Intensive Cultural Resources Survey for the Proposed INVENERGY Energy Center, Ector County, Texas

By:

Jeffrey D. Owens

HJN 080122 AR 54

Prepared for:

Zephyr Environmental Corporation
Austin, Texas

Prepared by:

Horizon Environmental Services, Inc.
Austin, Texas

May 2013

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MANAGEMENT SUMMARY

Horizon Environmental Services, Inc. (Horizon), was selected by Zephyr Environmental Corporation (Zephyr), on behalf of INVENERGY, LLC (INVENERGY), to conduct an intensive cultural resources inventory and assessment of the proposed location of a new INVENERGY industrial plant in north-central Ector County, Texas. The purpose of the proposed project is to construct a new simple-cycle electric generating plant consisting of 2 natural gas-fired combustion turbines. The proposed energy center would be constructed off the east side of Road SW 3601 approximately 4.2 kilometers (km) (2.6 miles [mi]) south of its intersection with Road SW 8000. Construction associated with the proposed facility would be conducted on an approximately 10.2-hectare (ha) (25.3-acre [ac]) tract, including a 4.6-ha (11.4-ac) plant construction site plus 5.6 ha (13.9 ac) of temporary equipment-laydown areas. The Area of Potential Effect (APE) of the proposed undertaking would consist of the entire 10.2-ha (25.3-ac) tract.

As construction of the proposed facility would require a Prevention of Significant Deterioration (PSD) permit for Greenhouse Gases (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 (16 USC §470, et seq.); the Historic Sites Act (16 USC §471, et seq.); the Archeological and Historic Preservation Act (16 USC §469, et seq.); and Executive Order 11593, "Protection and Enhancement of the Cultural Environment"; among others. These statutes are 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 May 6 2013, Horizon archeologist Briana Nicole Smith, under the overall direction of Jeffrey D. Owens, Principal Investigator, performed an intensive cultural resources survey of the 10.2-ha (25.3.-ac) tract to locate any cultural resource properties that potentially would be impacted by the proposed undertaking. Horizon's archeologist traversed the 10.2-ha (25.3.-ac) APE and thoroughly inspected the modern ground surface for aboriginal and historic-age

cultural resources. Currently, the APE consists of an undeveloped mesquite scrubland situated within the North Cowden Deep Oil Field, and the surrounding area has been extensively developed for oil drilling. Vegetation was relatively sparse across the APE, consisting of mesquite, yucca, and various small shrubs and clump grasses, and visibility of the modern ground surface ranged between 80% and 100%. Horizon excavated a total of 15 shovel tests on the 10.2-ha (25.3.-ac) tract, thereby exceeding the Texas State Minimum Archeological Survey Standards for a project area of this size. Subsurface investigations revealed moderately deep light reddish-brown very fine sand overlying compact yellowish-red sandy clay and sandy clay loam sediments, and sediments with the potential to contain archeological resources were fully penetrated via shovel testing. No cultural resources, historic or prehistoric, were observed on the modern ground surface or in any of the shovel tests excavated in the APE.

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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1.0 INTRODUCTION

Horizon Environmental Services, Inc. (Horizon), was selected by Zephyr Environmental Corporation (Zephyr), on behalf of INVENERGY, LLC (INVENERGY), to conduct an intensive cultural resources inventory and assessment of the proposed location of the new INVENERGY industrial plant in north-central Ector County, Texas. The purpose of the proposed project is to construct a new simple-cycle electric generating plant consisting of 2 natural gas-fired combustion turbines. The proposed energy center would be constructed off the east side of Road SW 3601 approximately 4.2 kilometers (km) (2.6 miles [mi]) south of its intersection with Road SW 8000. Construction associated with the proposed facility would be conducted on an approximately 10.2-hectare (ha) (25.3-acre [ac]) tract, including a 4.6-ha (11.4-ac) plant construction site plus 5.6 ha (13.9 ac) of temporary equipment-laydown areas (Figures 1 and 2). The Area of Potential Effect (APE) of the proposed undertaking would consist of the entire 10.2-ha (25.3-ac) tract.

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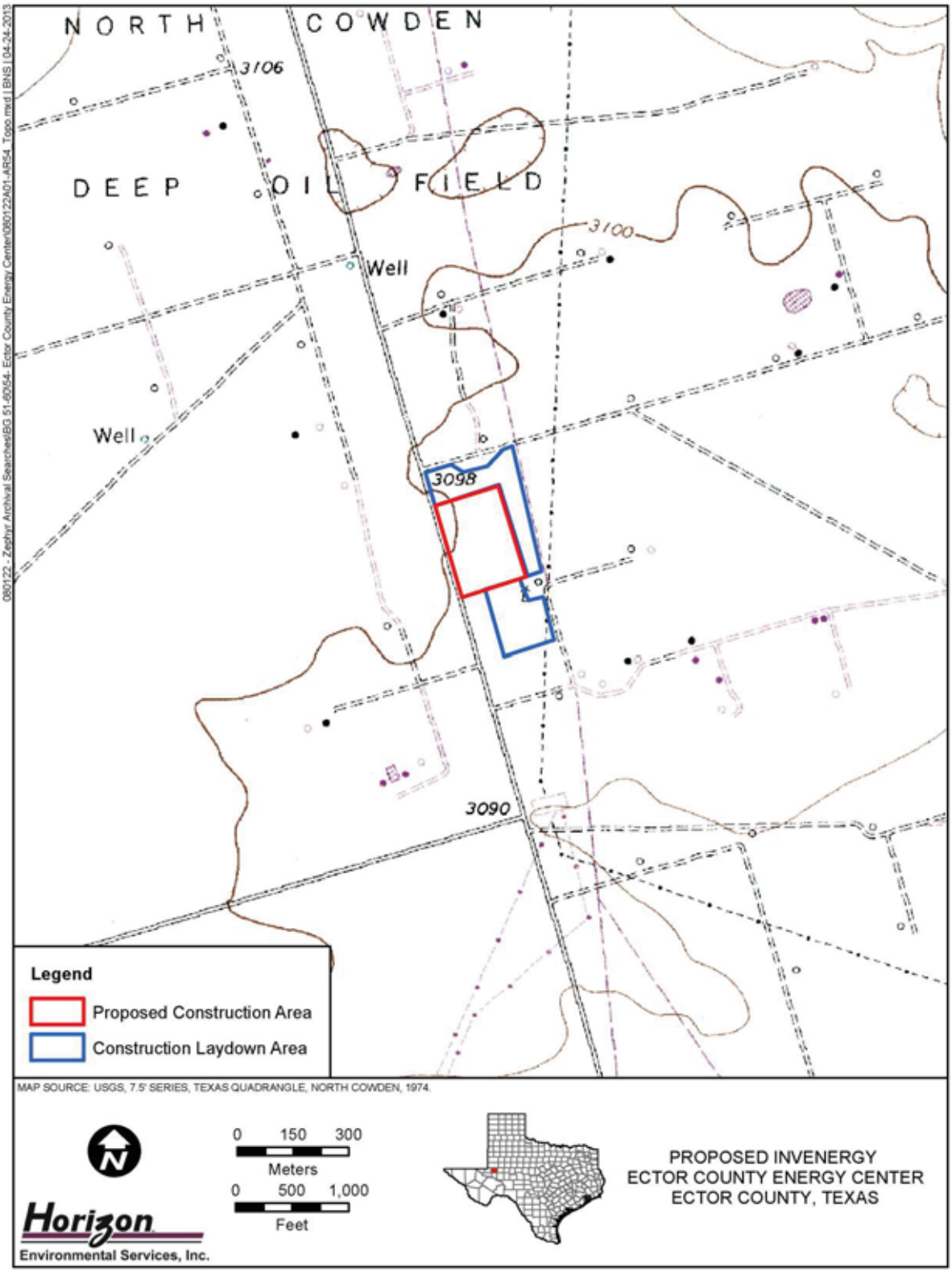

Figure 1. Location of Project Area on USGS Topographic Quadrangle

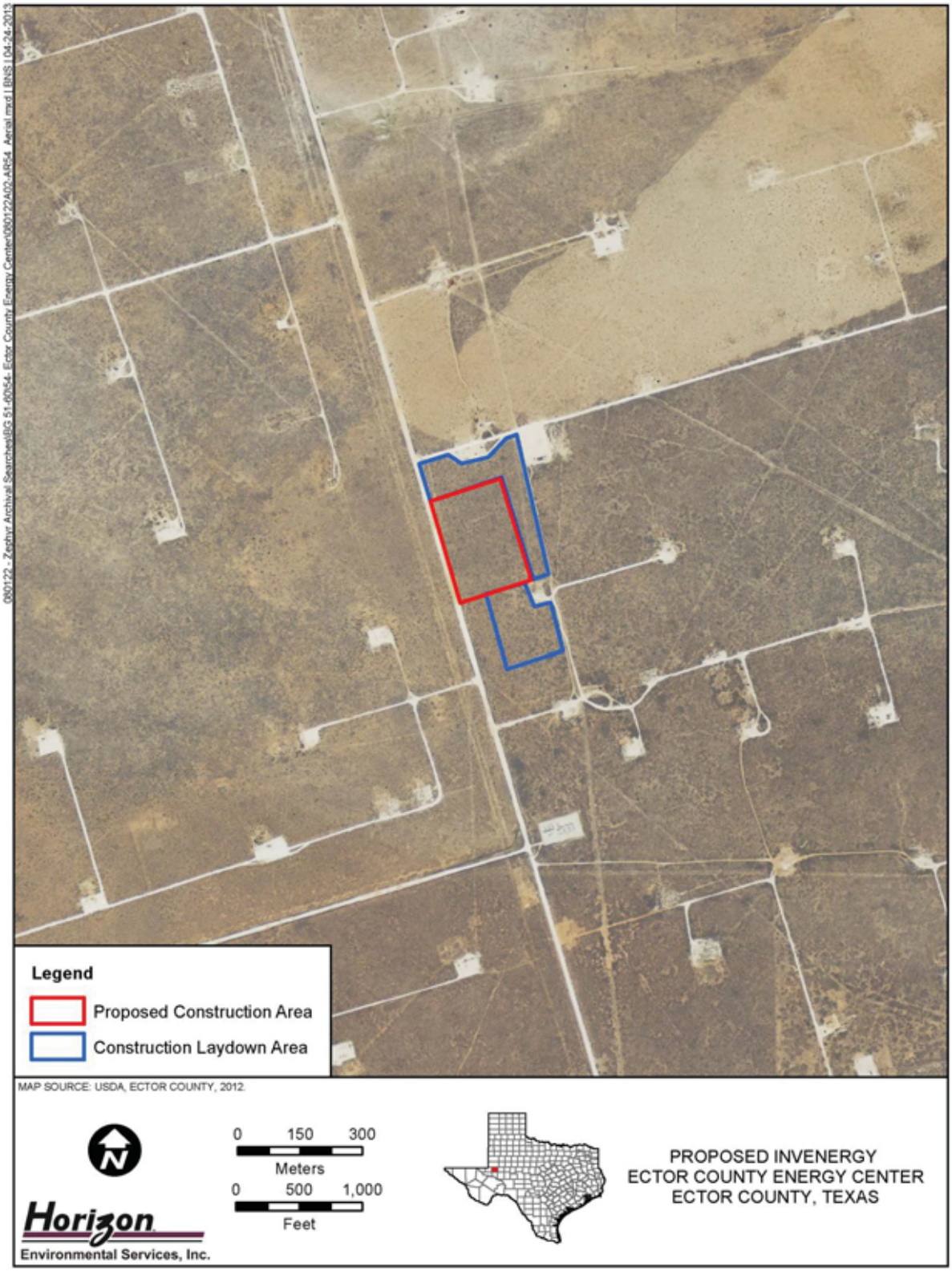

Figure 2. Location of Project Area on Aerial Photograph

resources investigations in the area surrounding the proposed project site, an intensive cultural resources survey, and production of a technical report suitable for review by the SHPO in accordance with the THC's 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.

2.0 ENVIRONMENTAL SETTING

The project area is located in north-central Ector County, Texas, in the Southern High Plains regional geographic unit within the southeastern edge of the Great Plains physiographic province near the northern border of the Edwards Plateau (Carr 1967:2-3; Fenneman 1938:100-103). The Permian Basin, which characterizes much of West Texas and the adjoining area of southeastern New Mexico, was formed via downwarping before being covered by the Permian Sea, and the subsidence continued through much of the Permian Period. Consequently, this region contains one of the thickest deposits of Permian rocks found anywhere. Although it is structurally a basin in the subsurface, much of the basin lies under the Llano Estacado and the northwestern portion of the Edwards Plateau, which are topographically high. On the west and south, it extends across the Pecos River valley to mountain ranges in both New Mexico and West Texas.

Hydrologically, the project area is located in a broad downwarped basin formation. No major stream systems occur in the vicinity of the project area, and local drainage is predominantly to the southeast, primarily via overland sheet flow, toward an ephemeral wash that drains toward the southeast. Seasonal playas are relatively abundant in the surrounding area.

Geomorphologically, the project area is situated on Triomas loamy fine sand, 0 to 3% slopes (TrB), which consists of sandy eolian deposits of Pleistocene age from the Blackwater Draw formation found on open plains (Figure 3) (NRCS 2013). The typical sediment profile consists of loamy fine sand from 0 to 46 centimeters (cm) (0 to 18 inches [in]) below surface underlain by sandy clay loam to depths exceeding 203 cm (80 in).

Aboriginal cultural resources are commonly encountered on alluvial terraces adjacent to prominent streams and washes as well as surrounding seasonal playas in West Texas but are comparatively rare in upland settings. Due to the relative antiquity of the sediments that compose the project area and the overall lack of predictable water sources in the surrounding area, combined with the erosional potential of the exposed upland plains setting, aboriginal cultural resources would be expected to be rather rare and, if they were to occur, to be constrained to largely surficial contexts that likely would lack integrity due to the deflated, erosional settings in which they likely would be found. Historic-age cultural resources may occur almost anywhere in this region; however, historic settlement in Ector County was rather

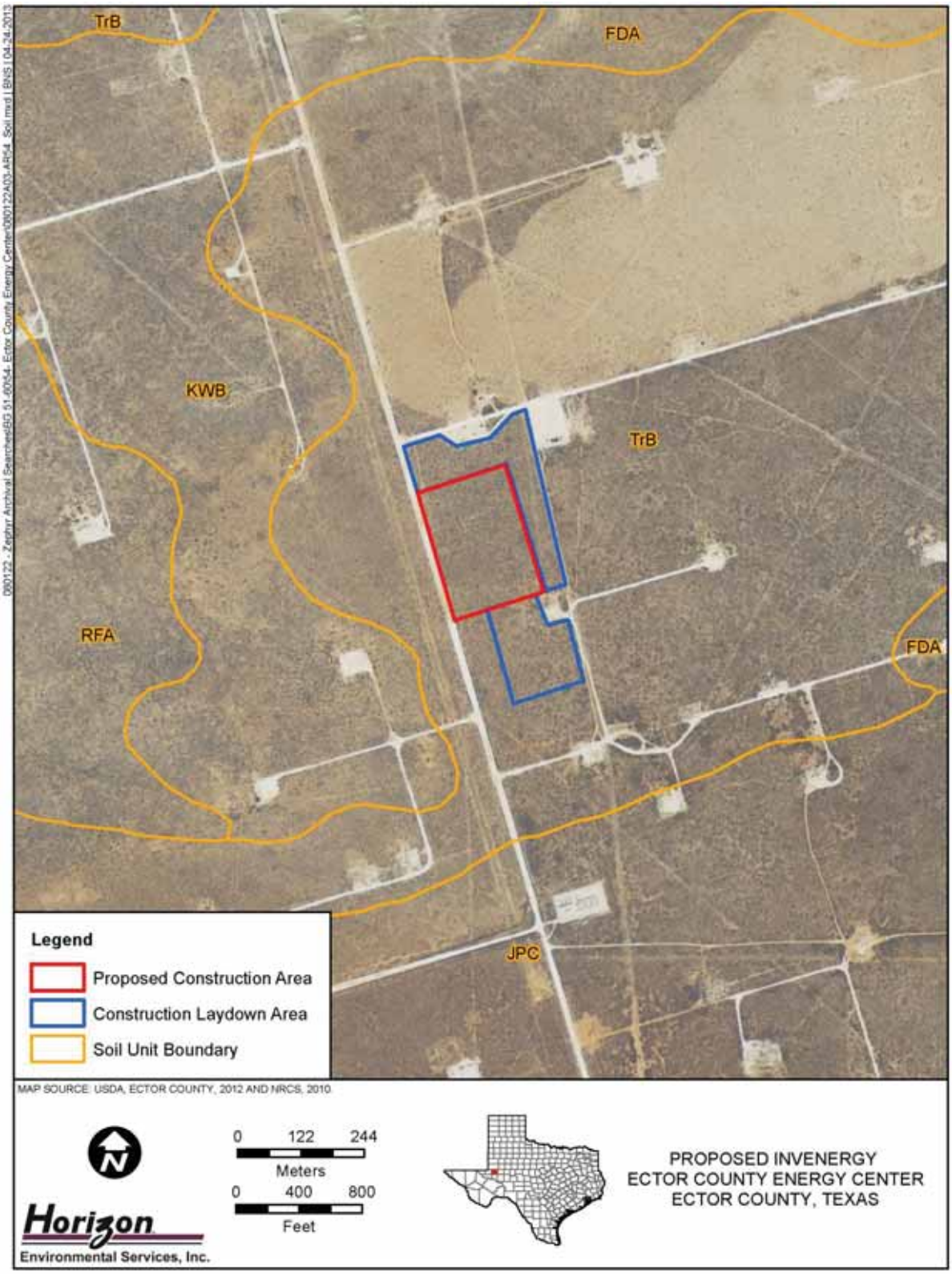

Figure 3. Distribution of Mapped Soils in Project Area

sparse and sporadic due to the low amount of rainfall the region typically receives. Several standing structures are visible on the 1974 US Geological Survey (USGS) North Cowden, Texas, 7.5-minute topographic quadrangle in the area surrounding the project area, but no structures are visible within or immediately adjacent to the APE. Hundreds of oil-drilling rigs are present in the surrounding area to take advantage of the rich Permian oil deposits in the North Cowden Deep Oil Field.

3.0 CULTURAL BACKGROUND

The following brief culture history represents a summation of a regional cultural history developed for the Southern Plains (e.g., Bell 1984; Hofman et al. 1989).

3.1 PALEOINDIAN PERIOD (CA. 9500 TO 7000 B.C.)

The PaleoIndian period represents the earliest recognizable human occupation in the region. However, very little is known about this time period beyond stone tool technology, subsistence, and mobility. In general, the PaleoIndian period is known for kill sites containing now-extinct megafauna such as mammoth and bison. While the association of stone tools with the remains of these large animals has often given PaleoIndians the title of big-game hunters, other faunal and floral resources were commonly utilized as well. The variety of sourceable lithic materials used in stone tool production by PaleoIndian groups has been used to infer a generally high level of mobility.

The PaleoIndian period is subdivided into several distinct temporal periods based primarily on projectile point morphologies. The earliest component of the PaleoIndian period on the Southern Plains is the Clovis complex (12,000 to 11,000 BP). This complex was originally identified at Blackwater Draw near Clovis, New Mexico (Hester 1972). The distinct fluted Clovis projectile points are often recovered in association with mammoth, bison, and camel remains, as well as with the remains of smaller rodents and turtles.

The second earliest component of the PaleoIndian period is known as the Folsom complex (11,000 to 10,000 BP). It was originally defined during the excavation of a bison kill site near Folsom, New Mexico (Cook 1927; Figgins 1927). The presence of the distinct fluted Folsom projectile points at other bison kill sites suggests that the Folsom complex represents mobile groups of hunter-gatherers who focused on the exploitation of bison.

Between 10,000 and 8,000 BP, a series of groups continued the bison-hunting tradition on the Southern Plains. Known collectively as the Plano complex, these groups led similar lifestyles, with the major difference being changes in projectile point styles. Plainview, Milnesand, Hell Gap, Agate Basin, Scottsbluff, Eden, Cody, Angostura, Allen, and Frederick projectile points represent these varying styles.

3.2 PLAINS ARCHAIC PERIOD (CA. 7000 TO 200 B.C.)

The Archaic period, although lasting for roughly 6,000 years, is still somewhat poorly known. Groups of hunter-gatherers continued a mobile foraging lifeway much like their PaleoIndian predecessors. Just as projectile point styles serve to differentiate the various complexes within the PaleoIndian period, the Archaic period is marked by the appearance of stemmed and notched projectile points. The Archaic period is further subdivided into 3 periods—the Early Archaic (8,000 to 5,000 BP), the Middle Archaic (5,000 to 3,000 BP), and the Late Archaic (3,000 to 1,500 BP). Between 8,000 and 5,500 BP, the climate became increasingly arid. Climatic conditions during this period, known as the Altithermal (Antevs 1955), were not suitable for archeological site formation. As a result, very few stratified Early and Middle Archaic sites have been recorded on the Southern Plains. However, during the Late Archaic, the environment shifted to more mesic conditions similar to those of today. It is during this period that an increase in the evidence of human occupation is seen in the region.

During the Archaic period, groups began to rely more heavily on local plant resources. This is evidenced to some extent by the presence of roasting pits and ground stone at Early and Middle Archaic sites like Lubbock Lake (Johnson 1987) and Gore Pit (Hammett 1976). During the Late Archaic period, the increasingly wetter climate appears to have led to an increase in both human and bison populations. This is supported by the large number of recorded Late Archaic camp and kill sites in the region (e.g., Bement and Buehler 1994; Buehler 1997; Thurmond 1991).

3.3 LATE PREHISTORIC PERIOD (CA. 200 B.C. TO A.D. 1541)

The Late Prehistoric period is generally defined by the appearance of arrow points and ceramics in the archeological record. On the Southern Plains, the Late Prehistoric period is divided into the Plains Woodland period (1,500 to 1,000/800 BP) and the Plains Village period (1,000/800 BP to A.D. 1541).

The Plains Woodland period is estimated to have begun around 1,500 BP (Hofman and Brooks 1989), when groups from the east introduced the use of ceramics and the bow and arrow to the region. In eastern Oklahoma, horticulture begins to supplement hunting and gathering during this time. However, on the plains, the only apparent difference between the Late Archaic and the Plains Woodland periods is the appearance of ceramics and arrow points.

The Plains Village period sites often include small hamlets or villages, as well as hunting and special-activity camps. The usual hunting-and-gathering subsistence strategy is now combined with horticultural practices. This period is further divided into regional periods, including the Antelope Creek phase (800 to 500 BP) and the Buried City complex (900 to 500 BP).

The Antelope Creek phase is represented by sites along the Beaver and Canadian rivers in the Texas and Oklahoma panhandles. Vertically stacked stone slab foundations used in the construction of structures is one of the defining characteristics of this phase (Lintz 1986). The Buried City complex has similar architectural features to those of the Antelope Creek phase with

some variations. It is defined by a series of sites stretching roughly 5 miles along Wolf Creek in the northwestern Texas Panhandle. Non-local trade materials recovered at Buried City sites suggest that these groups participated in regional trade networks (Hughes and Hughes-Jones 1987).

3.4 PROTOHISTORIC PERIOD (CA. A.D. 1541 TO 1850)

The Protohistoric period begins on the Southern Plains with the exploration of the region by Francisco Vásquez de Coronado in 1541. The material economies of Protohistoric groups appear to remain relatively unchanged from the Plains Village period, with the exception of an increase in bison hunting and trade accompanied by a decrease in horticulture. Much of the Permian Basin was home to the Comanche until they were finally forced out by the US Army in 1875.

3.5 HISTORIC PERIOD (CA. A.D. 1850 TO PRESENT)

Ector County was marked off in 1887 from land previously assigned to Tom Green County, and was attached to Midland, Crane, and Upton counties for judicial purposes.[1] As early as 1881, promoters of the Texas and Pacific Railway encouraged immigration by offering to haul farm machinery and household goods for prospective settlers at no charge; they ignored the limited rainfall and predicted a splendid agricultural potential for the area. Pointing to the county's supposed resemblance to the steppes of Russia, a railroad official named the first settlement in the county Odessa; in 1882, the town became 1 of 9 stopping places on the railroad's route through West Texas. In 1886, the Odessa Land and Townsite Company was formed in Zanesville, Ohio, to sell farmland in Ector County; the company's exaggerated promises and bi-monthly excursion trains failed to attract enough buyers, however, and by 1889 the company was bankrupt. In fact, the region was most suitable for ranching, and for many years Ector County was known mainly for its fine Hereford cattle. Much of the land in the county was owned by the University of Texas.

As pioneer J. J. Amburgery later pointed out, the area did present one decided advantage to prospective farmers: "Land was pretty cheap out there. I bought seven sections of school land for $1 an acre" (TSHA 2013). During the late 1880s and in the 1890s, settlers began to trickle in. In 1890, the census enumerated 224 residents, and in 1891 Ector County was formally organized, with Odessa, the largest town, designated as the county seat. In the early 1890s, Methodists established a small school, Odessa College, but it burned down in 1892. By 1900, there were 25 farms and ranches in the county, and the population had grown to 381.

Between 1900 and 1930, despite periodic droughts, farmers continued to move into the county in small numbers. A few farmers experimented with cotton production during this period. In 1908, about 800 bales of cotton were ginned in the county. In 1910, cotton was planted on 222 acres in the county; in 1920, when only about 80 acres in the entire county was devoted to

[1] The following historical summary of Ector County is adapted from TSHA (2013).

cereal crops, cotton culture occupied 363 acres; in 1930, cotton was produced on 1,326 acres of the 2,580 acres of cropland harvested. Local farmers also planted hundreds of fruit trees; by 1910, for example, 588 peach trees were growing in the county.

Local cattle ranchers continued to be noted for their registered Herefords during this period. Almost 24,000 cattle were counted in Ector County in 1910, and in 1914 Joe Graham and Charles Price shipped 15,000 yearlings from their ranch alone. In 1929, almost 16,000 cattle were counted in the area. Periodic droughts hindered the best efforts to establish farming in the county, however, and the number of farms subsequently fluctuated. In 1910, the US Agricultural Census found 84 farms and ranches in Ector County but only 55 in 1920; there were 107 in 1925, but only 69 in 1929. The county's population similarly fluctuated, rising to 1,178 in 1910, for example, before dropping to 760 in 1920. Farming virtually died in Ector County during the Great Depression of the 1930s; in 1940, the 52 farms and ranches in the county harvested only 583 acres of land.

The great oil strike made in 1926 on W.E. Connell's ranch marked the beginning of a tremendous boom that fundamentally changed the character of the county's economy and society. After the Penn field was opened in 1929 and the Cowden field in 1930, Odessa became the shipping and oilfield supply center for the county's burgeoning petroleum boom. County lands produced almost 12,330,000 barrels of oil in 1938, and by the mid-1940s Ector County had over 2,000 producing wells, to rank as one of the leading oil-producing counties in the state. Almost 62,249,000 barrels of oil came from county lands in 1948; more than 57,132,000 barrels in 1956; almost 58,959,000 in 1960; almost 59,228,000 in 1978; and about 45,958,000 in 1982. In the mid-1960s, the nation's largest petrochemical complex was established near Odessa.

The continuing oil and petrochemical boom induced thousands to move to the area in search of work and opportunity, and the population of the county rose almost continuously from the late 1920s into the 1990s. In 1930, 3,958 people lived in Ector County; the population increased to 15,051 in 1940, 42,102 in 1950, 90,995 in 1960, 91,805 in 1970, and 115,374 in 1980. In 1992, the county's population was estimated at 118,934.

4.0 RESEARCH OBJECTIVES AND METHODOLOGY

The cultural resource 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 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 2013) and the NPS's NRIS database (NPS 2013) 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 no previously recorded archeological sites within a 1.6-km (1.0-mi) radius of the project area (THC 2013), and a review of the NPS's NRIS database indicated the presence of no historic properties listed on the NRHP within the review area (NPS 2013). No previous cultural resources surveys have been conducted in the vicinity of the current project's area, and no portion of the APE has been previously surveyed.

4.2 SURVEY METHODS

On 6 May 2013, Horizon archeologist Briana Nicole Smith, under the overall direction of Jeffrey D. Owens, Principal Investigator, performed an intensive cultural resources survey of the 10.2-ha (25.3-ac) APE to locate any cultural resource properties that potentially would be impacted by the proposed undertaking. Horizon's archeologist traversed the 10.2-ha (25.3-ac) APE and thoroughly inspected the modern ground surface for aboriginal and historic-age cultural resources. Currently, the APE consists of an undeveloped mesquite scrubland situated within the North Cowden Deep Oil Field, and the surrounding area has been extensively developed for oil drilling (Figure 4). Vegetation was relatively sparse across the APE, consisting of mesquite, yucca, and various small shrubs and clump grasses, and visibility of the modern ground surface ranged between 80% and 100%.

In addition to pedestrian walkover, the Texas State Minimum Archeological Survey Standards (TSMASS) require the excavation of 1 subsurface probe per 2 acres within project areas 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. Horizon excavated a total of 15 shovel tests on the 10.2-ha (25.3-ac) tract, thereby exceeding the Texas State Minimum Archeological Survey Standards for a project area of this size (Figure 5). Shovel tests measured approximately 30 cm (12 in) in diameter and were excavated

Figure 4. Overview of Project Area from North End (Facing South)

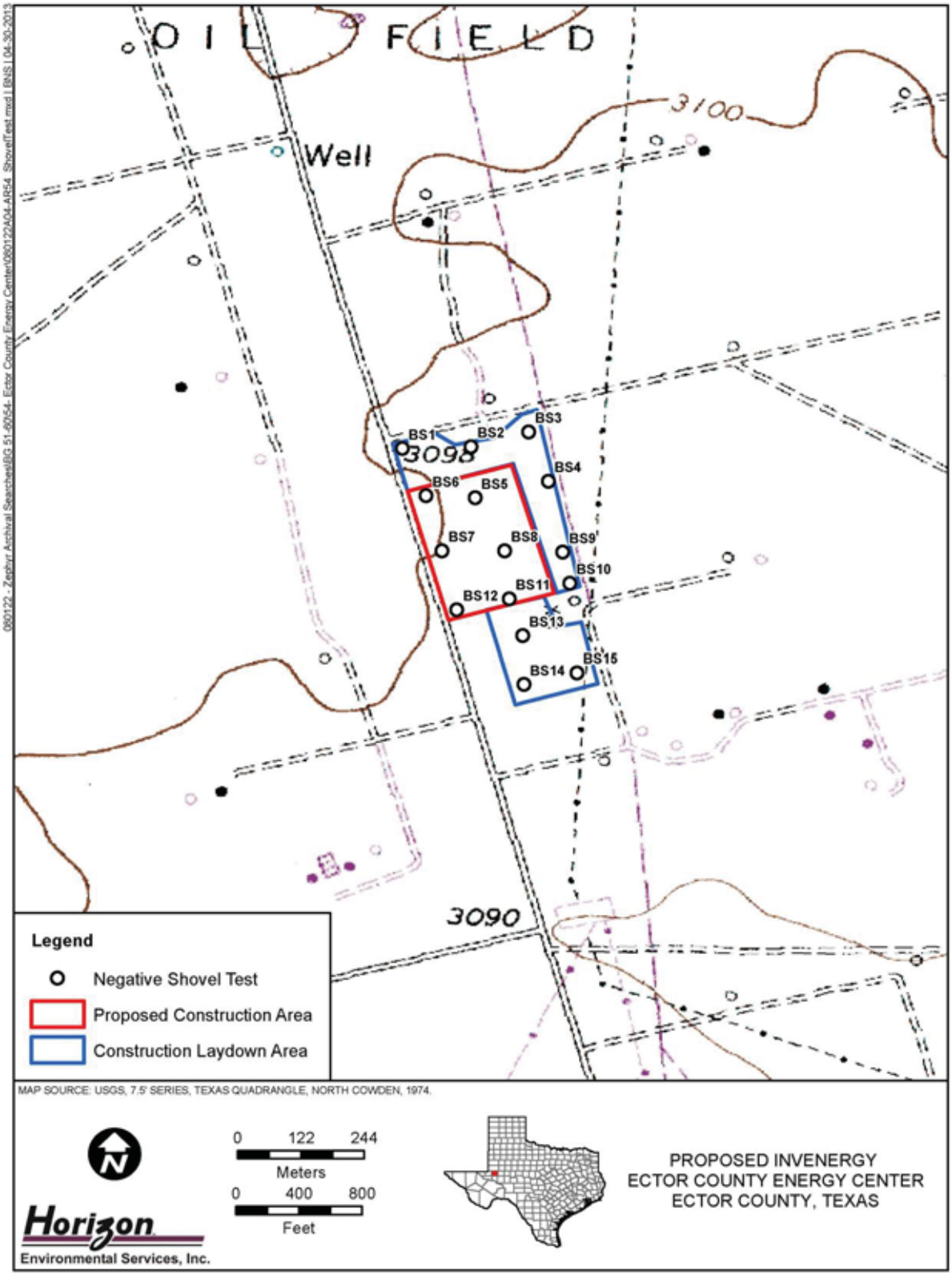

Figure 5. Locations of Shovel Tests Excavated in Project Area

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 45 to 75 centimeters (cm) below surface (cmbs) due to the presence of pre-Holocene sediments in surface and near-surface contexts. Subsurface investigations revealed moderately deep light reddish-brown very fine sand overlying compact yellowish-red sandy clay and sandy clay loam sediments, and sediments with the potential to contain archeological resources were fully penetrated via shovel testing (Figure 6). 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.

During the survey, field notes were maintained on terrain, vegetation, soils, landforms, survey methods, and shovel test results. Digital photographs were taken, and a photographic log was maintained. Horizon employed a non-collection policy for cultural resources. Diagnostic artifacts (e.g., projectile points, ceramics, historic materials with maker's marks) and non-diagnostic artifacts (e.g., lithic debitage, burned rock, historic glass, and metal scrap) were to be described, sketched, and/or photo-documented in the field and replaced in the same location in which they were found. As no cultural resources were observed during the survey, the collections policy was not brought into play. 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.

Figure 6. Typical View of Sandy Sediments Observed in Shovel Tests

5.0 RESULTS OF INVESTIGATIONS

Horizon was selected by Zephyr on behalf of INVENERGY to conduct an intensive cultural resources inventory and assessment of the proposed location of a new INVENERGY industrial plant in north-central Ector County, Texas. The purpose of the proposed project is to construct a new simple-cycle electric generating plant consisting of 2 natural gas-fired combustion turbines. The proposed energy center would be constructed off the east side of SW 3601 approximately 4.2 km (2.6 mi) south of its intersection with Road SW 8000. Construction associated with the proposed facility would be conducted on an approximately 10.2-hectare (ha) (25.3-acre [ac]) tract, including a 4.6-ha (11.4-ac) plant construction site plus 5.6 ha (13.9 ac) of temporary equipment-laydown areas. The APE of the proposed undertaking would consist of the entire 10.2-ha (25.3-ac) tract.

As construction of the proposed facility would require a PSD permit for GHG issued by the US EPA, the undertaking falls under the regulations of Section 106 of the NHPA of 1966, as amended (16 USC §470, et seq.); the Historic Sites Act (16 USC §471, et seq.); the Archeological and Historic Preservation Act (16 USC §469, et seq.); and Executive Order 11593, "Protection and Enhancement of the Cultural Environment"; among others. These statutes are 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.

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Subsurface investigations revealed moderately deep light reddish-brown very fine sand overlying compact yellowish-red sandy clay and sandy clay loam sediments, and sediments with the potential to contain archeological resources were fully penetrated via shovel testing.

No cultural resources, historic or prehistoric, were observed on the modern ground surface or in any of the shovel tests excavated in the APE.

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.
- Formulate recommendations for the treatment of these resources based on their NRHP 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, archeological resources are evaluated according to criteria established to determine the significance of archeological resources for inclusion in the NRHP.

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 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.

Criterion A—Events

To be considered for listing under Criterion A, a property must be associated with 1 or more events important in the defined historic context. Criterion A recognizes resources

associated with single events, such as the founding of a town, or with a pattern of events, repeated activities, or historic trends, such as the gradual rise of a port city's prominence in trade and commerce. The event or trends, however, must clearly be important within the associated context of settlement, in the case of the town, or development of a maritime economy, in the case of the port city. Moreover, the property must have an important association with the event or historic trends, and it must retain historic integrity.

Criterion B—Persons

Criterion B applies to resources associated with individuals whose specific contributions to history can be identified and documented. Persons "significant in our past" refers to individuals whose activities are demonstrably important within a local, state, or national historic context. The criterion is generally restricted to those resources that illustrate (rather than commemorate) a person's important achievements.

Criterion C—Design or Construction

This criterion applies to resources significant for their physical design or construction, including such elements as architecture, landscape architecture, engineering, and artwork. To be eligible under this criterion, a property must meet *at least one* of the following requirements—embody distinctive characteristics of a type, period, or method of construction; represent the work of a master; possess high artistic value; or represent a significant and distinguishable entity whose components may lack individual distinction.

Criterion D—Information Potential

Certain important research questions about human history can only be answered by the actual physical material of cultural resources. Criterion D encompasses the resources that have the potential to answer, in whole or in part, those types of research questions. The most common type of property nominated under this Criterion is the archeological site (or a district composed of archeological sites). Buildings, objects, and structures (or districts composed of these property types), however, can also be eligible for their information potential. Criterion D has 2 requirements, which must *both* be met for a property to qualify—the property must have, or have had, information to contribute to our understanding of human history or prehistory, and the information must be considered important.

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 15 shovel tests were excavated within the APE, thereby exceeding the TSMASS requirements for a survey 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.

7.0 REFERENCES CITED

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Hughes, D.T., and A.A. Hughes-Jones

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Natural Resources Conservation Service (NRCS)

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Texas State Historical Association (TSHA)

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US Department of Agriculture (USDA)

2012 Digital orthophoto quarter-quadrangle, Ector County, Texas. National Agriculture Imagery Program, Farm Service Agency, Aerial Photography Field Office.

US Geological Survey (USGS)

1974 North Cowden, Texas, 7.5-minute topographic quadrangle.

APPENDIX A:

Shovel Test Summary Data

Table A-1. Shovel Test Summary Data

ST No.	UTM Coordinates[1]		Depth (cmbs)	Soils	Artifacts
	Easting	Northing			
BS-1	727730	3550914	0-70 70+	Light reddish-brown very fine sand Very compact yellowish-red sandy loam	None
BS-2	727842	3550921	0-55 55+	Light reddish-brown very fine sand Very compact yellowish-red sandy clay	None
BS-3	727936	3550951	0-75 75+	Light reddish-brown very fine sand Very compact yellowish-red sandy loam	None
BS-4	727970	3550857	0-55 55+	Light reddish-brown very fine sand Very compact yellowish-red sandy clay loam	None
BS-5	727851	3550823	0-55 55+	Light reddish-brown very fine sand Very compact yellowish-red sandy clay loam	None
BS-6	727770	3550825	0-55 55+	Light reddish-brown very fine sand Very compact yellowish-red sandy clay loam	None
BS-7	727799	3550720	0-70 70+	Light reddish-brown very fine sand Very compact yellowish-red sandy clay loam	None
BS-8	727902	3550722	0-55 55+	Light reddish-brown very fine sand Very compact yellowish-red sandy clay loam	None
BS-9	727997	3550721	0-50 50+	Light reddish-brown very fine sand Very compact yellowish-red sandy clay loam	None
BS-10	728010	3550662	0-55 55+	Light reddish-brown very fine sand Very compact yellowish-red sandy loam	None
BS-11	727912	3550630	0-60 60+	Light reddish-brown very fine sand Very compact yellowish-red sandy loam	None
BS-12	727826	3550606	0-55 55+	Light reddish-brown very fine sand Very compact yellowish-red sandy clay loam	None
BS-13	727935	3550559	0-45 45+	Light reddish-brown very fine sand Very compact yellowish-red sandy clay loam	None

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

ST No.	UTM Coordinates[1]		Depth (cmbs)	Soils	Artifacts
	Easting	Northing			
BS-14	727939	3550467	0-55	Light reddish-brown very fine sand	None
			55+	Very compact yellowish-red sandy clay loam	
BS-15	728026	3550491	0-55	Light reddish-brown very fine sand	None
			55+	Very compact yellowish-red sandy clay loam	

[1] All UTM coordinates are located in Zone 13 and utilize the North American Datum of 1983 (NAD 83)

cmbs = Centimeters below surface

ST = Shovel test

UTM = Universal Transverse Mercator

APPENDIX B:

Curriculum Vitae of Principal Investigator

Horizon
Environmental Services, Inc.

Jeffrey D. Owens, M.A., R.P.A.

Archeological Principal Investigator/Project Manager

EXPERTISE

- Prehistoric Archeology
- Historic Archeology

RESEARCH AREAS

- Eastern North America (esp. Midwest, Southeast)
- Great Plains
- American Southwest

AREAS OF EXPERTISE

- Project Management
- Archival and Historical Research
- Archeological Survey, Testing, and Data Recovery
- National Register of Historic Places (NRHP) Evaluations
- Section 106 of the National Historic Preservation Act (NHPA)
- Antiquities Code of Texas (ACT)
- Native American Graves Protection and Repatriation Act (NAGPRA)
- Lithic and Ceramic Analysis
- Technical Writing and Editing
- Quality Assurance/ Quality Control

EDUCATION

- A.B.D., Anthropology, Southern Methodist University, 1997
- M.A., Anthropology, New York University, 1995
- B.A., Anthropology, New York University, 1991

Mr. Owens is an accomplished cultural resources professional with more than 23 years of experience in archeological fieldwork, research and analysis, and cultural resources management (CRM). He is an adept principal investigator and project manager, proficient at managing suites of turnkey, fast-turnaround projects as well as long-term, multidisciplinary research projects. He is fully versed in historic and environmental preservation laws, assessing the National Register of Historic Places (NRHP) eligibility of cultural resources, and developing management plans for historic properties that ensure compliance with applicable federal, state, and local laws while ensuring projects meet construction schedules and adhere to budgetary constraints.

Mr. Owens has planned, implemented, and successfully completed cultural resources survey, testing, and data recovery projects in Arizona, Arkansas, Illinois, Louisiana, Mississippi, Missouri, New Jersey, New Mexico, New York, Oklahoma, Pennsylvania, and Texas. He has completed hundreds of projects for a broad range of clients in the public and private sectors, including oil and gas exploration, development, and transportation; ethanol and petrochemical production; coastal and inland residential, commercial, and industrial land development; solid waste landfills; dredging activities; municipal planning; reservoir development; coastal port and channel improvements; transportation infrastructure; water and wastewater transportation and treatment; electricity generation and transportation; military reservations; and university research.

Mr. Owens also regularly contributes cultural resources oversight to the preparation of environmental regulatory documents, including Environmental Assessments (EA), Environmental Impact Statements (EIS), Biological Assessments (BA), and Categorical Exclusions (CE) for National Environmental Policy Act (NEPA) compliance projects.

Mr. Owens' project management style incorporates innovative leadership skills, resourcefulness, versatility, swift adaptability, and attention to the bottom line. His success is due in part to his thorough familiarity with federal, state, and local historic preservation laws and long-standing personal relationships with regulatory agency reviewers.

CERTIFICATIONS/QUALIFICATIONS

- Meets all Secretary of the Interior's standards for performing cultural resources investigations
- Permittable to perform cultural resource investigations on federal and state projects
- Listed on qualified cultural resource consultant lists in numerous states
- Pre-certified by TxDOT for Service 2.10.1 (Archeological Surveys, Documentation, Excavations, Testing, Reports, and Data Recovery Plans) and Service 2.11.1 (Historical and Archival Research)

PROFESSIONAL AFFILIATIONS

- Register of Professional Archaeologists (RPA)
- Council of Texas Archeologists (CTA)
- Texas Archeological Society (TAS)

PROFESSIONAL EXPERIENCE

Archaeological Principal Investigator/Project Manager Jan 2005 Present
Horizon Environmental Services, Inc.
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Project Archaeologist/Managing Editor Mar 2002 – Jan 2005
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Crew Chief Sep 1993 – Nov 1993
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Research Associate May 1993 – Sep 1993
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TECHNICAL PUBLICATIONS

n.d. *Intensive Cultural Resources Survey for the Proposed Invenergy Ector County Energy Center, Ector County, Texas*. HJN 080122.54. Horizon Environmental Services, Inc., Austin, Texas.

n.d. *Intensive Cultural Resources Survey for the Proposed Kansas City Southern K478.0 Bridge Construction and Railroad Alignment Project, Little River County, Arkansas*. HJN 130023. Horizon Environmental Services, Inc., Austin, Texas.

n.d. *Intensive Cultural Resources Survey for the Proposed Southern Company Natural Gas Plant, Trinidad, Henderson County, Texas*. HJN 080122.53. Horizon Environmental Services, Inc., Austin, Texas.

n.d. *Intensive Cultural Resources Survey of Proposed Yoakum Cryogenic Gas Processing Plant Expansion Areas, Lavaca County, Texas*. HJN 110012.15. Horizon Environmental Services, Inc., Austin, Texas.

n.d. *Intensive Cultural Resources Survey of Proposed INVISTA Victoria Plant Improvements, Victoria County, Texas*. HJN 130035. Horizon Environmental Services, Inc., Austin, Texas.

n.d. *Intensive Cultural Resources Survey of the Proposed 545-Acre Kansas City Southern Railroad Wylie Intermodal Facility, Wylie, Collin County, Texas*. HJN 130042. Horizon Environmental Services, Inc., Austin, Texas.

n.d. *Proposed Equistar Chemicals, L.P., Corpus Christi Complex Expansion Project, Corpus Christi, Nueces County, Texas—Cultural Resources Assessment*. HJN 110012.13. Horizon Environmental Services, Inc., Austin, Texas.

n.d. *Intensive Cultural Resources Survey of the Proposed 78-Acre La Paloma Energy Center Tract, Harlingen, Cameron County, Texas*. HJN 080122.31. Horizon Environmental Services, Inc., Austin, Texas.

n.d. *Proposed Clinker Production Increase at the CEMEX Construction Materials South, LLC, Balcones Cement Plant, Comal County, Texas—Cultural Resources Review*. HJN 080122.39. Horizon Environmental Services, Inc., Austin, Texas.

n.d. *Intensive Cultural Resources Survey of the Proposed 77-Acre Pinecrest Energy Center Tract, Lufkin, Angelina County, Texas*. HJN 080122.40. Horizon Environmental Services, Inc., Austin, Texas.

n.d. *Proposed Guadalupe Generating Station Expansion Project, Marion, Guadalupe County, Texas—Cultural Resources Review*. HJN 130016. Horizon Environmental Services, Inc., Austin, Texas.

n.d. *Intensive Cultural Resources Survey of the Proposed 181-Acre Enterprise Mont Belvieu Complex Propane Dehydrogenation Unit Project, Chambers County, Texas*. HJN 110012.12. Horizon Environmental Services, Inc., Austin, Texas.

n.d. *Intensive Cultural Resources Survey of a Proposed 20-Acre Expansion Tract Adjacent to an Existing PL Propylene, LLC, Facility, Houston, Harris County, Texas*. HJN 080122.30. Horizon Environmental Services, Inc., Austin, Texas.

2013 *Intensive Cultural Resources Survey of a USACE Jurisdictional Area on a Proposed 4.6-Acre HEB Grocery Store Expansion Tract, Georgetown, Williamson County, Texas*. HJN 120085. Horizon Environmental Services, Inc., Austin, Texas.

2013 *Cultural Resources Investigations along the Proposed Lone Star Competitive Renewable Energy Zone (CREZ) 345-kV Transmission Line Right-of-Way in North-Central Texas*, Vols. I and II (with Jennifer L. Cochran, Russell K. Brownlow, and Raymundo Chapa). HJN 100137. Horizon Environmental Services, Inc., Austin, Texas.

2013 *Intensive Cultural Resources Survey of the San Antonio River Outfall Project, San Antonio, Bexar County, Texas*. HJN 120150. Horizon Environmental Services, Inc., Austin, Texas.

2012 *Intensive Archeological Survey for the Proposed Brushy Creek Regional Trail Gap Project, Round Rock, Williamson County, Texas*. HJN 080151. Horizon Environmental Services, Inc., Austin, Texas.

2012 *Intensive Archeological Survey for the Proposed San Gabriel River Trail Extension Project, Georgetown, Williamson County, Texas*. HJN 120057. Horizon Environmental Services, Inc., Austin, Texas.

2012 *Intensive Cultural Resources Survey of the 1,102-Acre Creekside Park West Tract, Harris County, Texas* (with Raymundo Chapa). HJN 100142. Horizon Environmental Services, Inc., Austin, Texas.

2012 *Intensive Cultural Resources Survey of Two 0.9-Acre HDD Locations on the Trinity River, Madison and Houston Counties, Texas*. HJN 120009.14. Horizon Environmental Services, Inc., Austin, Texas.

2012 *Intensive Cultural Resources Survey of a USACE Jurisdictional Area on the Proposed 18.5-Acre Esperanza Crossing Tract, Austin, Travis County, Texas*. HJN 120052. Horizon Environmental Services, Inc., Austin, Texas.

2012 *Intensive Cultural Resources Survey, One USACE Jurisdictional Area, Existing East Red Segment 1 Pipeline Maintenance Activities, Clay County, Missouri*. HJN 120075. Horizon Environmental Services, Inc., Austin, Texas.

2012 *Intensive Cultural Resources Survey, Two USACE Jurisdictional Area Dig Sites (#253 and #261) on the Existing Eskridge to Kearney Pipeline Maintenance Activities, Clay County, Missouri*. HJN 120075. Horizon Environmental Services, Inc., Austin, Texas.

2012 *Intensive Cultural Resources Survey for the Penn City Coal Expansion Project, Houston, Harris County, Texas*. HJN 110097. Horizon Environmental Services, Inc., Austin, Texas.

2012 *Intensive Cultural Resources Survey for the Lake Anahuac East Levee Project, Anahuac, Chambers County, Texas* (with Sally Victor). HJN 120004. Horizon Environmental Services, Inc., Austin, Texas.

2012 *Intensive Cultural Resources Survey, One USACE Jurisdictional Area on the Existing Eskridge to Kearney Pipeline Right-of-Way, Platte County, Missouri*. HJN 120075. Horizon Environmental Services, Inc., Austin, Texas.

2012 *Intensive Cultural Resources Survey of the Proposed 0.6-Mile-Long Rattler Road Extension Project, San Marcos, Hays County, Texas*. HJN 120036. Horizon Environmental Services, Inc., Austin, Texas.

2011 *Intensive Cultural Resources Survey of 6 Jurisdictional Stream Crossings for the City of Hamshire Water System Improvements Project, Hamshire, Jefferson County, Texas*. HJN 110070. Horizon Environmental Services, Inc., Austin, Texas.

2011 *Cultural Resources Investigations on the Proposed Waller Creekside Apartments Tract, Austin, Travis County, Texas*. HJN 110116. Horizon Environmental Services, Inc., Austin, Texas.

2011 *Intensive Cultural Resources Survey of the Woodland Oaks Wastewater Treatment Plant Proposed 1.3-Acre Expansion Tract, Houston, Harris County, Texas*. HJN 100024. Horizon Environmental Services, Inc., Austin, Texas.

2011 *Intensive Archeological Survey of the Farm-to-Market Road 1660 Realignment Project, Hutto, Williamson County, Texas*. HJN 090047. Horizon Environmental Services, Inc., Austin, Texas.

2011 *Intensive Archeological Survey of a 3.7-Acre Tract in San Marcos, Hays County, Texas*. HJN 110124. Horizon Environmental Services, Inc., Austin, Texas.

2011 *Intensive Cultural Resources Survey of USACE Jurisdictional Areas on the Proposed Whispering Pines Par 3 Golf Course Tract, Trinity County, Texas*. HJN 110031. Horizon Environmental Services, Inc., Austin, Texas.

2011 *Archeological Avoidance Plan for the Proposed Washburn 3D Seismic Survey Project, Houston, Harris County, Texas*. HJN 110122. Horizon Environmental Services, Inc., Austin, Texas.

2011 *Intensive Cultural Resources Survey of the Orange County Sewer and Natural Gas Infrastructure Improvements Project, Orange County, Texas*. HJN 110121. Horizon Environmental Services, Inc., Austin, Texas.

2011 *Intensive cultural Resources Survey for the McInnish Park Water System Improvements Project, Carrollton, Dallas County, Texas*. HJN 110135. Horizon Environmental Services, Inc., Austin, Texas.

2011 *Intensive Cultural Resources Survey for the City of Liberty Wastewater System Improvement Project, Liberty County, Texas*. HJN 110005. Horizon Environmental Services, Inc., Austin, Texas.

2011 *Cultural Resource Investigations to Offset Mechanical Impacts to the Clear Creek Golf Course Site (41CV413), Fort Hood, Texas* (with J. Michael Quigg, Christopher Lintz, Grant D. Smith, and David DeMar). TRC Technical Report No. 02353. ARM Series, Research Report No. 60. TRC Environmental Corporation, Austin, Texas.

2011 *Archeological Avoidance Plan for the Proposed North Clinton Dome 3D Seismic Survey Project, Houston, Harris County, Texas*. HJN 110011. Horizon Environmental Services, Inc., Austin, Texas.

2010 *Cultural Resources Survey Activities for the Shelby East 3D Seismic Survey Project, Areas 1 and 2, Sabine National Forest, San Augustine and Shelby Counties, Texas*. HJN 090017. Horizon Environmental Services, Inc., Austin, Texas.

2010 *Cultural Resources Survey Activities for the Shelby East 3D Seismic Survey Project, Areas 1 and 2, Sabine National Forest, San Augustine and Shelby Counties, Texas. Addendum #1—Access Routes*. HJN 090017. Horizon Environmental Services, Inc., Austin, Texas.

2010 *Intensive Cultural Resources Survey of the 10.6-Acre Helbig Road Tract, Beaumont, Jefferson County, Texas*. HJN 100099. Horizon Environmental Services, Inc., Austin, Texas

2010 *Intensive Cultural Resources Survey of the 44-Acre Creekside Park, Section 18, Tract, The Woodlands, Harris County, Texas*. HJN 100079. Horizon Environmental Services, Inc., Austin, Texas.

2010 *Intensive Cultural Resources Survey of the 66-Acre Royal Shores Tract, Kingwood, Harris County, Texas*. HJN 100005. Horizon Environmental Services, Inc., Austin, Texas.

2010 *Intensive Cultural Resources Survey of the Proposed 74 Ranch Pittman 1-H Well Pad, Campbellton, Atascosa County, Texas*. HJN 100093.001. Horizon Environmental Services, Inc., Austin, Texas

2010 *Intensive Cultural Resources Survey of the Proposed 74 Ranch Axis 1-H Well Pad, Campbellton, Atascosa County, Texas*. HJN 100093.002. Horizon Environmental Services, Inc., Austin, Texas

2010 *An Intensive Cultural Resources Survey of a Proposed HDD Location Under an Abandoned Tram Road in Nacogdoches County, Texas*. HJN 100019. Horizon Environmental Services, Inc., Austin, Texas.

2010 *Intensive Cultural Resources Survey for the Green Valley Special Utility District's Water Supply Improvement Project, Guadalupe County, Texas*. HJN 090102. Horizon Environmental Services, Inc., Austin, Texas.

2010 *Intensive and Reconnaissance Survey of the Proposed Lake Halbert Water Treatment Plant Expansion Project, Corsicana, Navarro County, Texas*. HJN 100015. Horizon Environmental Services, Inc., Austin, Texas.

2010 *Intensive Cultural Resources Survey of a Proposed 2.9-Mile-Long Force Main Right-of-Way, Houston, Harris County, Texas*. HJN 100051. Horizon Environmental Services, Inc., Austin, Texas.

2010 *Intensive Cultural Resources Survey of a 13.9-Acre Tract for the Proposed Fort Bend County MUD No. 116 Wastewater Treatment Plant Project, Richmond, Fort Bend County, Texas*. HJN 100047. Horizon Environmental Services, Inc., Austin, Texas.

2010 *Intensive Cultural Resources Survey of a Proposed 3,100-Foot-Long Erosion-Control Bulkhead on the T-BAR-O Ranch, Llano County, Texas*. HJN 100075. Horizon Environmental Services, Inc., Austin, Texas.

2010 *Intensive Cultural Resources Survey of the 21.6-Acre Kalentari Tract, San Marcos, Hays County, Texas*. HJN 100055. Horizon Environmental Services, Inc., Austin, Texas.

2010 *Intensive Cultural Resource Survey of a 14.8-Acre Tract on Williams Gully in Houston, Harris County, Texas*. HJN 090127. Horizon Environmental Services, Inc., Austin, Texas.

2010 *Intensive Cultural Resources Survey of the Proposed Crossroad Exhibit Hall Expansion, Fort Griffin State Historic Site, Shackelford County, Texas*. HJN 090019. Horizon Environmental Services, Inc., Austin, Texas.

2010 *Intensive Phase I Cultural Resources Survey of 3.5 Miles of M2 LGS, LLC's, Proposed Natural Gas Pipeline Right-of-Way on the Mansfield Battlefield, DeSoto Parish, Louisiana*. HJN 090055.025. Horizon Environmental Services, Inc., Austin, Texas.

2009 *Intensive Archeological Survey of the US Highway 69 Expressway and Reliever Route, Jacksonville, Cherokee County, Texas*. HJN 080173. Horizon Environmental Services, Inc., Austin, Texas.

2009 *Intensive Cultural Resource Survey of the Proposed 5.4-Acre Floral Gardens Senior Living Apartments Tract, Houston, Harris County, Texas*. HJN 090129. Horizon Environmental Services, Inc. Austin, Texas.

2009 *Intensive Cultural Resource Survey, PEC Marshall Ford to Buttercup Substations Transmission Line Rebuild Project, Travis and Williamson County, Texas*. HJN 090096. Horizon Environmental Services, Inc. Austin, Texas.

2009 *Intensive Cultural Resources Survey of the Possum Kingdom Lake Hike and Bike Trail, Phase III, Palo Pinto County, Texas*. HJN 090053. Horizon Environmental Services, Inc., Austin, Texas.

2009 *Intensive Cultural Resource Survey of the Proposed 2.2-Acre Junker-Spencer Well No. 69, Fannett, Jefferson County, Texas*. HJN 090079. Horizon Environmental Services, Inc., Austin, Texas.

2009 *Cultural Resource Survey of the Proposed 60-Acre Harrison Ranch Park, Dripping Springs, Hays County, Texas*. HJN 090080. Horizon Environmental Services, Inc. Austin, Texas.

2009 *Intensive Cultural Resource Survey of the Tyrrell Park Storm Water Detention Pond Project, Beaumont, Jefferson County, Texas*. HJN 090042. Horizon Environmental Services, Inc. Austin, Texas.

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