

US EPA ARCHIVE DOCUMENT

Intensive Cultural Resources Survey of the Proposed 78-Acre La Paloma Energy Center Tract, Harlingen, Cameron County, Texas

By:

Jeffrey D. Owens



HJN 080122 AR 31

Prepared for:



Zephyr Environmental Corporation
Austin, Texas

Prepared by:



Horizon Environmental Services, Inc.
Austin, Texas

December 2012

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MANAGEMENT SUMMARY

Horizon Environmental Services, Inc. (Horizon), was selected by Zephyr Environmental Corporation (Zephyr), on behalf of La Paloma Energy Center, LLC (La Paloma), to conduct an intensive cultural resources inventory and assessment of the proposed location of the La Paloma Energy Center (LPEC) located at 24684 Farm-to-Market Road (FM) 1595, Harlingen, Cameron County, Texas. La Paloma is proposing to construct a new natural gas fired, combined cycle electric generating plant. The LPEC would consist of 2 natural gas fired combustion turbines, each exhausting to a fired heat-recovery steam generator (HRSG) to produce steam to drive a shared steam turbine. Construction of the LPEC, associated infrastructure, and auxiliary equipment would take place within a proposed 32-hectare (ha) (78-acre [ac]) project site. Currently, the site is an agricultural field utilized for growing cotton. Due to the nature of the soils on-site, the proposed facility would be installed on spread-footing foundations that would be formed and poured in excavations throughout the site. The topsoil on the site would be removed and replaced with structural fill material in the area of the power-generating equipment. The primary foundations for the gas turbines, boilers, and steam turbine pedestal would be excavated 1.8 to 2.4 meters (m) (6.0 to 8.0 feet [ft]) below surface and would be backfilled with imported sediments when completed. The Area of Potential Effect (APE) of the proposed undertaking consists of the entire proposed 32-ha (78-ac) LPEC site.

As construction of the proposed facility would require a Prevention of Significant Deterioration (PSD) permit for Greenhouse Gasses (GHG) issued by the US Environmental Protection Agency (EPA), the undertaking falls under the regulations of Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, which is invoked when federal funds are utilized or when federal permitting is required for a proposed project. The NHPA states that the Advisory Council for Historic Preservation (ACHP) and the Texas Historical Commission (THC), which serves as the State Historic Preservation Office (SHPO) for the state of Texas, must be afforded the opportunity to comment when any cultural resources potentially eligible for inclusion in the National Register of Historic Places (NRHP) are present in a project area affected by federal agency actions or covered under federal permits or funding.

On December 5, 2012, Horizon archeologists Michael Mudd and Jared Wiersema, under the overall direction of Russell K. Brownlow, Principal Investigator, performed an intensive cultural resources survey of the APE to locate any cultural resource properties that potentially

would be impacted by the proposed undertaking. Horizon's archeologists traversed the 32-ha (78-ac) APE and thoroughly inspected the modern ground surface for aboriginal and historic-age cultural resources. The APE consisted of an active agricultural field that had been recently plowed, though no crops had been planted at the time of the survey. No vegetation was present in the agricultural field, and visibility was excellent (100%) across the entire project area. Horizon excavated a total of 41 shovel tests in the 32-ha (78-ac) APE, thereby exceeding the Texas State Minimum Archeological Survey Standards requirements for a project area of this size.

No cultural resources, historic or prehistoric, were identified within the APE as a result of the survey. Based on the results of the survey-level investigations documented in this report, no potentially significant cultural resources would be affected by the proposed undertaking. In accordance with 36 CFR 800.4, Horizon has made a reasonable and good faith effort to identify archeological historic properties within the APE. No archeological resources were identified that meet the criteria for inclusion in the National Register of Historic Places (NRHP) according to 36 CFR 60.4, and no further archeological work is recommended in connection with the proposed undertaking. However, in the unlikely event that any human remains or burial accoutrements are inadvertently discovered at any point during construction, use, or ongoing maintenance in the project area, even in previously surveyed areas, all work should cease immediately and the THC should be notified of the discovery.

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1.0 INTRODUCTION

Horizon Environmental Services, Inc. (Horizon), was selected by Zephyr Environmental Corporation (Zephyr), on behalf of La Paloma Energy Center, LLC (La Paloma), to conduct an intensive cultural resources inventory and assessment of the proposed location of the La Paloma Energy Center (LPEC) located at 24684 Farm-to-Market Road (FM) 1595, Harlingen, Cameron County, Texas. La Paloma is proposing to construct a new natural gas fired, combined cycle electric generating plant. The LPEC would consist of 2 natural gas fired combustion turbines, each exhausting to a fired heat-recovery steam generator (HRSG) to produce steam to drive a shared steam turbine. Construction of the LPEC, associated infrastructure, and auxiliary equipment would take place within a proposed 32-hectare (ha) (78-acre [ac]) project site (Figures 1 and 2). Currently, the site is an agricultural field utilized for growing cotton. Due to the nature of the soils on-site, the proposed facility would be installed on spread-footing foundations that would be formed and poured in excavations throughout the site. The topsoil on the site would be removed and replaced with structural fill material in the area of the power-generating equipment. The primary foundations for the gas turbines, boilers, and steam turbine pedestal would be excavated 1.8 to 2.4 meters (m) (6.0 to 8.0 feet [ft]) below surface and would be backfilled with imported sediments when completed. The Area of Potential Effect (APE) of the proposed undertaking consists of the entire proposed 32-ha (78-ac) LPEC site.

As the proposed upgrades would require a Prevention of Significant Deterioration (PSD) permit for Greenhouse Gasses (GHG) issued by the US Environmental Protection Agency (EPA), the undertaking falls under the regulations of Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, which is invoked when federal funds are utilized or when federal permitting is required for a proposed project. The NHPA states that the Advisory Council for Historic Preservation (ACHP) and the Texas Historical Commission (THC), which serves as the State Historic Preservation Office (SHPO) for the state of Texas, must be afforded the opportunity to comment when any cultural resources potentially eligible for inclusion in the National Register of Historic Places (NRHP) are present in a project area affected by federal agency actions or covered under federal permits or funding.

On December 5, 2012, Horizon archeologists Michael Mudd and Jared Wiersema, under the overall direction of Russell K. Brownlow, Principal Investigator, performed an intensive cultural resources survey of the APE to locate any cultural resource properties that potentially would be impacted by the proposed undertaking. The cultural resources investigation consisted

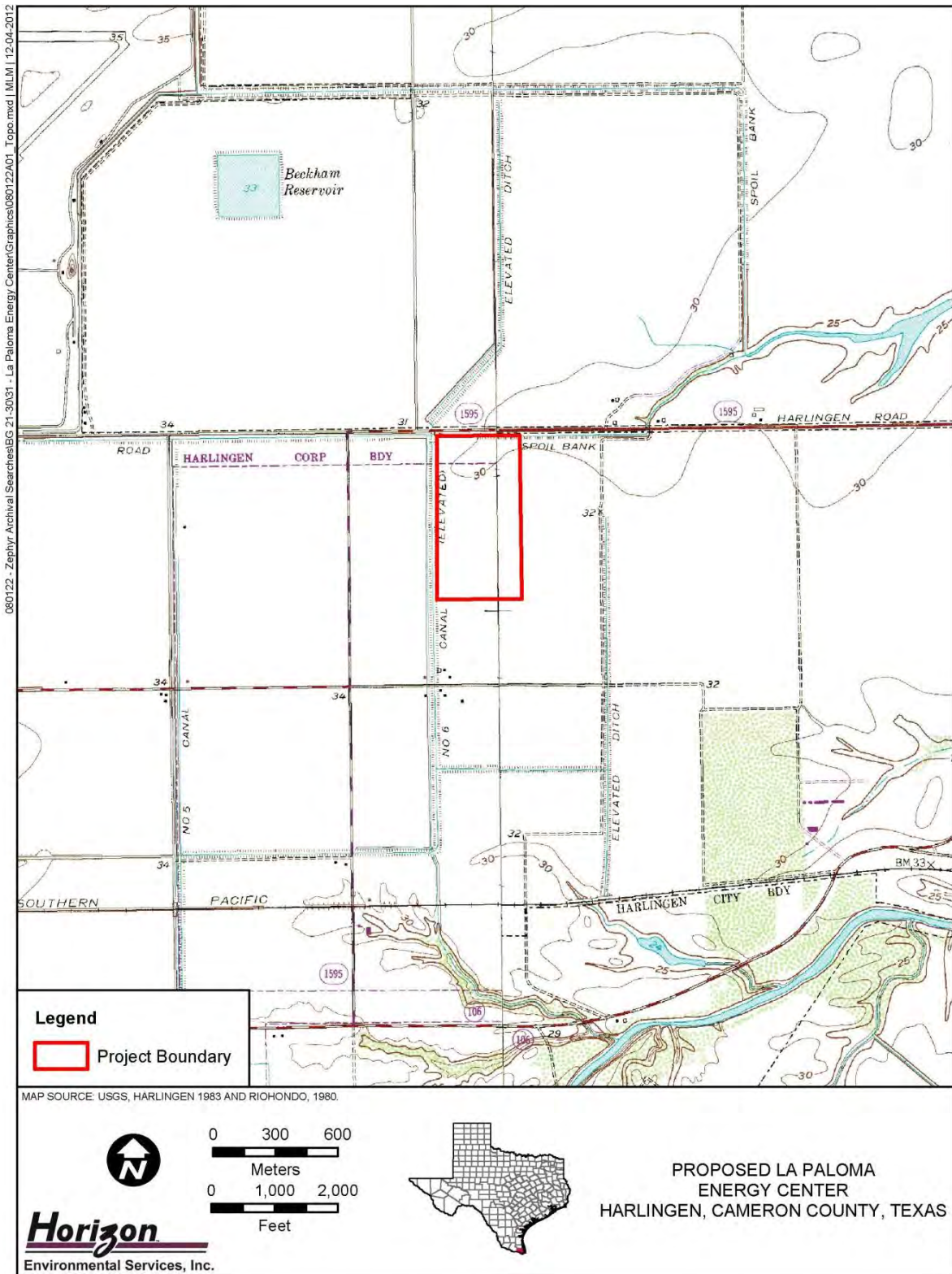


Figure 1. Location of Project Area on USGS Topographic Quadrangle

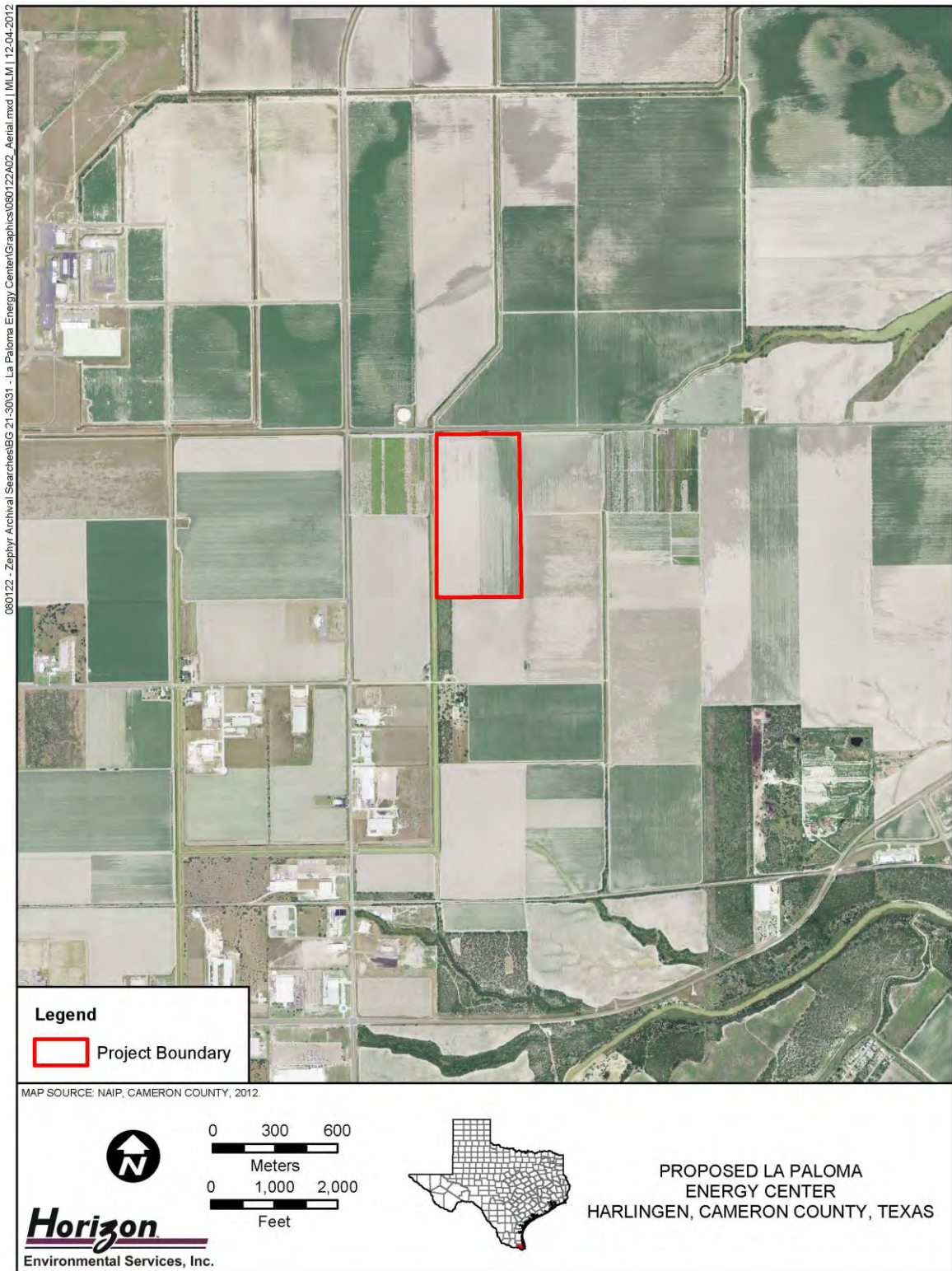


Figure 2. Location of Project Area on Aerial Photograph

of an archival review, an intensive pedestrian survey of the APE, and the production of a report suitable for review by the State Historic Preservation Office (SHPO) in accordance with the Texas Historical Commission's (THC) Rules of Practice and Procedure, Chapter 26, Section 27, and the Council of Texas Archeologists' (CTA) Guidelines for Cultural Resources Management Reports.

This report presents the results of this cultural resource survey. Following this introductory chapter, Chapters 2.0 and 3.0 present the environmental and cultural background, respectively, of the project area. Chapter 4.0 describes the research objectives, results of archival research, and cultural resource survey methods implemented during the survey. Chapter 5.0 presents the results of the cultural resource survey, and Chapter 6.0 presents cultural resource management recommendations for the project. Chapter 7.0 lists the references cited in the report. Appendix A summarizes shovel test data, and Appendix B contains the curriculum vitae of the Principal Investigator.

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2.0 ENVIRONMENTAL SETTING

2.1 PHYSIOGRAPHY AND HYDROLOGY

The proposed LPEC site is located east of Harlingen in central Cameron County in South Texas. The proposed project site is located on a broad alluvial flat located immediately adjacent to the No. 6 Canal, an artificial, elevated irrigation canal connected to the Arroyo Colorado. The project site is situated in an active crop agricultural field. Elevations within the project area are extremely flat, averaging approximately 30 feet above mean sea level. Hydrologically, the proposed project site is situated within the Arroyo Colorado basin, which drains directly into Laguna Madre, a barrier island lagoon of the Gulf of Mexico, approximately 34 kilometers (km) (21 miles [mi]) northeast of the project site. The project site is drained to the northeast toward an unnamed tributary of the Arroyo Colorado.

2.2 GEOLOGY AND GEOMORPHOLOGY

The project area is underlain by floodplain alluvial deposits (Qam), which along the lower course of the Rio Grande consist predominantly of mud with varying fractions of silt, sand, clay, and gravel (Fisher 1976). Specifically, the project area is underlain by the Mercedes clay, 0 to 1% slopes soil unit (MEA) (Figure 3) (NRCS 2012), which consists of calcareous clayey alluvium found on delta plains. A typical profile of this soil type consists of deep, undifferentiated deposits of clay extending to depths of more than 188 centimeters (cm) (74 inches [in]) below surface. This soil is moderately well drained and tends to have a relatively flat surface.

2.3 CLIMATE

The climate in Cameron County is generally mild in the winter, with an average temperature of 55.5 degrees. In the summer months, the average temperature is 84.7 degrees, with an average daily maximum temperature of 97.2 degrees. The average annual total precipitation is about 23.42 inches. Of this, about 21.08 inches, or 90%, usually falls in February through November. Thunderstorms occur on about 37 days each year, with most occurring in May.

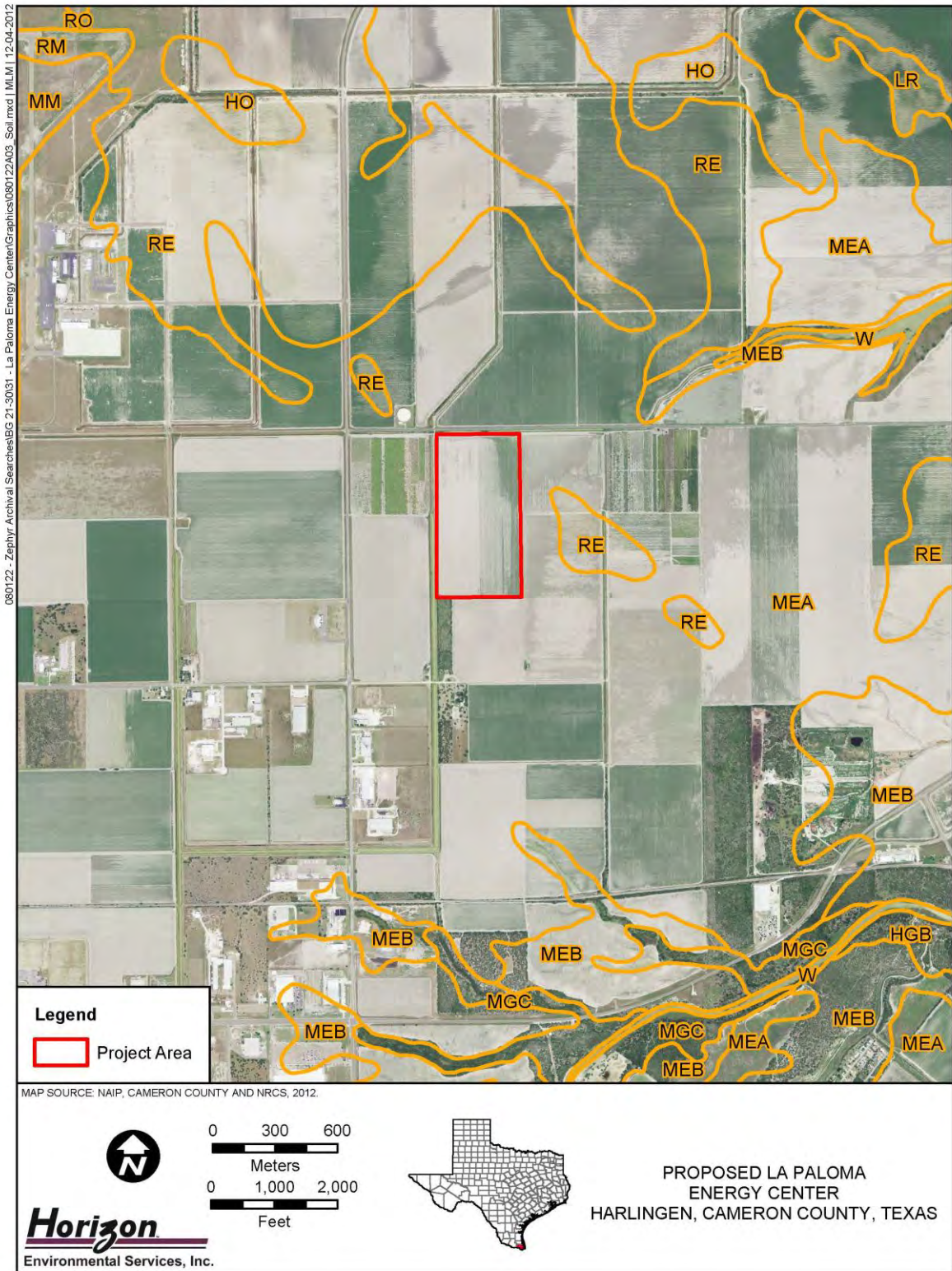


Figure 3. Distribution of Mapped Soils in Project Area

2.4 FLORA AND FAUNA

The project site is located in the Tamaulipan Biotic Province (Blair 1950) and the South Texas Plains vegetational region (Gould 1975). The upland areas support a rich tapestry of south Texas chaparral. The vegetation of the undeveloped and uncleared areas can be characterized as brush country, with variably dense scrub ranging in height from 4.0 to 10.0 feet. Mesquite and associated thorny shrubs, such as catclaw acacia, huisache, blackbrush, granjeno, whitebrush, prickly pear, and Spanish dagger are common locally. Understory vegetation is characteristically sparse. Along major drainages, live oak, Texas ebony, Texas sugarberry, cedar elm, and retama occur. Little bluestem, bristlegrass, paspalums, windmill grass, and buffelgrass are dominant grasses.

The Tamaulipan/Mezquital ecoregion of southern Texas and northeastern Mexico has unique plant and animal communities containing tree- and brush-covered dunes, wind tidal flats, and dense native brushland. Although there are large acreages of cultivated land on the South Texas Plains, most of the area is still rangeland. Land holdings predominantly are large cattle ranches. Deer and other wildlife species are common. This area originally supported a grassland- or savannah-type climax vegetation. Long continued grazing and other factors have altered the plant communities to such a degree that ranchmen of the region now face a severe brush problem (Gould 1975).

3.0 CULTURAL BACKGROUND

The prehistory of South Texas can essentially be divided into 3 major periods: (1) Paleoindian (9200–6000 BC); (2) Archaic, which has been subdivided into the Early Archaic (ca. 6000–2500 BC), Middle Archaic (ca. 2500–400 BC), and Late Archaic (ca. 400 BC–AD 800); and (3) Late Prehistoric (AD 800–1600). These prehistoric periods are principally defined by the presence of particular diagnostic projectile points, but they are intended to designate general cultural patterns based on ecology, technology, and subsistence strategies (Black 1989:48-57; Suhm et al. 1954).

3.1 PALEOINDIAN PERIOD (CA. 9200–6000 BC)

Evidence of Paleoindian occupations in South Texas (9200–6000 BC) usually consists of surface finds found most frequently in the Nueces-Guadalupe and Rio Grande plains. Only 2 stratified Paleoindian sites have been excavated in the region: Buckner Ranch (Sellards 1940) and Berger Bluff (Brown 1987). Both sites were deeply buried in alluvial terraces. Diagnostic projectile point styles of the Paleoindian period include Clovis (Meltzer 1986), Folsom (Largent et al. 1991), Golondrina, Scottsbluff, and Angostura (Black 1989:48-49). Finely flaked end scrapers fashioned on blades and bifacially worked Clear Fork tools are also diagnostic of the Paleoindian period. Paleoindian peoples have traditionally been characterized as terminal Pleistocene big-game hunters, but these highly mobile hunter-gatherers probably exploited a rich diversity of wild plant and animal foods. Investigations at Baker Cave, for instance, indicate that a diverse array of fish, snakes, and rodents was exploited by the Paleoindian occupants (Hester 1983). Paleoindian populations were probably organized into small groups that ranged over great distances across periglacial plains and marginally forested areas to acquire different food sources throughout the year (Black 1989:48).

3.2 ARCHAIC PERIOD (CA. 6000 BC–AD 800)

The major distinction of the Early Archaic period (6000–2500 BC) is the replacement of earlier lanceolate-shaped projectile points by stemmed and corner-notched types. These styles include Bell, Andice, Early Triangular, and Early Expanding Stemmed points such as Bandy, Martindale, Uvalde, and related forms (Turner and Hester 1999). Other diagnostic artifacts include Clear Fork tools and large, thin, triangular bifaces with concave bases. The beginning of the Early Archaic period marks the onset of the modern Holocene era, during which the periglacial climate of the late Pleistocene began to grow warmer. Available evidence from the

Gulf Coastal Plain suggests that population densities remained low through the beginning of the Archaic period in South Texas, reflecting a continuation of the highly mobile adaptations of the Paleoindian period.

The Middle Archaic period (2500–400 BC) in South Texas is defined by the presence of Pedernales, Langtry, Kinney, Bulverde, and Tortugas projectile point styles (Bell 1958; Turner and Hester 1999). Distally beveled tools are also common during this period, and ground stone tools, such as tubular grinding stones and manos, appear for the first time (Black 1989:49). Site densities in South Texas increase markedly during the Middle Archaic, possibly reflecting a decrease in group mobility and/or an increase in territoriality among groups (Black 1989:51). A heavier reliance on vegetal foods may be indicated by the introduction of ground stone technology and the appearance of large burned rock middens throughout Central Texas.

Late Archaic (400 BC–AD 800) occupations in South Texas are defined by small corner- and side-notched dart points, including Ensor, Frio, Marcos, Fairland, and Ellis types (Bell 1958, 1960; Turner and Hester 1999). Site densities continue to increase throughout the Late Archaic period, possibly indicating that population densities continued to rise. Cultural deposits on Late Archaic sites also tend to be deeper than during preceding periods, suggesting that occupations were either more extended in duration or that reoccupation of the same locations was more frequent (Black 1989:51). Cemeteries appear during this period, possibly indicating higher levels of social organization and increasing territoriality (Black 1989:51). During the Late Archaic, the exploitation of different ecological niches continued to intensify, becoming increasingly oriented toward the exploitation of seasonal food sources. This kind of adaptation is best illustrated by the frequent occurrence of shell middens along the coast and burned rock middens farther inland. Data collected from inland sites indicate that the economy was based primarily on vegetal resources supplemented with the hunting of small game such as rodents and rabbits (Black 1989:51).

3.3 LATE PREHISTORIC PERIOD (CA. AD 800–1600)

The onset of the Late Prehistoric period is defined by the appearance of pottery and the bow and arrow. The small dart points of the Late Archaic period were largely replaced by arrow points (Black 1989:52). The Late Prehistoric period in South Texas has been divided into 2 distinct time horizons, the Austin (AD 800–1350) and Toyah (AD 1350–1600) phases (Black 1986). The Austin phase is characterized by the presence of Scallorn arrow points, while the Toyah phase is defined by the presence of Perdiz arrow points. Faunal resources became increasingly important during this period, especially large mammals such as bison and deer. Lithic tool kits seem to have been manufactured for the processing of large mammals (Black 1989:51-57). Late Prehistoric sites are relatively common throughout South Texas, which might be interpreted as the result of population increases. The movement of bison from Central to South Texas may coincide with a movement of peoples and/or technology from both the Austin and Toyah phases of Central Texas (Black 1989:51-57).

3.4 HISTORIC PERIOD (CA. AD 1520 TO PRESENT)

The historic era of South Texas began with the arrival of Europeans in the region and can be subsumed within the overall history of Texas. In South Texas, the historic era has been divided into 3 time periods: (1) Spanish Exploration and Colonial (ca. AD 1520–1821); (2) Mexican (1821–1836); and (3) Texas-American (ca. 1836 to present). The Protohistoric era in this region can generally be incorporated within the early part of the Spanish Exploration and Colonial period.

Protohistoric

Records from the initial Spanish expeditions provide the earliest ethnohistoric accounts of the Coahuiltecan-affiliated groups indigenous to the Rio Grande Plain (Hester 1989a:1-4; 1989b:77-82). Based on fragmentary ethnohistorical records, it appears that these people—part of an extinct cultural group that occupied lands stretching from South Texas deep into Mexico—were highly nomadic hunter-gatherers who moved in a seasonal pattern within distinctive territories (Hester 1989a). Available evidence suggests that Coahuiltecan living in the Rio Grande Plain (as well as in other parts of South Texas and northern Mexico) subsisted on a number of seasonal food sources, ranging from prickly pear in the fall to bison or deer in the late fall or winter, as well as small mammals and roots during off-seasons or in times of hardship (Hester 1989b:77-81).

Two causes can be cited for the early destruction of the Coahuiltecan groups on the Rio Grande plain. The primary reason stems from the great period of unrest among Native American groups generated by the introduction of the horse by the Spanish. Groups who adopted the horse (especially the Apache and the Comanche) eagerly took to raiding neighboring groups. Nomadic peoples such as the Coahuiltecan were especially vulnerable to such pressure, as they could neither consolidate for protection nor occupy defensible positions without risking starvation. Therefore, finally, the Coahuiltecan asked for missions to be established in their territories in order to protect them from the Apache and Comanche raiders. After the establishment of the Spanish missions in South Texas during the first half of the 18th century, the remnants of the indigenous Native American groups were rapidly integrated into the mission system or were subjected to outright extinction by depredation or disease (John 1975:171-174).

Spanish Colonial

The first European incursion into Texas was by Alvarez de Pineda in 1513 during the course of a Spanish mapping expedition. In 1528, Cabeza de Vaca crossed South Texas after being shipwrecked along the Texas Coast near Galveston Bay (Folan et al. 1989:85). Between 1688 and 1717, Spanish explorers such as Mazanet and Espinosa passed through the Rio Grande Plain from Mexico on their way to the Caddoan settlements in northeast Texas (Hester 1989b:80-81). These early Spanish explorers recorded observations about the aboriginal groups in the region, but they were primarily engaged in consolidating territory for the Spanish Crown.

Following the founding of San Antonio in 1718, the town of Laredo was established along the Rio Grande in 1755 when rancher Tomas Sanchez de la Berrera y Gallardo was granted permission by the great Spanish colonizer, Jose de Escandon, to form a new settlement. Located in the province of Nuevo Santander, which included most of northeastern Mexico and parts of present-day Texas, Laredo was one of a series of settlements that Escandon established or authorized as part of Spain's effort to colonize the area south of the Nueces River (Clark and Juarez 1986:85; Folan et al. 1986:6).

Mexican and Texas-American

Prior to the Treaty of Guadalupe Hidalgo, a Spanish garrison was established in Laredo to minimize the effects of depredations by Lipan Apache and Comanche raiders. In 1790, a daring attack on the city overran the garrison and exploded the powder magazine, deepening fears that the Comanches' efforts to sweep through south Texas were succeeding" (Briggs 1982:7). Once the Texas-Mexico border was established along the Rio Grande in 1848, the role of protection in the Laredo area passed to the United States. In 1849, a company of mounted infantry under 2nd Lieutenant E.L. Viele arrived to establish an army post on "some high flats west of the city, opposite a ford and just north of a bend in the Rio Grande" (Briggs 1982:7) on the Texas side of the river about 3/4 of a mile west of the old Spanish town of Laredo. Originally named Camp Crawford (or Camp Laredo), the name of the post was changed in 1850 to Fort McIntosh in honor of Lieutenant Colonel James S. McIntosh, who died in September 1847 from wounds received at the Battle of Molino del Rey during the Mexican-American War (Frazer 1972). When construction began in 1850, the general military objective of the fort was to provide "escort service to caravans of travelers and [to reduce] Indian depredations and general outlawry" (Briggs 1982:8).

4.0 RESEARCH OBJECTIVES AND METHODOLOGY

The archeological survey described in this report was undertaken with 3 primary research goals in mind:

1. To locate and record cultural resources occurring within the designated project area
2. To provide a preliminary assessment of the significance of these resources regarding their potential for inclusion in the National Register of Historic Places (NRHP)
3. To make recommendations for the treatment of these resources based on their NRHP assessments

The first of these goals was accomplished by means of a review of documentation on file at the Texas Historical Commission's (THC) online *Texas Archeological Sites Atlas* (Atlas), the National Park Service's (NPS) online *National Register Information System* (NRIS), the Texas State Historical Association's (TSHA) *Handbook of Texas Online*, as well as a program of intensive pedestrian survey. No cultural resources were documented within the project area as a result of the survey; as a result, the second and third goals were not brought into play. The rest of this chapter presents the results of archival research, the methodological background for the current investigations, and the specific survey methods used in the field.

4.1 ARCHIVAL RESEARCH

Prior to initiating fieldwork, Horizon personnel reviewed existing information on the THC's online Atlas (THC 2012) and the NPS's NRIS database (NPS 2012) for information on previously recorded archeological sites, cemeteries, and historic properties as well as previous cultural resources investigations conducted within a 1.6-km (1.0-mi) radius of the project area. This archival research indicated the presence of 1 previously recorded archeological site (41CF196) within a 1.0-mile radius of the project site (Table 1) (THC 2012), while a review of the National Park Service's (NPS) NRHP Google Earth map layer indicated the presence of no historic properties listed on the NRHP within the review area (NPS 2012).

Recorded in 2005 during a cultural resources survey for a proposed pipeline, site 41CF196 was described as a surficial aboriginal lithic artifact scatter in a plowed agricultural field (Brownlow 2005). The site was recommended as ineligible for inclusion in the NRHP based on its disturbed context in a plowed agricultural field and its lack of subsurface cultural

Table 1. Summary of documented cultural resources within 1.0 miles of Project Area

Site No.	Site Type	NRHP Eligibility	Distance/Direction from Project Area	Potential to be Impacted by Project?
41CF196	Aboriginal lithic scatter (undated prehistoric)	Recommended ineligible	0.7 miles northeast	No

NRHP National Register of Historic Places

deposits. The proposed pipeline right-of-way (ROW) associated with this prior survey was subsequently rerouted in such a way that site 41CF196 would be avoided; as a result, the site was not included in the final report for the project and the THC did not review the NRHP eligibility recommendation associated with this site.

No previously recorded archeological sites, cemeteries, or historic properties, including any listed on the NRHP, are located within or immediately adjacent to the boundaries of the APE. Based on the Atlas data, no previous cultural resources surveys have been undertaken within the boundaries of the project site.

Prehistoric archeological sites are commonly found in upland areas and on alluvial terraces near stream and river channels. The proposed LPEC project site is located in an active agricultural field situated on calcareous, clayey alluvial deposits. Based on the location of the project site within an agricultural field set away from extant water sources and the low density of recorded cultural sites in the surrounding area, it is Horizon's opinion that there exists a low potential for intact, undocumented aboriginal cultural resources within the boundaries of the proposed project site.

In regard to historic-era resources, the lack of visible structures in proximity to the project site on topographic and aerial maps of the project area suggests a low potential for historic-era architectural or archeological resources within the limits of the proposed project site.

4.2 SURVEY METHODS

On December 5, 2012, Horizon archeologists Michael Mudd and Jared Wiersema, under the overall direction of Russell K. Brownlow, Principal Investigator, performed an intensive cultural resources survey of the APE to locate any cultural resource properties that potentially would be impacted by the proposed undertaking. The APE of the proposed undertaking consists of the proposed 32-ha (78-ac) LPEC site.

Horizon's archeologists traversed the 32-ha (78-ac) APE on foot in parallel transects spaced no more than 30 m (100 ft) apart and thoroughly inspected the modern ground surface for aboriginal and historic-age cultural resources. The APE consisted of an active agricultural field that had been recently plowed, though no crops had been planted at the time of the survey (Figures 4 to 6). No vegetation was present in the agricultural field, and visibility was excellent (100%) across the entire project area.



Figure 4. Overview of Project Area from Northwest Corner (Facing South)



Figure 5. Overview of Project Area from Northwest Corner (Facing Southeast)



Figure 6. Overview of Project Area from Southern Boundary (Facing North)

In addition to pedestrian walkover, the Texas State Minimum Archeological Survey Standards (TSMASS) for cultural resource surveys state that, for block-area projects, a minimum of 1 subsurface probe (i.e., shovel tests, auger tests, backhoe trenches) is required per 2 acres for projects the size of the current project's APE unless field conditions warrant excavation of more probes (e.g., due to the presence of culturally sensitive areas) or less probes (e.g., due to extensive prior disturbances or cultural low-probability areas). In the event that a probe yields evidence of subsurface cultural deposits, additional probes may be necessary to determine the horizontal and vertical extent of the subsurface deposits associated with the cultural resource. Thus, a minimum of 39 subsurface probes would be required within the proposed project's 32-ha (78-ac) APE. Horizon excavated a total of 41 shovel tests in the APE, thereby exceeding the TSMASS requirements for a project area of this size (Figure 7). In general, shovel tests measured approximately 30 cm (12 in) in diameter and were excavated to a target depth of 1.0 m (3.3 ft) below ground surface, to the top of pre-Holocene deposits, or to the maximum depth practicable, and all sediments were screened through 6.35-millimeter (mm) (0.25-in) hardware cloth. In practice, shovel tests were terminated at depths of 10 to 40 centimeters (cm) below surface (cmbs) less than 1.0 m (3.3 ft) below surface due to the presence of pre-Holocene sediments composed of dense, calcareous clay underlying a shallow, 30- to 40-cm-deep disturbed plowzone. The Universal Transverse Mercator (UTM) coordinates of all shovel tests were determined using hand-held Garmin ForeTrex Global Positioning System (GPS) devices based on the North American Datum of 1983 (NAD 83). Specific shovel test data are summarized in Appendix A.

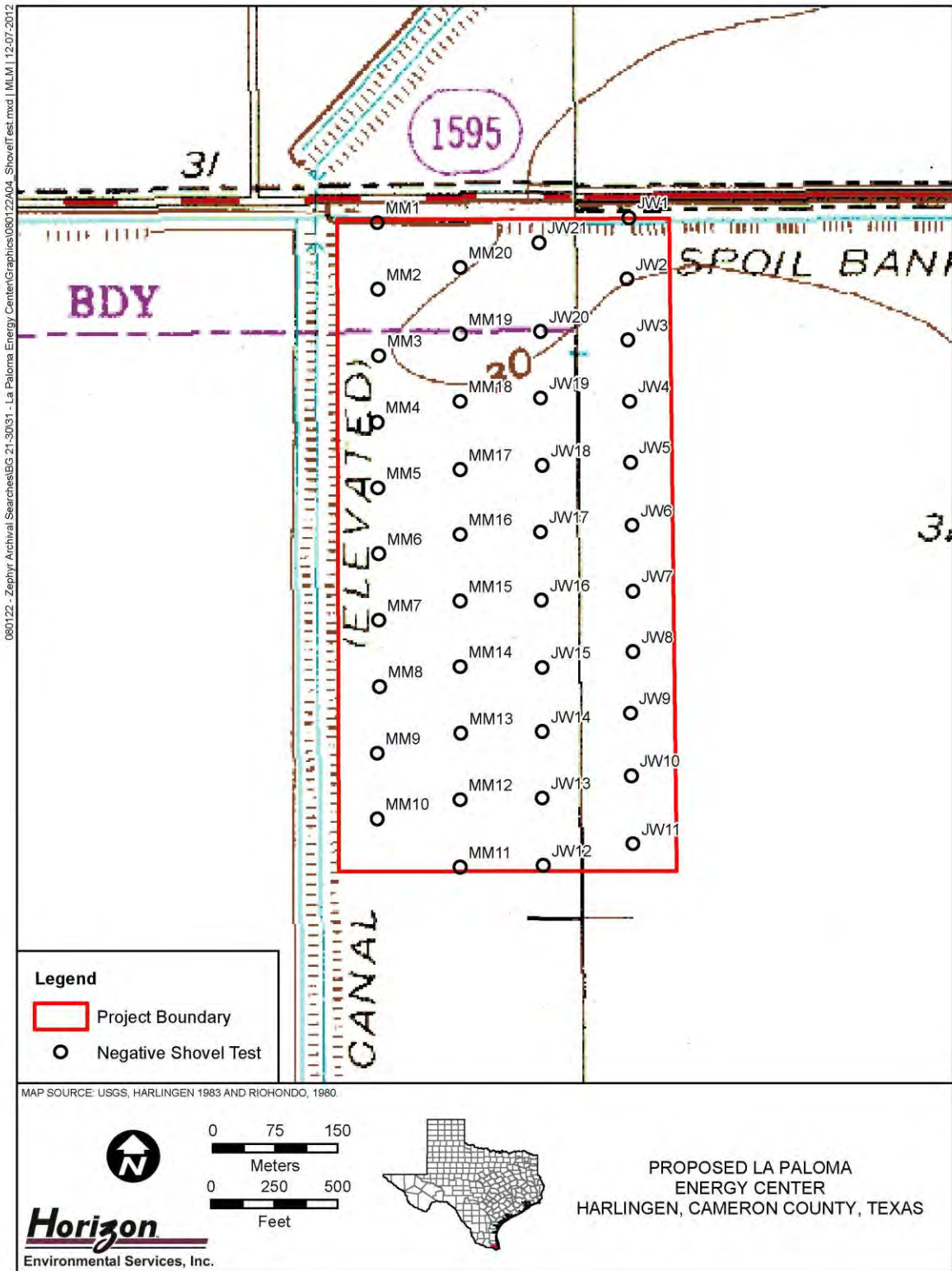


Figure 7. Locations of Shovel Tests Excavated in Project Area

The TSMASS also require backhoe trenching in stream terraces and other areas with the potential to contain buried cultural materials at depths below those that shovel tests are capable of reaching. Shovel testing revealed that sediments in the project area consisted of a shallow, 30- to 40-cm-deep, disturbed plowzone underlain by dense, calcareous, pre-Holocene clay sediments. Based on the physiographic setting of the project area in an active agricultural field set away from extant water sources and the soil characteristics observed in shovel tests, surface inspection with shovel testing constituted an adequate survey technique for identifying cultural resources within the APE, and no backhoe trenching was warranted.

The survey methods employed during the survey represented a “reasonable and good-faith effort” to locate significant archeological sites within the project area as defined in 36 Code of Federal Regulations (CFR) 800.3.

5.0 RESULTS OF INVESTIGATIONS

Horizon was selected by Zephyr, on behalf of La Paloma, to conduct an intensive cultural resources inventory and assessment of the proposed location of the LPEC located at 24684 FM 1595, Harlingen, Cameron County, Texas. La Paloma is proposing to construct a new natural gas fired, combined cycle electric generating plant. The LPEC would consist of 2 natural gas fired combustion turbines, each exhausting to a fired HRSG to produce steam to drive a shared steam turbine. Construction of the LPEC, associated infrastructure, and auxiliary equipment would take place within a proposed 32-ha (78-ac) project site. Currently, the site is an agricultural field utilized for growing cotton. Due to the nature of the soils on-site, the proposed facility would be installed on spread-footing foundations that would be formed and poured in excavations throughout the site. The topsoil on the site would be removed and replaced with structural fill material in the area of the power-generating equipment. The primary foundations for the gas turbines, boilers, and steam turbine pedestal would be excavated 1.8 to 2.4 m (6.0 to 8.0 ft) below surface and would be backfilled with imported sediments when completed. The APE of the proposed undertaking consists of the entire proposed 32-ha (78-ac) LPEC site.

As construction of the proposed facility would require a PSD permit for Greenhouse Gasses (GHG) issued by the US EPA, the undertaking falls under the regulations of Section 106 of the NHPA of 1966, as amended, which is invoked when federal funds are utilized or when federal permitting is required for a proposed project. The NHPA states that the ACHP and the THC, which serves as the SHPO for the state of Texas, must be afforded the opportunity to comment when any cultural resources potentially eligible for inclusion in the NRHP are present in a project area affected by federal agency actions or covered under federal permits or funding.

On December 5, 2012, Horizon archeologists Michael Mudd and Jared Wiersema, under the overall direction of Russell K. Brownlow, Principal Investigator, performed an intensive cultural resources survey of the APE to locate any cultural resource properties that potentially would be impacted by the proposed undertaking. Horizon's archeologist traversed the 32-ha (78-ac) APE and thoroughly inspected the modern ground surface for aboriginal and historic-age cultural resources. Horizon's archeologists traversed the 32-ha (78-ac) APE and thoroughly inspected the modern ground surface for aboriginal and historic-age cultural resources. The APE consisted of an active agricultural field that had been recently plowed, though no crops had been planted at the time of the survey. No vegetation was present in the

agricultural field, and visibility was excellent (100%) across the entire project area. Horizon excavated a total of 41 shovel tests in the 32-ha (78-ac) APE, thereby exceeding the TSMASS requirements for a project area of this size.

No cultural resources, historic or prehistoric, were identified within the APE as a result of the survey.

6.0 SUMMARY AND RECOMMENDATIONS

6.1 CONCEPTUAL FRAMEWORK

The archeological investigations documented in this report were undertaken with 3 primary management goals in mind:

- Locate all historic and prehistoric archeological resources that occur within the designated survey area.
- Evaluate the significance of these resources regarding their potential for inclusion in the NRHP and for designation as State Archeological Landmarks (SALs).
- Formulate recommendations for the treatment of these resources based on their NRHP and SAL evaluations.

At the survey level of investigation, the principal research objective is to inventory the cultural resources within the APE and to make preliminary determinations of whether or not the resources meet one or more of the pre-defined eligibility criteria set forth in the state and/or federal codes, as appropriate. Usually, management decisions regarding archeological properties are a function of the potential importance of the sites in addressing defined research needs, though historic-age sites may also be evaluated in terms of their association with important historic events and/or personages. Under the NHPA and the Antiquities Code of Texas, archeological resources are evaluated according to criteria established to determine the significance of archeological resources for inclusion in the NRHP and for designation as SALs, respectively.

Analyses of the limited data obtained at the survey level are rarely sufficient to contribute in a meaningful manner to defined research issues. The objective is rather to determine which archeological sites could be most profitably investigated further in pursuance of regional, methodological, or theoretical research questions. Therefore, adequate information on site function, context, and chronological placement from archeological and, if appropriate, historical perspectives is essential for archeological evaluations. Because research questions vary as a function of geography and temporal period, determination of the site context and chronological placement of cultural properties is a particularly important objective during the inventory process.

6.2 ELIGIBILITY CRITERIA FOR INCLUSION IN THE NATIONAL REGISTER OF HISTORIC PLACES

Determinations of eligibility for inclusion in the NRHP are based on the criteria presented in the Code of Federal Regulations (CFR) in 36 CFR §60.4(a-d). The 4 criteria of eligibility are applied following the identification of relevant historical themes and related research questions:

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

- a. [T]hat are associated with events that have made a significant contribution to the broad patterns of our history; or,
- b. [T]hat are associated with the lives of persons significant in our past; or,
- c. [T]hat embody the distinctive characteristics of a type, period, or method of construction, or that represent a significant and distinguishable entity whose components may lack individual distinction; or,
- d. [T]hat have yielded, or may be likely to yield, information important in prehistory or history.

The first step in the evaluation process is to define the significance of the property by identifying the particular aspect of history or prehistory to be addressed and the reasons why information on that topic is important. The second step is to define the kinds of evidence or the data requirements that the property must exhibit to provide significant information. These data requirements in turn indicate the kind of integrity that the site must possess to be significant. This concept of integrity relates both to the contextual integrity of such entities as structures, districts, or archeological deposits and to the applicability of the potential database to pertinent research questions. Without such integrity, the significance of a resource is very limited.

For an archeological resource to be eligible for inclusion in the NRHP, it must meet legal standards of eligibility that are determined by 3 requirements: (1) properties must possess significance, (2) the significance must satisfy at least 1 of the 4 criteria for eligibility listed above, and (3) significance should be derived from an understanding of historic context. As discussed here, historic context refers to the organization of information concerning prehistory and history according to various periods of development in various times and at various places. Thus, the significance of a property can best be understood through knowledge of historic development and the relationship of the resource to other, similar properties within a particular period of development. Most prehistoric sites are usually only eligible for inclusion in the NRHP under Criterion D, which considers their potential to contribute data important to an understanding of prehistory. All 4 criteria employed for determining NRHP eligibility potentially can be brought to bear for historic sites.

6.3 SUMMARY OF INVENTORY RESULTS

Horizon archeologists performed an intensive cultural resources survey of the APE to locate any cultural resource properties that potentially would be impacted by the proposed

undertaking. The APE was traversed by Horizon's archeologists, the modern ground surface was thoroughly inspected for cultural resources, and a total of 41 shovel tests were excavated within the APE. The TSMASS requirements were exceeded for a project area of this size. No cultural resources, historic or prehistoric, were identified within the APE as a result of the survey.

6.4 MANAGEMENT RECOMMENDATIONS

Based on the results of the survey-level investigations documented in this report, no potentially significant cultural resources would be affected by the proposed undertaking. In accordance with 36 CFR 800.4, Horizon has made a reasonable and good faith effort to identify archeological historic properties within the APE. No archeological resources were identified that meet the criteria for inclusion in the NRHP according to 36 CFR 60.4, and no further archeological work is recommended in connection with the proposed undertaking. However, in the unlikely event that any human remains or burial accoutrements are inadvertently discovered at any point during construction, use, or ongoing maintenance in the project area, even in previously surveyed areas, all work should cease immediately and the THC should be notified of the discovery.

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APPENDIX A:

Shovel Test Data

Table A-1. Shovel Test Summary Data

ST No.	UTM Coordinates ¹		Depth (cmbs)	Soils	Artifacts
	Easting	Northing			
JW-1	637403	2900360	0-20 20-40 40+	Dark gray clay loam Dark gray loamy clay Dark gray clay	None
JW-2	637401	2900286	0-40 40+	Dark gray loamy clay Dark gray clay	None
JW-3	637402	2900213	0-40 40+	Dark gray loamy clay Dark gray clay	None
JW-4	637404	2900139	0-30 30+	Dark gray loamy clay Dark gray clay	None
JW-5	637405	2900066	0-30 30+	Dark gray loamy clay Dark gray clay	None
JW-6	637407	2899990	0-30 30+	Dark gray loamy clay Dark gray clay	None
JW-7	637408	2899911	0-25 25-40 40+	Dark gray clay loam Dark gray loamy clay Moist dark gray clay	None
JW-8	637408	2899838	0-30	Moist dark gray clay	None
JW-9	637405	2899764	0-30	Moist dark gray clay	None
JW-10	637406	2899689	0-30	Moist dark gray clay	None
JW-11	637408	2899607	0-30	Moist dark gray clay	None
JW-12	637300	2899581	0-30 30+	Dark gray loamy clay Dark gray clay	None
JW-13	637299	2899662	0-30 30+	Dark gray loamy clay Dark gray clay	None
JW-14	637299	2899742	0-30 30+	Dark gray loamy clay Dark gray clay	None
JW-15	637299	2899819	0-30 30+	Dark gray loamy clay Dark gray clay	None
JW-16	637298	2899900	0-30 30+	Dark gray loamy clay Dark gray clay	None
JW-17	637297	2899982	0-30 30+	Dark gray loamy clay Dark gray clay	None

Table A-1. Shovel Test Summary Data (cont.)

ST No.	UTM Coordinates ¹		Depth (cmbs)	Soils	Artifacts
	Easting	Northing			
JW-18	637299	2900062	0-25 25+	Dark gray loamy clay Dark gray clay	None
JW-19	637297	2900143	0-25 25+	Dark gray loamy clay Dark gray clay	None
JW-20	637297	2900223	0-20 20+	Dark gray loamy clay Dark gray clay	None
JW-21	637295	2900330	0-30 30+	Dark gray loamy clay Dark gray clay	None
MM-1	637100	2900354	0-30 30+	Dark gray loamy clay Dark gray clay	None
MM-2	637101	2900274	0-10 10+	Moist dark gray clay loam Dark gray clay	None
MM-3	637102	2900194	0-25 25+	Dark gray loamy clay Dark gray clay	None
MM-4	637100	2900114	0-30 30+	Dark gray loamy clay Dark gray clay	None
MM-5	637101	2900035	0-30 30+	Dark gray loamy clay Dark gray clay	None
MM-6	637102	2899956	0-30 30+	Dark gray loamy clay Dark gray clay	None
MM-7	637102	2899876	0-30	Moist dark gray clay	None
MM-8	637103	2899796	0-30	Moist dark gray clay	None
MM-9	637100	2899716	0-30 30+	Dark gray loamy clay Dark gray clay	None
MM-10	637100	2899637	0-30 30+	Dark gray loamy clay Dark gray clay	None
MM-11	637200	2899579	0-30	Moist dark gray clay	None
MM-12	637200	2899660	0-30 30+	Dark gray loamy clay Dark gray clay	None
MM-13	637201	2899740	0-30	Moist dark gray clay	None
MM-14	637200	2899820	0-40 40+	Dark gray loamy clay Dark gray clay	None
MM-15	637200	2899899	0-30	Moist dark gray clay	None

Table A-1. Shovel Test Summary Data (cont.)

ST No.	UTM Coordinates ¹		Depth (cmbs)	Soils	Artifacts
	Easting	Northing			
MM-16	637200	2899979	0-40 40+	Dark gray loamy clay Dark gray clay	None
MM-17	637200	2900057	0-30	Moist dark gray clay	None
MM-18	637200	2900139	0-40 40+	Dark gray loamy clay Dark gray clay	None
MM-19	637200	2900220	0-30	Moist dark gray clay	None
MM-20	637200	2900300	0-30 30+	Dark gray loamy clay Dark gray clay	None

¹ All UTM coordinates are located in Zone 14 and utilize the North American Datum of 1983 (NAD 14)

cmbs = Centimeters below surface

ST = Shovel test

UTM = Universal Transverse Mercator

APPENDIX B:

Curriculum Vitae for Principal Investigator

RUSSELL K. BROWNLOW
PRINCIPAL / CULTURAL RESOURCES DIRECTOR

TECHNICAL SPECIALTIES

- Cultural resource management (CRM);
- Prehistoric archeology of Texas, Oklahoma, and Louisiana;
- Compliance with the Antiquities Code of Texas (ACT), Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, and the Native American Graves Protection and Repatriation Act (NAGPRA);
- Prehistoric lithic technology (flint knapping);
- Ethnohistory;
- Project management;
- Archeological survey, testing, and data recovery;
- Technical report writing

EDUCATION

- B.A., Anthropology / Archeology, The University of Texas at Austin, 1992
- M.A., Anthropology, The University of Houston, 1998

PROFESSIONAL REGISTRATIONS AND TRAINING

- Registered Professional Archeologist since 2001 (RPA ID# 11924)
- TxDOT pre-certified for Service 2.10.1 (Archeological Surveys, Documentation, Excavations, Testing, Reports, and Data Recovery Plans)
- Mine Safety and Health Administration (MSHA) certified through 11/23/12

PROFESSIONAL / TECHNICAL SOCIETIES

- Texas Archeological Society (TAS)
- Council of Texas Archeologists (CTA)
- Register of Professional Archeologists (RPA)
- Texas Association of Environmental Professionals (TAEP)

AWARDS

- Texas Historical Commission Award of Merit (2004) for exceptional field research, laboratory analysis, and report production associated with 41WM815 in Williamson County, Texas

PROFESSIONAL EXPERIENCE

- Horizon Environmental Services, Inc., Austin, Texas
 - 2000 to present
 - Horizon Principal / Cultural Resources Director / Principal Investigator / Project Manager
- Texas Archeological Research Laboratory, University of Texas at Austin
 - 1998 to 2000
 - Research Associate
- Archeological and Environmental Consultants, Inc., Austin, Texas
 - 1999
 - Project Archeologist
- Houston Museum of Natural Science, Houston, Texas
 - 1998
 - Consultant
- University of Houston, Department of Anthropology, Houston, Texas
 - 1997 to 1998
 - Teaching Assistant
- Espey, Huston & Associates, Inc., Austin, Texas (now PBS&J)
 - 1994 to 1998
 - Field Technician, Laboratory Technician, Crew Chief, Field Director
- Prewitt and Associates, Inc., Austin, Texas
 - 1993
 - Field Technician
- Texas Archeological Research Laboratory, University of Texas at Austin
 - 1992
 - Laboratory Technician

FIELDS OF EXPERIENCE

Mr. Brownlow has over 19 years of experience conducting archeological research for both public institutions and private consulting firms. Examples of his archeological project experience include the following:

- In excess of 300 cultural resources surveys completed for a wide array of projects within Texas, Oklahoma, and Louisiana;
- National Register of Historic Places and/or State Archeological Landmark eligibility testing on a minimum of 36 archeological sites;
- Data recovery/mitigation efforts on a minimum of 11 archeological sites;

- Excavation of human burials from at least 7 different archeological sites including a historic cemetery containing in excess of 431 human interments, a Caddoan cemetery containing 16 human interments, and a burned rock midden site containing at least 4 human interments;
- Archeo-Geophysical (remote sensing) sampling on 3 archeological sites;
- Authoring or co-authoring over 250 technical reports of archeological investigations;
- Preparation of several archeological avoidance plans for seismic projects;
- Countless desktop archival reviews to determine the potential for cultural resources on various properties for inclusion in non-archeological documents (i.e. Phase I Environmental Site Assessments, Categorical Exclusions, etc.);
- Section 106 and/or Antiquities Code of Texas consultation for hundreds of projects with various permitting agencies including the Texas Historical Commission, Texas Water Development Board, Texas Parks and Wildlife Department, US Army Corps of Engineers, US Fish and Wildlife Service, Oklahoma State Historic Preservation Office, the Louisiana Department of Culture, Recreation, and Tourism, as well as a vast array of Tribal Historic Preservation Officers;
- In addition to his cultural resources experiences, Mr. Brownlow has also prepared a variety of non-archeological documents includes numerous Categorical Exclusions (CEs), Phase I Environmental Site Assessments (Phase I ESAs), Environmental Reports (ERs), and Environmental Assessments (EAs). He has also contributed to the production of several Environmental Impacts Statements (EISs).

Types of projects in which Mr. Brownlow has participated in or managed cultural resources services include:

- Oil and gas exploration, development, and transportation;
- Ethanol production;
- Coastal and inland residential, commercial, and industrial land development;
- Solid waste landfills;
- Dredging activities;
- Surface lignite mines;
- Municipal planning;
- Reservoir development;
- Coastal port and channel improvements;
- Transportation corridors;
- Water and wastewater transportation and treatment;
- Electricity generation and transportation;
- University research;
- Military installations.

PRESENTATIONS

- Flint knapping and stone tool technology lecture for the 1997 spring semester Introduction to Archeology class at the Department of Anthropology, University of Houston.
- Flint knapping and stone tool technology lecture for the 1997 spring semester Archeology of Texas class at the Department of Anthropology, University of Houston.
- Flint knapping and stone tool technology lecture for the 1997 fall semester Introduction to Archeology class at the Department of Anthropology, University of Houston.
- Flint knapping and stone tool technology lecture for the 1997 fall semester Introduction to Physical Anthropology class at the Department of Anthropology, University of Houston.
- Two flint knapping demonstrations for the Brazoria County summer archeology programs sponsored by BCI Long Distance.
- Perdiz Arrow Point Origins for the TARL Brown Bag Lunch, 1998.
- Perdiz Arrow Point Origins for the Houston Archeological Society, 1998.
- Perdiz Arrow Point Origins for the Travis County Archeological Society, 1998.
- Flint knapping demonstration for the Austin French Legation's annual summer camp program, 1999.
- Data Recovery Investigations at the Holt Site (41HY341). "Burned Rock Midden" Symposium at the Annual Council of Texas Archeologists Spring Meeting, 2005.
- Yearly flint knapping demonstrations for Camp Mabry's annual "Muster Day" Event.
- Routine visits to various elementary school classes to conduct flint knapping demonstrations and present archeological career details for "career days".

ARTICLES

Brownlow, R.K.

- 2000 Excavations at Rice's Crossing (41WM815). *Current Archeology in Texas*. November 2000, Volume 2, No. 2. Texas Historical Commission. Austin, Texas.
- 2009 In Search of the Lost Community of Nottingham: Archival and Archo-Geophysical Investigations on Site 41GV71. *Current Archeology in Texas*. April 2009, Volume 11, No. 1. Texas Historical Commission. Austin, Texas.

TECHNICAL PUBLICATIONS

Espey, Huston & Associates (EH&A now PBS&J):

Brownlow, R.K.

- 1994 *Facilities Response Plan for Holly Street Power Plant, Austin, Texas*. EH&A Doc. No. 941257. Austin, Texas.

- 1995 *Facilities Response Plan for Decker Lake Power Plant, Austin, Texas*. EH&A Doc. No.950028. Austin, Texas.
- 1996 *Intensive Cultural Resource Survey of Proposed ORYX-MOYER 1-5 New 4-inch Pipeline Project*. EH&A Doc. No. 960270. Austin, Texas.

Schmidt, J.S., M.E. Cruse, and R.K. Brownlow

- 1995 *Cultural Resources Survey of Camp Swift, Bastrop County, Texas*. EH&A Doc. No. 951178. Austin, Texas.

Masters Thesis:

Brownlow, R.K.

- 1998 *Evaluating the Co-occurrence of Arrow Point Types in South Texas: Archaeological Excavations at the Batot-Hooker Site (41ME34), Medina County, Texas*. Masters Thesis presented to the Anthropology Department of the University of Houston. Houston, Texas.

Texas Archeological Research Laboratory (TARL):

Brownlow, R.K.

- 1999 Intensive Cultural Resource Survey of Fort Wolters Army National Guard Base, Parker and Palo Pinto Counties, Texas. *Studies in Archeology* 32. Texas Archeological Research Laboratory, The University of Texas at Austin.
- 2000 *Emergency Burial Salvage at 41PR88 on the Fort Wolters Training Facility, Parker Co., Texas*. Letter Report. Texas Archeological Research Laboratory, The University of Texas at Austin.
- 2000 Archeological Investigations at 41WM815, A Blackland Prairie Site, Williamson County, Texas. *Studies in Archeology* 36. Texas Archeological Research Laboratory, The University of Texas at Austin.
- 2001 National Register Eligibility of Four Sites at the Texas Army National Guard's Fort Wolters Facility, Parker Co., Texas. *Studies in Archeology* 37. Texas Archeological Research Laboratory, The University of Texas at Austin.

Contributing author in:

Takac, P.R., J.G. Paine, and M.B. Collins

- 2000 Reassessment of Ten Archeological Sites along the Houston Ship Channel – Morgan's Point to Buffalo Bayou, Harris County, Texas. *Studies in Archeology* 38. Texas Archeological Research Laboratory, The University of Texas at Austin.

Archeological and Environmental Consultants, Inc.:

Pertulla, T.K. and R.K. Brownlow

- 1999 An Archeological Survey of the Jett Road Water Project in Bexar County, Texas. *Letter Report of Investigations, No. 37.* Archeological & Environmental Consultants, Inc. Austin, Texas.

Horizon Environmental Services, Inc.:

Brownlow, R.K.

- 2000 *An Intensive Cultural Resources Survey of a Proposed Wal-Mart Site at the Northwestern Corner of the Intersection of U.S. Highway 183 and FM 1431, Cedar Park, Williamson County, Texas.* HJN 000255 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2001 *Backhoe Trench Investigations for a Proposed Wastewater Line Crossing Brushy Creek on the Ivie Tract, Williamson County, Texas.* HJN 010016 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2001 *Profile Documentation of Erosional Gullies in Borrow Pits Nos. 1 and 2 on Site 41WA255 for the Texas Department of Criminal Justice's Estelle Unit, Huntsville, Walker County, Texas.* Texas Antiquities Committee Permit No. 2509. HJN 000425 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2001 *An Intensive Cultural Resources Survey of Centennial Pipeline's Proposed Pump Stations A, B, and C, Bearegard, La Salle, and West Carroll Parishes, Louisiana.* HJN 000302 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2001 *An Intensive Cultural Resources Survey of the Proposed Centennial Pipeline Right-of-Way, Beauregard Parish, Louisiana.* HJN 000151 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2001 *An Intensive Cultural Resources Survey of the Proposed Centennial Pipeline Right-of-Way, Jefferson, Orange, Jasper, and Newton Counties, Texas.* HJN 000151 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2001 *An Intensive Cultural Resources Survey of a Proposed 15-acre Leander Independent School District School Site Located on the Steiner Ranch Tract, Travis County, Texas.* Texas Antiquities Committee Permit No. 2583. HJN 010136 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2001 *An Intensive Cultural Resources Survey and Subsequent Testing Along a Proposed Water/Wastewater Line within the Northern Right-of-Way of FM 1431 East, Williamson County, Texas.* Texas Antiquities Committee Permit Nos. 2385 and 2433. HJN 000053 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2001 *An Intensive Cultural Resources Survey of 15 Proposed Well Sites and Flow Lines on the Freeman Ranch and Tucker Leases, Texas County, Oklahoma.* HJN 010239 AR. Horizon Environmental Services, Inc. Austin, Texas.

- 2001 *An Intensive Cultural Resources Survey of 22 Proposed Well Sites and Flow Lines on the Freeman Ranch and Tucker Leases, Texas County, Oklahoma.* HJN 010239 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2001 *An Intensive Cultural Resources Survey of 13 Proposed Well Sites and Flow Lines on the Freeman Ranch and Tucker Leases, Texas County, Oklahoma.* HJN 010239 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2001 *An Intensive Cultural Resources Survey of the Proposed Legacy Ridge Estates Residential Subdivision and Golf Course, Bonham, Fannin County, Texas.* HJN 010348 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2001 *An Intensive Cultural Resources Survey of the Proposed UNOCAL Keystone Gas Storage Project, Winkler County, Texas.* HJN 000256 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2001 *An Intensive Cultural Resources Survey of 300 Acres on the Phillips Ranch, Hays County, Texas.* HJN 010367 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2001 *An Intensive Cultural Resources Survey of the approximately 25-acre United RV Campground, San Marcos, Hays County, Texas.* HJN 010382 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2001 *An Intensive Cultural Resources Survey of a Proposed Lower Neches Valley Authority 33-acre Water Treatment Plant Site and Associated Waterline Routes, Winnie, Chambers County, Texas.* HJN 010090. Horizon Environmental Services, Inc. Austin, Texas.
- 2002 *An Intensive Cultural Resources Survey of the 4.5-mile Rainbolt Lateral Pipeline Right-of-Way, Robertson and Leon Counties, Texas.* HJN 010392 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2002 *An Intensive Cultural Resources Survey of the Proposed Widening of Ranch-to-Market Road 2243 (Alternates A and B), Leander, Williamson County, Texas.* Texas Antiquities Committee Permit No. 2722. HJN 010185 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2002 *An Intensive Cultural Resources Survey of 12 Proposed Well Sites and Flow Lines on the Freeman Ranch and Tucker Leases, Texas County, Oklahoma.* HJN 010239 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2002 *An Intensive Cultural Resources Survey of a Proposed 1.25-mile Natural Gas Pipeline Right-of-Way, Sweeny, Brazoria County, Texas.* HJN 020041 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2002 *An Intensive Cultural Resources Survey of a Proposed 12-acre Home Depot Site at the Rivery, Georgetown, Williamson County, Texas.* HJN 020027 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2002 *An Intensive Cultural Resources Survey for a Proposed 29-mile Crude Oil Pipeline Right-of-Way, Port Neches Route of the Cameron Highway Pipeline Project, Jefferson County, Texas.* HJN 010344 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2002 *An Intensive Cultural Resources Survey of the Proposed 27-acre Target in Bee Cave #2 Site, Bee Cave, Travis County, Texas.* HJN 020067 AR. Horizon Environmental Services, Inc. Austin, Texas.

- 2002 *An Intensive Cultural Resources Survey of The Rivery, A Proposed 125-acre Development Site in Georgetown, Williamson County, Texas.* HJN 020046 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2002 *An Intensive Cultural Resources Survey of the Buttercup Creek Channelization and Wetland Mitigation Project (30 Acres), Cedar Park, Williamson County, Texas.* HJN 010333 PA. Horizon Environmental Services, Inc. Austin, Texas.
- 2002 *An Intensive Cultural Resources Survey of 5 Proposed Well Sites and Flow Lines on the Freeman Ranch and Tucker Leases, Texas County, Oklahoma.* HJN 010239 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2002 *An Intensive Cultural Resources Survey of a Proposed 122-acre Target Store Site Located at Parmer Lane and Interstate Highway 35, Austin, Travis County, Texas.* HJN 010354 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2002 *An Intensive Cultural Resources Survey of a Proposed 17-acre Tract to be Annexed to Kit McConnico Park Located in Lufkin, Angelina County, Texas.* Texas Antiquities Committee Permit No. 2876. HJN 020113 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2002 *An Intensive Cultural Resources Survey of 11 Proposed Well Sites and Flow Lines on the Freeman Ranch and Tucker Leases, Texas County, Oklahoma.* HJN 010239 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2002 *An Intensive Cultural Resources Survey of the 197-acre El Camino Real Phase I Tract, A Proposed Subdivision Site in San Marcos, Hays County, Texas.* HJN 020123 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2002 *An Intensive Cultural Resources Survey of the Proposed 75-acre Greenshores Subdivision Tract Located in Northwest Austin, Travis County, Texas.* HJN 020145 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2002 *An Intensive Cultural Resources Survey of the 100-acre Wolf Tract, A Proposed Development Site in Georgetown, Williamson County, Texas.* HJN 020144 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2002 *An Intensive Cultural Resources Survey of 9 Proposed Well Sites and Associated Flow Lines on the Freeman Ranch and Tucker Leases, Texas County, Oklahoma.* HJN 010239 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2002 *An Intensive Cultural Resources Survey of the Proposed UNOCAL Keystone Gas Storage Project and 3.8 Miles of Associated Pipeline ROW, Winkler County, Texas.* HJN 000256 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2002 *An Intensive Cultural Resources Survey, Monitoring, and Geomorphological Investigations along the Proposed 2.5-Mile Northern Natural Interconnect, UNOCAL Keystone Gas Storage Project, Winkler County, Texas.* HJN 000256 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2002 *Archeological Monitoring Conducted during Texas Eastern Transmission's Replacement of Approximately 1600 feet of Pipe via Horizontal Directional Drill under the San Antonio River, Goliad County, Texas.* HJN 020169 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2002 *Backhoe Trench Investigations Conducted on the 3.8-acre Hunt TDC No. 1 Well Site and Access Road, Anderson County, Texas.* Texas Antiquities Committee Permit No. 2935. HJN 020181. Horizon Environmental Services, Inc. Austin, Texas.

- 2002 *Backhoe Trench Investigations Conducted along the 8-mile Pinnacle Gregory A-1 Pipeline Right-of-Way, Anderson County, Texas.* Texas Antiquities Committee Permit No. 2916. HJN 020149 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2002 *An Intensive Cultural Resources Survey of a Proposed 8-mile EPGT Natural Gas Transmission Pipeline in Travis and Hays Counties, Texas.* HJN 020128 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2002 *An Intensive Cultural Resources Survey of a Proposed 6-acre Village 7 Sewer Treatment Plant #1 Located in The Woodlands, Harris County, Texas.* HJN 020207 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2002 *An Intensive Cultural Resources Survey of 13 Proposed Well Sites and Associated Flow Lines on the Freeman Ranch Lease, Texas County, Oklahoma.* HJN 010239 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2002 *Cultural Resources Investigations Conducted along Sections of New Hope and Bagdad Roads for Proposed Widening Efforts, Cedar Park, Williamson County, Texas.* Texas Antiquities Committee Permit No. 2967. HJN 020185 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2002 *An Intensive Terrestrial Cultural Resources Survey of the Proposed Crude Oil Pipeline Right-of-Way for the Cameron Highway Pipeline Project's Texas City Extension, Chambers County, Texas.* HJN 020077 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2002 *Pipeline Realignment, Cameron Highway Oil Pipeline System New 24-inch Crude Oil Pipeline, Port Neches Extension, Jefferson County, Texas.* An Addendum to: *An Intensive Cultural Resources Survey for a Proposed 29-mile Crude Oil Pipeline Right-of-Way, Port Neches Route of the Cameron Highway Pipeline Project, Jefferson County, Texas.* HJN 020078 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2002 *An Intensive Cultural Resources Survey of the Proposed 1600-acre Belterra Subdivision Tract Located in Hays County, Texas.* HJN 020196 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2002 *An Intensive Cultural Resources Survey of a Proposed Orange County WCID No. 1 2-acre Water Well Site; 2-acre Water Storage Tank Site; and 37,400 Linear Feet of Associated Waterline Routes in Vidor, Orange County, Texas.* Texas Antiquities Committee Permit No. 2998. HJN 020233 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2002 *An Intensive Cultural Resources Survey of Extra Work Spaces Associated with Centennial Pipeline LLC's Proposed Horizontal Directional Drill of the Little River in Grant and La Salle Parishes, Louisiana.* HJN 020258 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2002 *An Intensive Cultural Resources Survey of 1 Proposed Well Site and 1 Proposed Flow Line on EOG Resources' Tucker Lease, Texas County, Oklahoma.* HJN 010239 AR. Horizon Environmental Services, Inc. Horizon Environmental Services, Inc. Austin, Texas.
- 2003 *Addendum to An Intensive Cultural Resources Survey of the Proposed Widening of Ranch-to-Market Road 2243 (Alternates A and B), Leander, Williamson County, Texas.* Texas Antiquities Committee Permit No. 2722. HJN 010185 AR. TXDOT CSJ No. 2103-01-021. Horizon Environmental Services, Inc. Austin, Texas.

- 2003 *An Intensive Cultural Resources Survey of 6 Proposed Well Sites and Associated Flow Lines on the Freeman Ranch Lease, Texas County, Oklahoma.* HJN 010239 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2003 *An Intensive Cultural Resources Survey of 3 Proposed Well Sites and Associated Flow Lines on the Freeman Ranch Lease, Texas County, Oklahoma.* HJN 010239 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2003 *An Intensive Cultural Resources Survey of 1 Proposed Well Site and 1 Proposed Flow Line on EOG Resources, Inc.'s Tucker Lease, Texas County, Oklahoma.* HJN 010239 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2003 *An Intensive Cultural Resources Survey of 26 Proposed Well Sites and Associated Flow Lines on the Freeman Ranch and Tucker Leases, Texas County, Oklahoma.* HJN 010239 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2003 *An Intensive Cultural Resources Survey of the Jefferson County Drainage District No. 6's Proposed Mayhaw Diversion, Needmore Diversion, and Green Pond Detention Area, Jefferson County, Texas.* Texas Antiquities Committee Permit No. 3031. HJN 000418 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2003 *An Intensive Cultural Resources Survey of a Proposed Elevated Water Storage Tank Site and 2 Associated Waterline Easements, Cedar Park, Williamson County, Texas.* Texas Antiquities Committee Permit No. 3049. HJN 030012 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2003 *An Intensive Cultural Resources Survey of a Proposed 110-acre Sand and Gravel Mine and Sorting Plant for Riverside Aggregates, Austin County, Texas.* HJN 030023 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2003 *An Intensive Cultural Resources Survey of a Portion of the 47-acre Holt Property Located in San Marcos, Hays County, Texas.* HJN 030195 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2003 *An Intensive Cultural Resources Survey and Subsequent Testing of the Proposed Woodlands Southwest Detention Pond, The Woodlands, Montgomery County, Texas.* Texas Antiquities Committee Permit No. 3055. HJN 030019 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2003 *An Intensive Cultural Resources Survey of a Proposed 6-mile Natural Gas Pipeline for the UNOCAL Keystone Gas Storage Project, Winkler County, Texas.* HJN 000256. AR
- 2004 *An Intensive Cultural Resources Survey of a Proposed 31.18-acre Wal-Mart Site Located in Rockdale, Milam County, Texas.* HJN 040030. Horizon Environmental Services, Inc. Austin, Texas.
- 2004 *An Intensive Cultural Resources Survey of Proposed Oil/Gas Well Development on the Attwater's Prairie Chicken National Wildlife Refuge, Colorado County, Texas.* USFWS Special Use Permit #ATW-04-008. HJN 040088 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2004 *Data Recovery Investigations at the Holt Site (41HY341), San Marcos, Hays County, Texas.* HJN 040032 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2004 *An Intensive Cultural Resources Survey of a Proposed Water Transmission Line from High Island to Singing Sands, Galveston County, Texas.* Texas Antiquities Committee Permit No. 3298. HJN 020189 AR. Horizon Environmental Services, Inc. Austin, Texas.

- 2004 *Archeological Avoidance Plan: Proposed Seismic Survey, Brigham Oil and Gas, L.P., Alamo Project, Aransas, Calhoun, and Refugio Counties, Texas.* HJN 040006 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2004 *An Intensive Cultural Resources Survey of 13 Proposed Well Sites and Associated Flow Lines on the Freeman Ranch Lease, Texas County, Oklahoma.* HJN 010239 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2004 *An Intensive Cultural Resources Survey of 7 Proposed Well Sites on EOG Resources, Inc.'s Freeman Ranch and Tucker Leases, Texas County, Oklahoma.* HJN 010239 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2004 *National Register of Historic Places Eligibility Testing of 2 Sites (41WM650 and 41WM651) Located within the Cedar Park Town Center Development, Cedar Park, Williamson County, Texas.* HJN 040024 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2005 *Intensive Cultural Resources Survey of the Proposed Sierra Vista Substation Site and 138 kV Transmission Line, Webb County, Texas.* HJN 050144 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2005 *An Intensive Cultural Resources Survey of the Proposed 452-acre Park Lakes East Development near Humble, Harris County, Texas.* HJN 050131 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2005 *Archeological Monitoring of Scraping Investigations within the Port Bolivar Community Cemetery, Galveston County, Texas.* Texas Antiquities Committee Permit No. 3857. HJN 050057 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2005 *An Intensive Cultural Resources Survey of EOG Resources, Inc.'s Proposed Carthage Gas Unit No. 112 Alt Natural Gas Well Pad and Access Road, Panola County, Texas.* HJN 030169 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2005 *An Intensive Cultural Resources Survey for the Proposed Widening of Jefferson County Drainage District No. 6's Griffing Ditch, Beaumont, Jefferson County, Texas.* Texas Antiquities Committee Permit No. 3804. HJN 040240 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2005 *An Intensive Cultural Resources Survey of the USACE Jurisdictional Areas within a Proposed Ethanol Plant Facility in Hereford, Deaf Smith County, Texas.* HJN 050113 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2005 *Backhoe Trenching at 2 Proposed Lift Stations Located in Richmond, Fort Bend County, Texas.* Texas Antiquities Committee Permit No. 3712. HJN 050043 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2006 *An Intensive Cultural Resources Survey of the USACE Jurisdictional Areas Associated with the Proposed Realignment of Macho Creek, Duval County, Texas.* HJN 060199 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2006 *An Intensive Cultural Resources Survey of the USACE Jurisdictional Areas Associated with 3 Proposed Detention Ponds and 2 Proposed Road Crossings within the Proposed Headwaters of Barton Creek Development, Drippings Springs, Hays County, Texas.* HJN 040116 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2006 *An Intensive Cultural Resources Survey of the Area of Potential Effect within the 164-acre Webb Development, Austin, Travis County, Texas.* HJN 050068 AR. Horizon Environmental Services, Inc. Austin, Texas.

- 2006 *Cultural Resources Assessments of 4 Maintenance Locations along the Longhorn Partners Pipeline, L.P. in Schleicher County, Texas.* HJN 050175 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2006 *An Intensive Cultural Resources Survey of the Proposed Moore Street Detention Basin, Beaumont, Jefferson County, Texas.* Texas Antiquities Committee Permit No. 4028. HJN 060015 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2006 *An Intensive Cultural Resources Survey of the Proposed Erie Street Detention Basin, Beaumont, Jefferson County, Texas.* Texas Antiquities Committee Permit No. 4031. HJN 060017 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2006 *An Intensive Cultural Resources Survey of the Proposed Corley-Cartwright Detention Basin, Beaumont, Jefferson County, Texas.* Texas Antiquities Committee Permit No. 4030. HJN 060016 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2006 *An Intensive Cultural Resources Survey of the Proposed Ridgewood Detention Basin, Beaumont, Jefferson County, Texas.* Texas Antiquities Committee Permit No. 4029. HJN 060014 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2006 *Cultural Resources Assessments of 21 Maintenance Locations along the Longhorn Partners Pipeline, L.P. in Travis, Bastrop, and Fayette Counties, Texas.* HJN 050175 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2007 *An Intensive Cultural Resources Survey of 4 HDD Locations on the Proposed Pecan Pipeline Right-of-Way, Palo Pinto County, Texas.* HJN 060191 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2007 *An Intensive Cultural Resources Survey of 4 Additional HDD Locations on the Proposed Pecan Pipeline Right-of-Way, Palo Pinto County, Texas.* HJN 060191 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2007 *Cultural Resources Assessments of 53 Maintenance Locations along the Longhorn Partners Pipeline, L.P. ROW in Gillespie, Kimble, Schleicher, Crockett, Reagan, Upton, and Crane Counties, Texas.* HJN 050175 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2007 *An Intensive Cultural Resources Survey of 78 Archeological High Probability Areas between the Cedar Valley and Fort McKavett Pump Stations on the Longhorn Pipeline Right-of-Way in Hays, Blanco, Gillespie, Llano, Mason, Kimble, Menard, and Schleicher Counties, Texas.* Texas Antiquities Committee Permit No. 4576. HJN 050175 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2007 *An Intensive Cultural Resources Survey of Lake Travis ISD's 12.75-acre West Cypress Hills Elementary School Tract, Travis County, Texas.* Texas Antiquities Committee Permit No. 4729. HJN 070187 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2007 *An Intensive Cultural Resources Survey and Subsequent NRHP Eligibility Testing of Areas within the Proposed 238-acre Blanco Riverwalk Development, Hays County, Texas.* HJN 060195 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2007 *An Intensive Cultural Resources Survey of 12 Archeological High-Probability Areas along 42 Miles of Extra Work Spaces on the Longhorn Partners Pipeline Right-of-Way in Ward and Reeves Counties, Texas.* HJN 070176 AR. Horizon Environmental Services, Inc. Austin, Texas.

- 2007 *Cultural Resources Assessments of 4 Maintenance Locations along the Longhorn Partners Pipeline, L.P. Pipeline Right-of-Way in Gillespie and Blanco Counties, Texas.* HJN 050175 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2007 *An Intensive Cultural Resources Survey of the 15-acre Round Rock ISD Paloma Lake Tract, Round Rock, Williamson County, Texas.* Texas Antiquities Committee Permit No. 4713. HJN 070166 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2007 *An Intensive Cultural Resources Survey of 12 Cathodic Protection Beds along the Longhorn Pipeline Right-of-Way in Travis, Blanco, Gillespie, Mason, Crockett, Reagan, and Culberson Counties, Texas.* Texas Antiquities Committee Permit No. 4594. HJN 050175 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2007 *An Intensive Cultural Resources Survey of a Proposed HDD beneath an Abandoned Tram Road Owned by the US Forest Service in Nacogdoches County, Texas.* HJN 070193 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2007 *Cultural Resources Investigations on the Proposed 1060-acre Vizcaya Development, Spicewood, Travis County, Texas (Volume 1: Survey Level Investigations).* HJN 060231 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2007 *An Intensive Cultural Resources Survey of the Proposed 883-acre Siena Subdivision Property, Round Rock, Williamson County, Texas.* HJN 070065 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2008 *An Intensive Cultural Resources Survey of the Keechi Creek and Brazos River HDD Bore Pits on the Proposed Pecan Pipeline Right-of-Way, Palo Pinto County, Texas.* HJN 060191 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2008 *An Intensive Cultural Resources Survey of Orange County WCID No. 1's Oak Lane WWTP Improvements, Vidor, Orange County, Texas.* Texas Antiquities Committee Permit No. 4748. HJN 080006 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2008 *An Intensive Cultural Resources Survey of the Proposed 80-acre Arbol Grande on St. Charles Bay Subdivision Tract, Aransas County, Texas.* HJN 080045 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2008 *An Intensive Cultural Resources Survey of the Proposed Woodland Acres Flood Mitigation Project, Beaumont, Jefferson County, Texas.* Texas Antiquities Committee Permit No. 4972. HJN 080094 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2008 *Cultural Resources Investigations Conducted for the City of Anahuac's Proposed Water System Improvements, Anahuac, Chambers County, Texas.* Texas Antiquities Committee Permit No. 3856. HJN 050139 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2008 *An Intensive Cultural Resources Survey of the Proposed Houston Fuel Oil Terminal Barge Docks #7 and #8 on Carpenters Bayou, Harris County, Texas.* HJN 080106 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2009 *An Intensive Cultural Resources Survey of the Trinity Bay Conservation District's Proposed 90-acre Freshwater Impoundment Reservoir in Chambers County, Texas.* Texas Antiquities Committee Permit No. 5189. HJN 090009 AR. Horizon Environmental Services, Inc. Austin, Texas.

- 2009 *An Intensive Cultural Resources Survey of a Proposed TBCD Water Line and Sanitary Sewer Force Main ROW in Chambers County, Texas.* Texas Antiquities Committee Permit No. 5206. HJN 090039 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2009 *An Intensive Cultural Resources Survey of the Proposed 38.0-acre Hutto Lake Park Property, Hutto, Williamson County, Texas.* Texas Antiquities Committee Permit No. 5247. HJN 090049 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2009 *Cultural Resources Investigations along the Proposed LyondellBasell CVOS ETBE Pipeline Right-of-Way in Harris County, Texas.* HJN 090059 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2009 *An Intensive Cultural Resources Survey of Phase 2 of the Proposed Wild Horse Ranch Northwest Wastewater Interceptor Right-of-Way, Travis County, Texas.* HJN 090061 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2009 *An Intensive Cultural Resources Survey of M2 Midstream, LLC's proposed Blackstone 8-Inch Lateral Natural Gas Gathering Line, DeSoto Parish, Louisiana.* HJN 090055 AR 13. Horizon Environmental Services, Inc. Austin, Texas.
- 2009 *An Intensive Cultural Resources Survey of Louisiana Midstream Gas Services' proposed CHK LA Minerals 32 H-1 Natural Gas Gathering Line, DeSoto Parish, Louisiana.* HJN 080147 AR 107. Horizon Environmental Services, Inc. Austin, Texas.
- 2009 *Cultural Resources Investigations within a Proposed 27.0-acre US Army Reserve Training Center Survey Area, Humble, Harris County, Texas.* HJN 090108 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2009 *An Intensive Cultural Resources Survey of the Houston Fuel Oil Terminal Company's Proposed Ship Dock #4 on Buffalo Bayou, Harris County, Texas.* HJN 090101 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2009 *An Intensive Cultural Resources Survey of the Proposed 89.0-acre Lake Travis ISD Education Facilities Tract, Travis County, Texas.* Texas Antiquities Committee Permit No. 5419. HJN 090115 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2009 *Cultural Resources Investigations of a Proposed Reroute of the LyondellBasell CVOS ETBE Pipeline Right-of-Way in Harris County, Texas.* Texas Antiquities Committee Permit No. 5316. HJN 090059 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2010 *An Intensive Cultural Resources Survey of Louisiana Midstream Gas Services' proposed 15.0-acre Pines Compressor Facility Site, DeSoto Parish, Louisiana.* HJN 080147 AR 122. Horizon Environmental Services, Inc. Austin, Texas.
- 2010 *An Intensive Cultural Resources Survey of Louisiana Midstream Gas Services' proposed Porter-Beach 26-12-1 Natural Gas Gathering Line in DeSoto Parish, Louisiana.* HJN 080147 AR 125. Horizon Environmental Services, Inc. Austin, Texas.
- 2010 *An Intensive Cultural Resources Survey of Louisiana Midstream Gas Services' proposed Gilliam 23-13-14 H-1 Natural Gas Gathering Line in DeSoto Parish, Louisiana.* HJN 080147 AR 130. Horizon Environmental Services, Inc. Austin, Texas.
- 2010 *An Intensive Cultural Resources Survey of Petrohawk Energy Corporation's Proposed Bolton 26-H1 Well Pad and Access Road in Bossier Parish, Louisiana.* HJN 100011 AR. Horizon Environmental Services, Inc. Austin, Texas.

- 2010 *An Intensive Cultural Resources Survey of Petrohawk Energy Corporation's Proposed Ratzburg 18H No.1 Well Pad and Access Road in Caddo Parish, Louisiana.* HJN 100029 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2010 *An Intensive Cultural Resources Survey of Louisiana Midstream Gas Services' proposed Nabors Properties 13 H-1 Natural Gas Gathering Line in DeSoto Parish, Louisiana.* HJN 080147 AR 124. Horizon Environmental Services, Inc. Austin, Texas.
- 2010 *An Intensive Cultural Resources Survey of Louisiana Midstream Gas Services' proposed Brush Bayou Natural Gas Gathering Line in Caddo Parish, Louisiana.* HJN 080147 AR 138. Horizon Environmental Services, Inc. Austin, Texas.
- 2010 *Archeological Avoidance Plan for the Proposed Union Grave 3-D Seismic Survey Project in Sabine, San Augustine, and Nacogdoches Counties, Texas.* HJN 100026 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2010 *Archeological Avoidance Plan for the Proposed Union Grave 3-D Seismic Survey Project in San Augustine County, Texas.* HJN 100026 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2010 *Archeological Avoidance Plan for the Proposed Nac East 3-D Seismic Survey Project in Nacogdoches, San Augustine, and Shelby Counties, Texas.* HJN 100032 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2010 *An Intensive Phase I Cultural Resources Survey of the Proposed TGG 36-inch Phase 3 Section 1 Natural Gas Gathering Line in Caddo and DeSoto Parishes, Louisiana.* HJN 100050 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2010 *An Intensive Phase I Cultural Resources Survey of Louisiana Midstream Gas Services' Proposed CHK LA Minerals 24-13-12 Natural Gas Gathering Line, DeSoto Parish, Louisiana.* HJN 080147 AR 140. Horizon Environmental Services, Inc. Austin, Texas.
- 2010 *An Intensive Phase I Cultural Resources Survey of Louisiana Midstream Gas Services' Proposed Mansfield Lateral 4A East Natural Gas Gathering Line, DeSoto Parish, Louisiana.* HJN 080147 AR 141. Horizon Environmental Services, Inc. Austin, Texas.
- 2010 *An Intensive Phase I Cultural Resources Survey of Louisiana Midstream Gas Services' Proposed Calhoun 9-13-12 Natural Gas Gathering Line, DeSoto Parish, Louisiana.* HJN 080147 AR 149. Horizon Environmental Services, Inc. Austin, Texas.
- 2010 *An Intensive Phase I Cultural Resources Survey of Petrohawk Energy Corporation's Proposed TBD 22-16N-10W Off-Unit Alt. No. 1 Well Pad and Access Road in Bienville Parish, Louisiana.* HJN 100057 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2010 *An Intensive Phase I Cultural Resources Survey of Talco Midstream Assets, Ltd's Proposed Country Club 29H No.2 Natural Gas Gathering Line, Caddo and DeSoto Parishes, Louisiana.* HJN 100058 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2010 *An Intensive Phase I Cultural Resources Survey of Petrohawk Energy Corporation's Proposed Weyerhauser 29H-1 and 32H-1 Well Pad Projects, DeSoto Parish, Louisiana.* HJN 100068 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2010 *An Intensive Phase I Cultural Resources Survey of Louisiana Midstream Gas Services' Proposed Wiggins 31-12-12 Natural Gas Gathering Line, DeSoto Parish, Louisiana.* HJN 080147 AR 152. Horizon Environmental Services, Inc. Austin, Texas.

- 2010 *An Intensive Phase I Cultural Resources Survey of Louisiana Midstream Gas Services' Proposed CHK LA Min 2-13-12 H-1 Natural Gas Gathering Line, DeSoto Parish, Louisiana.* HJN 080147 AR 154. Horizon Environmental Services, Inc. Austin, Texas.
- 2010 *An Intensive Phase I Cultural Resources Survey of Louisiana Midstream Gas Services' Proposed Keatchie 15-14-15 H-1 Natural Gas Gathering Line, DeSoto Parish, Louisiana.* HJN 080147 AR 155. Horizon Environmental Services, Inc. Austin, Texas.
- 2010 *An Intensive Phase I Cultural Resources Survey of Louisiana Midstream Gas Services' Proposed JMD 3-14-15 H-1 Natural Gas Gathering Line, DeSoto Parish, Louisiana.* HJN 080147 AR 158. Horizon Environmental Services, Inc. Austin, Texas.
- 2010 *Archeological Monitoring Conducted During the Replacement of Waterline Segment 10, Anahuac, Chambers County, Texas.* HJN 100052 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2010 *An Intensive Cultural Resources Survey of G-M WSC's Proposed Surface Water Treatment Facility and Intake Structure Project in Sabine County, Texas.* Texas Antiquities Committee Permit No. 5676. HJN 10074 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2010 *Cultural Resources Investigations Conducted for the Proposed Rocky Creek Ranch WWTP Project in Travis County, Texas.* Texas Antiquities Committee Permit No. 5682. HJN 100081 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2010 *An Intensive Phase I Cultural Resources Survey of Louisiana Midstream Gas Services' Proposed Mansfield Lateral 14 West Natural Gas Gathering Line, Sabine Parish, Louisiana.* HJN 080147 AR 148. Horizon Environmental Services, Inc. Austin, Texas.
- 2010 *An Intensive Phase I Cultural Resources Survey of Louisiana Midstream Gas Services' Proposed Briarwood 25-12N-13W H-1 Natural Gas Gathering Line, DeSoto Parish, Louisiana.* HJN 080147 AR 166. Horizon Environmental Services, Inc. Austin, Texas.
- 2010 *An Intensive Phase I Cultural Resources Survey of Louisiana Midstream Gas Services' Proposed Rollert 23-12-13 H-1 Natural Gas Gathering Line, DeSoto Parish, Louisiana.* HJN 080147 AR 170. Horizon Environmental Services, Inc. Austin, Texas.
- 2010 *An Intensive Phase I Cultural Resources Survey of Petrohawk Energy Corporation's Proposed Tompkins 2-H No.1 Well Pad and Access Road in Bossier Parish, Louisiana.* HJN 100084 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2010 *An Intensive Phase I Cultural Resources Survey of Petrohawk Energy Corporation's Proposed TBD 19-16N-11W Off Unit Well Pad and Access Road in Bossier Parish, Louisiana.* HJN 100088 AR. Horizon Environmental Services, Inc. Austin, Texas.
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July 16, 2001

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A handwritten signature in black ink, appearing to read "Thurmond Cook", written over a horizontal line.

EXECUTIVE DIRECTOR, TEXAS HISTORICAL COMMISSION

A handwritten date "May 7, 2004" in black ink, written over a horizontal line.

DATE