Archeological Background Study

Project Name: FM 2931

Highway: FM 2931 from FM 428 to US 380

District(s): Dallas

County(s): Denton

CSJ Number(s): 2979-01-011

Author and Affiliation: Brandon S. Young/Hicks & Company

Report Completion Date: October 5, 2020

Table of Contents

Introduction

This project may require compliance both with Section 106 of the National Historic Preservation Act and with the Texas Antiquities Code. The purpose of this document is to identify risks for archeological historic properties within the project's area of potential effects (APE). The document also considers whether any cemeteries may extend into the APE, requiring compliance with the state Health and Safety Code.

The following sections list the results of review of readily available information for the APE's setting and adjacent areas. The report also evaluates adjacent areas (a buffer zone; see Recommendations Section for definition of the buffer zone). The buffer zone is evaluated in case a subsequent design change expands the APE. This report concludes with separate recommendations regarding project effects and the need for additional work within shallow deposits less than three feet in depth and within Holocene-age deposits of three feet or greater depth, if such deep deposits are present.

This background study is (check one):

☒ the initial study for this project

☐ a continuation of previous investigations due to design changes or other reasons

Identify previous investigation(s):

If this box is checked, then answer the questions below only for the area that is affected by the design change.

Area of Potential Effects

The APE is defined to encompass the limits of the existing right of way (ROW); proposed, new project ROW; permanent and temporary easements; and any project-specific locations and utility relocations designated by TxDOT. Note: the APE encompasses the entirety of the project area, regardless of the extent of prior archeological investigations, the particular locations subject to proposed field investigations, or the portion of a project added through a design change. If impacts are not known, worst-case impacts are assumed in defining the APE.

See Attachment 1 for a project location map and Attachment 2-1 for a project description (in ECOS). The 6.58-mile-long Farm to Market (FM) Road 2931 APE, extending from FM 428 to United States (US) Highway 380, encompasses approximately 132.09 acres, 84.11 acres of existing ROW, 45.85 acres of proposed ROW, and 2.13 acres of easements (see Attachments 2-2 through 2-8). The existing right of way width is approximately 100 feet, and the typical proposed right of way would be approximately 130 feet. Vertical impacts are anticipated to extend approximately three feet (ft) below ground surface for roadway construction, up to 10 ft for culvert replacements, and greater than 25 ft for bridge support columns.

Information Source Checklist

(check each source of information that was consulted by the professional archeologist in preparing this background study—the number and type of sources are at the professional archeologist's discretion)

☒ Labelled USGS 7.5' topographic quadrangle project location map (or equivalent if a 7.5' quadrangle is unavailable) is attached and includes an inset map that depicts the county within Texas where the project occurs. **Attachment 1**

☒ Predictive Archeological Liability Map (PALM) is attached if available *(consult TxDOT's Environmental Compliance Toolkit).* **Attachment 4-1** through **4-7**

☐ Geologic Atlas of Texas map is attached *(PALM may be substituted for the GAT map, if it is available).*

☐ Soils map is attached *(PALM may be substituted for the soils map, if it is available).*

☐ FEMA flood hazard map is attached.

☒ National Wetlands Inventory map is attached. See **Attachments 2-2** through **2-8**

☒ Texas Archeological Sites Atlas map is attached, depicting any sites within one kilometer of the APE or additional APE. **Attachment 3-1**

☒ Historic topographic map is attached. **Attachment 5**

☐ Historic soils map is attached.

☒ Historic road map is attached. **Attachment 6**

☐ As-built plans for roadway are attached.

☐ Other map of historic information is attached.

Specify Map:

☒ Aerial images are attached. See **Attachments 2-2** through **2-8**

☐ Project area photographs are attached.

Analysis of Project Setting

- **Previously Identified Archeological Sites**

☐ No archeological sites have been identified within the APE or within 150 feet of the APE

☒ Archeological sites have been identified within the APE or within 150 feet of the APE

A review of the Texas Archeological Sites Atlas (Atlas) on July 23, 2020, indicated that there are five previously recorded archeological sites (41DN40, 41DN366, 41DN380, 41DN618, and 41DN619) within a 1,000-meter (m) radius of the APE (see **Attachment 3-1** and **Attachment 3-2, Table 1**). Site 41DN618 is on the east side of FM 2931 immediately adjacent to the APE. The site was recorded as a historic-age house site with nine associated features and was recommended not eligible for the National Register of Historic Places (NRHP) or for State Antiquities Landmark (SAL) designation (Atlas 2020). The remaining four sites are sufficient distances from the APE that they would not be affected by the proposed project (see **Attachment 3-2**, **Table 1**).

- **Previously Identified Cemeteries**

☒ No known cemetery sites occur within the APE or within 150 feet of the APE.

A review of the Atlas and Texas Historic Sites Atlas on July 23, 2020, determined that there are two recorded cemeteries (Oak Grove and Rucker) within one kilometer of the APE (see **Attachment 3-1**). Oak Grove Cemetery is approximately 785 meters (2,879 feet) west-southwest of the FM 2931/US 380 intersection. No impacts would occur to Oak Grove Cemetery during the proposed project given its distance from the APE. The Rucker Cemetery is approximately 197 meters (643 feet) east of the APE on the east side of FM 2931 (see **Attachment 3-1**). No impacts would occur to Rucker Cemetery during the proposed project given its distance from the APE.

☐ Cemeteries occur within the APE or within 150 feet of the APE.

- **Holocene-Age Deposits**

☐ No Holocene-age deposits occur within or adjacent to the APE.

☒ Holocene-age deposits occur within or adjacent to the APE.

Data for the APE from TxDOT's PALM for the Dallas District is presented in **Attachments 4-1** through **4-7**. This model utilizes geologic, soils, landform (including distinct breaks in slope), topography, floodplain, and land use data to predict the likelihood of an area to contain archeological deposits eligible for listing on the NRHP or designation as SAL and organizes these data into different categories to rank probability for the occurrence of potentially

eligible archeological sites. Each category grades this potential as either low, moderate, or high for depths below the surface of up to one meter (shallow) and below the surface greater than one meter (deep), or as negligible. It should be noted that the PALM is applicable to prehistoric archeological sites, and more recent historic deposits and their NRHP eligibility are not reliably predicted by this model (Abbott 2013). Also, the PALM is not intended to be solely relied upon and is intended to be utilized in concert with other data to make informed recommendations regarding the level of effort that may be required in archeological investigations prior to construction of a project.

The PALM data available for the APE indicates that there are shallow, moderately deep, and deep Holocene deposits within the APE with the potential to contain buried intact archeological materials (see Attachment 4-1 through 4-7). As per the PALM data, 66.65 percent (88.04 acres) of the APE is considered to have a low potential to contain reasonably intact archeological deposits (PALM classification 1). Approximately 22.60 percent (29.85 acres) of the APE has a moderate potential for containing reasonably intact shallowly buried archeological deposits but a low potential for deeply buried materials (PALM classification 4). Roughly 6.84 percent (9.03 acres) of the APE is considered to have a moderate potential for containing reasonably intact archeological materials (PALM classification 5). Only 2.84 percent (3.76 acres) of the APE is considered to have a high potential for intact archeological deposits (PALM classification 9). The remaining 1.07 percent (1.41 acres) of the APE is considered to have a low potential for shallow deposits and a moderate potential for deep deposits (0.17 percent/0.22 acres) (PALM classification 2), a moderate potential for shallow deposits and a high potential for deep deposits (0.09 percent/0.12 acres) (PALM classification 6), or a high shallow potential and a moderate deep potential (0.81 percent/1.07 acres) (PALM classification 8).

- **Historically Reliable Water Sources**

☐ No historically-reliable water sources occur within 500 feet of the APE.

☒ Historically reliable water sources occur within 500 feet of the APE, or this question can't be answered confidently.

- **Wetlands and Frequently Flooded Areas**

☒ The APE and adjacent areas contain wetlands or frequently flooded areas.

See Attachments 2-2 through 2-8 for NWI data.

☐ The APE and adjacent areas do not contain wetlands or frequently flooded areas, or this question cannot be answered confidently.

- **Preferred Landforms for Occupation**

☐ The Atlas map or other information shows that the APE does not contain landforms on which human settlement or occupation typically occurred.

☒ The Atlas map or other information shows that the APE does contain landforms on which human settlement or occupation typically occurred, or this issue was not resolved with the available information.

As **Attachments 2-2** through **2-8** show, the APE contains two unnamed creek crossings, as well as a crossing of Running Branch, with terraces and floodplains with a potential to contain shallowly buried (3.0 feet [ft] or less below ground surface) and deeply buried (greater than 3.0 ft below ground surface) archeological materials. There are also upland ridges and hill tops overlooking the creeks that may contain archeological sites with surficial to shallowly buried artifacts and features. The portions of these landforms within the existing ROW have been extensively modified and disturbed by utilities, roadway construction, land clearing and grading, and development. Whereas areas of proposed ROW and existing easements adjacent to the existing ROW appear relatively intact.

- **Prior Disturbances**

Settings that are favorable for human occupation have been subject to the following previous disturbances *(check all that apply).*

☒ Previous road construction and maintenance.

☒ Installations of utilities.

☒ Modern land use practices like plowing, grade modifications, brush clearing, and tree removal,

☒ Industrial, commercial, urban and/or suburban development

☒ Erosion and scouring by natural causes.

☐ Other (identify)

☐ NO PRIOR DISTURBANCES OR UNKNOWN (do not check any foregoing disturbances)

- **Previous Archeological Surveys**

☐ The majority of the settings with high potential for archeological sites within or adjacent to the APE have been previously surveyed.

☒ The majority of the settings with high potential for archeological sites within or adjacent to the APE have not been previously surveyed.

The Atlas (2020) review indicated that there are nine previous archeological project areas within the 1,000-meter search radius; three test excavations and six surveys (see **Attachment 3-1** and **Attachment 3-2**, **Table 2**). None of the previous project areas overlap with the current APE, though two are adjacent to FM 2931.

Conclusions

- **Results of Previous Investigations**

☐ Previous surveys have covered a sufficient proportion of the APE or adjacent areas to conclude that the APE and adjacent areas are unlikely to contain archeological sites or cemeteries.

☒ Previous surveys have not covered a sufficient proportion of the APE or adjacent areas to draw inferences regarding the presence of archeological sites and cemeteries, or previous surveys show that archeological sites and/or cemeteries are present within the APE.

The APE and adjacent areas have not been subject to archeological survey investigations, and there are no previously recorded archeological sites within the APE (see **Attachment 3-1** and **Attachment 3-2, Table 1**). Given the lack of previous survey for FM 2931 and the PALM data, the APE has a potential to contain buried intact prehistoric or historic-age archeological historic properties eligible for the NRHP or sites warranting SAL designation.

- **APE Integrity (Prehistoric Sites)**

The APE contains no deposits with sufficient integrity that prehistoric archeological sites would have the potential to address important questions. Any such sites would lack integrity of *(check all that apply):*

☐ Location

☐ Design

☐ Materials

☐ Association

☐ Other (*identify*)

☒ THE APE HAS THE POTENTIAL TO PRESERVE SITES WITH SUFFICIENT INTEGRITY TO QUALIFY THOSE SITES FOR INCLUSION IN THE NATIONAL REGISTER OF HISTORIC PLACES *(if true, do not check any of the forgoing aspects of integrity).*

The existing FM 2931 ROW is sufficiently disturbed from surface and subsurface utilities and previous roadway construction that there is little to no potential for those parts of the APE to contain buried, intact prehistoric archeological properties eligible for the NRHP or sites warranting SAL designation unless buried within deep soils at relatively intact creek crossings where previous impacts are minimal (i.e., low density of buried utilities). However, as depicted in **Attachment 4-1** through **4-7,** there are areas of proposed ROW and some existing easements with a potential to contain shallowly and deeply buried intact prehistoric archeological historic properties eligible for the NRHP or sites warranting SAL designation (except in previously impacted areas disturbed by land use and development).

- **APE Integrity (Historic-Age Sites)**

The APE contains no deposits with sufficient integrity that historic-age archeological sites would have the potential to address important questions. Any such sites would lack integrity of *(check all that apply)*:

☐ Location

☐ Design

☐ Materials

☐ Association

☐ Other (*identify*)

☒ THE APE HAS THE POTENTIAL TO PRESERVE SITES WITH SUFFICIENT INTEGRITY TO QUALIFY THOSE SITES FOR INCLUSION IN THE NATIONAL REGISTER OF HISTORIC PLACES *(if true, do not check any of the forgoing aspects of integrity)*

The existing ROW is sufficiently disturbed from surface and subsurface utilities and previous roadway construction that there is little to no potential for those parts of the APE to contain buried, intact historic-age archeological properties eligible for the NRHP or sites warranting SAL designation unless buried within deep soils at relatively intact creek crossings where previous impacts have been minimal (i.e., low density of buried utilities). However, as depicted in **Attachment 4-1** through **4-7,** there are areas of proposed ROW and some existing easements with a potential to contain shallowly and deeply buried intact historic-age archeological historic properties eligible for the NRHP or sites warranting SAL designation (except in previously impacted areas disturbed by land use and development).

- **Results of Historic Map Research (Historic Age Sites)**

☐ Historic map research shows that historic-era archeological deposits are not likely to occur within or adjacent to the APE

☒ Historic map research shows that historic-era archeological deposits could occur within or adjacent to the APE; this research was inconclusive; or this research was not completed because it was not necessary to reach justifiable conclusions.

The 1939 highway map of Denton County (TSHD 1939) and the 1960 Aubrey, Texas and Little Elm, Texas 1:24,000 topographic quadrangle maps (USGS 1960a and 1960b) show that historic-era archeological deposits may be present within or adjacent to the APE (**Attachment 5** and **Attachment 6**). Both **Attachments 5** and **6** reveal a number of buildings and houses within and adjacent to the APE in the mid-1930s through 1960. Although an unknown number of these are no longer standing since 1960 (particularly those within the current alignment of FM 2931), there is potential for archeological deposits associated with former building locations within the proposed ROW and existing easements.

- **Results of Map Research (Cemeteries)**

☒ Map research shows that cemeteries are not likely to occur within or adjacent to the APE.

☐ Map research shows that cemeteries could occur within or adjacent to the APE, or this research was inconclusive.

- **Results of Landform Study**

☐ The APE and adjacent areas occur in a setting that was not conducive to human occupation and activity

☒ The APE and adjacent areas occur in a setting that was conducive to human occupation and activity.

There are three creek crossings (Running Branch and two unnamed drainages) with terraces and floodplains within and adjacent to the APE with a potential to contain shallowly and deeply buried archeological materials. There are also upland ridges and hill tops overlooking the creeks that may contain archeological sites with surficial to shallowly buried artifacts and features. However, the portions of those landforms within the existing FM 2931 ROW have been extensively modified and disturbed by utilities, roadway construction, land clearing and grading, and residential development. In contrast, these landforms are more intact outside the existing FM 2931 ROW and could contain buried intact archeological historic properties eligible for the NRHP or sites worthy of SAL designation.

Recommendations

- **Shallow Deposits**

  Evaluate the potential for shallow deposits (Holocene-age deposits less than three-feet in depth) within the APE to contain archeological historic properties and cemeteries. Make appropriate recommendations regarding the need for further work, including the need for shovel test pits, auger probes, or other methods for evaluating shallow deposits.

  The FM 2931 APE encompasses 132.09 acres, 84.11 acres of existing ROW, 45.85 acres of proposed ROW, and 2.13 acres of easements. Out of the 132.09-acre APE, the 84.11 acres of existing FM 2931 ROW, due to previous impacts from surface and subsurface utilities and roadway construction, has little to no potential to contain shallowly buried intact archeological historic properties eligible for the NRHP or sites warranting SAL designation, and is not recommended for survey.

  Given the PALM data, upland landforms, and disturbances from development, 35.24 acres of proposed ROW and easements have a generally low potential to contain shallowly buried prehistoric archeological historic properties eligible for the NRHP or sites warranting SAL designation. However, due to the PALM data's limitations regarding historic-age resources, the 35.24 acres have a potential for surficial to shallowly buried historic-age archeological historic properties eligible for the NRHP or sites warranting SAL designation. Based on these data, Hicks & Company recommends that those 35.24 acres of proposed ROW and easements warrant pedestrian survey with judgmental subsurface investigations (i.e., shovel test excavations) as necessary based on field conditions (see Attachments 7-1 through 7-8).

  The remaining 12.74 acres of APE have a moderate to high potential to contain deeply buried intact archeological materials (see below).

- **Deep Deposits**

  Evaluation of deep deposits (Holocene-age deposits of three feet or greater depth) may or may not be necessary, depending on the nature of the sediments within the APE and the depth of proposed impacts. If Holocene-age deposits extend to three feet or more within the APE and would be impacted by the project, make appropriate recommendations regarding the need for further work. If no deep, Holocene-age deposits occur within the APE note that they are absent and indicate that no additional work in needed. If the deep Holocene deposits are present but the project either would not affect them or they have been too extensively disturbed to hold intact archeological deposits, provide an appropriate justification that no additional work is needed.

  On Attachments 7-1 through 7-8, the 12.74 acres of proposed ROW and existing easements with a moderate to high potential to contain prehistoric archeological materials are encompassed within High Potential Areas (HPAs) 1 through 13. Based on the PALM data, the HPAs include the FM 2931 crossings of Running Branch (HPAs 8 and 9) and two unnamed drainages (HPAs 1, 2, 5, and 6), as well as seven additional non-stream based locations (HPAs 3, 4, 7, and 10 through 13) that also have a potential to contain intact shallow and/or deeply buried prehistoric archeological historic properties eligible for the

NRHP or sites warranting SAL designation. Given these data, Hicks & Company recommends that HPAs 1 through 13 should be subjected to a pedestrian survey augmented with systematic subsurface investigations (i.e., shovel test and/or backhoe trench excavations as necessary based on field conditions).

- **Recommendations Summary (select only one check box)**

☐ No further study needed ☐ Survey of entire APE ☒ Variable, see **Attachments 7-1** through **7-8**.

- **Results Valid Within**

The purpose of considering adjacent areas is to define, when possible, a buffer zone around the APE to which findings of no effect and recommendations for no further work can be extended. No additional investigation should be necessary if a subsequent design change expands the APE into the buffer zone. In some cases, however, no buffer zone may be reasonably defined for the project or portions of the project as expansion of the APE may warrant survey. In such cases, check the middle box and indicate that the results are valid within zero feet of the APE.

☐ 50 feet of APE ☒ 0 feet of APE ☐ Variable, see attached figure

- **The Definition and Evaluation of this Horizontal Buffer Zone is Based on One or More of the Following Considerations**

☒ The integrity of the areas within and adjacent to the setting is affected by prior development.

☐ Previous investigations show that archeological materials are unlikely to exist in this area.

☒ Adjacent areas have potential to preserve archeological sites with good integrity.

☐ Other (specify)

Findings of no effect to archeological historic properties and/or SALs and recommendations for no further work apply to all areas within the horizontal buffer zone, as specified in the previous section. Any design change within this study area would not require further action or review beyond those actions recommended in this study. Design changes that either extend beyond the buffer zone or result in potential impacts deeper than the impacts considered in this report would require additional review. Note that no buffer zone may be defined for some projects, based on local conditions.

References Cited

Abbott, James T.
2013 *Rapid, Broad-Scale Modeling of Generalized Archeological Integrity Potential in Texas Using Extant GIS Data*. Texas Department of Transportation Environmental Affairs Division.

Texas Archeological Site Atlas (Atlas)
2020 Texas Historical Commission. http://nueces.thc.state.tx.us/. Accessed July 10, 2020.

Texas State Highway Department (TSHD)
1939 *General Highway Map, Denton County, Texas*. Austin.

United States Geological Survey (USGS)
1960a *Aubrey, Texas* 1:24,000 topographic quadrangle map.

1960b *Little Elm, Texas* 1:24,000 topographic quadrangle map.

Attachments

Attachment 1: Project Location Map

Attachment 2-1: Project Information (ECOS)

Attachment 2-2 through 2-8: Area of Potential Effects

Attachment 3-1: Previous Investigations, Previously Recorded Archeological Sites, and Recorded Cemeteries within One Kilometer of the Area of Potential Effects

Attachment 3-2: Tables

- Table 1. Previously Recorded Archeological Sites within 1,000 meters of the APE
- Table 2. Previous Investigations within 1,000 meters of the APE

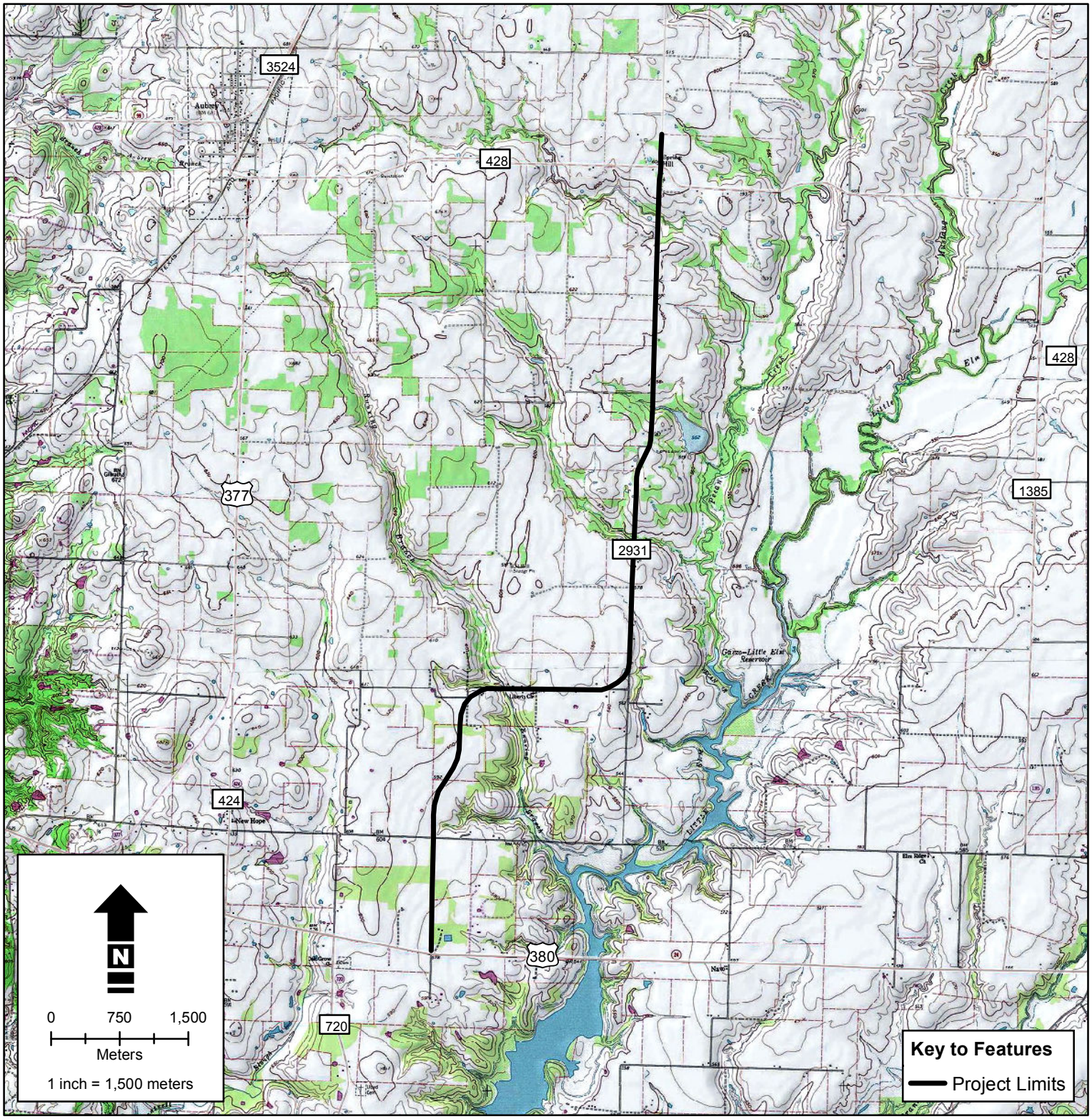
Attachment 4-1 through 4-7: Potential Archeological Liability Map (PALM)

Attachment 5: 1960 *Aubrey, Texas* and *Little Elm, Texas* 1:24,000 Topographic Quadrangle Map

Attachment 6: 1939 *General Highway Map, Denton County, Texas*

Attachment 7-1 through 7-8: Survey Recommendations

Attachment 1: Project Location Map



Attachment 1

Project Location

FM 2931 from FM 428 to US 380
Denton County, Texas
CSJ: 2979-01-011

USGS 7.5-minute Topographic Quadrangles:
Little Elm (33096-B8), & Aubrey (33096-C8), TX

Attachment 2-1: Project Information (ECOS)

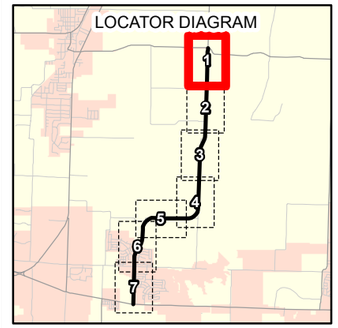
See Project Description in ECOS.

Attachment 2-2 through 2-8: Area of Potential Effects

Attachment 2-2

Area of Potential Effects

FM 2931 from FM 428 to US 380
Denton County, Texas
CSJ: 2979-01-011



Key to Features

- Wetland (NWI)
- Parcel Boundary
- Stream (NHD)

APE Features

- Existing ROW
- Proposed ROW
- Existing Easement

N

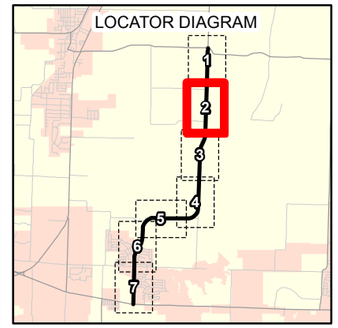
0 60 120
Meters

1 inch = 120 meters

Attachment 2-3

Area of Potential Effects

FM 2931 from FM 428 to US 380
Denton County, Texas
CSJ: 2979-01-011



Key to Features

- Wetland (NWI)
- Parcel Boundary
- Stream (NHD)

APE Features

- Existing ROW
- Proposed ROW
- Existing Easement

N

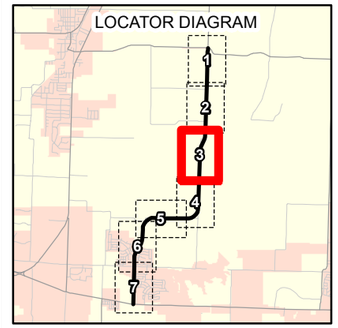
0 60 120
Meters

1 inch = 120 meters

Attachment 2-4

Area of Potential Effects

FM 2931 from FM 428 to US 380
Denton County, Texas
CSJ: 2979-01-011



Key to Features

- Wetland (NWI)
- Parcel Boundary
- Stream (NHD)

APE Features

- Existing ROW
- Proposed ROW
- Existing Easement

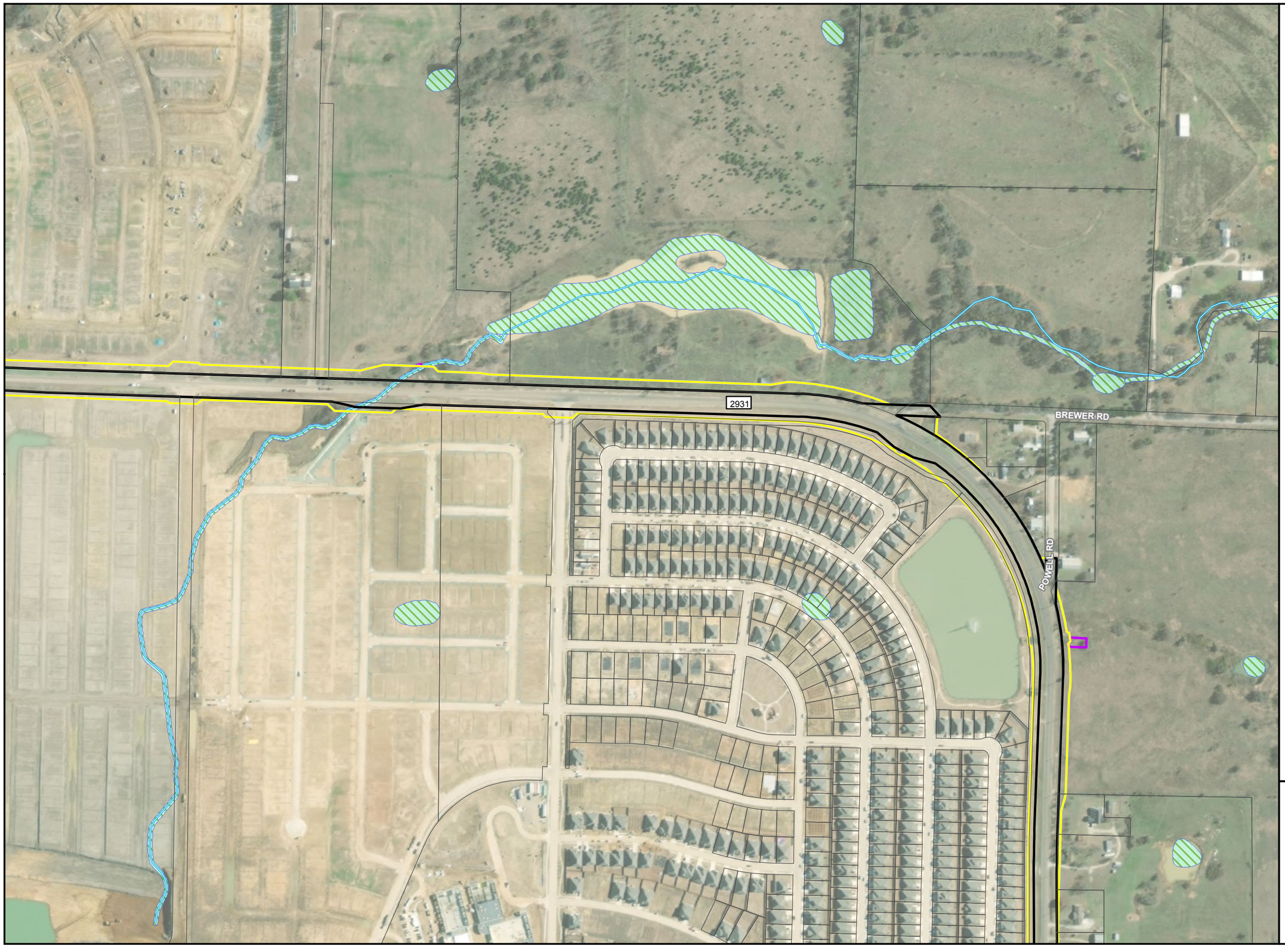
KNUCKLES RD

2931

N

0 60 120
Meters

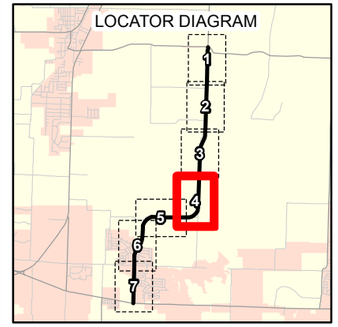
1 inch = 120 meters



Attachment 2-5

Area of Potential Effects

FM 2931 from FM 428 to US 380
Denton County, Texas
CSJ: 2979-01-011



Key to Features

- Wetland (NWI)
- Parcel Boundary
- Stream (NHD)

APE Features

- Existing ROW
- Proposed ROW
- Existing Easement

N

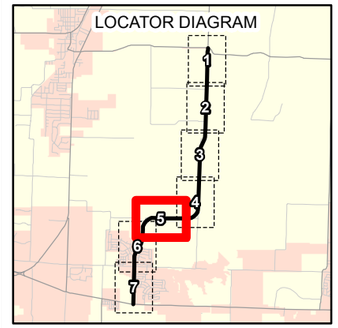
0 60 120
Meters

1 inch = 120 meters

Attachment 2-6

Area of Potential Effects

FM 2931 from FM 428 to US 380
Denton County, Texas
CSJ: 2979-01-011

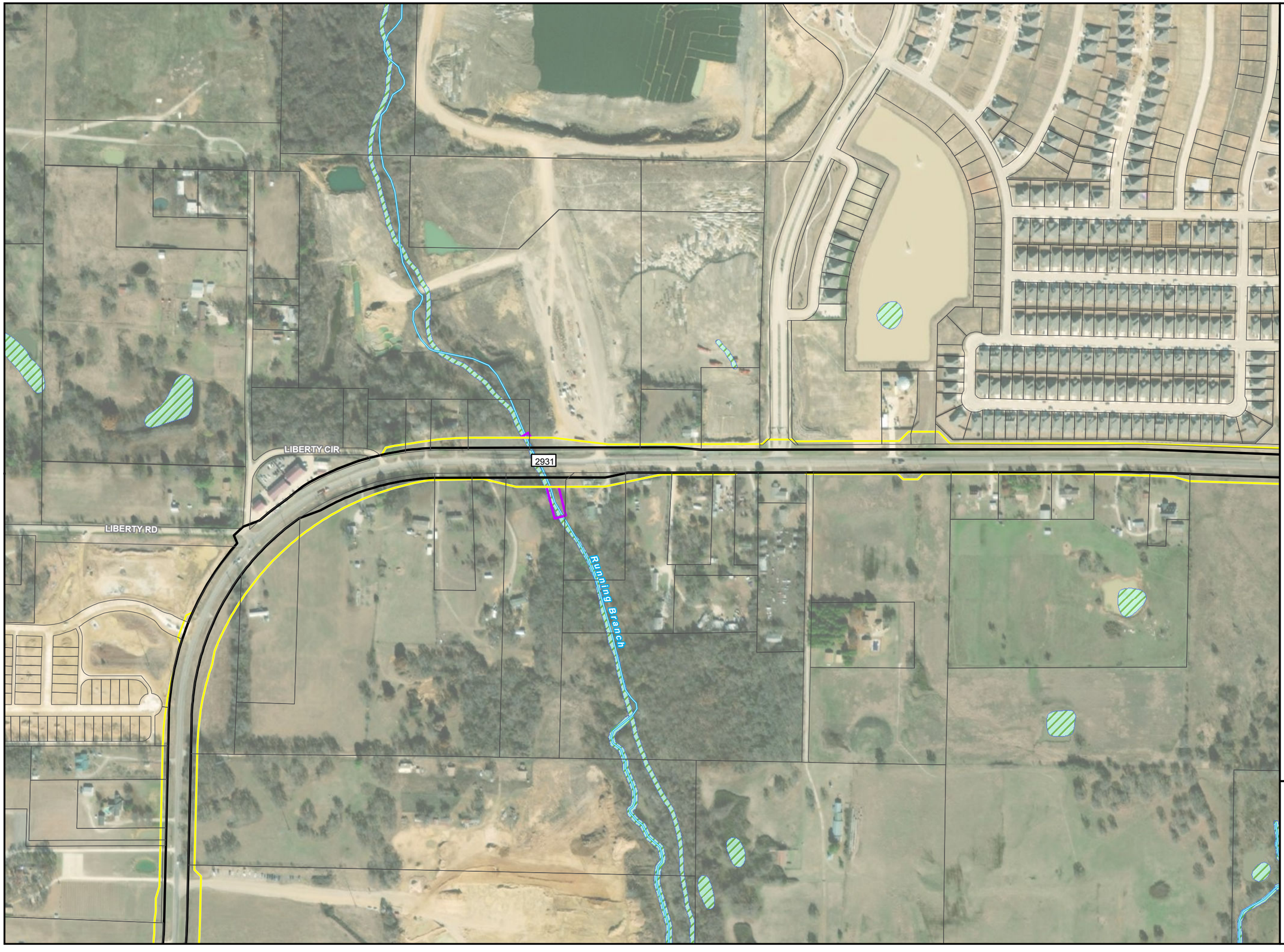


Key to Features

- Wetland (NWI)
- Parcel Boundary
- Stream (NHD)

APE Features

- Existing ROW
- Proposed ROW
- Existing Easement



N

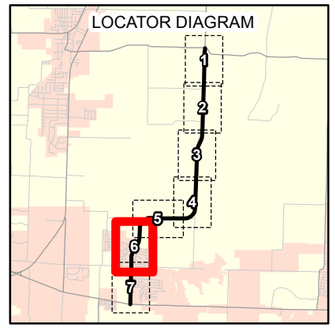
0 60 120
Meters

1 inch = 120 meters

Attachment 2-7

Area of Potential Effects

FM 2931 from FM 428 to US 380
Denton County, Texas
CSJ: 2979-01-011



Key to Features

- Wetland (NWI)
- Parcel Boundary
- Stream (NHD)

APE Features

- Existing ROW
- Proposed ROW
- Existing Easement

N

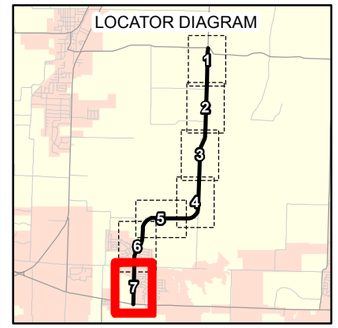
0 60 120
Meters

1 inch = 120 meters

Attachment 2-8

Area of Potential Effects

FM 2931 from FM 428 to US 380
Denton County, Texas
CSJ: 2979-01-011



Key to Features

- Wetland (NWI)
- Parcel Boundary
- Stream (NHD)

APE Features

- Existing ROW
- Proposed ROW
- Existing Easement

N

0 60 120
Meters

1 inch = 120 meters

Attachment 3-1: Previous Investigations, Previously Recorded Archeological Sites, and Recorded Cemeteries within One Kilometer of the Area of Potential Effects

Attachment 3-1

Previous Investigations, Known Sites & Cemeteries

FM 2931 from FM 428 to US 380
Denton County, Texas
CSJ: 2979-01-011

Key to Features

- Project Limits
- Stream (NHD)
- Archeological Survey (Linear)
- Archeological Survey (Areal)
- Archeological Site (Areal)
- Archeological Site (points)
- Cemetery

0 400 800
Meters

1 inch = 800 meters

Attachment 3-2: Tables

Table 1. Previously Recorded Archeological Sites within 1,000 meters of the APE				
Site Number	**Site Type**	**Distance from APE (meters)**	**Eligibility Status**	**Comments**
41DN40	Historic-age farmstead	920	Recommended eligible	Test excavations completed
41DN366	Prehistoric open campsite and historic homesite	1,000	Not recommended eligible	No additional work conducted
41DN380	Prehistoric camp	830	Recommended eligible	Test excavations completed
41DN618	Historic-age farmstead	Adjacent	Not recommended eligible	House site with nine associated features
41DN619	Prehistoric lithic scatter	160	Not recommended eligible	Site extends to adjacent areas

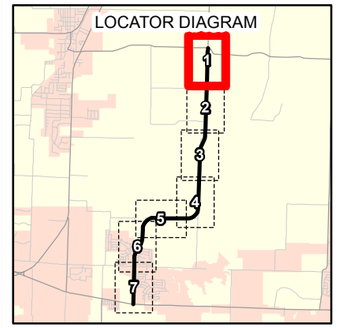
Table 2. Previous Investigations within 1,000 meters of the APE						
Project Type	**Project Name**	**Antiquities Permit**	**Date of Investigations**	**Agency/Sponsoring Entity**	**Investigative Firm**	**Principal Investigator**
Survey	Unknown	None	1980	Natural Resources Conservation Service (NRCS)	Unknown	Unknown
Survey	Lake Lewisville	None	1990	U.S. Army Corps of Engineers (USACE) (Fort Worth District)	Unknown	Unknown
Test Excavations	Lake Lewisville	None	1991	USACE (Fort Worth District)	Unknown	Unknown
Test Excavations	Lake Lewisville/41DN40	None	1991	USACE (Fort Worth District)	Unknown	Unknown
Test Excavations	Lake Lewisville/41DN380	None	1991	USACE (Fort Worth District)	Unknown	Unknown
Survey	US 380	None	1992	Federal Highway Administration (FHWA)	Texas Department of Transportation (TxDOT)	Unknown
Survey	Oak Point Substation and Transmission Line	None	2017	Brazos Electric Cooperative	Cox|McLain	M. Greene
Survey	Enclave at Pecan Creek	None	2019	USACE (Fort Worth District)	Cox|McLain	Unknown
Survey	EMLI at Pecan Creek Housing Development	None	2019	Housing and Urban Development (HUD)	AR Consultants	Unknown

Attachment 4-1 through 4-7: Potential Archeological Liability Map (PALM)

Attachment 4-1

Potential Archeological Liability Maps

FM 2931 from FM 428 to US 380
Denton County, Texas
CSJ: 2979-01-011



Key to Features

- Stream (NHD)
- 0-Negligible Potential
- 1-Low Potential
- 4-Moderate shallow potential, low deep potential
- 5-Moderate potential
- 8-High shallow potential, moderate deep potential
- 9-High potential

APE Features

- Existing ROW
- Proposed ROW
- Existing Easement

N

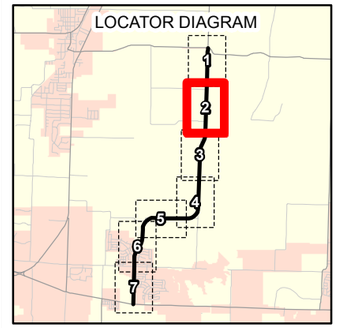
0 60 120
Meters

1 inch = 120 meters

Attachment 4-2

Potential Archeological Liability Maps

FM 2931 from FM 428 to US 380
Denton County, Texas
CSJ: 2979-01-011



Key to Features

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- 5-Moderate potential
- 8-High shallow potential, moderate deep potential

APE Features

- Existing ROW
- Proposed ROW
- Existing Easement

2931
REDFEARN RD
MCNATT RD

N

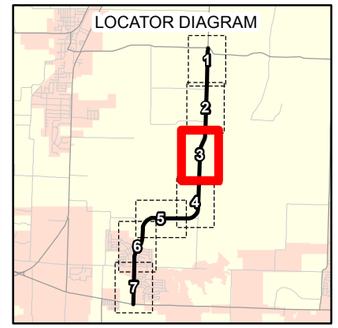
0 60 120
Meters

1 inch = 120 meters

Attachment 4-3

Potential Archeological Liability Maps

FM 2931 from FM 428 to US 380
Denton County, Texas
CSJ: 2979-01-011



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- 2-Low shallow potential, moderate deep potential
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- 5-Moderate potential
- 8-High shallow potential, moderate deep potential
- 9-High potential

APE Features

- Existing ROW
- Proposed ROW
- Existing Easement

N

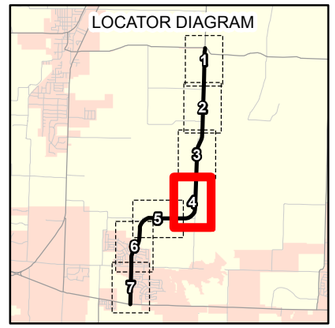
0 60 120
Meters

1 inch = 120 meters

Attachment 4-4

Potential Archeological Liability Maps

FM 2931 from FM 428 to US 380
Denton County, Texas
CSJ: 2979-01-011



Key to Features

- Stream (NHD)
- 0-Negligible Potential
- 1-Low Potential
- 4-Moderate shallow potential, low deep potential
- 5-Moderate potential

APE Features

- Existing ROW
- Proposed ROW
- Existing Easement

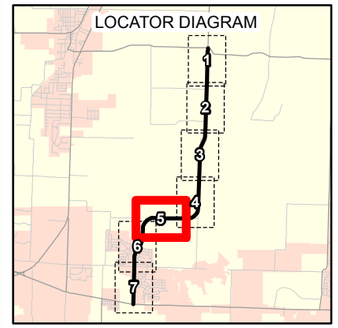
0 60 120
Meters

1 inch = 120 meters

Attachment 4-5

Potential Archeological Liability Maps

FM 2931 from FM 428 to US 380
Denton County, Texas
CSJ: 2979-01-011



Key to Features

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- 1-Low Potential
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- 6-Moderate shallow potential, high deep potential
- 8-High shallow potential, moderate deep potential
- 9-High potential

APE Features

- Existing ROW
- Proposed ROW
- Existing Easement

N

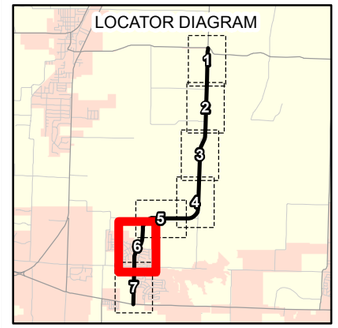
0 60 120
Meters

1 inch = 120 meters

Attachment 4-6

Potential Archeological Liability Maps

FM 2931 from FM 428 to US 380
Denton County, Texas
CSJ: 2979-01-011



Key to Features

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- 1-Low Potential
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- 5-Moderate potential
- 8-High shallow potential, moderate deep potential

APE Features

- Existing ROW
- Proposed ROW
- Existing Easement

N

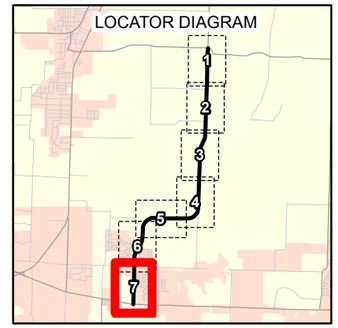
0 60 120
Meters

1 inch = 120 meters

Attachment 4-7

Potential Archeological Liability Maps

FM 2931 from FM 428 to US 380
Denton County, Texas
CSJ: 2979-01-011



Key to Features

- Stream (NHD)
- 0-Negligible Potential
- 1-Low Potential
- 4-Moderate shallow potential, low deep potential

APE Features

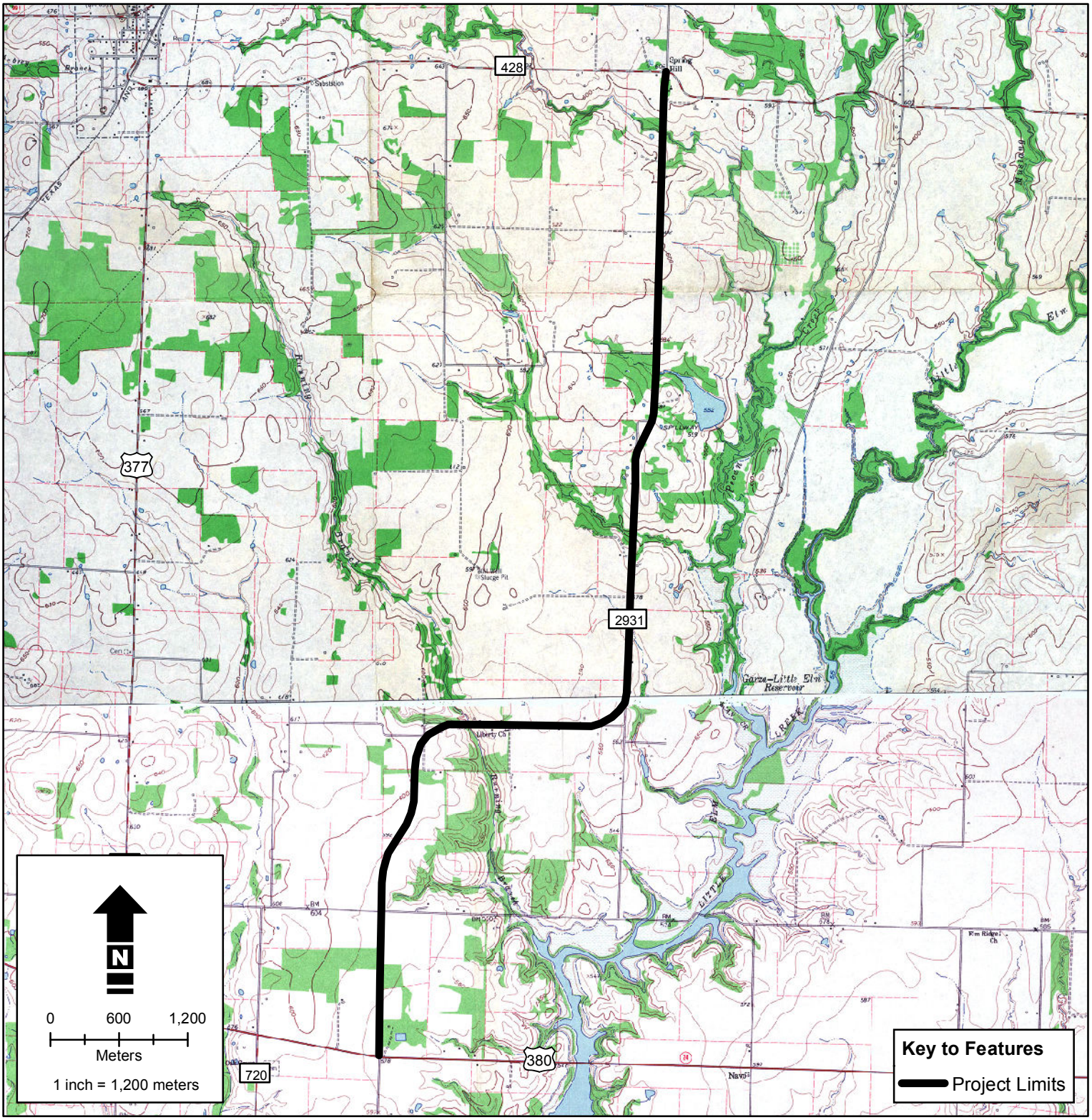
- Existing ROW
- Proposed ROW
- Existing Easement

N

0 60 120
Meters

1 inch = 120 meters

Attachment 5: 1960 *Aubrey, Texas* and 1960 *Little Elm, Texas 1:24,000* Topographic Quadrangle Map



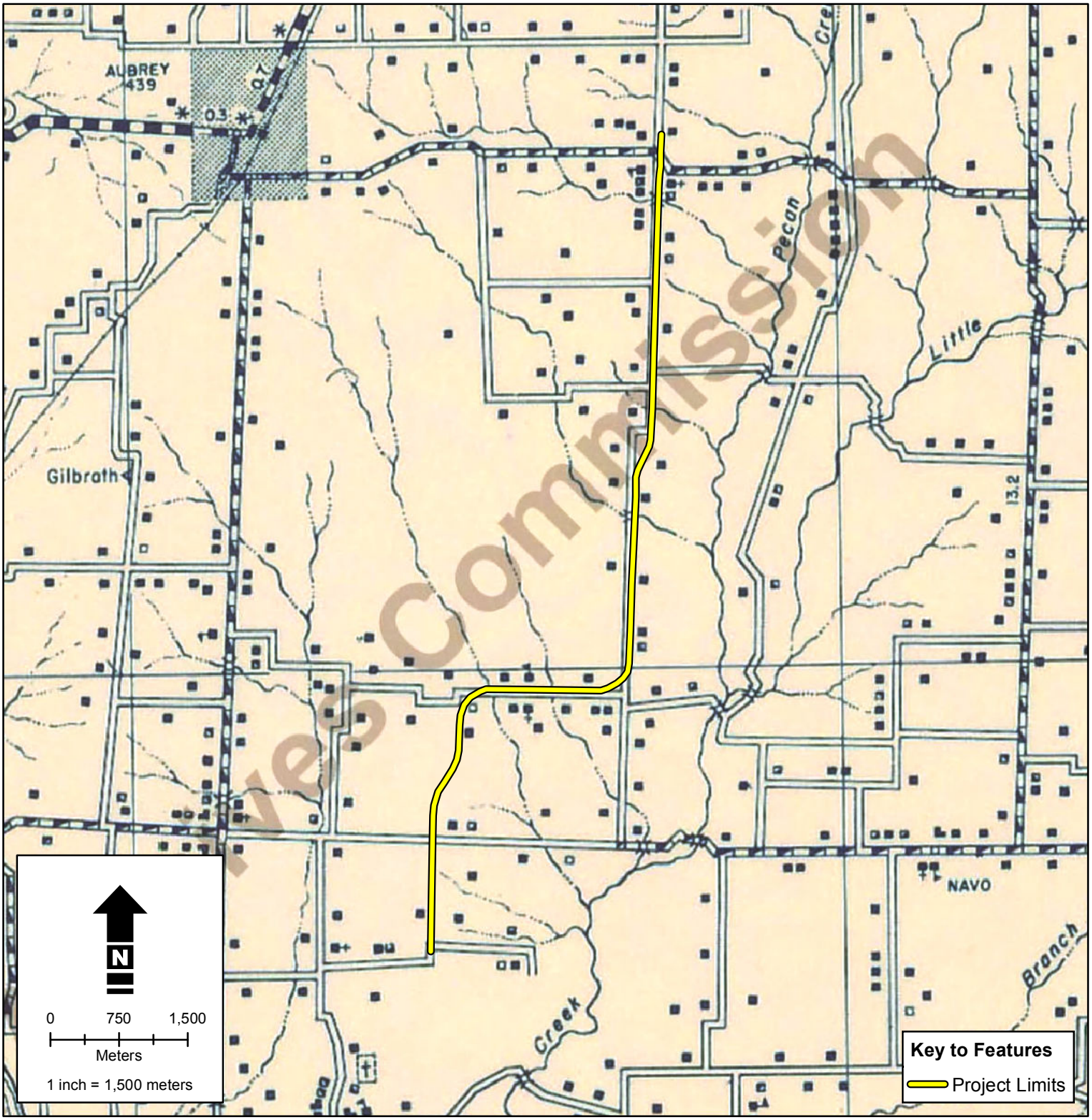
Attachment 5

1960 USGS Historic Topographic Map

FM 2931 from US 380 to FM 428
Denton County, Texas
CSJ: ????-??-???

USGS 7.5-minute Topographic Quadrangles:
Little Elm (33096-B8), & Aubrey (33096-C8), TX

Attachment 6: 1939 *General Highway Map, Denton County, Texas*



Attachment 6

1936 (Revised 1939) General Highway Map

FM 2931 from FM 428 to US 380
Denton County, Texas
CSJ: 2979-01-011

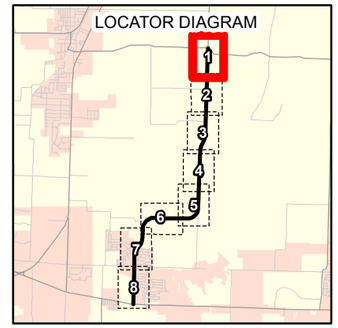
USGS 7.5-minute Topographic Quadrangles:
Little Elm (33096-B8), & Aubrey (33096-C8), TX

Attachment 7-1 through 7-8: Survey Recommendations

Attachment 7-1

Survey Recommendations

FM 2931 from FM 428 to US 380
Denton County, Texas
CSJ: 2979-01-011



Key to Features

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- Judgmental Subsurface Investigations
- Stream (NHD)
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- 9-High potential

APE Features

- Existing ROW
- Proposed ROW
- Existing Easement

N

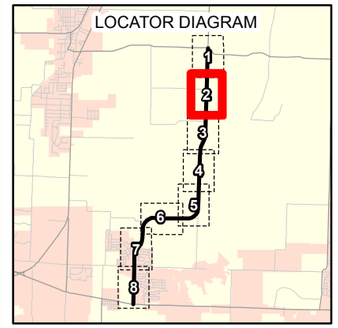
0 50 100
Meters

1 inch = 100 meters

Attachment 7-2

Survey Recommendations

FM 2931 from FM 428 to US 380
Denton County, Texas
CSJ: 2979-01-011



Key to Features

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- Stream (NHD)
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APE Features

- Existing ROW
- Proposed ROW
- Existing Easement

N

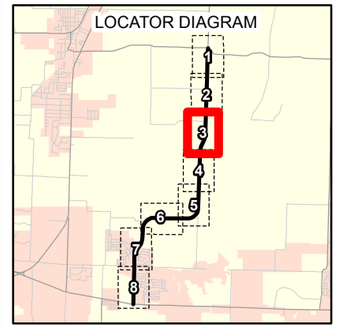
0 50 100
Meters

1 inch = 100 meters

Attachment 7-3

Survey Recommendations

FM 2931 from FM 428 to US 380
Denton County, Texas
CSJ: 2979-01-011



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APE Features

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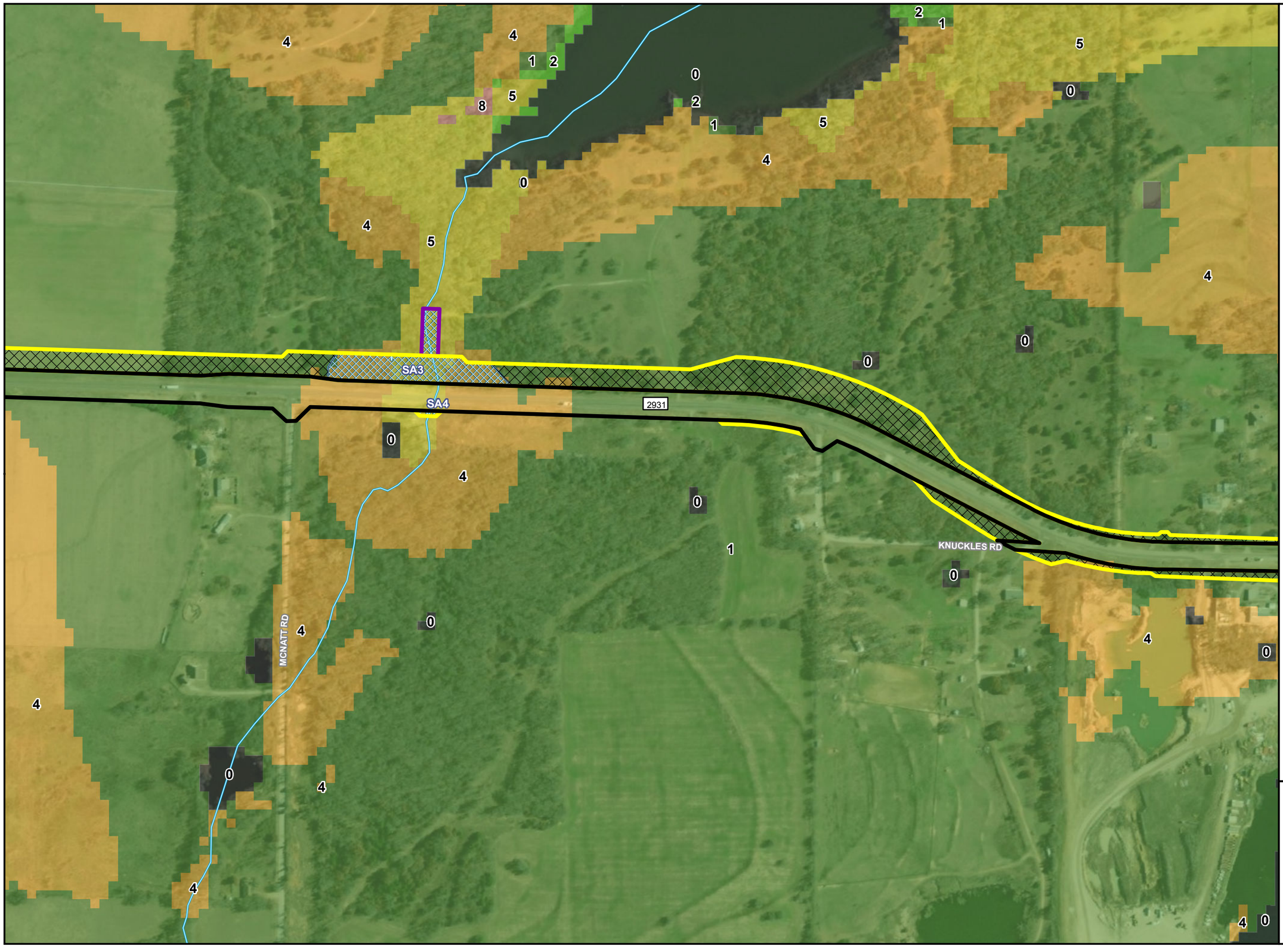


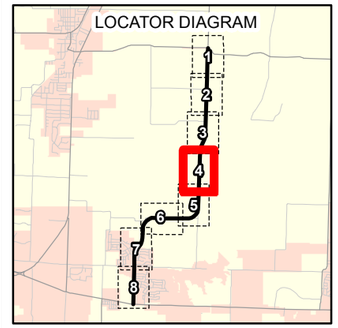
0 50 100
Meters

1 inch = 100 meters

Attachment 7-4

Survey Recommendations

FM 2931 from FM 428 to US 380
Denton County, Texas
CSJ: 2979-01-011



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APE Features

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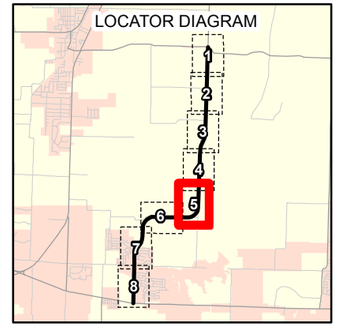
Meters

1 inch = 100 meters

Attachment 7-5

Survey Recommendations

FM 2931 from FM 428 to US 380
Denton County, Texas
CSJ: 2979-01-011



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- 0-Negligible Potential
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APE Features

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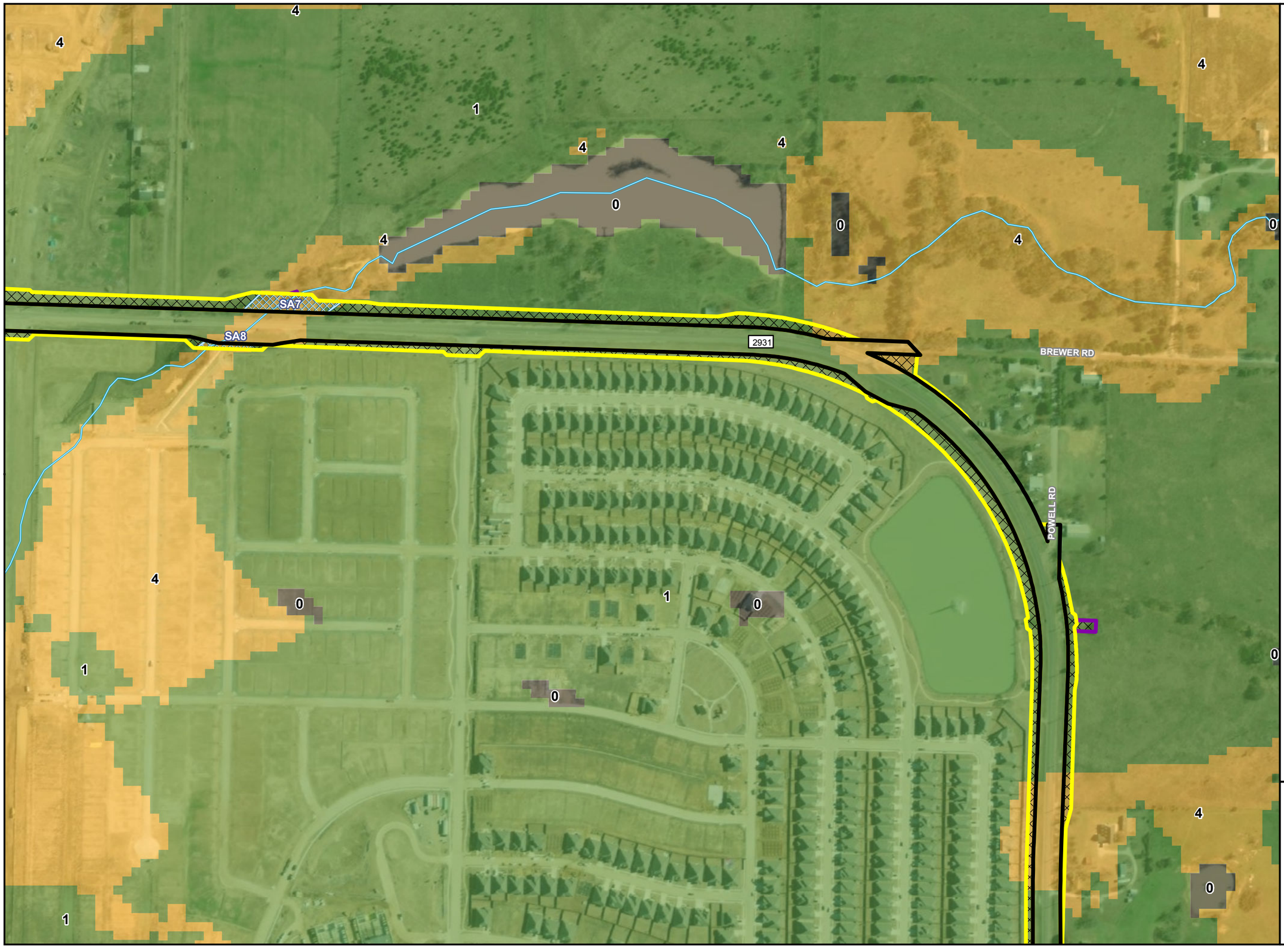


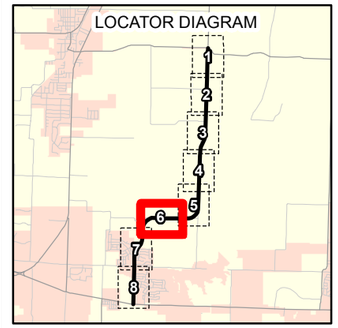
0 50 100
Meters

1 inch = 100 meters

Attachment 7-6

Survey Recommendations

FM 2931 from FM 428 to US 380
Denton County, Texas
CSJ: 2979-01-011



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APE Features

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- Existing Easement

N

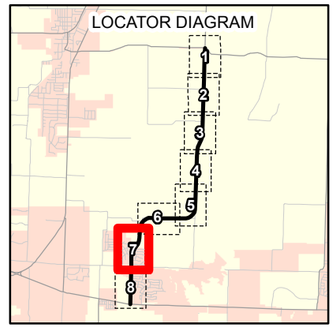
0 50 100
Meters

1 inch = 100 meters

Attachment 7-7

Survey Recommendations

FM 2931 from FM 428 to US 380
Denton County, Texas
CSJ: 2979-01-011



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- Proposed ROW
- Existing Easement

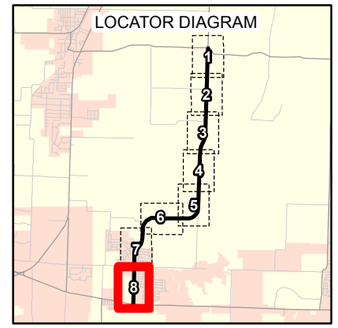
0 50 100
Meters

1 inch = 100 meters

Attachment 7-8

Survey Recommendations

FM 2931 from FM 428 to US 380
Denton County, Texas
CSJ: 2979-01-011



Key to Features

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- Stream (NHD)
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APE Features

- Existing ROW
- Proposed ROW
- Existing Easement

0 50 100
Meters

1 inch = 100 meters

This report was written on behalf of the Texas Department of Transportation by:

HICKS & COMPANY

ENVIRONMENTAL
ARCHEOLOGICAL
AND PLANNING
CONSULTANTS