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# An Intensive Cultural Resources Survey of the Proposed 372.0-Acre Formosa Plastics Expansion Project in Calhoun and Jackson Counties, Texas

By:

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HJN 080122 AR 26

Prepared for:



Zephyr Environmental Corporation  
Austin Texas

Prepared by:



Horizon Environmental Services, Inc.  
Austin, Texas

Revised January 2014



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## MANAGEMENT SUMMARY

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Formosa Plastics Corporation, Texas (FPC TX) currently operates a number of chemical plants at its chemical complex in Calhoun and Jackson counties, Texas. FPC TX proposes to expand the chemical complex within the existing FPC TX Point Comfort site footprint. The 2012 Expansion Project would consist of an Olefins Expansion (OL3) with a Propane Dehydrogenation (PDH) unit, a new Low-Density Polyethylene (LDPE) Plant, and 2 new Combined Cycle Turbines (Gas Turbines). No new linear facilities (i.e., gas or electrical line rights-of-ways [ROW]) will be constructed during the development of the current undertaking. Separate Prevention of Significant Deterioration (PSD) permits for Greenhouse Gas (GHG) emissions are being obtained for the proposed OL3, LDPE, and Gas Turbines. This cultural resources survey report is provided to assist with the required cultural resources investigation for each of the above-mentioned PSD permit applications.

On 27 and 28 November 2012, Horizon Environmental Services, Inc. (Horizon) conducted an intensive cultural resources survey of FPC TX's proposed facility expansion project in Calhoun and Jackson counties, Texas. The Area of Potential Effect (APE) of the proposed undertaking consists of approximately 372.0 acres (150.5 hectares) within the existing FPC facility in Point Comfort, Texas. The APE was determined based on the location and extent of FPC TX's proposed land clearing and construction plans. Although the APE is located entirely on private property and its development will utilize private funding, the undertaking would require 3 PSD permits issued by the US Environmental Protection Agency (EPA). As a result, the undertaking falls under the regulations of Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended. At the request of Zephyr Environmental Corporation (Zephyr), Horizon conducted the cultural resources survey of the APE on behalf of FPC TX in compliance with Section 106 of the NHPA. The purpose of the survey was to determine if the development of the APE had the potential to have an adverse effect on any significant cultural resources listed on or considered eligible for listing on the National Register of Historic Places (NRHP).

The cultural resources survey of the APE resulted in entirely negative findings. No cultural materials were observed on the modern ground surface of the APE or within any of the 128 excavated shovel tests. The negative results were anticipated due to the fact that the APE is located within the boundaries of an existing industrial facility where extensive ground-disturbing activities have occurred in the past.

Based on the negative survey results, it is Horizon's opinion that the development of the APE will have no adverse effect on significant cultural resources. Horizon therefore recommends that FPC TX be allowed to proceed with the proposed facility expansion project, relative to the jurisdiction of the EPA and Section 106 of the NHPA. However, in the unlikely event that any human remains or burial features are inadvertently discovered at any point during construction, use, or ongoing maintenance within the APE, even in previously surveyed areas, all work at the location of the discovery should cease immediately, and the Texas Historical Commission (THC) and the EPA should be notified of the discovery.

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## 1.0 INTRODUCTION

Formosa Plastics Corporation, Texas (FPC TX) currently operates a number of chemical plants at its chemical complex in Calhoun and Jackson counties, Texas. FPC TX proposes to expand the chemical complex within the existing FPC TX Point Comfort site footprint. The 2012 Expansion Project would consist of an Olefins Expansion (OL3) with a Propane Dehydrogenation (PDH) unit, a new Low-Density Polyethylene (LDPE) Plant, and 2 new Combined Cycle Turbines (Gas Turbines). No new linear facilities (i.e., gas or electrical line rights-of-ways [ROW]) will be constructed during the development of the current undertaking. Separate Prevention of Significant Deterioration (PSD) permits for Greenhouse Gas (GHG) emissions are being obtained for the proposed OL3, LDPE, and Gas Turbines. This cultural resources survey report is provided to assist with the required cultural resources investigation for each of the above-mentioned PSD permit applications.

This document reports the results of an intensive cultural resources survey of FPC TX proposed facility expansion project in Calhoun and Jackson counties, Texas. The Area of Potential Effect (APE) of the proposed undertaking consists of approximately 372.0 acres (150.5 hectares) within the existing FPC facility in Point Comfort, Texas (Figures 1-1 and 1-2). The APE was determined based on the location and extent of FPC TX's proposed land clearing and construction plans. Although the APE is located entirely on private property and its development will utilize private funding, the undertaking would require 3 PSD permits issued by the US Environmental Protection Agency (EPA). As a result, the undertaking falls under the regulations of Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended. At the request of Zephyr Environmental Corporation (Zephyr), Horizon conducted the cultural resources survey of the APE on behalf of FPC TX in compliance with Section 106 of the NHPA. The purpose of the survey was to determine if the development of the APE had the potential to have an adverse effect on any significant cultural resources listed on or considered eligible for listing on the National Register of Historic Places (NRHP).

The cultural resources investigations consisted of an archival review, an intensive cultural resources survey of the APE, and the production of a report suitable for review by the State Historic Preservation Officer (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. Russell Brownlow (Horizon's cultural resources director) served as the project's principal investigator,

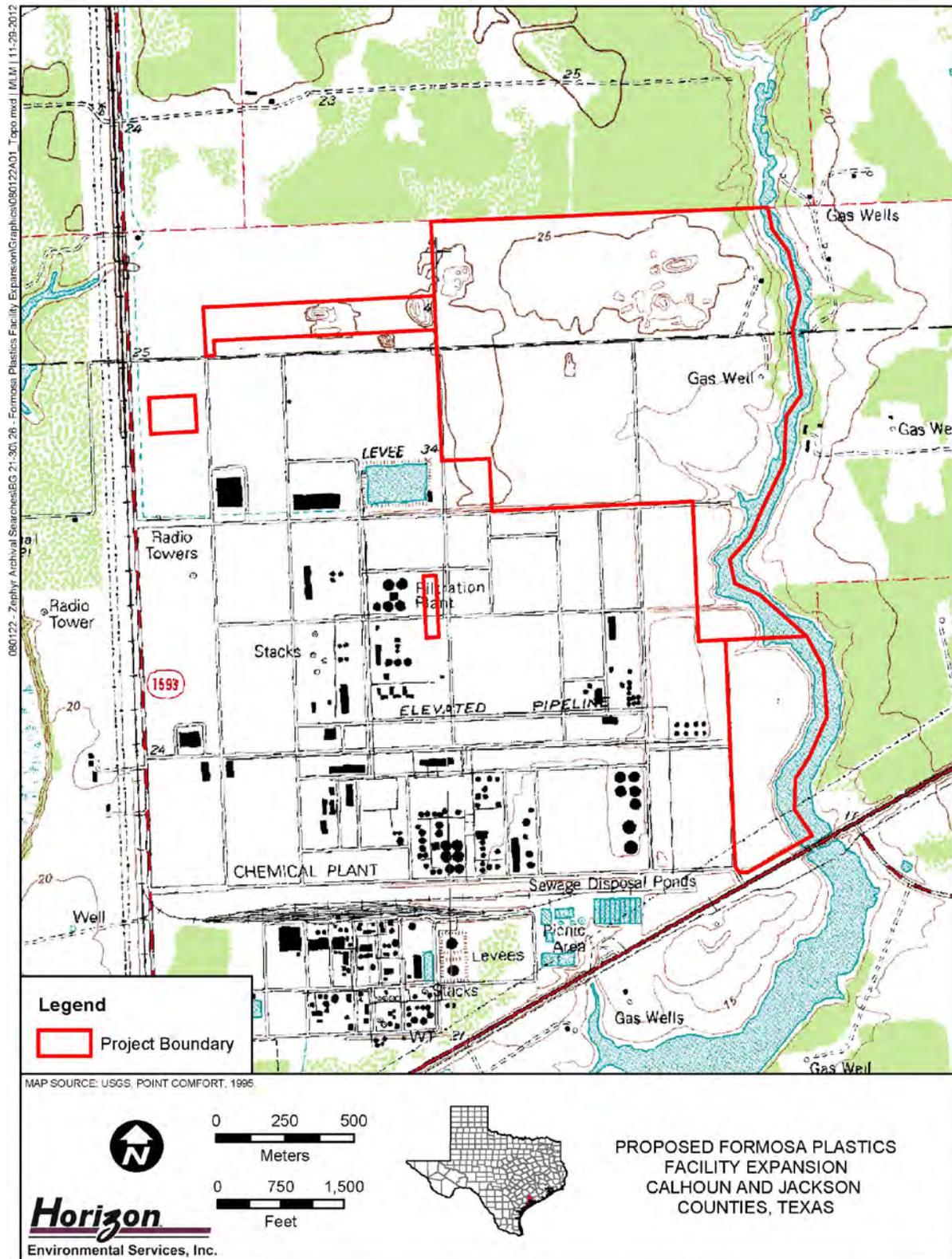


Figure 1-1. Topographic map with the location of the APE

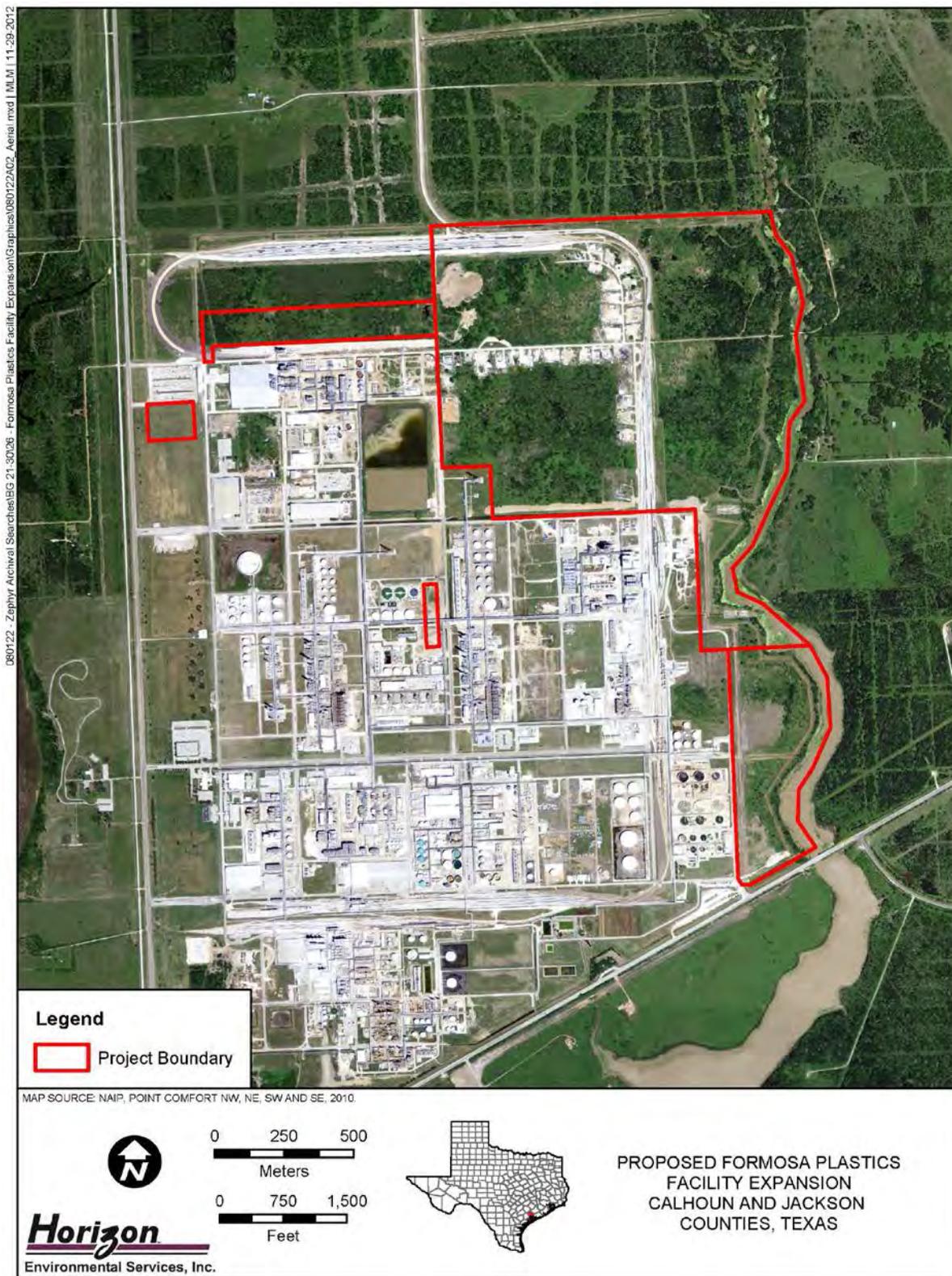


Figure 1-2. Aerial photograph with the location of the APE

while Jennifer Cochran, Michael Mudd, and Briana Smith (Horizon staff archeologists) conducted the field investigations.

Horizon conducted the survey of the APE on 27 and 28 November 2012. This entailed intensive surface inspection and subsurface shovel testing efforts within the APE. The Texas State Minimum Archeological Survey Standards (TSMASS) require a minimum of 1.0 shovel tests per 3.0 acres for projects more than 200.0 acres in size. As such, a total of 124 shovel tests were necessary within the 372.0-acre APE in order to comply with the TSMASS. Horizon exceeded the TSMASS by excavating a total of 128 shovel tests within the APE.

The cultural resources survey of the APE resulted in entirely negative findings. No cultural materials were observed on the modern ground surface of the APE or within any of the 128 excavated shovel tests. The negative results were anticipated due to the fact that the APE is located within the boundaries of an existing industrial facility where extensive ground-disturbing activities have occurred in the past.

Based on the negative survey results, it is Horizon's opinion that the development of the APE would have no potential to adversely affect significant cultural resources. Horizon therefore recommends that FPC TX be allowed to proceed with the proposed facility expansion project, relative to the jurisdiction of the EPA and Section 106 of the NHPA. However, in the unlikely event that any human remains or burial features are inadvertently discovered at any point during construction, use, or ongoing maintenance of the APE, even in previously surveyed areas, all work at the location of the discovery should cease immediately, and the THC and the EPA should be notified of the discovery.

## 2.0 ENVIRONMENTAL SETTING

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### 2.1 GENERAL PROJECT DESCRIPTION

FPC TX currently operates a 1600.0-acre petrochemical complex located in Point Comfort in Calhoun and Jackson counties, Texas. The approximately 372.0-acre APE is located primarily within the boundaries of FPC TX's existing chemical plant facility. The APE was determined based on the location and extent of FPC TX's proposed land clearing and construction plans. The 2012 Expansion Project will consist of an OL3, a new LDPE Plant, and 2 new Gas Turbines. No new linear facilities (i.e., gas or electrical line ROWs) will be constructed during the development of the current undertaking. The APE is situated just west of Cox Creek, approximately 3.1 kilometers (km) (1.9 miles [mi]) northwest of the confluence of Cox Creek and Huisache Cove (see Figures 1-1 and 1-2). It can be found on the US Geological Survey (USGS) 7.5-minute Point Comfort, Texas, topographic quadrangle map (see Figure 1-1). On-site photographs of the APE are provided in Figures 2-1 through 2-6.

### 2.2 CURRENT LAND USE

The majority of the APE consists of a portion of the existing FPC TX chemical complex property that is relatively undeveloped compared to the majority of the property. At the time of the survey, the northern and eastern portions of the APE contained mostly forested areas. Numerous service roads, vendor lots, and railroad tracks associated with the facility extend throughout the APE. Several plant employees indicated that the entire APE has been cleared in the past. They also indicated that the majority of the APE is covered by thick artificial fill deposits (see Figure 2-5). Most of the artificial fill deposits are overgrown with dense vegetation (see Figure 2-6).

### 2.3 PHYSIOGRAPHY AND HYDROLOGY

The APE is situated on a relatively flat landform just to the west of Cox Creek. Elevations within the APE range between approximately 3.0 and 7.6 meters (m) (10.0 and 25.0 feet) above mean sea level. Hydrologically, the APE is situated within the Colorado-Lavaca River basin. The APE is drained to the east via overland sheet flow into Cox Creek. Cox Creek joins Huisache Cove approximately 3.1 km (1.9 mi) southeast of the APE. Huisache



Figure 2-1. Typical view of Cox Creek (facing southeast)



Figure 2-2. Typical view of vegetation within the APE (facing northwest)



Figure 2-3. View within central portion of the APE (facing north)



Figure 2-4. Typical view of roads within the APE (facing south)



Figure 2-5. View of construction debris within the APE (facing north)



Figure 2-6. Vegetation overlying fill deposits within the APE (facing west)

Cove drains to the south into Cox Bay and Lavaca Bay and then discharges into Matagorda Bay farther southeast.

## 2.4 SOILS

A total of 10 soil types are mapped within the boundaries of the APE. These soils are presented in Table 2-1 (NRCS 2012) and in Figure 2-7.

**Table 2-1. Soils mapped within the APE**

Soil Name	Soil Type	Soil Depth (inches)	Setting
Dacosta sandy clay loam, 0 to 1% slopes (DaA)	Sandy clay loam	0 to 9: Sandy clay loam 9 to 62: Clay 62 to 80: Sandy clay loam	Clayey fluviomarine deposits of late Pleistocene age on flats
Dacosta-Contee complex, 0 to 1% slopes(Dc)	Clay loam	0 to 10: Clay loam 10 to 80: Clay	Clayey fluviomarine deposits of late Pleistocene age on flats
Edna very fine sandy loam (Ed)	Very fine sandy loam	0 to 6: Very fine sandy loam 6 to 38: Clay 38 to 50: Sandy clay loam	Loamy fluviomarine deposits of late Pleistocene age on flats
Laewest clay, 0 to 1% slopes (La)	Clay	0 to 80: Clay	Clayey fluviomarine deposits of late Pleistocene age on flats
Laewest clay, 0 to 1% slopes (LaA)	Clay	0 to 80: Clay	Clayey fluviomarine deposits of late Pleistocene age on flats
Marcado sandy clay loam, 3 to 8% slopes (MaC)	Sandy clay loam	0 to 8: Sandy clay loam 8 to 80: Clay	Loamy fluviomarine deposits of late Pleistocene age on flats
Dacosta clay loam, low (Mc)	Clay loam	0 to 9: Clay loam 9 to 48: Clay 48 to 80: Silty clay	Clayey fluviomarine deposits of late Pleistocene age on flats
Contee-Dacosta complex (Md)	Clay loam	0 to 8: Clay loam 8 to 80: Clay	Clayey fluviomarine deposits of late Pleistocene age on flats
Telfener very fine sandy loam (Te)	Very fine sandy loam	0 to 15: Very fine sandy loam 15 to 52: Sandy clay 52 to 80: Sandy clay loam	Loamy fluviomarine deposits of late Pleistocene age on meander scrolls
Texana-Cieno complex, 0 to 1% slopes (TxA)	Fine sandy loam	0 to 14: Fine sandy loam 14 to 33: Clay 33 to 69: Sandy clay loam 69 to 90: Fine sandy loam	Loamy fluviomarine deposits of late Pleistocene age on meander scrolls

Source: NRCS 2012

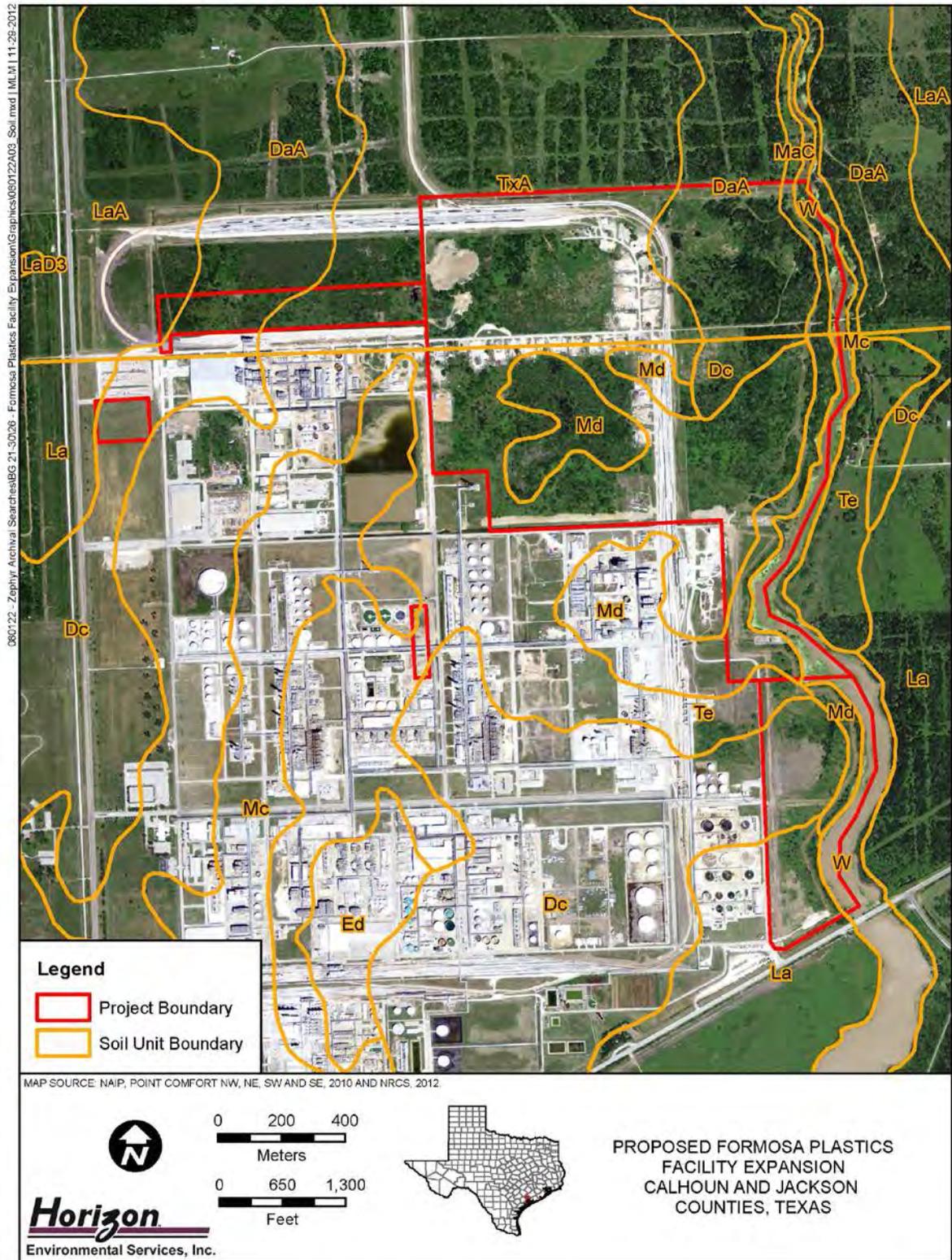


Figure 2-7. Soils mapped within the APE

## 3.0 CULTURAL BACKGROUND

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The archeological record of Central Texas Coast primarily spans between the Early Archaic and Late Prehistoric periods (7500 to 300 BP). Although Paleo-Indian materials such as Clovis spear points have been found washed up on the beach along the McFaddin Beach site on the Upper Texas Coast, Ricklis (1995) indicates that the earliest demonstrable human occupation along the Central Texas Coast is assignable to the Early Archaic period. A brief breakdown of this general cultural sequence for the Central Texas Coast is presented below.

### 3.1 EARLY ARCHAIC PERIOD (CA. 7500 TO 4200 BP)

Based on available radiocarbon assays, Ricklis (1995) divides the Early Archaic period into 2 subperiods of occupation. The first, dating between 7500 and 6800 BP, is represented by several sites in the Nueces Bay area. Cultural components typically consist of thin but dense lenses of oyster shell resting at the base of Holocene soils. Although limited specimens of lithic debitage and flaked shell tools have been recovered, other tools and preserved bone are generally absent from these deposits. The shell deposits clearly reflect the exploitation of estuarine shellfish, but the lack of preserved fish otoliths in the deposits may suggest that fishing did not play a significant role in the subsistence economy of early groups on the coast (Ricklis 1995).

The second period, dating between 5800 and 4200 BP, is represented by more numerous sites than the previous period. Again, components from this period are represented by lenses of shell deposits with generally sparse amounts of associated artifacts such as lithic debitage and flaked shell implements. However, a variety of project points have been recovered from deposits dating to this period, including Early Triangular, Bell, Andice, and Tortugas points. A variety of fish remains have also been recovered from sites dating to this period, suggesting that the coastal occupants were now exploiting both shellfish and fish (Ricklis 1995).

### 3.2 MIDDLE ARCHAIC (4200 TO 3100 BP)

Ricklis (1995) indicates that there is a striking absence of radiocarbon data and shell deposits dating to this interval. Based on this, he suggests that there was likely an apparent hiatus in shoreline occupations during this period (Ricklis 1995).

### 3.3 LATE ARCHAIC (3100 TO 1000 BP)

The Late Archaic initiates when sea level stabilized at its modern position around 3000 BP. During this period, sites are more numerous, larger, contain thick shell middens, and have a greater range and quantity of cultural materials, suggesting more frequent and intense occupations than the previous period (Ricklis 1995). The dense quantities of shell deposits at sites dating to this period clearly reflect a significant intensification in the exploitation of estuarine resources, and an abundance of recovered fish otoliths from midden deposits also reflects a dramatic increase in fishing. Faunal remains such as white-tailed deer and other mammals and birds are also present at these sites. Ricklis (1995) indicates that the increased economic importance of fishing during this time period can likely be linked to the emergence of the modern estuarine environment where available vegetated shallows led to a considerable increase in estuarine fish carrying capacity.

Diagnostic lithic implements associated with this time period include Kent, Ensor, Marcos, Catan, and Matamoros projectile points. Bone implements are also prevalent, consisting of bone pins, deer bone awls and flakes, antler points, and socketed bone points. In addition to lithic and bone, the shell tool industry during this period was fairly diverse. Flaked knives and scrapers made from sunray venus clam shells are present. Body whorls from conch shells were utilized in the production of adzes, while conch columellae were crafted into perforators, spear points, and gorges. Burned clay nodules and asphaltum fragments bearing basketry impressions also reflect the clear use of basketry. Finally, the use of distinct cemeteries appears to arise during this time period, suggesting the emergence of well-defined group territories (Ricklis 1995).

### 3.4 LATE PREHISTORIC PERIOD (CA. 1000 TO 250 BP)

Like other parts of the state, the advent of the Late Prehistoric period along the Central Texas Coast is marked by the replacement of dart/atlatl technology by the bow and arrow. While ceramics may have been present toward the end of the Late Archaic period, their use also becomes common during the Late Prehistoric period. Based on radiocarbon dates and distinctive assemblages, Ricklis (1995) divides the Late Prehistoric period into 2 subperiods.

The Initial Late Prehistoric period, dating between 1000 BP and 750 BP, contains cultural deposits similar to those seen in the Late Archaic period except that dart points have been replaced by smaller Fresno and Scallorn arrow points. Shell middens containing fish otoliths represent a continued exploitation of estuarine environments, while recovered deer bone also attests to hunting practices. As noted above, the use of ceramics becomes common during this period, with plain, sandy paste pottery similar to Goose Creek ceramic found along the Upper Texas Coast being the most prevalent during this period (Ricklis 1995).

The Final Late Prehistoric period, dating between 750 and 250 BP, is marked by the presence of artifacts associated with the Toyah technocomplex, which includes thin bifacial knives, Perdiz (contracting-stem) arrow points, small chert drills, and prismatic blades (Ricklis 1995, Ricklis and Collins 1995, Brownlow 1998). This technocomplex is potentially viewed as a bison hunting toolkit (Ricklis and Collins 1995), so it is not surprising that bison bone is often

found within site deposits dating to this period. Plain, sandy paste ceramics have also given way to a variety of ceramic vessel shapes, including cylindrical smoking pipes, that are often coated and/or decorated with asphaltum (Ricklis 1995). The Rockport phase is characterized by a combination of ceramics bearing asphaltum coating/decorations with Toyah technocomplex materials along the Central Texas Coast. As with the earlier periods, flaked shell and deer bone implements are present within the assemblage. Interestingly, Ricklis (1995) notes no major, dense shell middens dating to this time period. Rather, deposits associated with this period are often found draped over earlier shell middens and consist primarily of abundant fish remains and artifacts, but only scattered amounts of shell. Because of this, Ricklis (1995) suggests that fishing may have become so effective that shellfish gathering was only a minor subsistence practice.

### 3.5 HISTORIC PERIOD (CA. 250 BP TO PRESENT)

In 1519, Alonso Álvarez de Pineda drafted a map that included Espíritu Santo Bay and named the mainland “Amichal,” but it is not clear whether he ever set foot in the future Calhoun County<sup>1</sup>. René Robert Cavalier, Sieur de La Salle, is believed to have landed near Powderhorn Lake in 1685 after 1 of his 4 ships wrecked while attempting to cross the bar at Cavallo Pass. In 1936, the THC placed a monument that marks his landing site. The future county was explored by Spaniards, including Alonso De León, who found the ruins of the French fort in 1689, but no permanent settlement was made until Anglo-American colonization. As early as 1825, empresario Martín De León of Mexico brought 41 families to the area establishing a ranch near the former site of La Salle's fort. The first Anglo settlement site in the county was built at Linnville. In 1831, John J. Linn established a warehouse and wharf 4.8 km (3.0 mi) north of the future site of Lavaca (later Port Lavaca). During the Linnville Raid of 1840, Comanche Indians captured horses, sacked buildings, and burned the settlement before being pursued and defeated. The inhabitants of Linnville escaped by boat to a bluff about 4.8 km (3.0 mi) away, where a few men that operated a warehouse welcomed them. This was the beginning of the present town of Port Lavaca. In 1836, approximately 800 Tonkawas that were caught between settlers and the Comanches became loyal to the Texans.

As early as 1836, Mary Austin Holley reported a population of 200 at Cox's Point. In 1844, Prince Carl of Solms-Braunfels landed at Indian Point in Calhoun County with 100 German families. Although only few of German families remained on the Gulf, their tent village, originally named Karlshafen, and later Indianola, served as the Calhoun County seat for many years. Many native Tejanos were granted land in Calhoun County, where they developed more of the Spanish ranching culture on the flat, grassy prairie that was well-suited for rangeland. Plácido Benavides, one of the Tejanos who fought with the Texans during the Texas Revolution, owned land in Calhoun County, as did many other prominent Mexican families. The majority of

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<sup>1</sup> The following history of Calhoun County, Texas, derives from Calhoun County Historical Commission (1980), Cox (1922), Freier (1979), Haynes (1939), Port Lavaca Wave (1940), as summarized in *The Handbook of Texas Online* (T).

settlers in Calhoun County came from Southern states, including Louisiana, Georgia, Mississippi, Tennessee, and Alabama.

In antebellum Texas, Calhoun County residents were active in the trade and commerce stimulated by the Federalist wars of Texas and northern Mexico, and French blockades of Mexican ports in 1838 and 1839. Goods and ammunition for South Texas and Northern Mexico went through Lavaca, Cox's Point, Linnville, and Texana for overland distribution by wagon train. In 1842, many men from Calhoun County participated in the Mier expedition. US Army quartermaster depots were located at Lavaca until 1854, and later Indianola supplied military forts and garrisons.

During the 1840s, newcomers began rounding up cattle and developing ranching as an American occupation. Lavaca, established as a port in 1842, shipped hides and tallow and transported goods from New Orleans to San Antonio and points further west. Its present name, Spanish for "cow port," reflected the importance of cattle to the local economy.

On April 4, 1846, Calhoun County was formed from parts of Victoria, Jackson, and Matagorda counties. The county was named for John C. Calhoun of South Carolina, who had advocated Texas statehood. Lavaca was the first county seat. However in 1852, Indianola became the county seat due to the development of the Indianola Railroad, the formation of other transportation lines, and a shift of population. The county's earliest newspaper, the *Lavaca Journal*, began publication in 1848. The first county school opened at Lavaca in 1849; and a county courthouse was completed at Indianola in 1857. Both Lavaca and Indianola remained important trade centers until 1861. Exports from Lavaca included cotton, pecans, and lead and copper from Mexico; Indianola exported silver bullion and cattle. The Morgan Lines moved their headquarters from Lavaca to Indianola in 1849, and in 1852, they operated regular service to New York. The San Antonio and Mexican Gulf Railway completed a line from Lavaca to Victoria by 1861, and the Indianola Railroad was completed in the 1870s. Both roads eventually became parts of the Southern Pacific system. However, trade development ceased in the area at the beginning of the Civil War.

Despite cholera epidemics in 1849, 1852, and 1853, the county's population increased between 1850 and 1860 from 867 white and 234 black residents to a total of 2,642, of which 414 were slaves. Plantations operated at Green Lake and Cox's Point, but most black residents were urban dwellers who worked as servants or at seaport trades. Prior to the peak of slave trading in Indianola in 1852, only 1 free black resident lived in the county in 1840 and 9 black residents in 1850. In 1859, Calhoun County volunteers became part of the Third Texas Infantry of the Confederate Army. Others from the area joined the Indianola Guards or the Lavaca Guards, which became part of Company A of the Sixth Texas Infantry.

Because of the impact on its port facilities, Calhoun County felt the brunt of the war more than many Texas counties. During the war, women and slaves raised cotton, planted vegetables, and subsisted on cattle driven in to feed the families of soldiers. Fort Esperanza, on Matagorda Island, constructed by Confederate forces using slave labor, covered the approaches to Cavallo Pass, but in 1863, the fort was captured after the battle of Matagorda Bay. Wharves, warehouses, railroads, and bridges were destroyed or damaged. Indianola and

Lavaca were taken by federal troops, many of whom were quartered in the county by the end of the war. The only Civil War land battle in Calhoun County was fought on Christmas Eve, 1863, at Norris's Bridge, but Union and Confederate graves remain at the site of Fort Esperanza.

The county recovered during Reconstruction. The population rose from 2,642 in 1860 to 3,443 by 1870, of which 907 were black. Most county residents lived at Lavaca or Indianola, which for a time in the 1870s surpassed Galveston as the leading Texas seaport. Factories increased from 14 to 33, and sharecropping, which developed in many Texas counties, was not as widespread, probably because the soil facilitated ranching over farming. In 1870, the wealthiest man in the county, Fletcher S. Stockdale, a lawyer from Kentucky, had real estate property valued at \$100,000 and personal property at \$20,000.

Although Union troops were stationed in Calhoun County, the chief problems of the post-Civil War years were not political. A fire in 1867 destroyed buildings at Indianola, and a yellow fever epidemic reduced the population. In 1875, a Gulf storm brought heavy damage to Indianola, which recovered only briefly before a tidal wave virtually destroyed the community in 1886. By 1880, the county's population had dropped to 1,739. Lavaca, renamed Port Lavaca, became the county seat again in 1887, the post office and courthouse were moved there, and Indianola was never rebuilt. In 1878, the Southern Pacific Railroad bought out the property of the Morgan Lines, which had headquartered at Indianola since the 1850s, and in 1887 reopened the war-damaged railroad. This development, along with the growth of other railroads across the state, reduced Port Lavaca from a major seaport to a fishing center. Manufacturing establishments dropped to 4 by 1880 and disappeared altogether by 1890. The cattle industry peaked in 1890, when 32,629 head were reported, but by then the county population numbered only 815. Among those who registered brands in the county were several African Americans, including Ann Harred, a "free woman of color" who used the JD brand on her Matagorda Island ranch. Other blacks, who had been cowboys as slaves, continued driving cattle to Texas ports. Of 82 farms in operation in 1900, 56 were operated by their owners and 26 by tenants.

The value of taxable property in Calhoun County grew between 1870 and 1912 from \$1.5 million to almost \$4 million. At the turn of the century, land companies offering mortgage loans at ordinary interest brought an influx of small farmers, most of whom raised cotton. Oyster shipping began at Port Lavaca, and developers established a new community at Port O'Connor. Swedes established a Lutheran colony at Olivia in 1892, and by 1900, European immigrants included Irish, Scots, Germans, and Bohemians. The population increased gradually, reaching pre-1875 figures again only in 1910, when a total of 3,635 was estimated, and 4,325 by 1920, of which 584 were black. By 1930, roughly 1/4 of the population was described as "Mexican." Hurricanes in 1914 and 1919 wrought further damage, and to defend itself Port Lavaca built a seawall in 1920.

Transportation improved in 1909 with construction of the St. Louis, Brownsville and Mexico Railway in the southern part of the county, with its terminus at Port O'Connor. United States participation in World War I brought significant improvements in the county's economy, but slow growth during the Great Depression hurt county cattlemen, whose herds were reduced to a total of only 4,007 head by 1930. Livestock was raised on only half the county's acreage in the 1930s, as many farmers raised figs, citrus fruits, and other products. Tenant farming

increased in the 1920s and reached a high during the depression. By 1930, of 574 county farms, 372 were operated by tenants. The total number of farms began to decline from 574 in 1930 to 331 in 1950, by which time the average farm size was 731 acres, agribusiness had developed, and more than 200 farms were commercial. In 1931, improvements came with the construction of a causeway over Lavaca Bay that linked the area to the South Texas highway system, discoveries of natural gas near Port Lavaca in 1934, and oil in 1935. Black schools operated in the Port Lavaca and Long Mott districts. A colony of Christian Scientists was established at Magnolia Beach, which became a major resort. In World War II an army training camp was built on Matagorda Island, along with a Strategic Air Command base that remained in service until 1975.

The county suffered a tropical storm in 1945 and extensive damage from Hurricane Carla in 1961. From 1940 to 1950, the population increased from 5,911 to 8,971. An Alcoa plant that employed 2,600 workers opened at Point Comfort in 1947, and a Union Carbide and Carbon Chemicals Company plant near Seadrift opened in 1952; in 1980 it provided jobs for 1,400 employees. Other major industry included the Hartzog Shipyards, the U.S. Cold Storage Company, and the fishing and shrimping industry. By 1958 the county had a total of eleven manufacturers and 77 mineral-related enterprises. In agriculture, a maximum county production of 10,570 bales of cotton and 133,996 pounds of corn were harvested in 1940, when 95,000 acres of land were planted with cotton, corn, sorghum, flax, and rice.

The number of cattle increased steadily after 1940, and by 1969 reached 20,404. National Starch, a manufacturer of vinyl acetate, began operation in 1962, Witco manufactured pitch oil at Point Comfort, and Vistron Corporation was in operation by the 1970s. Other industries produced oilfield products and metal cleaner; there was some marine construction. The population grew steadily after the 1950s, to 17,831 by 1970, of which 957 were black. Of a total of 21,300 in 1982, 34% were Hispanic, 18% German, and 18% of English descent.

In the 1980s, Calhoun County farmers raised cattle, sorghum, rice, corn, pecans, and soybeans. Seventy percent of the land was in farms and ranches, but farmers faced problems of inefficient irrigation, soil compaction, poor drainage, and shoreline erosion. In 1981, businesses totaled 380 and included major industries such as oil and gas extraction, fish packaging, heavy construction, and industrial chemical production. In 1982, oil and gas production totaled 849,240 barrels of crude oil, 2,439,971,000 cubic feet of casinghead gas, 43,787,907,000 cubic feet of gas-well gas, and 313,318 barrels of condensate. In 1990, crude production was 1,179,390 barrels. In 1981, the Matagorda Ship Channel traffic totaled 4,148,664 short tons, including 3,347,547 tons of imports, 153,501 tons of exports, and 647,616 tons of domestic shipments. Important exports included oil, cotton, seafood, and cattle. In the 1980s, Calhoun County's principal natural resources, after discoveries around 1935, remained industrial sand, oil, and gas. Port Lavaca, Port O'Connor, and Magnolia Beach attracted tourists with recreation activities, such as hunting, fishing, boating, and bathing. In 1988, the Formosa Plastics Corporation of Taiwan established a petrochemical factory at Point Comfort. Calhoun County school districts consolidated after 1955 and, by the 1980s, a single school district was operating 8 elementary schools, 3 middle schools, and 1 high school. Many local

churches operated schools. Thirty-three percent of high school graduates planned to attend college. In 1990 the county's population was 19,053.

In 2000, the census accounted for 20,647 people living in Calhoun County. About 52% were Anglo, 41% were Hispanic, 3% were African American; and other minority groups comprised about 4% of the population. In the early 21st century, aluminum manufacturing, plastics, and some other manufacturing concerns were key elements of the area's economy. In 2002, the county had 328 farms and ranches covering 247,827 acres, 59% of which were devoted to pasture and 38% to crops. In that same year, local farmers and ranchers earned \$18,893,000, with livestock sales accounting for \$9,710,000 of that total. Cotton, cattle, corn, and grain sorghum were the chief agricultural products. Almost 594,000 barrels of oil and 9,446,198 cubic feet of gas-well gas were produced in the county in 2004 and by the end of that year, 103,913,124 barrels of oil had been taken from county lands since 1935. Port Lavaca (2000 population, 12,035) is the seat of government and the county's largest town. Other communities include Seadrift (1,352), Port O'Connor (1,184), Point Comfort (781), and Long Mott (76). In 1985 a Texas historical marker was placed at Half Moon Reef Lighthouse. Matagorda Island State Park and Wildlife Management Area, Calhoun County's principal state park, covered 7,325 acres. Annual special events in the county include the Sea Fest in May, Texas Water Safari in June, Shrimp-Fest in July, Fishing Derby and Youth Rodeo in August, Christmas Parade in December, and Calhoun County Fair in October at Port Lavaca.



## 4.0 ARCHIVAL RESEARCH

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Archival research conducted via the Internet at the THC's *Texas Archeological Sites Atlas* (Atlas) website indicated the presence of no previously recorded archeological sites or cemeteries within a 1.6-km (1.0-mi) radius of the APE, and a review of the National Park Service's (NPS) National Register of Historic Places (NRHP) Google Earth map layer indicated the presence of no historic properties listed on the NRHP within the 1.6-km (1.0-mile) review perimeter. No documented cultural resources, including any listed on the NRHP, are located within or immediately adjacent to the boundaries of the APE. Based on the Atlas database, the APE had not been previously surveyed for cultural resources.

Prehistoric archeological sites are commonly found in upland areas and on alluvial terraces near stream/river channels or drainages. Given the presence of Cox Creek within the eastern extent of the APE, it was Horizon's original opinion that there existed a moderate to high potential for undocumented prehistoric cultural deposits within any undisturbed areas within the APE. In regard to historic-era resources, 2 visible standing structures within the northeastern extent of the APE suggested an increased potential for historic-era standing structures or associated cultural deposits within the APE (see Figure 1-1).



## 5.0 METHODOLOGY

A 3-person Horizon archeological field crew completed the intensive pedestrian survey of the APE on 27 and 28 November 2012. This entailed intensive surface inspection and subsurface shovel testing efforts within the APE. The TSMASS require a minimum of 1 shovel test per 3.0 acres for projects more than 200.0 acres in size. As such, a total of 124 shovel tests were necessary within the approximately 372.0-acre APE in order to comply with the TSMASS. Horizon exceeded TSMASS by excavating a total of 128 shovel tests within the APE. The majority of the APE within the existing facility boundaries was covered by thick artificial fill deposits, decreasing the chances of identifying intact cultural deposits. All excavated matrices were screened through 0.25-inch (6.0-millimeter [mm]) hardware mesh or were trowel-sorted if the dense clay soils prohibited successful screening.

Field notes were maintained on terrain, vegetation, soils, land forms, shovel tests, cultural material observed (if any), etc. Standardized shovel test forms were completed for every shovel test. These forms included location data, depth, soil type, and notations on any artifacts encountered. If any new archeological sites were recorded, standard site forms were to be completed and filed at the Texas Archeological Research Laboratory (TARL) for permanent housing. Similarly, if any previously recorded archeological sites were assessed, updated site forms were to be completed and filed at TARL.

A selective collection strategy was utilized during the survey efforts wherein only diagnostic cultural materials were to be collected for eventual curation at an approved facility or returned to the appropriate landowner. Non-diagnostic artifacts were to be tabulated and assessed in the field and placed back where they were found. No cultural resources were observed during the survey; as such, the collections policy was not brought into play. Digital photographs with a photo log were completed as appropriate. The locations of all shovel tests were recorded via handheld global positioning system (GPS) units utilizing the Universal Transverse Mercator (UTM) coordinate system and the North American Datum of 1983 (NAD 83). Shovel test locations are presented in Figure 5-1. Shovel test data are presented in Appendix A.

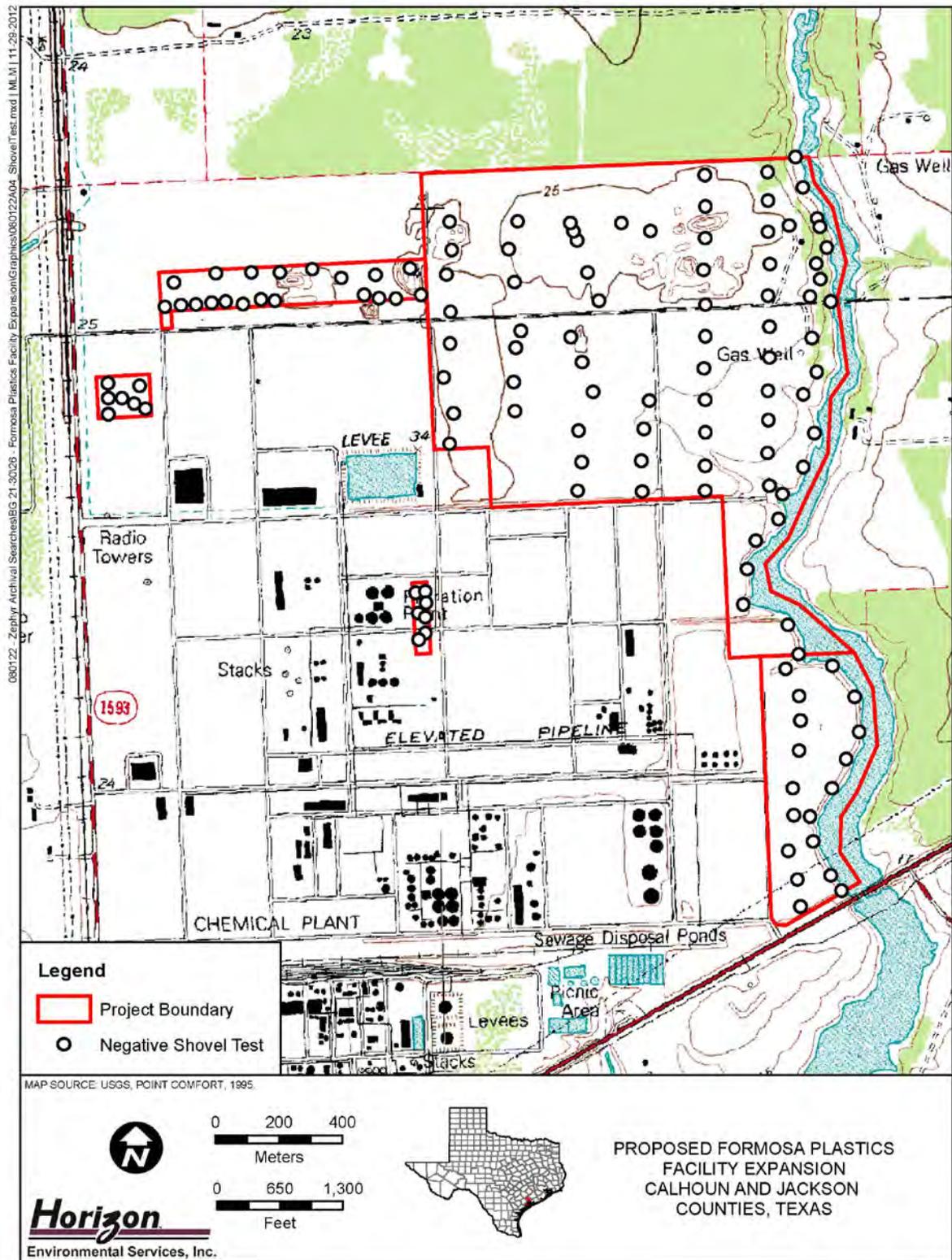


Figure 5-1. Shovel test locations within the APE

## **6.0 RESULTS AND RECOMMENDATIONS**

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### **6.1 RESULTS**

The cultural resources survey of the APE resulted in entirely negative findings. No cultural materials were observed on the surface of the APE or within any of the 128 excavated shovel tests. The negative results were anticipated due to the fact that the much of the APE is located within the boundaries of an existing industrial facility where extensive ground-disturbing activities have occurred in the past.

### **6.2 RECOMMENDATIONS**

Based on the negative survey results, it is Horizon's opinion that the development of the APE will have no adverse effect on significant cultural resources. Horizon therefore recommends that FPC TX be allowed to proceed with the proposed facility expansion project, relative to the jurisdiction of the EPA and Section 106 of the NHPA. However, in the unlikely event that any human remains or burial features are inadvertently discovered at any point during construction, use, or ongoing maintenance of the APE, even in previously surveyed areas, all work at the location of the discovery should cease immediately, and the THC and the EPA should be notified of the discovery.



## 7.0 REFERENCES CITED

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**APPENDIX A:**

**Shovel Test Data**



**Table A-1. Shovel Test Summary Data**

ST No.	UTM Coordinates <sup>1</sup>		Depth (cmb)	Soils	Artifacts
	Easting	Northing			
JC1	741284	3178339	0-25+	Very dark grayish-brown sandy clay	None
JC2	741361	3178119	0-15+	Dark grayish-brown sandy clay	None
JC3	741351	3178002	0-20+	Dark grayish-brown sandy clay	None
JC4	741331	3177900	0-15+	Grayish-brown sandy clay	None
JC5	741336	3177769	0-15+	Dark yellowish-brown sandy clay	None
JC6	741309	3177362	0-10	Grayish-brown clay	None
			10+	Brown clay	None
JC7	741160	3177130	0-20+	Light grayish-brown sandy clay	None
JC8	741470	3176637	0-25+	Grayish-brown sandy clay	None
JC9	741444	3176441	0-15	Dark grayish-brown sandy clay loam	None
			15-35+	Dark grayish-brown sandy clay	None
JC10	741296	3176467	0-10+	Very dark grayish-brown clay	None
JC11	740802	3177284	0-10+	Mottled yellowish-red and yellowish-brown clay	None
JC12	740799	3177382	0-5+	Dark yellowish-brown clay and gravels	None
JC13	740807	3177482	0-35	Light grayish-brown sandy clay loam	None
			35+	Dark yellowish-brown sandy clay	None
JC14	740825	3177570	0-10+	Yellowish-red clay with gravels (disturbed)	None
JC15	740666	3177886	0-10+	Dark yellowish-brown gravelly sandy clay	None
JC16	740630	3177975	0-10+	Dark yellowish-brown gravelly sandy clay (disturbed)	None
JC17	740597	3178077	0-15+	Dark yellowish-brown gravelly clay	None
JC18	740587	3178104	0-15+	Dark yellowish-brown gravelly clay (disturbed)	None
JC19	740576	3178131	0-25	Grayish-brown sandy clay loam (disturbed)	None
			25+	Grayish-brown sandy clay	None
JC20	740738	3178130	0-15+	Very dark grayish-brown clay	None
JC21	740829	3178105	0-15+	Dark yellowish-brown gravelly clay (disturbed)	None
JC22	740578	3177771	0-5+	Dark yellowish-brown gravelly clay	None
JC23	740613	3177692	0-15+	Dark yellowish-brown clay	None

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

ST No.	UTM Coordinates <sup>1</sup>		Depth (cmbs)	Soils	Artifacts
	Easting	Northing			
JC24	740648	3177598	0-15 15+	Light yellowish-brown sandy clay loam Dark yellowish-brown sandy clay	None None
JC25	740603	3177477	0-25 25+	Light grayish-brown silty clay loam Dark yellowish-brown silty clay	None None
JC26	740612	3177377	0-35 35+	Pale brown silty clay loam Dark yellowish-brown silty clay	None None
JC27	740600	3177287	0-10+	Mottled yellowish-red and yellowish-brown clay (disturbed)	None
JC28	740098	3176901	0-10+	Very dark grayish-brown clay	None
JC29	740090	3176965	0-15+	Very dark grayish-brown clay	None
JC30	740121	3176969	0-10+	Very dark grayish-brown clay	None
JC31	740123	3176934	0-20+	Very dark grayish-brown clay	None
JC32	740121	3176888	0-15+	Very dark grayish-brown clay	None
JC33	740121	3176839	0-5+	Limestone gravels (disturbed)	None
JC34	740100	3176817	0-5+	Limestone gravels (disturbed)	None
JC35	740107	3177905	0-30+	Dark brown clay	None
JC36	740028	3177893	0-20+	Mottled grayish-brown and yellowish-brown clay	None
JC37	739976	3177894	0-15+	Mottled grayish-brown and yellowish-brown clay	None
JC38	739928	3177904	0-15+	Mottled grayish-brown and yellowish-brown clay	None
BS1	741308	3178242	0-10 10+	Dark grayish-brown clay loam Dark grayish-brown clay	None None
BS2	741384	3178053	0-20 20+	Dark grayish-brown clay loam Dark grayish-brown clay	None None
BS3	741395	3177884	0-5 5+	Very dark grayish-brown clay loam Limestone gravels	None None
BS4	741309	3177590	0-30 30+	Gray very fine sandy loam Gray fine sandy loam	None None
BS5	741344	3177468	0-28 28+	Dark gray sandy clay loam Dark grayish-brown clay	None None
BS6	741232	3177198	0-15+	Mottled dark grayish-brown and dark yellowish-brown sandy clay	None
BS7	741120	3176928	0-10+	Dark grayish-brown clay (disturbed)	None

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

ST No.	UTM Coordinates <sup>1</sup>		Depth (cmbs)	Soils	Artifacts
	Easting	Northing			
BS8	741295	3176771	0-30 30+	Dark gray fine sandy loam Large roots	None None
BS9	741485	3176527	0-15+	Very dark grayish-brown clay	None
BS10	741399	3176349	0-20+	Black clay	None
BS11	741340	3176182	0-15+	Black clay	None
BS12	741430	3176026	0-10+	Mottled yellowish-red and dark grayish-brown clay (disturbed)	None
BS13	741300	3175976	0-5+	Very dark brown clay	None
BS14	741279	3176264	0-10+	Very dark grayish-brown clay	None
BS15	741300	3176563	0-10+	Black clay	None
BS16	741254	3176726	0-15+	Mottled dark grayish-brown, yellowish-red and yellowish-brown (disturbed)	None
BS17	741202	3177302	0-15+	Mottled reddish-brown and dark grayish-brown clay (disturbed)	None
BS18	741197	3177405	0-10 10+	Grayish-brown sandy loam with 80% gravels (disturbed) Artificial gravel fill	None None
BS19	741200	3177510	0-40 40-45+	Grayish-brown fine sandy loam Light grayish-brown fine sandy loam	None None
BS20	741198	3177602	0-30 30+	Light gray sandy loam Dark grayish-brown clay	None None
BS21	741202	3177706	0-30 30-35+	Very dark brown sandy clay loam Very dark brown compact sandy clay	None None
BS22	741202	3177804	0-10+	Very dark grayish-brown clay	None
BS23	741199	3177903	0-5+	Very dark grayish-brown clay	None
BS24	741204	3178001	0-20 20+	Dark gray sandy clay loam Dark grayish-brown clay	None None
BS25	741199	3178103	0-5+	Mottled reddish-brown, yellowish-brown and dark grayish-brown clay (disturbed)	None
BS26	741265	3178122	0-5+	Reddish-brown sand with 90% gravels (disturbed)	None
BS27	741198	3178201	0-10 10+	Black clay loam Black clay	None None
BS28	741197	3178292	0-5+	Mottled yellowish-red and dark grayish-brown clay	None (disturbed soils)

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

ST No.	UTM Coordinates <sup>1</sup>		Depth (cmbs)	Soils	Artifacts
	Easting	Northing			
BS29	740999	3178283	0-5+	Mottled yellowish-red and dark grayish-brown clay (disturbed)	None
BS30	741001	3178184	0-10+	Mottled dark grayish-brown, yellowish-red and yellowish-brown clay	None (disturbed soils)
BS31	741000	3178083	0+	Artificial gravel fill	None
BS32	740995	3177983	0-10+	Mottled yellowish-red and dark grayish-brown clay	None
BS33	741002	3177873	0-10	Reddish-brown sandy loam with 80% gravels	None
			10+	Mottled reddish-brown and dark grayish-brown clay	None
BS34	741001	3177774	0-10+	Mottled dark grayish-brown, black, yellowish-red and yellowish-brown clay	None
BS35	740997	3177672	0-5	Dark grayish-brown sandy clay loam	None
			5-10+	Dark grayish-brown clay	None
BS36	741000	3177573	0-20	Dark grayish-brown clay loam	None
			20+	Dark grayish-brown clay	None
BS37	741002	3177471	0-40	Grayish-brown fine sandy loam	None
			40+	Grayish-brown fine sandy loam	None
BS38	741000	3177366	0-30	Grayish-brown fine sandy loam	None
			30+	Grayish-brown fine sandy loam	None
BS39	741000	3177286	0-10+	Mottled yellowish-red and dark grayish-brown clay	None
BS40	739122	3177626	0-10+	Very dark grayish-brown clay	None
BS41	739123	3177578	0-10+	Black clay	None
BS42	739124	3177528	0-10+	Black clay	None
BS43	739167	3177578	0-10+	Black clay	None
BS44	739302	3177867	0-10	Very dark grayish-brown clay loam	None
			10+	Black clay	None
BS45	739352	3177872	0-10+	Black clay	None
BS46	739400	3177875	0-10	Black clay loam	None
			10+	Black clay	None
BS47	739448	3177880	0-25	Brown sandy loam	None
			25-30+	Brown sandy loam	None

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

ST No.	UTM Coordinates <sup>1</sup>		Depth (cmbs)	Soils	Artifacts
	Easting	Northing			
BS48	739493	3177884	0-30	Dark grayish-brown sandy clay loam	None
			30+	Mottled dark grayish-brown and Black clay	None
BS49	739547	3177876	0-10+	Very dark grayish-brown clay	None
BS50	739604	3177891	0-15	Dark grayish-brown clay loam	None
			15+	Mottled dark grayish-brown and grayish-brown clay	None
BS51	739648	3177887	0-10+	Very dark grayish-brown clay	None
MM1	741353	3178145	0-30+	Dense very dark gray clay	None
MM2	741362	3177953	0-30+	Dense very dark gray clay	None
MM3	741352	3177662	0-40	Light brown silty loam (disturbed)	None
			40+	Very dark gray clay	None
MM4	741244	3177276	0-30+	Wet black clay	None
MM5	741132	3177039	0-20+	Light reddish-brown clay	None
MM6	741260	3176864	0-20+	Very dark gray clay	None
MM7	741401	3176734	0-20+	Very dark gray clay	None
MM8	741331	3176260	0-25+	Very dark gray clay	None
MM9	741395	3176074	0-25+	Black clay	None
MM10	741291	3176061	0-30+	Very dark gray clay	None
MM11	741262	3176152	0-25+	Black clay	None
MM12	741276	3176349	0-20+	Very dark gray clay	None
MM13	741296	3176639	0-20+	Very dark gray clay	None
MM14	740197	3177435	0-20	Very light grayish-brown silty loam	None
			20+	Dark gray clay	None
MM15	740209	3177531	0-40	Compact very light brown silty clay (disturbed)	None
			40+	Dark gray clay	None
MM16	740179	3177644	0+	Dense gravels (disturbed)	None
MM17	740199	3177752	0-20	Dense road gravels (disturbed)	None
			20+	Black clay	None
MM18	740200	3177850	0-25+	Red clay (disturbed)	None
MM19	740187	3177968	0-20+	Light reddish-brown clay (disturbed)	None
MM20	740204	3178046	0-25+	Light brown clay with caliche gravels (disturbed)	None

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

ST No.	UTM Coordinates <sup>1</sup>		Depth (cmbs)	Soils	Artifacts
	Easting	Northing			
MM21	740197	3178134	0-25+	Light brown clay with caliche gravels (disturbed)	None
MM22	740411	3178136	0-30+	Light grayish-brown clay loam (disturbed)	None
MM23	740382	3178049	0-20	Brown silty loam	None
			20-40+	Very compact grayish-brown silty clay	None
MM24	740401	3177944	0-25	Light grayish-brown silty clay	None
			25+	Dark gray clay	None
MM25	740420	3177791	0+	Caliche gravels (disturbed)	None
MM26	740404	3177738	0-25+	Very dark gray clay	None
MM27	740398	3177630	0-20	Light grayish-brown silt (disturbed)	None
			20+	Dark gray clay	None
MM28	740402	3177538	0-30	Light grayish-brown silt	None
			30+	Dark gray clay	None
MM29	739223	3177618	0-20+	Very dark gray clay	None
MM30	739206	3177561	0-20+	Very dark gray clay	None
MM31	739241	3177546	0-20+	Very dark gray clay	None
MM32	739330	3177943	0-25+	Dark gray clay	None
MM33	739462	3177972	0-20	Grayish-brown silty loam (disturbed)	None
			20+	Grayish-brown clay loam	None
MM34	739574	3177975	0-25	Brown silty loam (disturbed)	None
			25+	Grayish-brown clay	None
MM35	739664	3177974	0-30+	Grayish-brown silty loam (disturbed)	None
MM36	739766	3177985	0-20+	Light reddish-brown clay (disturbed)	None
MM37	739856	3177958	0-30	Light gray silty clay (disturbed)	None
			30+	Dark gray clay (disturbed)	None
MM38	739964	3177967	0-30	Pale gray silty loam (disturbed)	None
			30+	Dark gray clay	None
MM39	740072	3177988	0-30+	Dark gray clay (disturbed)	None

<sup>1</sup> All UTM coordinates are located in Zone14 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 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.
- 2010 *An Intensive Phase I Cultural Resources Survey of Petrohawk Energy Corporation's Proposed Cowley 29H No. 1 Well Pad and Access Road in Bienville Parish, Louisiana.* HJN 100089 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2010 *An Intensive Phase I Cultural Resources Survey of Louisiana Midstream Gas Services' Proposed Rocking G-31 Natural Gas Gathering Line, DeSoto Parish, Louisiana.* HJN 080147 AR 173. Horizon Environmental Services, Inc. Austin, Texas.
- 2010 *An Intensive Phase I Cultural Resources Survey of Louisiana Midstream Gas Services' Proposed Mansfield Lateral 4BE Natural Gas Gathering Line, Red River Parish, Louisiana.* HJN 080147 AR 175. Horizon Environmental Services, Inc. Austin, Texas.

- 2010 *An Intensive Cultural Resources Survey of the USACE Jurisdictional Areas within the Proposed Crossings at Plum Creek Development in Hays County, Texas.* HJN 100067 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2010 *An Intensive Phase I Cultural Resources Survey of Louisiana Midstream Gas Services' Proposed ABG 25-14-12 & ABG 36-14-12 Natural Gas Gathering Line, DeSoto Parish, Louisiana.* HJN 080147 AR 174. Horizon Environmental Services, Inc. Austin, Texas.
- 2010 *An Intensive Phase I Cultural Resources Survey of Louisiana Midstream Gas Services' Proposed D'Artois 16 Well Connect Natural Gas Gathering Line, DeSoto Parish, Louisiana.* HJN 080147 AR 185. Horizon Environmental Services, Inc. Austin, Texas.
- 2010 *An Intensive Phase I Cultural Resources Survey of Louisiana Midstream Gas Services' Proposed Stalder 14-12N-13W Natural Gas Gathering Line, DeSoto Parish, Louisiana.* HJN 080147 AR 192. Horizon Environmental Services, Inc. Austin, Texas.
- 2010 *An Intensive Phase I Cultural Resources Survey of Louisiana Midstream Gas Services' Proposed Muse 24-14-15 H-1 Natural Gas Gathering Line, DeSoto Parish, Louisiana.* HJN 080147 AR 199. Horizon Environmental Services, Inc. Austin, Texas.
- 2010 *An Intensive Phase I Cultural Resources Survey of Louisiana Midstream Gas Services' Proposed Nabors 7-12-11 Natural Gas Gathering Line, DeSoto Parish, Louisiana.* HJN 080147 AR 204. Horizon Environmental Services, Inc. Austin, Texas.
- 2010 *An Intensive Phase I Cultural Resources Survey of Louisiana Midstream Gas Services' Proposed Aikens 17-12-11 Natural Gas Gathering Line, DeSoto Parish, Louisiana.* HJN 080147 AR 206. Horizon Environmental Services, Inc. Austin, Texas.
- 2010 *An Intensive Phase I Cultural Resources Survey of Louisiana Midstream Gas Services' Proposed Mansfield Lateral 5E-7E Interconnect Natural Gas Gathering Line, DeSoto Parish, Louisiana.* HJN 080147 AR 207. Horizon Environmental Services, Inc. Austin, Texas.
- 2010 *An Intensive Phase I Cultural Resources Survey of Louisiana Midstream Gas Services' Proposed Quinn 19-11-13 Natural Gas Gathering Line, DeSoto Parish, Louisiana.* HJN 080147 AR 180. Horizon Environmental Services, Inc. Austin, Texas.
- 2010 *An Intensive Phase I Cultural Resources Survey of Louisiana Midstream Gas Services' Proposed Patco 27-13-12 H-1 Natural Gas Gathering Line, DeSoto Parish, Louisiana.* HJN 080147 AR 211. Horizon Environmental Services, Inc. Austin, Texas.
- 2010 *An Intensive Phase I Cultural Resources Survey of Louisiana Midstream Gas Services' Proposed Petro-Hunt 8-13-7 H-1 Natural Gas Gathering Line, Natchitoches and Red River Parishes, Louisiana.* HJN 080147 AR 215. Horizon Environmental Services, Inc. Austin, Texas.
- 2010 *An Intensive Phase I Cultural Resources Survey of Louisiana Midstream Gas Services' Proposed LRE/DLP 13-13-12 H-1 Natural Gas Gathering Line, DeSoto Parish, Louisiana.* HJN 080147 AR 216. Horizon Environmental Services, Inc. Austin, Texas.
- 2010 *An Intensive Phase I Cultural Resources Survey of Louisiana Midstream Gas Services' Proposed Mansfield Trunkline Phase 2 Extension Natural Gas Gathering Line, DeSoto Parish, Louisiana.* HJN 080147 AR 131. Horizon Environmental Services, Inc. Austin, Texas.
- 2010 *An Intensive Phase I Cultural Resources Survey of Louisiana Midstream Gas Services' Proposed Nabors 26-10-13 Natural Gas Gathering Line, Sabine Parish, Louisiana.* HJN 080147 AR 153. Horizon Environmental Services, Inc. Austin, Texas.

- 2010 *An Intensive Phase I Cultural Resources Survey of Louisiana Midstream Gas Services' Proposed CHK 36-10-13 Natural Gas Gathering Line, Sabine Parish, Louisiana.* HJN 080147 AR 225. Horizon Environmental Services, Inc. Austin, Texas.
- 2010 *An Intensive Phase I Cultural Resources Survey of Louisiana Midstream Gas Services' Proposed NP LLC 17-12-13 Natural Gas Gathering Line, DeSoto Parish, Louisiana.* HJN 080147 AR 231. Horizon Environmental Services, Inc. Austin, Texas.
- 2010 *An Intensive Phase I Cultural Resources Survey of Petrohawk Energy Corporation's Proposed TBD 18-15N-10W Well Pad and Access Road in Bossier Parish, Louisiana.* HJN 100090 AR 23. Horizon Environmental Services, Inc. Austin, Texas.
- 2010 *An Intensive Phase I Cultural Resources Survey of Kinderhawk Field Services, LLC's Proposed CPS-Timberlands Natural Gas Gathering Line ROW in DeSoto Parish, Louisiana.* HJN 100090 AR 24. Horizon Environmental Services, Inc. Austin, Texas.
- 2010 *An Intensive Phase I Cultural Resources Survey of Kinderhawk Field Services, LLC's Proposed Culpepper North and Sustainable Natural Gas Gathering Line ROW in Bienville Parish, Louisiana.* HJN 100090 AR 25. Horizon Environmental Services, Inc. Austin, Texas.
- 2010 *An Intensive Phase I Cultural Resources Survey of Kinderhawk Field Services, LLC's Proposed Langford Natural Gas Gathering Line ROW in Bossier Parish, Louisiana.* HJN 100125 AR 08. Horizon Environmental Services, Inc. Austin, Texas.
- 2010 *An Intensive Phase I Cultural Resources Survey of a Segment of Kinderhawk Field Services, LLC's Proposed Loftin Lateral Natural Gas Gathering Line ROW in Red River and Bienville Parishes, Louisiana.* HJN 100125 AR 10. Horizon Environmental Services, Inc. Austin, Texas.
- 2010 *An Intensive Phase I Cultural Resources Survey of Louisiana Midstream Gas Services' Proposed Mansfield Lateral 13-14E Interconnect Natural Gas Gathering Line, Sabine Parish, Louisiana.* HJN 080147 AR 240. Horizon Environmental Services, Inc. Austin, Texas.
- 2010 *An Intensive Phase I Cultural Resources Survey of Louisiana Midstream Gas Services' Proposed Nabors 6-11-11 Natural Gas Gathering Line, DeSoto Parish, Louisiana.* HJN 080147 AR 241. Horizon Environmental Services, Inc. Austin, Texas.
- 2010 *An Intensive Phase I Cultural Resources Survey of Louisiana Midstream Gas Services' Proposed Gallaspy 19-12-11 Natural Gas Gathering Line, DeSoto Parish, Louisiana.* HJN 080147 AR 247. Horizon Environmental Services, Inc. Austin, Texas.
- 2010 *An Intensive Phase I Cultural Resources Survey of Louisiana Midstream Gas Services' Proposed Martinez 3 Natural Gas Gathering Line, DeSoto Parish, Louisiana.* HJN 080147 AR 248. Horizon Environmental Services, Inc. Austin, Texas.
- 2010 *An Intensive Phase I Cultural Resources Survey of Louisiana Midstream Gas Services' Proposed Norris 1-13-13 Natural Gas Gathering Line, DeSoto Parish, Louisiana.* HJN 080147 AR 248. Horizon Environmental Services, Inc. Austin, Texas.
- 2010 *An Intensive Phase I Cultural Resources Survey of Kinderhawk Field Services, LLC's Proposed Wilkinson-Almond Natural Gas Gathering Line ROW in Red River Parish, Louisiana.* HJN 100090 AR 28. Horizon Environmental Services, Inc. Austin, Texas.
- 2010 *An Intensive Phase I Cultural Resources Survey of Louisiana Midstream Gas Services' Proposed CHK LA Min 14-11-13 Natural Gas Gathering Line, DeSoto Parish, Louisiana.* HJN 080147 AR 245. Horizon Environmental Services, Inc. Austin, Texas.

- 2011 *An Intensive Phase I Cultural Resources Survey of Louisiana Midstream Gas Services' Proposed Bedsole 1-10-13 Natural Gas Gathering Line, DeSoto Parish, Louisiana.* HJN 080147 AR 253. Horizon Environmental Services, Inc. Austin, Texas.
- 2011 *An Intensive Phase I Cultural Resources Survey of Louisiana Midstream Gas Services' Proposed Springridge Lateral 1 West Loop Comped Route Natural Gas Gathering Line, Caddo Parish, Louisiana.* HJN 080147 AR 260. Horizon Environmental Services, Inc. Austin, Texas.
- 2011 *An Intensive Phase I Cultural Resources Survey of Louisiana Midstream Gas Services' Proposed Morton 34-11-14 Natural Gas Gathering Line, DeSoto Parish, Louisiana.* HJN 080147 AR 263. Horizon Environmental Services, Inc. Austin, Texas.
- 2011 *An Intensive Phase I Cultural Resources Survey of Kinderhawk Field Services, LLC's Proposed Robbins 8 Natural Gas Gathering Line ROW in DeSoto Parish, Louisiana.* HJN 100125 AR 15. Horizon Environmental Services, Inc. Austin, Texas.
- 2011 *An Intensive Cultural Resources Survey of the 18.95-Acre Aspen Heights Tract in San Marcos, Hays County, Texas.* HJN 110019 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2011 *An Intensive Phase I Cultural Resources Survey of Kinderhawk Field Services, LLC's Proposed CPS Timberland 21 Natural Gas Gathering Line, DeSoto Parish, Louisiana.* HJN 100125 AR 31. Horizon Environmental Services, Inc. Austin, Texas.
- 2011 *An Intensive Phase I Cultural Resources Survey of Kinderhawk Field Services, LLC's Proposed CHK Franks Pipeline Natural Gas Gathering Line, Bossier Parish, Louisiana.* HJN 100125 AR 26. Horizon Environmental Services, Inc. Austin, Texas.
- 2011 *An Intensive Phase I Cultural Resources Survey of Louisiana Midstream Gas Services' Proposed CHK LA Min 15-11-13 Natural Gas Gathering Line, DeSoto Parish, Louisiana.* HJN 110006 AR 20. Horizon Environmental Services, Inc. Austin, Texas.
- 2011 *An Intensive Phase I Cultural Resources Survey of Goodrich Petroleum Corporation's Proposed Lowery No. 1 Well Pad Expansion Project, Nacogdoches County, Texas.* HJN 110040 AR 01. Horizon Environmental Services, Inc. Austin, Texas.
- 2011 *An Intensive Cultural Resources Survey of KinderHawk Field Services, LLC's Proposed Dewitt Gathering - East Extension Phase I ROW in DeWitt County, Texas.* HJN 100125 AR 34. Horizon Environmental Services, Inc. Austin, Texas.
- 2011 *An Intensive Phase I Cultural Resources Survey of Mid-America Midstream Gas Services' Proposed Center Ranch A1H Natural Gas Gathering Line, Leon County, Texas.* HJN 110028 AR 02. Horizon Environmental Services, Inc. Austin, Texas.
- 2011 *An Intensive Phase I Cultural Resources Survey of Louisiana Midstream Gas Services' Proposed Rascoe 1-10-14 Natural Gas Gathering Line, DeSoto Parish, Louisiana.* HJN 110006 AR 29. Horizon Environmental Services, Inc. Austin, Texas.
- 2011 *An Intensive Phase I Cultural Resources Survey of Louisiana Midstream Gas Services' Proposed Evans 10-12-13 Natural Gas Gathering Line, DeSoto Parish, Louisiana.* HJN 110006 AR 31. Horizon Environmental Services, Inc. Austin, Texas.
- 2011 *An Intensive Phase I Cultural Resources Survey of Kinderhawk Field Services, LLC's Proposed Peavy Natural Gas Gathering Line, Bienville Parish, Louisiana.* HJN 100125 AR 56. Horizon Environmental Services, Inc. Austin, Texas.

- 2011 *An Intensive Phase I Cultural Resources Survey of 23 USACE Jurisdictional Crossings along an Eagle Ford Midstream, LLC Proposed 26.0-mile Natural Gas Gathering Line ROW and 2.2-mile Lateral ROW in LaSalle County, Texas.* HJN 080122 AR 10. Horizon Environmental Services, Inc. Austin, Texas.
- 2011 *An Intensive Phase I Cultural Resources Survey of Kinderhawk Field Services, LLC's Proposed Wallace Lake Phase II Natural Gas Gathering Line ROW in Caddo Parish, Louisiana.* HJN 100125 AR 46. Horizon Environmental Services, Inc. Austin, Texas.
- 2011 *An Intensive Cultural Resources Survey of Extra Work Spaces Associated with 5 Pipe Replacement Segments along the Longhorn Pipeline Right-of-Way in Hays and Blanco Counties, Texas.* HJN 050175 AR 07. Horizon Environmental Services, Inc. Austin, Texas.
- 2011 *An Intensive Phase I Cultural Resources Survey of Louisiana Midstream Gas Services' Proposed LA Minerals 36-12-12 Natural Gas Gathering Line, DeSoto Parish, Louisiana.* HJN 110006 AR 33. Horizon Environmental Services, Inc. Austin, Texas.
- 2011 *An Intensive Phase I Cultural Resources Survey of Petrohawk Energy Corporation' Proposed TBD 36-12N-14W Access Road ROW, DeSoto Parish, Louisiana.* HJN 100090 AR 42. Horizon Environmental Services, Inc. Austin, Texas.
- 2011 *An Intensive Cultural Resources Survey of 9 USACE Jurisdictional Crossings along Eagle Ford Midstream, LP's 20.8-mile 16" Natural Gas Pipeline ROW in LaSalle County, Texas.* HJN 080122 AR 17. Horizon Environmental Services, Inc. Austin, Texas.
- 2011 *An Intensive Phase I Cultural Resources Survey of Louisiana Midstream Gas Services' Proposed Lewis 7-10-13 Natural Gas Gathering Line, DeSoto Parish, Louisiana.* HJN 110006 AR 34. Horizon Environmental Services, Inc. Austin, Texas.
- 2011 *An Intensive Phase I Cultural Resources Survey of Magnolia Midstream Gas Services' Proposed Gray 14-14-15 Natural Gas Gathering Line, DeSoto Parish, Louisiana.* HJN 110026 AR 13. Horizon Environmental Services, Inc. Austin, Texas.
- 2011 *An Intensive Cultural Resources Survey of Petrohawk Energy Corporation's Proposed J-Hermann F 1H Access Road in DeWitt County, Texas.* HJN 100148 AR 32. Horizon Environmental Services, Inc. Austin, Texas.
- 2011 *An Intensive Cultural Resources Survey of Petrohawk Energy Corporation's Proposed Forest Wheeler B 1H and 2H Dual Well Access Road in McMullen County, Texas.* HJN 100148 AR 33. Horizon Environmental Services, Inc. Austin, Texas.
- 2011 *An Intensive Cultural Resources Survey of Aurora Resources Corporation's Proposed Quintanilla and Wheeler Eagle Ford Shale Well Pads in McMullen County, Texas.* HJN 110003 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2011 *An Intensive Phase I Cultural Resources Survey of Louisiana Midstream Gas Services' Proposed Ivory 14-10-13 2H Natural Gas Gathering Line, DeSoto Parish, Louisiana.* HJN 110006 AR 37. Horizon Environmental Services, Inc. Austin, Texas.
- 2011 *An Intensive Cultural Resources Survey of 3 Off-Site Wastewater Lines Associated with the Paso Robles Development in San Marcos, Hays County, Texas.* HJN 110078 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2011 *An Intensive Survey of the USACE Jurisdictional Areas within Petrohawk Energy Corporation's Proposed JC Martin State Unit 1H Well Pad and Access Road ROW in LaSalle County, Texas.* HJN 110141 AR. Horizon Environmental Services, Inc. Austin, Texas.

- 2011 *An Intensive Cultural Resources Survey of the USACE Jurisdictional Areas along Eagle Ford Midstream, LP's Proposed Asche to Nye Pipeline ROW in LaSalle County, Texas.* HJN 110143 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2011 *An Intensive Phase I Cultural Resources Survey of Enterprise Gathering LLC's Proposed CHK Evans 4-8-13 Natural Gas Gathering Line, Sabine Parish, Louisiana.* HJN 110136 AR2 07. Horizon Environmental Services, Inc. Austin, Texas.
- 2011 *An Intensive Cultural Resources Survey of Petrohawk Energy Corporation's Proposed Wheeler 7 1H Well Pad and Access Road in McMullen County, Texas.* HJN 100148 AR 34. Horizon Environmental Services, Inc. Austin, Texas.
- 2011 *An Intensive Cultural Resources Survey of Petrohawk Energy Corporation's Proposed Gentry 10H Well Pad and Access Road in McMullen County, Texas.* HJN 100148 AR 35. Horizon Environmental Services, Inc. Austin, Texas.
- 2011 *An Intensive Phase I Cultural Resources Survey of Petrohawk Energy Corporation's Proposed Murphy 12H-1 and Murphy 1H-1 Well Pads and Access Road in Bossier Parish, Louisiana.* HJN 100090 AR 51. Horizon Environmental Services, Inc. Austin, Texas.
- 2012 *An Intensive Cultural Resources Survey of Petrohawk Energy Corporation's Proposed Wheeler Unit 8 1H Well Pad and Access Road in McMullen County, Texas.* HJN 100148 AR 36. Horizon Environmental Services, Inc. Austin, Texas.
- 2012 *An Intensive Phase I Cultural Resources Survey of Magnolia Midstream Gas Services' Proposed JMD 2-14-15 3H Well Connect ROW, DeSoto Parish, Louisiana.* HJN 110026 AR 22. Horizon Environmental Services, Inc. Austin, Texas.
- 2012 *An Intensive Cultural Resources Survey of Petrohawk Energy Corporation's Proposed Gentry 1H Well Pad and Access Road in McMullen County, Texas.* HJN 100148 AR 37. Horizon Environmental Services, Inc. Austin, Texas.
- 2012 *An Intensive Phase I Cultural Resources Survey of Talco Midstream Assets, Ltd.'s Proposed Owens Extension East Pipeline ROW, DeSoto Parish, Louisiana.* HJN 100048 AR 111. Horizon Environmental Services, Inc. Austin, Texas.
- 2012 *An Intensive Phase I Cultural Resources Survey of the Proposed Caddo Mitigation Bank in DeSoto and Caddo Parishes, Louisiana.* HJN 120008 AR. Horizon Environmental Services, Inc. Austin, Texas.
- 2012 *An Intensive Phase I Cultural Resources Survey of Enterprise Gathering LLC's Proposed CHK Evans 26-10-14 Natural Gas Gathering Line, Sabine Parish, Louisiana.* HJN 110136 AR2 09. Horizon Environmental Services, Inc. Austin, Texas.
- 2012 *An Intensive Phase I Cultural Resources Survey of Enterprise Gathering LLC's Proposed CHK CHK SUMC 30-9-13 Natural Gas Gathering Line, Sabine Parish, Louisiana.* HJN 110136 AR2 10. Horizon Environmental Services, Inc. Austin, Texas.
- 2012 *An Intensive Phase I Cultural Resources Survey of Petrohawk Energy Corporation's Proposed Buckneck et al. 22H No. 1 Well Pad and Access Road in Natchitoches Parish, Louisiana.* HJN 100090 AR2 54. Horizon Environmental Services, Inc. Austin, Texas.
- 2012 *An Intensive Cultural Resources Survey of Petrohawk Energy Corporation's Proposed Gentry 11H and 21H Dual Well Pad and Access Road in McMullen County, Texas.* HJN 100148 AR 38. Horizon Environmental Services, Inc. Austin, Texas.

- 2012 *An Intensive Cultural Resources Survey of Petrohawk Energy Corporation's Proposed Gentry 17H and 23H Dual Well Pad and Access Road in McMullen County, Texas.* HJN 100148 AR 39. Horizon Environmental Services, Inc. Austin, Texas.
- 2012 *An Intensive Cultural Resources Survey of Petrohawk Energy Corporation's Proposed Wheeler McTee 2H Well Pad and Access Road in McMullen County, Texas.* HJN 100148 AR 40. Horizon Environmental Services, Inc. Austin, Texas.
- 2012 *An Intensive Cultural Resources Survey of Petrohawk Energy Corporation's Proposed Wheeler McTee 3H Well Pad and Access Road in McMullen County, Texas.* HJN 100148 AR 41. Horizon Environmental Services, Inc. Austin, Texas.
- 2012 *An Intensive Cultural Resources Survey of Petrohawk Energy Corporation's Proposed Moy A 1H Well Pad and Access Road in Karnes County, Texas.* HJN 100148 AR 42. Horizon Environmental Services, Inc. Austin, Texas.
- 2012 *An Intensive Cultural Resources Survey of Petrohawk Energy Corporation's Proposed Zgabay 2H, 3H, and 4H Triple Well Pad and Access Road in Gonzales County, Texas.* HJN 100148 AR 43. Horizon Environmental Services, Inc. Austin, Texas.
- 2012 *An Intensive Cultural Resources Survey of Petrohawk Energy Corporation's Proposed Musick A 1H and 2H Dual Well Pad and Access Road in DeWitt County, Texas.* HJN 100148 AR 44. Horizon Environmental Services, Inc. Austin, Texas.
- 2012 *An Intensive Cultural Resources Survey of Petrohawk Energy Corporation's Proposed Mueller 18 A 1H Well Pad and Access Road in McMullen County, Texas.* HJN 100148 AR 45. Horizon Environmental Services, Inc. Austin, Texas.
- 2012 *An Intensive Cultural Resources Survey of the Proposed Copano-Houston Central Plant Cryo Expansion Project in Colorado County, Texas.* HJN 110012 AR2 07. Horizon Environmental Services, Inc. Austin, Texas.
- 2012 *An Intensive Cultural Resources Survey of Petrohawk Energy Corporation's Proposed Krause B 5H, 6H, and 7H Well Pad and Access Road in DeWitt County, Texas.* HJN 100090 AR2 57. Horizon Environmental Services, Inc. Austin, Texas.
- 2012 *An Intensive Cultural Resources Survey of Petrohawk Energy Corporation's Proposed Krause B 2H, 3H, and 4H Well Pad and Access Road in DeWitt County, Texas.* HJN 100090 AR2 58. Horizon Environmental Services, Inc. Austin, Texas.
- 2012 *An Intensive Phase I Cultural Resources Survey of Enterprise Gathering LLC's Proposed Comstock Evans 13-9-13 Well Connect, Sabine Parish, Louisiana.* HJN 110136 AR2 18. Horizon Environmental Services, Inc. Austin, Texas.
- 2012 *An Intensive Cultural Resources Survey of Kinder Morgan's Proposed Galena Park Splitter Project in Harris County, Texas.* HJN 110012 AR2 08. Horizon Environmental Services, Inc. Austin, Texas.
- 2012 *An Intensive Cultural Resources Survey of Petrohawk Energy Corporation's Proposed Unit 73B 1H, 2H, 3H, 4H, and Unit 118 1H and 2H Well Pad and Access Road in DeWitt County, Texas.* HJN 100148 AR 46. Horizon Environmental Services, Inc. Austin, Texas.
- 2012 *An Intensive Cultural Resources Survey of BHP Billiton's Proposed Banduch A 1H, B 3H, and B 4H Well Pad Project in Karnes County, Texas.* HJN 100148 AR 47. Horizon Environmental Services, Inc. Austin, Texas.

- 2012 *An Intensive Cultural Resources Survey of BHP Billiton's Proposed Banduch A 2H, A 3H, B 1H, B 2H Well Pad and Access Road in Karnes County, Texas.* HJN 100148 AR 48. Horizon Environmental Services, Inc. Austin, Texas.
- 2012 *An Intensive Cultural Resources Survey of BHP Billiton's Proposed Hauglum C 1H Well Pad and Access Road in Live Oak County, Texas.* HJN 100148 AR 49. Horizon Environmental Services, Inc. Austin, Texas.
- 2012 *An Intensive Cultural Resources Survey of BHP Billiton's Proposed Marie A 2H and 3H Well Pad and Access Road in DeWitt County, Texas.* HJN 100148 AR 50. Horizon Environmental Services, Inc. Austin, Texas.
- 2012 *An Intensive Cultural Resources Survey of BHP Billiton's Proposed House Motherlode Unit 1 1H Well Pad and Access Road in Live Oak County, Texas.* HJN 100148 AR 51. Horizon Environmental Services, Inc. Austin, Texas.
- 2012 *An Intensive Cultural Resources Survey of Petrohawk Energy Corporation's Proposed Robert Gutierrez 3H Well Pad and Access Road in La Salle County, Texas.* HJN 100148 AR 52. Horizon Environmental Services, Inc. Austin, Texas.
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*The State Agency for Historic Preservation*

A handwritten signature in black ink, written over a horizontal line. The signature appears to be "A. Lawrence Cook".

EXECUTIVE DIRECTOR, TEXAS HISTORICAL COMMISSION

*May 7, 2004*

DATE