



Biological Evaluation Form

Main CSJ: 0718-02-045

Form Prepared By: Julie LeClair, Hicks & Company

Date of Evaluation: March 12, 2018

Project has no Federal nexus.

Proposed Letting Date: August 2018

Project not assigned to TxDOT under the NEPA Assignment MOU

District(s): Fort Worth

County(ies): Tarrant

Roadway Name: Farm-to-Market (FM) 156

Limits From: US 81/US 287

Limits To: Watauga Road/McLeroy Boulevard

Project Description: The project would include an expansion of Farm-to-Market Road (FM) 156/Blue Mound Road with logical termini extending from US 81/US 287 to McLeroy Boulevard/Watauga Road in Tarrant County, Texas. The portion of FM 156 under study lies within the cities of Saginaw, Blue Mound and Fort Worth.

The existing facility is a two lane undivided roadway with one 12-foot lane in each direction and variable width shoulders. The existing facility has a typical right of way width of 120 feet.

The proposed project would expand the existing facility from two lanes to four lanes with a raised center median. The facility would include 14-foot outside lanes and 12-foot inside lanes with a curb and gutter. Ten-foot wide sidewalks would be included on the outside southbound lane, and six-foot wide sidewalks would be included along the outside northbound lane.

Overall, the proposed improvements would extend 3.8 miles and would require the acquisition of approximately 0.45 acres of additional right of way.

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 16, 2014, and executed by FHWA and TxDOT.

Endangered Species Act (ESA)

Yes Is the action area of the proposed project within the range of federally protected species?

Yes Did the USFWS IPaC system identify any endangered species that may occur or could potentially be affected by the proposed project activities?

Date that the [IPaC system](#) was accessed: March 12, 2018

No Is the action area of the proposed project in suitable habitat of federally protected species?

***Explain:**

Desktop analysis and field investigations conducted by a qualified biologist on April 18 and July 7, 2016, indicate that no potential habitat for federally listed threatened or endangered species occurs in the vicinity of the proposed project area. Additionally, no critical habitat is present in the vicinity of the proposed project as detailed in the USFWS IPaC Official Species List. Therefore, the proposed project would have no effect on federally listed species.



Biological Evaluation Form

Resources consulted or activities conducted to make effect determination (if applicable):

- TPWD County List USFWS Critical Habitat Maps Species Expert Consulted
- Aerial Photography Coastal Areas Maps Site Visit
- Topographic Map Species Study Conducted Karst Zone Maps
- Ecological Mapping System of Texas (EMST) Natural Diversity Database (NDD)

Other:

Migratory Bird Treaty Act (MBTA)

- Yes Is there potential for nesting birds to be present in the project action area during construction?
- No Were active nests identified during the site survey?
- Yes Will BMPs will be incorporated to protect migratory bird nests?

Bald and Golden Eagle Protection Act (BGEPA)

- No Does the proposed project have the potential to impact Bald or Golden Eagles?

Fish and Wildlife Coordination Act (FWCA)

- Yes Does the project have impacts on one or more Waters of the U.S. or wetlands?
- Yes Is the project covered by a Nationwide Permit?
- No Is the project covered by an Individual Permit from the USACE?

Comments:

The proposed project would be authorized under a Nationwide Permit 14 with a Pre-construction Notification.

Executive Order 13112 on Invasive Species

- Yes Would the proposed project be in compliance with EO 13112?



Executive Memorandum on Environmentally and Economically Beneficial Landscaping

 No Would landscaping be included in the proposed projects?

Farmland Protection Policy Act (FPPA)

 Yes Would the project require new ROW or permanent easements (Do not include temporary easements)?

 No Is the project located in a "non-urbanized area" that contain areas mapped as prime, unique, statewide important or locally important farmland by the NRCS Web Soil Survey or Census Bureau?

General Comments

Please see the following ECOS file for additional project information: "Biological Evaluation Form and Tier I Site Assessment Form Supporting Documentation (0718-02-045).pdf"



Findings

Endangered Species Act (ESA)

No suitable habitat was observed for any federally listed species. Therefore, there would be no effect on federally listed species. However, measures to avoid harm to any threatened and endangered species would be taken should they be observed during construction of the proposed project. Coordination with the USFWS would not be required. The USFWS IPaC website was accessed on March 12, 2018.

Essential Fish Habitat (EFH)

Tidally influenced waters do not occur within the project action area. Coordination with National Marine Fisheries Service is not required.

Coastal Barrier Resources Act (CBRA)

This project is not located within a designated CBRA map unit. Coordination with the U.S. Fish and Wildlife Service (USFWS) is not required.

Marine Mammal Protection Act (MMPA)

Marine mammals are protected under the Marine Mammal Protection Act (MMPA). The Texas coast provides suitable habitat and is within range of several marine mammals including the West Indian Manatee (*Trichechus manatus*), and bottlenose dolphin (*Tursiops truncatus*).

The project area does not contain suitable habitat for marine mammals. Coordination with NMFS is not required.

Migratory Bird Treaty Act (MBTA)

The Migratory Bird Treaty Act (MBTA) states that it is unlawful to kill, capture, collect, possess, buy, sell, trade, or transport any migratory bird, nest, young, feather, or egg in part or in whole, without a federal permit issued in accordance within the Act's policies and regulations.

A site survey did not identify active nests within the project action area. While no impact to migratory birds is expected, TxDOT will take all appropriate actions to prevent the take of migratory birds, their active nests, eggs, or young should they be discovered on the project site. Direction to contractors is provided on the standard EPIC sheet.

Bald and Golden Eagle Protection Act (BGEPA)

The proposed project does not have the potential to impact Bald or Golden Eagles.

Fish and Wildlife Coordination Act (FWCA)

The Fish and Wildlife Coordination Act (FWCA) of 1958 requires that federal agencies obtain comments from USFWS and TPWD. This coordination is required whenever a project involves impounding, diverting, or deepening a stream channel or other body of water.

The proposed project is authorized under a Section 404 of the Clean Water Act Nationwide Permit; therefore, no coordination under FWCA would be required.

Executive Order 13112 on Invasive Species (EO 13112)



Biological Evaluation Form

Re-vegetation of disturbed areas would be in compliance with the Executive Order on Invasive Species (EO 13112). Regionally native and non-invasive plants will be used to the extent practicable in landscaping and re-vegetation.

Executive Memorandum on Beneficial Landscaping

Landscaping is not part of the proposed project. If revegetation is needed, disturbed areas would be revegetated according to TxDOT's standard practices, which to the extent practicable, complies with Executive Memorandum on Environmentally and Economically Beneficial Landscaping. Direction to contractors is provided on the standard EPIC sheet.

Farmland Protection Policy Act (FPPA)

Coordination with the National Resources Conservation Service (NRCS) for FPPA would not be required because the project is not located in areas mapped as prime, unique, statewide or locally important nor is it located in an "urbanized area" identified by the NRCS Web Soil Survey or Census Bureau.



Suggested Attachments

Aerial Map (with delineated project boundaries)

USFWS T&E List

TPWD T&E List

Species Impact Table

NDD EOID List and Tracked Managed Areas (Required for TPWD Coordination)

NOAA EFH Mapper Printout

USFWS CBRA Mapper Printout

EMST Project MOU Summary Table (Required for TPWD Coordination)

TPWD SGCN List

FPPA Documentation

NRCS Web Soil Survey Map

Census Bureau Urbanized Area Map

Landscaping Plans

Photos (Required for TPWD Coordination)

Previous TPWD Coordination Documentation (if applicable)



Tier I Site Assessment

Main CSJ: 0718-02-045

Form Prepared By: Julie LeClair, Hicks & Company

Date of Evaluation: March 12, 2018

Project is classified as a Categorical Exclusion

Proposed Letting Date: August 2018

Project not assigned to TxDOT under the NEPA Assignment MOU

District(s): Fort Worth

County(ies): Tarrant

Roadway Name: Farm-to-Market (FM) 156

Limits From: US 81/US 287

Limits To: Watauga Road/McLeroy Boulevard

Project Description: The project would include an expansion of Farm-to-Market Road (FM) 156/Blue Mound Road with logical termini extending from US 81/US 287 to McLeroy Boulevard/Watauga Road in Tarrant County, Texas. The portion of FM 156 under study lies within the cities of Saginaw, Blue Mound and Fort Worth.

The existing facility is a two lane undivided roadway with one 12-foot lane in each direction and variable width shoulders. The existing facility has a typical right of way width of 120 feet.

The proposed project would expand the existing facility from two lanes to four lanes with a raised center median. The facility would include 14-foot outside lanes and 12-foot inside lanes with a curb and gutter. Ten-foot wide sidewalks would be included on the outside southbound lane, and six-foot wide sidewalks would be included along the outside northbound lane.

Overall, the proposed improvements would extend 3.8 miles and would require the acquisition of approximately 0.45 acres of additional right of way.

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 16, 2014, and executed by FHWA and TxDOT.

1. Yes Is the project within range of a state threatened or endangered species or SGCN and suitable habitat is present?

*Explain:

The proposed project is within range and suitable habitat for three state-listed threatened mussel species, the Louisiana Pigtoe (*Pleurobema riddellii*), Texas Pigtoe (*Fusconaia askewi*) and Texas Heelsplitter (*Potamilus amphichaenus*); and five SGCN including two plants, the Texas milk vetch (*Astragalus reflexus*) and Topeka purple-coneflower (*Echinacea atrorubens*); one reptile, the Texas garter snake (*Thamnophis sirtalis annectens*); one bird, the Western Burrowing Owl (*Athene cunicularia hypugaea*); and one mammal, the Plains spotted skunk (*Spilogale putorius interrupta*).

Date [TPWD County](#) List Accessed: March 12, 2018

Date that the NDD was accessed: February 8, 2018

What agency performed the NDD search? TPWD



NDD Search Results for EOIDs and Tracked Managed Areas

EOID Number	Common Name	Scientific Name	Listing Status	Buffer Zone
No EOIDs or Tracked Managed Areas occur within 1.5 miles of the proposed project				1.5 Mile

 No Does the BMP PA eliminate the requirement to coordinate for all species?

Comments:

There are no BMPs for the Texas milk vetch or Topeka purple-coneflower listed in the Programmatic Agreement between TxDOT and TPWD; therefore, coordination with TPWD would be required for these species.

2. No NDD and TCAP review indicates adverse impacts to remnant vegetation?

3. Yes Does the project require a NWP with PCN or IP by USACE?

*Explain:

The proposed project would be covered under a Nationwide Permit 14 with a Pre-construction Notification.

4. No Does the project include more than 200 linear feet of stream channel for each single and complete crossing of one or more of the following that is not already channelized or otherwise maintained:

5. No Does the project contain known isolated wetlands outside the TxDOT ROW that will be directly impacted by the project?

6. Yes Would the project impact at least 0.10 acre of riparian vegetation?

*Explain:

As detailed in the EMST Project MOU Summary Table provided in the uploaded ECOS file "Biological Evaluation Form and Tier I Site Assessment Form Supporting Documentation (0718-02-045).pdf" (see table titled "Vegetation Potentially Impacted by the Proposed Project"), the project would result in impacts to 4.8 acres of riparian vegetation as a result of construction.

7. Yes Does project disturb a habitat type in an area equal to or greater than the area of disturbance indicated in the Threshold Table Programmatic Agreement?

*Explain:

A review of the Threshold Table Programmatic Agreement determined that vegetation to be impacted by the proposed project falls into three MOU types: Edwards Plateau Savannah, Woodland, and Shrubland; Riparian; and Urban. The Threshold Table Programmatic Agreement sets a disturbance threshold of 2.0 acres for Edwards



Tier I Site Assessment

Plateau Savannah, Woodland, and Shrubland; 0.1 acre for Riparian; and no threshold for Urban.

The project would impact 1.1 acre of Edwards Plateau Savannah, Woodland, and Shrubland; 4.8 acres of Riparian; and 69.3 acres of Urban. Based on this analysis, the project would exceed the disturbance thresholds for Edwards Plateau Savannah, Woodland, and Shrubland; and Riparian MOU habitat types.

*Attach associated file of EMST output (Mapper Report or other Excel File which includes MOU Type, Ecosystem Name, Common/Vegetation Type Name) in ECOS

Excel File Name:

EMST Project MOU Summary Table (0718-02-045).xlsx

7.1. Yes Is there a discrepancy between actual habitat(s) and EMST mapped habitat(s)?

*Explain:

As detailed in the EMST Project MOU Summary Table provided in the uploaded ECOS file "Biological Evaluation Form and Tier I Site Assessment Form Supporting Documentation (0718-02-045).pdf" (see table titled "Vegetation Potentially Impacted by the Proposed Project"), the EMST categorized the project area vegetation into ten different communities including Edwards Plateau: Savanna Grassland; Native Invasive; Deciduous Woodland; Central Texas: Floodplain Hardwood Forest; Central Texas: Floodplain Herbaceous Vegetation; Central Texas: Riparian Herbaceous Vegetation; Barren; Grand Prairie: Tallgrass Prairie; Native Invasive: Mesquite Shrubland; Row Crops; Urban High Intensity; and Urban Low Intensity.

There are discrepancies between vegetation communities observed during field survey and EMST vegetation communities for Central Texas: Floodplain Herbaceous Vegetation, Central Texas: Riparian Herbaceous Vegetation, Native Invasive: Mesquite Shrubland, Row Crop, Barren, and Edwards Plateau: Savanna Grassland; all of which do not exist within the proposed project area. As seen in Figures 4-1 to 4-6 provided in the Biological Evaluation Form and Tier I Site Assessment Form Supporting Documentation, the proposed project occurs primarily within the existing right of way which is predominately mowed and maintained, and therefore classified as urban. Areas along some streams exhibit floodplain woodland vegetation. Vegetation within a drainage easement that surrounds a pond exhibits a mixed shrubland community, but was classified as Urban by the EMST (see Figures 3-6 and 4-6 provided in the Biological Evaluation Form and Tier I Site Assessment Form Supporting Documentation). Hackberry (*Celtis occidentalis*) woodlands, classified as Native Invasive: Deciduous Woodland by EMST, slightly encroach into the right of way throughout the project area and are classified as the Edwards Plateau Savannah, Woodland, and Shrubland MOU type.

Attach file showing discrepancy between actual and EMST mapped habitat(s).

File Name:

Biological Evaluation Form and Tier I Site Assessment Form Supporting Documentation (0718-02-045).pdf (see attachment E)

Is TPWD Coordination Required?

Yes

Early Coordination

Administrated Coordination - Must be conducted through ENV-NRM



BMPs Implemented or EPICs included (as necessary):

- Contractors shall comply with the requirements of Executive Order 13112 on Invasive Species and the Executive Memorandum on Beneficial Landscaping. Unnecessary soil disturbance shall be minimized.
- During construction, efforts would be taken to avoid and minimize disturbance of vegetation and soils. Areas within the existing ROW, but outside the limits of construction, would not be disturbed. Every effort would be made to preserve trees where they would neither compromise safety nor substantially interfere with the proposed project.
- Between October 1 and February 15, the contractor would remove all old migratory bird nests from any structure that would be affected by the proposed project, and complete any bridge work/demolition and /or vegetation clearing. In addition, the contractor would be prepared to prevent migratory birds from building nests by utilizing nest prevention methods, such as bird-deterrent netting and bird-repelling sprays and/or gels, between February 15 and October 1. In the event that migratory birds are encountered on-site during project construction, adverse impacts on protected birds, active nests, eggs, and/or young would be avoided.
- The Eagle Protection Act prohibits the taking or possession of and commerce in eagles, parts, feathers, nests, or eggs with limited exceptions. The definition of take includes pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb. Eagles may not be taken for any purpose unless a permit is issued prior to the taking.
- The contractor and/or TxDOT personnel would be advised of potential for Whooping Cranes to occur within the project limits. Construction personnel will be advised to avoid adverse impacts to this species and to report any sightings to TxDOT District Environmental staff. Drainage modifications will be limited to the extent practical to accommodate the additional paved surface needed to bring the roadway up to current TxDOT safety standards. The construction personnel will report all sightings to TxDOT Fort Worth District Environmental staff. Reports should include the time, date and location and any available photos.
- Be advised of potential occurrence of the Western burrowing owl. The contractor would be prepared to take appropriate measures to avoid disturbing, destroying, or removing active nests, including ground nesting birds, during the nesting season. Avoid the removal of unoccupied, inactive nests, as practicable. As necessary, take appropriate measures to prevent the establishment of active nests during the nesting season on TxDOT owned and operated facilities and structures proposed for replacement or repair.
- Be advised of potential occurrence of the Texas garter snake and the Plains spotted skunk in the project area, and avoid harming the species if encountered.
- Collecting, capturing, relocation, or transporting birds, eggs, young, or active nests without a permit is prohibited.
- The use of equipment in streams and riparian areas during construction shall be minimized to the extent necessary to complete the construction activities. When possible, equipment access within streams shall be from banks, bridge decks, or barges.
- Remove all temporary stream crossings once they are no longer needed and stabilize banks and soils around the crossing.
- When work is in the water; the project footprints will be surveyed for state listed and SGCN species where appropriate habitat exists. State listed and SGCN mussels discovered during surveys shall be relocated under Texas Parks and Wildlife Department permit.
- Prior to conducting dewatering activities, TxDOT and/or the contractor would coordinate with the Texas Parks and Wildlife Department Kills and Spills Team to obtain any necessary permits.
- For all construction equipment and gear that comes in contact with any public waters: Follow the TPWD Clean/



Drain/Dry Procedures and Zebra Mussel Decontamination Procedures for Contractors Working in Inland Public Waters.

TxDOT Contact Information

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Phone Number: 817-370-6567

E-mail: Chad.Putnam@txdot.gov



Suggested Attachments

Aerial Map (with delineated project boundaries)

USFWS T&E List

TPWD T&E List

Species Impact Table

NDD EOID List and Tracked Managed Areas (Required for TPWD Coordination)

EMST Project MOU Summary Table (Required for TPWD Coordination)

TPWD SGCN List

Photos (Required for TPWD Coordination)

Previous TPWD Coordination Documentation (if applicable)

**ATTACHMENTS TO ACCOMPANY
BIOLOGICAL EVALUATION AND
TIER I ASSESSMENT FORMS**

**FM 156 from US 81/US 287 to
McLeroy Boulevard/Watauga Road
Tarrant County, Texas**

CSJ #0718-02-045

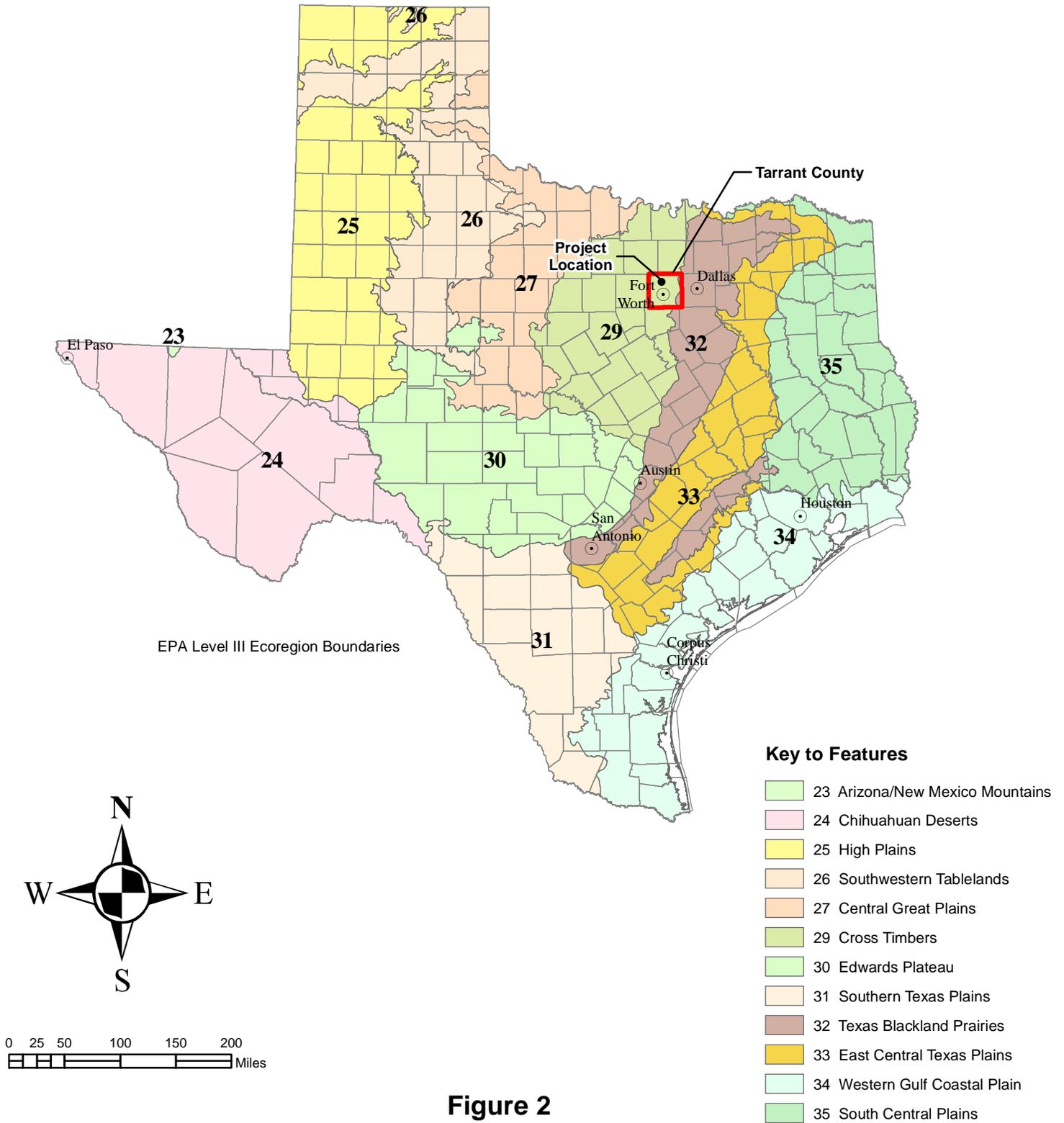
ATTACHMENT A

FIGURES

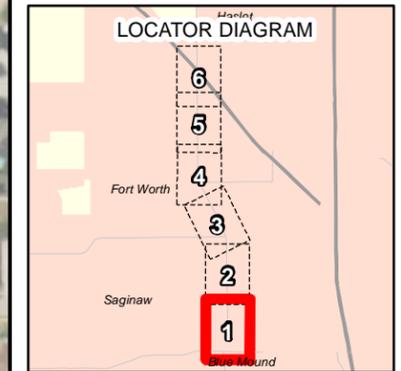


Figure 1
Project Area Location
 FM 156 From US 81/US 287 to
 McLeroy Boulevard/Watauga Road
 Tarrant County, Texas
 CSJ: 0718-02-045



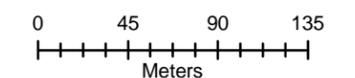
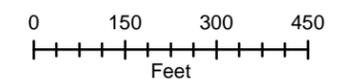


**PROJECT AREA
ECOLOGICAL
MANAGEMENT
SYSTEMS OF TEXAS**
FM 156 From US 81/US 287
to McLeroy Boulevard/Watauga Road
CSJ: 0718-02-045



Key to Features

- Streams (NHD)
- Existing ROW
- Proposed ROW
- Drainage Easements
- 1107 - Edwards Plateau: Savanna Grassland
- 1907 - Central Texas: Riparian Herbaceous Vegetation
- 2007 - Grand Prairie: Tallgrass Prairie
- 9307 - Row Crops
- 9410 - Urban High Intensity
- 9411 - Urban Low Intensity

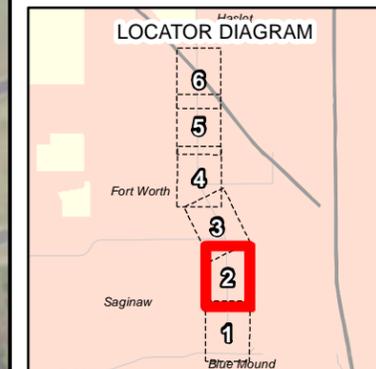


One inch equals 300 ft

FIGURE 3-1

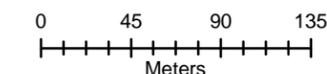


**PROJECT AREA
ECOLOGICAL
MANAGEMENT
SYSTEMS OF TEXAS**
FM 156 From US 81/US 287
to McLeroy Boulevard/Watauga Road
CSJ: 0718-02-045



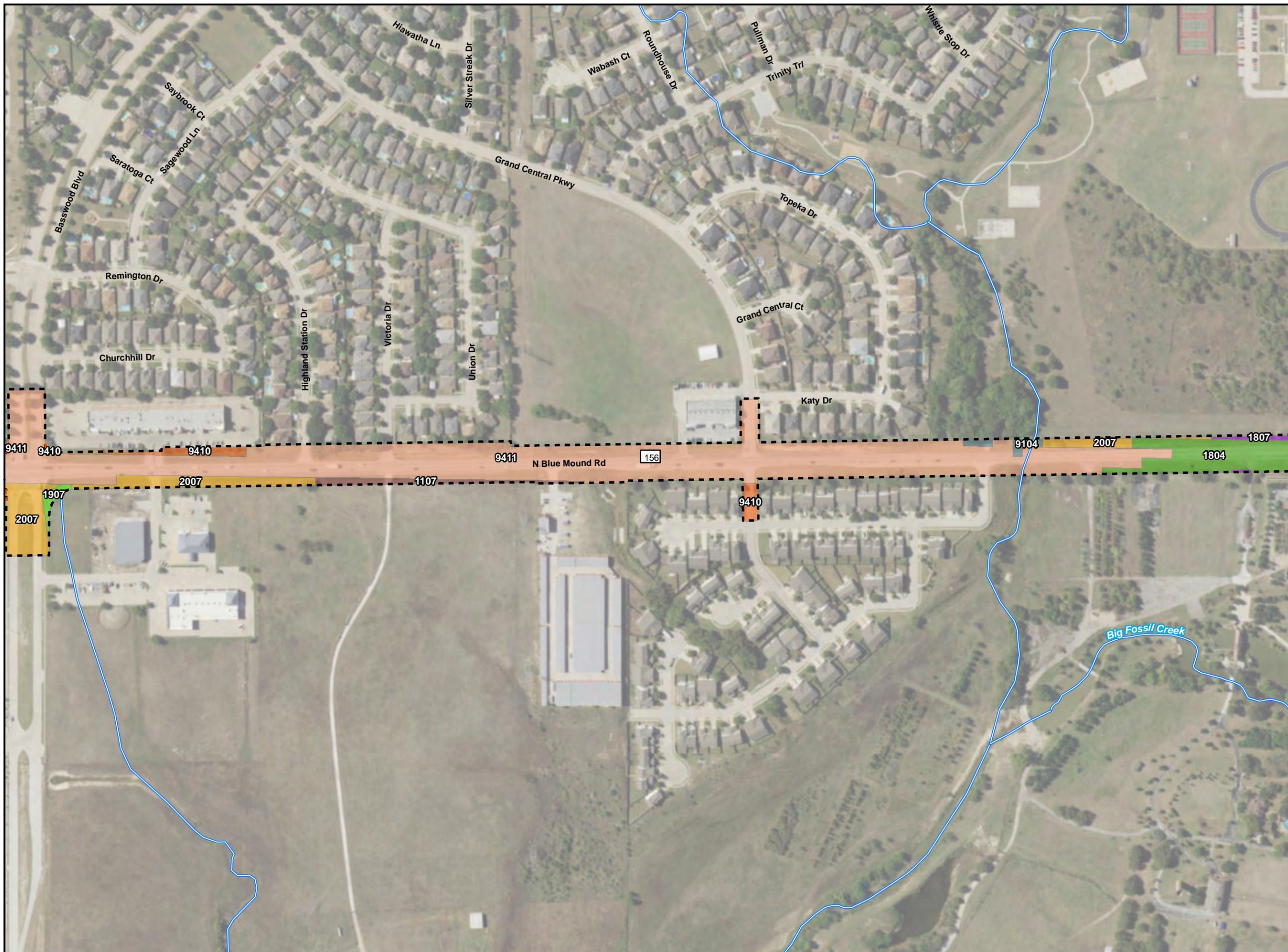
Key to Features

- Streams (NHD)
- Existing ROW
- Proposed ROW
- Drainage Easements
- 1107 - Edwards Plateau: Savanna Grassland
- 1804 - Central Texas: Floodplain Hardwood Forest
- 1807 - Central Texas: Floodplain Herbaceous Vegetation
- 1907 - Central Texas: Riparian Herbaceous Vegetation
- 2007 - Grand Prairie: Tallgrass Prairie
- 9104 - Native Invasive: Deciduous Woodland
- 9410 - Urban High Intensity
- 9411 - Urban Low Intensity

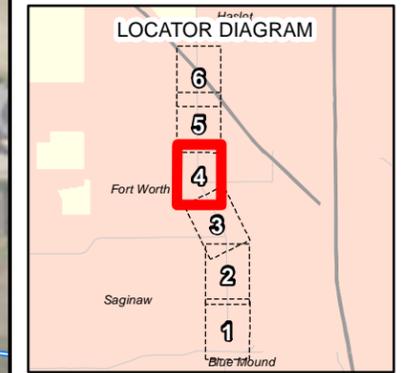


One inch equals 300 ft

FIGURE 3-2



**PROJECT AREA
ECOLOGICAL
MANAGEMENT
SYSTEMS OF TEXAS**
FM 156 From US 81/US 287
to McLeroy Boulevard/Watauga Road
CSJ: 0718-02-045



- Key to Features**
- Streams (NHD)
 - Existing ROW
 - Proposed ROW
 - Drainage Easements
 - 1107 - Edwards Plateau: Savanna Grassland
 - 1804 - Central Texas: Floodplain Hardwood Forest
 - 1807 - Central Texas: Floodplain Herbaceous Vegetation
 - 2007 - Grand Prairie: Tallgrass Prairie
 - 9410 - Urban High Intensity
 - 9411 - Urban Low Intensity

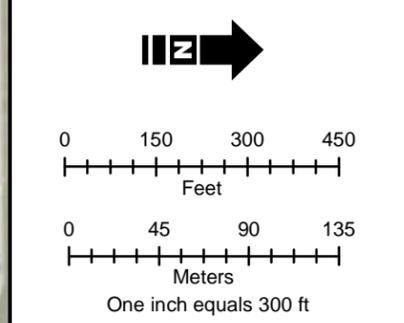
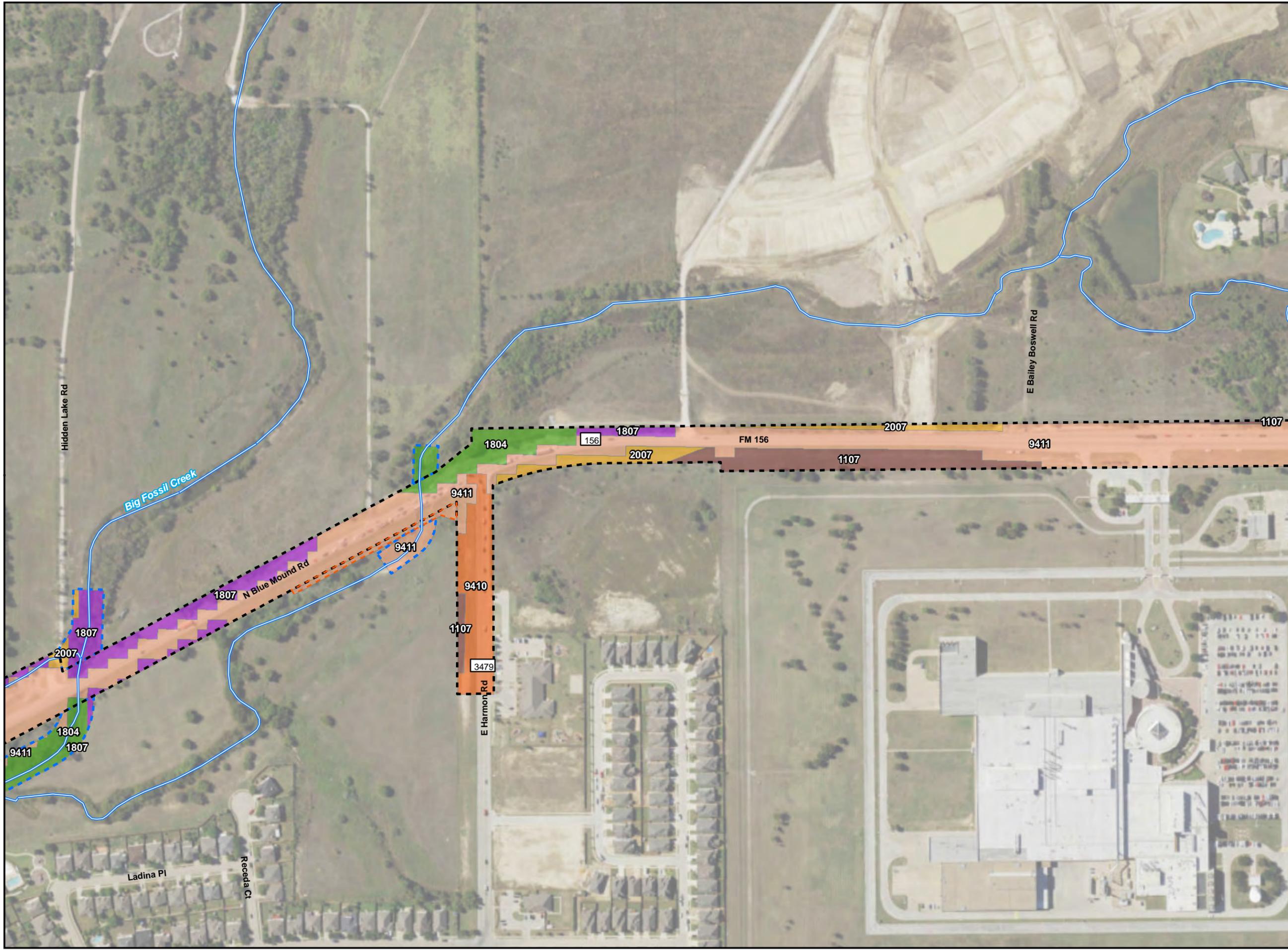
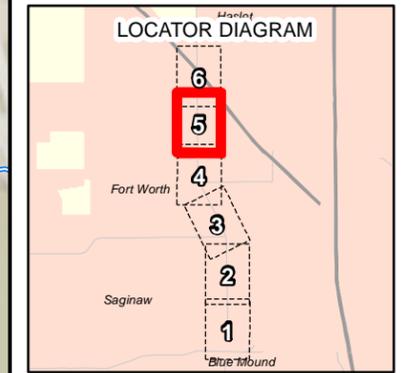


FIGURE 3-4



**PROJECT AREA
ECOLOGICAL
MANAGEMENT
SYSTEMS OF TEXAS**
FM 156 From US 81/US 287
to McLeroy Boulevard/Watauga Road
CSJ: 0718-02-045



- Key to Features**
- Streams (NHD)
 - Existing ROW
 - Proposed ROW
 - Drainage Easements
 - 1107 - Edwards Plateau: Savanna Grassland
 - 1807 - Central Texas: Floodplain Herbaceous Vegetation
 - 1907 - Central Texas: Riparian Herbaceous Vegetation
 - 2007 - Grand Prairie: Tallgrass Prairie
 - 9000 - Barren
 - 9106 - Native Invasive: Mesquite Shrubland
 - 9410 - Urban High Intensity
 - 9411 - Urban Low Intensity

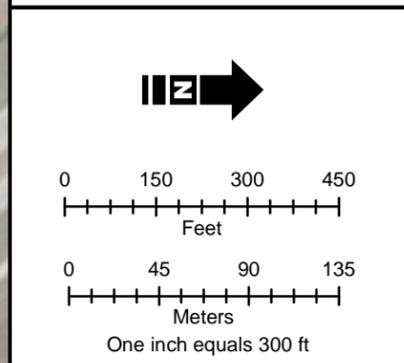
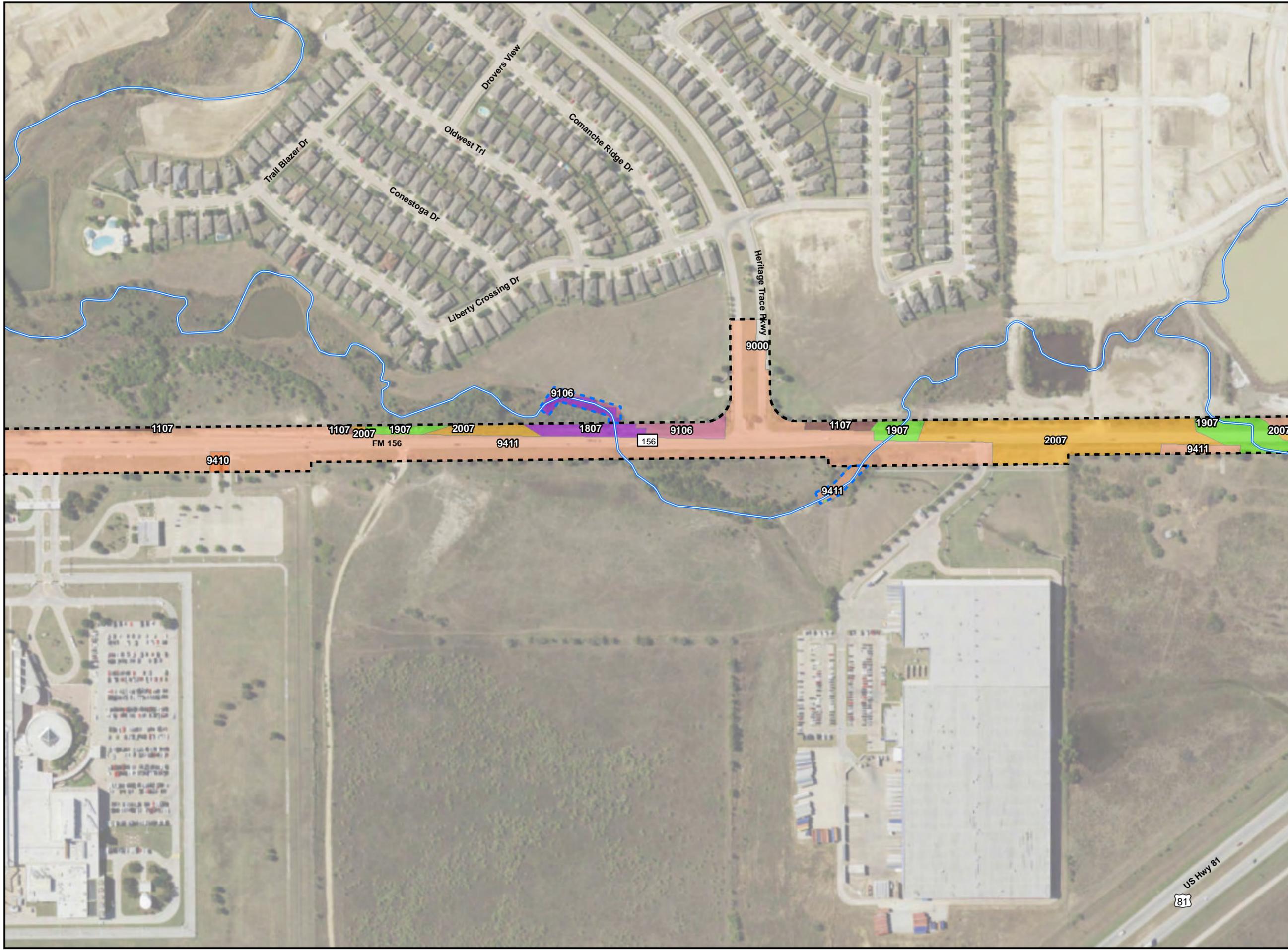
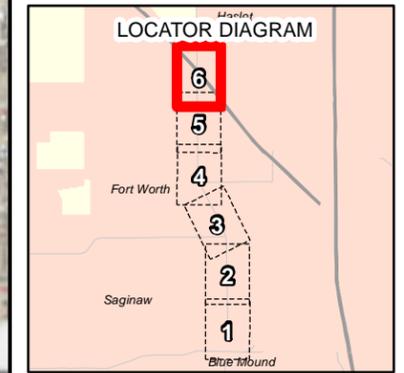


FIGURE 3-5



**PROJECT AREA
ECOLOGICAL
MANAGEMENT
SYSTEMS OF TEXAS**
FM 156 From US 81/US 287
to McLeroy Boulevard/Watauga Road
CSJ: 0718-02-045



- Key to Features**
- Streams (NHD)
 - Existing ROW
 - Proposed ROW
 - Drainage Easements
 - 1907 - Central Texas:
Riparian Herbaceous
Vegetation
 - 2007 - Grand Prairie:
Tallgrass Prairie
 - 9410 - Urban High
Intensity
 - 9411 - Urban Low
Intensity

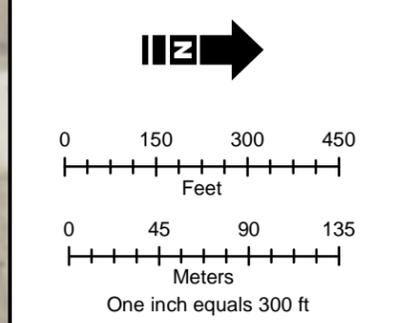
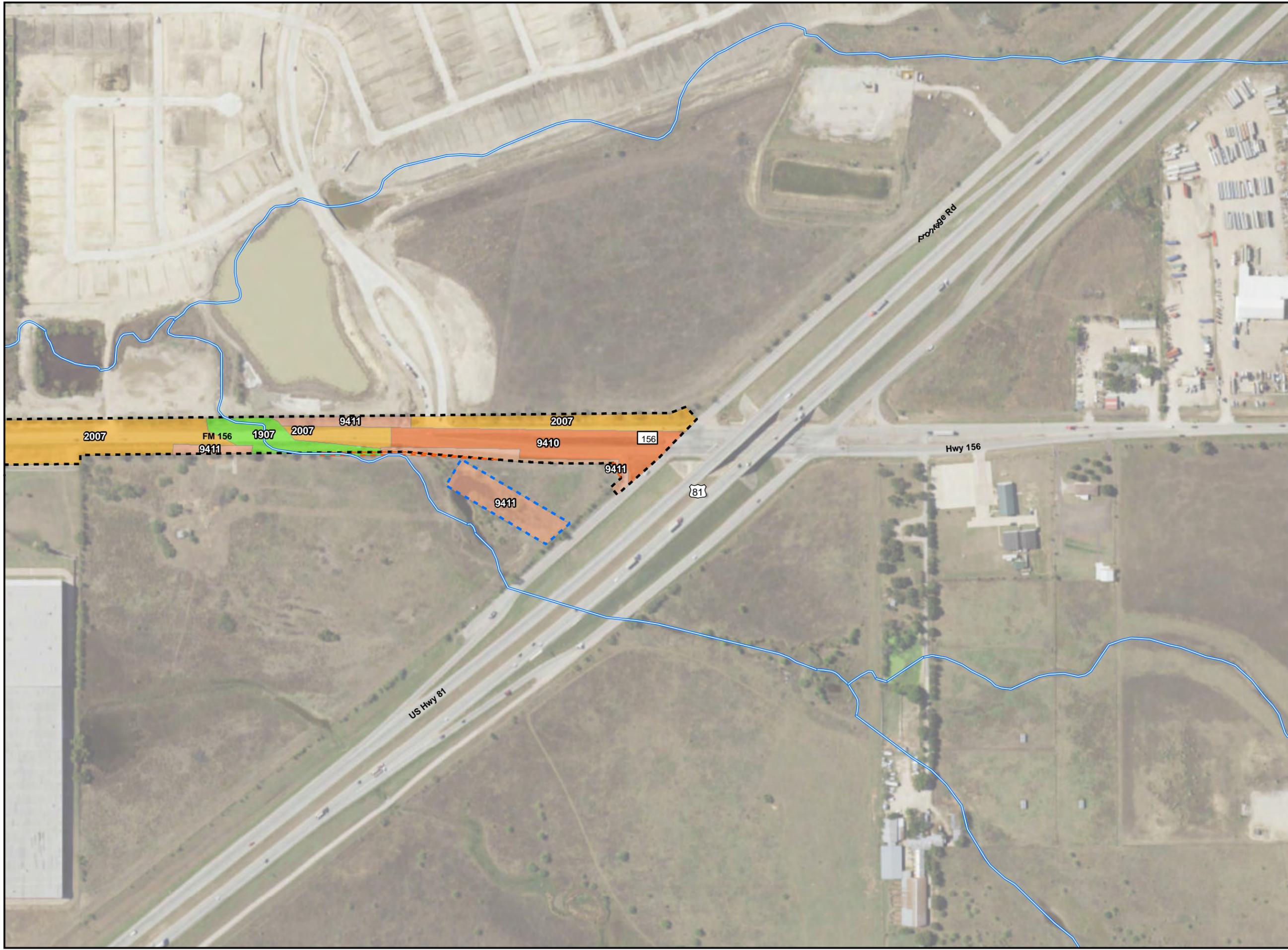
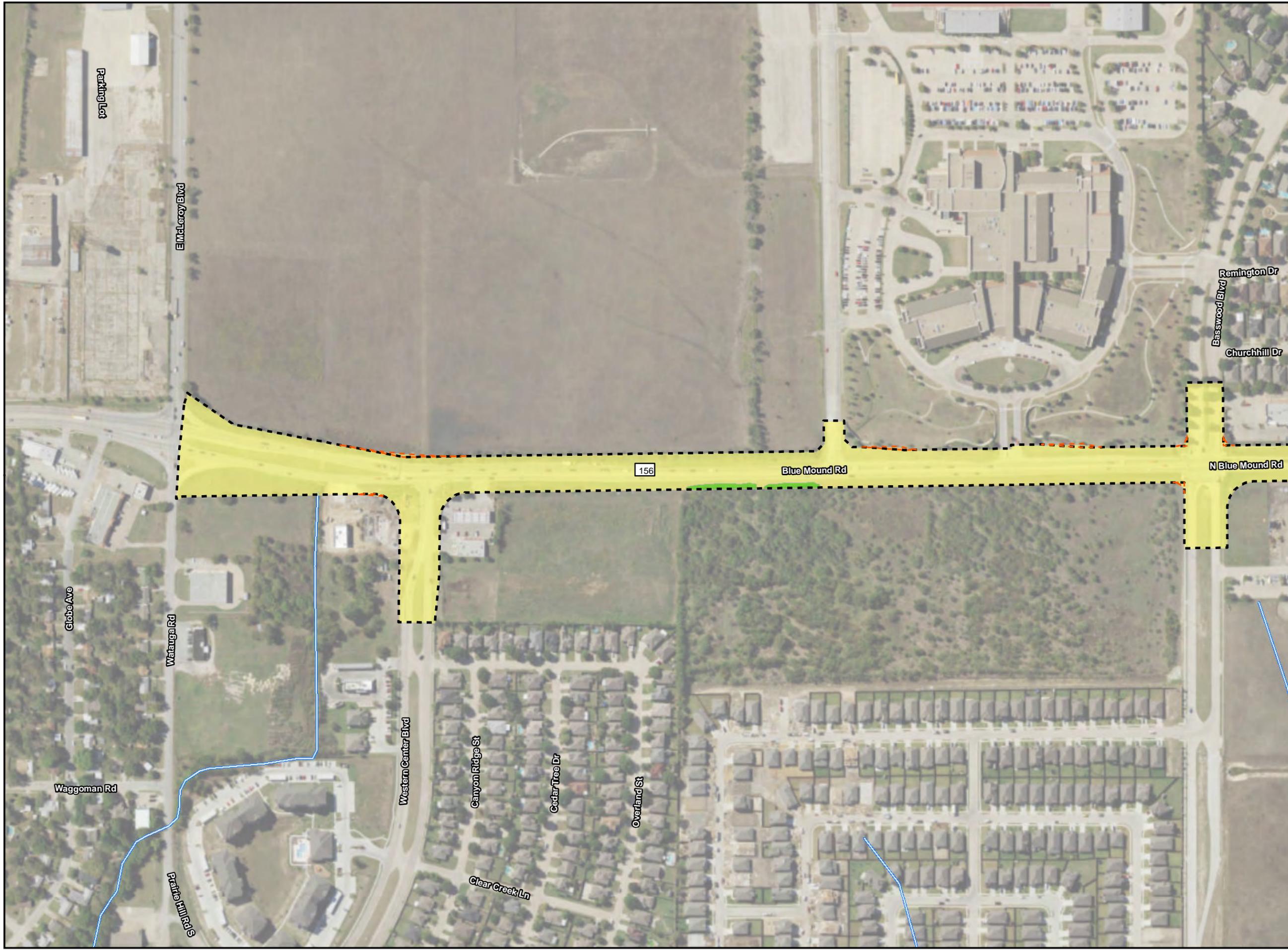


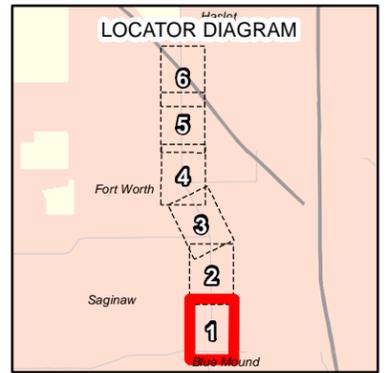
FIGURE 3-6





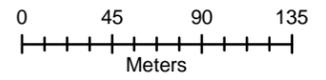
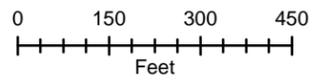
PROJECT AREA VEGETATION

FM 156 From US 81/US 287 to McLeroy Boulevard/Watauga Road
CSJ: 0718-02-045



Key to Features

- Streams (NHD)
- Existing ROW
- Proposed ROW
- Drainage Easements
- Floodplain Woodland
- Hackberry Woodland
- Mixed Shrubland
- Urban

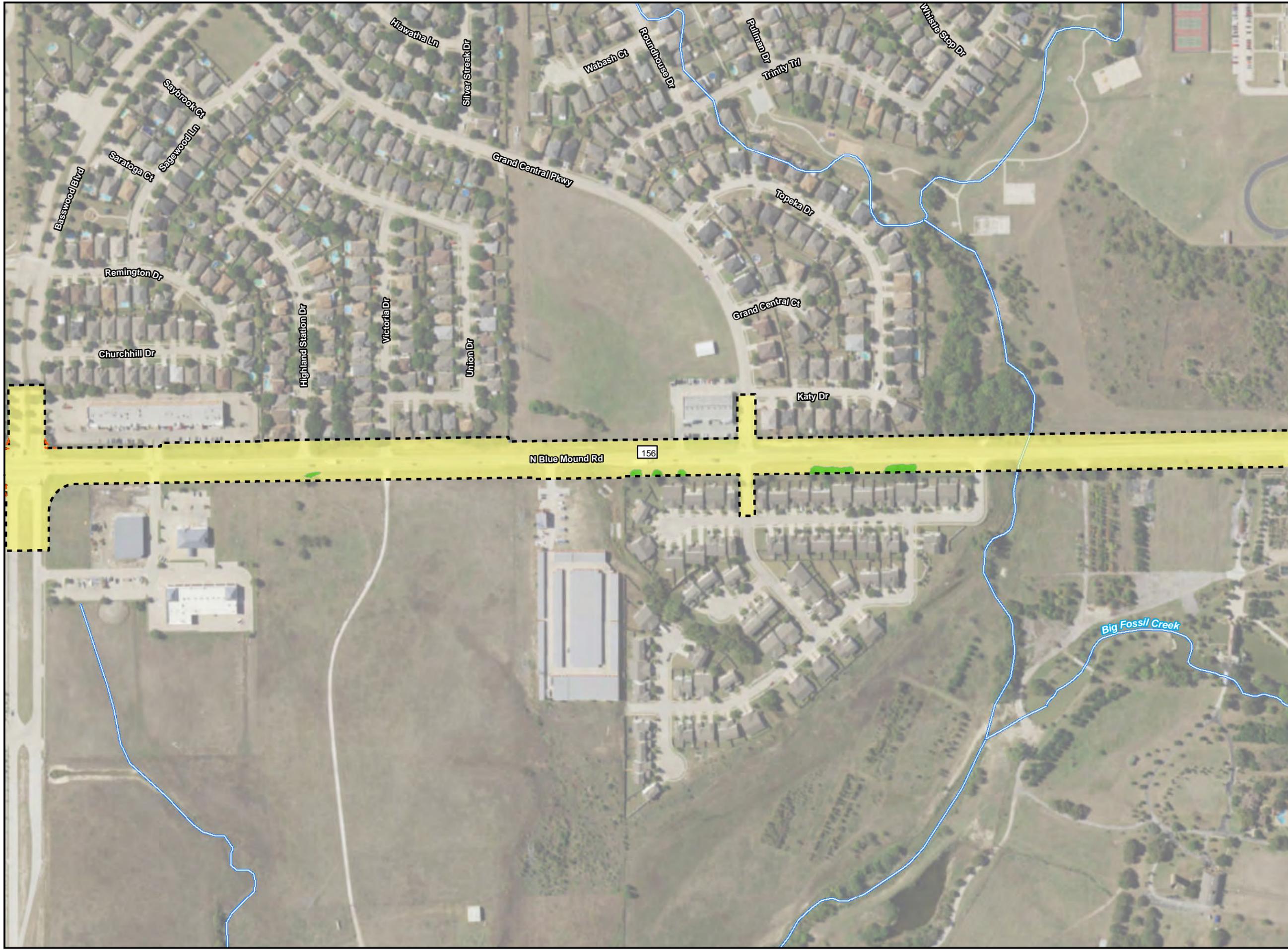
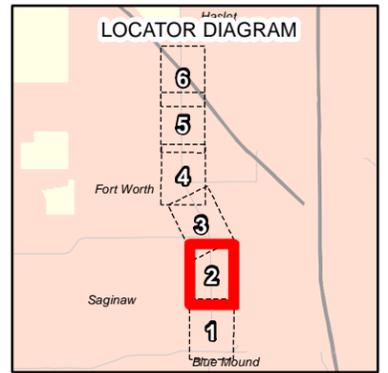


One inch equals 300 ft

FIGURE 4-1

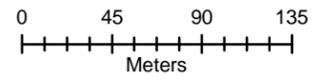
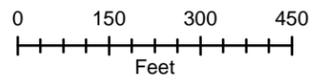
PROJECT AREA VEGETATION

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Key to Features

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- Mixed Shrubland
- Urban

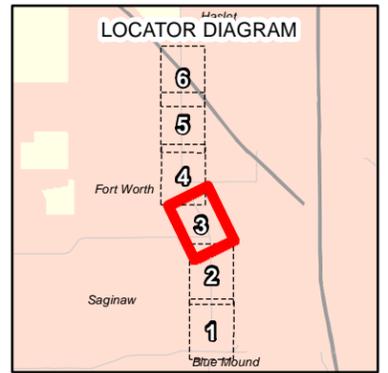


One inch equals 300 ft

FIGURE 4-2

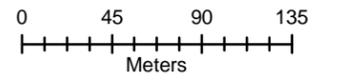
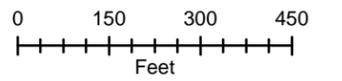
PROJECT AREA VEGETATION

FM 156 From US 81/US 287 to McLeroy Boulevard/Watauga Road
CSJ: 0718-02-045



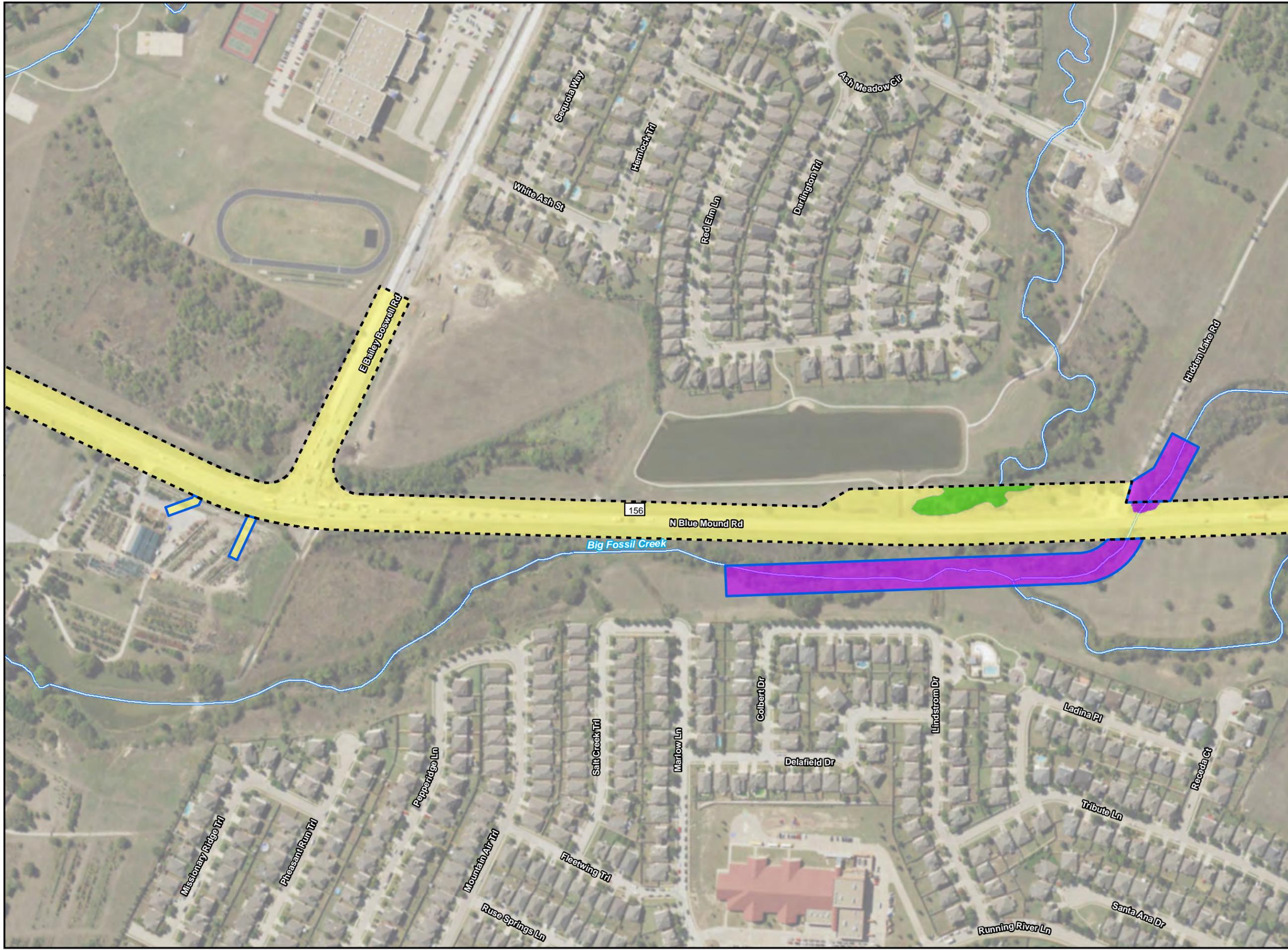
Key to Features

- Streams (NHD)
- Existing ROW
- Proposed ROW
- Drainage Easements
- Floodplain Woodland
- Hackberry Woodland
- Mixed Shrubland
- Urban



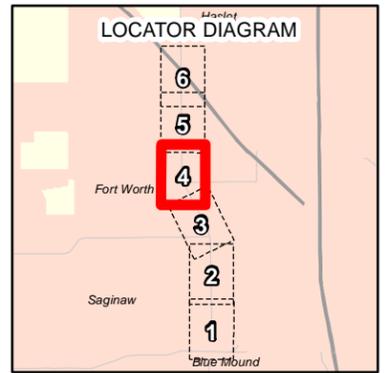
One inch equals 300 ft

FIGURE 4-3



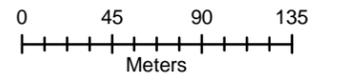
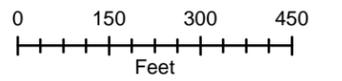
PROJECT AREA VEGETATION

FM 156 From US 81/US 287 to McLeroy Boulevard/Watauga Road
CSJ: 0718-02-045



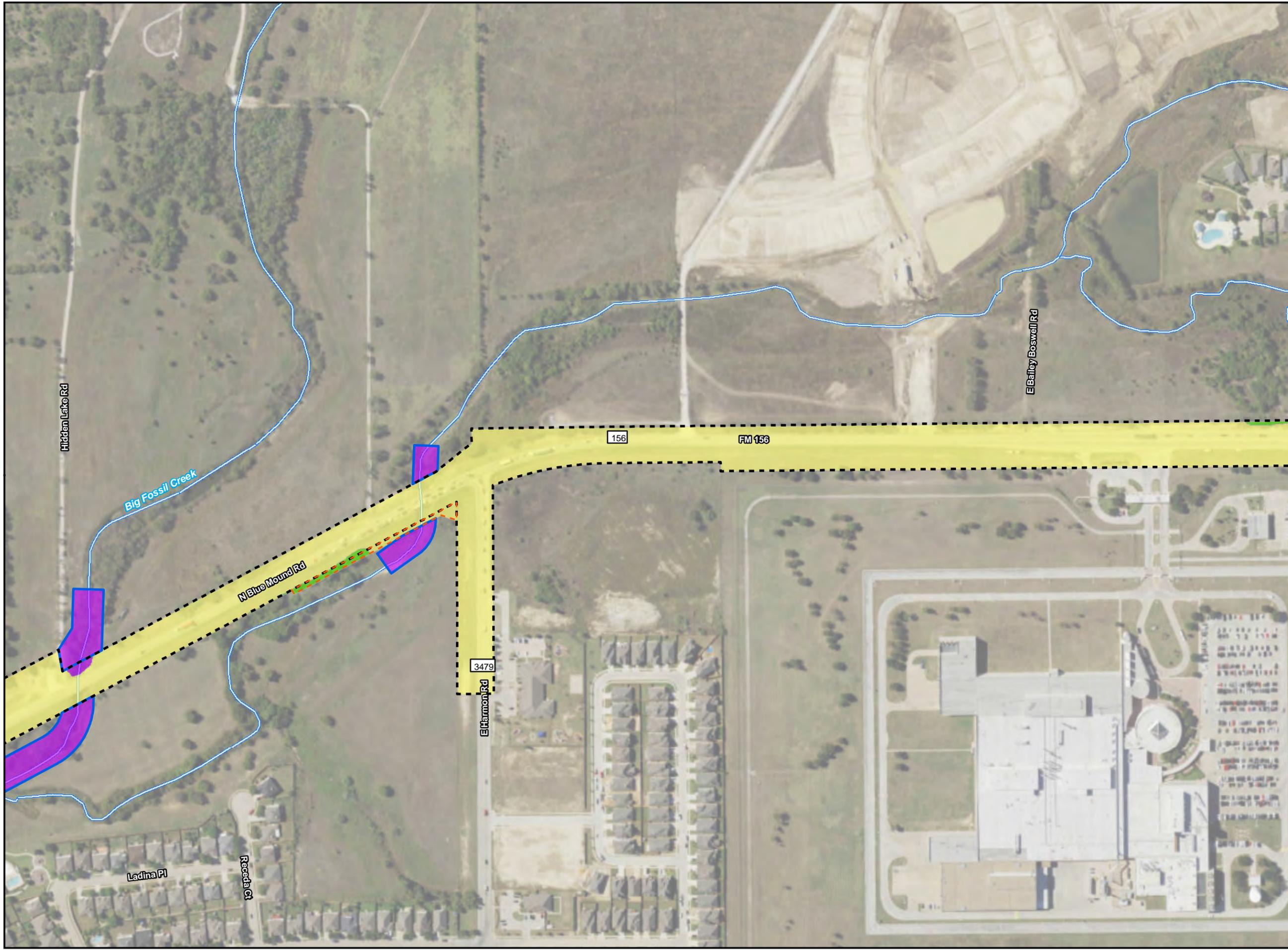
Key to Features

- Streams (NHD)
- Existing ROW
- Proposed ROW
- Drainage Easements
- Floodplain Woodland
- Hackberry Woodland
- Mixed Shrubland
- Urban



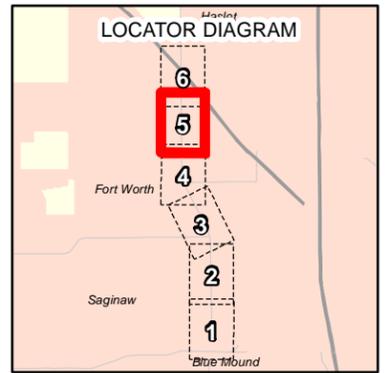
One inch equals 300 ft

FIGURE 4-4



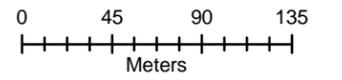
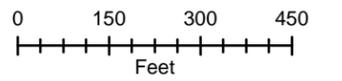
PROJECT AREA VEGETATION

FM 156 From US 81/US 287 to McLeroy Boulevard/Watauga Road
CSJ: 0718-02-045



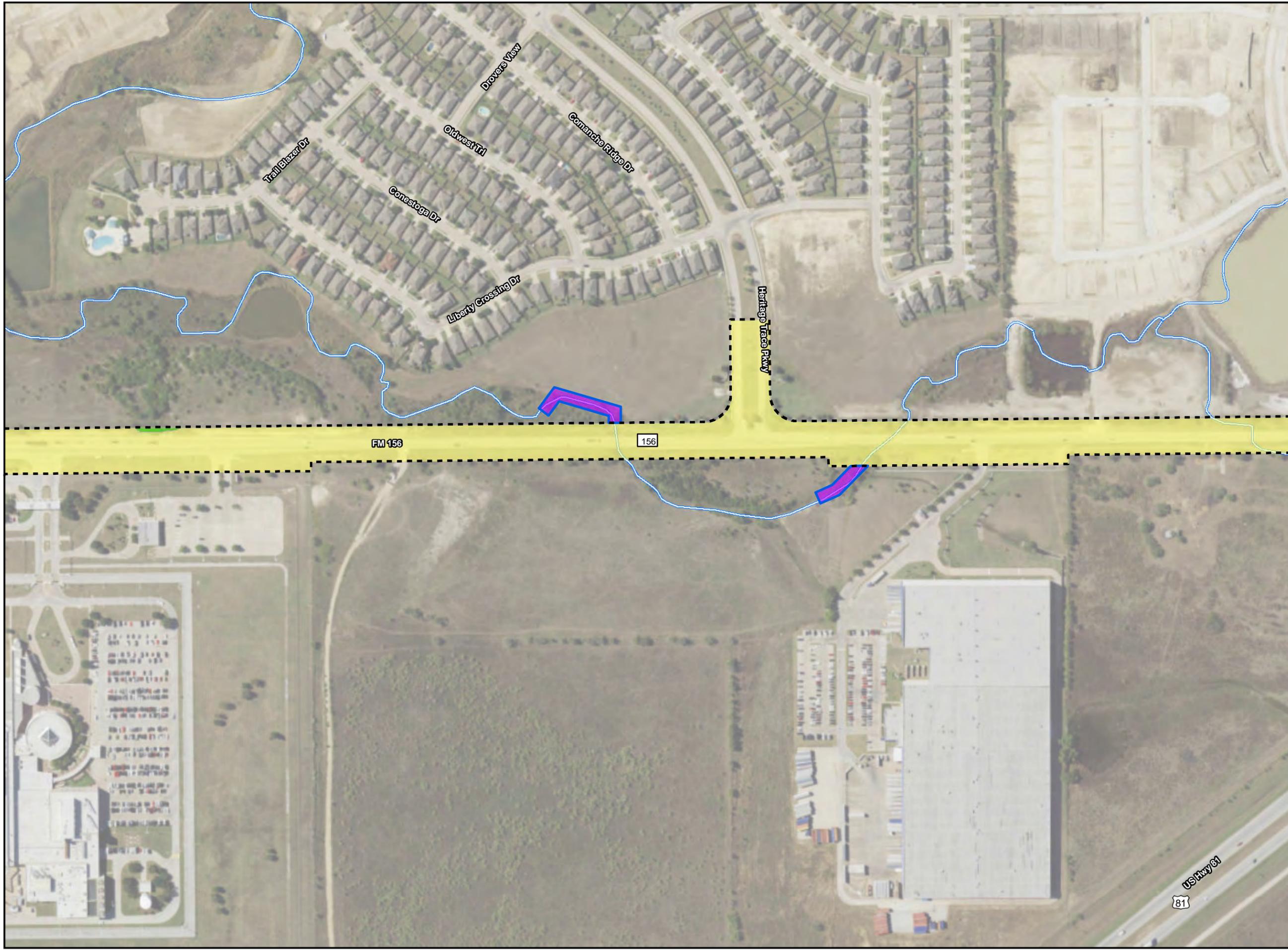
Key to Features

- Streams (NHD)
- Existing ROW
- Proposed ROW
- Drainage Easements
- Floodplain Woodland
- Hackberry Woodland
- Mixed Shrubland
- Urban



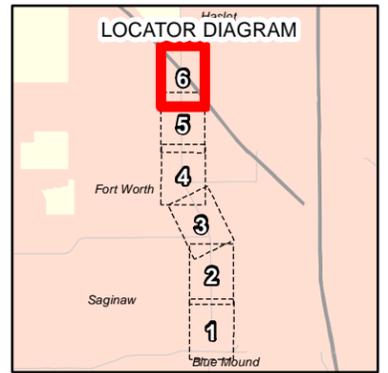
One inch equals 300 ft

FIGURE 4-5



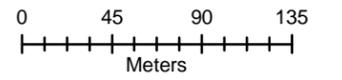
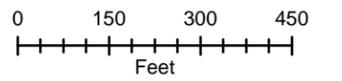
PROJECT AREA VEGETATION

FM 156 From US 81/US 287 to McLeroy Boulevard/Watauga Road
CSJ: 0718-02-045



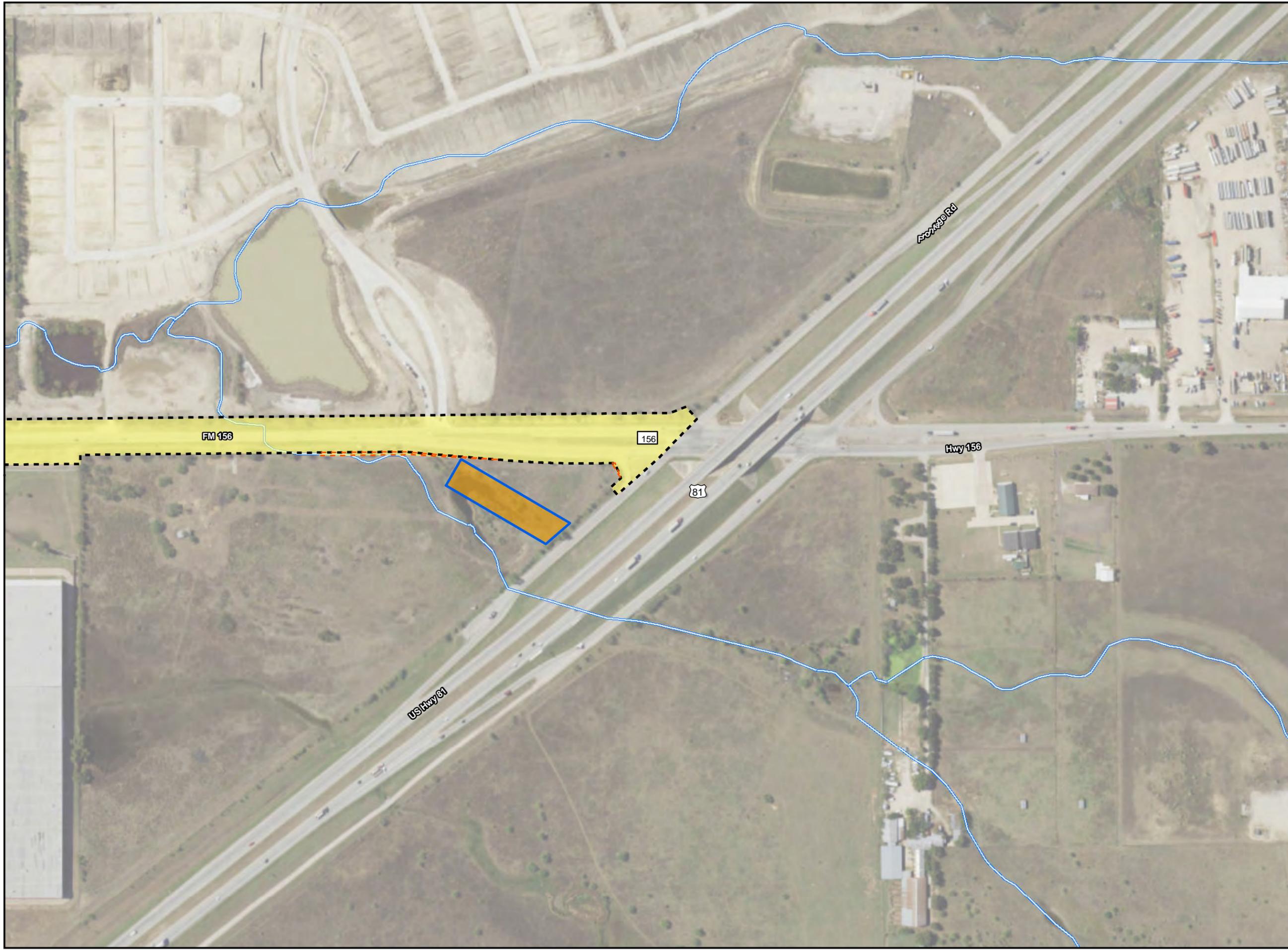
Key to Features

- Streams (NHD)
- Existing ROW
- Proposed ROW
- Drainage Easements
- Floodplain Woodland
- Hackberry Woodland
- Mixed Shrubland
- Urban



One inch equals 300 ft

FIGURE 4-6



ATTACHMENT B
USFWS AND TPWD T&E LISTS



United States Department of the Interior



FISH AND WILDLIFE SERVICE
Arlington Ecological Services Field Office

2005 Ne Green Oaks Blvd

Suite 140

Arlington, TX 76006-6247

Phone: (817) 277-1100 Fax: (817) 277-1129

<http://www.fws.gov/southwest/es/arlingontexas/>

<http://www.fws.gov/southwest/es/EndangeredSpecies/lists/>

In Reply Refer To:

March 12, 2018

Consultation Code: 02ETAR00-2018-SLI-0684

Event Code: 02ETAR00-2018-E-01551

Project Name: FM 156

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed, and candidate species, as well as proposed and final designated critical habitat, which may occur within the boundary of your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.).

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under section 7(a)(1) of the Act, Federal agencies are directed to utilize their authorities to carry out programs for the conservation of threatened and endangered species. Under and 7(a)(2) and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to determine whether their actions may affect threatened and endangered species and/or designated critical habitat. A Federal action is an activity or program authorized, funded, or carried out, in whole or in part, by a Federal agency (50 CFR 402.02).

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For Federal actions other than major construction activities, the Service suggests that a biological evaluation (similar to a Biological Assessment) be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

After evaluating the potential effects of a proposed action on federally listed species, one of the following determinations should be made by the Federal agency:

1. *No effect* - the appropriate determination when a project, as proposed, is anticipated to have no effects to listed species or critical habitat. A "no effect" determination does not require section 7 consultation and no coordination or contact with the Service is necessary. However, the action agency should maintain a complete record of their evaluation, including the steps leading to the determination of affect, the qualified personnel conducting the evaluation, habitat conditions, site photographs, and any other related information.
2. *May affect, but is not likely to adversely affect* - the appropriate determination when a proposed action's anticipated effects are insignificant, discountable, or completely beneficial. Insignificant effects relate to the size of the impact and should never reach the scale where "take" of a listed species occurs. Discountable effects are those extremely unlikely to occur. Based on best judgment, a person would not be able to meaningfully measure, detect, or evaluate insignificant effects, or expect discountable effects to occur. This determination requires written concurrence from the Service. A biological evaluation or other supporting information justifying this determination should be submitted with a request for written concurrence.
3. *May affect, is likely to adversely affect* - the appropriate determination if any adverse effect to listed species or critical habitat may occur as a direct or indirect result of the proposed action, and the effect is not discountable or insignificant. This determination requires formal section 7 consultation.

The Service recommends that candidate species, proposed species, and proposed critical habitat be addressed should consultation be necessary. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at: <http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF>

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 et seq.), and projects affecting these species may require development of an eagle conservation plan (<http://www.fws.gov/windenergy/>)

[eagle_guidance.html](#)). Additionally, wind energy projects should follow the wind energy guidelines (<http://www.fws.gov/windenergy/>) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm>; <http://www.towerkill.com>; and <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html>.

For additional information concerning migratory birds and eagle conservation plans, please contact the Service's Migratory Bird Office at 505-248-7882.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Arlington Ecological Services Field Office

2005 Ne Green Oaks Blvd

Suite 140

Arlington, TX 76006-6247

(817) 277-1100

Project Summary

Consultation Code: 02ETAR00-2018-SLI-0684

Event Code: 02ETAR00-2018-E-01551

Project Name: FM 156

Project Type: TRANSPORTATION

Project Description: Roadway improvements to FM 156 from US 81/US 287 to Watauga Road/McLeroy Boulevard.

Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/place/32.7713677992128N97.2916763421408W>



Counties: Tarrant, TX

Endangered Species Act Species

There is a total of 4 threatened, endangered, or candidate species on this species list. Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Note that 2 of these species should be considered only under certain conditions. See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

Birds

NAME	STATUS
Least Tern <i>Sterna antillarum</i> Population: interior pop. No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/8505	Endangered
Piping Plover <i>Charadrius melodus</i> Population: [Atlantic Coast and Northern Great Plains populations] - Wherever found, except those areas where listed as endangered. There is final critical habitat for this species. Your location is outside the critical habitat. This species only needs to be considered under the following conditions: <ul style="list-style-type: none"> ▪ Wind Energy Projects Species profile: https://ecos.fws.gov/ecp/species/6039	Threatened
Red Knot <i>Calidris canutus rufa</i> No critical habitat has been designated for this species. This species only needs to be considered under the following conditions: <ul style="list-style-type: none"> ▪ Wind Energy Projects Species profile: https://ecos.fws.gov/ecp/species/1864	Threatened
Whooping Crane <i>Grus americana</i> Population: Wherever found, except where listed as an experimental population There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/758	Endangered

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

TARRANT COUNTY

BIRDS

		Federal Status	State Status
American Peregrine Falcon	<i>Falco peregrinus anatum</i>	DL	T
<p>year-round resident and local breeder in west Texas, nests in tall cliff eyries; also, migrant across state from more northern breeding areas in US and Canada, winters along coast and farther south; occupies wide range of habitats during migration, including urban, concentrations along coast and barrier islands; low-altitude migrant, stopovers at leading landscape edges such as lake shores, coastlines, and barrier islands.</p>			
Arctic Peregrine Falcon	<i>Falco peregrinus tundrius</i>	DL	
<p>migrant throughout state from subspecies' far northern breeding range, winters along coast and farther south; occupies wide range of habitats during migration, including urban, concentrations along coast and barrier islands; low-altitude migrant, stopovers at leading landscape edges such as lake shores, coastlines, and barrier islands.</p>			
Bald Eagle	<i>Haliaeetus leucocephalus</i>	DL	T
<p>found primarily near rivers and large lakes; nests in tall trees or on cliffs near water; communally roosts, especially in winter; hunts live prey, scavenges, and pirates food from other birds</p>			
Henslow's Sparrow	<i>Ammodramus henslowii</i>		
<p>wintering individuals (not flocks) found in weedy fields or cut-over areas where lots of bunch grasses occur along with vines and brambles; a key component is bare ground for running/walking</p>			
Interior Least Tern	<i>Sterna antillarum athalassos</i>	LE	E
<p>subspecies is listed only when inland (more than 50 miles from a coastline); nests along sand and gravel bars within braided streams, rivers; also know to nest on man-made structures (inland beaches, wastewater treatment plants, gravel mines, etc); eats small fish and crustaceans, when breeding forages within a few hundred feet of colony</p>			
Peregrine Falcon	<i>Falco peregrinus</i>	DL	T
<p>both subspecies migrate across the state from more northern breeding areas in US and Canada to winter along coast and farther south; subspecies (F. p. anatum) is also a resident breeder in west Texas; the two subspecies' listing statuses differ, F.p. tundrius is no longer listed in Texas; but because the subspecies are not easily distinguishable at a distance, reference is generally made only to the species level; see subspecies for habitat.</p>			

TARRANT COUNTY

BIRDS

		Federal Status	State Status
Red Knot	<i>Calidris canutus rufa</i>		T

Red knots migrate long distances in flocks northward through the contiguous United States mainly April-June, southward July-October. A small plump-bodied, short-necked shorebird that in breeding plumage, typically held from May through August, is a distinctive and unique pottery orange color. Its bill is dark, straight and, relative to other shorebirds, short-to-medium in length. After molting in late summer, this species is in a drab gray-and-white non-breeding plumage, typically held from September through April. In the non-breeding plumage, the knot might be confused with the omnipresent Sanderling. During this plumage, look for the knot's prominent pale eyebrow and whitish flanks with dark barring. The Red Knot prefers the shoreline of coast and bays and also uses mudflats during rare inland encounters. Primary prey items include coquina clam (*Donax* spp.) on beaches and dwarf surf clam (*Mulinia lateralis*) in bays, at least in the Laguna Madre. Wintering Range includes- Aransas, Brazoria, Calhoun, Cameron, Chambers, Galveston, Jefferson, Kennedy, Kleberg, Matagorda, Nueces, San Patricio, and Willacy. Habitat: Primarily seacoasts on tidal flats and beaches, herbaceous wetland, and Tidal flat/shore.

Sprague's Pipit	<i>Anthus spragueii</i>		
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only in Texas during migration and winter, mid September to early April; short to medium distance, diurnal migrant; strongly tied to native upland prairie, can be locally common in coastal grasslands, uncommon to rare further west; sensitive to patch size and avoids edges.

Western Burrowing Owl	<i>Athene cunicularia hypugaea</i>		
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open grasslands, especially prairie, plains, and savanna, sometimes in open areas such as vacant lots near human habitation or airports; nests and roosts in abandoned burrows

Whooping Crane	<i>Grus americana</i>	LE	E
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potential migrant via plains throughout most of state to coast; winters in coastal marshes of Aransas, Calhoun, and Refugio counties

FISHES

		Federal Status	State Status
Shovelnose sturgeon	<i>Scaphirhynchus platyrhynchus</i>		T

open, flowing channels with bottoms of sand or gravel; spawns over gravel or rocks in an area with a fast current; Red River below reservoir and rare occurrence in Rio Grande

MAMMALS

		Federal Status	State Status
Gray wolf	<i>Canis lupus</i>	LE	E

extirpated; formerly known throughout the western two-thirds of the state in forests, brushlands, or grasslands

Plains spotted skunk	<i>Spilogale putorius interrupta</i>		
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catholic; open fields, prairies, croplands, fence rows, farmyards, forest edges, and woodlands; prefers wooded, brushy areas and tallgrass prairie

TARRANT COUNTY

MAMMALS

		Federal Status	State Status
Red wolf	<i>Canis rufus</i>	LE	E
extirpated; formerly known throughout eastern half of Texas in brushy and forested areas, as well as coastal prairies			

MOLLUSKS

		Federal Status	State Status
Louisiana pigtoe	<i>Pleurobema riddellii</i>		T
streams and moderate-size rivers, usually flowing water on substrates of mud, sand, and gravel; not generally known from impoundments; Sabine, Neches, and Trinity (historic) River basins			
Sandbank pocketbook	<i>Lampsilis satura</i>		T
small to large rivers with moderate flows and swift current on gravel, gravel-sand, and sand bottoms; east Texas, Sulfur south through San Jacinto River basins; Neches River			
Texas heelsplitter	<i>Potamilus amphichaenus</i>		T
quiet waters in mud or sand and also in reservoirs. Sabine, Neches, and Trinity River basins			
Texas pigtoe	<i>Fusconaia askewi</i>		T
rivers with mixed mud, sand, and fine gravel in protected areas associated with fallen trees or other structures; east Texas River basins, Sulphur River, Cypress Creek, Sabine through Trinity rivers as well as San Jacinto River			

REPTILES

		Federal Status	State Status
Texas garter snake	<i>Thamnophis sirtalis annectens</i>		
wet or moist microhabitats are conducive to the species occurrence, but is not necessarily restricted to them; hibernates underground or in or under surface cover; breeds March-August			
Texas horned lizard	<i>Phrynosoma cornutum</i>		T
open, arid and semi-arid regions with sparse vegetation, including grass, cactus, scattered brush or scrubby trees; soil may vary in texture from sandy to rocky; burrows into soil, enters rodent burrows, or hides under rock when inactive; breeds March-September			
Timber rattlesnake	<i>Crotalus horridus</i>		T
swamps, floodplains, upland pine and deciduous woodlands, riparian zones, abandoned farmland; limestone bluffs, sandy soil or black clay; prefers dense ground cover, i.e. grapevines or palmetto			

PLANTS

		Federal Status	State Status
Auriculate false foxglove	<i>Agalinis auriculata</i>		
Known in Texas from one late nineteenth century specimen record labeled -Benbrook-; in Oklahoma, degraded prairies, floodplains, fallow fields, and borders of upland sterile woods; in Arkansas, blackland prairie; Annual; Flowering August - October			

TARRANT COUNTY

PLANTS

Federal Status

State Status

Glen Rose yucca

Yucca necopina

Texas endemic; grasslands on sandy soils and limestone outcrops; flowering April-June

Hall's prairie clover

Dalea hallii

GLOBAL RANK: G3; In grasslands on eroded limestone or chalk and in oak scrub on rocky hillsides; Perennial; Flowering May-Sept; Fruiting June-Sept

Osage Plains false foxglove

Agalinis densiflora

GLOBAL RANK: G3; Most records are from grasslands on shallow, gravelly, well drained, calcareous soils; Prairies, dry limestone soils; Annual; Flowering Aug-Oct

Reverchon's curfpea

Pediomelum reverchonii

GLOBAL RANK: G3; Mostly in prairies on shallow rocky calcareous substrates and limestone outcrops; Perennial; Flowering Jun-Sept; Fruiting June-July

Texas milk vetch

Astragalus reflexus

GLOBAL RANK: G3; Grasslands, prairies, and roadsides on calcareous and clay substrates; Annual; Flowering Feb-June; Fruiting April-June

Topeka purple-coneflower

Echinacea atrorubens

GLOBAL RANK: G3; Occurring mostly in tallgrass prairie of the southern Great Plains, in blackland prairies but also in a variety of other sites like limestone hillsides; Perennial; Flowering Jan-June; Fruiting Jan-May

ATTACHMENT C
SPECIES IMPACT TABLE

Species Impact Table						
Species	Federal Status	State Status	Description of Suitable Habitat	Habitat Present?	Effects/Impact Determination	Justification
PLANTS						
Glen Rose yucca (<i>Yucca necopina</i>)	NL	SGCN	Texas endemic; grasslands on sandy soils and limestone outcrops; flowering April-June	No	The project would have no impact on this species.	Soils in the project area are silty clays, clay, and clay loams. Suitable habitat does not occur within the project area.
Hall's prairie clover (<i>Dalea hallii</i>)	NL	SGCN	In grasslands on eroded limestone or chalk and in oak scrub or rocky hillsides; perennial; flowering May through September and fruiting June through September.	No	The project would have no impact on this species.	Grasslands on eroded limestone or chalk, oak scrub or rocky hillsides do not occur within the proposed project area.
Osage Plains false foxglove (<i>Agalinis densiflora</i>)	NL	SGCN	Most records are from grasslands on shallow, gravelly, well drained, calcareous soils; prairies, dry limestone soils, annual; flowering August through October.	No	The project would have no impact on this species.	Well drained calcareous soils do not occur within the project area.
Auriculate false foxglove (<i>Agalinis auriculata</i>)	NL	SGCN	Known in Texas from one late nineteenth century specimen record labeled –Benbrook–; in Oklahoma on degraded prairies, floodplains, fallow fields, and borders of upland sterile woods; in Arkansas, blackland prairie; Annual; Flowering August to October.	No	The project would have no impact on this species.	This species is only known in Texas from one late nineteenth century specimen record. Additionally, given the vegetation and soil disturbance within the project area from road construction and maintenance as well as surrounding development, this species would be unlikely to occur in the project area.
Texas milk vetch (<i>Astragalus reflexus</i>)	NL	SGCN	Grasslands, prairies, and roadsides on calcareous and clay substrates; annual; flowering February through June and fruiting April through June.	Yes	This project may impact this species. However, occurrence would be considered rare.	Suitable habitat, including clay soils, occurs within the project area.
Reverchon's curfpea (<i>Pedimelum reverchonii</i>)	NL	SGCN	Mostly in prairies on shallow rocky calcareous substrates and limestone outcrops; perennial; flowering June to September; fruiting June to July.	No	The project would have no impact on this species.	Suitable substrates and limestone outcrops do not occur within the project area.
Topeka purple-coneflower (<i>Echinacea atrorubens</i>)	NL	SGCN	Occurring mostly in tallgrass prairie of the southern Great Plains, in blackland prairies but also in a variety of other sites like limestone hillsides; perennial; flowering January to June; Fruiting January to May.	Yes	This project may impact this species.	Suitable habitat for this species occurs within the project area.
MOLLUSKS						
Louisiana Pigtoe (<i>Pleurobema riddellii</i>)	NL	T	Inhabits streams and moderate-size rivers usually in flowing water on substrates of mud, sand, and gravel; not generally known from impoundments; Sabine, Neches, and Trinity (historic) River basins.	Yes	The project may impact this species.	Suitable habitat for this species occurs within Big Fossil Creek.

Species Impact Table						
Species	Federal Status	State Status	Description of Suitable Habitat	Habitat Present?	Effects/Impact Determination	Justification
Texas Heelsplitter (<i>Potamilus amphichaenus</i>)	NL	T	Quiet waters in mud or sand and also in reservoirs. Sabine, Neches, and Trinity River basins.	Yes	The project may impact this species.	Suitable habitat for this species occurs within Big Fossil Creek.
Texas Pigtoe (<i>Fusconaia askewi</i>)	NL	T	Rivers with mixed mud, sand, and fine gravel in protected areas associated with fallen trees or other structures; east Texas River basins, Sulphur River, Cypress Creek, Sabine through Trinity rivers as well as San Jacinto River	Yes	The project may impact this species.	Suitable habitat for this species occurs within the project area.
Sandbank pocketbook (<i>Lampsilis satura</i>)	NL	T	Small to large rivers with moderate flows and swift current on gravel, gravel-sand, and sand bottoms; east Texas, Sulfur south through San Jacinto River basins; Neches River.	No	The project would have no impact on this species.	The proposed project is outside of the known range of this species.
REPTILES						
Texas garter snake (<i>Thamnophis sirtalis annectens</i>)	NL	SGCN	Wet or moist microhabitats are conducive to the species occurrence, but it is not necessarily restricted to them. Hibernates underground or in or under surface cover. Breeds from March to August.	Yes	The project may impact this species.	Suitable habitat, particularly along creeks, occurs within the proposed project area.
Texas horned lizard (<i>Phrynosoma cornutum</i>)	NL	T	Open, arid and semi-arid regions with sparse vegetation, including grass, cactus, scattered brush or scrubby trees; soil may vary in texture from sandy to rocky; burrows into soil, enters rodent burrows, or hides under rock when inactive. Breeds from March to September.	No	The project would have no impact on this species.	Vegetation and soils are unsuitable (dense ground cover over silty clay and clay soils) within the proposed project area.
Timber/Canebrake rattlesnake (<i>Crotalus horridus</i>)	NL	T	Swamps, floodplains, upland pine and deciduous woodlands, riparian zones, abandoned farmland; limestone bluffs, sandy soil or black clay; prefers dense ground cover, i.e. grapevines or palmetto.	No	The project would have no impact on this species.	Given the vegetation and soil disturbance within the project area from road construction and maintenance as well as surrounding development, this species would be unlikely to occur in the project area.
FISH						
Shovelnose sturgeon (<i>Scaphirhynchus platyrhynchus</i>)	NL	T	Open, flowing channels with bottoms of sand or gravel; spawns over gravel or rocks in an area with fast current; Red River below reservoir and rare occurrence in Rio Grande.	No	The project would have no impact on this species.	The proposed project is within the Trinity River watershed and therefore outside of the known range of this species.
BIRDS						
Bald Eagle (<i>Haliaeetus leucocephalus</i>)	DL	T	Nests and winters near rivers, lakes and along coasts; nests in tall trees or on cliffs near large bodies of water.	No	The project would have no impact on this species.	Tall trees and cliffs near large water bodies do not exist within the proposed project area.

Species Impact Table						
Species	Federal Status	State Status	Description of Suitable Habitat	Habitat Present?	Effects/Impact Determination	Justification
American Peregrine Falcon (<i>Falco peregrinus anatum</i>)	DL	T	Nests in tall cliff eyries in west Texas; migrant across state from more northern breeding areas in U.S. and Canada, winters along coast and farther south; occupies wide range of habitats during migration, including urban.	No	The project would have no impact on this species.	Potential migrant; however, any occurrence of this species in or adjacent to the project area would be temporary and no impacts are expected to occur as a result of the proposed project.
Arctic Peregrine Falcon (<i>Falco peregrinus tundrius</i>)	DL	SGCN	Nests in tundra regions; migrates through Texas; winter inhabitant of coastlines and mountains from Florida to South America. Occupies wide range of habitats during migration, including urban; stopovers at leading landscape edges, usually near water.	No	The project would have no impact on this species.	Potential migrant; however, any occurrence of this species in or adjacent to the project area would be temporary and no impacts are expected to occur as a result of the proposed project.
Peregrine Falcon (<i>Falco peregrines</i>)	DL	T	Both subspecies migrate across the state from more northern breeding areas in U.S. and Canada to winter along the coast and farther south; subspecies (F. p. anatum) is also a resident breeder in west Texas. The two subspecies' listings statuses differ, F.p. tundrius is no longer listed in Texas; but because the subspecies are not easily distinguishable at a distance, reference is generally made only to the species level; see subspecies for habitat.	No	The project would have no impact on this species.	Potential migrant; however, any occurrence of this species in or adjacent to the project area would be temporary and no impacts are expected to occur as a result of the proposed project.
Whooping Crane (<i>Grus Americana</i>)	E	E	Potential migrant via plains throughout most of the state to the coast; winters in the coastal wetlands of Aransas, Calhoun, and Refugio Counties, Texas.	No	The project would have no effect on this species.	Potential migrant; however, any occurrence of this species in or adjacent to the project area would be temporary and no impacts are expected to occur as a result of the proposed project.
Piping Plover (<i>Charadrius melodus</i>)	T	NL	Wintering migrant along Texas Gulf Coast; beaches and bayside mud or salt flats.	No	The project would have no effect on this species.	Potential migrant; however, any occurrence of this species in or adjacent to the project area would be temporary and no impacts are expected to occur as a result of the proposed project.

Species Impact Table						
Species	Federal Status	State Status	Description of Suitable Habitat	Habitat Present?	Effects/Impact Determination	Justification
Red Knot (<i>Calidris canutus rufa</i>)	T	NL	Migrant through Texas from breeding grounds within the Canadian Arctic to wintering grounds in southern South America. Principally associated with marine and estuarine habitats. In Texas, this species forages on beaches, oyster reefs, and exposed bay bottoms and roosts on high sand flats, reefs, and other sites protected from high tides. Coquina clams (<i>Donax variabilis</i>) are a frequent and often important food resource for this species.	No	The project would have no effect on this species.	Potential migrant; however, any occurrence of this species in or adjacent to the project area would be temporary and no impacts are expected to occur as a result of the proposed project.
Least Tern (<i>Sterna antillarum</i>)	E	E	Listed as endangered only when found inland (more than 50 miles from a coastline); nests along sand and gravel bars within braided streams and rivers. Also known to nest on man-made structures such as inland beaches, wastewater treatment plants, gravel mines, etc. Eats small fish and crustaceans, when breeding forages within a few hundred feet of the colony.	No	The project would have no effect on this species.	Braided streams, inland beaches, wastewater plants, and gravel mines do not occur within the project area.
Western Burrowing Owl (<i>Athene cunicularia hypugaea</i>)	NL	SGCN	Open grassland, especially prairie, plains, and savanna, sometimes in open areas such as vacant lots near human habitation or airports; nests and roosts in abandoned burrows.	Yes	This project may impact this species.	Open grassland habitat occurs within the proposed project area.
Sprague's Pipit (<i>Anthus spragueii</i>)	NL	SGCN	Wintering migrant in TX; mid September to early April; short to medium distance, diurnal migrant; strongly tied to native upland prairie, can be locally common in coastal grasslands, uncommon to rare further west; sensitive to patch size, avoids edges.	No	The project would have no impact on this species.	Native upland prairie and coastal grasslands do not occur within the proposed project area.
Henslow's Sparrow (<i>Ammodramus henslowii</i>)	NL	SGCN	Wintering individuals found in weedy fields or cut-over areas where lots of bunch grasses occur along with vines and brambles; a key component is bare ground for running/walking.	No	The project would have no impact on this species.	Potential winter migrant; however, suitable habitat (bunch grasses, vines, and brambles) does not occur within the project area.
MAMMALS						
Plains spotted skunk (<i>Spilogale putorius interrupta</i>)	NL	SGCN	Habitat generalist; open fields, prairies, croplands, fence rows, farmyards, forest edges, and woodlands; prefers wooded, brushy areas and tallgrass prairie.	Yes	This project may impact this species.	Open fields and fence rows bordering croplands occur within the project area.

Species Impact Table						
Species	Federal Status	State Status	Description of Suitable Habitat	Habitat Present?	Effects/Impact Determination	Justification
Gray wolf (<i>Canis lupus</i>)	E	E	Extirpated; formerly known throughout the western two-thirds of the state in forested, brushlands, or grasslands.	No	The project would have no effect on this species.	This species is considered extirpated.
Red wolf (<i>Canis rufus</i>)	E	E	Extirpated; formerly known throughout the eastern half of Texas in brushy and forested areas, as well as coastal prairies.	No	The project would have no effect on this species.	This species is considered extirpated.
E – Endangered T – Threatened C – Candidate for Listing SGCN – Species of Great Conservation Need DL – Delisted NL – Not Listed						

Sources:

U.S. Fish and Wildlife Service. Official Species List: Tarrant County, Generated March 12, 2018.

<https://ecos.fws.gov/ipac/>

Texas Parks and Wildlife Department Annotated County Lists of Rare Species: Tarrant County, last revision December 30, 2016.

<http://www.tpwd.state.tx.us/gis/ris/es/> (accessed March 12, 2018).

ATTACHMENT D

EMST PROJECT MOU SUMMARY TABLE

Vegetation Potentially Impacted by the Proposed Project				
EMST Vegetation Community	Field Identification	TPWD MOU Type	MOU Thresholds (acres)	Total Acre(s) Impacted ¹
Urban Low Intensity	Mixed Shrubland	Edwards Plateau Savannah, Woodland, and Shrubland	2.0	1.1
Edwards Plateau: Savanna Grassland ²	Hackberry Woodland			
Native Invasive: Deciduous Woodland				
Central Texas: Floodplain Hardwood Forest	Floodplain Woodland	Riparian	0.1	4.8
Central Texas: Floodplain Herbaceous Vegetation ²				
Edwards Plateau: Savanna Grassland ²	Urban	Urban	NA	69.3
Central Texas: Riparian Herbaceous Vegetation ²				
Barren ²				
Grand Prairie: Tallgrass Prairie ²				
Native Invasive: Mesquite Shrubland ²				
Row Crops ²				
Urban High Intensity				
Urban Low Intensity				

¹Impact calculations were quantified based on field verified vegetation.

²This vegetation community does not exist within the proposed project area.

ATTACHMENT E

PROJECT AREA PHOTOGRAPHS



Photo 1: General view of project area vegetation; as well as discrepancy between urban vegetation (mowed and maintained right of way) and TPWD EMST mapped Edwards Plateau: Savanna Grassland.



Photo 2: Discrepancy between urban vegetation and TPWD EMST mapped Central Texas: Floodplain Herbaceous Vegetation.



Photo 3: Discrepancy between urban vegetation and TPWD EMST mapped Central Texas: Riparian Herbaceous Vegetation and Grand Prairie: Tallgrass Prairie.



Photo 4: Discrepancy between urban vegetation and TPWD EMST mapped Native Invasive: Mesquite Shrubland and Row Crops.

ATTACHMENT F

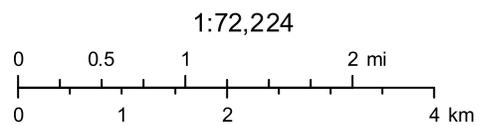
FPPA DOCUMENTATION

0718-02-045 FM 156



March 20, 2018

-  Project 1
-  Search Result (point)
-  Urbanized Areas



Chad Putnam

From: Chad Putnam
Sent: Thursday, March 22, 2018 1:59 PM
To: WHAB_TxDOT
Cc: Jamye Sawey
Subject: Early Coordination Request - CSJ:0718-02-045; FM 156 from US 81/US 287 to McElroy Blvd/Watauga Road; Tarrant County

The TxDOT Fort Worth District would like to request early coordination for a roadway widening project located in Tarrant County. The Tier I Site Assessment and other supporting documentation have been uploaded into TXECOS under CSJ: 0718-02-045. Alternatively, you can retrieve the drop-off by clicking the following link (or copying and pasting it into your web browser) within 21 days:

["https://ftp.dot.state.tx.us/dropbox/pickup.php?claimID=876P1Pu3v1f31Ltc&claimPasscode=XHaNgKN3j2QPNgRY&emailAddr=chad.putnam%40txdot.gov"](https://ftp.dot.state.tx.us/dropbox/pickup.php?claimID=876P1Pu3v1f31Ltc&claimPasscode=XHaNgKN3j2QPNgRY&emailAddr=chad.putnam%40txdot.gov)

Full information for the drop-off:

Claim ID: 876P1Pu3v1f31Ltc
Claim Passcode: XHaNgKN3j2QPNgRY

Thanks,

Chad Putnam
Environmental Specialist
TxDOT FTW District
817-370-6567
Chad.Putnam@txdot.gov

Work Schedule: Monday - 6AM to 4:30PM
Tuesday - 6AM to 1:30PM
Wednesday - 6AM to 4:30PM
Thursday - 6AM to 4PM
Friday - 6AM to 12:30PM

Chad Putnam

From: Sue Reilly <Sue.Reilly@tpwd.texas.gov>
Sent: Tuesday, April 03, 2018 12:14 PM
To: Chad Putnam
Cc: Jamye Sawey
Subject: RE: Early Coordination Request - CSJ:0718-02-045; FM 156 from US 81/US 287 to McElroy Blvd/Watauga Road; Tarrant County

Categories: 0718-02-045

Chad,

Thanks. I appreciate the response.

Thank you for submitting the following project for early coordination: FM 156 from US 81/US 287 to McElroy Blvd (CSJ 0718-02-045). TPWD appreciates TxDOT's commitment to implement the practices listed in the Tier I Site Assessment submitted on March 22, 2018 and subsequent emails. Based on a review of the documentation, the avoidance and mitigation efforts described, and provided that project plans do not change, TPWD considers coordination to be complete. However, please note it is the responsibility of the project proponent to comply with all federal, state, and local laws that protect plants, fish, and wildlife.

According to §2.204(g) of the 2013 TxDOT-TPWD MOU, TxDOT agreed to provide TXNDD reporting forms for observations of tracked SGCN (which includes federal- and state-listed species) occurrences within TxDOT project areas. Please keep this mind when completing project due diligence tasks. For TXNDD submission guidelines, please visit the following link: http://tpwd.texas.gov/huntwild/wild/wildlife_diversity/txndd/submit.phtml

Thank you,

Sue Reilly
Transportation Assessment Liaison
TPWD Wildlife Division
512-389-8021

From: Chad Putnam [mailto:Chad.Putnam@txdot.gov]
Sent: Friday, March 30, 2018 7:38 PM
To: Sue Reilly <Sue.Reilly@tpwd.texas.gov>
Cc: Jamye Sawey <Jamye.Sawey@txdot.gov>
Subject: Re: Early Coordination Request - CSJ:0718-02-045; FM 156 from US 81/US 287 to McElroy Blvd/Watauga Road; Tarrant County

Yes, we have been working with the local municipalities regarding any construction activities within park boundaries. At the present time, the project would not require any additional drainage easements than what currently exist along the roadway. The construction activities within the park boundaries, opposite Lazy Spur Road, would be done through a temporary construction license and would only involve improving the existing park road connection to the proposed FM 156 roadway profile.

Thanks,

Chad Putnam

Sent from my iPhone

On Mar 30, 2018, at 5:59 PM, Sue Reilly <Sue.Reilly@tpwd.texas.gov> wrote:

Chad,

Sorry I was in a hurry this morning and did not read that very thoroughly. I apologize.

It looks like some of your drainage easements are in park spaces. Are you coordinating your activities in these areas with the local parks department? You can use our LWRCRP viewer to find public parks. <http://tpwd.texas.gov/gis/apps/lwrcrp/>

Thanks,
Sue

From: Chad Putnam [<mailto:Chad.Putnam@txdot.gov>]
Sent: Friday, March 30, 2018 11:20 AM
To: Sue Reilly <Sue.Reilly@tpwd.texas.gov>
Cc: Jamye Sawey <Jamye.Sawey@txdot.gov>
Subject: Re: Early Coordination Request - CSJ:0718-02-045; FM 156 from US 81/US 287 to McElroy Blvd/Watauga Road; Tarrant County

NWP 14 for each of the anticipated 12 waters of the US.

Thanks,

Chad Putnam

Sent from my iPhone

On Mar 30, 2018, at 9:37 AM, Sue Reilly <Sue.Reilly@tpwd.texas.gov> wrote:

Chad,

I'm happy to hear that the engineers are trying to minimize impacts.

Are you using NWP 12 or did you mean 14? NWP 12 is utility line crossings.

Thanks,
Sue

From: Chad Putnam [<mailto:Chad.Putnam@txdot.gov>]
Sent: Thursday, March 29, 2018 11:19 AM
To: Sue Reilly <Sue.Reilly@tpwd.texas.gov>
Cc: Jamye Sawey <Jamye.Sawey@txdot.gov>

Subject: RE: Early Coordination Request - CSJ:0718-02-045; FM 156 from US 81/US 287 to McElroy Blvd/Watauga Road; Tarrant County

Sue,

Big Fossil Creek will be bridged to the south of Harmon Road. I have attached a clip of the configuration that is currently being proposed for the bridges. At the present time, we cannot rule out the potential for some permanent impacts within the drainage easements as a result of grading activities. The project engineers are still looking for ways to keep the impacts within the existing ROW boundaries where possible. We are currently anticipating NWP's at 12 individual crossings.

Thanks,

Chad Putnam

Work Schedule: Monday - 6AM to 4:30PM
Tuesday - 6AM to 1:30PM
Wednesday - 6AM to 4:30PM
Thursday - 6AM to 4PM
Friday - 6AM to 12:30PM

From: Sue Reilly [<mailto:Sue.Reilly@tpwd.texas.gov>]
Sent: Tuesday, March 27, 2018 6:07 PM
To: Chad Putnam
Cc: Jamye Sawey
Subject: RE: Early Coordination Request - CSJ:0718-02-045; FM 156 from US 81/US 287 to McElroy Blvd/Watauga Road; Tarrant County

Chad,

Starting over on the right project this time!

I have questions about the impacts to Big Fossil Creek. Will you be bridging the creek in this area? It looks like there are some pretty extensive drainage easements, will there be temporary or permanent impacts in those areas? Also, are you counting each crossing as its own NWP or are you counting all impacts together?

Thank you,

Sue Reilly
Transportation Assessment Liaison
TPWD Wildlife Division
512-389-8021

From: Chad Putnam [<mailto:Chad.Putnam@txdot.gov>]
Sent: Thursday, March 22, 2018 2:42 PM
To: Sue Reilly <Sue.Reilly@tpwd.texas.gov>
Cc: Jamye Sawey <Jamye.Sawey@txdot.gov>

Subject: RE: Early Coordination Request - CSJ:0718-02-045; FM 156 from US 81/US 287 to McElroy Blvd/Watauga Road; Tarrant County

Sue,

I just wanted to make you aware that this particular project is currently a high priority for our district. If there is anything you need from me to assist with your review of the project please feel free to give me a call or send me an email.

Thanks,

Chad Putnam

Work Schedule: Monday - 6AM to 4:30PM
Tuesday - 6AM to 1:30PM
Wednesday - 6AM to 4:30PM
Thursday - 6AM to 4PM
Friday - 6AM to 12:30PM

From: WHAB_TxDOT [mailto:WHAB_TxDOT@tpwd.texas.gov]
Sent: Thursday, March 22, 2018 2:35 PM
To: Chad Putnam; Jamye Sawey
Cc: Sue Reilly
Subject: RE: Early Coordination Request - CSJ:0718-02-045; FM 156 from US 81/US 287 to McElroy Blvd/Watauga Road; Tarrant County

The TPWD Wildlife Habitat Assessment Program has received your request and has assigned it project ID # 39572. The Habitat Assessment Biologist who will complete your project review is copied on this email.

Thank you,

John Ney
Administrative Assistant
Texas Parks & Wildlife Department
Wildlife Diversity Program - Habitat Assessment Program
4200 Smith School Road
Austin, TX 78744
Office: (512) 389-4571

From: Chad Putnam [<mailto:Chad.Putnam@txdot.gov>]
Sent: Thursday, March 22, 2018 1:59 PM
To: WHAB_TxDOT <WHAB_TxDOT@tpwd.texas.gov>
Cc: Jamye Sawey <Jamye.Sawey@txdot.gov>

Subject: Early Coordination Request - CSJ:0718-02-045; FM 156 from US 81/US 287 to McElroy Blvd/Watauga Road; Tarrant County

The TxDOT Fort Worth District would like to request early coordination for a roadway widening project located in Tarrant County. The Tier I Site Assessment and other supporting documentation have been uploaded into TXECOS under CSJ: 0718-02-045. Alternatively, you can retrieve the drop-off by clicking the following link (or copying and pasting it into your web browser) within 21 days:

["https://ftp.dot.state.tx.us/dropbox/pickup.php?claimID=876P1Pu3v1f31Ltc&claimPasscode=XHaNgKN3j2QPNgRY&emailAddr=chad.putnam%40txdot.gov"](https://ftp.dot.state.tx.us/dropbox/pickup.php?claimID=876P1Pu3v1f31Ltc&claimPasscode=XHaNgKN3j2QPNgRY&emailAddr=chad.putnam%40txdot.gov)

Full information for the drop-off:

Claim ID: 876P1Pu3v1f31Ltc
Claim Passcode: XHaNgKN3j2QPNgRY

Thanks,

Chad Putnam
Environmental Specialist
TxDOT FTW District
817-370-6567
Chad.Putnam@txdot.gov

Work Schedule: Monday - 6AM to 4:30PM
Tuesday - 6AM to 1:30PM
Wednesday - 6AM to 4:30PM
Thursday - 6AM to 4PM
Friday - 6AM to 12:30PM





Preliminary Jurisdictional Determination

FM 156

From US 81/US 287 to
McLeroy Boulevard/Watauga Road
CSJ: 0718-02-045

TxDOT Fort Worth District
December 2016

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 16, 2014, and executed by FHWA and TxDOT.

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1.0 INTRODUCTION

The Texas Department of Transportation (TxDOT) proposes an expansion of Farm-to-Market Road (FM) 156/Blue Mound Road with logical termini extending from US 81/US 287 to McLeroy Boulevard/Watauga Road in Tarrant County, Texas (see **Figure 1** and **Figure 2** in **Appendix A**). The proposed improvements would have independent utility without the need for additional improvements. The portion of FM 156 under study lies within the cities of Saginaw, Blue Mound and Fort Worth.

The existing facility is a two lane undivided roadway with one 12-foot lane in each direction and variable width shoulders. The existing facility has a typical right of way width of 120 feet. The current posted speed limit for this section of FM 156 is 45 miles per hour (mph) south of Bailey Boswell Road and 55 mph north of Bailey Boswell Road. Average annual daily traffic (AADT) for the facility in 2020 is estimated as 26,550 vehicles per day (vpd), while the 2040 AADT is estimated to be 37,750 vpd.

The Build Alternative would expand the existing facility from two lanes to four lanes with a raised median. The facility would include 14-foot outside lanes and 12-foot inside lanes with a curb and gutter. Ten-foot wide sidewalks would also be included on the outside southbound lane and six-foot wide sidewalks along the outside northbound lane.

Overall, the proposed improvements would extend 3.8 miles and would require the acquisition of 0.41 acres of additional right of way.

2.0 METHODS

2.1 Data Review

A review was conducted of the National Wetland Inventory (NWI), National Hydrologic Dataset (NHD) maps, Tarrant County Soil Survey (USDA-NRCS 1981), USGS 7.5-minute quadrangle sheets (Haltom City and Keller), and recent aerial photography. This review concluded that potential waters of the U.S. exist within the proposed project area. Field reconnaissance conducted on April 18 and July 7, 2016, confirmed this conclusion and these features are described below in **Section 4.1**.

2.2 Field Delineation

The routine method of wetland delineation outlined in the 1987 Corps of Engineers Wetland Delineation Manual (Environmental Laboratory 1987) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains (Version 2.0) (Environmental Laboratory 2010) were utilized for wetland determinations within the proposed project area. Field activities conducted on April 18, 2016, and July 7, 2016, focused on waters of the U.S., including wetland, determination and delineation.

The *1987 Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987) defines wetlands based on three criteria: hydrophytic vegetation, hydric soils, and wetland hydrology. In general, all three criteria must be present for an area to be characterized as a wetland. Some exceptions apply for disturbed areas, areas where wetland hydrology presently occurs, or in newly formed wetlands, where one indicator (such as hydric soils) might be lacking. This is the case for wetland/stream complexes which occur in the proposed project area. Hydric soils were assumed for these sites, as provided for in Part IV Section C of the *1987 Corps of Engineers Wetlands Delineation Manual*, due to wetland hydrology being present during the time of field investigation which prohibits accurate soil testing. Therefore, Wetland Determination Forms were not completed for wetland/stream complexes. In addition to jurisdictional wetlands as defined above, the CWA regulates impacts to other waters of the U.S. The term “waters of the U.S.” has broad meaning and incorporates both deepwater aquatic habitats and special aquatic sites, including wetlands, as listed below:

1. The territorial seas with respect to the discharge of fill material;
2. Coastal and inland waters, lakes, rivers, and streams that are navigable waters of the U.S. including their adjacent wetlands;
3. Tributaries to navigable waters of the U.S., including adjacent wetlands;
4. Interstate waters and their tributaries, including adjacent wetlands; and,
5. All other waters of the U.S. not identified above, such as lakes, intermittent streams, prairie potholes, and other waters that are not a part of a tributary system to interstate waters or navigable waters of the United States, the degradation or destruction of which could affect interstate commerce. Note that a 2006 U.S. Supreme Court decision found that, in many instances, isolated wetlands are not subject to USACE jurisdiction (*Rapanos vs. the U.S.* [2006] and *Carabell vs. the USACE* [2004]).

For linear features, the Ordinary High Water Mark (OHWM) is determined by assessing a combination of factors at each site. In accordance with Section 328.3(e) of the CWA, the following factors were considered in determining the jurisdictional boundary:

- Clear, natural line on the bank;
- Shelving;
- Changes in soil;
- Destruction of terrestrial vegetation; and,
- Presence of litter and debris.

Following the completion of preliminary data gathering and synthesis, the routine method of wetland determination was used to identify jurisdictional areas within the project area. Potential wetland sites were evaluated in the field, and wetland delineation forms were filled out in order to describe the dominant vegetative species observed at each site, along with edaphic and hydrologic characteristics.

3.0 GENERAL DESCRIPTION OF PROJECT AREA

3.1 Land Use

The proposed project is located within the cities of Fort Worth, Blue Mound, and Saginaw and is in an urban setting with surrounding land use consisting primarily of commercial and residential sites. Some undeveloped properties have been used for agricultural purposes. Notable buildings adjacent to the project area include Saginaw High School, the US Bureau of Engraving and Printing, and a Dickies Manufacturing Center. One park, Northeast Community Park, is also adjacent to the proposed project area. Named communities along FM 156 include Chisholm Villas and Liberty Crossing, which is still under development.

The majority of the construction activities will occur within the existing right of way. Small areas of additional right of way will be acquired for the proposed improvements but would not cause displacement or changes to existing land uses.

3.2 Geology and Topography

The geological formations underlying the proposed project area are mapped as Lower Cretaceous-age Pawpaw Formation, Weno Limestone, Denton Clay, undivided (Kpd); and Fort Worth Limestone and Duck Creek formation, undivided (Kfd) (BEG 2013). The Pawpaw Formation is comprised of sandstone, sandy clay, and, on occasion, ferruginous ironstone concretions. Within the north Texas region, Weno Limestone is noted as being composed of both marl and limestone with abundant concretions of cemented clays and ironstone with some thick bedding of limestone in the uppermost and lowermost reaches. Denton Clay is typically brownish-gray in color and calcareous with a marly basal unit and uppermost parts of impure limestone. Fort Worth Limestone is comprised of limestone and clay with the clay calcareous; while the Duck Creek Formation is primarily comprised of limestone and marl (see **Figure 3 in Appendix A**).

3.3 Soils

Eleven soil types are mapped as occurring within the proposed project area and include:

- Aledo gravelly loam, 1 to 8 percent slopes;
- Aledo-Bolar complex, 5 to 20 percent slopes;
- Chatt silty clay, 1 to 3 percent slopes;
- Frio silty clay, occasionally flooded;
- Purves clay, 0 to 3 percent slopes;
- Sanger clay, 1 to 3 percent slopes;
- Sanger clay, 3 to 5 percent slopes;
- Sanger-Urban land complex, 1 to 5 percent slopes;
- San Saba clay, 0 to 2 percent slopes;

- Slidell clay, 0 to 1 percent slopes; and
- Slidell clay, 1 to 3 percent slopes (USDA-NRCS 2016).

Of these, only Frio silty clay, occasionally flooded, is considered hydric (see **Table 1** below and **Figure 3** in **Appendix A**).

Soils of the Aledo series are shallow to well drained, moderately permeable soils derived from marls and interbedded limestone of Cretaceous age. In typical profile, A-horizons of this series can reach to 16 inches (41 centimeters [cm]) above indurated and coarsely fractured limestone. The Chatt series is comprised of deep, well drained, moderately-slowly-permeable soils that formed in clayey calcareous sediments. A-horizons for this series can reach depths of 17 inches (44 cm). B-horizons can extend to depths of approximately 80 inches (203 cm) with C-horizons another 10 inches (25 cm). The Frio series is comprised of very deep, well drained, moderately-permeable flood plain soils that have formed in loamy and clayey calcareous alluvium. A-horizons are typically shallow, rarely exceeding 8 inches (20 cm) in depth. B-horizons can extend to depths of approximately 80 inches (203 cm). The Soils of the Purves series are shallow, well drained, and moderately slowly permeable. They are derived from interbedded limestone and marl and typically located on gently sloping to steep uplands. A-horizons of this series can reach to 12 inches (30 cm) with very thin B-horizons to 14 inches (36 cm) above indurated limestone. The Sanger series consists of very deep, well drained, very slowly permeable soils parented from clayey marine sediments. These soils are found on broad uplands. Also located on uplands, the San Saba series consists of moderately deep, moderately well drained, very slowly permeable soils that formed in clayey sediments over hard limestone. A-horizons of this series can reach to 19 inches (48 cm) with B-horizons to 35 inches (89 cm) above indurated fractured limestone. Slidell soils are formed in calcareous clayey sediments on uplands. A-horizons extend up to 19 inches (48 cm) in depth while B-horizons reaching to depths of 80 inches (USDA-NRCS 2016) (203 cm).

Table 1: Tarrant County Soils Occurring Within the Project Area	
NRCS Soil Series	Hydric
Aledo gravelly clay loam, 1 to 8 percent slopes	No
Aledo-Bolar complex, 5 to 20 percent slopes	No
Chatt silty clay, 1 to 3 percent slopes	No
Frio silty clay, occasionally flooded	Yes
Purves clay, 0 to 3 percent slopes	No
Sanger clay, 1 to 3 percent slopes	No
Sanger clay, 3 to 5 percent slopes	No
Sanger-Urban land complex, 1 to 5 percent slopes	No
San Saba clay, 0 to 2 percent slopes	No
Slidell clay, 0 to 1 percent slopes	No
Slidell clay, 1 to 3 percent slopes	No

Source: December 2015 National List of Hydric Soils

3.4 Vegetation

Prior to field investigation, the project area vegetation was analyzed using the Ecological Mapping Systems of Texas (EMST) GIS database (Texas Parks and Wildlife [TPWD] 2014). The EMST categorized the proposed project vegetation into eleven different communities including:

- Edwards Plateau: Savanna Grassland
- Native Invasive: Deciduous Woodland
- Central Texas: Floodplain Hardwood Forest
- Central Texas: Floodplain Herbaceous Vegetation
- Central Texas: Riparian Herbaceous Vegetation
- Open Water
- Grand Prairie: Tallgrass Prairie
- Native Invasive: Mesquite Shrubland
- Row Crops
- Urban High Intensity
- Urban Low Intensity

However, field investigation did not agree with the EMST. The proposed project area primarily consists of mowed and maintained right of way (urban landscape), hackberry (*Celtis laevigata*) woodlands, and floodplain woodlands (see **Figures 4-1** through **4-6** in **Appendix A**). Vegetation for individual crossing sites is described below in Section 4.1.

3.5 Hydrography

The proposed project area lies within the Trinity River drainage basin. The Trinity River originates from four forks: West Fork starting in Archer County; Clear Fork starting in Parker County; Elm Fork starting in Montague County; and East Fork starting in Cooke County. The total drainage area is approximately 17,969 square miles and runs south/southeast across Texas to Trinity Bay (TCEQ 2000). Surface water features within the proposed project area are entirely within the Trinity drainage basin and include Big Fossil Creek and eight unnamed tributaries.

The project is located within a Federal Emergency Management Agency (FEMA) designated 100-year floodplain (map panels 48439C0065K and 48439C0180K; effective September 25, 2009). The hydraulic design for this project would be in accordance with current Federal Highway Administration (FHWA) and TxDOT design policies. The facility would permit the conveyance of the 100-year floodplain, 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 Administrators (City of Fort Worth and Tarrant County) would be required.

4.0 FINDINGS

4.1 Description of Potential Waters of the U.S. Crossing Sites

Two site investigations were conducted on April 18 and July 7 of 2016. Field conditions were wetter than normal during the April 18, 2016, field visit due to the area receiving just under two inches of rain the day before and continuing off and on throughout the day of the field visit. Because of this, a second field visit was conducted on July 7, 2016, to evaluate the area during normal/dryer conditions. These field investigations resulted in the identification of 14 potential waters of the U.S., including wetlands, within the project area. Wetland delineations followed the methods outlined in the *1987 Corps of Engineers Wetlands Delineation Manual* and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains Region (Version 2.0)* (see the Wetland Determination Forms provided as **Appendix B**). The OHWM of each stream crossing was determined in the field and delineated using a Trimble Geo 7X GPS receiver. Dominant vegetative species were noted at each site. These sites are described below and illustrated on **Figures 5-1 through 5-11** in **Appendix A**. Project area photographs are provided as **Appendix C**.

Site 1 – Wetland/Stream Complex 1

This site consists of an intermittent stream with emergent wetland vegetation established within the OHWM. It is located just north of E McLeroy Boulevard and flows east from the project area to its confluence with Little Fossil Creek (see **Figure 5-1** in **Appendix A**). No visible channel was noted on the upstream side of FM 156 during the field investigations; therefore, it appears as if the observed flow within this feature is stormwater outfall from the existing roadway drainage system. The portion of the stream within the project area has been channelized and lined with a concrete and stone mixture. The stream's substrate returns to a more natural state, gravel, just outside of the right of way. Within the project area, the stream has an average OHWM of approximately 41 feet. Water was present and flowing at the time of both field visits. Woody vegetation along the stream includes black willow (*Salix nigra*) and green ash (*Fraxinus pennsylvanica*). Dominant herbaceous vegetation within the project area, but outside of the OHWM includes giant ragweed (*Ambrosia trifida*), winter rye (*Lolium perenne*), pink evening primrose (*Oenothera speciosa*), bitterweed (*Helenium amarum*), johnsongrass (*Sorghum halepense*), wild oats (*Avena fatua*), and cheatgrass (*Bromus tectorum*). Herbaceous vegetation within the OHWM includes curly dock (*Rumex crispus*) and southern cattail (*Typha domingensis*). Hydric soils were assumed for this site, as provided for in Part IV Section C of the *1987 Corps of Engineers Wetlands Delineation Manual*, due to wetland hydrology being present during the time of field investigation which prohibits accurate soil testing. Therefore, a Wetland Determination Form was not completed for this site. This site is likely to be considered a water of the U.S. by the USACE and therefore subject to USACE permitting. Approximately 0.04 acre of this site occurs within the existing and proposed right of way.

Site 2 – Unnamed Tributary 1

This site consists of an ephemeral stream located north of Victoria Drive that flows east from the project area to its confluence with the Big Fossil Creek (see **Figure 5-2** in **Appendix A**). No visible channel was

noted on the upstream side of FM 156 during the field investigations; therefore, it appears as if the observed flow within this feature is stormwater outfall from the existing roadway drainage system. The portion of the stream within the project area has been channelized and lined with a concrete and stone mixture. The stream's substrate returns to a more natural state, gravel, just outside of the right of way. Within the right of way the stream has an average OHWM of approximately 13 feet. Water was present and flowing at the time of both field visits. Dominant herbaceous vegetation along the upland portion of the stream includes giant ragweed, winter rye, pink evening primrose, bitterweed, johnsongrass, cheat grass, bedstraw (*Galium aparine*), and wild oats. This site is likely to be considered a water of the U.S. by the USACE and therefore subject to USACE permitting. Approximately 0.01 acre of this site occurs within the existing and proposed right of way.

Site 3 – Unnamed Tributary 2

This site consists of an intermittent stream located just north of Lazy Spur Boulevard that flows east to its confluence with Big Fossil Creek (see **Figure 5-3 in Appendix A**). Within the project area, this stream has a gravel substrate and an average OHWM of approximately 31 feet. Water was present and flowing at the time of both field visits. Dominant herbaceous vegetation along the upland portion of the stream includes johnsongrass, giant ragweed, curly dock, winter rye, dandelion (*Taraxacum officinale*), wild geranium (*Geranium maculatum*), and Texas thistle (*Cirsium texanum*). Spikerush (*Eleocharis sp.*) occurred along the stream's edge. This site is likely to be considered a water of the U.S. by the USACE and therefore subject to USACE permitting. Approximately 0.06 acre of this site occurs within the existing and proposed right of way.

Site 4 – Wetland/Stream Complex 2

This site consists of an ephemeral stream with emergent wetland vegetation established within the OHWM. Site 4 is located on the southeast side of FM 156 and south of E. Bailey Boswell Road (see **Figure 5-4 in Appendix A**). This site is within a FEMA 100-year floodplain. Water was present at the time of the first field visit and flows north to its confluence with Site 5 where it eventually flows into Big Fossil Creek. Water was not present during the second field visit. There is no defined channel or OHWM upstream and west of FM 156. This site has an average OHWM of approximately 14 feet within the project area. Hydrophytic vegetation within the OHWM includes southern cattail, black willow, spikerush, and curly dock. Dominant herbaceous vegetation along the upland portion of the stream and outside of the OHWM includes dandelion, winter rye, pink evening primrose, and bermudagrass (*Cynodon dactylon*). Hydric soils were assumed for this site, as provided for in Part IV Section C of the *1987 Corps of Engineers Wetlands Delineation Manual*, due to wetland hydrology being present during the time of field investigation which prohibits accurate soil testing. Therefore, a Wetland Determination Form was not completed for this site. This site is likely to be considered a water of the U.S. by the USACE and therefore subject to USACE permitting. Approximately 0.03 acre of this site occurs within the existing and proposed right of way.

Site 5 – Unnamed Tributary 3

This site consists of an ephemeral stream located north of E. Bailey Boswell Road and east of FM 156 northeast (see **Figure 5-4** in **Appendix A**). Water was present at the time of both field visits and flows southeast to its confluence with Big Fossil Creek. This stream is within a FEMA 100-year floodplain and appears to have been recently created to improve the drainage of FM 156. The portion of the stream within the project area has been channelized and lined with a concrete and stone (approximately eight inch by eight inch) mixture. The stream's substrate returns to a more natural state, gravel, just outside of the right of way. The average OHWM within the project area is approximately 26 feet. Dominant woody vegetation includes hackberry (*Celtis laevigata*) which grows along a fence row on the northern boundary of the stream. Dominant herbaceous vegetation includes knotroot bristlegrass (*Setaria parviflora*), milkweed (*Asclepias sp.*), Texas thistle, winter rye, and bermudagrass. Hydrophytic vegetation along the stream's edge and established on in-stream sedimentation includes alligator weed (*Alternanthera philoxeroides*), spikerush, water primrose (*Ludwigia repens*), and southern cattail. This site is likely to be considered a water of the U.S. by the USACE and therefore subject to USACE permitting. Approximately 0.001 acre of this site occurs within the existing and proposed right of way.

Site 6 – Forested Wetland

This site consists of a forested wetland located north of E. Bailey Boswell Road and west of FM 156 (see **Figure 5-5** in **Appendix A**). This site is located within a FEMA 100-year floodplain and standing water was present during the time of both field visits. This site was evaluated in accordance with the *1987 Corps of Engineers Wetlands Delineation Manual* and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains Region (Version 2.0)* and Wetland Determination Forms are provided as **Appendix B**. Dominant woody vegetation within the forested wetland includes black willow and American elm (*Ulmus americana*). Dominant herbaceous vegetation includes smartweed (*Polygonum sp.*), southern cattail, and spikerush. This site is likely to be considered a water of the U.S. by the USACE and therefore subject to USACE permitting. This wetland lies directly adjacent to the right of way and no portion of this site occurs within the right of way.

Site 7 – Big Fossil Creek

Big Fossil Creek is a perennial stream located north of the intersection of Hidden Lake Road and FM 156 (see **Figure 5-6** in **Appendix A**). Within the existing right of way, Big Fossil Creek has an average OHWM of approximately 58 feet. This site is located within a FEMA 100-year floodplain. Flowing water was present at the time of both field visits. Dominant woody vegetation along the creek includes hackberry, Japanese privet (*Ligustrum japonicum*), greenbriar (*Smilax bona-nox*), dewberry (*Rubus trivialis*), and indigo bush (*Amorpha fruticosa*). Dominant herbaceous species include everlasting pea (*Lathyrus latifolius*), cheat grass, pink evening primrose, bur clover (*Medicago polymorpha*), winter rye, and bermudagrass. Big Fossil Creek is likely to be considered a water of the U.S. by the USACE and therefore subject to USACE permitting. Approximately 0.17 acre of this site occurs within the existing and proposed right of way.

Site 8 – Unnamed Tributary 4

This site consists of an intermittent stream located just south of E. Harmon Road and FM 156 (see **Figure 5-7 in Appendix A**). This site is located within a FEMA 100-year floodplain. Water was present during both field visits and flows southwest to its confluence with Big Fossil Creek. Within the right of way the stream has an average OHWM of approximately 43 feet. Woody vegetation along the stream was dominated by hackberry. Dominant herbaceous vegetation includes pink evening primrose, wild oats, bitterweed, johnsongrass, curly dock, Virginia wildrye (*Elymus virginicus*), and cattail. The existing Site 8 bridge is supported by concrete columns within the channel and additional columns are proposed as part of the bridge widening. This site is likely to be considered a water of the U.S. by the USACE and therefore subject to USACE permitting. Approximately 0.16 acre of this site occurs within the existing and proposed right of way.

Sites 9 and 10 – Wetland/Stream Complex 3 (Unnamed Tributary 5)

Site 9 includes the emergent wetland vegetation established within the OHWM of Site 10, and together both sites represent one single and complete crossing (see **Figure 5-8 in Appendix A**). Unnamed Tributary 5, Site 10, is an intermittent stream that flows west across the existing right of way and then southeast to its confluence with Big Fossil Creek. This crossing is located within the FEMA 100-year floodplain, and water was present at the time of both field visits. The average OHWM is approximately 38 feet within the proposed project area. Dominant woody vegetation along the stream includes cedar elm and hackberry. Herbaceous vegetation includes giant ragweed, bedstraw, wild oats, everlasting pea, wild geranium, dandelion, winter rye, pink evening primrose, Virginia wildrye, day flower, wild onion, and bermudagrass. Dominant hydrophytic vegetation, within the OHWM of Site 9, includes southern cattail, black willow, spikerush, smartweed, and curly dock. Dominant woody vegetation along a fence row crossing, which parallels the right of way and runs perpendicular to the stream, includes cedar elm and hackberry. Dominant herbaceous vegetation within the project area but outside of the OHWM includes giant ragweed, bedstraw, wild oats, everlasting pea, wild geranium, dandelion, winter rye, pink evening primrose, Virginia wildrye, day flower (*Commelina erecta*), wild onion (*Allium canadense*), and bermudagrass. Hydric soils were assumed for Site 9, as provided for in Part IV Section C of the *1987 Corps of Engineers Wetlands Delineation Manual*, due to wetland hydrology being present during the time of field investigation which prohibits accurate soil testing. Therefore, a Wetland Determination Form was not completed for Site 9. This crossing is likely to be considered a water of the U.S. by the USACE and therefore subject to USACE permitting. Sites 9 and 10 have a combined total acreage of approximately 0.08 acre within the existing and proposed right of way.

Site 11 – Unnamed Tributary 6

This site is an intermittent stream located north of Heritage Trace Parkway (see **Figure 5-9 in Appendix A**). Within the project area, Site 11 has an average OHWM of approximately 34 feet. This site is located within a FEMA 100-year floodplain. Dominant woody vegetation along a fence row crossing, which parallels the right of way and runs perpendicular to the stream, includes black willow and hackberry. Dominant herbaceous vegetation includes giant ragweed, bedstraw, wild oats, wild geranium, winter

rye, pink evening primrose, day flower, and bermudagrass. This site is likely to be considered a water of the U.S. by the USACE and therefore subject to USACE permitting. Approximately 0.09 acre of this site occurs within the existing and proposed right of way.

Site 12 – Unnamed Tributary 7

This site is an intermittent stream that is located just south of US 81 (see **Figure 5-10** in **Appendix A**). Water was present during both field visits and flows southwest under FM 156 to its confluence with Big Fossil Creek. This site is located within a FEMA 100-year floodplain. Within the right of way, this site has an average OHWM of approximately 17 feet. No woody vegetation occurs along the stream. Dominant herbaceous vegetation includes everlasting pea, wintery rye, bitterweed, wild oats, and Texas thistle. This site is likely to be considered a water of the U.S. by the USACE and therefore subject to USACE permitting. Approximately 0.06 acre of this site occurs within the existing and proposed right of way.

Site 13 – Emergent Wetland

Site 13 is located west of FM 156 just south of US 81 and, during wet weather conditions, flows into Site 12 (see **Figures 5-10** and **5-11** in **Appendix A**). From historical topographic maps (**Figure 2** in **Appendix A**; and USGS 1955 and 1981), this site likely functioned as a stream prior to the construction of an upstream dam and associated on-channel pond located just east of FM 156; however, due to the alteration in flow regimes caused by the dam, it has established into an emergent wetland. This site is located within a FEMA 100-year floodplain. Water was present during both field visits. This site was evaluated in accordance with the *1987 Corps of Engineers Wetlands Delineation Manual* and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains Region (Version 2.0)* and Wetland Determination Forms are provided as **Appendix B**. Dominant hydrophytic vegetation within this site includes camphor daisy (*Rayjacksonia phyllocephala*), alligator weed, nutsedge (*Cyperus sp.*), water primrose, spikerush, and jungle rice (*Echinochloa colona*). This site is likely to be considered a water of the U.S. by the USACE and therefore subject to USACE permitting. Approximately 0.15 acre of this site occurs within the existing and proposed right of way.

Site 14 – Unnamed Tributary 8

This site is located east of FM 156 and south of US 81 and flows through a concrete culvert into Site 13 (see **Figure 5-11** in **Appendix A**). This site appears to be a remnant intermittent stream segment located immediately downstream of the dam discussed above. Water was present during both field visits. Within the existing right of way, Site 14 has an average OHWM of approximately nine feet. This site is located within a FEMA 100-year floodplain. Woody vegetation along the stream is dominated by hackberry. Dominant herbaceous vegetation includes giant ragweed, bedstraw, johnsongrass, winter rye, and bermudagrass. This site is likely to be considered a water of the U.S. by the USACE and therefore subject to USACE permitting. Approximately 0.01 acre of this site occurs within the existing and proposed right of way.

5.0 CONCLUSION

There are 13 potential waters of the U.S., as defined by the USACE, that occur within the proposed project area. **Table 2** below lists these potential waters of the U.S., their OHWM, and total acreage within the existing and proposed right of way.

Table 2: Potential Waters of the U.S., Including Wetlands, Within the Right of Way

Site Number	Water of the U.S. Name	Existing Crossing	Type of Potential Water of the U.S.	Associated Wetland Determination Form Numbers	OHWB (feet)	Approximate Linear Feet within the Right of Way	Approximate Acreage within the Right of Way
Site 1	Wetland/Stream Complex 1	Concrete Culvert	Intermittent Stream and Emergent Wetland Complex	1	41	34	0.04
Site 2	Unnamed Tributary 1	Concrete Culvert	Intermittent Stream	NA	14	38	0.01
Site 3	Unnamed Tributary 2	Concrete Culvert	Intermittent Stream	NA	31	72	0.06
Site 4	Wetland/Stream Complex 2	Concrete Culvert	Stream and Emergent Wetland Complex	NA	14	63	0.03
Site 5	Unnamed Tributary 3	Concrete Culvert	Intermittent Stream	NA	27	2	0.001
Site 6	Forested Wetland	NA	Forested Wetland	4 and 5	NA	NA	0.0
Site 7	Big Fossil Creek	Bridge with Columns	Perennial Stream	NA	62	132	0.17
Site 8	Unnamed Tributary 4	Bridge with Columns	Intermittent Stream	NA	43	155	0.16
Site 9	Wetland/Stream Complex 3	Concrete Culvert	Stream and Emergent Wetland Complex	NA ¹	41	37	0.04
Site 10	Unnamed Tributary 5	Concrete Culvert	Intermittent Stream	NA	36	40	0.04
Site 11	Unnamed Tributary 6	Concrete Culvert	Intermittent Stream	NA	34	147	0.09
Site 12	Unnamed Tributary 7	Concrete Culvert	Intermittent Stream	NA	17	159	0.06

Table 2: Potential Waters of the U.S., Including Wetlands, Within the Right of Way

Site Number	Water of the U.S. Name	Existing Crossing	Type of Potential Water of the U.S.	Associated Wetland Determination Form Numbers	OHWL (feet)	Approximate Linear Feet within the Right of Way	Approximate Acreage within the Right of Way
Site 13	Emergent Wetland	NA	Emergent Wetland	7, 8, and 9	NA	NA	0.15
Site 14	Unnamed Tributary 8	Concrete Culvert	Intermittent Stream	NA	9	27	0.01

Detailed drainage design for the proposed project has not been completed at this time. The placement of temporary or permanent dredge or fill material into potential waters of the U.S. would be authorized under a USACE Section 404 Nationwide Permit (NWP) 14 provided that the permanent fill amount is less than 0.5 acre. A pre-construction notification (PCN) would be required for NWP 14 if the loss of waters of the U.S. exceeds 0.10 acre or there is a discharge into special aquatic sites, including wetlands. If permanent fill amounts exceed 0.5 acre, an Individual Permit would be required.

TxDOT would comply with all applicable requirements of Section 404 of the Clean Water Act regarding discharges into waters of the U.S., and measures would be taken during the design process in order to avoid and minimize adverse impacts to ecologically sensitive areas. If permitting through the USACE is necessary for impacts to waters of the U.S., mitigation would be negotiated during the Section 404 permit coordination process.

6.0 REFERENCES

- Bureau of Economic Geology (BEG). 2013. *Geologic Map Database of Texas*.
<http://pubs.usgs.gov/ds/2005/170/> (accessed May 27, 2016)
- Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual, Technical Report Y-87-1. U.S. Army Engineer Waterways Experiment Station. Vicksburg, MS.
- Environmental Laboratory. 2010. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains Region (Version 2.0), Technical Report ERDC/EL TR-10-1. U.S. Army Engineer Research and Development Center. Vicksburg, MS.
- Texas Parks and Wildlife Department (TPWD). 2014. Ecological Mapping Systems of Texas. <https://tpwd.texas.gov/gis/data/downloads#EMS-T>.
- Texas Commission on Environmental Quality (TCEQ). 2000. Water Quality Inventory. Trinity River Basin. http://www.tceq.state.tx.us/assets/public/comm_exec/pubs/sfr/050_00/vol2_basin08.pdf, accessed September 29, 2014.
- Texas Water Development Board (TWDB). 2013. Trinity Aquifer. <http://www.twdb.state.tx.us/groundwater/aquifer/majors/trinity.asp>.
- U.S. Department of Agriculture (USDA)-Soil Conservation Service (NRCS). 2016. Web Soil Survey. Electronic Document, <https://soilseries.sc.egov.usda.gov/osdname.asp> (18 April 2016).
- U.S. Department of Agriculture (USDA)-Soil Conservation Service (NRCS). 1981. Soil Survey of Tarrant County, Texas.
- US Geological Survey (USGS). 7.5-minute series topographic map, Keller, Texas, quadrangle. 1955.
- US Geological Survey (USGS). 7.5-minute series topographic maps, Haltom City and Keller, Texas, quadrangles. 1981.

APPENDIX A

FIGURES

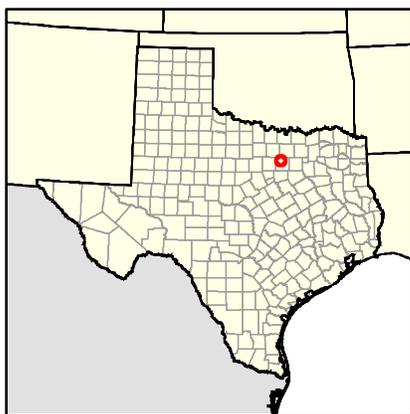


Figure 1
Project Area Location
 FM 156 From US 81/US 287 to
 McLeroy Boulevard/Watauga Road
 Tarrant County, Texas
 CSJ: 0718-02-045



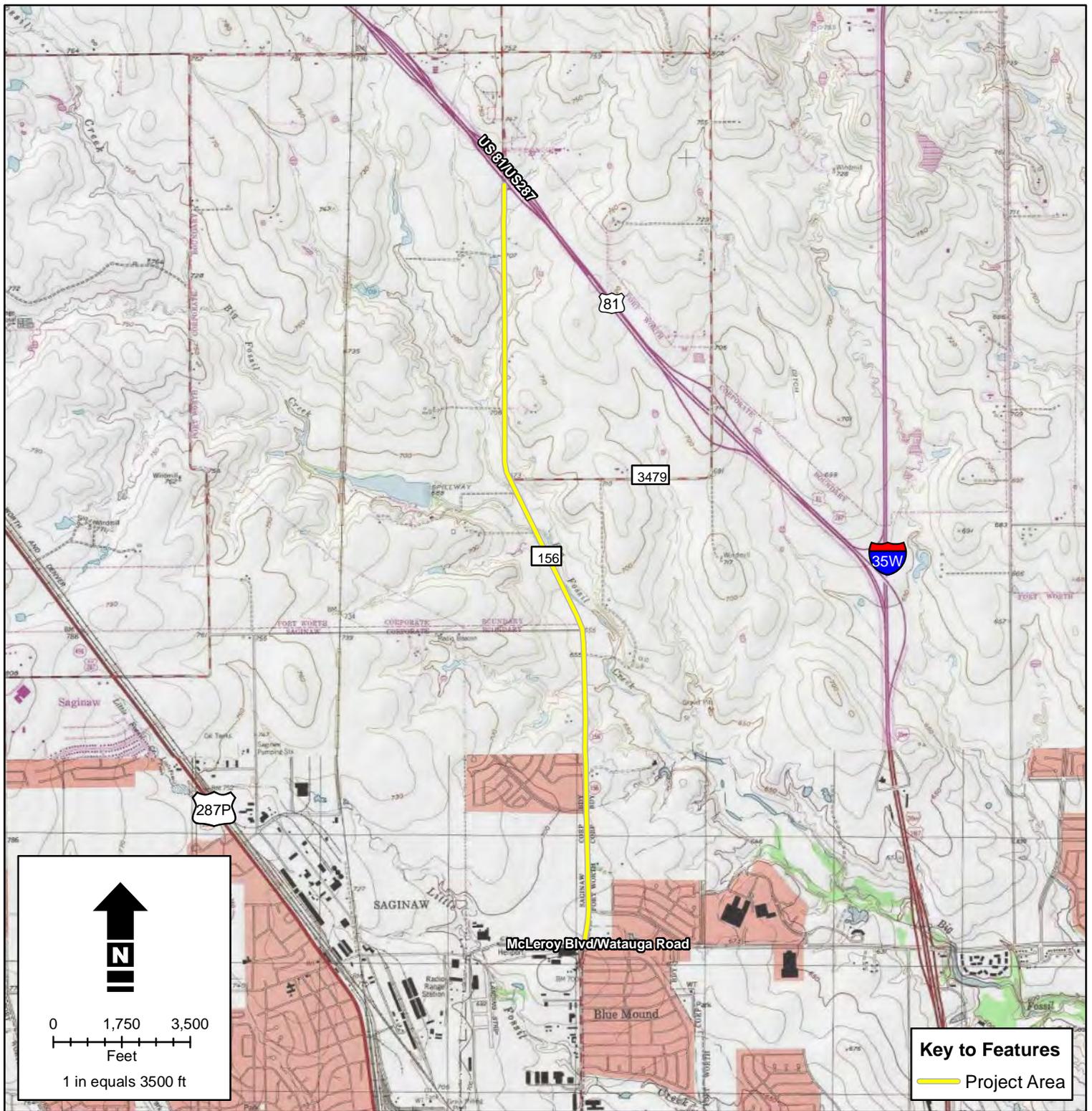


Figure 2
Project Area Location
 FM 156 From US 81/US287 to
 McLeroy Boulevard/Watauga Road
 Tarrant County, Texas
 CSJ: 0718-02-045

USGS 7.5-minute Topographic Quadrangles:
 Keller (USGS# 32097-H3) and Haltom City (USGS# 32097-G3), TX



PROJECT AREA GEOLOGY AND SOILS

FM 156 From US 81/US 287 to McLeroy Boulevard/Watauga Road

CSJ: 0718-02-045



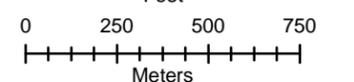
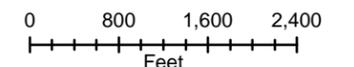
Key to Features

- Project Area
- Soil Type Boundaries
- Geologic Formation Boundaries
- Soils Intersecting Project Area

Project Area Soils

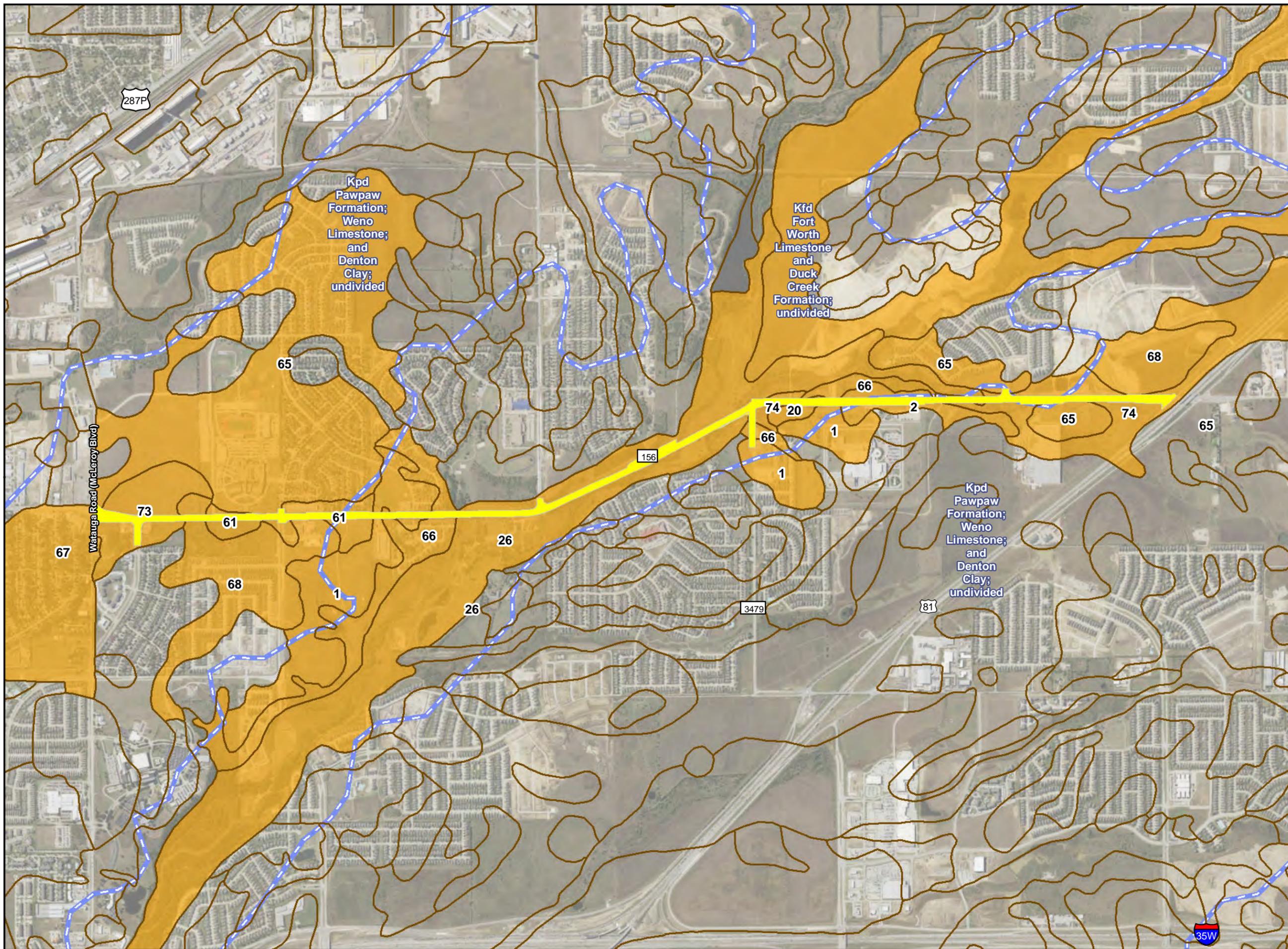
- 1 - Aledo gravelly clay loam, 1 to 8 percent slopes
- 2 - Aledo-Bolar complex, 5 to 20 percent slopes
- 20 - Chatt silty clay, 1 to 3 percent slopes
- 26 - Frio silty clay, occasionally flooded
- 61 - Purves clay, 0 to 3 percent slopes
- 65 - Sanger clay, 1 to 3 percent slopes
- 66 - Sanger clay, 3 to 5 percent slopes
- 67 - Sanger-Urban land complex, 1 to 5 percent slopes
- 68 - San Saba clay, 0 to 2 percent slopes
- 73 - Slidell clay, 0 to 1 percent slopes
- 74 - Slidell clay, 1 to 3 percent slopes

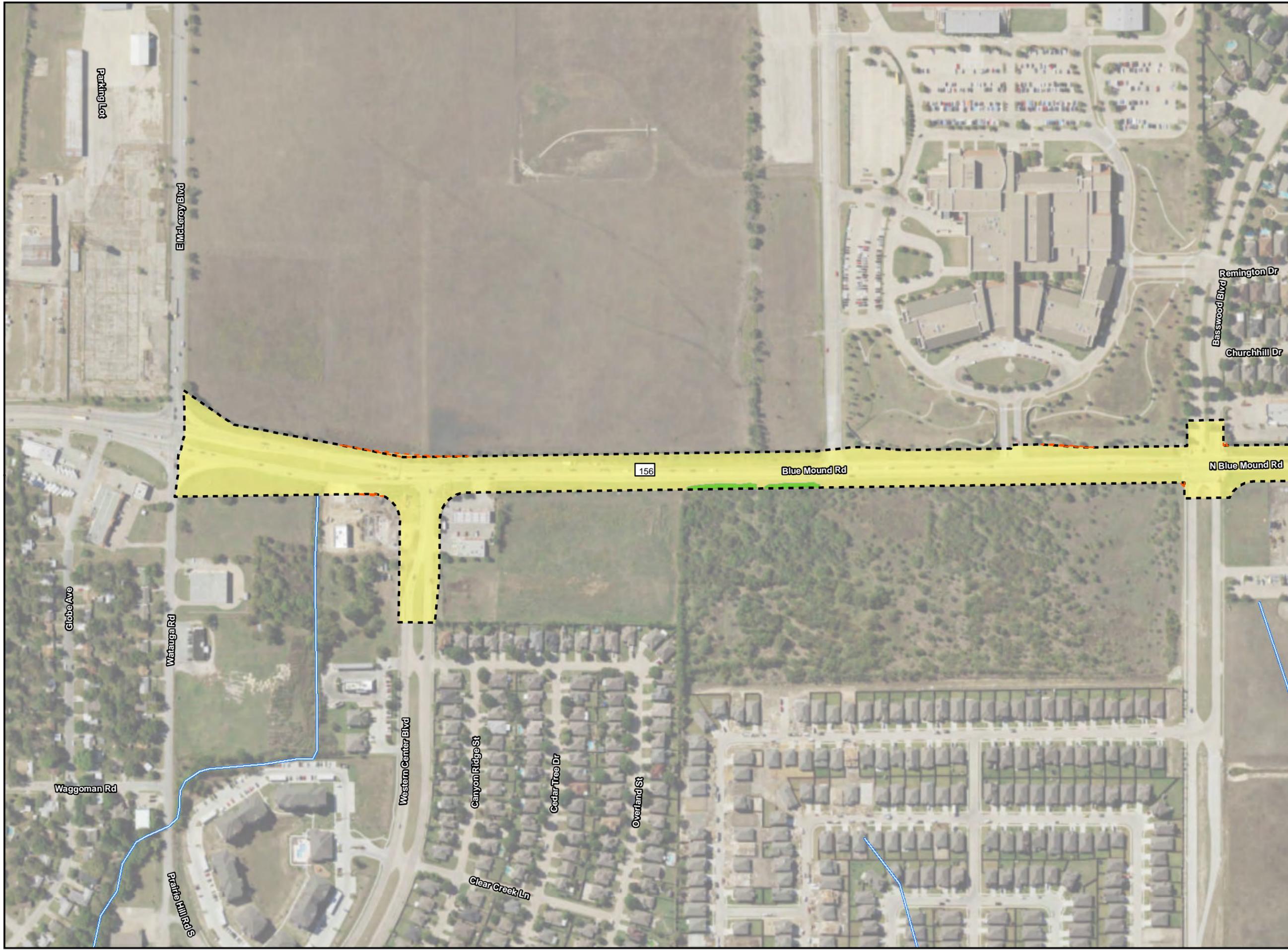
USGS 7.5-minute Topographic Quadrangles:
Keller (USGS# 32097-H3) and
Haltom City (USGS# 32097-G3), TX



One inch equals 500 meters

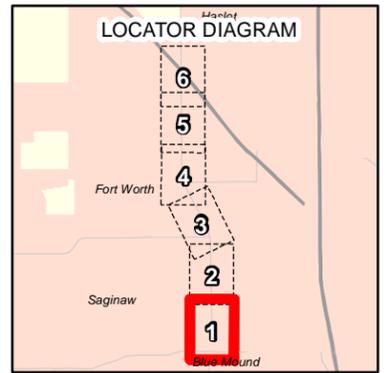
FIGURE 3





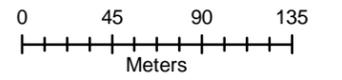
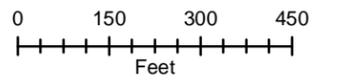
PROJECT AREA VEGETATION

FM 156 From US 81/US 287 to McLeroy Boulevard/Watauga Road
CSJ: 0718-02-045



Key to Features

- Streams (NHD)
- Existing ROW
- Proposed ROW
- FW - Floodplain woodland
- HW - Hackberry woodland
- UR - Urban

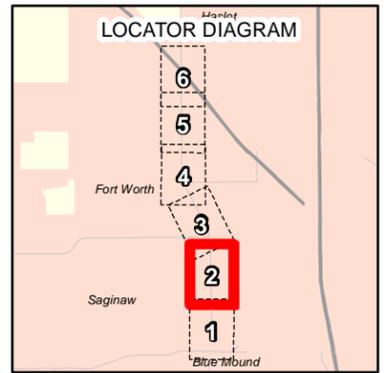


One inch equals 300 ft

FIGURE 4-1

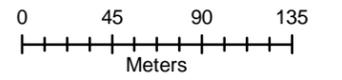
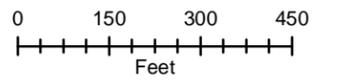
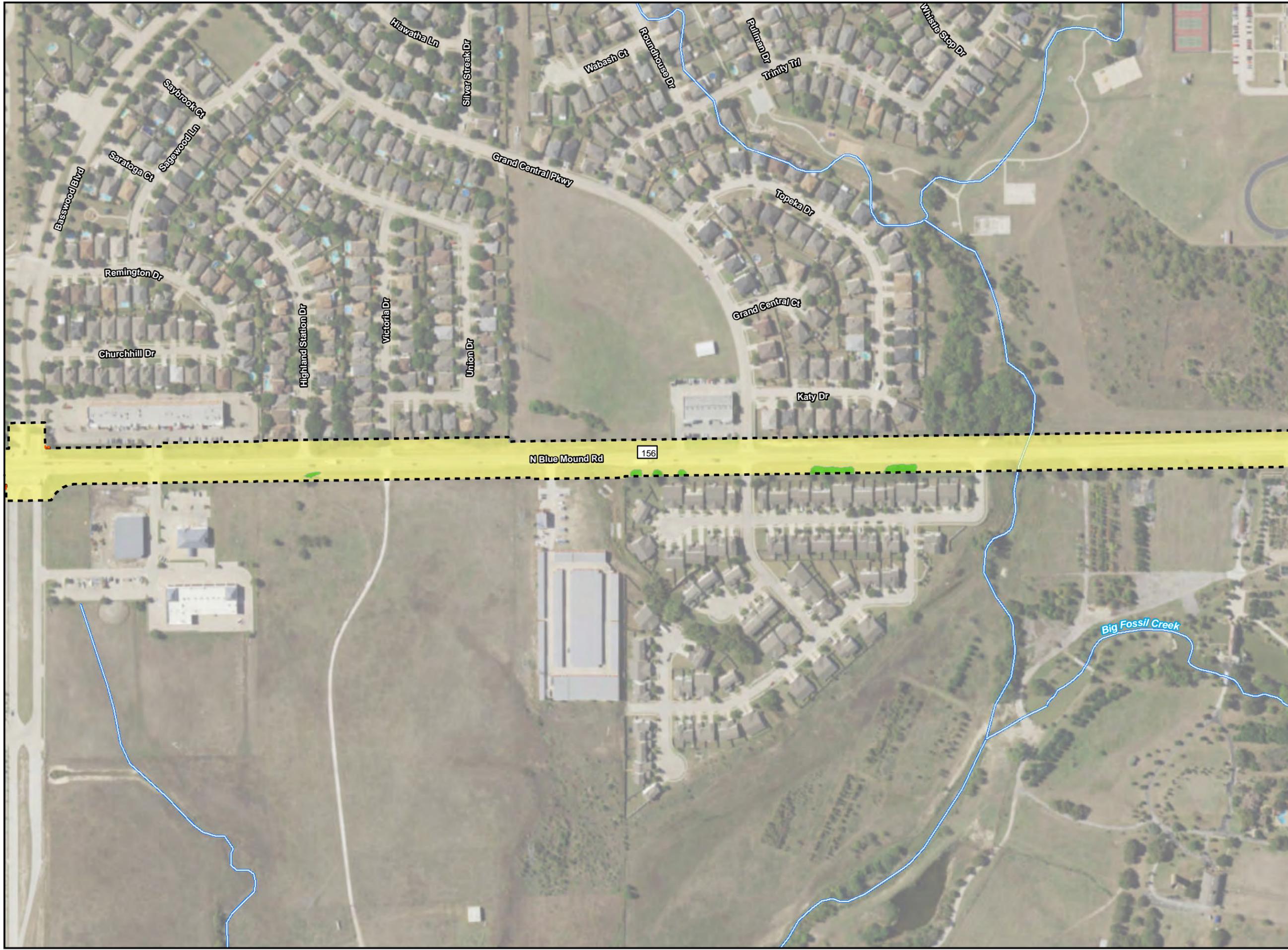
PROJECT AREA VEGETATION

FM 156 From US 81/US 287 to McLeroy Boulevard/Watauga Road
CSJ: 0718-02-045



Key to Features

- Streams (NHD)
- Existing ROW
- Proposed ROW
- FW - Floodplain woodland
- HW - Hackberry woodland
- UR - Urban

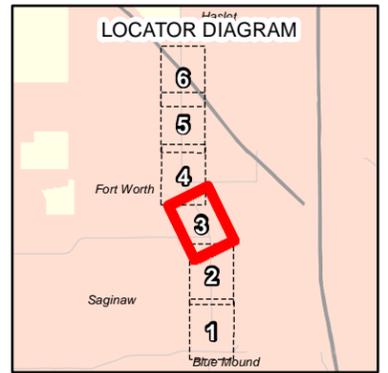


One inch equals 300 ft

FIGURE 4-2

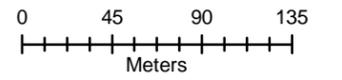
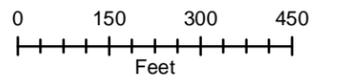
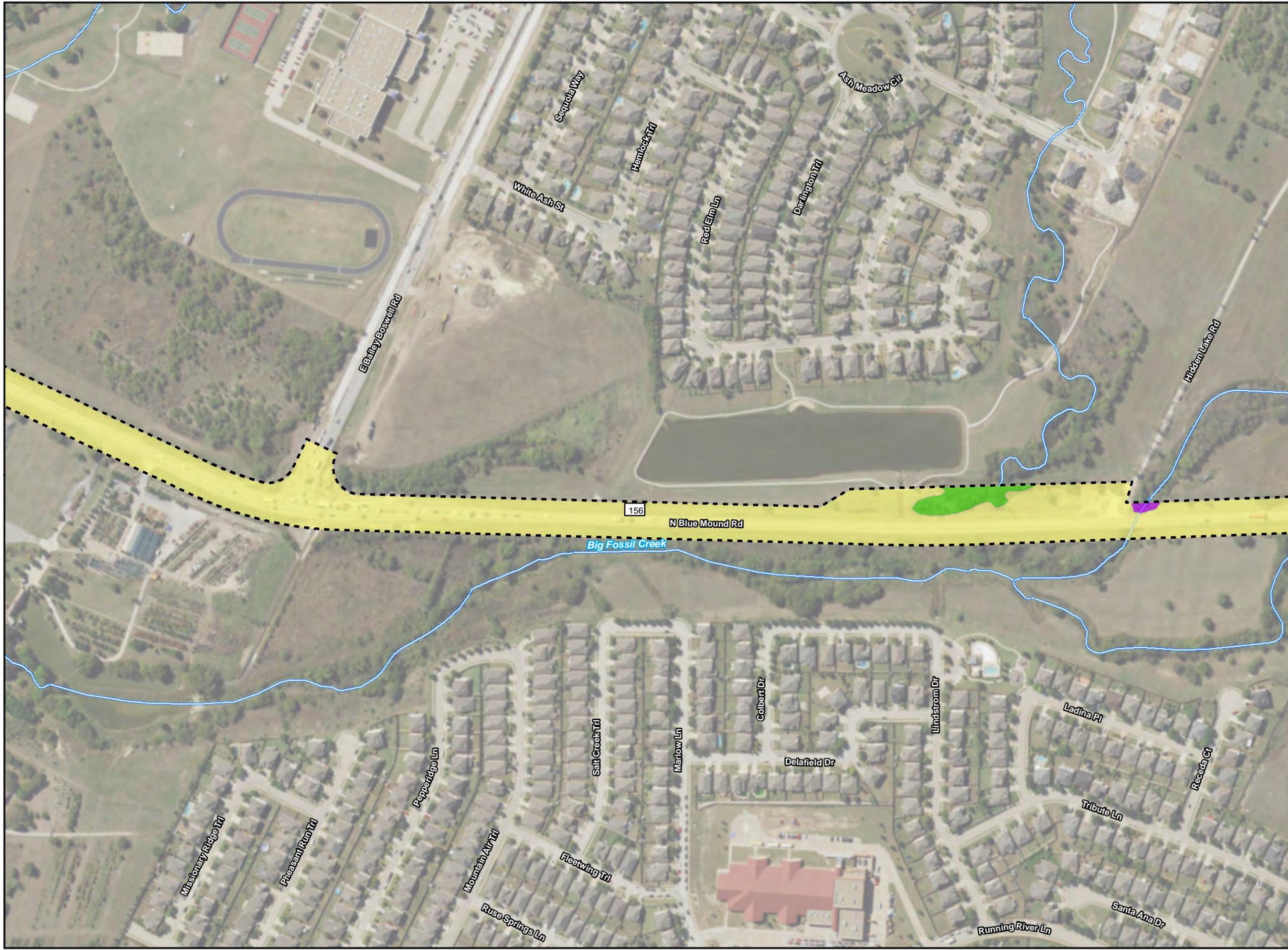
**PROJECT AREA
VEGETATION**

FM 156 From US 81/US 287
to McLeroy Boulevard/Watauga Road
CSJ: 0718-02-045



Key to Features

- Streams (NHD)
- Existing ROW
- Proposed ROW
- FW - Floodplain woodland
- HW - Hackberry woodland
- UR - Urban

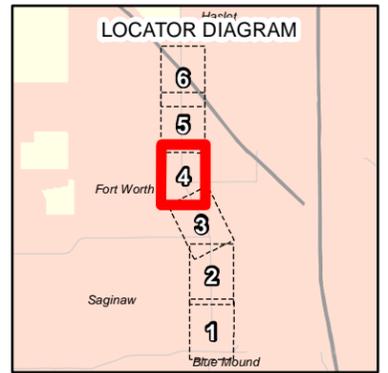


One inch equals 300 ft

FIGURE 4-3

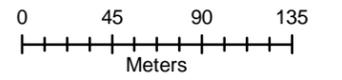
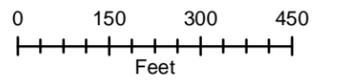
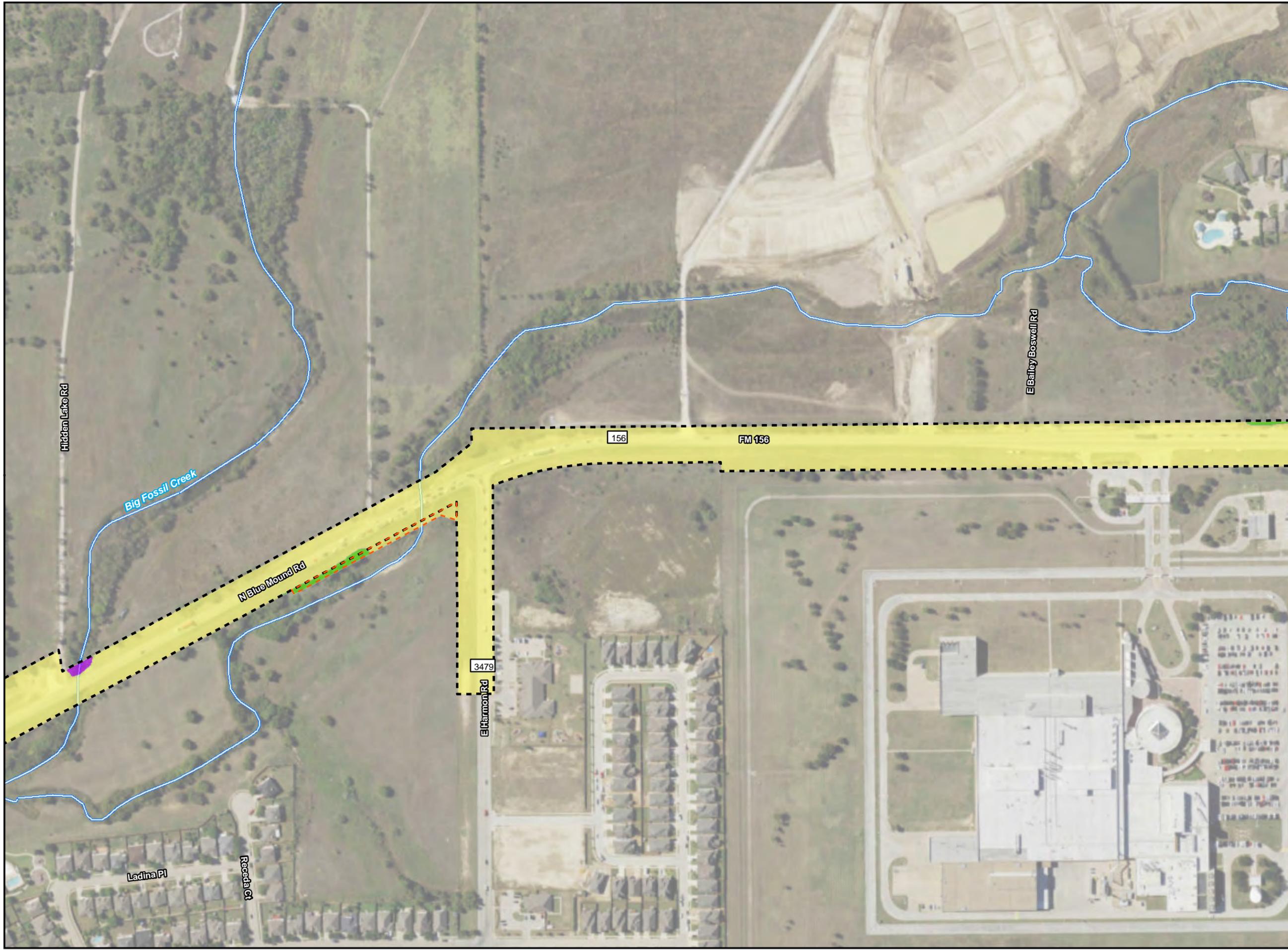
PROJECT AREA VEGETATION

FM 156 From US 81/US 287 to McLeroy Boulevard/Watauga Road
CSJ: 0718-02-045



Key to Features

- Streams (NHD)
- Existing ROW
- Proposed ROW
- FW - Floodplain woodland
- HW - Hackberry woodland
- UR - Urban

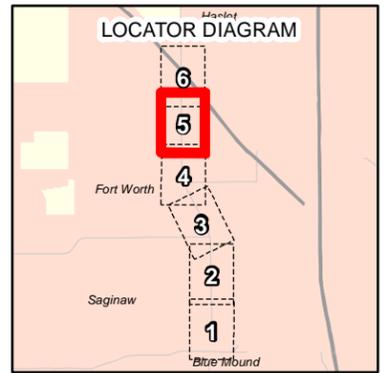


One inch equals 300 ft

FIGURE 4-4

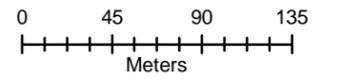
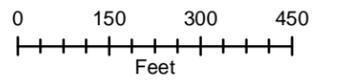
PROJECT AREA VEGETATION

FM 156 From US 81/US 287 to McLeroy Boulevard/Watauga Road
CSJ: 0718-02-045



Key to Features

- Streams (NHD)
- Existing ROW
- Proposed ROW
- FW - Floodplain woodland
- HW - Hackberry woodland
- UR - Urban

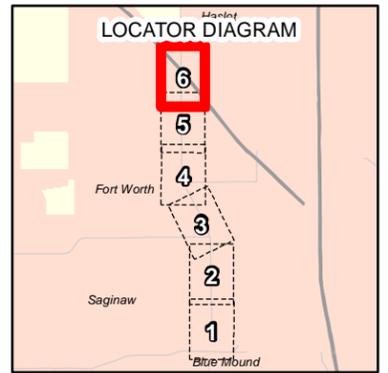


One inch equals 300 ft

FIGURE 4-5

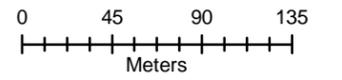
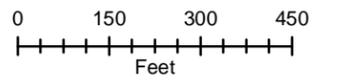
PROJECT AREA VEGETATION

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CSJ: 0718-02-045



Key to Features

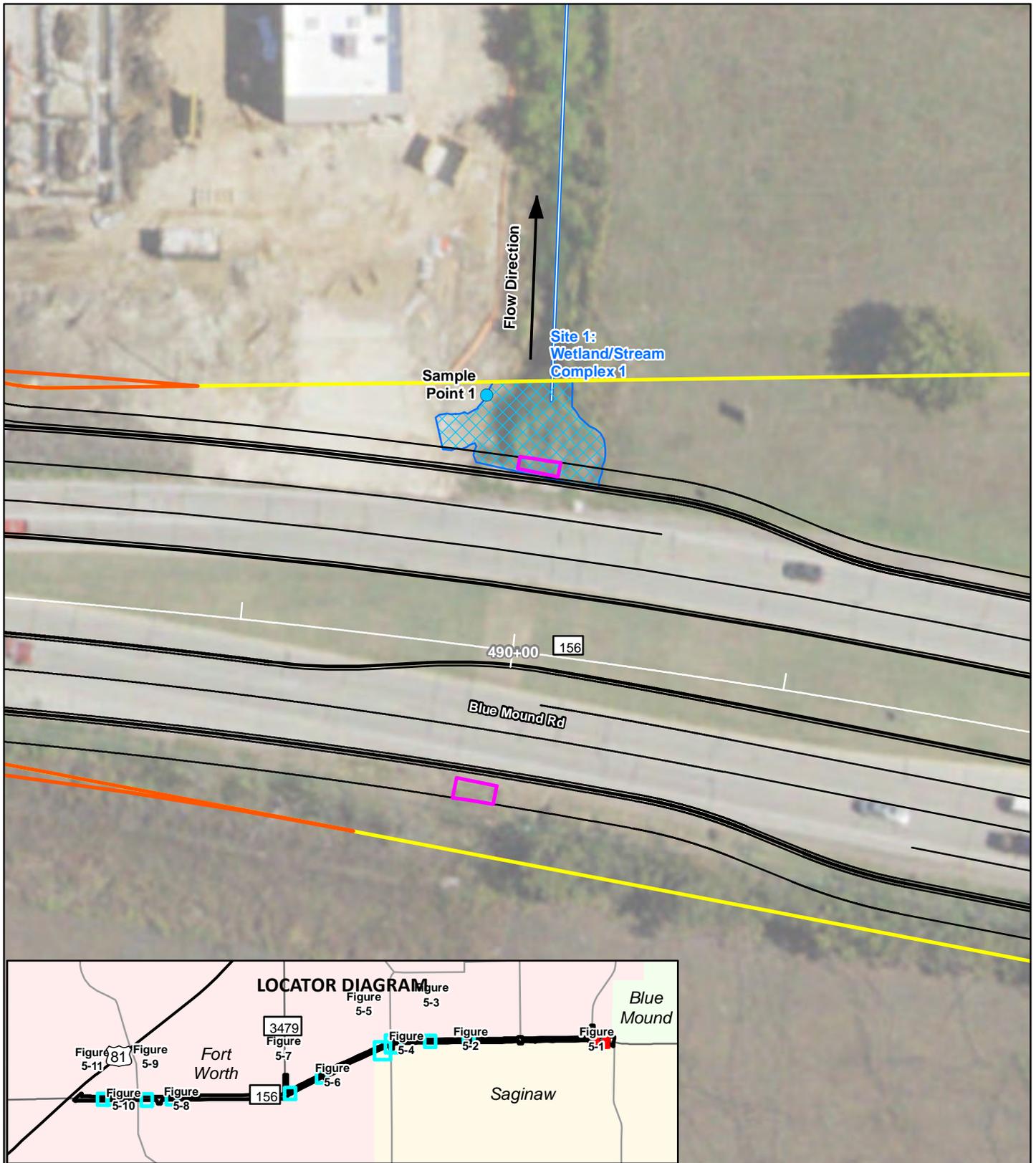
- Streams (NHD)
- Existing ROW
- Proposed ROW
- FW - Floodplain woodland
- HW - Hackberry woodland
- UR - Urban



One inch equals 300 ft

FIGURE 4-6

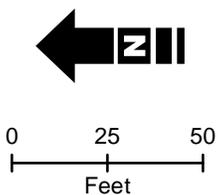


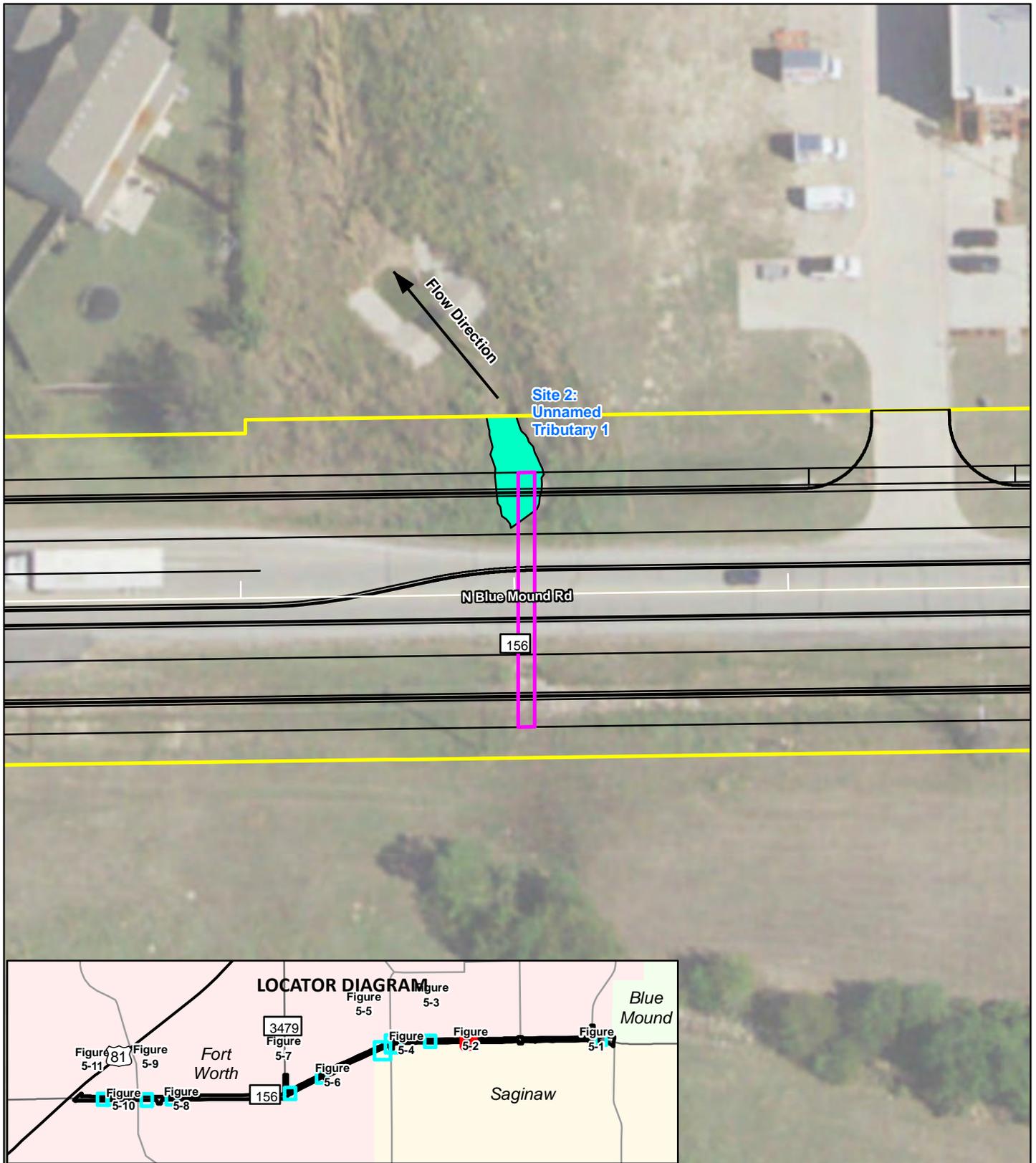


- Key to Features**
- Wetland Determination Points
 - ~ Streams (NHD)
 - Drainage Easement
 - Proposed ROW
 - Existing ROW
 - Delineated Waters of the US
 - Delineated Wetlands
 - Proposed Box Culvert

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 to McLeroy Boulevard/Watauga Road
 CSJ: 0718-02-045**
**POTENTIALLY JURISDICTIONAL
 WATERS OF THE US**

Figure 5-1

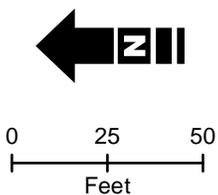


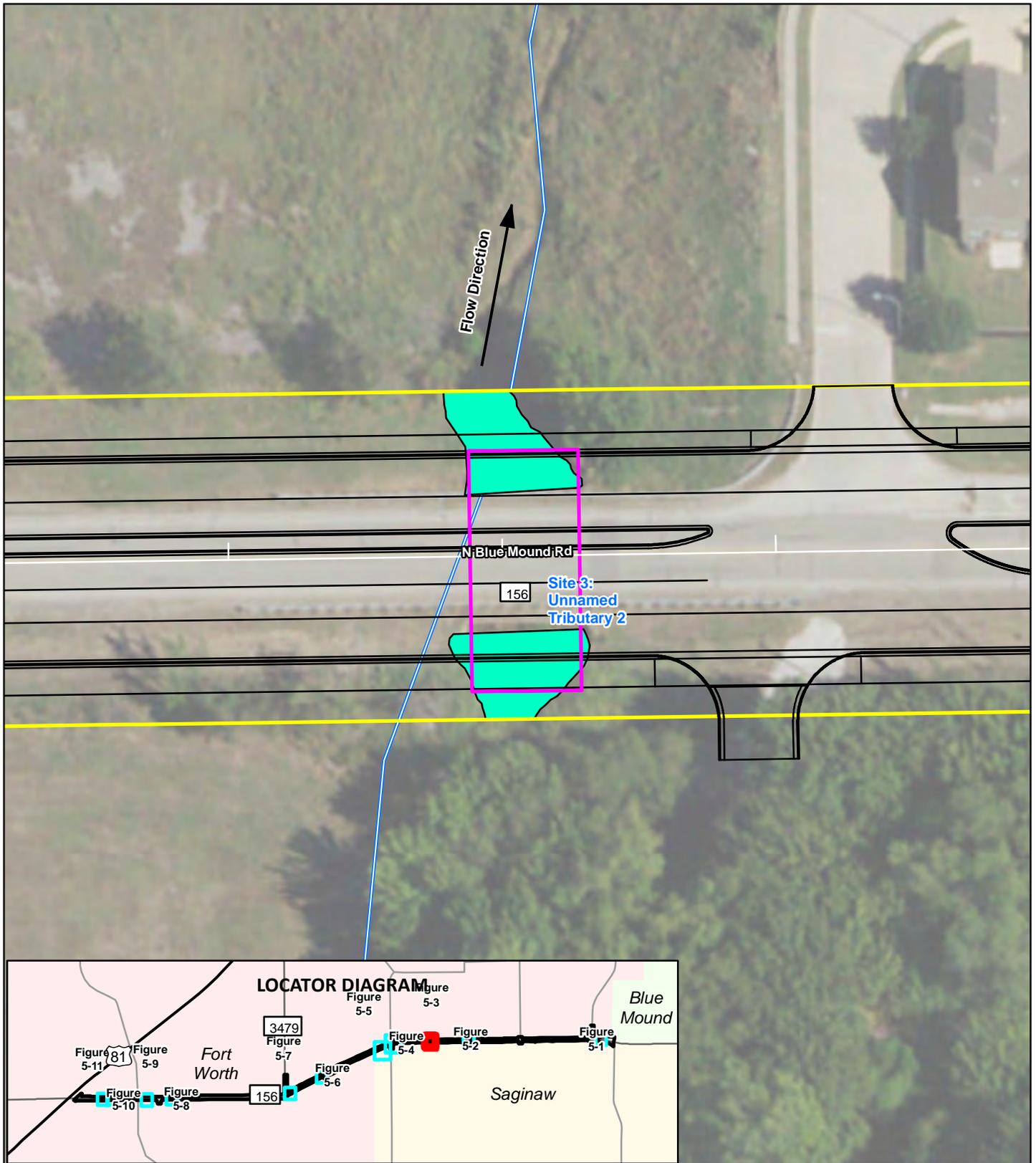


- Key to Features**
- Wetland Determination Points
 - ~ Streams (NHD)
 - Drainage Easement
 - Proposed ROW
 - Existing ROW
 - Delineated Waters of the US
 - Delineated Wetlands
 - Proposed Box Culvert

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Figure 5-2





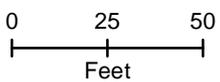
Key to Features

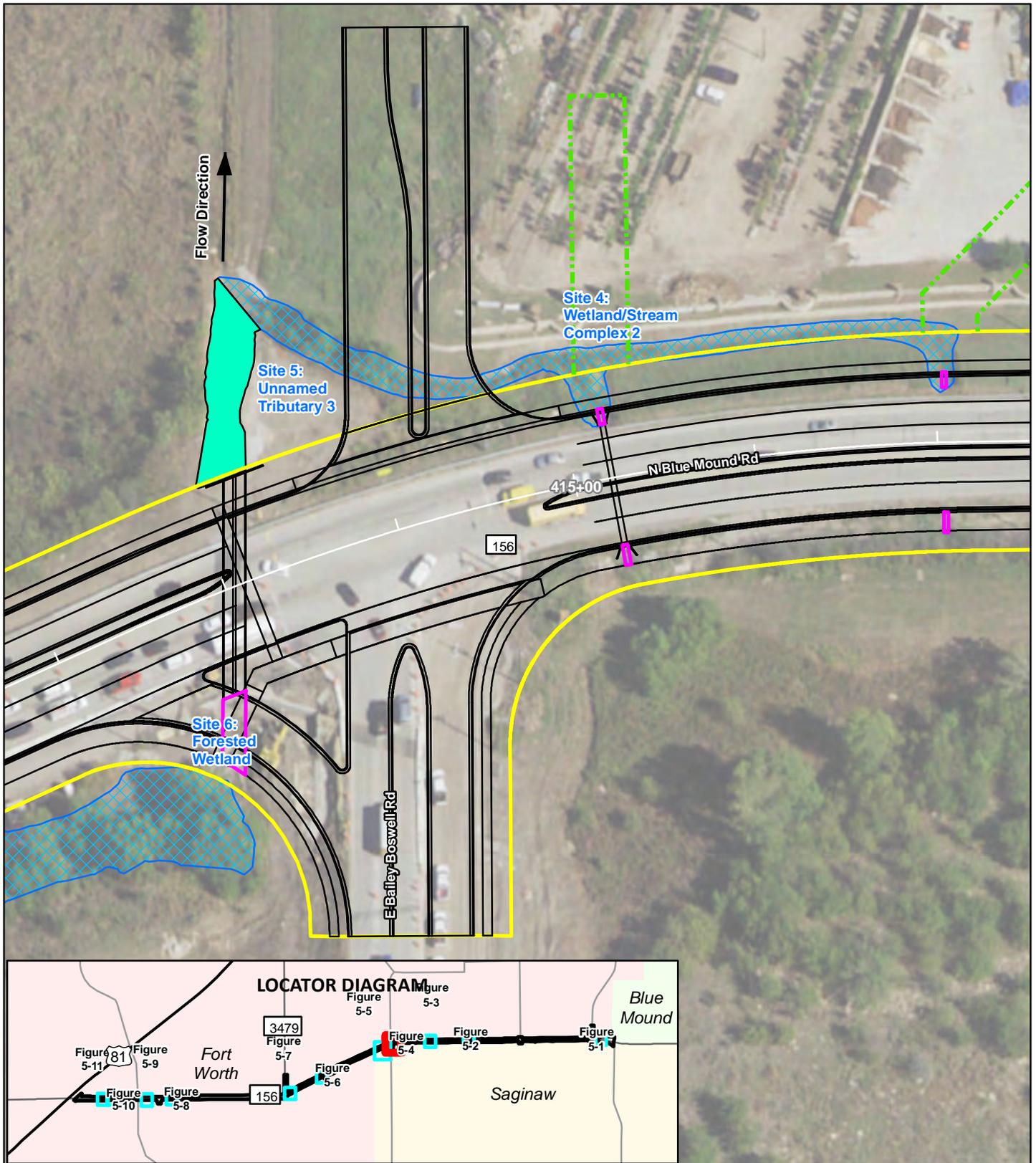
- Wetland Determination Points
- ~ Streams (NHD)
- Drainage Easement
- Proposed ROW
- Existing ROW
- Delineated Waters of the US
- Delineated Wetlands
- Proposed Box Culvert

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**POTENTIALLY JURISDICTIONAL
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Figure 5-3

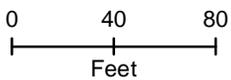




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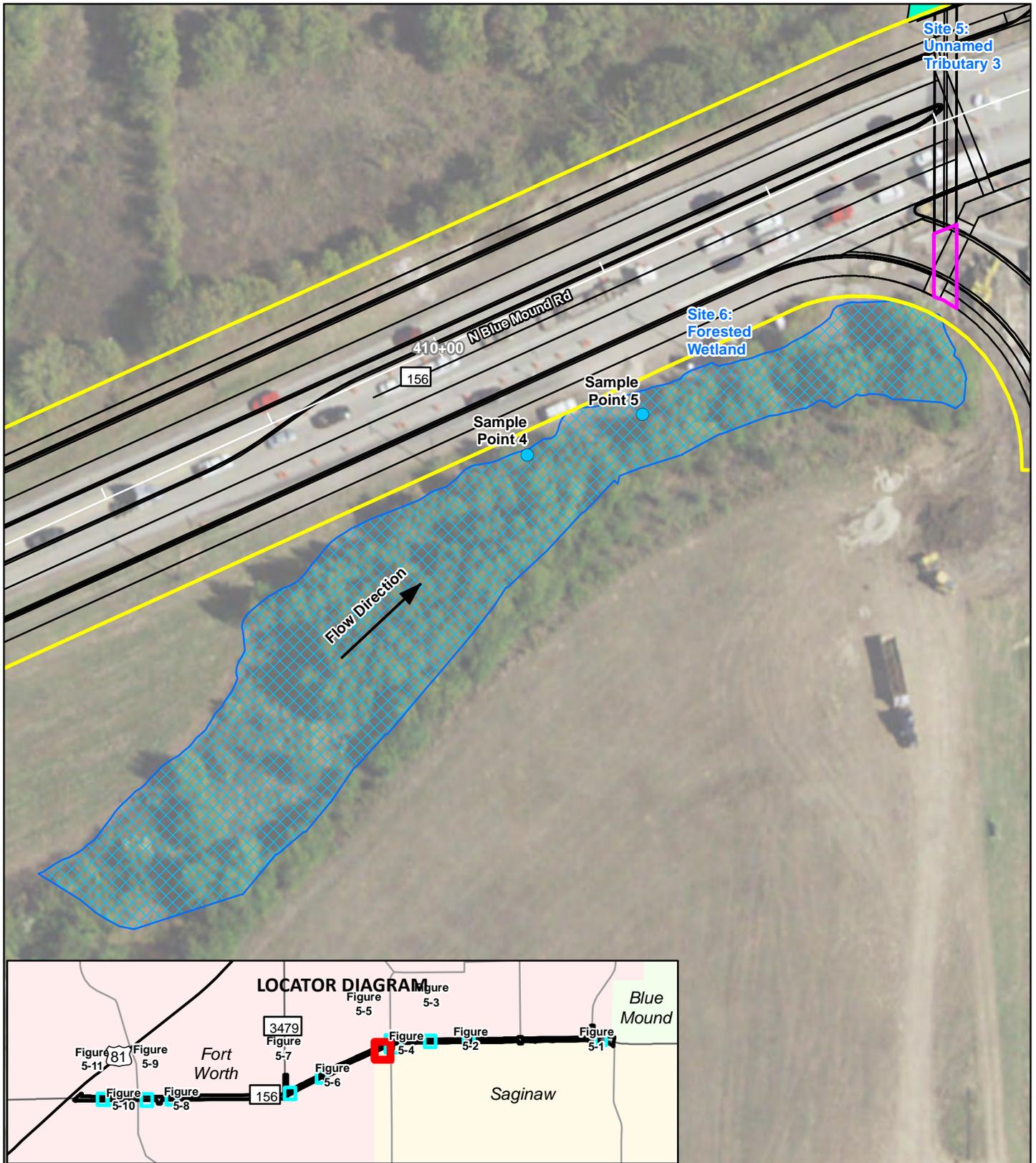
**POTENTIALLY JURISDICTIONAL
WATERS OF THE US**

Figure 5-4



Key to Features

- Wetland Determination Points
- ~ Streams (NHD)
- Drainage Easement
- Proposed ROW
- Existing ROW
- Delineated Waters of the US
- Delineated Wetlands
- Proposed Box Culvert

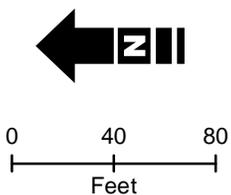


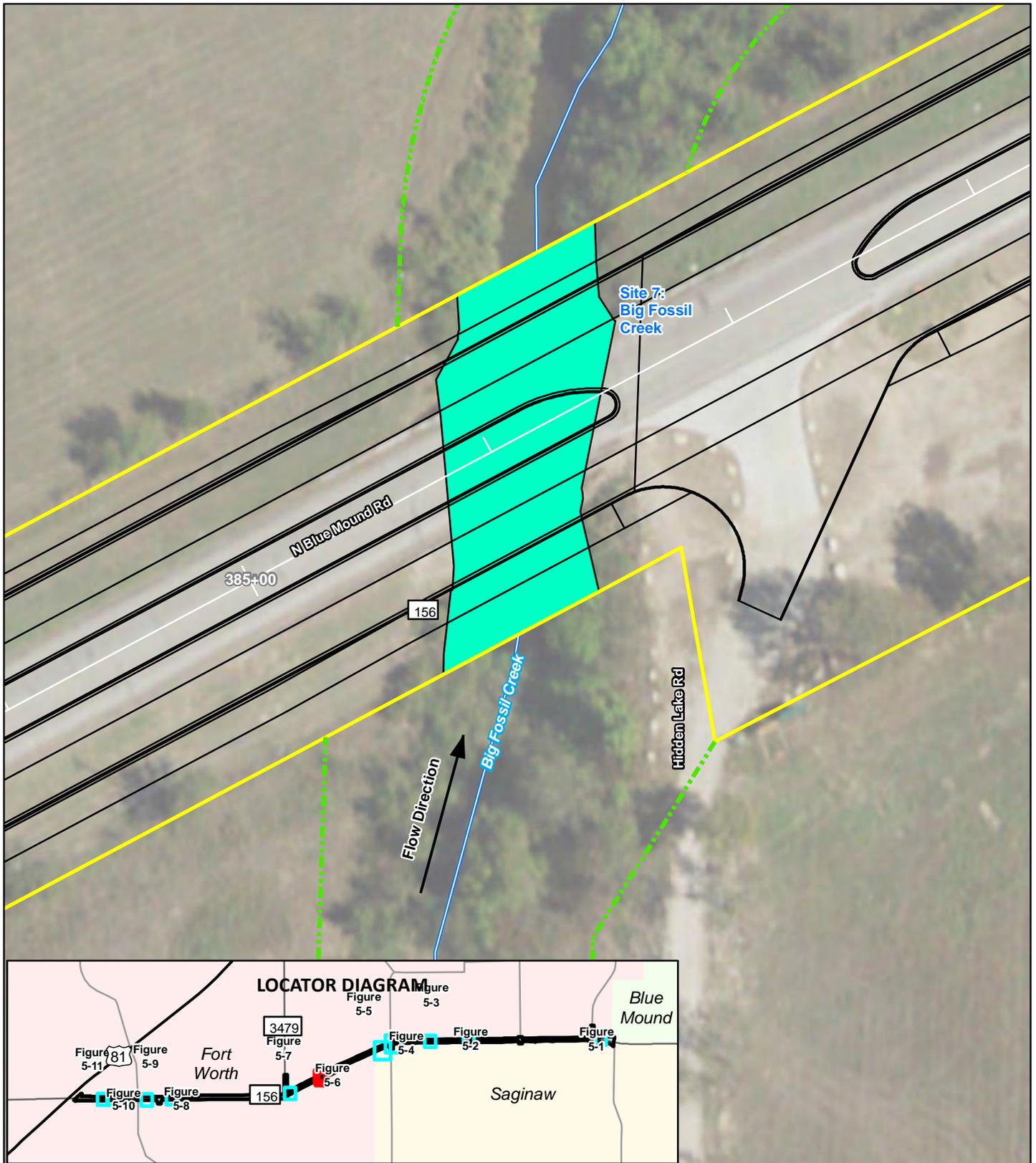
- Key to Features**
- Wetland Determination Points
 - ~ Streams (NHD)
 - Drainage Easement
 - Proposed ROW
 - Existing ROW
 - Delineated Waters of the US
 - Delineated Wetlands
 - Proposed Box Culvert

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to McLeroy Boulevard/Watauga Road
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**POTENTIALLY JURISDICTIONAL
WATERS OF THE US**

Figure 5-5



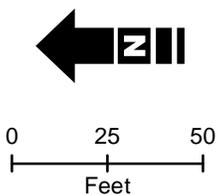


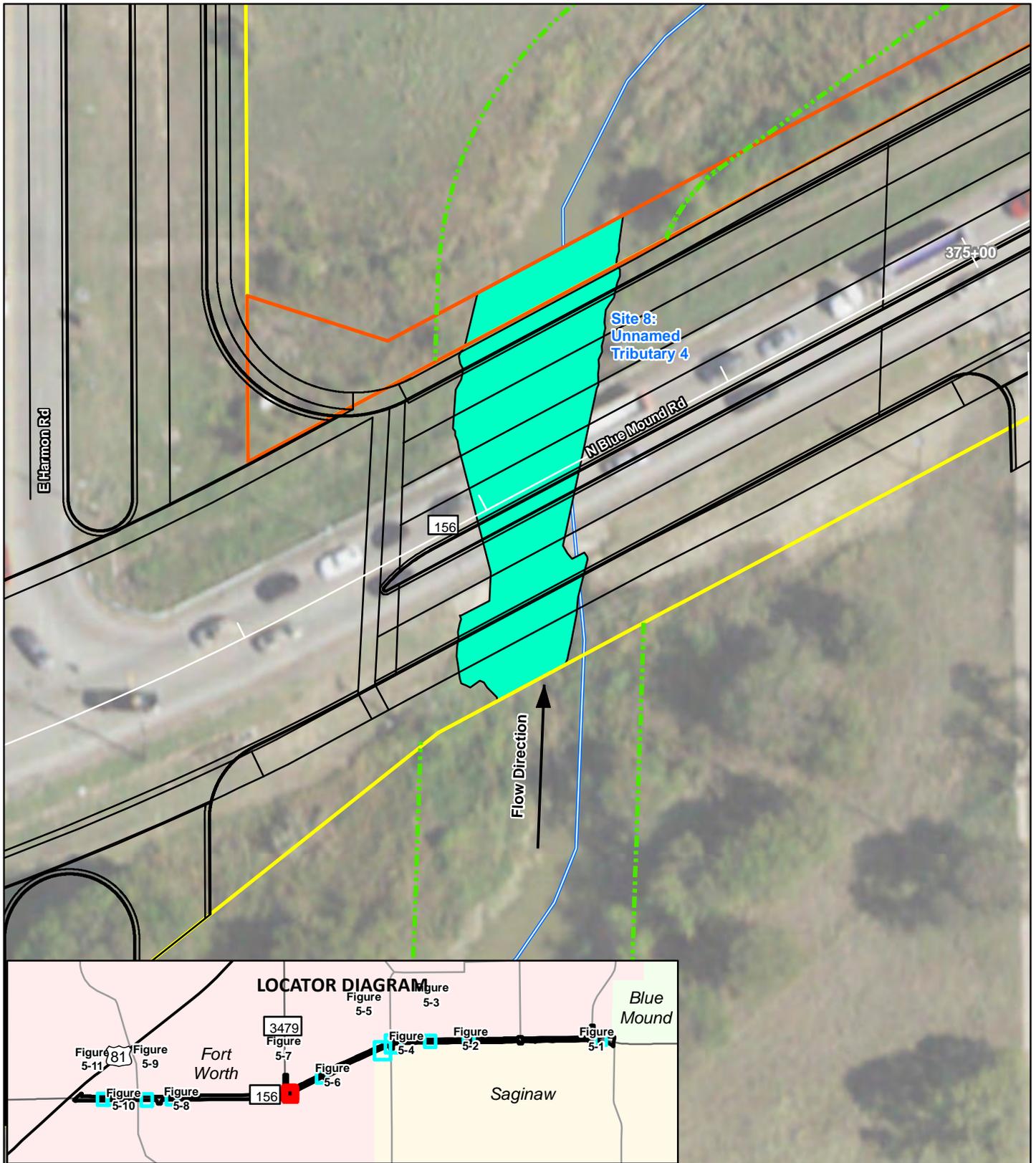
- Key to Features**
- Wetland Determination Points
 - ~ Streams (NHD)
 - - - Drainage Easement
 - Proposed ROW
 - Existing ROW
 - Delineated Waters of the US
 - Delineated Wetlands
 - Proposed Box Culvert

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**POTENTIALLY JURISDICTIONAL
WATERS OF THE US**

Figure 5-6



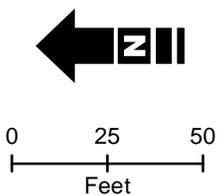


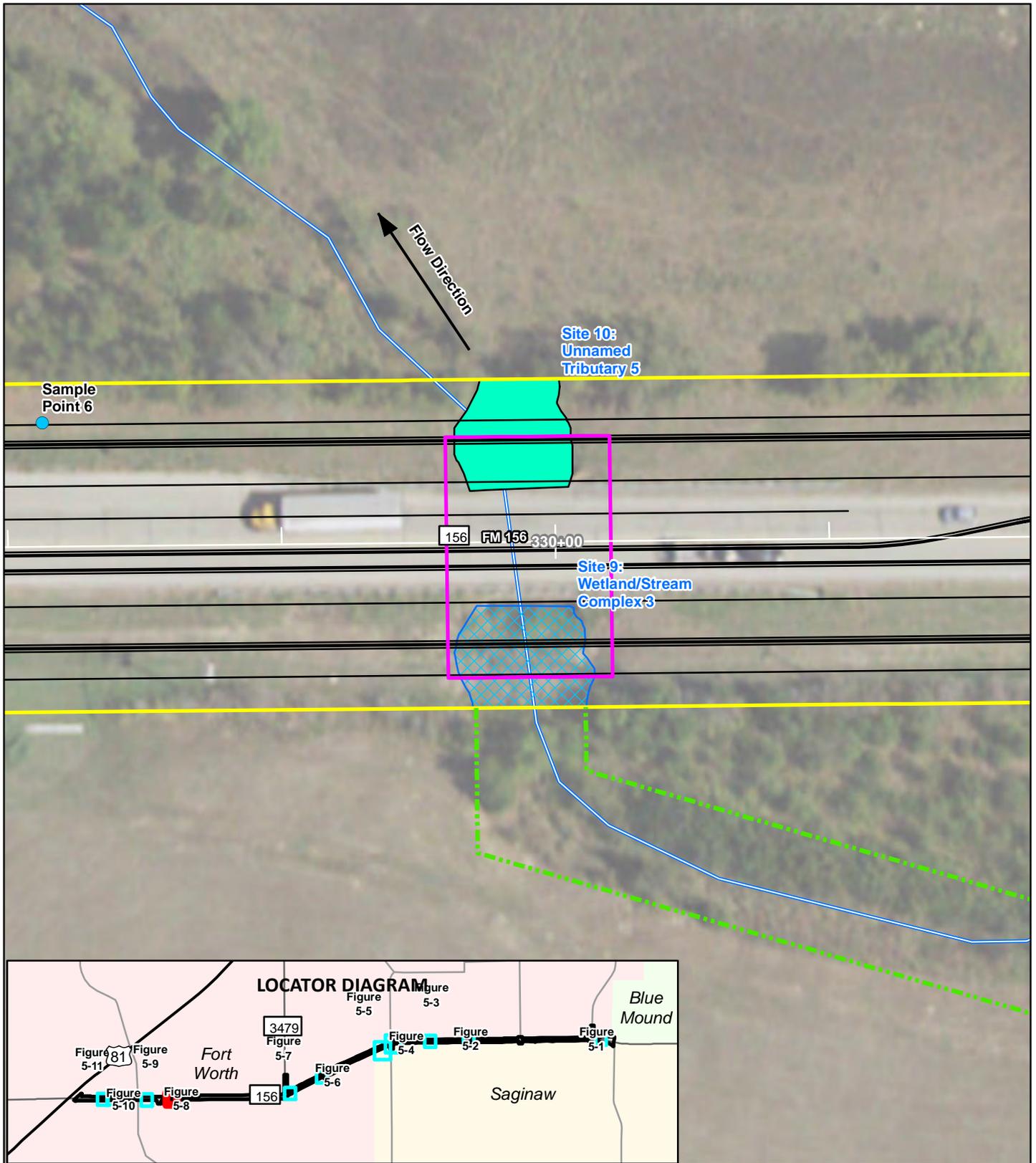
- Key to Features**
- Wetland Determination Points
 - ~ Streams (NHD)
 - - - Drainage Easement
 - Proposed ROW
 - Existing ROW
 - Delineated Waters of the US
 - Delineated Wetlands
 - Proposed Box Culvert

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**POTENTIALLY JURISDICTIONAL
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Figure 5-7



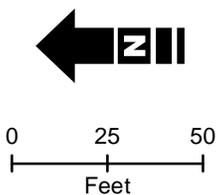


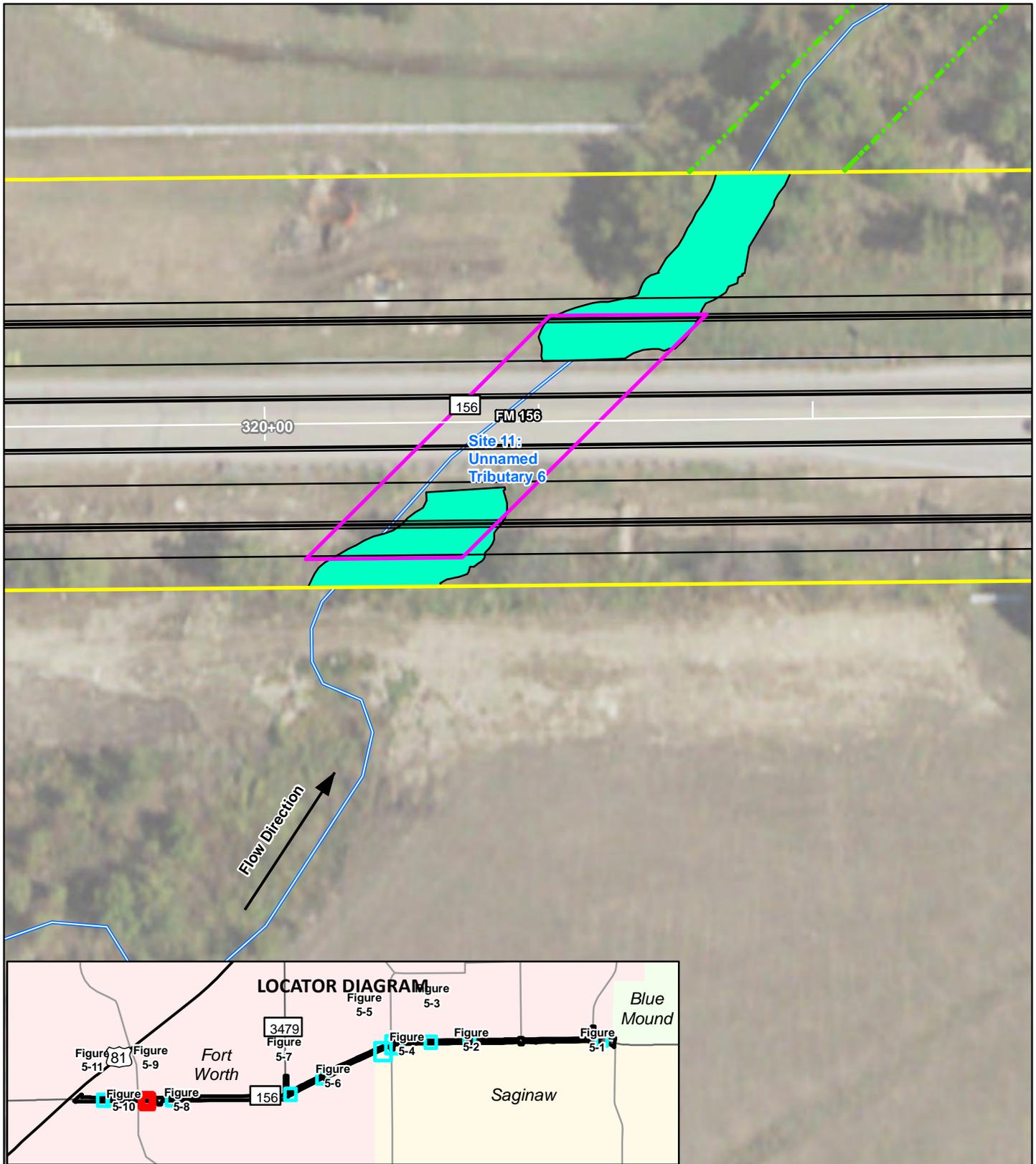
- Key to Features**
- Wetland Determination Points
 - ~ Streams (NHD)
 - - - Drainage Easement
 - Proposed ROW
 - ▭ Existing ROW
 - Delineated Waters of the US
 - ▨ Delineated Wetlands
 - ▭ Proposed Box Culvert

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Figure 5-8





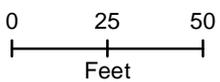
Key to Features

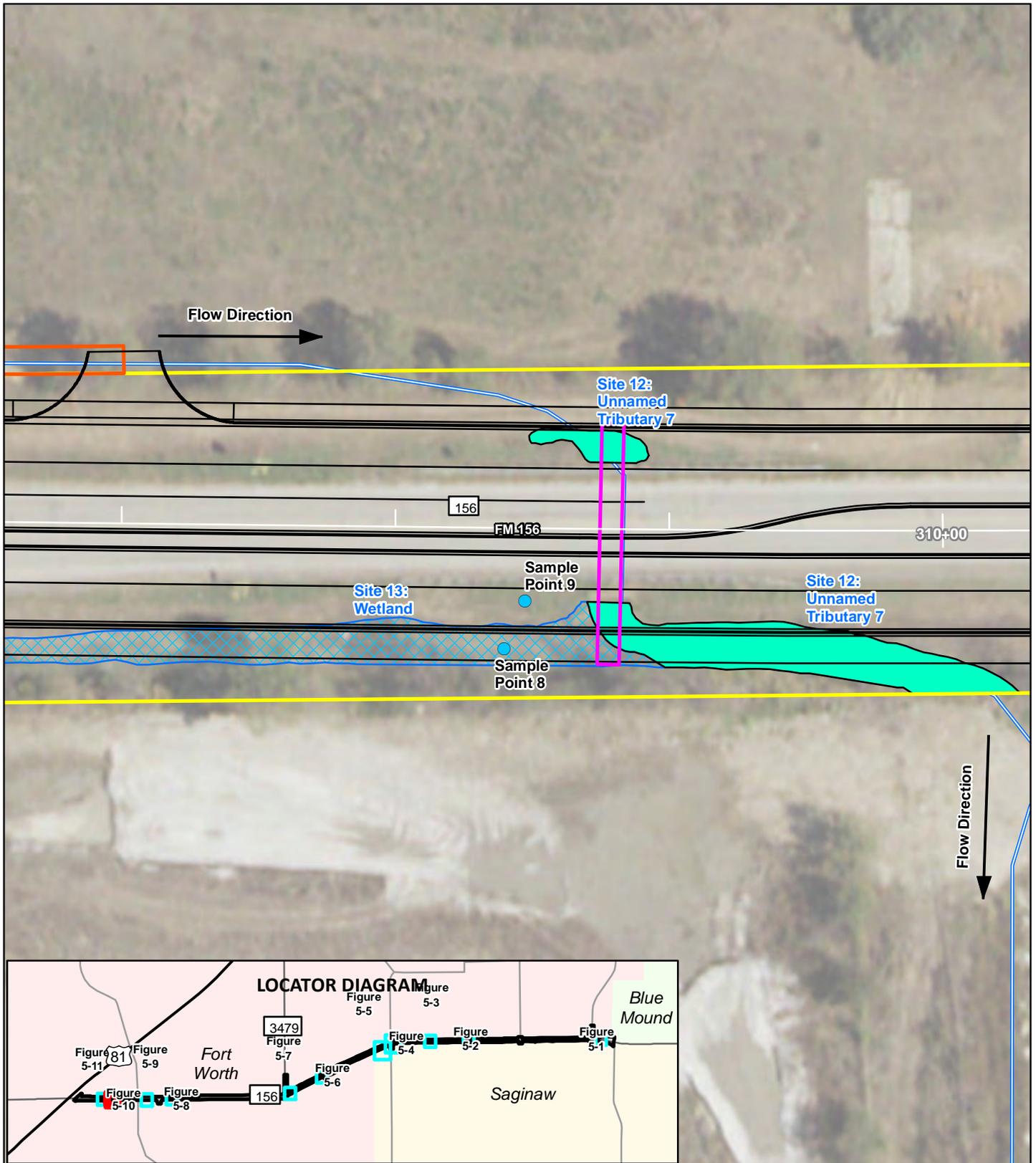
- Wetland Determination Points
- ~ Streams (NHD)
- - - Drainage Easement
- Proposed ROW
- Existing ROW
- Delineated Waters of the US
- Delineated Wetlands
- Proposed Box Culvert

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**POTENTIALLY JURISDICTIONAL
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Figure 5-9



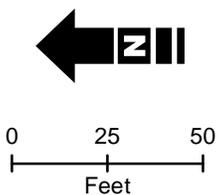


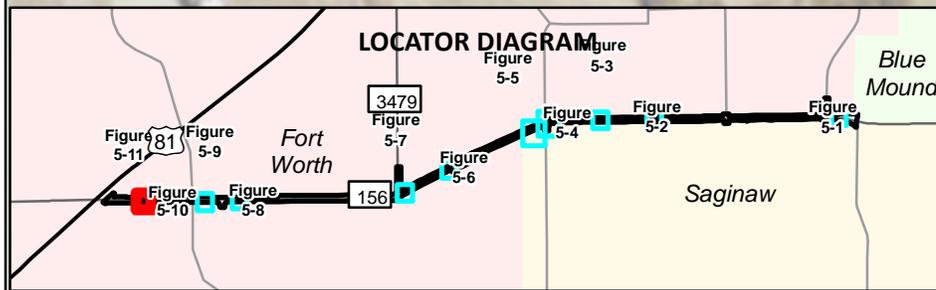
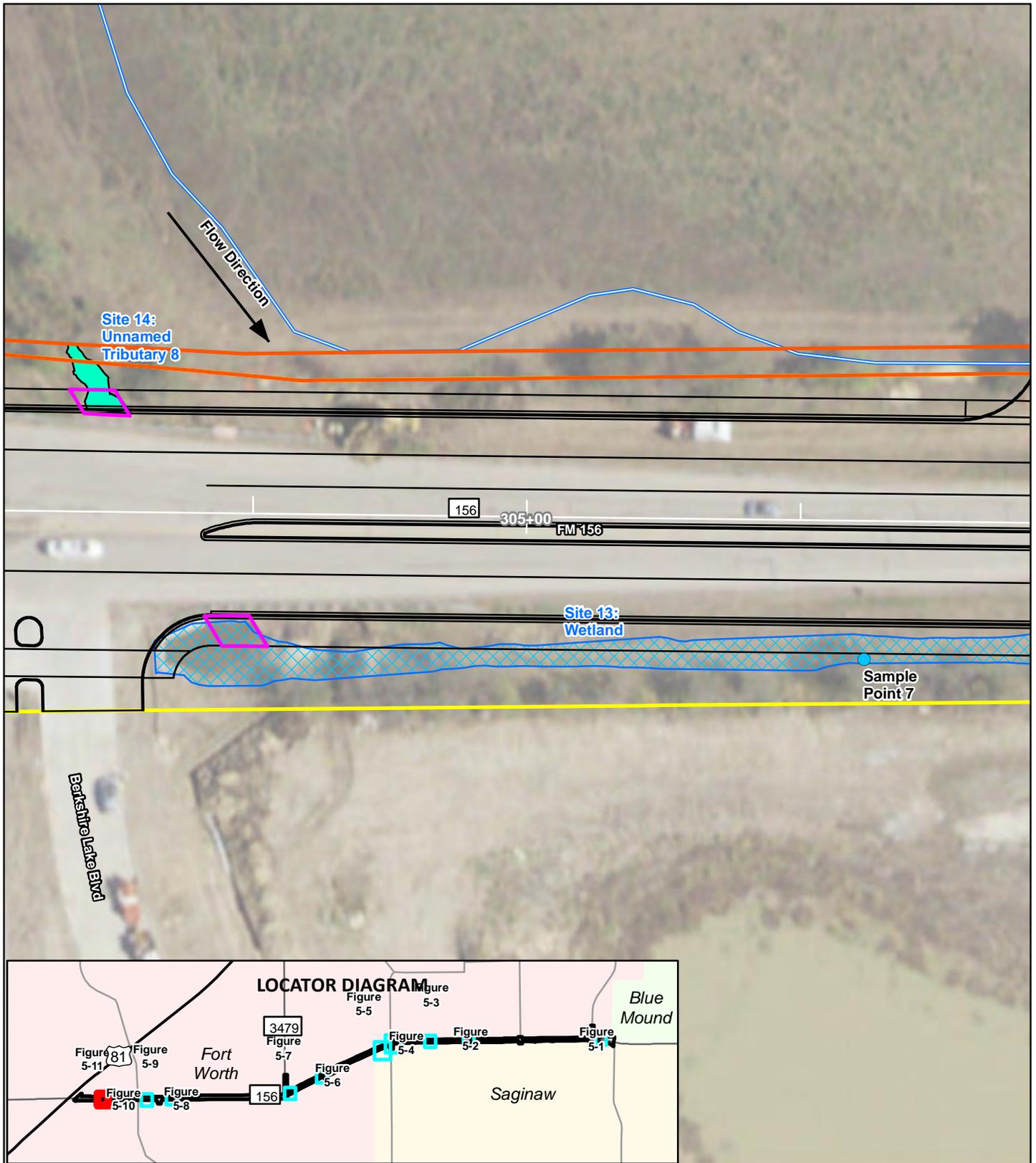
- Key to Features**
- Wetland Determination Points
 - ~ Streams (NHD)
 - Drainage Easement
 - Proposed ROW
 - Existing ROW
 - Delineated Waters of the US
 - Delineated Wetlands
 - Proposed Box Culvert

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**POTENTIALLY JURISDICTIONAL
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Figure 5-10





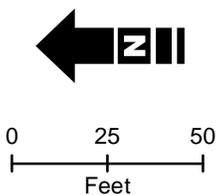
Key to Features

- Wetland Determination Points
- ~ Streams (NHD)
- Drainage Easement
- Proposed ROW
- Existing ROW
- Delineated Waters of the US
- Delineated Wetlands
- Proposed Box Culvert

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**POTENTIALLY JURISDICTIONAL
WATERS OF THE US**

Figure 5-11



APPENDIX B

WETLAND DETERMINATION FORMS

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: FM 156 City/County: Fort Worth, Tarrant Sampling Date: 4-18-16
 Applicant/Owner: Texas Department of Transportation State: TX Sampling Point: 1
 Investigator(s): Elizabeth Hauss, Fay Faye Section, Township, Range: NA
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): None Slope (%): 45
 Subregion (LRR): J Lat: 32.86287 Long: 97.342225 Datum: NAD83
 Soil Map Unit Name: Slidell clay, 0-1'. slopes NWI classification: None

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

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

Hydrophytic Vegetation Present?	Yes <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: Due to wetland vegetation (dominated by <i>Typha domingensis</i>) within the ordinary high water mark, this feature is considered a wetland/stream complex. Water was flowing during the time of field investigation. These soils may be considered problematic soils as they are situated within a stream and are seasonally ponded due to the construction of a culvert.			

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <u>Salix nigra</u>	<u>1</u>	<u>Yes</u>	<u>FACW</u>	Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): <u>4</u> (A)
2. <u>Fraxinus pennsylvanica</u>	<u>1</u>	<u>Yes</u>	<u>FAC</u>	
3. <u>Celtis occidentalis</u>	<u>2</u>	<u>Yes</u>	<u>FACU</u>	
4. _____	<u>4</u> = Total Cover			Total Number of Dominant Species Across All Strata: <u>5</u> (B)
Sapling/Shrub Stratum (Plot size: <u>15</u>)				Percent of Dominant Species That Are OBL, FACW, or FAC: <u>80</u> (A/B)
1. <u>NA</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. _____				
3. _____				
4. _____				
5. _____				
Herb Stratum (Plot size: <u>5</u>)				Hydrophytic Vegetation Indicators: ___ 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>Typha domingensis</u>	<u>50</u>	<u>Yes</u>	<u>OBL</u>	
2. <u>Rumex crispus</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	
3. <u>Brassica sp.</u>	<u>3</u>	<u>NO</u>	<u>—</u>	
4. <u>Ambrosia trifida</u>	<u>3</u>	<u>NO</u>	<u>—</u>	
5. <u>Polygonum sp.</u>	<u>3</u>	<u>NO</u>	<u>—</u>	
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
Woody Vine Stratum (Plot size: <u>30</u>)				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
1. <u>NA</u>				
2. _____				
% Bare Ground in Herb Stratum _____ = Total Cover				
Remarks: <u>Taken at site 1, unnamed tributary 1.</u>				

SOIL

Sampling Point: 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		
0-2	10YR 4/2	100					Silt	
2-16	10YR 2/1	100					Silt	

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 Soils ³ :
<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)	<input type="checkbox"/> (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 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, unless disturbed or problematic.
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR F)	<input type="checkbox"/> (MLRA 72 & 73 of LRR H)	

Restrictive Layer (if present):
 Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks: As stated above, wetland vegetation (dominated by Typha domingensis) occurs within the ordinary high water mark, and is therefore considered a wetland/stream complex. Water was flowing during the time of field investigation. These soils may be considered problematic soils as they are situated within a stream and are seasonally ponded due to the construction of a culvert.

HYDROLOGY

Wetland Hydrology Indicators:		
Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (minimum of two required)
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Dry-Season Water Table (C2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)
<input checked="" type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> (where tilled)
<input checked="" type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> (where not tilled)	<input type="checkbox"/> Crayfish Burrows (C8)
<input checked="" type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Water-Stained Leaves (B9)		<input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F)
Field Observations:		
Surface Water Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches): <u>0-3</u>	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches): <u>12-16</u>	
Saturation Present? (includes capillary fringe) Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches): <u>0-16</u>	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks: <u>Rocky substrate due to culvert fill.</u>		

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Fm 156 City/County: Fort Worth, Tarrant Sampling Date: 4/18/16
 Applicant/Owner: Texas Department of Transportation State: TX Sampling Point: 2
 Investigator(s): Elizabeth Hauss, Ray Frye Section, Township, Range: NA
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): None Slope (%): <2
 Subregion (LRR): J Lat: 32.87125 Long: -97.342147 Datum: NAD83
 Soil Map Unit Name: Sanger clay, 1-3% slopes and San Saba clay, 0-2% NWI classification: None
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks:	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <u>NA</u>				Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): <u>1</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>100</u> (A/B)
2.				
3.				
4.				
= Total Cover				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 = _____
Sapling/Shrub Stratum (Plot size: <u>15</u>)				
1. <u>NA</u>				
2.				
3.				
= Total Cover				
Herb Stratum (Plot size: <u>5</u>)				
1. <u>Eleocharis palustris</u>	<u>90</u>	<u>Yes</u>	<u>OBL</u>	Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. <u>Avena fatua</u>	<u>5</u>	<u>No</u>	<u>-</u>	
3. <u>Lolium perenne</u>	<u>5</u>	<u>No</u>	<u>-</u>	
4. <u>Brassica sp.</u>	<u>5</u>	<u>No</u>	<u>-</u>	
5. <u>Sorghum halepense</u>	<u>20</u>	<u>No</u>	<u>-</u>	
6. <u>Rumex crispus</u>	<u>5</u>	<u>No</u>	<u>-</u>	
7.				
8.				
9.				
10.				
<u>130</u> = Total Cover				
Woody Vine Stratum (Plot size: <u>30</u>)				
1. <u>NA</u>				
2.				
= Total Cover				
% Bare Ground in Herb Stratum _____				
Remarks: <u>Not a potential water of the U.S.</u>				

SOIL

Sampling Point: 2

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		
0-16	10YR 2/2	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"/> 1 cm Muck (A9) (LRR F, G, H)
<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)	<input type="checkbox"/> (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 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
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR F)	<input type="checkbox"/> (MLRA 72 & 73 of LRR H)	wetland hydrology must be present,
		unless disturbed or problematic.

Restrictive Layer (if present):
 Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes _____ No

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (minimum of two required)
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Silt Crust (B11)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Dry-Season Water Table (C2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> (where tilled)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> (where not tilled)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Water-Stained Leaves (B9)		<input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F)

Field Observations:

Surface Water Present? Yes <input checked="" type="checkbox"/> No _____	Depth (inches): <u>0-2</u>	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
Water Table Present? Yes _____ No _____	Depth (inches): _____	
Saturation Present? Yes <input checked="" type="checkbox"/> No _____	Depth (inches): <u>0-16</u>	

(includes capillary fringe)

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

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: FM 156 City/County: Fort Worth, Tarrant Sampling Date: 4/18/16
 Applicant/Owner: Texas Department of Transportation State: TX Sampling Point: 3
 Investigator(s): Roy Fnye, Elizabeth Hauss Section, Township, Range: NA
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): None Slope (%): 45
 Subregion (LRR): J Lat: 32.87115 Long: -97.342089 Datum: NAD83
 Soil Map Unit Name: Sanger clay, 1-3% slopes; San Saba clay, 0-2% NWI classification: None
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks:	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <u>NA</u>				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>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
2. _____				
3. _____				
4. _____				
_____ = Total Cover				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 = _____
Sapling/Shrub Stratum (Plot size: <u>15</u>)				
1. <u>NA</u>				
2. _____				
3. _____				
_____ = Total Cover				
Herb Stratum (Plot size: <u>5</u>)				
1. <u>Typha domingensis</u>	<u>30</u>	<u>Yes</u>	<u>OBL</u>	
2. <u>Eleocharis palustris</u>	<u>70</u>	<u>Yes</u>	<u>OBL</u>	
3. <u>Polygonum sp.</u>	<u>5</u>	<u>NO</u>	<u>-</u>	
4. <u>Sorghum halepense</u>	<u>15</u>	<u>NO</u>	<u>-</u>	
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
<u>120</u> = Total Cover				
Woody Vine Stratum (Plot size: <u>30</u>)				
1. <u>NA</u>				
2. _____				
_____ = Total Cover				
% Bare Ground in Herb Stratum _____ = Total Cover				
Remarks: <u>Not a potential water of the U.S.</u>				

SOIL

Sampling Point: 3

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		
0-16	10YR 2/1	100					Clay	

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

<p>Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)</p> <ul style="list-style-type: none"> <input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Stratified Layers (A5) (LRR F) <input type="checkbox"/> 1 cm Muck (A9) (LRR F, G, H) <input type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Sandy Mucky Mineral (S1) <input type="checkbox"/> 2.5 cm Mucky Peat or Peat (S2) (LRR G, H) <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR F) 	<p>Indicators for Problematic Hydric Soils³:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Sandy Gleyed Matrix (S4) <input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Loamy Mucky Mineral (F1) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8) <input type="checkbox"/> High Plains Depressions (F16) (MLRA 72 & 73 of LRR H) 	<ul style="list-style-type: none"> <input type="checkbox"/> 1 cm Muck (A9) (LRR I, J) <input type="checkbox"/> Coast Prairie Redox (A16) (LRR F, G, H) <input type="checkbox"/> Dark Surface (S7) (LRR G) <input type="checkbox"/> High Plains Depressions (F16) (LRR H outside of MLRA 72 & 73) <input type="checkbox"/> Reduced Vertic (F18) <input type="checkbox"/> Red Parent Material (TF2) <input type="checkbox"/> Very Shallow Dark Surface (TF12) <input type="checkbox"/> Other (Explain in Remarks) <p>³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.</p>
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Restrictive Layer (if present):
 Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes _____ No

Remarks:

HYDROLOGY

<p>Wetland Hydrology Indicators:</p> <p>Primary Indicators (minimum of one required; check all that apply)</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Surface Water (A1) <input checked="" type="checkbox"/> High Water Table (A2) <input checked="" type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input checked="" type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9) 	<p>Secondary Indicators (minimum of two required)</p> <ul style="list-style-type: none"> <input type="checkbox"/> Salt Crust (B11) <input type="checkbox"/> Aquatic Invertebrates (B13) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where not tilled) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks) 	<ul style="list-style-type: none"> <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where tilled) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> FAC-Neutral Test (D5) <input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F)
<p>Field Observations:</p> <p>Surface Water Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0-2</u></p> <p>Water Table Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>10-16</u></p> <p>Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0-16</u> (includes capillary fringe)</p>	<p>Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____</p>	
<p>Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:</p>		
<p>Remarks:</p>		

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Fm 156 City/County: Fort Worth, Tarrant Sampling Date: 4/18/16
 Applicant/Owner: Texas Department of Transportation State: TX Sampling Point: 4
 Investigator(s): Elizabeth Hauss, Roy Frye Section, Township, Range: NA
 Landform (hillslope, terrace, etc.): Swale Local relief (concave, convex, none): None Slope (%): <5
 Subregion (LRR): J Lat: 32.8846 Long: -97.343314 Datum: NAD83
 Soil Map Unit Name: Frio silty clay, 0-1% slopes, occasionally flooded NWI classification: None

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

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

Hydrophytic Vegetation Present? Yes <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"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Remarks: <u>Taken at Site 6, Forested Wetland.</u>	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:																
1. <u>Salix nigra</u>	<u>40</u>	<u>Yes</u>	<u>FACW</u>	Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): <u>2</u> (A)																
2. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata: <u>2</u> (B)																
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)																
4. _____	_____	_____	_____	Prevalence Index worksheet: <table style="width:100%; border: none;"> <tr> <td style="width:50%;">Total % Cover of:</td> <td style="width:50%;">Multiply by:</td> </tr> <tr> <td>OBL species _____</td> <td>x 1 = _____</td> </tr> <tr> <td>FACW species _____</td> <td>x 2 = _____</td> </tr> <tr> <td>FAC species _____</td> <td>x 3 = _____</td> </tr> <tr> <td>FACU species _____</td> <td>x 4 = _____</td> </tr> <tr> <td>UPL species _____</td> <td>x 5 = _____</td> </tr> <tr> <td>Column Totals: _____</td> <td>(A) _____ (B) _____</td> </tr> <tr> <td colspan="2">Prevalence Index = B/A = _____</td> </tr> </table>	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 = _____	
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 = _____																				
Sapling/Shrub Stratum (Plot size: <u>15</u>) <u>40</u> = Total Cover																				
1. <u>NA</u>	_____	_____	_____																	
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
Herb Stratum (Plot size: <u>5</u>) _____ = Total Cover																				
1. <u>Eleocharis palustris</u>	<u>90</u>	<u>Yes</u>	<u>OBL</u>																	
2. <u>Typha domingensis</u>	<u>7</u>	<u>NO</u>	<u>OBL</u>																	
3. <u>Oenothera speciosa</u>	<u>3</u>	<u>NO</u>	<u>UPL</u>																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
8. _____	_____	_____	_____																	
9. _____	_____	_____	_____																	
10. _____	_____	_____	_____																	
Woody Vine Stratum (Plot size: <u>30</u>) <u>100</u> = Total Cover																				
1. <u>NA</u>	_____	_____	_____																	
2. _____	_____	_____	_____																	
% Bare Ground in Herb Stratum _____ = Total Cover																				
Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> 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 checked="" type="checkbox"/> No <input type="checkbox"/>																				
Remarks: <u>The soil pit was unable to exceed 8 inches in depth due to a restrictive layer of residual rocks and gravel left over from recent (within the past year) highway construction activities. These soils would be considered problematic hydric soils as this is a recently developed wetland (has been created within the past five years) and occur within a floodplain. Hydrology is supported by a swale that collects runoff from an adjacent agricultural field, providing ephemeral runoff through the area during rain events.</u>																				

SOIL

Sampling Point: 4

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		
0-8	10YR 2/2	100					Clay	See remarks below.

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

<p>Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)</p> <ul style="list-style-type: none"> <input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Stratified Layers (A5) (LRR F) <input type="checkbox"/> 1 cm Muck (A9) (LRR F, G, H) <input type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Sandy Mucky Mineral (S1) <input type="checkbox"/> 2.5 cm Mucky Peat or Peat (S2) (LRR G, H) <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR F) 	<p>Indicators for Problematic Hydric Soils³:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Sandy Gleyed Matrix (S4) <input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Loamy Mucky Mineral (F1) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8) <input type="checkbox"/> High Plains Depressions (F16) (MLRA 72 & 73 of LRR H) 	<ul style="list-style-type: none"> <input type="checkbox"/> 1 cm Muck (A9) (LRR I, J) <input type="checkbox"/> Coast Prairie Redox (A16) (LRR F, G, H) <input type="checkbox"/> Dark Surface (S7) (LRR G) <input type="checkbox"/> High Plains Depressions (F16) (LRR H outside of MLRA 72 & 73) <input type="checkbox"/> Reduced Vertic (F18) <input type="checkbox"/> Red Parent Material (TF2) <input type="checkbox"/> Very Shallow Dark Surface (TF12) <input type="checkbox"/> Other (Explain in Remarks) <p>³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.</p>
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Restrictive Layer (if present):
 Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes _____ No _____

Remarks:

HYDROLOGY

<p>Wetland Hydrology Indicators:</p> <p>Primary Indicators (minimum of one required; check all that apply)</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Surface Water (A1) <input checked="" type="checkbox"/> High Water Table (A2) <input checked="" type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9) 	<p>Secondary Indicators (minimum of two required)</p> <ul style="list-style-type: none"> <input type="checkbox"/> Salt Crust (B11) <input type="checkbox"/> Aquatic Invertebrates (B13) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where not tilled) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks) 	<ul style="list-style-type: none"> <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where tilled) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> FAC-Neutral Test (D5) <input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F)
<p>Field Observations:</p> <p>Surface Water Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0-10</u></p> <p>Water Table Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0-10</u></p> <p>Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0-10</u> (includes capillary fringe)</p>	<p>Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____</p>	
<p>Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:</p>		

Remarks: The soil pit was unable to exceed 8 inches in depth due to a restrictive layer of residual rocks and gravel left over from recent (within the past year) highway construction activities. These soils would be considered problematic hydric soils as this is a recently developed wetland (has been created within the past five years) and occur within a floodplain. Hydrology is supported by a swale that collects runoff from an adjacent agricultural field, providing ephemeral runoff through the area during rain events.

SOIL

Sampling Point: 5

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		
0-8	10YR 2/2	100					Clay	See remarks below.

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"/> 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)	<input type="checkbox"/> (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 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 welland hydrology must be present, unless disturbed or problematic.
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR F)	<input type="checkbox"/> (MLRA 72 & 73 of LRR H)	

Restrictive Layer (if present):
 Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes _____ No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (minimum of two required)
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Dry-Season Water Table (C2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> (where tilled)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> (where not tilled)	<input type="checkbox"/> Crayfish Burrows (C8)
<input checked="" type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Water-Stained Leaves (B9)		<input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F)

Field Observations:

Surface Water Present?	Yes <input checked="" type="checkbox"/> No _____	Depth (inches): <u>0-10</u>	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
Water Table Present?	Yes <input checked="" type="checkbox"/> No _____	Depth (inches): <u>0-8</u>	
Saturation Present? (includes capillary fringe)	Yes <input checked="" type="checkbox"/> No _____	Depth (inches): <u>0-8</u>	

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

Remarks: The soil pit was unable to exceed 8 inches in depth due to a restrictive layer of residual rocks and gravel left over from recent (within the past year) highway construction activities. These soils would be considered problematic hydric soils as this is a recently developed wetland (has been created within the past five years) and occur within a floodplain. Hydrology is supported by a swale that collects runoff from an adjacent agricultural field, providing ephemeral runoff through the area during rain events.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: FM 156 City/County: Fort Worth, Tarrant Sampling Date: 7-7-16
 Applicant/Owner: Texas Department of Transportation State: TX Sampling Point: 6
 Investigator(s): J. Leclair, J. Kuhl, E. Hauss Section, Township, Range: NA
 Landform (hillslope, terrace, etc.): swale Local relief (concave, convex, none): Concave Slope (%): 45
 Subregion (LRR): J Lat: 32.906142 Long: -97.348717 Datum: NAD83
 Soil Map Unit Name: Slidest clay, 1-3% slopes NWI classification: None
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Is the Sampled Area within a Wetland?		
Hydric Soil Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>		Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>			
Remarks:					

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <u>NA</u>				Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): <u>1</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>100</u> (A/B)
2. _____				
3. _____				
4. _____				
Sapling/Shrub Stratum (Plot size: <u>15</u>) _____ = Total Cover				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>NA</u>				
2. _____				
3. _____				
4. _____				
Herb Stratum (Plot size: <u>5</u>) _____ = Total Cover				Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. <u>Eleocharis palustris</u>	<u>90</u>	<u>Yes</u>	<u>OBL</u>	
2. <u>Justicia americana</u>	<u>5</u>	<u>NO</u>	<u>OBL</u>	
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
Woody Vine Stratum (Plot size: <u>30</u>) _____ = Total Cover				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
1. <u>NA</u>				
2. _____				
% Bare Ground in Herb Stratum <u>5</u> _____ = Total Cover				

Remarks: Not a potential water of the U.S.

SOIL

Sampling Point: 6

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		
0-16	10YR 3/2	100					Clay & gravel	

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

Restrictive Layer (if present):
 Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes _____ No

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)
<u>Primary Indicators (minimum of one required; check all that apply)</u>		
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Dry-Season Water Table (C2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where not tilled)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		<input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F)
<input type="checkbox"/> Water-Stained Leaves (B9)		

Field Observations:

Surface Water Present? Yes No _____ Depth (inches): 2

Water Table Present? Yes No _____ Depth (inches): 8-16

Saturation Present? (includes capillary fringe) Yes No _____ Depth (inches): 0-16

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: FM 156 City/County: Fort Worth, Tarrant Sampling Date: 7-7-16
 Applicant/Owner: Texas Department of Transportation State: TX Sampling Point: 7
 Investigator(s): J. Leclair, J. Kuhl, E. Hauss Section, Township, Range: NA
 Landform (hillslope, terrace, etc.): Swale Local relief (concave, convex, none): concave Slope (%): 15
 Subregion (LRR): J Lat: 32.912167 Long: -97.348998 Datum: NAD83
 Soil Map Unit Name: Slidell clay, 1-3% slopes NWI classification: None
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes <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:			

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:	
1. <u>NA</u>				Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-):	<u>1</u> (A)
2. _____				Total Number of Dominant Species Across All Strata:	<u>1</u> (B)
3. _____				Percent of Dominant Species That Are OBL, FACW, or FAC:	<u>100</u> (A/B)
4. _____				Prevalence Index worksheet:	
= Total Cover				Total % Cover of:	Multiply by:
Sapling/Shrub Stratum (Plot size: <u>15</u>)				OBL species	x 1 = _____
1. <u>NA</u>				FACW species	x 2 = _____
2. _____				FAC species	x 3 = _____
3. _____				FACU species	x 4 = _____
4. _____				UPL species	x 5 = _____
5. _____				Column Totals:	(A) _____ (B) _____
= Total Cover				Prevalence Index = B/A = _____	
Herb Stratum (Plot size: <u>5</u>)				Hydrophytic Vegetation Indicators:	
1. <u>Eleocharis palustris</u>	<u>80</u>	<u>Yes</u>	<u>OBL</u>	<input checked="" type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation	
2. <u>Cyperus sp.</u>	<u>2</u>	<u>NO</u>	<u>-</u>	<input checked="" type="checkbox"/> 2 - Dominance Test is >50%	
3. <u>Rajacksonia phyllocephala</u>	<u>5</u>	<u>NO</u>	<u>-</u>	<input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹	
4. <u>Sorghum halepense</u>	<u>5</u>	<u>NO</u>	<u>-</u>	<input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)	
5. <u>Iva annua</u>	<u>5</u>	<u>NO</u>	<u>-</u>	<input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)	
6. _____				¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.	
7. _____				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
8. _____					
9. _____					
10. _____					
= Total Cover					
Woody Vine Stratum (Plot size: <u>30</u>)					
1. <u>NA</u>					
2. _____					
= Total Cover					
% Bare Ground in Herb Stratum _____					

Remarks: Taken at Site 13, Emergent wetland.

SOIL

Sampling Point: 7

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

Depth (inches)	Matrix		Redox Features			Loc ²	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹			
0-16	10YR 3/2	60	10YR 5/6	40	C	M	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 checked="" 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:

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

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

Restrictive Layer (if present):
 Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

<u>Primary Indicators (minimum of one required; check all that apply)</u>		<u>Secondary Indicators (minimum of two required)</u>
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Dry-Season Water Table (C2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)
<input type="checkbox"/> Sediment Deposits (B2)	<input checked="" type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	(where tilled)
<input checked="" type="checkbox"/> Drift Deposits (B3)	(where not tilled)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Water-Stained Leaves (B9)		<input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F)

Field Observations:

Surface Water Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u>2</u>	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Water Table Present? Yes <input type="checkbox"/> No <input type="checkbox"/> Depth (inches): _____	
Saturation Present? (includes capillary fringe) Yes <input type="checkbox"/> No <input type="checkbox"/> Depth (inches): _____	

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

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Fm 156 City/County: Fort Worth, Tarrant Sampling Date: 7-7-16
 Applicant/Owner: Texas Department of Transportation State: TX Sampling Point: 8
 Investigator(s): J. LeClair, J. Kuhl, E. Hauss Section, Township, Range: NA
 Landform (hillslope, terrace, etc.): Swale Local relief (concave, convex, none): Concave Slope (%): 25
 Subregion (LRR): J Lat: 32.911566 Long: -97.348993 Datum: NAD83
 Soil Map Unit Name: Slidell clay, 1-3% slopes NWI classification: None
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes <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:						

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:		
1. <u>NA</u>				Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): <u>2</u> (A)		
2.				Total Number of Dominant Species Across All Strata: <u>2</u> (B)		
3.				Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)		
4.				Prevalence Index worksheet:		
				Total % Cover of:		Multiply by:
				OBL species	x 1 =	
				FACW species	x 2 =	
				FAC species	x 3 =	
				FACU species	x 4 =	
				UPL species	x 5 =	
				Column Totals:	(A)	(B)
				Prevalence Index = B/A = _____		
				Hydrophytic Vegetation Indicators:		
				<input checked="" type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation		
				<input checked="" type="checkbox"/> 2 - Dominance Test is >50%		
				<input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹		
				<input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)		
				<input type="checkbox"/> 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 checked="" type="checkbox"/> No <input type="checkbox"/>		
Remarks: <u>Taken at site 13, Emergent wetland.</u>						

SOIL

Sampling Point: 8

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		
0-16	10YR 3/2	80	5YR 3/4	20	C	PL	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"/> 1 cm Muck (A9) (LRR F, G, H)
<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)	<input type="checkbox"/> (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 checked="" 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 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 Peal (S2) (LRR G, H)	<input type="checkbox"/> High Plains Depressions (F16)	³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.
<input type="checkbox"/> 5 cm Mucky Peat or Peal (S3) (LRR F)	<input type="checkbox"/> (MLRA 72 & 73 of LRR H)	

Restrictive Layer (if present):
 Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

<u>Primary Indicators (minimum of one required; check all that apply)</u>		<u>Secondary Indicators (minimum of two required)</u>
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Dry-Season Water Table (C2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)
<input type="checkbox"/> Sediment Deposits (B2)	<input checked="" type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> (where tilled)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> (where not tilled)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Water-Stained Leaves (B9)		<input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F)

Field Observations:

Surface Water Present? Yes <input type="checkbox"/> No <input type="checkbox"/> Depth (inches): _____	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Water Table Present? Yes <input type="checkbox"/> No <input type="checkbox"/> Depth (inches): _____	
Saturation Present? Yes <input type="checkbox"/> No <input type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	

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

Remarks: Top centimeter was organic matter.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Fm 156 City/County: Fort Worth, Tarrant Sampling Date: 7-7-16
 Applicant/Owner: Texas Department of Transportation State: TX Sampling Point: 9
 Investigator(s): J. Leclair, J. Kuhl, E. Hauss Section, Township, Range: NA
 Landform (hillslope, terrace, etc.): Swale Local relief (concave, convex, none): Convex Slope (%): 10
 Subregion (LRR): J Lat: 32.911545 Long: -97.348936 Datum: NAD83
 Soil Map Unit Name: Slidell clay, 1-3' Slopes NWI classification: None
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes <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:					

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <u>NA</u>				Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): _____ (A) Total Number of Dominant Species Across All Strata: _____ (B)
2. _____				
3. _____				
4. _____				
Sapling/Shrub Stratum (Plot size: <u>15</u>) _____ = Total Cover				Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B) Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
1. <u>NA</u>				
2. _____				
3. _____				
4. _____				
Herb Stratum (Plot size: <u>5</u>) _____ = Total Cover				Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0' <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. <u>Sorghum halapense</u>	<u>100</u>	<u>Yes</u>	<u>FACW</u>	
2. <u>Rayjacksonia phyllocephala</u>	<u>2</u>	<u>NO</u>	<u>-</u>	
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
Woody Vine Stratum (Plot size: <u>30</u>) _____ = Total Cover				Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
1. <u>NA</u>				
2. _____				
% Bare Ground in Herb Stratum _____ = Total Cover				

Remarks: Taken at site 13, emergent wetland.

SOIL

Sampling Point: 9

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		
0-10	10YR 3/2	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.)		Indicators for Problematic Hydric Soils ³ :
<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)	<input type="checkbox"/> (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 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, unless disturbed or problematic.
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR F)	<input type="checkbox"/> (MLRA 72 & 73 of LRR H)	

Restrictive Layer (if present):
 Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes _____ No

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)
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"/> Surface Soil Cracks (B6)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Dry-Season Water Table (C2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> (where tilled)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> (where not tilled)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Water-Stained Leaves (B9)		<input type="checkbox"/> 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:

APPENDIX C

PROJECT AREA PHOTOGRAPHS



Photo 1: Wetland sample point 1.



Photo 2: Wetland/stream complex 1.



Photo 3: Wetland sample point 2.



Photo 4: Wetland sample point 3.



Photo 5: Facing east at unnamed tributary 1.



Photo 6: Facing northwest at unnamed tributary 2.



Photo 7: Facing north at wetland/stream complex 2.



Photo 8: Facing east at unnamed tributary 3.



Photo 9: Facing south where wetland/stream complex 2 flows into unnamed tributary 3.



Photo 10: Facing south at the forested wetland.



Photo 11: Forested wetland sample point 4.



Photo 12: Forested wetland sample point 5.



Photo 13: Facing northwest at Big Fossil Creek.



Photo 14: Facing northeast at unnamed tributary 4.



Photo 15: Facing south at wetland/stream complex 3.



Photo 16: Facing northwest at unnamed tributary 5.



Photo 17: Facing south at unnamed tributary 6.



Photo 18: Facing south at unnamed tributary 7.



Photo 19: Wetland sample point 7.



Photo 20: Facing south at Site 13, Emergent Wetland.



Photo 21: Wetland sample point 8.



Photo 22: Wetland sample point 9.



Photo 23: Facing east at unnamed tributary 8.



Summary Table of Impacts to Potentially Jurisdictional Waters of the U.S.

Project Name: FM 156

CSJ: 0718-02-045

County: Tarrant

District: Fort Worth

Date Completed: 4/18/2018

Please include, as an attachment, all supporting documentation that was used to populate the information in the table.

Crossing #	Waterbody ID ¹	Latitude and Longitude (Decimal Degrees)	Resource Type ²	Linear Feet in Project Area	Acres in Project Area	Permanent Fill		Temporary Fill		Permit Type	Pre-Construction Notification	
						Linear Feet	Acres	Linear Feet	Acres		Required	If Yes, Reason ³
1	Site 1: Wetland/Stream Complex 1	32.862825, -97.34227	NFW	34	0.036	34	0.036	0	0	NWP 14	Y	B
2	Site 2: Unnamed Tributary 1	32.876029, -97.342313	IS	38	0.013	38	0.013	0	0	NWP 14	N	-
3	Site 3: Unnamed Tributary 2 ⁴	32.87987, -97.342472	IS	122	0.103	71	0.055	0	0	NWP 14	N	-
4	Site 4: Wetland/Stream Complex 2	32.883168, -97.342356	NFW	467	0.141	64	0.030	0	0	NWP 14	Y	B
5	Site 5: Unnamed Tributary 3 ⁵	32.883963, -97.342755	IS	0	0	0	0	0	0	NWP 14	N	-
6	Site 6: Forested Wetland ⁵	32.884009, -97.343065	FW	0	0	-	0	0	0	NWP 14	N	-
7	Site 7: Big Fossil Creek	32.890688, -97.346368	PS	1,803	1.10	0; Bridged	0.001	0	0	NWP 14	N	-
8	Site 8: Unnamed Tributary 4	32.893891, -97.348035	IS	28	0.002	0	0	0	0	NWP 14	N	-
9	Site 9: Unnamed Tributary 5	32.893846, -97.348285	IS	463	0.279	0; Bridged	0.0001	0	0	NWP 14	N	-



Summary Table of Impacts to Potentially Jurisdictional Waters of the U.S.

Crossing #	Waterbody ID ¹	Latitude and Longitude (Decimal Degrees)	Resource Type ²	Linear Feet in Project Area	Acres in Project Area	Permanent Fill		Temporary Fill		Permit Type	Pre-Construction Notification	
						Linear Feet	Acres	Linear Feet	Acres		Required	If Yes, Reason ³
10	Site 10: Wetland/Stream Complex 3 ^{4,6}	32.90566, -97.349002	IS	433	0.165	128	0.046	0	0	NWP 14	Y	B
			NFW	37	0.025	-	0.025	0	0			
11	Site 11: Unnamed Tributary 6 ⁴	32.908115, -97.34888	IS	386	0.153	143	0.089	0	0	NWP 14	N	-
12	Site 12: Unnamed Tributary 7 ⁴	32.91152, -97.348871	IS	225	0.070	174	0.061	0	0	NWP 14	Y	A, B
	Site 13: Wetland	32.912162, -97.348998	NFW	513	0.148	-	0.148	0	0			
	Site 14: Unnamed Tributary 8	32.912147, -97.348987	IS	27	0.005	27	0.005	0	0			
13	Site 15: Pond ⁵	32.913457, -97.348229	I	424	0.357	0	0	0	0	NWP 14	N	-

¹ Waterbody ID may be the name of a feature or an assigned label such as "W-1" for a wetland.
² Resource Types: NFW – Non-forested wetland, FW – Forested wetland, PS – Perennial Stream, IS – Intermittent Stream, ES – Ephemeral Stream, I – Impoundment
³ Reasons for PCN requirement:
 A – The loss of waters of the U.S. exceeds 1/10 acre
 B – There is a discharge in a special aquatic site (e.g., wetlands)
 C – Potential endangered species
 D – Potential historic properties
 E – Discharge into pitcher plant bog or bald cypress-tupelo swamp
 F – Discharge into the area of Caddo Lake within Texas that is designated as a "Wetland of International Importance" under the Ramsar Convention
 G – Required by Louisiana Regional Conditions
 H – Other
⁴ Culvert crossings were included in the total "linear feet in project area" and "acres in project area" calculations, but were not included in permanent fill calculations.
⁵ WOTUS is outside of the proposed project area, but was delineated as a precaution in case of design change.
⁶ A portion of the stream has wetland vegetation established within the OHWM and was included in the total acreage and linear feet of the stream.

**POTENTIALLY JURISDICTIONAL
WATERS OF THE US**

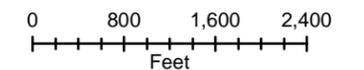
FM 156 From US 81/US 287 to
McLeroy Boulevard/Watauga Road

CSJ: 0718-02-045



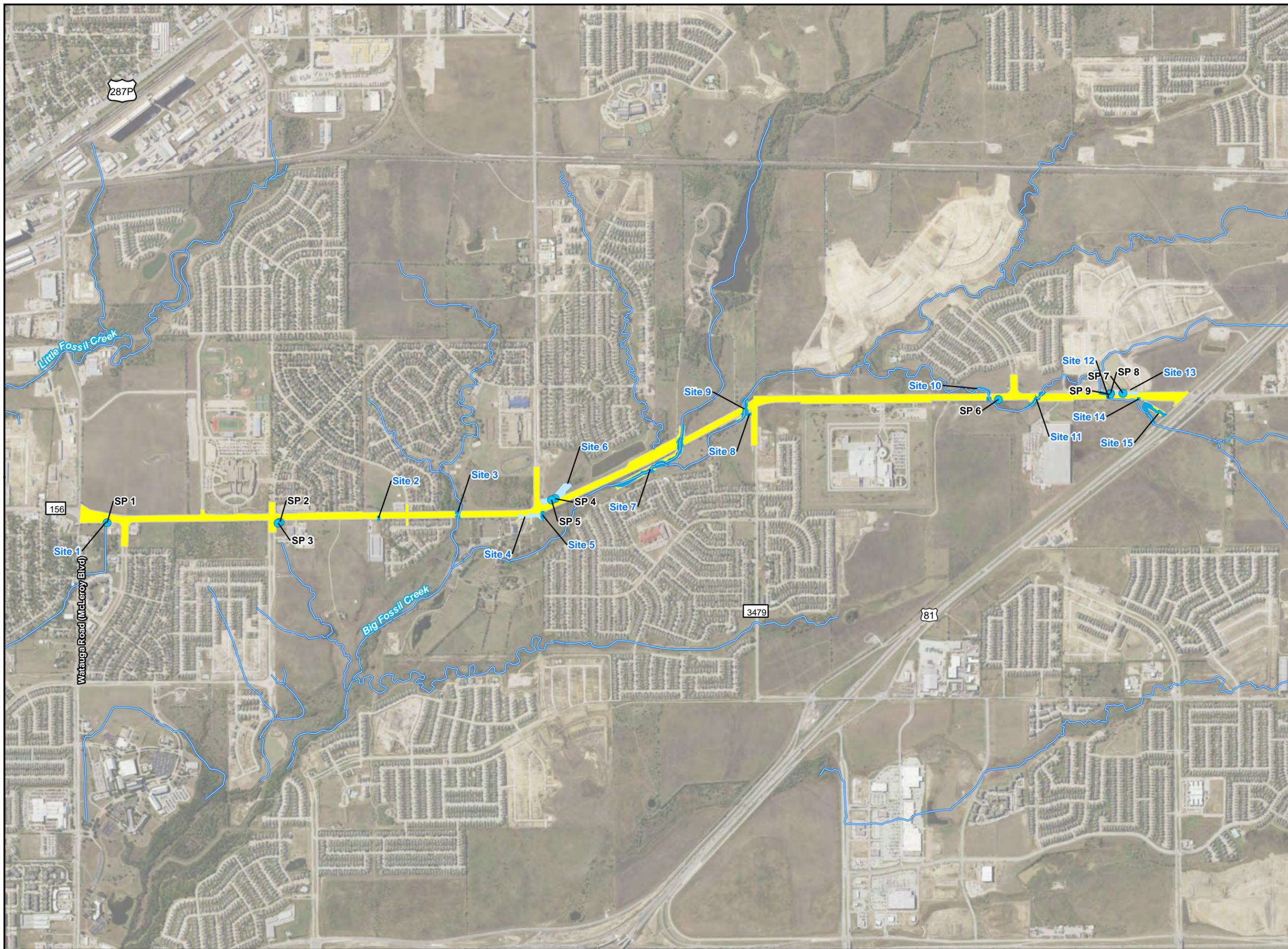
Key to Features

- Wetland Determination Points
- Streams (NHD)
- Project Area
- Delineated Waters of the US
- Delineated Wetlands



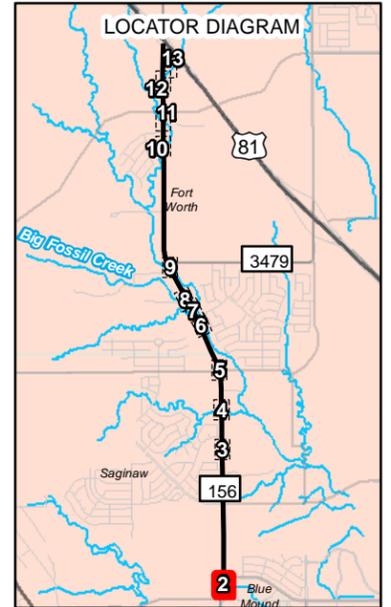
One inch equals 800 ft

FIGURE 5 - 1



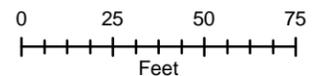
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CSJ: 0718-02-045



Key to Features

- Wetland Determination Points
- ~ Streams (NHD)
- ➔ Stream Flow Direction
- Culvert Connections
- Existing ROW
- Proposed ROW
- Drainage Easements
- Proposed Culverts
- Proposed Improvements
- Proposed Bridge Design
- Floodplains (FEMA)
- Delineated Waters of the US
- Delineated Wetlands
- Permanent Impacts



One inch equals 50 ft

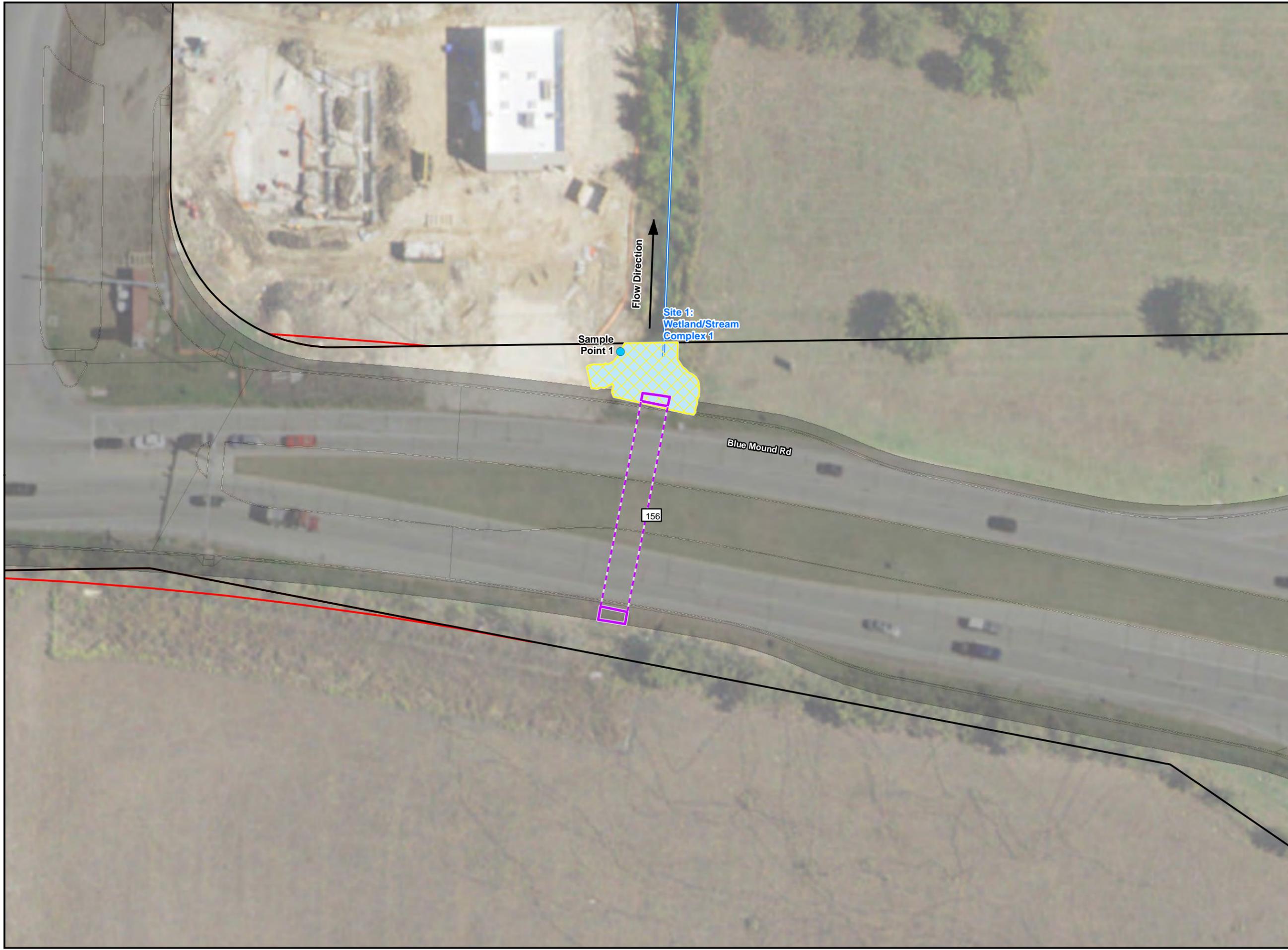
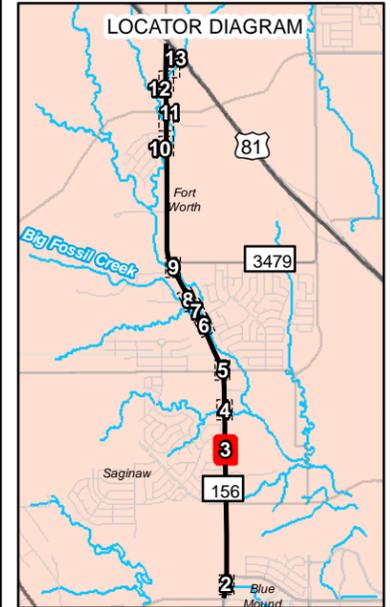


FIGURE 5 - 2

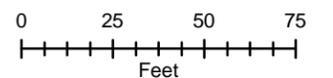
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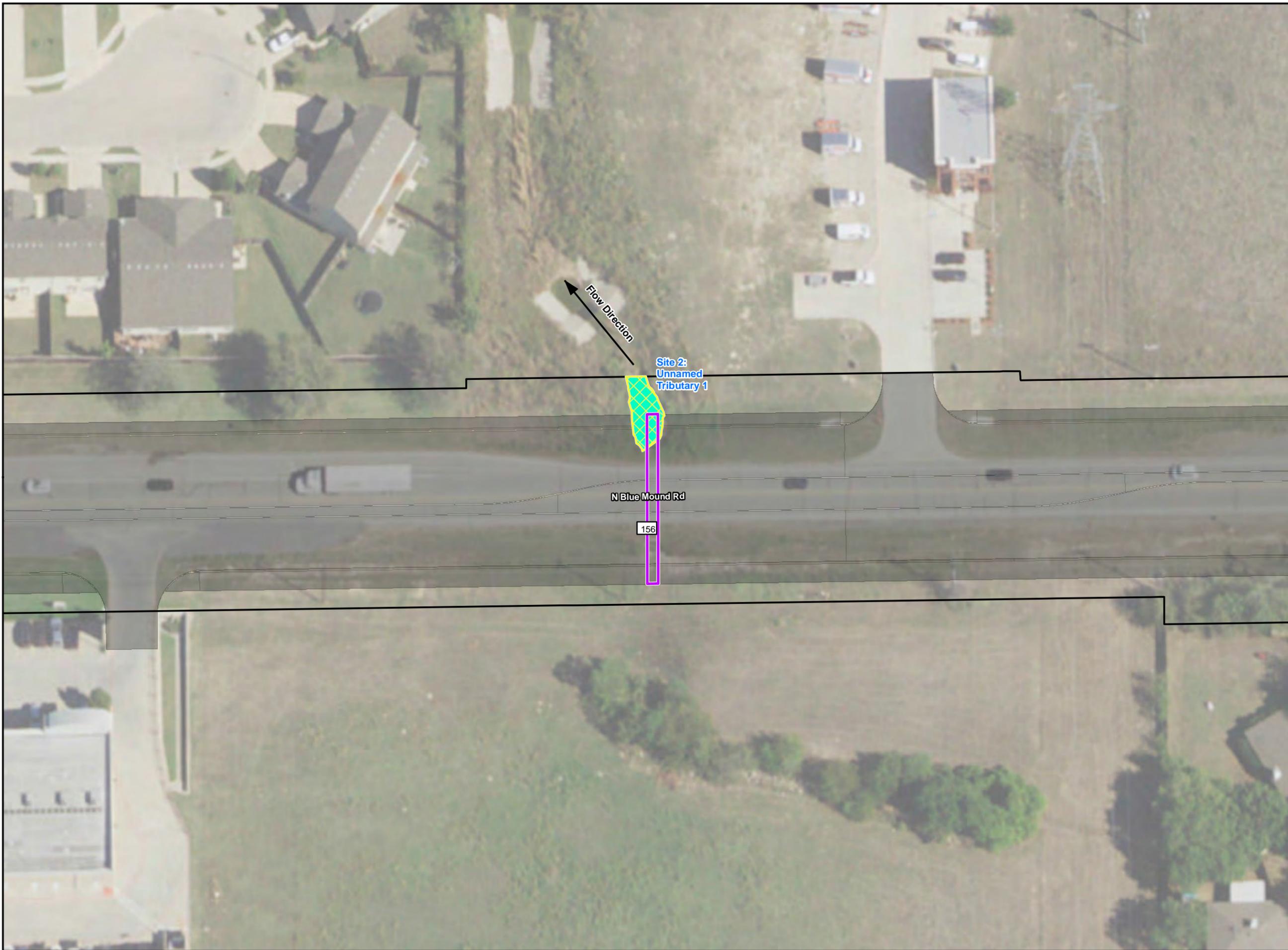
Key to Features

- Wetland Determination Points
- Streams (NHD)
- Stream Flow Direction
- Culvert Connections
- Existing ROW
- Proposed ROW
- Drainage Easements
- Proposed Culverts
- Proposed Improvements
- Proposed Bridge Design
- Floodplains (FEMA)
- Delineated Waters of the US
- Delineated Wetlands
- Permanent Impacts



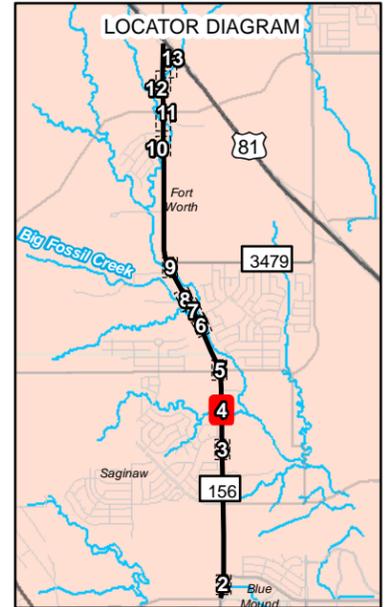
One inch equals 50 ft

FIGURE 5 - 3



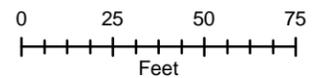
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Key to Features

- Wetland Determination Points
- Streams (NHD)
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- Existing ROW
- Proposed ROW
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- Proposed Culverts
- Proposed Improvements
- Proposed Bridge Design
- Floodplains (FEMA)
- Delineated Waters of the US
- Delineated Wetlands
- Permanent Impacts



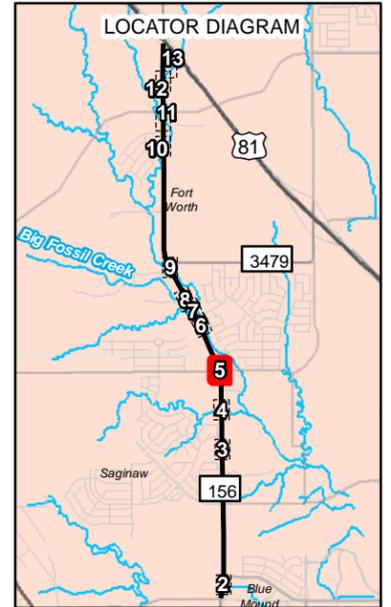
One inch equals 50 ft

FIGURE 5 - 4



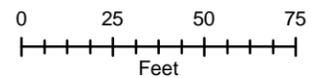
POTENTIALLY JURISDICTIONAL WATERS OF THE US

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CSJ: 0718-02-045



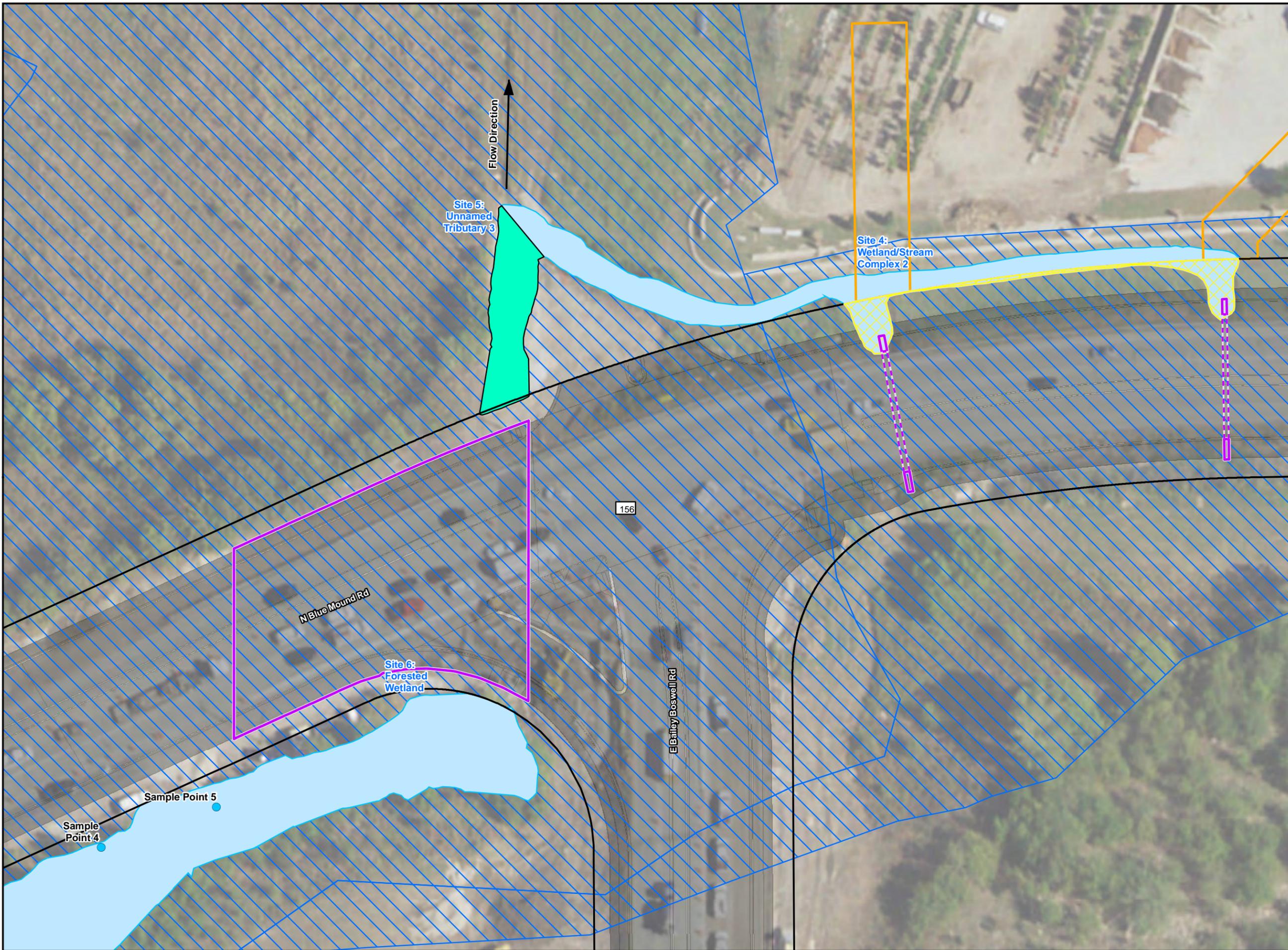
Key to Features

- Wetland Determination Points
- ~ Streams (NHD)
- Stream Flow Direction
- Culvert Connections
- Existing ROW
- Proposed ROW
- Drainage Easements
- Proposed Culverts
- Proposed Improvements
- Proposed Bridge Design
- Floodplains (FEMA)
- Delineated Waters of the US
- Delineated Wetlands
- Permanent Impacts



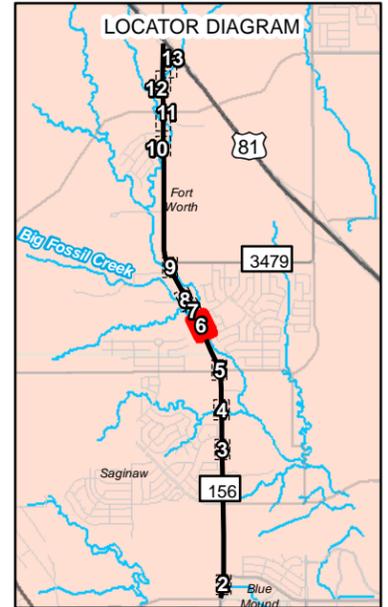
One inch equals 50 ft

FIGURE 5 - 5



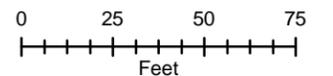
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Key to Features

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- Streams (NHD)
- Stream Flow Direction
- Culvert Connections
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- Proposed ROW
- Drainage Easements
- Proposed Culverts
- Proposed Improvements
- Proposed Bridge Design
- Floodplains (FEMA)
- Delineated Waters of the US
- Delineated Wetlands
- Permanent Impacts

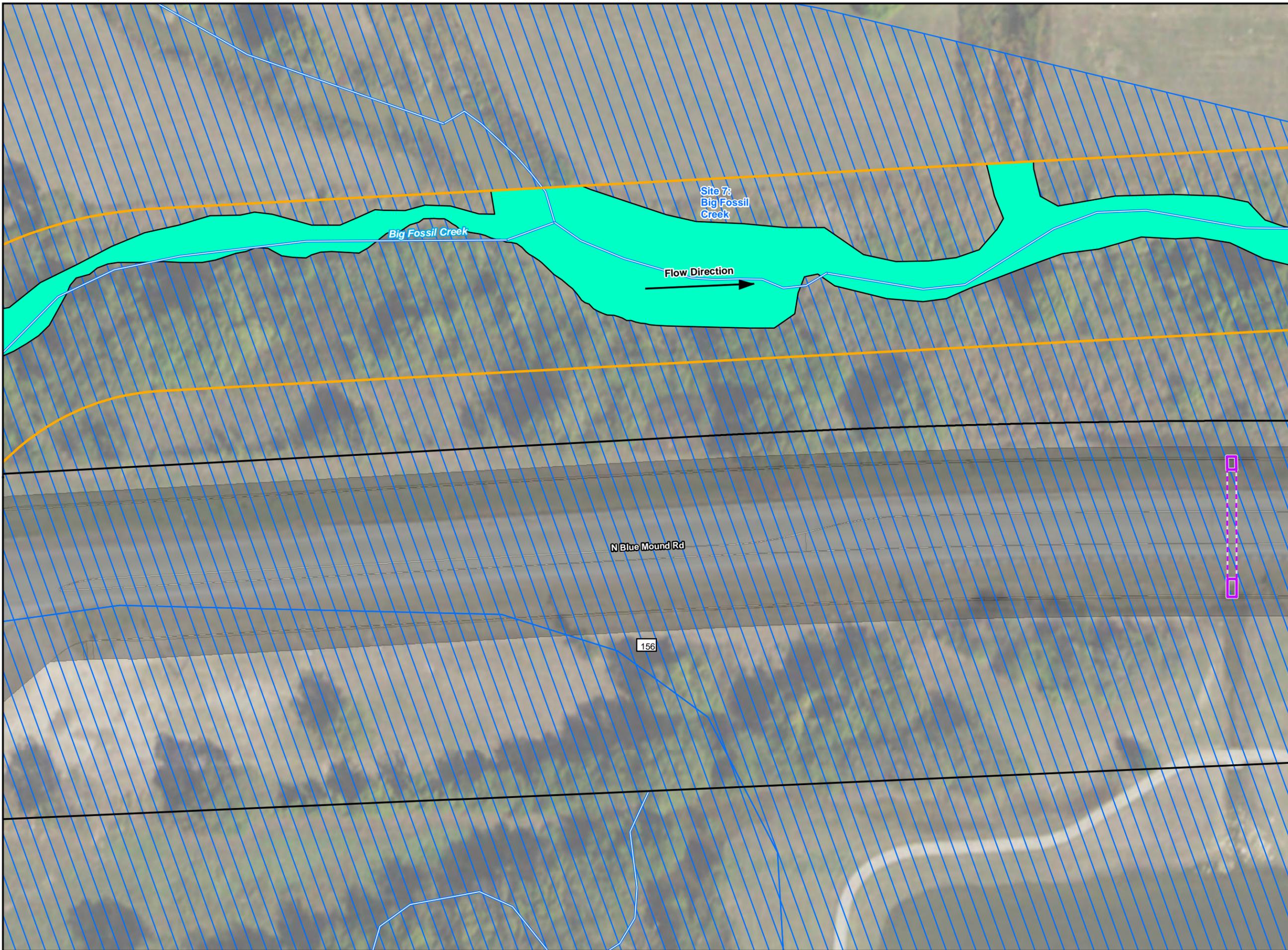
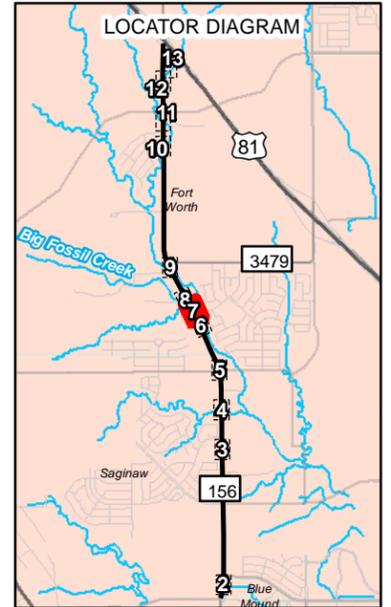


One inch equals 50 ft

FIGURE 5 - 6

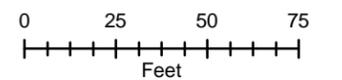
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Key to Features

-  Wetland Determination Points
-  Streams (NHD)
-  Stream Flow Direction
-  Culvert Connections
-  Existing ROW
-  Proposed ROW
-  Drainage Easements
-  Proposed Culverts
-  Proposed Improvements
-  Proposed Bridge Design
-  Floodplains (FEMA)
-  Delineated Waters of the US
-  Delineated Wetlands
-  Permanent Impacts

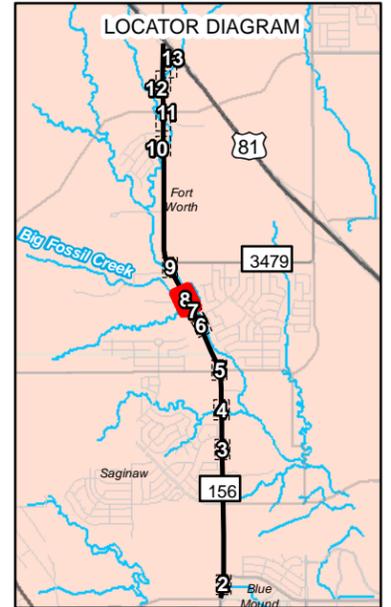


One inch equals 50 ft

FIGURE 5 - 7

**POTENTIALLY JURISDICTIONAL
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CSJ: 0718-02-045



Key to Features

- Wetland Determination Points
- Streams (NHD)
- Stream Flow Direction
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- Proposed ROW
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- Proposed Culverts
- Proposed Improvements
- Proposed Bridge Design
- Floodplains (FEMA)
- Delineated Waters of the US
- Delineated Wetlands
- Permanent Impacts

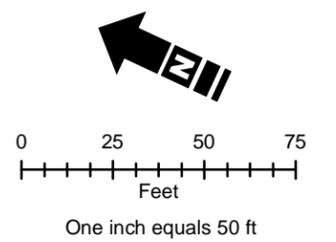
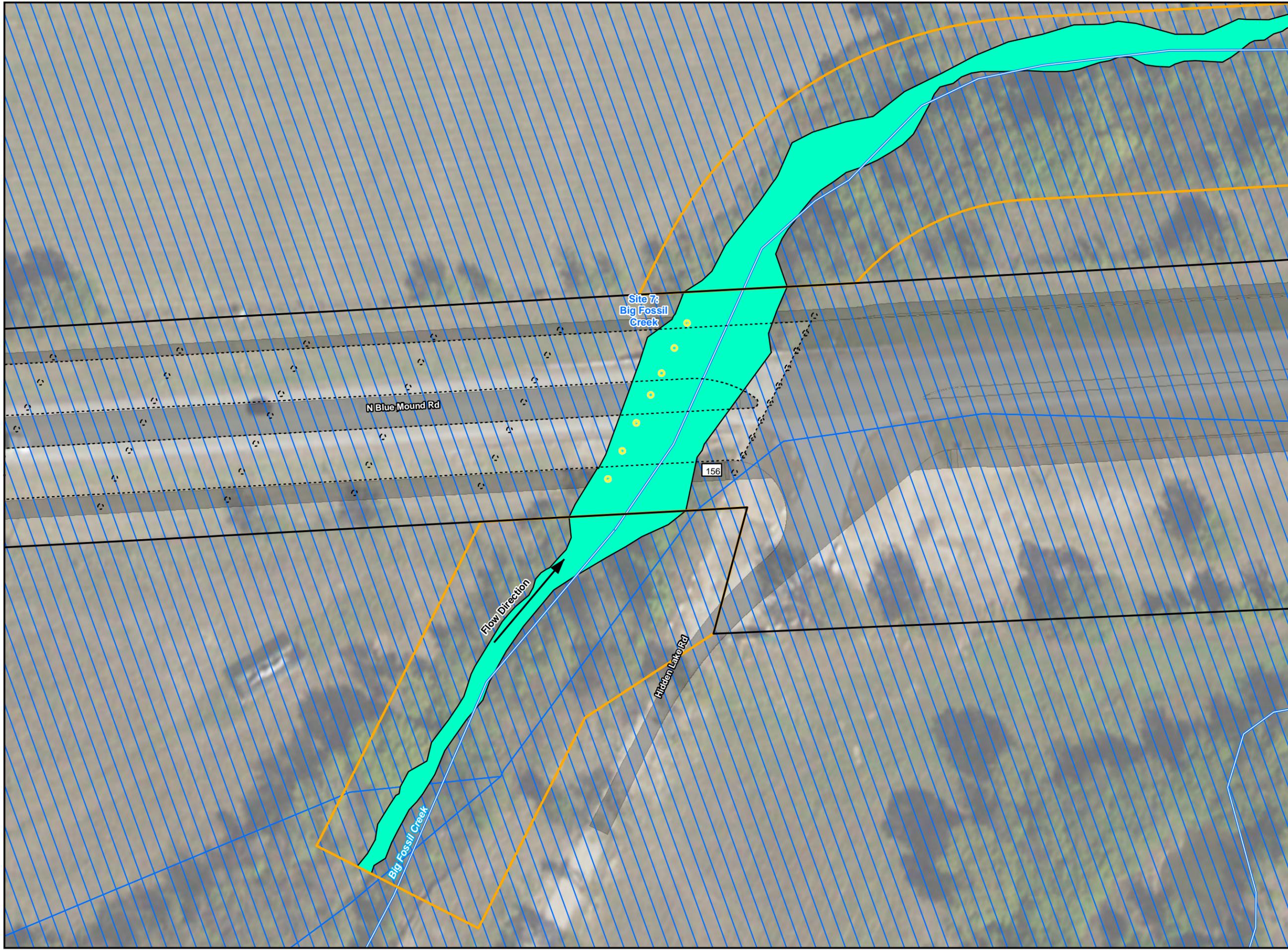


FIGURE 5 - 8

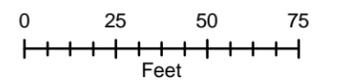


**POTENTIALLY JURISDICTIONAL
WATERS OF THE US**

FM 156 From US 81/US 287
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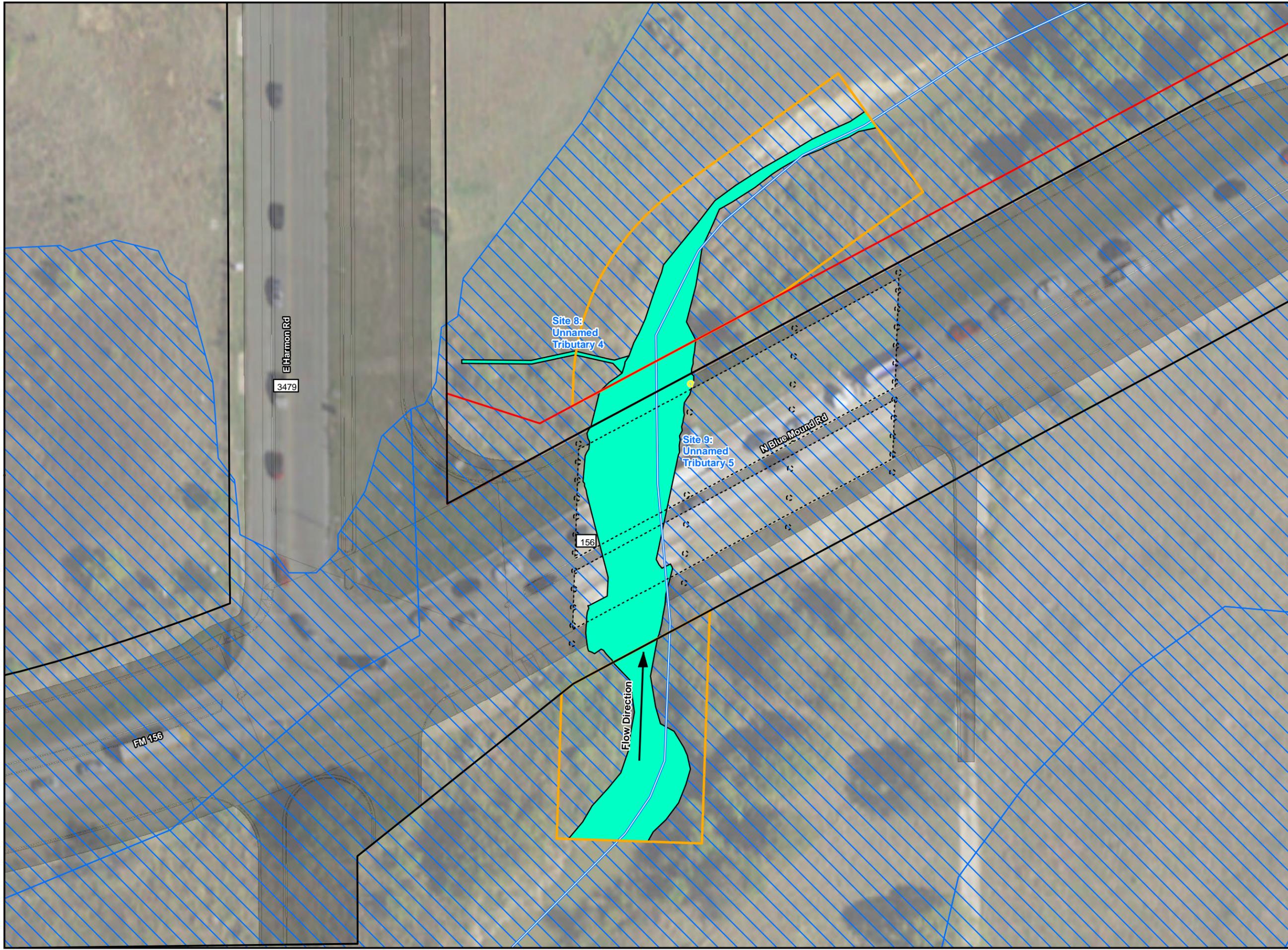


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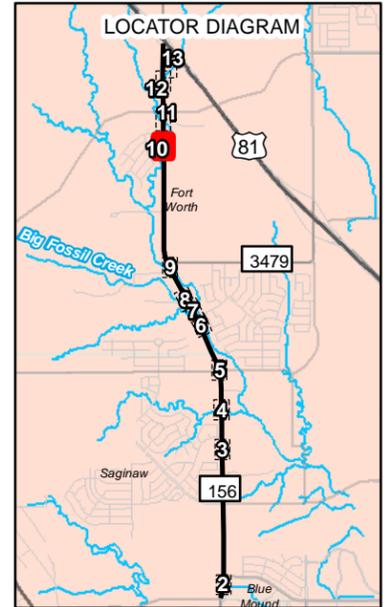
One inch equals 50 ft

FIGURE 5 - 9



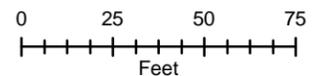
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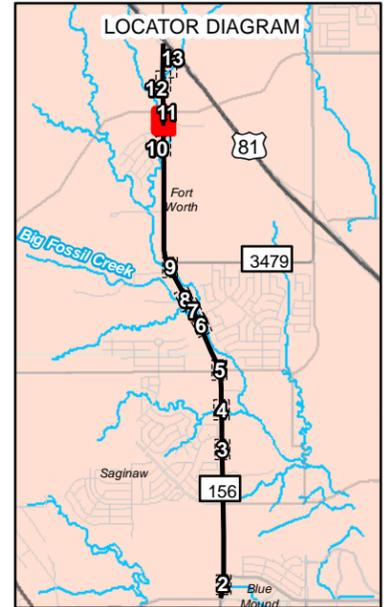
One inch equals 50 ft

FIGURE 5 - 10



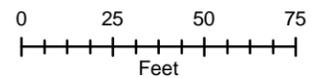
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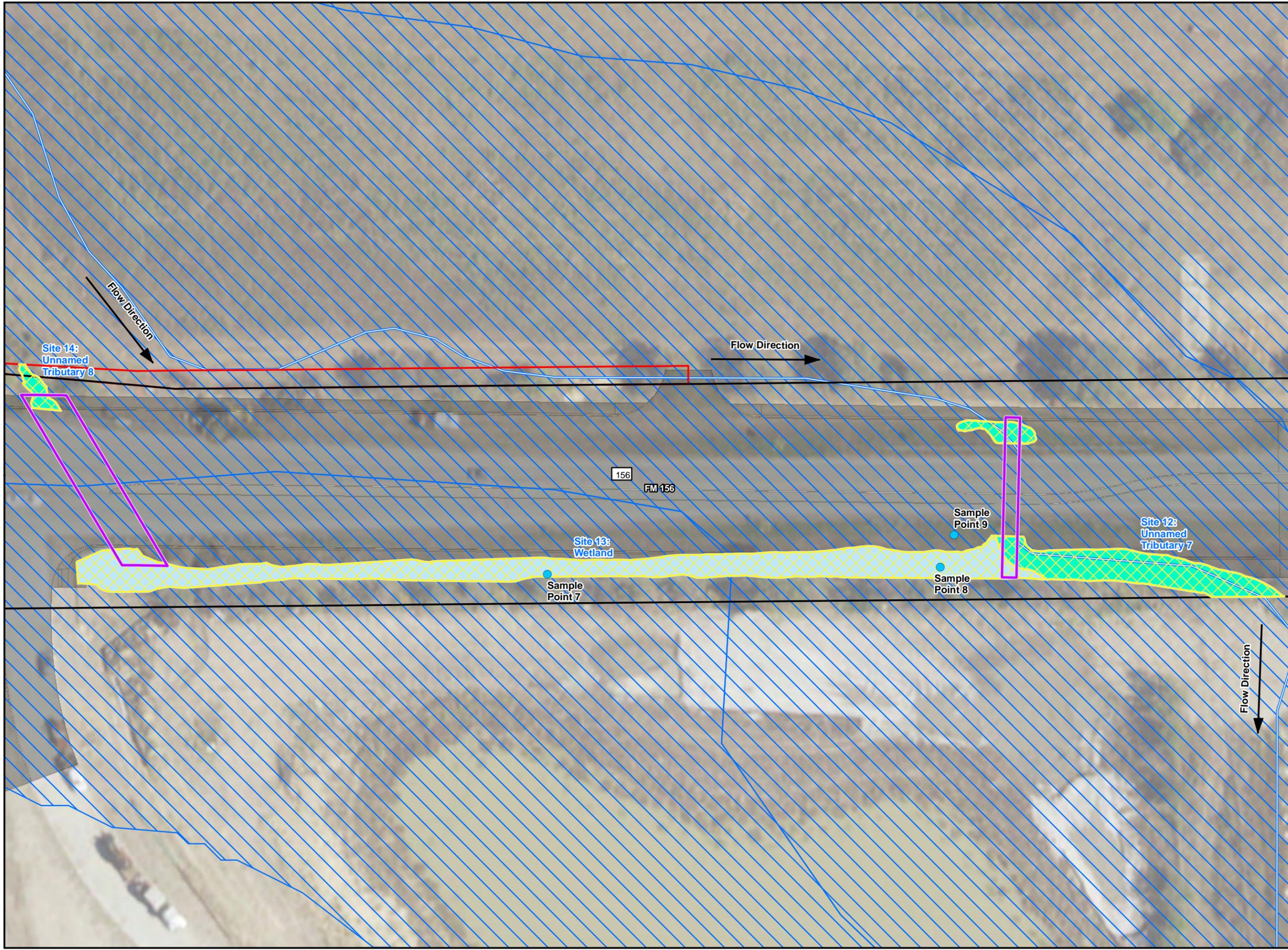
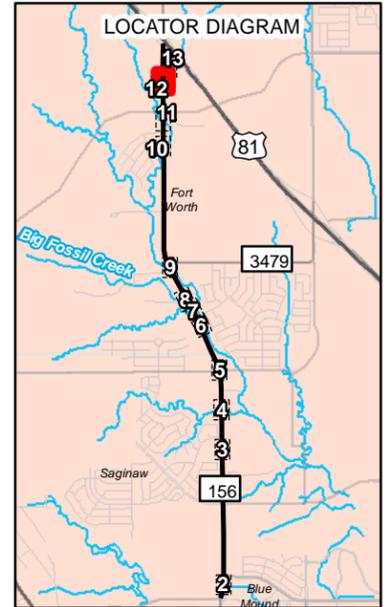
One inch equals 50 ft

FIGURE 5 - 11



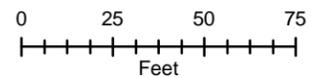
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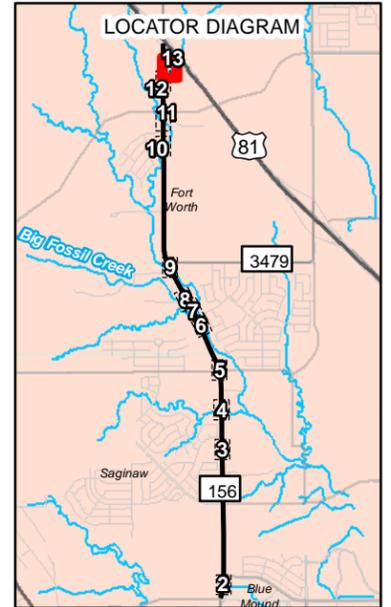


One inch equals 50 ft

FIGURE 5 - 12

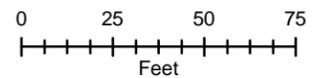
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One inch equals 50 ft

FIGURE 5 - 13

