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A Cultural Resources Survey Of Texas Eastern Transmission LPS Phase 2 And Phase 3 Pipeline Anomaly Repairs On The PETR To TIVO Segment Of Line 16 In Refugio And Aransas Counties, Texas

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HRA Gray & Pape

A CULTURAL RESOURCES SURVEY OF TEXAS EASTERN TRANSMISSION LPs PHASE 2 AND PHASE 3 PIPELINE ANOMALY REPAIRS ON THE PETR TO TIVO SEGMENT OF LINE 16 IN REFUGIO AND ARANSAS COUNTIES, TEXAS

Lead Federal Agency:
U.S. Army Corps of Engineers, Galveston District

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AUGUST 7, 2015

HRA Gray & Pape Project #1034.00 August 7, 2015

A CULTURAL RESOURCES SURVEY OF TEXAS EASTERN TRANSMISSION LPS PHASE 2 AND PHASE 3 PIPELINE ANOMALY REPAIRS ON THE PETR TO TIVO SEGMENT OF LINE 16 IN REFUGIO AND ARANSAS COUNTIES, TEXAS

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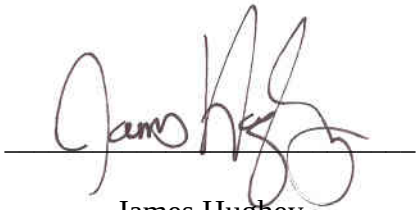


James Hughey
Principal Investigator

ABSTRACT

On behalf of Texas Eastern Transmission, LP and Edge Engineering and Science, LLC., HRA Gray & Pape, LLC, of Houston, Texas, has completed a 100% pedestrian cultural resources survey and limited shovel testing of an estimated 7.84 kilometers (4.87 miles) of linear area in Refugio and Aransas Counties, Texas. Texas Eastern has identified several locations along the PETR to TIVO Segment of Line 16 that require replacement of aging pipe. Two of the areas requiring maintenance work are identified as "Phase 2" and "Phase 3" for which the archaeological survey was completed in May of 2015.

The Lead Federal Agency has been identified as the United States Army Corps of Engineers, Galveston District. Thus the goals of the survey were to determine if land altering activities required to complete this project would affect any previously identified historic properties as defined by Section 106 of the National Historic Preservation Act of 1966, as amended (36 CFR 800), and to establish whether or not previously unidentified cultural resources were located within the project's Area of Potential Effects (Advisory Council for Historic Preservation 2004).

Initial investigation consisted of a background literature and site files search to identify the presence of recorded sites in close proximity to the project area. No previous archaeological linear or area surveys have taken place within the project area. No previously recorded archaeological sites were identified within the project area. The project is located on private property, thus an Antiquities Code of Texas Permit was not required prior to performing fieldwork. All work was conducted following accepted standards set forth by the Texas Historical Commission and the Council of Texas Archeologists.

All 7.84 kilometers (4.87 miles) of the proposed "Phase 2" and "Phase 3" pipeline replacement areas have been investigated. Fieldwork for the workspaces was completed in a single mobilization that took place from May 22 to May 29, 2015, and required 128 person hours to complete. Field investigation was conducted entirely on privately-owned properties and consisted of walkover and shovel testing within the project area. During this investigation, no cultural resources were identified or confirmed within the project's Area of Potential Effects.

Based on the negative findings of the survey, HRA Gray & Pape, LLC. recommends that no further cultural resources work be required for the "Phase 2" and "Phase 3" portions of the project and that the project be allowed to proceed as planned within the surveyed areas.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

1.0 INTRODUCTION

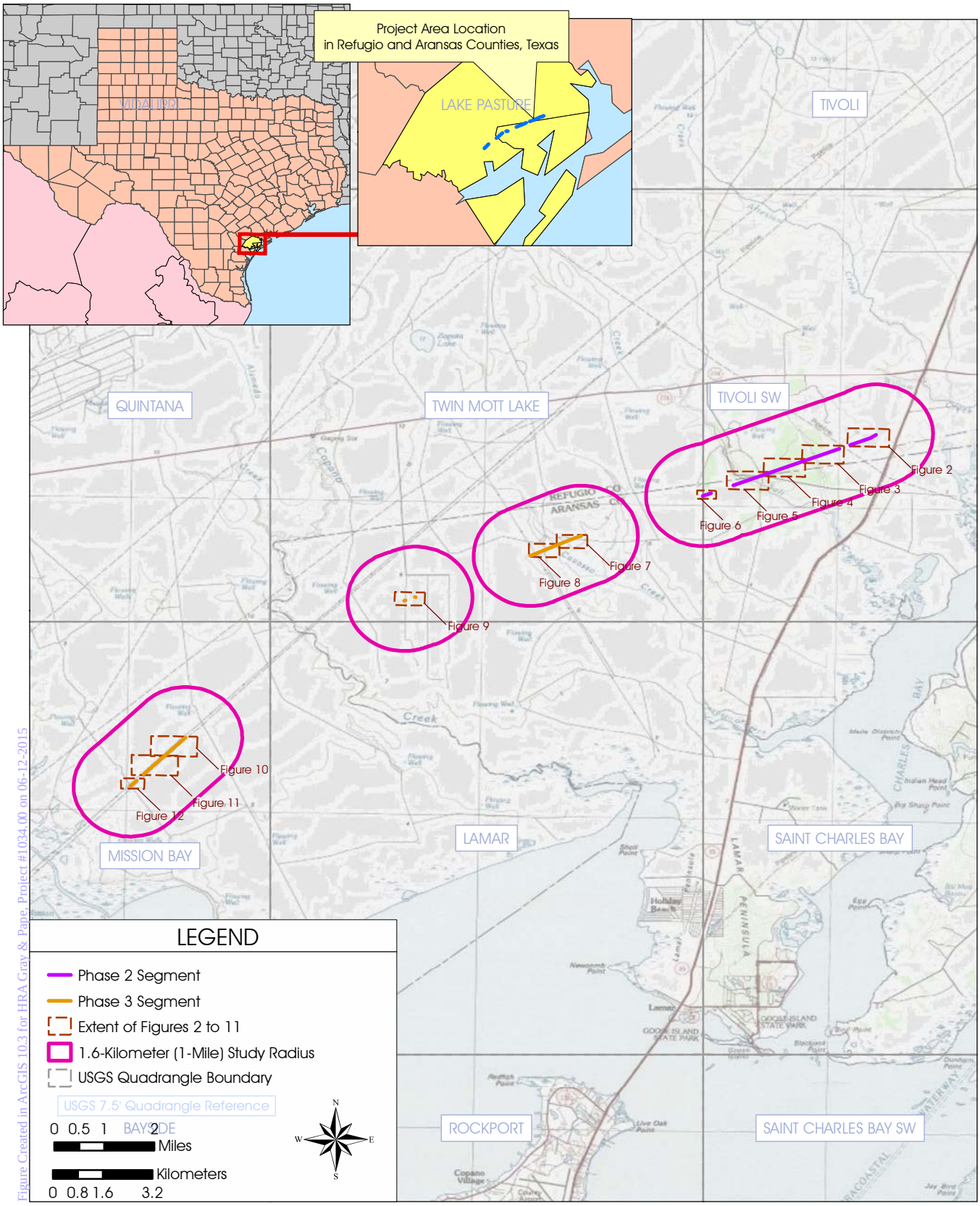
This report presents the results of a cultural resources survey of the "Phase 2" and "Phase 3" areas requiring the replacement of aging pipe on the PETR to TIVO Segment of the existing Line 16 Pipeline Project (Project), conducted by HRA Gray & Pape, LLC. (HRA Gray & Pape) of Houston, Texas on behalf of Edge Engineering and Science, LLC (EDGE) of Houston, Texas, under contract with Texas Eastern Transmission LP, (Texas Eastern).

The Lead Federal Agency has been identified as the United States Army Corps of Engineers (USACE), Galveston District. The procedures to be followed by the USACE to fulfill the requirements set forth in the National Historic Preservation Act (NHPA), other applicable historic preservation laws, and Presidential directives as they relate to the regulatory program of the USACE (33 CFR Parts 320-334) are articulated in the Regulatory Program of the USACE, Part 325 - Processing of Department of the Army Permits, Appendix C - Procedures for the Protection of Historic Properties. All fieldwork and reporting activities were completed with reference to State laws and guidelines (the Antiquities Code of Texas). Survey and site identification followed Texas Antiquities Code standards. The Project is privately funded and entails privately-owned property; therefore, a Texas Antiquities Permit was not required from the Texas Historical Commission (THC) Division of Archeology prior to conducting the archaeological survey.

1.1 Project Area Description

Texas Eastern has identified several locations along the PETR to TIVO Segment of Line 16 that require replacement of aging pipe in Refugio and Aransas Counties, Texas. The proposed replacement sections of the PETR to TIVO Segment are located on the *Lamar* and *Twin Mott Lake* 7.5-minute United States Geological Survey (USGS) topographic quadrangle maps. The existing pipe will be replaced in phases, with those locations requiring immediate attention to be replaced first. The order of construction locations along the PETR to TIVO Segment have been designated Phases 1, 2, and 3. Each phase is composed of multiple short segments proposed for replacement within the longer PETR to TIVO Segment.

Between May 22 and 29, 2015, HRA Gray & Pape completed survey of all "Phase 2" and "Phase 3" areas (Figure 1). As such, this report includes the archaeological survey methods and results for the proposed "Phase 2" and "Phase 3" replacement areas. Surveys of the "Phase 1" area were reported under separate cover (Bludau and Scott 2015). A total of 7.84 kilometers (4.87 miles) of additional temporary workspace within an 8-meter (25-foot) wide survey corridor was subject to 100% intensive pedestrian survey in Refugio and Aransas Counties, Texas. To date, all 7.84 kilometers (4.87 miles) of the "Phase 2" and "Phase 3" portions of the Project have been investigated.



Project Area Location in Refugio and Aransas Counties, Texas

HRA Gray & Pape LLC.

Figure 1

1.3 Organization of the Report

This report is organized into seven numbered chapters. Chapter 1.0 provides an overview of the Project. Chapter 2.0 presents the environmental setting of the area. Chapter 3.0 discusses the cultural history of the region. Chapter 4.0 presents the research design and field methods developed for this survey. The results of research and survey activities are presented in Chapter 5.0. Chapter 6.0 presents the investigation summary and conclusions. A list of professional references cited is provided in Chapter 7.0.

1.4 Acknowledgments

Fieldwork entailed approximately 128 person hours and was conducted in one mobilization by field crews comprised of Archaeological Crew Chiefs Jacob Hilton and Michael Quennoz and Archaeological Field Technician Clay Zdobylak. Fieldwork and reporting were performed under the supervision of Charles E. Bludau, Jr. James Hughey acted as Project Manager. Contents of the report were prepared by Charles E. Bludau, Jr. with contributions from Tony Scott. Tony Scott and Duncan Hughey prepared the report graphics. Jessica Bludau reviewed and edited the report.

2.0 NATURAL SETTING

2.1 Physiography and Geomorphology

The Project APE falls within Western Gulf Coastal Plains ecoregion and within Texas Coastal Prairie Province of the larger Gulf Coastal Plains (University of Texas, Bureau of Economic Geology [UT-BEG] 1996, 2010). This is a low, level to gently sloping region extending from Florida to Mexico. The Texas Coastal Prairie reaches as far north as the Ouachita uplift in Oklahoma, and as far west as the Balcones Escarpment in central Texas. The basic geomorphological characteristics of the Texas coast and associated inland areas resulted from depositional conditions influenced by the combined action of sea level changes from glacial advance in the northern portions of the continent and subsequent down cutting and variations in the sediment load capacity of the region's rivers. Regional Pleistocene formations, such as the Lissie and Beaumont, are the result of these processes (Abbott 2001; Van Siclen 1991).

2.2 Soils

The majority of the soils recorded within the Project APE are clayey or loamy soils with parental material of Pleistocene age fluviomarine deposits or Holocene age alluvium (Table 1). Hydrological conditions of the recorded soils vary based on the locations. Coastal counties crossed by the APE have an abundance of natural resources, with soils being one of them. These soils are generally good for croplands, pastures, and rangelands (Guckian 1988; Guckian and Garcia 1979; Miller 1997, 1982; Mowery and Bower 1978). The table below provides general summery of all the soil types within the Project APE and their characteristics.

Table 1. Soils Recorded within the Project APE.

SYM	Name/Complex	Parental Material	Location	Land Use	Drainage	County
RaA	Raymondville clay loam, 0 to 1 percent slopes	Loamy fluviomarine deposits of Late Pleistocene age	Meander scrolls on coastal plains	Cropland and wildlife habitat	Moderately well drained	Aransas
RaB	Raymondville clay loam, 1 to 3 percent slopes	Loamy fluviomarine deposits of Late Pleistocene age	Meander scrolls on coastal plains	Cropland and wildlife habitat	Moderately well drained	Aransas
Or	Orelia fine sandy loam	Loamy fluviomarine deposits of Pleistocene age	Flats on coastal plains	Cropland, pasture, and wildlife habitat	Poorly drained	Aransas
VcA	Victoria clay, 0 to 1 percent slopes	Clayey fluviomarine deposits of Late Pleistocene age	Gilgai on flats on coastal plains	Cropland	Well drained	Refugio/ Aransas
VcB	Victoria clay, 1 to 3 percent slopes	Loamy fluviomarine deposits of Late Pleistocene age	Gilgai on flats on coastal plains	Cropland	Well drained	Refugio/ Aransas
Vd	Victoria clay, depressional	Clayey over loamy fluviomarine deposits of Late Pleistocene age	Gilgai flats on coastal plains	cropland	Well drained	Aransas
Va	Victine clay	Clayey fluviomarine deposits of Late Pleistocene age	Gilgai on flats on coastal plains	Pasture and wildlife habitat	Poorly drained	Refugio

SYM	Name/Complex	Parental Material	Location	Land Use	Drainage	County
Ec	Edroy clay	Loamy fluviomarine deposits of Late Pleistocene age	Open depressions on coastal plains	Rangeland	Poorly drained	Refugio
Ed	Edroy clay, depressional	Loamy fluviomarine deposits of Late Pleistocene age	Open depressions on Coastal Plains	Rangeland	Poorly drained	Refugio
Na	Narta fine sandy loam	Clayey fluviomarine deposits of Late Pleistocene age	Flats on coastal plains	Rangeland and wildlife habitat	Poorly drained	Refugio
As	Aransas clay, saline	Clayey alluvium of Holocene age	Flood plains on river valleys on coastal plains	Rangeland and wildlife habitat	Poorly drained	Refugio
PaA	Papalote fine sandy loam, 0 to 1 percent slopes	Clayey fluviomarine deposits of Late Pleistocene age	Flats on coastal plains	Cropland and pasture	Moderately well drained	Refugio

2.3 Climate

The Project area is located within an area consisting of a humid subtropical climate subject to coastal weather conditions, which means prevailing southeasterly winds from the Gulf of Mexico generally regulate temperatures and greatly reduce the potential for wild temperature swings. The average high temperature in summer is 96 degrees Fahrenheit (F) and the average low in winter is 46 degrees F. Peak rainfall occurs in September and October and again in the months of April through June (Guckian and Garcia 1979).

2.4 Land Use

The Project area is mostly agricultural fields occasionally intermingled with pasturelands and some wetland type areas. Woods and wetlands are typically located adjacent to waterways and confluences. Portions of some agricultural fields also show the remains of gas well pads (Texas General Land Office [TxGLO] 2015). Typical disturbances within the Project APE include plowed soils, utility lines and previous pipeline construction, utility access roads, county roads, and long-term use as pastureland for livestock. Agricultural activities within the counties associated with the Project area have been dominant since the late-twentieth century (Leffler 2015; Long 2015).

3.0 PREHISTORIC SETTING

3.1 Cultural Periods

Researchers have identified four archaeological time periods associated with Native Americans in south and south central Texas; in general, these include the Paleoindian, Archaic (with Early, Middle, and Late subdivisions), Late Prehistoric, and Historic Indian. The PaleoIndian stage of south Texas has been dated to be between 9,000-6,000 B.C. The Archaic period is believed to have started around 6,000 B.C. and ending sometime around A.D. 800 (Prewitt 1981, 1985; Story 1985; Black 1989). The Late Prehistoric began at the end of the Archaic phase circa 800 A.D. After the Late Prehistoric, the Historic Indian stage began circa 1600 A.D. with the exposure of native populations to European travelers. The chronologies developed by researchers are based primarily on changes in projectile point technologies within the region and the introduction of new technologies. It is generally recognized that a broad-based hunting and gathering lifestyle was utilized throughout all time periods.

3.1.1 Paleoindian Period

Evidence is sparse for Paleoindian habitation; much of what is known about the period in the area comes from a compilation of materials gathered from around the state of Texas and across North America. At the close of the Pleistocene, large game hunters crossed the Bearing Strait, and within a few millennia had penetrated into South America (Culberson 1993; Newcomb 1961). The Paleoindian people traveled in small bands and were mega-fauna hunter-gathers with the bulk of their meat protein derived from mammoths, mastodons, giant bison, and giant sloths (Culberson 1993). In the Texas Gulf Coastal Plains, it is highly likely that these small bands migrated from the plains and prairies to the coastal river bottoms in order to obtain new resources (Campbell 1988; McGraw and Hindes 1987). These groups carried with them an easily recognizable stone tool material culture, though little is known about their wooden or bone tools or their clothing types. Diagnostic points such as fluted Clovis, Folsom, and Plainview points can be used to identify the Paleoindian component of a site and the nature of these points demonstrate the nature of the hunting style. These points are large and designed to be attached to a spear. No evidence of bow and arrow hunting has been found associated with this period (Culberson 1993; Newcomb 1961).

3.1.2 Archaic Period

After the Pleistocene, the Gulf of Mexico started a transgression onto the Texas coast creating estuaries along the shoreline. The formation of these estuaries gave the Archaic people of the Texas coast a strong emphasis on marine resources (Jurgens 1989). This shift in food supply is seen as the pivotal transition point between the Paleo and Archaic periods (Biesaart et al. 1985; Culberson 1993; Newcomb 1961). Within the boundaries of the south Texas coast, Corbin (1974) has termed the Archaic period, the Aransas complex. Most of the material culture recovered from Archaic sites within the south Texas region consists of shell artifacts such as Conch columella gouges, adzes, hammers, and awls. There are three progressive stages recognizable during the Archaic period: the Early, Middle, and Late.

Early Archaic people relied on hunter-gathering subsistence and organized in small, isolated bands that remained in relatively restricted regions (Aten 1984). Many researchers (Black 1989; Prewitt 1981, 1985; Story 1985) believe that the Early Archaic tradition in this area began around 6,000 B.C. and is really a continuation of the Paleoindian lifeway. With the loss of the mega-fauna as a food source, the Early Archaic peoples adopted the hunting of smaller game such as bison and deer and increased their reliance on foraging (Culberson 1993). The material record fits the transitional makeup of this period because there was a dramatic shift from the large spear points of the Paleoindian period to a reliance on smaller "Dart" type points. Diagnostic designs for this period are Dalton, San Patrice, Angostura, Golondrina, Merserve, Scottsbluff, Wells, Hoxie, Gower, Uvalde, Martindale, Bell, Andice, Baird, and Taylor. These points are much more crudely made than their Paleo precursors, but remain designed for use on a spear shaft.

The Middle Archaic is believed have started around 3,000 B.C. (Black 1989; Prewitt 1981, 1985; Story 1985) and has the largest growth in technology and in the number of stone tools utilized. Specialized tools appeared for the milling of wild plant foodstuffs (Culberson 1993) along with a large assortment of tools for food preparation and procurement. Many researchers believe there was an increased reliance on plant resources during the Middle Archaic. Gravers, scrapers, axes and choppers, knives, drills, and polished stone tools also known as ground stone tools, began to appear in large quantities (Newcomb 1961). Diagnostic points such as Gary, Kent, Palmillas, Nolan, Travis, Belvedere, Pedernales, Marshall, Williams, and Lange dominate the spectrum of dart points from the Middle Archaic period (Turner and Hester 1993; see also the Edwards Plateau Aspect [Newcomb 1961]). The advent of the spear-throwing device, the atlatl, also seems to be placed within this period (Culberson 1993).

The Late Archaic period is thought to have begun around 400 B.C. (Prewitt 1981, 1985; Story 1985; Black 1989) at which time there is a dramatic increase in the population densities of Native American groups. Human habitation of areas rich in diverse flora and fauna intensified, as did the variety of materials and artifacts (Culberson 1993; Aten 1984). Late Archaic peoples began relying heavily on foraging tubers, berries, and nuts and hunting small game such as deer, rabbits, raccoons, fish and shellfish, and birds. Groups became socially more complex than earlier periods and the result was an increasing intercommunication with neighboring groups. Culberson (1993:55) states that a "Lapidary Industry" developed in which stone artifacts were made from exotic materials (jasper, hematite, quartz, shale, slate, etc.) acquired from sources great distances away. These materials were fashioned into an increasingly complex array of household goods such as celts, plummets, banner stones, mortars and pestles, and pendants; also during this period, there is an increase in the occurrence of sandstone bowls (Culberson 1993). Diagnostic points of this period are difficult to distinguish from those of the Middle Archaic. Points such as Marcos, Montell, San Gabriel, Mahomet, Fairland, and Castroville also appear at times.

3.1.3 Late Prehistoric Period

The Late Prehistoric continues from the end of the Archaic period (circa 800 A.D.) to the Historic period (circa 1500 A.D.) ushered in by the Spanish Missions and Anglo-American settlers. During the Late Prehistoric period in south Texas, two cultural complexes appear to have existed. The first complex, located further east on the coast, is characterized by ceramics

that appear similar to the Goose Creek ceramics found farther north (Jurgens 1989; Ricklis 2004). The second and later complex has been called the Rockport complex, and has been associated with the Karankawa groups (Newcomb 1961; Ricklis 2004).

Within south Texas there were two dominate cultural groups that extended south of Galveston Bay down to the Rio Grande and as far west as present-day San Antonio. The coastal group was known as the Karankawas and the inland group was known as the Coahuiltecans (Ricklis 1996). The Karankawas, whose language is in the Hokan group, occupied an area that extended from Galveston Bay southwestward as far as the present site of Corpus Christi Bay (Aten 1984). As described by Newcomb (1961:59), seven proper names are associated with the culture. Researchers subdivide these names into five distinct groups based on geography. The Capoques and the Hans lived in the area between Galveston Bay and the Brazos River. The Kohanis lived south of the Capoques and the Hans at the mouth of the Colorado River. The Karankawa proper (which included the Korenkake, Clamcoets, and Carancaguacas) lived in the region of Matagorda Bay. Along Copano Bay and St. Joseph Island were the Kopanos (Newcomb 1961).

In the seventeenth and eighteenth centuries, the Spanish and French relied heavily on interaction with Native American groups in the area to further their own interests (Newcomb 1961). Most destructive for all native groups in the region was the influx of European diseases. When Euro-American settlers began moving into the area in mass around the 1850s, disease and warfare had decimated the groups to near extinction.

3.1.4 Historic Period

The earliest European thought to have explored Aransas Bay was Alonzo Alvarez de Pineda, who sailed along the Texas gulf coast in 1519. A few years later, Spanish explorer Alvar Nunez Cabeza de Vaca was shipwrecked on the coast. Some historians believe that he and his crew may have crossed through Aransas County. It wasn't until the French established a colony in the area that the Spanish interest began to grow (Long 2015).

In the seventeenth and eighteenth centuries, the Spanish and French used the Native American groups as pawns in the two nations' quest to settle the area (Newcomb 1961). Most destructive for all native groups in the region was the influx of European diseases. When Anglo-American settlers began moving into the area in mass around the 1850s, disease and warfare had brought the groups close to extinction.

By the late 1700s, a port of entry and customhouse was established. The port served as a landing point for hundreds of settlers, although most colonists moved further inland and the coast remained mostly unsettled until the mid-1800s (Long 2015). After Texas independence, the area became part of Refugio County. In 1832, Aransas City was founded. Comanche and Karankawa Indians raided the town on several occasions, as did Mexican bandits.

At the same time that Aransas City was developing, the town of Lamar was established. As a result, the first president of Texas, Mirabeau Lamar ordered the customhouse moved to Lamar, and Refugio was declared the county seat. As a result, Aransas City began to decline and by 1846 was nonexistent (Long 2015). After the revolution, cattlemen and sailors

developed the community of Aransas on the south end of St. Joseph's Island, a prosperous port prior to the Civil War.

During the Civil War, the area was used for many engagements between the Union and Confederate troops. In 1862, a Union ship called the *USS Afton* docked at St. Joseph's Island and destroyed the town of Aransas. Despite the disruption of the area caused by the Civil War, the future Aransas County was quickly rebuilt, including the town of Lamar (Long 2015).

Due to great success of cattle ranching in the newly established city of Rockport, the community became the new county seat of Refugio County. In 1871, legislature voted to divide Refugio County, and on September 18th, the County of modern-day Aransas was born and Rockport became the county seat. In 1888, the San Antonio and Aransas Pass Railroad reached Rockport and thus cemented the city's prosperity by making it an important shipping center. A new county courthouse was built in 1889 and by 1900 the county had seven post offices and six public schools. In 1919, the area was devastated by a powerful hurricane and much of Rockport was destroyed. The first half of the twentieth century resulted in the introduction of two emerging industries, fishing and ship-building. By 1950, the shrimping industry produced 51 million pounds of shrimp. The ship-building industry flourished during World War I (Long 2015).

4.0 METHODOLOGY

4.1 Site File and Literature Review

The site file research and literature review was performed in order to identify all previously recorded archaeological sites and previous investigations within a 1.6-kilometer (1-mile) radius of the Project APE (Figure 1). This work was conducted by reviewing online data available on the Texas Archeological Sites Atlas, an online resource maintained by the THC, as well as an online database of the National Register of Historic Places (NRHP) (NRHP 2015; THC 2015). This work was used to provide a historic context to the archaeological survey.

Literature review was conducted in order to provide an understanding of the development and history of the Project APE and the surrounding area in general. This research then was used to prepare an overview history of the region and provide an understanding of the contextual framework of the prehistory and history of the area. A large number and variety of historic maps were consulted as part of this historical research. These included historic maps maintained by TxGLO (2015) and historic topographic maps provided by Perry-Castañeda Map Collection (2015) maintained by The University of Texas at Austin.

4.2 Field Methods

The archaeological investigation was designed to define all sites, prehistoric and historic, within the defined boundaries for the Project. In addition to site identification, the investigation also must provide sufficient data to determine whether or not additional investigations will be required to evaluate fully the potential eligibility of any newly defined site location for inclusion on the NRHP or as a State Antiquities Landmark.

Archaeological survey methods utilized during the survey consisted of shovel testing, photo-documentation, and pedestrian reconnaissance. Horizontal control was maintained by the use of a Global Positioning System (GPS) data collector. All actions performed, the general observations of the surveyor, and the results of survey actions were recorded on a shovel test form.

4.2.1 Pedestrian Reconnaissance Survey

Survey activities were designed to assess the potential impact that proposed construction might have on cultural resources located within the Project APE. Survey efforts were conducted along a single transect on all three segments of the “Phase 2” area identified as Segments 2, 3, and 4 and on all 5 segments of the “Phase 3” area identified as Segments 7, 12, 13, 21, and 22. Survey was conducted within an 8-meter (25-foot) wide corridor proposed for use as additional temporary workspace along the northern side of the existing Line 16 right-of-way. Testing intervals were spaced at 30 meters (98 feet) within high potential areas and 90-meter (295-foot) intervals along the rest of the Project APE.

Shovel tests were approximately 30 centimeters (12 inches) in diameter and excavated to a maximum of 100 centimeters (39 inches) in depth or until culturally sterile subsoil was reached. When possible, all sediment was screened through 0.64-centimeter (0.25-inch) wire mesh; clay soils required hand sorting. Descriptions of soil texture and color followed standard terminology and the Munsell (2005) soil color charts. Any historic and archaeological features noted during the pedestrian walkover, subsurface test, and surface finds were to be recorded with a GPS and drawn on the field maps additionally provided to the survey crew. As preliminary Project plans did not include plans for deep impacts, deep testing was not performed as part of field investigations.

If historic standing structures within or immediately adjacent to the Project areas had been located, each would have been photographed during the survey and their locations plotted on field maps with GPS points collected. General characteristics of each resource would have been documented on standardized forms.

4.2.2 Site Definition

If artifacts were located, additional shovel tests would have been excavated at 10-meter (30-foot) intervals in an effort to define site boundaries and to determine the integrity of surface and subsurface deposits. Two consecutive negative shovel tests excavated in cardinal directions would have been used to determine site boundaries. For each resource identified, photographs would have been taken of the general vicinity and of any visible features. A sketch map would have been prepared, showing site limits, feature locations, permanent landmarks, topographic and vegetational variation, sources of disturbance, and all shovel test locations.

5.0 RESULTS OF INVESTIGATIONS

The primary purposes of this investigation were to: 1) determine if any previously identified cultural resources or eligible or listed NRHP properties were located within a 1.6-kilometer (1-mile) radius of the Project area; 2) determine if any previous cultural resource investigations had been conducted in or near the Project APE; 3) determine whether or not any previously unidentified and intact cultural resources were present within the Project area by conducting an intensive pedestrian survey; and 4) provide management recommendations based on the research and survey activities.

5.1 Results of Site File Research

Research activities, including a site file research and a review of available historic maps, were initiated in May of 2015. The site file research revealed that no previously recorded archaeological sites, historic markers, or National Register properties have been identified within the current Project area, nor have any previous archaeological surveys been performed within the Project area. Additionally, no previously recorded archaeological sites, historic markers, National Register properties or any previous archaeological surveys been performed within a 1.6-kilometer (1-mile) radius of the Project area (Figure 1).

5.2 Results of Field Investigations

Fieldwork was completed in one mobilization in May of 2015 and required 128 person hours to complete. A total of three segments of the "Phase 2" area identified as Segments 2, 3, and 4 as well as five segments of the "Phase 3" area identified as Segments 7, 12, 13, 21, and 22, were surveyed, resulting in a total of 85 shovel tests, 17 of which were not excavated do to water inundation. In general, shovel testing was intensified around ephemeral streams within Segments 3 and 7. Overall, observed soils were similar to those mapped for the area. All shovel tests were negative for cultural resources.

5.2.1 "Phase 2" Segment 2

Segment 2 is 0.81 kilometers (0.5 miles) in length. The entire length was surveyed. A total of eight shovel tests were excavated within "Phase 2" Segment 2 along a single transect (Figure 2). Five shovel tests were not excavated due to water inundation associated with a freshwater emergent wetland. Segment 2 consists primarily of grasses and mesquite trees, with grasses dominating in wetland areas (Figure 2; Photo 1). All shovel tests were excavated to culturally sterile soil horizons encountered at depths between 40 and 55 centimeters (15 and 22 inches) below the surface or when the water table was exposed. A typical soil recorded within Segment 2 was composed of a dark gray (10YR4/1) wet clay loam from the surface to a depth of 25 centimeters (10 inches) followed by a gray (10YR5/1) clay with calcium carbonate inclusions. All shovel tests were negative for cultural resources and no intact structures of historic-age were observed within or immediately adjacent to the APE. Typical disturbances observed within Segment 2 include equipment traffic, previous utility line and pipeline construction, roads, and long-term livestock use.

Figure Created in ArcGIS 10.3 for HRA Gray & Pape, LLC. Project #1034.00 on 06/01/2015.

1. Project overview of field conditions of Shovel Test 3. View is to the south.

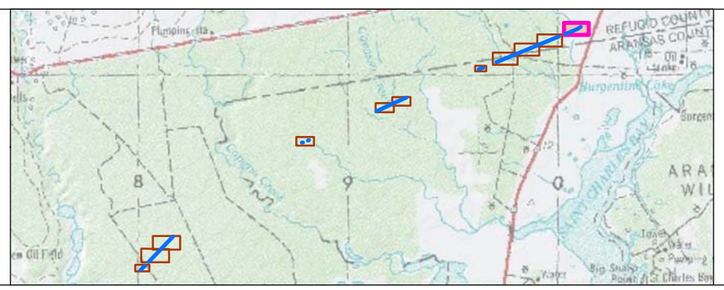
Phase 2 Survey Line
Phase 3 Survey Line
Survey Start Point
Survey Stop Point

Shovel Test Result
Negative
Unexcavated

Photo Location and Bearing
Stream
Wetland

0 50 100 Meters
0 100 200 Feet

N W E S



PETR to TIVO “Phase 2”, Segment 2 Field Results and Representative Photograph

Figure 2

HRA Gray & Pape LLC.

5.2.2 “Phase 2” Segment 3

Segment 3 is 3.22 kilometers (2 miles) in length. The entire length was surveyed. A total of 35 shovel tests were excavated within “Phase 2” Segment 3 along a single transect (Figures 3, 4 and 5). One shovel test was not excavated due to water inundation. Segment 3 consists primarily of grasses and mesquite trees (Figure 3; Photo 2). All shovel tests were excavated to culturally sterile soil horizons encountered at depths between 50 and 70 centimeters (20 and 28 inches) below the surface or when the water table was exposed. A typical soil recorded within Segment 3 was composed of very dark gray (2.5Y4/1) wet clay loam from the surface to a depth of 60 centimeters (24 inches). All shovel tests were negative for cultural resources and no intact structures of historic-age were observed within or immediately adjacent to the APE. Typical disturbances observed within Segment 3 include equipment traffic, previous utility line and pipeline construction, roads, and long-term livestock use.

5.2.3 “Phase 2” Segment 4

Segment 4 is 0.24 kilometers (0.15 miles) in length. The entire length was surveyed. A total of three shovel tests were excavated within “Phase 2” Segment 4 along a single transect (Figure 6). Segment 4 consists primarily of grasses and mesquite trees (Figure 6; Photo 3). All shovel tests were excavated to culturally sterile soil horizons encountered at depths between 50 and 70 centimeters (20 and 28 inches) below the surface or when the water table was exposed. A typical soil recorded within Segment 4 was composed of black (Gley1 2.5/N) clay from the surface to a depth of 60 centimeters (24 inches). All shovel tests were negative for cultural resources and no intact structures of historic-age were observed within or immediately adjacent to the APE. Typical disturbances observed within Segment 4 include farming activities, equipment traffic, previous utility line and pipeline construction, and long-term livestock use.

5.2.4 “Phase 3” Segment 7

Segment 7 is 1.58 kilometers (0.98 miles) in length. The entire length was surveyed. A total of 17 shovel tests were excavated within “Phase 3” Segment 7 along a single transect (Figures 7 and 8). One shovel test was not excavated due to being inundated by water. Segment 7 consists primarily of grasses and mesquite trees and is crossed by an unnamed service road as well as Cavasso Creek (Figures 7; Photo 4). All shovel tests were excavated to culturally sterile soil horizons encountered at depths between 50 and 70 centimeters (20 and 28 inches) below the surface or when the water table was exposed. A typical soil recorded within Segment 7 was composed of dark gray (10YR4/1) clay loam from the surface to a depth of 60 centimeters (24 inches). All shovel tests were negative for cultural resources and no intact structures of historic-age were observed within or immediately adjacent to the APE. Typical disturbances observed within Segment 7 include farming activities, equipment traffic, previous utility line and pipeline construction, roads, and long-term livestock use.

5.2.5 “Phase 3” Segment 12

Segment 12 is 27.7 meters (90.9 feet) in length. The entire length was surveyed and one shovel test was excavated within the segment (Figure 9). Segment 12 consists of live oak trees

Figure Created in ArcGIS 10.3 for HRA Gray & Pape, LLC. Project #1034.00 on 06/01/2015.

2. Project overview of field conditions at start of segment. View is to the west.

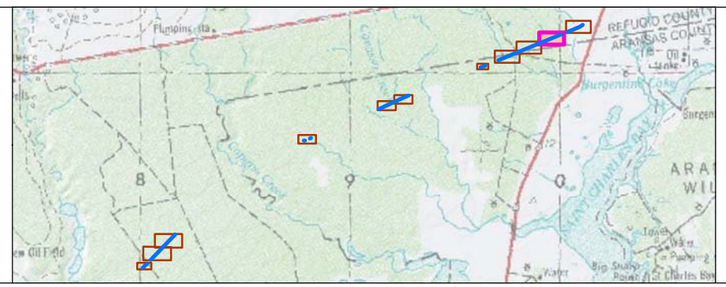
Phase 2 Survey Line
Phase 3 Survey Line
Survey Start Point
Survey Stop Point

Shovel Test Result
Negative
Unexcavated

Photo Location and Bearing
Stream
Wetland

0 50 100 Meters
0 100 200 Feet

N
W E
S



PETR to TIVO “Phase 2”, Segment 3 Field Results and Representative Photograph

Figure 3

HRA Gray & Pape LLC.

Figure Created in ArcGIS 10.3 for HRA Gray & Pape, LLC. Project #1034.00 on 06/01/2015.

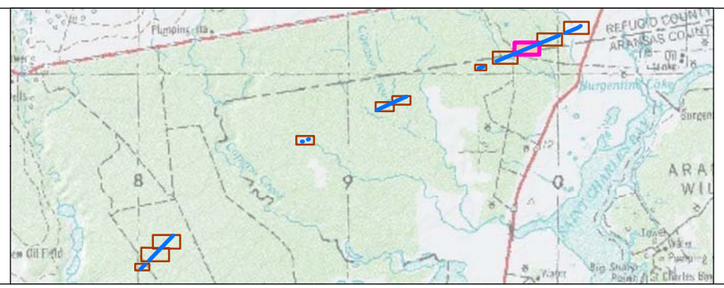
Phase 2 Survey Line
Phase 3 Survey Line
Survey Start Point
Survey Stop Point

Shovel Test Result
Negative
Unexcavated

Photo Location and Bearing
Stream
Wetland

0 50 100 Meters
0 100 200 Feet

N
W E
S

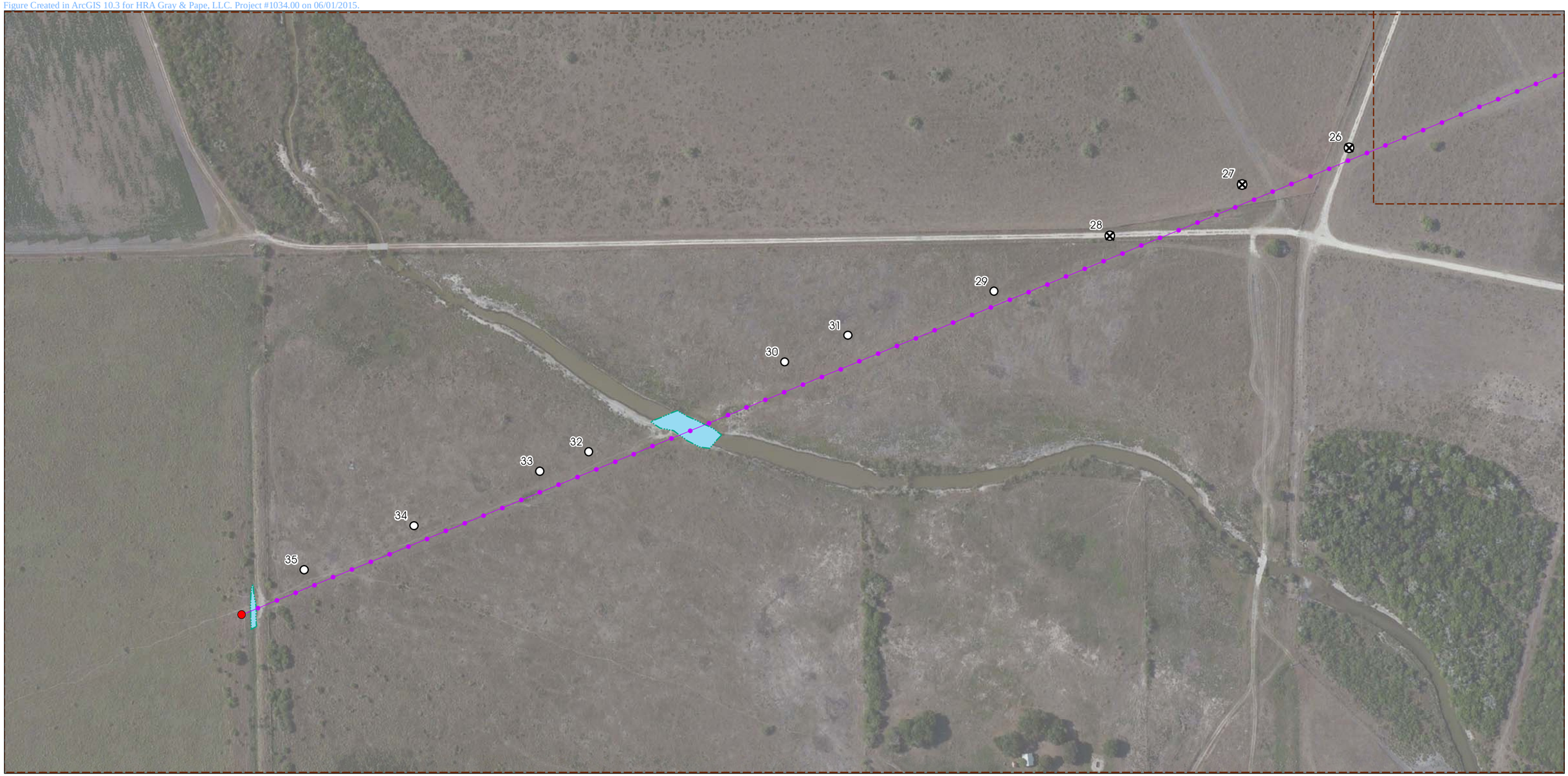


PETR to TIVO “Phase 2”, Segment 3 Field Results

Figure 4

HRA Gray & Pape LLC.

Figure Created in ArcGIS 10.3 for HRA Gray & Pape, LLC. Project #1034.00 on 06/01/2015.



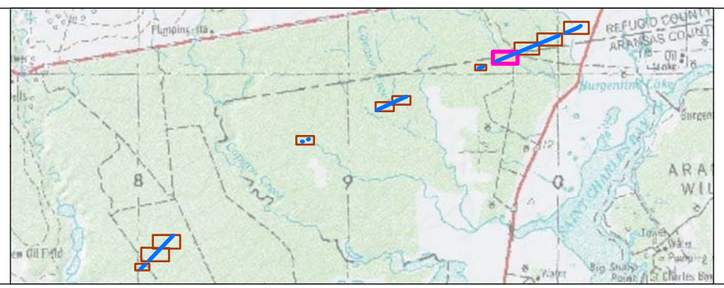
Phase 2 Survey Line
Phase 3 Survey Line
Survey Start Point
Survey Stop Point

Shovel Test Result
Negative
Unexcavated

Photo Location and Bearing
Stream
Wetland

0 50 100 Meters
0 100 200 Feet

N W E S



PETR to TIVO “Phase 2”, Segment 3 Field Results

Figure 5

HRA Gray & Pape LLC.

Figure Created in ArcGIS 10.3 for HRA Gray & Pape, LLC. Project #1034.00 on 06/01/2015.

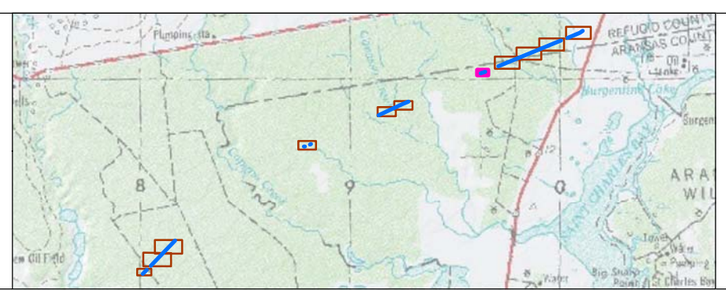
3. Project overview of field conditions at start of segment. View is to the southwest

Phase 2 Survey Line
Phase 3 Survey Line
Survey Start Point
Survey Stop Point

Shovel Test Result
Negative
Unexcavated

Photo Location and Bearing
Stream
Wetland

0 50 100 Meters
0 100 200 Feet



PETR to TIVO “Phase 2”, Segment 4 Field Results and Representative Photograph

Figure 6

HRA Gray & Pape LLC.

Figure Created in ArcGIS 10.3 for HRA Gray & Pape, LLC. Project #1034.00 on 06/01/2015.

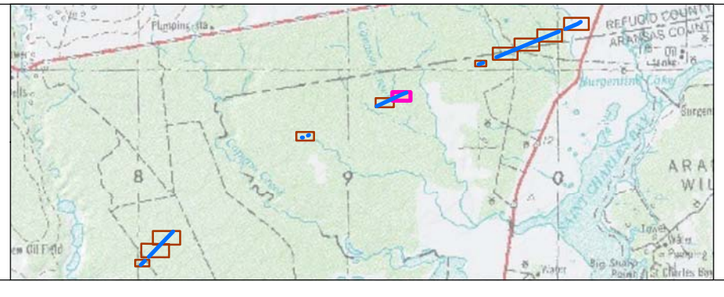
Phase 2 Survey Line
Phase 3 Survey Line
Survey Start Point
Survey Stop Point

Shovel Test Result
Negative
Unexcavated

Photo Location and Bearing
Stream
Wetland

0 50 100 Meters
0 100 200 Feet

N W E S



PETR to TIVO “Phase 3”, Segment 7 Field Results

Figure 7

HRA Gray & Pape LLC.

Figure Created in ArcGIS 10.3 for HRA Gray & Pape, LLC. Project #1034.00 on 06/01/2015.

4. Project overview of field conditions near Covasso Creek. View is to the northeast.

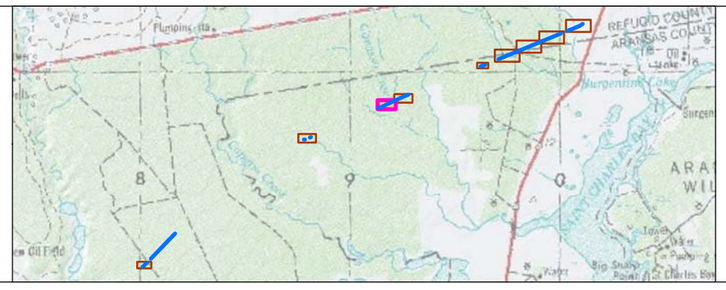
Phase 2 Survey Line
Phase 3 Survey Line
Survey Start Point
Survey Stop Point

Shovel Test Result
Negative
Unexcavated

Photo Location and Bearing
Stream
Wetland

0 50 100 Meters
0 100 200 Feet

N W E S



PETR to TIVO "Phase 3", Segment 7 Field Results and Representative Photograph

Figure 8

HRA Gray & Pape LLC.

Figure Created in ArcGIS 10.3 for HRA Gray & Pape, LLC. Project #1034.00 on 06/01/2015.

5. Project overview of field conditions at end of segment. View is to the east.

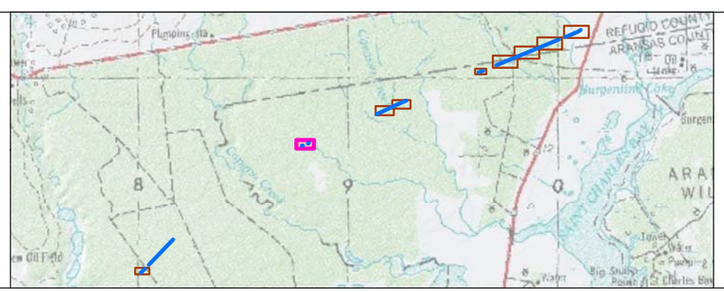
Phase 2 Survey Line
Phase 3 Survey Line
Survey Start Point
Survey Stop Point

Shovel Test Result
Negative
Unexcavated

Photo Location and Bearing
Stream
Wetland

0 50 100 Meters
0 100 200 Feet

N W E S



PETR to TIVO "Phase 3", Segments 12 and 13 Field Results and Representative Photograph

Figure 9

HRA Gray & Pape LLC.

and grasses (Figure 9; Photo 5). There is a nearby marsh extending to the north and west. The shovel test was excavated to the culturally sterile horizon encountered at 30 centimeters (11.8 inches) below the surface. The soil was a dark gray (10YR4/1) very wet clay mottled with a gray (10YR5/1) clay to a depth of 30 centimeters (11.8 inches). The shovel test was negative for cultural resources and no intact structures of historic-age were observed within or immediately adjacent to the APE. Observed disturbances were from previous pipeline construction and equipment traffic.

5.2.6 "Phase 3" Segment 13

Segment 13 is 42.8 meters (140.4 feet) in length. The entire length was surveyed and one shovel test was excavated within the segment (Figure 9). Segment 13 consists of thick stands of mesquite as well as grasses (Figure 9). There is a power line corridor that crosses the segment as does Windsor Road. A single shovel test was excavated to 85 centimeters (33.5 inches) below the surface. The soil was a very dark gray (10YR3/1) clay to a depth of 85 centimeters (33.5 inches). The shovel test was negative for cultural resources and no intact structures of historic-age were observed within or immediately adjacent to the APE. Observed disturbances included farming activities, equipment traffic, previous utility line and pipeline construction.

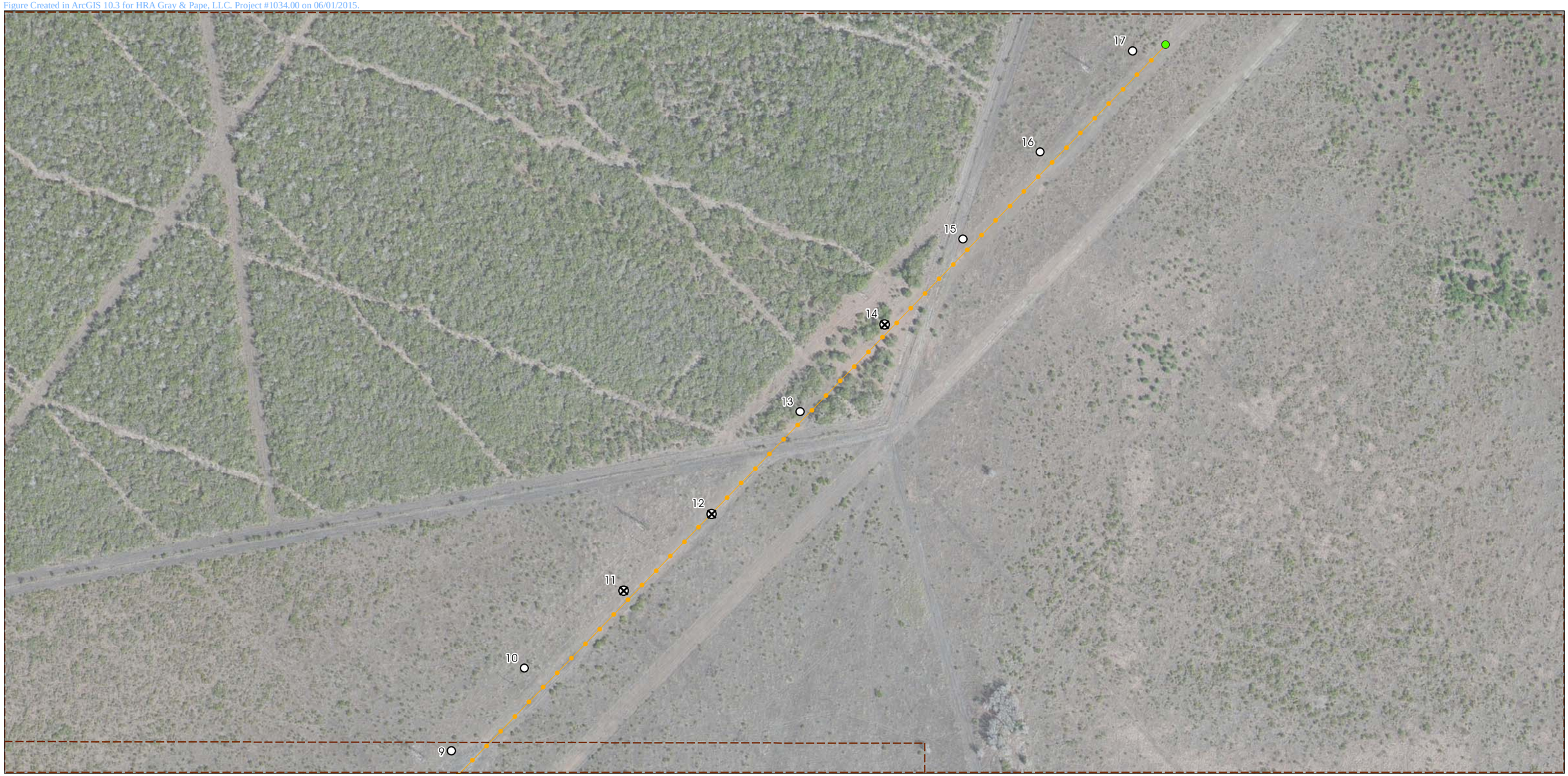
5.2.7 "Phase 3" Segment 21

Segment 21 is 1.6 kilometers (1.0 mile) in length. The entire length was surveyed. A total of 17 shovel tests were excavated within "Phase 3" Segment 21 along a single transect (Figures 10 and 11). Six shovel tests were not excavated due to being inundated by water. Segment 21 consists primarily of grasses and mesquite trees (Figures 10; Photo 6). All shovel tests were excavated to culturally sterile soil horizons encountered at depths between 50 and 60 centimeters (20 and 24 inches) below the surface or when the water table was exposed. A typical soil recorded within Segment 21 was composed of dark gray (10YR4/1) clay loam from the surface to a depth of 60 centimeters (24 inches). All shovel tests were negative for cultural resources and no intact structures of historic-age were observed within or immediately adjacent to the APE. Typical disturbances observed within Segment 21 include farming activities, equipment traffic, previous utility line and pipeline construction, roads, and long-term livestock use.

5.2.8 "Phase 3" Segment 22

Segment 22 is 260 meters (853 feet) in length. The entire length was surveyed. A total of three shovel tests were attempted within Segment 22 but all three were not excavated due to being inundated by water. Segment 22 consists primarily of tall grasses and sparse mesquite and is partially covered by a freshwater emergent wetland (Figure 12; Photo 7). Photos and GPS points were taken at each attempted shovel test location. No intact structures of historic-age were observed within or immediately adjacent to the APE. Typical disturbances observed within Segment 22 include farming activities, equipment traffic, previous utility line and pipeline construction, and roads.

Figure Created in ArcGIS 10.3 for HRA Gray & Pape, LLC. Project #1034.00 on 06/01/2015.



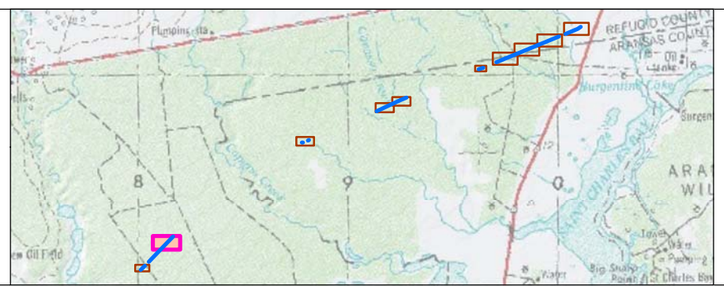
Phase 2 Survey Line
Phase 3 Survey Line
Survey Start Point
Survey Stop Point

Shovel Test Result
Negative
Unexcavated

Photo Location and Bearing
Stream
Wetland

0 50 100 Meters
0 100 200 Feet

N W E S



PETR to TIVO Phase 3, Segment 21 Field Results

Figure 10

HRA Gray & Pape LLC.

Figure Created in ArcGIS 10.3 for HRA Gray & Pape, LLC. Project #1034.00 on 06/01/2015.

6. Project overview of field conditions at end of segment. View is to the southwest.

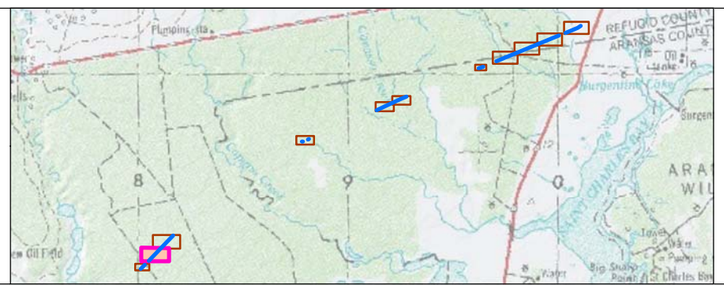
Phase 2 Survey Line
Phase 3 Survey Line
Survey Start Point
Survey Stop Point

Shovel Test Result
Negative
Unexcavated

Photo Location and Bearing
Stream
Wetland

0 50 100 Meters
0 100 200 Feet

N
W E
S



PETR to TIVO Phase 3, Segment 21 Field Results and Representative Photograph

Figure 11

HRA Gray & Pape LLC.

Figure Created in ArcGIS 10.3 for HRA Gray & Pape, LLC. Project #1034.00 on 06/01/2015.

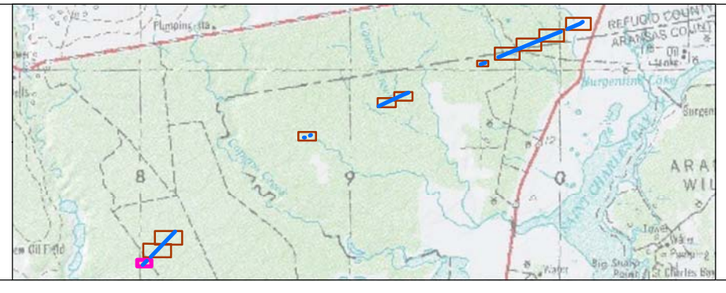
7. Project overview of flooded field conditions throughout segment. View is to the north.

Phase 2 Survey Line
Phase 3 Survey Line
Survey Start Point
Survey Stop Point

Shovel Test Result
Negative
Unexcavated

Photo Location and Bearing
Stream
Wetland

0 50 100 Meters
0 100 200 Feet



PETR to TIVO Phase 3, Segment 22 Field Results and Representative Photograph

Figure 12

HRA Gray & Pape LLC.

6.0 CONCLUSIONS AND RECOMMENDATIONS

On behalf of EDGE, under contract with Texas Eastern, this report presents the findings of an archaeological background literary review and a pedestrian cultural resources survey for an estimated 7.84 kilometers (4.87 miles) of proposed Texas Eastern pipeline workspaces located in Refugio and Aransas Counties, Texas. The Lead Federal Agency has been identified as the USACE, Galveston District.

Prior to fieldwork, initial investigation consisted of a background literature and site file search to identify the presence of previously recorded sites within a 1.6-kilometer (1-mile) radius of the Project area. The site file research revealed that no previously recorded archaeological sites, historic markers, or National Register properties have been identified within the current Project area, nor have any previous archaeological surveys been performed within the Project area. Additionally, no previously recorded archaeological sites, historic markers, National Register properties or any previous archaeological surveys been performed within a 1.6-kilometer (1-mile) radius of the Project area.

The survey corridor consisted mostly of agricultural fields. Field methodology consisted of a 100% intensive pedestrian reconnaissance survey coverage with shovel testing within the APE. Fieldwork was conducted within one mobilization in May 2015. A total of 85 shovel tests were attempted within the “Phase 2” and “Phase 3” pipeline replacement areas. Of those, 19 were not excavated do to standing water or road disturbance. All shovel tests were negative for cultural resources and no intact structures of historic-age were observed within or immediately adjacent to the APE.

Based on the results of the survey, HRA Gray & Pape recommends that no further cultural resources work be required within the areas that were surveyed. Should Project plans change or additional details become available that indicate the need for additional survey, HRA Gray & Pape will continue agency coordination.

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