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## Cultural Resources Investigations for the Oncor Permian Basin – Culberson 138 kV Transmission Line Project, Culberson, Reeves, and Ward Counties, Texas

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# Cultural Resources Investigations for the Oncor Permian Basin – Culberson 138 kV Transmission Line Project, Culberson, Reeves, and Ward Counties, Texas

## Authors

Steven W. Ahr, Christopher R. von Wedell, Shelley Hartsfield, Andrew Parkyn, Tanya McDougall, and Deborah Anglin

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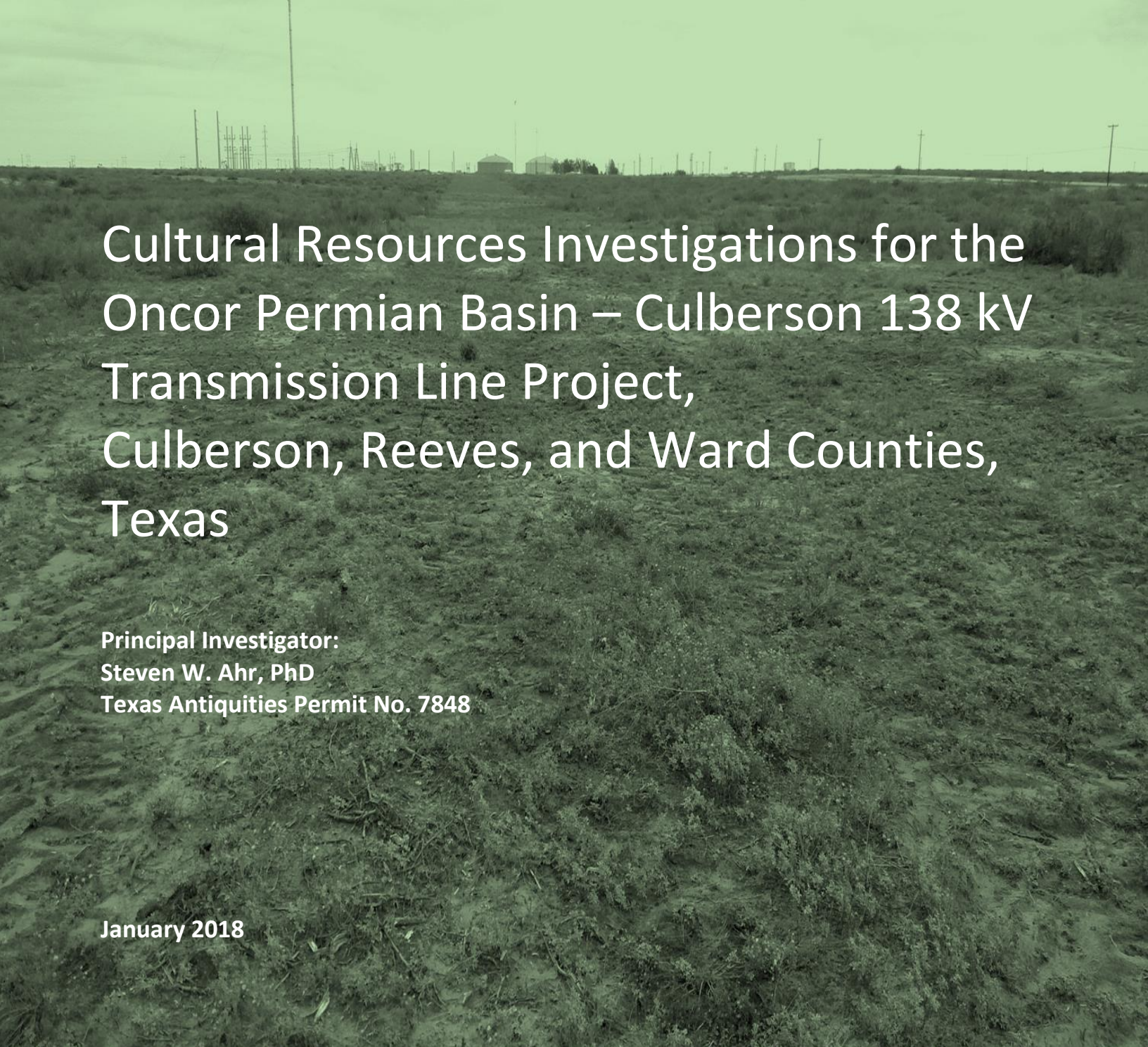
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Public Copy

The background of the page is a photograph of a flat, open field with sparse vegetation. In the distance, several tall utility poles and power lines are visible against a clear sky. The entire image has a light green tint.

# Cultural Resources Investigations for the Oncor Permian Basin – Culberson 138 kV Transmission Line Project, Culberson, Reeves, and Ward Counties, Texas

Principal Investigator:  
Steven W. Ahr, PhD  
Texas Antiquities Permit No. 7848

January 2018

# **Cultural Resources Investigations for the Oncor Permian Basin – Culberson 138 kV Transmission Line Project, Culberson, Reeves, and Ward Counties, Texas**

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**Prepared for:**

Oncor Electric Delivery Company, LLC

**January 2018**



## Management Summary

URS Corporation (URS) was retained by Oncor Electric Delivery Company, LLC (Oncor) to conduct an intensive cultural resources survey of the new Permian Basin - Culberson 138 kilovolt (kV) Double-Circuit Transmission Line Project (Project) right-of-way (ROW) located in Culberson, Reeves, and Ward Counties, Texas. The proposed 70-foot (ft) (21-meter [m]) wide Project ROW encompasses approximately 825 acres and traverses a total of approximately 97 miles of rural lands between the existing Oncor Permian Basin Switching Station, located approximately four miles west of Monahans, Texas in Ward County, to the existing Oncor Culberson Switching Station, located approximately 17 miles south of the Texas/New Mexico state line in Culberson County. This includes 88.7 miles of the original route, along with 8.3 miles of additional segments that were evaluated.

Currently, the Project is not subject to federal funding or permitting; therefore, no review under Section 106 of the National Historic Preservation Act of 1966, as amended, is required. Should the Project subsequently become subject to federal funding or permitting, the cultural resources investigations and site evaluations reported herein will be updated and coordinated with the Texas Historical Commission (THC) as part of fulfilling any Section 106 requirements that may arise at a later date. While the majority of the Project is located on private land, an approximately 6-mile long segment of the Project ROW traverses lands owned by University Lands (UL), which is a political subdivision of the State of Texas. Consequently, this portion of the project falls within the purview of the Antiquities Code of Texas, which requires the THC to review actions that have the potential to disturb prehistoric or historic sites in the public domain. In order to comply with the Antiquities Code, Antiquities Permit No. 7848 was obtained from the THC for the UL-owned lands, and the survey methods for this portion of the Project followed the THC's archaeological survey standards for Texas. For the remaining areas of the Project, all cultural resources investigations were carried out in conformance with the methodologies outlined in the THC-approved *Generic Research Design for Archaeological Surveys of Oncor Electric Delivery Electric Transmission Line Projects in Texas* (PBS&J 2008).

The cultural resources survey was conducted between December 7, 2015 and May 5, 2016, and consisted of an intensive 100 percent pedestrian survey and shovel testing within the Project ROW. The survey resulted in the identification of 16 newly-recorded sites and one previously recorded site (41WR85). Site forms were completed for each of the 16 newly identified archaeological sites, and trinomials were obtained from the Texas Archeological Research Laboratory. In addition, 16 isolated finds (IFs) were identified; however no site forms were prepared for IFs. All sites within the Project ROW were located in areas of eroded and/or mixed soils, lacked diagnostic artifacts, and were found to exhibit poor integrity context due to prior disturbances. Based on these observations, the portions of these sites within the Project ROW do not meet National Register of Historic Places (NRHP) and State Antiquities Landmark (SAL) eligibility requirements. However, because each of these sites appears to extend beyond the current Project ROW boundary, they have not been evaluated in their entirety and their overall NRHP and SAL eligibility is recommended to be Undetermined. Due to a lack of research potential and integrity, all IFs are recommended as not eligible for NRHP or SAL designation.

During the survey, a small bedrock cavity was observed at site 41CU835. Due to safety concerns about the surrounding ground stability, this feature could not be fully investigated. The ground immediate adjacent to the cavity, as well as the upper two feet of the cavity, did not present any indications that it was culturally related, or that the cavity extended much deeper. The entirety of the observed cavity appeared to be too narrow to have served as an effective place of interment. However, based on survey level data, the cultural utilization of this feature could not be entirely ruled out. It was recommended that construction activities avoid this cavity

and that site monitoring during construction be conducted, until such time as any cultural association is definitively ruled out, or until it can be confirmed that no construction impacts to the cavity would take place.

A geomorphological assessment revealed that selected areas within the Project ROW potentially exhibit the necessary pedologic and geomorphic conditions for the deep burial and preservation of cultural deposits. These areas represent a combined total of 15.5 linear miles (25 kilometers) of Project ROW. In accordance with the *Generic Research Design*, monitoring was recommended for any transmission pole excavations in the areas that were assessed as exhibiting high geoarchaeological potential.

An interim draft report of the foregoing recommendations was submitted to the THC on April 27, 2017. On May 26, 2017, the THC concurred with all interim report recommendations. During preparations for the monitoring effort, URS was notified by Oncor that a majority of the Project had already been constructed, including those areas recommended for monitoring. The only location that had not yet been constructed was the bedrock cavity at site 41CU835. On May 24, 2017, a meeting between Oncor, URS, and the THC resulted in an agreement that monitoring should be undertaken during construction activities near the bedrock cavity at site 41CU835. In addition, it was agreed that spot-checks would be performed within a subset of the previously constructed structures within high geoarchaeological probability areas, including portions of the Project owned by UL. Following completion of these tasks, it was agreed that a comprehensive revised draft report of investigations and findings (current report) would be submitted to the THC for review and project closure.

Subsequent investigations at the bedrock cavity at 41CU835 were carried out from July 10-11, 2017. During the site visit, it was established that the cavity is located approximately 30 m to the southeast of the proposed location of monopole structure No. 56/3. Following additional inspections, it was possible to rule out any prehistoric use of this natural feature. The immediate area around the cavity was taped off for safety reasons so that other related construction activities would not adversely impact the cavity or surrounding area. On July 11, 2017, monitoring was carried out for the excavation of monopole structure no. 56/3. Soil stratigraphy was recorded for the total depth of the excavation, which was 20 ft. No cultural materials were identified.

From August 12-13, 2017, URS archaeologists performed spot-checks for 99 monopoles, including 53 structures within the Project ROW extending approximately 10 kilometers (km) west of the Pecos River in Reeves County; 22 structures within the Project ROW extending approximately 4 km east of the Pecos River in Ward County; and 24 structures within the Project ROW extending approximately 4.5 km across Monument Draw within UL in Ward County. Spot-checking included visual inspection and photo documentation of disturbances, as well as ground surface inspection to identify cultural resources.

The Project ROW around each monopole exhibited construction related disturbances from equipment access roads and from drilling operations. No evidence was found that indicated any deeply buried cultural resource sites were impacted from auguring. Within the intervening areas between monopoles, however, a total of two previously unrecorded, low-density historic surface scatters (41RV128 and 41RV129) and three new IFs (H-07, H-08, and P-28) were identified and recorded. Both sites were found to exhibit poor integrity due to prior disturbances, and low research potential due to minimal information potential. The portions of these sites within the Project ROW were not found to meet NRHP and SAL eligibility requirements. However, because each of these sites appears to extend beyond of the current Project ROW boundary, they have not been evaluated in their entirety and their overall NRHP and SAL eligibility is recommended to be Undetermined. The three new IFs are recommended as not eligible for NRHP or SAL designation.

Based on the final results of the survey, monitoring, and spot-checking investigations, no cultural resources sites eligible for listing in the NRHP or that merit SAL designation within the Project ROW will be affected by the Project, and it is recommended that the project be allowed to proceed. Should the dimensions of the Project ROW change, additional archaeological investigations may be warranted.

Should any unmarked prehistoric or historic human remains or burials be encountered at any point during the project, the area of the remains is considered a cemetery under current Texas law. All cemeteries are protected under State law and cannot be disturbed. Section 28.03(f) of the Texas Penal Code provides that intentional damage or destruction inflicted on a human burial site is a state jail felony. If a cemetery is identified in the Project ROW, all work in the immediate area of the discovery must cease and the THC must be notified by contacting the History Programs Division at (512) 463-5853 and the Archeology Division at (512) 463-6096. Following consultation with the THC, a treatment or avoidance plan would be developed and implemented.

No artifacts were collected during the survey. Pursuant to 13 TAC 26.17, correspondence, field records, and photographs generated during field investigations have been prepared for permanent curation at the Texas Archeological Research Laboratory, Austin, Texas.

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## List of Acronyms

amsl	above mean sea level
APE	Area of Potential Effect
B.P.	Before Present
CFR	Code of Federal Regulations
cm	centimeter
cmbs	centimeters below surface
FM	Farm-to-Market
ft	feet
HPA	High Probability Area
HTC	Historic Texas Cemetery
IH	Interstate Highway
km	kilometer
kV	kilovolt
LPA	Low Probability Area
m	meter
MPA	Moderate Probability Area
NHPA	National Historic Preservation Act
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
Oncor	Oncor Electric Delivery Company, LLC
OTHM	Official Texas Historical Marker
ROW	right-of-way
RTHL	Recorded Texas Historical Marker
SAL	State Antiquities Landmark
SH	State Highway
SHPO	State Historic Preservation Officer
TAC	Texas Administrative Code
TARL	Texas Archeological Research Laboratory
TASA	Texas Archeological Sites Atlas
THC	Texas Historical Commission
THSA	Texas Historic Sites Atlas
T&P	Texas and Pacific Railway
UL	University Lands
URS	URS Corporation
USGS	United States Geological Survey



# 1 Introduction

URS Corporation (URS), contracted by Oncor Electric Delivery Company, LLC (Oncor), conducted an intensive cultural resources survey, excavation monitoring, and monopole spot-checking investigations for Oncor's Permian Basin - Culberson 138 kilovolt (kV) Double-Circuit Transmission Line Project (Project) right-of-way (ROW) located in Culberson, Reeves, and Ward Counties, Texas (**Figure 1**). The proposed 70-foot (ft) (21-meter [m]) wide Project ROW (the Area of Potential Effect [APE]) encompasses approximately 825 acres and traverses a total of approximately 97 miles of rural lands between the existing Oncor Permian Basin Switching Station, located approximately four miles west of Monahans, Texas in Ward County, to the existing Oncor Culberson Switching Station, located approximately 17 miles south of the Texas/New Mexico state line in Culberson County. This includes 88.7 miles of the original route, along with 8.3 miles of additional segments that were evaluated.

The typical types of impacts from these types of projects include mechanized clearing of vegetation within the Project ROW, and deep (but narrow) impacts from the construction of support footings. Mechanized land clearing for vegetation removal and construction of access roads typically impacts only to depths of 15-60 centimeters (cm). The impacts resulting from the construction of support footing varies in depth from 3 to 7.5 m within a 0.5 to 1.5 m diameter area for monopole structures. If the monopole is to be directly embedded, then a single hole will be augured into the ground at each structure location. Once the structure has been placed, the foundation will be filled with concrete, native material, or other approved material, to hold the structure in place. If the pole is to have an anchor bolted foundation, a hole will be augured into the ground at each structure location, an anchor bolt cage will be placed in addition to steel rebar to reinforce the foundation, and the hole will be filled with concrete. Depth and diameter of the foundation will vary depending on the design of the structure specific to that location. After foundations are in place, the structures are assembled and erected. Once a series of structures have been erected along the transmission line centerline, the conductor stringing phase can begin. Specialized equipment will be attached to properly support and protect the conductor during the pulling, tensioning, and sagging operations. Once conductors and shield wire are in place and tension and sag have been verified, conductor and shield wire hardware is installed at each suspension point to maintain conductor position. Conductor stringing continues until the transmission line construction is complete. All construction equipment will be removed. All temporary culverts and environmental controls previously installed will be removed.

According to the Advisory Council on Historic Preservation, regulations pertaining to the protection of historic properties (Title 36 Code of Federal Regulations [CFR] Part 800.4), Section 106 of the National Historic Preservation Act of 1966 (NHPA), as amended, requires federal agencies to identify and evaluate the effects of their undertaking on properties listed in, or eligible for listing in, the National Register of Historic Places (NRHP). A federal undertaking is a project, activity, or program funded in whole or in part by a federal agency, including those carried out by or on behalf of a federal agency, those carried out with federal financial assistance, and those requiring a federal permit, license, or approval. Currently, the proposed project is not subject to federal funding or permitting, and therefore no review under Section 106 of the NHPA, as amended, is required. Should the Project subsequently become subject to federal funding or permitting, the cultural resources investigations and site evaluations reported herein will be updated and coordinated with the Texas Historical Commission (THC) as part of fulfilling any Section 106 requirements that may arise at a later date.

While the majority of the Project is located on private land, an approximately 6-mile long segment of the Project ROW traverses lands owned by University Lands (UL), which is a political subdivision of the State of Texas. Consequently, this portion of the project falls within the purview of the Antiquities Code of Texas, which requires the THC to review actions that have the potential to disturb prehistoric or historic sites in the public domain. Regulations can be found within Title 13, Part 2, Chapter 26 of the Texas Administrative Code (TAC), Rules of Practice and Procedure. In order to comply with the Code, Antiquities Permit No. 7848 was obtained for the UL-owned lands, and the survey methods for this portion of the Project followed the THC's archaeological survey standards for Texas. For the remaining areas of the Project, all survey investigations were carried out in conformance with the methodologies outlined in the THC-approved *Generic Research Design for Archaeological Surveys of Oncor Electric Delivery Electric Transmission Line Projects in Texas* (PBS&J 2008), hereafter referred to as the Research Design. The Research Design stipulates the methods under which cultural resources within proposed transmission line ROWs will be identified and assessed for NRHP eligibility and State Antiquities Landmarks (SAL) designation, and how site-specific recommendations for additional archaeological research should be handled.

Field survey investigations reported herein were undertaken between December 7, 2015 and May 5, 2016. Monitoring was carried out from June 10-11, 2017, and spot-check investigations were carried out from August 12-13, 2017. Steve Ahr served as Principal Investigator. The field survey was supervised by URS Project Archaeologist Chris von Wedell. Monitoring and spot-checking was carried out by Andy Parkyn, Shelley Hartsfield, and Steve Ahr. Architectural historians Deborah Anglin and Tanya McDougal performed archival research for historic sites identified during the survey, as well as prepared the historic context of the report. URS Field Archaeologists Gary Hawkins and Chris Matthews assisted in the field survey efforts.

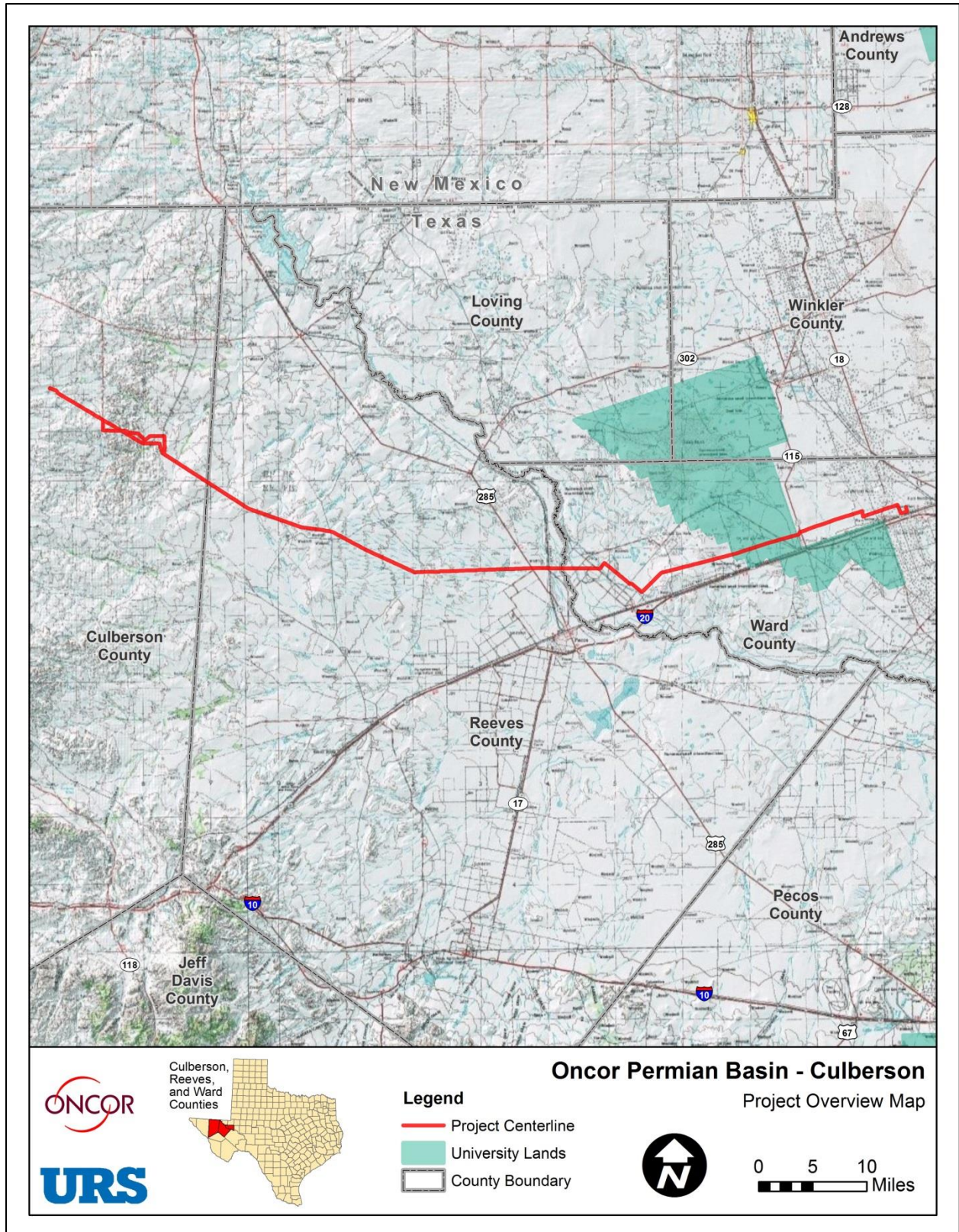


Figure 1. Overview of Project location.

## 2 Environmental Setting

### 2.1 Physiography

The study area is within the Southern High Plains physiographic region of Texas (Bureau of Economic Geology [BEG] 2013). The geologic beds of the Southern High Plains generally dip slightly to the southeast and, in many places, are mantled by Late Quaternary eolian silt and fine sand. Topography of the Southern High Plains is generally flat, but is dotted with numerous playas and localized clay dunes. The Southern High Plains ranges in elevation from 2,200 to 3,800 ft above mean sea level (amsl). The study area ranges in elevation from 2,569 to 3,182 ft amsl. The western portion of the study area traverses rugged hills and numerous drainage features, while the eastern portion exhibits gently undulating hills and nearly level terrain, along with drainage features associated with the Pecos River and its tributaries. Rustler Hills, in the western portion of the study area, provide the greatest elevation change and are suggestive of the neighboring physiographic trends of the Basin and Range Region. Noted geologic features of the study area are the Wink sinkholes, commonly referred to as the “Wink Sinks.” These large sinkholes, 50 to 200 m in diameter, were formed in oilfields over Permian salt beds in June 1980 and May 2002 (Paine et al. 2009). These sinkholes formed by way of the migration of a dissolution cavity upward due to successive roof failures, which eventually resulted in the surficial depression which can be seen today (Johnson 1989). It has been noted that oil drilling and completion activities in the area may have created the conditions necessary for the collapse to take place. Erosional features are fairly limited along the eastern third of the study area. Those drainage features that occur through the rest of the study area feed into the Pecos River that generally bisects the study area.

### 2.2 Geology and Soils

Numerous geologic units are traversed by the proposed project, including Permian and Quaternary (Pleistocene and Holocene) deposits. The oldest deposits in the study area are Permian (Ochoa) in age, which are found primarily in the western part of the study area in Culberson County (BEG 1983). The Castile Formation (Pcs) is extensive in this area and consists of gypsum, anhydrite, and limestone and is the main geologic unit in the far western five miles of the study area. The Rustler and Castile Formations Undivided (Pgrc), is found along the Reeves/Culberson County line and consists of gypsum in collapse structures (BEG 1976, 1983). It is brecciated as much as 30 ft below the surface, mostly from the uppermost part of Rustler Formation, and may include gypsum and limestone residuals from the Salado Formation.

The Rustler Formation (Pru) is a very prevalent geologic unit, located between the Culberson and Reeves County line and the western edge of the study area (BEG 1976, 1983). This geologic unit consists of limestone, siltstone, sandstone, gypsum, and clay. Near Kent are thinly bedded dolomitic limestones that are light greenish gray to yellowish gray, with some beds as much as 140 ft thick. Near Cottonwood Draw, the upper part consists of limestone and dolomitic limestone, with thicknesses of 100 to 140 ft. The lower part is siltstone and fine-grained sandstone, which is thin to medium bedded, yellowish gray, and with a thickness up to 50 ft.

Pleistocene fluvial terrace deposits (Qt) are prevalent along the Pecos River and tributaries (BEG 1976). This geologic unit consists of gravel, sand, and silt, with common chert cobbles, quartzite, igneous rock, metamorphic rock, and caliche. These deposits are dominated by quartz sand, which ranges from cross-bedded to massive, and weathers reddish brown, pink, and gray to light gray. Other Quaternary deposits (Qao) of Pleistocene age are also present in the study area, but are less extensive. This geologic unit consists of alluvium, colluvium,



caliche, and gypsite on surfaces that have been dissected by modern drainages (BEG 1976). This unit contains mostly of boulders, cobbles, and pebbles of Cretaceous limestone and chert, and these are locally overlain by brown silt.

The Pleistocene-age Tahoka Formation (Qta), which occurs mainly in the eastern portion of the study area around the City of Pecos, is made up of lacustrine clay, silt, sand, and gravel. This geologic unit ranges from bedded to massive, is weakly coherent, and weathers various shades of light gray, bluish gray, and reddish brown. Numerous molluscan fossils are present within this deposit, which is 40 ft thick (BEG 1976). Late Pleistocene to possibly early Holocene Playa deposits (Qp) occur sporadically through the eastern part of the study area, and rarely exceed 100 acres in size. This unit is present in shallow depressions and consists of clay, silt, and sand, and is light to dark gray in color. The Caliche (Qcc) formation is prevalent east of the Pecos River and consists of caliche stripped of covering materials, with a thickness up to 35 ft (BEG 1976). The Gypsite (Qgy) Formation consists of white to light gray granular gypsum and occurs in localized areas ranging in size from 30 to several thousand acres (BEG 1976).

Holocene-age alluvium (Qal) is a primary geologic unit west of US-285 in the study area, and closely follows the eastern edge of the Pecos River. This geologic unit includes low terrace deposits along streams, and consists of sandy silts on pediments locally modified by sheetwash action. Holocene-age Windblown sand (Qs) is prevalent east of the Pecos River and consists of sand and silt in sheets, or cover sands (BEG 1976).

Online Natural Resources Conservation Service (NRCS) soil data for Culberson, Reeves, and Ward Counties was used to identify and characterize the soils in the Project ROW. Soils are predominately of the Orla and Delnorte Associations, with several other soil associations present in lesser amounts (NRCS 2017). Individual soil map units within the overall project area are described in **Table 1**.

**Table 1. Soils Within the Project ROW**

Map Unit Symbol	Map Unit Name	Percent of APE	Taxonomic Class/ Horizons	Parent Material	Series Description
Culberson County					
HPC	Hollebeke-Pokorny complex, 1 to 8 percent slopes	5.0	Ustic Petrogypsis/A-Byy-Byym-R	Gypseous residuum weathered from the Castile Formation, with alluvial and eolian inputs of silicate material	Shallow, well drained soils on low hills
BIE	Bissett-Rock outcrop complex, 10 to 30 percent slopes	3.8	Lithic Ustic Haplocalcids/A-Bk-R	Colluvium and residuum weathered from limestone	Shallow, well drained soils on undulating to very steep hills and mountains
DNB	Dellahunt-Neimahr-Joberanch complex, 1 to 3 percent slopes	3.8	Ustic Calcigypsis/A-Bw1-Bw2-Bky1-Bky2-Bky3-Bky4-Bky5	Loamy alluvium derived from rock gypsum and/or loamy alluvium derived from sandstone	Deep well drained soils on alluvial flats and fans
EPA	Elcor-Dellahunt-Pokorny complex, 0 to 2 percent slopes	3.1	Lithic Haplogypsis/Ayy-Byy-R	Residuum weathered from rock gypsum	Shallow, well drained soils on hills and side slopes
ELC	Elcor gypsiferous	1.8	Lithic	Gypseous residuum	Shallow, well drained

Map Unit Symbol	Map Unit Name	Percent of APE	Taxonomic Class/ Horizons	Parent Material	Series Description
	loam, 1 to 8 percent slopes		Haplogypsiids/Ayy-Byy-R	weathered from rock gypsum from the Castile Formation	soils on hills and side slopes
DEB	Dellahunt silt loam, 0 to 5 percent slopes, occasionally flooded	1.2	Ustic Calcigypsiids/A-Bw1-Bw2-Bky1-Bky2-Bky3-Bky4-Bky5	Loamy alluvium derived from rock gypsum and/or loamy alluvium derived from sandstone	Deep well drained soils on alluvial flats and fans
DOC	Double loam, 1 to 8 percent slopes	0.7	Ustic Haplocambids/A-Bw1-Bw2-Bw3	Calcareous alluvium derived from limestone	Very deep, well drained, moderately slowly permeable soils on alluvial fans
EPE	Elcor-Pokorny-Hollomex-Walkerwells complex, 0 to 30 percent slopes	0.3	Lithic Haplogypsiids/Ayy-Byy-R	Gypsiferous alluvium	Shallow, well drained soils on hills and side slopes
WAB	Walkerwells silty clay loam, 0 to 3 percent slopes, occasionally flooded	0.1	Ustifluventic Haplocambids/A1-A2-Ab1-Ab2-Ab3-Bwb1-Bwb2-Bkyb-Byb	Loamy alluvium derived from rock gypsum and/or sandstone	Very deep well drained soils on flood plains and drainageways
<b>Reeves County</b>					
12	Delnorte-Chilicotal association, rolling	21.2	Petrocalcids/A-Bkk-Bkkm-Bck	Calcareous loamy materials containing igneous gravel	Very shallow, well drained, moderately rapidly permeable soils above petrocalcic horizon, on nearly level hilly uplands, fan piedmonts, and fan remnants
17	Hoban-Reeves-Holloman association, nearly level	9.3	Ustic Haplocalcids/Ap-A-Bk-Cky1-Cky2	Calcareous loamy or clayey alluvium	Very deep, well drained, moderately permeable soils on broad, nearly level to very gently sloping valleys, alluvial outwash plains or broad basins
27	Orla association, nearly level	4.0	Typic Haplogypsiids/A-Cky-Cy	Loamy gypsiferous materials of lacustrine or alluvial origin	Shallow, well drained, moderately permeable soils on gently sloping plains and depressions
32	Reakor association, nearly level	2.4	Typic Haplocalcids/A1-A2-Bkw1-Bkw2-Bk1-Bk2	Loamy alluvium derived from mixed sources	Very deep, well drained soils on broad plains and alluvial fans
20	Holloman-Reeves	0.8	Typic	Loamy, calcareous, and	Shallow, well drained,

Map Unit Symbol	Map Unit Name	Percent of APE	Taxonomic Class/ Horizons	Parent Material	Series Description
	association, gently undulating		Torriorthents/A-Aky-Cy-Cry1-Cry2	gypsiferous sediments	moderately permeable soils on basins, valley floors, or adjacent terraces
16	Hoban silty clay loam, 0 to 1 percent slopes	0.4	Ustic Haplocalcids/Ap-A-Bk-Cky1-Cky2	Calcareous loamy or clayey alluvium	Very deep, well drained, moderately permeable soils on broad, nearly level to very gently sloping valleys, alluvial outwash plains or broad basins
29	Pecos silty clay, saline	0.3	Vertic TorrifluventsAp-Byz1-Byz2-Byz3-Byz4	Calcareous clayey alluvium	Very deep, moderately well drained, slowly permeable soils on nearly level flood plains
40	Toyah clay loam, saline	0.3	fluventic Haplustolls/ Ap-Bck1-Bck2	Calcareous loamy alluvium	Deep, well drained, moderately permeable, soils on nearly level flood plains and alluvial fans
34	Reeves clay loam, 0 to 1 percent slopes	0.2	Ustic Calcigypsiids/A1-A2-Bk1-Bk2-Bk3-By1-By2-Bky	Calcareous and gypsiferous fine textured alluvium derived from gypsum beds	Very deep, well drained, moderately permeable soils on hillslopes, plateaus, and basin floors
26	Orla clay loam, 0 to 1 percent slopes	0.1	Typic Haplogypsiids/A-Cky-Cy	Loamy gypsiferous materials of lacustrine or alluvial origin	Shallow, well drained, moderately permeable soils on gently sloping plains and depressions
28	Patrole silt loam	0.0	Typic Torrifluvents/Ayz-BCyz1-2BCyz	Stratified silty over clayey alluvium	Very deep, well drained, very slowly permeable soils on nearly level flood plains
<b>Ward County</b>					
PY	Pyote soils, undulating	10.1	Ustic Haplargids/A-E1-E2-Bt1-Bt2-Bt3-Bct-Bck	Sandy alluvium and/or sandy eolian deposits	Very deep, well drained, moderately rapidly permeable soils on nearly level to gently undulating uplands
WS	Wickett and Sharvana soils, gently undulating	7.2	Ustalfic Petrocalcids/A1-A2-Bt1-Bt2-Bkm-Bck	Sandy and loamy eolian materials over thick beds of calcium carbonate	Moderately deep, well drained soils that are moderately rapidly permeable above petrocalcic horizon, on nearly level to very gently sloping uplands
SH	Sharvana soils, nearly level	3.9	Petrocalcic Paleustalfs/Ap-Bt1-Bt2-Bkkm-	Calcareous, loamy eolian deposits from the Pleistocene age	Very shallow and shallow, well drained, and moderately permeable

Map Unit Symbol	Map Unit Name	Percent of APE	Taxonomic Class/ Horizons	Parent Material	Series Description
			Bkk1-Bkk2	Blackwater Draw Formation	above a petrocalcic horizon, on nearly level to gently sloping plains
MC	McCarran soils, nearly level	3.8	Typic Haplogypsis/A-C1-C2-Cy1-Cy2-Cy3	Calcareous and gypsiferous loamy alluvium	Very deep, well drained soils on alluvial flats
Mo	Monahans fine sandy loam, 0 to 2 percent slopes	3.7	Typic Calcigypsis/Ap-Bk-Bky1-Bky2	Calcareous and gypsiferous coarse-loamy ancient alluvium	Very deep, well drained, moderately permeable soils on nearly level to gently sloping upland plains and fan skirts on fan piedmonts
DE	Delnorte gravelly soils, undulating	3.6	Petrocalcids/A-Bkk-Bkkm-Bck	Calcareous loamy materials containing igneous gravel	Very shallow, well drained, moderately rapidly permeable soils above petrocalcic horizon, on nearly level hilly uplands, fan piedmonts, and fan remnants
UP	Upton gravelly soils, gently undulating	3.0	Calcic Petrocalcids/A-Bk-Bkm-Bck	Pleistocene-age gravelly Calcareous loamy alluvium derived from limestone and/or Pleistocene-age gravelly Peds sediments	Shallow, well drained, and moderately permeable soils over a petrocalcic horizon, on nearly level to moderately sloping uplands
Kc	Kinco fine sandy loam, 0 to 3 percent slopes	2.4	Ustic Haplocalcids/A-Bw-Bk-Bck	Calcareous loamy alluvium and/or eolian deposits	Very deep, well drained, moderately rapidly permeable soils on nearly level to very gently sloping uplands
Pe	Pecos silty clay	1.0	Vertic Torrifluvents/Ap-Byz1-Byz2-Byz3-Byz4	Calcareous clayey alluvium	Very deep, moderately well drained, slowly permeable soils on nearly level flood plains
To	Toyah clay loam	1.0	Torrifluventic Haplustolls/Ap-Bck1-Bck2	Calcareous loamy alluvium	Deep, well drained, moderately permeable, soils on nearly level flood plains and alluvial fans
Im	Ima fine sandy loam, 0 to 3 percent slopes	0.6	Ustic Haplocambids/A1-A2-Bw-Bk-C	Coarse-loamy alluvium and eolian materials derived from sandstone and shale of the Jurassic, Triassic, and Permian ages	Deep, well drained soils on hillslopes, plains, alluvial fans, terraces, and piedmonts
WT	Wickett and	0.6	Ustalfic	Sandy and loamy eolian	Moderately deep,

Map Unit Symbol	Map Unit Name	Percent of APE	Taxonomic Class/ Horizons	Parent Material	Series Description
	Sharvana fine sandy loams, gently sloping		Petrocalcids/A1-A2-Bt1-Bt2-Bkm-Bck	materials over thick beds of calcium carbonate	moderately rapidly permeable, and well drained soils above petrocalcic, on nearly level to very gently sloping uplands
Gf	Gila fine sandy loam	0.2	Typic Torrifluvents/A-C1-C2-C3-C4	Coarse-loamy alluvium	Very deep, well drained soils on alluvial fans and flood plains
Ha	Harkey loam	0.1	Typic Torrifluvents/Ap-Ck1-Ck2	Coarse-silty calcareous alluvium derived from sedimentary material	Very deep, well drained soils on floodplains and stream terraces
Ho	Hodgins clay loam	0.0	Ustic Haplocambids/A1-A2-Bw-Bk1-Bk2	Fine-silty and loamy calcareous alluvium derived from sedimentary rock	Deep, calcareous, well drained, moderately permeable soils on nearly level to very gently sloping uplands and shallow valleys
Total		100			

Source: NRCS (2017)

### 2.3 Hydrology

The study area is within the Rio Grande River Basin within the Pecos River Sub-basin (Texas Water Development Board 2013). The Pecos River serves as a county boundary for Loving, Ward and Reeves Counties and runs diagonally from the northwest to the southeast through the APE. The National Hydrography Dataset, produced by the United States Geological Survey (USGS), suggests multiple unnamed intermittent drainage features occur in the study area, in addition to numerous small impoundments and stock ponds. Six shallow draws intersect the APE, including Maverick, Virginia, and Horseshoe Draws in Culberson County, McIlvay and Incline Draws in Reeves County, and Monument Draw in Ward County. Additional conveyance features in the study area include ditches, canals, and laterals along the Pecos River.

Several wetlands occur within the region, including palustrine emergent, palustrine forested, palustrine scrub/shrub, and open water. Palustrine emergent wetlands are dominated by herbaceous vegetation that appears as grasslands or stands of reedy growth (Tiner 1999). Palustrine forested wetlands typically consist of stands of woody vegetation at least 19.6 ft in height and possess an overstory of trees, an understory of young trees or shrubs, and an herbaceous layer. Palustrine scrub/shrub wetlands are dominated by shrubs or trees less than 19.6 ft tall. All of these wetlands types primarily occur adjacent to riverine systems and within floodplains.

### 2.4 Flora and Fauna

The project area lies east and south of the New Mexico/Texas border and is within the Chihuahuan Basins and Playas Level IV Ecoregion of the Chihuahuan Deserts Level III Ecoregion of Texas (Griffith et al. 2007), which extends from the Madrean Archipelago in southeastern Arizona to the Edwards Plateau in south-central Texas. The Chihuahuan Basins and Playas represent the hottest and driest portions of west Texas (Griffith et al. 2007). The alluvial valleys, basins, and river valleys of the Chihuahuan Desert are characterized by salt flats, dunes, and

windblown sand deposits. Similar to the High Plains, intermittent and ephemeral streams are typical, with playa lakes forming briefly after rainfall events. Vegetative cover of the Chihuahuan Deserts Level III Ecoregion is predominantly semi-desert grassland and arid shrub land. At high elevations, islands of oak, juniper, and pinyon pine woodland exist. The extent of desert shrub land is increasing across lowlands and mountain foothills due to gradual desertification caused in part by historical grazing pressure (Griffith et al. 2007).

The landscape of the Chihuahuan Basins and Playas Level IV Ecoregion was formed during the Basin and Range tectonism when the earth's crust stretched, causing portions of the crust to collapse, creating deep depressions or grabens that filled with sediment over time (Griffith et al. 2007). The sediments are composed of clay, silt, sand, and gravel up to 9,000 ft thick (Spearing 1991). The level arid bottoms have saline or alkaline soils and areas of white salt flats, dunes, and windblown sand. Surrounding the playas at low elevations are miles of desert shrub land. The extremely saline areas of the playas have salt-tolerant plants such as fourwing saltbush, pickleweed, and alkali sacaton (Bezanson 2000). The valleys and rolling alluvial fans are dominated by creosote bush and tarbush. In addition, alien saltcedars and river cane now occupy most riparian areas (Griffith et al. 2007).

The study area lies along the southwestern portion of the Kansan biotic province and the northeastern portion of the Chihuahuan as described by Blair (1950). Blair recognized 14 lizard species, 31 snake species, 14 anuran species (frogs and toads), one land turtle, one urodele species (salamanders and newts), and 59 species of mammals within the Kansan province. Blair recognized 22 lizard species, 38 snake species, 13 anuran species, one land turtle, one urodele species, and 83 species of mammals within the Chihuahuan province, which he describes as being the most diverse in Texas; however, these numbers have likely changed considerably due to taxonomic revisions over the last half-century. Fish are prominent in the trophic structure of most streams in the region, including the Pecos River as well as minor water bodies. At least 43 species of freshwater fish are known to occur in this region of Texas (Thomas et al. 2007), including sunfish, catfish, trout, and bass. Several wildlife species are present within the study area, including white-tailed deer, mule deer, pronghorn, javelina, northern bobwhite, scaled quail, mourning dove, white-winged dove, squirrel, rabbit, and wild turkey.

## 3 Cultural Background and Previous Investigations

### 3.1 Cultural Background

The Permian Basin — Culberson new 138 kV double-circuit transmission line traverses portions of Ward, Reeves, and Culberson Counties, Texas. Approximately 60 percent of the Project ROW is in Reeves and Culberson Counties, which is within the eastern portion of the Trans-Pecos Archaeological Region (Miller and Kenmotsu 2004), while 40 percent of the approved route is within the southernmost portions of the Lower Plains Archaeological Region (in Ward County). The prehistoric cultural chronologies for both archaeological regions recognize the occurrence of Paleoindian, Archaic, Late Prehistoric, and Protohistoric periods, though they differ somewhat in terms of date ranges and specific material attributes.

#### Paleoindian Period

The Paleoindian Period was characterized by small groups of highly mobile hunter-gatherers who hunted megafauna such as mammoth, bison, and horse. Some evidence suggests that additional diverse resources may have also been exploited, such as alligator, and raccoon, along with a wider range of plants than previously believed (Bousman et al. 1990; Collins 1998). Within the Trans-Pecos Archaeological Region, the Paleoindian Period is divided into Early (Clovis and Folsom; ca. 11,500 to 10,000 Before Present [B.P.]) and Late (Plainview and Firstview, ca. 10,000 to 8500 B.P.). In the southern portion of the Lower Plains Archaeological Region, this period is dated to have occurred roughly between 12,500 and 8000 years B.P. Defining characteristics of Paleoindian lithic assemblages included lanceolate points with straight or concave bases, scrapers, and notched tools (Johnson and Holliday 2004; Perttula 2004). These tools appear to be predominantly associated with the hunting and butchering of large game (i.e., megafauna) during the late Pleistocene period. Most of the cultural materials associated with the Paleoindian period are encountered within the draws that drain this region, along playa margins, and as surface finds in the dune fields and uplands (Johnson and Holliday 2004).

The Early Paleoindian Period is represented by Clovis and Folsom cultures. The Clovis culture is characterized by the use of distinctive Clovis-style projectile points that were lanceolate in shape and fluted, and Clovis sites on the Lower Plains often consist of mammoth kill sites (Meltzer 1987; Waters and Stafford 2007; Waters et al. 2011). Common to Clovis assemblages are engraved stones, bone projectile points, stone bolas, and ochre (Collins 1995; Collins 2002; Collins et al. 1992). The use of non-local lithic resources suggests that these groups were highly mobile and may have engaged in long-distance trade networks (Collins 1995; Hester 1995; Prewitt 1981). Surface finds of Clovis points are commonly reported throughout Texas, while buried and preserved sites are rare. The Folsom culture, beginning around 11,450 B.P., was more reliant on bison hunting, which is evidenced by numerous bison kill sites on the Lower Plains. Diagnostic artifacts for this period include fluted Folsom projectile points, distinctive bifaces, and hide scrapers (Collins 1995). Site types in the southern portion of the Lower Plains include rockshelter sites, burned rock and ring middens, prehistoric wells, open campsites, lithic scatters, and isolated burials.

During the Late Paleoindian Period, the overall climate was shifting toward modern conditions where large fauna were no longer in abundance. Lower Plains Late Paleoindian sites typically contain unfluted lanceolate projectile points, and kill sites contain greater amounts of bison bone (Hoffman 1989). Populations were still highly mobile at this time. Various cultural complexes arose during the Late Paleoindian Period and included Plainview, Cody, and Plano Complexes, each with its own distinctive projectile point style. Notable Late Paleoindian sites in the Lower Plains include the Blackwater Draw Locality No. 1 (Hester 1972) and Lubbock Lake



(Holliday 1987). Near the study area, Hoffman et al. (1990) identified the Shifting Sands Site near Monahans Sandhills State Park, in Winkler County. At this site, faunal remains point to the exploitation of bison, and human teeth remains have been found. At the Scharbauer site near the city of Midland, Davis (1993) identified several Midland style lanceolate projectile points, chipped stone and groundstone, caliche cooking hearths, and a human skeleton dating to approximately 7700 B.P.

### **Archaic Period**

The Archaic Period in Texas, in general, witnessed an overall change, from exploiting large game hunting, to increasing diversification of plant and animal resources. Reoccupation and re-use of seasonal campsites, restricted movements, and resource intensification are often cited as evidence for increasing populations. Further evidence of this is in the artifact assemblages, which often include grinding tools for processing plant foods, roasting ovens, and rock-lined hearths. The Archaic Period is typically subdivided into three periods: Early Archaic, Middle Archaic, and Late Archaic. Changes in tool technology and other material culture appear to have arisen in response to climatic changes that were occurring during the early Holocene (i.e., decreasing effects of continental glaciation and increasing warming and drying) (Bense 1994; Johnson and Holliday 2004).

#### ***Early Archaic***

In the Trans-Pecos Region, the Early Archaic Period dates from 8500 to 6000 B.P., while in the southern portion of the Lower Plains, this period begins somewhat earlier, around 8800 B.P. The archaeological record for this period in this region is scant, which suggests that it was a relatively marginal subsistence zone (Meltzer 1991; Meltzer and Collins 1987; Quigg et al. 1994; Smith et al. 1966). Changes in material culture that begin with the onset of the Archaic include a shift from lanceolate-shaped points, to stemmed and barbed dart points, as well as an increased use of groundstone tools, which suggests plant processing (Black 1989; Collins 2004). As opposed to the lanceolate shaped points used in the preceding period, this period is marked by the use of stemmed dart points, including Bell, Martindale, Gower, and Golondrina. Pollen data indicates that this period exhibited increasingly warmer and drier environmental conditions (Collins 1995), which resulted in adaptive subsistence strategies away from a reliance on bison, to include diverse and increasingly localized resources than in the preceding period. Exploitation of these resources is evidenced by small campsites containing large rocks for use in cooking (Johnson and Goode 1994). Excavations have been conducted at a limited number of sites, including Lubbock Lake (Texas) and San Jon (New Mexico), located east and north of the current project area, respectively (Johnson and Holliday 2004). Both are described as bison kill/butchery locations. Radiometric dates show an Early Archaic association for the sites although diagnostic projectile points were not recovered (Johnson and Holliday 2004; Hogan 2006). Within the Trans-Pecos region, the majority of Archaic period assemblages are associated with open-air (disturbed) sites or rockshelter deposits (Miller and Kenmotsu 2004).

#### ***Middle Archaic***

In the Trans-Pecos Region, the Middle Archaic is dated from 6000 to 3500 B.P., while in the Lower Plains, this period begins around 5000 3000 B.P. (Hoffman 1989). This period was characterized by increasing aridity, the accumulation of aeolian sediments in the various draws on the Southern High Plains, and the development of sand dunes during the Altithermal climatic event (Johnson and Holliday 2004). This climate event, which peaked approximately 5,000 years ago, is a well-documented warm/dry climate shift that occurred throughout the southwestern and mid-continental regions of North America (Bousman 1998; Boutton et al. 1994; Dorale et al. 1992; Fredlund and Tieszen 1997; Humphrey and Ferring 1994; Nordt et al. 1994; Nordt et al. 2002). Hand-dug water wells found within the Lower Plains attest to the effects of this warming period on local hydrological systems (Meltzer 1991). Another indication of environmental stresses brought on by increasingly warm and arid conditions is the occurrence of occupation sites in more diverse environmental settings. This environmental diversification is accompanied by the increased utilization of smaller mammals and the gathering of a wider variety of plant foods. This period also saw decreased mobility and increased exploitation of seasonal resources,

as well as changes in lithic technologies. A prehistoric response to the increasing aridity is found at three sites (Blackwater Draw Locality #1, Mustang Springs, and Marks Beach) by the presence of numerous excavated water wells (Johnson and Holliday 2004). In the eastern Trans-Pecos, Miller and Kenmotsu (2004) also discuss the tendency for Middle Archaic archaeological sites to be located along intermittent drainages. Paleoenvironmental data from this period suggests extreme warm and dry conditions, which resulted in significant shifts in subsistence and technology. Sites tend to be more common than in the preceding period, possibly due to the emergence of territories as populations increased. The Lubbock Lake Site in the Lower Plains provides evidence of continuing bison procurement and processing during the Middle Archaic, although a more diversified spectrum of faunal species, including antelope, gopher, rabbit, turtle and woodrat, were identified, as well as a rock-covered oven, probably used for plant food processing (Johnson and Holliday 2004; Hogan 2006). While little is known about this period on the Lower Plains, the Central Texas Middle Archaic Period is often characterized by greater exploitation of more diverse and local food resources. Within these larger campsites are increased numbers and frequencies of burned rock middens, indicative of intensification of plant food resources (Collins 1995; Prewitt 1981). Lithic assemblages from this time period are represented by a variety of dart point styles, Clear Fork gauges, gravers, scrapers, and other unifacially and bifacially flaked tools.

### ***Late Archaic***

In the Trans-Pecos Region, the Late Archaic is dated from 3500 to 2000 B.P. As with the Early and Middle Archaic, bison hunting and processing appear to be major subsistence activities; evidence for tool caches, campsites, hearths, lithic procurement and processing locations, and rock shelters have also been noted (Johnson and Holliday 2004). Initial horticultural intensification, focusing on corn and bean cultigens, perennials and weedy annuals, is also suggested immediately to the west of the study area, in the western Trans-Pecos region and southeastern New Mexico (Hogan 2006). In the Lower Plains, populations reached their maximum during the Late Archaic in the northern portion of the Lower Plains, and campsites are more common which suggests greater mobility. The Late Archaic period in west Texas is currently best represented by corner- and side- notched projectile point types and assemblages associated with the Chalk Hollow and Lubbock Lake sites (Johnson and Holliday 2004). During this period, temperatures cooled, landscapes began to stabilize, and surface water (in the form of playas and marshlands) expanded (Johnson and Holliday 2004). Climates returned to cooler and possibly wetter conditions than previously during this period, and bison populations increased (Dillehay 1974). Human subsistence strategies likely adapted quickly to this and were organized to exploit this important game resource. Lithic assemblages are still dominated by a variety of dart point styles, with continued use of Clear Fork gauges, gravers, scrapers, and other unifacially and bifacially flaked tools.

### **Late Prehistoric Period**

The Late Prehistoric Period began approximately 2000 B.P. Like many areas of North America, this period in the study area is marked by the introduction of the bow and arrow and ceramics (Johnson and Holliday 2004). The most prevalent Late Prehistoric diagnostic artifacts for this time period are corner-notched Scallorn arrow points and early, cord-marked, coarse tempered pottery. The introduction of the bow-and-arrow and ceramic technology during the Late Prehistoric Period represents a major technological shift from the preceding Archaic Period. Native groups on the Lower Plains were influenced by the Eastern Woodlands to the east and the Southwestern cultures to the west. Broad-based hunting and gathering was the main mode of subsistence and included exploitation of deer, freshwater mussels, and snails (Prewitt 1981). Scallorn points indicative of this period possibly indicate the emergence of extensive trade networks.

The latter part of the Late Prehistoric Period is represented by a marked increase in bison exploitation. Prehistoric subsistence within the study area was likely influenced by regionally adjacent Puebloan and Southern Plains practices in agriculture and horticulture, use of bow and arrow technologies, and ceramics. Sites of this period are generally considered part of the Toyah Phase (650 to 250 B.P.), which represents a significant

economic shift (Creel 1991; Dillehay 1974; Hester 1995; Prewitt 1981). This cultural change is manifested by diagnostic materials including Perdiz and other contracting-stem arrow points, bone- and shell-tempered pottery, beveled-edge bifacial knives (e.g., Harahey knives), perforators, and large end-scrapers (Creel 1991; Hester 1995; Prewitt 1981). An increase in bison hunting is suggested during this time by the archaeological presence of bison-related hunting camps, base camps, and residential and processing sites (Johnson and Holliday 2004). Artifact assemblages from this period are also geared toward bison exploitation and are represented in archaeological sites within this region and across much of the state (Creel 1991; Dillehay 1974; Hester 1995; Prewitt 1981). Greater artifact diversity is found during the latter part of the period in which Puebloan pottery, dominated by Jornada Mogollon ceramics, and Plains lithic tools, find their way into local archaeological assemblages (Johnson and Holliday 2004).

Interaction with the Jornada Mogollon and Eastern Trans-Pecos groups is suggested by the occurrence of Southern High Plains and Panhandle styles of ceramics and projectile points, the appearance of Mogollon ceramics, and the expanding role of horticulture (Boyd 2004; Cloud and Sanchez 1994; Collins 1968; Kenmotsu 2001; Johnson and Holliday 2004; Mallouf 1985; Miller and Kenmotsu 2004; Perttula 2004). The presence of ring middens and circular pithouses has been noted within the eastern Trans-Pecos region during this period; however, in general, there is a continuity of Late Archaic subsistence and mobility strategies (see Miller and Kenmotsu 2004). From 1000 to 500 B.P., increased frequencies of Jornada Mogollon ceramic trade wares are noted; unfortunately, the majority of these sites also lack stratigraphic integrity (Johnson and Holliday 2004).

### **Protohistoric Period**

The term “protohistoric” refers to those Native American sites which contain evidence of early contact with Europeans (Hoffman 1989). No such sites have been identified and investigated near the study area. Probably the nearest encounter to this region was during the mid-sixteenth century as Coronado ventured across present-day north Texas and Oklahoma. During this period, the area was inhabited by nomadic Apachean hunters and traders that migrated from the northwest. Subsequently, the Comanche had moved south from the High Plains and displaced the Apachean groups. Common diagnostic elements to historic native sites include metal arrow points and European gun flints. These groups dominated the Southern Great Plains well into the middle of the nineteenth century. Native control over this region ended abruptly during the Red River War of 1874, after which Euro-Americans established a strong foothold.

To the north and east of the study area, in the Caprock Canyonlands and Southern High Plains, Garza Phase assemblages, dating to ca. 500 to 300 B.P., characterize the Protohistoric period; however, few of these sites display stratigraphic integrity (Johnson and Holliday 2004; Perttula 2004). The Garza Phase is defined through the presence of triangular, basally-notched Garza and Lott projectile point forms (Hogan 2006). Ethnographically, these assemblages represent manifestations of the Comanche, Apache, and Teyas Native American sites. Following this period, European trade goods (i.e., glass trade and seed beads) and modern horse remains (as a subsistence item) entered the archaeological record; these materials are generally associated with the occupations from ca. 300 to 150 B.P. (Johnson and Holliday 2004).

### **Historic Euro-American Period**

Due to the remote setting of the study area, extensive contact between Native Americans and Europeans did not occur until the middle of the nineteenth century. Increased interaction occurred in the mid-1800s when buffalo hunters and U.S. military units, traders, ranchers and settlers entered the region (Johnson and Holliday 2004). Prior to this time, little change is reported in the native archaeological record, save for the occasional occurrence of European trade goods and horse remains (Johnson and Holliday 2004).

The Spanish began explorations in the Gulf of Mexico beginning in the early 1500s. In 1538, Cabeza De Vaca was part of an unsuccessful expedition to establish a colony in Florida. En route back to Mexico, his ships were

wrecked off the coast of Texas. De Vaca made his way with the remaining survivors of the expedition down the Texas coast and finally reached Mexico City. Upon his return, De Vaca met with the Viceroy of Mexico and told him stories of the large amounts of gold to be found to the north. These stories sparked several expeditions throughout Texas in the 1530s and 1540s; however, no gold was found in present day Texas and the Spanish gave up their explorations of the area for the next fifty years (Campbell 2003).

The next explorers to enter Texas were Catholic missionaries accompanied by Spanish soldiers. The Spanish used the mission system to their advantage, with the missionaries attempting to ‘civilize’ the nomadic Indians by teaching them Christianity and farming techniques. The hope was that the Indians would become loyal Spanish citizens and help defend Spain’s interests against neighboring Indian nations. A presidio (e.g., military outpost) would be established within each mission that was constructed. The first missions were established in Mexico, but were later built in California, Arizona, New Mexico, and Texas (Campbell 2003).

Spain’s control of Mexico and Florida created an impetus for the French to expand their interests along the Gulf Coast. The French wanted to increase their fur trading territory and gain control of the Mississippi River valley. By 1682, LaSalle, a Frenchman, launched an expedition down the Mississippi River that claimed all of the lands drained by the river for France. He then returned to France and organized a colonization effort to settle the mouth of the Mississippi River. On his return to the Gulf Coast, LaSalle landed to the west of the mouth of the Mississippi River, at Matagorda Bay, Texas. He searched west, then east from his landing point to find the Mississippi River, but was not successful. This expedition sparked the interest of the Spanish, who did not want to see French interests expanding into their territory. In response to the French incursion into the western portion of the Gulf Coast, the Spanish began to plan settlements in Texas (Campbell 2003).

In 1690, the Spanish sent soldiers and several missionaries across the Rio Grande River to establish a presence in east Texas; however, these missions were remote and not well supported. After several years, the missions were abandoned following several crop failures and a realization by the Spanish government that there was no real threat from French expansion into the region. By the beginning of the eighteenth century, the French had established permanent settlements on the Gulf Coast. In 1711, Spanish missionaries, with the goal of expanding into east Texas, sent a letter to the Governor of Louisiana inviting the French to also begin missionary work in this area. The French also saw this as an opportunity to open up trade networks with the Indians along what would become the Louisiana/Texas border. The governor sent Louis Saint-Denis to set up trade relationships with the Spanish and help establish the missions in east Texas. He ended up developing a good relationship with the Spanish and eventually was part of an expedition that established a series of missions in eastern Texas. During this period, the Spanish also began establishing a mission, presidio and civilian settlement in modern-day San Antonio; this solidified a permanent Spanish presence north of the Rio Grande River (Campbell 2003).

In 1719, a European dispute between France and Spain increased tensions along the Louisiana/Texas border. The French sent soldiers from Natchitoches to capture the Spanish mission at Los Adaes. Word spread that the French were coming and this caused all of the missionaries to flee from east Texas to San Antonio. Unlike the mission failures of the 1690s, the circumstances were different following the abandonment of the east Texas missions in 1719. First, the missionaries did not have to return all the way to Mexico for support, as they could now relocate to San Antonio. Second, as there was a real threat of French encroachment into Spanish territory, this prompted the Spanish government to actively resettle east Texas. Within two years of this mission abandonment, a large expedition was mounted to bring numerous men and livestock to east Texas and establish a large Spanish presence in Los Adaes; this became the capital of Spanish Texas (Campbell 2003).

The Spanish mission system failed to expand during the eighteenth century. Relentless Indian attacks and a lack of colonists, contributed to the downturn of Spanish settlement in Texas. In 1762, the Spanish acquired Louisiana from the French, which slowed the need to settle east Texas. At this time, Texas was seen by the Spanish as a large frontier with sparse settlements, which was used as a buffer to Louisiana. In order to

concentrate the population of the colony, an attempt was made by the Spanish to relocate the settlers of east Texas to San Antonio. One lasting benefit from this time of consolidation was the influx of cattle and livestock into Texas, which would later become a dominant industry (Campbell 2003).

In 1800 Spain ceded Louisiana to France, who then sold it to the United States. As a result, the need for east Texas to function as a buffer zone against a foreign neighbor arose again. The Spanish placed troops near the Louisiana/Texas border and made plans to attract additional settlers. Their goal was to draw Anglo-Saxon immigrants from Louisiana and the southeastern United States and make them loyal Spanish citizens (Campbell 2003).

From 1800 to the 1820s, the population of Texas decreased as a result of the effects of the Mexican Revolution. Because of the fighting in Mexico, the government neglected and isolated Texas, leading to increased instability and food shortages. In 1819, Spain signed a treaty with the United States that gave the Florida Territories to America. In return, the U.S. had to give up any claim to the southwest (Campbell 2003). In 1821, Mexico finally became an independent nation, separate from Spain. This newly independent country encouraged Anglo-American settlement within Texas; this effort was led by Stephen F. Austin. Austin came to an agreement with the Mexican government in which he would bring settlers to Texas and, in return, he would be rewarded with land and money. By 1830, ten thousand Anglo-Americans, mostly from the American southeast, had settled in Texas (Campbell 2003).

By the 1830s, the majority of the populations in Texas were American Protestants. During this period, obvious cultural and governmental differences between the Anglo-American and the Mexican inhabitants became apparent. The Anglo-American settlers failed to comply with rules for converting to Catholicism, or those that did were not true converts. Many of the settlers also brought slaves into Texas; by the 1830s the Mexican government began to outlaw slavery. Texas, operating as a separate colony, was able to skirt around some of the Mexican laws, such as emancipation. In 1835, Santa Anna, the president of Mexico, wanted to centralize all of the Mexican territories. Texas, not willing to be subjected to Mexican laws, decided to become an independent nation. After a year of fighting, Texas won its independence in 1836 at the Battle of San Jacinto (Campbell 2003).

Texas operated as an independent nation for 10 years (1836 to 1846) and during this time the Mexican government never truly recognized its independence. In 1846, Texas was annexed by the United States and it was now up to the U.S. government to settle the border dispute with Mexico. The Mexicans claimed the international border as the Nueces River, while the U.S. claimed the Rio Grande River as the demarcation line. After two years of skirmishes and an attack on Mexico City, the United States succeeded in its efforts; with the treaty of Guadalupe Hidalgo, Mexico recognized the Rio Grande as the border and ceded the entire southwest to the Pacific Ocean to the U.S. (McComb 1989).

At the time of annexation by the United States, west Texas was unexplored territory, home to various Native American groups. Settlers began slowly pushing into this territory in the mid-nineteenth century. In 1848, the U.S. army stationed troops in west Texas and created travel routes through this new territory, which would become corridors for pioneers traveling to California. These included the Chihuahua Trail, which led from Mexico to Indianola, Texas, and Horsehead Crossing and Castle Gap in Crane County, all of which were utilized as trade networks during the prehistoric period as well as forming part of a historic transportation corridor linking Mexico, the U.S. and Canada (Dearen 2008). Castle Gap functioned as a primary route for the U.S. Cavalry, California Forty-niners, cattle drives, and stage coach/wagon trains.

The land in west Texas was home to several Native American groups that had already been removed from their original lands; when Americans began settling in these areas, further problems arose. The United States tried to negotiate peace treaties between these groups, but was unsuccessful, mainly due to state law and the rapidly

expanding number of settlers. In 1859 there was a removal of almost all of the Native Americans from west Texas; however, this action by the federal government also increased Indian raids, which then required more troops to be stationed in the area to protect the settlers (Campbell 2003).

During the Civil War, Texas was a large contributor to the Confederacy, but differed significantly from other southern states. Texas was a frontier state, with a diversified population of Mexicans, Anglo-Americans, and Native Americans. The state also had a large European immigrant population, many of whom were small farmers. Two-thirds of the farmers in the state were non-slave holding, which meant that the agricultural economy was maintained following the Civil War. In addition, cattle ranches were a large industry, resulting in economic diversity. Thus, Texas was not as negatively impacted economically as other southern states during post-Civil War Reconstruction (Campbell 2003).

Ranchers moved in and began raising large herds of cattle, as the demand for beef had risen after the Civil War. New cattle trails developed throughout west Texas, where large herds were driven hundreds of miles north to the mid-western railroad routes. In 1881, the Texas Pacific Railway extended their rail lines through west Texas. Up to this point, rail transportation was only available further east. Between the 1870s and 1890s, 8,000 miles of railway track were laid, connecting the entire state. These new railroads reduced the distance the cattle industry had to transport their herd to market (Campbell 2003).

The expansion of the railroad connected the rural communities of west Texas with the booming cities to the east. Towards the end of the nineteenth century, cattle ranchers began to fence off their herds and create small communities on the frontier. West Texas communities grew slowly due to poor soil conditions and the difficulty of accessing water. People began to farm corn and cotton on the newly settled land, but ranching was still the dominant economic product of west Texas at the end of the nineteenth century (Campbell 2003).

The Native American groups of Texas saw the defeat of the Confederacy and the weakening of Texas as a chance to regain lands they had lost. During this period, the Comanche and Apache occupied the areas of west Texas. In response to this increase of Native American attacks, the United States sent troops to reoccupy several forts. By 1874, a major campaign was initiated in Texas that took away Native Americans' horses, destroyed their villages and forced them to return to their reservations. The consolidation of Native Americans on reservations allowed for Anglo-Americans to settle permanently in west Texas (Campbell 2003).

Following these campaigns, the military sent troops to conduct detailed expeditions of the former Native American lands. By 1876, several of the counties northeast of the project area were surveyed by parties from Fort Concho. Ranchers moved into these areas and began raising large herds of cattle, as the demand for beef had risen after the Civil War. New cattle trails developed throughout west Texas, where large herds were driven hundreds of miles north to the mid-western railroad routes. In 1881, the Texas and Pacific Railway extended their rail lines through west Texas; up to this point, rail transportation was only available in east Texas. Between the 1870s and 1890s, 8,000 miles of railway track were laid, connecting the entire state. The new railroads significantly reduced the time and distance it took for the cattle industry to transport their herds to market (Campbell 2003).

The expansion of the railroad connected the rural communities of west Texas with the booming cities to the east. Towards the end of the nineteenth century, cattle ranchers began to fence off their herds and create small communities on the frontier. In 1895, a law was passed that broke up these larger ranches, allowing farmers to purchase smaller tracts of land. This led to the end of open-range ranching and attracted additional settlers. West Texas communities grew slowly due to poor soil conditions and the difficulty of accessing water. People began to farm corn and cotton on the newly settled land, but ranching was still the dominant economic product of west Texas at the end of the nineteenth century (Campbell 2003).

### ***Culberson County***

American exploration of the Culberson County area began in earnest as new routes were needed to connect central and eastern Texas with El Paso and California. The initial efforts consisted of military expeditions to establish these routes and secure strategic sources of water and other resources (Kohout 2013). Soon after the American Civil War, the drive to establish a transcontinental railroad through the Trans-Pecos region of West Texas prompted the need to exterminate or resettle the Mescalero Apache onto reservations. The ensuing Apache Wars spanned the next 37 years, from 1849 to 1886 (Kohout 2013).

By 1881, the Texas and Pacific Railway was completed and a surge of American settlement soon followed. Culberson County was officially formed in 1911 out of territory from El Paso County, with Van Horn as the county seat. The new county was named after David B. Culberson, a lawyer and Confederate soldier in the American Civil War. Ranching was the most important activity for many of the early settlers in the county. Other economically important industries included mineral extraction of copper, silver, barite, mica, gypsum, brucitic marble, and molybdenum (Kohout 2013). The discovery of oil in 1953 spurred further economic growth within Culberson County though not to the same degree as it transformed the economy of the counties situated to the east in the core of the Permian Basin. In 1920, the population of the county was 912; in 1990, the census reported a county population of 3,407. Today, much of Culberson County remains rural in character, and tourism, mining, and oil and gas production remain important economic pursuits (Kohout 2013).

### ***Reeves County***

The earliest excursion of Europeans into the region includes the expedition of Spanish explorer Antonio de Espejo, who encountered three Jumano Indians near Toyah Lake (Smith 2013). The Jumano assisted Espejo by serving as guides and providing a safe route to La Junta de los Rios. Prior to the Mexican-American War, the Madera and Toyah Valleys were cultivated by both the Mescalero Apache and Mexican farmers who took advantage of the area's abundant supply of water to grow rich harvests of cereal crops and vegetables. By the late nineteenth century, Anglo-American newcomers began establishing farms and ranches in the area that would become Reeves County until eventually most of the previous occupants were either driven off, exterminated, or forcibly relocated onto reservations (Smith 2013).

The construction of the Texas and Pacific Railway through Pecos and Toyah in 1881 brought with it a surge of economic growth (Smith 2013). The need to develop a municipal infrastructure to service the growing population led the state legislature to form Reeves County in 1883 (Smith 2013). The county was formed from Pecos County and was named for Confederate Colonel George R. Reeves. That same year, a three-room school was constructed in Pecos, followed by the opening of a post office. In 1890, Reeves County had a population of 1,247 (Smith 2013). Most of the population relied on farming and ranching for their livelihood. The growth of a successful farming and ranching economy was facilitated by the school-land rush after 1901. Two additional railroads were built through the county, including the Pecos River Railway (Pecos to the New Mexico) in 1890 and the Pecos Valley Southern Railway (Pecos to Toyahvale) in 1911 (Smith 2013).

### ***Ward County***

Ward County was officially organized in 1892. The townsite of Barstow became the county seat, and the following year, a county courthouse was built. In 1900, the United States Agricultural Census reported the presence of 1,451 people; 167 farms and ranches encompassing 424,000 acres; 13,000 cattle; and about 4,400 sheep. Only 1,583 acres of the farm and ranch land was under cultivation. The amount of acreage under cultivation rapidly increased following the completion of several irrigation projects along the Pecos River; however, the farming boom along the Pecos River was short-lived. In 1904, an earthen dam on the Pecos River failed, which resulted in flooding and extensive soil salinization of many farms near Barstow. Following droughts

in 1907 and 1910, cotton production increased during the 1910s. By 1920, more than 10,000 acres were devoted to cotton cultivation. The 1920 census reported 238 farms and ranches in the county with a population of 2,615 (Justice and Leffler 2013).

Ward County witnessed significant economic growth following the discovery of oil in the 1920s. The Hendrick oilfield was opened in 1926, which led to the construction of pipelines and railroad loading tanks in Wickett, Pyote, and Monahans. The development of infrastructure to support the growing oil industry led to an increase in population and a sharp decline in cotton production. By 1930, the population of Ward County had increased to nearly 4,600. With its developing oil, gas, potash, and sodium sulfate industries, the town of Monahans became the economic and population center of the county and replaced Barstow as the county seat in 1938. In 1940, the population of Ward County rose to nearly 9,600 (Justice and Leffler 2013).

The latter part of the twentieth century saw sustained economic growth for Ward County as oil production expanded during the 1950s and 1960s. The opening of the 3,840-acre Monahans Sandhills State Historic Park in 1957 attracted tourist dollars to the local economy. By 1960, the county's population was at 14,917. Ranching and oil production remain the most important economic activities in Ward County (Justice and Leffler 2013). A substantial increase in population resulted from the discovery of oil and the development of oil and gas production in the 1920s (Smith 2013). By 1930, there were 6,407 residents in Reeves County, which included 178 African Americans and 56 foreign-born individuals representing 15 countries. In 1950, the population increased to 11,745, including 280 non-white residents. By 1960, the population reached an all-time high of 17,644, which included 634 non-white residents (Smith 2013). Today, manufacturing and agribusiness continue to be important sectors of the economy, while tourism is quickly developing into an important industry. Oil and gas production, however, remains the primary engine that fuels population and economic growth in Reeves County (Smith 2013).

### 3.2 Previous Investigations

In accordance with the Research Design, archival and historic research was conducted prior to the commencement of fieldwork in order to identify all previously recorded cultural resource sites inside, or within 1,000 ft (305 m) of, the proposed ROW. This research included any cultural resource sites that are listed in, or eligible for listing in, the NRHP, or that have the potential to be designated as SALs, or have been previously recorded as cemeteries. This research was carried out by reviewing the Texas Archeological Sites Atlas (TASA) and Texas Historic Sites Atlas (THSA), as well as historic aerials, historic topographic maps, and the NRHP online database.

As a result of the background review, a total of four archaeological sites were identified that have been previously recorded within 1,000 ft (305 m) of the Project ROW (**Table 2**). Three of the sites contain prehistoric cultural materials, including two lithic scatters and one isolated hearth. One site is a historic scatter and contains the remnants of domestic refuse that was possibly associated with a former structure (TASA 2017). The three prehistoric sites have been previously determined to be Not Eligible for listing in the NRHP. While no further work was recommended at historic site 41WR87, the site currently has an undetermined eligibility. No Recorded Texas Historic Landmarks, NRHP-listed properties, Texas Historical Markers, or cemeteries were identified within the search area.

**Table 2. Previously Recorded Archaeological Sites Within 1,000 ft (305 m) of the Project ROW**

Site	Cultural Period(s)	Recorder / Permit No.	Site Description	Recommendation	Distance from APE
41WR76	Prehistoric	Center for Big Bend Studies, Sul Ross State	This site consists of approximately 300 pieces of chert, chalcedony, and	No further work recommended; Site determined	1,000 ft (305 m) north of Proposed



Site	Cultural Period(s)	Recorder / Permit No.	Site Description	Recommendation	Distance from APE
		University / Texas Antiquities Permit No. 5664	quartzite debitage, smaller than 2 cm, and one piece of fire-cracked-rock in a low dune setting east of Monument Draw. No formal tools, temporally diagnostic artifacts, or features were found. No evidence of discrete activity areas were identified that could provide information concerning prehistoric lifeways in the region, and the research value of the site was presumed to be low.	Ineligible by State Historic Preservation Officer (SHPO) on 5/6/11	ROW
41WR84	Prehistoric	Prewitt and Associates, Inc. / Texas Antiquities Permit No. 6030	The site consists of a single isolated hearth composed of approximately 15 fragments of burned caliche. Site is located in an eroded sand dune area dominated by 1-1.5 m high low coppice dunes stabilized by mesquite and other small shrubs. Site is heavily disturbed.	No further work recommended; Site determined Ineligible by SHPO on 12/28/11	680 ft (207 m) east of Proposed ROW
41WR85	Prehistoric	URS Corporation / Texas Antiquities Permit No. 6782	The site consists of a low-density scatter of debitage and a possible hammerstone over an 84-x-60-m sand dune area that has been mechanically disturbed and eroded.	No further work recommended; Site determined Ineligible by SHPO on 4/8/14	123 ft (37 m) north of Proposed ROW
41WR87	Historic	AR Consultants Inc. / No Permit	The site consists of a domestic refuse dump possibly associated with a structure mapped on the 1961 topo map. Historic artifacts included a scatter of 150+ amber glass, 100+ clear glass, 15 SCA glass, 5 green glass (including '2-way' soda bottle), 20 window glass, 30+ white wares (including 5 with pale blue glaze), 2 pale blue opaque glass, 5 milk glass, 3 crockery with brown and gray glazes, 1 porcelain figurine fragment, pull tab beer cans, metal scraps, 2 glass marbles, and 2 rubber shoe soles. No features were noted within	No further investigations recommended for the portion of the site within the project ROW; undetermined eligibility	1,000 ft (305 m) north of Proposed ROW

Site	Cultural Period(s)	Recorder / Permit No.	Site Description	Recommendation	Distance from APE
			the project ROW.		

Source: TASA 2017

Compared to other parts of the state, relatively little archaeological work has been conducted within the study area. Previous archaeological investigations have primarily consisted of linear cultural resources surveys associated within pipelines and transmission lines for the energy industry. Six previous archaeological surveys have been conducted within 1,000 ft (305 m) of the Project ROW (**Table 3**). No sites were recorded as part of these surveys (TASA 2016). The low number of recorded sites in the area is most likely partially due to the lack of formal cultural resources investigations. As such, previously unrecorded prehistoric and historic sites may be present, but have not yet been identified.

**Table 3. Previous Cultural Resources Investigations Within 1,000 ft (305 m) of the Project ROW**

Type of Investigation	Date	Agency	Investigating Firm	Antiquities Permit No.
Linear Survey	February 2014	General Land Office	URS Corporation	6782
Linear Survey	September 2011	Texas Parks and Wildlife Department (TPWD)	Prewitt and Associates, Inc.	6030
Areal Survey	June 2010	Texas Water Development Board (TWDB)	Center for Big Bend Studies	-
Linear Survey	July 1995	Environmental Protection Agency (EPA)	No Data	-
Linear Survey	December 1994	EPA	No Data	-
Linear Survey	No Data	No Data	No Data	-

Source: TASA 2017

A review of prehistoric site data for Ward, Reeves, and Culberson Counties indicates that prehistoric sites in the region include open campsites, lithic procurement sites, surficial and shallowly-buried lithic scatters, and burned rock features (Fields et. al 1996). Prehistoric sites are most frequent along rivers, streams, and other water sources such as playas, and are less frequent in upland settings at some distance from water sources, and on steep slopes. Prehistoric sites may occur in rock shelters and in terrace deposits. Sites in alluvial settings may be deeply buried, while sites located in upland contexts tend to be at the surface or shallowly buried. Within this general region, ongoing wind erosion and extensive bioturbation from ranching and burrowing have exposed the upper surface of the landscape, and upland prehistoric sites generally exhibit moderate to high surface visibility due to sparse vegetation cover. Except for a few specific geomorphological locations, archaeological sites of all ages tend to be located on the exposed ground surface, either because of erosion or because they were never buried to begin with (Hall 2006). The majority of archaeological sites within the project area and the region will most likely be located on eroded surfaces and therefore lack integrity (Hall 2006). However, intact archaeological deposits may be encountered where depositional processes have been occurring, such as: (a) colluvial slopewash along playa margins; (b) eolian sand deposits associated with the playa margins; (c) upland playa and lake fill deposits; and (d) within and adjacent to draws and/or drainages of Late-Pleistocene to early Holocene age (Hall 2006; Johnson and Holliday 2004).

Historic archaeological sites in the region generally have a greater surface visibility because they are usually not buried as deeply as prehistoric sites, or are not buried at all. Historic sites tend to be located near historic transportation routes, streams, springs, wells, and windmills. Historic sites commonly consist of aboveground structures, structural elements, or may only be represented by buried (archaeological) historic artifacts (Fields et al. 1996). They are also often associated with surface features, such as wells and buildings, and, as a rule, contain a much higher density of artifacts compared to prehistoric sites. Sites abandoned in the middle

nineteenth century are an exception to this, as they are usually not associated with any structural features and are often characterized by low artifact density. Historic sites often occur along old roads, and are more common in the uplands than on floodplains. Of the historic sites recorded in the study area, most are farmstead or ranch-related sites (including buildings or other features) and historic dumps or trash scatters.

## 4 Survey Methods

The field methodology for the privately-owned portion of the project is described in the Research Design, which stipulates the methods under which cultural resources within the Project ROW will be identified, assessed for NRHP and SAL eligibility, and how site-specific recommendations for additional archaeological research would be handled. The objectives of the survey were to identify and inventory any cultural resources sites within the Project ROW, assess the potential of any resources for NRHP eligibility and/or SAL designation, and determine the need for additional archaeological studies, including monitoring. All work was supervised by a URS cultural resource professional meeting the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation 36 CFR 61).

Within the 6-mile long segment of the Project ROW corridor that traverses lands owned by University Lands, which is a political subdivision of the State of Texas, fieldwork was conducted in conformance with THC/CTA Archaeological Survey Standards for Texas (THC 2014), which necessitated transect intervals of 30 m or less. Two parallel transects spaced 10 m (33 ft) apart within the 21-m (70-ft) wide Project ROW were utilized, which exceeded CTA standards. Shovel testing density within this area also followed THC/CTA standards, which call for 16 shovel tests per mile in settings that have potential for buried cultural materials. Shovel testing was not required in areas exhibiting greater than 30 percent ground surface visibility, or areas with slopes greater than 20 percent, or did not exhibit potential for buried deposits. All fieldwork within the privately-owned portion of the Project ROW followed the Research Design, which is outlined below.

### 4.1 Identification of Probability Areas

Prior to fieldwork, and in accordance with the Research Design, the proposed ROW was subdivided into areas of high, moderate, and low probability for the presence of prehistoric archaeological sites. Probability areas are shown on the maps in **Appendix A**. These subdivisions were made prior to fieldwork and were based on the background review of extant site distributions, soils, geomorphology, topography, prior disturbances, and distance from permanent and intermittent water sources. For historic sites, identification of probable site locations was determined through archival and historic research specific to the ROW.

High Probability Areas (HPAs) are defined as those possessing the greatest potential for containing cultural resources sites. Potential integrity is presumed to be highest in the HPAs. Within the Lower Plains portion of the project (Ward County), HPAs contain deep soils and are in proximity to natural water sources (such as the Pecos River), including interfluvial summits and shoulderslopes overlooking alluvial valleys; lower slope components, such as interfluvial toeslopes and alluvial and colluvial fans; areas adjacent to alluvial valleys; natural levees or levee remnants; relict alluvial terraces; rises within floodplains; upland edges adjacent to alluvial valleys and stream confluences; areas near springs; and floodplain deposits. Within the Trans-Pecos portion of the project (Reeves and Culberson Counties), HPAs include sheltered saddles near seasonally watered canyons; canyon mouths; interfluvial summits and shoulderslopes overlooking alluvial valleys; lower slope components, such as interfluvial toeslopes and alluvial fans adjacent to alluvial valleys; relict alluvial terraces; rises and prominent topographic features within drainage basins; higher slopes adjacent to valley walls and mountain ranges; prominent topographic features around the edges of internal-draining basins; near local outcrops of workable chert and quartzite; and around springs and old playa lakes. In general, areas of deep burial potential offer the greatest preservation potential for prehistoric sites. Though such sites have the greatest research potential, sites in such settings are typically deeply buried and exhibit low visibility. As such, they are typically located through

deep mechanical excavation or by observing eroding stream banks. Site preservation in these settings may also be affected from development, roadways, sand and gravel operations, and landfills. Identification of HPAs for historic sites was dependent on the results of archival and historic research specific to the ROW and was conducted prior to fieldwork. Based on these criteria, approximately 38.1 percent of the Project ROW is classified as HPAs.

Moderate Probability Areas (MPAs) include areas that may contain archaeological remains, but site presence is considered to be less likely due to greater distances to water, strongly sloping areas, and/or eroded soils. MPAs in this region consist of upland prairies, areas further away from natural water sources, and areas close to water sources, but with slopes greater than 20 percent. While site visibility in MPAs tends to be higher than in HPAs due to decreased vegetation and shallower soils, MPAs are less likely to exhibit the geologic conditions necessary for the burial and preservation of cultural materials. Furthermore, mixing of cultural components and near-surface ground disturbances are more likely to occur and thus reduce the integrity of archaeological deposits. Based on these criteria, approximately 46.4 percent of the Project ROW is classified as MPAs.

Low Probability Areas (LPAs) are those areas in which cultural resource sites are unlikely to be present, or in which they would be greatly disturbed. For example, LPAs may include areas with steeply sloping topography, areas situated at a significant distance (i.e., greater than 500 m) to water, deflated or eroded surfaces, areas of mass wasting or sheet erosion, or areas with slopes greater than fifty percent. Archaeological sites in LPAs are unlikely to retain integrity. Based on these criteria, approximately 15.5 percent of the Project ROW is classified as LPAs.

## 4.2 Pedestrian Survey

Because the Project ROW crosses two distinct archaeological regions within different probability areas (as per the Research Design), the specific field methodologies vary. In general, a pedestrian walkover is conducted in the Project ROW, with surface examination and shovel testing in HPAs and MPAs, as dictated primarily by field conditions. LPAs were documented with a combination of pedestrian walkover and visual inspection to confirm prior disturbances.

Within the Lower Plains archaeological region, which includes Ward County, HPAs were subjected to intensive pedestrian survey. Survey transects were no more than 30 m (98 ft) apart and distances between shovel tests did not exceed 30 m (98 ft), unless field conditions (e.g., soil depth, ground surface visibility, soil disturbances, etc.) obviated the need for shovel testing. Thus, in areas warranting shovel test excavations, the overall density of shovel tests within HPAs was not less than 1 per 30 m (98 ft) of linear ROW. This strategy was necessarily adjusted in the field at the discretion of the lead field archaeologist on the basis of extant ground conditions, particularly in areas that exhibited greater than expected surface visibility, areas which had undergone significant prior disturbances, areas of exposed bedrock, and in steeply sloping areas. For example, most of the landforms that were classified as HPAs were found to be near a draw, but exhibited stable, non-aggrading surfaces, or erosional upland geomorphic surfaces, with little or no soil cover. In such instances, no shovel tests are warranted. Within the Trans-Pecos archaeological region (Reeves and Culberson Counties), HPAs were also subjected to intensive pedestrian survey, and were carefully walked and examined. Survey transects in these areas were required to be no more than 15 m (49 ft) apart, with shovel tests placed judgmentally (i.e., locations determined at the discretion of the lead archaeologist in the field), with no maximum distance between shovel tests. Thus, there is no minimum overall density of shovel tests within HPAs in this region.

Within the Lower Plains archaeological region, MPAs were walked and examined to verify surface conditions. Survey transects were no more than 30 m (98 ft) apart, with shovel tests placed judgmentally (i.e., in locations determined at the discretion of the project archaeologist in the field), with no maximum distance between shovel tests. Generally, shovel tests were avoided in areas with exposed bedrock, upland areas with excellent

ground surface visibility, and/or area with steep slopes. According to the Research Design, there is no minimum overall density of shovel tests within MPAs in this region. Within the Trans-Pecos archaeological region, the MPAs were treated the same as HPAs; they were walked over and examined. Survey transects were no more than 15 m (49 ft) apart, with shovel tests placed judgmentally, with no maximum distance between shovel tests.

Within the Lower Plains and Trans-Pecos archaeological regions, LPAs were identified prior to fieldwork based on contour maps and aerial photographs. Some HPAs and MPAs identified prior to the survey were subsequently reclassified in the field as LPAs based on observable field conditions. LPAs exhibit extensive natural ground disturbance, such as mass wasting or sheet erosion, or consist of areas that have been disturbed by modern development or areas with slopes of greater than 50 percent. Because LPAs lack the necessary geologic and pedologic preservation conditions to contain significant, intact archaeological deposits, these areas were only subjected to walkover documentation and verification, but were not subjected to further archaeological examination.

### **4.3 Shovel Testing**

Excavated shovel tests were approximately 20 cm (8 inches) in diameter and excavated in 10 cm (4-inch) levels. All shovel tests were excavated to a depth where pre-Holocene sterile substrates were encountered, if possible. In deeper soils or if the stratum was indeterminate, the shovel tests were excavated to a maximum of 80 cm (32 inches). The excavated soil from each shovel tests was sifted through ¼-inch (0.64-cm) mesh hardware cloth unless the matrix was dominated by clay. A clayey matrix was visually inspected. For each of the excavated shovel tests, the following information was recorded on shovel test forms: location, maximum depth, and the number of soil strata. All shovel tests were backfilled upon completion. All cultural materials recovered from subsurface shovel tests were collected. Collection of surface artifacts from newly recorded sites was limited to temporally diagnostic artifacts. Isolated occurrences were noted, but not recorded as sites.

### **4.4 Site Recording and Assessment**

Once a cultural resource site was located, site boundaries were delineated by the surficial extent of artifacts or surface features. In areas where buried deposits were suspected, shovel tests were dug to help define the site's boundaries and depth within the Project ROW, and to provide information on potential integrity of the cultural deposits. The location of each site was recorded on a USGS topographic map, and a sketch map was drawn showing the location of all shovel tests and other salient features at the site. A site was determined to be present when at least 5 or more artifacts, with or without tools, or 4 artifacts including at least one informal tool, or 3 artifacts with at least one formal tool were present. Historic finds, including isolated farm/ranch equipment items (e.g., oil well pump jacks or a single irrigation gate) were generally not considered sites. A temporary field designation was assigned to each site, and a TexSite form was completed and submitted to the Texas Archeological Research Laboratory (TARL) for assignment of a permanent trinomial designation. All newly discovered sites were assessed to determine if they could be eligible for listing in the NRHP, and whether they meet the criteria to merit official designation as a SAL. In general, for a site to be considered eligible for the NRHP or to merit SAL designation, it must be able to contribute important information for understanding prehistory or history, and it must retain integrity.

### **4.5 Geoarchaeological Investigations**

Although the use of backhoe trenches to investigate alluvial, colluvial, and eolian settings for potential buried archaeological sites is conducted for some linear survey projects in Texas, the Research Design recommends that no trenching be conducted in settings where transmission structures are to be constructed. Excavation of one or more backhoe trenches at a proposed structure location is considered destabilizing since undisturbed soil is necessary to support the structure foundation. To address this issue, the Research Design calls for a

geoarchaeological assessment of the potential for deeply buried cultural deposits within the Project ROW in order to determine the need for monitoring during the excavation of structure foundations. The results of this assessment are presented in Chapter 6 of the report.

#### **4.6 Curation**

No artifacts were collected during the survey. Pursuant to 13 TAC 26.17, correspondence, field records, and photographs generated during field investigations have been prepared for permanent curation at TARL, Austin, Texas.

## 5 Survey Results

### 5.1 Overview of Project Area

The pedestrian survey revealed that the Project ROW traverses a mosaic of alternating open flatland interspersed with scrubby low-lying areas and rocky ground surfaces; numerous areas are disturbed from oil and gas activities (**Figures 2-6**). Other disturbances noted in the Project ROW included erosion, deflation, cultivation and land clearing, bioturbation, and earth moving activities. Due to bedrock and gravel lag deposits that are common at the ground surface, ground surface visibility over the project area generally exceeded 75 percent, though visibility within areas adjacent to draws was somewhat reduced because of increased density of vegetation. Under such conditions, in upland areas that dominate the Project ROW, prehistoric sites tend to exhibit high surface visibility due to wind erosion and extensive bioturbation caused by ranching and rodent burrowing.

A total of 97 linear miles of Project ROW encompassing approximately 825 acres was evaluated. The pedestrian survey utilized two parallel transects spaced 10 m (33 ft) apart within the 21 m (70 ft) wide ROW corridor (**Appendix A**). Because of ground surface visibility conditions related to the dominant soil-geomorphological setting in upland areas, archaeological sites of all age components were expected to be located primarily on the ground surface, either because of erosion or because they were never buried to begin with (Hall 2006). Because of the exposed and eroded ground conditions that offered excellent visibility, with no potential for deep artifact-bearing soils, the survey was conducted primarily by pedestrian walkover and intensive ground surface inspection. Nonetheless, the pedestrian survey was supplemented by the excavation of 13 shovel tests (**Appendix B**) in order to assess soil depths in areas suspected of having deeper deposits which could contain buried archaeological materials. Overall, however, soil-geomorphic conditions typically only warranted ground surface inspection to identify sites.

All shovel test placements were selected judgmentally in locations determined at the discretion of the project archaeologist in the field in areas where intact soils might possibly be encountered, in which archaeological materials might be found. Specifically, this included two primary areas of the project. The first location, including Shovel Tests (STs) 1 through 11, was in western Ward County across the base of a large alluvial fan traversed by numerous intermittent drainages (**Appendix A-37**). Here, soils were observed to range between 20 and 100 cm thick, and are described as poorly-sorted, highly-mixed, grayish brown to red sand intermixed with 5 percent gravel clasts. The second location was to test the western floodplain of the Pecos River on the Ward County side of the river (**Appendix A-32**). Two STs (12 and 13) were excavated, which revealed 20 to 40 cm of brown and pale brown silt loam and sand over a hardpan subsoil that could not be penetrated with a shovel. All shovel tests were negative for cultural materials.

During the pedestrian survey, a total of 16 newly-recorded sites and one previously recorded site (41WR85) were identified and recorded. This includes nine prehistoric lithic scatter sites and eight newly-recorded historic sites (7 historic scatters and one windmill site). Site forms were completed for each of the 16 newly identified archaeological sites, and trinomials were obtained from TARL. In addition, 16 isolated finds (IFs) were identified. In accordance with standard practice, no site forms were prepared for IFs. Each site and IF identified within the Project ROW is described below. The discussion is organized by county, from west to east. The locations of all sites and other salient features are shown in project route maps found in **Appendix A**.





**Figure 2. Typical Oil and Gas Disturbances in Project ROW as seen in Ward County, Facing Northwest**



**Figure 3. Overview of Project ROW within Rustler Hills in Culberson County, Facing Northwest**



**Figure 4. Overview of Typical Landscape in Project ROW in Reeves County, Facing West**



**Figure 5. Overview of Typical Landscape in Project ROW in Ward County, Facing Northwest**





**Figure 6. Overview of Typical Shallow, Vegetated Draw in Culberson County, Incised into Exhumed Caliche Surface, Facing East**

## 5.2 Culberson County Cultural Resources (n=3)

A total of three previously unrecorded archaeological sites were identified and recorded within the Culberson County portion of the Project ROW, including one historic scatter and two prehistoric lithic scatters.

### 41CU833

Site 41CU833 is a historic scatter that was recorded by URS in 2016 during the survey for the current transmission line project (**Appendix A-3**). The site was identified near the western end of Rustler Hills, approximately 1.5 miles west of Rustler Springs Road on a flat upland plain. The site is situated at approximately 3,580 ft amsl. Soils at the site are mapped as Hollebeke-Pokorny complex, 1 to 8 percent slopes, and vegetation at the time of the survey consisted of mesquite scrub and sparse grasses, with approximately 50 percent ground surface visibility. Disturbances observed during the survey include soil erosion and ranch-related disturbances such as trampling from cattle grazing.

The site was identified when a diffuse surface scatter of historic materials were observed over a 33-x-21-m area within the Project ROW (**Figure 7**). The site is oriented northwest to southeast within the Project ROW, and is bisected by the proposed centerline (**Figure 8**). The observed historic materials within the Project ROW were randomly distributed and include numerous glass and miscellaneous metal fragments (**Table 4; Figures 9-11**). Based on the age ranges of site artifacts, the site likely represents a late nineteenth to early twentieth century historic trash scatter.

Site 41CU833 is located near the southeast corner of the west ½ of an 80-acre parcel located on the south half of Section 10, Block 114 of the Public School Lands in Culberson County, Texas. The original section contained 640 acres that was divided into three land grants, including the 80-acre parcel on which site 41CU833 is located.



**Figure 7. 41CU833 Site Overview, Facing West**

Sensitive Site Location Information  
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**Figure 8. 41CU833 Site Map**

**Table 4. Historic Artifacts Identified at 41CU833**

<b>Artifacts</b>	<b>Quantity</b>	<b>Dates</b>	<b>Reference</b>
<u>Glass</u>			
Clear	25	1875-present	Intermountain Antiquities Computer System [IMACS] (1992)
Brown/Amber	5	1860-present	IMACS (1992)
Green/Olive	15	1860-present	IMACS (1992)
Amethyst/solarized	50	1820-1930	Society for Historical Archaeology [SHA] (2015)
Aqua	15	1800-1930	SHA (2015)
<b>Sub-total</b>	<b>110</b>		
<u>Metal</u>			
Cast-iron stove fragment	2		
Horse bridle	1		
16-gage shell casing	10		
.45 caliber shell casing	1		
Hole-in-top can	25	1850-1920	Memcott (2015)
<b>Sub-total</b>	<b>39</b>		
<b>Total</b>	<b>149</b>		





**Figure 9. Cast Iron Stove Damper from 41CU833**



**Figure 10. Solder Dot Can Lid from 41CU833**





**Figure 11. Amethyst Jar Base from 41CU833**

In 1916, the State of Texas granted the patent for the 80-acre parcel to F. M. Dancy, a third party of Mrs. A. J. Cooksey, who sold the property to Mrs. Pearl M. Rarey in 1940 (Culberson County Clerk [CCC] 1916:DB 1:34; CCC 1940:DB 45:133). Between 1940 and 1972, the property was transferred to J. T. Crim, who in 1972 transferred  $\frac{1}{4}$  interest in the property to Jerry Covington and his wife, Doris Eloise Covington (CCC 1972:DB 29:197). In 1978, J. T. Crim granted additional  $\frac{1}{4}$  interests in the property, which was a part of what became known as the Double C Ranch, to his children, John T. Crim Jr. and William Robert Crim (CCC 1978:DB 109:263). Currently the Double C Ranch is listed as the owner of the property.

No cultural features or standing structures were identified at site 41CU833. Given the eroded and disturbed ground surface, and the lack of testable soils, the site boundaries were established on the basis of surficial extent of artifacts within the Project ROW; no shovel tests were excavated due to soil conditions. Examination of aerial photographs does not indicate the presence of any type of nearby residential or ranch related structures. However, numerous two-track ranch roads are present in the vicinity, and well pad activities are on-going approximately 150 m to the east of the site. Thus, it is likely that the historic materials at 41CU833 are associated with late nineteenth or early twentieth century ranching, and possibly modern day oil and gas activities. Field observations indicate that additional site artifacts extend north of the Project ROW.

Historic debris scatters are a common occurrence throughout rural areas of Texas. Given the disturbed setting of these artifacts, which range in age from the late nineteenth to early twentieth century, this site would not likely contribute new or important data that would aid in understanding the history of the area. These artifacts are not likely associated with events that have made a significant contribution to the broad patterns of our history; or are associated with the lives of significant persons in our past; or 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 significant and distinguishable entity whose components may lack individual distinction; or have yielded or may be likely to yield, information important in history. Additionally, the site does not have the potential to contribute to a better understanding of the history of Texas by the addition of new and important information; the site does not display any archaeological deposits that are preserved and intact,

thereby supporting the research potential or preservation interests of the site; the site does not offer the opportunity to test theories and methods of preservation, thereby contributing to new scientific knowledge; and there is not a high likelihood that vandalism and relic collecting has occurred or could occur, and official landmark designation is not needed to insure maximum legal protection, or alternatively further investigations are not needed to mitigate the effects of vandalism and relic collecting when the site cannot be protected.

Because the site extends outside of the Project ROW and has not been recorded and evaluated in its entirety, the overall NRHP and SAL eligibility of the site is recommended as **Undetermined**. However, based on current field investigations, it is recommended that the portion of site 41CU833 within the proposed ROW does not meet NRHP or SAL eligibility criteria. Therefore, no further archaeological work is recommended for the portion of the site within the Project ROW.

#### 41CU834

Site 41CU834 is a prehistoric lithic scatter of unknown age that was recorded by URS in 2016 during the survey for the current transmission line project (**Appendix A-1**). The site was identified on a broad flat upland hilltop, near the western extent of Rustler Hills, approximately 350 m east of the Oncor Permian Basin Switching Station. The site is situated approximately 190 m east of the edge of an unnamed draw, at 3,690 ft amsl. Soils at the site are mapped as Elcor gypsiferous loam, 1 to 8 percent slopes, and vegetation at the time of the survey consisted of mesquite scrub and sparse grasses, with approximately 90 percent ground surface visibility. Extant disturbances observed during the survey include soil erosion and ranch-related disturbances such as trampling from cattle grazing. Exposures of gypsum are prevalent across the site and surrounding areas.

Intensive ground surface inspection was carried out at this site during the current investigations. Given the observable eroded and disturbed ground surface, and the lack of testable soils, the site boundaries were established on the basis of surficial extent of artifacts within the Project ROW; due to soil conditions, no shovel tests were excavated. The site area exhibited excellent (90 percent) surface visibility, and was found to lack the necessary depositional context to contain buried archaeological deposits (**Figure 12**). The survey revealed a surface scatter of prehistoric lithic material over a 53-x-21-m area within the Project ROW. The site is oriented northwest to southeast within the Project ROW, and the site is bisected by the project centerline (**Figure 13**). The observed artifacts within the Project ROW include one small chert biface fragment (**Figure 14**) and 11 flakes, including 8 tertiary, two secondary, and one primary flake. The majority of the flakes were manufactured from high quality chert and chalcedony. The scatter of artifacts appeared to be randomly distributed within the Project ROW, and field observations indicate that additional site materials may be present to the south of the Project ROW boundary. No temporally diagnostic artifacts or features were observed.

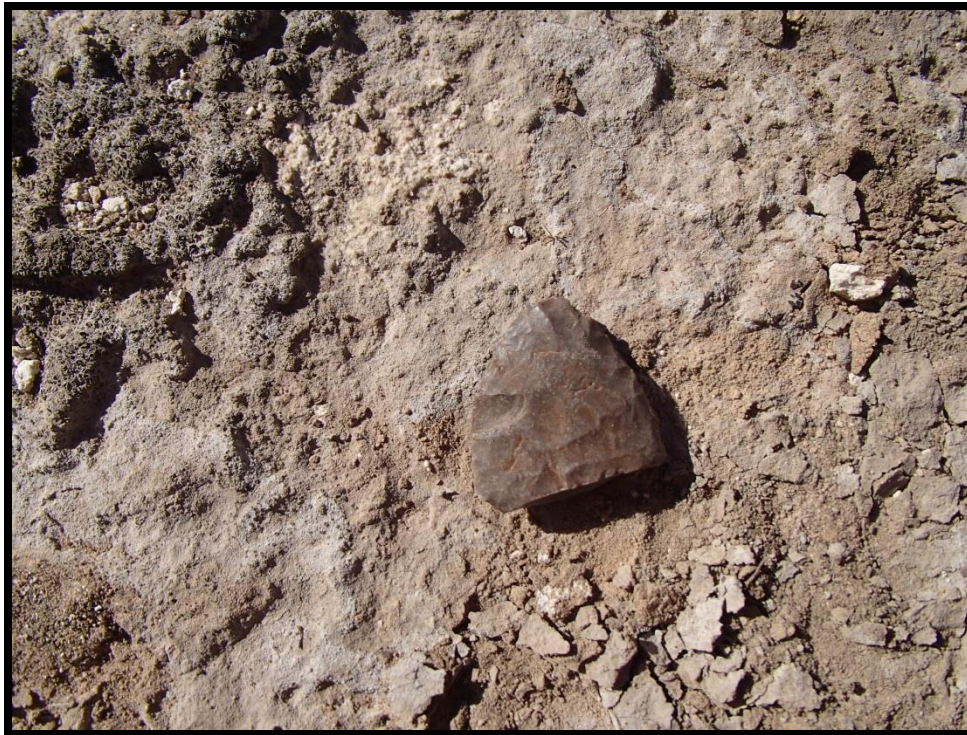


Figure 12. Overview of 41CU834, Facing North

Sensitive Site Location Information  
Map Removed

**Figure 13. 41CU834 Site Map**





**Figure 14. Biface from Site 41CU834**

Prehistoric lithic scatters are a common occurrence throughout Texas. The evaluation of site 41CU834 did not produce any temporally diagnostic artifacts or testable soils with the potential to contain intact buried cultural materials. Due to the low density of artifacts in an upland geomorphic setting, site 41CU834 would not likely contribute new or important data that would aid in the understanding of the prehistory of the area. The site is not associated with events that have made a significant contribution to the broad patterns of prehistory; or are associated with the lives of significant persons in our past; or 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 have yielded or may be likely to yield, information important in prehistory. Additionally, the site does not have the potential to contribute to a better understanding of the prehistory of Texas by the addition of new and important information; the site does not display any archaeological deposits that are preserved and intact thereby supporting the research potential or preservation interests of the site; the site does not possess unique or rare attributes concerning Texas prehistory; the study of the site does not offer the opportunity to test theories and methods of preservation, thereby contributing to new scientific knowledge; and there is not a high likelihood that vandalism and relic collecting has occurred or could occur, and official landmark designation is not needed to insure maximum legal protection, or alternatively further investigations are not needed to mitigate the effects of vandalism and relic collecting when the site cannot be protected.

Because the site extends south of the Project ROW and has not been recorded and evaluated in its entirety, the overall NRHP and SAL eligibility of the site is recommended as **Undetermined**. However, based on current field investigations, it is recommended that the portion of site 41CU834 within the Project ROW does not meet NRHP or SAL eligibility criteria. Therefore, no further archaeological work is recommended for the portion of the site within the Project ROW.

## 41CU835

Site 41CU835 is a prehistoric lithic scatter of unknown age that was recorded by URS in 2016 during the survey for the current transmission line project (**Appendix A-1**). The site was identified on a broad flat upland plain, near the western extent of Rustler Hills, approximately 2 km southeast of the Oncor Permian Basin Switching Station. The site is situated approximately 580 m south of an unnamed draw, at 3,690 ft amsl. Soils at the site are mapped as Elcor gypsiferous loam, 1 to 8 percent slopes, and vegetation at the time of the survey consisted of mesquite scrub and sparse grasses, with approximately 80 percent ground surface visibility. Extant disturbances observed during the survey include ongoing soil erosion and ranch-related disturbances such as trampling from cattle grazing. Exposures of gypsum are prevalent across the site and surrounding areas.

Intensive ground surface inspection was carried out at this site during the current investigations. Given the observable eroded and disturbed ground surface, and the lack of testable soils, the site boundaries were established on the basis of surficial extent of artifacts within the Project ROW; due to soil conditions, no shovel tests were excavated. The site area exhibited excellent (80 percent) surface visibility, and was found to lack the necessary depositional context to contain buried archaeological deposits (**Figure 15**). The survey revealed a surface scatter of lithic material over a 47-x-21-m area within the Project ROW. The site is oriented northwest to southeast within the Project ROW, and the site is bisected by the project centerline (**Figure 16**). The observed artifacts within the Project ROW include one side-scraper (**Figure 17**) and three primary chert flakes. The scraper is manufactured from quartzite and measures 65-x-32-x-15 mm. The scatter of artifacts appeared to be randomly distributed within the Project ROW. No temporally diagnostic artifacts or features were observed. During the site inspection, a small cavity in the surrounding rock and soil was observed at the southeastern edge of the site, on the southern edge of the Project ROW (**Figure 18**). The opening of this cavity measures between 40 and 60 cm in diameter. Due to safety concerns about the surrounding ground stability, the subterranean extent of this feature could not be firmly established, though it appeared to extend just a few feet below the surface. No indications were observed in the immediate vicinity of the opening, or within the observable portion below ground, that would indicate the cavity is part of a cultural feature (i.e., prehistoric interment). While such a possibility cannot be definitively ruled out based on available information, the entrance nonetheless appears to be too narrow to have served as an effective place of interment. Other possibilities are that this cavity is an animal den, or that it is simply a shallow erosional feature in the soil and bedrock.



**Figure 15. Overview of 41CU835, Facing West**

Sensitive Site Location Information  
Map Removed

**Figure 16. 41CU835 Site Map**





**Figure 17. Side-scraper at 41CU835**



**Figure 18. Cavity at 41CU835**

Prehistoric lithic scatters are a common occurrence throughout Texas. The evaluation of site 41CU835 did not produce any temporally diagnostic artifacts or testable soils with the potential to contain intact buried cultural materials. Due to the low density of artifacts in an upland geomorphic setting, site 41CU835 would not contribute new or important data that would aid in the understanding of the archaeological history of the area. The site is not associated with events that have made a significant contribution to the broad patterns of prehistory; or are associated with the lives of significant persons in our past; or 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 have yielded or may be likely to yield, information important in prehistory. Additionally, the site does not have the potential to contribute to a better understanding of the prehistory of Texas by the addition of new and important information; the site does not display any archaeological deposits that are preserved and intact thereby supporting the research potential or preservation interests of the site; the site does not possess unique or rare attributes concerning Texas prehistory; the study of the site does not offer the opportunity to test theories and methods of preservation, thereby contributing to new scientific knowledge; and there is not a high likelihood that vandalism and relic collecting has occurred or could occur, and official landmark designation is not needed to insure maximum legal protection, or alternatively further investigations are not needed to mitigate the effects of vandalism and relic collecting when the site cannot be protected.

Because the site appears to extend beyond the Project ROW and has not been recorded and evaluated in its entirety, the overall NRHP and SAL eligibility of the site is recommended as **Undetermined**. Based on the survey investigations, a cultural association with the cavity at the east end of the site could not be confirmed. Therefore, it was recommended that construction activities avoid this cavity and that site monitoring during construction be conducted. Subsequent field investigations, findings, and recommendations were carried out at this site, which are discussed in Chapter 6.



### 5.3 Reeves County Cultural Resources (n=6)

A total of six previously unrecorded archaeological sites were identified within the Reeves County portion of the Project ROW. Each of these six sites consists of a prehistoric lithic scatter.

#### 41RV98

Site 41RV98 is a prehistoric lithic scatter of unknown age that was recorded by URS in 2016 during the survey for the current transmission line project (**Appendix A-13**). The site was identified on an eroded hilltop immediately north of Farm-to-Market (FM) 2119. The hill is bisected by the road. The site, which is at 3,240 ft amsl, overlooks Coalson Draw, which lies approximately 25 m to the west. Soils at the site are mapped as Holloman-Reeves association, gently undulating, and vegetation at the time of the survey consisted of mesquite scrub and sparse grasses, with approximately 95 percent ground surface visibility (**Figure 19**). Extant disturbances observed during the survey include ongoing soil erosion and ranch-related disturbances such as trampling from cattle grazing.

Intensive ground surface inspection was carried out at this site during the current investigations. Given the observable eroded and disturbed ground surface, and the lack of testable soils, the site boundaries were established on the basis of surficial extent of artifacts within the Project ROW; due to soil conditions, no shovel tests were excavated. The site area exhibited excellent (95 percent) surface visibility, and was found to lack the necessary depositional context to contain buried archaeological deposits. The survey revealed a surface scatter of lithic material over a 38-x-15-m area within the Project ROW and is bisected by the project centerline (**Figure 20**). The observed artifacts within the Project ROW include one chert tertiary flake, a tested cobble made of quartzite (**Figure 21**), and one biface fragment made of brown chert, which may be a possible basal fragment of a projectile point (**Figure 22**) measuring 35 mm in length, 30 mm in width, and 4 mm in thickness. The scatter of artifacts appeared to be randomly distributed within the Project ROW. No temporally diagnostic artifacts or features were observed.



Figure 19. Overview of 41RV98, Facing East

Sensitive Site Location Information  
Map Removed

**Figure 20. 41RV98 Site Map**





**Figure 21. Tested Cobble from 41RV98**



**Figure 22. Biface from 41RV98**

Prehistoric lithic scatters are a common occurrence throughout Texas. The evaluation of site 41RV98 did not produce any temporally diagnostic artifacts or testable soils with the potential to contain intact buried cultural materials. Due to the low density of artifacts in an upland geomorphic setting, site 41RV98 would not contribute new or important data that would aid in the understanding of the prehistory of the area. The site is not associated with events that have made a significant contribution to the broad patterns of prehistory; or are associated with the lives of significant persons in our past; or 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 have yielded or may be likely to yield, information important in prehistory. Additionally, the site does not have the potential to contribute to a better understanding of the prehistory of Texas by the addition of new and important information; the site does not display any archaeological deposits that are preserved and intact thereby supporting the research potential or preservation interests of the site; the site does not possess unique or rare attributes concerning Texas prehistory; the study of the site does not offer the opportunity to test theories and methods of preservation, thereby contributing to new scientific knowledge; and there is not a high likelihood that vandalism and relic collecting has occurred or could occur, and official landmark designation is not needed to insure maximum legal protection, or alternatively further investigations are not needed to mitigate the effects of vandalism and relic collecting when the site cannot be protected.

The site is on a small rise within the Project ROW. However, because the site likely extends beyond the Project ROW and has not been recorded and evaluated in its entirety, the overall NRHP and SAL eligibility of the site is recommended as **Undetermined**. However, based on current field investigations, it is recommended that the portion of site 41RV98 within the Project ROW does not meet NRHP or SAL eligibility criteria. Therefore, no further archaeological work is recommended for the portion of the site within the Project ROW.



#### 41RV99

Site 41RV99 is a prehistoric lithic scatter of unknown age that was recorded by URS in 2016 during the survey for the current transmission line project (**Appendix A-27**). The site was identified on a broad flat upland plain. The site, which is at 2,660 ft amsl, is situated along the edge of a small unnamed draw leading to Sand Lake, which is located 2.16 km to the east. Soils at the site are mapped as the Reakor association, nearly level, and vegetation at the time of the survey consisted of mesquite scrub and sparse grasses, with approximately 60 percent ground surface visibility. Extant disturbances observed during the survey include ongoing heavy soil erosion and ranch-related disturbances such as trampling from cattle grazing. The site is bisected by the project centerline.

Intensive ground surface inspection was carried out at this site during the current investigations. Given the observable eroded and disturbed ground surface, and the lack of testable soils, the site boundaries were established on the basis of surficial extent of artifacts within the Project ROW; due to soil conditions, no shovel tests were excavated. The site area exhibited good (60 percent) ground surface visibility, and was found to lack the necessary depositional context to contain buried archaeological deposits (**Figure 23**). The survey revealed a surface scatter of lithic material over a 23-x-21-m area within the Project ROW (**Figure 24**). The observed artifacts within the Project ROW include four primary flakes, one secondary flake, two tertiary flakes, one core, and one early stage biface. All of the specimens are manufactured from chert. The biface measures 45-x-36-x-19 mm (**Figure 25**). The scatter of artifacts appeared to be randomly distributed within the Project ROW. No temporally diagnostic artifacts or features were observed.



**Figure 23. Overview of 41RV99, Facing North**

Sensitive Site Location Information  
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**Figure 24. 41RV99 Site Map**





**Figure 25. Biface Identified at 41RV99**

Prehistoric lithic scatters are a common occurrence throughout Texas. The evaluation of site 41RV99 did not produce any temporally diagnostic artifacts or testable soils with the potential to contain intact buried cultural materials. Due to the low density of artifacts in an upland geomorphic setting, site 41RV99 would not contribute new or important data that would aid in the understanding of the prehistory of the area. The site is not associated with events that have made a significant contribution to the broad patterns of prehistory; or are associated with the lives of significant persons in our past; or 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 have yielded or may be likely to yield, information important in prehistory. Additionally, the site does not have the potential to contribute to a better understanding of the prehistory of Texas by the addition of new and important information; the site does not display any archaeological deposits that are preserved and intact thereby supporting the research potential or preservation interests of the site; the site does not possess unique or rare attributes concerning Texas prehistory; the study of the site does not offer the opportunity to test theories and methods of preservation, thereby contributing to new scientific knowledge; and there is not a high likelihood that vandalism and relic collecting has occurred or could occur, and official landmark designation is not needed to insure maximum legal protection, or alternatively further investigations are not needed to mitigate the effects of vandalism and relic collecting when the site cannot be protected.

Because the site extends south of the Project ROW and has not been recorded and evaluated in its entirety, the overall NRHP and SAL eligibility of the site is recommended as **Undetermined**. However, based on current field investigations, it is recommended that the portion of site 41RV99 within the Project ROW does not meet NRHP or SAL eligibility criteria. Therefore, no further archaeological work is recommended for the portion of the site within the Project ROW.

#### 41RV100

Site 41RV100 is a prehistoric lithic scatter of unknown age that was recorded by URS in 2016 during the survey for the current transmission line project (**Appendix A-27**). The site was identified on a broad flat upland plain. The site, which is at 2,660 ft amsl, is situated along the edge of a small unnamed draw leading to Sand Lake, which is located 2.07 km to the east. Soils at the site are mapped as the Reakor association, nearly level, and vegetation at the time of the survey consisted of mesquite scrub and sparse grasses, with approximately 60 percent ground surface visibility. Extant disturbances observed during the survey include ongoing heavy soil erosion and ranch-related disturbances such as trampling from cattle grazing. The site is bisected by the project centerline.

Intensive ground surface inspection was carried out at this site during the current investigations. Given the observable eroded and disturbed ground surface, and the lack of testable soils, the site boundaries were established on the basis of surficial extent of artifacts within the proposed ROW; due to soil conditions, no shovel tests were excavated. The site area exhibited good (60 percent) ground surface visibility, and was found to lack the necessary depositional context to contain buried archaeological deposits (**Figure 26**). The survey revealed a surface scatter of lithic material over a 26-x-21-m area within the Project ROW (**Figure 27**). The observed artifacts within the Project ROW include 27 flakes and three stone tools. Of the lithic flakes, six are primary flakes, nine are secondary flakes, and 12 are tertiary flakes. Tools in the assemblage include one modified flake/spokeshave (48-x-40-x-10 mm), one scraper (28-x-28-x-6 mm), and one core chopper (52-x-47-x-20 mm) (**Figure 28**). All of the artifacts are manufactured from chert. The scatter of artifacts appeared to be randomly distributed within the Project ROW. No temporally diagnostic artifacts or features were observed.



**Figure 26. Overview of 41RV100, Facing South**

Sensitive Site Location Information  
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**Figure 27. 41RV100 Site Map**





**Figure 28. Selected Lithic Artifacts from 41RV100**

Prehistoric lithic scatters are a common occurrence throughout Texas. The evaluation of site 41RV100 did not produce any temporally diagnostic artifacts or testable soils with the potential to contain intact buried cultural materials. Due to the low density of artifacts in an upland geomorphic setting, site 41RV100 would not contribute new or important data that would aid in the understanding of the prehistory of the area. The site is not associated with events that have made a significant contribution to the broad patterns of prehistory; or are associated with the lives of significant persons in our past; or 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 have yielded or may be likely to yield, information important in prehistory. Additionally, the site does not have the potential to contribute to a better understanding of the prehistory of Texas by the addition of new and important information; the site does not display any archaeological deposits that are preserved and intact thereby supporting the research potential or preservation interests of the site; the site does not possess unique or rare attributes concerning Texas prehistory; the study of the site does not offer the opportunity to test theories and methods of preservation, thereby contributing to new scientific knowledge; and there is not a high likelihood that vandalism and relic collecting has occurred or could occur, and official landmark designation is not needed to insure maximum legal protection, or alternatively further investigations are not needed to mitigate the effects of vandalism and relic collecting when the site cannot be protected.

Because the site extends south of the Project ROW and has not been recorded and evaluated in its entirety, the overall NRHP and SAL eligibility of the site is recommended as **Undetermined**. However, based on current field investigations, it is recommended that the portion of site 41RV100 within the Project ROW does not meet NRHP or SAL eligibility criteria. Therefore, no further archaeological work is recommended for the portion of the site within the Project ROW.

#### 41RV101

Site 41RV101 is a prehistoric lithic scatter of unknown age that was recorded by URS in 2016 during the survey for the current transmission line project (**Appendix A-28**). The site was identified on the edge of a broad, flat upland hill, at 2,620 ft amsl, and approximately 450 m west of Sand Lake. Soils at the site are mapped as the Orla association, nearly level, and vegetation at the time of the survey consisted of mesquite scrub and sparse grasses and forbs, with approximately 90 percent ground surface visibility. Extant disturbances observed during the survey include ongoing heavy soil erosion and ranch-related disturbances such as trampling from cattle grazing. The site is bisected by the project centerline.

Intensive ground surface inspection was carried out at this site during the current investigations. Given the observable eroded and disturbed ground surface, and the lack of testable soils, the site boundaries were established on the basis of surficial extent of artifacts within the Project ROW; due to soil conditions, no shovel tests were excavated. The site area exhibited excellent (90 percent) ground surface visibility, and was found to lack the necessary depositional context to contain buried archaeological deposits (**Figure 29**). The survey revealed a surface scatter of lithic material over a 56-x-21-m area within the Project ROW (**Figure 30**). The observed artifacts within the Project ROW include approximately 10 primary flakes, 15 secondary flakes, 15 tertiary flakes, and two cores (**Figure 31**). All of the artifacts are manufactured from local chert. The scatter of artifacts appeared to be randomly distributed within the Project ROW. No temporally diagnostic artifacts or features were observed.



Figure 29. Overview of 41RV101, Facing North

Sensitive Site Location Information  
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**Figure 30. 41RV101 Site Map**





**Figure 31. Selected Artifacts from 41RV101**

Prehistoric lithic scatters are a common occurrence throughout Texas. The evaluation of site 41RV101 did not produce any temporally diagnostic artifacts or testable soils with the potential to contain intact buried cultural materials. Due to the low density of artifacts in an upland geomorphic setting, site 41RV101 would not contribute new or important data that would aid in the understanding of the prehistory of the area. The site is not associated with events that have made a significant contribution to the broad patterns of prehistory; or are associated with the lives of significant persons in our past; or 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 have yielded or may be likely to yield, information important in prehistory. Additionally, the site does not have the potential to contribute to a better understanding of the prehistory of Texas by the addition of new and important information; the site does not display any archaeological deposits that are preserved and intact thereby supporting the research potential or preservation interests of the site; the site does not possess unique or rare attributes concerning Texas prehistory; the study of the site does not offer the opportunity to test theories and methods of preservation, thereby contributing to new scientific knowledge; and there is not a high likelihood that vandalism and relic collecting has occurred or could occur, and official landmark designation is not needed to insure maximum legal protection, or alternatively further investigations are not needed to mitigate the effects of vandalism and relic collecting when the site cannot be protected.

Because the site extends north and south of the Project ROW and has not been recorded and evaluated in its entirety, the overall NRHP and SAL eligibility of the site is recommended as **Undetermined**. However, based on current field investigations, it is recommended that the portion of site 41RV101 within the Project ROW does not meet NRHP or SAL eligibility criteria. Therefore, no further archaeological work is recommended for the portion of the site within the Project ROW.

## 41RV102

Site 41RV102 is a large and diffuse prehistoric lithic scatter of unknown age that was recorded by URS in 2016 during the survey for the current transmission line project (**Appendix A-28**). The site was identified in the center of a large, lobate-shaped ancient alluvial fan on the western edge of Sand Lake, at an elevation of 2,620 ft amsl. The surrounding landscape is comprised of heavily eroded rolling hills, hill slopes, and flat plains. Lower elevation portions of the site are crossed by a series of ephemeral distributaries drainages that create an undulating, somewhat dendritic topographic patterning. Soils at the site are mapped as the Orla association, nearly level, and vegetation at the time of the survey consisted of mesquite scrub and sparse grasses and forbs, with approximately 75 percent ground surface visibility. Extant disturbances observed during the survey include ongoing heavy soil erosion and ranch-related disturbances such as trampling from cattle grazing. Evidence of feral hog wallowing was also observed. The site is bisected by the project centerline.

Intensive ground surface inspection was carried out at this site during the current investigations. Given the observable eroded and disturbed ground surface, and the lack of testable soils, the site boundaries were established on the basis of surficial extent of artifacts within the Project ROW; due to soil conditions, no shovel tests were excavated. The site area exhibited excellent (75 percent) ground surface visibility, and was found to lack the necessary depositional context to contain buried archaeological deposits (**Figure 32**). The survey revealed a surface scatter of lithic material over a 183-x-21-m area within the Project ROW (**Figure 33**). The observed artifacts within the Project ROW include approximately 50 primary flakes, 100 secondary flakes, 75 tertiary flakes, 10 cores, 15 pieces of shatter, a broken biface, and 10 edge-modified flakes (**Figures 34-35**). No formal tools or diagnostics were noted at the site. Artifacts at the site are manufactured from a variety of cherts with quartzite and chalcedony also noted. The survey was limited to the Project ROW corridor. However, based on the numbers of artifacts observed and the areal extent of the landform to the north and south of the Project ROW, the site likely continues for a significant distance to the north and south of the Project ROW along the western rim of Sand Lake. The scatter of artifacts appeared to be randomly distributed within the Project ROW. No temporally diagnostic artifacts or features were observed.



**Figure 32. Overview of 41RV102, Facing East**



Sensitive Site Location Information  
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**Figure 33. 41RV102 Site Map**



**Figure 34. Edge-modified Flakes from 41RV102**



**Figure 35. Selected Lithic Flakes from 41RV102**

Prehistoric lithic scatters are a common occurrence throughout Texas. The evaluation of site 41RV102 did not produce any temporally diagnostic artifacts or testable soils with the potential to contain intact buried cultural materials. Due to the eroded site setting and lack of diagnostic artifacts and features, site 41RV102 would not contribute new or important data that would aid in the understanding of the prehistory of the area. The site is not associated with events that have made a significant contribution to the broad patterns of prehistory; or are associated with the lives of significant persons in our past; or 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 have yielded or may be likely to yield, information important in prehistory. Additionally, the site does not have the potential to contribute to a better understanding of the prehistory of Texas by the addition of new and important information; the site does not display any archaeological deposits that are preserved and intact thereby supporting the research potential or preservation interests of the site; the site does not possess unique or rare attributes concerning Texas prehistory; the study of the site does not offer the opportunity to test theories and methods of preservation, thereby contributing to new scientific knowledge; and there is not a high likelihood that vandalism and relic collecting has occurred or could occur, and official landmark designation is not needed to insure maximum legal protection, or alternatively further investigations are not needed to mitigate the effects of vandalism and relic collecting when the site cannot be protected.

Because the site extends north and south of the Project ROW and has not been recorded and evaluated in its entirety, the overall NRHP and SAL eligibility of the site is recommended as **Undetermined**. However, based on current field investigations, it is recommended that the portion of site 41RV102 within the Project ROW does not meet NRHP or SAL eligibility criteria. Therefore, no further archaeological work is recommended for the portion of the site within the Project ROW.

### 41RV103

Site 41RV103 is a prehistoric lithic scatter of unknown age that was recorded by URS in 2016 during the survey for the current transmission line project (**Appendix A-25**). The site was identified on a heavily eroded surface on an upland area that is a combination of flat plains and subtle slopes. The site is located approximately 2.1 km north of FM 2119, at an elevation of 2,850 ft amsl. The surrounding landscape is comprised of heavily eroded rolling hills, hill slopes, and flat plains. Portions of the site are crossed by several ephemeral distributaries drainages that have transported a large number of small, high quality lithic cobbles in the area. Soils at the site are mapped as the Delnorte-Chilicotal association, rolling, and vegetation at the time of the survey consisted of mesquite scrub and sparse grasses and forbs, with approximately 90 percent ground surface visibility. Extant disturbances observed during the survey include ongoing heavy soil erosion and ranch-related disturbances such as trampling from cattle grazing. The site is bisected by the project centerline, as well as a gravel access road and barbed wire fence, both of which are oriented north to south.

Intensive ground surface inspection was carried out at this site during the current investigations. Given the observable eroded and disturbed ground surface, and the lack of testable soils, the site boundaries were established on the basis of surficial extent of artifacts within the Project ROW; due to soil conditions, no shovel tests were excavated. The site area exhibited excellent (90 percent) ground surface visibility, and was found to lack the necessary depositional context to contain buried archaeological deposits (**Figure 36**). The survey revealed a surface scatter of lithic material over a 376-x-21-m area within the Project ROW (**Figure 37**). The observed artifacts within the Project ROW include 15 primary flakes, 30 secondary flakes, 5 tertiary flakes, 60 tested cobbles, and 15 edge modified flakes (**Figures 38-39**). No formal tools were noted at the site. Artifacts were primarily manufactured from chert although quartzite, chalcedony, and a single specimen of jasper were also observed. Based on the numbers of artifacts observed and the areal extent of the landform to the north and south of the Project ROW, the site likely continues for a significant distance to the north and south of the Project ROW. The scatter of artifacts appeared to be randomly distributed within the Project ROW. No temporally diagnostic artifacts or features were observed.



**Figure 36. Overview of 41RV103, Facing East**

Sensitive Site Location Information  
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**Figure 37. 41RV103 Site Map**





**Figure 38. Selected Artifacts from 41RV103**



**Figure 39. Edge-modified Flake from 41RV103**

Prehistoric lithic scatters are a common occurrence throughout Texas. The evaluation of site 41RV103 did not produce any temporally diagnostic artifacts or testable soils with the potential to contain intact buried cultural materials. Due to the eroded site setting and lack of diagnostic artifacts and features, site 41RV103 would not contribute new or important data that would aid in the understanding of the prehistory of the area. The site is not associated with events that have made a significant contribution to the broad patterns of prehistory; or are associated with the lives of significant persons in our past; or 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 have yielded or may be likely to yield, information important in prehistory. Additionally, the site does not have the potential to contribute to a better understanding of the prehistory of Texas by the addition of new and important information; the site does not display any archaeological deposits that are preserved and intact thereby supporting the research potential or preservation interests of the site; the site does not possess unique or rare attributes concerning Texas prehistory; the study of the site does not offer the opportunity to test theories and methods of preservation, thereby contributing to new scientific knowledge; and there is not a high likelihood that vandalism and relic collecting has occurred or could occur, and official landmark designation is not needed to insure maximum legal protection, or alternatively further investigations are not needed to mitigate the effects of vandalism and relic collecting when the site cannot be protected.

Because the site extends north and south of the Project ROW and has not been recorded and evaluated in its entirety, the overall NRHP and SAL eligibility of the site is recommended as **Undetermined**. However, based on current field investigations, it is recommended that the portion of site 41RV103 within the Project ROW does not meet NRHP or SAL eligibility criteria. Therefore, no further archaeological work is recommended for the portion of the site within the Project ROW.

#### 5.4 Ward County Cultural Resources (n=8)

A total of seven previously unrecorded archaeological sites were identified within the Ward County portion of the Project ROW, including six historic scatter sites and one historic ranch/farmstead related site. In addition, a disturbed portion of previously recorded prehistoric site 41WR85 was observed during the survey.

##### 41WR85

Site 41WR85 is a previously recorded low-density prehistoric lithic scatter of unknown age that was recorded by URS in 2014 during a survey for the Pecos NGL Pipeline, under Texas Antiquities Permit No. 6782 (von Wedell et al. 2014). The site was identified on a small rise/sand dune, at an elevation of 2,760 ft amsl, and surrounded by flat desert prairie covered in mesquite scrub, yucca, and grasses. Observed artifacts include eleven tertiary flakes and one possible hammerstone. Extant site disturbances included erosion from an existing pipeline that bisects the site. One shovel test was placed at the center of the site with four additional shovel tests excavated in cardinal directions, away from the central shovel test. A typical shovel test consisted of very pale brown (10YR 7/3) sand at 0 to 40 cm before reaching a caliche-rich 10YR 7/3 sandy clay subsoil horizon. All of the shovel tests were negative for cultural material. The site boundary was determined to be 84-x-60-m, based on the surface distribution of artifacts. Due to the high level of prior disturbances and the lack of diagnostic artifacts, no further work was recommended. The site was determined to be ineligible by the SHPO on April 4, 2014.

The Project ROW for the current project crosses the NGL ROW, and is situated approximately 37 m south of the originally recorded site boundary for 41WR85 (**Appendix A-38**). During the current survey, two lithic flakes (one primary and one secondary flake) were identified within the Oncor Project ROW, just a few meters east of the NGL pipeline ROW. Given the proximity of these materials to 41WR85, the flakes are likely part of the previously recorded site. Current inspection of the expanded site area revealed significant levels of disturbances from pipeline ROW clearing (**Figures 40-41**).

Given the observable eroded and disturbed ground surface, the lack of testable soils, and the absence of any diagnostic artifacts, the portion of site 41WR85 within the Project ROW would not contribute new or important data that would aid in the understanding of the prehistory of the area. The site is not associated with events that have made a significant contribution to the broad patterns of prehistory; or are associated with the lives of significant persons in our past; or 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 have yielded or may be likely to yield, information important in prehistory. Additionally, the site does not have the potential to contribute to a better understanding of the prehistory of Texas by the addition of new and important information; the site does not display any archaeological deposits that are preserved and intact thereby supporting the research potential or preservation interests of the site; the site does not possess unique or rare attributes concerning Texas prehistory; the study of the site does not offer the opportunity to test theories and methods of preservation, thereby contributing to new scientific knowledge; and there is not a high likelihood that vandalism and relic collecting has occurred or could occur, and official landmark designation is not needed to insure maximum legal protection, or alternatively further investigations are not needed to mitigate the effects of vandalism and relic collecting when the site cannot be protected.

Based on current field investigations, it is recommended that the portion of site 41WR85 within the Project ROW corridor does not meet NRHP or SAL eligibility criteria. Therefore, no further archaeological work is recommended for the portion of the site within the Project ROW.





**Figure 40. 41WR85 Site Disturbances, Facing Southeast**



**Figure 41. 41WR85 Site Overview, Facing Northwest**

### 41WR97

Site 41WR97 is a historic scatter that was recorded by URS in 2015 during the survey for the current transmission line project (**Appendix A-35**). The site was identified within the Project ROW on a flat upland plain, approximately 4 km north of Barstow and 1 km west of FM 2355. The site is situated at 2,575 ft amsl. Soils at the site are mapped as Ima fine sandy loam, 0 to 3 percent slopes, and vegetation at the time of the survey consisted of mesquite scrub and sparse grasses, with approximately 95 percent ground surface visibility (**Figure 42**). Disturbances observed during the survey include soil erosion, two-track road impacts, and disturbances related to cattle ranching.

The site was identified when a large scatter of historic materials were observed over a 60-x-21-m area within the Project ROW (**Figure 43**). The site is oriented northwest to southeast within the Project ROW, and is adjacent to a wood and barbed wire corral and two metal silos. The observed historic materials within the Project ROW were randomly distributed and include numerous glass, metal, and ceramic fragments, and several coin-operated appliances (**Table 5; Figures 44-46**). The coin-operated appliances may have once been housed in a local laundry mat although their origins cannot be determined from the available information. Collectively, the artifact assemblage appears to date to the early to middle twentieth century based on the lack of significant corrosion. In Texas, laundromats (also referred to as wash-a-terias) appeared in Texas around sometime after 1936 (Chohan 2013).



**Figure 42. Overview of 41WR97, Facing Southwest**



Sensitive Site Location Information  
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**Figure 43. 41WR97 Site Map**

**Table 5. Historic Artifacts Identified at 41WR97**

Artifacts	Quantity	Dates	Reference
<u>Glass</u>			
Clear	100	1875-present	IMACS (1992)
Opaque white / milk	10	1890-1960	IMACS (1992)
<b>Sub-total</b>	<b>110</b>		
<u>Metal</u>			
Coin operated washer/drier	24		
Refrigerator	1		
Bicycle part	1		
Miscellaneous fragments	500		
<b>Sub-total</b>	<b>526</b>		
<u>Ceramics</u>			
Undecorated whiteware	100	1820-1930+	Stelle (2011)
Porcelain	10		
<b>Sub-total</b>	<b>110</b>		
<b>Total</b>	<b>746</b>		



**Figure 44. Cluster of Dumped Appliances at 41WR97, Facing Southeast**





**Figure 45. Overview of 41WR97 Trash Scatter, Facing Southwest**



**Figure 46. Overview of Silos Near 41WR97, Facing North**

Site 41WR97 is located within Section 200, Block 34 of the Houston & Texas Central Railroad Company Survey in Ward County. The original survey consisted of 200 acres that was granted by the State of Texas to George E. Briggs in 1917. Site 41WR97 is situated on a 40-acre tract of land in the north quarter of the original survey. Between 1917 and 1938, Edward Hidden and Albert N. Edwards obtained ownership of the 40-acre tract, and in 1938 sold the property to Manley A. Moule and Theodore R. Barker (Ward County Clerk [WCC] 1938:Deed Book [DB] 82:421). On May 28, 1942, John M. Wood, acting as Power of Attorney for Theodore R. Barker, Manley A. Moule, as well as Presley W. Edwards and Malcolm W. Martin, sold the property to W. H. Echols (WCC 1942:DB 133:229). In 1956, W. H. Echols and his wife Valera Echols sold the property to John L. Harper and Mary Harper (WCC 1956:DB 181:308). On June 24, 1968, Charles E. Conwell, acting as Trustee for John L. Harper, sold the property to E. G. Spruill as a result of bankruptcy proceedings (WCC 1968:DB 320:6). In 1989, Ed Keys, acting as Trustee for E. G. Spruill, sold the property to Domingo Rico and his wife Delia, who later that same year sold the property to Simona Villalobos (WCC 1989:DB 393:365; WCC 1989:DB 561:681). On Jan 16, 2007, Simona Villalobos deeded  $\frac{1}{2}$  of her interest in the property to her husband, Felipe Villalobos, and both are the current owners of the property (WCC: 2007:DB 808:473). No cultural features or standing structures were identified at site 41WR97 within the Project ROW. However, two silos are located 35 m northeast of the Project ROW. Based on their function, it is unlikely that these silos are related to the materials at site 41WR97. Given the observable eroded and disturbed ground surface, and the lack of testable soils, the site boundaries were established on the basis of surficial extent of artifacts within the proposed ROW; due to soil conditions, no shovel tests were excavated.

Historic debris scatters are a common occurrence throughout rural areas of Texas. Given the disturbed setting of these artifacts, which are likely mid-twentieth century in age, this site would not likely contribute new or important data that would aid in understanding the history of the area. These artifacts are not likely associated with events that have made a significant contribution to the broad patterns of our history; or are associated with the lives of significant persons in our past; or 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 significant and distinguishable entity whose components may lack individual distinction; or have yielded or may be likely to yield, information important in history. Additionally, the site does not have the potential to contribute to a better understanding of the history of Texas by the addition of new and important information; the site does not display any archaeological deposits that are preserved and intact, thereby supporting the research potential or preservation interests of the site; the site does not offer the opportunity to test theories and methods of preservation, thereby contributing to new scientific knowledge; and there is not a high likelihood that vandalism and relic collecting has occurred or could occur, and official landmark designation is not needed to insure maximum legal protection, or alternatively further investigations are not needed to mitigate the effects of vandalism and relic collecting when the site cannot be protected.

Because the site extends east and west of the Project ROW and has not been recorded and evaluated in its entirety, the overall NRHP and SAL eligibility of the site is recommended as **Undetermined**. However, based on current field investigations, it is recommended that the portion of site 41WR97 within the Project ROW does not meet NRHP or SAL eligibility criteria. Therefore, no further archaeological work is recommended for the portion of the site within the Project ROW.

## 41WR98

Site 41WR98 is a historic scatter that was recorded by URS in 2015 during the survey for the current transmission line project (**Appendix A-33**). The site was identified within the Project ROW on a flat upland surface and an artificial earthen berm, approximately 7.7 km northwest of Barstow and 4.8 km east of the Pecos River. The site is situated at 2,592 ft amsl. Soils at the site are mapped as Upton gravelly soils, gently undulating, and vegetation at the time of the survey consisted of mesquite scrub and sparse grasses, with approximately 95 percent ground surface visibility. Disturbances observed during the survey include soil erosion and ranch-related disturbances.

The site was identified when a large scatter of historic materials were observed over an 86-x-21-m area within the Project ROW, which is oriented east to west (**Figure 47**). The observed historic materials were randomly distributed and include one water pump mounted on a concrete platform (**Figure 48**), a towable metal and lumber hay (dump) thresher (**Figure 49**), and a small scatter of miscellaneous metal and timber. A large earthen berm is located on the eastern boundary of the site although the function or purpose of the berm is unknown. Overall, the site appears to be a dump for defunct agricultural equipment. The site lacks temporally diagnostic artifacts, though the pump appears to be electric, suggesting the assemblage may date to the early or mid-twentieth century.

Site 41WR98 is located within Section 25 of the S. V. Biggs survey in Ward County. The original survey consisted of approximately 429.5 acres that was granted by the State of Texas to S. V. Biggs in 1906. Site 41WR98 is situated on a 40-acre tract of land in the southeast end of the original survey. By 1932, 72.67 acres of the original survey, which included the 40-acre tract, was owned by O. C. Majors. Between 1932 and 1969, O. C. Majors had died and the property was granted to his wife, Grace Majors, who in 1969 granted the property to Winnie E. Majors (WCC 1969:DB 323:565). In 1985, Winnie E. Majors died and Theresa M. Walker and Bobbie M. Avary were assigned co-executors of her estate, and are listed as the current owners of the property (WCC 1985:DB 511:354).

No cultural features or standing structures were identified at site 41WR98 or within the immediate vicinity. Given the observable eroded and disturbed ground surface, and the lack of testable soils, the site boundaries were established on the basis of surficial extent of artifacts within the Project ROW; due to soil conditions, no shovel tests were excavated. Examination of aerial photographs does not indicate the presence of any type of residential or ranch related structures nearby.

Historic debris scatters are a common occurrence throughout rural areas of Texas. The results of the survey indicate site 41WR98 has not been utilized in recent history and serves no current function. Given the disturbed setting of these artifacts, which are likely early or mid-twentieth century in age, this site would not likely contribute new or important data that would aid in understanding the history of the area. These artifacts are not likely associated with events that have made a significant contribution to the broad patterns of our history; or are associated with the lives of significant persons in our past; or 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 significant and distinguishable entity whose components may lack individual distinction; or have yielded or may be likely to yield, information important in history. Additionally, the site does not have the potential to contribute to a better understanding of the history of Texas by the addition of new and important information; the site does not display any archaeological deposits that are preserved and intact, thereby supporting the research potential or preservation interests of the site; the site does not offer the opportunity to test theories and methods of preservation, thereby contributing to new scientific knowledge; and there is not a high likelihood that vandalism and relic collecting has occurred or could occur, and official



Sensitive Site Location Information  
Map Remove

**Figure 47. 41WR98 Site Map**



**Figure 48. Pump on Concrete Pad at 41WR98, Facing Northwest**



**Figure 49. Hay Thresher at 41WR98, Facing Southwest**

landmark designation is not needed to insure maximum legal protection, or alternatively further investigations are not needed to mitigate the effects of vandalism and relic collecting when the site cannot be protected.

Because the site extends north and south of the Project ROW and has not been recorded and evaluated in its entirety, the overall NRHP and SAL eligibility of the site is recommended as **Undetermined**. However, based on current field investigations, it is recommended that the portion of site 41WR98 within the Project ROW does not meet NRHP or SAL eligibility criteria. Therefore, no further archaeological work is recommended for the portion of the site within the Project ROW.

#### 41WR99

Site 41WR99 is a historic scatter and possible temporary habitation area that was recorded by URS in 2015 during the survey for the current transmission line project (**Appendix A-34**). The site was identified within the Project ROW on a slightly elevated flat upland surface surrounded by subtle 3 to 5 percent slopes, approximately 7.2 km north of Barstow and 0.61 km northeast of FM 516. The site is situated at 2,516 ft amsl. Soils at the site are mapped as Delnorte gravelly soils, undulating, and vegetation at the time of the survey consisted of mesquite scrub and sparse grasses, with approximately 90 percent ground surface visibility (**Figure 50**). Disturbances observed during the survey include soil erosion and ranch-related disturbances.

The site was identified when a large scatter of historic materials and three stone features were observed over an 89-x-21-m area within the Project ROW, which is oriented northeast to southwest (**Figure 51**). Feature 1 consists of a rectangular arrangement of a single course of sandstone cobbles measuring approximately 20-x-8 ft with a north to south orientation (**Figure 52**). Located immediately northeast of the rectangular stone arrangement, Feature 2 is a large, ovoid-shaped sandstone cobble arrangement of unknown function. The ovoid arrangement measures approximately 24-x-30 ft and is approximately 5-6 courses in height (**Figure 53**). Finally, located 30 m north of the rectangular stone arrangement is Feature 3, a 10-x-3 ft pile of stones oriented north-south. Based on field investigations, it is unclear as to what function these features served. Several historic artifacts were noted at the site, and included a random scatter of numerous fragments of glass, metal, and ceramics (**Table 6; Figure 54**).



Figure 50. 41WR99 Overview, Facing North

Sensitive Site Location Information  
Map Removed

**Figure 51. 41WR99 Site Map**





**Figure 52. Feature 1 at 41WR99, Facing West**



**Figure 53. Feature 2 at 41WR99, Facing Northwest**



**Table 6. Historic Artifacts Identified at 41WR99**

Artifacts	Quantity	Dates	Reference
<u>Glass</u>			
Clear	100	1875-present	IMACS (1992)
Amethyst/solarized	50	1820-1930	SHA (2015)
Brown/Amber	25	1860-present	IMACS (1992)
Cobalt Blue	10	1890-1960	IMACS (1992)
Opaque white / milk	10	1890-1960	IMACS (1992)
<b>Sub-total</b>	<b>195</b>		
<u>Metal</u>			
Sanitary cans	10	Post-1900	Memcott (2015)
Sardine cans	10		
Barrel hoops	2		
Miscellaneous fragments	50		
<b>Sub-total</b>	<b>72</b>		
<u>Ceramics</u>			
Unidentified fragments	5		
Chamber pot	1		
Porcelain	3		
<b>Sub-total</b>	<b>9</b>		
<b>Total</b>	<b>276</b>		



**Figure 54. Chamber Pot at 41WR99**

Site 41WR99 is on a 40-acre parcel located at the North  $\frac{1}{4}$  of the West  $\frac{1}{4}$  of Section 214, Block 34 of the Houston & Texas Central Railroad Company survey in Ward County. The original survey consisted of 640 acres, but in 1930, the State of Texas granted Juan Evaro a patent for a 40.50-acre parcel in the North  $\frac{1}{4}$  of the West  $\frac{1}{4}$  of Section 214. In 1940, Juan Evaro and his wife Concepcion Evaro sold the property to Leonides Evaro, who sold the land to the Veterans Land Board of Texas in 1954 (WCC 1940:DB 92:560; WCC 1954:DB 165:15). In that same year, the Veterans Land Board sold the land to James C. Whitmire, who retained ownership until 1965, when he sold the property to L. D. Bankston (WCC 1954:DB 165:13; WCC 1965:DB 288:208). L. D. Bankston then deeded an undivided  $\frac{1}{2}$  interest in the property to Dolores (Petty) and Gordon D. Bankston in 1972 (WCC 1972:DB 357:375). A correction deed was filed on May 22, 1972 (WCC 1972:DB 363:144). On Jan 15, 1973, a Special Warrant Deed was issued from Gordon D. Bankston to Delores Bankston Petty, formerly Delores Bankston (WCC 1973:DB 368:356). In 2016, Dolores Petty deeded an undivided  $\frac{1}{2}$  interest to Gary Gordon Bankston and Debra D. Stearns, the current owners (WCC 2016:DB 1071:320).

No standing structures were identified at site 41WR99. Given the observable eroded and disturbed ground surface, and the lack of testable soils, the site boundaries were established on the basis of surficial extent of artifacts within the proposed ROW; due to soil conditions, no shovel tests were excavated. Examination of aerial photographs does not indicate the presence of any type of residential or ranch related structures nearby.

Historic debris scatters are a common occurrence throughout rural areas of Texas. The results of the survey indicate site 41WR99 has not been utilized in recent history and serves no current function. Given the disturbed setting of these artifacts, which are likely early or mid-twentieth century in age, this site would not likely contribute new or important data that would aid in understanding the history of the area. These artifacts are not likely associated with events that have made a significant contribution to the broad patterns of our history; or are associated with the lives of significant persons in our past; or 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 significant and distinguishable entity whose components may lack individual distinction; or have yielded or may be likely to yield, information important in history. Additionally, the site does not have the potential to contribute to a better understanding of the history of Texas by the addition of new and important information; the site does not display any archaeological deposits that are preserved and intact, thereby supporting the research potential or preservation interests of the site; the site does not offer the opportunity to test theories and methods of preservation, thereby contributing to new scientific knowledge; and there is not a high likelihood that vandalism and relic collecting has occurred or could occur, and official landmark designation is not needed to insure maximum legal protection, or alternatively further investigations are not needed to mitigate the effects of vandalism and relic collecting when the site cannot be protected.

Because the site extends outside of the Project ROW and has not been recorded and evaluated in its entirety, the overall NRHP and SAL eligibility of the site is recommended as **Undetermined**. However, based on current field investigations, it is recommended that the portion of site 41WR99 within the Project ROW does not meet NRHP or SAL eligibility criteria. Therefore, no further archaeological work is recommended for the portion of the site within the Project ROW.

## 41WR100

Site 41WR100 is a historic scatter and possible temporary habitation area that was recorded by URS in 2015 during the survey for the current transmission line project (**Appendix A-34**). The site was identified within the Project ROW on a flat upland surface surrounded by subtle 3 to 5 percent slopes, approximately 7.3 km northwest of Barstow and 1.2 km northeast of FM 516. The site is situated at 2,630 ft amsl. Soils at the site are mapped as Delnorte gravelly soils, undulating, and vegetation at the time of the survey consisted of mesquite scrub and sparse grasses, with approximately 90 percent ground surface visibility (**Figure 55**). Disturbances observed during the survey include soil erosion and ranch-related disturbances.



**Figure 55. 41WR100 Overview, Facing West**

The site was identified when a surficial scatter of historic materials was observed over a 37-x-21-m area within the Project ROW, which is oriented northeast to southwest (**Figure 56**). Artifacts observed on the site included approximately numerous glass shards, intact bottles, and metal cans (**Table 7; Figures 57-59**). This site appears to have been utilized as a late dump site over several decades, from the late nineteenth through mid-twentieth centuries, based on the varying date ranges of the artifacts observed on site.

Sensitive Site Location Information  
Map Removed

**Figure 56. 41WR100 Site Map**



**Table 7. Historic Artifacts Identified at 41WR100**

Artifacts	Quantity	Dates	Reference
<u>Glass fragments</u>			
Clear	100	1875-present	IMACS (1992)
Brown/Amber	41	1860-present	IMACS (1992)
Cobalt Blue	4	1890-1960	IMACS (1992)
<b>Sub-total</b>	<b>145</b>		
<u>Glass bottles</u>			
Clorox (base)	3	1929-1930	
Ponds (complete)	1		
Revlon (complete)	1		
Owens-Illinois (complete)	2	1939-1949	Toulouse (2001)
Woodbury (complete)	1	1882-1916)	Toulouse (2001)
Fitch’s (complete)	1		
<b>Sub-total</b>	<b>9</b>		
<u>Metal</u>			
Sanitary cans	150	Post-1900	Memmott (2015)
Solder dot cans	5	Pre-1900	IMACS (2001)
<b>Sub-total</b>	<b>155</b>		
<b>Total</b>	<b>309</b>		



**Figure 57. Clorox Bottle Bases at 41WR100**



Figure 58. Pond Bottle (left) and Revlon Bottle (right) at 41WR100



Figure 59. Selected Glass Bottles from 41WR100; Left to Right: Owens-Illinois; Woodbury; Fitch's

Site 41WR100 is located on an 80-acre parcel at the Northeast ½ of the North ¼ of Section 214, Block 34 of the Houston & Texas Central Railroad Company survey in Ward County. The original survey consisted of 640 acres. Prior to 1941, the State of Texas granted Mary Z. Brown a patent for the 80-acre parcel on which site 41WR100 is situated. In 1941, Cynthia L. Monroe is shown to be the owner of the property, but by 1952, Ralph W. Burkholder appears to own the parcel (WCC 1941:DB 84:629; WCC 1952:DB 154:124). The deed showing the transfer of ownership between Cynthia L. Monroe and Ralph W. Burkholder was not found. However, in 1972, Ralph Burkholder created the Ralph and Janice Burkholder Trust No. 1 and assigned Bob Richard Burkholder and Terry Burkholder as Trustees (WCC 1972:DB 364:481). In 1991, Bob Richard Burkholder and Terry Burkholder granted equal rights of the property to Bob Richard Burkholder and Genora Burkholder Prewit (WCC 1991:DB 589:442). That same year, Genora Burkholder Prewit granted Bob Richard Burkholder, the current owner, her half interest in the property (WCC 1991:DB 589:444).

No standing structures were identified at site 41WR100. Given the observable eroded and disturbed ground surface, and the lack of testable soils, the site boundaries were established on the basis of surficial extent of artifacts within the Project ROW; due to soil conditions, no shovel tests were excavated. Examination of aerial photographs does not indicate the presence of any type of residential or ranch related structures nearby.

Historic debris scatters are a common occurrence throughout rural areas of Texas. The results of the survey indicate site 41WR100 has not been utilized in recent history and serves no current function. Given the disturbed setting of these artifacts, which are likely late nineteenth to mid-twentieth century in age, this site would not likely contribute new or important data that would aid in understanding the history of the area. These artifacts are not likely associated with events that have made a significant contribution to the broad patterns of our history; or are associated with the lives of significant persons in our past; or 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 significant and distinguishable entity whose components may lack individual distinction; or have yielded or may be likely to yield, information important in history. Additionally, the site does not have the potential to contribute to a better understanding of the history of Texas by the addition of new and important information; the site does not display any archaeological deposits that are preserved and intact, thereby supporting the research potential or preservation interests of the site; the site does not offer the opportunity to test theories and methods of preservation, thereby contributing to new scientific knowledge; and there is not a high likelihood that vandalism and relic collecting has occurred or could occur, and official landmark designation is not needed to insure maximum legal protection, or alternatively further investigations are not needed to mitigate the effects of vandalism and relic collecting when the site cannot be protected.

Because the site extends southeast of the Project ROW and has not been recorded and evaluated in its entirety, the overall NRHP and SAL eligibility of the site is recommended as **Undetermined**. However, based on current field investigations, it is recommended that the portion of site 41WR100 within the Project ROW does not meet NRHP or SAL eligibility criteria. Therefore, no further archaeological work is recommended for the portion of the site within the Project ROW.



#### 41WR101

Site 41WR101 is a historic ranch/farmstead site that was recorded by URS in 2015 during the survey for the current transmission line project (**Appendix A-42**). The site was identified within the Project ROW on a flat upland surface, approximately 10.7 km west of Pyote, and 0.8 km west of FM 1280. The site is situated at 2,650 ft amsl. Soils at the site are mapped as Kinco fine sandy loam, 0 to 3 percent slopes, and vegetation at the time of the survey consisted of yucca, desert scrub, and various grasses and forbs, with approximately 85 percent ground surface visibility (**Figure 60**). Disturbances observed during the survey include soil erosion, ranch-related disturbances, mineral development, and impacts from road construction.

The site was identified when remnants of a collapsed windmill were observed over a 46-x-21-m area within the Project ROW (**Figure 61**). The windmill tower is constructed of collapsed timber with steel bolts and wire nails connecting the tower legs to several cross beams. Measurements of the collapsed timbers indicate that the windmill had a minimum original height of 36 ft. A square sandstone foundation is located 6 ft northwest of the collapsed windmill (**Figures 62-64**). The 11-x-12 ft foundation ranges from 2 to 3 courses tall and is oriented northwest to southeast. It is constructed from non-uniform sized sandstone blocks that are mortared with cement. An additional, discordant pile of similar sandstone cobbles are located approximately 12 ft west of the square sandstone foundation, and possibly represent left over construction materials. Artifacts located near the windmill include several hole-in-top cans, miscellaneous unidentifiable metal fragments, and glass shards (**Table 8**). Based on these artifacts, the site likely dates to the late nineteenth through early twentieth centuries. No standing structures were identified at or near site 41WR101. Given the observable eroded and disturbed ground surface, and the lack of testable soils, the site boundaries were established on the basis of surficial extent of artifacts within the Project ROW; due to soil conditions, no shovel tests were excavated. Examination of aerial photographs does not indicate the presence of any type of residential or ranch related structures nearby.



Figure 60. 41WR101 Site Overview, Facing South



Sensitive Site Location Information  
Map Removed

**Figure 61. 41WR101 Site Map**



**Figure 62. Windmill Remnants Near Feature 1 at 41WR101, Facing West**



**Figure 63. Red Brick Foundation Near Fallen Windmill at 41WR101, Facing North**





Figure 64. Pile of Red Sandstone at 41WR101, 5 m West of Feature 1, Facing South

Table 8. Historic Artifacts Identified at 41WR101

Artifacts	Quantity	Dates	Reference
<u>Glass fragments</u>			
Brown/Amber	10	1860-present	IMACS (1992)
Amethyst/solarized	10	1820-1930	SHA (2015)
<b>Sub-total</b>	<b>20</b>		
<u>Metal</u>			
Hole-in-top cans	5	1850-1920	Memcott (2015)
Miscellaneous fragments	25		
<b>Sub-total</b>	<b>30</b>		
<b>Total</b>	<b>50</b>		

Site 41WR101 is located near the northwest boundary line of the northeast ¼ of Section 146, Block 34 of the Houston & Texas Central Railroad Company survey in Ward County. The original survey and current parcel consists of 640 acres. The State of Texas granted a patent for the entire survey to Wilburn Rippetoe in 1950 (WCC 1950:DB 2:300). By 1952, Wilburn Rippetoe died and Daisy Minnie King, the administrator of the Wilburn Rippetoe Deceased Estate, granted the property to Minnie Lee King (WCC 1952:DB 150:24). Minnie Lee King granted the property back to Daisy Minnie King in 1960 (WCC 1960:DB 224:491). In 1967, Daisy Minnie King granted the property to John H. Wilson, who owned the property until his death, at which time the property was passed on to his heirs John V. Wilson, Sue W. Dawson, and Carey B. Wilson. In 2009, John V. Wilson, Sue W.

Dawson, and Carey B. Wilson conveyed the property to the Cross V Ranch, L.P., which is listed as the current owner (WCC 2009:DB 866:499; WCC 2010:DB 884:344).

Historic windmills and associated structural remains and/or debris are a common occurrence throughout rural areas of Texas. The results of the survey indicate site 41WR101 has not been utilized in recent history and serves no current function. Given the disturbed setting of these artifacts, which are likely early or mid-twentieth century in age, this site would not likely contribute new or important data that would aid in understanding the history of the area. These artifacts are not likely associated with events that have made a significant contribution to the broad patterns of our history; or are associated with the lives of significant persons in our past; or 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 significant and distinguishable entity whose components may lack individual distinction; or have yielded or may be likely to yield, information important in history. Additionally, the site does not have the potential to contribute to a better understanding of the history of Texas by the addition of new and important information; the site does not display any archaeological deposits that are preserved and intact, thereby supporting the research potential or preservation interests of the site; the site does not offer the opportunity to test theories and methods of preservation, thereby contributing to new scientific knowledge; and there is not a high likelihood that vandalism and relic collecting has occurred or could occur, and official landmark designation is not needed to insure maximum legal protection, or alternatively further investigations are not needed to mitigate the effects of vandalism and relic collecting when the site cannot be protected.

Because the site extends north and south of the Project ROW and has not been recorded and evaluated in its entirety, the overall NRHP and SAL eligibility of the site is recommended as **Undetermined**. However, based on current field investigations, it is recommended that the portion of site 41WR101 within the Project ROW does not meet NRHP or SAL eligibility criteria. Therefore, no further archaeological work is recommended for the portion of the site within the Project ROW.



## 41WR102

Site 41WR102 is a historic scatter that was recorded by URS in 2015 during the survey for the current transmission line project (**Appendix A-46**). The site was identified within the Project ROW on a flat upland surface, located 2 km north of Pyote and situated between State Highways 247 and 115. The site is situated at 2,675 ft amsl. Soils at the site are mapped as Upton gravelly soils, gently undulating, and vegetation at the time of the survey consisted of mesquite scrub and sparse grasses, with approximately 80 percent ground surface visibility (**Figure 65**). Disturbances observed during the survey include soil erosion, mineral extraction, transportation infrastructure, and ranch-related disturbances.



**Figure 65. 41WR102 Site Overview, Facing Southeast**

The site was identified when a scatter of historic materials was observed over a 26-x-18-m area within the Project ROW, which is oriented northeast to southwest (**Figure 66**). The artifact assemblage consists of over 100 pieces of glass, ceramics, and metal fragments (**Table 9; Figures 67-71**). Based on the manufacturing date ranges on the observed artifacts, the site likely represents a late nineteenth to early twentieth century historic trash dump site. Based on the distribution across the site, it is apparent that the site continues to extend southeast of the Project ROW for an undetermined distance. However, the site investigation was only limited to the Project ROW.

Sensitive Site Location Information  
Map Removed

**Figure 66. 41WR102 Site Map**

**Table 9. Historic Artifacts Identified at 41WR101**

Artifacts	Quantity	Dates	Reference
<u>Glass fragments</u>			
Clear	100	1875-present	IMACS (1992)
Brown/Amber	10	1860-present	IMACS (1992)
<b>Sub-total</b>	<b>110</b>		
<u>Glass bottles</u>			
Clear glass (bottle base)	1	1875-present	IMACS (1992)
Clear glass bottle (complete)	1	1875-present	IMACS (1992)
<b>Sub-total</b>	<b>2</b>		
<u>Ceramics</u>			
Undecorated whiteware mug base	1	1820-1930+	Stelle (2011)
Ceramic crockery	5		
Unidentified ceramics	10		
<b>Sub-total</b>	<b>16</b>		
<u>Metal</u>			
Solder dot cans	2	Pre-1900	IMACS (2001)
Tobacco snuff cans	2	Post-1900	Memcott (2015)
Sardine can	1		
Tin can lids	2		
Wire fragment	1		
<b>Sub-total</b>	<b>8</b>		
<b>Total</b>	<b>136</b>		



**Figure 67. Clear Glass Bottle at 41WR102**



**Figure 68. Clear Glass Bottle Base at 41WR102, Embossed With “DESIGN PAT FEB 23-15”**





**Figure 69. Whiteware Base with Partial Maker's Mark**



**Figure 70. Solder Dot Can at 41WR102**



**Figure 71. Tin Can Lid Markings at 41WR102: "PUSH IN THESE PLUGS X2"**

Site 41WR102 is located on Section 99, Block F of the of the Gunter, Munson, Maddox Brothers and Anderson survey. The original survey consisted of 640 acres that was granted by the State of Texas to Gunter, Munson, Maddox Brothers and Anderson in 1883. Site 41WR102 is situated on a 462.69 acre parcel located in the northeast  $\frac{1}{4}$  of the southwest  $\frac{1}{4}$  of the original survey. Deed title research conducted for this site was unable to identify any deed records earlier than 1982, at which time the property was granted from J. D. Crider and Ruth C. Crider to J. D. Crider, who is listed as the current property owner (WCC 1982:DB 482:591). Review of historic aerial photographs from 1954 and 1967, as well as USGS topographic maps (quadrangle Pyote West, TEX) dating 1969 and 1981, show no structures or building in the location of the site. However, gravel pits were located east of State Highway 115 and northwest of State Highway 247, as early as 1952. No standing structures were identified at site 41WR102. Given the observable eroded and disturbed ground surface, and the lack of testable soils, the site boundaries were established on the basis of surficial extent of artifacts within the proposed ROW; due to soil conditions, no shovel tests were excavated. Examination of aerial photographs does not indicate the presence of any type of residential or ranch related structures nearby.

Historic debris scatters are a common occurrence throughout rural areas of Texas. The results of the survey indicate site 41WR102 has not been utilized in recent history and serves no current function. Given the disturbed setting of these artifacts, which are likely early twentieth century in age, this site would not likely contribute new or important data that would aid in understanding the history of the area. These artifacts are not likely associated with events that have made a significant contribution to the broad patterns of our history; or are associated with the lives of significant persons in our past; or 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 significant and distinguishable entity whose components may lack individual distinction; or have yielded or may be likely to yield, information important in history. Additionally, the site does not have the potential to contribute to a better understanding of the history of Texas by the addition of new and important information; the site does not display any archaeological deposits that are preserved and intact, thereby supporting the research potential or preservation interests of the site; the site does not offer the

opportunity to test theories and methods of preservation, thereby contributing to new scientific knowledge; and there is not a high likelihood that vandalism and relic collecting has occurred or could occur, and official landmark designation is not needed to insure maximum legal protection, or alternatively further investigations are not needed to mitigate the effects of vandalism and relic collecting when the site cannot be protected.

Because the site extends southeast of the Project ROW and has not been recorded and evaluated in its entirety, the overall NRHP and SAL eligibility of the site is recommended as **Undetermined**. However, based on current field investigations, it is recommended that the portion of site 41WR102 within the Project ROW does not meet NRHP or SAL eligibility criteria. Therefore, no further archaeological work is recommended for the portion of the site within the Project ROW.



### 41WR103

Site 41WR103 is a historic scatter that was recorded by URS in 2015 during the survey for the current transmission line project (**Appendix A-32**). The site was identified within the Project ROW, 9.6 km north of Pecos and immediately west of Ward County Road 175 and an irrigation canal. The site is situated at 2,590 ft amsl. Soils at the site are mapped as Gila fine sandy loam, and vegetation at the time of the survey consisted of mesquite scrub and sparse grasses, with nearly 100 percent ground surface visibility (**Figure 72**). The site is heavily eroded and has been cultivated for crops in the past although it is currently fallow. A single shovel test (ST 12) was excavated to 20 cmbs at the site, which revealed disturbed and mixed silt loam indicative of former plowing.

The site was identified when a scatter of historic materials were observed over a 62-x-21-m area within the Project ROW, which is oriented east to west (**Figure 73**). The artifact assemblage consists of numerous pieces of glass, undecorated whiteware, a green and white marble, a 1944 liberty dime, and a single brick fragment (**Table 10**). Based on the assemblage of artifacts identified within the proposed ROW, the site may date to the late nineteenth through early twentieth centuries.



**Figure 72. 41WR103 Site Overview, Facing Southeast**



Sensitive Site Location Information  
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**Figure 73. 41WR103 Site Map**

**Table 10. Historic Artifacts Identified at 41WR103**

Artifacts	Quantity	Dates	Reference
<u>Glass fragments</u>			
Amethyst/solarized	100	1820-1930	SHA (2015)
Green/Olive	50	1860-present	IMACS (1992)
Opaque white / milk	50	1890-1960	IMACS (1992)
<b>Sub-total</b>	<b>200</b>		
<u>Ceramics</u>			
Undecorated whiteware	25	1820-1930+	Stelle (2011)
Ceramic crockery	40		
White and green marble	1		
<b>Sub-total</b>	<b>66</b>		
<u>Other</u>			
1944 Dime	1	1944	
Brick fragment	1		
<b>Sub-total</b>	<b>2</b>		
<b>Total</b>	<b>268</b>		

Site 41WR103 is located within Section 53, Block 33 of the Houston & Texas Central Railroad Company Survey in Ward County. The original survey consisted of 640 acres that was granted by the State of Texas to Houston & Texas Central Railroad Company in 1890. Site 41WR103 is situated on the north end of the south half of the original survey, on a parcel consisting of 310 acres. The earliest deed located during the research effort dates to 1942, when John M. Woods, under Power of Attorney for Persley W. Edwards, Theodore R. Barker, Malcolm W. Martin, and Manley A. Moule, sold the property to W. H. Echols (WCC 1942:DB 133:229). In 1955, W. H. Echols and his wife Valera H. Echols sold the property to John L. Harper, who sold the land to the Cedarville Corporation in 1968 (WCC 1955:DB 172:144; WCC 1968:DB 315:620). The Cedarville Corporation sold the property to Errol Estate LTD. in 1971 (WCC 1971:DB 350:187). In 1975, Errol Estate LTD. granted the property to the Republic National Life Insurance Company, who in 1977 granted the property to and entered into a Deed of Trust with the Pinnacle Company owned by James H. Chadwick and Ronald P. Coenod (WCC 1975:DB 389:354; WCC 1977:DB 417:311; WCC 1977:DB 106:23). By 1988, the Pinnacle Company had filed for bankruptcy and the Republic National Life Insurance Company, known at that time as the American General Life Insurance Company, gained ownership of the property through a bankruptcy sale (WCC 1988:DB 541:29). In 1990, The American General Life Insurance Company sold the property to Robert Nelson, who in 2001 sold the property to Dan and Hazel Nelson (WCC 1990:DB 570:474; WCC 2001:DB 716:682). Dan and Hazel Nelson retained ownership of the property until 2003, when they sold it to C. J. Collum, who in 2013 sold the property to the current owner, Deeprock Energy Resources (WCC 2003:DB 739:508; WCC 2013:DB 965:718).

No standing structures were identified at site 41WR103. Given the observable eroded and disturbed ground surface, and the lack of testable soils, the site boundaries were established on the basis of surficial extent of artifacts within the proposed ROW; due to soil conditions, no shovel tests were excavated. Examination of aerial photographs does not indicate the presence of any type of residential or ranch related structures.

Historic debris scatters are a common occurrence throughout rural areas of Texas. The results of the survey indicate site 41WR103 has not been utilized in recent history and serves no current function. Given the disturbed setting of these artifacts, which are likely early twentieth century in age, this site would not likely contribute new or important data that would aid in understanding the history of the area. These artifacts are not likely associated with events that have made a significant contribution to the broad patterns of our history; or are associated with the lives of significant persons in our past; or 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 significant and distinguishable entity whose components may lack individual distinction; or have yielded or may be likely to yield, information important in history. Additionally, the site does not have the potential to contribute to a better understanding of the history of Texas by the addition of new and important information; the site does not display any archaeological deposits that are preserved and intact, thereby supporting the research potential or preservation interests of the site; the site does not offer the opportunity to test theories and methods of preservation, thereby contributing to new scientific knowledge; and there is not a high likelihood that vandalism and relic collecting has occurred or could occur, and official landmark designation is not needed to insure maximum legal protection, or alternatively further investigations are not needed to mitigate the effects of vandalism and relic collecting when the site cannot be protected.

Because the site extends north and south of the Project ROW and has not been recorded and evaluated in its entirety, the overall NRHP and SAL eligibility of the site is recommended as **Undetermined**. However, based on current field investigations, it is recommended that the portion of site 41WR103 within the Project ROW does not meet NRHP or SAL eligibility criteria. Therefore, no further archaeological work is recommended for the portion of the site within the Project ROW.

**5.5 Isolated Finds (n=16)**

Sixteen isolated finds (IFs) were documented during the survey of the Project ROW (**Table 11**). Locations of these finds are shown on project maps in **Appendix A**. As previously indicated, a site was determined to be present when at least 5 or more artifacts, with or without tools, or 4 artifacts including at least one informal tool, or 3 artifacts with at least one formal tool were present. Historic finds, including isolated farm/ranch equipment items (e.g., oil well pump jacks or a single irrigation gate) were generally not considered sites. Cultural materials not meeting the above criteria were designated as isolated finds and were noted, but were not recorded as sites. Due to the isolated occurrences of these cultural materials and the lack of integrity context, isolated finds do not meet NRHP eligibility requirements set for in 36 CFR 60.4 – *Criteria of Eligibility*, nor do they merit designation as a SAL as outline in 13 TAC 26.10, *Criteria for Evaluating Archeological Sites*. No further investigations are recommended for these isolated finds.

**Table 11. Isolated Finds in Project ROW**

Isolated Find Field ID No.	Appendix A	County	Cultural Period	Item	Recommendation
H-06	A-45	Ward	Historic	6 brick fragments	Not eligible; no further work
P-03	A-1	Culberson	Prehistoric	1 unmodified flake	Not eligible; no further work
P-06	A-19	Reeves	Prehistoric	1 edge modified flake	Not eligible; no further work
P-07	A-20	Reeves	Prehistoric	1 edge modified flake	Not eligible; no further work
P-11	A-31	Reeves	Prehistoric/Historic	1 unmodified flake; 1 amethyst bottle top	Not eligible; no further work

Isolated Find Field ID No.	Appendix A	County	Cultural Period	Item	Recommendation
P-12	A-27	Reeves	Prehistoric	2 unmodified flakes	Not eligible; no further work
P-13	A-27	Reeves	Prehistoric	3 unmodified flakes 1 core	Not eligible; no further work
P-16	A-27	Reeves	Prehistoric	4 unmodified flakes	Not eligible; no further work
P-17	A-27	Reeves	Prehistoric	3 unmodified flakes	Not eligible; no further work
P-18	A-27	Reeves	Prehistoric	3 unmodified flakes	Not eligible; no further work
P-21	A-31	Reeves	Prehistoric	2 unmodified flakes 1 core	Not eligible; no further work
P-22	A-25	Reeves	Prehistoric	4 unmodified flakes	Not eligible; no further work
P-23	A-25	Reeves	Prehistoric	1 unmodified flake 1 modified flake	Not eligible; no further work
P-24	A-25	Reeves	Prehistoric	2 unmodified flakes 1 core	Not eligible; no further work
P-26	A-29	Reeves	Prehistoric	1 unmodified flakes 1 modified flake	Not eligible; no further work
P-27	A-30	Reeves	Prehistoric	1 unmodified flake	Not eligible; no further work



## 6 Monitoring Investigations

### 6.1 Introduction

Investigation of geoarchaeologically-sensitive areas within the Project ROW (e.g., areas with deep archaeological burial potential) that would be affected by construction of a support structure would normally involve trenching at the proposed structure location. Although backhoe trenching is commonly used to prospect for deeply buried archaeological deposits in certain depositional settings, the Research Design recommends that such trenching should not be conducted in areas where transmission structures are to be located because trench excavations could be potentially destabilizing to the structure foundations. The Research Design therefore provides for monitoring if a transmission structure is to be constructed in areas that could contain deeply buried cultural deposits. In order to make a determination about the need for monitoring, an assessment of the geoarchaeological potential of the Project ROW was conducted. Geoarchaeological potential refers to the likelihood that the soils could contain deeply buried cultural deposits exhibiting integrity. The geoarchaeological assessment presented herein was based on information derived from the field survey, as well as previously published data on the local geomorphology, geology, soils, and cultural site patterns. Any transmission tower structures that would be placed in areas determined to exhibit geoarchaeological potential were therefore recommended for archaeological monitoring during foundation excavations, with the objective of monitoring the soil as it is removed (typically, by using an auger) from the foundation excavation.

### 6.2 Geomorphological Assessment

Very little geomorphological and geoarchaeological work has been done regarding the Late Quaternary geology within the Middle Pecos River Valley. While several studies have been conducted within the Mescalero sand sheet along the upper reaches of the Pecos River in New Mexico (Hall and Goble 2008, 2012; Railey et al. 2009; Reeves 1972; Rich 2013), those studies are not readily applicable to the current project setting. Much of the following discussion is modeled off of recent work conducted by Burden and Kibler (2016), who conducted a cursory geomorphological background study for an archaeological survey in Reeves County, approximately 35 miles upstream (north) of the current project.

The formation of the present Pecos River Valley configuration began as early as the Miocene (Bretz and Horberg 1949; Hawley 1993), following major erosional downcutting and carving out of the valley, after which extensive and thick valley fills were deposited from the uplifted and eroded highland sediments to the north and west, resulting in the Gatuña Formation. Along the Pecos River in Texas, this formation is occasionally exposed within deeply incised areas and is described as fine-grained eolian and alluvial sediments that are intercalated with well-developed and indurated calcrete ledges (BEG 1976). While these deposits are commonly found resting unconformably upon Permian, Triassic, and Cretaceous rocks (Kelley 1980), there is currently no consensus on the age of the Gatuña Formation, which is estimated to range from Pliocene to as late as middle Pleistocene (Bachman 1976; 1980). No outcrops of this ancient formation were observed at the Project ROW crossing of the Pecos River. Rather, this formation appears to be buried beneath thick deposits of Quaternary eolian and alluvial sediments that are extensively distributed throughout Ward and Reeves Counties (BEG 1976) (**Figure 74**).

Within Ward County, the Project ROW east of the Pecos River traverses uplands that are mantled by various Quaternary-age eolian and alluvial sand and silt formations. These are mapped on BEG (1976, 1983) maps as



**Figure 74. Overview of Thick Alluvial Landforms of Pecos River Crossing in Project ROW, Facing West**

Holocene and Pleistocene-age Caliche (Qcc) and Holocene Windblown sand (Qs). The Qcc deposits are prevalent east of the Pecos River and consist of exhumed caliche zones that are reportedly up to 35 ft thick (BEG 1976). The Qs deposits east of the Pecos River and are dominated by sand sheets and silt deposits (BEG 1976). Portions of the upland landscape are also dotted by ancient Playa deposits (Qp), and exist as shallow depressions consisting of light to dark gray clay, silt, and sand.

Soil data for this upland landscape is described generally as calcareous and/or gypsiferous, with extensive coarse loamy and gravelly Pleistocene alluvial deposits. The majority of the soils are shallow to very shallow gravelly loams overlying well-cemented petrocalcic and petrogypsic horizons. In some areas, where deeper sandy and loamy eolian materials are mapped, they typically overlie well-developed argillic and indurated petrocalcic horizons (NRCS 2017). Bioturbation and wind erosion have mixed the sandy and loamy upper sola. Based on these observations, the upland areas of the Project ROW in Ward County appear to exhibit low geoarchaeological potential.

Within the Pecos River Valley portion of the Project ROW, Holocene alluvium (Qal) and fluvial terrace deposits (Qt) are mapped (BEG 1976). The Qal deposits consist of a coalescence of alluvial fan sediments that originated from the upland plain, and these deposits interfinger with the alluvial floodplain valley fills. Both facies consist of sands and silts on pediments that have been locally modified by sheetwash action. The Qt deposits flanking the Pecos River channel are dominated by quartz sand, which ranges from cross-bedded to massive, and weathers reddish brown, pink, and gray to light gray. They are described as also consisting of gravel, sand, and silt, with common chert cobbles, quartzite, igneous rock, metamorphic rock, and caliche.

Mapped soils within the valley do not appear to differentiate between the underlying Qt and Qal geologic deposits, which suggests that the older Qt surfaces within the valley may be capped by more recent, silt loam and sandy Holocene age overbank sediment veneers. The soils associated with both the Qal and Qt deposits in the valley are described as very deep within calcareous loamy and clayey alluvium and fan skirts on fan piedmonts (NRCS 2017) (see **Table 1**), and this was confirmed by the excavation of Shovel Tests 12 and 13 within

these deposits (see **Appendix B**). Due to great potential depth (> 1 m) and their likely recent (Holocene) age, these soils exhibit the potential for deeply buried and intact archaeological materials, and monitoring was recommended for transmission pole emplacement (see **Appendix A**).

West of the Pecos River in Reeves County, two primary Quaternary surfaces are intersected by the Project ROW, including those mapped as “Other Quaternary” (Qao) deposits, and those mapped as Holocene alluvium (Qal) (BEG 1976). The Qao deposits represent a higher elevation landscape surface that is several meters above the Qal surface. The Pleistocene-age Qao deposits consist of fine-grained deposits with rounded gravels with extensive secondary calcium carbonate coatings. The Qao surface is highly dissected west of the Pecos River by a vast network of eastward trending intermittent drainages. These drainages originate at the Delaware and Guadalupe Mountains to the west, and drain the broad plain toward the Pecos River. Due to the presence of numerous well-rounded metamorphic and igneous gravels within the Qao deposits, Burden and Kibler (2016) suggest that the origin of these gravels would have been over 200 km to the north in the northern Sacramento Mountains of New Mexico. Many of these gravels are present on the modern ground surface in a lag context, indicating that significant erosion and deflation have occurred over the millennia since their original deposition (Burden and Kibler 2016). Given the relative landscape position, well developed soil carbonates, and the degree of terrace dissection, Burden and Kibler (2016) interpret the Qao deposits to represent an ancient Pleistocene terrace of the Pecos River that may be as much as 100,000 years old. This is further supported by soils data, which indicate shallow to very shallow soils are present overlying petrocalcic and petrogypsic horizons, both of which are time-diagnostic pedogenic features (NRCS 2017). Based on these observations, the Qao portion of the Project ROW exhibits low geoarchaeological potential.

The Qal deposits within Reeves County occupy a lower surface elevation, from one to several meters below the Qao deposits. These deposits are widely distributed as a broad outwash plain of sands and silts that are reportedly several meters thick, and were transported eastward by the broad drainage network (BEG 1976). These recent deposits also occupy the numerous narrow channels that have dissected the older Qao deposits, and have been modified by sheetwash and eolian processes. Soils throughout the Qal surface are generally described as very deep, well drained soils on broad, gently sloping valleys, alluvial outwash plains, broad basins, alluvial fans, floodplains along narrow drainageways, and terraces. Official series descriptions for individual soil mapping units indicate minimal degrees of pedogenesis have occurred, thus indicating they are Holocene in age. As such, potential exists for the presence of deeply buried and intact cultural materials. In addition to these primary geomorphic surfaces in Reeves County, one small area mapped as Gypsite (Qgy) is crossed by the Project ROW, and it is described as a late Pleistocene/Holocene deposit bordering Sand Lake. The ancestral dimensions of this playa lake measure approximately 3 km in diameter. Given the high potential for archaeological deposits in deep settings adjacent to playa lakes, monitoring was recommended in this locality for any pole emplacements that may be necessary.

Within Culberson County, the Project ROW traverses an upland landscape of outcropping deposits of the Permian-age Castile Formation (Pcs), Rustler Formation (Pru), and Gypsum of Rustler and Castile Formations undivided (Pgrc) (BEG 1983). Ancient residual soils have developed upon these formations and are typically shallow, gypsiferous, and overlie petrogypsic and petrocalcic horizons (NRCS 2017). Based on these observations, these upland areas in Culberson County exhibit low potential for deep archaeological burial and preservation. However, within the catchments of some of the larger drainages that are traversed by the Project ROW, including Virginia Draw, Horseshoe Draw, and Maverick Draw, Holocene alluvium (Qal) is present, which exhibits some potential for deeply buried deposits. Soils within these recent deposits are described as deep, well-drained soils that formed from calcareous alluvium on alluvial flats and fans (NRCS 2017). As such, potential exists for deeply buried cultural materials.

### 6.3 Monitoring Recommendations

URS completed a 100% pedestrian archaeological survey of the Project ROW, which resulted in the identification of 16 newly-recorded sites, one previously recorded site (41WR85), and 16 isolated finds. None of the cultural resources sites were recommended as eligible for inclusion in the NRHP or for designation as a SAL. A geomorphological assessment revealed that approximately 15 miles (25 kilometers) of Project ROW potentially exhibited the necessary pedologic and geomorphic conditions for the deep burial and preservation of cultural deposits.

Following the conclusion of the survey and geomorphological assessment, an interim draft report was submitted to Oncor on March 31, 2017, which included the recommendations for the archaeological monitoring of transmission pole excavations in accordance with the Research Design. Additionally, a small bedrock cavity observed at site 41CU835 during the survey was recommended for construction avoidance and/or monitoring. Following Oncor's review and approval, the interim report was submitted to the THC on April 27, 2017. On May 26, 2017, the THC concurred with the interim report recommendations. In preparation for the monitoring effort, URS was subsequently notified by Oncor that a majority of the transmission line project had already been constructed, including those areas recommended for monitoring. The only location that had not yet been constructed was the bedrock cavity at site 41CU835. On May 24, 2017, a meeting between Oncor, URS, and the THC resulted in an agreement that monitoring during construction activities near the bedrock cavity at site 41CU835 should be undertaken. In addition, it was agreed that ground surface spot-checks would be performed within a subset of the previously constructed structures within high probability areas, and within portions of State lands owned by UL. Following completion of these tasks, a revised and updated report would be submitted to THC for review and project closure. The remainder of this chapter presents the results of these additional field investigations.

### 6.4 Results

#### Monitoring at 41CU835 (Structure No. 56/3)

As previously described in Chapter 5 of the current report, site 41CU835 is a prehistoric lithic scatter of unknown age that was recorded by URS in 2016 during the survey for the current transmission line project (see **Appendix A-1**). The site is a surface scatter of lithic material over a 47-x-21-m area within the Project ROW. It was identified on a broad flat upland plain, near the western extent of Rustler Hills, approximately 2 km southeast of the Culberson Switching Station. A small cavity measuring approximately 50 cm in diameter was observed in the bedrock at the southeastern edge of the site. The cavity was recorded approximately 2 m from the southern boundary of the Project ROW. Due to safety concerns about the surrounding ground stability, the subterranean extent of this feature could not be firmly established during the survey. No indications were observed in the immediate vicinity of the opening, or within the observable portion below ground, to suggest the cavity is related to prehistoric cultural use (e.g., interment). However, because such a possibility could not be entirely ruled out, it was recommended that monitoring investigations should be carried out in order to confirm that construction activities would not impact the cavity area.

URS archaeologists visited the site from July 10-11, 2017. During the site visit, it was verified that the cavity is located approximately 30 m to the southeast of the proposed location of monopole structure No. 56/3 (see **Figure 16**). Additional inspections of the cavity were carried out in order to search for any evidence of cultural association. Two separate but connected cavities were observed. The dimensions of the larger cavity were confirmed to be approximately 50 cm in diameter, which tapered downward to approximately 10 cm, over a total depth of approximately 60 cm (**Figure 75**). Solid bedrock could be observed at the bottom. The second cavity, located approximately 3 m to the north, measured 44-x-33 cm (**Figure 76**). A tape measure was dropped





**Figure 75. Main Cavity Opening at 41CU835, Approximately 50 cm Wide at its Widest Point**



**Figure 76. Small Vertical Cavity to the North of Main Cavity, Measuring 44x33 cm**

into this crevice, which extended to a depth of 10 ft below surface. No cultural materials other evidence of prehistoric use of these natural features was observed during this inspection. These features begin at the end of an erosional gully, and thus they likely developed naturally due to runoff and the differential weathering and dissolution of the surrounding gypsum. Each of these crevices is too narrow and too shallow to have been used as an effective place of interment.

Following this additional field inspection, the immediate area around the cavity was taped off so that other related construction activities (e.g., blading, equipment movement, etc.) would not adversely impact the cavity or surrounding area (**Figures 77-78**). Finally, on July 11, 2017, monitoring during the excavation of monopole structure no. 56/3 was undertaken in accordance with the Research Design. The monitoring of this drilling operation involved examination of the soil as it was removed from the auger hole in order to identify any cultural remains that may have been disturbed. The auguring proceeded slowly, generally in increments of 1 to 2 ft (**Figure 79**). Observations were limited to when the auger was removed and reverse-spun. When the auger was removed from the hole, the fill was visually inspected in order to identify strata and potential cultural materials. Observations of soil stratigraphy were recorded, and all depths were measured from the ground surface to the base of auger penetration (**Figure 80**). The total depth of the excavation was 20 ft.





**Figure 77. Erosional Gully Leading to Main Cavity Within Project ROW at 41CU835, Facing North**



**Figure 78. Location of Cavity at Southern Edge of Project ROW at Site 41CU835, Facing East**





**Figure 79. Auguring at Structure No. 56/3, at Site 41CU835, Facing Southeast**



**Figure 80. Completed Auger Hole at Structure No. 56/3 at Site 41CU835**

No cultural materials were identified during the excavation monitoring at 56/3, which is within the limits of site 41CU835. Observations of the soil setting revealed deep, gypsiferous residuum that has weathered from the Castile Formation. Field observations are consistent with the Elcor series, which exhibits light gray (10YR 7/2) to very pale brown (10YR 8/3) loams with high concentrations (65-81 percent) of gypsum masses. Very strongly cemented to indurated gypsum bedrock is shallowly buried, and occurs within 20 cm below surface.

### **Spot-Checking of Selected Structures**

In May 2017, during preparations for the monitoring effort, URS was notified by Oncor that nearly all monopole structures had already been constructed. In an effort to mitigate this oversight, Oncor, THC, and URS agreed that a subset of structures in high-probability areas that had been recommended for monitoring, and areas within the UL portion of the project, should be subjected to post-construction spot-checking and documentation.

From August 12-13, 2017, URS archaeologists performed spot-checking investigations for a total of 99 monopoles at three locations, including 53 structures within the Project ROW extending approximately 10 km west of the Pecos River in Reeves County; 22 structures within the Project ROW extending approximately 3.8 km east of the Pecos River in Ward County; and 24 structures within the Project ROW extending approximately 4.5 km across Monument Draw within State-owned UL in Ward County (**Figure 81; see Appendix A**).



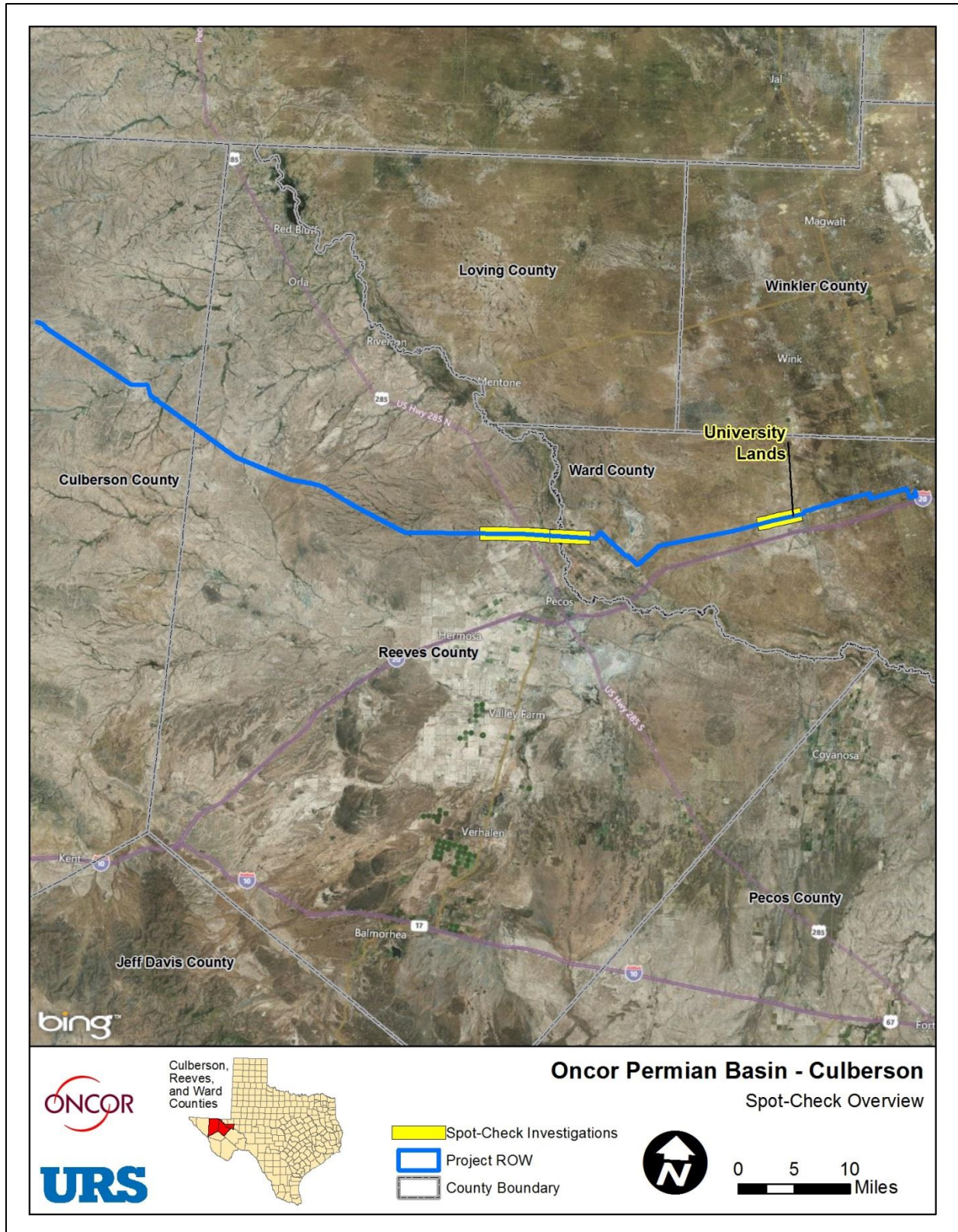


Figure 81. Map Illustrating the Locations of Spot-Checking Investigations

Individual spot-check localities included visual inspection and photo documentation of ground surfaces and any back dirt piles in order to search for evidence of any cultural resources that may have been impacted by monopole emplacement. Each spot-check location and any identified cultural materials were recorded with a handheld GPS unit. Upon identifying any previously unrecorded cultural materials, an inventory of artifacts was made. All newly discovered archaeological sites were assigned state trinomials obtained from TARL. Isolated finds that were not previously identified during the survey were noted, but not recorded as sites.

As anticipated, the Project ROW areas around each monopole exhibited construction related disturbances from equipment access roads and from drilling operations (**Figures 82-85**). In each of these areas, vegetation was already sparse, thus ground disturbances were not extensive. Because general operating procedure included removal of any standing backdirt piles, inspections were limited to areas within approximately 20 m of each monopole location, which afforded excellent extant surface visibility. As a result, evidence of ground surface scraping from soil removal was observed, in some cases, revealing exposed subsoil and caliche. ROW access roads were in various conditions, with minimal rutting. Culverts that were emplaced across local drainages had since been removed, and the draws returned to their natural state.



**Figure 82. Overview of Monopole Structure No. 15/8, on University Lands, Facing Northwest**





Figure 83. Overview of Monopole Structure 14/5, on University Lands, Facing Northwest



Figure 84. Overview of Monopole Structure No. 2/2, on the Eastern Pecos River Floodplain, Facing West



**Figure 85. Overview of Monopole Structure No. 8/6, on the Western Pecos River Floodplain, Facing West**

No evidence was found that indicated any deeply buried cultural resource sites were impacted by excavations for the monopole structures. However, during the spot-checking, a total of two previously unrecorded archaeological sites and three new IFs were identified and recorded within the Project ROW. These finds are discussed below.

#### **41RV128**

Site 41RV128 is a low-density historic trash scatter that was recorded by URS in 2017 during monitoring spot-checks for the Project (**Appendix A-32**). The site was identified near monopole structure no. 3/4, which is within the Project ROW approximately 75 m west of the Pecos River. The site is situated at approximately 2,595 ft amsl. Soils at the site are mapped as Toyah clay loam; vegetation at the time of the survey was sparse, with approximately 90 percent ground surface visibility. Disturbances observed during the survey include vegetation clearing from ROW development, monopole emplacement, and vehicular impacts.

The site was identified during the spot-check investigation of monopole structure no. 3/4, when a diffuse surface scatter of historic materials were observed over a 50-x-20-m area within the Project ROW (**Figures 86-87**). The observed historic materials within the Project ROW were randomly distributed on an eroded surface and include one amber glass body shard, one clear bottle glass body shard, and three amethyst glass bottle shards, one of which is heavily patinated (**Figure 88**).

Sensitive Site Location Information  
Map Removed

**Figure 86. 41RV128 Site Map**





**Figure 87. Overview of 41RV128, Facing West**



**Figure 88. Patinated Amethyst glass at 41RV128**



Site 41RV128 is located in the southeast corner of an 80-acre parcel in the southeast part of Section 35, Block 4, of the Houston & International-Great Northern Railway (H&GN) survey in Reeves County. The original survey consisted of 640 acres, which was issued a patent deed by the State of Texas to the International Great Northern Railroad Company in 1873. By 1916, Jesse Murphy et al. obtained the property and in that same year sold all 640 acres to Charles K. McKnight (Reeves County Clerk [RCC] 1916: DB 40:582). In 1922, Charles K. McKnight agreed to sell the property to L. H. Lamkin under a land contract, but the title for the land was issued to Lamkin through a Sheriff's Deed (RCC 1922:DB 57:20; RCC 1922:DB 57:21). Lamkin retained ownership of the land until 1934, at which time he sold it to A. H. Fulgim and his wife, Maude Fulgim, who in that same year put the land in escrow with Barney Hubbs and Louise Robinson (RCC 1934:DB 77:508). In 1940, A. H. Fulgim and Maude Fulgim sold 624.50 acres to Barney Hubbs and Louise Robinson, who in that same year sold 80 acres in the southeast part of the survey back to A. H. Fulgim and Maude Fulgim (RCC 1940:DB 93:171; RCC 1940:DB 93:172). By 1955, A. H. Fulgim had died and his estate was left to his wife Maude Fulgim, who in that year sold the 80 acres to J. T. Creighton et al. (RCC 1955:DB 167:139). Two years later, J. T. Creighton sold the land to E. P. Crie, who died by 1958 and left the land to his wife Ruth Moffett Crie (RCC 1956:DB 170:466). In 1958, Ruth Moffett Crie sold the 80 acre parcel to Cecil Jim Lee, who died in ca. 2007 and left the land in trust to his heirs (RCC 1958:DB 181:443). The current owner of the property is listed as Cecil J Lee II.

No cultural features or standing structures were identified at site 41RV128. Based on the age ranges of site artifacts, the site likely represents a late nineteenth to early twentieth century historic trash scatter. Given the eroded and disturbed ground surface, and low artifact density, the site boundaries were established on the basis of surficial extent of artifacts within the Project ROW; no shovel tests were excavated. Examination of aerial photographs does not indicate the presence of any type of nearby residential or ranch related structures. However, numerous two-track ranch roads and canals are present in the vicinity. Thus, it is possible that the historic materials at 41RV128 are associated with late nineteenth or early twentieth century ranching and farming. Field observations indicate that additional site artifacts continue beyond the Project ROW.

Historic debris scatters are a common occurrence throughout rural areas of Texas. Given the disturbed setting of these artifacts, which range in age from the late nineteenth to early twentieth century, this site would not likely contribute new or important data that would aid in understanding the history of the area. These artifacts are not likely associated with events that have made a significant contribution to the broad patterns of our history; or are associated with the lives of significant persons in our past; or 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 significant and distinguishable entity whose components may lack individual distinction; or have yielded or may be likely to yield, information important in history. Additionally, the site does not have the potential to contribute to a better understanding of the history of Texas by the addition of new and important information; the site does not display any archaeological deposits that are preserved and intact, thereby supporting the research potential or preservation interests of the site; the site does not offer the opportunity to test theories and methods of preservation, thereby contributing to new scientific knowledge; and there is not a high likelihood that vandalism and relic collecting has occurred or could occur, and official landmark designation is not needed to insure maximum legal protection, or alternatively further investigations are not needed to mitigate the effects of vandalism and relic collecting when the site cannot be protected.

Because the site extends outside of the Project ROW and has not been recorded and evaluated in its entirety, the overall NRHP and SAL eligibility of the site is recommended as **Undetermined**. However, based on current field investigations, it is recommended that the portion of site 41RV128 within the proposed ROW does not meet NRHP or SAL eligibility criteria. Therefore, no further archaeological work is recommended for the portion of the site within the Project ROW.

## 41RV129

Site 41RV129 is a historic scatter that was recorded by URS in 2017 during monitoring spot-checks for the Project (**Appendix A-31**). The site was identified near monopole structure no. 4/6, which is within the Project ROW approximately 160 m east of FM 1216. The site is situated at approximately 2,600 ft amsl. Soils at the site are mapped as part of the Orla association, and vegetation at the time of the survey consisted of mesquite scrub and sparse grasses, with approximately 90 percent ground surface visibility. Disturbances observed during the survey include vegetation clearing from ROW development, monopole emplacement, and vehicular impacts.

The site was identified during the spot-check investigation in the vicinity of monopole structure no. 4/6, when a diffuse surface scatter of historic materials were observed over a 20-x-12-m area within the Project ROW (**Figure 89; Figure 90**). The observed historic materials within the Project ROW were randomly distributed and include one clear glass base from the Illinois glass Company dating from 1915-1929, part of the Lyric range of medicine bottle with a 'c' and '9'; one flattened tin can, three clear glass body shards, one large cylindrical metal bolt probably associated with the nearby railroad berm related to the Atchison Topeka and Santa Fe Railway. The railroad berm that runs north-south across the Project ROW and rises above the natural grade by approximately 10 to 20 cm. Soil has been mounded over the berm to allow for vehicular access along the ROW. A push pile could be observed approximately 10 to 15 m southwest of the site, which contained discarded metal and wood (**Figure 91**). The artifact scatter, which appears to date to the early twentieth century, continues to the south of the Project ROW, and includes an in-situ railroad tie.

Site 41RV129 is located within Section 26, Block 4, of the H&GN survey in Reeves County. Information from the Texas General Land Office shows the survey was 560 acres, but does not provide a date for the patent deed. Research found that in 1914, Hanna Goldstein sold the 560 acres to Sol H. Cohn, who died in 1925 and left his estate to his nephew, John B. Quigley (RCC 1914:DB 38:454; RCC 1925:DB 59:206). John B. Quigley retained ownership of the property until 1984, at which time he sold the property to Joan and Ruth Quigley, who are listed as the current owners (RCC 1984:DB 439:518).

Given the eroded and disturbed ground surface, the site boundaries were established on the basis of surficial extent of artifacts within the Project ROW; no shovel tests were excavated. Examination of aerial photographs does not indicate the presence of any type of nearby residential or ranch related structures; only the old railroad berm. It is possible that the historic materials at 41RV129 are associated with early twentieth century railroad operations. The site has limited research value within the Project ROW due to low artifact density and few diagnostics artifacts. Field observations indicate that the site-related components extend beyond the Project ROW, including the push pile and railroad ties, but were not investigated.

Sensitive Site Location Information  
Map Removed

**Figure 89. 41RV129 Site Map**



**Figure 90. Overview of 41RV129, Facing West**



**Figure 91. Push piles at 41RV129, located outside Project ROW, Facing Southwest**

Historic debris scatters are a common occurrence throughout rural areas of Texas. Given the disturbed setting of these artifacts, which range in age from the early twentieth century, this site would not likely contribute new or important data that would aid in understanding the history of the area. These artifacts are not likely associated with events that have made a significant contribution to the broad patterns of our history; or are associated



with the lives of significant persons in our past; or 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 significant and distinguishable entity whose components may lack individual distinction; or have yielded or may be likely to yield, information important in history. Additionally, the site does not have the potential to contribute to a better understanding of the history of Texas by the addition of new and important information; the site does not display any archaeological deposits that are preserved and intact, thereby supporting the research potential or preservation interests of the site; the site does not offer the opportunity to test theories and methods of preservation, thereby contributing to new scientific knowledge; and there is not a high likelihood that vandalism and relic collecting has occurred or could occur, and official landmark designation is not needed to insure maximum legal protection, or alternatively further investigations are not needed to mitigate the effects of vandalism and relic collecting when the site cannot be protected.

Because the site extends outside of the Project ROW and has not been recorded and evaluated in its entirety, the overall NRHP and SAL eligibility of the site is recommended as **Undetermined**. However, based on current field investigations, it is recommended that the portion of site 41RV129 within the proposed ROW does not meet NRHP or SAL eligibility criteria. Therefore, no further archaeological work is recommended for the portion of the site within the Project ROW.

**Isolated Finds**

Three newly identified IFs were documented during the spot-checking (**Table 12**). Locations of these finds are shown on project maps in **Appendix A**. As previously indicated, a site was determined to be present when at least 5 or more artifacts, with or without tools, or 4 artifacts including at least one informal tool, or 3 artifacts with at least one formal tool were present. Historic finds, including isolated farm/ranch equipment items (e.g., oil well pump jacks or a single irrigation gate) were generally not considered sites. Cultural materials not meeting the above criteria were designated as isolated finds and were noted, but were not recorded as sites. Due to the isolated occurrences of these cultural materials and the lack of integrity context, isolated finds do not meet NRHP eligibility requirements set for in 36 CFR 60.4 – *Criteria of Eligibility*, nor do they merit designation as a SAL as outline in 13 TAC 26.10, *Criteria for Evaluating Archeological Sites*. No further investigations are recommended for these isolated finds.

**Table 12. New Isolated Finds Identified in Project ROW During Spot-Checking.**

Isolated Find Field ID No.	Appendix A	County	Cultural Period	Item	Recommendation
H-07	A-32	Ward	Historic	2 clear glass and 1 amethyst glass fragments, 12 m east of structure no. 3/3	Not eligible; no further work
H-08	A-28	Reeves	Historic	1 shard of aqua glass, 9 m east of structure no. 8/6	Not eligible; no further work
P-28	A-28	Reeves	Prehistoric	1 chert flake, 16 m east of structure no. 8/7	Not eligible; no further work

## 7 Summary and Recommendations

An intensive pedestrian survey and shovel testing of the Project ROW was conducted between December 7, 2015 and May 5, 2016. The survey resulted in the identification of 16 newly-recorded sites, one previously recorded site (41WR85), and 16 IFs. Each site was found in an eroded context and lacked integrity. Based on these observations, the portions of these 17 sites within the Project ROW do not meet NRHP and SAL eligibility requirements. However, because each of these sites appears to extend beyond of the current Project ROW boundary, they have not been evaluated in their entirety and their overall NRHP and SAL eligibility is recommended to be Undetermined. All IFs are recommended as not eligible for NRHP or SAL designation. During the survey, a small bedrock cavity was observed at site 41CU835. The ground surface near the opening did not yield any evidence that the cavity had been utilized prehistorically. However, the cultural utilization of this feature could not be entirely ruled out, given the current level of survey work. Therefore, it was recommended that construction should avoid this cavity, and that monitoring would take place during construction. A geomorphological assessment performed as part of the survey revealed that some areas within the Project ROW could exhibit the necessary pedologic and geomorphic conditions for the deep burial and preservation of cultural deposits. These areas represented a combined total of 15.5 linear miles (25 km) of the Project. Archaeological monitoring was therefore recommended for transmission pole excavations that would occur within these high geoarchaeological potential areas.

An interim draft report of these recommendations was submitted to the THC on April 27, 2017. On May 26, 2017, THC concurred with the interim report recommendations. During preparations for the monitoring effort, URS was notified by Oncor that a majority of the transmission line project had already been constructed, including those areas recommended for monitoring. The only location that had not yet been constructed was the bedrock cavity at site 41CU835. On May 24, 2017, a meeting between Oncor, URS, and the THC resulted in an agreement that monitoring should be undertaken during construction activities near the bedrock cavity at site 41CU835. In addition, it was agreed that spot-checks would be performed for a subset of the monopole structures that were constructed within the high geoarchaeological potential areas.

Field investigations at the bedrock cavity at 41CU835 were carried out from July 10-11, 2017. During the site visit, it was verified that the cavity is located approximately 30 m to the southeast of the proposed location of monopole structure No. 56/3. Based on additional field inspections of this cavity, URS was able to rule out prehistoric use of this natural erosional feature, which was found to be too narrow and too shallow to have served as a place of interment. Subsequently, the immediate area around the cavity was taped off so that other related construction activities (e.g., blading, equipment movement, etc.) would not adversely impact the cavity. On July 11, 2017, monitoring was carried out during the excavation of monopole structure no. 56/3. Observations of soil stratigraphy were recorded, and all depths were measured from the ground surface to the base of auger penetration. The total depth of the excavation was 20 ft. No cultural materials were identified.

From August 12-13, 2017, URS archaeologists performed spot-checks for 99 monopoles at three locations, including 53 structures within the Project ROW extending 10 km west of the Pecos River in Reeves County; 22 structures within the Project ROW extending 3.8 km east of the Pecos River in Ward County; and 24 structures within the Project ROW extending approximately 4.5 km across Monument Draw within the UL in Ward County. Spot-checks included visual inspection and photo documentation of disturbances to identify cultural resources. Spot-checks revealed that the areas around each monopole exhibited construction related disturbances from equipment access roads and from drilling operations; no evidence was found that indicated any deeply buried

cultural resource sites were impacted. However, two previously unrecorded, low-density historic surface scatters (41RV128 and 41RV129) and three new IFs (P-28, P-29, and P-30) were identified and recorded within the Project ROW. Both sites were found to exhibit poor integrity due to prior disturbances, and low research potential due to minimal information potential. Based on these observations, the portions of these sites within the Project ROW were not found to meet NRHP and SAL eligibility requirements. However, because each of these sites appears to extend beyond of the current Project ROW boundary, they have not been evaluated in their entirety and their overall NRHP and SAL eligibility is recommended to be Undetermined. The three new IFs are recommended as not eligible for NRHP or SAL designation.

Based on the final results of the survey, monitoring, and spot-checking investigations, no cultural resources sites eligible for listing in the NRHP or that merit SAL designation were identified within the Project ROW. It is therefore recommended that the project be allowed to proceed. Should the dimensions of the Project ROW change, additional archaeological investigations may be warranted.

Should any unmarked prehistoric or historic human remains or burials be encountered at any point during the Project, the area of the remains is considered a cemetery under current Texas law. All cemeteries are protected under State law and cannot be disturbed. Section 28.03(f) of the Texas Penal Code provides that intentional damage or destruction inflicted on a human burial site is a state jail felony. If a cemetery is identified in the Project ROW, all work in the immediate area of the discovery must cease and the THC must be notified by contacting the History Programs Division at (512) 463-5853 and the Archeology Division at (512) 463-6096. Following consultation with the THC, a treatment or avoidance plan would be developed and implemented.

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