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Cultural Resources Investigations of the Concho River Veribest Pipeline Replacement Project, San Angelo, Tom Green County, Texas

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FINAL REPORT (Redacted)

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Texas Antiquities Committee Permit Number 8286

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MANAGEMENT SUMMARY

Raba Kistner Environmental, Inc. (**RKEI**), was contracted by Kleinfelder (CLIENT), on behalf of Valley Proteins, Inc., to perform cultural resources investigations for a pipeline rehabilitation and replacement project east of San Angelo in Tom Green County, Texas. The pipeline targeted for replacement is located within the channel of the Concho River, approximately 18 feet below the current banks. Archaeological investigations of this lower terrace focused on areas that may be impacted by the project, which includes laydown and equipment staging areas, as well as ingress and egress areas. Ashley E. Jones acted as Principal Investigator and Rhiana D. Ward served as Project Archaeologist. Rhiana D. Ward and Chris Matthews completed field investigations, which resulted in negative findings. All work was conducted under Texas Antiquities Committee Permit No. 8286.

Although the pipeline is controlled by a privately-owned wastewater company, the project is located within and adjacent to lands owned by the City of San Angelo, a political subdivision of the state. As such, the project was subject to review under the jurisdiction of the Antiquities Code of Texas (Texas Natural Resource Code, Title 9, Chapter 191). Furthermore, because the proposed project will directly impact the Concho River, compliance with Section 106 of the National Historic Preservation Act (54 United States Code 306108) and its implementing regulations (36 Code of Federal Regulations 800) will be required. A preliminary review conducted by the Texas Historical Commission (THC) and the U. S. Army Corp of Engineers-Fort Worth Division (USACE-FW) determined that archaeological investigations were required for the project due to its proximity to the Concho River, as well as its location within the boundaries of known archaeological site 41TG307. Site 41TG307 is designated as eligible for listing as a National Register of Historic Places (NRHP) property and was designated as a State Antiquities Landmark (SAL) in 1996.

Archaeological investigations for the San Angelo Veribest Pipeline Replacement Project were conducted on January 24-25, 2018. Investigations consisted of an intensive pedestrian survey augmented with shovel testing of the 1.26-acre Area of Potential Effects (APE). Twelve shovel tests (STs) were excavated, with eight on the western side of the Concho River and four on the eastern side. Excavations encountered compact to very hard silty clay soils with modern refuse identified as deep as 50 centimeters below surface (cmbs) (ST 5 and ST 10). STs were excavated to a depth of 60 cmbs, except in locations where bedrock was shallowly buried beneath the soil. Compact soils and the presence of

modern refuse indicated that the APE has been impacted, likely from the construction of Farm to Market 380 and the existing pipeline right-of-way. Additional disturbances documented include multiple sewer manholes near the western APE terminus, and an underground electric cable to the north of the APE.

Approximately 0.27-acres of the western APE is located within the site boundaries of 41TG307. Site 41TG307 is a prehistoric open campsite recorded in 1991 atop an upper terrace of the Concho River. During a revisit in 1996, the site tested positive for multiple occupational components that date as early as the Early Archaic (5170-8210 B.C.). The artifact assemblage consists of burned rock, mussel shell fragments, lithic chert flakes at ground surface, and one possible rock-lined hearth feature. Site 41TG307 was designated as eligible for listing as a NRHP property and listed as an SAL in 1996 (THC 2018).

Investigations conducted a total of five shovel tests (ST 1-5) within the known site boundaries of 41TG307, none of which identified any evidence of cultural materials or features. The portion of the site within the APE has been impacted from road and utility construction, evidenced by compact soils and the presents of modern materials (two aluminum pull tabs) at 20 to 40 cmbs within ST 5. Given this conclusion, **RKEI** does not recommend further archaeological investigations for the documented site located within the boundaries of the APE. Furthermore, no further work is recommended for the remaining APE. However, should changes be made to the project area, it is recommended that additional testing be conducted to determine the extent and significance of cultural deposits beyond the currently defined boundaries. Furthermore, because site 41TG307 is designated as eligible for listing as a NRHP property and is listed as an SAL, avoidance measures are recommended to prevent impacts of any cultural deposits that might not have been identified during investigations. The regulating agencies have required avoidance measures of the site and request the use of timber mats or other protective materials to prevent ground disturbance within the laydown area within the site boundary.

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CHAPTER 1. INTRODUCTION

Raba Kistner Environmental, Inc. (**RKEI**) was contracted by Kleinfelder (CLIENT), on behalf of the Valley Proteins, Inc., to perform cultural resources investigations for a pipeline rehabilitation and replacement project east of San Angelo in Tom Green County, Texas (**Figure 1-1**). Investigations included an intensive pedestrian survey with shovel testing of a 45-meter (m) long section of pipeline and its existing right-of-way (ROW), as well as a temporary laydown area. This report summarizes the results of the investigations, and provides recommendations for the replacement and rehabilitation project.

A preliminary review conducted by the Texas Historical Commission (THC) and the U. S. Army Corp of Engineers-Fort Worth Division (USACE-FW) determined that archaeological investigations were required for the project due to its proximity to the Concho River, as well as known archaeological sites. The eastern portion of the proposed laydown area is located within the boundaries of known archaeological site 41TG307. Site 41TG307 is designated as eligible for listing as a National Register of Historic Places (NRHP) property and was designated as a State Antiquities Landmark (SAL) in 1996. The purpose of the investigations was to locate any surface-exposed or buried cultural deposits within the project area and assess their significance and eligibility for inclusion in the NRHP and for formal designation as SAL. This includes any contributing elements that might be identified within the known boundaries of 41TG307. All work was conducted under Texas Antiquities Committee Permit No. 8286.

Although the pipeline is controlled by a privately-owned wastewater company, the project is located within and adjacent to lands owned by the City of San Angelo, a political subdivision of the state. As such, the project was subject to review under the jurisdiction of the Antiquities Code of Texas (ACT) (Texas Natural Resource Code, Title 9, Chapter 191). This legislation calls for the assessment of all improvement activities that have the potential to disturb historically significant standing structures, as well as significant subsurface deposits on lands owned by the State or one of its political subdivisions. Projects under the ACT are regulated by the THC. Furthermore, because the proposed project will directly impact the Concho River, compliance with Section 106 of the National Historic Preservation Act (NHPA) (54 United States Code 306108) and its implementing regulations (36 Code of Federal Regulations 800) will be required. Section 106 of the NHPA is regulated by the USACE-FW.

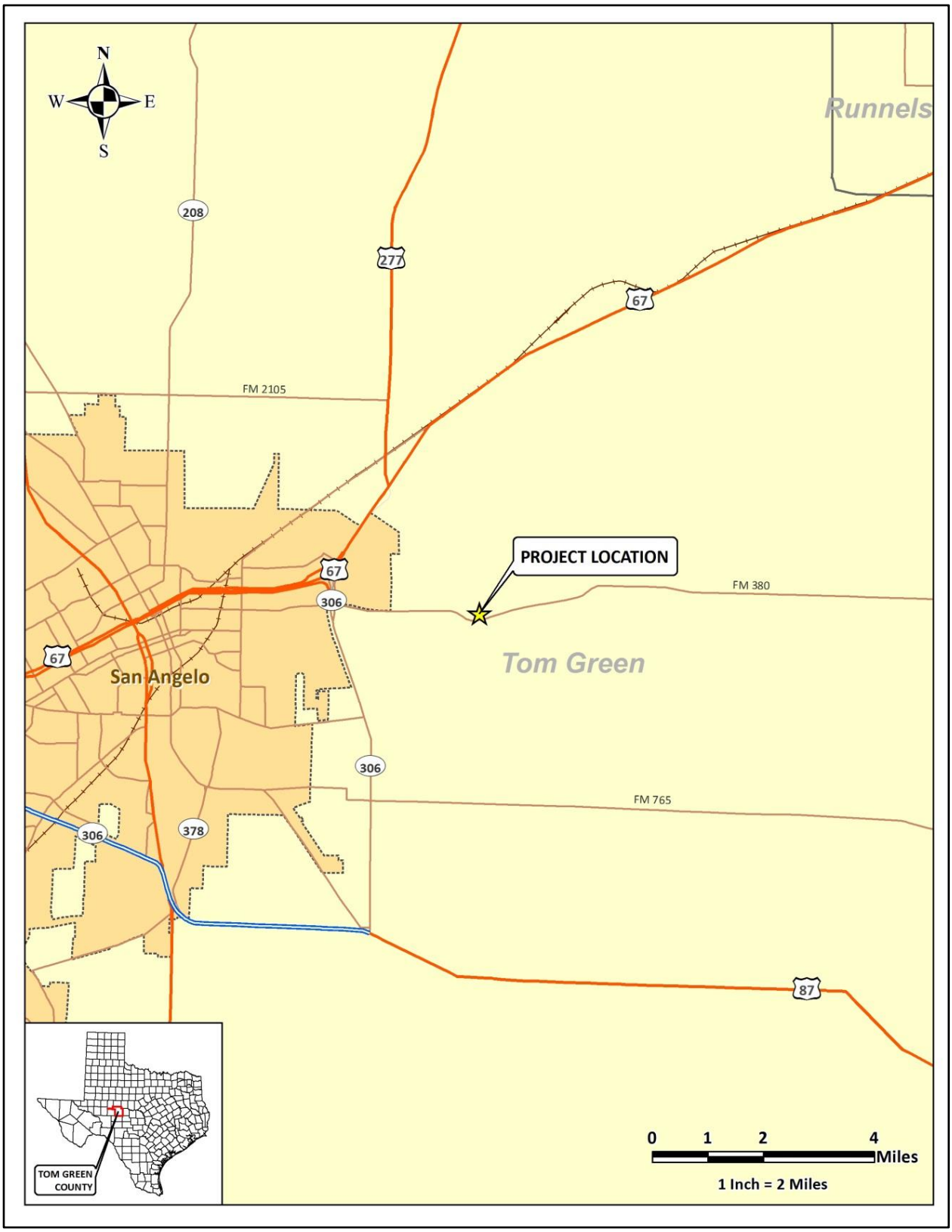


Figure 1-1. Area of potential effects east of San Angelo in Tom Green County, Texas.

Area of Potential Effects

The Area of Potential Effects (APE) is located 9 kilometers (km) east of San Angelo, at the intersection of Farm-to-Market (F.M.) 380 and the Concho River. The proposed project consists of the rehabilitation and replacement of a 45-m long section of existing pipeline that parallels F.M. 380 and is located within the northern ROW. The pipeline is contained within a 6-m wide existing ROW. The APE also includes an additional laydown area that will serve as temporary work space for the duration of the project. The laydown area measures 420 m long and ranges from 6 to 26 m wide, with the widest areas overlaying the existing pipeline to be replaced. Overall, the APE encompasses approximately 1.26 acres. **Figure 1-2** depicts the entire APE on the *Veribest (3100-134*) 7.5-minute United States Geological Society (USGS) topographic quadrangle map.

The APE is located in a rural setting surrounded by agricultural farm land with sporadic areas of residential housing. Vegetation consists of dense riparian forests immediately adjacent to the Concho River, with a combination of moderately vegetated rangeland and cultivated agricultural fields along the upper river terraces. The APE is situated on the lower terraces of the Concho River in an area historically identified as Six Mile Crossing.

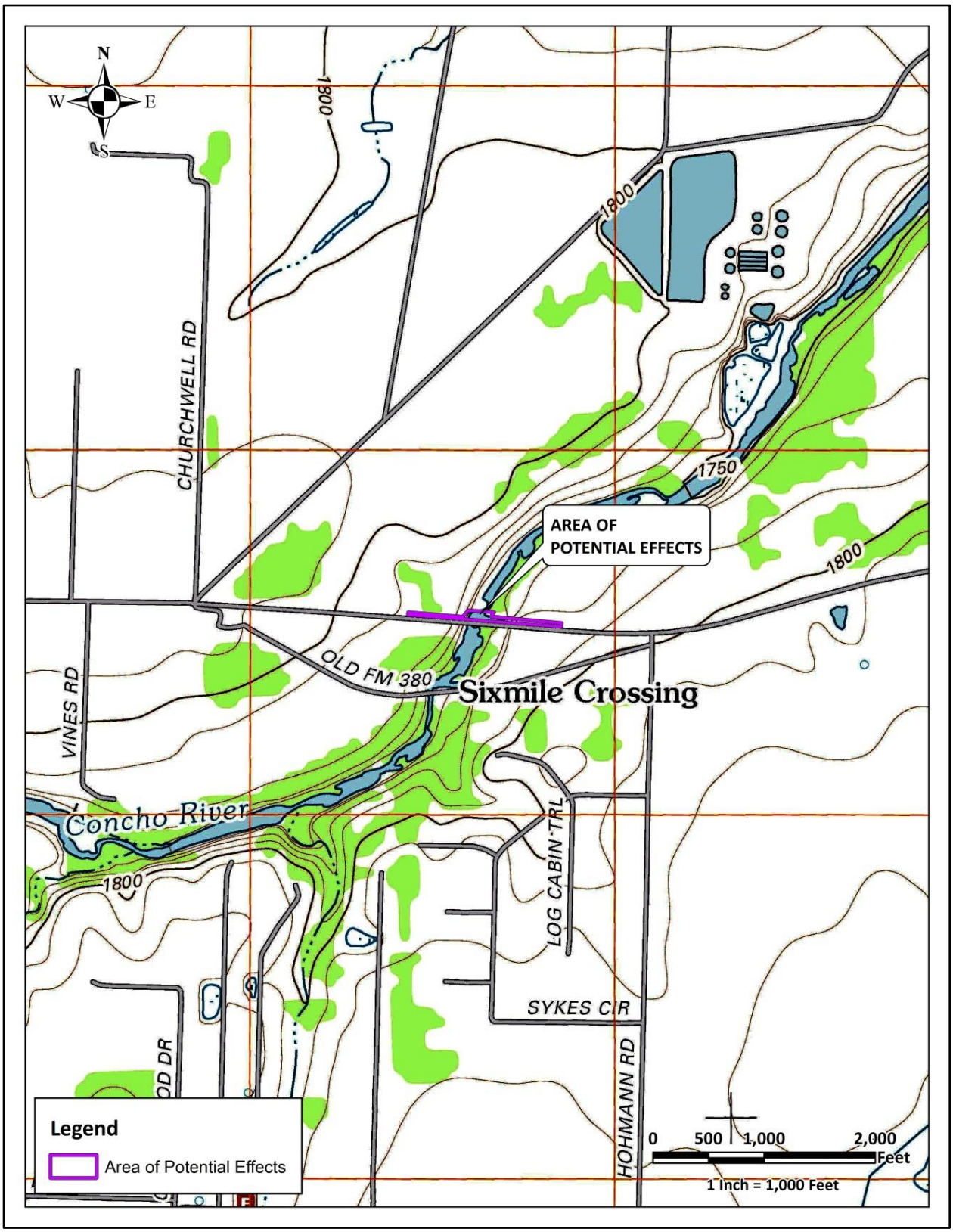


Figure 1-2. Project APE on the Veribest 7.5-minute USGS topographic quadrangle map.

CHAPTER 2. ENVIRONMENTAL SETTING

The APE is located in the central-west Texas geographic region within the Rolling Plains eco-region. The Rolling Plains are composed of gently rolling rangelands cut by streams and rivers. The region's elevation ranges between 0.27and 1.21 km above sea level. However, a majority of the region falls between 0.30 and 0.91 km above sea level.

Geology

The entire APE footprint is underlain by Quaternary (Qu) deposits, undivided, and composed of sands, silts, clays and gravels. Calcium carbonates can be found locally and along point bars, natural levees, stream channels and terraces (Barnes 1992).

Soils

Although a majority of the APE is mapped within the Concho River waters, soils along the lower terraces are mapped as the Rioconcho and Spur series soils (Rs) (National Resources Conservation Service [NRCS] 2018) (**Figure 2-1**). Rioconcho soils are described as very deep, moderately well drained soils that formed in clayey or silty alluvium derived from limestone on nearly level (0 to 2 percent slope) floodplain steps of river valleys or dissected plateaus. Rioconcho soils measure 203 centimeters (cm) deep, with the upper horizon (0 to 91 cm below surface [bs]) consisting of hard to very hard, dark grayish-brown to very dark brown clay loams with a fine to medium, angular, blocky structure. Root and wormcast inclusions may be observed. The lower horizon of Rioconcho soils (91 to 203 cm) is characterized by hard, light brown to brown clay loams with a weak, fine, angular blocky structure. Inclusions observed include fine roots and calcium carbonates. The Spur soil series is described as very deep, well drained soils formed in calcareous, loamy alluvium along very gently sloping (0 to 2 percent slope) flood plains or draws on dissected plains. Soils measure 152 cmbs, with the upper horizon (0 to 38 cmbs) consisting of brown to dark brown, hard clay loams with a moderate, medium granular structure. Many fine roots and worm casts are commonly observed. The lower horizon of Spur soils consists of brown to light reddish-brown clay loams with a moderate to weak subangluar blocky structure.

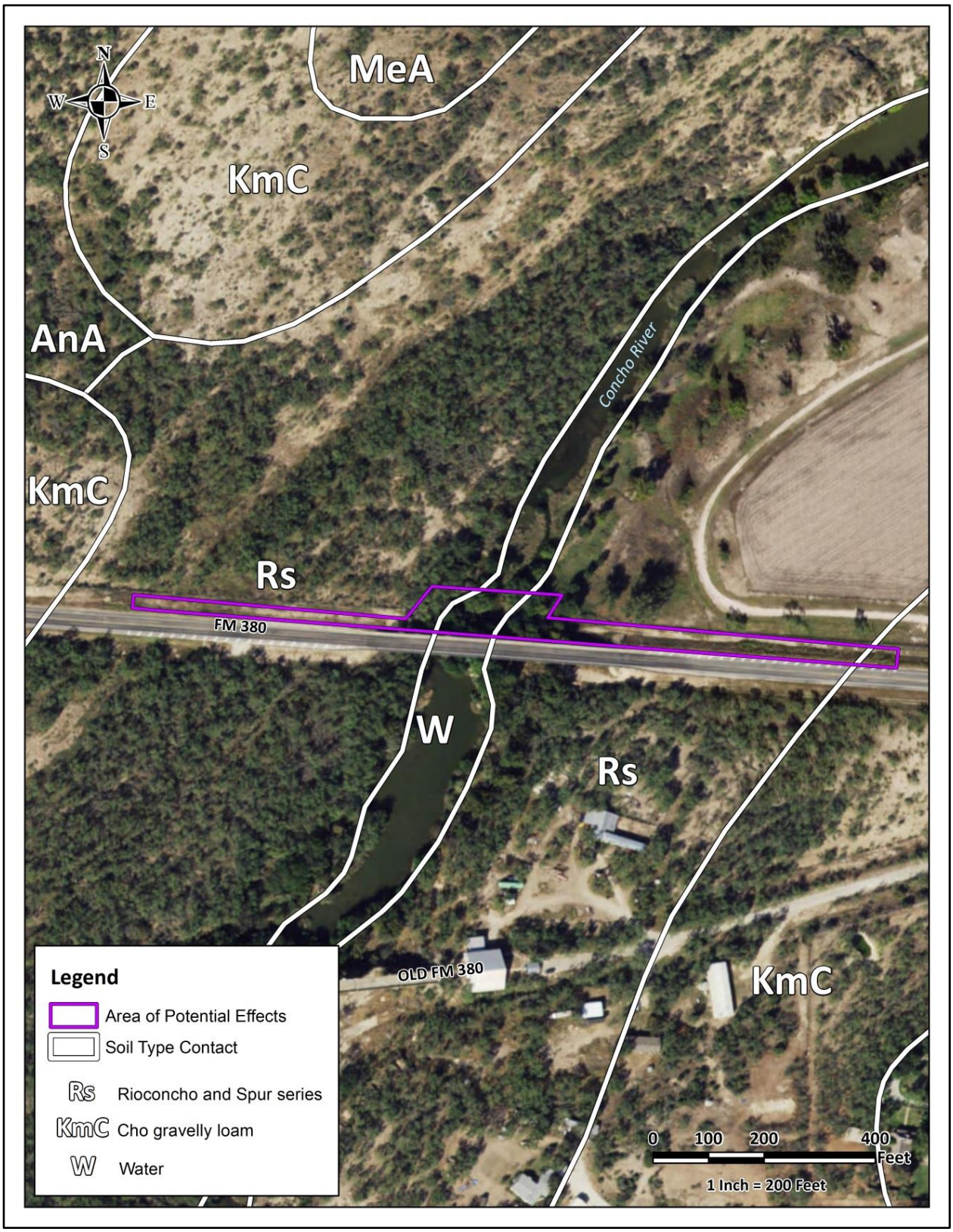


Figure 2-1. Project area soils.

Flora and Fauna

As the region is composed of rolling prairie cross-cut by rivers and streams, it is home to a diverse range of flora and fauna. Plant species within the prairie include little blue stem, blue and shinoaks gramas, Indiangrass, and sand bluestem. Other species within the prairie are invasive due to the longevity of cattle grazing in the region. These species include mesquite, redberry juniper, yucca, lotebush, hackberry, prickly pear, skunkbush sumac, plum, western soapberry, little leaf sumac, shin oak, agarito, and catclaw acacia. Native wildflowers add color to the landscape and include winecups, Indian paintbrush, blue flax, prairie verbena, copper-mallow, Englemann daisy, Blackfoot daisy, and evening-primrose. A sub-region within the Rolling Plains is the mesquite plains, composed of mesquite and short-grass savannah. The bottomland areas around rivers and streams are dominated by tress, including American elm, button willow, pecan, and cottonwood.

The fauna in the region reflect species that are well-adapted to prairie and riparian environments, and can survive long, arid summers. Mammal species include coyote, ringtail, ocelot, white-tailed deer, collard peccary, cottontail, and a variety of mice, shrews, and squirrels. A variety of songbirds can be found in the region, along with turkey, scaled quail, and golden-fronted woodpeckers. Amphibians, including the Couche's spadefood toad, Great Plains narrow-mouthed frog, green toad, red-spotted toad, and yellow mud-turtle can be found in areas with water. Reptiles are common throughout the region and include the lesser earless lizard, Texas spotted whiptail, Great Plains and prairie skinks, western hook-nosed snake, and the plains black-headed snake.

Rolling Plains Climate

The climate in the Rolling Plains region is characterized by warm, dry summers, with cool winters. The average temperature of the region is 65.5 °F. The region receives an average rainfall of 53.8 centimeters, with the heaviest rainfall in the fall and spring months.

CHAPTER 3. CULTURE CHRONOLOGY

Two distinct cultural areas are located within Tom Green County – West Central Texas and the Southern Great Plains. Scholars have approached the archaeological data of these regions with two distinct approaches. The cultural history of both regions spans approximately 11,500 years. Although there have been sites with components pre-dating 11,500 years ago, including the Gault Site near Austin, Texas, sites in the Southern Great Plains remain controversial (Hofman and Graham 1998:87-88). Archaeologists have divided the occupation of the Central Texas region into four principal periods and several sub-periods: Paleoindian, Archaic, Late Prehistoric, and Protohistoric/Historic. The Southern Great Plains contains a period called Plains Woodland (or Ceramic), which differs from the Central Texas Late Prehistoric (Hofman 1989).

These temporal divisions for the Central Texas region serve as phases based on projectile point technology (Black 1989a, 1989b; Collins 1995). These divisions mark changing complexes for the Southern Great Plains. These complexes are influenced by shifting climate and subsistence (Hofman 1989; and see Kay 1998). Regardless, each of these periods are characterized by changes in climatic conditions, distinct vegetation types and structure, and concomitant adaptive changes by human populations in hunting and gathering technologies and strategies, general material culture, and at the tail end of the cultural sequence, the arrival of non-indigenous populations. Below is a brief summary of the cultural sequence that has been reconstructed by archaeologists for this area of Texas.

Paleoindian Period

The oldest cultural materials found in the region date to the Paleoindian period. The period spans roughly from 11,500–8800 B.P. (Collins 1995, 2004) in Central Texas and between 11,200 and 7950 B.P. in the Southern Great Plains (Hofman 1989:29-45; Hofman and Graham 1998). The Aubrey site in Denton County has one of the earliest occupations, with radiocarbon assays dating to between 11,542 ± 11 B.P. and 11,590 ± 93 B.P. (Bousman et al. 2004:48). Paleoclimatic proxy measures suggest that a cooler climate with increased precipitation was predominant during the Late Pleistocene (Mauldin and Nickels 2001), the later portion of the period.

Initial reconstructions of Paleoindian adaptations typically viewed these hunter-gatherers as traversing

extreme distances in pursuit of now extinct mega-fauna such as mammoth and mastodon. While these Paleoindian populations did exploit the Late Pleistocene mega-fauna when it was accessible, a number of faunal assemblages from an increasingly larger number of sites indicate that the Paleoindian diet was more varied and consisted of a wide range of resources, including small game and plants. The Lewisville (Winkler 1982) and the Aubrey sites (Ferring 2001) produced faunal assemblages that represented a wide range of taxa, including large, medium, and small species. Information on the consumption of plant resources during the Paleoindian period is lacking. Bousman et al. (2004) reported that the late Paleoindian component at the Wilson-Leonard site reflected the exploitation of riparian, forest and grassland species. Analysis of Paleoindian skeletal remains indicates that the diets of the Paleoindian populations may have been similar to Archaic period hunter-gatherer populations (Bousman et al. 2004; Powell and Steele 1994).

The early portion of the Paleoindian period was characterized by the appearance of Clovis and Folsom fluted projectile points that were used for hunting mega-fauna. Typical projectile points produced at sites with occupations dating to the later portion of the Paleoindian period included the Plainview, Dalton, Angostura, Golandrina, Meserve, and Scottsbluff types. In portions of the Southern Great Plains, the Goshen type has been identified as a transitional complex between Clovis and Folsom (Hofman and Graham 1998:96-97). However, Hofman and Graham (1998) hypothesize that this complex is most likely one of several coexisting lithic traditions, representing the experimentation and variability in technology that coincided with changing climatic and environmental conditions.

Meltzer and Bever (1995) have identified 406 Clovis sites in Texas. One of the earliest, 41RB1, yielded radiocarbon assays that put the maximum age for the Paleoindian component at 11,415 ± 125 B.P. (Bousman et al. 2004:47). In Central Texas, Paleoindian sites are typically lithic scatters located on ridges and upland terraces (Black 1989b). Clovis sites are frequently found in the Southern Great Plains, however, *in situ* finds are rare, making it difficult to understand settlement patterns in the region (Hofman and Graham 1998:93; Johnson and Holliday 2004:285). The area surrounding Tom Green County contains three Southern Great Plains Paleoindian sites with *in situ* evidence of occupation. Blackwater Draw (New Mexico) has yielded the most evidence of Clovis occupation in North America, including the remains of five mammoths, horse, camel and bison. The tools found at the site, along with processing marks on the animal remains, suggests that Clovis projectile points were repurposed into cutting tools in order to scavenge and process the remains of these animals. A second kill and scavenge

site (Miami) is located in the Texas Panhandle. As with Blackwater Draw, the remains of megafauna were found in association with Clovis tools. The remains were found in a playa-lake basin, and had been subjected to heavy weathering. The Lubbock Lake site contains distinct Clovis and Folsom deposits, and represents mammoth scavenging and bison hunting activities. In addition, plant remains and soils found in the stratigraphy at Lubbock Lake suggest that climatic changes occurred at the Clovis-Folsom transition which led to a change in subsistence strategy on the Southern Great Plains. As temperatures changed to colder winters and hotter summers, compared to the Clovis, mixed grasslands habitat became dominant in the area, and ponds became muddy marshes (Hofman and Graham 1998; Johnson and Holliday 2004).

Archaic Period

The Archaic period dates between ca. 8800 to 1200 B.P. It is divided into three sub-periods: Early, Middle, and Late. During the Archaic, mobility strategies may have shifted to more frequent short distance movements that allowed the exploitation of seasonal resource patches. The intermittent presence of bison in parts of Texas, combined with changes in climatic conditions and the primary productivity of the plant resources may have contributed to shifts in subsistence strategies and associated technological repertoire. When bison were not present in the region, hunting strategies focused on medium to small game along with continued foraging for plant resources. When bison were available, hunter-gatherers targeted the larger-bodied prey on a regular basis.

Early Archaic

Collins (1995) suggests that the Early Archaic spans from 8800 to 6000 B.P. in Central Texas. In the Southern Great Plains, sites such as Lubbock Lake suggest that the period spans between 8000 to 6000 B.P. (Johnson and Holliday 2004:290-291). Projectile point styles characteristic of the Early Archaic include Angostura, Early Split Stem, Martindale, and Uvalde (Collins 1995). The Early Archaic climate was drier than the Paleoindian period and witnessed a return to grasslands (Bousman 1998). Mega-fauna of the Paleoindian period could not survive the new climate and ecosystems, therefore eventually dying out. Early Archaic exploitation of medium to small fauna intensified.

The Wilson-Leonard excavation produced a wealth of cultural materials representative of a lengthy period in regional prehistory. The projectile point assemblages from the site indicate that the lanceolate Paleoindian point forms, such as Angostura, continue from the Paleoindian into the Early Archaic. However, these forms are replaced by corner- and basally-notched and shouldered forms (Early Triangular, Andice, Bell), and these quickly become the dominant points tipping the atlatl-thrown darts. In addition, the uses of small to medium hearths similar to the previous period were noted too. The appearance of earth ovens suggests a shift in subsistence strategies. The earth ovens encountered at the Wilson-Leonard site were used to cook wild hyacinth along with aquatic and terrestrial resources (Collins et al. 1998). Analyses of Early Archaic human remains encountered in Kerr County (Bement 1991) reveal diets low in carbohydrates in comparison to the Early Archaic populations found in the Lower Pecos region.

Middle Archaic

The Middle Archaic sub-period spans from 6000 to 4000 B.P. (Collins 1995; Johnson and Holliday 2004:290-291; Weir 1976). Archaeological data indicates that populations may have increased during this time. Climate was gradually drying leading to the onset of a long drought period. Changes to the demographics and cultural characteristics were likely in response to the warmer and increasingly arid conditions. The Lubbock Lake site indicates that there was an increase in sedimentation, and this coupled with arid conditions, led to a decrease in vegetation cover on the Southern Great Plains (Johnson and Holliday 2004:290). Projectile point styles included in this sub-period include Bell, Andice, Calf Creek, Taylor, Nolan, and Travis.

Subsistence during the Middle Archaic includes an increased reliance on nuts and other products of riverine environments (Black 1989a). The upsurge of burned rock middens during the Middle Archaic represents the increased focus on the use of plant resources in Central Texas (Black 1989a; Johnson and Goode 1994). Large ovens are found in the Southern Great Plains region and date to this time period. At Lubbock Lake, a large oven, capped with burned caliche rocks, was identified among camp ovens, a plant processing area, and bison processing areas (Johnson and Holiday 2004:291). Little is known about burial practices during the Middle Archaic, however an excavation of an Uvalde County sinkhole (41UV4) contained 25–50 individuals (Johnson and Goode 1994:28).

Late Archaic

The Late Archaic spans from 4000 to 1200 B.P. in Central Texas and to 2000 B.P. in the Southern Great Plains (Collins 2004; Johnson and Holiday 2004). It is represented by the Bulverde, Pedernales, Kinney, Lange, Marshall, Williams, Marcos, Montell, Castroville, Ensor, Frio, Fairland and Darl projectile points. The early part of the Late Archaic exhibited fluctuations in the temperature and rainfall. In the Southern Great Plains, the Late Archaic brought a relatively stable climate, and reliable surface water returned to the region (Johnson and Holiday 2004:291). There appears to have been an increase in population at this time (Nickels et al. 1998).

While some researchers believe that the use of burned rock middens decreased during the Central Texas Late Archaic, recent research has challenged this notion (Black and Creel 1997; Mauldin et al. 2003). Johnson and Goode (1994) discuss the role of burned rock middens in relation to acorn processing.

Burials related to the Late Archaic in Central and South Texas suggests the region saw an increase in population. This increase may have prompted the establishment of territorial boundaries which resulted in boundary disputes (Story 1985). Human remains dating to this sub-period have been encountered near the Edwards Plateau.

Late Prehistoric/Plains Woodland Period

The Late Prehistoric period begins ca. 1200 B.P. (Collins 1995), and appears to continue until the Protohistoric period (ca. A.D. 1700). The Southern Great Plains calls this period the Plains Woodland or Ceramic, extending between 2000 B.P. and 1450 A.D. (Johnson and Holliday 2004:292-293). A series of traits characterize the shift from the Archaic to the Late Prehistoric period. The main technological changes were the adoption of the bow and arrow and the introduction of pottery. In Central Texas, the Late Prehistoric is divided into two temporal phases, the Austin and Toyah phases. The Plains Woodland is divided into the Plains Woodland and later Plains Village phases (Hofman 1989).

During this time period, warmer and drier conditions slowly transitioned to a period of increased moisture, starting after 1000 B.P. (Mauldin and Nickels 2001). Plant and faunal remains at Late Prehistoric sites indicate that subsistence practices are similar to that of the Late Archaic. Projectile

points associated with the Austin phase include the Scallorn and Edwards types. The Toyah phase is characterized by the prominence of the Perdiz point (Collins 1995).

Plains Woodland phase sites followed a similar trajectory as those in Central Texas. Changing climatic conditions, along with the adoption of Scallorn arrow points, appear in association with pottery. Excavations at Lubbock Lake revealed a Plains Woodland occupation with a hearth, camping debris with a Scallorn arrow point, bison remains, and bone beads (Johnson and Holiday 2004:292). The later Plains Village phase is defined by increased trade across the region. Puebloan pottery and Plains lithics are found at sites in the region. Mogollon ceramics, representing the Jornada branch in Western Texas, are frequently found at sites dating to this time period. Unfortunately, few sites in the region have correlated stratigraphic context, but at Lubbock Lake, game animals are found with strong radiocarbon dates from this period (Johnson and Holiday 2004:293).

Most researchers concur that the early portion of the Late Prehistoric period saw a decrease in population density (Black 1989:32). Radiocarbon dates from some sites have indicated that the middens were utilized during the Late Prehistoric. Some archaeologists feel the peak of midden use was after A.D. 1 and into the Late Prehistoric (Black and Creel 1997:273). Radiocarbon dates from Camp Bowie middens provide evidence that supports Black and Creel's arguments that burned rock middens were primarily a Late Prehistoric occurrence (Mauldin et al. 2003).

Beginning rather abruptly at about 650 B.P., a shift in technology occurred. This shift is characterized by the introduction of blade technology, the first ceramics in Central Texas (bone-tempered plainwares), the appearance of Perdiz arrow points, and alternately beveled bifaces (Black 1989a:32; Huebner 1991:346). Prewitt (1981) suggests this technology originated in north-central Texas. Patterson (1988), however, notes that the Perdiz point was first seen in southeast Texas by about 1350 B.P., and was introduced to west Texas some 600 to 700 years later.

Early ceramics in Central Texas (ca. A.D. 1250 to 1300) are associated with the Toyah phase of the Late Prehistoric and are referred to as Leon Plain ware. The Leon Plain ceramic types are undecorated, bone-tempered bowls, jars, and ollas with oxidized, burnished and floated exterior surfaces (Ricklis 1995). There is notable variation within the type (Black 1986; Johnson 1994; Kalter et al. 2005). This variation can be attributed to differences in manufacturing techniques and cultural affiliation. Analysis of residues

on ceramic sherds suggests that vessels were used to process bison bone grease/fat, mesquite bean/bison bone grease and deer/bison bone grease (Quigg et al. 1993).

The return of bison to South and Central Texas during the Late Prehistoric resulted from a drier climate in the plains located to the north of Texas and increased grasses in the Cross-Timbers and Post Oak Savannah in north-central Texas (Huebner 1991). The increased grasses in the two biotas formed the "bison corridor" along the eastern edge of the Edwards Plateau and into the South Texas Plain (Huebner 1991:354–355). Rock shelter sites, such as Scorpion Cave in Medina County (Highley et al. 1978) and Classen Rock Shelter in northern Bexar County (Fox and Fox 1967), have indicated a shift in settlement strategies (Skinner 1981). Burials encountered that dated to this period often reveal evidence of conflict (Black 1989a:32).

Protohistoric/Historic Period

This period is marked by the first written accounts of European contact with indigenous groups. This period of first contact is highly visible in European writings, and interpreted in archaeological data. Archaeologists argue that this time period should be designated the Protohistoric, in order to demonstrate the brief interactions between indigenous groups and European explorers (Hofman 1989). It is known, however, that there were several ethnic groups, such as the Jumanos and Coahuiltecans living in the region.

The Concho River was an important feature on the landscape for several indigenous groups, including the Comanche. Located upstream from San Angelo is the town of Paint Rock. Paint Rock has pictographs on the bluffs over the river and is reported to be an important area for the Comanche (Smith 2010). The river was named by Hernán Martín and Diego del Castillo during their exploration of the region in 1650. They found large quantities of freshwater mussels in the river that contained pearls.

The Concho River and San Angelo played an important role in the development of Forts across the Texas Frontier. Fort Concho was established in 1867 at the confluence of the Concho and Colorado rivers. The fort was designed to protect travelers and settlers from Comanche attack (Smith 2010). After Fort Concho was established, an informal frontier settlement was established nearby—complete with saloons, gambling halls, and brothels. Bartholomew J. Dewitt purchased land for a trading post and

named it Santa Angela. In 1882, the town was officially named San Angelo, when the town was named the county seat. San Angelo was an attractive area to settle, given its reliable water supply, land for ranching and agriculture, and the arrival of the railroads (Duke 2010).

CHAPTER 4. PREVIOUS ARCHAEOLOGY AND ARCHIVAL REVIEW

A review of the Texas Archaeological Site Atlas (Atlas), an online data base maintained by the THC, revealed that no cultural resource surveys have been conducted within the APE, and only one archaeological site is documented within the APE boundaries (**Figure 4-1**) (THC 2018). Furthermore, three archaeological surveys have been conducted within a 1-km radius of the APE. The surveys recorded site 41TG307, as well as two additional sites within the 1-km study area: 41TG308 and 41TG309 (THC 2018).

Three cultural resources have been conducted within a 1-km radius of the project area, but only two surveys have additional information available on Atlas (THC 2018). In 1991, NRHP eligibility testing was conducted for archaeological sites 41TG305–41TG309 in anticipation of the San Angelo Gravity Interceptor Wastewater Project. The 1991 investigations determined that only sites 41TG307 and 41TG309 should be considered significant and eligible for designation as NRHP properties and SALs. In 1997, a linear survey was conducted in anticipation of a proposed 48-inch wastewater pressure line installation. The survey revisited sites 41TG307 and 41TG308, and conducted investigations for three alternative routes to avoid impacts to the known sites. No information for the third survey is available on Atlas. However, the investigation is likely the original survey which first identified known archaeological sites 41TG307–41TG309 (THC 2018).

Site 41TG307 is located within the western boundaries of the APE, within the temporary laydown area (THC 2108). The site was first recorded as a prehistoric open campsite on the upper terrace of the Concho River. Cultural materials observed include burned rock, mussel shell fragments, and lithic chert flakes at ground surface. Additionally, one possible rock-lined hearth feature was documented eroding out of the ground surface. The 1991 initial investigations recommended additional testing for 41TG307. In 1997, the site was revisited and identified multiple occupational components that date as early as the Early Archaic (5170-8210 B.C.). No further information on the 1997 revisit investigations is available on Atlas. In 1996 site 41TG307 was designated as eligible for listing as an NRHP property and listed as an SAL (THC 2018).

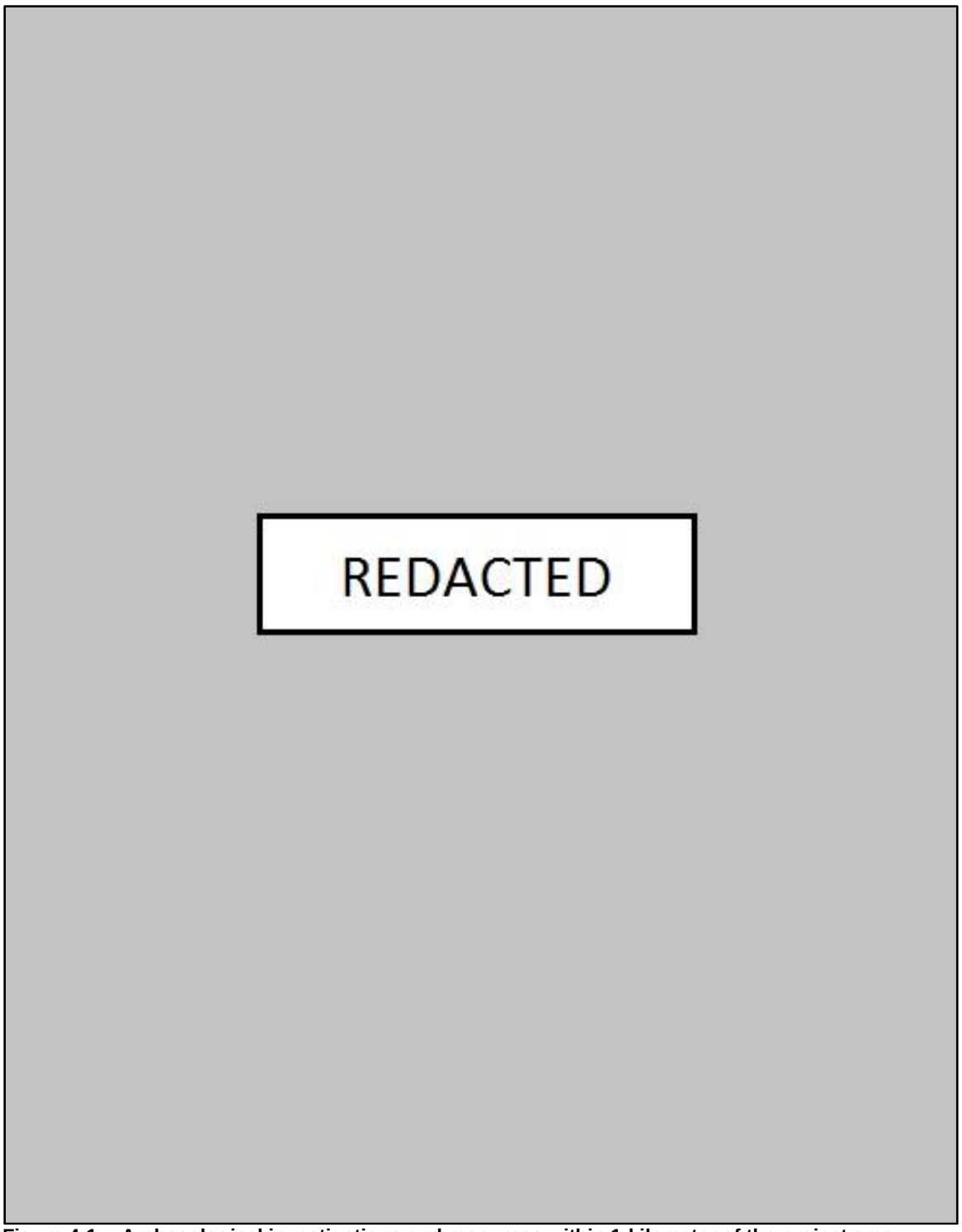


Figure 4-1. Archaeological investigations and resources within 1-kilometer of the project area.

Two additional archaeological sites are located within the 1-km study area: 41TG308 and 41TG309 THC 2018). Site 41TG308 is a multiple component site originally recorded in 1991 and revisited in 1993 and 1997. The site is a probable continuation of site 41TG307, but is located on a higher terrace of the Concho River. Cultural deposits are limited to the ground surface and consist of prehistoric bedrock mortars, lithic stone tool debitage, tested cobbles, mussel shell fragments, and burned rock mixed with historic glass, metal, and wood fragments. Initial investigations recommended no further work for site 41TG308, and the site was designated as eligibility undetermined in 1994. In 1998, a portion of the site was revisited within a linear project ROW and was listed as "ineligible in ROW" for listing as an NRHP property or as an SAL (THC 2018).

Site 41TG309 is another probable continuation of 41TG307 (THC 2018). The open campsite is located on the lower terraces of the Concho River, north of 41TG307, and consists of a similar artifact assemblage as 41TG307, including a thick biface (likely a dart point preform). Four *in situ* rock-lined hearth features and two mussel shell lenses were also documented, eroding from the ground along the steep terrace bluff. In 1996, site 41TG309 was determined eligible for listing as an NRHP property and listed as an SAL in 1996 (THC 2018).

Archival Review

A review of historical maps, deeds, and newspapers indicated that the APE has remained predominately rural, with a history of ranching activities. Deed records indicate that the APE is within the Mary McMillan Survey, Grantee No. 335 ½ (**Figure 4-2**). Additional research indicated that the APE was once owned by a well-known Texas lawman—J. Willis Johnson. Johnson arrived in Texas from Tennessee in 1857 and traveled across the state, working as a cowboy and helping to establish Fort Concho. He arrived in San Angelo in 1874 and was elected Sheriff of Tom Green County in 1882. Johnson held the position until 1892. Besides serving as a lawman, Johnson acquired land and cattle and used his wealth to develop the Western National Bank and *The Standard*, San Angelo's local newspaper (Duke 2010). At the time of Johnson's death, a portion of his holdings were placed into a foundation, while the remaining portions were passed to his daughter, Ruth. Ruth sold the property containing the APE to the City of San Angelo (Duke 2010; Tom Green County Appraisal District [TGCAD] 2018:815:172).

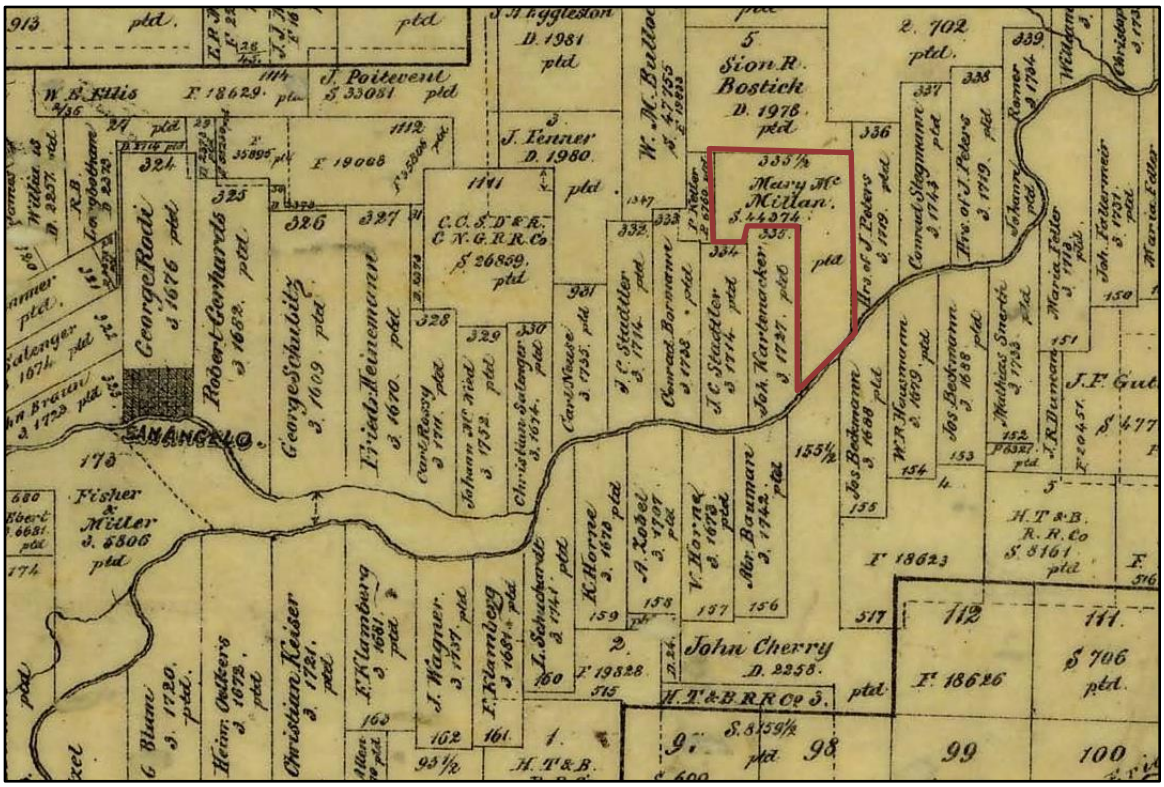
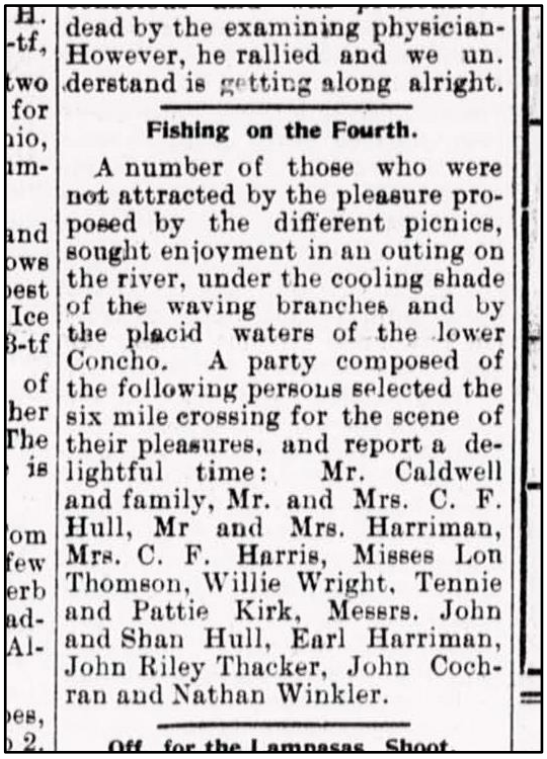


Figure 4-2. The August Gast Bank Note & Lithographic Co. 1894 map of the eastern part of Tom Green County, showing San Angelo and the Mary McMillan survey (red). Courtesy of the Library of Congress.

Historic maps identify the crossing of the Concho River at F.M. 380 as Sixmile Crossing, appropriately named as the location is six miles east from downtown San Angelo. A review of historic newspaper postings indicated that the crossing served as a popular outing location throughout the early 1900s. The social section in *The San Angelo Press* mentioned various outings, including picnics, at this location (**Figure 4-3**). The Sykes family, landowners to the south of the APE, are frequently mentioned as hosting parties at their "country home" in the area (*The San Angelo Press* 1904:1).

The earliest topographic map depicting the APE dates to 1953 (**Figure 4-4**). This map shows the original route of F.M. 380 (identified as Rock Paint Road), located south of the current alignment. The 1953 map illustrates gravel and caliche pits to the north and south of the APE with multiple buildings and structures adjacent to county roads. No buildings or structures are depicted within the APE on the 1953 topographic map.



dead by the examining physician. However, he rallied and we understand is getting along alright.

Fishing on the Fourth.

A number of those who were not attracted by the pleasure proposed by the different picnics, sought enjoyment in an outing on the river, under the cooling shade of the waving branches and by the placid waters of the lower Concho. A party composed of the following persons selected the six mile crossing for the scene of their pleasures, and report a delightful time: Mr. Caldwell and family, Mr. and Mrs. C. F. Hull, Mr and Mrs. Harriman, Mrs. C. F. Harris, Misses Lon Thomson, Willie Wright, Tennie and Pattie Kirk, Messrs. John and Shan Hull, Earl Harriman, John Riley Thacker, John Cochran and Nathan Winkler.

Off for the Lampasas Shoot.

Figure 4-3. A newspaper article on an outing to Six-Mile Crossing. *The San Angelo Press* 1902.

A review of the 1984 *Veribest* topographic map illustrates the realigned route of F.M. 380 (**Figure 4-5**). The new road was directed roughly 180 m north of the original alignment, along a narrower portion of the Concho River. Multiple buildings and structures continue to be illustrated along F.M. 380, and a sewage disposal pond is depicted to the north of the APE.

Although the course of the river appears to be relatively stable between 1953 and 1984, the banks were altered to accommodate the new bridge. In addition, it is likely that the channels were affected by the construction of reservoirs and dams along the Concho River. In 1939, the O.C. Fisher Dam and Reservoir was constructed 14 km west of the APE, on the North Concho River to aid in flood water control (Tom Green County Water Control & Improvement [TGCWCI] 2012). In 1960, the Twin Buttes Reservoir was constructed roughly 21 miles southwest of the APE to control water on the Middle and South Concho rivers and provides irrigation waters to the town and county (TGCWCI 2012).

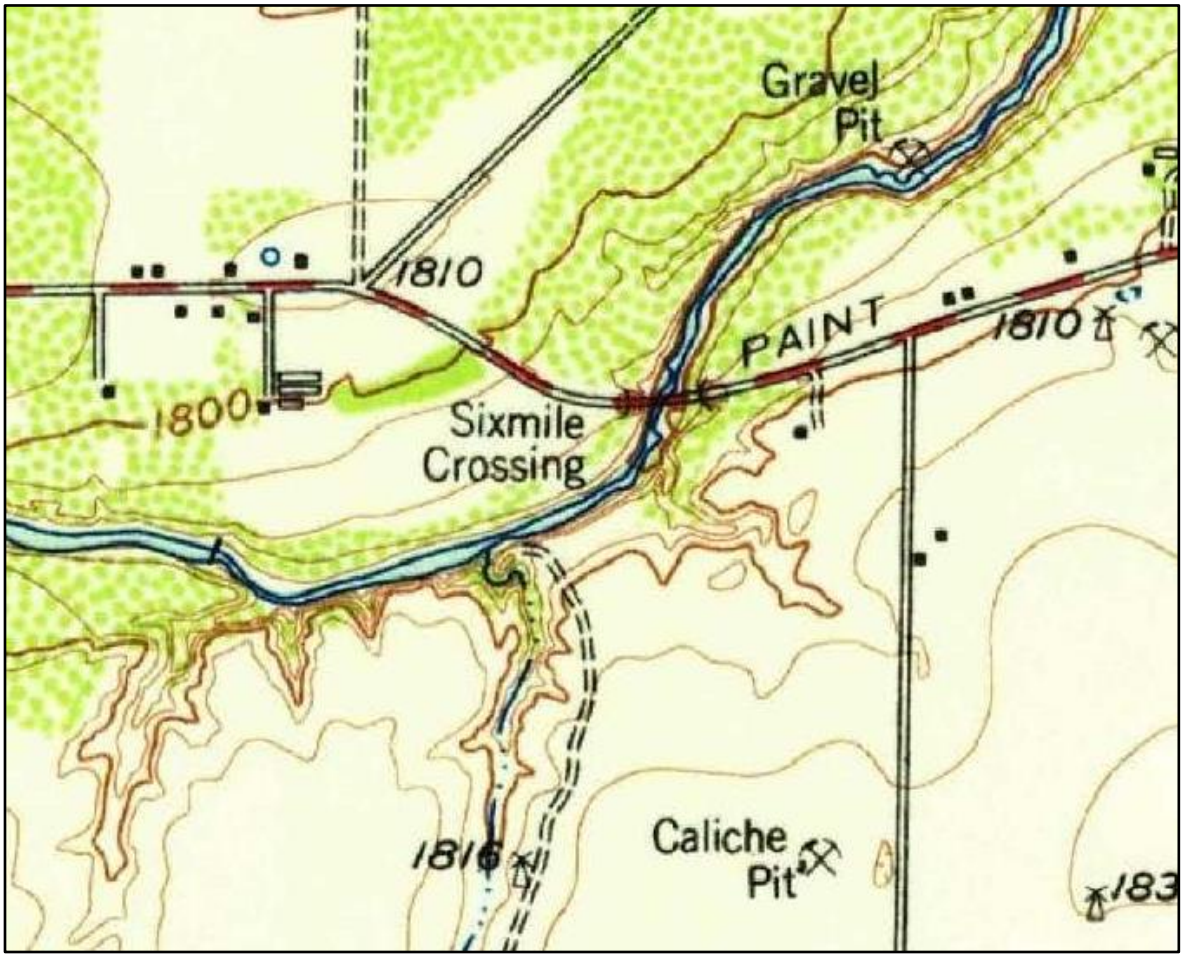


Figure 4-4. The *Wall* USGS Quadrangle Map, 1958.

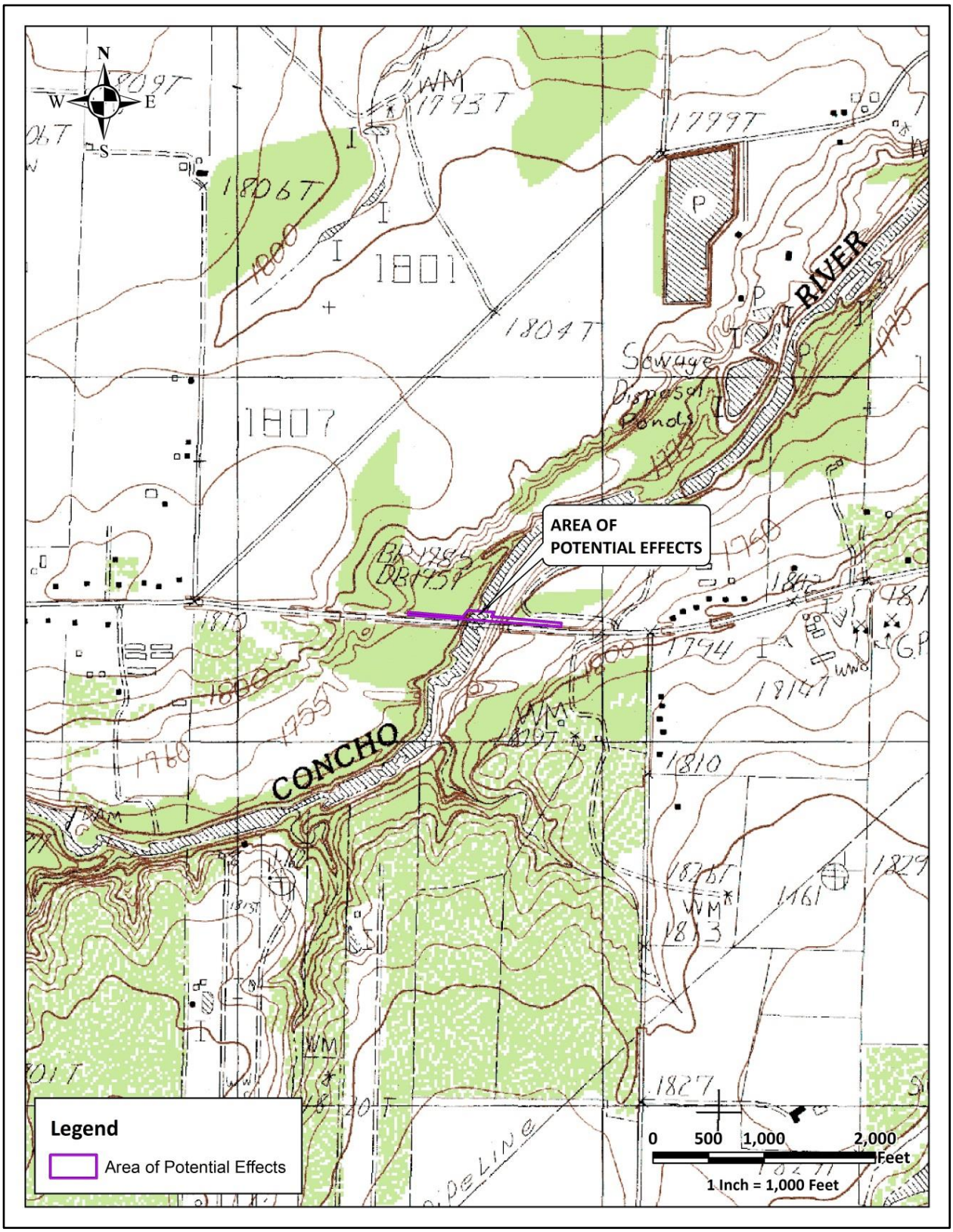


Figure 4-5. The *Veribest* USGS Quadrangle Map, 1984.

CHAPTER 5. METHODS OF INVESTIGATION

To ensure that the project met the requirements of regulating agencies, **RKEI** performed an intensive archaeological survey augmented with shovel testing of the entire APE. All work complied with THC and Council of Texas Archeologists (CTA) guidelines and standards. Investigations ensured that if historic or prehistoric deposits and/or features were present within the APE, they were properly recorded and evaluated for their significance prior to negative impacts associated with the project. No cultural deposits or features were identified during the survey.

A visual inspection of the ground surface was conducted in areas of high ground surface visibility (greater than 30-percent) in order to locate cultural materials on the ground surface or evidence of cultural features beneath the ground surface. A preliminary review by the USACE-FW determined that a minimum of 12 shovel tests would be conducted within the APE. If a given shovel test was positive for cultural materials, additional units would be excavated in 10-m intervals in the four cardinal directions until two consecutive, negative shovel tests were produced. If cultural materials were determined to be associated with an archaeological site, the original shovel tests would be used as part of the site boundary definition stage of the investigation. No cultural materials were uncovered, and no new sites were identified during the survey.

Shovel tests were excavated to a depth of 60 cm below surface. They averaged 35 cm in diameter and were excavated in 10 cm levels. All soils were screened through a ¼-inch mesh to observe artifacts. A shovel test form was completed for each excavated unit. The forms contained information on the soils encountered, any artifacts recovered, disturbances levels, and references to samples retained and/or photographs taken. A shovel test log is provided in Appendix A.

Artifacts derived from each level of each shovel test would have been noted on appropriate level forms and collected by provenience and returned to the **RKEI** Archaeology Laboratory for processing and analysis. If archaeological features had been encountered during the survey, they would have been documented via GPS location, photography, drawings, and notes. No features were encountered during the survey.

Laboratory Methods

The project adhered to a 100-percent artifact collection policy during the course of the investigations. However, no artifacts were encountered; thus, no artifacts were analyzed or summited for curation. All project related documentation produced during the investigations will be prepared for curation in accordance with federal regulation 36 CFR Part 79, and THC requirements for State Held-in-Trust collections. Field notes, field forms, photographs, and field drawings will be placed into labeled archival folders and converted into electronic files. Digital photographs will be printed on acid-free paper, labeled with archival quality appropriate materials, and will be placed in archival-quality plastic sleeves when needed. All field forms will be completed with pencil. Ink-jet produced maps and illustrations will be placed in archival quality plastic page protectors to prevent against accidental smearing due to moisture. A copy of the report and all digital materials will be saved onto a CD and stored with field notes and documents.

All project related documentation will be curated at the Center for Archaeological Research at the University of Texas, One UTSA Boulevard, San Antonio, Texas 78249.

CHAPTER 6. RESULTS OF INVESTIGATIONS

RKEI archaeologists conducted an intensive pedestrian survey augmented with shovel testing of the San Angelo Veribest Pipeline Replacement Project on January 24–25, 2018. Ashley Jones acted as Principal Investigator and Rhiana D. Ward served as Project Archaeologist. Rhiana D. Ward and Chris Matthews completed field investigations, which resulted in negative findings. The APE was found to be disturbed from road and utility construction, and no evidence of site 41TG307 was encountered.

Investigations began on the western side of the APE, along a generally level, lower terrace of the Concho River's left descending bank (**Figure 6-1**). The western APE was contained completely within the existing ROW of F.M. 380, with a property fence line to the north and the raised road bed partially within the southern boundary of the APE. One concrete box culvert was observed, directing storm water run-off beneath the road and into the APE approximately 42 m east of the western APE boundary (**Figure 6-2**).

Figure 6-1. Overview of western half of the APE, facing east.

Figure 6-2. Concrete box culvert directing storm water run-off into the western APE from beneath F.M. 380, facing east.

Other disturbances observed within the western half of the APE included a modern manhole, an abandoned concrete manhole, and an underground electric cable line (**Figure 6-3**). The modern manhole was documented 20 m east of the western APE boundary, and consisted of a 76 cm-diameter metal cover for the City of San Angelo Sewer System (**Figure 6-4**). A review of the City of San Angelo Water and Sewer maps depicts the sewer line as intersecting the APE from southwest to northeast (City of San Angelo Geographic Information Systems Online Mapping [COSA GIS] 2018). Soils around the cover had been recently disturbed prior to archaeological investigations, likely for access to the sewer line.

An abandoned manhole was documented 9 m east/southeast of the modern sewer manhole (**Figure 6-5**). The abandoned utility was constructed of a course-grain concrete conglomerate reinforced with a hog-wire mesh frame (**Figure 6-6**). The opening measured 45 cm in diameter and the exterior concrete lip measured 106 cm in diameter. The depth of the manhole is unknown, as the hole had been filled with concrete and a soil matrix with high gravel content. A review of the COSA GIS maps suggested that the abandoned utility was likely the former sewer manhole for the alignment that once connected to the former wastewater treatment plan, 0.6 km north of the APE (COSA GIS 2018).

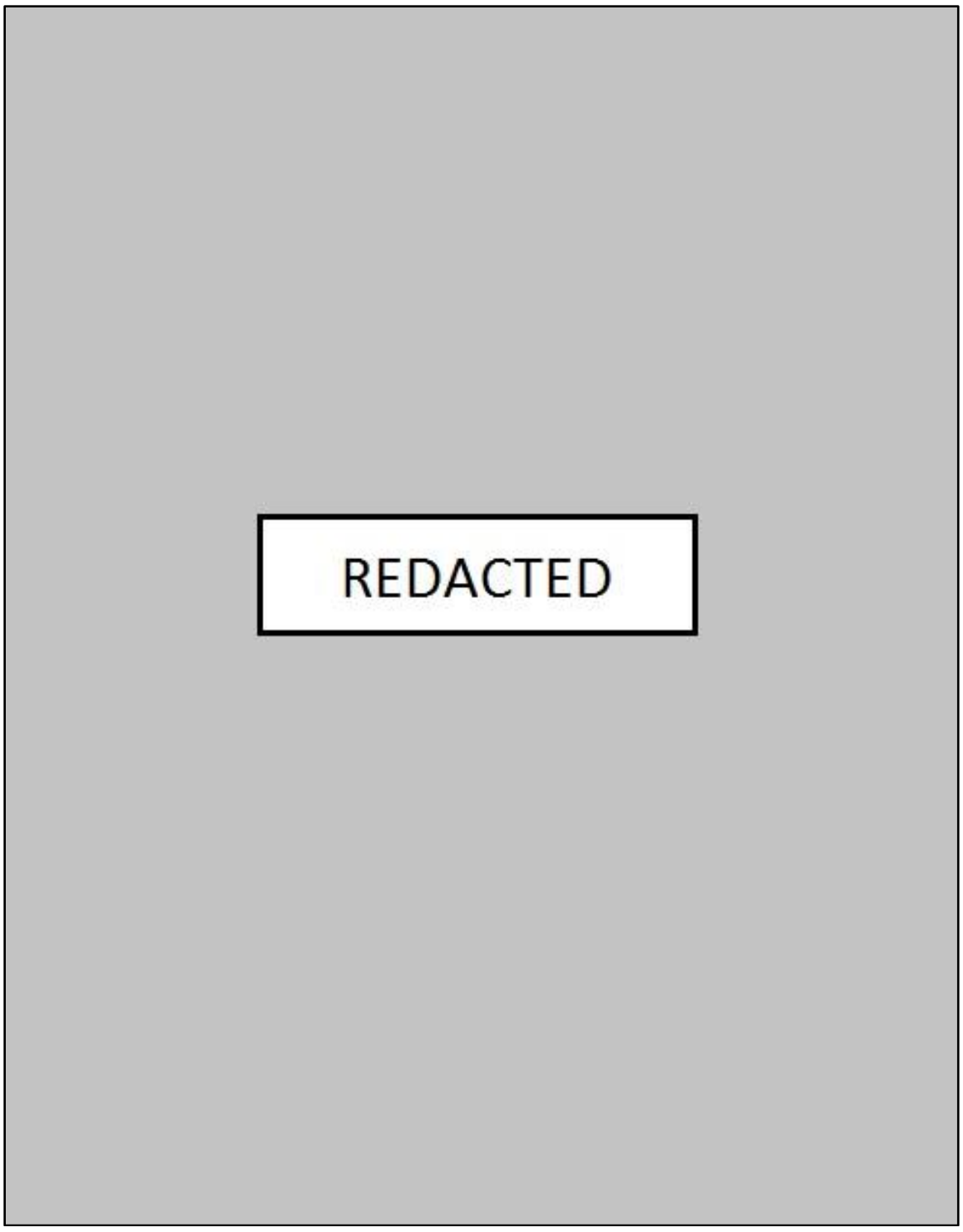


Figure 6-3. Results of archaeological investigations

Figure 6-4. Modern sewer manhole cover within APE, facing east.

Figure 6-5. Abandoned manhole utility with modern manhole cover in background, facing west.

Figure 6-6. Close up of concrete matrix and hog-wire mesh framing of abandoned utility.

The last disturbance observed along the western half of the APE was an unground electric cable that parallels the fence immediately north of the APE boundary (**Figure 6-7**). The electric line appeared to begin at the edge of the Concho River lower terrace and direct west. No posted signs or pylons for the buried cable were observed within the eastern portion of the APE.

Eight shovel tests (ST 1–8) were excavated within the western half of the APE (see Appendix A). Shovel tests (ST) 1–5 were situated atop the level terrace and generally consisted of brown (10YR4/3 and 7.5YR4/4) to dark brown (10YR3/3) silty clay matrices. Soils were compact to hard and contained root, gravel, and calcium carbonate inclusions (**Figure 6-8**). Gravels consisted predominately of angular limestone gravels, with few rounded limestone gravels observed. Angular chert gravels, initially identified in ST 1, were also observed. Given that the western end of the APE was located within the boundaries of a known archaeological site (41TG307), additional shovel tests were excavated in 10 m intervals to confirm that the chert materials observed were not cultural in nature. STs 3–5 identified additional chert material within the upper levels of excavation (0 to 40 cmbs). However, examination of the materials identified evidence of mechanical crushing and fracturing and it was determined that none of the materials were cultural in nature. Other materials observed included two aluminum pull tabs within ST 5. The tabs were documented between 20 to 40 cmbs, and were not collected.

Figure 6-7. Overview of buried electric cable paralleling the fence line, marked with orange signage, facing west.

Figure 6-8. Average soil profile for STs 1–5, ST 3, facing south.

One shovel test, ST 6, was excavated at the edge of the lower terrace, adjacent to an erosional cut and a steep drop-off (50 to 90 percent slope) into the river drainage (**Figures 6-9 and 6-10**). Soils of ST 6 consisted of hard, light brownish-gray (10YR6/2) silt that increased in hardness with depth (**Figure 6-11**). Inclusions consisted of 10-percent rounded gravels throughout. Excavations were terminated at 50 cmbs due to extreme compaction. One fragment of white polyvinyl chloride (PVC) pipe was observed between 30 to 40 cmbs within ST 6. Compacted soils and the presents of the PVC pipe suggests that the area has been disturbed, likely from road and utility construction and storm water runoff diverted from the box culvert to the west. No cultural materials or evidence of cultural features were observed in ST 6.

Figure 6-9. Erosional cut adjacent to ST6, facing southeast.

Two shovel tests (ST 7 and ST 8) were excavated on a narrow, heavily vegetated ledge within the river drainage (**Figure 6-12**). Soils consisted of soft brown (10YR5/3) and dark yellowish-brown (10YR4/4) silty clays and silts with root inclusions. ST 7 terminated at 60 cmbs and ST 8 terminated at 53 cmbs due to an impassable tree root. No cultural materials or evidence of cultural features were observed during ST 7 and ST 8 excavations.

Figure 6-10. Decent (50 to 90 degree angle) into river channel, facing east.

Figure 6-11. Soil profile of ST 6, facing southwest.

Figure 6-12. Overview of narrow ledge, adjacent to river bank, facing northeast.

An examination of erosional cut banks immediately adjacent to the southern APE boundary was conducted along the descending left bank of the Concho River. Cut banks were present beneath the F.M. 380 bridge and extended up to the southern boundary of the APE. Multiple stratigraphic levels of silty clays and gravel deposits were noted, ranging from 130 cmbs (**Figure 6-13**) to 300 cmbs (**Figure 6-14**). Close inspection of the cut bank profiles did not identify any cultural materials or features.

The APE extends roughly 56 m across the Concho River, encompassing 0.35 acres of riverbed and lower flood plain (**Figure 6-15**). The river is characterized by earthen banks covered with moderately dense riparian trees, vines, and low shrubs. The descending left bank is steeply sloped (45 to 50-degree slope), while the descending right bank is moderately sloped (15 to 20-degree slope). Evidence of recent flooding was observed throughout the lower floodplain, including vegetation debris and modern refuse debris (**Figure 6-16**). The existing pipe to be replaced was visible within the river channel (**Figure 6-17**).

Figure 6-13. Erosional cut profile, 2 m southeast of ST6, facing north. Shovel measures 140 cm long for scale.

Figure 6-14. Erosional soil profile beneath the F.M. 380 bridge, facing west. Shovel measures 140 cm long for scale.

Figure 6-15. Overview of Concho River within the APE, facing northwest.

Figure 6-16. Overview of lower floodplain of Concho River, descending right bank, with evidence of recent flooding activity, facing east/southeast.

Figure 6-17. Existing pipeline within Concho River, facing east.

The eastern half of the APE is located mostly within a well-worn, two-track road along the lower terrace of the descending right bank of the Concho River (**Figure 6-18**). The APE is positioned between a property fence to the north and the steeply sloping, (45 degree slope) raised road base for F.M. 380 to the south. The two-track road is used for access beneath the F.M. 380 bridge, where a modern refuse dump has accumulated within and adjacent to the lower river floodplain (**Figure 6-19**). Modern refuse observed included tires, small kitchen appliances, coolers, and animal carcasses.

Four shovel tests (ST 9-12) were conducted along the eastern half of the APE (see Appendix A). ST 9 was excavated 5 m from the lower floodplain, adjacent the modern dump (see **Figure 6-19**). Soils consisted of compact dark brown (10YR3/3) silty clays with gravel and pebble inclusions. ST 9 was terminated at 40 cmbs due to an impassable gravel lens. No cultural materials or evidence of cultural features was identified.

The three remaining shovel tests (ST 10-12) on the east side of the APE were excavated atop the level, lower terrace of the Concho River. Space for shovel testing was limited due to the raised road bed and existing two-track road. Shovel tests documented compact to very hard brown (10YR4/3 and 10YR5/3)

Figure 6-18. Overview of eastern APE, within two-track road and steeply sloped road base, facing west.

Figure 6-19. Overview of ST 9 and modern refuse dump along the descending right bank of the Concho River, facing west.

silty loam soils with less than 5-percent angular gravel and rounded pebble inclusions (**Figure 6-20**). Shovel tests were terminated at depth (60 cmbs). Aside from two shards of brown glass noted at 40-50 cmbs within ST 10 (materials not collected), no cultural materials were identified in the ST 10-12 excavations.

Figure 6-20. Average soil profile for the eastern half of the APE, ST 11, facing south.

Site 41TG307 Revisit

Current investigations revisited known archaeological site 41TG307 on January 24, 2018. Approximately 120 m of the western APE is located within the documented site boundaries, originally recorded in 1991 (**Figure 6-21**). Current investigations excavated a total of five shovel tests (ST 1-5) within the known site boundaries, none of which identified any evidence of cultural materials or features. Furthermore, an examination of the ground surface within the APE did not identify any cultural materials or evidence of cultural features.

Figure 6-21. Overview of 41TG307 within APE, facing west. Note small rise in background.

Soils consisted of compact to hard brown (10YR4/3 and 7.5YR4/4) to dark brown (10YR3/3) silty clay matrices with root, gravel, and calcium carbonate inclusions. Gravels consisted predominately of angular limestone and chert gravels, with few rounded limestone gravels observed. Chert materials were first identified in ST 1, which prompted archaeologist to excavated additional shovel tests to confirm that the chert materials observed were not cultural in nature. STs 3–5 identified additional chert material within the upper levels of excavation (0 to 40 cmbs); however, examination of the material identified evidence of mechanical crushing and fracturing. Chert materials observed were likely the result of road and utility construction, as well as erosion from the small rise immediately west of the APE boundary (see **Figure 6-21, background**). No further work is recommended for 41TG307 within the APE.

CHAPTER 7. SUMMARY AND RECOMMENDATIONS

Archaeological investigations for the San Angelo Veribest Pipeline Replacement Project were conducted on January 24-25, 2018. Investigations consisted of an intensive pedestrian survey augmented with shovel testing of the 1.26-acre APE. Twelve shovel tests were excavated: eight on the western side of the Concho River, and four on the eastern side. Excavations encountered compact to very hard silty clay soils with modern refuse identified as deep as 50 cmbs (ST 5 and ST 10). Compact soils and the presence of modern refuse indicated that the APE has been impacted, likely from the construction of F.M. 380 and the existing pipeline ROW. Additional disturbances documented include multiple sewer manholes near the western APE terminus, and an underground electric cable to the north of the APE.

Approximately 0.27-acres of the western APE is located within the site boundaries of 41TG307. Site 41TG307 is a prehistoric open campsite recorded in 1991 atop the upper terrace of the Concho River. During a revisit in 1996, the site tested positive for multiple occupational components that date as early as the Early Archaic (5170-8210 B.C.). The artifact assemblage consists of burned rock, mussel shell fragments, lithic chert flakes at ground surface, and one possible rock-lined hearth feature. Site 41TG307 was designated as eligible for listing as a NRHP property and listed as an SAL in 1996 (THC 2018).

Investigations conducted a total of five shovel tests (ST 1-5) within the known site boundaries of 41TG307, none of which identified any evidence of cultural materials or features. The portion of the site within the APE has been impacted from road and utility construction, evidenced by compact soils and the presents of modern materials (two aluminum pull tabs) at 20 to 40 cmbs within ST 5. Given this conclusion, **RKEI** does not recommend further archaeological investigations for the documented site located within the boundaries of the APE. Furthermore, no further work is recommended for the remaining APE. However, should changes be made to the project area, it is recommended that additional testing be conducted to determine the extent and significance of cultural deposits beyond the currently defined boundaries. Additionally, because site 41TG307 is designated as eligible for listing as an NRHP property and is listed as an SAL, avoidance measures are recommended to prevent impacts of any cultural deposits that might not have been identified during investigations. The regulating agencies may require avoidance measures to include timber mats or other protective materials to prevent ground disturbance within the laydown area within the site boundary.

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Appendix A
Shovel Test Log

Shovel Test No.	Site Trinomial	County	Depth (cm)	Munsell	Soil Color	Soil Texture	Inclusions	Positive/ Negative	Cultural Materials	Reason for Termination/ Comments
1	41TG307	Tom Green	0-10	10YR3/3	Dark Brown	Hard Silty Loam	Gravels	Negative	-	Within road ROW and adjacent to underground electric cable and sewer ROW. Termination due to depth.
			10-20	10YR3/3	Dark Brown	Compact Silty Loam	Gravels	Negative	Mussel shell observed (not collected)	
			20-30	10YR3/3	Dark Brown	Compact Silty Loam	Gravels	Negative	-	
			30-40	10YR3/3	Dark Brown	Compact Silty Loam	Gravels and Calcium Carbonates	Negative	-	
			40-50	10YR3/3	Dark Brown	Compact Silty Loam	Gravels and Calcium Carbonates	Negative	-	
			50-60	10YR3/3	Dark Brown	Compact Silty Loam	Gravels and Calcium Carbonates	Negative	-	
2	41TG307	Tom Green	0-10	10YR4/3	Brown	Hard Silty Clay	<10% gravels; roots	Negative	-	Within road ROW and adjacent to underground electric cable and sewer ROW. Termination due to depth.
			10-20	10YR4/3	Brown	Hard Silty Clay	<5% Gravels; Roots	Negative	-	
			20-30	10YR4/3	Brown	Compact Silt	Roots	Negative	-	
			30-40	10YR4/3	Brown	Compact Silt	-	Negative	-	
			40-50	10YR4/3	Brown	Compact Silt	-	Negative	-	
			50-60	10YR4/3	Brown	Compact Silt	-	Negative	-	

Shovel Test No.	Site Trinomial	County	Depth (cm)	Munsell	Soil Color	Soil Texture	Inclusions	Positive/ Negative	Cultural Materials	Reason for Termination/ Comments
3	41TG307	Tom Green	0-10	7.5YR4/4	Brown	Hard silty Clay	<10% Angluar Gravels; Roots	Negative	-	Within road ROW and adjacent to underground electric cable and sewer ROW. Termination due to depth.
			10-20	7.5YR4/4	Brown	Hard Silty Clay	<10% Angular Gravels	Negative	-	
			20-30	7.5YR4/4	Brown	Compact Silty Clay	10% Angular Gravels	Negative	-	
			30-40	7.5YR4/4	Brown	Compact Silty Clay	<10% angular gravels	Negative	-	
			40-50	10YR4/4	Dark Yellowish Brown	Compact Silty Clay	< 5% angular gravels	Negative		
			50-60	10YR4/4	Dark Yellowish Brown	Compact Silty Clay	<5% angular and rounded gravels	Negative	-	
4	41TG307	Tom Green	0-10	10YR3/3	Dark Brown	Very Hard Silty Loam	Pebbles; Gravels	Negative	Mussel shell observed (not collected)	Within road ROW and adjacent to underground electric cable and sewer ROW. Termination due to depth.
			10-20	10YR3/3	Dark Brown	Hard Silty Loam	Pebbles; Gravels	Negative	-	
			20-30	10YR3/3	Dark Brown	Hard Silty Loam	Pebbles; Gravels	Negative	-	
			30-40	10YR3/3	Dark Brown	Hard Silty Loam	Pebbles	Negative	-	
			40-50	10YR3/3	Dark Brown	Hard Silty Loam	Pebbles	Negative	-	

Shovel Test No.	Site Trinomial	County	Depth (cm)	Munsell	Soil Color	Soil Texture	Inclusions	Positive/ Negative	Cultural Materials	Reason for Termination/ Comments
			50-60	10YR3/3	Dark Brown	Hard Silty Loam	Pebbles	Negative	-	
5	41TG307	Tom Green	0-10	10YR3/3	Dark Brown	Compact Silty Loam	-	Negative	-	Within road ROW and adjacent to underground electric cable and sewer ROW. Termination due to depth.
			10-20	10YR3/3	Dark Brown	Compact Silty Loam	-	Negative	-	
			20-30	10YR3/3	Dark Brown	Compact Silty Loam	-	Negative	1 aluminum pull tab (not collected)	
			30-40	10YR3/3	Dark Brown	Compact Silty Loam	-	Negative	1 aluminum pull tab (not collected)	
			40-50	10YR3/3	Dark Brown	Compact Silty Loam	-	Negative	-	
			50-60	10YR3/3	Dark Brown	Compact Silty Loam	-	Negative	-	
6	-	Tom Green	0-10	10YR6/2	Light Brownish Gray	Hard Silt	10% Rounded Gravels	Negative	-	Within road ROW at edge of bridge overpass and within 2 m of high bank drop-off. Termination due to compaction.
			10-20	10YR6/2	Light Brownish Gray	Very Hard Silt	10% Rounded Gravels	Negative	-	
			20-30	10YR6/2	Light Brownish Gray	Very Hard Silt	10% Rounded Gravels	Negative	-	

Shovel Test No.	Site Trinomial	County	Depth (cm)	Munsell	Soil Color	Soil Texture	Inclusions	Positive/ Negative	Cultural Materials	Reason for Termination/ Comments
			30-40	10YR6/2	Light Brownish Gray	Very Hard Silt	10% Rounded Gravels	Negative	1 hard plastic fragment observed (not collected)	
			40-50	10YR6/2	Light Brownish Gray	Very Hard Silt	10% Rounded Gravels	Negative	-	
7	-	Tom Green	0-10	10YR4/4	Dark Yellowish Brown	Soft Clay Silt	-	Negative	-	At base of 45 to 90 degree slope from high bank, approximately 10 m from river drainage. Termination at depth.
			10-20	10YR4/4	Dark Yellowish Brown	Soft Clay Silt	-	Negative	-	
			20-30	10YR4/4	Dark Yellowish Brown	Soft Clay Silt	-	Negative	-	
			30-40	10YR4/4	Dark Yellowish Brown	Soft Clay Silt	-	Negative	-	
			40-50	10YR5/4	Yellowish Brown	Soft Clay Silt	-	Negative	-	
			50-60	10YR5/4	Yellowish Brown	Soft Clay Silt	-	Negative	-	
8	-	Tom Green	0-10	10YR5/3	Brown	Soft Silt	Roots	Negative	-	At base of 45 to 90 degree slope from high bank, approximately 2 m from river drainage. Termination at impassable root.
			10-20	10YR5/3	Brown	Soft Silt	Roots	Negative	-	
			20-30	10YR5/3	Brown	Soft Silt	Roots	Negative	-	
			30-40	10YR5/3	Brown	Soft Silt	Roots	Negative	-	
			40-50	10YR5/3	Brown	Soft Silt	Roots	Negative	-	
			50-53	10YR5/3	Brown	Soft Silt	Roots	Negative	-	

Shovel Test No.	Site Trinomial	County	Depth (cm)	Munsell	Soil Color	Soil Texture	Inclusions	Positive/ Negative	Cultural Materials	Reason for Termination/ Comments
9	-	Tom Green	0-10	10YR3/3	Dark Brown	Compact Silty Clay	Pebbles; Gravels	Negative	-	Located on low bank, roughly 5 m from river drainage. Local dumping site. Termination due to impassable gravel lens.
			10-20	10YR3/3	Dark Brown	Compact Silty Clay	Pebbles; Gravels	Negative	-	
			20-30	10YR3/3	Dark Brown	Compact Silty Clay	Pebbles; Gravels	Negative	-	
			30-40	10YR3/3	Dark Brown	Compact Silty Clay	Pebbles; Gravels	Negative	-	
10	-	Tom Green	0-10	10YR4/3	Brown	Compact Silty Loam	Gravels	Negative	-	Within two-track road, at base of raised road bed. Termination at depth.
			10-20	10YR4/3	Brown	Compact Silty Loam	Gravels	Negative	-	
			20-30	10YR4/3	Brown	Compact Silty Loam	Gravels	Negative	-	
			30-40	10YR4/3	Brown	Compact Silty Loam	Gravels	Negative		
			40-50	10YR4/3	Brown	Compact Silty Loam	Pebbles; Gravels	Negative	2 brown glass container shards observed (not collected)	
			50-60	10YR4/3	Brown	Compact Silty Loam	Pebbles; Gravels	Negative	-	
11	-	Tom Green	0-10	10YR5/3	Brown	Very Hard Silt	-	Negative	-	Within two-track road, at base of raised road bed. Termination at depth.
			10-20	10YR5/3	Brown	Very Hard Silt	-	Negative	-	
			20-30	10YR5/3	Brown	Very Hard Silt	-	Negative	-	
			30-40	10YR5/3	Brown	Very Hard Silt	-	Negative	-	
			40-50	10YR5/3	Brown	Very Hard Silt	<5% angular gravels	Negative	-	

Shovel Test No.	Site Trinomial	County	Depth (cm)	Munsell	Soil Color	Soil Texture	Inclusions	Positive/ Negative	Cultural Materials	Reason for Termination/ Comments
			50-60	10YR5/3	Brown	Very Hard Silt	<5% angular gravels	Negative	-	
12	-	Tom Green	0-10	10YR4/3	Brown	Compact Silty Loam	Gravels	Negative	-	Within two-track road, at base of raised road bed. Termination at depth.
			10-20	10YR4/3	Brown	Compact Silty Loam	Gravels	Negative	-	
			20-30	10YR4/3	Brown	Compact Silty Loam	Gravels	Negative	-	
			30-40	10YR4/3	Brown	Compact Silty Loam	Gravels	Negative	-	
			40-50	10YR4/3	Brown	Compact Silty Loam	Gravels	Negative	-	
			50-60	10YR4/3	Brown	Compact Silty Loam	Gravels	Negative	-	