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Cultural Resources Survey of the Lone Star Express II Pipeline Project - Loop 1, in Midland, Martin, Howard, Mitchell, and Nolan Counties, Texas

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HERITAGE MANAGEMENT

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Lead Agency:
The United States Army Corps of Engineers, Fort Worth District

SWG-2019-00091

Texas Antiquities Code Permit No. 8896

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ABSTRACT

Gray & Pape, Inc., of Houston, Texas, on behalf of Lone Star NGL Pipeline, LP, conducted an intensive pedestrian cultural resources survey within permitted areas of the 174.36-kilometer (108.34-mile) long Lone Star Express II Pipeline Project – Loop 1, in Midland, Martin, Howard, Mitchell, and Nolan Counties, Texas. The lead agency for the project has been identified as the United States Army Corps of Engineers, Fort Worth District (Permit No. SWG-2019-00091). Thus, survey efforts concentrated on areas anticipated to be under the jurisdiction of the United States Army Corps of Engineers (permit areas). Within Loop 1, the total Area of Potential Effects within the permit areas measures approximately 125.6 hectares (310.3 acres). This area encapsulates approximately 29.6 kilometers (18.4 miles) of proposed project alignment. In addition, approximately 2.3 kilometers (1.4 miles) or 8.9 hectares (21.9 acres) of the proposed route are controlled by the City of Colorado City and thus required the issuance of a Texas Antiquities Code Permit. Permit number 8896 was issued for the project. The procedures to be followed by the United States Army Corps of Engineers to fulfill the requirements set forth in the National Historic Preservation Act, other applicable historic preservation laws, and Presidential directives as they relate to the regulatory program of the United States Army Corps of Engineers (33 CFR Parts 320-334) are articulated in the Regulatory Program of the United States Army Corps of Engineers, Part 325 - Processing of Department of the Army Permits, Appendix C - Procedures for the Protection of Historic Properties.

All fieldwork and reporting activities were completed according to a scope of work submitted to the United States Army Corps of Engineers and the Texas Historical Commission and accepted standards set forth by the Texas Historical Commission and the Council of Texas Archeologists and in accordance with Section 106 of the National Historic Preservation Act. Gray & Pape, Inc. submitted project records to the Center of Archaeological Studies at Texas State University.

A records and literature review of the project location prior to survey identified 62 previously recorded archaeological resources, one cemetery, one historic marker, and 22 previously conducted surveys within a 0.8-kilometer (0.5-mile) radius of the Loop 1 segment. Of those, 10 recorded archaeological resources and six previous surveys intersect anticipated permit areas. Fieldwork on Loop 1 was conducted in the Spring of 2019 with supplemental survey in July, August, and September 2019. Survey of Loop 1 required approximately 1,200 Gray & Pape, Inc. person-hours to complete and involved archaeological reconnaissance and shovel testing throughout anticipated permit areas within the project corridor. In total, approximately 664 shovel tests were excavated within permit areas, 25 of which were positive for cultural materials. An additional 122 shovel tests were conducted as part of resource delineation efforts. Field effort also included the excavation of a total of 13 deep tests.

Nine previously recorded resources: 41NL6, 41NL313, 41NL314, 41NL315, 41NL316, 41NL320, 41NL321, 41NL323, and 41NL326; eight new previously unrecorded resources: 41HW142, 41MH128, 41MH130, 41NL377, 41NL378, 41NL379, 41NL380, and 41NL392; and four isolate finds were identified within Loop 1 permit areas. An additional 10 previously recorded resources: 41MD41, 41HW8, 41HW104, 41HW105, 41HW106, 41NL310, 41NL312, 41NL322, 41NL324, and 41NL325; and one newly identified resource, 41MH129, were identified within the Area of Potential Effects but outside of jurisdictional areas. These sites largely exhibited surface scatters of lithics which are typical for the area and were consistent with the resources identified within jurisdictional permit areas.

Two of the isolates, MH-48-ISO-01 and MH-50-ISO-01, were identified on properties controlled by the City of Colorado City. These finds consisted of one to two chert flakes each with no additional materials present. Only one resource (41MH128) is of historic age, consisting of surface remnants associated with a former nearby farmstead. The remainder are prehistoric. Prehistoric contents consist nearly entirely of surface scatters of artifacts, with artifact classes largely the same across each site, consisting mainly of debitage, with small numbers of cores, bifaces, and utilized flakes, and less than half of the permit area sites containing fire-cracked rock. On very few occasions, a preform, an identifiable tool such as a scraper, or a broken projectile point fragment were also observed.

In general, the resources appear to represent raw material procurement areas due to the abundant chert deposits available in the rocky soil. Activities are believed to have been largely limited to the procurement and testing of cobbles and expedient manufacture of bifaces. It appears that more refined tool manufacture was taking place elsewhere. None of the lithic scatters or isolates contained temporally or culturally diagnostic artifacts and no artifacts were collected. Nor were any cultural features or historic-age standing resources encountered in the field. The presence of fire-cracked rock suggests thermal features were once present at a few sites, but these are now deflated and dispersed. The resource areas within the pipeline corridor showed clear disturbance from the adjacent pipeline right-of-way. Indications of soil deflation, erosion, and past land modifications such as terracing were also observed. Soils within the resources were shallow and artifacts found subsurface were often within 0 to 10 centimeters (0 to 4 inches) and most likely are the result of pipeline disturbance or taphonomic processes. Deep test results undertaken adjacent to Sweetwater Creek in Nolan County indicated a lack of A horizon soils and showed no potential for deeply buried cultural material within the anticipated depth of impacts at the location.

Based on the overall sparsity of artifacts, lack of diagnostic materials, lack of soil deposition, and lack of integrity, it is the opinion of Gray & Pape, Inc. that none of the recorded resources portions located within the proposed right-of-way retain the potential to provide significant research value and are thus recommended not eligible for the National Register, under Evaluation Criterion D. In addition, all are recommended not eligible for State Antiquities Landmark status. Gray & Pape, Inc. recommends no additional archaeological work for these resources or surveyed permit areas of the project. However, Gray & Pape, Inc. recommends that an unanticipated discoveries plan be put into place in the event that such discoveries take place during construction.

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1.0 INTRODUCTION

EDGE Engineering and Science, LLC (EDGE), of Houston, Texas, contracted with Gray & Pape, Inc. (Gray & Pape), of Houston, Texas, and Horizon Environmental Services, Inc. (Horizon) to perform an intensive pedestrian cultural resources survey within portions of the Area of Potential Effects (APE) of the Lone Star Express II Pipeline Project-Loop 1, located in Midland, Martin, Howard, Mitchell, and Nolan Counties, Texas.

The lead agency for permitting purposes has been determined to be the United States Army Corps of Engineers, Fort Worth District (USACE). Thus, survey efforts were conducted within portions of the APE anticipated to be within USACE permit areas. The procedures to be followed by the USACE to fulfill the requirements set forth in the National Historic Preservation Act (NHPA), other applicable historic preservation laws, and Presidential directives as they relate to the regulatory program of the USACE (33 CFR Parts 320-334) are articulated in the Regulatory Program of the USACE, Part 325 - Processing of Department of the Army Permits, Appendix C - Procedures for the Protection of Historic Properties. All fieldwork and reporting activities were completed with reference to state (the Antiquities Code of Texas) and federal (NHPA) guidelines.

Most of the project is located on private property. However, portions of the route are controlled by the City of Colorado City, a political subdivision of the state. Thus, Texas Antiquities Code Permit No. 8896 was issued for the project.

The following report includes the results of the archaeological survey completed within anticipated permit areas along approximately 174.36 kilometers (108.34 miles) of centerline in Loop 1.

1.1 Project Overview

Lone Star proposes to construct, operate, and maintain an approximately 174.36 kilometers (108.34 miles) of 24-inch outside diameter NGL pipeline loop in Martin, Midland, Howard, Mitchell, and Nolan Counties, Texas (Figure 1-1). The purpose of the proposed Lone Star Express II Pipeline Project will add approximately 400,000 barrels per day of NGL capacity to the existing Lone Star Express system which will help alleviate infrastructure constraints out of the Delaware and Permian basins in West Texas. The proposed Loop 1 portion of the project will increase system capacity between the existing LSXI Baden Pump Station in Martin County, Texas, and the existing LSX2 Pump Station in Nolan County, Texas.

The pipeline will begin at the existing Lone Star's LSXI Baden Pump Station in Martin County and will terminate at Lone Star's existing LSX2 Pump Station in Nolan County. The proposed pipeline loop will generally be constructed within existing utility corridors and has been designed to parallel the existing Lone Star Express I Pipeline. New permanent facilities will be constructed alongside the existing Lone Star Express Pipeline facility locations where possible. Construction is currently scheduled to begin on September 1, 2019. The anticipated in-service date for it is January 2020.

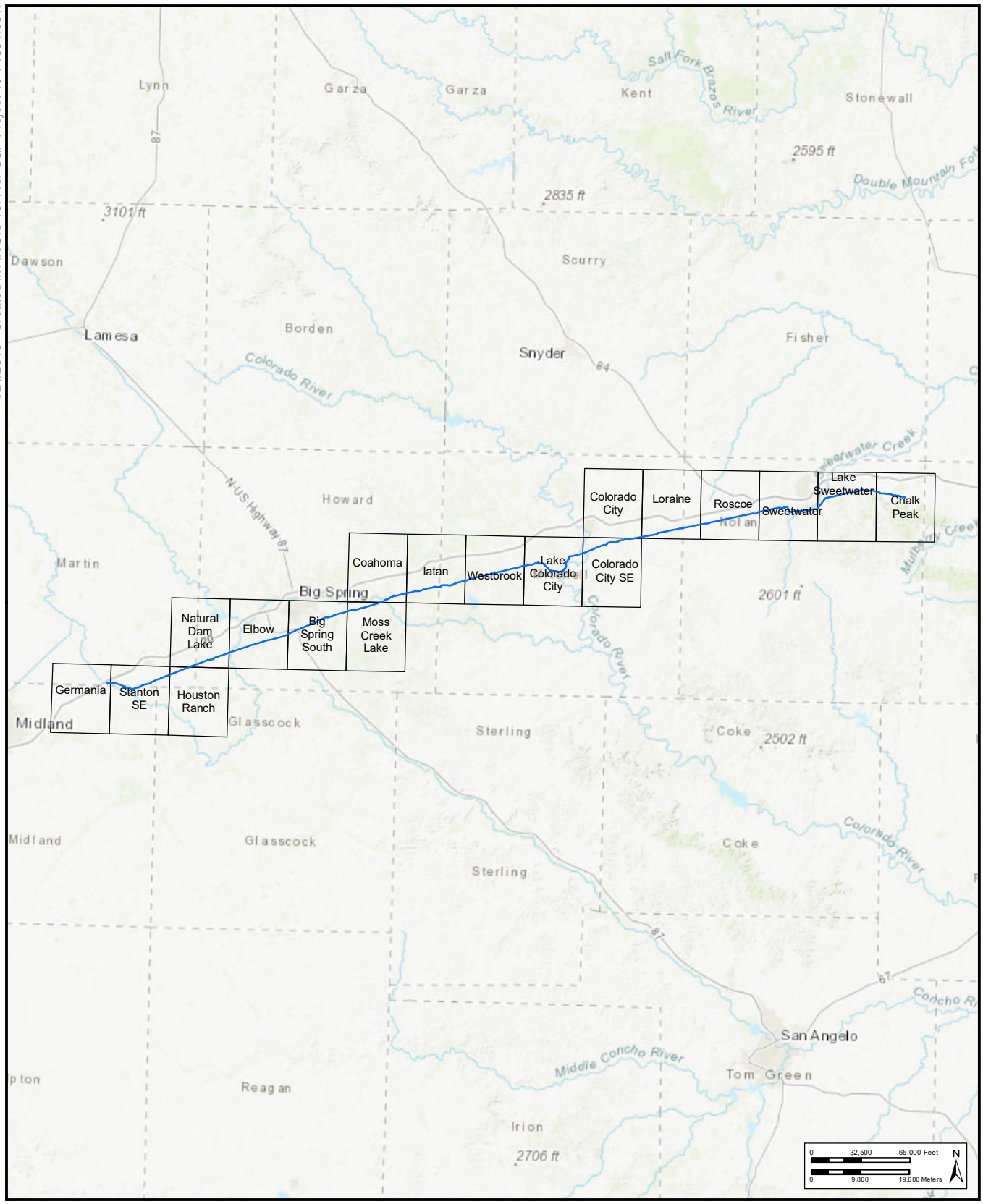
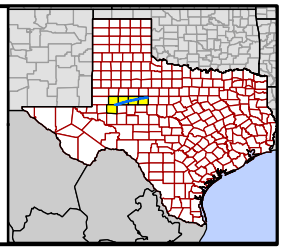


Figure 1-1
Project location in Midland, Martin, Howard, Mitchell, and Nolan Counties, Texas.

Project Location
USGS Quadrangle Boundary



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Loop 1 intersects 18 USGS 7.5-minute topographic quadrangle maps (Figure 1-1, Table 1-1). Loop 1 begins approximately 14.23 kilometers (8.84 miles) southwest of Stanton in Martin County and continues 10.65 kilometers (6.62 miles) southeast into Midland County, then extends approximately 163.7 kilometers (101.72 miles) to the northeast through Howard, Mitchell, and Nolan Counties before terminating approximately 6.15 kilometers (3.82 miles) southwest of Sweetwater in Nolan County (Figure 1-1). The project area within Loop 1 roughly parallels Interstate 20 to the north. Along that path the APE is largely collocated with an existing pipeline corridor and intersects several major and county roads, unimproved roads, oil fields, and agricultural fields. Loop 1 also crosses approximately 20 natural waterways (Table 1-2).

The anticipated USACE Permit Area/APE for Loop 1 consists of approximately 29 kilometers (18 miles) of centerline or approximately 120.6 hectares (298 acres) of project survey corridor. The breakdown of area/length per county is provided in Table 1-3. In addition, approximately 2.3 kilometers (1.4 miles) of the proposed route fall within City of Colorado City property, and thus are investigated under Texas Antiquities Code Permit No. 8896.

Table 1-1. USGS Quadrangles Intersecting Loop 1.

USGS Quad ID	Name	State	Date Revised	Date Published	Date Photo Revised
32101-B6	Natural Dam Lake	Texas	-	69	-
32101-B5	Elbow	Texas	76	79	-
32101-B4	Big Spring South	Texas	76	79	-
32101-B3	Moss Creek Lake	Texas	-	74	76
32101-A8	Germania	Texas	74	75	-
32101-A7	Stanton SE	Texas	-	69	-
32101-A6	Houston Ranch	Texas	-	68	-
32101-C3	Coahoma	Texas	-	74	76
32100-D7	Colorado City	Texas	77	80	-
32100-D6	Loraine	Texas	-	72	-
32100-D5	Roscoe	Texas	-	72	-
32100-D4	Sweetwater	Texas	-	73	-
32100-D3	Lake Sweetwater	Texas	-	72	-
32100-D2	Chalk Peak	Texas	-	84	-
32101-C2	Iatan	Texas	76	79	-
32101-C1	Westbrook	Texas	76	79	-
32100-C8	Lake Colorado City	Texas	76	79	-
32100-C7	Colorado City SE	Texas	76	79	-

Table 1-2. Natural Waterways Crossed by Loop 1.

Waterway Name
Plum Creek
Idlewild Creek
Bitter Creek
Stink Creek
Little Stink Creek
Noodle Creek
Sweetwater Creek
Beals Creek
Colorado River
Red Draw
Plum Draw
Hamilton Draw
Elbow Creek
Morgan Creek
Wildhorse Creek
Unnamed Tributary of Beals Creek
North Fork Champion Creek
Mustang Draw
Dugout Creek

Table 1-3. Permit Areas by County.

County	Permit Area Count	Acres	Miles
Martin	3	17.00	1.0
Howard	14	75.3	4.2
Mitchell	20	111.5	6.9
Nolan	17	93.9	5.4
Total	**54**	**297.7**	**17.5**

1.2 Report Organization

This report is organized into seven numbered chapters and two lettered appendices. Chapter 1.0 provides an overview of the project. Chapter 2.0 presents an overview of the environmental setting and geomorphology. Chapter 3.0 presents a discussion of the cultural context associated with the APE. Chapter 4.0 presents the research design and methods developed for this investigation. The results of this investigation are presented in Chapter 5.0. Chapter 6.0 presents the investigation summary and provides recommendations based on the results of field survey. A list of literary references cited in the body of the report is provided in Chapter 7.0. Maps of the field survey results for Loop 1 are displayed in Appendices A and B.

1.3 Acknowledgements

Fieldwork on Loop 1 was conducted between March and May 2019 and again between August and September 2019 and required approximately 1,256-person hours to complete. The project was managed by Senior Principal Investigator Tony Scott. Field activities were conducted by Gray & Pape Field Leaders Chris Baltz, Matthew Kinsey, Kyle Mayer, and Charlie Rose, along with Technicians Lindsay Gundler, William Leake, Marie Swartz, Jonathan Cooper, Linsey Griffin, Petrina Kelly, Katrina Miller, Kaitlin Roberts, Steven Sykes, and Amanda Kleopfer. Field efforts were also conducted by Horizon Field Leader Elizabeth Sefton and Field Technicians Dan Cambiano, McKinzie Froese, Duncan Foster, and Steven Schooler under the guidance of Horizon Project Manager Jesse Owens. The report was prepared by Tony Scott and Amanda Kleopfer. Graphics were produced by Tony Scott. Jessica Bludau edited and produced the report.

Gray & Pape extends a special thank you to Lone Star Construction Manager Mike Churchman, Assistant Construction Manager Clyde McDonald, and Pipeline Inspectors Jimmy Preece, Craig Kitchens, Jeff Burns, Bill Laird, and Shane Holdridge, whose assistance and knowledge was instrumental in the timely and safe completion of the survey effort.

2.0 ENVIRONMENTAL CONTEXT

2.1 Physiography and Geomorphology

Most of the project is situated in the Southern High Plains and North Central Plains areas of the Interior Plains physiographic region. The Southern High Plains, which includes Midland and the surrounding counties, are characterized by a nearly level to low rolling topography situated on an elevated plateau. This area includes portions of the *Llano Estacado*, a large, flat mesa that covers parts of New Mexico and northwest Texas. The area as a whole is dotted by more than 20,000 playa lakes, with many older such features buried under wind deposited sands. These ephemeral lake basins formed as a result of deflation and karstic processes and served as a valuable water source for both wildlife and humans (Ferring 2007). The paleogeographic setting was a deep ocean basin surrounded by shallow carbonate platforms (Bureau of Economic Geology [BEG] 1996). The eastern portion of the project, which includes Mitchell and Nolan Counties, is characterized by the rolling plains of the North Central Plains Physiographic region. The rolling terrain was created by the effects of erosion from ancient streams, leaving a landscape that is also steeply sloped in areas of highly dissected riverine edges (BEG 1996).

2.2 Surface Geology

Loop 1 crosses 14 geologic formations (Table 2-1). The surface deposits across the western portions of the project primarily consist of Holocene-age windblown cover sands underlain by Pleistocene-age fluviatile terrace deposits.

Table 2-1. Geologic Groups/Formations Intersected by Loop 1.

Label	Formation/Group	Age	Rock Type 1	Rock Type 2
Ka	Antlers Sand	Early Cretaceous	sand	clay or mud
Ked	Edwards Limestone	Early Cretaceous	limestone	dolostone (dolomite)
PoMo	Ogallala Formation	Pliocene to Miocene	sand	silt
Pwh	Whitehorse Group, undivided	Permian; Guadalupe Series	sandstone	shale
Qal	alluvium	Holocene	sand	silt
Qbd	Blackwater Draw Formation	Pleistocene	sand	silt
Qli	Lingos Formation	Middle (?) Pleistocene to Recent	sand	gravel
Qs	Sand sheet deposits	Holocene	sand	silt
Qsd	Sand dune deposits	Holocene	sand	silt
Qse	Seymour Formation	Middle Pleistocene; Irvingtonian	sand	gravel
Qt	Terrace deposits	Pleistocene and Holocene	terrace	sand
Qta	Tahoka Formation	Pleistocene; Wisconsinan	clay or mud	silt
Qu	Quaternary deposit, undivided	Quaternary	sand	silt
TRd	Dockum Group, undivided	Late Triassic	fine-grained mixed clastic	limestone

2.3 Soils

Loop 1 intersects approximately 91 soils (Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture [SSS NRCS USDA] 2019). Loop 1 is represented by the Patricia-Brownfield-Nutivoli, Miles-Delwin-Woodward, and Tillman-Vernon-Hollister soil associations (BEG 2008). Patricia-Brownfield-Nutivoli associations are generally characterized as deep, well-developed sandy soils that increase in clay and calcium carbonate content with depth (USDA-NRCS Soil Survey Office [SSO] 2008). Moving east to the SWTOI and CTOA segments, soils are representative of the Miles-Delwin-Woodward and Tillman-Vernon-Hollister associations (BEG 2008). These soils are generally characterized as reddish, well-developed soils that can be moderately deep before transforming into sandstone and mudstone bedrock (USDA-NRCS SSO 2008).

Martin County contains red moderately fine-textured to sandy loams overlying clay loam, with a horizon of calcium carbonate, while Midland County has sandy red and dark loams. Howard County soils are comprised of brown to dark brown sandy clay loam or crumbly clay loam overlying reddish-brown sandy clay loam to clay loam, with lime accumulations. Mitchell County contains sandy, red, and loamy soils. Clay can be found in the western portion of the county, while the northern and eastern areas contain reddish-brown loam overlying brown to yellowish-red sandy clay loam with a yellowish-brown sandstone sub-layer. Parts of the county that are at lower elevations have reddish-brown fine sandy loam overlying reddish-brown crumbly loam on top of reddish-brown to yellowish-red sandy clay loam. Nolan County soils range from dark brown gravelly clay loam atop limestone bedrock to grayish brown gravelly clay loam overlying white caliche to reddish-brown loam atop red mottled sandstone (SSS NRCS USDA 2019).

2.4 Natural Environment

The western portion of the project area is largely dominated by Mesquite brush and grassland (BEG 2000). As the project moves east, the Mesquite shrub becomes more interspersed and, in some places, entirely replaced with agricultural crops (BEG 2000). Local plants include oak, sand sage, acacia, yucca, prickly pear cactus, juniper, mesquite, and buffalo grass. Wildlife include the critically endangered lesser prairie chicken, as well as mammal species such as deer, fox, raccoon, skunk, opossum, badger, ringtail cat, bobcat, coyote, and peccary (Griffith et al. 2007). Other species inhabiting the area include waterfowl, rattlesnake, raptor, and jackrabbit (Lowther 1981). Loop 1 lies within the Kansan and Balconian biotic provinces. The Kansan biotic province contains grassland species, along with some Austroriparian species. The Balconian biotic province contains a mix of Austroriparian, Tamaulipan, Chihuahuan, and Kansan province species (Blair 1950).

2.4.1 Climate

The project area has a semi-arid climate. Rainfall is typically less than 33 centimeters (13 inches), most of which falls during spring and early summer storms. The level landscape and high intensity rains can lead to flash flooding. Summer temperatures can be intense, but a large diurnal range and low humidity results in relatively cool evenings, even in the hottest times of the year. Winters are highly variable, with cold fronts, and occasional light snows, quickly followed by rapid warming. Dust storms are also common in late winter and early spring, and dust can hang in the air for days, leading to hazy skies (Stoner 1974; Stoner et al. 1969,1974).

2.5 Land Use

Land use is largely split into two broad categories: 1) oil and gas infrastructure activities, and 2) agricultural including livestock. Most of the former are located throughout Midland and Martin Counties. A small portion

of Loop 1 crosses a suburban area on the outskirts of Big Spring. For the most part, portions of the project not used for agriculture are covered by desert grasses and mesquite scrub. Much of the project length is collocated and shows clear signs of disturbance from adjacent pipeline corridors and supporting infrastructure.

3.0 CULTURAL CONTEXT

3.1 Prehistoric Context

Prehistoric sites in the Southern High Plains and Central Plains regions are commonly found on the surface and in mixed context (Meltzer 1987). Sites are typically located along the remnants of draws, playas, and larger salina basins that have been filled in by eolian processes (Johnson and Holliday 2004). The majority of known prehistoric Clovis, Folsom, and Late Paleoindian archaeological sites in Texas are found in portions of the High Plains region near New Mexico and western Oklahoma. The general area was near the southernmost reach of now extinct megafauna in the United States and included mammoth and a large form of bison, which were frequently hunted by prehistoric groups.

Sites with historical components in the region date as far back to the 1700s as was recorded in Blanco Canyon. Most historic sites in the area represent materials left behind by Hispanic sheepherders called *pastores*, European buffalo hunters, military outfits, and Anglo dumpsites (Perttula 2004).

Archaeological materials that have contributed to the development of a five-period cultural chronology, as developed by Kelley (1964) and Prikryl (1990), in the area based on excavations at a handful of intact sites. For the purpose of this report, an attempt is made to generalize these periods in the following paragraphs; however, it should be noted that cultural periods are not equally represented across the varying ecological and physiographic areas that the project intersects.

3.2 Paleoindian Period

The Paleoindian period falls within the latter part of the Pleistocene and into the early Holocene. It is generally agreed to have begun as far back as 11,500 years before present (B.P.) and continued until 8,500 B.P. and is marked by ubiquitous hunting and on-site butchering of megafauna in small nomadic groups. Martin, Midland, and Nolan Counties contain a number of sites in the vicinity of the APE from this time period.

The Paleoindian period is further subdivided into three more specific periods marked by projectile point technologies (Frison 1991; Holliday 1997; Wheat 1972; Wormington 1957). These include the well-known Clovis, Folsom, and Late Paleoindian periods. The Clovis period is thought to have endured at least 500 years during the latter part of the Pleistocene and its lithic technology is the oldest known in North America. Clovis points are lanceolate-shaped with short flutes (Turner and Hester 1993). Clovis points are large, heavy, and well-made tools that were used for puncturing the thick flesh of large game. The Folsom period, from 10,800-10,300 B.P., is also defined by a large fluted lanceolate-shaped point. Folsom points look similar to the Clovis point, but are thinner, more symmetrical, evenly chipped on the edges, and have a single classic flute all the way up the center of the point (Turner and Hester 1993). The Late Paleoindian period, from 10,000-8,500 B.P, is characterized by excellent craftsmanship of long, thin, narrow, lanceolate points without flutes. Instead, these points have parallel flakes and are ground with thinned bases typically accomplished with a few vertical flakes (Turner and Hester 1993). Paleoindian sites of note located in the Southern High Plains and Central Plains regions include the Lone Wolf Creek (41MH23), Midland (41MD1), and McClean (41TA29) sites.

3.3 Archaic Period

Following a transition to a warmer climate, the Archaic period is accepted to have lasted between 8,500-1,250 B.P. The Archaic period is marked by an adaptation to less abundant water resources and to more dependence on

vegetation as a food source than compared to people living in the Paleoindian period (Johnson and Holliday 2004). The Archaic period is further subdivided into two periods, known as the Early and Late Archaic periods, which the former is characterized by a lack of occupational sites in the area during a time called the Altithermal when the land was hot, dry, and dusty. The Late Archaic is defined by a sudden increase in the number of sites around 4,500 B.P., when a noticeably milder climate with less hostile conditions returned to the area (Antevs 1954; Hughes 1991). Archaic sites are commonly associated with fewer megafauna kill sites than earlier Paleoindian sites. Such sites are often associated with an array of stemmed and later barbed dart points, ground stones, and hearths lined with burned stone and caliche-cobbles (Hofman 1989).

3.4 Late Prehistoric Period

The Archaic period was followed by the development of ceramic technology and the bow and arrow. These two inventions made way for significant sociocultural changes including a shift toward sedentism and decreased mobility. These developments are the hallmarks of the Late Prehistoric period, which lasted from A.D. 200-1450.

Because of more specific diagnostic traits associated with the Late Prehistoric, it is further subdivided into the Woodland period (A.D. 200-1450), the Palo Duro Complex (A.D. 500-1100), and the Antelope Creek Phase (A.D. 1200-1450). The Lake Creek Site in the Texas Panhandle represents the Woodland period in the High Plains, which is characterized by cordmarked ceramics, corner-notched Scallorn arrow points, and a large assemblage of lithic flake tools (Hughes 1962). Palo Duro Complex Sites are defined by the use of pit houses and evidence of plant food procurement and processing. The first evidence of such was gathered during excavations by Willey and Hughes (1978) of the Deadman's Terrace Site, more commonly called Deadman's Shelter.

Finally, the Antelope Creek Phase, sometimes called the Antelope Creek Focus, is the most distinctive and well-known of the Late Prehistoric periods in the Panhandle. Hughes (1991:31) documents the highest density of Antelope Creek Sites occurring along the Canadian breaks. Antelope Creek sites are best known by their pueblo-like structures with numerous rooms. These sites are also commonly identified by the presence of bone tools, made from butchered bison, scrapers, grinding slabs for plant processing, and sometimes obsidian (Hughes 1991).

3.5 Protohistoric Period

The Protohistoric period dates from A.D. 1450 to AD 1600. It is defined by documented trade activities with neighboring Pueblos and increased ceramic production projectile points that seem to be confined to one of two subdivisions of the Protohistoric. The Tierra-Blanca Complex and the Garza Complex are contemporary. The Tierra-Blanca Sites are thought to have traded with the New Mexico Pueblos and are typically identified by the presence of larger villages (Hughes 1991). The Garza Complex is associated with the Garza point type which seems to only appear at Garza Complex sites. Other point types found at Garza Complex sites include the Washita, Harrell, Lott, and Fresno (Hughes 1991).

3.6 Historic Period

Several Native-American tribes are known to have inhabited the area prior to Spanish contact in 1541; these include the Apache, Comanche, Kiowa, and Kiowa-Apache (Newcomb 1961). In the nineteenth century, the area was inhabited by the Kiowa and Comanche tribes, who preferred free range over Oklahoma's reservations (Whitlock 1970). By then, the Comanche had displaced the Apache. It is widely known that by the nineteenth century, aboriginal groups remaining in the High Plains had begun exploiting horses for use during hunting and raiding. During that time, the

Comanche were assigned by the Army to reservation life in Oklahoma (Newcomb 1961).

3.7 Historical Context of the Region

The earliest written descriptions of the north-central region of Texas come as a result of Spanish exploration of the areas to the north and west of the current project. The cliff on the north facing side of the Canadian River was seen by Francisco Vásquez de Coronado in 1541 on his way east from Cíbola, leading him to name the plateau the Llano Estacado, or *Palisaded Plain*. In addition to recording the initial explorations of the Llano Estacado, Coronado developed the region's orientation toward the Hispanic Southwest. Coronado's efforts were mimicked by Juan de Oñate during an early seventeenth century expedition along the Canadian River. In 1872, the Llano Estacado was described by General Randolph Marcy as a "great North American desert" with "not a tree, bush or water" (Whitlock 1970).

At the time, buffalo herds were common across the Llano Estacado. In the 1870s, conflict between American buffalo hunters and regional Native-American tribes reached its apex in the Red River War. Military defeat and the slaughter of the buffalo herds forced the Comanches, Kiowa, Cheyenne, and Arapaho off the plains to reservations (Haley 2010).

The area was originally organized as Tom Green County in 1874. The massive area would eventually be subdivided into 66 modern counties (Henderson 2010). White settlement in the region remained sparse, with large cattle ranches being the primary industry. Irrigation diverted from the Pecos allowed for agriculture in some areas, but repeated drought and floods often disrupted production. It wasn't until the 1920s and the discovery of oil that the region experienced significant growth. Subsequent booms and bust within the petroleum and natural gas industries have continued to be the major driver of development of the region into the present day (Justice and Leffler 2010; Smith 2010; Leffler 2010).

4.0 FIELD METHODOLOGY

This cultural resource investigation was designed to identify and assess new and previously recorded cultural resources that may be impacted by the proposed project. Desktop assessment and modeling were performed prior to initiating field investigations to better understand cultural, environmental, and geological settings. Results of the desktop assessment were then used to develop the field methodology.

4.1 Site File and Literature Review

The background literature search included a review of previously conducted cultural resource surveys in the vicinity of the proposed project area, and of any historical document pertaining to the history of the area. Site file research was performed to identify all previously recorded archaeological sites within a 0.8-kilometer (0.5-mile) study radius of the project area and any recorded historic structures eligible for the National Register of Historic Places (NRHP) or State Antiquities Landmark (SAL) listing located adjacent to the project area. Site file research was done by reviewing records maintained by the Texas Archeological Research Laboratory in Austin, Texas, and by consulting the Texas Historical Commission (THC).

Historical topographic maps and aerial photographs, when available, were reviewed to identify any historic structures, residential, and other structures that might be located close to or within the project area. Historical maps of Texas and Texas counties were also reviewed in order to better understand the history of the region and to identify any potential historic trails and important historic sites located or crossing the project area.

4.2 Field Methods

4.2.1 Intensive Pedestrian Survey

The project was subjected to pedestrian survey within permit areas. Permit areas were based on water features which were field delineated by biological field crews in conjunction with the cultural resource survey. The permit areas for each water feature was assessed on a case-by-case basis but in general comprised the first terrace to first terrace of large perennial creeks and rivers that intersect the APE. For smaller streams and water features without terraces, a minimum baseline buffer area placed to either side of the water feature was assessed. These buffer areas consist of 180 linear meters (600 linear feet) to either side of larger perennial and intermittent drainages and 100 linear meters (300 linear feet) to either side of some intermittent and ephemeral drainages, wetlands, and catch basins. Preliminary permit areas were further modified based on additional data such as geological units, soils, riparian areas, and previously identified resources. Based on the project's typical corridor width of 39.6 meters (130 feet), two transects were investigated, with additional transects added as needed for wider temporary workspaces. Transects were spaced no more than 30 meters (100 feet) apart. Because most of the project APE is collocated with an existing pipeline corridor, which at times subsumes half or more of the total corridor width, one survey transect was often within an existing pipeline easement. Existing easements were routinely maintained and often displayed greater than 30 percent surface visibility. Survey transects overlapping existing easements were at a minimum subjected to pedestrian surface inspection/walkover and also judgmentally shovel tested where warranted to confirm/refute suspected subsurface disturbance. Digital photography aided documentation of the existing conditions of the project area and fieldwork methods, with photograph locations recorded on field maps and logged with a global positioning system (GPS) unit.

Shovel testing within permit areas and areas subject to the state antiquities code was attempted along each transect at a number

which met or exceeded Texas State Minimum Archaeological Survey Standards regardless of surface visibility. Shovel tests were generally spaced at intervals between 30 and 60 meters (100 and 200 feet). In areas of clear previous disturbance or areas of lower probability for cultural resources, shovel tests were not to be conducted at a distance greater than 100 meters (328 feet). Shovel tests were attempted to depths of 1 meter (3.3 feet) or until culturally sterile subsoil was reached, except where bedrock was present at shallow depths, or where potential existing pipelines were present.

All shovel tests measured approximately 30 centimeters by 30 centimeters (1 foot by 1 foot). When possible, all soil was screened through 0.64-centimeter (0.25-inch) wire mesh. Vertical control of each shovel test was maintained by excavating in arbitrary 10-centimeter (4-inch) levels with reference to the parent soil stratum. The profile of each shovel test was inspected for color and texture change potentially associated with the presence of cultural features. Descriptions of soil texture and color followed standard terminology and soil color charts (Munsell 2005). Additional information such as mottling, evidence of disturbance, and moisture level was also recorded. All shovel test data were recorded on standardized forms for analysis. All shovel tests were backfilled after excavation and documentation. The excavated shovel tests were placed on field maps and points were taken with GPS.

4.2.2 Deep Testing

One permit location in Loop 1, Sweetwater Creek in Nolan County, was identified as a likely candidate for deep testing based on geomorphological data, project plans, and field survey results in conjunction with agency coordination. The location contains Holocene-age alluvial deposits and soils mapped for the location have the potential for a deep A horizon. Agency consultation concurred with the use of machine auguring at the location. Auger tests were placed at 50-meter (164-foot) intervals, conducted along a single transect placed outside of the existing pipeline right-of-way (ROW) for safety concerns. Mechanical auguring was conducted with reference to the most recent draft of the Council of Texas Archeologists (CTA) guidelines. Soil matrix removed during auguring was placed on plastic tarp to keep it separated from the surrounding vegetation. The removed material was monitored for texture and color changes and screened using ¼-inch mesh. Descriptions of soil texture and color followed standard terminology and the Munsell (2005) soil color charts. The locations of all deep tests were recorded with a sub-meter accurate GPS data collector and recorded on field maps.

4.2.3 Site Definition

Surface visibility along the entire project length was generally 70 percent or greater. Thus, all previously recorded sites that intersect the APE within permit areas were subjected to surface inspection supplemented by a sample of shovel tests placed at regular intervals within the previously established site boundary to check for deposition and density. The number and interval of these sample shovel tests was determined by the field Archaeologist on a case-by-case basis but generally was based on the previously established site size, previous disturbance, landforms, amount of surface visibility, and perceived areas of surface density. Beyond the previously or newly established site boundary, a minimum of six radial shovel tests were conducted in 10-meter (33-foot) intervals in cardinal directions within the limits of the APE. Delineation tests were pursued until reaching two consecutive negative tests.

Newly identified sites were delineated in the same manner. Positive shovel tests, artifacts visible on the surface, and site boundaries were recorded on project maps and via sub-meter accurate GPS. Newly identified sites and revisited previously recorded sites were also documented on standardized archaeological site forms.

For each cultural resource identified, including structures or other resources within or immediately adjacent to the APE, photographs were taken of the general vicinity and of any visible features, if present. A sketch map was prepared showing site limits, feature locations, permanent landmarks, topographic and vegetation variations, sources of disturbances, and total number of tests performed within and near the site. Artifacts recovered from shovel tests were not to be collected. All discovered artifacts were photographed in the field and placed in the backfilled shovel test or left on the surface. Locations of all positive tests were recorded with the GPS.

Each identified resource was given a temporary field site number. Site forms were submitted for each cultural site identified. Revisit site forms were completed for previously recorded sites re-identified in the field. State-issued trinomial site numbers were requested for cultural sites but not for identified isolates.

If any architectural resources had been identified, these would have been recorded on corresponding field forms. Details of form, construction, material, style, condition, and alteration would be recorded both on the forms and photographically for each structure. All documentation would be reviewed by a qualified Architectural Historian who would decide if additional information or a personal field inspection was necessary at the survey level.

4.3 Laboratory Analysis

4.3.1 Artifact Analysis

Artifacts encountered in the field were not collected; thus, no lab analysis was conducted. Artifacts were instead described and classified in the field as best as possible and representative samples were photographed. Data recorded in the field for uncollected artifacts included general attributes such as form (if identifiable), material, functional classification (if identifiable), and counts.

4.4 Curation

No diagnostic or non-diagnostic artifacts were collected in the course of the current survey. As a project permitted through the THC; however, Gray & Pape submitted project records to the Center of Archaeological Studies at Texas State University.

5.0 RESULTS OF INVESTIGATIONS

5.1 Result of Site File and Literature Review

A search of the Texas Archeological Sites Atlas, maintained by the THC, determined that no National Register properties intersect the project alignment within Loop 1. The same research identified that 62 previously recorded archaeological sites, 22 previously conducted archaeological surveys, one historical marker, and one cemetery had been recorded within the 0.8-kilometer (0.5-mile) study radius of the project area.

5.1.1 Previously Recorded Surveys

According to a search of the Texas Archeological Sites Atlas, at least 22 previous surveys have been conducted within a 0.8-kilometer (0.5-mile) study radius of Loop 1 (Table 5-1, Appendix A). Fourteen of those surveys intersect the project alignment; however, all but two of these consist of narrow survey corridors and do not significantly overlap the current project. Two previously conducted surveys, the Permian Express II Pipeline (Karpinski et al. 2014) and the Lone Star Express 24-inch Pipeline Project (Turpin and Sons, Inc.), both overlap significant portions of the current project; however, the Turpin and Sons project is not published and no data regarding survey coverage is available. The most recent of these surveys were conducted by Tetra Tech, SWCA, AR Consultants, ACI Consulting, and others. A review of reports associated with these and other surveys in the vicinity indicated a mix between 100 percent survey coverage and survey of USACE jurisdictional water crossings. Survey findings suggests that while archaeological sites are not uncommon in the general vicinity, they do not typically contain the information that would result in a recommendation for eligibility. Some of these resources are discussed further in-depth below.

5.1.2 Previously Recorded Archaeological Resources

Per a search of the Texas Archeological Sites Atlas, 62 previously recorded archaeological resources occur within the 0.8-kilometer (0.5-mile) study radius of the project area. Of those 62 resources, 23 are located within 91 meters (300 feet) of the APE (Table 5-2). And 10 of those are potentially located within permit areas. Those 10 resources, or at least portions of them, have been previously determined to be ineligible for listing on the National Register. Nine of those resources were re-identified during survey and are described in greater detail in Section 5.2.2 of this report. Previously recorded resource 41NL317 was not re-identified during the current survey effort.

5.1.3 Historical Markers

One historical marker is recorded within 0.8 kilometers (0.5 miles) of the project (Figure A23). Marker number 1146, entitled "Wallace, D.W. '80 John' (1860-1939)" was established in 1965, and commemorates the marker's namesake, who was a child of slaves before emancipation. At 15 years old he became a cowboy and rode for a local rancher beginning in 1877. He eventually became a ranch owner himself. As an adult he went back to school and his emphasis on education was passed to his children, some of whom became teachers (THC 2019).

5.1.4 Cemeteries

Only one cemetery is located within the 0.8-kilometers (0.5-miles) radius of the Loop 1 project area (Figure A23). The Wallace Cemetery (No. MH-C010) is located approximately 200 meters (656 feet) south of the project corridor at its closest. The Wallace family cemetery is located west of County Road 424 near Loraine, Texas, and includes the property's namesake, D.W. "80 John" Wallace along with approximately 19 other family members.

Table 5-1. Previously Recorded Surveys within 0.8 Kilometers (0.5 Miles) of the Proposed Loop 1 Project Area.

Project Type	Date	TAC Permit No.	Sponsor/Agency	Investigating Firm	Report Author	THC Review Date
Area Survey	10/2/2002	2765	Texas Parks and Wildlife Department (TPWD)	TPWD	Hicks, Kent	4/2/2004
*Area Survey	12/2/2002	2775	Lower Colorado River Authority	LCRA	Malof, Andrew F.	12/21/2002
*Area Survey	11/15/2007	4656	Federal Housing Administration (FHA)	PAI Inc	Griffith, Timothy B.	4/17/2008
*Area Survey	8/1/2011	-	Public Utility Commission (PUC)	ACI Consulting	Kimbell, Jennifer H., et al.	11/21/2011
*Area Survey	5/1/2011	-	PUC	ACI Consulting	Kimbell, Jennifer Hatchett, et al.	9/7/2011
*Area Survey	8/10/2012	-	PUC	ACI Consulting	Scott, Ann	8/10/2012
*Area Survey	1/11/2013	6407	Texas Water Development Board (TWDB)	AR Consultants	Hall, Molly, Nick Coleman	1/30/2013
Area Survey	3/21/2013	6402	Environmental Protection Agency (EPA), County of Mitchell	SWCA	Stotts, Matthew C., et al	6/6/2013
Area Survey	3/20/2013	6402	EPA	SWCA	Stotts, Matthew C. et al.	4/28/2014
*Area Survey	5/2/2014	-	Sunoco Pipeline, L.P.	Tetra Tech, Inc.	-	8/18/2014
*Area Survey	2015	-	Lone Star NGL Pipeline, LP	Turpin and Sons, Inc.	Burgess and Davis	2015
Eligibility Testing	6/1/1986	-	FHWH	-	-	4/2/2004
*Linear Survey	04/1979	-	EPA	-	-	-
*Linear Survey	07/1984	-	EPA	-	-	-
Linear Survey	07/1984	-	EPA	-	-	-
Linear Survey	04/1979	-	EPA	-	-	-
Linear Survey	06/1982	-	FWCOE	-	-	-
*Linear Survey	09/1987	-	SDHPT	-	-	-
*Linear Survey	11/1993	-	SDHPT	-	-	-
*Linear Survey	11/1993	-	PUC	-	-	-
Linear Survey	08/1983	-	TDHPT	-	-	-
*Linear Survey	03/2001	-	EPA	-	-	-

*Indicates an intersection with the current project.

Table 5-2. Previously Recorded Archaeological Resources within 91 Meters (300 Feet) of the Loop 1 Project Area.

Trinomial	Site Type	Cultural Affiliation	Materials Observed	Record Date	NRHP Status	NRHP Review Date
*41HW8	Quarry/ Procurement	Unknown Prehistoric	Flint nodules, fire hearths, lithic debitage	11/3/2015	Ineligible within ROW	10/28/2015
41HW104	Lithic Scatter	Unknown Prehistoric	Chert cores, unifaces, bifaces, flakes, and debitage	10/12/2011	Ineligible within ROW	10/28/2015
41HW105	Lithic Scatter	Unknown Prehistoric	Secondary flakes, exhausted core, chert core, edge modified tool fragment, tertiary flakes, tested cobble	10/12/2011	Ineligible	11/18/2011
41HW106	Lithic Scatter	Unknown Prehistoric	Primary and secondary flakes, Edwards chert drill tip	10/12/2011	Undetermined	11/18/2011
41HW133	Open Camp; Quarry/ Procurement	Unknown Prehistoric	Uniface scrapers, expedient tools, secondary flakes, tertiary flakes, utilized flakes, chopper with impact fractures, tested cobbles, FCR	4/24/2015	Ineligible	10/28/2015
*41MD41	Campsite	Late Paleoindian to Protohistoric	Hearths, caliche hearthstones, tools, debitage, late Paleoindian, Marshall, Ceramic Scallorn, and Protohistoric Fresno projectile points	3/27/2015	Undetermined	N/A
**41NL6	Open Camp; Quarry/ Procurement	Mid to Late Archaic	Tecovas and Edwards flakes, tested cobbles, cores, bifaces, dart points, utilized flakes, debitage	4/4/2014	Ineligible within ROW	10/28/2015
41NL72	Prehistoric Artifact Scatter; Historic Artifact Scatter	Unknown Prehistoric; 19th-20th century	Flakes, tools, utilized flakes, point fragment, mussel shell, metal, washtub, glass, historic ceramics, cans, plastic buttons, porcelain, bullet casing	5/18/2011	Undetermined	6/1/2011
41NL252	Campsite/ Habitation Site	Unknown Prehistoric	Chert secondary and tertiary flakes, coring flakes, tools, FCR	7/9/2010	Ineligible	N/A
41NL310	Lithic Scatter	Unknown Prehistoric	Primary flakes, tested cobbles, cores	2/2/2013	Ineligible within ROW	1/29/2013
41NL312	Lithic Scatter	Mid to Late Archaic	Corner-notched Williams-like dart point fragment, biface, core, debitage	4/4/2014	Ineligible	8/18/2014
**41NL313	Open Camp/Midden	Mid to Late Archaic	FCR, cores, unifacial tools, bifaces,	4/4/2014	Ineligible within ROW	10/28/2015

Trinomial	Site Type	Cultural Affiliation	Materials Observed	Record Date	NRHP Status	NRHP Review Date
			projectile points, lithic debitage			
**41NL314	Open Camp; Quarry/ Procurement	Unknown Prehistoric	Debitage, cores, utilized flakes	4/4/2014	Ineligible	10/28/2015
**41NL315	Open Camp/Lithic Scatter	Mid to Late Archaic	Five features containing debitage, tools, and FCR	4/4/2014	Ineligible within ROW	10/28/2015
**41NL316	Quarry/ Procurement	Unknown Prehistoric	Two burned rock features and lithics	4/4/2014	Ineligible	8/18/2014
41NL317	Prehistoric Lithic Scatter; Historic Artifact Scatter	Unknown; Prehistoric; Historic	Lithic debitage, chert cores, tin can fragments, clear glass	4/4/2014	Ineligible within ROW	10/28/2015
**41NL320	Open Camp; Quarry/ Procurement	Unknown Prehistoric	FCR, stone tools, and flakes	4/24/2015	Ineligible	10/28/2015
**41NL321	Open Camp	Unknown Prehistoric	FCR, stone tools, and flakes	4/24/2015	Ineligible	10/28/2015
*41NL322	Quarry/ Procurement	Unknown Prehistoric	Debitage, tested cobbles, primary and secondary flakes	4/24/2015	Ineligible within ROW	10/28/2015
**41NL323	Open Camp	Unknown Archaic	Hearths, stone tools, and flakes	4/24/2015	Ineligible within ROW	10/28/2015
41NL324	Quarry/ Procurement	Unknown Prehistoric	Tested cobbles, debitage	4/24/2015	Ineligible within ROW	10/28/2015
*41NL325	Quarry/ Procurement	Unknown Prehistoric	Tested cobbles, procurement debitage, coarse tools	4/24/2015	Ineligible within ROW	10/28/2015
**41NL326	Quarry/ Procurement	Unknown Prehistoric	Raw chert, tested cobbles, debitage	4/24/2015	Ineligible	10/28/2015

* Denotes the potential to intersect the APE.
** Denotes the potential to intersect a permit area.

5.2 Results of Field Investigations

Fieldwork included archaeological reconnaissance throughout USACE jurisdictional areas of the APE. Crews from both Gray & Pape and Horizon conducted field survey. In total, 56 permit areas were surveyed (Table 5-3). These entailed approximately 93 water features consisting of streams, rivers, wetlands, and ponds/catch basins. Three permit areas were surveyed under the provisions of the Texas Antiquities Code.

In total, 664 shovel tests were excavated within the permit areas (see maps in Appendix B). Of those, 25 were positive for cultural materials resulting in the re-identification of nine previously recorded resources, the discovery of eight new resources, and four isolate finds within permit areas (Table 5-4). An additional 10 previously recorded resources and one newly identified resource were identified within the project APE but outside of permit areas (see Report Sections 5.3 and 5.4). Resource and artifact descriptions are provided in more detail in report sections below.

Table 5-3. Survey Results within Permit Areas of the Loop 1 Project Area.

Permit Area No.	Parcels	Miles	Acres	UTM E	UTM N	Shovel Test Count	Resources Identified	Appendix A Figure	Appendix B Figure
1	LSX-MT-0021.000	0.4	6.7	243409.7	3557064.9	15		A4-A5	B1
2	LSX-MT-0021.000, LSX-MT-0022.000	0.4	6.3	244004.5	3557297.3	12		A5	B2
3	LSX-MT-0022.000	0.3	4.3	245110.2	3557727.2	8		A5	B3
4	LSX-HW-0006.000	0.3	4.9	255850.2	3561499	6		A8	B4
5	LSX-HW-0039.000	0.4	8.5	UTM redacted	UTM redacted	10	41HW142	A12	B5
6	LSX-HW-0041.000	0.4	7.1	274002.2	3568062.1	8		A12-A13	B6
7	LSX-HW-0041.000	0.2	3.0	275181.8	3568377.8	6		A13	B7
8	LSX-HW-0041.000	0.4	7.3	276227.9	3568698	8		A13	B8
9	LSX-HW-0041.000	0.2	3.0	277104.4	3568905.4	2		A13	B9
10	LSX-HW-0045.000	0.1	2.5	278249.8	3569084.5	4		A14	B10
11	LSX-HW-0052.000	0.3	6.0	284003.2	3571005.8	9		A15	B11
12	LSX-HW-0052.000, LSX-HW-0053.000	0.3	4.3	284662.4	3571362.4	4		A15	B12
13	LSX-HW-0053.000	0.1	2.0	285005	3571541.6	3		A15	B13
14	LSX-HW-0056.000	0.3	5.3	289681.9	3572656.6	5		A17	B14
15	LSX-HW-0057.000	0.2	3.3	291036.9	3572868	7		A17	B15
16	LSX-HW-0057.000, LSX-HW-0058.000	0.7	11.5	291985.2	3573174	20		A17	B16
17	LSX-HW-0060.000	0.3	6.6	294619	3573579	11		A18	B17
18	LSX-MH-002.000	0.2	4.1	297342.3	3573984.4	10		A18	B18
19	LSX-MH-002.000	0.2	3.9	297768.3	3574265.6	8		A19	B19
20	LSX-MH-004.000, LSX-MH-005.000	0.5	8.4	299435.2	3574764.9	17		A19	B20
21	LSX-MH-006.000, LSX-MH-007.000	0.5	3.8	302599.7	3575628.4	9		A20	B21
22	LSX-MH-007.000	0.5	3.7	302984.3	3575720.1	9		A20	B22
23	LSX-MH-008.000, LSX-MH-009.000	0.4	7.0	304057.2	3575971.2	15		A20	B23
24	LSX-MH-009.000	0.3	5.0	304572.2	3576090.3	8		A20	B24
25	LSX-MH-009.000	0.3	5.0	305017.6	3576200.2	11		A20	B25
26	LSX-MH-011.000, LSX-MH-012.000	0.5	8.0	307447.5	3576763.8	15		A21	B26
27	LSX-MH-017.000	0.1	2.7	UTM redacted	UTM redacted	9	41MH128	A22	B27
28	LSX-MH-019.000	0.1	2.6	313793.5	3578231.8	5		A23	B28

Permit Area No.	Parcels	Miles	Acres	UTM E	UTM N	Shovel Test Count	Resources Identified	Appendix A Figure	Appendix B Figure
29	LSX-MH-027.100	0.8	13.0	319633.7	3576959.6	24		A24	B29
30	LSX-MH-027.100	0.0	4.4	UTM redacted	UTM redacted	16	MH-27-ISO-01	A25	B30
31	LSX-MH-029.000	0.4	6.9	321099.6	3579762.3	15		A25	B31
*32	LSX-MH-034.000	0.6	9.8	331574.3	3582644.1	21		A26	B32
33	LSX-MH-044.000- LSX-MH-045.000	0.2	3.6	UTM redacted	UTM redacted	14	41MH130	A28	B33
34	LSX-MH-045.000	0.2	3.5	UTM redacted	UTM redacted	14	MH-045-ISO-01	A28	B34
*35	LSX-MH-048.000	0.3	4.1	UTM redacted	UTM redacted	16	MH-48-ISO-01	A28	B35
*36	LSX-MH-050.000	0.5	7.9	UTM redacted	UTM redacted	24	MH-50-ISO-01	A29	B36
37	LSX-MH-053.000, LSX-MH-054.000	0.3	5.3	338869.9	3584463.9	13		A29	B37
38	LSX-MH-056.000	0.1	2.1	341446	3584974.9	5		A30	B38
39	LSX-NO-025.000	0.3	5.1	UTM redacted	UTM redacted	31	41NL321, 41NL377	A35	B39
40	LSX-NO-026.000	0.1	1.6	361094.9	3589106.8	1		A35	B40
41	LSX-NO-042.000	0.2	3.9	UTM redacted	UTM redacted	10	41NL378	A35	B41
42	LSX-NO-042.000	0.2	4.0	UTM redacted	UTM redacted	18	41NL378	A35	B42
43	LSX-NO-042.000-LSX-NO-043.000	0.3	6.6	UTM redacted	UTM redacted	27	41NL378, 41NL323	A36	B43
44	LSX-NO-043.000, LSX-NO-044.000	0.6	12.1	UTM redacted	UTM redacted	22	41NL320	A36	B44
45	LSX-NO-057.100	0.4	7.7	UTM redacted	UTM redacted	20	41NL6	A37	B45
46	LSX-NO-057.100	0.3	6.7	UTM redacted	UTM redacted	14	41NL326	A37	B46
47	LSX-NO-067.000	0.2	4.1	371112.1	3589823.4	8		A37	B47
48	LSX-NO-068.100	0.2	4.0	UTM redacted	UTM redacted	17	41NL392	A38	B48
49	LSX-NO-070.200	0.4	7.7	UTM redacted	UTM redacted	25	41NL313	A39	B49
50	LSX-NO-071.200	0.3	5.5	379536.7	3593047.9	8		A40	B50
51	LSX-NO-084.000	0.3	4.4	UTM redacted	UTM redacted	10	41NL314	A40	B51
52	LSX-NO-084.000, LSX-NO-085.100	1.0	15.2	UTM redacted	UTM redacted	12	41NL379	A41	B52
53	LSX-NO-087.000	0.3	5.4	UTM redacted	UTM redacted	6	41NL315/41NL316	A41	B53
54	LSX-NO-087.000, LSX-NO-089.000	0.2	4.1	UTM redacted	UTM redacted	9	41NL315/41NL316	A41	B54
55	LSX-NO-089.000	0.1	2.5	387210.6	3591829.8	3		A42	B55
56	LSX-NO-089.000	0.1	2.2	UTM redacted	UTM redacted	7	41NL380	A42	B56
Total		18.4	310.3			664			

* Denotes properties surveyed under provisions of Texas Antiquities Permit #8896.

Table 5-4. Identified Resources within the Loop 1 Permit Areas.

Trinomial	MP Begin	MP End	Site Type	New Site ?	Cultural Affiliation	Previous Materials Observed	Record Date	Previous NRHP Status	NRHP Review Date	Current Materials Observed	Current Eligibility Rec	Appendix A Figure	Appendix B Figure	Report Figure
41HW142	29.50	29.55	Prehistoric surface scatter	Yes	Unknown Prehistoric	N/A	5/29/2019	N/A	N/A	Moderate surface scatter of about 30 flakes, at least one biface, and one tested cobble	Ineligible within ROW	A12	B5	5-30
41MH128	56.20	56.30	Historic scatter	Yes	Historic	N/A	5/29/2019	N/A	N/A	whiteware fragments, brown bottle glass, clear flat glass, metal cans, aqua colored vessel glass, brick, and mortared stone, and metal barrels	Ineligible within ROW	A22	B27	5-34
41MH130	71.70	71.80	Prehistoric lithic scatter	Yes	Unknown Prehistoric	N/A	9/9/2019	N/A	N/A	Surface scatter of 4 flakes	Ineligible	A28	B33	5-37
41NL6	95.30	95.70	Open Camp; Quarry/ Procurement	No	Mid to Late Archaic	FCR, thousands of pieces of lithic debitage, cobbles, cores, bifaces, utilized flakes, and dart points	4/4/2014	Ineligible within ROW	10/28/2015	21 flakes (21 surface, 4 subsurface) and 10 FCR	Ineligible within ROW	A37	B45	5-4
41NL313	101.35	101.50	Open Camp/ Midden	No	Mid to Late Archaic	burned rock midden, 13 cores, 7 unifacial tools, 6 bifaces, 4 projectile points, and approximately 526 pieces of lithic debitage	4/4/2014	Ineligible within ROW	10/28/2015	20+ flakes, a scraper, 3+ bifaces, a preform, and one core, FCR	Ineligible within ROW	A39	B49	5-7
41NL314	103.95	104.00	Open Camp; Quarry/ Procurement	No	Unknown Prehistoric	Two expedient tools, three exhausted secondary cores, and approximately	4/4/2014	Ineligible	10/28/2015	Surface of 40 flakes, two cores, and a single biface. One flake subsurface.	Ineligible within ROW	A40	B51	5-5

Trinomial	MP Begin	MP End	Site Type	New Site ?	Cultural Affiliation	Previous Materials Observed	Record Date	Previous NRHP Status	NRHP Review Date	Current Materials Observed	Current Eligibility Rec	Appendix A Figure	Appendix B Figure	Report Figure
						nine pieces of lithic debitage								
41NL315/ 41NL316	106.75	107.50	Open Camp/Lithic Scatter	No	Mid to Late Archaic	Five features containing debitage, tools, and FCR	4/4/2014	Ineligible within ROW/Ineligible	10/28/2015 /8/18/2014	Within the APE approximately 39 debitage, one biface, five cores, one possible ground stone, one reworked flake, and one biface/knife, loose cluster of FCR	Ineligible within ROW	A41-A42	B53-B54	5-11
41NL317	107.9		Prehistoric Lithic Scatter; Historic Artifact Scatter	No	Unknown; Prehistoric ; Historic	Lithic debitage, chert cores, tin can fragments, clear glass	4/4/2014	Ineligible within ROW	10/28/2015	N/A	No further work	A42	B56	5-93
41NL320	92.05	92.35	Open Camp; Quarry/ Procurement	No	Unknown Prehistoric	FCR, stone tools, and flakes	4/24/2015	Ineligible	10/28/2015	Approximately 50+ chert debitage, 5+ bifaces, and 1 projectile point base fragment, FCR	Ineligible within ROW	A36	B44	5-15
41NL321	88.95	89.00	Open Camp	No	Unknown Prehistoric	FCR, stone tools, and flakes	4/24/2015	Ineligible	10/28/2015	3 positive ST of 4 flakes and surface finds of approx. 29 flakes, and a biface frag, 3 tools	Ineligible within ROW	A35	B39	5-18
41NL323	91.45	91.75	Open Camp	No	Unknown Archaic	Hearths, stone tools, and flakes	4/24/2015	Ineligible within ROW	10/28/2015	30+ surface lithics of mostly secondary and tertiary flakes, 12 positive tests containing 36 flakes, 1 biface, 1 unifacial tool	Ineligible within ROW	A36	B43	5-21
41NL326	96.35	96.60	Quarry/ Procurement	No	Unknown Prehistoric	Raw chert, tested cobbles, debitage	4/24/2015	Ineligible within ROW	10/28/2015	Surface artifacts of 50+ chert debitage, 5+ bifaces, 6+ cores, at least 2 unifacial tools, 2 scrapers. 2 subsurface flakes from one test.	Ineligible within ROW	A37	B46	5-24
41NL377	89.10	89.20	Prehistoric lithic scatter	Yes	Unknown Prehistoric	N/A	5/29/2019	N/A	N/A	7 flakes, a biface, and 1 small reworked flake within APE	Ineligible within ROW	A35	B39	5-40

Trinomial	MP Begin	MP End	Site Type	New Site ?	Cultural Affiliation	Previous Materials Observed	Record Date	Previous NRHP Status	NRHP Review Date	Current Materials Observed	Current Eligibility Rec	Appendix A Figure	Appendix B Figure	Report Figure
41NL378	90.75	91.40	Prehistoric lithic scatter	Yes	Unknown Prehistoric	N/A	5/29/2019	N/A	N/A	8 positive ST and surface finds including numerous flakes, scrapers, cores, tools, bifaces, PP frag	Ineligible within ROW	A35-A36	B41-B42	5-43
41NL379	105.90	105.95	Prehistoric lithic scatter	Yes	Unknown Prehistoric	N/A	5/29/2019	N/A	N/A	20+ chert flakes and 5 possible cores	Ineligible within ROW	A41	B52	5-44
41NL380	107.75	107.85	Prehistoric lithic scatter	Yes	Unknown Prehistoric	N/A	5/29/2019	N/A	N/A	Moderate to high density prehistoric lithic scatter of 30+ chert flakes and 4 possible cores	Ineligible within ROW	A42	B55-B56	5-48
41NL392	99.57		Prehistoric lithic scatter	Yes	Unknown Prehistoric	N/A	9/9/2019	N/A	N/A	Light scatter of approximately 4 surface flakes and one subsurface flake	Ineligible	A38	B48	5-51
MH-27-ISO-001	62.90	62.90	Isolate	Yes	Unknown Prehistoric	N/A	5/29/2019	N/A	N/A	Single flake	Ineligible	A24-A25		5-54
MH-45-ISO-02	72.04	72.04	Isolate	Yes	Unknown Prehistoric	N/A	9/9/2019	N/A	N/A	Scraper	Ineligible	A28	B34	5-58
MH-48-ISO-001	73.40	73.40	Isolate	Yes	Unknown Prehistoric	N/A	5/29/2019	N/A	N/A	Single flake	Ineligible	A28-A29	B35	5-59
MH-50-ISO-001	74.10	74.10	Isolate	Yes	Unknown Prehistoric	N/A	5/29/2019	N/A	N/A	Single flake	Ineligible	A29	B36	5-63

5.2.1 Loop 1 General Characteristics

The loop's setting largely consisted of two surface characteristics: 1) desert plains with vegetation consisting of desert grasses, scrub, and forbs typically seen in Midland to Mitchell Counties (Figure 5-1); and 2) agricultural fields in various stages of growth typically seen in Mitchell to Nolan Counties (Figure 5-2). To the west, the vicinity of the loop is pockmarked by several well pads and petroleum infrastructure. Surface visibility generally ranged from 70 to 100 percent. Almost the entire survey corridor has been previously impacted by pipeline installation, maintenance, or subsequent erosion, county roads, and unimproved roads that cross the APE.

Figure 5-1. Overview of the typical field conditions observed in the western portions of Loop 1. View is to the northeast.

Within Loop 1, 664 shovel tests were excavated within permit areas (Appendix B: Figures B1 to B56). The typical shovel test profile for the loop consisted of reddish-brown to brown silt loam or sand followed by a subsurface layer of reddish-brown loam or clay. The depth of the surface and subsurface layers was typically shallow (10-50 centimeters [4-20 inches]), indicating past impact by erosion or land modification. In most tests, these layers were underlain by a layer of cemented caliche. Because of this, very few tests approached 100 centimeters (33 inches). Approximately 148 shovel tests showed evidence of disturbance displayed as mottled soils containing larger quantities of calcium carbonate or gravels throughout. These tests typically were located within or very near the existing pipeline corridor limits.

Figure 5-2. Overview of the typical field conditions observed in the eastern portions of Loop 1. View is to the southwest.

5.2.2 Revisits of Previously Recorded Resources Located within Jurisdictional Areas

Nine previously recorded resources located within permit areas: 41NL6, 41NL313, 41NL314, 41NL315, 41NL316, 41NL320, 41NL321, 41NL323, and 41NL326, were re-identified during survey. The resources were re-identified by either Horizon or Gray & Pape crews. In some cases described below, Horizon performed the site investigation within the APE and Gray & Pape conducted delineation work outside of the APE to better define the site boundary. Results at each re-identified resource are described below.

5.2.2.1 Resource 41NL6

According to the earliest site form for the site, Resource 41NL6 was first recorded in 1979 by Biddy R. Harrison as an approximately 0.4-hectare (1-acre) area located to the west of Sweetwater Creek. The site was reported to contain an undocumented number of shallow sandstone hearths along the eastern edge of an eroded terrace. The site form also mentions an unknown number of lithics of Tecovas and Edwards chert (THC 2019).

The resource was revisited in 2014 by Tetra Tech as part of survey for the Permian Express II Pipeline (Karpinski et al. 2014). That visit resulted in a revision to the site record. The 2014 record describes the site as being composed of a Middle Archaic to Late Archaic period series of short-term camp sites and lithic procurement and/or tool maintenance workstations. The 2014 visit expanded the resource to both sides of Sweetwater Creek, east side of Highway 70. The hearths recorded in 1979 were absent at the time of the 2014 recording; however, sparsely scattered fire-cracked rock (FCR), four tested cobbles, two cores, two bifaces, 12 retouched or utilized flakes, approximately 2,000 pieces of lithic debitage, and five projectile points dating to the Middle and Late Archaic period were observed. Investigation in 2014 included a systematic surface inspection at 5 meter (16 foot) intervals as well as the excavation of four shovel tests and two test units. Although two shovel tests resulted in near-surface cultural materials, testing failed to provide evidence for a potential intact subsurface cultural component. As a result of the investigation, the investigation suggested that the site has been impacted by water erosion, wind deflation, livestock grazing, agriculture, and mechanical vegetation treatments. As of 2015, the resource was determined by the THC to be ineligible for listing on the NRHP within the Permian Express II Pipeline right-of-way (ROW) (Texas Archeological Sites Atlas 2019).

Current investigation of the resource was initiated by Horizon on April 5, 2019, which conducted surface inspection and the excavation of 20 shovel tests spaced at 30-meter (100-foot) intervals across the length of the resource within the APE (Figures 5-3 and 5-4). As discussed by previous reports, the site consists of gently sloping uplands to either side of Sweetwater Creek. The site is largely covered by thick short grasses, causing significant hindrance in the rerecording of the resource (Figure 5-3). The APE within the resource generally measures 40 meters (131 feet) wide with an expanded workspace at the water crossing to approximately 47 meters (156 feet). Of that width, approximately 30 meters (100 feet) is located within the existing ROW. Only one flake was observed on the ground surface by Horizon. Two positive shovel tests within the APE contained one flake each (Table 5-5).

On April 12, 2019, Gray & Pape conducted delineation of the site boundaries (Figure 5-4). Fourteen delineation shovel tests placed to the east and west of the resource boundary produced no additional positive shovel tests. Two additional surface flakes were identified. Soils mapped for the location consist of primarily of Nipsum clay loam, which consists of a surface layer of brown (10YR 4/3 to 7.5YR 5/2) clay followed by a subsurface layer of reddish brown (5YR 5/4) clay (SSS NRCS USDA 2019). Of the 19 shovel tests placed within the resource boundary/APE, four were positive for one lithic flake each (Table 5-5).

Figure 5-3. Location of Site 41NL6 within the APE. View is to the east.

Table 5-5. Provenience of Subsurface Materials Identified within Resource 41NL6.

Test Number	Material	Depth
41	1 chert flake	30-40 cm
44	1 chert flake	30 cm
47	1 chert flake	60 cm
54	1 chert flake	40 cm

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Plan view of Resource 41NL6

A typical shovel profile within the resource / APE differed from soils mapped for the location and consisted of a surface layer of light reddish brown (5YR 6/4) silt loam to a depth of 50 centimeters (20 inches) followed by a layer of reddish brown (5YR 5/4) clay. As was determined by Tetra Tech in 2014, current shovel test results suggest that here is a lack natural surface soils at the location. However, to verify the depth of soils and to determine if deeper cultural deposits or buried paleosols exist at the location, 13 auger tests were conducted within the APE at the site (Figure 5-4). These resulted in 1 flake identified within 0-10 centimeters (4 inches) below surface with no signs of buried paleosols or features. Further details of the auger testing are provided below in report Section 5-4. The resource was not investigated beyond the ROW to the north and south during the current effort.

The site was revisited by Gray & Pape and agency representatives of the THC and USACE on August 28, 2019. During a cursory walk-over of the western portion of the site within the APE, approximately 10 FCR and 20 flakes (chert) were observed across the site.

The sparsity of subsurface deposits within the APE and lack of diagnostics are consistent with previous findings recorded in 2014 by Tetra Tech. Based on these results, Site 41NL6 appears to have low research potential and no further work is recommended within the project footprint. The site portion located within the APE does not retain the potential to provide significant research value and is thus recommended not eligible for the National Register, under Evaluation Criterion D.

5.2.2.2 Resource 41NL313

Resource 41NL313 was originally recorded in 2014 by Tetra Tech, Inc. for the Permian Express Pipeline II survey (Karpinski et al. 2014). The resource consists of a Middle Archaic to Late Archaic period lithic scatter and short-term camp. The resource was initially recorded on the eastern terrace of Bitter Creek, approximately, 220 meters (725 feet) south of County Road (CR) 221. The 2014 recordation identified over 600 artifacts consisting of 24 FCR, 13 cores, 7 unifacial tools, 6 bifaces, 4 projectile points, and approximately 526 pieces of lithic debitage. A burned rock midden feature was also reported. The resource was investigated by a systematic surface inspection at 5-meter (16-foot) intervals and three shovel tests and two test units. The tests uncovered sparse amounts of material, located generally less than 10 centimeters (4 inches) deep and no intact subsurface components. The burned rock midden was found to have been significantly impacted by general land maintenance causing displacement of feature components. Testing revealed the midden to be shallow and mostly exposed on the surface. Overall, the 2014 investigation determined that the site has been impacted by water erosion, wind deflation, and mechanical vegetation treatments causing moderate artifact displacement and cultural component erosion throughout the site. The site's overall eligibility potential was left undetermined by Tetra Tech and the site was to be avoided by horizontal boring during construction. In 2014 and 2015, the site was determined by the THC to be undetermined but ineligible for listing on the NRHP within the pipeline ROW (Texas Archeological Sites Atlas 2019).

Resource 41NL313 was revisited on April 8 by Horizon which conducted a pedestrian walkover and three shovel tests excavated at 30-meter (100-foot) intervals within the APE (Figure 5-5). The surface scatter along the pipeline ROW is located on the east side of Bitter Creek. The location within the existing ROW is sparsely covered by grasses with the ground surface visibility decreasing outside of the ROW (Figure 5-5). The area is currently being used as a cattle pasture and has been impacted by flooding, erosion, existing pipelines and berming.

Figure 5-5. Overview of Site 41NL313 within the APE. View is to the northeast.

Figure 5-6. Chert core found on the surface of Resource 41NL313.

The APE within the resource generally measures 47.5 meters (156 feet) wide, with approximately 30 meters (100 feet) of that width located within the existing ROW. Within the APE, Horizon recorded a scatter of 20+ flakes, a scraper, 3+ bifaces, a preform, and one core (Table 5-6, Figure 5-6). Of the three shovel tests placed within the resource boundary/APE, only one was positive with a single piece of clear glass observed at between 0 and 20 centimeters (0 and 8 inches) below ground surface. The previously recorded midden feature was not re-identified during the effort. The feature and likely one of Tetra Tech's two reported artifact concentrations are likely located outside of the current APE to the north based on the field map depicted in Karpinski et al. (2014).

Table 5-6. Artifact Assemblage Observed at 41NL313.

Depth	Flakes	Bifaces	Scraper	Preform	Core
Surface	20+	3+	1	1	1
0-10	-	-	-	-	-
10-20	-	-	-	-	-
20-40	2	-	-	-	-
40-50	-	-	-	-	-

Gray & Pape conducted delineation of the site on April 12, 2019. Eleven delineation shovel tests placed around the resource boundary produced no additional positive shovel tests. The resultant resource measures approximately 176 meters (577 feet) east-west by 116 meters (379 feet) north-south (Figure 5-7).

Soils mapped for the location consist of primarily of Colorado loam, which consists of a surface layer of light reddish brown (5YR 6/3) silt loam to a depth of 13 centimeters (5 inches) followed by a subsurface layer of light reddish brown (5YR 6/3) loam (SSS NRCS USDA 2019). This differed slightly from soils observed in shovel tests which contained a surface layer of brown (7.5YR 4/3) sandy loam to a depth of 20 centimeters (8 inches) followed by a layer of reddish brown (5YR 5/4) clay.

The site was revisited by Gray & Pape and agency representatives of the THC and USACE on August 28, 2019. During a cursory walk-over of the site it was noted that FCR is scattered across the site with concentrations in the existing pipeline area at the northern side of the site (possibly corresponding with Artifact Concentration 1 reported by Tetra Tech in 2014), a concentration just south of the APE, and a linear concentration of FCR along an alluvial terrace slope within the APE.

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Plan view of Resource 41NL313.

Almost all FCR observed was limestone, two pieces of sandstone FCR were observed. Approximately 100 to 200 FCR were observed, some tabular, within and immediately adjacent to the APE. Approximately 25 to 50 flakes (chert) were observed, and two uniface/modified flakes were observed.

At the request of the THC, Gray & Pape conducted an additional investigation within the APE on August 29, 2019, to finish site delineation within the southern portion of the APE. As a result of the supplemental investigation, six shovel tests were conducted within the central and southern portions of the APE within the site boundary. Two of the shovel tests were positive for cultural materials, consisting of one reworked flake identified at between 20 and 40 centimeters (8 and 16 inches) below surface in Shovel Test 5 and one unmodified flake between 30 and 40 centimeters (12 and 16 inches) below surface in Shovel Test 7. Both shovel tests are located within the existing ROW.

Within the APE, the resource appears to have experienced moderate erosion since its original recordation in 2014, resulting in soil deflation and the exposure and likely displacement of artifacts now on the surface. Based on the sparsity of significant subsurface deposits within the APE and lack of diagnostics recorded during the current effort, Site 41NL313 appears to have low research potential within the APE and no further work is recommended within the project footprint. The site portion located within the APE does not retain the potential to provide significant research value and is thus recommended not eligible for the National Register, under Evaluation Criterion D.

5.2.2.3 Resource 41NL314

Resource 41NL314 was originally recorded in 2013 and 2014 by Tetra Tech, Inc. for the Permian Express Pipeline II (Karpinski et al. 2014). The resource was recorded as a temporary lithic reduction and tool maintenance locality of unknown prehistoric affiliation. The resource is located approximately 657 meters (0.4 miles) south of Highway 221, along the west side of Little Stink Creek, between a two-track road and manmade pond. Materials recorded at the time were distributed between two small, sparse artifact concentrations located along the western side of the drainage and consisted of two expedient tools, three exhausted secondary cores, and approximately nine pieces of lithic debitage. Investigation in 2014 included a systematic surface inspection at 5-meter (16-foot) intervals. No shovel tests were excavated due to previous impacts of the man-made pond and visual inspection of the sediments within the adjacent cut bank. The resource was recorded as having been significantly impacted by the two-track road and a man-made pond. The resource was not recommended for further work and in 2014 and 2015 was determined by the THC to be ineligible for listing on the NRHP (Texas Archeological Sites Atlas 2019).

Gray & Pape revisited Resource 41NL314 on April 8 and conducted a pedestrian walkover and seven shovel tests excavated at between 20 and 30-meter (66 and 100-foot) intervals within the APE. The location within the existing ROW is sparsely covered by grasses with the ground surface visibility decreasing outside of the ROW (Figure 5-8). The area is currently being used as a cattle pasture. The vegetation consists of mesquite brush, paddle cactus, and various grasses and forbs. The location has been impacted by flooding, erosion, the existing pipelines and access road. Current observations recorded a small scatter of lithics located on a rise west of a drainage (Figure 5-9).

The APE within the resource generally measures 40 meters (131 feet) wide, with approximately 30 meters (100 feet) of that width located within the existing ROW. Surface finds within the APE consist of approximately 13 flakes (Figure 5-10) and one core (Table 5-7).

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Plan view of Resource 41NL314.

Figure 5-9. Overview of Resource 41NL314 within the APE. View is to the west.

Gray & Pape returned to the site location on April 12, 2019 in an attempt to identify the site's northern and southern limits. Delineation efforts identified and additional 27 flakes, one core, and one biface (Table 5-7, Figure 5-10). An additional four shovel tests placed beyond the identified limits of the surface scatter produced no additional cultural materials.

Table 5-7. Artifact Assemblage Observed at 41NL314.

Depth	Flakes	Bifaces	Cores
Surface	40	1	2
0-10	1	-	-
10-20			
20-30			
30-40			
40-50			

The resulting resource measures 185 meters (605 feet) north-south by 144 meters (470 feet) east-west. The area has abundant rock, including chert on the surface, most of which has not been modified. Of 11 shovel tests excavated in and around the resource, one was positive for cultural materials and most of the shovel tests showed signs of disturbance. A single flake was recovered from the top 10 centimeters (4 inches). The subsurface nature of the find is likely the result of cattle trampling or other taphonomic processes.

Figure 5-10. Representative materials identified on the surface within Resource 41NL314.

Soils mapped for the location primarily consist of Sagerton clay loam and Burson-Quinlan association. These soils consist of shallow A horizons composed of red (2.5YR 5/6) to brown (7.5YR 4/2) loam/clay loam to a depth of about 20 centimeters (8 inches) followed by a subsurface layer of red (2.5YR 4/6) loam to brown (7.5YR 4/2) clay (SSS NRCS USDA 2019). A typical shovel profile within the resource/APE consisted of a surface layer of brown (7.5YR 4/4) sand to a depth of 10 centimeters (4 inches) followed by a layer of rock. The results of shovel tests at the location suggest the soils have been eroded.

The resource was found to extend beyond the pipeline corridor to the south and may continue to the north as well. The resource appears to have experienced moderate erosion. Based on the lack of significant subsurface deposits within the APE, lack of diagnostics, and signs of disturbance observed during the current effort, Site 41NL314 appears to have low research potential. No further work is recommended within the project footprint and the site within the APE does not retain the potential to provide significant research value and is thus

recommended not eligible for the National Register, under Evaluation Criterion D.

5.2.2.4 Resources 41NL315/316

Resource 41NL315 was originally recorded in 2014 by Tetra Tech, Inc. for the Permian Express Pipeline II (Karpinski et al. 2014). The resource was recorded as habitation/camp site with features dating to the Mid to Late Archaic periods. The resource is situated along both banks of an unnamed tributary of Stink Creek, approximately 1,026 meters (3,361 feet) east of CR 131 along the existing pipeline corridor. Investigation by Tetra Tech included a systematic surface inspection at 5-meter (16-foot) intervals and the excavation of six shovel tests. Surface finds included numerous pieces of debitage, six projectile points (two tips and four with intact bases), three biface fragments, one crude biface, a chopper, an endscraper, a side-scraper, three retouched/utilized flakes, and a possible grinding stone fragment. Five features (F1 through F5) were also recorded by the survey, including a burned-rock midden, two small clusters of FCR, a dense concentration of debitage, and a small concentration of FCR. All the features were recorded north of the proposed Permian Express Pipeline. Of the six shovel tests placed within the site, four were positive, producing artifacts within the top 20 centimeters (8 inches). Although likely eligible features exist within portions of the site, the portion of the resource located within the Permian Express project area was considered to have little or no research value and was recommended as ineligible for listing on the NRHP within the project ROW. Formal determinations by the THC in 2014 and 2015 concurred with that recommendation (Texas Archeological Sites Atlas 2019).

Resource 41NL316 was originally recorded in 2014 by Tetra Tech, Inc. for the Permian Express Pipeline II (Karpinski et al. 2014). The resource was recorded as an open camp site/lithic scatter of Mid to Late Archaic temporal affiliation. The resource is approximately 0.9 miles NE of where CR 131 meets CR 130 (Adrian Rd.) along and south of existing pipeline ROWs. The resource is situated to the east of Stink Creek along a small tributary, approximately 1,026 meters (3,361 feet) east of CR 131 along the existing pipeline corridor. Investigation by Tetra Tech included a systematic surface inspection at 5-meter (16-foot) intervals and the excavation of three shovel tests. Observed surface finds recorded in 2014 consisted of two burned-rock midden features as well as approximately 200 pieces of lithic debitage and a possible mano. No tools were identified at the location. Investigation of the resource suggested it had been highly impacted by landscape alterations, which have caused artifact displacement and erosion throughout the resource. The resource was recommended as ineligible for listing on the NRHP and a formal determination by the THC in 2014 concurred with that recommendation (Texas Archeological Sites Atlas 2019).

The location of Resources 41NL315 and 41NL316 were revisited by Gray & Pape on April 6, 2019. The location within the existing ROW consists of roughly two long uplands spaced between tributaries of Little Stink Creek (Figure 5-11). The location is covered by short grasses with the ground surface visibility decreasing outside of the ROW to the south (Figure 5-12). A series of erosion control berms cross the APE north to south every 61 to 91 meters (200 to 300 feet). The area is currently being used as a cattle pasture. Rocky outcroppings are located at the surface of each hilltop. The resource consists of a near continuous scatter of lithics, eventually joining the former two resource locations and continuing to the south, far beyond the project ROW.

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Plan view of Resources 41NL315/41NL316.

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Figure 5-11

Figure 5-12. Overview of Resources 41NL315 and 41NL316 within the APE. View is to the west.

The APE within the resource generally measures 40 meters (131 feet) wide, with approximately 30 meters (100 feet) of that width located within the existing ROW. Within the APE, observed surface artifacts consist of at least 68 flakes (Figure 5-13), 12 cores, one worked flake, two bifaces, and one possible groundstone (Figure 5-14; Table 5-8). Initial investigation of the resources consisted of pedestrian walkover and shovel tests excavated at 30 to 60-meter (100 to 200-foot) intervals along the APE (Figure 5-11). Of the 27 shovel tests excavated along the length of APE within and between the two former resource boundaries, none were positive for cultural materials and most of the shovel tests showed signs of disturbance from the adjacent pipelines. Several soils are mapped for the location including Sagerton clay loam, Burson-Quinlan association, Pyron clay loam, and Pitzer gravelly loam. A general characteristic of these soils is that they consist of a shallow red (2.5YR 5/6 to 2.5YR 4/6) A horizon of loam / clay loam followed by varying thicknesses of red (2.5YR 5/6) Cr horizon of interbedded weakly-cemented fine-grained sandstone, siltstone, and shale (SSS NRCS USDA 2019). A representative shovel test profile within the resource/APE consisted of a surface layer of brown (7.5YR 4/4) sand to a depth of 10 to 25 centimeters (4 to 10 inches) followed by a layer of rock. This closely resembles soils mapped for the location; however, this profile was typically identified outside of the existing ROW to the south. Shovel test profiles nearer to the proposed centerline typically contained disturbed or eroded soils, with bedrock located at increasingly shallow depths.

Figure 5-13. Representative materials identified on the surface of Resources 41NL315 and 41NL316.

Figure 5-14. Groundstone identified on the surface of Resource 41NL315 and 41NL316.

Table 5-8. Artifact Assemblage Observed at 41NL315/41NL316.

Depth	Flakes	Bifaces	Cores	Groundstone	FCR
Surface	68	2	12	1	25
0-10	-	-	-	-	-
10-20	-	-	-	-	-
20-30	-	-	-	-	-
30-40	-	-	-	-	-
40-50	-	-	-	-	-

On April 11, 2019, Gray & Pape revisited the location to attempt delineation of the site to the south. Surface finds continue a great distance to the south and likely continue all the way to County Road 130. Pedestrian survey outside of the proposed ROW to the south observed a continuance of surface material for at least another 400 meters (1,312 feet), approaching other previously recorded resources in the vicinity. The relationship between these off-ROW finds to the previously recorded resources in the area, as well as to each other, were not investigated. The area to the north of the ROW in the vicinity of 41NL315 was likewise not investigated. The resulting surface scatter measures nearly 1,200 meters (0.73 miles) east-west within the project corridor.

The location of both previously recorded sites was revisited by Gray & Pape and agency representatives of the THC and USACE on August 28, 2019. During a cursory walk-over of the site it was noted that approximately 20-40 flakes are located across the surface in the vicinity of the previously mapped location of 41NL315, mostly consisting of tertiary and secondary reduction stages. Approximately 20-40 flakes of mostly tertiary and secondary reduction stages were observed across the previously mapped location of 41NL316 as well as a concentration of FCR observed within the southeastern corner of the site (Figure 5-14). The FCR concentration consisted of approximately 25 limestone and likely represents a deflated feature.

Current investigation of the former resource boundaries within the corridor found that cultural materials continue between the two resources. However, the location has been previously disturbed by previous pipeline installation, particularly adjacent to the existing pipeline ROW, and subsequent erosion/displacement. Shovel testing within the APE produced no subsurface artifacts and displayed a shallow or deflated soil deposition. Based on the lack of subsurface deposits within the APE, lack of diagnostics, and signs of disturbance observed during the current effort, Site 41NL315/41NL316 appears to have low research potential. No further work is recommended within the project footprint. The Corps agreed with this recommendation subsequent to the visit on August 28, 2019. The site portion located within the APE does not retain the potential to provide significant research value and is thus recommended not eligible for the National Register, under Evaluation Criterion D. The Corps agreed with this recommendation subsequent to the visit on August 28, 2019.

5.2.2.5 Resource 41NL320

Resource 41NL320 was originally recorded in 2015 by Turpin and Sons, Inc. (TAS) for the Lone Star Express 24 survey (Burgess and Burgess 2015). The resource was recorded as a camp site and quarry/procurement location of an unknown prehistoric temporal affiliation. The resource is located along both banks of Idlewild Creek, approximately 800 meters (0.5 miles) east of CR 143. The 2014 site form describes 3 thermal features consisting of a burned rock midden and two hearths, FCR, and stone tools and flakes consisting of a spokeshave, unifaces, modified flakes, and hammerstone, but lacking temporally diagnostic artifacts. The resource was found to be largely disturbed due to damage from previous pipelines, erosion, deflation, and a two-track road that cuts through the resource. The resource was not recommended for further work and in 2015 was determined by the THC to be ineligible for listing on the NRHP (Texas Archeological Sites Atlas 2019).

Current investigation of Resource 41NL320 was initiated by Horizon on April 3, of 2019, and consisted of pedestrian walkover and 15 shovel tests excavated at 30-meter (100-foot) intervals within the APE (Figure 5-15). The APE within the resource generally measures 40 meters (131 feet) wide with an expanded workspace at the water crossing to approximately 47 meters (156 feet). Of that width, very little of the APE is outside the limits of previous disturbance related

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Plan view of Resource 41NL320.

to either pipeline construction or mechanical land modification. The location is dissected into northern and southern portions by Idlewild Creek, which is damned alongside the southern half of the site. The northern APE of the site consists entirely of previous pipeline workspace. The area is devoid of vegetation and contains several gravels. The southern portion of the site is largely covered by short grasses with the ground surface visibility decreasing outside of the ROW (Figure 5-16). Observed surface artifacts recorded within the APE by Horizon consist of approximately 34 chert debitage (Table 5-9). Of the 15 shovel tests placed across the location, one (test 28) was positive with a single chert flake observed between 20 and 30 centimeters (8 to 12 inches) below ground surface.

Figure 5-16. Overview of Resource 41NL320 within the APE. View is to the south.

Gray & Pape revisited the location on April 11, 2019 to undertake delineation efforts. Delineation efforts observed an additional 15 flakes, 5+ bifaces, and 1 projectile point base fragment (Figure 5-17; Table 5-9). Thirteen delineation shovel tests placed around the visible surface scatter at 10-meter (33-foot) intervals produced one additional positive shovel test (Test 2), containing one flake at between 20 and 30 centimeters (8 to 12 inches) below ground surface.

Figure 5-17. Projectile point base identified on the surface of Resource 41NL320.

Table 5-9. Artifact Assemblage Observed at 41NL320.

Depth	Flakes	Bifaces	Projectile Point
Surface	49	5+	1
0-10	-	-	-
10-20	-	-	-
20-30	2	-	-
30-40	-	-	-
40-50	-	-	-

The resultant resource measures approximately 580 meters (0.4 miles) north-south by roughly 240 meters (790 feet) east-west. Soils mapped for the location consist of Colorado loam and Woodward loam (SSS NRCS USDA 2019). Both contain relatively shallow surface layers of light reddish-brown (5YR 6/3) to reddish brown (5YR 4/3) silt loam followed by (5YR 4/3) loam C1 horizon. A typical shovel profile within the resource/APE consists of a surface layer of light brown (7.5YR 6/4) silt loam to a depth of 30 centimeters (12 inches) followed by bedrock/cemented caliche. In other tests, hard pan layer was encountered at varying depths but almost always present. This suggests the location is highly deflated.

The southern portion of the site location was revisited by Gray & Pape and agency representatives of the THC and USACE on August 28, 2019. During a cursory walk-over of

the site it was noted loosely clustered limestone and quartzite FCR was inside the APE. At the request of the USACE, Gray & Pape revisited the northern portion of the site within the APE on September 4, 2019, to look for additional signs of FCR. The revisit noted the APE within the site boundary was entirely disturbed but noted no additional finds of FCR. The location had been previously graded as part of previous pipeline construction.

The resource appears to have experienced moderate erosion and deflation due to previous impacts along the length of the resource. The area is currently being used as a cattle pasture and has been impacted by flooding, erosion, multiple existing pipelines and two-track roads. This observation combined with the sparsity of surface artifacts, lack of diagnostics, and shallow soils recorded during the current effort suggests the resource is not significant or intact. No further work is recommended within the project footprint. The site portion located within the APE does not retain the potential to provide significant research value and is thus recommended not eligible for the National Register, under Evaluation Criterion D.

5.2.2.6 Resource 41NL321

Resource 41NL321 was originally recorded in 2015 by TAS for the Lone Star Express 24 survey (Burgess and Burgess 2015). The resource was recorded as a camp site and quarry/procurement location of an unknown prehistoric temporal affiliation. The resource is located along the west side of Long Branch immediately south of CR 152 within the existing pipeline corridor. The 2015 site form describes a scatter of stone tools and lithics consisting of three scrapers, one uniface, four tertiary, one sec, two utilized flakes, one biface, four expedient tools, one shatter, FCR, and a single displaced hearth. The resource was found to be largely disturbed due to damage from previous pipelines, erosion, and deflation. The resource was not recommended for further work and in 2015 was determined by the THC to be ineligible for listing on the NRHP (Texas Archeological Sites Atlas 2019).

Resource 41NL321 was revisited on March 27 by Gray & Pape and was investigated by pedestrian walkover and 14 shovel tests excavated at 30-meter (100-foot) intervals within the APE (Figure 5-18). The APE within the resource measures 40 meters (131 feet) wide with approximately 30 meters (100 feet) of that distance within the existing ROW. The location consists of an upland/hilltop adjacent to Long Branch Creek. A great deal of non-cultural rock was present at the surface of the hilltop. The area is currently being used as a cattle pasture and is sparsely covered by short grasses with the ground surface visibility decreasing outside of the ROW and adjacent to waterways (Figure 5-19). Within the ROW, the resource consists of a small lithic scatter of approximately 10 confirmed lithics of mostly secondary and tertiary flakes, and a biface fragment (Figure 5-20, Table 5-10). Of the 14 shovel tests placed within and around the previous resource boundary and surface scatter, three tests were positive for cultural materials, one test (A8) containing two flakes between 20 and 30 centimeters (8 and 12 inches) below ground surface and the remaining two tests (A8+10S and A8+20W) each containing a single flake located between 20 and 30 centimeters (8 and 12 inches) below ground surface.

On April 1, 2019, the resource was subjected to delineation by surface inspection and shovel testing in an effort to identify the southern limits of the site. Delineation tests were placed within and around visible surface scatters at 10-meter (33-foot) intervals. Surface finds continue to the south where they expand consistent with the topography. The southern portion of the resource contains a good deal more materials and types including a multitude of bifaces and scrapers.

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Plan view of Resource 41NL321.

Figure 5-19. Overview of Resource 41NL321 within the APE. View is to the west.

Figure 5-20. Biface or scraper identified on the surface of Resource 41NL321.

Table 5-10. Artifact Assemblage Observed at 41NL321.

Depth	Flakes	Bifaces	Tools
Surface	25	1	3
0-10	-	-	-
10-20	-	-	-
20-30	4	-	-
30-40	-	-	-
40-50	-	-	-

The resultant resource limits within the current pipeline ROW measures approximately 40 meters (130 feet) north-south by roughly 40 meters (130 feet) east-west. However, the resource continues to the south by potentially several hundred meters. The area to the north of the previously recorded resource boundary was not investigated due to the number of previous pipelines. Soils mapped for the location consist of Dermott gravelly loam, a very shallow fractured and weathered soil found on gently to steeply sloping hills and ridges and derived from the Ogallala Formation (SSS NRCS USDA 2019). A typical shovel profile within the resource/APE consists of a surface layer of dark yellowish brown (10YR 3/4) sandy loam and gravel to a depth of 30 centimeters (12 inches) followed by bedrock/cemented caliche. In other tests, hard pan layer was encountered at varying depths but almost always present. Rock was present at the surface of much of the site location within the APE.

The location of the site was revisited by Gray & Pape and agency representatives of the THC and USACE on August 27, 2019. During a cursory walk-over of the site a light scatter of lithics (approx. 25) were noted, including three tools, in the proposed APE.

While more intact areas may exist beyond the ROW to the south where the topography changes to include higher terraces and landforms, the portion of the site within the current APE has experienced moderate erosion and deflation due to previous adjacent impacts. This observation combined with the sparsity of artifacts, lack of diagnostics, and shallow soils recorded during the current effort suggests that the portion of Site 41NL321 within the ROW has low research potential and no further work is recommended within the project footprint. This recommendation was concurred with by the USACE. The site portion located within the APE does not retain the potential to provide significant research value and is thus recommended not eligible for the National Register, under Evaluation Criterion D.

5.2.2.7 Resource 41NL323

Resource 41NL323 was originally recorded in 2015 by TAS for the Lone Star Express 24 survey (Burgess and Burgess 2015). The resource was recorded as a camp site and

quarry/procurement location of an unknown Archaic temporal affiliation. The resource is located along the east side of Idlewild Creek, 800 meters (0.5 miles) east of CR 143. The 2015 site form describes a burned rock midden with FCR and two dispersing hearths as well as a lithic scatter containing a consisting of a spokeshave, unifaces, modified flakes, hammerstone, and numerous flakes but without temporally diagnostic artifacts. The resource was found to be largely deflated and disturbed due to existing pipelines, fence lines, and two-track road. The resource was not recommended for further work and in 2015 was determined by the THC to be ineligible for listing on the NRHP (Texas Archeological Sites Atlas 2019).

Resource 41NL323 was revisited on April 3, 2019, by Horizon and was investigated by surface inspection and the excavation of 19 shovel tests every 30 meters (100 feet) within the APE (Figure 5-21). The APE is wider in this area, measuring roughly 55 meters (180 feet) across for much of the distance, of which approximately half consists of existing ROW. The location is roughly dissected by Idlewild Creek. The site contains two topographic settings, with a hilltop located in the west southwestern edge of the site between Idlewild Creek and County Road 143. The east side of the creek contains a broad low terrace. The eastern edge of the site is crossed by remnant path or intermittent tributary of Idlewild Creek. Within the existing ROW, the site is sparsely covered by grasses with the ground surface visibility decreasing outside of the ROW (Figure 5-22). The area is currently being used as pasture. Within the ROW, the resource consists of a lithic scatter of approximately 30+ lithics of mostly secondary and tertiary flakes (Figure 5-23). Of 19 shovel tests excavated across the resource area, six were positive for cultural materials. These consisted of flakes at depths of 0 to 50 centimeters (0 to 20 inches) below the ground surface (Table 5-11).

Table 5-11. Artifact Assemblage Observed at 41NL323.

Depth	Flakes	Bifaces	Cores/ Tested Cobbles	Reworked Flake	FCR
Surface	175+	4	4	1	5
0-10	14	-	-	-	
10-20	10	1	-	-	
20-30	6	-	-	-	
30-40	5	-	-	-	
40-50	2	-	-	1	

On April 10, 2019, the resource was later subjected to surface inspection and delineation by Gray & Pape, with shovel tests placed within and around visible surface scatters at 10-meter (33-foot) intervals. Surface finds continue to the north, south, and west where they expand consistent with the topography and continue to the west side of Idlewild Creek. Surface artifacts consisted mainly of chert debitage (175+) with a small number of cores and cobbles (4), bifaces (4), and one reworked flake (Table 5-12).

Of 26 delineation shovel tests placed within and around the previous resource boundary and surface scatter, six tests were positive for cultural materials (Table 5-12). All positive delineation tests are located outside of the project APE at the north and south margins of the resource. The resource's margins to the east and west are largely disturbed by an existing facility (east) and road (west). Delineation tests were not conducted to the east due to the fenced facility.

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Plan view of Resource 41NL323.

Figure 5-22. Overview of Resource 41NL323 within the APE. View is to the west.

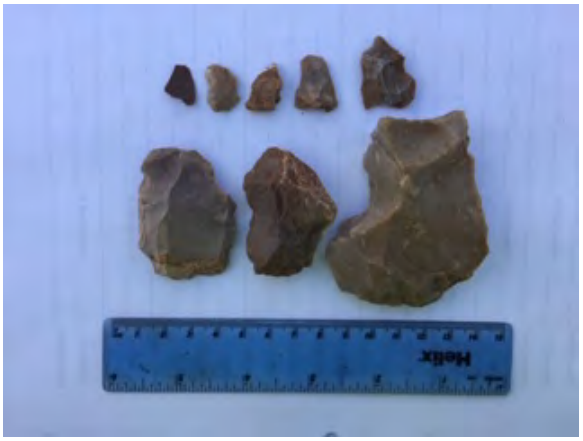

Figure 5-23. Representative materials identified on the surface of Resource 41NL323.

Table 5-12. Provenience of Subsurface Materials Identified within Resource 41NL323.

Test Number	Material	Depth
*017	1 chert flake	0-3 cm
*019	1 chert flake	0-20 cm
*020	1 chert flake	40 cm
*022	1 chert flake	10-20 cm
*024	1 chert flake	50 cm
*025	2 chert flakes	20-40 cm
B2	6 chert flakes	0-10 cm
	1 biface	10-20 cm
	2 chert flakes	20-30 cm
	4 chert flakes	30-40 cm
2	3 chert flakes	10-20 cm
B2 10E	1 chert flake	0-10 cm
	4 chert flakes	10-20 cm
ST2+20N	1 chert flake	0-10 cm
	2 chert flakes	10-20 cm
	1 chert flake	20-30 cm
	1 chert flake	30-40 cm
	1 unifacial tool	40-50 cm
ST2+30N	1 chert flake	20-30 cm
B2 20E	3 chert flakes	0-20 cm

*Denotes tests located within the project APE.

The resultant resource limits measure approximately 427 meters (1,400 feet) east-west by roughly 285 meters (935 feet) north-south. Soils mapped for the location consist of Colorado loam, Woodward loam, and Dermott gravelly loam which typically contain shallow A horizon soils with a surface layer of light reddish brown (5YR 6/3) silt loam followed by a C horizon of light reddish brown (5YR 6/3) loam (SSS NRCS USDA 2019). A typical shovel profile within the resource/APE consists of a surface layer of yellowish red (5YR 5/6) sandy clay to a depth of 50 centimeters (20 inches) followed by either yellowish red (5YR 5/6) clay/cemented caliche. Based on these results, there does not appear to be an intact A horizon within the APE.

The location of the site was revisited by Gray & Pape and agency representatives of the THC and USACE on August 27, 2019. During a cursory walk-over of the site approximately 50 flakes (chert), with approximately five limestone FCR were observed scattered on the surface within the eastern half the site. At the request of the THC, further delineation work was undertaken to delineate the western edge of the site within the APE. This work was undertaken by Gray & Pape on September 4, 2019. Three shovel tests were placed within the APE spaced 15 to 20 meters (49 to 66 feet) apart. No additional cultural finds were discovered by the additional tests.

Outside of the project ROW, there are relatively intact soils with some increase in artifact density and deposition. However, within the current APE, the resource appears to have experienced

moderate erosion and deflation due to previous impacts. This observation combined with the sparsity of surface artifacts, lack of diagnostics, and shallow soils recorded within the APE during the current effort suggests that the portion Site 41NL323 located within the APE has low research potential. No further work is recommended within the project footprint. The site portion located within the APE does not retain the potential to provide significant research value and is thus recommended not eligible for the National Register, under Evaluation Criterion D.

5.2.2.7 Resource 41NL326

Resource 41NL326 was originally recorded in 2015 by TAS for the Lone Star Express 24 survey (Burgess and Burgess 2015). The resource was recorded as a quarry/procurement location of an unknown prehistoric temporal affiliation. The resource is located on the eastern terrace of an unnamed tributary of Sweetwater Creek, approximately, 1.6 kilometers (1 mile) east of Highway 70, and 1.6 kilometers (1 mile) south-southeast of East Bradford Lane. The 2015 site form describes debitage and tested cobbles visible on the ground surface and lacking temporally diagnostic artifacts or formal and well-executed tools. The resource was found to be largely disturbed due to damage from previous pipelines, erosion, and deflation. The resource was not recommended for further work and in 2015 was determined by the THC to be ineligible for listing on the NRHP (THC 2019).

Resource 41NL326 was revisited on April 5 by Horizon and was subjected to pedestrian walkover and nine shovel tests excavated at 30-meter (100-foot) intervals within the APE (Figure 5-24). The APE at the location generally measures 40 meters (131 feet) wide, with an area of expanded workspace north and south of the tributary of Sweetwater Creek. The location within the existing ROW is sparsely covered by grasses with the ground surface visibility decreasing outside of the ROW (Figure 5-25). The area is currently being used as a cattle pasture. The resource consists of a gravel bar and contains several natural chert cobbles eroding out of the hillside.

Within the APE, ten or more flakes were observed on the surface as well as two cores and one scraper. It is thought that some of the observed flakes may be the result of mechanical disturbance rather than deliberate cultural manufacture. Nine shovel tests were placed within and beyond the original resource boundary/APE, all of which were negative for cultural materials.

On April 12, 2019, the resource was subjected to delineation outside of the APE by Gray & Pape. Delineation consisted of surface inspection and shovel tests spaced 10 to 20 meters (33 to 66 feet) apart beyond the limits of the identified surface scatter. Surface artifacts continue outside of the project APE to the west and east. Twelve delineation shovel tests placed around the visible surface scatter at 10-meter (33-foot) intervals produced one positive shovel test, containing two flakes between 0 and 10 centimeters (4 inches) below ground surface (Table 5-13). Observed surface artifacts include approximately 50+ chert debitage, 5+ bifaces, 6+ cores (Figure 5-26), at least 2 unifacial tools, 2 scrapers (Figure 5-27), and 1 preform.

The resultant resource measures approximately 400 meters (0.25 miles) north-south by roughly 350 meters (0.2 miles) east-west with most of the scatter located outside of the APE. The resource likely continues to the west and east along the tributary. Soils mapped for the location consist of Burson-Quinlan association rock outcrop, Woodward loam, and Paducah loam (SSS NRCS USDA 2019). These loamy soils entail shallow A horizons of reddish brown (5YR 4/4) loam. A typical shovel profile within the resource/APE consists of a surface layer of strong brown (7.5YR 5/6) silty clay loam to a depth of 25 centimeters (10 inches) followed by bedrock/cemented caliche. In other tests, this hard pan layer was encountered at varying depths but always present. Shovel test results within the APE suggest the soil is eroded or disturbed.

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Plan view of Resource 41NL326.

Table 5-13. Artifact Assemblage Observed at 41NL323.

Depth	Flakes	Bifaces	Unifaces	Cores	Preform	Scrapers
Surface	50+	5+	2+	6+	1	2
0-10	2	-	-	-	-	-
10-20	-	-	-	-	-	-
20-30	-	-	-	-	-	-
30-40						
40-50						

Figure 5-25. Overview of Resource 41NL326 within the APE. View is to the southwest.

Figure 5-26. Representative tools identified on the surface of Resource 41NL326.

Figure 5-27. Chert cores identified on the surface of Resource 41NL326.

Outside of the project ROW, there are relatively intact soils with some increase in artifact density and deposition. However, within the current APE, the site has experienced moderate erosion and deflation due to previous impacts. This observation combined with the sparsity of surface artifacts, lack of diagnostics, and shallow soils recorded within the APE during the current effort suggests that the portion of Site 41NL326 located within the APE has low research potential. No further work is recommended within the project footprint. The site portion located within the APE does not retain the potential to provide significant research value and is thus recommended not eligible for the National Register, under Evaluation Criterion D.

5.2.3 Newly Identified Resources within Jurisdictional Areas

Six new archaeological sites were identified as a result of survey within jurisdictional permit areas in Loop 1. These are described below.

5.2.3.1 Resource 41HW142

Resource 41HW142 was identified on April 6 The resource is located approximately 800 meters (0.5 miles) northeast of the Big Spring Country Club golf course. The resource consists of a surface scatter of lithics, dispersed to either side of an unnamed tributary of Beals Creek on a series of rises near the base of a bluff. The APE is wider in this area, measuring roughly 55 meters (180 feet) across to the east of the tributary, the majority of which to the north is outside the existing ROW. The location is sparsely covered by grasses but with good surface visibility due in part to the rocky soil and outcroppings prevalent at the location (Figure 5-28). Observed surface materials include about 30 flakes, at least one biface (Figure 5-29) and at least one cobble (Table 5-14).

No diagnostic artifacts or more developed tools were identified. Investigation of the resource consisted of pedestrian walkover and shovel tests excavated on a judgmental basis within the APE (Figure 5-30). Five shovel tests were conducted within and outside the site boundary. All were negative for cultural materials.

Figure 5-28. Overview of Resource 41HW142 within the APE. View is to the east.

Figure 5-29. Representative biface identified on the surface of Resource 41HW142.

Table 5-14. Artifact Assemblage Observed at 41HW142.

Depth	Flakes	Bifaces	Cobble
Surface	30+	1	1
0-10	-	-	-
10-20	-	-	-
20-30	-	-	-
30-40	-	-	-
40-50	-	-	-

Gray & Pape returned to the site on April 12, 2019 in an effort to delineate the site's boundaries beyond the APE. An additional five shovel tests were conducted beyond the observed surface limits of the site. None of the tests were positive for buried cultural materials. The resultant resource boundary was an L shape measuring approximately 110 meters (360 feet) northeast to southwest by 90 meters (295 feet) northwest to southeast. The resource was not pursued to the south due to a multitude of existing pipelines. Soils mapped for the location consist of Potter soils sandy loam (SSS NRCS USDA 2019). These soils are characterized by a very thin A horizon of grayish brown (10YR 5/2) and brown (10YR 5/3) gravelly loam. A typical

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Plan view of Resource 41HW142.

shovel profile conducted within the site center consists of a surface layer of dark yellowish brown (10YR 5/4) gravelly silt to a depth of 5 centimeters (2 inches) followed by cemented caliche. Rock is visible at the surface over most of the site.

The site was revisited by Gray & Pape and agency representatives of the THC and USACE on August 27, 2019. During a cursory walk-over of the site, cut banks with lithics exposed in-situ from 25 to 100 centimeters (10 to 39 inches) were observed along the centerline at beyond the recorded western edge of the site (Figure 5-31). The observance of this material resulted in the expansion of the boundary of 41HW142. The cultural materials are embedded within a mixture of colluvium/alluvium due to matrix attributes and close proximity to the sloping headwaters of the adjacent water feature. Approximately 100 to 200 lithics (all chert) were observed across the surface, with approximately 15 of these buried in the cut bank exposure. One uniface was observed.

Figure 5-31. Cleaned profile of the cut bank at the western edge of Site 41HW142. View is to the southeast.

At the request of the USACE, Gray & Pape revisited the location on August 29, 2019 to conduct additional testing. The investigation consisted of three shovel tests and a column excavation into the exposed cutbank. All were negative for additional cultural materials. Two shovel tests were within the center of the previously mapped site boundary, and the third shovel test was placed above/beyond the cut bank in an effort to determine the extent of the soil deposition away from the cut. The column sample was excavated into the cut bank approximately 10 centimeters (3.9 inches) wide and 70 centimeters (27.6 inches) deep (Figure 5-32). The sample exhibited a surface layer of brown (10YR 4/3) silty loam to a depth of 15 centimeters (6 inches). This was followed by dark brown (10YR 3/2) silty clay loam with several caliche gravels. To a depth of 60 centimeters (24 inches). Beyond that was a layer of caliche and the column excavation was terminated at 70 centimeters (27.6 inches). The column sample produced no additional cultural material. The sample was extremely difficult to excavate due to the compactness and caliche content of the soil. Further, the compactness of the soil and caliche content increased greatly 5 to 10 centimeters (2 to 4 inches) horizontally into the cut bank. Based on this, it would appear that the alluvial/colluvial matrix is thinly spread along the tributary and this thin veil of material was exposed by the washed-out bank.

Figure 5-32. Profile of excavated column sample at Site 41HW142. View is to the southeast.

A shovel test placed approximately 5 meters (16 feet) beyond the cut bank column sample produced a layer of brown (10YR 4/3) silty loam to a depth of 19 centimeters (7.5 inches). This was followed by dark brown (10YR 3/2) hard pan and caliche to a depth of 25 centimeters (10 inches) where the test was terminated due to the compactness of the matrix. Based on the results of the supplemental work, it appears that the cultural material buried into the cut bank does not extend very far horizontally into the bank, but rather is deposited vertically along the wall of the gully within a thin veneer of alluvial/colluvial matrix. Above the cut bank but below the landform, there is a thin amount of silty soils, but these terminate within 10 to 20 centimeters (4 to 8 inches). Based on these results, the site boundary was expanded to the cut bank but not further.

The resource is characterized by a number of lithics on the surface, but a lack of diagnostic artifacts, lack of significant amounts of subsurface materials, and shallow soils. Shovel testing across the site suggests that any additional buried materials within the site will be limited in number. For these reasons, Site 41HW142 appears to have low research potential in terms of contributing to the knowledge of prehistoric occupation of the area. No further work is recommended. The site does not retain the potential to provide significant research value and is thus recommended not eligible for the National Register, under Evaluation Criterion D.

5.2.3.2 Resource 41MH128

Resource 41MH128 was identified on April 2, 2019 by Gray & Pape. The resource is located immediately east of CR 264, approximately 1-kilometer (0.8 miles) south of CR 252. The location is sparsely covered by grasses with good surface visibility (Figures 5-33 and 5-34). The area is currently not being used but is a transitional area between pasture and adjacent agricultural field and man-made pond.

Figure 5-33. Overview of Resource 41MH128 within the APE. View is to the east.

The resource was identified by a surface scatter of mid-twentieth century materials. Observed materials include whiteware fragments, brown bottle glass, clear flat glass, metal cans, aqua colored vessel glass, brick, and mortared stone, and metal barrels (Figure 5-35). No intact structures such as foundations were identified. The adjacent pond is surrounded by an artificial berm. The majority of the resource is located on a slightly elevated terrace. Investigation of the resource consisted of pedestrian walkover and shovel tests excavated at 30-meter (100-foot) intervals within the APE (Figure 5-34). Of six shovel tests conducted within the scatter, none were positive for buried cultural materials.

The resultant resource boundary within the APE measures approximately 150 meters (492 feet) east-west by roughly 70 meters (230 feet) north-south. The resource likely continues to the north, where the 1952 Lake Colorado City USGS topographic map shows a structure placed adjacent to the road. Soils mapped for the location consist of Miles fine sandy loam (SSS NRCS USDA 2019). A typical shovel profile within the resource/APE consists of a surface layer of brown (7.5YR 4/4) sand to a depth of 15 centimeters (6 inches) followed by cemented caliche. In other tests, this hard pan layer was encountered at varying depths but always present.

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Plan view of Resource 41MH128.

Figure 5-35. Representative biface identified on the surface of Resource 41MH128.

Figure 5-36. Overview of Resource 41MH130 within the APE. View is to the northeast.

The resource likely extends both north and south of the corridor, however, within the corridor the resource is characterized by a sparsity of surface artifacts, lack of subsurface materials, and shallow soils. For these reasons, Site 41MH128 appears to have low research potential in terms of contributing to the knowledge of historic occupation of the area. No further work is recommended. The site portion located within the APE does not retain the potential to provide significant research value and is thus recommended not eligible for the National Register, under Evaluation Criterion D.

5.2.3.3 Resource 41MH130

Resource 41MH130 was identified on March 29, 2019 by Gray & Pape. The site is a relatively small lithic scatter located on an upland bench within a plowed field west of North Fork Champion Creek and approximately 175 meters (574 feet) east of an unnamed tributary of North Fork Champion Creek (Figure 5-36). The resource is located approximately 145 meters (476 feet) south of CR 406 and 25 meters (82 feet) east of a fence line that is the south extension of CR 408. It is situated within a plowed field which offered excellent surface visibility (Figure 5-36). The APE at the location measures 40 meters (131 feet) wide.

Investigation consisted of pedestrian survey and shovel testing across the area. Observed artifacts consisted of four chert flakes and one crude biface scattered over an area measuring approximately 20 meters (66 feet) east-west by 10 meters (33 feet) north-south within the proposed APE. Seven shovel tests were excavated within and adjacent to the surface scatter at 10-meter (33-foot) intervals and all were negative for cultural materials (Figure 5-37).

Soils mapped for the location consist of Miles fine sandy loam which is characterized by an A horizon of brown (7.5YR 4/2) fine sandy loam followed by a B horizon of reddish brown (5YR 4/4) sandy clay loam (SSS NRCS USDA 2019). A typical shovel profile within the resource/APE consists of a surface layer of brown (7.5YR 4/4) sand to a depth of 15 centimeters (6 inches) followed by cemented caliche. In other tests, this hard pan layer was encountered at varying depths but always present. These results suggest that the natural A horizon is lacking at the location, likely the result of continued agricultural use and erosion.

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Plan view of Resource 41MH130.

The resource is small and contained within the APE. The site is characterized by a sparsity of surface artifacts, lack of subsurface materials, and shallow soils. For these reasons, Site 41MH130 appears to have low research potential. No further work is recommended. The site does not retain the potential to provide significant research value and is thus recommended not eligible for the National Register, under Evaluation Criterion D.

5.2.3.4 Resource 41NL377

Resource 41NL377 was identified on March 27, 2019 by Gray & Pape. The resource is located south of CR 152, 100 meters (328 feet) east of Long Branch and 173 meters (568 feet) east of previously recorded Site 41NL321. The APE in the location measures 40 meters (131 feet) across with approximately 30 meters (100 feet) of that distance is outside of the existing ROW. The location consists of a flat upland between Long Branch creek to the west and an unnamed tributary to the east. The area is currently scrub brush pasture, sparsely covered by grasses but with good surface visibility (Figure 5-38). The resource consists of a surface scatter of lithics dispersed over the landform. Observed surface materials within the APE initially consisted of a single flake. A shovel test placed near the surface find produced a single chert flake between 0 and 10 centimeters (4 inches) below the ground surface. A surface inspection of the surrounding area within the APE produced more surface finds consisting of approximately 7 flakes, a biface (Figure 5-39), and 1 small reworked flake (Table 5-15).

Seven delineation shovel tests placed around the lone positive test at 10-meter (33-foot) intervals produced no additional positive shovel tests (Figure 5-40).

On April 1, 2019, Gray & Pape attempted delineation of the site to the south. Surface finds were found to continue to the south where they expand consistent with the topography. The southern portion of the resource contains a good deal more materials and types including a multitude of bifaces and flakes, heat treated rocks, two broken projectile points, a 1917 penny, and brown glass bottle. No complete diagnostic prehistoric artifacts were identified.

Figure 5-38. Overview of Resource 41NL377 within the APE. View is to the west.

Figure 5-39. Representative materials identified on the surface of Resource 41NL377.

Table 5-15. Artifact Assemblage Observed at 41NL377.

Depth	Flakes	Bifaces	Reworked Flake
Surface	7	1	1
0-10	1	-	-
10-20	-	-	-
20-30	-	-	-
30-40	-	-	-
40-50	-	-	-

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Plan view of Resource 41NL377.

The resultant resource boundary within the corridor measures approximately 70 meters (230 feet) east-west by 40 meters (130 feet) north-south. However, the resource continues to the south by potentially several hundred meters. The area to the north of the previously recorded resource boundary was not investigated due to the number of previous pipelines. Soils mapped for the location consist of Dermott gravelly loam, a very shallow fractured and weathered soil found on gently to steeply sloping hills and ridges and derived from the Ogallala Formation (SSS NRCS USDA 2019). A typical shovel profile within the resource / APE consists of a surface layer of dark yellowish brown (10YR 4/4) sandy loam and gravel to a depth of 20 centimeters (8 inches) followed by cemented caliche. In other tests, this hard pan layer was encountered at varying depths but almost always present.

The site was revisited by Gray & Pape and agency representatives of the THC and USACE on August 27, 2019. During a cursory walk-over of the site, approximately 10 flakes and two unifaces (all chert) were observed within the APE.

While more intact areas may exist beyond the ROW to the south where the topography changes to include higher terraces and landforms, the portion of the site within the current APE, has experienced moderate erosion and deflation due to previous adjacent impacts. This observation combined with the sparsity of surface artifacts, lack of complete diagnostics, and shallow soils recorded during the current effort suggests that the portion of the site within the ROW has low research value. No further work is recommended. The USACE agreed with this recommendation. The site portion located within the APE does not retain the potential to provide significant research value and is thus recommended not eligible for the National Register, under Evaluation Criterion D.

5.2.3.5 Resource 41NL378

Resource 41NL378 was identified on March 27, 2019 by Gray & Pape. The resource is located immediately west of CR 143 at the pipeline ROW, and roughly parallels Idlewild Creek which is located north of the site. The APE at the location measures 40 meters (131 feet) wide with expanded workspaces at the road and one larger water feature that dissects the site. The location is characterized by a series of several undulating uplands. The area is sparsely covered by grasses but with good surface visibility (Figure 5-41). The area is currently scrub brush pasture. The resource consists of a near continuous surface scatter of lithics, dispersed along the project APE as it parallels Idlewild Creek. The site was investigated by pedestrian walkover and shovel tests spaced between 30 and 100 meters (100 and 328 feet) within the APE. Observed surface materials within the APE consisted of a multitude of debitage (100+) (Figure 5-42), at least two cores, two bifaces, three utilized flakes, and tools including two end scrapers, and one projectile point tip (Table 5-16). A small number of flakes could technically be described as blades. No diagnostic artifacts were identified. Fifteen shovel tests were excavated across the property. Of those, eight were found to be positive for cultural materials which consisted of a single non-diagnostic artifact in 7 of the 8 tests (Table 5-17).

On April 1, 2019, Gray & Pape returned to the location in an effort to delineate the southern boundaries of the site. Delineation of the resource consisted of pedestrian walkover and shovel tests excavated at intervals of 30 meters (100 feet) (Figure 5-43). Of nine additional shovel tests placed south of the scatter none were positive for cultural materials. However, surface finds continue to the south where they expand consistent with the topography. The southern portion of the resource contains a good deal more materials and types including a multitude of flakes, bifaces (20+), cores (10+), and rudimentary tools such as utilized flakes and scrapers (7+).

The resultant resource boundary within the corridor measures approximately 1 kilometer (0.7 miles) east-west by 40 meters (130 feet) north-south. However, the resource continues to the south by potentially several hundred meters. The area to the north of the previously recorded resource boundary was not investigated due to previous pipelines.

Figure 5-41. Overview of Resource 41NL378 within the APE. View is to the east.

The site was revisited by Gray & Pape and agency representatives of the THC and USACE on August 27, 2019. A cursory walk-over of the site identified approximately 250 to 500 lithics across the surface including 6 bifaces, 6 unifaces, 6 cores, and 6 modified flakes. Almost all artifacts were chert with approximately 3 chipped stone artifacts made from quartzite.

Figure 5-42. Representative materials identified on the surface of Resource 41NL378.

At the request of the USACE and THC, Gray & Pape conducted supplemental testing within the APE at site 41NL378 on September 4, 2019. Twenty additional shovel tests were excavated along the centerline resulting in shovel test coverage throughout the site with tests spaced between 30 and 40 meters (98 and 131 feet) between each. None of the supplemental tests were positive for cultural materials.

Table 5-16. Artifact Assemblage Observed at 41NL378.

Depth	Flakes	Bifaces	Cores	Modified Flakes	Unifaces	Projectile Point Tip
Surface	250+	6	6	6	6	1
0-10	3	-	-	-	-	-
10-20	4	-	-	-	-	-
20-30	2	-	-	-	-	-
30-40	-	-	1	-	-	-
40-50	1	-	-	-	-	-

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Plan view of Resource 41NL378.

Table 5-17. Provenience of Subsurface Materials Identified within Resource 41NL378.

Test Number	Material	Depth
A1	1 rough core	30-40 cm
A2	1 chert flake	20-30 cm
A4	1 chert flake	10-20 cm
	1 chert flake	20-30 cm
A6	1 chert flake	0-10 cm
A8	1 chert flake	10-20 cm
	1 chert flake	40-50 cm
A10	1 chert flake	0-10 cm
A12	1 chert flake	0-10 cm
M13	2 chert flakes	10-20 cm

Soils mapped for the location consist of Dermott gravelly loam, a very shallow fractured and weathered soil found on gently to steeply sloping hills and ridges and derived from the Ogallala Formation (SSS NRCS USDA 2019). A typical shovel profile within the resource / APE consists of a surface layer of light brown (7.5YR 6/4) silt loam to an average depth of 25 centimeters (10 inches). This was followed by cemented caliche. Several other shovel tests performed within the existing pipeline corridor showed signs of disturbance exhibited by mottled soils. During the August 27 visit, recent disturbance from an adjacent pipeline was observed. The surface if the adjacent pipeline was graded along the entire length of Site 41NL378. The adjacent workspace was graded to an approximate depth of 30 centimeters (12 inches). Caliche was visible in the graded surface and backdirt for much of the length of the site, underscoring the shallowness of the soils in the area.

Within the current APE, the resource appears to have experienced moderate erosion and deflation due to previous adjacent impacts. The extent of surface artifacts, although relatively continuous along the corridor, are loosely associated and likely represent multiple components which have been displaced by previous impacts, erosion, and migration. The soils are also relatively shallow. For these reasons, the portion of the site within the ROW appears to have low research potential. More intact areas may exist beyond the ROW to the south where the topography changes to include higher terraces and landforms. The site portion located within the APE does not retain the potential to provide significant research value and is thus recommended not eligible for the National Register, under Evaluation Criterion D.

5.2.3.6 Resource 41NL379

Resource 41NL379 was investigated on April 8, 2019 by Gray & Pape. The resource is located approximately 260 meters (853 feet) west of CR 131 on an upper (3rd) terrace east of an unnamed tributary of Little Stink Creek. The site may be an extension of previously recorded site 41NL72, but the distance between the two has not been investigated and thus their association to each other has not been determined. The location is sparsely covered by grasses but with good surface visibility (Figures 5-44 and 45). The area currently consists of pasture but is nearly entirely within the existing pipeline corridor. The APE at the location measures 40 meters (131 feet) wide, all of which is within the existing ROW. Investigation of the resource consisted of pedestrian walkover and shovel tests excavated at 10-meter (10-foot) intervals around the perimeter of the scatter within the APE (Figure 5-44). The resource consists of a moderately dense surface scatter of lithics, composed of 20+ chert flakes and 5 possible cores (Figure 5-46, Table 5-18).

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Plan view of Resource 41NL379.

Figure 5-45. Overview of Resource 41NL379 within the APE. View is to the west.

Figure 5-46. Representative materials identified on the surface of Resource 41NL379.

Table 5-18. Artifact Assemblage Observed at 41NL379.

Depth	Flakes	Cores
Surface	20+	5
0-10	-	-
10-20	-	-
20-30	-	-
30-40	-	-
40-50	-	-

However, it should be noted that the entirety of the corridor is within a highly disturbed area and at least some portion of the materials could be the result of mechanical manufacture. No diagnostic artifacts or more developed tools were identified. Of six shovel tests conducted within and surrounding the scatter, none were positive for buried cultural materials and nearly all showed signs of disturbance.

The resultant resource boundary measures approximately 65 meters (213 feet) east to west by 24 meters (79 feet) north to south. The resource was not pursued to the north or south outside of the APE but did not appear to continue. Soils mapped for the location consist of Pitzer gravelly loam (SSS NRCS USDA 2019). A typical shovel profile within the resource/APE consists of a surface layer of dark yellowish brown (7.5YR 4/4) sand to a depth of 20 centimeters (10 inches) followed by bedrock.

The site may be associated with previously recorded site 41NL72, located approximately 90 meters (295 feet) to the north, however the distance between them was not investigated. Thus, its relationship to previously recorded site 41NL72 is undetermined. Site 41NL72 was originally recorded by Foy Steadman who collected 10 dart points from the surface. In 2010 Geo-Marine, Inc. revisited the site and noted a large lithic scatter as well as a historic scatter of glass, ceramics, and metal cans. Geo-Marine recommended the site as not eligible within their ROW (Hunt 2011). The site is listed as Undetermined on the Texas Archeological Sites Atlas.

Resource 41NL379 is characterized by a sparsity of surface artifacts, lack of diagnostic artifacts, lack of subsurface materials, and shallow soils. For these reasons, Site 41NL379 appears to have low research value in terms of contributing to the knowledge of prehistoric occupation of the area. No further work is recommended. The site does not retain the potential to provide significant research value and is thus recommended not eligible for the National Register, under Evaluation Criterion D.

5.2.3.7 Resource 41NL380

Resource 41NL380 was identified on April 6, 2019 by Gray & Pape. The resource is located approximately 225 meters (735 feet) north of

CR 130 on an upper (3rd) terrace between Noodle Creek to the east and an unnamed drainage to the west. The location is approximately 95 meters (312 feet) west of previously recoded site 41NL317, which was not re-identified during the current survey, and 447 meters (1467 feet) east of Site 41NL315/316. The location is sparsely covered by grasses but with good surface visibility (Figure 5-47). The area currently consists of pasture but is nearly entirely within the existing pipeline corridor. The APE at the location measures 40 meters (131 feet) wide, of which approximately 30 meters (100 feet) is within the existing ROW. Investigation of the resource consisted of pedestrian walkover and shovel tests excavated around the perimeter of the scatter at 10-meter (10-foot) intervals within the APE (Figure 5-48). The resource consists of a moderately dense surface scatter of lithics, composed of 30+ chert flakes and 4 possible cores (Figure 5-49, Table 5-19).

Figure 5-47. Overview of Resource 41NL380 within the APE. View is to the west.

Table 5-19. Artifact Assemblage Observed at 41NL380.

Depth	Flakes	Cores
Surface	30+	4
0-10	-	-
10-20	-	-
20-30	-	-
30-40	-	-
40-50	-	-

However, it should be noted that the entirety of the corridor is within a highly disturbed area and at least some portion of the materials could be the result of mechanical manufacture. No diagnostic artifacts or more developed tools were identified. Of seven shovel tests conducted within and surrounding the scatter, none were positive for buried cultural materials and nearly all showed signs of disturbance. Soils mapped for the location consist of Pitzer gravelly loam and Nipsum clay loam (SSS NRCS USDA 2019). A typical shovel profile within the resource/APE consists of a surface layer of dark yellowish brown (7.5YR 4/4) sandy loam to a depth of 10 to 20 centimeters (4 to 10 inches) followed by bedrock.

The resultant resource boundary measures approximately 187 meters (613 feet) east to west by 30 meters (98 feet) north to south. The resource was not pursued to the north or south outside of the APE.

The site was revisited by Gray & Pape and agency representatives of the THC and USACE on August 28, 2019. A cursory walk-over of the site identified two tertiary flakes on the surface.

The resource is characterized by a sparsity of surface artifacts, lack of diagnostic artifacts, lack of subsurface materials, and shallow soils. For these reasons, Site 41NL380 appears to have low research value in terms of contributing to the knowledge of prehistoric occupation of the area. No further work is recommended. The site as currently mapped within APE does not retain the potential to provide significant research value and is thus recommended not eligible for the National Register, under Evaluation Criterion D.

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Plan view of Resource 41NL380.

Figure 5-49. Representative materials identified on the surface of Resource 41NL380.

5.2.3.8 Resource 41NL392

Resource 41NL392 was first identified on April 6, 2019 by Horizon. The site was originally identified as an isolate find of a single positive shovel test containing a single flake between 0 and 10 centimeters (0 and 4 inches) below ground surface (Table 5-20). The resource is located approximately 0.6 kilometers (0.4 miles) west of CR 1856, adjacent to small unnamed intermittent drainage. The location is a broad flat terrace, sparsely covered by grasses but with good surface visibility (Figure 5-50). The west bank of the drainage contains an exposed cut bank. The APE at the location measures between 40 and 55 meters (131 and 180 feet) wide as the location incorporates and extra wide portion of workspace. Nearly all of the APE is within the existing ROW. Investigation of the resource by Horizon consisted of pedestrian walkover and shovel tests excavated around the lone positive shovel test at 16-meter (52.5-foot) intervals within the APE (Figure 5-51). Of six tests placed in the vicinity, none were positive for additional materials.

Gray & Pape revisited the location on September 5, 2019. The revisit entailed pedestrian survey and supplemental shovel testing of the resource. Surface survey observed an additional 4 flakes on the surface adjacent to the west bank of the drainage (Table 5-20). The survey crew also inspected the cut bank along the west bank of the drainage (Figure 5-52). No artifacts or buried A horizons were observed in the bank. Further, soils in the bank were observed to be shallow with hard pan / caliche present at 20 centimeters (8 inches) below surface.

Of seven shovel tests conducted within and surrounding the scatter and previous positive shovel test, none were positive for buried cultural materials. Soils mapped for the location consist of Quinlan-Burson-Woodward association, rolling (SSS NRCS USDA 2019). These soils typically consist of a shallow (20 centimeter [8-inch]) A horizon of reddish brown (5YR 5/4) loam followed by B and C horizons of red to reddish brown loam. A typical shovel profile within the resource/APE consists of a surface layer of yellowish red (5.5YR 5/6) silt loam to depths between 5 and 15 centimeters (2 and 6 inches) followed by hard pan / caliche.

Figure 5-50. Overview of Site 41NL392. View is to the east.

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Plan view of Resource 41NL392.

Table 5-20. Artifact Assemblage Observed at 41NL392.

Depth	Flakes
Surface	4
0-10	1
10-20	-
20-30	-
30-40	-

Figure 5-52. Overview of the west cut bank of an unnamed drainage at Site 41NL392. View is to the west.

The resultant resource boundary measures approximately 67 meters (219 feet) east to west by 32 meters (106 feet) north to south. The resource was not pursued to the north or south outside of the APE. The resource is characterized by a sparsity of surface artifacts, most of which are located within the existing ROW, lack of diagnostic artifacts, lack of significant subsurface materials, and shallow soils. For these reasons, Site 41NL392 appears to have low research value. No further work is recommended. The site as currently mapped within APE does not retain the potential to provide significant research value and is thus recommended not eligible for the National Register, under Evaluation Criterion D.

5.2.4 Newly Identified Isolates within Jurisdictional Areas

Three new isolates were identified as a result of survey within jurisdictional permit areas in Loop 1. These are described below.

5.2.4.1 Isolate MH-27-ISO-01

Resource MH-27-ISO-01 was identified by Horizon on April 2, 2019. The resource is located 400 meters (0.25 miles) east of Highway 163 and 420 meters (0.26 miles) south-southeast of CR 323. The find is located on a terrace adjacent to a berm of a man-made pond created from an unnamed tributary of the Colorado River. The location is sparsely covered by grasses but with good surface visibility (Figure 5-53 and 5-54). The area is currently scrub brush pasture.

Figure 5-53. Overview of Isolate MH-27-ISO-01. View is to the northeast.

The resource consists of a single flake identified within a shovel test at a depth of 80 centimeters (31.5 inches) (Figure 5-55). Investigation of the resource consisted of pedestrian walkover and seven delineation shovel tests placed around the lone positive test at 10-meter (33-foot) intervals within the APE (Figure 5-54). No additional tests were positive for cultural materials. The isolate does not retain the potential to provide significant research value and is thus recommended not eligible for the National Register, under Evaluation Criterion D.

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Plan view of Isolate MH-27-ISO-01.

Figure 5-55. Representative materials identified at Isolate MH-27-ISO-01.

5.2.4.2 Isolate MH-45-ISO-02

Resource MH-45-ISO-02 was identified on March 29, 2019. The resource is located south of CR 406, approximately 70 meters (229.6 feet) east of North Fork Champion Creek. The find is located on a low terrace in a plowed agricultural field with excellent surface visibility (Figure 5-56). The resource consists of chert scraper identified on the surface (Figure 5-57).

Investigation of the resource consisted of pedestrian walkover and seven delineation shovel tests placed around the lone positive test at 10-meter (33-foot) intervals within the APE (Figure 5-58). No additional tests were positive for cultural materials. The isolate does not retain the potential to provide significant research value and is thus recommended not eligible for the National Register, under Evaluation Criterion D.

Figure 5-56. Location of Isolate MH-45-ISO-02. View is to the northwest.

Figure 5-57. Scraper identified as MH-45-ISO-02.

5.2.4.3 Isolate MH-48-ISO-01

Resource MH-48-ISO-01 was identified on March 29, 2019. The resource is located on property controlled by the City of Colorado City, 247 meters (817 feet) east of South CR 412, approximately 187 meters (612 feet) south of the intersection with CR 406. The find is located in a recently plowed agricultural field with excellent surface visibility (Figures 5-59 and 5-60).

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Plan view of Isolate MH-45-ISO-02.

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Plan view of Isolate MH-48-ISO-01.

Figure 5-60. Overview of Isolate MH-48-ISO-01. View is to the southwest.

Figure 5-61. Overview of Isolate MH-50-ISO-01. View is to the southwest.

5.2.4.4 Isolate MH-50-ISO-01

Resource MH-50-ISO-01 was identified on March 29, 2019. The resource is located controlled by the City of Colorado City, 247 meters (817 feet) east of South CR 412, approximately 187 meters (612 feet) south of the intersection with CR 406. The find is located in a recently plowed agricultural field with excellent surface visibility (Figure 5-61). The resource consists of a single chert flake identified on the surface (Figure 5-62). Investigation of the resource consisted of pedestrian walkover and six delineation shovel tests placed around the surface find at 10-meter (33-foot) intervals within the APE (Figure 5-63). No additional tests were positive for cultural materials. The isolate does not retain the potential to provide significant research value and is thus recommended not eligible for the National Register, under Evaluation Criterion D.

Figure 5-62. Representative materials identified on the surface of Isolate MH-50-ISO-01.

5.2.5 Revisit Results of Non-Jurisdictional Resources

In addition to revisits of previously recorded resources located in permit areas, 13 previously recorded resources are located within 91 meters (300 feet) of the APE along non-jurisdictional uplands (Table 5-21). Of those 13 sites, portions of 10: 41MD41, 41HW8, 41HW104, 41HW105, 41HW106, 41NL310, 41NL312, 41NL322, 41NL324, and 41NL325 were re-identified within the APE. These largely were exhibited by surface scatters of lithics. Details for each site are provided below.

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Plan view of Isolate MH-50-ISO-01.

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Figure 5-63

Table 5-21. Previously Recorded Resources Re-Identified within Non-jurisdictional Uplands of the APE.

Trinomial	MP Begin	MP End	Site Type	Cultural Affiliation	Previous Materials Observed	Record Date	Previous NRHP Status	NRHP Review Date	Current Materials Observed	Current Eligibility Rec	Appendix A Figure	Appendix B Figure	Report Figure
41MD41	1.30	1.65	Campsite	Late Paleoindian to Protohistoric	Hearths, caliche hearthstones, tools, debitage, late Paleoindian, Marshall, Ceramic Scallorn, and Protohistoric Fresno projectile points	3/27/2015	Undetermined	N/A	four pieces of debitage, two expedient/edge- modified tools, five handstones, and 79 FCR fragments	Ineligible within ROW	A1		5-74
41HW8	29.10	29.20	Quarry/ Procurement	Unknown Prehistoric	Flint nodules, fire hearths, lithic debitage	11/3/2015	Ineligible within ROW	10/28/2015	8 surface flakes	Ineligible within ROW	A12		5-77
41HW104	37.40	37.50	Lithic Scatter	Unknown Prehistoric	20-50 flakes, a few cores, 3 unifaces, 2 bifaces, and some debitage.	10/12/2011	Ineligible within ROW	10/28/2015	14 surface flakes	Ineligible within ROW	A15		5-79
41HW105	38.00		Lithic Scatter	Unknown Prehistoric	Secondary flakes, exhausted core, chert core, edge modified tool fragment, tertiary flakes, tested cobble	10/12/2011	Ineligible	11/18/2011	2 surface flakes	Ineligible within ROW	A15		5-81
41HW106	40.10		Lithic Scatter	Unknown Prehistoric	Primary and secondary flakes, Edwards chert drill tip	10/12/2011	Undetermined	11/18/2011	4 surface flakes	Ineligible within ROW	A16		5-82
41MH129	65.20		Prehistoric lithic scatter	Unknown Prehistoric	N/A	5/29/2019	N/A	N/A	Small lithic scatter of a handful (10+) of chert flakes	Ineligible within ROW	A25		5-94
41NL310	101.60	102.35	Lithic Scatter	Unknown Prehistoric	Primary flakes, tested cobbles, cores	2/2/2013	Ineligible within ROW	1/29/2013	A scatter of tested cobbles, unifaces, bifaces, and flakes were observed on the ground surface	Ineligible within ROW	A39		5-84
41NL312	95.95	96.20	Lithic Scatter	Mid to Late Archaic	Corner-notched Williams-like dart point fragment, biface, core, debitage	4/4/2014	Ineligible	8/18/2014	500+ flakes, 10+scrapers, 20+cores, and 10+bifaces were observed on the ground surface	Ineligible within ROW	A37		5-87
41NL322	100.40	100.65	Quarry/ Procurement	Unknown Prehistoric	Debitage, tested cobbles, primary and secondary flakes, several non-specific tools.	4/24/2015	Ineligible within ROW	10/28/2015	A scatter of tested cobbles, flakes, 1 biface, 1 uniface and 1 scraper on the surface. A single chert flake between 0 and 20 centimeters	Ineligible within ROW	A39		5-88
41NL324	89.70		Quarry/ Procurement	Unknown Prehistoric	unspecified quantity of debitage and tested cobbles	4/24/2015	Ineligible within ROW	10/28/2015	3 flakes on surface, 1 of them modified	Ineligible within ROW	A35		5-90
41NL325	97.20		Quarry/ Procurement	Unknown Prehistoric	unspecified quantity of debitage and tested cobbles	4/24/2015	Ineligible within ROW	10/28/2015	5 flakes were observed on the ground surface	Ineligible within ROW	A37-A38		5-92

5.2.5.1 Resource 41MD41

Site 41MD41 is a prehistoric campsite recorded in Midland County in 2009 by Dr. Eileen Johnson during the Lubbock Lake Landmark regional research program. The site is located on the Stanton SE USGS 7.5-minute quadrangle topographic map approximately 250 meters (820 feet) east of Mustang Draw. The site was reported to contain several thousand lithics (tools and debitage), over 1,000 hearthstones (caliche and sandstone), and 43 groundstones. The site was also reported to contain hearth fill sediments and buried soils. While the site recorders considered the resource potentially eligible for listing as a State Archeological Landmark, the site's NRHP status is unknown or undetermined.

The site was revisited by Gray & Pape on July 15 and 16, 2019. Within the APE, the site area entails two landscape usages: cotton field and pasture (Figure 5-64 through 5-66). Pedestrian survey was conducted across three transects spaced 10 meters (33 feet) apart throughout the APE within tracts 3, 4, and 5. A total of 90 artifacts were recorded on the surface. No artifacts were identified east of the cotton field within tract 3. A total of 88 artifacts were recorded on the surface within the APE (Table 5-22). These materials included approximately four pieces of debitage, two expedient/edge-modified tools, five hand stones, and 79 FCR fragments (Figures 5-67 and 5-68).

Based on the extent of artifacts on the surface, the site boundary within the APE measures approximately 560 meters (1,837 feet) east to west and 40 meters (131 feet) north to south (Figure 5-66). Shovel tests were excavated along two transects, A and B, staggered at 60-meter (197-foot) intervals. A total of 23 shovel tests were excavated within the previously recorded site boundary to a maximum depth of 80 centimeters (32 inches) below surface (10 centimeters [4 inches] below the maximum depth of buried materials previously recorded at this site). Three of these shovel tests contained buried artifacts. A representative soil profile from Shovel Test A3+10N contained two strata. Stratum I from 0 to 36 centimeters (14 inches) was strong brown (7.5YR 4/6) moderate fine to medium granular loamy fine sand. Stratum II from 36 to 70 (14 28 inches) to centimeters was strong brown (7.5YR 5/6) strong medium to coarse subangular blocky silt loam with common caliche gravels throughout.

Figure 5-64. Overview of the location of Site 41MD41 within the APE where it crosses a cotton field. View is to the northwest.

Figure 5-65. Overview of the location of Site 41MD41 within the APE where it crosses a fallow field/pasture. View is to the northwest.

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Plan view of Resource 41MD41.

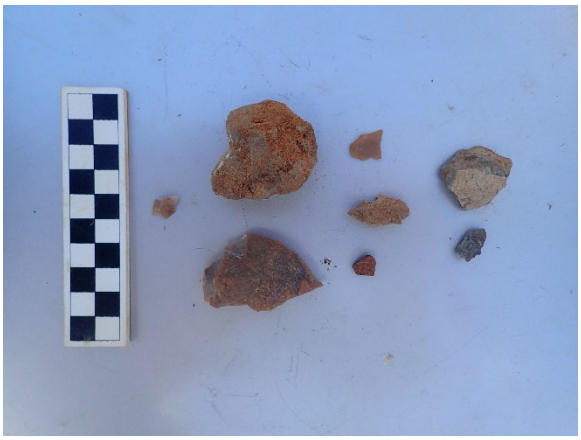

Figure 5-67. Representative artifacts observed at Site 41MD41 including chert flakes and FCR.

Figure 5-68. A basaltic handstone identified on the surface of site 41MD41.

A total of 14 artifacts were found below surface. Shovel Test A3 contained one piece of limestone FCR between 10 and 20 centimeters (4 and 8 inches), one interior chert flake and one limestone FCR fragment between 20 and 30 centimeters (8 and 12 inches), one broken interior chert flake, one limestone FCR fragment and one pigmented sedimentary rock between 30 and 40 centimeters (12 and 16 inches), and one interior chert flake fragment between 40 and 50 centimeters (16 and 20 inches). An additional seven shovel tests were excavated to delineate A3, one of which was positive for buried cultural material. One FCR fragment was found between 10 and 20 centimeters (4 and 8 inches), and one complete chert flake along with one broken chert flake were found between 20 and 30 centimeters (8 and 12 inches). Shovel Test B3 contained three pieces of FCR within the first 10 centimeters (4 inches) and one piece of FCR between 10 and 20 centimeters (4 and 8 inches). Soils from this test were clearly disturbed and the materials were likely buried during the previous pipeline construction and installation.

Table 5-22. Artifact Assemblage Observed at 41MD41.

Depth	Flakes	Tools	Hand stones	FCR	Pigmented Sedimentary Rock
Surface	4	2	5	79	-
0-10	-	-	-	4	-
10-20	-	-	-	2	-
20-30	3	-	-	1	-
30-40	2	-	-	1	1
40-50	1	-	-	-	-
50-60	-	-	-	-	-
60-70	-	-	-	-	-
70-80	-	-	-	-	-

The portion of Site 41MD41 that lies within the proposed workspace, both above and below surface, has undergone disturbances associated with the previous adjacent pipeline construction and installation as well as agricultural land use across all three tracts. While a variety of artifact types were identified here including debitage, expedient/edge-modified tools, FCR and groundstone tools, none of these materials were in primary context. Due to the lack of integrity, and limited interpretive value of the artifacts recorded, this site appears to have low research potential. No further work is recommended within the project footprint. The site portion located within the APE does not retain the potential to provide significant research value and is thus recommended not eligible for the National Register, under Evaluation Criterion D.

5.2.5.2 Resource 41HW8

Resource 41NLHW8 was originally recorded by Tom Adams in 1970. The resource was described as a 4-hectare (10-acre) flint quarry site, with material evidence of tool manufacture, including hearths, overlooking a hillside of exposed flint nodules. The site was revisited in 1998 by TRC Mariah Associates Inc. as part of the York Windpower Farm project. Other than noting chipped stone, no other information was recorded on the site form at that time (Tomka 1998). In 2015, the site was again revisited, this time by Turpin and Sons, Inc. as part of a pipeline project. They noted only "sparse" debitage within that project's ROW, and no further work was recommended (Burgess and Davis 2015). The THC notes the site as Ineligible within ROW in October 2015 (THC 2019).

Resource 41HW8 was revisited by Gray & Pape on April 6, 2019. The site location within the existing ROW consists of an upland terrace and a steep, gravelly slope. The surface is sparsely covered by grasses with the visibility decreasing outside of the ROW (Figure 5-69). The area is currently being used as a cattle pasture and has been impacted by erosion, and existing pipelines. Within the ROW, cultural material was limited to a surface scatter along the bluff top. Approximately 8 flakes were observed intermixed with raw chert rocks (Table 5-23).

Figure 5-69. Overview of Site 41HW8 within the APE. View is to the east.

Table 5-23. Artifact Assemblage Observed at 41HW8.

Depth	Flakes
Surface	8
0-10	-
10-20	-
20-30	-
30-40	-
40-50	-

Initial investigation of the resource consisted of pedestrian walkover and shovel tests excavated at 30-meter (100-foot) intervals within the APE (Figure 5-70). Of the seven attempted shovel tests placed within the resource boundary/APE, five were left unexcavated due to heavily disturbed surface conditions and steep bluff slope. The two excavated shovel tests were both negative for cultural resources. The resultant resource measures approximately 80 meters (263 feet) east-west by 42 meters (138 feet) north-south within the ROW. Soils mapped for the location consist of Ector and Potter soils (SSS NRCS USDA 2019). A typical shovel profile within the resource / APE consisted of a surface layer of brown (10YR 4/3) gravelly loam to a depth of 15 centimeters (6 inches) followed by a layer of limestone bedrock.

The resource appears to have experienced moderate erosion since its original recordation in 1970, resulting in soil deflation and the exposure and likely displacement of artifacts now on the surface. The lack of subsurface deposits within the APE and lack of diagnostics recorded during the current effort suggests the resource is not significant within the ROW. The site portion located within the APE does not retain the potential to provide significant research value and is thus recommended not eligible for the National Register, under Evaluation Criterion D.

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Plan view of Resource 41HW8.

5.2.5.3 Resource 41HW104

Resource 41HW104 was originally recorded by ACI Consulting in 2011. The resource was described as a 130 by 45-meter (390 by 135-foot) light lithic scatter located across a hilltop. Material noted at the time included 20-50 flakes, a few cores, 3 unifaces, 2 bifaces, and some debitage. Material was limited to the ground surface and no diagnostic material or cultural features were identified. No further work was recommended (Casias 2011). In 2015, the site was again revisited, this time by Turpin and Sons, Inc. as part of a pipeline project. That investigation identified no cultural material within their ROW (Burgess and Davis 2015). The Texas Archeological Sites Atlas lists 41HW104 as Ineligible within three separate ROW's.

Resource 41HW104 was revisited by Gray & Pape on April 5, 2019. The location within the existing APE is located on an upland remnant between Moss Creek and Beals Creek. The area is currently being used as a cattle pasture and has been impacted by erosion, the installation of electric transmission towers, and existing pipelines (Figure 5-71). A gravel access road runs along the western boundary of the site and a second graveled access road divides the new extension of 41HW104 from the original site boundary to the north. Approximately 14 flakes were observed on the ground surface within the ROW (Table 5-24).

Figure 5-71. Overview of 41HW104. View is to the east.

Table 5-24. Artifact Assemblage Observed at 41HW104.

Depth	Flakes
Surface	14
0-10	-
10-20	-
20-30	-
30-40	-
40-50	-

Initial investigation of the resource consisted of pedestrian walkover. An additional six shovel tests were excavated within the site boundary, all were negative for cultural resources (Figure 5-72). As a result, the boundaries of 41HW104 has been extended south to include an area of 125 by 47 meters (410 by 154 feet) within the current ROW. Soils mapped for the location consist of Vernon clay (SSS NRCS USDA 2019). A typical shovel profile within the resource/APE consisted of a surface layer of red (2.5YR 4/6) clay to a depth of 10 centimeters (4 inches). This was underlain by a dark red (2.5YR 3/6) clay between 10 and 55 centimeters (4 and 22 inches) below the surface, which gave way to a reddish brown (2.5YR 4/4) friable bedrock.

The lack of subsurface deposits within the APE and lack of diagnostics recorded during the current effort suggests the resource is not significant within the ROW. The site portion located within the APE does not retain the potential to provide significant research value and is thus recommended not eligible for the National Register, under Evaluation Criterion D.

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Plan view of Resource 41HW104.

5.2.5.4 Resource 41HW105

Resource 41HW105 was originally recorded by GCI Consulting in 2011. The resource was described as an 85 by 45-meter (278 by 135-foot) lithic scatter located below an eroded ridgetop. Material noted at the time included 10 flakes, 2 cores, 1 tested cobble, and 1 edge modified tool fragment. Material was limited to the ground surface and no diagnostic material or cultural features were identified. No further work was recommended (Noble 2011). The Texas Archeological Sites Atlas lists 41HR105 as Ineligible.

The portion of APE adjacent to Resource 41HW105 was surveyed by Gray & Pape on April 5, 2019. The location within the existing ROW is located on a bench approximately 510 meters (0.3 miles) east of Beals Creek, covered in grasses and typical desert scrub (Figures 5-74). The area is currently being used as a cattle pasture and has been impacted by erosion and existing pipelines. A well pad is located immediately north of the site and the connecting gravel access road runs along the site's western edge. An electric transmission tower is located immediately to the south. Approximately two flakes were observed on the ground surface within the ROW (Table 5-25).

Initial investigation of the resource consisted of pedestrian walkover survey. An additional shovel test was excavated within the site's extended boundary and was negative for cultural resources (Figure 5-75). As a result, the boundaries of 41HW104 has been extended north to include an area of 20 by 20 meters (66 by 66 feet) within the current ROW. Soils mapped for the location consist of Vernon clay (SSS NRCS USDA 2019). A typical shovel profile within the resource / APE consisted of a surface layer of red (2.5YR 4/6) clay to a depth of 15 centimeters (6 inches). This was underlain by a dark red (2.5YR 3/6) clay between 15 and 50 centimeters (6 and 20 inches) below the surface, which gave way to a reddish brown (2.5YR 4/4) friable bedrock.

Figure 5-73. Overview of 41HW105. View is to the north.

Table 5-25. Artifact Assemblage Observed at 41HW105.

Depth	Flakes
Surface	2
0-10	-
10-20	-
20-30	-
30-40	-
40-50	-

The extensive disturbances in the area, lack of subsurface deposits within the APE and lack of diagnostics recorded during the current effort suggests the resource is not significant within the ROW. The site portion located within the APE does not retain the potential to provide significant research value and is thus recommended not eligible for the National Register, under Evaluation Criterion D.

5.2.5.5 Resource 41HW106

Resource 41HW106 was originally recorded by ACI Consulting in 2011. The resource was described as a 250 by 100-meter (820 by 328-foot) lithic scatter located atop a low rise. Material noted at the time included a few flakes and a possible drill tip. Material was limited to the ground surface and no diagnostic material or cultural features were identified (Schooler 2011).

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Plan view of Resource 41HW105.

The APE adjacent to Resource 41HW106 was surveyed by Gray & Pape on April 5, 2019. The location within the existing ROW is located on a hilltop, 64 meters (211 feet) south of the original site boundary, separated by an existing pipeline corridor. The area is currently being used as a cattle pasture and has been impacted erosion and existing pipelines. In addition, an electric transmission line and associated two-track road run north/south along the eastern edge of the revised site boundary (Figures 5-75). Approximately 4 flakes were observed on the ground surface within the ROW (Table 5-26).

Figure 5-75. Overview of 41HW106. View is to the west.

Table 5-26. Artifact Assemblage Observed at 41HW106.

Depth	Flakes
Surface	4
0-10	-
10-20	-
20-30	-
30-40	-
40-50	-

Initial investigation of the resource consisted of pedestrian walkover. An additional six shovel tests were excavated, all were negative for cultural resources. Two further planned shovel tests were left unexcavated due to the presence of extensively disturbed soils at the surface (Figure 5-76). As a result, the boundaries of 41HW104 has been extended south to include an area of 50 by 50 meters (164 by 164 feet) within the current ROW. Soils mapped for the location consist of Amarillo loamy fine sand (SSS NRCS USDA 2019). A typical shovel profile within the resource / APE consisted of a surface layer of dark brown (7.5YR 3/4) sandy loam to a depth of 30 centimeters (12 inches) below the surface. This was underlain by a reddish brown (5YR 4/4) sandy clay loam that continued to the base of the shovel test at 70 centimeters (27 inches) below the surface.

The lack of subsurface deposits within the APE and lack of diagnostics recorded during the current effort suggests the resource is not significant within the ROW.

5.2.5.6 Resource 41NL310

Resource 41NL310 was originally recorded by AR Consultants, Inc. in 2013. The resource was described as a 240 by 55-meter (787 by 180-foot) lithic scatter located across the saddle of a prominent ridge. Material density was estimated at 30 lithics per square-meter and consisted of flakes, tested cobbles, and cores. Material was limited to the ground surface and no diagnostic material or cultural features were identified (Hall 2013). The Texas Archeological Sites Atlas lists 41NL310 as Ineligible within the ROW.

Horizon on April 8, 2019. The location within the existing ROW is located across the top of a landform covered in short scrub vegetation and grasses (Figure 5-77 and 5-78). The area is currently being used as a cattle pasture and has been impacted by erosion, the construction of gravel access roads, and existing pipelines. A scatter approximately 20+ flakes were observed on the ground surface within the ROW (Figure 5-79; Table 5-27).

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Plan view of Resource 41HW106.

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Plan view of Resource 41NL310.

Figure 5-78. Overview of 41NL310 within ROW. View is to the west.

Figure 5-79. Sample of artifacts recovered from 41NL310.

Table 5-27. Artifact Assemblage Observed at 41HNL310.

Depth	Flakes
Surface	20+
0-30	2
30-40	-
40-50	-

Initial investigation of the resource consisted of pedestrian walkover. An additional 12 shovel tests were excavated in the undisturbed portions of the revised site boundary. Only one shovel test was positive for cultural resources, producing two chert flakes between 0 and 30 centimeters (0 and 12 inches) below the surface. As a result, the boundaries of 41NL310 has been extended south to include an area of 1,150 by 50 meters (3,768 by 164 feet) within the current ROW. Soils mapped for the location consist of Burson-Quinlan association, Quinlan loam, and Acme-Cottonwood complex (SSS NRCS USDA 2019). A typical shovel profile within the resource / APE consisted of a surface layer of reddish brown (5YR 5/4) sandy loam to a depth of 20 centimeters (8 inches) below the surface. This was underlain by a dark reddish brown (5YR 3/4) clay that continued to the base of the shovel test at 50 centimeters (20 inches) below the surface.

The lack of subsurface deposits within the APE and lack of diagnostics recorded during the current effort suggests the resource is not significant within the ROW. Thus, the site portion located within the APE does not retain the potential to provide significant research value and is thus recommended not eligible for the National Register, under Evaluation Criterion D.

5.2.5.7 Resource 41NL312

Resource 41NL312 was originally recorded by Tetra Tech, Inc. in 2014. The resource was described as a 0.10-hectare (0.25-acre) lithic scatter located on broad flat terraces between Sweetwater Creek and an unnamed tributary. The investigation consisted of systematic surface inspection and the excavation of four shovel tests. Material noted at the time included approximately 100 pieces of debitage, a core, a biface, and a Williams-like broken dart point. The dart point was believed to date the site to the mid to late Archaic. Material was limited to the ground surface and no diagnostic material or cultural features were identified. Investigators noted the site had been heavily impacted by erosion, deflation, grazing, and the mechanical clearing of vegetation and no further work was recommended (Karpinski et al 2014). The Texas Archeological Sites Atlas lists 41NL312 as Ineligible.

The section of APE located adjacent to Resource 41NL312 was surveyed by Horizon on April 5, 2019. The location within the existing ROW, which comprises the majority of the APE, is located on a hilltop of level open pasture of grasses and scattered scrub vegetation (Figure 5-80). The area is currently being used as a cattle pasture and has been impacted by flooding, erosion, and existing pipelines. Approximately 500+ flakes, 10+scrapers, 20+cores, 10+bifaces, and one preform were observed on the ground surface within the ROW (Figure 5-81; Table 5-28).

Initial investigation of the resource consisted of pedestrian walkover. An additional six shovel tests were excavated within the extended site boundary, all were negative for cultural resources (Figure 5-82). A single positive shovel test was identified within the APE but outside of the newly established site boundary to the west. This test contained one flake at a depth of between 0 and 10 centimeters (4 inches) below ground surface. Additional tests around the positive contained no additional materials and no materials were identified on the surface near the find. The proximity of the lone positive test and the previous or new site boundary suggests it may be an outlier of the site but is insignificant in its association.

As a result, the boundaries of 41NL312 have been extended south and east to include an area of 380 by 50 meters (1,256 by 164 feet) within the current ROW. Soils mapped for the location consist of Colorado loam, Paducah loam, and Burson-Quinlan association (SSS NRCS USDA 2019). The best shovel profile example within the resource / APE consisted of a surface layer of yellowish red (5YR 5/6) silt loam to a depth of 30 centimeters (12 inches) below the surface. This was underlain by a reddish brown (5YR 4/4) clay to the base of the shovel test at 40 centimeters (16 inches) below the surface.

Figure 5-80. Site overview of 41NL312 within the ROW. View is to the east.

Figure 5-81. Sample of artifacts from 41NL312.

Table 5-28. Artifact Assemblage Observed at 41NL312.

Depth	Flakes	Bifaces	Cores	Utilized Flakes	Scrapers	Preform
Surface	500+	10+	20+	1	10+	1
0-10	-	-	-	-	-	-
10-20	-	-	-	-	-	-
20-30	-	-	-	-	-	-
30-40	-	-	-	-	-	-
40-50	-	-	-	-	-	-

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Plan view of Resource 41NL312.

The majority of the shovel tests conducted at the location were either very shallow or showed signs of disturbance. Despite the moderate number of surface finds identified, the location has clearly been impacted by the adjacent pipelines. The lack of subsurface deposits within the APE (which is nearly entirely within the existing pipeline ROW) and lack of diagnostics recorded during the current effort suggests the resource is not significant within the APE. The site portion located within the APE does not retain the potential to provide significant research value and is thus recommended not eligible for the National Register, under Evaluation Criterion D.

5.2.5.8 Resource 41NL322

Resource 41NL322 was originally recorded by Turpin and Sons, Inc. in 2015. The resource was described as a 50-meter (164-foot) diameter lithic quarry and procurement site on the western slope of a rise approximately 1.1 kilometers (0.7 miles) west of Bitter Creek. Material noted at the time included hundreds of flakes, tested cobbles, and several non-specific tools. Material was limited to the ground surface and no diagnostic material or cultural features were identified. Portions of the lithic procurement area had been disturbed by previous pipelines (Burgess and Burgess 2015). The Texas Archeological Sites Atlas lists 41NL322 as Ineligible within the ROW.

The portion of APE that passes through Resource 41NL322 was surveyed by Horizon on April 8, 2019. The location within the existing ROW is located in pasture (Figure 5-83). The area is currently being used as a cattle pasture and has been impacted by erosion and existing pipelines. A two-track road cuts through the middle of the site. A scatter of an unrecorded number of tested cobbles, and flakes, 1 biface, 1 uniface and 1 scraper were observed on the ground surface within the ROW (Table 5-29).

Figure 5-83. Overview of 41NL322 within the ROW. View is to the west.

Table 5-29. Artifact Assemblage Observed at 41NL322.

Depth	Flakes	Biface	Tested Cobbles	Uniface	Scraper
Surface	+	1	+	1	1
0-10	-	-	-	-	-
10-20	-	-	-	-	-
20-30	-	-	-	-	-
30-40	-	-	-	-	-
40-50	-	-	-	-	-

Initial investigation of the resource consisted of pedestrian walkover. An additional four shovel tests were excavated within the extended site boundary. Only one test was positive for cultural resources, producing a single chert flake between 0 and 20 centimeters (0 and 8 inches) below the surface (Figure 5-84). As a result, the boundaries of 41NL322 has been extended south, east, and west to include an area of 424 by 50 meters (1,391 by 164 feet) within the current ROW. Soils mapped for the location consist of Woodward loam, Burson-Quinlan association, and Quinlan-Burson-Woodward association (SSS NRCS USDA 2019). A typical shovel profile within the resource / APE consisted of a surface layer of yellowish red (5YR 5/6) sandy loam to a depth of 20 centimeters (8 inches) below the surface. This was underlain by a yellowish red (5YR 5/6) clay

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Plan view of Resource 41NL322.

that extended to 30 centimeters (12 inches) below the surface and terminated at bedrock.

The lack of subsurface deposits within the APE and lack of diagnostics recorded during the current effort suggests the resource is not significant within the ROW. The site portion located within the APE does not retain the potential to provide significant research value and is thus recommended not eligible for the National Register, under Evaluation Criterion D.

5.2.5.9 Resource 41NL324

Resource 41NL324 was originally recorded by Turpin and Sons, Inc. in 2015. The resource was described as a 150 by 40-meter (492 by 130-foot) lithic quarry and procurement approximately 130 meters (427 feet) beyond and above an unnamed tributary of Long Branch Creek. Material noted at the time included an unspecified quantity of debitage and tested cobbles. Material was limited to the ground surface and no diagnostic material or cultural features were identified. No further work was recommended (Burgess and Davis 2015). The Texas Archeological Sites Atlas lists 41NL324 as Ineligible within the ROW.

The portion of APE that passes near Resource 41NL324 was surveyed by Gray & Pape on March 27, 2019. The location within the existing ROW is located on a dissected upland with an existing pipeline corridor to the north and an access road cutting across it from northeast to southwest. The area is currently being used as a cattle pasture and has been impacted by flooding, erosion, and existing pipelines. The location contains abundant rock, including chert, on the surface. Most of which has not been modified. At least two cultural flakes and 1 retouched flake were observed on the ground surface within the ROW (Table 5-30).

Table 5-30. Artifact Assemblage Observed at 41NL324.

Depth	Flakes	Retouched flake
Surface	2	1
0-10	-	-
10-20	-	-
20-30	-	-
30-40	-	-
40-50	-	-

Initial investigation of the resource consisted of pedestrian walkover which resulted in the identification of approximately three flakes, one of which was modified. An additional six shovel tests were attempted, four of which were unexcavated due to ground disturbances associated with the existing pipeline, all were negative for cultural resources (Figure 5-85). As a result, the boundaries of 41NL324 has been extended south to include an area of 75 by 50 meters (245 by 164 feet) within the current ROW. Soils mapped for the location consist of Dermott soils and Veal loam (SSS NRCS USDA 2019). A typical shovel profile within the resource / APE consisted of a surface layer of brown (10YR 4/3) gravelly loam to a depth of 10 centimeters (4 inches) below the surface. This was underlain by a brown (10YR 5/3) sandy loam with gravels increasing in quantity and size to the base of the shovel test at 65 centimeters (25 inches) below the surface.

The sparsity of cultural material, lack of subsurface deposits within the APE, and lack of diagnostics recorded during the current effort suggests the resource is not significant within the ROW. The site portion located within the APE does not retain the potential to provide significant research value and is thus recommended not eligible for the National Register, under Evaluation Criterion D.

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Plan view of Resource 41NL324.

5.2.5.10 Resource 41NL325

Resource 41NL325 was originally recorded by Turpin and Sons, Inc. in 2015. The resource was described as a 140 by 40-meter (460 by 130-foot) lithic quarry and procurement site on an upland approximately 60 meters (200 feet) southwest of a dry gully that branches from Sweetwater Creek. Material noted at the time included an unspecified quantity of debitage and tested cobbles. Material was limited to the ground surface and no diagnostic material or cultural features were identified. Investigators noted substantial mechanical disturbance from pipeline construction and no further work was recommended (Burgess and Davis 2015). The Texas Archeological Sites Atlas lists 41NL325 as Ineligible within the ROW.

The portion of APE that passes through Resource 41NL325 was surveyed by Horizon on April 5, 2019. The location within the existing ROW is on a terrace overlooking a dry gully (Figure 5-86). The area is currently being used as a cattle pasture and has been impacted by flooding, erosion, and existing pipelines. Approximately 5 flakes were observed on the ground surface within the ROW (Figure 5-87; Table 5-31).

Figure 5-86. Overview of 41NL325 within the ROW. View is to the west.

Table 5-31. Artifact Assemblage Observed at 41NL325.

Depth	Flakes
Surface	5
0-10	-
10-20	-
20-30	-
30-40	-
40-50	-

Figure 5-87. Sample of artifacts recorded at 41NL325.

Initial investigation of the resource consisted of pedestrian walkover. An additional four shovel tests were excavated within the APE, all were negative for cultural materials (Figure 5-88). As a result, the boundaries of 41NL325 were not adjusted. Soils mapped for the location consist of Dermott soils and Woodward loam (SSS NRCS USDA 2019). A typical shovel profile within the resource/APE consisted of 25 centimeters (10 inches) of brown (7.5YR 4/3) gravelly sandy loam underlain by caliche.

The lack of subsurface deposits within the APE and lack of diagnostics recorded during the current effort suggests the resource is not significant within the ROW. The site portion located within the APE does not retain the potential to provide significant research value and is thus recommended not eligible for the National Register, under Evaluation Criterion D.

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Plan view of Resource 41NL325.

5.2.6 Newly Identified Non-Jurisdictional Site

5.2.6.1 Resource 41MH129

Resource 41MH129 was investigated on April 2, 2019. The resource is located on the western bluff above the Colorado River, south of existing pipelines and approximately 2.2 kilometers (1.37 miles) southeast of SR 163. The resource was initially located within a USACE permit area, but the Colorado River will be avoided by directional drill, thus removing the location from permitting. The location is sparsely covered by grasses and scrub brush pasture but with good surface visibility (Figure 5-89). The site consists of a small lithic scatter located on the sandstone bluff above the Colorado River. The artifacts were scattered over an area measuring approximately 30 meters (98 feet) north-south by 55 meters (180 feet) east-west within the proposed pipeline corridor. Observed materials include a handful (10+) of chert flakes with no diagnostic artifacts or more developed tools identified (Figure 5-90, Table 5-22).

Figure 5-89. Overview of Resource 41MH129 within the APE. View is to the east.

Investigation of the permit area consisted of pedestrian walkover and shovel tests excavated at 60-meter (197-foot) intervals within the APE (Figure 5-91). After identification of the resource, six shovel tests were placed within and adjacent to the site; all were negative, and only two exhibited more than 5 centimeters (2 inches) of sand above bedrock.

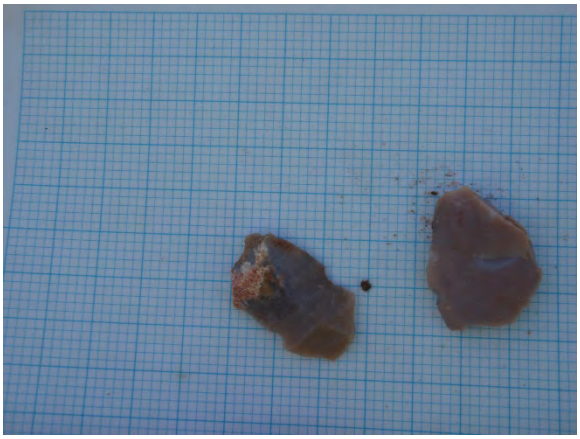

Figure 5-90. Representative materials identified on the surface of Resource 41MH129.

Table 5-32. Artifact Assemblage Observed at 41MH129.

Depth	Flakes
Surface	10
0-10	-
10-20	-
20-30	-
30-40	-
40-50	-

The resource was not pursued outside of the proposed project corridor. Soils mapped for the location consist of rough broken land (SSS NRCS USDA 2019). Most of the area was bare rock. A typical shovel profile within the resource/APE consists of 0 and 10 centimeters (0 to 4 inches) of sand before hitting bedrock.

The site was revisited by Gray & Pape and agency representatives of the THC and USACE on August 27, 2019. During a cursory walk-over of the site, approximately 4 to 5 chert flakes were observed on the surface. The resource is characterized by a sparsity of surface artifacts, lack of diagnostic artifacts, lack of subsurface materials, and shallow soils.

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Plan view of Resource 41MH129.

The resource is not likely to add to the knowledge of prehistoric occupation of the area. No further work is recommended. The site does not retain the potential to provide significant research value and is thus recommended not eligible for the National Register, under Evaluation Criterion D.

5.2.7 Previously Recorded Sites Not Re-Identified

Of the 23 previously recorded resources within 91 meters (300 feet) of the APE, three were not re-identified by the current field effort (Table 5-31). These are described below.

5.2.7.1 Resource 41HW133

Resource 41HW133 was originally recorded by TAS, Inc. in 2015. The resource was described as an open camp; quarry/procurement site of unknown prehistoric temporal affiliation measuring 80 meters (262.5 feet) north-south by 150 meters (492 feet) east-west. The site is located on a flat on east side of Plum Draw, gently sloping toward the drainage.

All materials observed at the site were on the surface and included: 2 uniface scrapers, 2 expedient tools, 2 tertiary flakes, 2 sec flakes, 5 utilized flakes, 1 chopper with impact fractures, tested cobbles, and scattered FCR (deflated hearth). No temporally diagnostic artifacts were found. Soils mapped for the location consist of shallow gravelly soils of the Potter series. TAS concluded that the site contained low research potential due to the lack of well-preserved features, erosion/deflation, and no potential for buried deposits. As of 2015, the Texas Archeological Sites Atlas lists 41HW133 as Ineligible for listing on the NRHP.

The portion of APE that passes near Resource 41HW133 was surveyed by Gray & Pape on April 6, 2019. The segment of APE surveyed overlaps a portion of Permit Area #6 for the current project. The location within the APE is an upland that gradually slopes toward Plum Draw to the west (Figure 5-92). The location is dissected by several pipeline corridors. The area is currently scrub brush pasture and has been greatly impacted by existing pipelines and subsequent erosion. Investigation of the area consisted of pedestrian walkover and shovel testing within the APE. No surface artifacts were observed during survey. Nine shovel tests were excavated within the APE where it passes the site, all were negative for cultural material (Figure 5-92). A typical shovel profile within the APE consisted of a surface layer of strong brown (7.5YR 4/6) gravelly sand to a depth of 5 centimeters (2 inches) below the surface before hitting bedrock.

The lack of surface or subsurface deposits within the APE during the current effort suggests the resource is not located within the APE. No further work is recommended for the location.

5.2.7.2 Resource 41NL317

Resource 41NL317 was originally recorded in 2014 by Tetra Tech, Inc. for the Permian Express Pipeline II survey (Karpinski et al. 2014). The resource consists of a prehistoric lithic scatter and historic artifact scatter. The resource was initially recorded to be situated on either side of a north to south trending creek south of a pipeline ROW. The resource is currently entirely within the existing ROW. The 2014 record lists 14 artifacts consisting of 1 secondary core, 2 cores, 8 debitage, 2 cans, and 1 clear glass fragment. The resource was investigated by a systematic surface inspection at 5-meter (16-foot) intervals and two shovel tests. The tests uncovered no additional cultural materials. Overall the 2014 investigation determined that the site has been impacted by water erosion, wind deflation, and previous pipeline construction. The site's research potential was considered to be low. In 2015, the site was determined by the THC to be ineligible for listing on the NRHP within the pipeline ROW (Texas Archeological Sites Atlas 2019).

Table 5-33. Previously Recorded Resources Not Re-Identified within the APE.

Trinomial	MP	JD?	Site Type	Cultural Affiliation	Previous Materials Observed	Record Date	Previous NRHP Status	NRHP Review Date	Current Materials Observed	Current Rec	Appendix A Figure	Report Figure
41HW133	Offline	No	Open Camp; Quarry/Procurement	Unknown Prehistoric	Uniface scrapers, expedient tools, secondary flakes, tertiary flakes, utilized flakes, chopper with impact fractures, tested cobbles, FCR	4/24/2015	Ineligible	10/28/2015	N/A	Not Located within the APE. No further work.	A13	5-96
41NL317	107.9	Yes	Prehistoric Lithic Scatter; Historic Artifact Scatter	Unknown; Prehistoric; Historic	Lithic debitage, chert cores, tin can fragments, clear glass	4/4/2014	Ineligible within ROW	10/28/2015	N/A	Not Located within the APE. No further work.	A42	5-97
41NL252	Offline	No	Campsite/Habitation Site	Unknown Prehistoric	Chert secondary and tertiary flakes, coring flakes, tools, FCR	7/9/2010, 4/11/2011	Undetermined / Ineligible	N/A	N/A	Not Located within the APE. No further work.	A40	5-99

*JD = Jurisdictional

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Plan view of Resource 41HW133.

The portion of the APE that passes Resource 41NL317 was revisited on April 6 by Gray & Pape which conducted a pedestrian walkover and four shovel tests excavated within the APE (Figure 5-93). The location is overlapped by Permit Area #56 and straddles Noodle Creek. The area consists of a low terrace at the base of uplands to the east and west. The APE within the resource generally measures 40 to 55 meters (131 to 180 feet) wide, with approximately 30 meters (100 feet) of that width located within the existing pipeline ROW. The existing ROW is sparsely covered by grasses with the ground surface visibility decreasing outside of the ROW to the south. The area is currently being used as a cattle pasture and has been impacted by flooding, erosion, existing pipelines. Gray & Pape observed no cultural materials on the surface during survey. Four shovel tests were excavated in the location of the site and the adjacent corridor, none of which were positive for cultural materials.

Soils mapped for the location consist of primarily of Nipsum clay loam (1 to 3 percent slopes), which consists of a surface layer of light brown (10YR 4/3) to dark brown (10YR 3/3) clay followed by brown (7.5YR 5/2) to dark brown (7.5YR 3/2) clay (SSS NRCS USDA 2019). This differed slightly from soils observed in shovel tests which contained a surface layer of brown 7.5YR 4/4 sandy loam to a depth of 20 centimeters (8 inches) followed by bed rock or caliche. Tests within and immediately adjacent to the site exhibited disturbance by indicated by mottled clay soils of lower strata.

No attempt was made to investigate outside of the APE to the north during the current effort. Remnants of the resource may still exist between pipelines. However, the lack of surface or subsurface deposits identified within the APE suggests the resource is not located within the APE or has been destroyed within the APE. No further work is recommended for the location.

5.2.7.3 Resource 41NL252

Resource 41NL252 was originally recorded in 2010 and 2011 by Geo-Marine, Inc. for the Oncor - Tonkawa to Sweetwater Project (THC 2019). The site is located approximately 1 kilometer (1.6 miles) east of Little Stink Creek, south of CR 221. There are two site records, one recorded by an initial phase I survey and a revisit form for further testing. The site records describe the site as a campsite/ habitation consisting of a somewhat eroded FCR midden located on the southwest side of the terrace with a lithic scatter to the north. Observed artifacts are reported to consist of 6 cores, 7 edge-modified flakes, 3 bifaces, 2 unifaces, 37 debitage, and 80 FCR. Less than 50 percent of the site was believed to be intact as it had been impacted by severe erosion and pipeline construction. Specifically, the records state that the south edge of the site had been modified by gas pipeline construction. The site area had been cleared at the time of the investigations and yielded excellent surface visibility. The site was investigated by surface survey at 5-meter (16-foot) intervals, shovel testing, six 50 by 50-centimeter (20 by 20-inch) units, and nine 1 by 1-meter (39 by 39-inch) units. The test units revealed a low density of artifactual material and shallow deposits, and the potential features proved to have little deposition. No diagnostic artifact or datable materials were discovered during the investigations. Baes on those findings the site was considered to have low research potential and was recommended as not eligible for listing on the NRHP (THC 2019). The resource is currently entirely within existing pipeline ROW.

The portion of the APE that passes Resource 41NL252 was revisited on April 8 by Gray & Pape. Because the location is outside of any USACE permit areas, no shovel tests were conducted, however, the segment of APE was subjected to pedestrian walkover. (Figure 5-94). Gray & Pape observed no cultural materials on the surface during survey. No attempt was made to investigate outside of the APE to the north

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Plan view of Resource 41HW317.

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Plan view of Resource 41NL252.

during the current effort. No further work is recommended for the location.

5.2.8 Deep Test Results

Fieldwork at Sweetwater Creek (Permit Area #45) was conducted on August 7, 2019. The permit area at Sweetwater Creek subsumes approximately 3.1 hectacres (7.7 acres) and is located approximately 1.75 kilometers (1.09 miles) south-southeast of Sweetwater, Texas (Figures 5-95 and 5-96). Field investigations consisted of mechanically augured deep testing and included 13 mechanical augur tests measuring 38.1 centimeters (15 inches) in diameter (Figure 5-96). All deep tests conducted overlap with the site boundary of 41NL6. Soils mapped for this area include Woodward loam (57), Veal loam (54), Nipsum clay loam (24), and Colorado loam (7) (NRCS 2019).

Figure 5-95. Deep testing in progress at Sweetwater Creek, Location DT5. View is to the northeast.

The Woodward series consists of moderately deep, well drained, moderately permeable inceptisols that formed in residuum from sandstone bedrock of Permian age. These soils occur on very gently sloping to steep interfluves and side slopes of hillslopes, ridges and escarpments in the Central Rolling Red Plains. A typical soil profile includes four strata (Ap-Bw-BCk-Cd) to a depth of 152 centimeters (60 inches) below surface. The profile includes a surface layer (A horizon) of reddish brown (5YR 4/4) loam to a depth of 25 centimeters (10 inches). That is followed by successive B horizons of reddish brown (5YR 5/4) loam to a depth of 71 centimeters (28 inches). Below that is red (2.5YR 4/6) noncemented sandstone bedrock (NRCS 2019).

Veal soils are very deep, well drained, moderately permeable inceptisols that formed in calcareous, slope alluvium and colluvium derived from the Ogalla Formation of Miocene-Pliocene age. These soils are on very gently sloping to moderately steep scarps, knolls, and valley sides. A typical soil profile includes five strata (A-Bk-Bkk1-Bkk2-Bkk3) that extend to 203 centimeters (80 inches) below the surface. The profile includes a surface layer (A horizon) of brown (10YR 4/3) loam to a depth of 8 centimeters (3 inches). That is followed by successive B horizons of brown (10YR 5/3) gravelly fine sandy loam 74 centimeters (29 inches). Below that are layers of pink (7.5YR 8/3) and light brown (7.5YR 6/4) gravelly loam down to a depth of 203 centimeters (80 inches) (NRCS 2019).

The Nipsum series is comprised of very deep, well drained, slowly permeable mollisols that formed in clayey and loamy alluvium and colluvium. These soils are on nearly level to very gently sloping drainageways and terraces on uplands in the Central Rolling Red Plains. A typical soil profile consists of four strata (A1-A2-Bk1-Bk2) to a depth of 152.4 centimeters (60 inches). The profile includes a surface layer (A horizon) of brown (10YR 4/3) clay to a depth of 25. Centimeters (10 inches). That is followed by a subsurface layer (A2 horizon) of brown (7.5YR 5/2) clay to a depth of 76 centimeters (30 inches). Below that is successive B horizons of reddish brown (5YR 5/4) clay to a depth of 152.4 centimeters (60 inches) (NRCS 2019).

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Deep test locations within Permit Area 45/Resource 41NL6 at Sweetwater Creek.

The Colorado series is comprised of very deep, well drained, moderately permeable entisols that formed in calcareous loamy alluvium. These nearly level soils can be found on flood plains. A typical soil profile consists of three strata (A-C1-C2) to a depth of 152 centimeters (60 inches). The profile includes a surface layer (A horizon) of light reddish brown (5YR 6/3) silt loam to a depth of 13 centimeters (5 inches). That is followed by successive subsoil (C horizon) layers of light reddish brown (5YR 6/3) loam to a depth of 152 centimeters (60 inches). (NRCS 2019).

Of 13 tests placed within the APE, only one was positive for cultural material. One piece of lithic debitage was discovered within the top 10 centimeters (4 inches) of Deep Test 9. Deep Test 9 (Figure 5-97) is located approximately 45 meters (147.64 feet) east of Sweetwater Creek and contains silty clay loam throughout the profile. A typical deep test profile (Table 5-34) within the permit area consists of a surface layer of strong brown (7.5YR 4/6) silty clay loam to an average depth of 50 centimeters (19.69 inches) followed by brown (7.5YR 5/4) silty clay loam or silty clay extending to an average depth of 150 centimeters (59.06 inches) underlain in some areas by yellowish red (5YR 5/6) silty clay loam to the base of excavation at 180 centimeters (70.87 inches) below surface.

Figure 5-97. Representative soil profile as observed in Deep Test 9 at Sweetwater Creek.

Other than one piece of debitage, no historic or prehistoric artifacts or cultural features were identified. Results of the deep testing indicate a general lack of A horizon, and instead encounter what most closely resembles the Bk1 horizon (Nipsum series) at the surface, which either continues or transitions to the Bk2 horizon until bedrock or the test was terminated. No evidence was observed of deeply buried A horizons or paleosols. Based on these results, there is no evidence for deeply buried cultural materials within the anticipated depth of impacts at Sweetwater Creek.

Table 5-34. Deep Test Soil Profiles from within the APE at Sweetwater Creek.

Number	Creek	Survey Result	Strat I Depth	Strat I Munsell	Strat I Texture	Strat II Depth	Strat II Munsell	Strat II Texture	Strat III Depth	Strat III Munsell	Strat III Texture	Comment
DT1	Sweetwater	Negative	15	5YR 5/6	SiClLo	45	5YR 6/6	SiCl				Terminated at 45 cmbs due to bedrock
DT2	Sweetwater	Negative	10	5YR 5/6	SiClLo	80	7.5YR 5/6	SiClLo	180	7.5YR 5/8	SiClLo	
DT3	Sweetwater	Negative	10	5YR 5/6	SiClLo							Terminated at 10 cmbs due to bedrock
DT4	Sweetwater	Negative	60	7.5YR 5/4	SiCl	180	5YR 5/6	SiClLo	180	5YR 5/6	SiClLo	
DT5	Sweetwater	Negative	60	7.5YR 4/6	SiClLo	160	10YR 3/4	SiClLo	180	10YR 4/4	SiCl	
DT6	Sweetwater	Negative	80	7.5YR 4/6	SiClLo	180	7.5YR 4/6	SiClLo				
DT7	Sweetwater	Negative	60	7.5YR 6/3	SiClLo	120	7.5YR 4/4	SiClLo	180	7.5YR 6/4	SiClLo	
DT8	Sweetwater	Negative	30	7.5YR 5/4	SiClLo	145	7.5YR 5/6	SiLo	180	5YR 4/6	Lo	
DT9	Sweetwater	Positive	45	7.5YR 4/6	SiClLo	150	7.5YR 5/4	SiClLo	180	5YR 4/6	SiClLo	One piece of lithic debitage 0-10 cmbs
DT10	Sweetwater	Negative	60	7.5YR 4/6	SiClLo	180	5YR 5/3	SiCl				
DT11	Sweetwater	Negative	80	7.5YR 4/6	SiClLo	180	5YR 5/3	SiCl				
DT12	Sweetwater	Negative	60	7.5YR 4/6	SiClLo	180	5YR 5/3	SiCl				
DT13	Sweetwater	Negative	60	7.5YR 4/6	SiClLo	180	5YR 5/3	SiCl				

6.0 CONCLUSIONS AND RECOMMENDATIONS

This report details the results of pedestrian cultural resources survey of permit areas within 174.36 kilometers (108.34 miles) of the Lone Star Express II Pipeline Project - Loop 1 in Midland, Martin, Howard, Mitchell, and Nolan Counties, Texas. The lead agency for the project is the USACE, Fort Worth District. Nearly all of the project will be installed by open trench.

A records and literature review initiated prior to survey identified 10 previously recorded archaeological sites potentially intersecting USACE permit areas within Loop 1. Survey of Loop 1 required approximately 1,200-person hours of Gray & Pape personnel to complete and involved archaeological reconnaissance and shovel testing throughout anticipated permit areas within the project corridor.

Fieldwork was conducted by crews affiliated with both Gray & Pape and Horizon. Field work began in March and continued into May 2019. Supplemental field efforts took place in July, August, and September 2019. A total of 56 permit areas were surveyed, encapsulating a total of 29.6 kilometers (18.4 miles) of centerline and 125.6 hectares (310.3 acres) of APE. In total, approximately 664 shovel tests were excavated within permit areas, 24 of which were positive for cultural materials. An additional 122 shovel tests were conducted as part of resource delineation efforts.

A total of 21 resources were identified within permitted areas of the project. Nine previously recorded resources: 41NL6, 41NL313, 41NL314, 41NL315, 41NL316, 41NL320, 41NL321, 41NL323, and 41NL326, were re-identified as a result of survey within permit areas. In addition, eight new previously unrecorded resources: 41MH128, 41MH130, 41HW142, 41NL377, 41NL378, 41NL379, 41NL380, and 41NL392; and four isolate finds were also identified within permit areas. None are recommended as eligible for listing on the NRHP or as a SAL (Table 6-1).

Table 6-1. Summary of Resources Identified within Permit Areas of the APE.

Trinomial	Site Type	Temporal Affiliation	Research Value	NRHP Recommendation
41NL6	Prehistoric Lithic Scatter	Unspecified Prehistoric	Low	Not eligible
41NL313	Prehistoric Open Camp/Midden	Middle to Late Archaic	Low	Not eligible
41NL314	Prehistoric Lithic Scatter	Unspecified Prehistoric	Low	Not eligible
41NL315	Prehistoric Open Camp	Archaic	Low	Not eligible
41NL316	Prehistoric Open Camp	Archaic	Low	Not eligible
41NL320	Prehistoric Open Camp / Quarry	Unspecified Prehistoric	Low	Not eligible
41NL321	Prehistoric Open Camp	Unspecified Prehistoric	Low	Not eligible
41NL323	Prehistoric Open Camp	Unspecified Prehistoric	Low	Not eligible
41NL326	Prehistoric Quarry / Procurement	Unspecified Prehistoric	Low	Not eligible
41MH128	Historic Scatter	Mid-20th Century	Low	Not eligible
41MH130	Prehistoric Lithic Scatter	Unspecified Prehistoric	Low	Not eligible
41HW142	Prehistoric Lithic Scatter	Unspecified Prehistoric	Low	Not eligible
41NL377	Prehistoric Lithic Scatter	Unspecified Prehistoric	Low	Not eligible
41NL378	Prehistoric Lithic Scatter	Unspecified Prehistoric	Low	Not eligible

Trinomial	Site Type	Temporal Affiliation	Research Value	NRHP Recommendation
41NL379	Prehistoric Lithic Scatter	Unspecified Prehistoric	Low	Not eligible
41NL380	Prehistoric Lithic Scatter	Unspecified Prehistoric	Low	Not eligible
41NL392	Prehistoric Lithic Scatter	Unspecified Prehistoric	Low	Not eligible
MH-27-ISO001	Prehistoric Isolate	Unspecified Prehistoric	Low	Not eligible
MH-45-ISO-02	Prehistoric Isolate	Unspecified Prehistoric	Low	Not eligible
MH-48-ISO001	Prehistoric Isolate	Unspecified Prehistoric	Low	Not eligible
MH-50-ISO001	Prehistoric Isolate	Unspecified Prehistoric	Low	Not eligible

Only one resource (41MH128) is of historic age, consisting of surface remnants associated with a former structure. The remainder are prehistoric. Prehistoric resource contents consist nearly entirely of surface scatters of artifacts. Artifact classes are largely consistent across each resource, consisting primarily of debitage, with varying numbers of cores and bifaces. On very few occasions, a preform or more refined tool were observed. In general, the resources appear to represent raw material procurement and testing areas due to the abundant chert deposits available in the rocky soil or eroding out of nearby waterways. Activities are believed to have been largely limited to the procurement and testing of cobbles and expedient manufacture of bifaces. While secondary and tertiary flakes were noted at a few locations, it appears that for the most part more refined tool manufacture was taking place elsewhere. Based on the preliminary assessment of the larger resource areas located beyond the current corridor, these activities were taking place on landforms above the surrounding landscape. None of the lithic scatters or isolates contained complete temporally or culturally diagnostic artifacts and no artifacts were collected. Nor were any cultural features or historic-age standing resources encountered within the proposed workspace.

The resource areas within the pipeline corridor showed clear disturbance from the adjacent pipeline ROW. Indications of soil deflation, erosion, and past and current land modifications such as agriculture and landscape terracing were also observed. Due to these impacts the observed materials are likely displaced and thereby limit the information that could be gained from any further formal study of these resources.

One location, Sweetwater Creek, was investigated by mechanical auguring to determine if the location contained soils with A horizons deeper than can be reached by shovel. However, deep testing within the APE at the location displayed a surface and subsurface that likely represents the B horizon of the Nipsum series and produced no evidence for deeply buried resources or buried paleosols within the anticipated depth of impact at the location.

Based on the overall sparsity of artifacts within the current corridor, lack of diagnostic materials, and lack of integrity or soil deposition, it is the opinion of Gray & Pape that none of the recorded resource portions located within the current ROW retain the potential to provide significant research value and are thus recommended not eligible for the National Register, under Evaluation Criterion D or for State Antiquities Landmark status. Gray & Pape recommends no additional archaeological work for these resources or surveyed permit areas of the Loop 1 project.

An additional 11 resources were identified within the APE but outside of jurisdictional areas: 41MD41, 41HW8, 41HW104, 41HW105, 41HW106, 41MH129, 41NL310, 41NL312, 41NL322, 41NL324, and 41NL325. These largely were exhibited by

surface scatters of lithics which are typical for the area and were consistent with the resources identified within jurisdictional permit areas. Observance of these resources within the APE indicated no features or diagnostic artifacts and suggests research potential is low. None of these resources are recommended as eligible within the APE and no further work is recommended regarding them (Table 6-2).

No further cultural resources work is recommended for the project as currently planned. However, Gray & Pape recommends that an unanticipated discoveries plan be put into place in the event that such discoveries take place during construction.

Table 6-2. Summary of Resources Identified Outside of Permit Areas of the APE.

Trinomial	Site Type	Cultural Affiliation	Current Recommendations
41MD41	Campsite	Late Paleoindian to Protohistoric	Ineligible within ROW
41HW8	Quarry/Procurement	Unknown Prehistoric	Ineligible within ROW
41HW104	Lithic Scatter	Unknown Prehistoric	Ineligible within ROW
41HW105	Lithic Scatter	Unknown Prehistoric	Ineligible within ROW
41HW106	Lithic Scatter	Unknown Prehistoric	Ineligible within ROW
41MH129	Lithic Scatter	Unknown Prehistoric	Ineligible within ROW
41NL310	Lithic Scatter	Unknown Prehistoric	Ineligible within ROW
41NL312	Lithic Scatter	Mid to Late Archaic	Ineligible within ROW
41NL322	Quarry/Procurement	Unknown Prehistoric	Ineligible within ROW
41NL324	Quarry/Procurement	Unknown Prehistoric	Ineligible within ROW
41NL325	Quarry/Procurement	Unknown Prehistoric	Ineligible within ROW

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APPENDIX A: LOCATION OF PERMIT AREAS WITHIN THE LOOP 1 PROJECT ALIGNMENT

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APPENDIX B: FIELD RESULTS WITHIN PERMIT AREAS ALONG THE PROPOSED LOOP 1 PROJECT ALIGNMENT

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