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An Intensive Pedestrian Survey For A 143-Acre Development And Outfall Project Near Pederson Road And Williow Fork In Waller And Fort Bend Counties, Texas

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HRA Gray & Pape

AN INTENSIVE PEDESTRIAN SURVEY FOR A 143-ACRE DEVELOPMENT AND OUTFALL PROJECT NEAR PEDERSON ROAD AND WILLOW FORK IN WALLER AND FORT BEND COUNTIES, TEXAS

Lead Federal Agency:
United States Army Corps of Engineers (USACE), Galveston District

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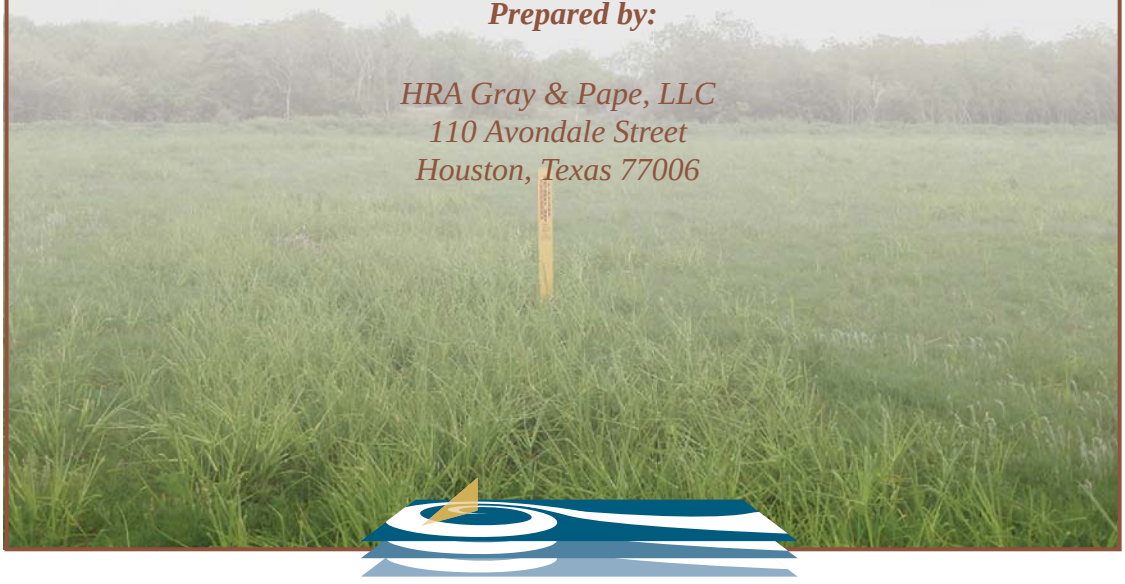

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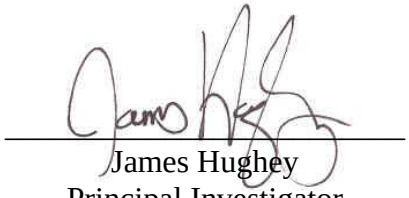

James Hughey
Principal Investigator

ABSTRACT

HRA Gray & Pape, LLC., of Houston, Texas, conducted an intensive pedestrian cultural resources survey of approximately 58 hectares (143 acres) of property proposed for development as well as 2 outfalls in Waller and Fort Bend Counties, Texas. The United States Army Corps of Engineers has been identified as the Lead Agency for this Project.

The goals of the survey were to determine if the Project would affect any previously identified archaeological sites 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 buried archaeological resources were located within the Project's Area of Potential Effects. The procedures to be followed by the United States Army Corps of Engineers to fulfill the requirements set forth in the National Historic Preservation Act, other applicable historic preservation laws, and Presidential directives as they relate to the regulatory program of the United States Army Corps of Engineers (33 CFR Parts 320-334) are articulated in the Regulatory Program of the United States Army Corps of Engineers, Part 325 - Processing of Department of the Army Permits, Appendix C - Procedures for the Protection of Historic Properties. All fieldwork and reporting activities were completed with reference to state (the Antiquities Code of Texas) and federal (National Historic Preservation Act) guidelines. Survey and site identification followed Texas Antiquities Code standards. The Project area includes private property; therefore, a Texas Antiquities Permit was not required.

The property boundary for this Project is approximately 58 hectares (143 acres) and includes 2 outfalls. This defines the Area of Potential Effects. Field investigation consisted of visual inspection, subsurface shovel testing and supplemental deep testing. Subsurface investigation resulted in the excavation of 130 shovel tests and 9 manual bucket auger tests. All were negative for archaeological deposits and no intact structures of historic-age were observed within or immediately adjacent to the Area of Potential Effects. Based on the negative results of the archaeological investigation, HRA Gray & Pape, LLC. recommends no further archaeological work for this Project.

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1.0 INTRODUCTION

In March of 2015, Berg-Oliver Associates, Inc., of Houston, Texas contracted with HRA Gray & Pape, LLC (HRA Gray & Pape), of Houston, Texas, to perform an intensive pedestrian cultural resources survey of property proposed for development in Fort Bend and Waller Counties, Texas. The Lead Federal Agency for this Project has been identified as United States Army Corps of Engineers (USACE), Galveston District. The goals of the survey were to determine if the Project would affect any previously identified archaeological sites as defined by Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended (36 CFR 800), and to establish whether or not previously unidentified buried archaeological resources were located within the Project's Area of Potential Effects (APE). The property boundary for this Project is approximately 58 hectares (143 acres) in addition 2 outfalls (the Project). No Texas Antiquities Permit was required as all survey work was completed on privately owned property. All fieldwork and reporting activities were completed with reference to state (the Antiquities Code of Texas) and federal (NHPA) guidelines.

1.1 APE Description

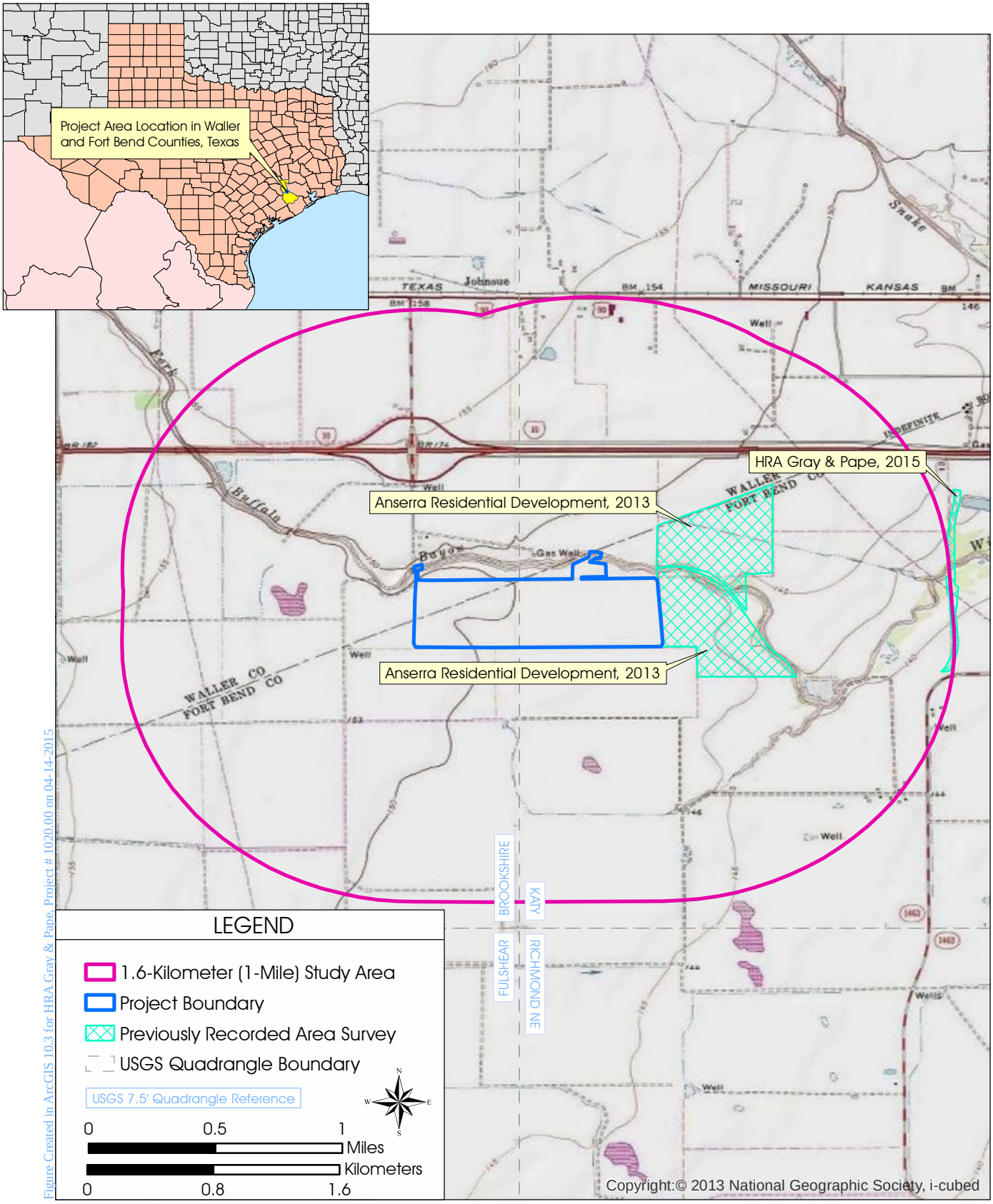
The APE can be located on the *Brookshire* and *Katy, Texas* United States Geological Survey (USGS) 7.5-minute topographic quadrangle map, located south of Interstate 10 and east of Pederson Road in Fort Bend and Waller Counties, Texas (Figure 1). Willow Fork is located north of the Project area. According to historical aerials, the majority of the Project area has been for agricultural purposes. Sometime between 1953 and 1958 Willow Fork was channelized (Google Earth 2015). The Project will include approximately 58 hectares (143 acres) proposed for development as well as 2 outfalls.

1.2 Organization of the Report

This report is organized into 7 numbered chapters. Chapter 1.0 provides an overview of the Project. Chapter 2.0 presents an overview of the environmental setting and geomorphology. Chapter 3.0 presents a discussion of the cultural context associated with the APE. Chapter 4.0 presents the research design and methods developed for this investigation. The results of this investigation are presented in Chapter 5.0. Chapter 6.0 presents the investigation summary and provides recommendations based on the results of field survey. A list of literary references cited in the body of the report is provided in Chapter 7.0.

1.3 Acknowledgements

Fieldwork was conducted in April of 2015 by Senior Project Archaeologist Charles E. Bludau Jr. and Field Technicians Katrina Miller, Clay Zdobylak and Abidemi Babatunde Babalola working under the supervision of Mr. Bludau and Principal Investigator James Hughey. Fieldwork required approximately 188 person hours to complete. Mr. Bludau, Jr. conducted site file research prior to fieldwork mobilization. Mr. Bludau, Jr. and Jessica Bludau prepared the report. Duncan Hughey produced report graphics. The report was edited and produced by Ms. Bludau.



Project Area Location in Waller and Fort Bend Counties, Texas

HRA Gray & Pape LLC.

Figure 1

2.0 NATURAL SETTING

2.1 Physiography and Geomorphology

The Texas Coastal Plain makes up part of the larger Gulf Coastal Plain, a low level to gently sloping region extending from Florida to Mexico. The Texas Coastal Plain 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, which includes Waller and Fort Bend Counties, 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 downcutting and variations in the sediment load capacity of the region's rivers. Locally, Waller and Fort Bend County is underlain by relatively recent sedimentary rocks and unconsolidated sediments ranging in age from the Miocene to Holocene (Abbott 2001; Van Siclen 1991).

Although older geologic units have been identified in the region (Abbott 2001; Barnes 1982; Van Siclen 1991), units relevant to the study of long-term human occupation in modern-day Waller and Fort Bend Counties include the Beaumont Formation and Lissie Formation (which underlies the Project area), generally believed to predate human occupation in the region, the so-called "Deweyville Terraces", stratigraphically positioned between the Beaumont and Recent deposits. These deposits are made up of clay, silt, and sand. This includes stream channel, point bar, natural levee, back swamp, and mud flat deposits (Barnes 1982). Gilgae, a succession of microbasins and microknolls in generally level areas or microvalleys and microridges parallel to the slope, are common microfeatures.

The date of deposition for the Deweyville Terraces is not known. However, Abbott (2001:16) among others believes the north-south oriented terraces aggraded during the Late Pleistocene from overbank deposition of rivers and streams including the ancient Brazos River prior to the beginning of the Holocene. Abbott suggests that aggradation ended by approximately 20,000 years before present (B.P.) (Abbott 2001:106). However, meanders of rivers including the Brazos cut valleys through these terraces regularly during the Holocene and then abandoned them. This process leaves large, flat, open, and well drained areas favored for campsites. While all depositional facies other than channels have the potential to preserve archaeological sites, behaviorally, human activity favors well drained, sandy channel-proximal localities over floodbasin muds (Abbott 2001:126). Other Recent or Holocene deposits on the Gulf Plain typically result from overbank flooding of extant streams, eolian transport including dune formation, and infilling of marshes.

2.2 Soils

A review of the United States Department of Agriculture (USDA) Web Soil Survey revealed that the Project area is composed primarily Katy fine sandy loam, 0 to 1 percent slopes (Soil Survey Staff, Natural Resources Conservation Service [SSS NRCS], USDA 2015).

Katy fine sandy loam, 0 to 1 percent slopes, has a parent material that consists of clayey alluvium of Holocene age and is found on flood plains on river valleys on coastal plains (SSS

NRCS USDA 2015). It has a surface layer of fine sandy loam to a depth of 61 centimeters (24 inches). Next is a layer of loam to 107 centimeters (42 inches) and below that is clay loam to 203 centimeters (80 inches). This soil generally has a low potential to produce intact deeply buried resources. According to Abbott (2001: table 2) these soils all typically have a low geoarchaeological potential "or likelihood that the soil could contain buried cultural material in reasonable context" (Abbott 2001:20).

The Texas Department of Transportation (TxDOT)-Houston District's PALM covers Harris and other counties in the Greater Houston area, including Waller and Fort Bend County, and is based on a combination of data including soil associations, landform types, cultural and natural resource distribution, and historic and modern land use data. The PALM is a Cultural Resource Management tool that predicts the likelihood of detecting deeply buried intact cultural resources in various topographic settings around Houston. The model also recommends the type of archaeological survey strategy that should be implemented for a given PALM unit, of which there are 5 major groupings.

- 0 - Water. No survey recommended.
- 1 - Surface Survey Recommended, Deep Reconnaissance Recommended if Deep Impacts are Anticipated.
- 2 - Surface Survey Recommended, No Deep Reconnaissance Recommended.
- 2a - Surface Survey of Mounds Only; No Deep Reconnaissance Recommended.
- 3 - No Surface Survey Recommended, Deep Reconnaissance Recommended if Deep Impacts are Anticipated.
- 3a - No Surface Survey Recommended, Deep Reconnaissance Recommended only if Severe Deep Impacts are Anticipated.
- 4 - No Survey Recommended.

The current Project does not require TxDOT review. The PALM modeling units were, however, referred to as part of the desktop assessment and used to plan an appropriate field strategy. The entire Project area falls within TxDOT-Houston District's PALM Unit 4 which recommends no survey.

2.3 Previous Land Use and Disturbance

A review of the available historic aerials and topographic maps revealed that a large part of the Project area has been used as an agricultural field (most likely rice cultivation) and/or pasture for at least 60 years (Google, Inc. 2015). During survey several artificial berms were recorded within the Project area. Sometime between 1953 and 1970, Willow Fork was channelized. Aerial imagery and topographic maps dating to the early 1950s show agricultural fields covering a majority of the Project APE (Google, Inc. 2015). A large part of the APE continued to be used as an agricultural field up to the time of survey. The area adjacent to Willow Fork has remained relatively wooded since 1953. The portion of the Project area around Willow Fork is characterized by the presence of fill dirt likely associated with the waterway's channelization, which occurred between 1953 and 1970. Additionally, running through the central portion of the Project area are at least 2 buried pipelines (Texas General Land Office [TxGLO] 2015).

3.0 CULTURAL SETTING

Most sites near the coast between the Brazos River and Sabine Lake consist of middens found in estuaries or exposed in cutbanks along streams (Aten 1983; Patterson and Hudgins 1985). These middens usually contain faunal material as well as cultural remains such as lithic tools and pottery. Inland sites are less likely to consist of middens and are more similar to generalized open campsites. In both areas, sites are found near stream channels.

Addicks Reservoir was one of the earliest projects conducted in the area (Wheat 1953). The research done during that project initialized the formation of the Galveston Bay Focus and the development of a cultural sequence of the region based on lithics and ceramics (Aten 1983). Aten (1983) and Story (1990) have aptly described the cultural context of the upper coastal region. This information is merged with the archaeological data here to give a complete picture of life on the Upper Texas Coast.

Along the Upper Texas Coast, the Paleoindian period begins around 12,000 B.P. and ends near 9,000 B.P. (Aten 1983; Story 1990). There are very few archaeological sites that still exist from Paleoindian times, and few contain large artifact assemblages. Recent data recovery efforts at the Dimond Knoll Site (41HR796) will likely add to the knowledge of the early occupation of the region once published (Barrett and Weinstein 2013). Isolated artifacts include Clovis, Angostura, Scottsbluff, Meserve, Plainview, and Golondrina point types (Aten 1983). Sites from this stage would be either buried by alluvium or found in upland sites.

The Transitional Archaic period begins about 9,000 B.P. and ends around 7,500 B.P. (Aten 1983; Story 1990). This stage is also poorly represented in the archaeological work in the area but isolated finds of Bell/Calf Creek, Early-Side Notched, and Early Expanding Stemmed dart points are attributed to this time period. The Archaic stage is thought to include a shift towards a diet more geared towards plant processing but still includes hunting. Plant processing technology seen during the entire Archaic period includes stone-lined hearths and baking pits as well as milling tools (Story 1990). Groups began to travel over less of the landscape and population density seems to have risen.

Beginning at 7,500 B.P. and spanning 2,500 years (Aten 1983), the Early Archaic period in this region has not been well documented. The sites may have been destroyed or deeply buried (Aten 1983; Story 1990). In situ Early Archaic remains have been found at the Addicks Reservoir as well as other localities in the area (Story 1990). Points from this period include Bell, Carrollton, Trinity, Wells, and Early Stemmed. It is possible that the Carrollton, Trinity, and Wells points continued to be used into the middle Archaic (Patterson 1996).

The Middle Archaic period (5,000 to 3,000 B.P.) reveals the earliest surviving shell middens (Aten 1983). These middens often contain remains of shellfish, such as oysters and estuarine clams, faunal material from terrestrial and aquatic vertebrates, and the earliest known human burials in the region (Aten 1983). Characteristic projectile points include Bulverde, Williams, Lange, and Pedernales types.

The Late Archaic lasted from 3,000 to 2,000 B.P. and shows evidence for population increase (Aten 1983). By 2,500 B.P., the climate in this area was essentially like the modern climate. Ground stone artifacts made from materials from southwestern Arkansas and found in context with human burials in cemeteries such as the Ernest Witte Site indicate the possibility of trade (Hall 1981). Projectile points differ from earlier periods in that they are corner-notched or expanding-stemmed forms, such as the Kent, Ellis, and Pontchartrain types. Other types can be found, such as the un-notched Pamillas. These types are thought to precede the Gary type, which can be found into the Late Prehistoric (Story 1990). During the Late Archaic, more utilitarian biface tools are prevalent as well as are bone tools. Late Archaic assemblages are very similar to the early part of the Late Prehistoric stage (Aten 1983).

The transition from the Late Archaic stage to the Late Prehistoric is indicated by the introduction of ceramics into the assemblage (Aten 1983). Cultural shifts during the Late Prehistoric include the possible adoption of a more sedentary lifestyle and major technological changes, such as sandy paste ceramics and late in the stage, the bow and arrow (Story 1990). The cultural tradition during the Late Prehistoric along the Upper Gulf Coast has been designated as Woodland. Story (1990) has suggested the use of the term Mossy Grove Tradition to define cultural patterns of the region. The Trinity River seems to be a dividing line in this tradition with cultures east of the river being more similar to those in Louisiana than to those west of Galveston Bay. The eastern tradition also seems to have begun earlier than that in the west, beginning about 2,000 B.P. and lasting 600 years (Aten 1983; Story 1990).

Story (1990) splits the Mossy Grove Tradition into 5 distinct time intervals on the coast, while noting that only 2 are found inland. Aten (1983) defined these intervals for the area between the Brazos River and Galveston Bay as the Clear Lake (1,850 to 1,525 B.P.), Mayes Island (1,525 to 1,300 B.P.), Turtle Bay (1,300 to 950 B.P.), Round Lake (950 to 600 B.P.), and Old River (600 to 250 B.P.) periods based on ceramic styles. Only the Round Lake period is recognized by Aten for the West Bay-Brazos Delta due to the low artifact class diversity compared to areas east of Galveston Bay as well as a time discrepancy in which equivalent periods are later in time than those to the east (Aten 1983).

Early ceramics from this area are similar to Tchefuncte period wares found near Sabine Lake and into Louisiana and include sandy paste varieties such as Mandeville Plain, Goose Creek Plain (Anahuac variety), and Tchefuncte Plain (Aten 1983; Story 1990). These early sites appear similar to pre-ceramic sites due to the low number of ceramic sherds found. The appearance of sandy paste and sand-tempering occurs about 1,900 B.P. with the O'Neal Plain (variety Conway) being a good example (Aten 1983). Rocker-stamped decorations, a distinctive marker for this period, are uncommon in the West Bay-Brazos Delta, as are incised wares (Aten 1983).

The Mayes Island period brought about the introduction of the bow and arrow, which was probably used along with the atlatl until the historic period (Aten 1983; Story 1990). The arrow points during this period included both notched and expanding-stemmed forms (Aten 1983; Story 1990).

Ceramic indicators for the Turtle Bay period include Goose Creek red-filmed along with other decorated ceramics, all of which are rare in the West Bay-Brazos Delta area. At the beginning of the Round Lake period, the earliest use of grog or large crushed ceramic particles as tempering agents is seen. Typical varieties include Baytown Plain (variety San Jacinto) and San Jacinto Incised. Along with these types, a reduction in Goose Creek types is seen. Aten (1983) describes this period as having an increase in population due to the larger number of sites in more specialized locations.

During the Old River period, a resurgence of Goose Creek ceramics is seen as the Baytown types decrease in popularity. Contact with Europeans begins near the end of this period, but visible changes in material culture are not seen until about A.D. 1750 along with a rapid decline in population (Story 1990).

3.1 Brief History of Fort Bend County

The historic period settlement within future Fort Bend County began in the 1820s as part of general colonization of Texas by Anglo-Americans and under patronage by Mexican government in an effort to populate the area. With support from Baron Bastrop, the land was granted by the Mexican government to Moses Austin. Moses Austin died in 1821 never seeing his newly obtained grant; however, his son, Stephen Fuller Austin, took over "the venture" in Texas. Governor Martinez, impressed with young Austin, offered him to choose the site for the future colony. After several considerations young Austin picked fertile lands between the Colorado and Brazos rivers in the Texas southern coastal plains (Ott 2015; Hardin 2015).

On December 29, 1837, Fort Bend County was established from parts of Austin, Brazoria, and Harrisburg counties. The Town of Cane Island, now known as Katy, began in 1875 with 1 family, Thomas and Mary Robinson, settling 81 hectares (200 acres) (Rylander 2015). The town was originally named after the Cane Island branch of Buffalo Bayou. Originally, the area was an open prairie, only thought suitable for grazing. Additional families moved to the area over the next 15 years and, with the introduction of the Missouri, Kansas, and Texas (M-K-T) Railroad, the Katy area slowly began to grow (Rylander 2015). The town was platted out in 1895 and believed to have been named after the M-K-T Railroad. Another story claims the town was named after the popular wife of a saloon owner, Katy Mares. The railroad workers were known to shout, "Let's go to Katy's" at the end of the day. The railroad depot opened in 1898 and the post office in Katy opened in 1896. Katy farmers focused on peanuts, cotton, and corn until rice was introduced in 1901.

The economy of Fort Bend in the nineteenth century focused on cotton, sugar, corn, and livestock production. In the 1890s, a one million dollar sugar refinery was constructed at Sugar Land. The county also contains substantial amounts oil, gas, and sulfur deposits, which have played a major role in the economic development of the area (Hardin 2015).

3.2 Brief History of Waller County

A review of the Handbook of Texas Online (Christian and Leffler 2015), indicated the following about Waller County's historical development. Waller County was sparsely

populated by Native Americans when Europeans first began exploring the area in the 1800s. The county was noted to have large herds of wild horses, free roaming cattle, as well as deer and chickens. Governmental authority for the area during Mexican rule was originally held by the Municipality of Washington, but was later held by Washington County and then Austin County. The Mexican Government granted the lands which comprise modern-day Waller County to Stephen F. Austin as a part of his original colony. Austin's colonists began to settle in the area around 1820. Jared Groce settled within the boundaries of modern day Waller County in 1821. He settled on the Bernardo Plantation, just 6.4 kilometers (4 miles) west of present day Hempstead. Groce, a large slaveholder, grew cotton and in 1825 he constructed the first cotton gin in Texas. Groce's plantation quickly became the center of settlement in the area after he added a commissary and blacksmith's shop to his plantation (Christian and Leffler 2015). By 1845, Groce and other settlers made the Brazos River a wealthy cotton-growing region. The population of the area consisted of roughly 200 Caucasians and more than 1,000 slaves. The area's continued development was rapidly increased by the construction of the Houston and Texas Central Railway in 1858. The railroad provided fast and reliable transportation to the cotton markets of Houston, and prompted the founding of Hempstead in 1858. Hempstead became the commercial center of the area and it rapidly became the most important settlement in the area because of the railroad link to Houston. The town's importance was further emphasized in 1861, when Washington County Rail Road connected it with community of Brenham (Christian and Leffler 2015).

Waller County was created in 1873 by the Texas Legislature form parts of Austin and Grimes Counties, and Hempstead was made the county seat. The continued development of railroads within the county prompted new settlements and facilities. The construction of the Texas Western Narrow Gauge Railroad in 1878 prompted the founding of Pattison. Prairie View State Normal School, now Prairie View A&M, was founded in 1879 as an institution of higher learning focused on training African-American educators. An influx of settlers from Germany, Ireland, Italy, and other Central and Eastern European Countries occurred during the late nineteenth and early twentieth centuries. The influx of these divergent ethnic groups also diversified the counties religious faiths, as the first synagogue was founded in 1873. The construction of the MKT Railroad through Brookshire in 1893 resulted in a vast expansion of that community. The railroad also encouraged the development of the town of Waller, which was founded in 1898 (Christian and Leffler 2015).

Racial tensions in Waller County resurfaced after Reconstruction, as the white minority sought legal and extralegal means to reduce African-American voting power. A White Man's Party was founded in the 1880s to reduce black political power and violence often marked elections. The end of Reconstruction and increasing intimidation by whites effectively reduced African-American political participation. The passage of the state white primary law effectively disenfranchised the African-American population in 1903. Students at Prairie View A&M became politically active in the 1960s, forcing businesses to integrate and successfully challenging obstacles to their enfranchisement in the 1970s.

Cotton cultivation steadily declined in the twentieth century as truck farming became more profitable. Federal regulations enacted during the Depression encouraged this trend, and many of Waller County's cotton gins closed down. Rice became the county's most important crop after World War II, as well as watermelon and egg production. Cattle ranching also became

important in the post-war era. Oil was discovered in 1934, but production has been fairly limited. The county's population began growing in the 1960s because of its close proximity to the City of Houston (Christian and Leffler 2015).

4.0 METHODOLOGY

4.1 Site File and Literature Review

Background review and literature research were conducted prior to fieldwork mobilization. The background literature search included a review of previously conducted cultural resource surveys in the vicinity of the proposed Project area, and of any historic document pertaining to the history of the area. Site file research was performed in order to identify all previously recorded archaeological sites within a 1.6-kilometer (1-mile) study radius of the Project area (Figure 1), and any recorded historic structures eligible for the National Register of Historic Places (NRHP) listing located adjacent to the Project area. Site file research was done by consulting online research archives maintained by the Texas Historical Commission (THC).

Historic topographic and aerial maps were reviewed in order to identify any historic structures that might be located close to or within the Project area (Google, Inc. 2015; Nationwide Environmental Title Research, LLC [NETR] 2015). Topographic maps were downloaded from the Perry Castañeda online library collection, and aerial imagery was provided by Google Earth and NETR. Historic maps of Texas and Texas counties were reviewed in order to better understand the history of the region and to identify any potential historic trails and important historic sites located or crossing the Project area. TxDOT's PALM model was referred to as well.

4.2 Intensive Pedestrian Survey Field Methods

The archaeological investigations associated with the current undertaking were designed to define all sites, prehistoric and historic, within the defined boundaries for the Project. In addition to site identification, the investigations 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 (SAL).

Archaeological 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. These forms included information on provenience, survey method, and cultural materials identified.

All shovel tests measured 30 x 30 centimeters (12 x 12 inches) in diameter. Vertical control of each shovel test was maintained by excavating in arbitrary 10-centimeter (4-inch) levels. One wall of each shovel test was profiled and the walls and floor of each shovel test were inspected for color or texture change potentially associated with the presence of cultural features. Descriptions of soil texture and color followed standard terminology and soil color charts (Munsell 2005). Additional information concerning the encountered soils such as mottling, disturbance, and moisture level was recorded on standardized forms for each excavation. Whenever possible, shovel tests were excavated into sterile subsoil. All friable soils were

screened through 0.64-centimeter (0.25-inch) wire mesh, while soils with high clay content were hand sorted.

Additionally, auger tests were placed in areas selected by the field crew in order to gather stratigraphic information beyond the range of shovel testing and to locate any buried paleosols in the Holocene age Alluvium located beneath the Project area. The 2.74-meter (9-foot) bucket auger has a 7.62-centimeter (3-inch) diameter bore.

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. If historic standing structures within or immediately adjacent to the Project area 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.

5.0 RESULTS OF INVESTIGATIONS

5.1 Results of Site File and Literature Review

Research activities, including a site file research and a review of available historic maps, were initiated in April 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.

Three cultural resource surveys have been conducted within a 1.6-kilometer (1-mile) radius of the Project area (Figure 1). In February of 2013, 2 cultural resources surveys were conducted east of the Project area by Horizon Environmental Services. The Lead Federal agency for the surveys was the USACE, Galveston District. No cultural resources were recorded during these surveys. Additionally, in March of 2015, HRA Gray & Pape conducted an area survey east of the Project area. No cultural resources were recorded during this survey.

5.2 Results of Field Investigations

The primary purposes of field investigations were to determine whether or not any previously unidentified, intact, and significant cultural resources were present within the APE and to provide management recommendations based on research and survey activities. A combined total of 130 shovel tests and 9 manual bucket auger tests were excavated where previous subsurface disturbances were not apparent (Figure 2). Shovel testing and manual bucket auger testing was intensified around the 2 proposed outfalls near Willow Fork. All shovel tests and manual bucket auger tests were negative for buried cultural resources. The APE is made up of agricultural fields (Plate 1). Outfall 1 and 2 are located near Willow Fork and shovel tests were not excavated where the ground was previously disturbed by the channelization of Willow Fork (Plates 2 and 3). The buried pipeline is located throughout the center of the APE and artificial berms were observed throughout (Plates 4 and 5). A drainage ditch is located along the southern boundary of the APE.

Soils were generally similar to those mapped for the area. Shovel tests were excavated to depths between 50 and 100 centimeters (20 and 40 inches). A typical shovel test (D05) located on the west side of the APE consisted of a brown (10YR 4/3) sandy loam from the surface down to a depth of 30 centimeters (12 inches) followed by yellowish brow (10YR 5/4) fine sandy loam with iron down to 50 centimeters (20 inches) (Figure 3). A shovel test on the east side of the APE consisted of dark brown (10YR 3/3) sandy loam down to a depth of 30 centimeters (12 inches). This stratum was followed by a yellowish brown (10YR 5/6) sandy clay with few iron concretions down to 60 centimeters (24 inches). The final stratum, down to 100 centimeters (40 inches), consisted of yellowish brown (10YR 5/6) mottled with red (2.5YR 4/8) compact clay (Figure 3).

Auger tests were excavated to a maximum depth of 300 centimeters (118 inches). Auger tests were placed at the bottom of shovel tests within the 2 outfall locations near Willow Fork. Auger 2 was placed within Outfall 1 and started with a shovel test to a depth of 100

Figure Created in ArcView 10.3 for HRA Gray & Pape Project # 1020.00 on 04-23-2015

Project Boundary
Negative Shovel Test
Negative Shovel Test with Auger
ST D5 Representative Shovel Test/Auger Profile
Auger 2 (See Figures 3 and 4)
Disturbed Area
Drainage Ditch
Pipeline
Plate Photo Location and Camera Direction
USGS Quadrangle Boundary

0 200 400 800 Feet
0 60 120 240 Meters

USGS 7.5' Quadrangle Reference

Overview of the Project Area with Field Survey Results

Figure 2

HRA Gray & Pape LLC.

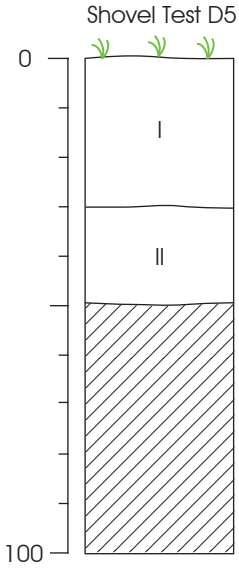
Plate 1. Overview of the Project Area.
View is to the west.

Plate 2. Overview of Project Outfall 1 showing disturbance.
View is to the northeast.

Plate 3. Overview of the Project Area showing channelized Willow Fork Creek.
View is to the east.

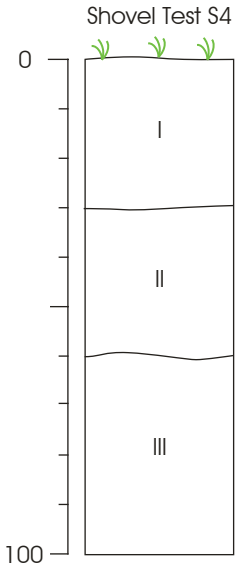
Plate 4. Overview of the Project Area showing the buried pipeline and corridor.
View is to the northeast.

Plate 5. Overview of the Project Area showing artificial berm.
View is to the north.



I (0-30 cmbs) 10YR4/3 Brown sandy loam;

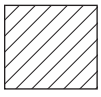
II (30-50 cmbs) 10YR5/4 Yellowish brown fine sand loam with iron staining;



I (0-30 cmbs) 10YR3/3 Dark brown sandy loam;

II (30-60 cmbs) 10YR5/6 Yellowish brown sandy clay with few concretions and moderately moist;

III (60-100 cmbs) 10YR5/6 Yellowish brown mottled with 2.5YR4/8 red compact clay;



Unexcavated

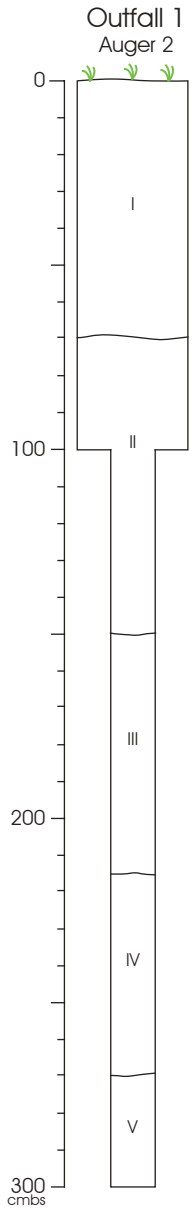
Representative Shovel Test Profiles

HRA Gray & Pape, LLC

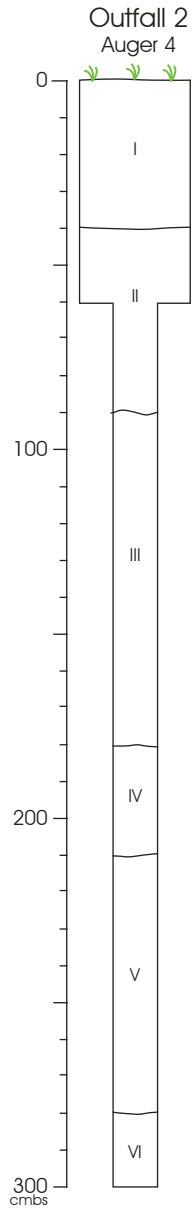
Figure 3

centimeters (40 inches) with the first layer consisting of dark yellowish (10YR 4/4) clay loam to a depth 70 centimeters (28 inches). The second stratum consisted of yellowish brown (10YR 5/4) moist loamy clay mottled with red redox to a depth of 150 centimeters (59 inches). Stratum 3 consisted of strong brown (7.5YR 5/8) sandy clay mottled with gray (10YR 6/1) to a depth of 215 centimeters (85 inches) with increasing sand content with depth. Stratum 4 consisted of light gray (10YR 7/1) mottled with light yellowish brown (10YR 6/4) and yellowish red (5YR 4/6) red sandy clay to a depth of 270 centimeters (106 inches). The final stratum to a depth of 300 centimeters (118 inches) consisted of yellowish (5YR 4/6) mottled light gray (10YR 7/1) sandy clay (Figure 4).

Auger 4 was placed within Outfall 2 and started with a shovel test to a depth of 60 centimeters (24 inches) with the first layer consisting of brown (10YR 4/3) sandy loam to a depth 40 centimeters (16 inches). The second stratum consisted of brown (10YR 4/3) mottled with strong brown (7.5YR 4/6) sandy clay to a depth of 90 centimeters (36 inches). Stratum 3 consisted of light brownish gray (10YR 6/2) sandy loam with iron oxidation and rusted iron to a depth of 180 centimeters (71 inches). Stratum 4 consisted of pale brown (10YR 6/3) compact sandy clay with intense iron concretion oxidation to a depth of 210 centimeters (83 inches). The Stratum 5 consisted of pale brown (10YR 6/3) compact clay with iron oxidation and some sand lenses to a depth of 280 centimeters (110 inches). The final stratum consisted of pale brown (10YR 6/3) mottled yellowish red (5YR 5/6) compact clay to a depth of 300 centimeters (118 inches) (Figure 4).



I	(0-70 cmbs)	10YR4/4 Dark yellowish brown clay loam;
II	(70-150 cmbs)	10YR5/4 Yellowish brown moist loamy clay mottled with red redox;
III	(150-215 cmbs)	7.5YR5/8 Strong brown mottled with 10YR6/1 gray sandy clay, increasing sand content with depth;
IV	(215-270 cmbs)	10YR7/1 Light gray mottled with 10YR6/4 light yellowish brown and 5YR4/6 yellowish red sandy clay;
V	(270-300 cmbs)	5YR4/6 Yellowish red mottled with 10YR7/1 light gray sandy clay;



I	(0-40 cmbs)	10YR4/3 Brown sandy loam;
II	(40-90 cmbs)	10YR4/3 Brown mottled with 7.5YR4/6 strong brown sandy clay;
III	(90-180 cmbs)	10YR6/2 Light brownish gray fine sandy loam with iron oxidation and rusted, almost decomposed iron;
IV	(180-210 cmbs)	10YR6/3 Pale brown compact sandy clay with intense iron concretion oxidation;
V	(210-280 cmbs)	10YR6/3 Pale brown compact clay with intense iron oxidation and blackened stains with some sand lenses;
VI	(280-300 cmbs)	10YR6/3 Pale brown mottled with 5YR5/6 yellowish red compact clay;

Representative Auger Profiles

Figure 4

HRA Gray & Pape, LLC

6.0 CONCLUSIONS AND RECOMMENDATIONS

This report summarizes the results of an intensive pedestrian cultural resources survey of approximately 58 hectares (143 acres) of property proposed for development as well as 2 outfalls in Waller and Fort Bend Counties, Texas. The USACE, Galveston District has been identified as the Lead Agency for this Project. The goals of the cultural resources survey were to determine if Project construction would affect any previously identified historic properties and to establish whether or not previously unidentified cultural resources were located within the APE.

Prior to fieldwork mobilization, a background literature and site file search was conducted to identify the presence of recorded sites within or near the APE. The search indicated that 3 previous cultural resource surveys are located within the 1.6-kilometer (1-mile) study radius. Prior to survey, no previously known sites, or historic markers, were known to be located within the APE.

Field investigation consisted of visual inspection, subsurface shovel testing and supplemental deep testing. Subsurface investigation resulted in the excavation of 130 shovel tests and 9 manual bucket auger tests. All were negative for archaeological deposits and no intact structures of historic-age were observed within or immediately adjacent to the APE. Based on the negative results of the archaeological investigation, HRA Gray & Pape recommends no further archaeological work for this Project.

7.0 REFERENCES

Abbott, James T.
2001 *Houston Area Geoarcheology; A Framework for Archeological Investigation, Interpretation, and Cultural Resource Management in the Houston Highway District.* Texas Department of Transportation, Environmental Affairs Division.

Aten, Lawrence E.
1983 *Indians of the Upper Texas Coast*. Academic Press, New York.

Barnes, V.E.
1982 Geologic Atlas of Texas, Houston Sheet. Bureau of Economic Geology, University of Texas at Austin.

Christian, Carole E. and John Leffler
2015 "Waller County," *Handbook of Texas Online* (http://www.tshaonline.org/handbook/online/articles/hcw02), accessed April 2015. Uploaded on June 15, 2010. Published by the Texas State Historical Association.

Google, Inc.
2015 Google Earth Aerial Imagery 1989, 1995, 2002-2006, 2008-2012, 2014. Accessed April 2015.

Hall, Grant D.
1981 Allens Creek: A Study in the Cultural Prehistory of the Lower Brazos River Valley, Texas. Research Report No. 61. Texas Archaeological Survey, The University of Texas at Austin.

Hardin, S.
2015 "Fort Bend County", *The Handbook of Texas Online* http://www.tsha.utexas.edu/handbook/online/articles/view/FF/hcf7.html. Accessed April 2015.

Munsell Color
2005 *Munsell Soil Color Charts.* Macbeth Division of Kollomorgan Instruments Corporation, New Windsor, New York.

Nationwide Environmental Title Research, LLC (NETR)
2015 Historic Aerials and Topographic Maps. Available URL: http://www.historicaerials.com/. Accessed April 2015.

Ott, Virginia Laird
2015 "Fort Bend County," Handbook of Texas Online (http://www.tshaonline.org/handbook/online/articles/hcf07), accessed April 2015. Published by the Texas State Historical Association.

Patterson, L. W., and J. D. Hudgins
1985 Paleo-Indian Occupations in Wharton County, Texas. *Bulletin of the Texas Archeological Society* 56.

Rylander, Roberta Wright
2015 "KATY, TX," *Handbook of Texas Online* (http://www.tshaonline.org/handbook/online/articles/hfk01), accessed April 2015. Uploaded on June 15, 2010. Published by the Texas State Historical Association.

Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. (SSS NRCS USDA)
2015 Web Soil Survey. Available URL: http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx. Accessed April 2015.

Story, D. A.
1990 Cultural History of the Native Americans. *The Archeology and Bioarcheology of the Gulf Coastal Plain*, by D. A. Story, et al., 1:163-366. 2 vols. Research Series No. 38. Fayetteville: Arkansas Archeological Survey.

Texas General Land Office.
2015 http://www.historicaerials.com. Accessed April 2015.

Van Siclen, D.C.
1991 Surficial Geology of the Houston Area: An Offlapping Series of Pleistocene (& Pliocene?) highest Sea Level Fluviodeltaic Sequences. *Transactions of the Gulf Coast Association of Geological Societies* 41:651-666

Wheat, J.B.
1953 The Addicks Dam Site: An Archeological Survey of the Addicks Sam Basin, Southeast Texas. River Basin surveys Papers No. 4, Part 1. Bureau of American Ethnology, Bulleting 154:143-252.