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Intensive Archaeological Survey for the Hayhurst Lateral Pipeline Project

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Reeves and Culberson Counties, Texas

September 2017

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Principal Investigator: Clayton Tinsley

Final Draft

Intensive Archaeological Survey for the Hayhurst Lateral Pipeline Project, Reeves and Culberson Counties, Texas

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Texas Antiquities Permit Number 8163

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Management Summary

XRI Blue (XRI) has contracted HDR to conduct an intensive archaeological survey in advance of the installment of the Hayhurst Lateral Pipeline in Reeves and Culberson Counties, Texas (Figure 1-1). The proposed pipeline will begin approximately 0.5 mile (mi; 0.8 kilometer [km]) west of Orla, Texas, along Ranch-to-Market (RM) 652. The proposed project area is approximately 8.5 mi (13.7 km) long located within the existing Texas Department of Transportation (TxDOT) Right-of-Way (ROW) with six pump station easements located on private land. Since the majority of the project area is on state-owned land, the proposed developments are required to be in compliance with Chapter 191 of the Texas Natural Resources Code, also known as the Antiquities Code of Texas (13 Texas Administrative Code [TAC] 26.12).

The pipeline is a 16-inch water pipeline. It will begin on the south side of RM 652 and cross to the north side at Pump #5.5 approximately 0.8 mi (1.3 km) west from the eastern edge of the Area of Potential Effects (APE). The permanent pipeline easement is 8.5 mi (13.7 km) long and 10 feet (ft; 3 meters [m]) wide. Each pump station easement is 100 ft x 100 ft (30.5 m x 30.5 m). The depth of impacts will be up to 4 ft (1.2 m) along the entire project area. Pipeline construction will include boring at waterway crossings. The APE for the main pipeline will be contained within the existing TxDOT ROW. The total APE includes the 8.5 mi x 10 ft pipeline corridor and the six 100 ft x 100 ft pump station easements for a total of approximately 12 acres (ac; 4.9 hectares [ha]).

The purpose of the archaeological investigation is to determine the presence/absence of archaeological resources within the APE as per the Antiquities Code of Texas (13 TAC 26.12) and to evaluate identified resources for their eligibility for inclusion in the National Register of Historic Places (NRHP) or as a designated State Antiquities Landmark (SAL). The cultural resources survey was conducted under Texas Antiquities Permit Number 8163. The field effort was led by Melanie Johnson on September 20, 2017.

HDR conducted an intensive archaeological survey within the 12-ac (4.9 ha) APE. A total of 11 shovel tests were excavated during the survey: 5 within the RM 652 ROW and 6 within the pump station easements. The soils encountered were typically shallow overlying caliche. All shovel tests were negative. No cultural materials were discovered within the APE during the investigation.

In accordance with 13 TAC 26.12, no further archaeological investigations are recommended and construction may proceed. In the event that any archaeological deposits are encountered during construction, work should cease and the Texas Historical Commission (THC) should be notified.

All records and materials generated by this project will be permanently curated at the Center for Archaeological Studies (CAS) at Texas State University in San Marcos, Texas.

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Abbreviations and Acronyms

ac	acre(s)
APE	Area of Potential Effects
Atlas	Texas Archeological Sites Atlas
CAS	Center for Archaeological Research
CFR	Code of Federal Regulations
cm	centimeters
cmbs	centimeters below surface
ft	foot/feet
GPS	Global Positioning System
ha	hectare(s)
in	inch(es)
inbs	inches below surface
km	kilometer(s)
m	meter(s)
mi	mile(s)
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
OTHM	Official Texas Historical Marker
RM	Ranch-to-Market
ROW	Right-of-Way
SAL	State Antiquities Landmark
T&P	Texas and Pacific Railway
TAC	Texas Administrative Code
THC	Texas Historical Commission
TxDOT	Texas Department of Transportation
XRI	XRI Blue

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1 Introduction

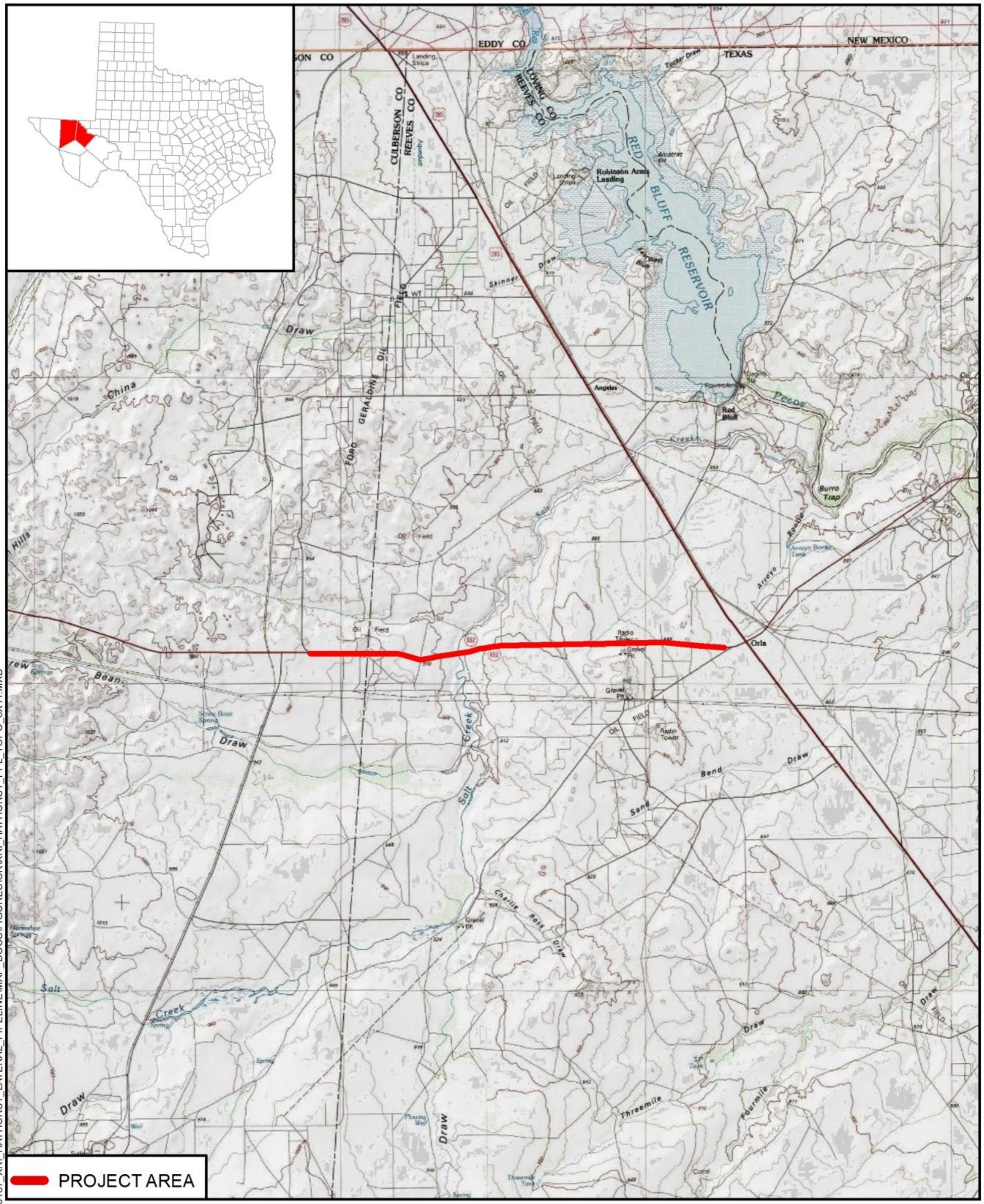
XRI has contracted HDR to conduct an intensive archaeological survey in advance of the construction of the Hayhurst Lateral Pipeline in Reeves and Culberson Counties, Texas (see Figure 1-1). The proposed pipeline will begin approximately 0.5 mi (0.8 km) west of Orla, Texas, along RM 652. The proposed project area is approximately 8.5 mi (13.7 km) long located within the existing TxDOT ROW with six pump station easements located on private land. Since the majority of the project area is on state-owned land, the proposed developments are required to be in compliance with Chapter 191 of the Texas Natural Resources Code, also known as the Antiquities Code of Texas (13 Texas Administrative Code [TAC] 26.12).

The pipeline is a 16-in water pipeline. It will begin on the south side of RM 652 and cross to the north side at Pump #5.5 approximately 0.8 mi (1.3 km) west from the eastern edge of the APE. The permanent pipeline easement is 8.5 mi (13.7 km) long and 10 ft (3 m) wide. Each pump station easement is 100 ft x 100 ft (30.5 m x 30.5 m). The depth of impacts will be up to 4 ft (1.2 m) along the entire project area. Pipeline construction will include boring at waterway crossings. The APE for the main pipeline will be contained within the existing TxDOT ROW. The total APE includes the 8.5 mi x 10 ft pipeline corridor and the six 100 ft x 100 ft pump station easements for a total of approximately 12 ac (4.9 ha).

The purpose of the archaeological investigation is to determine the presence/absence of archaeological resources within the APE as per the Antiquities Code of Texas (13 TAC 26.12) and to evaluate identified resources for their eligibility for inclusion in the NRHP or as a designated SAL. The cultural resources survey was conducted under Texas Antiquities Permit Number 8163. The field effort was led by Melanie Johnson on September 20, 2017.

All records and materials generated by this project will be permanently curated at the CAS at Texas State University in San Marcos, Texas.

Figure 1-1. Topographic Map of the Project Location.



XRI HAYHURST LATERAL PIPELINE

USGS SCREW BEAN DRAW EAST AND ORLA QUADS
REEVES AND CULBERSON COUNTIES, TX

0 0.75 1.5 3
Miles

3 1.5 0 3
Kilometers

XRI BLUE

HDR

FILE: O:\10070544_10187_XRI_HAYHURST_LATERAL_PIPELINE\MAP_DOCS\FIGURES\CR\XRI_HAYHURST_PPL_TOPO_8X11.MXD

2 Background

2.1 Geology and Soils

The underlying geology of the majority of the APE consists of alluvium of Holocene age. The western portion is underlain by Old Quaternary deposits of Pleistocene age and Gypsum of Rustler and Castile Formations undivided (USGS 2007).

According to data from the Natural Resources Conservation Service (NRCS), the APE contains eight soil map units: Reakor association, nearly level; Delnorte-Chilicotal association, rolling; Hoban-Reeves-Holloman association, nearly level; Holloman-Reeves association, gently undulating; Reakor-Lozier association, undulating; Dellahunt silt loam, 0 to 5 percent slopes, occasionally flooded; Bissett-Rock outcrop complex, 1 to 8 percent slopes; and Elcor-Dellahunt-Pokorny complex, 0 to 2 percent slopes (Soil Survey Staff 2017). The primary soils within the APE consist of shallow loams with calcium carbonate and/or gypsum appearing between 10–20 centimeters (cm) below surface (cmbs; 4–8 in below surface [inbs]).

2.2 Cultural History

The prehistory of western Texas can be divided into three major periods: Paleoindian, Archaic (both periods subdivided into Early, Middle, and Late), and Late Prehistoric (or Formative) period in the western Trans-Pecos (Table 2-1). These periods are primarily defined by diagnostic cultural artifacts found in the archaeological record that are indicative of major shifts or changes in socio-cultural practices.

Table 2-1. Prehistoric Chronology of the Trans-Pecos Region (Miller and Kenmotsu 2004).

Period	Sub-period	Western Trans-Pecos/Jornada		Eastern Trans-Pecos/La Junta	
		Regional Phase	Date Range	Regional Phase	Date Range
Paleoindian*	Early Paleoindian	Clovis	10,000–6000 B.C.*	Clovis	10,000–6000 B.C.
	Middle Paleoindian	Folsom		Folsom	
	Late Paleoindian	Plano/Cody		Plano/Cody	
Archaic	Early Archaic	Early Archaic	6000–4000 B.C.	Early Archaic	6500–3000 B.C.
	Middle Archaic	Middle Archaic	4000–1200 B.C.	Middle Archaic	3000–1200 B.C.
	Late Archaic	Late Archaic	1200 B.C.–A.D. 200	Late Archaic	1200 B.C.–A.D. 900
Late Prehistoric / Formative**		Mesilla/Pithouse	A.D. 200–1100	Livermore	A.D. 900–1200
		Dona Ana/ Traditional	A.D. 1100–1200	La Junta	A.D. 1200–1400
		El Paso/Pueblo	A.D. 1200–1400	Conception	A.D. 1400–1683
		Post-Pueblo	A.D. 1400–1500		

* The Paleoindian phases are marked by functional and stylistic differences in tool kits, but the lack of chronometric dates precludes any attempt to provide date ranges for each phase (Miller and Kenmotsu 2004)

**The Late Prehistoric Period in the western Trans-Pecos is referred to as the Formative Period (Miller and Kenmotsu 2004)

2.2.1 Paleoindian Period

The Paleoindian period is traditionally characterized by small, highly mobile bands reliant on big-game hunting, including large megafauna such as mammoths (Judge 1973). While no chronometric dates have been obtained for a Paleoindian occupation of the Trans-Pecos region, various artifacts and features confirm their presence (Miller and Kenmotsu 2004). Based on the stylistic differences in tool kits, the Paleoindian period is divided into three phases—the Clovis, Folsom, and Plano/Cody phases. Fluted lanceolate projectile points, characteristic of the Clovis phase, have been discovered in the Trans-Pecos region, providing evidence of a Clovis occupation. In addition, two Clovis habitation sites have been found in the western segment of the Trans-Pecos region (Miller and Kenmotsu 2004).

Evidence from the Folsom phase of the Paleoindian period is far more common than the preceding Clovis phase in the Trans-Pecos region. Folsom tools and sites are well documented throughout the region. The reliance on big game hunting continued during the Folsom phase with an emphasis on bison hunting, specifically the large, extinct species of bison, *Bison antiquus.* However, the Tularosa/Hueco Bolsons in the Trans-Pecos region present a unique settlement pattern during this phase that seems to have been oriented toward hunting other animals (Amick 1994).

The end of the Pleistocene, climatic change, and disappearance of megafauna led to the emergence of the late Paleoindian phase and the diversification of point types (Hester

and Turner 2015). The various tool traditions of the late Paleoindian phase are grouped into the Plano and Cody Complexes. While cultural material from this phase is more common than that of earlier Paleoindian phases, well documented occupation sites are rare in comparison to the Folsom phase (Miller and Kenmotsu 2004).

2.2.2 Archaic Period

The continuation of climatic change during the early Holocene "contributed to the large-scale changes in subsistence strategies, requiring a diversification of the Paleoindian subsistence base with a greater focus on exploitation of plant foods" (Miller and Kenmotsu 2004:218). This transition marked the beginning of the Archaic period across the continent around 6000 B.C. Like the Paleoindian period, the Archaic period is typically divided into three phases: the Early, Middle, and Late Archaic. The Archaic period generally represents locally specific adaptation to the Holocene environment. It is during the Archaic period that the eastern and western Trans-Pecos regions distinguish themselves from one another.

The Early Archaic in the Trans-Pecos is poorly represented in the archaeological record, which is mainly composed of surface finds and only a few features or substantial settlements. Populations were still organized into small, fairly mobile groups, but changes in projectile point technology suggest a more restricted, seasonally mobile settlement system (Miller and Kenmotsu 2004). Projectile points changed from the lanceolate points to a variety of stemmed points, and coarser-grained materials were utilized. The projectile point styles began to become more regionally specific during this phase.

The Middle Archaic in the Trans-Pecos saw an increase in populations, resulting in a greater number of settlement sites in the archaeological record. The discovery of house structures within Middle Archaic settlements in the Trans-Pecos suggest longer periods of occupation. These structures in the western Trans-Pecos region are "among the earliest evidence for semi-sedentary settlements in the Southwest" (Miller and Kenmotsu 2004:224). The trend of increased regionalization of projectile point forms continued in the Middle Archaic period.

The land use during the Late Archaic was greatly intensified, and the first evidence of agricultural development emerged during this phase. Hunting and gathering remained an important aspect of the economy, but prey shifted to focus more on small game such as rabbits. As a result of a briefly wetter environment in the Trans-Pecos, Late Archaic sites expanded into all ecological zones and promoted interaction among hunting-gathering groups (Miller and Kenmotsu 2004). The use of dry rock shelters during the Late Archaic period resulted in the better preservation of cultural materials including fiber netting, basketry, animal skins, and wooden and shell pendants. Thermal features increased in number during the Late Archaic, indicating an intensification of plant processing. Ring middens became prominent features in the Late Archaic that have been known historically to have been used to cook bulbs such as sotol. Evidence suggests that during this period, populations were increasing and becoming more sedentary with an increasing reliance on agriculture.

2.2.3 Late Prehistoric Period

In the western Trans-Pecos region, the Late Prehistoric (or Formative) period is divided into three phases: the Mesilla, Doña Ana, and El Paso. During this period, the bow and arrow was introduced, and small to medium sized game animals were the primary focus of these groups. Throughout the Formative period, settlement patterns became increasingly standardized. The Mesilla phase witnessed the beginning of the transition to a more sedentary society. While a fair degree of mobility was maintained and hunting and gathering was still conducted, , the emergence of pithouse architecture along with huts and the presence of some domesticated plant species laid the groundwork for the more agriculturally dependent societies that developed in later phases. El Paso plain brown ceramics are also present in the archaeological record as well as some imported wares.

The Doña Ana phase began constructing surface rooms in addition to pithouses. These changes in architecture and settlement patterns are believed to represent an increasing dependence on agriculture during the Formative period (Binford 1990). Beginning around A.D. 1000, decoration of local ceramics became more prevalent. This phase also saw an increase in interregional interaction, as evidenced by the increase in nonlocal ceramics.

The El Paso phase represents the apex of the transition from the mobile hunter-gatherers in the Mesilla phase to an increasingly sedentary population. Architecture is seen in the form of pueblos (square or rectangular, multi-roomed structures with caliche plastered walls and floors) (Miller and Kenmotsu 2004). Settlement distribution became markedly more restricted, focusing around well-watered landscapes. The development of water control features during the El Paso phase corresponded with the pronounced agricultural development at this time in comparison to the earlier phases. Thermal and storage features along with the changes in groundstone technologies point to an increase in plant processing. Ceramic decoration continued to be more frequent and more elaborate.

The Late Prehistoric period in the eastern Trans-Pecos region is usually undivided, though two poorly-defined phases have been assigned the eastern Trans-Pecos/La Junta district. These phases are the Livermore and La Junta phases. Throughout most of the eastern Trans-Pecos, few changes took place during the Late Prehistoric in terms of subsistence and mobility aside from the introduction of the bow and arrow (Miller and Kenmotsu 2004). Hunting and gathering continued to be the primary means of subsistence in the region. While small groups across the eastern Trans-Pecos maintained their traditional subsistence patterns from the Late Archaic, they were still knowledgeable of the changes taking place in other regions and even adapted some of the new technologies, such as pottery, to fit their way of life.

However, two distinct regions in the eastern Trans-Pecos, the La Junta district and the Salt Flat Basin, adopted a more agriculturally dependent subsistence pattern during the Late Prehistoric period. These groups were semi-sedentary to sedentary, living in small pithouse villages and growing crops. In general, the changes visible in the archaeological record taking place during the Late Prehistoric in the La Junta district followed a similar, though less pronounced, pattern to those in the western Trans-Pecos (Miller and Kenmotsu 2004).

2.2.4 Historic European and Euro-American Cultural Period (1725–1950)

Reeves County

The project location extends approximately 7.3 mi across northwest Reeves County, beginning on the west side of the community of Orla and continuing west to the Culberson County line. The area in the vicinity of the project is sparsely populated. The village of Loving is the nearest incorporated community, approximately 35 mi north in Eddy County, New Mexico. Pecos, the county seat of Reeves County, is approximately 38 mi to the southeast of the project.

Prior to the establishment of Reeves County in 1883, Jumano groups irrigated crops of corn and peaches in the vicinity of San Solomon Spring, and three Jumano guides assisted the Antonio de Espejo expedition near Toyah Lake in 1583 (Smith 2016). Corn cultivation by Mescalero groups in the Toyah Creek area was noted by travelers in 1849. Settlers of Mexican descent were also present in the Reeves County area, noted as supplying Fort Davis with grains, vegetables, and beef in the second half of the nineteenth century (Smith 2016). Euro-American settlement first occurred in the 1870s.

The Texas and Pacific Railway (T&P) arrived in present-day Reeves County in 1881, proceeding southwest from Ward County. T&P section houses were built at Pecos and Toyah. Reeves County was established in 1883 from Pecos County, and officially organized in 1884 with Pecos as the county seat. Ranching was the county's primary economic driver. The county's population was 1,247 in 1890 and, with the completion of the Pecos River rail line in 1890 bringing additional settlers and manufacturing interests, the county's population reached 1,847 by 1900 (Smith 2016). Agriculture remained most important to the local economy through the twentieth century. While free use of state land ended in Texas in 1900, local ranchers were able to acquire up to four sections of school lands in West Texas at excellent rates from 1901 to 1905. This opportunity also helped increase the number of new settlers in the area, which reached 4,392 in 1910. Most farms were subsistence farms at this point (Smith 2016). The addition of the Pecos Valley Southern Railway in 1911 helped facilitate larger-scale agricultural operations; however, a 1916 drought forced many of the newer family farms out of business (Smith 2016).

The scarcity of fresh water was an ongoing challenge for early residents of Reeves County. Artesian wells were discovered in the vicinity of Pecos in the early twentieth century, supplying much-needed water for Pecos residents and nearby farms (El Paso *Herald* 1911:20). The construction of the Red Bluff Dam on the Pecos River, about 11 mi east of the project, produced power and helped alleviate water shortages in Reeves, Culberson, and Loving Counties (Big Spring *Daily Herald* 1933:11). Nonetheless, the availability of water continued to be a problem for local residents and especially farmers to overcome (Odessa *American* 1968:19).

Oil interest in the Delaware basin began in the 1920s and, although there was little early return, the population in Reeves County grew to 6,407 by 1930. The agriculture economy changed in the wake of the Great Depression, from largely farmer-owned operations to tenant farming. Raising livestock remained much more prevalent than harvesting crops, as livestock in the county was valued at more than $1 million while crops brought in just over $375,000 in 1940 (Smith 2016). The county's population continued to grow in the

mid-twentieth century, from 8,006 in 1940 to 11,745 in 1950. In the 1950s, crops outpaced livestock in the local economy, and gas interests in the Toyah field helped boost the economy. The county population reached 17,644 in 1960 (Smith 2016). Development of three oilfields in the 1970s helped solidify the county's financial standing, although farming and ranching continued as its backbone.

Orla was established in 1890 as a section house on the Pecos River Railroad. The small community had a population of just 10 for more than 40 years (Smith 2010). A post office was established there in 1906, primarily serving homesteaders in the area. In the late 1930s, work began on Red Bluff Dam just north of Orla, and the town's population grew to 40 by 1940 (*Odessa American* 1986:8E). After oil was discovered south of Orla in 1948, the town evolved into a rural oil supply center (*Odessa American* 1986:8E; Smith 2010). Orla's population peaked at 250 in 1970. One of the chief difficulties facing communities in northern Reeves County, along with adjacent Loving County, was the lack of drinking water as the local underground water contains gypsum and other minerals, and the Pecos River in the area is too salty to be suitable for drinking (Abilene *Reporter-News* 1976:5A). Water had to be hauled in tanks from Pecos, which likely contributed to Orla's failure to grow despite petroleum production there (*Port Arthur News* 1977:17). The community's population remained just under 200 from 1980 until the first decade of the twenty-first century (Smith 2010). Its post office continues operations, though the 2010 Census recorded a population of 33 for Orla's zip code (U.S. Census Bureau 2017).

Culberson County

The west end of the project location extends west from the Reeves County line approximately 1 mi into northeast Culberson County. This part of the county, like northwest Reeves County, is also sparsely populated. The project is located approximately 70 mi from Van Horn, the county seat and the county's only incorporated community.

The area that became Culberson County was largely untouched by Spanish exploration due to its distance from important roads and its mountainous topography. The Mescalero Apache, based in the Guadalupe Mountains, became notorious for fierce and regular raids, and fear of Apache raids as well as the isolation of the area discouraged Euro-American settlements through the mid-nineteenth century (Kohout 2016). Explorations following the 1848 Treaty of Guadalupe Hidalgo increased knowledge of the area (Kohout 2016). In addition, the California Gold Rush of 1849 and the resultant push of settlers westward increased demand for new routes connecting central and east Texas with El Paso and California. In February 1850, El Paso County was organized and included the land that would later become Culberson County (Bryson 2016). Despite increasing interest and activity, Culberson County area was not settled until after the Civil War.

In order to complete work on a transcontinental railroad route through Texas and support increasing demands for longhorn cattle rangeland, military expeditions pursued Mescalero and Warm Spring Apaches beginning in the 1860s. It was not until late 1869 that any expeditions risked following the Apaches into the Guadalupe Mountains and it took more than a decade until the Apache were defeated in 1881 (Kohout 2016). That same year, the T&P line met the line of the Galveston, Harrisburg, and San Antonio

Railway, a subsidiary of the Southern Pacific, near Sierra Blanca, completing the T&P corridor from California to east Texas (Werner 2010). Settlement of the Trans-Pecos region began immediately thereafter, and the towns of Van Horn, Plateau, and Kent were established along the railroad's route through what would become southern Culberson County (Kohout 2016).

Most of the earlier settlers were ranchers, and Van Horn became a prosperous cattle-shipping center. Mineral extraction was also an important early industry (Kohout 2016). Between the late nineteenth century and the middle of the twentieth century, mines in the Van Horn Mountains yielded significant amounts of copper and silver (Texas State Historical Association 2010). The population in the area remained small, however. In 1912, Culberson County was organized and Van Horn was chosen as the county seat. In 1920, the first census after the county was organized, the population was 912 people (Kohout 2016). In 1926, U.S. Highway 62 was completed connecting northwest Culberson County with El Paso to the southwest and Carlsbad, New Mexico, to the northeast (Kohout 2016). US Highway 285 connected Carlsbad southeast through a small part of Culberson and much of Reeves County down to Pecos and Fort Stockton (El Paso Herald-Post 1938:10). A fledgling tourism industry began in Culberson County after the highways were completed due to the relative proximity of Carlsbad Caverns, Big Bend in Presidio County, and the Guadalupe Mountains (Kohout 2016). The new tourism traffic helped lead to population growth in the county, which reached 1,228 people by 1930 (Kohout 2016).

As was true in Reeves County, Culberson County residents also suffered from the lack of available fresh water. In Culberson County, the average rainfall is approximately 12 in—one third of the national average. To help alleviate the shortage, farmers and ranchers began improvements to conserve rainwater and also began drilling wells during the 1920s and 1930s. The most common improvement was installation of spreader dams, which harvested water runoff from roads, diverting the water into earthen tanks adjacent to the road (El Paso *Herald-Post* 1939:3B).

The number of farms in the county increased from 47 in 1920 to 52 in 1930, peaking at 81 in 1940. This growth is reflected in increasing population as well, as Culberson County reached 1,653 residents by 1940 (Kohout 2016). As tourism and farming became more common, ranching decreased: the number of cattle in Culberson County decreased from 50,000 head in 1920 to less than 9,000 in 1960 (Kohout 2016). This change also coincided with a short-lived boom in cotton production between 1950 and the mid-1960s (Kohout 2016). The ongoing water shortage was the principal obstacle to significant agriculture in the county (Odessa American 1968:19)

Tourism became the main driver of the local economy in the late twentieth century as agricultural production slowed due to the expense of methods to provide sufficient water (Kohout 2016). By 1982, 828 residents of Culberson County were employed in service and related industries, out of the population of 3,616 (Kohout 2016). In the early twenty-first century, tourism, talc mining and processing, and agribusiness are important elements of the economy. Beef cattle, cotton, vegetables, melons, and pecans are the chief agricultural products, with cattle accounting for more than 50 percent of the agricultural income in the county (Kohout 2016). In 2016, the U.S. Census Bureau estimated Culberson County's population to be 2,198 people, with 1,896 of those residing in Van Horn (U.S. Census Bureau 2016).

3 Methods

3.1 Previous Investigations near the APE

A review of the Texas Historical Commission's (THC) Archeological Sites Atlas (Atlas) indicates that three archaeological sites, one of which is designated as an SAL, have been recorded within a 1 mi (1.6 km) buffer around the APE. In addition, one Official Texas Historical Marker (OTHM) is located within 1 mi of the APE. No cultural resources surveys, Recorded Texas Historic Landmarks, cemeteries, or National Register of Historic Places (NRHP) listed properties or districts are located within the 1 mi search area (Figure 3-1).

The OTHM is located on the northeastern edge of the 1 mi buffer around the APE. The marker (#3876) records the history of the city of Orla, Texas.

Table 3-1 lists the three archaeological sites previously recorded within 1 mi of the APE. None of these sites are located within the APE. One site (41RV14) is recorded as being eligible for inclusion in the NRHP and was designated as an SAL in 1986. The other two sites have unknown or undetermined NRHP eligibility statuses.

Site 41RV14 is a prehistoric site located 0.74 mi (1.2 km) south of the APE on a plain between Salt Creek and an unnamed tributary of Salt Creek. It was originally recorded in 1985 and was revisited in 2003. The combination of these two surveys revealed a large Archaic campsite containing over 100 hearths and thousands of lithic and groundstone artifacts located on the surface and up to 10 cmbs. The site appears to have been used for habitation, food processing, and lithic procurement/production. The site was designated as an SAL in 1986 and as eligible for inclusion in the NRHP in 2003. The proposed routes of two pipelines have been re-routed in order to avoid further destruction to this site.

Table 3-1. Previously Recorded Archaeological Sites Located within One Mile of APE.

Identifier	Affiliation	Features/ Function	NRHP Eligibility	Comments / Recommendations
41RV14	Prehistoric (Archaic and Late Formative)	Open campsite	Eligible	The site was designated as an SAL in 1986. NRHP eligibility was reviewed in November 1986, February 1998, and October 2003. The site was noted as being eligible in 1986, undetermined in 1998, and eligible in 2003 for SHPO determination. See NRHP determination ID numbers: 18524, 27142, and 6314; Tracking numbers: 199818249 and 200300640.
41RV15	Prehistoric	Lithic procurement/ quarry	Undetermined	NRHP eligibility was reviewed in February 1998 and October 2003. The site was noted as being undetermined for SHPO determination both times. See NRHP determination ID numbers: 18525, and 6317; Tracking numbers: 199818249 and 200300640.
41RV17	Prehistoric & Historic	Prehistoric: open campsite Historic: ranching site	Unknown	Disturbance due to construction of a road and ORCA pump station

Figure 3-1. Aerial Photographic Map Showing Previous Cultural Resources within One Mile of the APE.

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3.2 Survey Methods

The majority of the APE is located within an existing TxDOT ROW that shows evidence of prior disturbance due to the construction of RM 652. In addition, the location shows heavy disturbance as evidenced by the presence of roads, pipelines, and other features of oil activity that frequently cross or run adjacent to the APE. However, the APE intersects Salt Creek, a tributary of the Pecos River, and a previously recorded NRHP eligible Archaic site (41RV14) is located 0.74 mi (1.2 km) south of the APE along Salt Creek. Due to the presence of known archaeological sites along this waterway, HDR conducted an intensive archaeological survey of the APE consisting of pedestrian survey with judgmental shovel testing. Shovel tests were placed along the pipeline corridor within the RM 652 ROW and at the approximate boring locations on either side of water crossings for a total of five shovel tests within the RM 652 ROW. Each pump station easement, which is approximately 0.2 ac (0.09 ha) in area, was surveyed by shovel tests. One shovel test was excavated within each of the 0.2 ac (0.09 ha) pump station easement for a total of six shovel tests within the pump station easements. A total of 11 shovel tests were excavated within the APE.

Each shovel test was approximately 30 cm (12 in) in diameter and was excavated in 20-cm (8-in) arbitrary levels to a depth of 80 cm (32 in) below surface or until sterile subsoil was encountered. The soil removed was screened through 0.635-cm (0.25-in) mesh screen, and soil descriptions followed the guidelines and terminology established by the National Soil Survey Center (Schoeneberger et al. 2002). Soil colors were recorded using a Munsell Soil Color Chart. All excavated shovel tests were recorded on shovel test forms that note depth, soil matrix descriptions, and cultural materials recovered. Digital photographs were used to document the survey conditions, disturbances, and any cultural features observed; and details of each photograph were recorded on standardized forms. All shovel test locations were recorded using a Global Positioning System (GPS) unit.

4 Results

HDR conducted an intensive archaeological survey consisting of pedestrian survey with judgmental shovel testing within the 8.5-mi (13.7-km) long, 10-ft (3-m) wide APE (Figure 4-1). The majority of the APE within the RM 652 ROW had high ground surface visibility (approximately 90–100 percent). The APE within the proposed pump station easements consisted of shallow windblown sediments with a mixture of mesquite, prickly pear cactus, and various grasses (Figure 4-14). The majority of the APE was characterized by a high level of disturbance. Much of the APE within the RM 652 ROW showed disturbance from the creation of ditches on either side of the road during its construction. In addition, active construction was underway during the time of the survey on the bridge of Salt Creek (Figure 4-5 and Figure 4-6). Other disturbance activities in the area included a buried power line at the Salt Creek crossing and a construction staging area on the west side of Salt Creek used for the construction on the RM 652 bridge (Figure 4-7). The depth of these impacts was confirmed by one shovel test (ST 11) which revealed asphalt from road construction at a depth of 60 cmbs (24 inbs).

A total of 11 shovel tests were excavated: 5 spaced out within the APE within the RM 652 ROW, and 6 in the pump station easements (Figure 4-1). All shovel tests were negative for cultural material. A shovel test was excavated at the boring location on the west side of Salt Creek, but not on the east side due to the presence of a buried power line at this location (see Figure 4-7). The shovel test on the west side boring location revealed 70 cm of sandy flood deposits (Figure 4-11). The soil profiles for the shovel tests throughout the rest of the APE typically consisted of sandy to silty loam. Three soil profiles included 30–40 percent gravel in the soil, and the majority of shovel tests terminated when caliche was encountered (Figure 4-12 and Figure 4-13).

No cultural materials were identified during the survey.

Figure 4-1. Aerial Photographic Map Showing APE and Survey Results, Page 1.

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Figure 4-1. Aerial Photographic Map Showing APE and Survey Results, Page 2.

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Figure 4-1. Aerial Photographic Map Showing APE and Survey Results, Page 3.

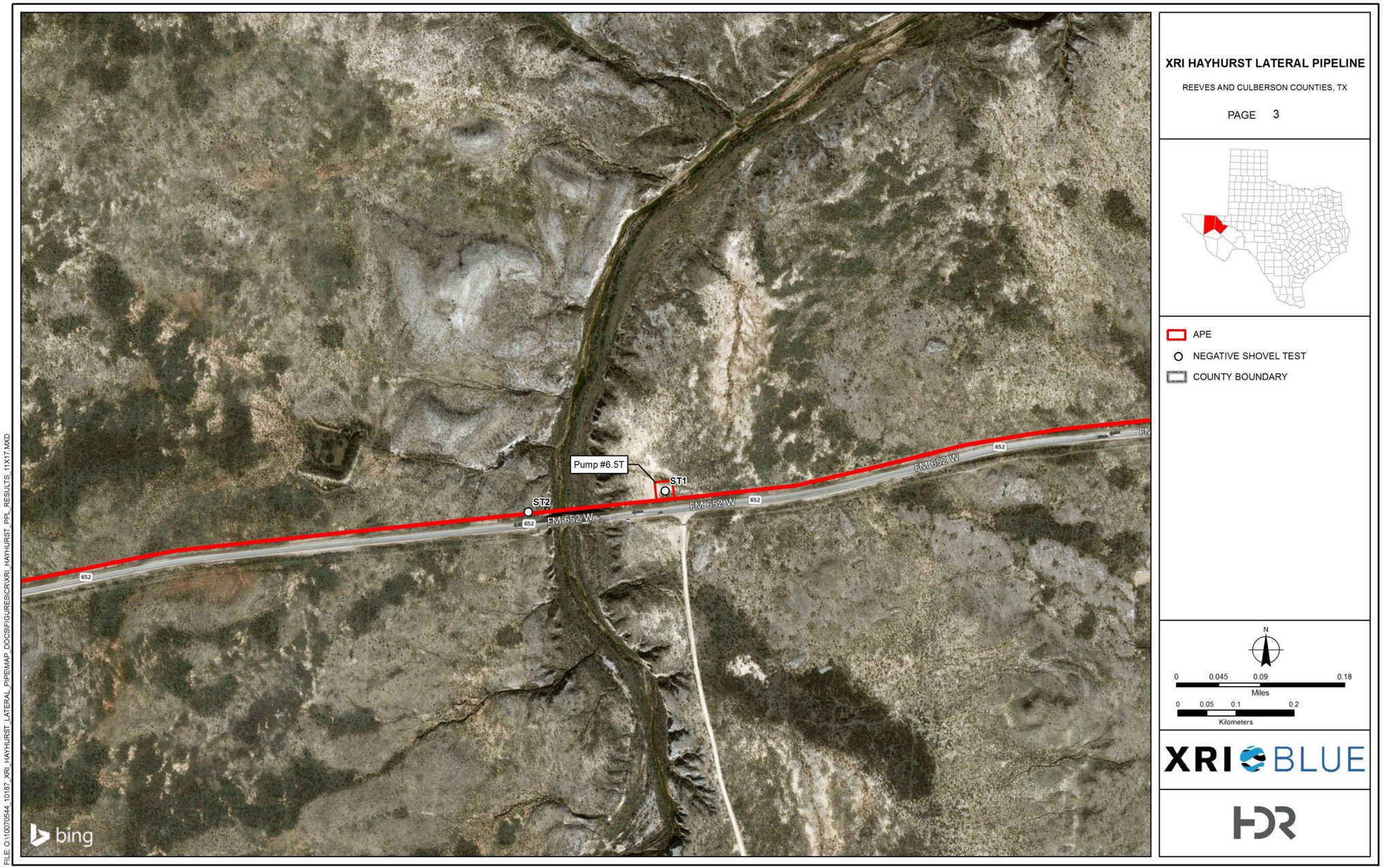

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Figure 4-1. Aerial Photographic Map Showing APE and Survey Results, Page 4.

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Figure 4-1. Aerial Photographic Map Showing APE and Survey Results, Page 5.

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Figure 4-1. Aerial Photographic Map Showing APE and Survey Results, Page 6.

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Figure 4-1. Aerial Photographic Map Showing APE and Survey Results, Page 7.

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Figure 4-2. Overview of APE Showing Pipeline on Surface, Facing East.

Figure 4-3. Overview of APE, Facing East.

Figure 4-4. Temporary Pump #6.5, Facing Northwest.

Figure 4-5. Active Construction on Salt Creek Bridge, Facing South.

Figure 4-6. Active Construction at Salt Creek Crossing, Facing Southwest.

Figure 4-7. Buried Cable Warning at Eastern Side of Salt Creek Crossing, Facing North.

Figure 4-8. Evidence of Modern Disturbance at Salt Creek East Side Boring Location, Facing East.

Figure 4-9. Evidence of Modern Disturbance at Salt Creek East Side, Facing West.

Figure 4-10. West Side of Salt Creek Crossing, Facing East.

Figure 4-11. Shovel Test 2 on West Side of Salt Creek Crossing.

Figure 4-12. Representative Photograph of Shallow Soils in APE (ST3).

Figure 4-13. Representative Photograph of Gravelly Soils within RM 652 ROW (ST8).

Figure 4-14. Representative Photograph of Pump Station Location, Facing South (Pump #7).

5 Summary and Recommendations

5.1 National Register Eligibility

5.1.1 Criteria for Evaluation of Eligibility

As part of this review process, cultural resources investigations are undertaken with the purpose of identifying resources that are listed in, or eligible for listing in, the NRHP. The assessment of significance of cultural resources is based on federal guidelines and regulations. Any cultural resource that is listed in or eligible for inclusion in the NRHP is known as a "historic property," and the term "eligible for inclusion in the NRHP" includes both properties formally determined as such by the Secretary of the Interior and all other properties that meet NRHP listing criteria (36 Code of Federal Regulations [CFR] 800.2). The criteria for evaluating properties for inclusion in the NRHP (36 CFR 60.4 [a–d]) are codified under the authority of the National Historic Preservation Act of 1966, as amended, and the Advisory Council on Historic Preservation has set forth guidelines to use in determining site eligibility. Subsequent to the identification of relevant historical themes and related research questions, these four criteria for eligibility are applied:

The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, material, workmanship, feeling, and association and

A. that are associated with events that have made a significant contribution to the broad patterns of our history; or

B. that are associated with the lives of persons significant in our past; or

C. that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

D. that have yielded, or may be likely to yield, information important in prehistory or history. Note that the application of Criterion D presupposes that the information imparted by the site is significant in history or prehistory [36 CFR 60.4].

The physical characteristics and historic significance of the overall property are examined when conducting NRHP evaluations. Although a property in its entirety may be considered eligible based on Criteria A, B, C, and/or D, specific data are also required for individual components therein based on date, function, history, physical characteristics, and other information. Resources that do not relate in a significant way to the overall property may contribute if they independently meet the NRHP criteria.

For a historic resource, district, or landscape to be determined eligible for the NRHP, it must retain enough of its historic integrity to convey its significance. For the NRHP, there are seven aspects of integrity:

1. Location

2. Design

3. Setting
4. Materials
5. Workmanship
6. Feeling
7. Association

Occasionally, certain resources fall into categories in which they must be evaluated further using one or more of the following Criterion Considerations. If a resource identified during the reconnaissance-level survey falls into one of these categories, the following Criterion Considerations will be applied in conjunction with one or more of the four NRHP criteria:

A. A religious property deriving primary significance from architectural or artistic distinction or historical importance; or

B. A building or structure removed from its original location but which is significant primarily for architectural value, or which is the surviving structure most importantly associated with a historic person or event; or

C. A birthplace or grave of a historical figure of outstanding importance if there is no other appropriate site or building directly associated with his or her productive life; or

D. A cemetery that derives its primary significance from graves of persons of transcendent importance, from age, from distinctive design features, or from association with historic events; or

E. A reconstructed building when accurately executed in a suitable environment and presented in a dignified manner as part of a restoration master plan, and when no other building or structure with the same association has survived; or

F. A property primarily commemorative in intent if design, age, tradition, or symbolic value has invested it with its own historical significance; or

G. A property achieving significance within the past 50 years if it is of exceptional importance (36 CFR 60.4).

The value of archaeological sites is often assessed under Criterion D. With regard specifically to this criterion, the goal of prehistoric archaeological research and management is to fill gaps in the knowledge about specific research domains. Scientific importance is driven, in part, by the research paradigms of the time and in part by the amount of information available about a particular research topic in a specific geographic area. The most robust forms of scientific importance should honor diverse and occasionally competing schools of research interests and their attendant approaches. In order to fulfill Criterion D, a site must possess certain attributes (e.g., intact buried cultural strata with functionally and temporally diagnostic materials, datable cultural features) such that further intensive research at the site could be expected to add additional information to relevant research questions.

5.1.2 State Antiquities Landmark

At the state level, archaeological sites may be considered significant and be recognized or designated as an SAL, provided that at least one of the following conditions is met:

1. The archaeological site is situated on lands owned or controlled by the State of Texas or one of its political subdivisions; or
2. The archaeological site is situated on private land that has been specifically designated as an SAL and fits at least one of the following criteria:
    A. Preservation of materials must be sufficient to allow application of standard archaeological techniques to advantage;
    B. The majority of artifacts are in place so that a significant portion of the site's original characteristics can be defined through investigation;
    C. The site has the potential to contribute to cumulative cultural history by the addition of new information;
    D. The site offers evidence of unique or rare attributes; and/or
    E. The site offers a unique and rare opportunity to test techniques, theories, or methods of preservation, thereby contributing to scientific knowledge [Texas Natural Resources Code 1977; Title 9, Chapter 191, Texas Antiquities Committee, Section 191.094 and Chapter 41.7, Antiquities Code of Texas].

Buildings, structures, cultural landscapes, and non-archaeological sites, objects, and districts may be designated as an SAL, provided that the following conditions are met:

1. The property fits within at least one of the following criteria:
    A. The property is associated with events that have made a significant contribution to the broad patterns of our history, including importance to a particular cultural or ethnic group;
    B. The property is associated with the lives of persons significant in our past;
    C. The property embodies the distinctive characteristics of a type, period, or method of construction, represents the work of a master, possesses high artistic values, or represents a significant and distinguishable entity whose components may lack individual distinction;
    D. The property has yielded, or may be likely to yield, information important in Texas culture or history;
2. The property retains integrity at the time of the nomination, as determined by the executive director of the commission; and
3. For buildings and structures only, the property must be listed in the NRHP, either individually, or as a contributing property within a historic district. Contributing status

may be determined by the Keeper of the National Register or the executive director of the commission.

5.2 Conclusion and Recommendation Summary

HDR conducted an intensive archaeological survey consisting of pedestrian survey with judgmental shovel testing of the 8.5 mi (13.7 km) of proposed water pipeline located near Orla, Texas, in Reeves and Culberson Counties. A total of 11 shovel tests were excavated within the APE all of which were negative for cultural materials. A high level of disturbance in the majority of the APE was revealed both on the surface and subsurface. No cultural materials were discovered during the course of the survey.

In accordance with 13 TAC 26.12, no further archaeological investigations are recommended, and construction may proceed. In the event that any archaeological deposits are encountered during construction, work should cease, and the THC should be notified.

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Appendix A: Shovel Test Results

Shovel Test (ST) Number	Matrix Description	Contents
1	0–80 cmbs: reddish brown (5YR 5/3) sandy loam	No cultural materials
2	0–70 cmbs: pinkish gray (7.5YR 7/2) sand 70 cmbs: bedrock	No cultural materials
3	0–35 cmbs: pinkish gray (7.5YR 7/2) sand with 30–40% gravels 35 cmbs: bedrock	No cultural materials
4	0–60 cmbs: dark brown (7.5YR 3/4) silty loam	No cultural materials
5	0–60 cmbs: dark brown (7.5YR 3/4) silty loam 60 cmbs: bedrock	No cultural materials
6	0–35 cmbs: dark brown (7.5YR 3/4) silty loam with 30–40% gravels Terminated when gravels increased in size creating impasse	No cultural materials
7	0–80 cmbs: strong brown (7.5YR 4/6) clay loam	No cultural materials
8	0–35 cmbs: brown (7.5YR 5/4) silty loam with 30–40% gravels Terminated when gravels increased in size creating impasse	No cultural materials
9	0–80 cmbs: light brown (7.5YR 6/4) silty loam	No cultural materials
10	0–10 cmbs: dark brown (7.5YR 3/4) silty loam 10–35 cmbs: soft bedrock	No cultural materials
11	0–60 cmbs: light brown (7.5YR 6/4) sand Terminated when asphalt was encountered	No cultural materials; disturbed context

Appendix B: THC Communication

Johnson, Melanie

From: Info_Tech@thc.state.tx.us
Sent: Tuesday, November 14, 2017 1:55 PM
To: Johnson, Melanie; reviews@thc.state.tx.us
Subject: Project Review: 201804097

TEXAS HISTORICAL COMMISSION
real places telling real stories

Re: Project Review under Section 106 of the National Historic Preservation Act and/or the Antiquities Code of Texas
Permit 8163
201804097
Hayhurst Lateral Pipeline
along RM 652
Orla,TX 79770

Dear Melanie Johnson:
Thank you for your submittal regarding the above-referenced project.

The review staff led by David Camarena and Justin Kockritz has completed its review and has made the following determinations based on the information submitted for review:

Above-Ground Resources

- No historic properties present or affected

Archeology Comments

- No effect on archeological sites. However, if buried cultural materials are encountered during construction or disturbance activities, work should cease in the immediate area; work can continue where no cultural materials are present. Please contact the THC's Archeology Division at 512-463-6096 to consult on further actions that may be necessary to protect the cultural remains.
- THC/SHPO concurs with information provided
- No sites recorded
- Draft report acceptable. Please submit another copy as a final report along with shapefiles showing the area where the archeological work was conducted. Shapefiles should be submitted electronically to Archeological_projects@thc.texas.gov.

We have the following comments: For the final report please include in the Appendix a table that summarizes the shovel test results.

We look forward to further consultation with your office and hope to maintain a partnership that will foster effective historic preservation. Thank you for your cooperation in this review process, and for your efforts to preserve the irreplaceable heritage of Texas. If you have any questions concerning our review or if we can be of further assistance, please email the following reviewers: david.camarena@thc.texas.gov,

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justin.kockritz@thc.texas.gov.

Sincerely,

For Mark Wolfe, State Historic Preservation Officer
Executive Director, Texas Historical Commission

Please do not respond to this email.