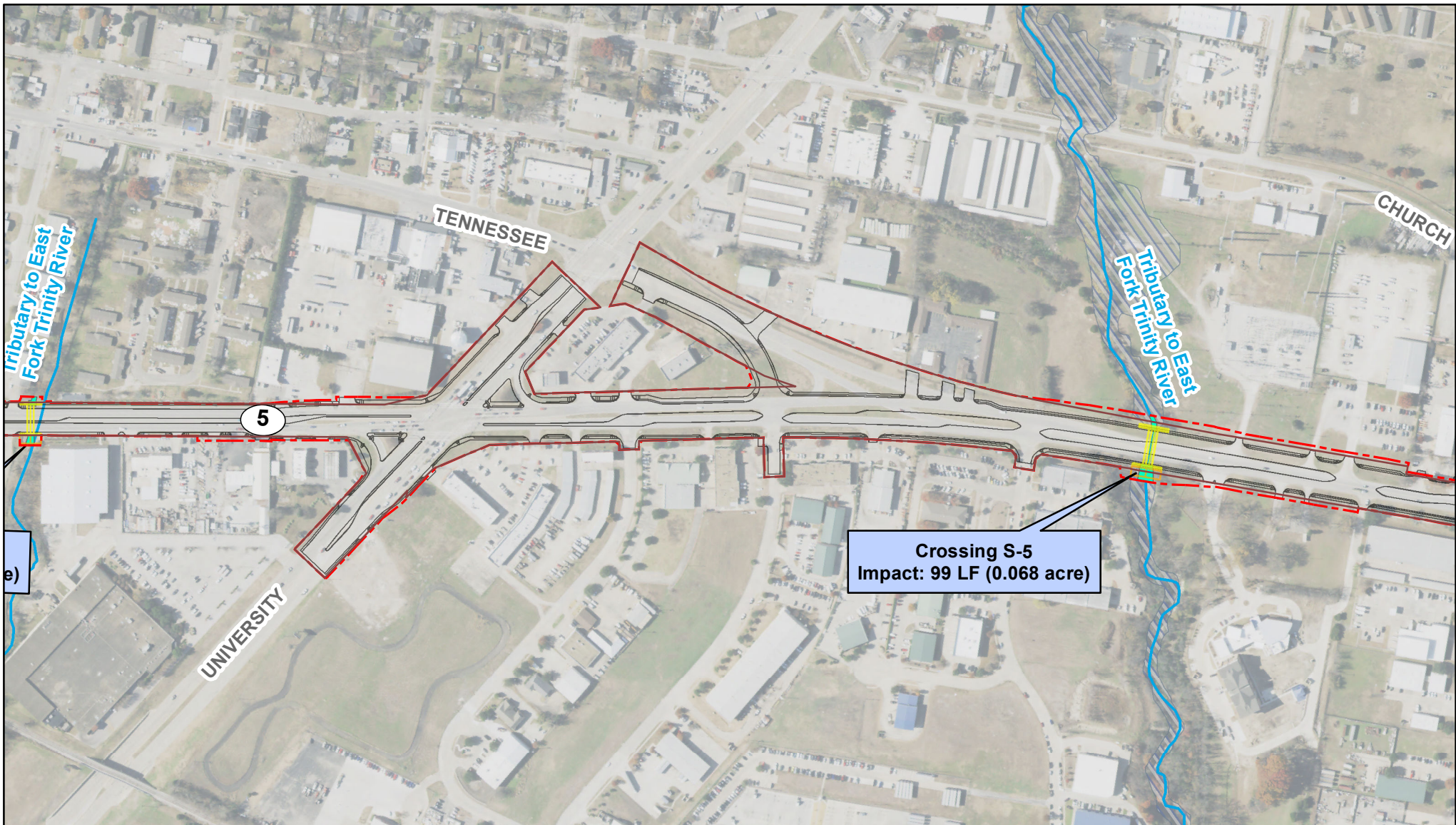


Figure 4
Wetland and Waters of the U.S. Map
(Map 11 of 22)

SH 5
South of FM 1378
to South of Melissa Road
CSJ: 0047-05-054, etc.
Collin County, Texas

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Sources: 2015 Texas TOP Imagery, TNIRIS, TxDOT, USGS NHD, TCEQ

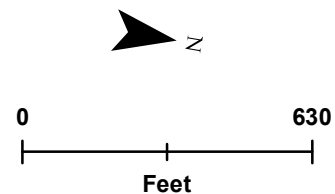
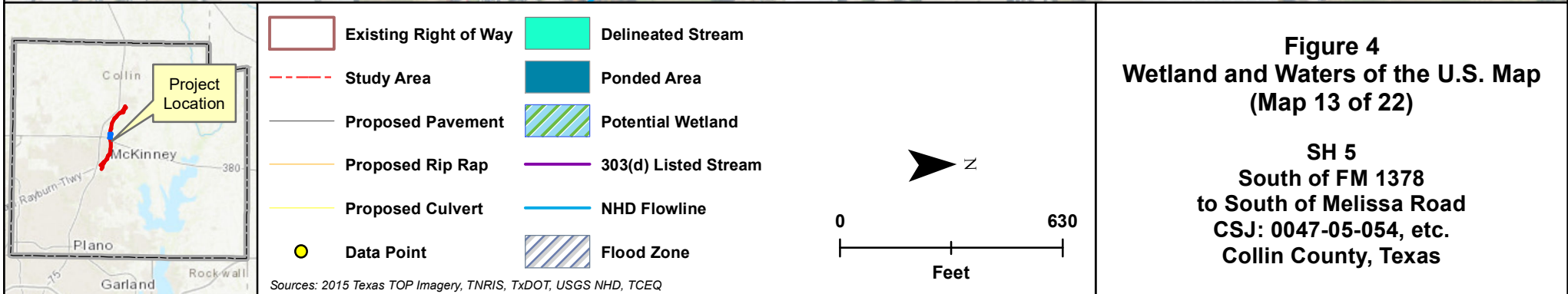
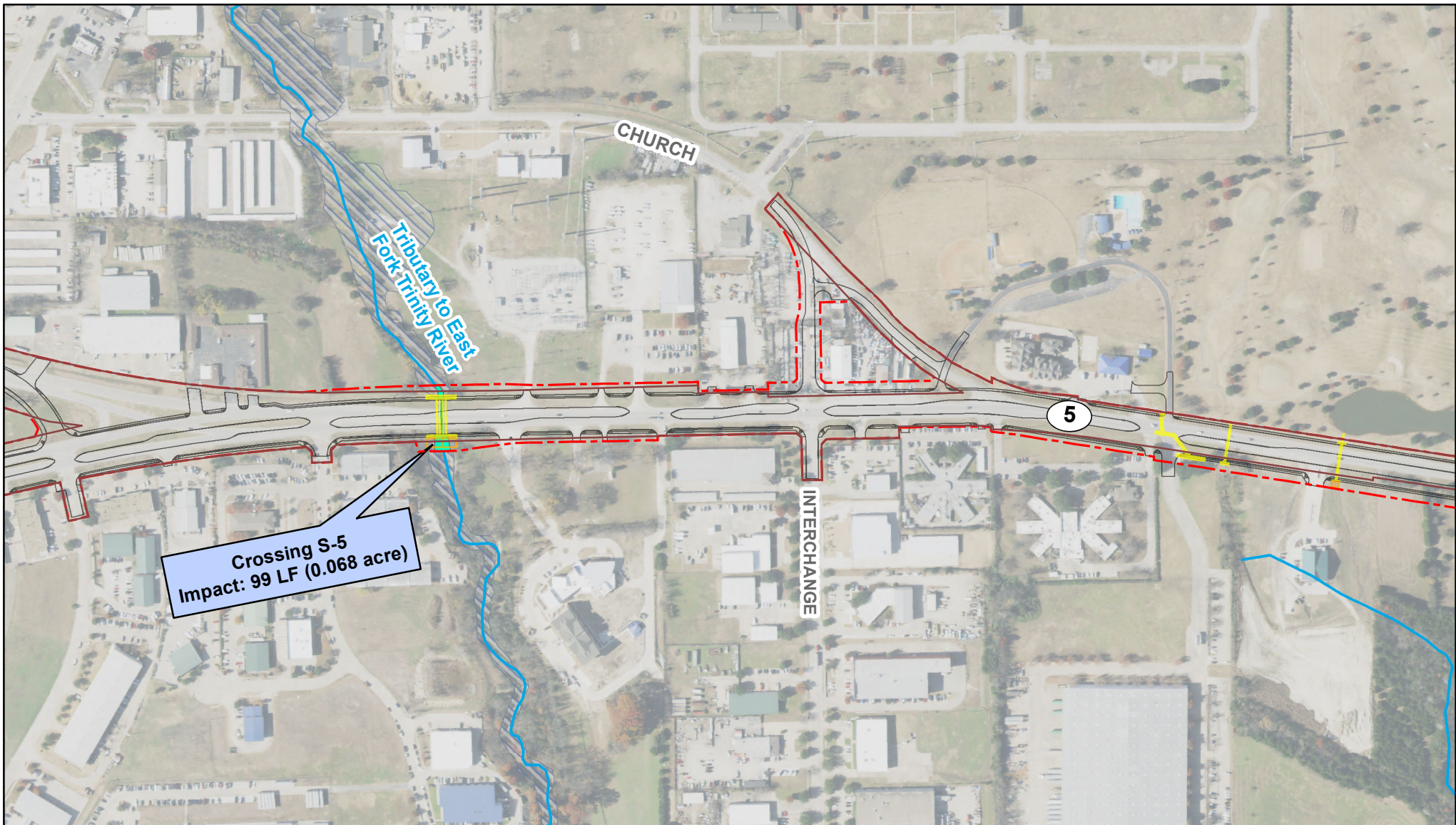


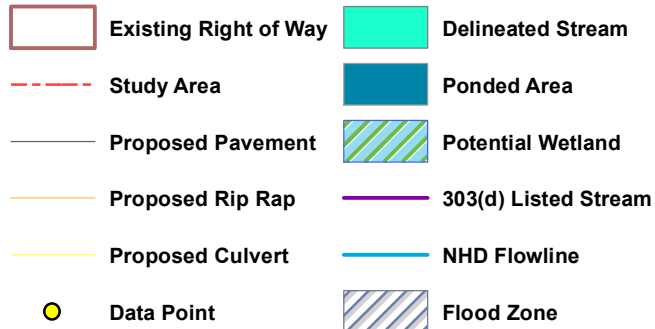
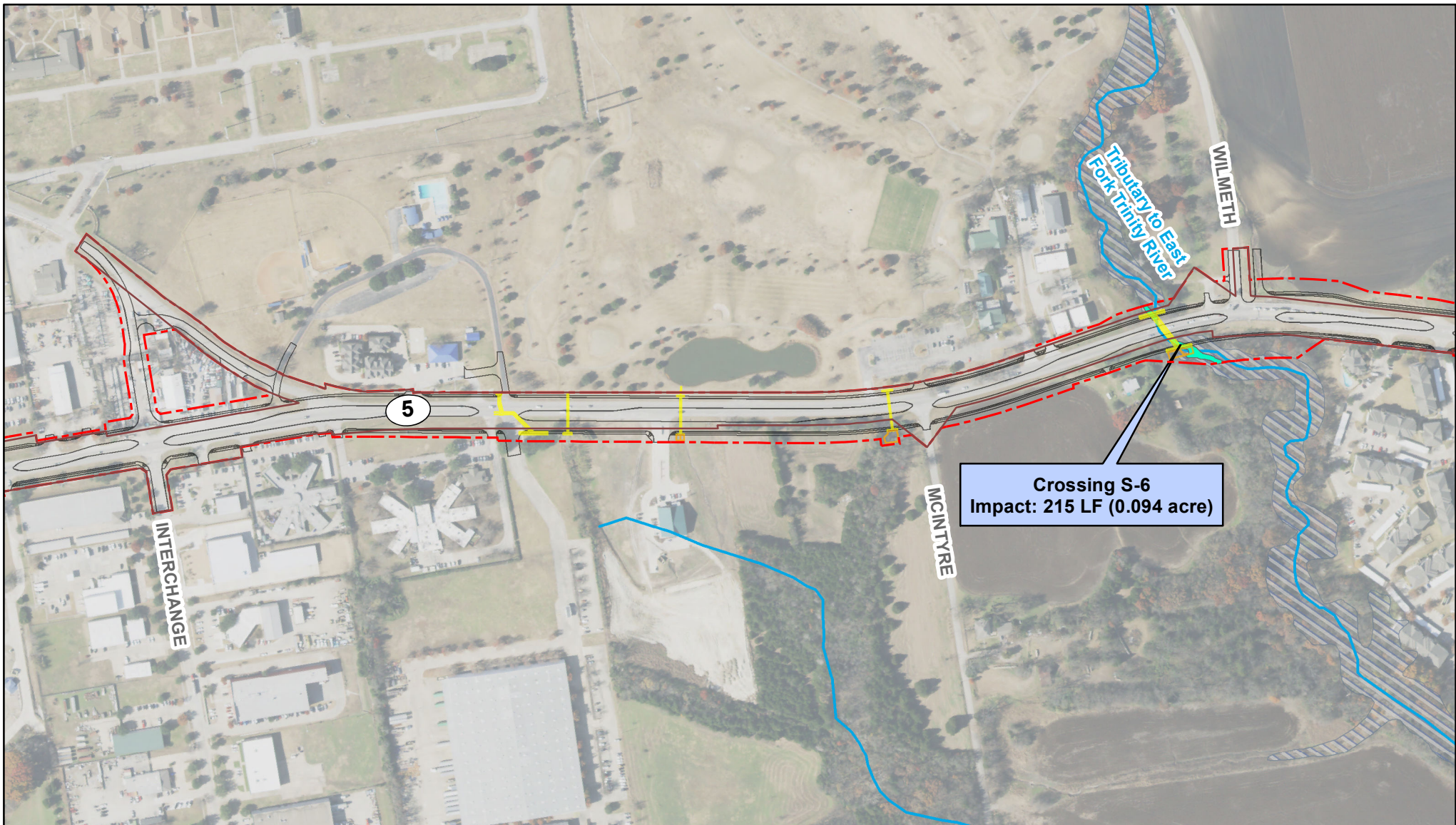
Figure 4
Wetland and Waters of the U.S. Map
(Map 12 of 22)

SH 5
South of FM 1378
to South of Melissa Road
CSJ: 0047-05-054, etc.
Collin County, Texas

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Sources: 2015 Texas TOP Imagery, TNIRIS, TxDOT, USGS NHD, TCEQ

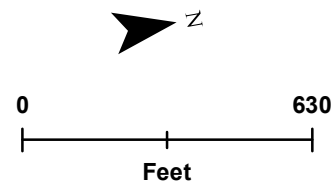
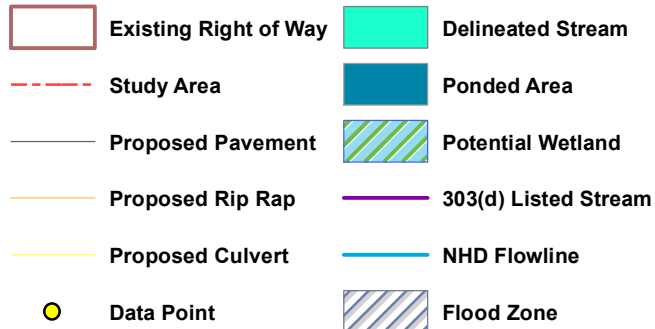
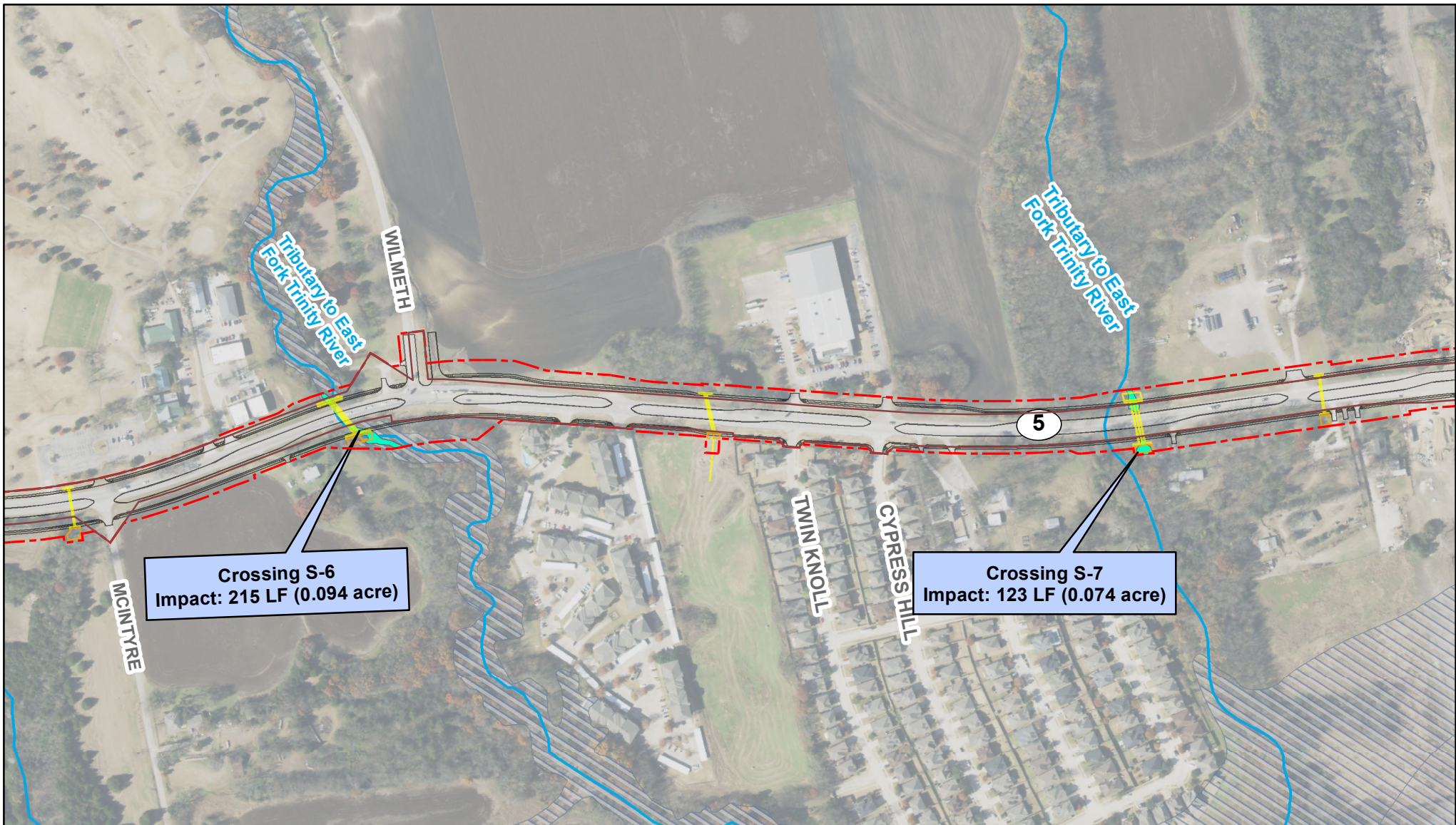


Figure 4
Wetland and Waters of the U.S. Map
(Map 14 of 22)

SH 5
South of FM 1378
to South of Melissa Road
CSJ: 0047-05-054, etc.
Collin County, Texas

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Sources: 2015 Texas TOP Imagery, TNIRIS, TxDOT, USGS NHD, TCEQ

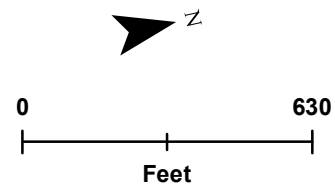


Figure 4
Wetland and Waters of the U.S. Map
(Map 15 of 22)

SH 5
South of FM 1378
to South of Melissa Road
CSJ: 0047-05-054, etc.
Collin County, Texas

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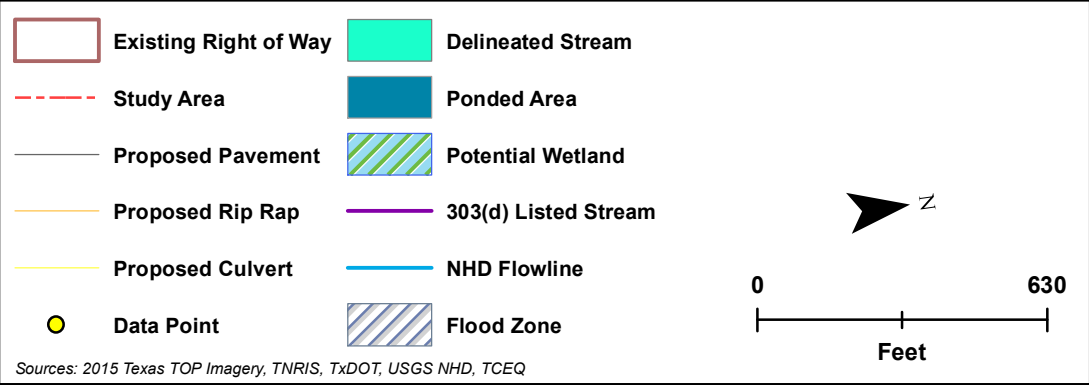
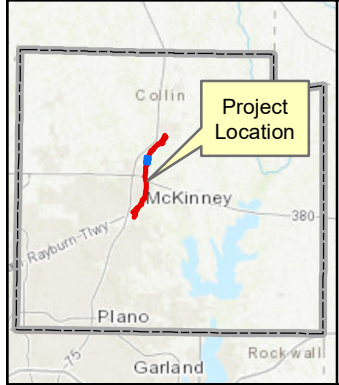
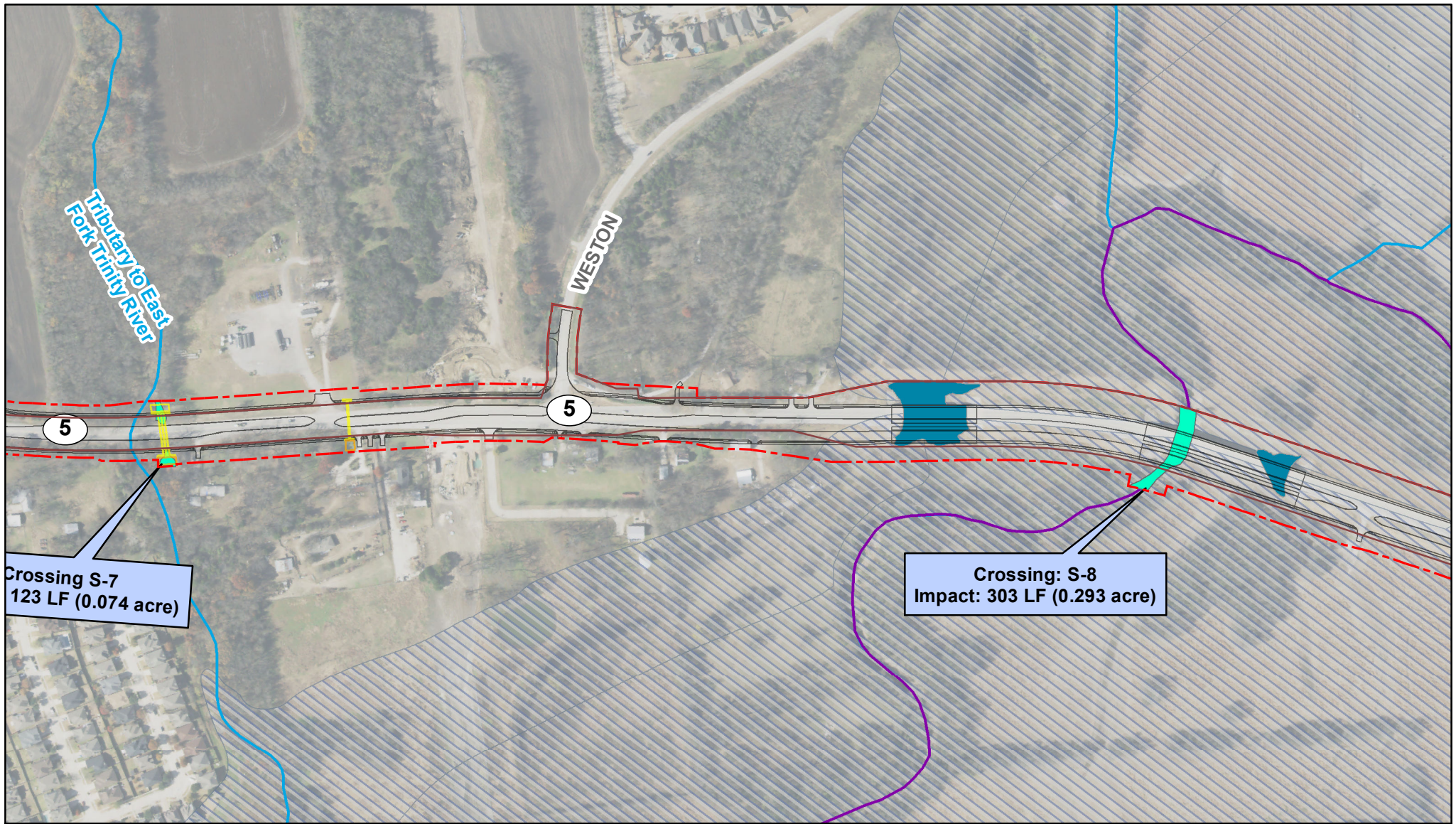
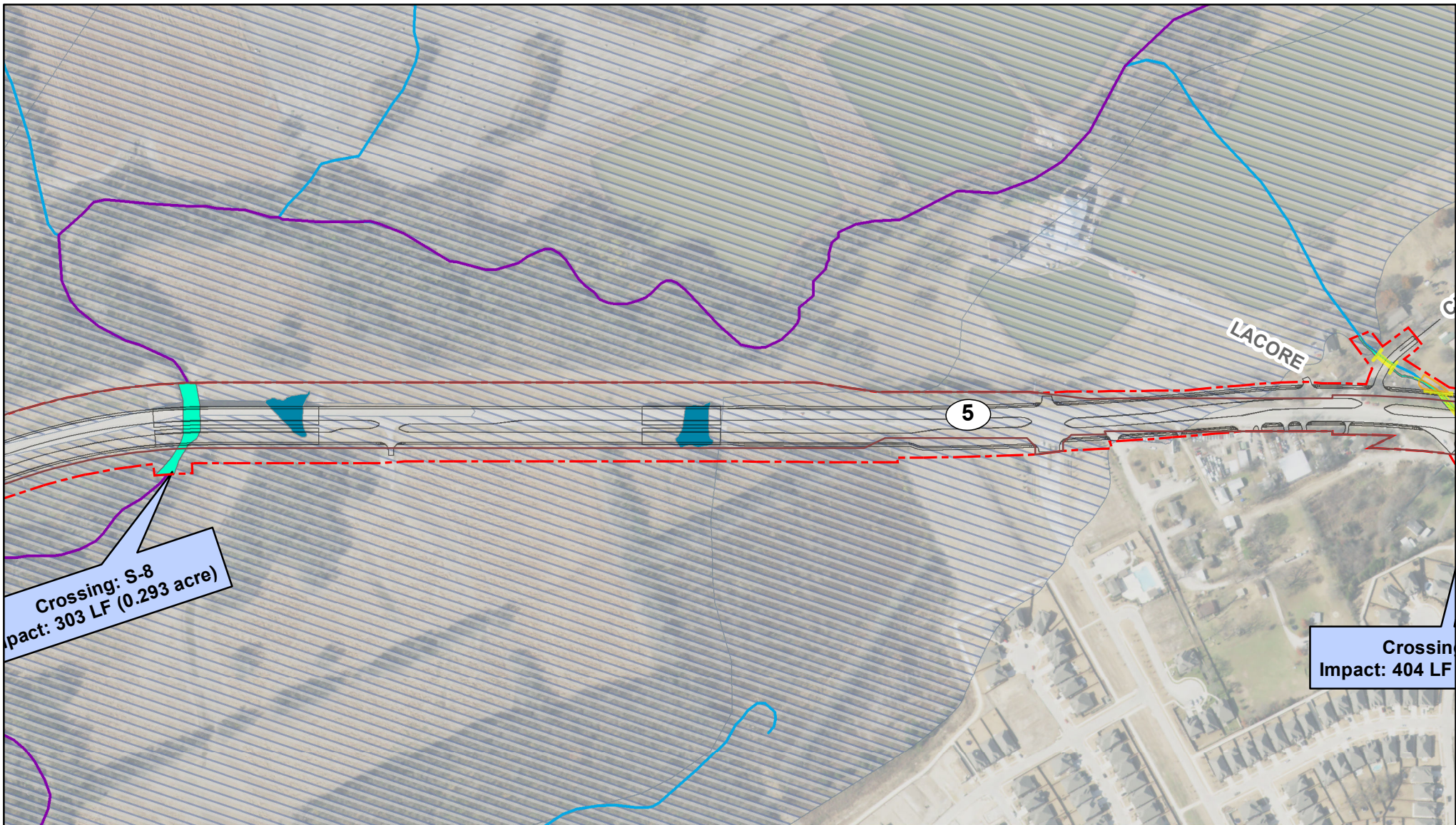


Figure 4
Wetland and Waters of the U.S. Map
 (Map 16 of 22)

SH 5
South of FM 1378
to South of Melissa Road
CSJ: 0047-05-054, etc.
Collin County, Texas

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- | | |
|-----------------------|----------------------|
| Existing Right of Way | Delineated Stream |
| Study Area | Ponded Area |
| Proposed Pavement | Potential Wetland |
| Proposed Rip Rap | 303(d) Listed Stream |
| Proposed Culvert | NHD Flowline |
| Data Point | Flood Zone |

Sources: 2015 Texas TOP Imagery, TNIRIS, TxDOT, USGS NHD, TCEQ

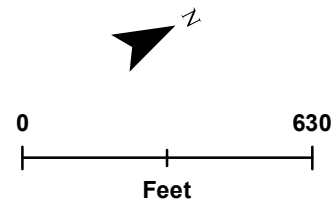
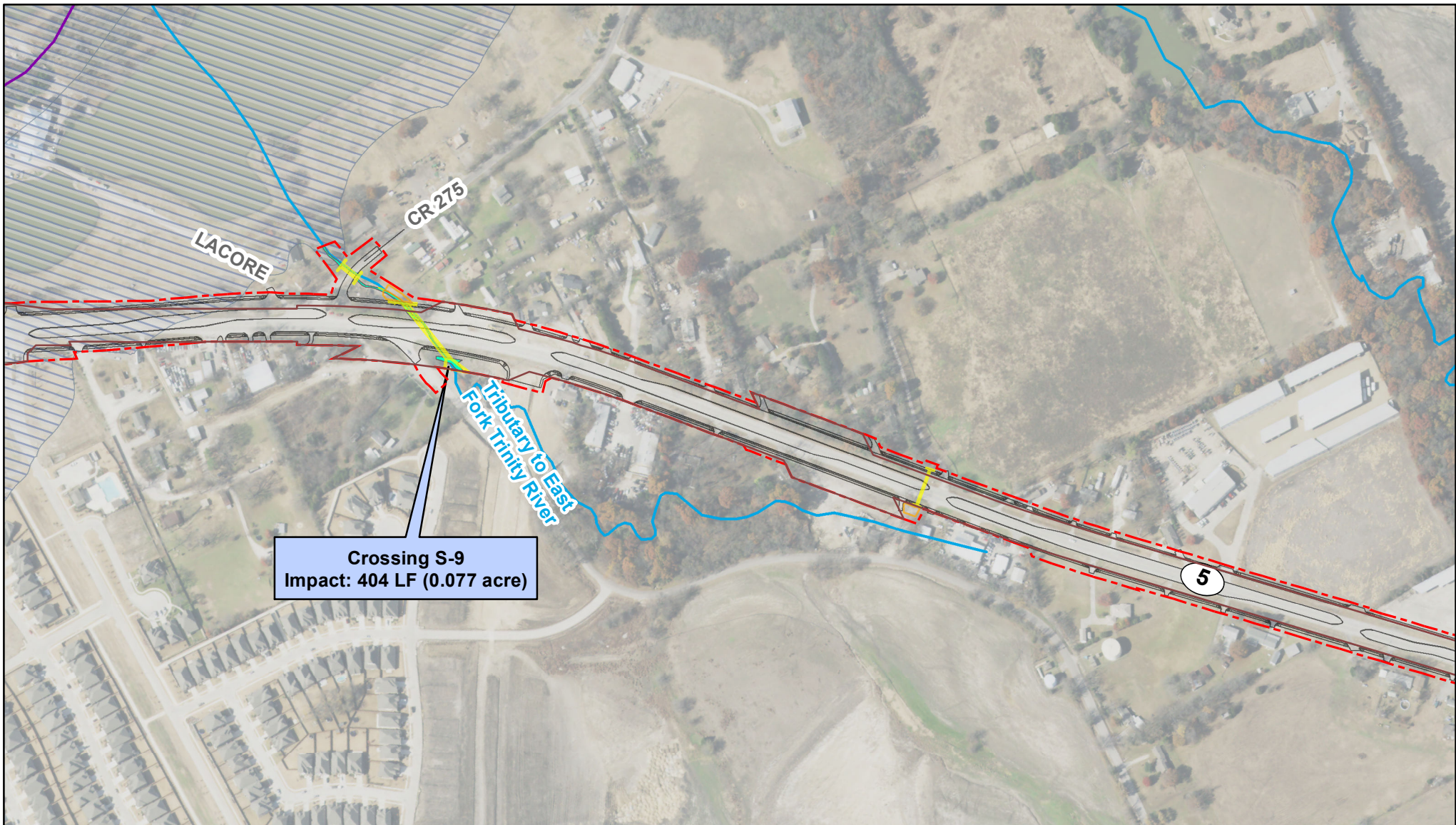


Figure 4
Wetland and Waters of the U.S. Map
(Map 17 of 22)

SH 5
South of FM 1378
to South of Melissa Road
CSJ: 0047-05-054, etc.
Collin County, Texas

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- | | |
|-----------------------|----------------------|
| Existing Right of Way | Delineated Stream |
| Study Area | Ponded Area |
| Proposed Pavement | Potential Wetland |
| Proposed Rip Rap | 303(d) Listed Stream |
| Proposed Culvert | NHD Flowline |
| Data Point | Flood Zone |

Sources: 2015 Texas TOP Imagery, TNIRIS, TxDOT, USGS NHD, TCEQ

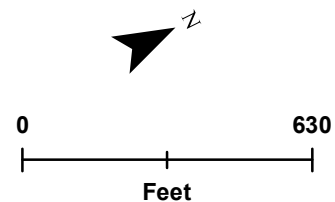
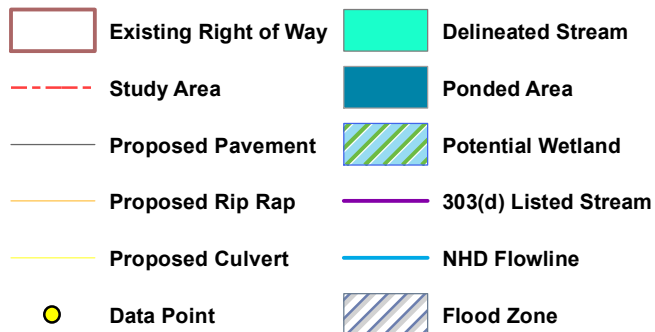
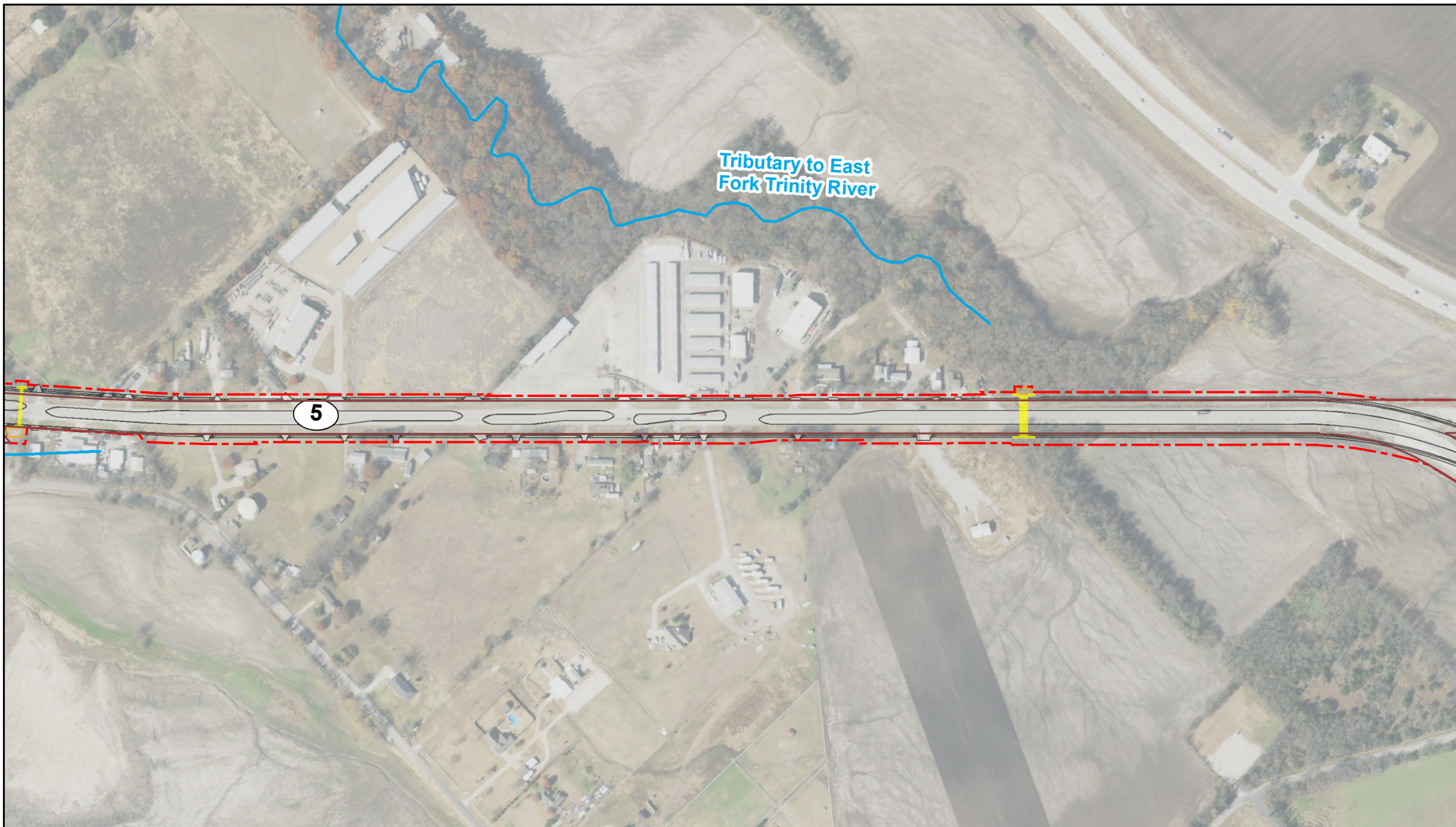


Figure 4
Wetland and Waters of the U.S. Map
(Map 18 of 22)

SH 5
South of FM 1378
to South of Melissa Road
CSJ: 0047-05-054, etc.
Collin County, Texas

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Sources: 2015 Texas TOP Imagery, TNIRIS, TxDOT, USGS NHD, TCEQ

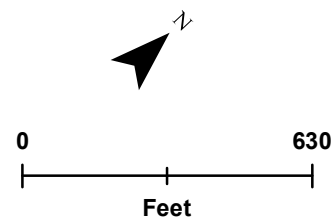
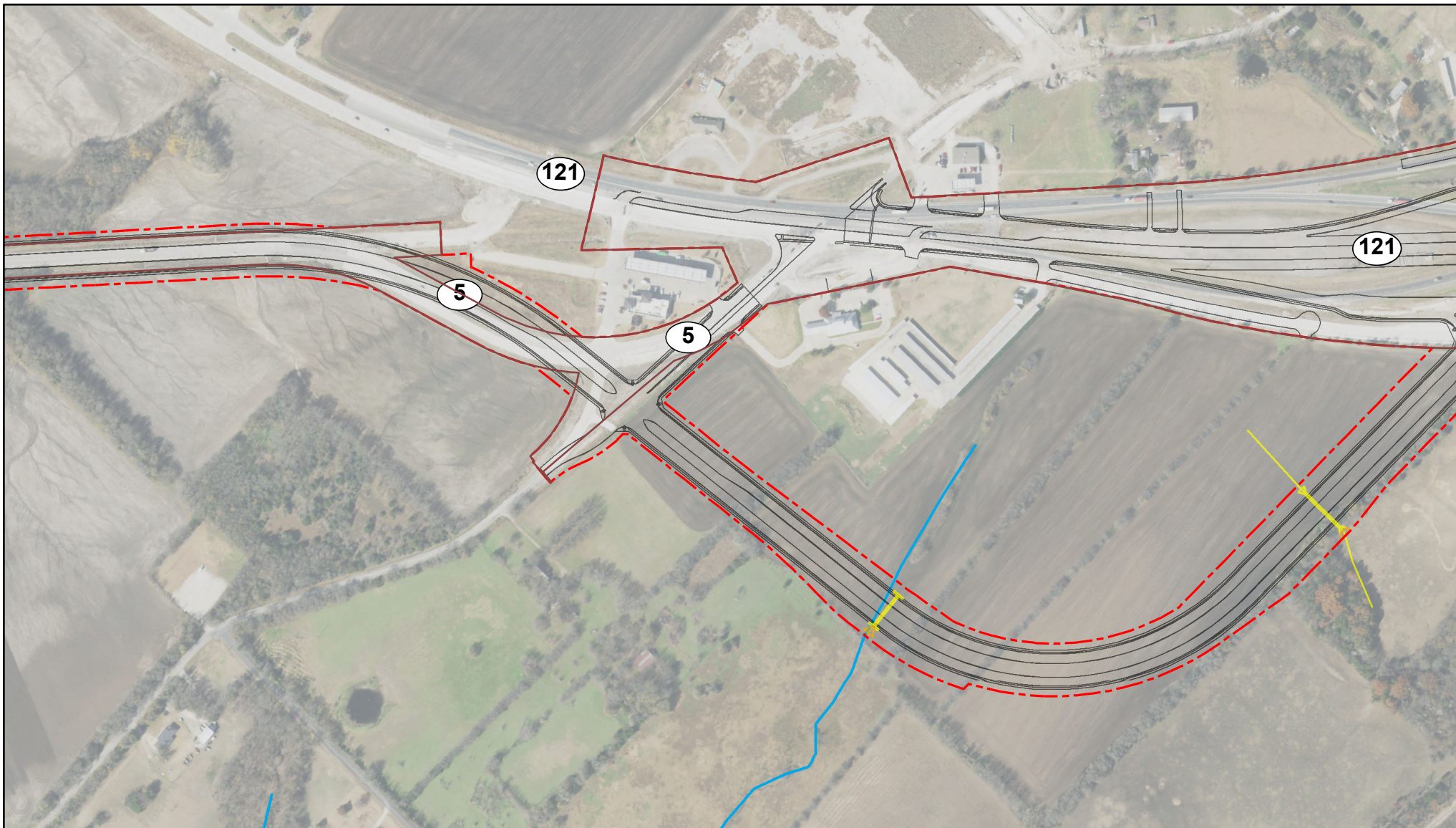














Figure 4
Wetland and Waters of the U.S. Map
(Map 19 of 22)

SH 5
South of FM 1378
to South of Melissa Road
CSJ: 0047-05-054, etc.
Collin County, Texas

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- | | |
|---|--|
|  Existing Right of Way |  Delineated Stream |
|  Study Area |  Ponded Area |
|  Proposed Pavement |  Potential Wetland |
|  Proposed Rip Rap |  303(d) Listed Stream |
|  Proposed Culvert |  NHD Flowline |
|  Data Point |  Flood Zone |

Sources: 2015 Texas TOP Imagery, TNIRIS, TxDOT, USGS NHD, TCEQ

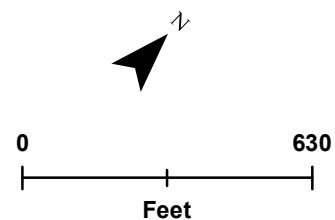
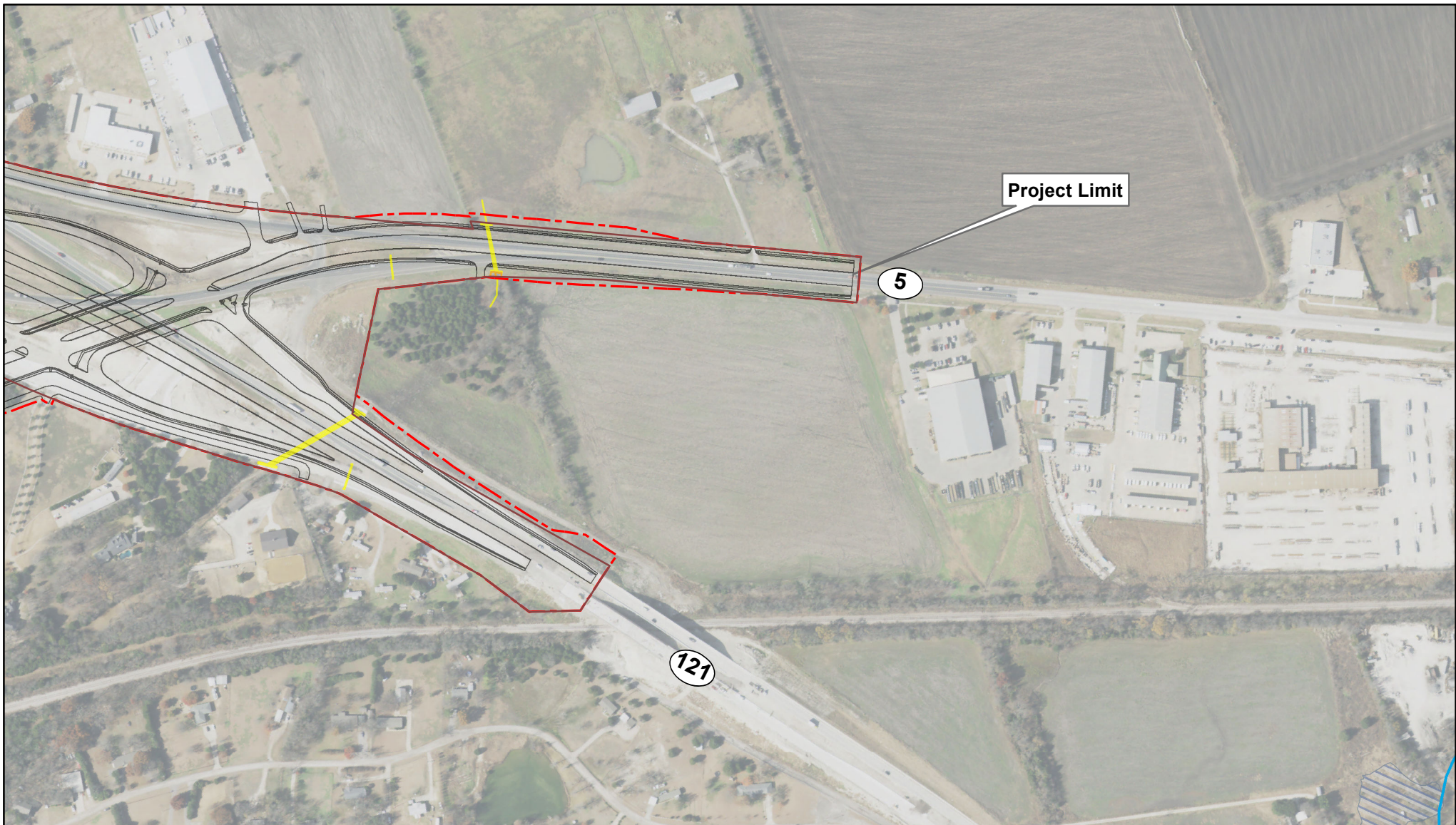


Figure 4
Wetland and Waters of the U.S. Map
(Map 20 of 22)

SH 5
South of FM 1378
to South of Melissa Road
CSJ: 0047-05-054, etc.
Collin County, Texas

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- | | |
|-----------------------|----------------------|
| Existing Right of Way | Delineated Stream |
| Study Area | Ponded Area |
| Proposed Pavement | Potential Wetland |
| Proposed Rip Rap | 303(d) Listed Stream |
| Proposed Culvert | NHD Flowline |
| Data Point | Flood Zone |

Sources: 2015 Texas TOP Imagery, TNIRIS, TxDOT, USGS NHD, TCEQ

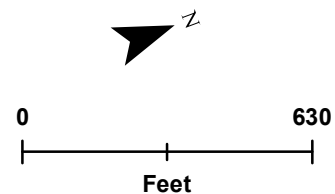


Figure 4
Wetland and Waters of the U.S. Map
(Map 22 of 22)

SH 5
South of FM 1378
to South of Melissa Road
CSJ: 0047-05-054, etc.
Collin County, Texas

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Appendix B: Project Area Photographs



Photo 1: View looking northwest at crossing S-1 – Barksdale Creek from east of SH 5. Approximately 0.027 acre (243.33 linear feet) of permanent impacts is currently anticipated at the crossing due to proposed road widening.



Photo 2: View looking north at crossing S-1 – Barksdale Creek from west of SH 5. Approximately 0.027 acre (243.33 linear feet) of permanent impacts is currently anticipated at the crossing due to proposed road widening.



Photo 3: View looking southwest along crossing S-2a – tributary to Wilson Creek from north of Spur 399. Approximately 0.071 acre (628.3 linear feet) of permanent impacts is currently anticipated at the crossing due to proposed frontage road bridge construction.



Photo 4: View looking south along crossing S-2a – tributary to Wilson Creek from north of Spur 399. Approximately 0.071 acre (628.3 linear feet) of permanent impacts is currently anticipated at the crossing due to proposed frontage road bridge construction.



Photo 5: View looking east at crossing S-2a – tributary to Wilson Creek from northwest of the Spur 399 and SH 5 interchange. Approximately 0.071 acre (628.3 linear feet) of permanent impacts is currently anticipated at the crossing due to proposed frontage road construction and drainage improvements.



Photo 6: View looking north at crossing S-2b – tributary to Wilson Creek from northwest of the intersection of Stewart Road and SH 5. Approximately 0.042 acre (153.48 linear feet) of permanent impacts is currently anticipated at the crossing due to proposed frontage road construction.



Photo 7: View looking northeast at crossing S-2b – tributary to Wilson Creek from northwest of the intersection of Stewart Road and SH 5. Approximately 0.042 acre (153.48 linear feet) of permanent impacts is currently anticipated at the crossing due to proposed frontage road construction.



Photo 8: View looking north at Wetland Area 1 (sample point WL-1) from southeast of SH 5 and Wilson Creek. Approximately 0.154 acre of permanent impacts is currently anticipated in the wetland due to proposed frontage road construction.



Photo 9: View looking north at Wetland Area 1 (sample point WL-2) from southeast of SH 5 and Wilson Creek. Approximately 0.154 acre of permanent impacts is currently anticipated in the wetland due to proposed frontage road construction.



Photo 10: View looking west at Upland Area 1 (sample point UP-1) from southeast of SH 5 and Wilson Creek. Approximately 0.154 acre of permanent impacts is currently anticipated in the adjacent Wetland Area 1 (sample points WL-1/WL-2) due to proposed frontage road construction.



Photo 11: View looking south at crossing S-3 – Wilson Creek from northwest of the SH 5 mainlane bridges. Approximately 0.347 acre (265.3 linear feet) of permanent impacts is currently anticipated at the crossing due to proposed mainlane bridge expansion.



Photo 12: View looking west at crossing S-3 – Wilson Creek from southeast of the SH 5 mainlane bridges. Approximately 0.347 acre (265.3 linear feet) of permanent impacts is currently anticipated at the crossing due to proposed mainlane bridge expansion.



Photo 13: View looking west at crossing S-4 – tributary to East Fork Trinity River from east of SH 5. Approximately 0.028 acre (59.65 linear feet) of permanent impacts is currently anticipated at the crossing due to proposed road widening.



Photo 14: View looking west at crossing S-4 – tributary to East Fork Trinity River from west of SH 5. Approximately 0.028 acre (59.65 linear feet) of permanent impacts is currently anticipated at the crossing due to proposed road widening.



Photo 15: View looking east at crossing S-5 – tributary to East Fork Trinity River from east of SH 5. Approximately 0.068 acre (99.19 linear feet) of permanent impacts is currently anticipated at the crossing due to proposed road widening.



Photo 16: View looking northeast at crossing S-5 – tributary to East Fork Trinity River from west of SH 5. Approximately 0.068 acre (99.19 linear feet) of permanent impacts is currently anticipated at the crossing due to proposed road widening.



Photo 17: View looking west at crossing S-6 – tributary to East Fork Trinity River from west of SH 5. Approximately 0.094 acre (215.06 linear feet) of permanent impacts is currently anticipated at the crossing due to proposed road widening.



Photo 18: View looking east at crossing S-6 – tributary to East Fork Trinity River from east of SH 5. Approximately 0.094 acre (215.06 linear feet) of permanent impacts is currently anticipated at the crossing due to proposed road widening.



Photo 19: View looking east at crossing S-7 – tributary to East Fork Trinity River from east of SH 5. Approximately 0.074 acre (122.67 linear feet) of permanent impacts is currently anticipated at the crossing due to proposed road widening.



Photo 20: View looking south at crossing S-7 – tributary to East Fork Trinity River from west of SH 5. Approximately 0.074 acre (122.67 linear feet) of permanent impacts is currently anticipated at the crossing due to proposed road widening.



Photo 21: View looking north at crossing S-8 – East Fork Trinity River from southeast of the SH 5 mainlane bridge. Approximately 0.293 acre (303.14 linear feet) of permanent impacts is currently anticipated at the crossing due to proposed northbound mainlane bridge addition.



Photo 22: View looking northwest at crossing S-8 – East Fork Trinity River from northwest of the SH 5 mainlane bridge. Approximately 0.293 acre (303.14 linear feet) of permanent impacts is currently anticipated at the crossing due to proposed northbound mainlane bridge addition.



Photo 23: View looking southwest at crossing S-9 – tributary to East Fork Trinity River from east of SH 5. Approximately 0.077 acre (404.22 linear feet) of permanent impacts is currently anticipated at the crossing due to proposed road widening.



Photo 24: View looking southwest at crossing S-9 – tributary to East Fork Trinity River from west of SH 5. Approximately 0.077 acre (404.22 linear feet) of permanent impacts is currently anticipated at the crossing due to proposed road widening.

Appendix C: Stream and Wetland Data Forms

Stream Data Form

Stream Data Form #: S-1
Project Name: SH 5
CSJ: 0047-05-054, etc.

Surveyor(s): Michael Baker International
USGS Stream Name: Barksdale Creek
USGS Topo Quad Name: McKinney West
Associated Wetland(s): NA

Date of Field Work: 06/18/2019
County/State: Collin, TX
Stream Number [303(d) List]: NA
GPS Data: 33.156024°, -96.633128°

Stream Type: Intermittent Characteristics: Natural channel
Bank Stability (e.g. highly eroding, sloughing banks, etc.): Stable; vegetation matting present
Stream Flow Direction: East
OHWM Width (ft): 10.0 OHWM Height (in): 6.0

Stream Bottom Composition:

☒ Silts ☐ Cobbles ☒ Concrete ☐ Other:
☐ Sands ☐ Bedrock ☐ Muck Type: Herbaceous stream bottom with concrete culvert
☒ Gravel ☐ Vegetation

Aquatic Habitat: Indicate all types present within proposed ROW/project limits.

☐ Sand bar ☐ Sand/Gravel beach/bar ☐ Gravel riffles ☐ Aquatic vegetation
☒ Overhanging trees/shrubs ☐ Deep pool/ hole/ channel ☐ Other: _____

Stream has the following characteristics:

☒ Bed and banks
☐ OHWM (check all indicators that apply):
☒ clear, natural line impressed on the bank
☐ changes in the character of soil
☐ shelving
☒ vegetation matted down, bent, or absent
☐ leaf litter disturbed or washed away
☐ sediment deposition
☐ water staining
☐ other (list): _____
☐ the presence of litter and debris
☐ destruction of terrestrial vegetation
☐ the presence of wrack line
☐ sediment sorting
☐ scour
☐ multiple observed or predicted flow events
☐ abrupt change in plant community

Water Quality:

☐ Clear ☒ Slightly Turbid ☐ Turbid ☐ Very Turbid ☐ Oily film ☐ High organic content
☐ Other characteristics (pollutants, etc.): _____

Aquatic Organisms: List all species observed. This would include waterfowl, fish, snakes, turtles, frogs, invertebrates, etc.

Crayfish (*Procambarus clarkii*)

Riparian Vegetation: List species observed.

Ragweed (*Ambrosia trifida*)

T&E Species/Suitable Habitat: List T&E species observed or which species the habitat is suitable for.

Suitable habitat for southern crawfish frog, eastern box turtle, and Texas garter snake.

Stream Data Form #:

S-1

Project Name:

SH 5

CSJ:

0047-05-054, etc.

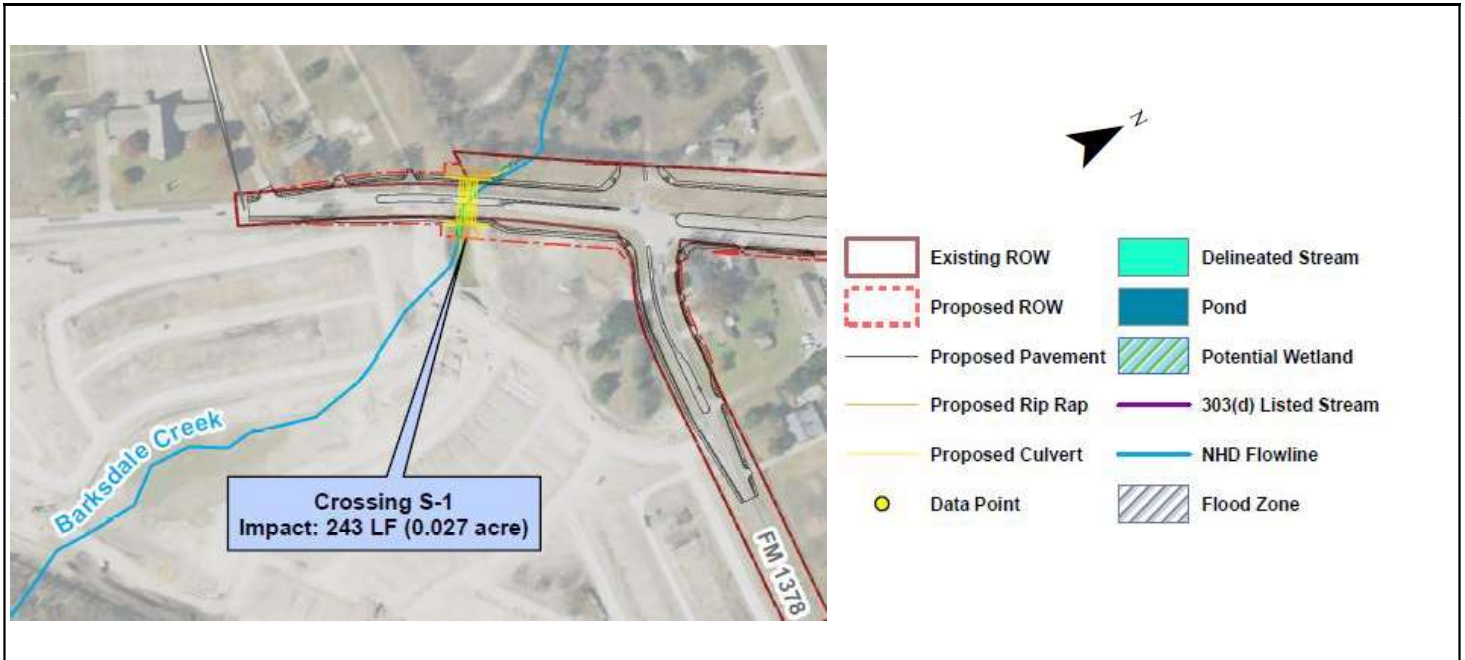
Stream Data Form (continued)

Please provide a plan and section view sketch of the stream channel.

Sketch should include:

- Directional arrow;
- Width of channel from top of bank to top of bank;
- Depth of channel,
- Approximate side slope; and,
- Width of stream from water edge to water edge.

Plan View (NTS)



Sectional View (NTS)



Stream Data Form

Stream Data Form #: S-2A
Project Name: SH 5
CSJ: 0047-05-054, etc.

Surveyor(s): Michael Baker International
USGS Stream Name: Unnamed
USGS Topo Quad Name: McKinney West
Associated Wetland(s): NA

Date of Field Work: 06/18/2019
County/State: Collin, TX
Stream Number [303(d) List]: NA
GPS Data: 33.164762°, -96.633257°

Stream Type: Intermittent Characteristics: Natural channel
Bank Stability (e.g. highly eroding, sloughing banks, etc.): Highly eroding banks
Stream Flow Direction: North
OHWM Width (ft): 4.0 OHWM Height (in): 6.0

Stream Bottom Composition:

<input checked="" type="checkbox"/> Silts	<input checked="" type="checkbox"/> Cobbles	<input type="checkbox"/> Concrete	<input type="checkbox"/> Other:
<input checked="" type="checkbox"/> Sands	<input type="checkbox"/> Bedrock	<input type="checkbox"/> Muck	Type: _____
<input checked="" type="checkbox"/> Gravel	<input type="checkbox"/> Vegetation		

Aquatic Habitat: Indicate all types present within proposed ROW/project limits.

<input type="checkbox"/> Sand bar	<input type="checkbox"/> Sand/Gravel beach/bar	<input checked="" type="checkbox"/> Gravel riffles	<input type="checkbox"/> Aquatic vegetation
<input checked="" type="checkbox"/> Overhanging trees/shrubs	<input type="checkbox"/> Deep pool/ hole/ channel	<input type="checkbox"/> Other: _____	

Stream has the following characteristics:

<input checked="" type="checkbox"/> Bed and banks	
<input checked="" type="checkbox"/> OHWM (check all indicators that apply):	
<input checked="" type="checkbox"/> clear, natural line impressed on the bank	<input type="checkbox"/> the presence of litter and debris
<input type="checkbox"/> changes in the character of soil	<input type="checkbox"/> destruction of terrestrial vegetation
<input checked="" type="checkbox"/> shelving	<input type="checkbox"/> the presence of wrack line
<input type="checkbox"/> vegetation matted down, bent, or absent	<input type="checkbox"/> sediment sorting
<input type="checkbox"/> leaf litter disturbed or washed away	<input checked="" type="checkbox"/> scour
<input type="checkbox"/> sediment deposition	<input type="checkbox"/> multiple observed or predicted flow events
<input type="checkbox"/> water staining	<input type="checkbox"/> abrupt change in plant community
<input type="checkbox"/> other (list): _____	

Water Quality:

☒ Clear ☐ Slightly Turbid ☐ Turbid ☐ Very Turbid ☐ Oily film ☐ High organic content
☐ Other characteristics (pollutants, etc.): _____

Aquatic Organisms: List all species observed. This would include waterfowl, fish, snakes, turtles, frogs, invertebrates, etc.

Fish, Crawfish (*Procambarus clarkii*)

Riparian Vegetation: List species observed.

Black Willow (*Salix nigra*), Ragweed (*Ambrosia trifida*), Chinese Tallow (*Triadica sebifera*), Cattail (*Typha latifolia*), Poison Ivy (*Toxicodendron radicans*), American Elm (*Ulmus americana*), Virginia Creeper (*Parthenocissus quinquefolia*)

T&E Species/Suitable Habitat: List T&E species observed or which species the habitat is suitable for.

Suitable habitat for southern crawfish frog, eastern box turtle, and Texas garter snake.

Stream Data Form #:

S-2A

Project Name:

SH 5

CSJ:

0047-05-054, etc.

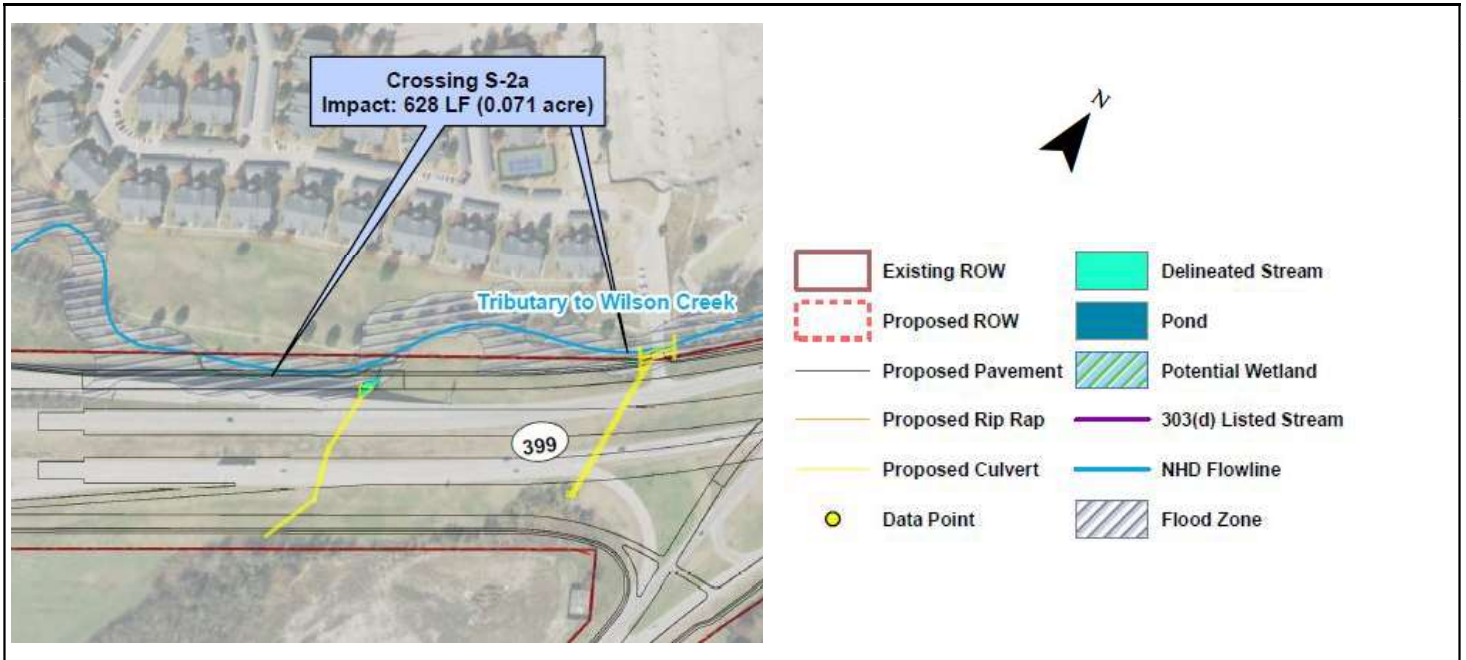
Stream Data Form (continued)

Please provide a plan and section view sketch of the stream channel.

Sketch should include:

- Directional arrow;
- Width of channel from top of bank to top of bank;
- Depth of channel,
- Approximate side slope; and,
- Width of stream from water edge to water edge.

Plan View (NTS)



Sectional View (NTS)



Stream Data Form

Stream Data Form #: S-2B
Project Name: SH 5
CSJ: 0047-05-054, etc.

Surveyor(s): Michael Baker International
USGS Stream Name: Unnamed
USGS Topo Quad Name: McKinney West
Associated Wetland(s): NA

Date of Field Work: 06/18/2019
County/State: Collin, TX
Stream Number [303(d) List]: NA
GPS Data: 33.171179°, -96.625651°

Stream Type: Intermittent Characteristics: Artificially reinforced embankments
Bank Stability (e.g. highly eroding, sloughing banks, etc.): Stable - concrete and bedrock shoreline protection
Stream Flow Direction: North
OHWM Width (ft): 4.0 OHWM Height (in): 6.0

Stream Bottom Composition:

☒ Silts ☐ Cobbles ☐ Concrete ☐ Other: _____
☒ Sands ☐ Bedrock ☐ Muck Type: _____
☒ Gravel ☐ Vegetation

Aquatic Habitat: Indicate all types present within proposed ROW/project limits.

☒ Sand bar ☐ Sand/Gravel beach/bar ☐ Gravel riffles ☒ Aquatic vegetation
☐ Overhanging trees/shrubs ☐ Deep pool/ hole/ channel ☐ Other: _____

Stream has the following characteristics:

☒ Bed and banks
☒ OHWM (check all indicators that apply):
☒ clear, natural line impressed on the bank
☐ changes in the character of soil
☐ shelving
☐ vegetation matted down, bent, or absent
☐ leaf litter disturbed or washed away
☐ sediment deposition
☐ water staining
☐ other (list): _____
☐ the presence of litter and debris
☐ destruction of terrestrial vegetation
☐ the presence of wrack line
☐ sediment sorting
☐ scour
☐ multiple observed or predicted flow events
☐ abrupt change in plant community

Water Quality:

☒ Clear ☐ Slightly Turbid ☐ Turbid ☐ Very Turbid ☐ Oily film ☐ High organic content
☐ Other characteristics (pollutants, etc.): _____

Aquatic Organisms: List all species observed. This would include waterfowl, fish, snakes, turtles, frogs, invertebrates, etc.

None

Riparian Vegetation: List species observed.

Ragweed (*Ambrosia trifida*), Cattail (*Typha latifolia*)

T&E Species/Suitable Habitat: List T&E species observed or which species the habitat is suitable for.

Suitable habitat for southern crawfish frog, eastern box turtle, and Texas garter snake.

Stream Data Form #:

S-2B

Project Name:

SH 5

CSJ:

0047-05-054, etc.

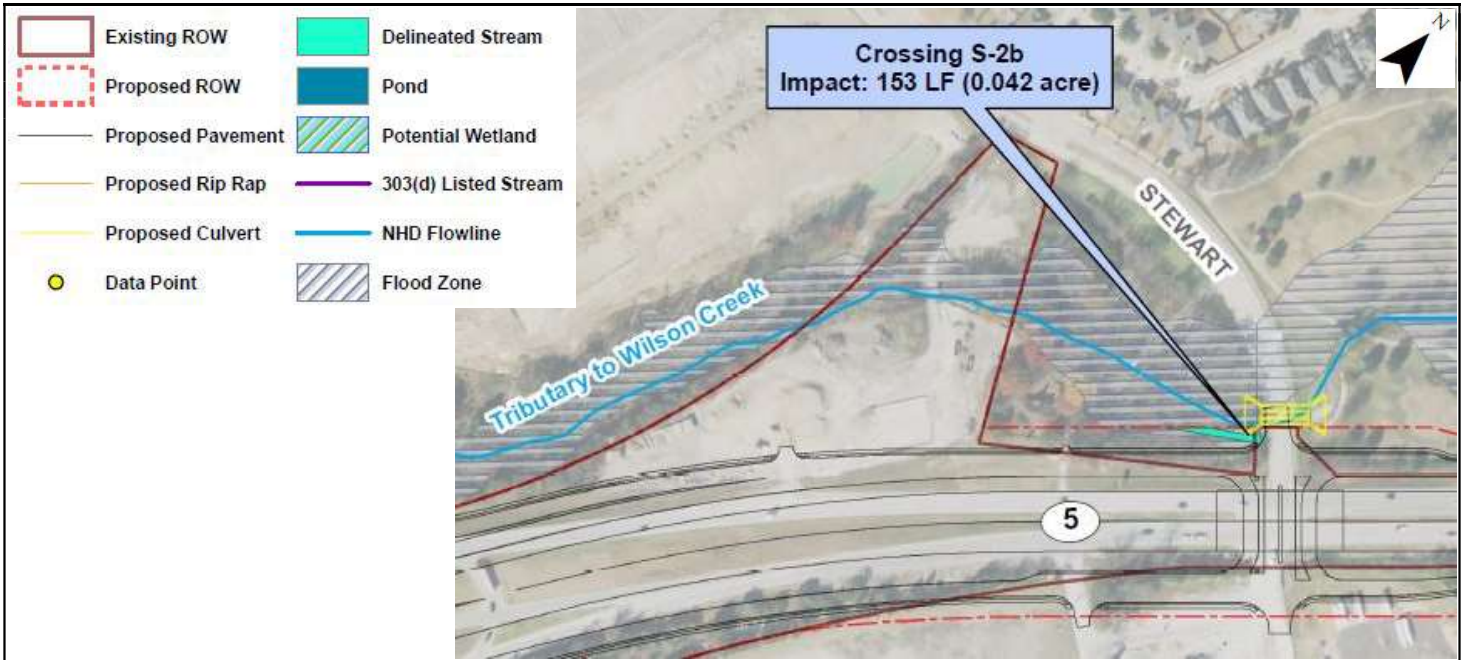
Stream Data Form (continued)

Please provide a plan and section view sketch of the stream channel.

Sketch should include:

- Directional arrow;
- Width of channel from top of bank to top of bank;
- Depth of channel,
- Approximate side slope; and,
- Width of stream from water edge to water edge.

Plan View (NTS)



Sectional View (NTS)



Stream Data Form

Stream Data Form #: S-3
Project Name: SH 5
CSJ: 0047-05-054, etc.

Surveyor(s): Michael Baker International
USGS Stream Name: Wilson Creek
USGS Topo Quad Name: McKinney East
Associated Wetland(s): WL-1, WL-2

Date of Field Work: 06/18/2019
County/State: Collin, TX
Stream Number [303(d) List]: 0821C_01
GPS Data: 33.173759°, -96.621711°

Stream Type: Perennial Characteristics: Natural flowing stream
Bank Stability (e.g. highly eroding, sloughing banks, etc.): Highly eroded banks
Stream Flow Direction: East
OHWM Width (ft): 57.0 OHWM Height (in): 72.0

Stream Bottom Composition:

☒ Silts ☐ Cobbles ☐ Concrete ☐ Other: _____
☒ Sands ☐ Bedrock ☐ Muck Type: _____
☐ Gravel ☐ Vegetation

Aquatic Habitat: Indicate all types present within proposed ROW/project limits.

☐ Sand bar ☐ Sand/Gravel beach/bar ☐ Gravel riffles ☐ Aquatic vegetation
☒ Overhanging trees/shrubs ☐ Deep pool/ hole/ channel ☐ Other: _____

Stream has the following characteristics:

☒ Bed and banks
☒ OHWM (check all indicators that apply):
☒ clear, natural line impressed on the bank
☐ changes in the character of soil
☐ shelving
☐ vegetation matted down, bent, or absent
☐ leaf litter disturbed or washed away
☐ sediment deposition
☐ water staining
☐ other (list): _____
☐ the presence of litter and debris
☐ destruction of terrestrial vegetation
☐ the presence of wrack line
☐ sediment sorting
☐ scour
☐ multiple observed or predicted flow events
☐ abrupt change in plant community

Water Quality:

☐ Clear ☒ Slightly Turbid ☐ Turbid ☐ Very Turbid ☐ Oily film ☐ High organic content
☐ Other characteristics (pollutants, etc.): _____

Aquatic Organisms: List all species observed. This would include waterfowl, fish, snakes, turtles, frogs, invertebrates, etc.

Crawfish (*Procambarus clarkii*)

Riparian Vegetation: List species observed.

Ragweed (*Ambrosia trifida*)

T&E Species/Suitable Habitat: List T&E species observed or which species the habitat is suitable for.

Suitable habitat for southern crawfish frog, chub shiner, Louisiana pigtoe, Texas heelsplitter, eastern box turtle, and Texas garter snake.

Stream Data Form #:

S-3

Project Name:

SH 5

CSJ:

0047-05-054, etc.

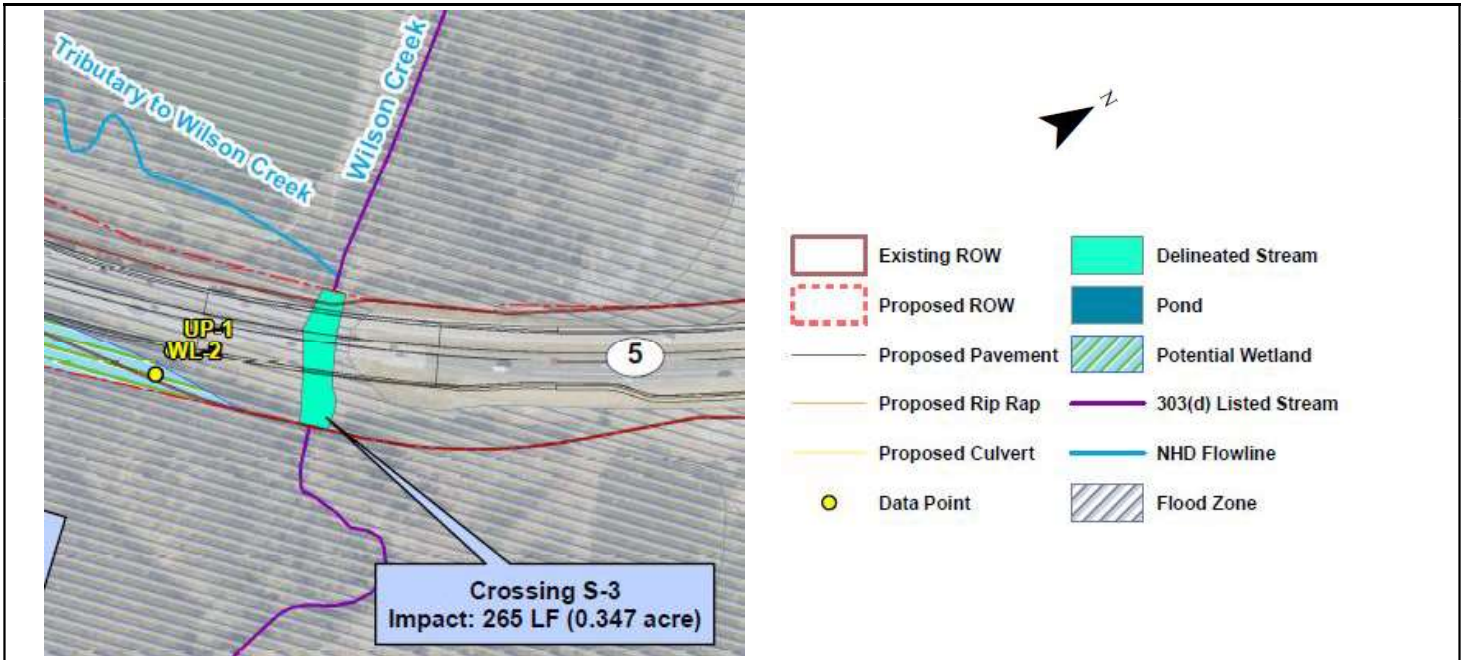
Stream Data Form (continued)

Please provide a plan and section view sketch of the stream channel.

Sketch should include:

- Directional arrow;
- Width of channel from top of bank to top of bank;
- Depth of channel,
- Approximate side slope; and,
- Width of stream from water edge to water edge.

Plan View (NTS)



Sectional View (NTS)



Stream Data Form

Stream Data Form #: S-4
Project Name: SH 5
CSJ: 0047-05-054, etc.

Surveyor(s): Michael Baker International
USGS Stream Name: Unnamed
USGS Topo Quad Name: McKinney East
Associated Wetland(s): NA

Date of Field Work: 06/18/2019
County/State: Collin, TX
Stream Number [303(d) List]: NA
GPS Data: 33.208109°, -96.611994°

Stream Type: Intermittent Characteristics: Natural channel with reinforced concrete banks at the culvert
Bank Stability (e.g. highly eroding, sloughing banks, etc.): Partially eroded vegetated banks
Stream Flow Direction: East
OHWM Width (ft): 19.0 OHWM Height (in): 1.0

Stream Bottom Composition:

<input type="checkbox"/> Silts	<input checked="" type="checkbox"/> Cobbles	<input type="checkbox"/> Concrete	<input checked="" type="checkbox"/> Other: <u>Concrete at the culvert inlet</u>
<input type="checkbox"/> Sands	<input checked="" type="checkbox"/> Bedrock	<input type="checkbox"/> Muck	Type: _____
<input checked="" type="checkbox"/> Gravel	<input checked="" type="checkbox"/> Vegetation		

Aquatic Habitat: Indicate all types present within proposed ROW/project limits.

<input type="checkbox"/> Sand bar	<input type="checkbox"/> Sand/Gravel beach/bar	<input type="checkbox"/> Gravel riffles	<input type="checkbox"/> Aquatic vegetation
<input checked="" type="checkbox"/> Overhanging trees/shrubs	<input type="checkbox"/> Deep pool/ hole/ channel	<input type="checkbox"/> Other: _____	

Stream has the following characteristics:

<input checked="" type="checkbox"/> Bed and banks	
<input checked="" type="checkbox"/> OHWM (check all indicators that apply):	
<input checked="" type="checkbox"/> clear, natural line impressed on the bank	<input type="checkbox"/> the presence of litter and debris
<input type="checkbox"/> changes in the character of soil	<input type="checkbox"/> destruction of terrestrial vegetation
<input checked="" type="checkbox"/> shelving	<input type="checkbox"/> the presence of wrack line
<input checked="" type="checkbox"/> vegetation matted down, bent, or absent	<input type="checkbox"/> sediment sorting
<input type="checkbox"/> leaf litter disturbed or washed away	<input type="checkbox"/> scour
<input type="checkbox"/> sediment deposition	<input type="checkbox"/> multiple observed or predicted flow events
<input type="checkbox"/> water staining	<input type="checkbox"/> abrupt change in plant community
<input type="checkbox"/> other (list): _____	

Water Quality:

☒ Clear ☐ Slightly Turbid ☐ Turbid ☐ Very Turbid ☐ Oily film ☐ High organic content
☐ Other characteristics (pollutants, etc.): _____

Aquatic Organisms: List all species observed. This would include waterfowl, fish, snakes, turtles, frogs, invertebrates, etc.

None

Riparian Vegetation: List species observed.

Box Elder (*Acer negundo*), Pecan (*Carya illinoensis*), Eastern Cottonwood (*Populus deltoides*)

T&E Species/Suitable Habitat: List T&E species observed or which species the habitat is suitable for.

Suitable habitat for southern crawfish frog, eastern box turtle, and Texas garter snake.

Stream Data Form #:

S-4

Project Name:

SH 5

CSJ:

0047-05-054, etc.

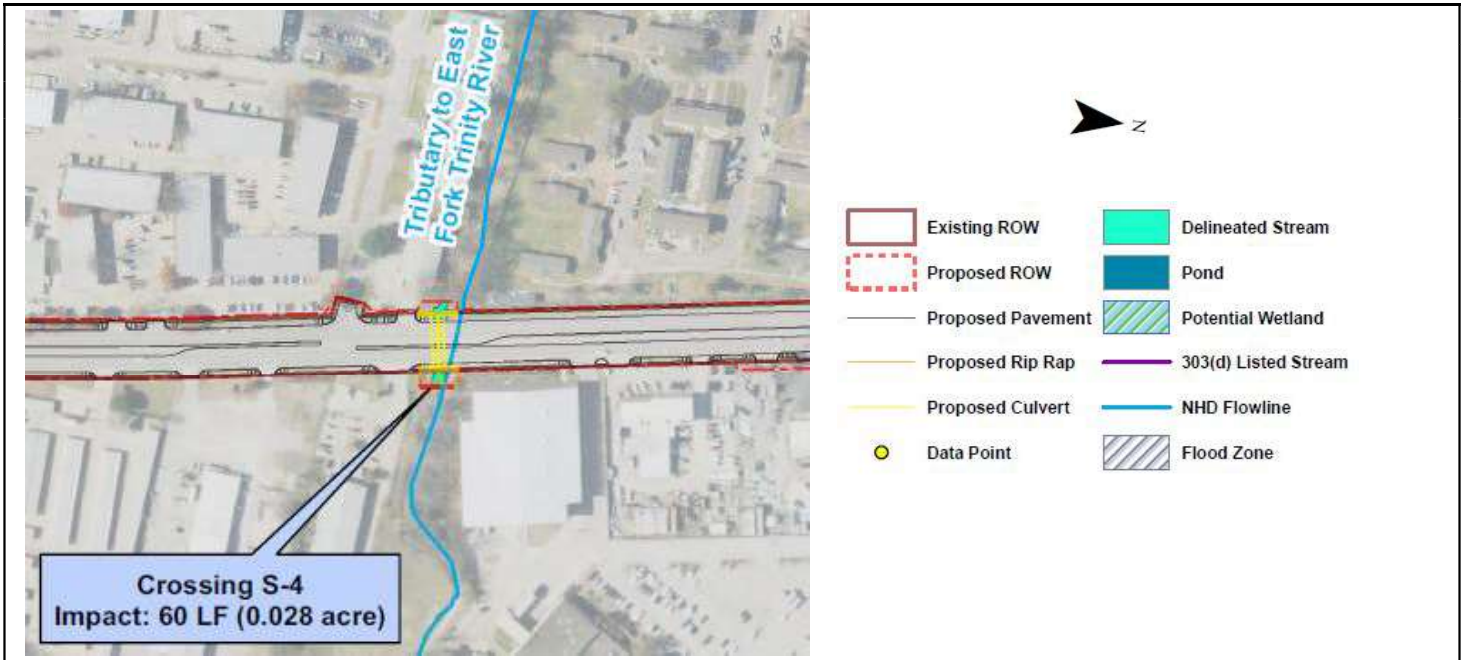
Stream Data Form (continued)

Please provide a plan and section view sketch of the stream channel.

Sketch should include:

- Directional arrow;
- Width of channel from top of bank to top of bank;
- Depth of channel;
- Approximate side slope; and,
- Width of stream from water edge to water edge.

Plan View (NTS)



Sectional View (NTS)



Stream Data Form

Stream Data Form #: S-5
Project Name: SH 5
CSJ: 0047-05-054, etc.

Surveyor(s): Michael Baker International
USGS Stream Name: Unnamed
USGS Topo Quad Name: McKinney East
Associated Wetland(s): NA

Date of Field Work: 06/18/2019
County/State: Collin, TX
Stream Number [303(d) List]: NA
GPS Data: 33.217406°, -96.613349°

Stream Type: Intermittent Characteristics: Natural bedrock
Bank Stability (e.g. highly eroding, sloughing banks, etc.): Severely eroded with 30+ ft. banks
Stream Flow Direction: East
OHWM Width (ft): 36.0 OHWM Height (in): 18.0

Stream Bottom Composition:

☐ Silts ☐ Cobbles ☒ Concrete ☐ Other: _____
☐ Sands ☒ Bedrock ☐ Muck Type: 0% herbaceous cover
☒ Gravel ☐ Vegetation

Aquatic Habitat: Indicate all types present within proposed ROW/project limits.

☐ Sand bar ☐ Sand/Gravel beach/bar ☐ Gravel riffles ☐ Aquatic vegetation
☒ Overhanging trees/shrubs ☐ Deep pool/ hole/ channel ☒ Other: Hard clay/bedrock bottom

Stream has the following characteristics:

☒ Bed and banks
☒ OHWM (check all indicators that apply):
☒ clear, natural line impressed on the bank
☐ changes in the character of soil
☐ shelving
☐ vegetation matted down, bent, or absent
☐ leaf litter disturbed or washed away
☐ sediment deposition
☒ water staining
☐ other (list): _____
☐ the presence of litter and debris
☐ destruction of terrestrial vegetation
☐ the presence of wrack line
☐ sediment sorting
☒ scour
☐ multiple observed or predicted flow events
☐ abrupt change in plant community

Water Quality:

☒ Clear ☐ Slightly Turbid ☐ Turbid ☐ Very Turbid ☐ Oily film ☐ High organic content
☐ Other characteristics (pollutants, etc.): _____

Aquatic Organisms: List all species observed. This would include waterfowl, fish, snakes, turtles, frogs, invertebrates, etc.

None

Riparian Vegetation: List species observed.

Ragweed (*Ambrosia trifida*), Hackberry (*Celtis laevigata*), Pecan (*Carya illinoensis*), Eastern Cottonwood (*Populus deltoides*)

T&E Species/Suitable Habitat: List T&E species observed or which species the habitat is suitable for.

Suitable habitat for southern crawfish frog, eastern box turtle, and Texas garter snake.

Stream Data Form #:

S-5

Project Name:

SH 5

CSJ:

0047-05-054, etc.

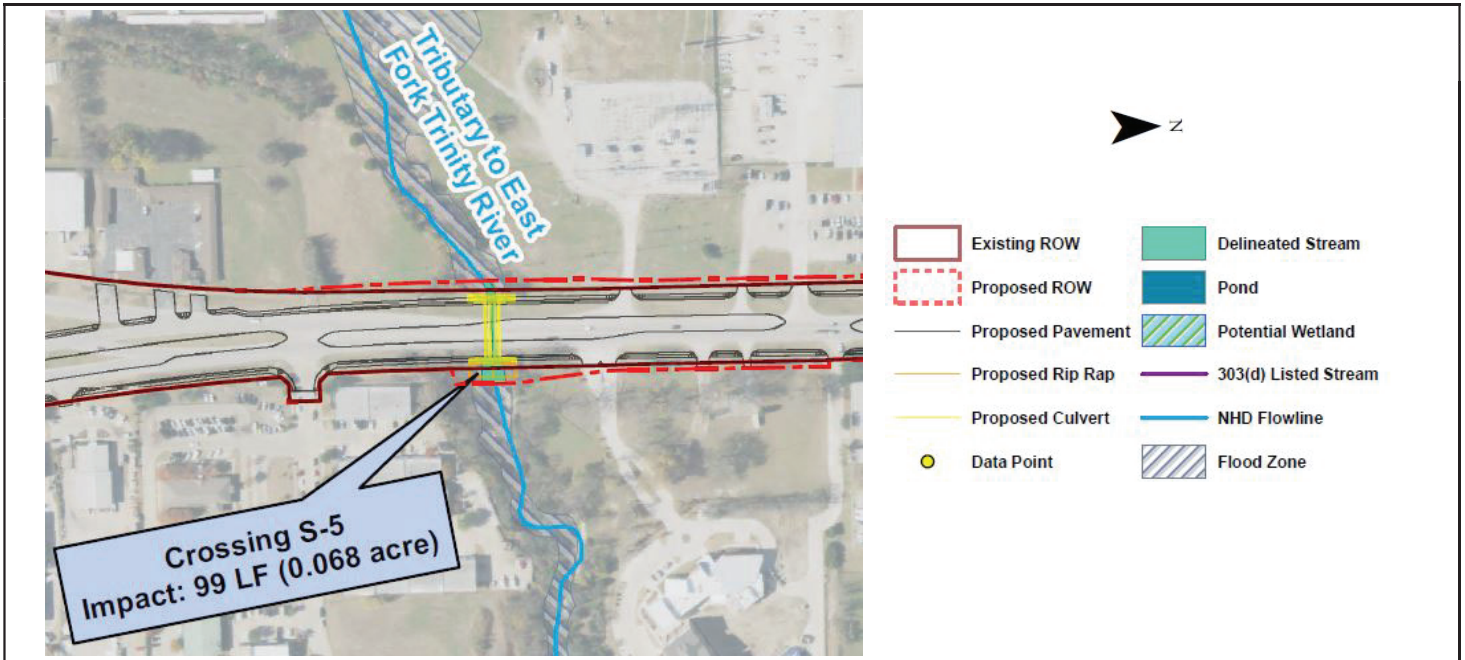
Stream Data Form (continued)

Please provide a plan and section view sketch of the stream channel.

Sketch should include:

- Directional arrow;
- Width of channel from top of bank to top of bank;
- Depth of channel,
- Approximate side slope; and,
- Width of stream from water edge to water edge.

Plan View (NTS)



Sectional View (NTS)



Stream Data Form

Stream Data Form #: S-6
Project Name: SH 5
CSJ: 0047-05-054, etc.

Surveyor(s): Michael Baker International
USGS Stream Name: Unnamed
USGS Topo Quad Name: McKinney East
Associated Wetland(s): NA

Date of Field Work: 06/18/2019
County/State: Collin, TX
Stream Number [303(d) List]: NA
GPS Data: 33.228999°, -96.612911°

Stream Type: Intermittent Characteristics: Natural stream channel
Bank Stability (e.g. highly eroding, sloughing banks, etc.): Moderately eroded, vegetated banks
Stream Flow Direction: East
OHWM Width (ft): 23.0 OHWM Height (in): 12.0

Stream Bottom Composition:

<input type="checkbox"/> Silts	<input checked="" type="checkbox"/> Cobbles	<input type="checkbox"/> Concrete	<input type="checkbox"/> Other:
<input type="checkbox"/> Sands	<input type="checkbox"/> Bedrock	<input type="checkbox"/> Muck	Type: <u>5% herbaceous cover</u>
<input checked="" type="checkbox"/> Gravel	<input checked="" type="checkbox"/> Vegetation		

Aquatic Habitat: Indicate all types present within proposed ROW/project limits.

<input type="checkbox"/> Sand bar	<input checked="" type="checkbox"/> Sand/Gravel beach/bar	<input checked="" type="checkbox"/> Gravel riffles	<input type="checkbox"/> Aquatic vegetation
<input checked="" type="checkbox"/> Overhanging trees/shrubs	<input type="checkbox"/> Deep pool/ hole/ channel	<input type="checkbox"/> Other:	

Stream has the following characteristics:

<input checked="" type="checkbox"/> Bed and banks	
<input checked="" type="checkbox"/> OHWM (check all indicators that apply):	
<input checked="" type="checkbox"/> clear, natural line impressed on the bank	<input type="checkbox"/> the presence of litter and debris
<input checked="" type="checkbox"/> changes in the character of soil	<input type="checkbox"/> destruction of terrestrial vegetation
<input type="checkbox"/> shelving	<input type="checkbox"/> the presence of wrack line
<input type="checkbox"/> vegetation matted down, bent, or absent	<input type="checkbox"/> sediment sorting
<input type="checkbox"/> leaf litter disturbed or washed away	<input type="checkbox"/> scour
<input type="checkbox"/> sediment deposition	<input type="checkbox"/> multiple observed or predicted flow events
<input type="checkbox"/> water staining	<input type="checkbox"/> abrupt change in plant community
<input type="checkbox"/> other (list):	

Water Quality:

☒ Clear ☒ Slightly Turbid ☐ Turbid ☐ Very Turbid ☐ Oily film ☐ High organic content
☒ Other characteristics (pollutants, etc.): Slightly turbid on western side of the stream.

Aquatic Organisms: List all species observed. This would include waterfowl, fish, snakes, turtles, frogs, invertebrates, etc.

Turtle, Crawfish (*Procambarus clarkii*)

Riparian Vegetation: List species observed.

Pecan (*Carya illinoensis*), Hackberry (*Celtis laevigata*), Ragweed (*Ambrosia trifida*), Privet (*Ligustrum sinense*), Trumpet Vine (*Campsis radicans*), American Elm (*Ulmus americana*), Eastern Cottonwood (*Populus deltoides*), Poison Ivy (*Toxicodendron radicans*)

T&E Species/Suitable Habitat: List T&E species observed or which species the habitat is suitable for.

Suitable habitat for southern crawfish frog, eastern box turtle, and Texas garter snake.

Stream Data Form #:

S-6

Project Name:

SH 5

CSJ:

0047-05-054, etc.

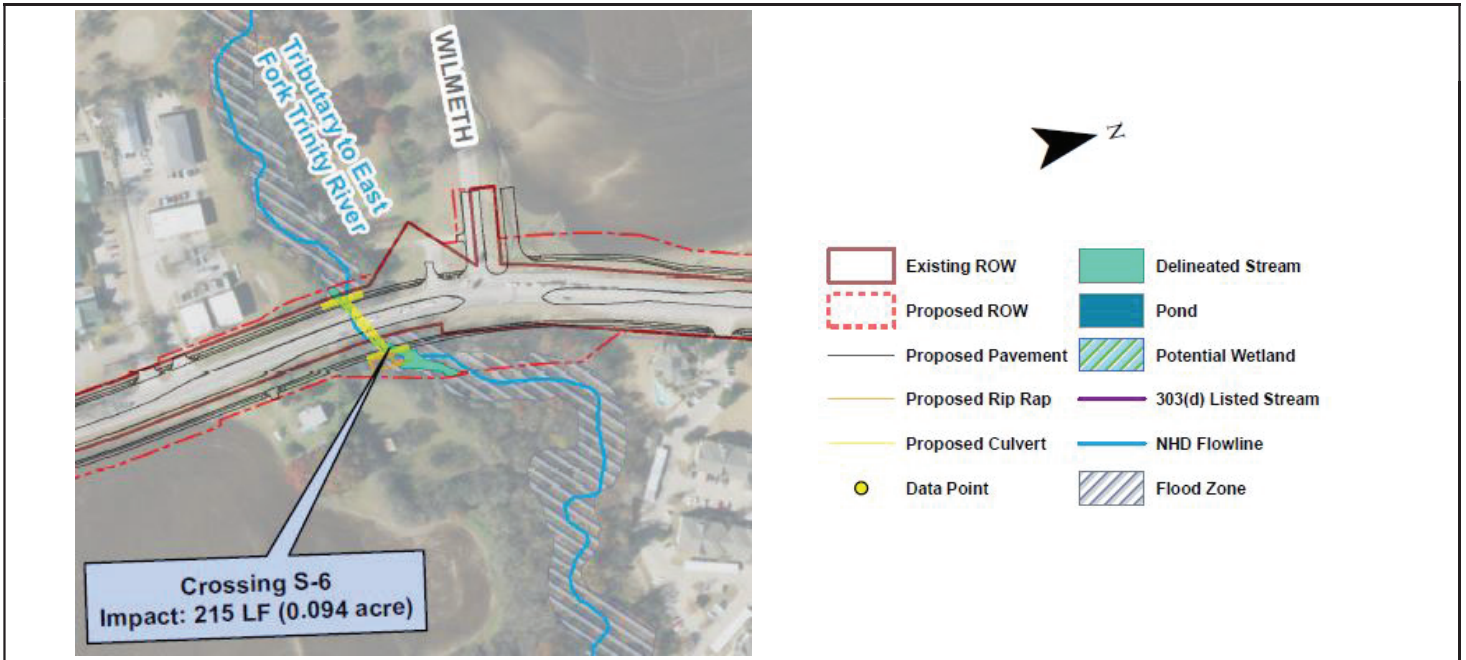
Stream Data Form (continued)

Please provide a plan and section view sketch of the stream channel.

Sketch should include:

- Directional arrow;
- Width of channel from top of bank to top of bank;
- Depth of channel,
- Approximate side slope; and,
- Width of stream from water edge to water edge.

Plan View (NTS)



Sectional View (NTS)



Stream Data Form

Stream Data Form #: S-7
Project Name: SH 5
CSJ: 0047-05-054, etc.

Surveyor(s): Michael Baker International
USGS Stream Name: Unnamed
USGS Topo Quad Name: McKinney East
Associated Wetland(s): NA

Date of Field Work: 06/18/2019
County/State: Collin, TX
Stream Number [303(d) List]: NA
GPS Data: 33.235458°, -96.610925°

Stream Type: Intermittent Characteristics: Natural channel with concrete box culvert
Bank Stability (e.g. highly eroding, sloughing banks, etc.): stabilized vegetated banks
Stream Flow Direction: East
OHWM Width (ft): 25.0 OHWM Height (in): 42.0

Stream Bottom Composition:

☒ Silts ☐ Cobbles ☐ Concrete ☐ Other: _____
☒ Sands ☐ Bedrock ☒ Muck Type: _____
☐ Gravel ☐ Vegetation

Aquatic Habitat: Indicate all types present within proposed ROW/project limits.

☐ Sand bar ☐ Sand/Gravel beach/bar ☒ Gravel riffles ☐ Aquatic vegetation
☐ Overhanging trees/shrubs ☐ Deep pool/ hole/ channel ☐ Other: _____

Stream has the following characteristics:

☒ Bed and banks
☒ OHWM (check all indicators that apply):
☒ clear, natural line impressed on the bank
☐ changes in the character of soil
☒ shelving
☒ vegetation matted down, bent, or absent
☐ leaf litter disturbed or washed away
☒ sediment deposition
☐ water staining
☐ other (list): _____
☐ the presence of litter and debris
☒ destruction of terrestrial vegetation
☐ the presence of wrack line
☐ sediment sorting
☐ scour
☐ multiple observed or predicted flow events
☐ abrupt change in plant community

Water Quality:

☐ Clear ☒ Slightly Turbid ☐ Turbid ☐ Very Turbid ☐ Oily film ☐ High organic content
☐ Other characteristics (pollutants, etc.): _____

Aquatic Organisms: List all species observed. This would include waterfowl, fish, snakes, turtles, frogs, invertebrates, etc.

None

Riparian Vegetation: List species observed.

Ragweed (*Ambrosia trifida*), Muscadine (*Vitis rotundifolia*), Hackberry (*Celtis laevigata*), American Elm (*Ulmus americana*), Eastern Cottonwood (*Populus deltoides*), Pecan (*Carya illinoensis*)

T&E Species/Suitable Habitat: List T&E species observed or which species the habitat is suitable for.

Suitable habitat for southern crawfish frog, eastern box turtle, and Texas garter snake.

Stream Data Form #:

S-7

Project Name:

SH 5

CSJ:

0047-05-054, etc.

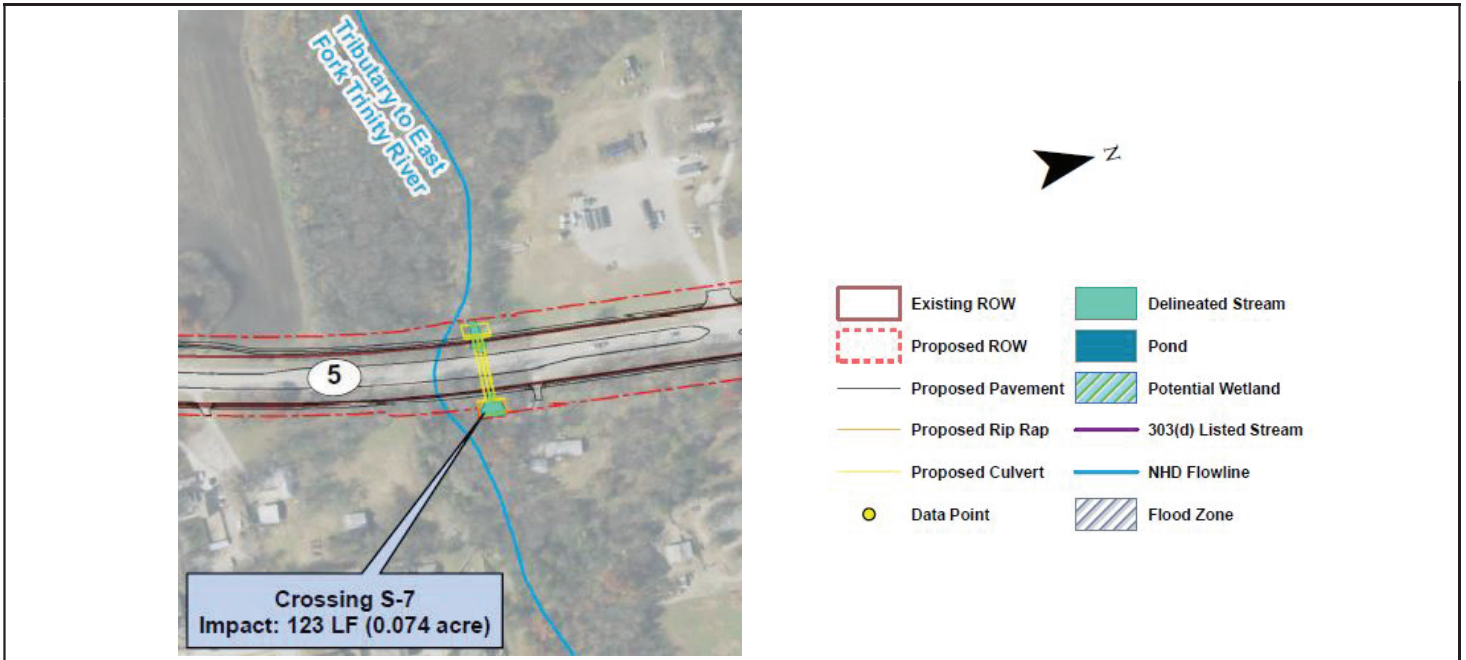
Stream Data Form (continued)

Please provide a plan and section view sketch of the stream channel.

Sketch should include:

- Directional arrow;
- Width of channel from top of bank to top of bank;
- Depth of channel,
- Approximate side slope; and,
- Width of stream from water edge to water edge.

Plan View (NTS)



Sectional View (NTS)



Stream Data Form

Stream Data Form #: S-8
Project Name: SH 5
CSJ: 0047-05-054, etc.

Surveyor(s): Michael Baker International
USGS Stream Name: East Fork Trinity River
USGS Topo Quad Name: McKinney East
Associated Wetland(s): NA

Date of Field Work: 06/18/2019
County/State: Collin, TX
Stream Number [303(d) List]: 0821D_01
GPS Data: 33.243951°, -96.609242°

Stream Type: Perennial Characteristics: Natural flowing channel
Bank Stability (e.g. highly eroding, sloughing banks, etc.): Highly eroded banks
Stream Flow Direction: East
OHWM Width (ft): 42.0 OHWM Height (in): 60.0

Stream Bottom Composition:

<input checked="" type="checkbox"/> Silts	<input checked="" type="checkbox"/> Cobbles	<input type="checkbox"/> Concrete	<input type="checkbox"/> Other:
<input checked="" type="checkbox"/> Sands	<input checked="" type="checkbox"/> Bedrock	<input checked="" type="checkbox"/> Muck	Type: <u>0% herbaceous cover</u>
<input type="checkbox"/> Gravel	<input type="checkbox"/> Vegetation		

Aquatic Habitat: Indicate all types present within proposed ROW/project limits.

<input type="checkbox"/> Sand bar	<input checked="" type="checkbox"/> Sand/Gravel beach/bar	<input type="checkbox"/> Gravel riffles	<input type="checkbox"/> Aquatic vegetation
<input type="checkbox"/> Overhanging trees/shrubs	<input type="checkbox"/> Deep pool/ hole/ channel	<input checked="" type="checkbox"/> Other: <u>Deep flowing channel</u>	

Stream has the following characteristics:

<input checked="" type="checkbox"/> Bed and banks	
<input checked="" type="checkbox"/> OHWM (check all indicators that apply):	
<input checked="" type="checkbox"/> clear, natural line impressed on the bank	<input checked="" type="checkbox"/> the presence of litter and debris
<input checked="" type="checkbox"/> changes in the character of soil	<input type="checkbox"/> destruction of terrestrial vegetation
<input checked="" type="checkbox"/> shelving	<input type="checkbox"/> the presence of wrack line
<input type="checkbox"/> vegetation matted down, bent, or absent	<input type="checkbox"/> sediment sorting
<input type="checkbox"/> leaf litter disturbed or washed away	<input checked="" type="checkbox"/> scour
<input type="checkbox"/> sediment deposition	<input type="checkbox"/> multiple observed or predicted flow events
<input checked="" type="checkbox"/> water staining	<input type="checkbox"/> abrupt change in plant community
<input type="checkbox"/> other (list):	

Water Quality:

☐ Clear ☐ Slightly Turbid ☐ Turbid ☒ Very Turbid ☐ Oily film ☐ High organic content
☐ Other characteristics (pollutants, etc.): _____

Aquatic Organisms: List all species observed. This would include waterfowl, fish, snakes, turtles, frogs, invertebrates, etc.

Blue Heron (*Ardea herodias*)

Riparian Vegetation: List species observed.

Box Elder (*Acer negundo*), Ragweed (*Ambrosia trifida*), Privet (*Ligustrum sinense*), Poison Ivy (*Toxicodendron radicans*), American Elm (*Ulmus americana*), Pecan (*Carya illinoensis*), Johnsongrass (*Sorghum halepense*), Black Elderberry (*Sambucus nigra*)

T&E Species/Suitable Habitat: List T&E species observed or which species the habitat is suitable for.

Suitable habitat for southern crawfish frog, chub shiner, Louisiana pigtoe, Texas heelsplitter, eastern box turtle, and Texas garter snake.

Stream Data Form #:

S-8

Project Name:

SH 5

CSJ:

0047-05-054, etc.

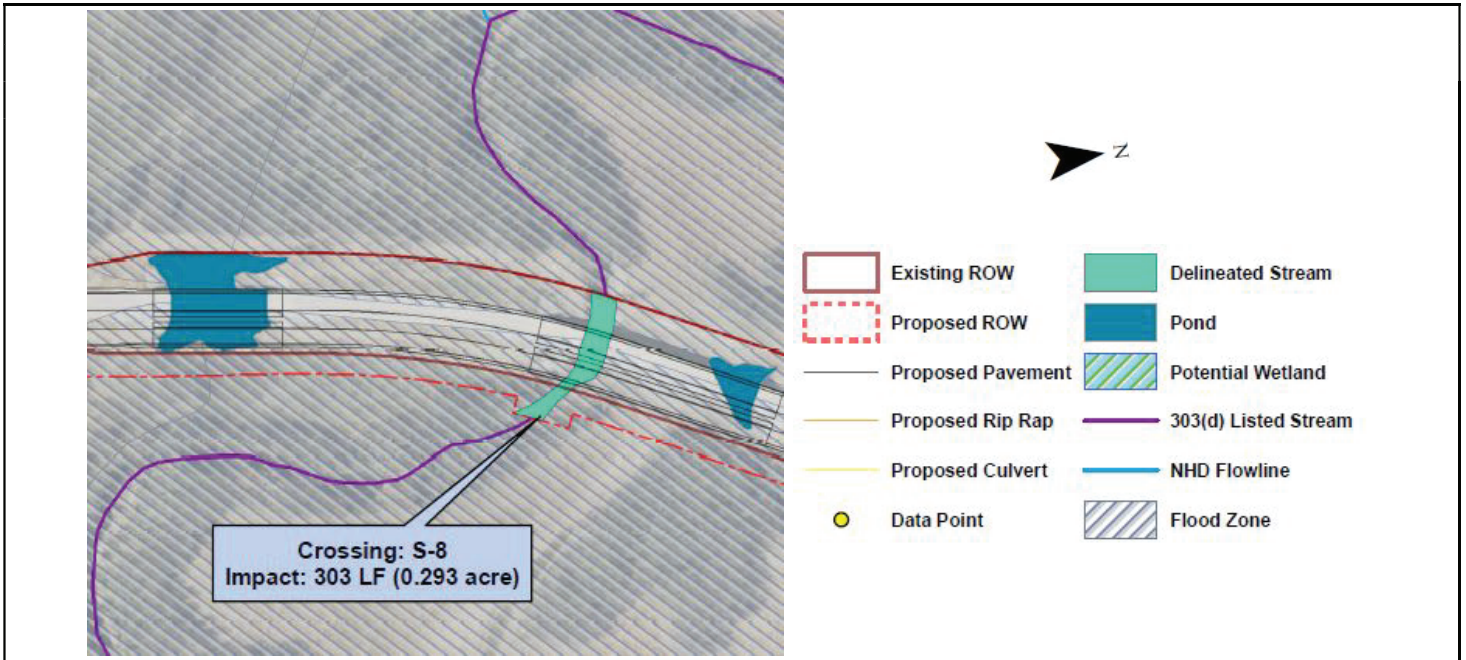
Stream Data Form (continued)

Please provide a plan and section view sketch of the stream channel.

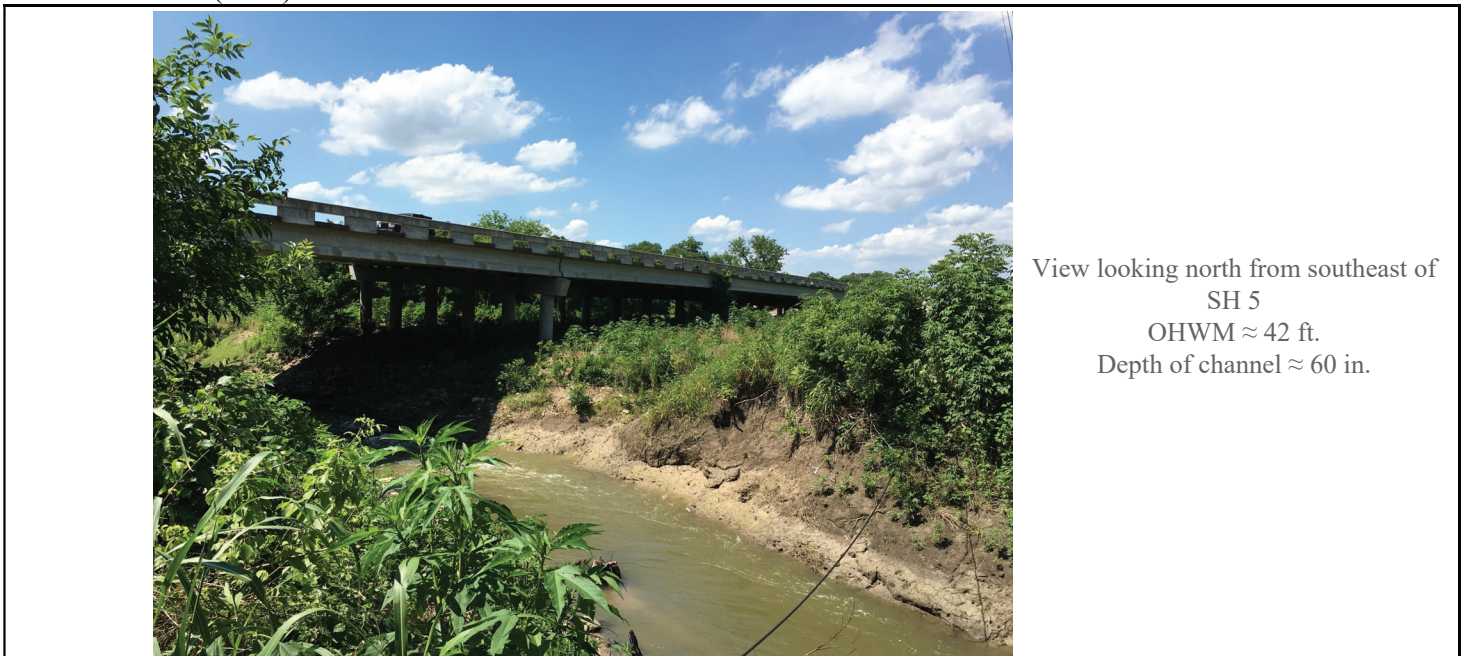
Sketch should include:

- Directional arrow;
- Width of channel from top of bank to top of bank;
- Depth of channel,
- Approximate side slope; and,
- Width of stream from water edge to water edge.

Plan View (NTS)



Sectional View (NTS)



Stream Data Form

Stream Data Form #: S-9
Project Name: SH 5
CSJ: 0047-05-054, etc.

Surveyor(s): Michael Baker International
USGS Stream Name: Unnamed
USGS Topo Quad Name: Anna, TX
Associated Wetland(s): NA

Date of Field Work: 06/18/2019
County/State: Collin, TX
Stream Number [303(d) List]: NA
GPS Data: 33.253403°, -96.602795°

Stream Type: Intermittent Characteristics: Significantly disturbed due to construction
Bank Stability (e.g. highly eroding, sloughing banks, etc.): Highly eroded, sparse vegetation
Stream Flow Direction: West
OHWM Width (ft): 16.0 OHWM Height (in): 4.0

Stream Bottom Composition:

<input checked="" type="checkbox"/> Silts	<input checked="" type="checkbox"/> Cobbles	<input type="checkbox"/> Concrete	<input checked="" type="checkbox"/> Other: <u>Construction debris</u>
<input checked="" type="checkbox"/> Sands	<input checked="" type="checkbox"/> Bedrock	<input checked="" type="checkbox"/> Muck	Type: <u>1% vegetation cover (herbaceous)</u>
<input checked="" type="checkbox"/> Gravel	<input checked="" type="checkbox"/> Vegetation		

Aquatic Habitat: Indicate all types present within proposed ROW/project limits.

<input type="checkbox"/> Sand bar	<input type="checkbox"/> Sand/Gravel beach/bar	<input type="checkbox"/> Gravel riffles	<input type="checkbox"/> Aquatic vegetation
<input type="checkbox"/> Overhanging trees/shrubs	<input type="checkbox"/> Deep pool/ hole/ channel	<input checked="" type="checkbox"/> Other: <u>None - disturbed</u>	

Stream has the following characteristics:

<input checked="" type="checkbox"/> Bed and banks	
<input type="checkbox"/> OHWM (check all indicators that apply):	
<input type="checkbox"/> clear, natural line impressed on the bank	<input type="checkbox"/> the presence of litter and debris
<input type="checkbox"/> changes in the character of soil	<input type="checkbox"/> destruction of terrestrial vegetation
<input type="checkbox"/> shelving	<input type="checkbox"/> the presence of wrack line
<input type="checkbox"/> vegetation matted down, bent, or absent	<input type="checkbox"/> sediment sorting
<input type="checkbox"/> leaf litter disturbed or washed away	<input checked="" type="checkbox"/> scour
<input checked="" type="checkbox"/> sediment deposition	<input type="checkbox"/> multiple observed or predicted flow events
<input type="checkbox"/> water staining	<input type="checkbox"/> abrupt change in plant community
<input type="checkbox"/> other (list):	

Water Quality:

☒ Clear ☐ Slightly Turbid ☐ Turbid ☐ Very Turbid ☐ Oily film ☐ High organic content
☐ Other characteristics (pollutants, etc.): _____

Aquatic Organisms: List all species observed. This would include waterfowl, fish, snakes, turtles, frogs, invertebrates, etc.

None

Riparian Vegetation: List species observed.

Ragweed (*Ambrosia trifida*), Rough Cocklebur (*Xanthium strumarium*), Johnsongrass (*Sorghum halepense*)

T&E Species/Suitable Habitat: List T&E species observed or which species the habitat is suitable for.

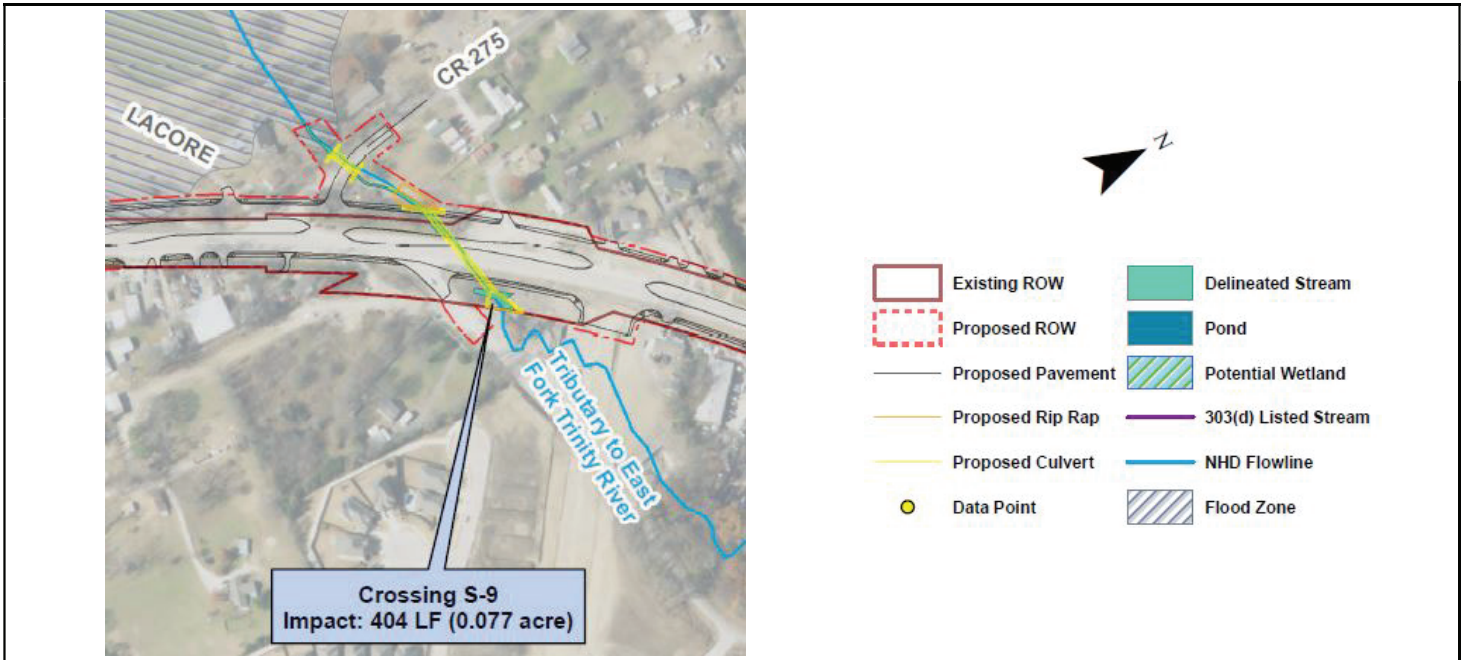
None

S-9

SH 5

0047-05-054, etc.

- Approximate side slope; and,
- Width of stream from water edge to water edge.



WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: State Highway 5 City/County: McKinney, Collin County Sampling Date: 06/19/2019
 Applicant/Owner: Texas Department of Transportation State: TX Sampling Point: WL-1
 Investigator(s): Michael Baker International Section, Township, Range: NA
 Landform (hillslope, terrace, etc.): Floodplain depression Local relief (concave, convex, none): None Slope (%): 0
 Subregion (LRR): LRR J Lat: 33.171438 Long: -96.623769 Datum: NAD 83
 Soil Map Unit Name: Houston Black clay, 0 to 1 percent slopes NWI classification: NA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)
 Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐
 Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Hydric Soil Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
Remarks: Sample area is a forested wetland located on the southeast side of State Highway 5, south of Wilson Creek. Sample point was collected the day after an evening rainfall event.			

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>67%</u> (A/B)
1. <u>Ulmus americana</u>	<u>85%</u>	<u>Yes</u>	<u>FAC</u>	
2. <u>Acer negundo</u>	<u>15%</u>	<u>No</u>	<u>FAC</u>	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
<u>100</u> = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
1. <u>Ulmus americana</u>	<u>30</u>	<u>Yes</u>	<u>FAC</u>	
2. <u>Acer negundo</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
<u>35</u> = Total Cover				
Herb Stratum (Plot size: <u>5'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% ____ 3 - Prevalence Index is ≤3.0 ¹ ____ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ____ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. <u>Toxicodendron radicans</u>	<u>20</u>	<u>Yes</u>	<u>FACU</u>	
2. <u>Ambrosia trifida</u>	<u>15</u>	<u>Yes</u>	<u>FAC</u>	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
<u>35</u> = Total Cover				
Woody Vine Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
<u>0</u> = Total Cover				
% Bare Ground in Herb Stratum <u>65</u>				
Remarks: Sample area is largely populated in the tree stratum, with 65% bare ground and approximately 85% canopy cover				

SOIL

Sampling Point: WL-1

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-12	10YR 3/1	100					Clay	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

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

- | | |
|--|--|
| <input type="checkbox"/> Histosol (A1) | <input type="checkbox"/> Sandy Gleyed Matrix (S4) |
| <input type="checkbox"/> Histic Epipedon (A2) | <input type="checkbox"/> Sandy Redox (S5) |
| <input type="checkbox"/> Black Histic (A3) | <input type="checkbox"/> Stripped Matrix (S6) |
| <input type="checkbox"/> Hydrogen Sulfide (A4) | <input type="checkbox"/> Loamy Mucky Mineral (F1) |
| <input type="checkbox"/> Stratified Layers (A5) (LRR F) | <input type="checkbox"/> Loamy Gleyed Matrix (F2) |
| <input type="checkbox"/> 1 cm Muck (A9) (LRR F, G, H) | <input type="checkbox"/> Depleted Matrix (F3) |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Redox Dark Surface (F6) |
| <input checked="" type="checkbox"/> Thick Dark Surface (A12) | <input type="checkbox"/> Depleted Dark Surface (F7) |
| <input type="checkbox"/> Sandy Mucky Mineral (S1) | <input type="checkbox"/> Redox Depressions (F8) |
| <input type="checkbox"/> 2.5 cm Mucky Peat or Peat (S2) (LRR G, H) | <input type="checkbox"/> High Plains Depressions (F16) |
| <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR F) | (MLRA 72 & 73 of LRR H) |

Indicators for Problematic Hydric Soils³:

- ☐ 1 cm Muck (A9) (LRR I, J)
- ☐ Coast Prairie Redox (A16) (LRR F, G, H)
- ☐ Dark Surface (S7) (LRR G)
- ☐ High Plains Depressions (F16)
- (LRR H outside of MLRA 72 & 73)**
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: NA
Depth (inches): _____

Hydric Soil Present? Yes ☒ No ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

- | | |
|--|---|
| <input checked="" type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Salt Crust (B11) |
| <input checked="" type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Aquatic Invertebrates (B13) |
| <input checked="" type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Dry-Season Water Table (C2) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) |
| <input type="checkbox"/> Drift Deposits (B3) | (where not tilled) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Presence of Reduced Iron (C4) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Thin Muck Surface (C7) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Water-Stained Leaves (B9) | |

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☒ Drainage Patterns (B10)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- (where tilled)**
- ☒ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ FAC-Neutral Test (D5)
- ☐ Frost-Heave Hummocks (D7) (LRR F)

Field Observations:

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

Wetland Hydrology Present? Yes ☒ No ☐

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

Remarks:

Rained the evening prior to the day of site sampling. Ongoing surface drainage observed, with water flowing easterly.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: State Highway 5 City/County: McKinney, Collin County Sampling Date: 06/19/2019
 Applicant/Owner: Texas Department of Transportation State: TX Sampling Point: WL-2
 Investigator(s): Michael Baker International Section, Township, Range: NA
 Landform (hillslope, terrace, etc.): Floodplain depression Local relief (concave, convex, none): none Slope (%): 0
 Subregion (LRR): LRR J Lat: 33.172911 Long: -96.621984 Datum: NAD 83
 Soil Map Unit Name: Trinity clay, 0 to 1 percent slopes, occasionally flooded NWI classification: PFO

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)
 Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐
 Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Hydric Soil Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
Remarks: Sample area is a forested wetland located on the southeast side of State Highway 5, south of Wilson Creek. sample point collected the day after a evening rainfall event.			

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>5</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>80%</u> (A/B)
1. <u>Celtis laevigata</u>	<u>70</u>	<u>Yes</u>	<u>FAC</u>	
2. <u>Acer negundo</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	
3. <u>Ulmus americana</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	
4. <u>Fraxinus americana</u>	<u>10</u>	<u>No</u>	<u>FACU</u>	
<u>100</u> = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>15'</u>)				
1. <u>Ulmus americana</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
2. <u>Fraxinus americana</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
<u>25</u> = Total Cover				
Herb Stratum (Plot size: <u>5'</u>)				
1. <u>Elymus virginicus</u>	<u>30</u>	<u>Yes</u>	<u>FAC</u>	Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% ___ 3 - Prevalence Index is ≤3.0 ¹ ___ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ___ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. <u>Solidago altissima</u>	<u>25</u>	<u>Yes</u>	<u>FACU</u>	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
<u>55</u> = Total Cover				
Woody Vine Stratum (Plot size: <u>15'</u>)				
1. <u>Smilax rotundifolia</u>	<u>2</u>	<u>Yes</u>	<u>FAC</u>	Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
2. _____	_____	_____	_____	
<u>2</u> = Total Cover				
% Bare Ground in Herb Stratum <u>45</u>				
Remarks: Sample area is largely populated in the tree stratum, with 45% bare ground and approximately 90% canopy cover.				

SOIL

Sampling Point: WL-2

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

[illegible]

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

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

Indicators for Problematic Hydric Soils³:

- | | | |
|---|--|--|
| <input type="checkbox"/> Histosol (A1) | <input type="checkbox"/> Sandy Gleyed Matrix (S4) | <input type="checkbox"/> 1 cm Muck (A9) (LRR I, J) |
| <input type="checkbox"/> Histic Epipedon (A2) | <input type="checkbox"/> Sandy Redox (S5) | <input type="checkbox"/> Coast Prairie Redox (A16) (LRR F, G, H) |
| <input type="checkbox"/> Black Histic (A3) | <input type="checkbox"/> Stripped Matrix (S6) | <input type="checkbox"/> Dark Surface (S7) (LRR G) |
| <input type="checkbox"/> Hydrogen Sulfide (A4) | <input type="checkbox"/> Loamy Mucky Mineral (F1) | <input type="checkbox"/> High Plains Depressions (F16) |
| <input type="checkbox"/> Stratified Layers (A5) (LRR F) | <input type="checkbox"/> Loamy Gleyed Matrix (F2) | (LRR H outside of MLRA 72 & 73) |
| <input type="checkbox"/> 1 cm Muck (A9) (LRR F, G, H) | <input type="checkbox"/> Depleted Matrix (F3) | <input type="checkbox"/> Reduced Vertic (F18) |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Redox Dark Surface (F6) | <input type="checkbox"/> Red Parent Material (TF2) |
| <input type="checkbox"/> Thick Dark Surface (A12) | <input type="checkbox"/> Depleted Dark Surface (F7) | <input checked="" type="checkbox"/> Very Shallow Dark Surface (TF12) |
| <input type="checkbox"/> Sandy Mucky Mineral (S1) | <input type="checkbox"/> Redox Depressions (F8) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> 2.5 cm Mucky Peat or Peat (S2) (LRR G, H) | <input type="checkbox"/> High Plains Depressions (F16) | ³ Indicators of hydrophytic vegetation and wetland hydrology must be present, |
| <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR F) | (MLRA 72 & 73 of LRR H) | |

Restrictive Layer (if present):

Type: Rock

Depth (inches): 8 in

Hydric Soil Present? Yes X No

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

- | | |
|--|---|
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Salt Crust (B11) |
| <input type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Aquatic Invertebrates (B13) |
| <input type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Dry-Season Water Table (C2) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) |
| <input checked="" type="checkbox"/> Drift Deposits (B3) | (where not tilled) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Presence of Reduced Iron (C4) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Thin Muck Surface (C7) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input checked="" type="checkbox"/> Water-Stained Leaves (B9) | |

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☒ Drainage Patterns (B10)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
(where tilled)
- ☒ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ FAC-Neutral Test (D5)
- ☐ Frost-Heave Hummocks (D7) (LRR F)

Field Observations:

Surface Water Present? Yes _____ No ~~X~~ Depth (inches): _____

Water Table Present? Yes _____ No ~~X~~ Depth (inches): _____

Saturation Present? Yes _____ No ~~X~~ Depth (inches): _____
(includes capillary fringe)

Wetland Hydrology Present? Yes ☒ No ☐

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

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: State Highway 5 City/County: McKinney/Melissa, Collin County Sampling Date: 06/19/2019
 Applicant/Owner: Texas Department of Transportation State: TX Sampling Point: UP-1
 Investigator(s): Michael Baker International Section, Township, Range: NA
 Landform (hillslope, terrace, etc.): Road embankment Local relief (concave, convex, none): concave slope Slope (%): 25
 Subregion (LRR): LRR J Lat: 33.173043 Long: -96.622056 Datum: NAD 83
 Soil Map Unit Name: Trinity clay, 0 to 1 percent slopes, occasionally flooded NWI classification: NA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)
 Are Vegetation Yes, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐
 Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Hydric Soil Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		
Wetland Hydrology Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		
Remarks: Sample area is a maintained roadbed embankment adjacent to the existing Right of Way fence line on the southeast side of State Highway 5, parallel to the proposed improvements. Sample point collected the day after a evening rainfall event.			

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): <u>0</u> (A) Total Number of Dominant Species Across All Strata: <u>1</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A/B)														
1. _____	_____	_____	_____															
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
_____ = Total Cover				Prevalence Index worksheet: <table border="0"> <tr> <td>Total % Cover of:</td> <td>Multiply by:</td> </tr> <tr> <td>OBL species <u>0</u></td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species <u>0</u></td> <td>x 2 = <u>0</u></td> </tr> <tr> <td>FAC species <u>0</u></td> <td>x 3 = <u>0</u></td> </tr> <tr> <td>FACU species <u>85</u></td> <td>x 4 = <u>340</u></td> </tr> <tr> <td>UPL species <u>5</u></td> <td>x 5 = <u>25</u></td> </tr> <tr> <td>Column Totals: <u>90</u> (A)</td> <td><u>365</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>4.06</u>	Total % Cover of:	Multiply by:	OBL species <u>0</u>	x 1 = <u>0</u>	FACW species <u>0</u>	x 2 = <u>0</u>	FAC species <u>0</u>	x 3 = <u>0</u>	FACU species <u>85</u>	x 4 = <u>340</u>	UPL species <u>5</u>	x 5 = <u>25</u>	Column Totals: <u>90</u> (A)	<u>365</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>0</u>	x 1 = <u>0</u>																	
FACW species <u>0</u>	x 2 = <u>0</u>																	
FAC species <u>0</u>	x 3 = <u>0</u>																	
FACU species <u>85</u>	x 4 = <u>340</u>																	
UPL species <u>5</u>	x 5 = <u>25</u>																	
Column Totals: <u>90</u> (A)	<u>365</u> (B)																	
_____ = Total Cover																		
Sapling/Shrub Stratum (Plot size: <u>15'</u>) 1. _____ 2. _____ 3. _____ 4. _____ 5. _____ _____ = Total Cover																		
Herb Stratum (Plot size: <u>5'</u>) 1. <u>Sorghum halepense</u> 85 Yes FACU 2. <u>Acalypha ostryifolia</u> 5 No UPL 3. _____ 4. _____ 5. _____ 6. _____ 7. _____ 8. _____ 9. _____ 10. _____ _____ = Total Cover																		
Woody Vine Stratum (Plot size: <u>15'</u>) 1. _____ 2. _____ _____ = Total Cover % Bare Ground in Herb Stratum <u>0</u>																		
Hydrophytic Vegetation Indicators: ___ 1 - Rapid Test for Hydrophytic Vegetation ___ 2 - Dominance Test is >50% ___ 3 - Prevalence Index is ≤3.0 ¹ ___ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ___ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.																		
Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>																		
Remarks: Sample area is located within disturbed maintained/mowed Right of Way.																		

SOIL

Sampling Point: UP1

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-9	10YR 4/2	100					Clay	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

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

- | | |
|--|--|
| <input type="checkbox"/> Histosol (A1) | <input type="checkbox"/> Sandy Gleyed Matrix (S4) |
| <input type="checkbox"/> Histic Epipedon (A2) | <input type="checkbox"/> Sandy Redox (S5) |
| <input type="checkbox"/> Black Histic (A3) | <input type="checkbox"/> Stripped Matrix (S6) |
| <input type="checkbox"/> Hydrogen Sulfide (A4) | <input type="checkbox"/> Loamy Mucky Mineral (F1) |
| <input type="checkbox"/> Stratified Layers (A5) (LRR F) | <input type="checkbox"/> Loamy Gleyed Matrix (F2) |
| <input type="checkbox"/> 1 cm Muck (A9) (LRR F, G, H) | <input type="checkbox"/> Depleted Matrix (F3) |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Redox Dark Surface (F6) |
| <input type="checkbox"/> Thick Dark Surface (A12) | <input type="checkbox"/> Depleted Dark Surface (F7) |
| <input type="checkbox"/> Sandy Mucky Mineral (S1) | <input type="checkbox"/> Redox Depressions (F8) |
| <input type="checkbox"/> 2.5 cm Mucky Peat or Peat (S2) (LRR G, H) | <input type="checkbox"/> High Plains Depressions (F16) |
| <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR F) | (MLRA 72 & 73 of LRR H) |

Indicators for Problematic Hydric Soils³:

- ☐ 1 cm Muck (A9) (LRR I, J)
- ☐ Coast Prairie Redox (A16) (LRR F, G, H)
- ☐ Dark Surface (S7) (LRR G)
- ☐ High Plains Depressions (F16)
- (LRR H outside of MLRA 72 & 73)**
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: Roadbed material
Depth (inches): 9 in

Hydric Soil Present? Yes ☐ No ☒

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

- | | |
|--|---|
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Salt Crust (B11) |
| <input type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Aquatic Invertebrates (B13) |
| <input type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Dry-Season Water Table (C2) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) |
| <input type="checkbox"/> Drift Deposits (B3) | (where not tilled) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Presence of Reduced Iron (C4) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Thin Muck Surface (C7) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Water-Stained Leaves (B9) | |

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- (where tilled)**
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ FAC-Neutral Test (D5)
- ☐ Frost-Heave Hummocks (D7) (LRR F)

Field Observations:

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

Wetland Hydrology Present? Yes ☐ No ☒

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

Remarks: