Archeological Background Study

Project Name: FM 1173 from FM 156 to Interstate Highway 35

Highway: FM 1173

District(s): Dallas District

County(s): Denton County

CSJ Number(s): 1059-01-047 and 1059-02-002

Author and Affiliation: Brittany S. McClain, AmaTerra Environmental

Report Completion Date: 3-6-2020

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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; proposed, new project right of way; 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 map of the APE, which is based on the project information attached as Attachment 2.

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.

☐ Predictive Archeological Liability Map (PALM) is attached if available *(consult TxDOT's Environmental Compliance Toolkit).*

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

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

☐ FEMA flood hazard map is attached.

☐ National Wetlands Inventory map is attached

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

☒ Historic topographic map is attached.

☐ Historic soils map is attached.

☐ Historic road map is attached.

☐ As-built plans for roadway are attached.

☒ Other map of historic information is attached.

Specify Map: 1952 USGS Aerial photograph

☒ Aerial images are attached.

☐ 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

The only site recorded within a kilometer of the APE is 41DN535, which is west of APE (west of N. Masch Branch Road). 41DN535 was documented in 2005 during a PBS&J survey. The Atlas site form identifies the site as a historic surface scatter containing color glass fragments (n=2), cast iron stove fragment (n=1), and whiteware fragments (n=8). No further work was recommended due to the lack of site integrity and sparsity among the artifacts. See Attachment 3.

- **Previously–Identified Cemeteries**

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

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

No cemeteries were identified within a kilometer of the APE. See Attachment 3.

- **Holocene-Age Deposits**

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

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

The project area is underlain by the Pawpaw Formation, Weno Limestone, and Denton Clay, undivided (Kpd) which dates to the Early Cretaceous. Soils within the APE are loamy residuum, calcareous clayey alluvium, clayey alluvium, and clayey residuum. See Attachment 4.

- **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.

There are several creeks and streams which cross the APE. Additionally, several ponds were identified near the APE. However, it is unclear as to whether the ponds were established along natural features, which may or may not have been historically reliable.

- **Wetlands and Frequently-Flooded Areas**

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

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

These areas that contain wetlands or frequently-flooded areas are associated with some of the four stream crossings within the proposed project area (see **Attachment 1**).

- **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.

The APE is located in an area with relatively flat topography, however, there are several low terrace landforms adjacent to creeks which cross the APE (see **Attachment 1**).

- **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)

The majority of disturbance caused by development is located in the western half of the APE. The eastern half of the APE is largely rural with impacts typically associated with roadway construction, utilities, and plowing.

☐ 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 APE has not been previously surveyed and areas with archeological potential, located adjacent to streams and creeks, cross the APE at multiple points, especially in the eastern portion of the APE where minimal urban disturbances have occurred. See Attachments 1 and 3.

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

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.

- **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*)

Areas identified as having potential for Holocene deposits are located in the western half of the project area, where the APE has less obvious disturbance.

☒ 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)*

- **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*)

Several properties are depicted along or within the APE on a 1952 aerial photograph (**Attachment 5**) in addition a 1961 topographic map (**Attachment 6**). These properties are still present within the APE (**Attachment 1**).

☒ 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)*

- **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.

- **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; research on this issue was inconclusive; or this research was not completed because it was not necessary to reach justifiable conclusions.

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 APE contains four stream crossings within the proposed project limits. As no portion of the APE has been previously surveyed, there may be a high potential for prehistoric cultural deposits situated near areas that cross streams and creeks. Other portions of the APE have little topographic relief and soils are ancient with low potential to contain intact prehistoric deposits. As there are multiple historic properties located within or in proximity to the western portion of the APE, there is a moderate to high potential to encounter historic materials associated with these properties. As such, survey is recommended for the proposed FM 1173 project. The survey should include pedestrian survey with 100 percent surface inspection of the APE and shovel testing in locations where past disturbance (e.g. plowing and grading) may not have significantly impacted buried deposits.

- **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.

Geology and soils data indicate that no Holocene deposits are present within the APE (see Attachment 4). However, there are low terrace landforms along the creeks which cross-cut the APE where sites may be located. Trenching should be considered in these areas where shovel testing shows there is potential for deep soil deposits which may contain cultural deposits.

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

☐ No further study needed ☒ Survey of entire APE ☐ Variable, see attached figure

- **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)

Any proposed design changes, particularly within the eastern half of the APE where less development has occurred, may require additional coordination.

Findings of no effect to archeological historic properties and/or State Antiquities Landmarks 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

Griffith, Glenn, Sandy Bryce, James Omernik, and Anne Rogers

2007 Ecoregions of Texas. Project Report to Texas Commission on Environmental Quality. Electronic Document, accessed February 2020.

Texas Historical Commission

2020 Texas Archeological Sites Atlas Online. Electronic document, http://atlas.thc.tx.gov/, accessed February 2020.

United States Department of Agriculture, Natural Resources Conservation Service (USDA-NRCS)

2020 Denton County, Texas – Web Soil Survey. Electronic document, http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.asp, accessed February 2020.

United States Geological Survey (USGS)

2020 Geologic Database of Texas. Digital Dataset.

Archeological Survey Report

Project Name: FM 1173 Relocation

From FM 156 **To** Interstate Highway 35

District(s): Dallas

County(s): Denton

CSJ Number(s): 1059-01-047, 1059-02-002

Prinicipal Investigator and Firm/Organization: Aaron Norment, AmaTerra Environmental

Antiquities Permit No. 9404

Report Completion Date: July 1, 2020

Abstract

On behalf of the Texas Department of Transportation (TxDOT), at the request of Garver, LLC., (Garver), AmaTerra environmental conducted an archeological survey for the proposed expansion and relocation of FM 1173 from FM 156 to Interstate Highway 35, in the city of Krum and Denton County, Texas. The project length is approximately 3.6 miles. Total project acreage of the area of potential effects (APE) measures 92.05 acres, with 40.3 acres being existing right of way (ROW) and 51.75 acres being proposed new ROW (AmaTerra's calculations based on KMZ files provided measured proposed ROW at 54.78 acres, differing slightly from the project description). Fieldwork consisted of visually inspecting the entire project area, photographing areas that were disturbed and/or lacked right of entry (ROE) from accessible areas of the APE, and excavating 51 shovel tests and seven backhoe trenches. The fieldwork was conducted on May 18-21, 2020. Two archeological sites (41DN620 and 41DN621) were recorded, both consisting of 20th century historic debris (ceramics, window and vessel glass, nails, and brick/tile fragments), each associated with a filled in cistern or well. Neither site is considered eligible for listing in the National Register of Historic Places (NRHP) or for designation as a State Antiquities Landmark (SAL). No further work is recommended for either of these sites within the APE.

The survey team encountered soils in portions of the APE which consisted of alluvial clay and loam sediments with depths extending beyond one meter. As a result, backhoe trenching was necessary and conducted in accessible portions of the APE. However, the field crew lacked right of entry to all the portions of the APE that required trenching and/or shovel testing, so further work is recommended once the ROE is obtained. No artifacts were collected as part of this project. All records generated for this project will be permanently housed at the Center for Archaeological Studies (CAS) at Texas State University for curation under Antiquities Permit 9404.

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Management Summary

Between May 18–21, 2020, AmaTerra Environmental, Inc. (AmaTerra) conducted an archeological survey on behalf of the Texas Department of Transportation (TxDOT), at the request of Garver, LLC. (Garver) in support of the proposed expansion and relocation of FM 1173 between FM 156 and Interstate Highway 35, in the city of Krum and Denton County, Texas. The Area of Potential Effects (APE) is located on private property to be acquired by TxDOT and is approximately 3.6 miles in length with a total area of potential effects (APE) of 92.05 acres, and 51.75 acres of new right of way (ROW) (Attachments 1 and 2). The proposed project is needed to provide congestion relief and improve traffic flow.

The existing FM 1173 facility is a two-lane undivided roadway with two 12-foot-wide lanes, and 1 to 2-foot outside shoulders occupying a 25 to 26-foot-wide paved roadway in each direction. Existing right-of-way width along FM 1173 varies from 90 to 100 feet. The existing Barthold Road section is a two-lane undivided roadway with two 12-foot-wide lanes in each direction occupying a 24-foot-wide paved roadway. The existing right-of-way width along Barthold Road varies from 50 to 60 feet. There is no control of access along the entire length of the project.

The project includes constructing four travel lanes from FM 156 to E.6th Street and six travel lanes from E. 6th Street to IH 35. In the FM 156 to E. 6th Street segment the travel lanes will include one outside 14-foot shared-use lane and a varying 11 to 12-foot inside lane in each direction. In the E. 6th Street to IH 35 segment the travel lanes will include one outside 14-foot shared-use lane and two varying 11 to 12-foot inside lanes in each direction. The eastbound and westbound lanes will be divided with a raised median along the centerline from the BNSF Railroad Tracks to IH 35. Sidewalks will vary from five feet wide with a three-foot berm to six feet wide adjacent to the back of the curb. The proposed facilities ROW widths would vary from 120 to 300 feet.

The reconstruction of FM 1173 would be approximately 5,400 feet in length, the new construction portion of FM 1173 would be approximately 3,200 feet, and the reconstruction of existing Barthold Road would be approximately 10,400 feet in length. Typical impacts are expected to reach 1 foot deep, with maximum vertical impacts of 40 feet for bridge columns and support.

Mechanical trenching was recommended based on moderate potential for sediments with deeply buried archeological materials. Other portions of the APE have little topographic relief consisting of ancient upland soils. These areas had low potential to contain buried, intact prehistoric deposits. However, there was moderate potential for historic sites, particularly in the western portion of the APE closest to Krum. The remainder of the project area was visually

inspected and shovel tested where right of entry (ROE) and lack of disturbances allowed. Developed and/or disturbed areas were documented in photographs.

Shovel testing recorded two historic sites in the APE. 41DN620 is a historic scatter of mid-20th century materials surrounding a probable filled in well with an adjacent spigot. Additional surface features included a small concrete slab foundation for a shed, and a driveway slope. Artifacts observed included concrete, tile, window glass, and porcelain with a partial maker's mark. The second site, 41DN621, is another historic scatter surrounding a filled cistern, likely from the early 20th century. Materials included ceramics, round and square nails, a .44 cartridge casing, melted glass, and burned bricks and rock. Due to the lack of archeological integrity, these sites are recommended as not eligible for listing in the National Register of Historic Places (NHRP) or as a State Archeological Landmark (SAL), and no further work is recommended for these sites within the APE.

ROE had not been obtained for every property within the APE at the time of the survey, and some of these properties may require shovel testing and backhoe trenching. It is recommended that these properties should be surveyed in the future after ROE has been obtained.

As a political subdivision of the State of Texas, TxDOT is subject to the provisions of the Antiquities Code of Texas (ACT). In addition, as a recipient of FHWA funding, this project is also subject to Section 106 of the National Historic Preservation Act (NHPA). AmaTerra's work conformed to the guidelines under 13 TAC Chapter 26, as well as the survey standards and guidelines set forth by the Council of Texas Archeologists (CTA).

Project Information

- **This survey is:** ☒ the initial survey for this project.

  ☐ a continuation of previous survey(s) due to:

  ☐ access issues and/or

  ☐ design changes.

  Identify previous investigation(s):

- **Report Completion Date:** 06/22/2020
- **Date(s) of Survey:** 05/18/2020 to 05/21/2020
- **Archeological Survey Type:** ☐ Reconnaissance ☒ Intensive
- **Report Version:** ☒ Draft ☐ Final
- **Report Author(s) and Affiliation:** Robert Lassen, Aaron Norment, and Brittany S. McClain – AmaTerra Environmental, Inc.
- **Estimated Percentage of Time that the Principal Investigator was in the Field:** 0 percent

Area of Potential Effects and Survey Area

- **Area of Potential Effects (APE)**

  The APE is defined to encompass the limits of the existing right of way; proposed, new project right of way; 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 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 map of the APE, which is based on the project information attached as Attachment 2.

- **No Survey Area**

  The 40.3 acres of existing ROW within the APE were excluded from intensive survey due to extensive disturbances – buried and above ground utilities, commercial and residential developments, and continued road and ditch maintenance.

- **Access Denied Area:**

  Table 1 indicates the properties for which access was denied but still require intensive archeological survey. These nine parcels total 30.28 acres. Attachment 3 shows color-coded parcels within the APE where ROE was denied but requires survey, as well as areas with ROE and areas without ROE not requiring survey.

Table 1: Parcels denied ROE requiring survey needs.

Parcel	Property ID	Needs Shovel Testing	Needs Trenching
26	61632	Yes	No
36	613421	Yes	No
49	246891	Yes	No
74	307349	Yes	No
78	307350	Yes	No
79	307351	Yes	No
97	61068	Yes	Yes
102	208223	Yes	No
103	38485	Yes	No

- **Survey Area:**

  The survey area included the 38 parcels with proposed new ROW to which AmaTerra had access (22.28 acres), along with the 13 denied access parcels (2.22 acres) that were visually inspected

from accessible portions of the APE and existing ROW (**Table 2**) and determined not to require shovel testing or trenching (see Attachment 3). All parcels within the survey area were visually assessed, documented either by photography (for disturbed, developed, or no access areas) or by shovel testing/trenching (for accessible areas with intact soils). In total the survey area includes 41 parcels totaling 24.5 acres.

Table 2: Parcels denied ROE not requiring survey based on visual inspection.

Parcel	Property ID	Needs Shovel Testing	Needs Trenching
22	168154	No	No
42	157500	No	No
43	157501	No	No
56	268328	No	No
59	268330	No	No
60	241800	No	No
63	241799	No	No
66	235546	No	No
67	235545	No	No
81	307352	No	No
98	260244	No	No
100	260243	No	No
109	315333	No	No

- **Project Area Ownership:**

  Property ownership within the project area was comprised of commercially owned establishments, private property, and portions owned by political subdivisions of the State of Texas.

Project Setting

- **Natural Setting**
  - Topography:

    The project setting falls within the Grand Prairie subregion of the Cross Timbers ecoregion (Griffith et al. 2007). The Cross Timbers is characterized as a transitional area between the once sprawling prairies of the plains and less arable land to the west, consisting of forests, woodlands, savannas, and prairies.

  - Geology:

    According to the Geologic Atlas of Texas, the project area is underlain by Pawpaw Formation, Weno Limestone, and Denton Clay, undivided, with a small mapped area of Grayson Marl and Main Street Limestone, undivided, both from the Cretaceous Washita Group (USGS 2020).

  - Soils:

    There are a variety of different upland soils mapped across the APE, which are typically derived from ancient marine sources (**Attachment 4; Table 3**) (USDA-NRCS 2020). No Holocene alluvium is mapped within the APE, however soils within the small floodplains along the four drainage crossings within the APE could possess intact buried archaeological resources.

Table 3: Mapped soils within the APE.

Soil Unit Number	Soil Type
13	Birome-Rayex-Aubrey complex, 2 to 15 percent slopes
22	Burleson Clay, 1 to 3 percent slopes
54	Lindale clay loam, 1 to 3 percent slopes
56	Medlin-Sanger clay, 5 to 15 percent slopes
58	Mingo clay loam, 1 to 3 percent slopes
66	Ponder loam, 1 to 3 percent slopes
67	Sanger clay, 1 to 3 percent slopes
68	Sanger clay, 3 to 5 percent slopes
74	Slidell clay, 1 to 3 percent slopes
75	Somervell gravelly loam, 1 to 5 percent slopes

  - Potential Archeological Liability Map:

    The Dallas District PALM (**Attachment 5**) for the project area indicates that the four water crossings possess moderate potential for buried archaeological deposits.

  - Historic Land Use:

Historically, the project area has been primarily rural farm and ranch land, with the exception of the portion of FM 1173 between FM 156 and the railroad tracks within the city of Krum, which has been an urban setting since at least the mid-20th century (Attachment 6). Occasional farmsteads dot the landscape along the APE outside of Krum, as well as a small cluster of houses just east of Krum (where 41DN620 was identified), but by and large the land use remains agricultural and undeveloped.

- Land Use:

  The project is in a rural/suburban setting near Krum, Denton County, Texas. Today the land within the APE contains a large amount of newly built high-density residential neighborhoods and subsequent service establishments that generate substantial traffic. Developed and undeveloped lands are present within the proposed project area. Developed land includes single-family residences, retail, commercial, public facilities, and places of worship. Undeveloped lands comprise vacant (not utilized), agriculture (ranch and pasture), fenced row vegetation, streams, and ponds. Active agricultural lands exist adjacent to the proposed project.

- Vegetation:

  Vegetation in the project vicinity consists primarily of maintained urban grasses, landscaping, and cropland. Some woodland and mixed shrub areas are also present near the streams.

- Estimated Ground Surface Visibility:

  Visibility throughout the APE was between zero and 20 percent.

- **Regional Cultural History:**

The project area lies in the North Central Texas archeological region (Pertulla 2004). Many archeological investigations within the region have been summarized by Lynott (1980), McCormick (1976), Perttula (2004), McGregor and Bruseth (1987), and Prikryl (1990). Even with these, the chronological framework of North Central Texas remains poorly lacking in data. For this report, chronological information presented is in accordance with the data available (Ferring and Yates 1997, 1998). The chronological sequence of the North Central Texas region reflects that of North America, spanning 12,000 years consisting of the Paleo-Indian, Archaic, Late Prehistoric and Historic Periods.

The Paleoindian Period in Texas is characterized by nomadic hunters who relied on a broad range of animal species based on available faunal data (Bousman et al 2004:75). Johnson (1977) reviewed reports on numerous Paleoindian sites that indicated a range of small and medium fauna were harvested in addition to big game. Investigations at the Wilson-Leonard site (41WM235), the Gault site (41BL323), and Lubbock Lake (41LU1) provide evidence of small and medium faunal remains (i.e., turtle, rabbit, squirrel, snakes, gopher, and deer) associated with megafaunal remains (i.e., bison and mammoth) (Collins 1998: 1505–1506). Clovis and Folsom points are the primary diagnostic artifacts associated with this period (Turner and Hester 1999; Collins 1995).

In the North Central Texas archeological region, the Paleoindian period spans roughly the period from 9950 to 6500 BC but lacks extensive archeological evidence. Although the Paleoindian period is poorly represented in the North Central Texas archeological region, surface collections of Paleoindian points such as Plainview and Dalton points (Meltzer 1987; Meltzer and Bever 1995; Prikryl 1990), in situ deposits of Paleoindian points at the Acton site (Blaine et al. 1969), and occurrences of megafauna and small game fauna at the Aubrey site (Ferring and Yates 1997) suggest the presence of a Paleoindian culture.

The Archaic Period spans nearly 7,000 years of prehistory. Generally, trends during the Archaic period suggest increasingly complex settlement systems which correspond with decreased mobility, increased population size and density, and the development of distinct territories (Johnson and Goode 1994; Prikryl 1990). Projectile points also changed; lanceolate-shaped points gave way to dart points that were stemmed and barbed (Turner and Hester 1999). During the Archaic Period, the climate changed from wet and mild conditions seen in the Paleoindian period, to warmer and drier conditions. Researchers believe that the changes in climate influenced prehistoric subsistence strategies (Weir 1976). The Archaic period in North Central Texas dates from 6500 BC to AD 700, and is subdivided into the Early, Middle and Late Archaic periods.

The Early Archaic period (ca. 6500–4000 BC) is poorly known in the region and is based primarily on surface collections and sites with no isolable Early Archaic components (Prikryl 1990). Projectile points associated with the Early Archaic period include Early Split Stemmed and perhaps Angostura (Prikryl 1990). The period is characterized by small and widely distributed sites, which researchers have suggested is an indication of a generalized hunting and gathering subsistence strategy with high group mobility within large, poorly defined territories (Prikryl 1990).

The Middle Archaic period (4000–1500 BC) is even less well known than the Early Archaic and components from this period are the most poorly represented within the region. As with the Early Archaic, most Middle Archaic sites consist of surface collections. Projectile points associated with the Middle Archaic period include the Basal Notched group (Andice, Bell, Calf Creek), as well as Dawson, Carrollton, Wells, and Bulverde (Prikryl 1990). What evidence is available, (mostly from an intact Middle Archaic component at the Calvert site, 41DN102), has led Ferring and Yates (1997) to suggest the Middle Archaic in North Central Texas can generally be characterized by broad cultural interactions between people, a high degree of mobility, and a subsistence strategy based on small game and deer.

The Late Archaic period (ca. 1500 BC–AD 700) is characterized by an increase in the total number of sites and a greater distribution of sites over the landscape. Prikryl (1990) has suggested this settlement patterning is an indication of an increase in population density and decreased group mobility during the Late Archaic period in North Central Texas. Projectile points associated with the Late Archaic period include Marshall, Edgewood, Castroville, Ellis, Trinity, Dallas, Palmillas, Yarbrough, Godley, Gary and Elam (Prikryl 1990). Investigations at Late Archaic occupation sites in the region have led researchers to suggest that these were used

seasonally by small bands pursuing a generalized hunting and foraging strategy (Peter and McGregor 1988; Ferring and Yates 1997).

The Late Prehistoric is marked by the replacement of the atlatal by the bow and arrow and by the production of small arrow points (Turner and Hester 1999). With this technological advancement an apparent increase in warfare is reported (Prewitt 1974; Johnson and Goode 1994). During this stage, several important technological innovations appeared including ceramics. The first evidence of horticulture appeared and resulted in significant changes to ecological and economic adaptations.

In North Central Texas, the Late Prehistoric dates from AD 700 to 1700. This period in North Central Texas can be further subdivided into an early and a late phase (Lynott 1977, Prikryl 1990). The early phase (AD 700–1200) is characterized by a continuation of the hunting and gathering subsistence strategy of the Archaic period, ceramics tempered with sand and grog, and Scallorn, Catahoula, Alba and Steiner arrow points (Lynott 1977, Prikryl 1990). The late phase (AD 1200 to 1700) is characterized by evidence of horticulture and bison procurement, shell-tempered Nocona Plain ceramics, and Maud, Fresno, Washita, Harrell, and Perdiz points (Harris and Harris 1970; Lynott 1977; Prikryl 1990).

The presence of domesticates at the Cobb-Pool (41DL148) site and other nearby locations has sparked debate surrounding the timing and extent of maize agriculture during the Late Prehistoric period in North Central Texas (Peter and McGregor 1988; Brown et al. 1987; Rohn 1998), although the lack of definitive evidence has left the issue unresolved. Huhnke and Wurtz (2004) suggest the stable carbon isotope value for a single disturbed burial dated to AD 1200 (41DL373; Peter and Clow 1999) is comparable to those of initial maize-consuming Caddo populations in Arkansas. Based on these findings, they suggest maize horticulture may have been introduced into North Central Texas around AD 1200; however, without additional samples this suggestion is speculative.

Historically, Euro-American settlement began in the 1840s with farmers settling along rivers and streams (Odom 2010). In 1841, William Peters and other settlers obtained a land grant from the Texas Congress and established the Texian Land and Immigration Company. Their grant included what is now Denton County. The area was settled slowly, primarily by settlers from other southern states, although a French and a German settlement were also established (Odom 2010). The town of Pilot Point was established by James Pierson along a prominent lookout in 1851 and quickly attracted settlers. It contributed a Confederate company of 101 men under Capt. N. Wilson during the Civil War (Maxwell 2020).

The population of Denton County grew quickly in the 1870s following the Civil War (Odom 2010). In the mid-1880s, the town of Krum was founded to serve the Gulf, Colorado and Santa Fe Railway (Hilliard 2020). The railroad accessibility also contributed greatly to the agricultural production of the area, and nearly all the towns in the county were established along rail lines until the 1970s. The soils of the region proved to be suitable for crops such as wheat and peanuts, and Krum became known as "largest inland grain market in the world." (Hilliard 2010).

The arrival of the automobile and the construction of IH-35 and the Dallas–Fort Worth International Airport contributed to the growth of Denton County through the twentieth century. Much of Denton County is now considered a suburb of Dallas-Fort Worth, particularly the southeastern portion (Odom 2010). Today, the APE is a mix of commercial, residential, and agricultural development.

- **Previous Investigations and Known Archeological Sites:**

Background research for this project consisted of an online records search through the Texas Historical Commission's (THC) Archeological Sites Atlas (Atlas 2020) and a review of historical maps and aerial photographs. Research focused on the identification of archeological sites, sites listed as State Antiquities Landmarks (SALs), Recorded Texas Historic Landmarks (RTHLs), sites listed on the National Register of Historic Places (NRHP), cemeteries, and previously conducted archeological surveys with 0.62 miles (one kilometer) of the APE (Attachment 7). The search identified six previously conducted archeological surveys (Table 4), one documented archeological site, no cemeteries, no NRHP Districts, no NRHP properties, and one Historical Marker discussing the City of Krum and its founding and settlement. The single archeological site recorded within one kilometer of the APE is 41DN535, north of FM 1173. 41DN535 was documented in 2005 by PBS&J, but the Atlas does not indicate the circumstances under which the site was recorded. The site form identifies the site as a recent (twentieth century) historic surface scatter consisting of colored glass fragments (n=2), a cast iron stove fragment (n=1), and whiteware fragments (n=8). No further work was recommended due to sparse artifacts and lack of subsurface deposits.

Table 4. Previous archeological surveys within a kilometer of the APE.

Year	TAC Permit	Investigator	Sponsor	Overlap APE
1993	none	SCS	FHWA	No
1997	1664	-	UTRW	No
1998	none	-	TPWD	No
2010	5660	ECOMM	TxDOT	No
2018	none	IES	USACE	No
2018	8383	HDR	TxDOT	Yes

- **Evaluation of Project Setting:**

The land adjacent to the APE includes commercial and residential developments, continually plowed farmland, and livestock grazing pastures. Common disturbances within the APE include levelled and paved surfaces, excavated drainage ditches, commercial and residential construction, driveways, manmade berms, and various utility installations. These disturbances occur throughout the APE with more residential and commercial disturbances occurring closer

to Krum and farming disturbances located within the rural, eastern reaches of the APE (Attachment 8 - all).

Survey Methods

- **Surveyors:**

  Robert Lassen and Sara Parkin

- **Description of Methods:**

  Survey efforts involved 100 percent pedestrian survey with shovel testing and backhoe trenching of parcels granted ROE. A total of 51 shovel tests and seven backhoe trenches were excavated in the APE where ROE was granted (Attachment 9). Shovel testing was conducted to locate and identify, and determine the nature, extent, and if possible, the significance of any archeological resources discovered in the APE. Shovel tests were distributed throughout the project area based on observed field conditions. In some instances, prior disturbances and/or impervious ground cover (pavement, concrete, etc.) negated the need for shovel tests in certain areas. Twenty-two parcels totaling 32.5 acres were denied ROE. These parcels were visually inspected from existing ROW, as well as from adjacent parcels where ROE was granted. Disturbances and environmental conditions observed within the denied ROE parcels were similar to those present in the accessible parcels, and 13 of these parcels totaling 2.22 acres were visually inspected as not requiring survey. Shovel tests were excavated near the boundaries between parcels granted ROE and those denied ROE to better understand potential subsurface conditions in the parcels denied ROE (see Attachment 6).

  Shovel tests were excavated in 20 cm levels until sterile subsoil, compact clay, or until another reason presented itself for terminating the shovel test. All fill was screened through ¼-inch mesh hardware cloth. All shovel tests were mapped using a hand-held GPS unit and logged on digital and standardized forms that recorded profile characteristics, depth, and contents, if any. Investigators took photographs of the landscape and various disturbances to document the APE setting.

  Backhoe trenches ranged in depth from 1.0–1.4 meters, terminating at the point investigators believed they had exhausted potential for archeological deposits (see Tables Attachment, Backhoe Trenching Results. Trench lengths varied between 3.4–4.1 meters. Following excavations, archeologists cleaned and examined trench walls to investigate for cultural material, cultural features, and/or soil anomalies in the trench profiles. Stratigraphic zones identified in each trench were documented and described. During the excavation of the trenches, a sample of every soil zone was screened through ¼-inch hardware cloth as best as it could be. As with shovel tests, the location of each trench was recorded with a GPS, notes were made on standardized forms, and trenches were digitally photographed (Attachments 10a-j). Upon completion of the excavations, the backhoe operator backfilled the trenches and compacted the soil.

- **Subsurface Probes**

Method	Quantity in Existing ROW	Quantity in Proposed New ROW	Quantity in Proposed New Easements	Total Number per Acre
Shovel Test Pits	NA	51	NA	2.29*
Power Auger Probes	NA	NA	NA	NA
Mechanical Trenches/Scrapes	NA	7	NA	0.3*

*the per acre total is based on the 22.28 acres of granted ROE parcels surveyed

- **Other Methods:**

  None.

- **Collection and Curation:** ☒ NO ☐ YES

  No artifacts were collected during this survey, and all records generated for this project will be permanently housed at the Center for Archaeological Studies (CAS) at Texas State University.

- **Comments on Methods:**

  The methods used during the survey meet or exceed CTA standards for area surveys, which call for a shovel testing rate of at least 2 shovel test per acre for project areas measuring up to 25 acres. Due to areas the backhoe could reach, trenching deviated slightly from CTA standards with few trenches falling just below the 4-m recommended minimum trench length.

Survey Results

- **Survey Area Description:**

  The westernmost portion of the survey area (from FM 156 to the railroad crossing) lies within the city of Krum and is heavily developed (see Attachment 8a). However, the portion of the APE that extends south along FM 156 overlaps a property that was once the site of the Hattie Dyer house, which is marked by a local historical marker (see Attachment 8b). Three shovel tests were excavated in the APE in front of this property, with the only artifact documented being a late-twentieth century pull tab. Immediately east of the railroad crossing, most of the properties within the APE allowed access, were relatively undeveloped, and were shovel tested. The pasture along the south side of FM 1173 in this area was also backhoe trenched, as the PALM indicated moderate potential for both shallow and deeply buried materials along an ephemeral drainage in this area. 41DN620 was identified about 250 meters east of this pasture, based on surface features and positive shovel tests. As FM 1173 curves slightly northward east of 41DN620, modern developments become more prevalent, with Krum Middle School along the north side of the road, and various businesses to the south (see Attachment 8c). Minimal shovel tests were excavated in this area due to the disturbed nature of the APE. East of these businesses, four backhoe trenches were excavated in Eastside Park where the PALM indicated moderate potential for deeply buried materials (see Attachment 5). One additional trench as well a line of shovel tests was excavated on the north side of FM 1173 across from the park. East of the park and up to the intersection with Masch Branch Road, the south side of the APE follows existing ROW bordering residential developments, while the north side contains new ROW going through mostly pasture land (though some had denied access, see Attachment 8d). East of the intersection with Masch Branch Road, the APE deviates from the existing FM 1173 to the northeast to follow Barthold Road. The property on which this transition occurs is a wheat field with an ephemeral stream drainage with no ROE (see Attachment 8e and 8f). It will require shovel testing and backhoe trenching once access is permitted. Along Barthold Road, most of the undeveloped pasture on the north side of the APE was accessible and shovel tested, resulting in the recording of 41DN621. The property immediately east of 41DN621 was not accessible however, and it will need to be shovel tested once access is permitted (see Attachment 8g). Most of the property along the south side of the road was also denied access and will require additional shovel testing. The east end of the project area, where Barthold Road joins IH 35, is developed and did not require shovel testing (see Attachment 8i and 8j).

- **Potential Buffer Zone Description:**

  Conditions 50 feet beyond this APE is nearly identical to conditions observed within the APE.

- **Archeological Materials Identified and Archeological Site Description:**

  Two archeological sites were recorded within the APE, 41DN620 and 41DN621 (Attachment 11). Both sites are historic in age. 41DN620 consists of some surface features, including a filled well, a capped galvanized utility line (likely gas), a concrete slab for a shed, and the slope of a driveway leading to FM 1173 (Attachments 12a-d). Shallowly buried artifacts were

scattered around most of these features, except for the concrete slab. A total of six shovel tests were excavated within the site boundary, three being positive of historic artifacts within the upper 20 cm of the test. Other artifacts were observed scattered on the ground surface. Artifacts included fragmentary concrete, asbestos tile fragments, window glass, and thick porcelain (Attachments 12e–h). One of the porcelain fragments had a partial marker's mark, attributed to a Crane Norwich sink made by the Trenton Potteries Company. This style mark was used during a relatively short period of time spanning roughly ten years and ending shortly after World War II (Lehner 1988). The maker's mark and the asbestos tile fragments indicate that the site was likely a mid-twentieth century house that had been demolished. Deed research via the Denton County archives indicates that the property was owned by the Starnes family no later than the 1930s, with Edward Starnes inheriting the property from J. E. and Minnie Starnes in 1939. Edward and Thelma Starnes then sold the property to William F. and Birdie Lee Patterson in 1944, covering the general time span of the cultural material at the site. The portion of the site recorded within the APE lacks sufficient integrity of location, association, and materials to be able to address important questions of history and is not considered eligible for listing to the NRHP (36 CFR 60.4) or for designation as a SAL (13 TAC 26.8). Overall, the site exhibits no remaining standing structures and is not associated with any historically significant persons or events. As such, no further work on this site is recommended within the APE.

41DN621 was initially identified based on a filled cistern located on a gentle hillslope within the APE along Barthold Road (Attachments 12i–k). Shovel tests around the cistern uncovered artifacts that range in age from the late nineteenth to early twentieth century. A total of seven shovel tests were excavated within the site boundary, but FM 1173, APE limits, and ROE permission precluded shovel testing farther from the site center. All shovel tests within the site boundary were positive for historic artifacts. Artifacts included cut and wire nails, a metal bolt, burned stone and brick fragments, charcoal, melted glass, whiteware and brown ware ceramic sherds, and a single copper .44 caliber rimfire cartridge casing (Attachments 12l–n). The copper case indicates it was an earlier manufacture. Later cartridges were made of brass. According to the Denton County Appraisal District, the property on which 41DN621 is located has changed hands at least 4 times since 1990, most recently in 1999 when the current owner, Harlan Property Inc., purchased the land from Ellouise McDonnell. The earliest record that could be located indicates that Herman and Ida Domke sold the land to Lena Dettmer in July 1947. Records for anything occurring with the land prior to 1947 could not be located. This is the oldest occupation that could be found for this property performing a basic records search, and the artifacts recovered could be associated with a homestead that belonged to the Domke's around 1947 or even earlier. The 1952 aerial photo of this area appears to show trees and a possible structure at this location (see Attachment 6) Because the artifact scatter lies on a hillslope and much of the material shows evidence of a fire, it appears that a house was demolished, and the remains were pushed downhill and burned sometime likely in the twentieth century. The top of the hill lies on property with no ROE access, but it may reveal additional evidence of the site once it becomes accessible. The portion of the site recorded within the APE with granted ROE lacks sufficient integrity of location, association, and materials

to be able to address important questions of history and is not considered eligible for listing to the NRHP (36 CFR 60.4) or for designation as a SAL (13 TAC 26.8). No further work is warranted on the portion of this site within the surveyed portion of APE.

Recommendations

- **Results Valid Within (check all that apply to define the buffer zone):**

No Survey Area (NSA)	Survey Area	Either
☐ 50 feet of NSA	☒ 50 feet of survey area	☒ Variable, see map
☐ 0 feet of NSA	☐ 0 feet of survey area	See Attachments

- **The Definition and Evaluation of this Horizontal Buffer Zone Is Based on One or More of the Following Considerations (check all that apply):**

  ☒ The integrity of the areas has been affected by prior development, modern land use practices, or other disturbances.
  ☐ The areas are unlikely locations for past human activity.
  ☐ The survey shows that archeological materials are unlikely to exist in this area.
  ☒ The survey shows that areas may contain intact archeological sites or the survey results cannot preclude the possibility of such sites.
  ☐ Other (specify)

- **Archeological Site Evaluations:**

  Both 41DN620 and 41DN621 lack archeological integrity of location, association, and material within the accessible APE, and the portions surveyed area considered not eligible for listing in the NRHP (36 CFR 60.4) or for designation as a SAL (13 TAC 26.8). The sites are not associated with significant events (Criterion A), historically significant individuals (Criterion B), or any distinctive artistic style (Criterion C), nor do they have potential to yield information important to history or prehistory (Criterion D).

- **Comments on Evaluations:**

  None.

- **Further Work:**

  No further work is recommended for any of the areas surveyed, including the 38 parcels where ROE was granted and for the 13 parcels where ROE was denied, but visual inspection determined survey was not needed. The proposed project would have no effect on archeological historic properties and/or State Antiquities Landmarks within the horizontal buffer zone, as specified in the previous subsections. Any design change within this area would not require additional review or investigation. 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. In addition, the following recommendations apply to the APE.

Additional shovel testing will be needed for the parcel east (Parcel 102, see Attachment 9) of 41DN621 once access is obtained. It is not expected that the additional shovel testing will change the eligibility for 41DN621, as no preserved historic structures are evident visually, and limited archival research did not indicate any significant persons or events occurring.

The nine parcels that were denied access and could not be assessed during this survey will need intensive archeological survey once the State has taken ownership of the properties. These parcels are discussed in the Survey Area Description and shown in Attachment 3 (parcels in orange).

- **Justification:**

The archeological materials encountered during this survey do not merit inclusion in the National Register of Historic Places or formal designation as State Antiquities Landmarks, so no further work is recommended for the portions of the APE that has been surveyed. However, access was denied for 22 parcels within the APE. Visual inspection of 13 of these properties from existing ROW indicates that intensive archeological survey is not warranted. For the remaining nine parcels, archeological survey is recommended.

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