**A PHASE I CULTURAL RESOURCES SURVEY OF THE
ORBIT PIPELINE PROJECT
JEFFERSON, LIBERTY, AND CHAMBERS COUNTIES, TEXAS**

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SWG-2019-00074

Texas Antiquities Permit #8690

Perennial Report No. 19-008

March 2019

(Revised January 2020)

MANAGEMENT SUMMARY

Energy Transfer Company (ETC) is proposing to construct the Orbit Pipeline Project (Project) located in Jefferson, Liberty, and Chambers counties, Texas. The Project consists of approximately 68.7 miles (mi) (110.6 kilometer [km]) of new 20.0-inch (in) (50.8-centimeter [cm]) diameter pipeline that will be used to transmit ethane and propane. The Project is located within the jurisdictional boundary of the United States Army Corps of Engineers (USACE) - Galveston District.

At the request of ETC, Perennial Environmental Services, LLC (Perennial) conducted an intensive Phase I cultural resources investigation for the proposed Project to comply with anticipated USACE permitting requirements. Archaeological investigations for the Project were conducted in accordance with Section 106 of the *National Historic Preservation Act* (NHPA) and Texas State Historical Preservation Office (SHPO) standards. Additionally, the Project traverses several discontinuous publicly-owned tracts that fall under the jurisdiction of the Antiquities Code of Texas (Code). The results of survey investigations conducted under Texas Antiquities Permit (TAP) #8690 (issued December 17, 2018, and amended on August 30, 2019) across six discontinuous publicly -owned tracts are also presented herein.

Consistent with USACE application requirements, and in accordance with Section 106 of the NHPA of 1966, as amended (36 CFR 800) and the Code, the proposed Project must make a reasonable and good faith effort to identify historic properties within the Project Area of Potential Effect (APE) and to take into account any potential effects, direct or indirect, the proposed undertaking could have on properties listed or considered eligible for listing in the National Register of Historic Places (NRHP) or for designation as a State Antiquities Landmark (SAL), as warranted.

As the Project footprint was not finalized at the time of field investigations, survey efforts were concentrated within the vicinity of delineated wetland and waterbody features along the length of the route within a 300.0-foot- (ft-) (91.4-meter- [m-]) wide Environmental Survey Area (ESA). The anticipated depths of impact for the Project will range from 4.0 to 7.0 ft. (1.2 to 2.1 m) along the pipeline centerline, with limited deeper impacts at horizontal directional drill (HDD) and bore locations, including Cow Island Bayou, Hillebrandt Bayou, Lower Neches Valley River Authority canals, Nolte Canal, the Trinity River, Turtle Bayou, Whites Bayou, Willow Marsh Bayou, and public road crossings. The anticipated depths of impact for temporary workspace areas within the Project APE corridor would not exceed 0.6 to 1.0 ft. (0.1 to 0.3 m). The overall APE for direct effects for the Project measured 2307.19 acres (ac) (933.68 ha), while APE for Code-permitted tracts totaled 210.0 ac (85.06 ha). As presented herein, the Project ESA is coterminous with the Project APE, which is also referred to as the USACE permit areas. Only the areas adjacent to the USACE permit areas and the entirety of Code-permitted areas were surveyed for cultural resources.

Jennifer Cochran served as the Principal Investigator, and field efforts were conducted by Sarah Boudreaux, Rafael Cortez, Wyatt Ellison, Rachel Kelley, William Kinkner, Colene Knaub, Jonathan Laird, Alejandro Martinez, and Thomas Ross across multiple field mobilizations between October 1, 2018, and November 12, 2019.

Investigations included an archival background review and intensive pedestrian surveys augmented by shovel testing in the vicinity of delineated wetland and waterbody features. Archival research determined that there are no previously recorded sites within, or directly adjacent to the Project APE, and approximately 32.7% of the Project APE has been previously surveyed for cultural resources. However, many of these surveys are outdated and do not meet modern survey standards. Additionally, many of these previously surveys were conducted for USACE-permitted projects, and the entire Project was not surveyed for the presence of cultural resources. As such, all areas surrounding identified wetland and waterbody for this Project were surveyed.

Perennial biologists delineated a total of 490 wetland areas. Of the 490 wetlands identified within the Project APE, 290 were characterized as palustrine emergent (PEM) wetlands, 106 were characterized as palustrine forested (PFO) wetlands, 4 were classified as PFO-Cypress wetlands, and 90 were characterized as palustrine scrub-shrub (PSS) wetlands. Perennial biologists also identified 270 waterbodies that ranged from perennial streams to ephemeral streams. Of the 270 waterbodies delineated, 36 were classified as having perennial flow, 66 were classified as having intermittent flow, and 148 were classified as ephemeral flow. Additionally, 20 open water features were delineated and classified as manmade ponds.

Survey efforts were concentrated in the vicinity of these features where land access was voluntarily granted in accordance with a scope of work for the Project approved by the USACE on August 28, 2018, and the Texas Historical Commission (THC) on October 1, 2018. Following the approval of the scope of work, ETC extended the eastern terminus of the Project to the western bank of the Neches River, and other minor reroutes were also implemented. Perennial applied the approved survey methodology to all new Project components.

For Code-permitted tracts, surveys were conducted across the entire length of the Project APE corridor in accordance with a stand-alone scope submitted to the THC on December 14, 2018, and amended August 30, 2019. Additionally, following the receipt of TAP#8690, the proposed Project was routed onto two additional publicly-owned tracts belonging to the Texas Department of Corrections (DOC) – Stiles Unit and Jefferson County. The TAP #8690 was revised and amended on August 30, 2019. Following this August 30, 2019 amendment, ETC added additional route options across the DOC – Stiles Unit tract. This additional mileage was surveyed using the same methods as stated in the previously presented revised TAP scope of work for this property.

In all, the survey investigations included the excavation of a total of 1,250 shovel tests of which 1,171 shovel tests were excavated within the Project APE. The remaining 79 shovel tests were excavated outside of USACE permit areas but within the Project workspace. For the purposes of this report, only investigations within the Project APE will be discussed.

Survey investigations within the Project APE resulted in entirely negative findings. No archeological sites were encountered within the survey areas reported herein. Additionally, no historic standing structures or landscape features such as historic-age canals were observed with any USACE permit areas. Overall, the surveys documented predominately inundated landscapes with a low probability for intact cultural resources. Numerous existing pipeline corridors and modern canal features are traversed by the Project. While some of the modern canals could be historic in nature or connected to a greater network of irrigation features used historically to supply agricultural crops with water, it is important to note that the majority of the waterways associated with these features will be bypassed via bore/HDD. As such, any impacts to these waterbodies as well as the associated canal structure will be entirely avoided. Additionally, all visual impacts from the proposed pipeline corridor will be temporary in nature.

To date, field surveys have been completed for all accessible wetland and waterbody features along the pipeline route, as well as the total length of the Project survey corridor across all Code-permitted tracts. Prior to the beginning of November 2019, field surveys had not been conducted along the eastern banks and associated bottomlands of the Trinity River due to multiple flooding events that resulted in heavy inundation beginning in September 2018 which prevented access or survey investigations of any kind. Additionally, field surveys did not occur along portions of the Project containing denied landowner permissions.

On November 6, 2019, a survey crew was able to access previously inaccessible areas associated with the Trinity River due to several months of normalized weather conditions throughout portions of Eastern Texas. Even under normal conditions, large portions of this area remain constantly inundated due to strong hydrological influences and the geomorphic position of the landscape. However, crews were able to traverse inundated areas by foot to access portions of the Project located immediately adjacent to the Trinity River. While the area located immediately adjacent to the Trinity River was not inundated at the time of survey, wetlands with strong hydrological indicators still dominate the landscape.

Of the 760 delineated wetland and waterbody features, 74 features were originally not surveyed for cultural resources due to restricted land access including denied landowner permissions and significant inundation. Of these 74 features, 38 feature locations (27 streams and 42 wetlands) will be bypassed via horizontal directional drill (HDD) or bore trenchless construction methods resulting in no impacts to these features. The remaining five features (including multiple crossing locations of the same feature) are located along the eastern banks of the Trinity River. While these features were surveyed for cultural resources with negative findings, the presence of buried deposits exists within the vicinity of these features. However, access to these features with heavy

machinery is not feasible due to the remote location and constant hydrological influences (e.g. inundation and saturation) associated with the floodplain setting of the Trinity River. As such, these five features are proposed to be monitored by a qualified Archeological Monitor during construction efforts. **Appendix C** provides each wetland and waterbody feature crossed by the Project with management recommendations and associated comments, while **Appendix F** provides a Cultural Monitoring Plan to evaluate the five features that will not be avoided during construction efforts. **Appendix F** also includes a table in response to a letter issued by the USACE Staff Archeologist, Mr. Jerry Androy, on May 17, 2019, indicating that the 74 aforementioned permit areas associated with the Project would require cultural resources investigations. The table lists each permit area, the reason surveys were not originally conducted, and justification for/against the need for monitoring.

Based on the results of the survey effort reported here, no cultural resources will be affected by any construction activities within the Project APE. Aside from Cultural Monitoring at five features (including multiple crossing locations of the same feature) within the Trinity River floodplain, it is Perennial's opinion that no further cultural resources investigations are warranted for the Project. Should archaeological remains be encountered during construction, work in the immediate area will cease, and a qualified archaeologist will be called upon to evaluate the remains and provide recommendations for how to manage the resources under the State's Historic Preservation Plan.

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INTRODUCTION

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Should cultural materials be encountered during this phase of the Project, then the Archeological Monitor would follow the procedures outlined in the Cultural Monitoring Plan, which would require construction to stop in the immediate area of discovery, and initiation of notification protocols needed to ensure the find is adequately evaluated in accordance with Section 106 of the NHPA. Details of the Archeological Monitoring Plan are presented in **Appendix F**.

Project records associated with Code-permitted tracts will be curated at the Texas Archeological Research Laboratory (TARL), while all original records for non-Code-permitted portions of the Project will be permanently housed at Perennial's laboratory in Austin. Copies of the records will be provided electronically to ETC.

Agency correspondence for the Project is presented in **Appendix A**. Mapping exhibits for the Project APE are provided in **Appendix B**, and corresponding data tables detailing the level of effort for each delineated wetland or waterbody feature is provided in **Appendix C**. Shovel test data for the USACE permit areas are provided in **Appendix D**, while shovel test data for the Code-permitted tracts are provided in **Appendix E**. The Archeological Monitoring Plan is presented in **Appendix F** and the Unanticipated Discovery Plan is provided in **Appendix G**.

PROJECT AREA DESCRIPTION

The Project traverses a combination of highly developed oil and gas landscapes, expansive lowland agricultural fields that have been heavily modified to facilitate rice production, and pockets of dense bottomland forests (Figures 2 and 3). Many of the natural waterways have been channelized for flood control and irrigation purposes resulting in the alteration of natural levee and terrace formations.

ETC has attempted to minimize impacts to wetland and waterbody features to the greatest extent practicable by co-locating a majority of the overall route with the existing Energy Transfer Mariner Pipeline constructed in 2014. Additionally, the HDD or bore installation technique will be implemented to avoid impacts to larger waterbody features, namely Cow Island Bayou, Hillebrandt Bayou, Lower Neches Valley River Authority canals, Nolte Canal, the Trinity River, Turtle Bayou, Whites Bayou, and Willow Marsh Bayou.

Figure 2. Typical view of Project APE within existing corridors

Figure 3. View of expansive inundated areas characteristic of the Project APE

ENVIRONMENTAL SETTING

The Project APE is located within the Northern Humid Gulf Coastal Prairies of the Western Gulf Coastal Plain ecoregion. The Western Gulf Coastal Plains ecoregion is a relatively flat expanse of grassland heavily utilized to grow rice, grain, cotton and soybeans, and for oil and gas production in recent decades (Griffith et al. 2007, 73).

Native vegetation includes clusters of hardwoods including Sweetgum, Sugarberry, and Loblolly pine interspersed among grasslands of bluestem, switchgrass, and yellow Indiangrass (Griffith et al. 2007, 74). The invasive species Chinese tallow accounts for a large percentage of the vegetation in this area (Griffith et al. 2007, 74-75). This region has an extended history of modification and the majority of the area has been converted to cropland, rangeland, and urban and industrial uses. As the soils are poorly draining, and the region remains inundated for extended periods, expansive networks of drainage channels and canals crisscross the landscape (Griffith 2007, 74).

GEOLOGY AND SOILS

Geologically, the Project APE is intermittently underlain by the Beaumont Formation (Qbs and Qbc) (USGS 2019). The Beaumont Formation (Qbs) consists of sandy deposits concentrated on point-bars, natural levee ridges, and poorly defined meander-belt ridge and pimple mounds in the

southwestern extent of the Project. The Beaumont Formation (Qbc) consists of predominantly clay deposits in flood basins, coastal lakes, and former stream channels.

Holocene-age alluvial deposits (Qal) are located in only two portions of the Project area: in the vicinity of the Trinity River, and at the eastern terminus adjacent to the Neches River. These deposits are comprised of sand, silt, and clay, and were found to consist of expansive inundated lowland areas.

According to the United States Department of Agriculture (USDA) National Resources Conservation Service (NRCS) Web Soil Survey for Chambers, Liberty, and Jefferson counties, the Project lies within 39 soil mapping units. Of these, seven soils units are included in James Abbott's analysis of the geoarcheological potential of soil units within the greater Houston area (2001) (Table 1). Two soils units (Voss and Kaman) are referenced as having a high, or moderate to high geoarcheological potential, while the remaining soil units have a low geoarcheological potential. Both the Voss and Kaman soils units are situated in the vicinity of the Trinity River.

Table 1 Soil Mapping Units corresponding to Abbott's geoarcheological model (2001)			
Mapping Unit (Map Symbol)	Texture and Drainage	General Location	Geoarcheological Potential
Beaumont clay, 0 to 1 percent slopes (BeaA)	The Beaumont series consists of very deep, poorly drained, very slowly permeable soils on coastal plains. These nearly level soils formed in clayey sediments on the Beaumont Formation of the Pleistocene Age. Slopes range from 0 to 1 percent.	Flats, Coastal Plains	Low
Mocarey-Yeaton complex, 0 to 1 percent slopes (MofA)	<p>The Mocarey series consists of very deep, moderately well drained, moderately slow permeable soils. These nearly level soils formed in loamy fluviomarine deposits of the Beaumont Formation. Slope ranges from 0 to 1 percent.</p> <p>The Yeaton series consists of very deep, moderately well drained soils. These nearly level soils formed in loamy fluviomarine deposits of the Beaumont Formation. These soils have been leveled for rice irrigation. Slope ranges from 0 to 1 percent.</p>	Flats, Coastal Plains	Low
Voss sand, 0 to 1 percent slopes, occasionally flooded (VorA)	The Voss series consists of very deep, moderately well drained, rapidly permeable soils that formed from deep sandy sediments. These nearly level to very gently sloping soils are on flood plains. Slopes range from 0 to 3 percent.	River Valleys, Coastal Plains	High

Table 1
Soil Mapping Units corresponding to Abbott's geoarcheological model (2001)

Mapping Unit (Map Symbol)	Texture and Drainage	General Location	Geoarcheological Potential
Kaman clay, 0 to 1 percent slopes, frequently flooded (KanA)	The Kaman series consists of very deep, somewhat poorly drained, very slowly permeable soils that formed in clayey alluvium. These nearly level soils occur on floodplains. Slope ranges from 0 to 1 percent.	Flood Plains, River Valleys	Moderate to High
Morey-Levac complex, 0 to 1 percent slopes (MorA)	<p>The Morey series consists of very deep, somewhat poorly drained very slowly permeable soils. These nearly level soils formed in loamy fluviomarine deposits of the Beaumont Formation. Slope ranges from 0 to 1 percent.</p> <p>The Levac series consists of very deep, somewhat poorly drained soils. These nearly level soils formed in loamy fluviomarine deposits of the Beaumont Formation. These soils have been leveled for rice irrigation. Slope ranges from 0 to 1 percent.</p>	Flats, Coastal Plains	Low
Beaumont silty clay, 0 to 1 percent slopes, rarely flooded (BebA)	Beaumont- see above	Flats, Coastal Plains	Low
Beaumont-Urban land complex, 0 to 1 percent slopes (BecA)	<p>Beaumont- see above</p> <p>Urban Land consists of very high runoff.</p>	Flats, Coastal Plains	Low

CULTURAL SETTING

INTRODUCTION

Based on technological and stylistic changes evident in the archeological record, the sequence of recognized cultural manifestations in the central and upper Texas coastal region has been traditionally divided into four periods: the Paleoindian period (ca. 11,500 to 8,000 B.P.), the Archaic period (8,000 to 2,000 B.P.), the Ceramic period (2,000 to 300 B.P.), and the Historic period (after 300 B.P.). These periods are further divided into finer-grained temporal divisions depending on often subtle changes in cultural practices as observed in the archaeological record.

PALEOINDIAN PERIOD (CA. 11,500 TO 8,000 B.P.)

The character of the first human occupation of the coastal regions of Texas during the Paleoindian period is considered to be relatively sparse (Ricklis 2004, 184). While a number of Paleoindian artifacts – notably projectile points – have been encountered in the coastal region of Texas, none of these were identified in discrete Paleoindian contexts – the Paleoindian material was either found on the surface, or was mixed with later cultural material (Hester 1980, 4; Patterson 1980, 6; Ricklis 2004, 184). The seeming lack of contextualized Paleoindian cultural material identified to date in the Texas coast may be due to a combination of various site formation processes, such as the rise of sea levels in the Late Pleistocene, which inundated approximately 30 to 40 km of exposed coastline in the Texas coast (land that may have been utilized by Paleoindian peoples) (Aten 1983, 178-210). Holocene erosion and site burial by alluvium deposition may also have obscured or obliterated some Paleoindian sites (Abbott 2001; Hester 1980). Due to the lack of contextualized cultural material, it is difficult to provide an assessment that goes beyond a generalized overview of Texas coast inhabitant lifeways during the Paleoindian period. It is doubtless that the Paleoindian peoples of the Texas coast were, like their counterparts elsewhere in Texas and beyond, hunters and gatherers. Moreover, based on the observation that the high-quality stone material used to make the projectile points encountered in the Texas coast was procured from elsewhere, it is likely that Paleoindian people of the Texas coast engaged in long-distance trade networks and/or large-scale migratory rounds (Ricklis 2004, 184). Early Paleoindian points are represented by Clovis and Folsom points, and Late Paleoindian projectile points identified in the Texas coastal regions include San Patrice and Scottsbluff (Ricklis 2004, 184). One notable Paleoindian site in the upper Texas coast is the McFaddin Beach Site (41JF50) in Jefferson County, a secondary context site located on the east side of Galveston Bay (Bousman et al 2004). This site is characterized by a high concentration of cultural material deposited on the beach by tidal action, which includes over one hundred Paleoindian projectile points, more than any other site or county in Texas. It is unknown, however, whether this high density of artifact distribution is due to nearby ancient human occupation, dynamic coastal processes, or over-diligence by the beachcombers and archaeologists working in the area (Brown 2004).

ARCHAIC PERIOD (CA. 8,000 TO 2,000 B.P.)

In the upper coastal region of Texas, the Archaic period is generally divided into Early Archaic (8,000 to 6,000 B.P.), Middle Archaic (6,000 to 3,000 B.P.), and Late Archaic (3,000 to 2,000 B.P.). The Archaic period on the upper Texas coast is marked by sea-level rise and climatic fluctuation during the middle to late Holocene, from 9,000 to 2,000 B.P. (Aten 1983, 152–157). Archaeologically, this period is generally marked by an increase in the proliferation of sites in the region, mainly along stream courses and shoreline, reflecting larger occupational patterns observed elsewhere in Texas. The Archaic period is further characterized by reduced group mobility and well-defined social territories, as exemplified by a significant increase in the representation of local chert in tool manufacture (Ricklis 2004, 185; Story 1990). Specialized hunting and gathering represented the main subsistence strategy for inhabitants of the central Texas coast in the Archaic period. Generally, Archaic sites near the coastline demonstrate a dietary focus on marine resources, while the remains of terrestrial mammals are better represented in Archaic sites further inland.

EARLY ARCHAIC (CA. 8,000 TO 6,000 B.P.)

While it was previously thought that habitation and exploitation of the upper Texas coastline was relatively constricted in the Early and Middle Archaic periods (Aten 1983), it has been suggested that many of these early sites may be in fact buried or obscured in submerged upland stream margins; transgressive marine waters; and later Holocene bay, estuarine, and alluvial sediments, as the sea level changed and finally stabilized at the start of the Late Archaic period (Ricklis 2004, 186). Nevertheless, Early Archaic occupation at the shoreline, where identified, was small in scale in comparison with later habitation of the region. Moreover, the period between 6,800 and 5,900 B.P. is considered to have represented a time of occupational hiatus in the region, marked by a break in shell midden deposition. This identified lack of cultural material is associated with fluctuations in sea level that may have destabilized the biotic balance of the coastal region, leading to the depletion of exploitable resources for human populations (Ricklis 2004, 187).

Inland from the coast, a number of sites with components dating to the Early Archaic have been recorded. Notable sites include 41GV53 and the Eagle's Ridge site (41CH252) in Galveston and Chambers counties, respectively (Ricklis 2004). Both of these sites are characterized by dense stratified shellfish (*rangia*) middens, hearths, and artifact scatters associated with long occupational sequences starting in the Early Archaic. Technologically, this period is associated with early side-notched and corner-notched projectile points that include the Keithville, Neches River, and Trinity types (Ricklis 2004, 185).

MIDDLE ARCHAIC (CA. 6,000 TO 3,500 B.P.)

Evidence for human occupation in the upper Texas coast initially shows a marked increase from previous periods after ca. 6,000 B.P., as demonstrated by a significant rise in the number of

archaeological sites associated with this period. Sites with an Early Archaic component, such as 41GV53 and Eagle's Ridge Site (41CH252), also show continuous occupation through the first half of the Middle Archaic period. Exploitation of local resources, particularly estuarine and marine fish and shellfish, continued. The artifact assemblages most commonly associated with this period in the upper Texas coast demonstrate a marked degree of tool diversification: different types of projectile points, such as the Carrollton, Morhiss, Palmillas, and Travis appear in the archaeological record (Ensor and Ricklis 1998). Scrapers, bifacial drills, awls, utilized flakes, and beads are also documented in this period (Ricklis 2004). Obsidian and non-local high-grade chert were also recovered from Middle Archaic sites such as the McKinzie Site (41NU221), which may hint at the existence of an extensive trade network in this period (Ricklis 2004). The Middle Archaic is also the period when cemeteries are first identified in the archaeological record, located in the inland prairies of the upper Texas coast. Ernest Witte site, (41AU36) located in the lower Brazos River drainage system, is the largest cemetery in the upper Texas coast and was first established in the Middle Archaic. Like many cemeteries in this period, Ernest Witte site was also continuously used through the Late Archaic (Ricklis 2004).

Similar to the occupational hiatus observed in the latter part of the Early Archaic, the period between 4,000 to 3,000 B.P. is also marked with distinguishable break in the deposition of shell middens in certain portions of the Texas coastal region. While inland sites such as Eagle's Ridge (41CH252) are continuously occupied or utilized through the Middle Archaic and beyond, sites close to the shoreline, the portion of the coast between Galveston Bay and Baffin Bay in particular, may have experienced fluctuating sea levels. These sea level variations likely disrupted the coastal biome and caused the depletion of food resources commonly exploited by Middle Archaic peoples. Sea levels ultimately stabilized in 3,000 B.P.

LATE ARCHAIC (CA. 3,500 TO 2,000 B.P.)

The Late Archaic occupation of the central and upper Texas coastal areas is characterized by a significant increase in the population, based on the proliferation of shell midden sites along the shores of bays and in estuarine zones (Ricklis 2004, 187). This population increase was likely facilitated by the stabilization of the sea level around 3,000 B.P. and subsequent strengthening of the regional biome, which provided a plentiful and reliable source of food for the inhabitants of the area. Moreover, although the main focus of the subsistence strategy of these Late Archaic communities seems to have been estuarine and marine resources, as shown by the abundance of fish and shellfish remains in Late Archaic sites, reptiles and mammals were also similarly targeted, pointing to a diversified diet (Ricklis 2004). Sites in this period show variability among each other in terms of occupational intensity and size, which has led to the suggestion that not all communities in the area were alike (Dillehay 1975; Ricklis 2004). Hall (1981) argues that the highly productive environments such as river valley bottoms, estuaries, and bays that formed during the late Holocene allowed Late Archaic groups to operate within smaller, more exclusive territories. The territorialization of the landscape is further supported by the establishment and continued use of earlier cemeteries, such as Ernest Witte site, which has been interpreted to indicate the expression

of distinct social identities and territorial ties between discrete social units in the Texas coast (Ricklis 2004, 186; Story 1985, 40).

Technologically, the Late Archaic is characterized by the adoption of dart points such as Yarbrough, Kent, and Gary types, which are found in both shoreline and inland sites (Gadus and Howard 1990). It has been suggested that the development and application of technologies such as fish weirs may have also allowed for higher levels of efficiency in the exploitation of coastal and riverine food resources, although empirical evidence for such device lacks from the region (Aten 1983; Ricklis 2004).

Significant Late Archaic sites in this region include sites 41HR80 and 41HR85, known collectively as Harris County Boys' School. These sites are defined by an extensive midden and a cemetery, established and occupied from approximately 3,500 to 1,500 B.P. The midden is comprised mainly of Rangia shell, with a significant quantity of lithic debitage and broken or reworked bifacial stone tools, bone tools, and beads (Aten 1983). Other significant Late Archaic sites include the Ernest Witte site (41AU36) and the Eagle's Ridge site (41CH252), which, although established in earlier periods, grew in size in the Late Archaic (Ricklis 2004).

CERAMIC PERIOD (2,000 TO 300 B.P.)

The Ceramic Period, sometimes referred to as the Late Prehistoric Period, is distinguishable from earlier periods in particular due to the development and adoption of two new technologies: ceramics and the bow and arrow. Ceramics first appear in the archaeological record in the upper and central Texas coastal regions in 2,000 B.P., potentially via diffusion from the east, most likely the Mississippi River area (Ricklis 2004). The adoption of ceramic technology is largely interpreted to have represented a development in cooking and storage efficiency in comparison to earlier periods. However, the extent to which ceramics influenced other aspects of life and community in the Ceramic Period is still contested, as the majority of material culture found in Ceramic Period sites does not seem to differ greatly from that of the Archaic Period (Ricklis 2004, 189; Shafer et al 1975; Takac et al. 2000, 17). The bow and arrow are first identified in the archaeological record in the second half of the Ceramic Period around 1,200 B.P., replacing the atlatl and spear as the dominant projectile technology and thus, mirroring technological developments elsewhere in inland Texas and beyond (Ricklis 2004, 194). The Ceramic Period is generally divided into Early Ceramic and Late Prehistoric Periods, after Ensor et al. (1990) and Story et al. (1990).

Although the Ceramic Period differs from earlier periods in technological terms, the high degree of occupational permanence observed in many sites established in Archaic Period has led to the suggestion that Ceramic Period communities largely followed subsistence and settlement practices established in previous periods (Ricklis 2004, 189). Nevertheless, the nature of the larger regional cultural affiliations of central and upper Texas coast communities is still under debate. Two perspectives have been proposed. One, advocated by Shafer (1975) and Aten (1983), proposes

that coastal Texas communities in the Ceramic Period were largely affiliated with the pre-Mississippian Woodland cultures of eastern United States, an association that is supported by perceived ceramic stylistic and technological similarities between the two groups (Ricklis 2004, 189). The second perspective positions upper and central Texas groups in the Ceramic Period as part of the more circumscribed, archaeologically distinct Mossy Grove cultural tradition (Story 1990), with closer ties to coastal Louisiana groups than to eastern Woodland cultural traditions. This second perspective is generally favored in contemporary literature (Ricklis 2004; Ricklis and Weinstein 2005).

EARLY CERAMIC PERIOD (2,000 TO 1,200 B.P.)

As there is a high degree of occupational continuity between the Late Archaic and Early Ceramic period, Early Ceramic sites in the central and upper Texas coast are generally characterized by rangia shell middens along coastal bays or river margins, with a noticeable regional population increase (Ricklis 2004, 192). Early Ceramic sites are identified in the archaeological record only by the presence of certain material culture, namely the co-occurrence of sandy or clay paste Tchefuncte and Mandeville ceramics and dart points, primarily Gary and Kent types (Aten 1983, 303; Ricklis 2004). As sandy-pasted ceramics are associated with cultural traditions prior to the development and adoption of horticultural practices at the larger regional scale in places such as East Texas, it is thought that the subsistence strategies of the Early Ceramic period in the Texas coast was largely dependent on hunting and gathering, similarly to earlier periods (Ricklis 2004, 193). Significant Early Ceramic sites in the area include Eagle's Ridge site (41CH252), inhabited since the Late Paleoindian (Ensor and Ricklis 1998; Ricklis 2004). The site of Mitchell Ridge (41GV66) on Galveston Island is significant in the Late Prehistoric Period, although initial occupation likely dates to the end of the Early Ceramic Period and extends into the Historic Period (Ricklis 1994).

HISTORIC PERIOD (POST 300 B.P.)

The Trinity River region was dominated by the Atakapan Indians when the first Europeans arrived in the area in the 1700's (Kliener 2019c). The Louisiana Purchase in 1803 encouraged additional people to move to the region from the southern states, and the population of the region increased steadily until the mid-19th century due to the abundant land available.

Economically, Antebellum Trinity River Region was dominated by plantations along the Trinity River that raised cotton, sugarcane, tobacco, indigo, grains, and vegetables. A large number of lumber mills were also in operation during this time and remained a mainstay in economic stability. The economy received a further boost in 1840 when an extensive ranch was built and cattle drives began to move through the area.

LIBERTY COUNTY

River travel via steamboat to and from the Gulf of Mexico was the dominant mode of transportation for people and products in the region from 1838 to 1878. The United States governmental assistance for making the Trinity River more navigable came after 1880, and by 1940, a total of 236 miles of waterway had been constructed. Attempts to build an extensive railroad system were interrupted by the Civil War, but construction continued after Reconstruction (Kliener 2019c). This rail system caused the Port of Liberty to see significantly less traffic.

The population within Liberty County remained stable from 1870 to 1900 when it doubled, signaling an important growth in the county's agriculture and industry (Kliener 2019c). During the same timeframe, Liberty County became the center for Texas cattle production and rice industry when irrigation plants were developed. Oil prospecting and production began about 1901. The population steadily grew, as did the agricultural and cattle industry. As with the rest of the Trinity River region, lumber milling remained an important county industry.

JEFFERSON COUNTY

Jefferson County was formed in 1836 as one of the original counties in the Republic of Texas (Kliener 2016b). By the 1840s, shingle manufacture and timber exports helped to supplement an existing domestic economy. After 1880, rail transportation increased significantly. The Port Arthur Ship Canal was dug in 1897 and 1898 from Sabine Pass to Port Arthur (Kliener 2016b).

In the early 1900s, population in Jefferson County grew from a major influx followed by the Spindletop oilfield opening in 1901. Additionally, there was significant migrations of the Cajun French from Louisiana to Jefferson County in 1910, as a result of damaged cotton crops by insect infestation (Kliener 2016b).

Spindletop transformed the Beaumont area into a major industrial center. By the 1950s, the Spindletop field was still active, however sulfur mining was also gaining popularity in the region. By the 1970s, rice and cattle were the dominant agricultural products, and many of the residents were employed in the petrochemical, shipbuilding, and rubber industries (Kliener 2016b).

CHAMBERS COUNTY

In 1858, Chambers County was formed from Liberty and Jefferson counties. Industry was small scale at this time with only a steam sawmill and a shipyard (Kliener 2016a). Railroad routes did not reach into Chambers County so the county was dependent on steam traffic and other water transportation from Galveston. Between 1910 and 1930, tenant farming increased in the area. Additionally, rice farming increased greatly on the area in the 1900s due to the development of a canal system (Kliener 2016a). Lumber was also an important industry during the early twentieth century as well.

METHODS

BACKGROUND REVIEW

Prior to initiating fieldwork, Perennial conducted a records and literature review of the THC's Texas Archeological Sites Atlas (Atlas) online database and the NRHP database to identify previously recorded cultural resource sites, historic structures, properties listed in the NRHP, designated historic districts, or SAL which could potentially be affected by the proposed undertaking. Previously recorded cultural resource site forms, reports of archaeological investigations, general historical documents, and secondary sources concerning the background of the area were reviewed. The records search included a review of all site records and previous surveys on file within 1.00 mi (1.61 km) of the Project.

In addition to a records and literature search, archaeologists gathered information from secondary sources concerning the prehistoric and historic background of the area. Documents associated with the history of the area were used to model prehistoric and historic settlement patterns in relation to the landscape and terrain characteristics as well as cultural patterns and regional trends. NRCS soil data, USGS 7.5 minute topographic quadrangles, aerial photographs, and contemporary geologic and physiographic features were also examined.

FIELD SURVEY METHODS

The cultural resources surveys were conducted by one to two crews comprised of up to three archeologists each under the supervision of the Principal Investigator who provided logistical and technical support, as well as oversight of all staff. Phase I survey investigations were concentrated in the vicinity of delineated wetland or waterbody features, and survey efforts were conducted in accordance with a scope of work for the Project approved by the USACE on August 28, 2018, and the THC on October 1, 2018. Following the approval of the scope of work, ETC extended the eastern terminus of the Project to the western bank of the Neches River, and other minor reroutes were also implemented. Perennial applied the approved survey methodology to all new Project components. Additionally, several route options were presented across the DOC – Stiles Unit. These tracts were added to the Project in late August 2019, and the additional route options were added to the Project in late September and October 2019. Any reroutes across public tracts were surveyed in accordance with the previously approved scope of work associated with TAP #8690 Project.

In practice, the archeological field crew utilized data collected by Perennial field biologists to identify feature locations within the Project APE. In general, the Texas State Minimum Archeological Survey Standards (TSMASS) require that a minimum of 16 shovel tests be excavated per 1.0 mi (1.6 km) for rights-of-way (ROWs) measuring up to 100.0 ft. (30.0 m) in width (one survey transect). For the majority of the Project length, intensive survey investigations took place within an approximately 300.0 ft. (91.5 m) wide corridor. Within the vicinity of

delineated wetland and waterbody features, shovel tests were excavated along three evenly spaced transects at intervals ranging from 98.4 to 328.0 ft. (30.0 to 100.0 m), depending on the archaeological sensitivity of the landscape.

Perennial conducted a preliminary probability assessment for the Project APE utilizing multiple data sources, including location of previously recorded sites, soils and geology, aerial imagery, as well as topographic and historic maps. Overall, the probability classifications are meant to be a guidance tool that serves to inform survey strategy and level of effort while ensuring adherence to state and federal standards and guidelines. The three probability classifications and the characteristics for each probability area are defined as follows:

High Probability Areas (HPAs) were defined as areas that are likely to contain prehistoric and/or historic-age archaeological sites. HPAs generally include settings along major waterbodies, such as the Trinity River and bayous, and incorporate other high probability settings such as alluvial terraces, Holocene-aged soil deposits, remnant natural levees, benches, and topographic rises in floodplain settings (relatively unaffected by natural or human-induced processes), or proximity to previously recorded sites or historic structures. In HPAs, survey efforts extended beyond the water feature by a variable distance of 164.0 to 492.0 ft. (50.0 to 150.0 m) to include any adjacent prominent landforms, terrace projections, remnant natural levees, benches, topographic rises in floodplain settings, (relatively unaffected by natural or human-induced processes), as well as any previously recorded sites or historic structures. Surveys across HPA settings included shovel testing intervals ranging from 82.0 to 164.0 ft. (25.0-50.0 m) along parallel transects. In cases where the pipeline will be installed via HDD under major waterway crossing resulting in no impacts to high probability alluvial settings, surveys were concentrated in the drill entry and exit workspaces.

Medium Probability Areas (MPAs) were defined as areas that exhibit landscape characteristics of an HPA, but that show evidence of human-induced or natural disturbances that would impact the integrity of any previously unrecorded archaeological deposits. MPAs are also defined as areas in which resources, such as lithic raw materials, may be located. Generally, the remnants of historic structures and artifact scatters are often found in MPAs. In MPAs, survey efforts extended beyond the water feature by a variable distance of 164.0 to 492.0 ft. (50.0 to 150.0 m) to include any adjacent landscape features and/or potential raw material resources. Surveys across these settings included shovel testing intervals ranging from 165.0 to 330.0 ft. (50.0 to 75.0 m) along parallel transects.

Low Probability Areas (LPAs) were defined as areas consisting of inundated lowlands, swamps and sloughs, as well as expansive wetlands within agricultural settings. LPAs consisted of areas where soils are of Pleistocene-age or older. LPAs also included locations with significant disturbance from oil and gas, and/or modern development that have created varying levels of landscape modification. Survey efforts in LPAs were conducted within roughly 164.0 to 492.0 ft.

(50.0 to 150.0 m) of either side of the delineated feature boundaries. Surveys across these settings included shovel testing intervals ranging from 246.0 to 328.0 ft. (75.0 to 100.0 m) along parallel transects. Much of the Project traverses irrigations ditches across low-lying agricultural fields. Much of these areas were considered low probability for cultural resources due to the extensive ground-disturbing activities needed to construct water control features.

In areas where wetlands were delineated across large areas with a discontinuous or irregular boundary, survey investigations consisted primarily of pedestrian surveys across feature clusters with shovel testing efforts conducted at the discretion of the Principal Investigator or crew chief. In lieu of shovel testing in areas with standing water, field archeologists recorded inundation points with GPS units to demonstrate the extent of waterlogged settings. These inundation points are demonstrated on the survey results maps provided in Appendix B.

In general, shovel tests measured approximately 30.0 cm (12.0 in) in diameter and were excavated by natural strata. Where possible, shovel tests were excavated to a depth commensurable with the Project impacts per the THC/CTA survey standards, or to where pre-Holocene sterile substrates are encountered, if possible, unless manual shovel testing is unable to penetrate hard clay soils. All soil matrices were sifted through 6.3-millimeter (¼-inch) mesh hardware cloth unless dominated by clay. Clayey matrix was finely divided by trowel and visually inspected.

For each of the shovel tests, the following information was recorded on shovel test logs: location, maximum depth, and the number of soil strata. For each soil stratum, thickness, texture, color, and the presence or absence and nature of cultural materials was recorded. Perennial maintained a selective artifact collection survey strategy whereby only representative samples of artifacts by category and diagnostic artifacts would have been collected from each newly recorded or revisited site and housed temporarily at Perennial's laboratory for analysis. Any collected artifacts would have been catalogued, analyzed, and prepared for submittal to an approved permanent curatorial facility or returned to the landowner upon request at the completion of the Section 106 consultation process. In practice, the survey investigations as detailed herein resulted in negative findings, as such the artifact collection strategy was not implemented.

The field crew recorded all shovel test locations, isolated finds, archaeological sites and associated features using a handheld GPS device (as encountered). Also, each archaeologist was equipped with a compass, shovel test and photographic logs, daily journal forms, and appropriate state site forms. Each crew also utilized topographic maps and aerial photographs of the APE, a digital camera, and a cellular telephone to maintain contact with the Principal Investigator (terrain permitting).

In addition to shovel testing, the THC/Council of Texas Archeologists (CTA) survey standards require that mechanical trenching be conducted in areas of the Project APE with deep alluvial sediments, namely the Trinity River crossing, and the western banks of the Neches River. Overall,

both of these settings were noted on multiple field visits to consist of heavily inundated settings with up to 2.0 ft. (0.6 m) of standing water in areas. Access these areas with heavy machinery is not a feasible option due to the limited access points associated with these areas (Figure 4).

Field surveys across Code-permitted tracts were conducted along 100% of the length of the Project APE for each tract. Shovel tests were conducted in non-inundated areas along three parallel transects (when capable) at intervals ranging from 98.4 to 328.0 ft. (30.0 to 100.0 m) apart. Overall, surveys across these tracts noted extensive disturbance from modern development, as well as widespread inundation that prevented traditional shovel testing in some areas. In such cases, inundation points were taken with hand-held GPS units during pedestrian surveys. Based on the underlying geology and the low potential for buried cultural deposits for soils found within the Code-permitted tracts, trenching was not warranted across these areas.

Figure 4. View of flooded access point on the eastern side of the Trinity River

RESULTS

BACKGROUND REVIEW

Based upon a background literature review on the THC's Atlas, ten archaeological sites (Table 2) and eight cemeteries (Table 3) are mapped within a 1.0 mi (1.6 km) of the Project APE. None of the 10 archaeological sites identified are located within or adjacent to the Project APE. These sites consist either of historic artifact scatters or farmsteads located in agricultural settings, or prehistoric shell middens documented on the banks of the Neches River. Site 41JF66 is mapped within 400.0 ft. (121.95 m) of the Project APE and is recorded as a single point on the Atlas, suggesting that the boundaries of the site were not well defined. For this reason, additional archival research and a more intensive shovel testing regime were implemented in this area to better define the limits and characteristics of the site within the APE.

Of the eight cemeteries identified within the 1.0 mi (1.6 km) background review radius, one cemetery (Sahara Cemetery [LC-C070]) is located approximately 130.0 ft. (40.0 m) north of Project APE. The cemetery is delineated by a barbed-wire boundary fence, and is located within an isolated stand of trees situated within an expansive open pasture (Figure 5). Construction activities associated with the Project are not anticipated to encroach on the 25-foot cemetery buffer.

Table 2. Sites previously recorded within the 1.0 mi background review radius

Site Trinomial	Site Description	Year Recorded	NRHP Eligibility	Distance from Project APE
41LB121	Prehistoric Lithic Scatter	2013	Not Eligible	0.58 mi (0.93 km)
41JF66	Tyrrell Tenant Farmstead - Historic, Early 20th Century	1990	Undetermined	360.0 ft. (109.7 m)
41JF97	Historic Scatter	2011	Not Eligible	0.37 mi (0.59 km)
41JF99	Historic Isolated Find	2013	Not Eligible	0.13 mi (0.20 km)
41JF101	Historic Scatter	2016	Not Eligible	0.4 mi (0.64 km)
41JF5	Shell Midden/Campsite	1940	Undetermined	0.63 mi (1.01 km)
41OR110	Shell Midden	2013	Not Eligible	0.29 mi (0.46 km)
41OR8	Shell Midden	1940	Undetermined	0.88 mi (1.41 km)
41OR9	Shell Midden/Human Burial	1940	Undetermined	0.8 mi (1.28 km)
41OR10	Shell Midden	1940	Undetermined	0.68 mi (1.09 km)

Table 3. Cemeteries recorded within the 1.0 mi background review radius

Cemetery Name	Cemetery Number	Distance from Project APE
Freeman Cemetery	N/A	0.78 mi (1.25 km)
Sahara Cemetery	LB-C070	130.0 ft. (39.6 m)
Quarters Cemetery	LB-C075	0.43 mi (0.69 km)
Unknown Cemetery	LB-C067	0.93 mi (1.49 km)
Redmond Field	LB-C132	0.76 mi 1.22 km)
Miller Cemetery	LB-C068	0.6 mi (0.96 km)
Memorial Gardens	JF-C026	0.19 mi (0.30 km)
Unknown Cemetery	JF-C007	0.74 mi (1.19 km)

Figure 5. View of Sahara Cemetery with boundary fencing

The background review also determined that a total of 60 previous archaeological projects have been conducted within 1.0 mi (1.6 km) of the Project. The vast majority of these archaeological investigations consist of Phase I surveys for large-scale energy infrastructure projects. The lead agency on these projects is typically either the USACE Galveston District or the Federal Energy Regulatory Commission (FERC). Many of the remaining surveys were conducted in support of municipal transportation projects.

Twenty-seven of the 60 surveys overlap or intersect portions of the Project route. These previous survey investigations constitute approximately 32.7% overlap with the current Project APE (Appendix B). However, many of these surveys are outdated and do not meet modern survey standards. Additionally, many of these previously surveys were conducted for USACE-permitted projects, and the entire Project was not surveyed for the presence of cultural resources. As such, all areas surrounding identified wetland and waterbody for this Project were surveyed.

FIELD SURVEY

Perennial archaeologists Colene Knaub, William Kinkner, Jonathan Laird, Rachel Kelley, Rafael Cortez, Thomas Ross, and Wyatt Ellison conducted an intensive cultural resources survey of the Project APE between October 1, 2018, and November 12, 2019. The objectives of the survey were to (1) locate cultural resource sites within the APE in the vicinity of delineated wetland and waterbody features; (2) delineate the vertical and horizontal extent of any newly identified sites within the APE; (3) provide a preliminary evaluation of each site's eligibility for listing in the NRHP; and (4) assess any potential for the Project to directly or indirectly affect historic properties, or other sensitive cultural resources.

In addition to pedestrian surveys, investigations included the excavation of a total of 1,250 shovel tests of which 1,171 shovel tests were excavated adjacent to delineated wetland and waterbody features, also referred to as USACE permit areas (**Appendix B**). The remaining 79 shovel tests were excavated outside of USACE permit areas but within the Project workspace. For the purposes of this report, only investigations within the Project APE will be discussed.

In practice, the survey crews were strategically staggered to follow Perennial biological surveys to ensure adequate survey coverage within the USACE permit areas, which include expansive wetlands in forested areas, inundated agricultural fields that have existed in a fallow state for several years, drainage canals and ditches, and natural waterway crossings. **Appendix C** details the level of effort for each delineated feature.

Survey efforts across the USACE permit areas resulted in entirely negative findings with no cultural materials noted on the surface or within any shovel tests. Additionally, no historic standing structures or features were observed with any USACE permit areas. Large portions of the Project APE consist of heavily modified agricultural landscapes, or inundated lowlands underlain by clayey, saturated soils. Overall, the majority of the Project was determined to have a low probability for cultural resources based on the prevalence of previous disturbance and land modification from oil and gas development and agricultural practices. Greenfield settings with intact forested areas were also noted to have a low probability for cultural resources based on the presence of expansive inundated or wetland areas. These probability determinations are also reflected in the broader archeological dataset, which shows extensive survey efforts conducted on behalf of prolific oil and gas development, with sparse archeological findings.

The exception to this patterning would be the Trinity River basin. The initial assessment of this area determined that the Trinity River crossing, and the associated bottomlands that extend the east of the River, are underlain by Holocene-age alluvial deposits with soils characterized as having a high geoarcheological potential (NRCS 2019; Abbott 2001). The Project APE crosses the Trinity River in an area where numerous previous survey investigations converge, and survey and trenching efforts in support of these projects were negative for cultural materials and documented a disturbed soil profile (Wilcox et al. 2007; Brownlow and Clark 2006).

Prior to the beginning of November 2019, field surveys had not been conducted along the eastern banks and associated bottomlands of the Trinity River due to multiple flooding events that resulted in heavy inundation beginning in September 2018 which prevented access or survey investigations of any kind. For more than one year, field crews have attempted to survey the Trinity River bottomlands on multiple occasions. Access to this area was determined to be not feasible due to the presence of up to 2.0 ft. (6.0 m) of standing water for the entire 2.6 mi (4.1 km) stretch extending from the eastern banks of the Trinity River to Self Bayou. However, on November 6, 2019, a survey crew was able to access previously inaccessible areas associated with the Trinity River due to several months of normalized weather conditions throughout portions of Eastern Texas. This landscape, which is characterized by swampy marshes and ridge and swale topography. Even under normal conditions, large portions of this area remain constantly inundated due to strong hydrological influences and the geomorphic position of the landscape. While the area located immediately adjacent to the Trinity River was not inundated at the time of survey, wetlands with strong hydrological indicators still dominate the landscape. In non-inundated areas, shovel tests were excavated at 82.0-to -164-ft (25.0- to 50-m) intervals along three transects. Figure 6 present a representative photo of the non-inundated areas. A total of 96 shovel tests were excavated within this location, all of which were negative for cultural resources. Inundated locations within this area consisted of low-lying mapped wetland features that likely hold water much of the year (Figures 7-9). These areas are located between the only access/entry path to the eastern side of the Trinity River, and they had to be traversed on foot. It is not feasible to gain access to the drier areas near the river with heavy equipment.

Overall, deep impacts associated with the HDD exit workspace will be confined to the existing, permanent easement with temporary workspace extending across the broader APE corridor at select locales. As such, Perennial recommends that Construction Monitoring be conducted by a qualified archaeologist during construction efforts in the vicinity of the HDD crossing the Trinity River near MP 17.0-17.2.

Of the 760 delineated wetland and waterbody features, 74 features were originally not surveyed for cultural resources due to restricted land access including denied landowner permissions and significant inundation. Of these 74 features, 38 feature locations (27 streams and 42 wetlands) will be bypassed via horizontal directional drill (HDD) or bore trenchless construction methods resulting in no impacts to these features. The remaining five features (including multiple crossing locations of the same feature) are located along the eastern banks of the Trinity River. While these features were surveyed for cultural resources with negative findings, the presence of buried deposits exists within the vicinity of these features. However, access to these features with heavy machinery is not feasible due to the remote location and constant hydrological influences (e.g. inundation and saturation) associated with the floodplain setting of the Trinity River. As such, these five features are proposed to be monitored by a qualified Archeological Monitor during construction efforts. **Appendix C** provides each wetland and waterbody feature crossed by the Project with management recommendations and associated comments, while **Appendix F**

provides a Cultural Monitoring Plan to evaluate the five features that will not be avoided during construction efforts. **Appendix F** also includes a table in response to a letter issued by the USACE Staff Archeologist, Mr. Jerry Androy, on May 17, 2019, indicating that the 74 aforementioned permit areas associated with the Project would require cultural resources investigations. The table lists each permit area, the reason surveys were not originally conducted, and justification for/against the need for monitoring.

Should cultural materials be encountered during this phase of the Project, then the Archeological Monitor would follow the procedures outlined in the Cultural Monitoring Plan, which would require construction to stop in the immediate area of discovery, and initiation of notification protocols needed to ensure the find is adequately evaluated in accordance with Section 106 of the NHPA. Details of the Archeological Monitoring Plan are presented in **Appendix F**

CODE-PERMITTED TRACTS

The Project APE crosses six tracts owned by Jefferson County, the City of Beaumont, and the DOC – Stiles Unit (Figure 6). These properties fall under the jurisdiction of the Texas Antiquities Code (TAC [13 TAC § 22.1-22.6]). As such, survey investigations were conducted for 100% of the Project APE across these properties by Perennial archaeologists Sarah Boudreaux, Wyatt Ellison, Colene Knaub, William Kinkner, Jonathan Laird, and Alejandro Martinez on December 20, 2018, September 25-27, 2019, and October 10, 2019.

Figure 6. View of non-inundated areas in Trinity River Bottomlands within Project APE, facing northwest

Figure 7. View of inundated areas in Trinity River Bottomlands within Project APE, facing southeast

Figure 8. View of inundated areas in Trinity River Bottomlands within Project APE, west

Figure 9. View of inundated areas in Trinity River Bottomlands within Project APE, facing south

The Jefferson County tracts consist of a large sport complex with existing outdoor sport fields and several paved parking lots (two tracts) (Figure 7); a heavily wooded tract with large expansive wetlands; and an existing utility corridor across the southern edge (Figure 8; Table 4;). The City of Beaumont tracts consist of a large, heavily vegetated area with some nature trails present. Large expansive forested and emergent wetlands were present across the entirety of the City of Beaumont tracts (Figure 9), and extensive inundation was present at the time of survey. The DOC – Stiles Units tracts consists of short, dense grasses with large, expansive wetlands present across the property (Figure 10). Generally, ground surface visibility across the Code-permitted tracts was poor.

A total of 66 shovel tests were excavated in non-inundated and undisturbed areas as part of survey efforts for the six Code-permitted tracts, all of which were negative for cultural resources (see Table 4; Figures 11 to 17). The locations of shovel tests within this portion of the Project APE were strategically chosen to avoid any areas with evidence of disturbance, such as existing gravel roads, and large areas of inundation.

The Project APE across the Code-permitted tracts is considered to be within a low probability setting due to underlying soils, geology, and the observed level of disturbance and expansive wetlands. Overall, survey efforts revealed a heavily inundated and disturbed landscape that has a limited capacity to harbor intact cultural resources.

Table 4. Survey Data for Code-Permitted Tracts

Tract	Owner	Setting	Acreage	Shovel Tests Excavated	Survey Results
TX-JE-041.402	Jefferson County	Emergent Wetland, Manicured Lawn, and Paved Road	2	1	All surveys negative for cultural resources – no further work warranted; Tract bypassed via bore/HDD
TX-JE-041.406	Jefferson County	Emergent Wetland, Paved Parking Lot, Sports Facility, Paved Roads, and Manicured Lawn	10	3	All surveys negative for cultural resources – no further work warranted; Tract bypassed via bore/HDD
TX-JE-116.200	Jefferson County	Forested area; disturbed parking areas	35.6	3	All surveys negative for cultural resources – no further work warranted
TX-JE-077.000	City of Beaumont	Forested and Emergent Wetlands	21	13	All surveys negative for cultural resources – no further work warranted
TX-JE-079.310	City of Beaumont	Agricultural Fields, Forested Wetlands, Emergent Wetlands, Palustrine Wetlands, Open Water, and Oil/Gas Infrastructure	49	19	All surveys negative for cultural resources – no further work warranted
TX-JE-115.220; TX-JE-115.900 (combined)	Texas Department of Corrections – Stiles Unit	Existing prison facility	92.6	27	All surveys negative for cultural resources – no further work warranted

Figure 10. Vicinity Map for Code-Permitted Tracts

Figure 11. Overview of Jefferson County Tracts, facing northwest

Figure 12. Overview of Jefferson County Tract (adjacent to DOC – Stiles Unit tract), facing west

Figure 13. Overview of City of Beaumont Tracts, facing northeast.

Figure 14. Overview of DOC – Stiles Unit tracts, facing northwest.

Figure 15. Survey Results for Code-Permitted Tracts – Jefferson County

Figure 16. Survey Results for Code-Permitted Tracts – City of Beaumont (continued)

Figure 18. Survey Results for Code-Permitted Tracts, DOC – Stiles Unit and Jefferson County

Figure 19. Survey Results for Code-Permitted Tracts, DOC – Stiles Unit and Jefferson County

Figure 20. Survey Results for Code-Permitted Tracts, DOC – Stiles Unit and Jefferson County

Figure 21. Survey Results for Code-Permitted Tracts, DOC – Stiles Unit and Jefferson County

CONCLUSION AND RECOMMENDATIONS

ETC retained Perennial to conduct an intensive Phase I cultural resources investigation for the proposed Project to comply with anticipated USACE and Code permitting requirements. Specifically, archaeological investigations for the Project were conducted in accordance with Section 106 of the NHPA and the Texas SHPO survey standards.

Consistent with the USACE application requirements, the Code, and in accordance with Section 106 of the NHPA of 1966, as amended, the proposed Project must make a reasonable and good faith effort to identify historic properties within the APE and to take into account any direct or indirect effects the proposed undertaking could have on properties listed or considered eligible for listing in the NRHP or for designation as a SAL, as warranted.

As the Project footprint was not finalized at the time of field investigations, survey efforts were concentrated within the vicinity of delineated wetland and waterbody features along the length of the route within a 300.0ft- (91.4-m-) wide ESA. The anticipated depths of impact for the Project will range from 4.0 to 7.0 ft. (1.2 to 2.1 m) along the pipeline centerline, with limited deeper impacts at HDD and bore locations, including Cow Island Bayou, Hillebrandt Bayou, Lower Neches Valley River Authority canals, Nolte Canal, the Trinity River, Turtle Bayou, Whites Bayou, Willow Marsh Bayou, and public road crossings. The anticipated depths of impact for temporary workspace areas within the APE corridor would not exceed 0.6 to 1.0 ft. (0.1 to 0.3 m). The overall APE for direct effects for the Project measured 2307.19 acres (ac) (933.68 ha), while APE for Code-permitted tracts totaled 210.0 ac (85.06 ha). The ESA is coterminous with the Project APE, which is also referred to as the USACE permit areas. Only the areas adjacent to the USACE permit areas and the entirety of Code-permitted areas were surveyed for cultural resources.

Investigations included an archival background review and intensive pedestrian surveys augmented by shovel testing in the vicinity of delineated wetland and waterbody features. Archival research determined that there are no previously recorded sites within, or directly adjacent to the Project APE, and approximately 32.7% of the Project APE has been previously surveyed for cultural resources. However, many of these surveys are outdated and do not meet modern survey standards. Additionally, many of these previously surveys were conducted for USACE-permitted projects, and the entire Project was not surveyed for the presence of cultural resources. As such, all areas surrounding identified wetland and waterbody for this Project were surveyed.

Perennial biologists delineated a total of 490 wetland areas. Of the 490 wetlands identified within the Project APE, 290 were characterized as palustrine emergent (PEM) wetlands, 106 were characterized as palustrine forested (PFO) wetlands, 4 were classified as PFO-Cypress wetlands, and 90 were characterized as palustrine scrub-shrub (PSS) wetlands. Perennial biologists also identified 270 waterbodies that ranged from perennial streams to ephemeral streams. Of the 270

waterbodies delineated, 36 were classified as having perennial flow, 66 were classified as having intermittent flow, and 148 were classified as ephemeral flow. Additionally, 20 open water features were delineated and classified as manmade ponds.

Survey efforts were concentrated in the vicinity of these features where land access was voluntarily granted in accordance with a scope of work for the Project approved by the USACE on August 28, 2018, and the Texas Historical Commission (THC) on October 1, 2018. Following the approval of the scope of work, ETC extended the eastern terminus of the Project to the western bank of the Neches River, and other minor reroutes were also implemented. Perennial applied the approved survey methodology to all new Project components.

For Code-permitted tracts, surveys were conducted across the entire length of the Project APE corridor in accordance with a stand-alone scope submitted to the THC on December 14, 2018, and amended August 30, 2019. Additionally, following the receipt of TAP#8690, the proposed Project was routed onto two additional publicly-owned tracts belonging to the Texas Department of Corrections (DOC) – Stiles Unit and Jefferson County. The TAP #8690 was revised and amended on August 30, 2019. Following this August 30, 2019, amendment, ETC added additional route options across the DOC – Stiles Unit tract. This additional mileage was surveyed using the same methods as stated in the previously presented revised TAP scope of work for this property.

In all, the survey investigations included the excavation of a total of 1,250 shovel tests of which 1,171 shovel tests were excavated within the Project APE. The remaining 79 shovel tests were excavated outside USACE permit areas but within the Project workspace. For the purposes of this report, only investigations within the Project APE will be discussed.

Survey investigations within the Project APE resulted in entirely negative findings. No archeological sites were encountered within the survey areas reported herein. Additionally, no historic standing structures or landscape features such as historic-age canals were observed within any USACE permit areas. Overall, the surveys documented predominately inundated landscapes with a low probability for intact cultural resources. Numerous existing pipeline corridors and modern canal features are traversed by the Project. While some of the modern canals could be historic in nature or connected to a greater network of irrigation features used historically to supply agricultural crops with water, it is important to note that the majority of the waterways associated with these features will be bypassed via bore/HDD. As such, any impacts to these waterbodies as well as the associated canal structure will be entirely avoided. Additionally, all visual impacts from the proposed pipeline corridor will be temporary in nature.

To date, field surveys have been completed for all accessible wetland and waterbody features along the pipeline route, as well as the total length of the Project survey corridor across all Code-permitted tracts. Prior to the beginning of November 2019, field surveys had not been conducted along the eastern banks and associated bottomlands of the Trinity River due to multiple flooding events that resulted in heavy inundation beginning in September 2018 which prevented access or

survey investigations of any kind. Additionally, field surveys did not occur along portions of the Project containing denied landowner permissions.

On November 6, 2019, a survey crew was able to access previously inaccessible areas associated with the Trinity River due to several months of normalized weather conditions throughout portions of Eastern Texas. Even under normal conditions, large portions of this area remain constantly inundated due to strong hydrological influences and the geomorphic position of the landscape. However, crews were able to traverse inundated areas by foot to access portions of the Project located immediately adjacent to the Trinity River. While the area located immediately adjacent to the Trinity River was not inundated at the time of survey, wetlands with strong hydrological indicators still dominate the landscape.

Of the 760 delineated wetland and waterbody features, 74 features were originally not surveyed for cultural resources due to restricted land access including denied landowner permissions and significant inundation. Of these 74 features, 38 feature locations (27 streams and 42 wetlands) will be bypassed via horizontal directional drill (HDD) or bore trenchless construction methods resulting in no impacts to these features. The remaining five features (including multiple crossing locations of the same feature) are located along the eastern banks of the Trinity River. While these features were surveyed for cultural resources with negative findings, the presence of buried deposits exists within the vicinity of these features. However, access to these features with heavy machinery is not feasible due to the remote location and constant hydrological influences (e.g. inundation and saturation) associated with the floodplain setting of the Trinity River. As such, these five features are proposed to be monitored by a qualified Archeological Monitor during construction efforts. **Appendix C** provides each wetland and waterbody feature crossed by the Project with management recommendations and associated comments, while **Appendix F** provides a Cultural Monitoring Plan to evaluate the five features that will not be avoided during construction efforts. **Appendix F** also includes a table in response to a letter issued by the USACE Staff Archeologist, Mr. Jerry Androy, on May 17, 2019, indicating that the 74 aforementioned permit areas associated with the Project would require cultural resources investigations. The table lists each permit area, the reason surveys were not originally conducted, and justification for/against the need for monitoring.

Based on the results of the survey effort reported here, no cultural resources will be affected by any construction activities within the Project APE. Aside from Cultural Monitoring at five features (including multiple crossing locations of the same feature) within the Trinity River floodplain, it is Perennial's opinion that no further cultural resources investigations are warranted for the Project. Should archaeological remains be encountered during construction, work in the immediate area will cease, and a qualified archaeologist will be called upon to evaluate the remains and provide recommendations for how to manage the resources under the State's Historic Preservation Plan.

HUMAN REMAINS

In the event that human remains are encountered during any part of the Phase I survey effort, work will stop immediately and the appropriate local law enforcement personnel and medical examiner's office will be notified of the discovery. Should the medical examiner determine that the human remains are older than 50 years, personnel will notify the THC and file a notice of existence of a cemetery with the county clerk. Consultation with any concerned parties including landowners, appropriate Tribes, and living descendants will be conducted to ensure compliance with existing state laws. No remains will be removed from the site until jurisdiction has been established and the appropriate permits have been obtained. All activities will adhere to the Texas Health and Safety Code (8 THSC § 711.010) and the Texas Antiquities Code (13 TAC §§ 22.1-22.6). If the human remains are determined to be Native American, they will be handled in accordance with (modeled after) the Native American Graves Protection and Repatriation Act (NAGPRA).

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APPENDIX A: AGENCY CORRESPONDENCE

SCOPE OF WORK

A PHASE I CULTURAL RESOURCES SURVEY OF THE ORBIT 20-INCH ETHANE PIPELINE PROJECT JEFFERSON, LIBERTY, AND CHAMBERS COUNTIES, TEXAS

Lead Agency:

U.S. Army Corps of Engineers
Galveston District

Prepared For:

Orbit Gulf Coast NGL Exports, LLC

Prepared By:

Perennial Environmental Services, LLC
4425 Mopac South, Building II Suite 204
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Principal Investigator:
Heidi Shaw, MSc.

Introduction

Orbit Gulf Coast NGL Exports, LLC (Orbit) is proposing to construct approximately 61.5 miles (mi) (107.8 kilometer [km]) of new 20.0-inch (50.8-centimeter [cm])-diameter ethane pipeline known as the Orbit 20-inch Ethane Pipeline Project (Project) in Jefferson, Liberty, and Chambers counties, Texas (Figure 1). The U.S. Army Corps of Engineers (USACE) is the lead federal agency and the Project will require a permit pursuant to Sections 10 and 404 of the Clean Water Act. Perennial Environmental Services, LLC (Perennial) has been contracted to conduct the cultural resources survey for the proposed Project.

The following scope of work outlines an intensive Phase I survey plan, including historical inventory and archaeological survey, designed to identify and assess cultural resources within the Project area.

Project Description

In accordance with permit requirements, Orbit is initiating the pre-application process with the USACE for construction and operation of the Project. Consistent with USACE application requirements, and in accordance with Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended (36 CFR 800), the proposed Project must make a reasonable and good faith effort to identify historic properties within the Project Area of Potential Effect (APE) and to take into account any potential effects, direct or indirect, the proposed undertaking could have on properties listed or considered eligible for listing in the National Register of Historic Places (NRHP). While the actual APE for direct effects will be limited to the workspace easement (typically not to exceed 120.0-feet (ft) [36.6-meters (m)]), unless located within additional temporary workspace [ATWS]), survey efforts will cover an expanded 300.0-ft (91.5-m) wide survey corridor, unless otherwise constrained by existing utility infrastructure, to accommodate minor shifts in the pipeline alignment at the discretion of Orbit. The APE for indirect effects at new above-ground facilities will be the area from which any permanent aboveground facilities has the potential to visually diminish or alter the setting of an NRHP-listed or -eligible property. Only historic properties within visible range of permanent above-ground Project facilities will be evaluated.

On behalf of Orbit, Perennial is requesting the Texas Historical Commission's (THC) and USACE Galveston District's participation and assistance in determining the need and level of cultural resources investigation necessary for a successful project. It is our hope that by requesting your participation in the process, we can be more effective in protecting important cultural resources.

Figure 1. Project location map.

Cultural resource investigations will be conducted in compliance with Section 106 of the NHPA of 1966 (Public Law [PL] 89-665), as amended; its implementing regulations, “Protection of Historic and Cultural Properties” (36 CFR 800); the National Environmental Policy Act of 1969 (NEPA) (PL 91-190. 83 Stat. 852), and the survey guidelines set forth by the THC and Council of Texas Archeologists (CTA).

The objectives of the survey will be to (1) locate cultural resource sites within the survey corridor within USACE jurisdictional areas; (2) delineate the vertical and horizontal extent of any newly identified sites within the Project boundaries; (3) provide a preliminary evaluation of each site’s eligibility for listing in the NRHP; and (4) assess any potential for the Project to directly or indirectly affect historic properties, or other sensitive cultural resources.

To date, Perennial has conducted preliminary research and desktop analyses of the proposed pipeline corridor. The following scope-of-work outlines Perennial’s proposed cultural resources survey procedures for the Project.

Previously Recorded Cultural Resources

Perennial conducted a records and literature review of the THC’s Texas Archeological Sites Atlas (Atlas) online database and the NRHP database to identify previously recorded cultural resource sites, historic structures, properties listed in the NRHP, designated historic districts, or State Antiquities Landmarks (SAL) which could potentially be affected by the proposed undertaking. Previously recorded cultural resource site forms, reports of archaeological investigations, general historical documents, and secondary sources concerning the background of the area were reviewed. The records search included a review of all site records and previous surveys on file within 1.0 mi (1.6 km) of the Project centerline.

In addition to a records and literature search, archaeologists gathered information from secondary sources concerning the prehistoric and historic background of the area. Documents associated with the history of the area were used to model prehistoric and historic settlement patterns in relation to the landscape and terrain characteristics as well as cultural patterns and regional trends. National Resources Conservation Service (NRCS) soil data, US Geological Survey (USGS) 7.5-minute topographic quadrangles, aerial photographs, and contemporary geologic and physiographic features were also examined.

Previously Recorded Sites

Based upon a background literature review on the THC’s Atlas, 3 archaeological sites (**Table 1**) and 6 cemeteries (**Table 2**) are within a 1.0-mi (1.6-km) background review

area (**Attachment 1**). None of the 3 archaeological sites identified are located within or adjacent to the Project area. These three sites include one prehistoric lithic scatter (41LB121), one historic artifact scatter (41JF97), and a historical farmstead (41JF66). Sites 41LB121 and 41JF97 are not eligible for listing on the NRHP, while Site 41JF66 has an undetermined NRHP eligibility. Site 41JF66 is mapped within 400 ft of the Project ESA and is recorded as a single point on the Atlas, suggesting that the boundaries of the site are not well defined. For this reason, additional archival research and a more intensive shovel testing regime will be implemented in this area to better define the limits and characteristics of the site within the ESA.

Of the six cemeteries identified within the 1-mi background review radius, one cemetery (LC-C070) is recorded as being within 130 ft of the Project ESA. The cemetery appears to be located within a copse of trees within an open pasture. The Project is unlikely to impact the cemetery and the likelihood for unmarked graves within the Project ESA remains low. Nonetheless, if public access to the cemetery is permitted, Perennial will assess the risk of the Project impacting the cemetery and/or unmarked graves during pedestrian survey efforts. Moreover, Perennial is recommending to Orbit to reroute their proposed centerline to better avoid the cemetery delineations. If field efforts indicate a high risk of the Project impacting the cemetery and/or unmarked graves and the client is unable to reroute the centerline, Perennial will recommend mechanical scraping of the topsoil to determine the presence or absence of any human burials within the Project ESA.

Table 1. Sites previously recorded within the 1.0 mi background review radius				
Site Trinomial	Site Description	Year Recorded	NRHP Eligibility	Distance from Project ESA
41LB121	Prehistoric lithic scatter	2013	Not eligible	0.58 mi
41JF66	Tyrrell Tenant Farmstead - Historic, early 20th century	1990	Undetermined	360 ft
41JF97	Historic scatter	2011	Not eligible	0.37 mi

Table 2. Cemeteries recorded within the 1.0 mi background review radius		
Cemetery Name	Cemetery Number	Distance from Project ESA
Freeman Cemetery	N/A	0.78 mi
Sahara Cemetery	LB-C070	130 ft
Quarters Cemetery	LB-C075	0.43 mi
Unknown Cemetery	LB-C067	0.93 mi

Table 2. Cemeteries recorded within the 1.0 mi background review radius		
Cemetery Name	Cemetery Number	Distance from Project ESA
Redmond Field	LB-C132	0.76 mi
Miller Cemetery	LB-C068	0.6 mi

Previously Conducted Surveys

The background review also determined that a total of 37 previous archaeological projects have been conducted within 1-mi (1.6 km) of the Project centerline (see **Attachment 1**). The vast majority of these archaeological investigations consist of Phase I surveys for large-scale energy infrastructure projects. The lead agency on these projects is typically either the USACE Galveston District or the Federal Energy Regulatory Commission (FERC). Many of the remaining surveys were conducted in support of municipal transportation projects.

Twenty of the 37 surveys overlap or intersect portions of the Project route. These previous survey investigations constitute an approximately 20 percent overlap with the current Project route. Portions of the Project that have been previously surveyed in accordance with current CTA/THC survey standards will not be resurveyed by Perennial. In areas where the previous survey do not overlap with the proposed Project environmental survey area (ESA), then the area will be surveyed according to the existing standards.

Field Methods

The cultural resources survey will be conducted by one to two crews comprised of up to three archaeologists each under the supervision of the Principal Investigator who will provide logistical and technical support, as well as oversight of all staff. In anticipation of USACE permitting requirements, Phase I survey investigations will be concentrated in the vicinity of USACE-jurisdictional wetland or waterbody features. In practice, the archeological field crew will utilize data collected by Perennial field biologists to identify jurisdictional feature locations within the proposed survey corridor.

In general, the Texas State Minimum Archeological Survey Standards (TSMASS) require that a minimum of 16 shovel tests be excavated per 1.0 mi (1.6 km) for rights-of-way (ROWs) measuring up to 100.0 ft (30.0 m) in width (1 survey transect). For the majority of the Project length, intensive survey investigations will take place within an approximately 300.0 ft (91.5 m) – wide corridor. Within the vicinity of USACE jurisdictional areas, shovel tests will be excavated along three evenly spaced transects at intervals ranging from 30 to 100 meters, depending on the archaeological sensitivity of the landscape.

Perennial has been conducted a preliminary probability assessment for the Project ESA utilizing multiple data sources, including location of previously recorded sites, soils and geology, aerial imagery, as well as topographic and historic maps. Overall, the probability classifications are meant to be a guidance tool that serves to inform survey strategy and level of effort while ensuring adherence to state and federal standards and guidelines. The three probability classifications and the characteristics for each probability area are defined as follows:

High Probability Areas (HPAs) will be defined as areas that are likely to contain prehistoric and/or historic-age archaeological sites. HPAs generally include settings along major waterbodies, such as the Trinity River and bayous, and incorporate other high probability settings such as alluvial terraces, Holocene-aged soil deposits, remnant natural levees, benches, and topographic rises in floodplain settings (relatively unaffected by natural or human-induced processes), or proximity to previously recorded sites or historic structures. In HPAs, survey efforts would extend beyond the water feature by a variable distance of 164.0 to 492.0 ft (50 to 150 m) to include any adjacent prominent landforms, terrace projections, remnant natural levees, benches, topographic rises in floodplain settings, (relatively unaffected by natural or human-induced processes), as well as any previously recorded sites or historic structures. Surveys across HPA settings will include shovel testing intervals ranging from in intervals spaced 82.0 to 164.0 feet (25.0-50.0 meters) along parallel transects. If it is determined that the pipeline will be installed via horizontal directional drill (HDD) under major waterway crossing resulting in no impacts to high probability alluvial settings, then surveys would be concentrated in the HDD entry and exit workspaces.

Medium Probability Areas (MPAs) will be defined as areas that exhibit landscape characteristics of an HPA, but that show evidence of human-induced or natural disturbances that would impact the integrity of any previously unrecorded archaeological deposits. MPAs are also defined as areas in which resources, such as lithic raw materials, may be located. Generally, the remnants of historic structures and artifact scatters are often found in MPAs. In MPAs, survey efforts would extend beyond the water feature by a variable distance of 164.0 to 492.0 ft (50 to 150 m) to include any adjacent landscape features and/or potential raw material resources. Surveys across these settings included shovel testing intervals ranging from 165.0 to 330.0 ft (50.0 to 75.0 m) along parallel transects

Low Probability Areas (LPAs) will be defined as areas that are inundated lowlands, swamps and sloughs, as well as expansive wetlands within agricultural settings. LPAs will consist of soils that are of Pleistocene-age or older. LPAs will also include locations with significant disturbance from oil and gas, and/or modern development that have created varying levels of landscape modification. Survey efforts in LPAs will be

conducted within roughly 164.0 to 492.0 ft (50 to 150 m) of either side of the delineated feature boundaries. Surveys across these settings included shovel testing intervals ranging from 246.0 to 328.0 ft (75.0 to 100.0 m) along parallel transects

Should wetlands be delineated across large areas with a discontinuous or irregular boundary, then the investigations would consist primarily of pedestrian surveys across feature clusters with shovel testing efforts conducted at the discretion of the Principal Investigator or crew chief.

Portions of the Project that have been previously surveyed in accordance with the current TSMASS will not be resurveyed during the proposed Phase I survey, with the exception of revisiting previously recorded sites. In addition, significant portions of the proposed route are collocated with existing utility corridors with multiple buried pipelines. In such settings, the number of survey transects may be reduced with shovel tests excavated only in greenfield settings. Any deviations from the state mandated survey standards will be thoroughly documented, and disturbances will be photographed.

In general, shovel tests will measure approximately 30-cm (12-in) in diameter and will be excavated by natural strata. Shovel tests will be excavated to a depth commiserate with the project impacts where possible per the THC/CTA survey standards, or to where pre-Holocene sterile substrates are encountered, if possible, unless manual shovel testing is unable to penetrate hard clay soils. All soil matrices will be sifted through 6.3-millimeter (1/4-inch) mesh hardware cloth unless dominated by clay. Clayey matrix will be finely divided by trowel and visually inspected.

For each of the shovel tests, the following information will be recorded on shovel test logs: location, maximum depth, and the number of soil strata. For each soil stratum, thickness, texture, color, and the presence or absence and nature of cultural materials will be recorded. Perennial will maintain a selective artifact collection survey strategy whereby only representative samples of artifacts by category and diagnostic artifacts will be collected from each newly recorded or revisited site and housed temporarily at Perennial's laboratory for analysis. Any collected artifacts will then be catalogued, analyzed, and prepared for submittal to an approved permanent curatorial facility or returned to the landowner upon request at the completion of the Section 106 consultation process.

The field crew will record all shovel test locations, isolated finds, archaeological sites and associated features using a handheld GPS device. Also, each archaeologist will be equipped with a compass, shovel test and photographic logs, daily journal forms, and appropriate state site forms. The crew will be equipped with topographic maps and aerial

photographs of the survey corridor, a digital camera, and a cellular telephone to maintain contact with the Principal Investigator (terrain permitting).

If an archaeological site is identified, the appropriate delineation techniques will be systematically applied to identify the horizontal and vertical limits of each site's boundary. Site boundaries may be determined based on both surface artifact density and the presence or lack of subsurface components. For subsurface sites, a series of shovel tests will be excavated radiating in the four cardinal directions or, if more appropriate, along perceived major and minor topographic and site axis. In practice, shovel tests within potential sites will be placed along transects at 10.0-m (33.0-ft) intervals to determine the depth and potential integrity of cultural deposits, and to carefully examine for the presence of intact archaeological features and/or discrete episodes of occupation. In the absence of subsurface deposits, controlled pedestrian surface inspections will be conducted and site boundaries defined based on a marked reduction in surface artifact density. Shovel testing or pedestrian surveys will not be conducted beyond the project right-of-way boundary to ensure no trespassing onto private property occurs.

In addition to shovel testing, a hand-operated or mechanical auger, and/or mechanical trenching may be needed in areas of the Project ESA with deep alluvial sediments that are within HPAs or known archaeological site deposits to probe for deeply buried cultural materials below shovel testing capabilities (i.e., 1 m). The method for testing in areas of deep alluvial sediments will be determined at a later date in conjunction with the THC and USACE based on observed field conditions. Should field conditions (i.e., inundation, lack of access, prevalence of buried active utilities) prevent testing of deep alluvial sediments in the Project ESA, then construction monitoring by a qualified archaeologist may be necessary.

Historic Structure Documentation

All historic-age structures (i.e., older than 50 years) located within the Project survey corridor will be thoroughly documented during the survey efforts. Historic Standing Structure forms will be completed for each resource. The historic structures will be adequately photo-documented, sketch maps will be drawn, and each resource will be plotted with a GPS device. Shovel tests may be excavated in the vicinity of the structures to determine if an associated subsurface archaeological component is present. All data will be reviewed by a qualified architectural historian to determine date of construction, style, integrity, and overall significance and NRHP eligibility.

Viewshed Analysis

As the majority of the Project will be below-ground, viewshed analysis will only be conducted at designated above-ground facilities. At present, these facilities have not been

identified. As such, Perennial will assess any indirect effects associated with these individual facilities as they become available. In general, however, most will likely be constructed in high-production areas in close proximity to other similar facilities. In such cases, indirect impacts may have already been incurred and the addition of another similarly-functioning facility would constitute an in-kind element on the landscape.

For all new permanent above ground facilities, investigations will include an initial desktop analysis of the built environment within a 0.5-mile radius. Using the results of the desktop analysis, features within the built environment that are identified as being historical or potentially historic in age within the viewshed radius will be reviewed through aerial photography, historical topographic maps, and on the ground assessment. If the Principal Investigator determines that the built environmental feature is in fact historical and has the potential to be impacted by the construction of the new facility, an architectural historian will be retained and an official NRHP eligibility assessment rendered.

Reporting

Following the completion of the field surveys, Perennial will prepare a draft report of the investigations. The format of the report will adhere to review guidelines suitable to the State Historic Preservation Officer (SHPO) in accordance with the THC's Rules of Practice and Procedure, Chapter 26, Section 27, and the CTA *Guidelines for Cultural Resources Management Reports*. The report will document previous investigations in the area, background cultural setting, the methodology used during the investigations, the general nature and extent of cultural resources encountered during the cultural resource survey, and management recommendations for of any documented cultural resources per all applicable state and federal laws. Once the client approves the report, the draft report will be submitted to the THC and the USACE for review. Following the agency review period, any appropriate edits or comments will be incorporated, and a final draft will be produced and distributed appropriately.

Laboratory Methods

The artifact collection procedure employed by Perennial is meant to be flexible to accommodate variations in site size, density of artifacts, setting, presence/absence of subsurface assemblages, site type, and feasibility constraints. In general, the artifact collection strategy is designed to procure comprehensive inventory-level information to facilitate NRHP evaluations and avoidance strategies, as well as adhere to property restrictions. Specifically, the artifact collection policy may vary between 100% collection of observed artifacts, and a representative sample collection strategy. In practice, the 100% collection strategy would most commonly be applied to sites with subsurface assemblages. For surficial sites, the Principal Investigator in consultation

with the field supervisor would determine the collection strategy based on the site type and setting. In the event that a sample collection policy is implemented for a site, field staff will inventory and describe the characteristics, material, type, decoration, and other descriptive traits; and photograph all observed artifacts whenever feasible. Meanwhile, Perennial will also collect representative samples of each diagnostic artifact type and variety. All artifacts that are collected will be brought back to Perennial's laboratory to be cleaned, sorted, cataloged, photo-documented, and analyzed. Standard analytical techniques and existing typologies, as appropriate for Southeastern prehistoric and historic archaeological studies, will be employed. Artifacts collected on private land will be curated in Perennial's laboratory in Austin, unless requested otherwise by the landowner.

Laboratory and curation methods for artifacts identified and collected on public lands will be described in a forthcoming Texas Antiquities Committee Permit Application scope-of-work.

Human Remains

In the event that human remains are encountered during any part of the Phase I survey effort, work will stop immediately and the appropriate local law enforcement personnel and coroner's office will be notified of the discovery. Should the coroner determine that the human remains are not forensic in nature, then the lead federal agency will claim jurisdiction of the discovery and will commence consultation with any concerned parties including landowners, appropriate tribes, and/or living descendants to ensure compliance with existing state and federal laws. No remains will be removed from the site until jurisdiction has been established and the appropriate permits have been obtained. All activities will adhere to the Texas Health and Safety Code (8 THSC § 711.010) and the ACT (13 TAC §§ 22.1-22.6). If the human remains are determined to be Native American, they will be handled in accordance with the Native American Graves Protection and Repatriation Act (NAGPRA).

References

(Atlas) Texas Archaeological Sites Atlas

2018 Texas Archaeological Site Atlas restricted database, Texas Historical Commission. <http://nueces.thc.state.tx.us/>. Accessed August 1, 2018.

**ATTACHMENT 1 – TOPOGRAPHIC MAPS OF THE PROJECT SURVEY
CORRIDOR**

This Page Intentionally Left Blank to Protect Sensitive Cultural Resources

Heidi Shaw

From: Androy, Jerry L CIV USARMY CESWG (US) <Jerry.L.Androy@usace.army.mil>
Sent: Tuesday, August 28, 2018 3:50 PM
To: Heidi Shaw
Cc: Abby Peyton
Subject: RE: Scope of Work submittal for review--Orbit 20-inch Ethane Pipeline Project

Hi Heidi,

The SOW looks fine as submitted. Please make sure the SHPO signs off on the SOW as well.

Jerry Androy
Regulatory Archeologist and Tribal Liaison U.S. Army Corps of Engineers
2000 Fort Point Road
Galveston, TX 77550
(409) 766-3821
Jerry.L.Androy@usace.army.mil

-----Original Message-----

From: Heidi Shaw [mailto:hshaw@perennialenv.com]
Sent: Tuesday, August 21, 2018 12:28 PM
To: Androy, Jerry L CIV USARMY CESWG (US) <Jerry.L.Androy@usace.army.mil>
Cc: Abby Peyton <APeyton@perennialenv.com>
Subject: [Non-DoD Source] Scope of Work submittal for review--Orbit 20-inch Ethane Pipeline Project

Dear Mr Androy,

In anticipation of our client submitting a PCN application for a project in Jefferson, Liberty, and Chambers Counties, we have attached a cultural scope of work for your review. We have concurrently submitted the SOW to the THC for their comments. We estimate that we will be ready to mobilize for fieldwork in mid-September, pending any comments/directions from the ACOE.

If you have any questions or require any clarifications, please feel free to reach out via phone or email.

Kind Regards,

Heidi Shaw

Heidi Shaw, MSc, RPA

Abby Peyton

From: noreply@thc.state.tx.us
Sent: Monday, October 01, 2018 9:42 AM
To: Heidi Shaw; reviews@thc.state.tx.us; Jerry.L.Androy@usace.army.mil
Subject: Project Review: 201900720

Re: Project Review under Section 106 of the National Historic Preservation Act and/or the Antiquities Code of Texas

201900720

Orbit 20-inch Ethane Pipeline Project
Beaumont, TX

Dear Heidi Petyo:

Thank you for your submittal regarding the above -referenced project. This response represents the comments of the State Historic Preservation Officer, the Executive Director of the Texas Historical Commission (THC), pursuant to review under Section 106 of the National Historic Preservation Act.

The review staff led by Maggie Moore has completed its review and has made the following determinations based on the information submitted for review:

Archeology Comments

- THC/SHPO concurs with information provided

We look forward to further consultation with your office and hope to maintain a partnership that will foster effective historic preservation. Thank you for your cooperation in this review process, and for your efforts to preserve the irreplaceable heritage of Texas. If you have any questions concerning our review or if we can be of further assistance, please email the following reviewers: Maggie.Moore@thc.texas.gov.

Sincerely,

A handwritten signature in black ink that reads "Maggie Moore". The signature is written in a cursive, flowing style.

For Mark Wolfe, State Historic Preservation Officer
Executive Director, Texas Historical Commission

Please do not respond to this email.

cc: Jerry.L.Androy@usace.army.mil

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, GALVESTON DISTRICT
P. O. BOX 1229
GALVESTON, TEXAS 77553-1229

May 17, 2019

Evaluation Branch

SUBJECT: Department of the Army Permit Application SWG-2019-00074

Energy Transfer Company
Attn: Jonathan Minton
1300 Main Street
Houston, Texas 77002

Dear Mr. Minton:

The U.S. Army Corps of Engineers, Galveston District (Corps) Staff Archeologist has reviewed the draft report titled, *A Phase I Cultural Resources Survey of the Orbit Pipeline Project, Jefferson, Liberty, and Chambers Counties, Texas*, prepared for Energy Transfer Company by Perennial Environmental Services, and dated March 2019. Seventy four permit areas have not been investigated for the presence of historic properties (see enclosure 1). A cultural resources investigation is required within these areas to determine if historic properties are present.

The archeologist contracted by the applicant must submit a draft report of the cultural resources investigations for review and approval to both the Corps Staff Archeologist and the SHPO. The Corps Staff Archeologist's approval of the final report and formal concurrence from the SHPO will document completion of the cultural resources review. Your permit application will not be considered complete until the cultural resource review is completed.

Please contact our Staff Archeologist, Mr. Jerry Androy at 409-766-3821 with your Corps Permit Application Number (SWG-2019-00074) for specific instructions regarding the requirements of this investigation. For questions regarding the permit process, please contact Kate Mott at 409-766-3945. Please send a copy of this letter to the archeologist you contract.

Sincerely,

For:

Janet Thomas Botello
Chief, Evaluation Branch

cc w/Encl:
RD-P - Mr. Jerry Androy

TSHPO - Mr. Mark Wolfe

Perennial Environmental Services, LLC, Attn: Josh Melnar, 13100 Northwest Freeway,
Suite 150, Houston, Texas 77040

Feature_ID	Feature_Cl	Milepost	Crossing_M	Latitude	Longitude
WP9CH004_DT	PFO	2.7	Workspace Only b	29.875929	-94.956216
WP4LI002_PFO (First Crossing)	PFO	16.9	Workspace Only b	29.963916	-94.802633
WP4LI002_PFO_C (First Crossing)	PFO	17	Workspace Only b	29.96456	-94.800863
WP4LI002_PFO (Second Crossing)	PFO	17	Workspace Only b	29.964256	-94.801752
WP4LI002_PFO_C (Second Crossing)	PFO	17.2	Workspace Only b	29.965676	-94.796901
WP3LI007_PFO (First Crossing)	PFO	17.8	Workspace Only b	29.968084	-94.788748
WP3LI007_PFO (Second Crossing)	PFO	17.8	Workspace Only b	29.968249	-94.78815
WP3LI007_PFO (Third Crossing)	PFO	17.8	Workspace Only b	29.968349	-94.787812
WP4LI002_PEM (Second Crossing)	PEM	17.8	Open Cut	29.965887	-94.795373
WP3LI007_PEM	PEM	17.9	Open Cut	29.968771	-94.784439
WP3LI007_PFO (Fourth Crossing)	PFO	17.9	Workspace Only b	29.968583	-94.7873
WP3LI007_PFO (Fifth Crossing)	PFO	17.9	Workspace Only b	29.968669	-94.786712
WP3LI007_PFO (Sixth Crossing)	PFO	18	Workspace Only b	29.968816	-94.785516
WP3LI007_PFO (Seventh Crossing)	PFO	18	Workspace Only b	29.968896	-94.78513
WP3LI007_PFO (Eighth Crossing)	PFO	18	Workspace Only b	29.968951	-94.784851
WP3LI007_PFO (Ninth Crossing)	PFO	18.1	Workspace Only b	29.969052	-94.783928
WP3LI007_PFO (Tenth Crossing)	PFO	18.2	Workspace Only b	29.969174	-94.78273
WP3LI007_PFO (Eleventh Crossing)	PFO	18.3	Workspace Only b	29.969344	-94.781038
WP3LI006_PSS	PSS	18.3	Workspace Only b	29.969426	-94.78005
WP3LI006_PFO (First Crossing)	PFO	18.3	Workspace Only b	29.969462	-94.779828
WP3LI006_PFO (Second Crossing)	PFO	18.4	Workspace Only b	29.969477	-94.779518
WP3LI006_PEM	PEM	18.4	Open Cut	29.969788	-94.774379
WP3LI006_PFO (Third Crossing)	PFO	18.5	Workspace Only b	29.969639	-94.777941
WP3LI006_PFO (Fourth Crossing)	PFO	18.6	Workspace Only b	29.969816	-94.776179
WP3LI006_PFO (Fifth Crossing)	PFO	18.6	Workspace Only b	29.969985	-94.774364
WP3LI006_PFO (Sixth Crossing)	PFO	18.8	Workspace Only b	29.970208	-94.772384
WP3LI006_PFO	PFO	18.9	Workspace	29.970378	-94.770791

Feature_ID	Feature_CI	Milepost	Crossing_M	Latitude	Longitude
(Seventh Crossing)			Only b		
WP3LI002_PEM	PEM		19 HDD	29.970024	-94.768551
(First Crossing)					
WP3LI002_PSS_B	PSS	19.1	HDD	29.970131	-94.767401
WP3LI002_PEM	PEM	19.1	HDD	29.970155	-94.767593
(Second Crossing)					
WP3LI002_PEM	PEM	19.1	HDD	29.970164	-94.767275
(Third Crossing)					
WP3LI004	PSS	19.1	HDD	29.970064	-94.767918
WP3LI005_PEM	PEM	19.1	HDD	29.970214	-94.767066
(First Crossing)					
WP3LI005_PFO_CY	PFO - Cypress	19.2	HDD	29.970213	-94.766636
P					
WP4LI020_PSS_B	PSS	26.5	HDD	29.990743	-94.647094
WP4LI020_PSS	PSS	26.5	HDD	29.990638	-94.647534
(First Crossing)					
WP4LI020_PEM	PEM	26.5	HDD	29.990757	-94.646559
(First Crossing)					
WP4LI020_PSS	PSS	26.6	HDD	29.99078	-94.645972
(Second Crossing)					
WP4LI020_PSS	PSS	26.6	HDD	29.99085	-94.645255
(Third Crossing)					
WP4LI020_PEM	PEM	26.7	HDD	29.991067	-94.642455
(Second Crossing)					
WP4LI021_PSS	PSS	29.5	Workspace Only b	29.994985	-94.597182
WP4LI021_PEM	PEM	29.5	Workspace Only b	29.994973	-94.59725
WP9JE010_PFO_DT	PFO	47.5	HDD	30.008831	-94.299479
(First Crossing)					
WP9JE010_PEM_DT	PEM	47.6	HDD	30.00881	-94.29922
WP9JE010_PFO_DT	PFO	47.6	HDD	30.008876	-94.298903
(Second Crossing)					
WP4JE060	PEM	47.7	HDD/Open Cut	30.00908	-94.296288
SP9CH002_DT	Intermittent	2.5	HDD	29.874287	-94.954042
SP9CH013_DT	Intermittent	2.9	HDD	29.878056	-94.958084
SP4LI004	Ephemeral	17	Workspace Onlyb	29.96451	-94.801017
(First Crossing)					
SP3LI004	Intermittent	17.8	Open Cut	29.968041	-94.788427
SP3LI003	Intermittent	18.3	Open Cut	29.969306	-94.78036
SP3LI001	Ephemeral	19	Workspace Onlyb	29.969804	-94.768933
(First Crossing)					
SP3LI001	Ephemeral	19	HDD	29.969993	-94.768843
(Second Crossing)					
SP3LI002	Perennial	19.1	HDD	29.970079	-94.767966
(First Crossing)					
SP3LI002	Perennial	19.1	HDD	29.970163	-94.767135
(Second Crossing)					
SP9LI018_DT	Intermittent	22.7	Open Cut	29.982212	-94.708772
SP9LI016_DT	Intermittent	23	Open Cut	29.982905	-94.70401

Feature_ID	Feature_Cl	Milepost	Crossing_M	Latitude	Longitude
SP9LI017_DT	Intermittent	23.4	HDD	29.983716	-94.698527
SP4LI009	Perennial	26.5	HDD	29.990659	-94.647849
SP9JE012_DT	Intermittent	46.3	Open Cut	30.007294	-94.32033
SP9JE011_DT	Intermittent	46.5	Open Cut	30.007542	-94.316881
SP9JE010_DT	Intermittent	46.9	HDD	30.008011	-94.310084
SP9JE009_DT	Intermittent	47	HDD	30.008125	-94.308518
SP9JE008_DT	Intermittent	47.2	Open Cut	30.008397	-94.30514
SP9JE007_DT	Intermittent	47.4	HDD	30.008602	-94.302008
SP9JE019_DT	Intermittent	47.5	HDD	30.008769	-94.299814
SP4JE049	Intermittent	47.6	HDD	30.008875	-94.298407
SP9JE050_DT	Ephemeral	47.8	Open Cut	30.009144	-94.295261
SP9JE001_DT (First Crossing)	Intermittent	48.1	Workspace Onlyb	30.009432	-94.289942
SP9JE001_DT (Second Crossing)	Intermittent	48.1	HDD	30.009587	-94.289724
SP9JE003_DT	Intermittent	48.4	HDD	30.010026	-94.284569
SP9JE004_DT	Intermittent	48.8	HDD	30.010582	-94.278097
SP9JE005_DT	Intermittent	49	Open Cut	30.010839	-94.275431
SP9JE006_DT	Intermittent	49.2	Open Cut	30.011092	-94.272477

SCOPE OF WORK

A PHASE I CULTURAL RESOURCES SURVEY OF THE ORBIT PIPELINE PROJECT JEFFERSON, LIBERTY, AND CHAMBERS COUNTIES, TEXAS

Prepared For:

Energy Transfer Company

Prepared By:

Perennial Environmental Services, LLC
4425 Mopac South, Building II Suite 204
Austin, TX 78735

**Principal Investigator:
Jennifer Cochran MA, RPA**

**Revised Scope of Work
August 2019**

Introduction

Energy Transfer Company (ETC) is proposing to construct the Orbit Pipeline Project (Project) located in Jefferson, Liberty, and Chambers counties, Texas. The Project consists of approximately 68.3 miles (mi) (109.9 kilometer [km]) of new 20.0-inch (in) (50.8-centimeter [cm]) diameter pipeline that will be used to transmit ethane and propane (**Figure 1 and 2**). The U.S. Army Corps of Engineers (USACE) is the lead federal agency and the Project will require a permit pursuant to Sections 10 and 404 of the Clean Water Act. Perennial Environmental Services, LLC (Perennial) has been contracted to conduct the cultural resources survey for the proposed Project.

Consistent with USACE application requirements, and in accordance with Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended (36 CFR 800), the proposed Project must make a reasonable and good faith effort to identify historic properties within the Project Area of Potential Effects (APE) and to take into account any potential effects, direct or indirect, the proposed undertaking could have on properties listed or considered eligible for listing in the National Register of Historic Places (NRHP). At the time of field investigations, temporary workspaces had not yet been finalized. As such, survey efforts are being expanded to cover a broader Environmental Survey Area (ESA), including a 300-foot (ft) (91.44-meter [m])-wide corridor centered on the pipeline right-of-way that will be considered the APE for the Project.

While the majority of the Project will traverse private property, or fall under the jurisdiction of the USACE, approximately 3.8 cumulative mi (6.1 km) of the Project route also traverses state-owned properties (**Attachment 1**). These properties, designated herein as the Permit Areas, are owned by Jefferson County, the City of Beaumont, and Texas Department of Corrections (Stiles Unit) and are considered a political subdivision of the State of Texas (**Table 1**). As such, the Permit Areas also fall under the jurisdiction of the Antiquities Code of Texas (Code) and the proposed undertaking must take into account any potential effects, direct or indirect, to cultural resources that qualify as State Antiquities Landmarks (SAL). The APE associated with the Permit Areas measures approximately 128.0 acres (ac) (51.8 hectares [ha]) with depths of impact ranging from 4.0 to 6.0 feet (ft) (1.2 to 1.8 meters [m]) below ground surface. The following scope of work outlines the field survey methods, artifact collection and site recordation strategies, and reporting protocols that will be utilized by Perennial for the Permit Areas.

Table 1. Permit Areas			
Tract	Owner	Setting	Acreage
TX-JE-041.402	Jefferson County	Emergent wetland, manicured lawn, and paved road	2
TX-JE-041.406	Jefferson County	Emergent wetland, paved parking lot, sports facility, paved roads, and manicured lawn	10
TX-JE-116.200	Jefferson County	Forested area	12
TX-JE-077.000	City of Beaumont	Forested and palustrine wetlands	21
TX-JE-079.310	City of Beaumont	Agricultural fields, forested wetlands, emergent wetlands, palustrine wetlands, open water, and oil/gas infrastructure	49
TX-JE-115.220; TX-JE-115.900	Texas Department of Corrections – Stiles Unit	Existing prison facility	34

Environmental Setting

The Permit Areas are located along the western edge of the City of Beaumont. According to aerial imagery and U.S. Geological Survey (USGS) topographic maps, the state lands appear to be situated within a disturbed setting, based on the presence of existing utility corridors and recreational facilities. The Permit Areas are located within the Great Plains of the Northern Humid Gulf Coastal Plains ecoregion (Griffith et al. 2004). Locally known as the ‘Piney Woods’, this ecoregion was once covered by a mix of pine and hardwood forests. Natural vegetation includes loblolly pine, shortleaf pine, southern red oak, post oak, white oak, hickory, and sweetgum, and mid and tall grasses such as yellow Indian grass, pinehill bluestem, narrowleaf woodoats, and panicums. American beautyberry, sumac, greenbriar, and hawthorn are part of the understory (Griffith et al. 2007).

However, much of the region is now covered in loblolly and shortleaf pine plantations with loblolly pine for timber production or converted to improved pasture. (Griffith et al. 2004). Lumber and pulpwood production, livestock grazing, and poultry production are typical land uses. Oil and gas production is also widespread.

Geologically, the Permit Areas are underlain by the Beaumont Formation (Qbs, Qbc) (USGS 2017). Qbs deposits consist of very fine to fine quartz sand, silt, and minor fine gravel that dates to the Pleistocene. Qbc deposits consist of clay and silt intermixed and interbed with lenses of fine sand, decayed organic matter, and calcium carbonate.

Soil survey data for the proposed Project was derived from the National Resources Conservation Service (NRCS 2018). Five soil units are mapped within the Permit Areas including Beaumont

Figure 1 Vicinity Map showing location of original state-owned tracts

Figure 2 Vicinity Map showing location of recently added state-owned tracts

clay, 0 to 1 percent slopes; China clay, 0 to 1 percent slopes; Estes clay, 0 to 1 percent clay; League clay, 0 to 1 percent slopes, and Viterbo silty clay loam, 0 to 1 percent slopes. The Beaumont soil series consist of very deep, poorly drained, and very slowly permeable soils on coastal plains. These soils form in clayey sediments on the Beaumont Formation and are of the Pleistocene Age. The China soil series consists of a very deep, somewhat poorly drained, and very slowly permeable soils. These soils form on clayey fluviomarine deposits derived from the Beaumont Formation. The Estes soil series consists of very deep, somewhat poorly drained soils. They form in acid clayey and loamy alluvium in the Coastal Plains. The League soils series consists of very deep, somewhat poorly drained, very slowly permeable soils. These soils form in clayey fluviomarine deposits derived from the Beaumont Formation (NRCS 2019). The Viterbo series consists of very deep, somewhat poorly drained, very slowly permeable soils. These nearly level soils formed in loamy fluviomarine deposits derived from the Beaumont Formation. All of the soils found within the Permit Areas are considered to have a low potential for buried cultural resource deposits.

Cultural Resources Background Review Results

Perennial conducted a thorough cultural resources and environmental literature search of the Permit Areas. A Perennial archaeologist reviewed the Port Acres, Beaumont East, Beaumont West, and Fannett East, Texas USGS 7.5-minute topographic quadrangle maps and searched the Texas Historical Commission's (THC) Texas Archeological Sites Atlas (Atlas) online database and the NRHP database to identify previously recorded cultural resource sites, historic structures, properties listed in the NRHP, designated historic districts, and SALs, which could potentially be affected by the proposed undertaking. Any previously recorded cultural resource site forms, reports of archaeological investigations, general historical documents, and secondary sources concerning the background of the area were also reviewed. The records search included a review of all previously recorded site forms, cemetery data, and surveys on file within a 1.0-mi (1.6-km) review radius of the Permit Areas.

Based upon the archival review, no previously recorded archeological sites or cemeteries are mapped within the Project Permit Areas. One site is mapped within 1.0-mi (1.6-km) radius of the Permit Areas (**Table 2**) (Atlas 2019). Site 41JF66 is the Tyrell Tenant Farmstead and is located adjacent to, but distinctly outside of Permit Area TX-JE-041.402. The site is currently recorded as being located across Fannett Road from the Permit Area. Historical imagery from 1938, also corroborate that the historical farmstead was isolated to the southeast side of Fannett Road, opposite the Permit Area. Site 41JF97 also represents a historic farmstead. The site was recorded in 2011. The site has an undetermined NRHP eligibility. However, the site is located approximately 0.49 mi (0.79 km) northwest of the Permit Area (TX-JE-115.200), and will not be impacted by any project related activities.

A total of 24 surveys have been previously conducted within the 1-0-mi (1.6-km) radius review area for the Permit Areas. Five of the previously conducted surveys cover portions (approximately 30 percent) of the Permit Areas (**Table 3**).

Table 2. Site previously recorded within the 1.0 mi background review radius				
Site Trinomial	Site Description	Year Recorded	NRHP Eligibility	Distance from Permit Area
41JF66	Tyrrell Tenant Farmstead - Historic, early 20th century	1990	Undetermined	600 ft from TX-JE-041.402
41JF97	Historic Farmstead	2011	Undetermined	0.49 mi north west of Texas Department of Corrections – Stiles Unit (TX-JE-115.220, TX-JE-115.900)

Table 3. Surveys previously that overlap with the Permit Areas					
Atlas Number	Survey Type	Year	In APE?	Tract	Acreage of APE
8500060431	Survey	2011	Yes	TX-JE-079.310	17.1
8500003414	Remote Sensing	1972	Yes	TX-JE-079.310	5
8400003386	Survey	1990	Yes	TX-JE-077.000	Less than 0.5 ac
8500041363	Survey	2013	Yes	TX-JE-116.200; TX-JE-115.220, TX-JE-115.900	17.0
8500001883	Survey	1995	Yes	TX-JE-115.220	5.7

Field Methods

The cultural resources survey will be performed by a team of two archaeologists. The entire 128.0 ac (51.8 ha) of the Permit Areas will be pedestrian surveyed, except in those areas that have been previously surveyed. The objectives of the survey will be to (1) locate cultural resource sites within the portion of the Project APE that corresponds to the Permit Areas; (2) delineate the vertical and horizontal extent of any newly identified sites within the Permit Area portions of the APE; (3) provide a preliminary evaluation of each site's eligibility for listing in the NRHP and as a SAL; and (4) assess any potential for the Project to directly or indirectly affect historic properties, SALs, or other sensitive cultural resources.

In general, the Texas State Minimum Archeological Survey Standards (TSMAS) require that a minimum of 16 shovel tests be excavated per 1.0 mi (1.6 km) for ROWs measuring up to 100.0 ft (30.0 m) in width (1 survey transect). The proposed ESA for the Permit Areas within the Project

will measure approximately 100.0 ft to 300.0 ft (32.8 ft to 91.5 m) in width and will require one to three evenly spaced survey transects in order to conform to TSMASS. Overall, the survey will cover 100 percent of the Project length for areas located across the Permit Areas. An intensive pedestrian survey will be conducted at survey intervals no greater than 91.5 ft (30.0 m) apart along the width of the Permit Areas. In areas where the ground visibility is less than 50 percent, shovel tests will be excavated at 164.0 to 328.0-ft (50.0 to 100.0-m) intervals apart along the length of the Permit Areas. In areas where the surface visibility exceeds 50 percent, shovel testing will be conducted intermittently along areas with increased probability to contain buried cultural deposits, such as areas adjacent to drainages. The number of survey transects may be reduced in areas where the Permit Areas overlaps with existing pipeline corridors or other industrial areas. Additional shovel tests may be excavated in portions of the Permit Areas with distinct landforms. In areas where landforms exhibit moderate-to-extensive disturbances from natural or human-induced processes, such as inundation; land clearing, minor channelization, installation of oil and gas facilities, recreational facilities, pipeline systems, road and utility ROW, and transportation infrastructure; shovel tests were excavated on a discretionary basis. Any deviations from TSMASS will be thoroughly documented, and disturbances will be photographed. Based on the underlying geology and the low potential for buried cultural deposits for soils found within the Permit Areas, it is not anticipated that trenching or mechanical auguring will be warranted in the portions of the Project that fall within the Permit Areas. However, if field investigations encounter areas with the potential for deep deposits, a trenching plan will be coordinated with the THC.

In general, shovel tests will measure approximately 12.0 in (30.0 cm) in diameter and will be excavated by 3.93 to 7.87 in (10.0 to 20.0 cm) levels. Per the Council of Texas Archeologists (CTA)/THC survey standards, shovel tests will be excavated to a depth consistent with the project impacts or to the base of Holocene deposits likely to contain cultural resources unless dense, impenetrable clay soils or inundation prevent the continuation of excavations. All soil matrices will be screened through 6.3-millimeter (¼-inch) mesh hardware cloth unless dominated by clay. Clayey matrix will be trowel-sorted and visually inspected.

For each of the shovel tests, the following information will be recorded on shovel test logs: location, maximum depth, reason for termination, and the number of soil strata. Copies of field logs will be provided in the appendices of the Phase I cultural resources report. For each soil stratum, thickness, texture, color, and the presence or absence and nature of cultural materials will be recorded. The field crew will record all shovel test locations, isolated finds, archaeological sites and associated features using a handheld GPS device. Also, each archaeologist will be equipped with a compass, shovel test and photographic logs, daily journal forms, and appropriate THC site forms. The crew will be equipped with topographic maps and aerial photographs of the survey corridor, a digital camera, and a cellular telephone to maintain contact with the home office (terrain permitting).

If an archaeological site is identified, the appropriate delineation techniques will be systematically applied to identify the horizontal and vertical limits of each site's boundary. Site boundaries may be determined based on both surface artifact density and the presence or lack of subsurface components. For subsurface sites, a series of shovel tests will be excavated radiating in the four cardinal directions or, if more appropriate, along perceived major and minor topographic and site axis. In practice, shovel tests within potential sites will be placed along transects at 33.0-ft (10.0-m) intervals to determine the depth and potential integrity of cultural deposits, and to carefully examine for the presence of intact archaeological features and/or discrete episodes of occupation. In the absence of subsurface deposits, controlled pedestrian surface inspections will be conducted and site boundaries defined based on a marked reduction in surface artifact density. Shovel testing or pedestrian surveys will not be conducted beyond the Permit Area property boundaries to ensure no trespassing onto private property occurs. Data collected during site recordation will be used to determine whether the site qualifies as a SAL.

Historic Structure Documentation

All historic-age structures (i.e., older than 50 years) located within the Permit Areas will be thoroughly documented during the survey efforts. Historic Standing Structure forms will be completed for each resource. The historic structures will be adequately photo-documented, sketch maps will be drawn, and each resource will be plotted with a GPS device. Shovel tests may be excavated in the vicinity of the structures to determine if an associated subsurface archaeological component is present. All data will be reviewed by a qualified architectural historian to determine construction date, style, integrity, and overall significance and SAL designation.

Reporting

Following the completion of the field surveys, Perennial will incorporate findings into the overall report for the Project. Data on any newly recorded sites will be submitted to the Texas Archeological Research Laboratory (TARL) in order to receive trinomial data for reporting. The format of the report will adhere to review guidelines suitable to the State Historic Preservation Officer (SHPO) in accordance with the THC's Rules of Practice and Procedure, Chapter 26, Section 27, and the CTA *Guidelines for Cultural Resources Management Reports*. The report will document previous investigations in the area, background cultural setting, the methodology used during the investigations, the general nature and extent of cultural resources encountered during the cultural resource survey, and management recommendations for any documented cultural resources per all applicable state and federal laws. Standard analytical techniques and existing typologies, as appropriate for Southeastern prehistoric and historic archaeological studies, will be employed.

Laboratory Methods

The artifact collection procedure employed by Perennial is meant to be flexible to accommodate variations in site size, density of artifacts, setting, presence/absence of subsurface assemblages, site type, and feasibility constraints. In general, the artifact collection strategy is designed to procure comprehensive inventory-level information to facilitate NRHP evaluations and avoidance

strategies, as well as adhere to property restrictions. Specifically, the artifact collection policy may vary between 100% collection of observed artifacts, and a representative sample collection strategy. In practice, the 100% collection strategy would most commonly be applied to sites with subsurface assemblages. For surficial sites, the Principal Investigator in consultation with the field supervisor would determine the collection strategy based on the site type and setting. In the event that a sample collection policy is implemented for a site, field staff will inventory and describe the characteristics, material, type, decoration, and other descriptive traits; and photograph all observed artifacts whenever feasible. Meanwhile, Perennial will also collect representative samples of each diagnostic artifact type and variety. All artifacts that are collected will be brought back to Perennial's laboratory to be cleaned, sorted, cataloged, photo-documented, and analyzed. All collected material will be curated at the Texas Archaeological Research Laboratory.

Perennial will prepare all paperwork recovered during the study and arrange for the transfer of records to a suitable curatorial facility pursuant to the standards and guidelines set forth by the THC/CTA. An additional ten copies will be distributed to various designated repositories across the state in accordance with the TAC permit obligations.

Human Remains

In the event that human remains are encountered during any part of the Phase I survey effort, work will stop immediately and the appropriate local law enforcement personnel and medical examiner's office will be notified of the discovery. Should the medical examiner determine that the human remains are older than 50 years, personnel will notify the THC and file a notice of existence of a cemetery with the county clerk. Consultation with any concerned parties including landowners, appropriate Tribes, and living descendants will be conducted to ensure compliance with existing state laws. No remains will be removed from the site until jurisdiction has been established and the appropriate permits have been obtained. All activities will adhere to the Texas Health and Safety Code (8 THSC § 711.010) and the Texas Antiquities Code (13 TAC §§ 22.1-22.6)..

References

(Atlas) Texas Archaeological Sites Atlas

2019 Texas Archaeological Site Atlas restricted database, Texas Historical Commission. <http://nueces.thc.state.tx.us/>. Accessed August 18, 2019.

Griffith, G.E., Bryce, S.A., Omernik, J.M., Comstock, J.A., Rogers, A.C., Harrison, B., Hatch, S.L., and Bezanson, D.

2004 *Ecoregions of Texas*. U.S. Geological Survey, Reston VA (map scale 1:2,500,000)

(NRCS) Natural Resources Conservation Service

2019 Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. <http://websoilsurvey.nrcs.usda.gov>. Accessed August 18, 2019.

(USGS) United States Geological Survey

2019 U.S. Geological Survey, United States Department of the Interior. Information and graphics available at <http://mrdata.usgs.gov/sgmc/tx.html>. Accessed August 18, 2019.

ATTACHMENT 1 – Permit Area Mapping

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Jenn Cochran

From: Maggie Moore <Maggie.Moore@thc.texas.gov>
Sent: Friday, August 30, 2019 9:14 AM
To: Jenn Cochran
Cc: Abby Peyton; Laney Fisher
Subject: RE: Orbit - Antiquities Permit 8690 - Need to Amend Permit

Hi Jenn,
Your amendment to permit 8690 is approved. Expiration date is still 12/17/2023.

Maggie Moore
Regional Archeologist/Project Reviewer
Texas Historical Commission
Archeology Division
PO Box 12276
Austin, TX 78722-2276
(512) 463-6508
www.thc.texas.gov

From: Jenn Cochran <JCochran@perennialenv.com>
Sent: Wednesday, August 21, 2019 5:43 PM
To: Maggie Moore <Maggie.Moore@thc.texas.gov>
Cc: Abby Peyton <APeyton@perennialenv.com>; Bill Martin <Bill.Martin@thc.texas.gov>
Subject: RE: Orbit - Antiquities Permit 8690 - Need to Amend Permit

CAUTION: External Email – This email originated from outside the THC email system. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hi Maggie,

Attached is a revised scope of work to amend new tracts from Jefferson County and the Texas Department of Corrections (DOC) onto Permit #8690. I have attached a signed permit application for the DOC property. I have already submitted signed permit application for Jefferson County. The tracts will be surveyed using the same methods as for the other TAP properties. The results of the surveys across these tracts will be included in the revised Phase I as well as the comments that you have already provided us. Please let me know if you have any questions or need additional information. We need to survey these tracts soon, so please shoot me an email confirmation as soon as you can.

Thanks,

Jennifer L. Cochran, MA, RPA
Senior Archeologist/ Principal Investigator

Perennial Environmental
5424 W. US Hwy 290, Suite 208
Austin, TX 78735
512-358-0345 office
512-695-4057 cell
jcochran@perennialenv.com

From: Maggie Moore <Maggie.Moore@thc.texas.gov>
Sent: Friday, July 19, 2019 2:07 PM
To: Jenn Cochran <JCochran@perennialenv.com>
Cc: Abby Peyton <APeyton@perennialenv.com>
Subject: RE: Orbit - Antiquities Permit 8690

Ok, great.

Maggie Moore
Regional Archeologist/Project Reviewer
Texas Historical Commission
Archeology Division
PO Box 12276
Austin, TX 78722-2276
(512) 463-6508
www.thc.texas.gov

From: Jenn Cochran <JCochran@perennialenv.com>
Sent: Friday, July 19, 2019 1:53 PM
To: Maggie Moore <Maggie.Moore@thc.texas.gov>
Cc: Abby Peyton <APeyton@perennialenv.com>
Subject: RE: Orbit - Antiquities Permit 8690

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Hi Maggie,

Please see attached Permit Transfer letter for TAP #8690.

Jennifer L. Cochran, MA, RPA
Senior Archeologist/ Principal Investigator

Perennial Environmental
4425 Mopac South
Building II, Suite 204
Austin, Texas 78735
512-358-0345 office
512-695-4057 cell
jcochran@perennialenv.com

From: Maggie Moore <Maggie.Moore@thc.texas.gov>
Sent: Monday, July 15, 2019 11:36 AM
To: Jenn Cochran <JCochran@perennialenv.com>
Cc: Abby Peyton <APeyton@perennialenv.com>
Subject: RE: Orbit - Antiquities Permit 8690

Ok, because I'm not finding an e-mail about a transfer for this.

Maggie Moore
Regional Archeologist/Project Reviewer
Texas Historical Commission
Archeology Division
PO Box 12276
Austin, TX 78722-2276
(512) 463-6508
www.thc.texas.gov

From: Jenn Cochran <JCochran@perennialenv.com>
Sent: Monday, July 15, 2019 10:38 AM
To: Maggie Moore <Maggie.Moore@thc.texas.gov>
Cc: Abby Peyton <APeyton@perennialenv.com>
Subject: Re: Orbit - Antiquities Permit 8690

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Hi Maggie,

I am pretty sure the Permit was transferred to me. I will look for transfer paperwork once I am back from being in the field.

Thanks,

Jenn C.
Perennial Environmental Services

On Jul 15, 2019, at 10:31 AM, Maggie Moore <Maggie.Moore@thc.texas.gov> wrote:

Hi Jenn,

A permit revision should be fine. But is this still in Heidi's name? If so, what are your plans on that?

Maggie Moore

Regional Archeologist/Project Reviewer
Texas Historical Commission
Archeology Division
PO Box 12276
Austin, TX 78722-2276
(512) 463-6508
www.thc.texas.gov

<image001.png>

From: Jenn Cochran <JCochran@perennialenv.com>

Sent: Tuesday, June 18, 2019 2:18 PM

To: Maggie Moore <Maggie.Moore@thc.texas.gov>

Cc: Abby Peyton <APeyton@perennialenv.com>

Subject: Orbit - Antiquities Permit 8690

CAUTION: External Email – This email originated from outside the THC email system. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hi Maggie,

There is a proposed reroute on the Orbit Project that now crosses another state owned property. Are you ok with me providing any updated SOW, mapping exhibits, and Permit application, so you can amend the existing permit? Or do I need to get a new one?

Thanks,

Jennifer L. Cochran, MA, RPA
Senior Archeologist/ Principal Investigator
Perennial Environmental
4425 Mopac South
Building II, Suite 204
Austin, Texas 78735
512-358-0345 office
512-695-4057 cell
jcochran@perennialenv.com

Jenn Cochran

From: noreply@thc.state.tx.us
Sent: Friday, December 20, 2019 8:55 AM
To: Jenn Cochran; reviews@thc.state.tx.us; Jerry.L.Androy@usace.army.mil
Subject: Project Review: 202003491

TEXAS HISTORICAL COMMISSION

real places telling real stories

Re: Project Review under Section 106 of the National Historic Preservation Act and/or the Antiquities Code of Texas
Permit 8690

202003491

Orbit 20-inch Ethane Pipeline Project SWG-2019-00074
intersection of Hatcherville Rd and Crobby Rd
Mont Belvieu, TX

Dear Jennifer Cochran:

Thank you for your submittal regarding the above-referenced project. This response represents the comments of the State Historic Preservation Officer, the Executive Director of the Texas Historical Commission (THC), pursuant to review under Section 106 of the National Historic Preservation Act and the Antiquities Code of Texas.

The review staff led by Maggie Moore and Caitlin Brashear has completed its review and has made the following determinations based on the information submitted for review:

Above-Ground Resources

- No historic properties are present or affected by the project as proposed. However, if historic properties are discovered or unanticipated effects on historic properties are found, work should cease in the immediate area; work can continue where no historic properties are present. Please contact the THC's History Programs Division at 512-463-5853 to consult on further actions that may be necessary to protect historic properties.

Archeology Comments

- No historic properties present or affected. However, if buried cultural materials are encountered during construction or disturbance activities, work should cease in the immediate area; work can continue where no cultural materials are present. Please contact the THC's Archeology Division at 512-463-6096 to consult on further actions that may be necessary to protect the cultural remains.
- THC/SHPO concurs with information provided.
- Draft report acceptable. Please submit another copy as a final report along with shapefiles showing the area where the archeological work was conducted. Shapefiles should be submitted electronically to Archeological_projects@thc.texas.gov.

We have the following comments: On August 30, 2019, our office approved a Permit Amendment Application adding 12 acres of Jefferson County tract TX-JE0116.200 and 34 acres of Texas Department of Corrections (TDJ) – Stiles Unit tracts TX-JE-115.220 and TX-JE-115.900 to the Antiquities Code-permitted project area. The draft report indicates that substantial additional acreage was added to the project area subsequent to our approval of that amendment. The

additional 82.2 acres of reroute changes should have been submitted to our office as an additional permit amendment request prior to conducting the fieldwork. To complete the administrative record, a Permit Amendment Application must be submitted for approval before we can accept the final report and close Texas Antiquities Permit. Thank you for addressing our previous comments; please correct the following in the final report. 1) Jerry's last name is misspelled. 2) We recommend showing all shovel tests excavated on this project, including ones outside the USACE permit areas. 3) Please clarify the meaning of the Construction dots on the maps (e.g., 1, 59, 63, 67, 72, and elsewhere). Are these GPSed observations, similar to inundation points? Has pipeline construction commenced already? 4) Figure 1 still does not have a meter scale, and the meters on Figure 15 are not labeled. 5) Appendix F Archeological Monitoring: As requested in our 7/22/2019 comments on the monitoring SOW, please illustrate where these sites will be on the maps, and add map references to the Appendix F tables. B(2) says if the monitor determined that the find constitutes a site, then additional personnel may be required to delineate the find in accordance with THC guidelines. Please insert this prior to that sentence: "All cultural materials found will be fully delineated in accordance with THC guidelines at least within the project area." Our office address is P.O. Box 12276, Austin, TX 78711 (1511 Colorado is not the correct street address either)

We look forward to further consultation with your office and hope to maintain a partnership that will foster effective historic preservation. Thank you for your cooperation in this review process, and for your efforts to preserve the irreplaceable heritage of Texas. If you have any questions concerning our review or if we can be of further assistance, please email the following reviewers: Maggie.Moore@thc.texas.gov, caitlin.brashear@thc.texas.gov.

Sincerely,

A handwritten signature in cursive script that reads "Maggie Moore". The ink is dark and the signature is fluid, with the first and last names clearly legible.

For Mark Wolfe, State Historic Preservation Officer
Executive Director, Texas Historical Commission

Please do not respond to this email.

cc: Jerry.L.Androy@usace.army.mil

APPENDIX B: PROJECT MAPPING EXHIBITS

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**Aerial Map
Orbit Pipeline Project
Energy Transfer Company
Chambers County, Texas**

Page 1 of 82

Scale: 1:6,000

NAD83 UTM 15N Meters

Date: January, 2020

● Milepost	— Centerline	Stream
⦿ HDD/Bore Entry/Exit	▭ Project APE	PEM Wetland
● Avoid via HDD/Bore	▭ Archaeological Monitoring Area	PFO Wetland
■ Inundation	▭ Code-permitted Tract	PFO Cypress Wetland
⊙ Negative Shovel Test	▭ Avoid via HDD/Bore	PSS Wetland
● Positive Shovel Test	▭ Disturbed Area	Open Water
◆ Disturbance		

**Aerial Map
Orbit Pipeline Project
Energy Transfer Company
Chambers County, Texas**

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Scale: 1:6,000

NAD83 UTM 15N Meters

Date: January, 2020

Aerial Map
Orbit Pipeline Project
Energy Transfer Company
Chambers County, Texas

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NAD83 UTM 15N Meters	Date: January, 2020

● Milepost	— Centerline	Stream
⦿ HDD/Bore Entry/Exit	Project APE	PEM Wetland
● Avoid via HDD/Bore	Archaeological Monitoring Area	PFO Wetland
■ Inundation	Code-permitted Tract	PFO Cypress Wetland
⊙ Negative Shovel Test	Avoid via HDD/Bore	PSS Wetland
● Positive Shovel Test	Disturbed Area	Open Water
◆ Disturbance		

**Aerial Map
Orbit Pipeline Project
Energy Transfer Company
Chambers County, Texas**

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Scale: 1:6,000

NAD83 UTM 15N Meters

Date: January, 2020

Aerial Map
Orbit Pipeline Project
Energy Transfer Company
Chambers County, Texas

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NAD83 UTM 15N Meters	Date: January, 2020

Aerial Map
Orbit Pipeline Project
Energy Transfer Company
Liberty & Chambers Counties, Texas

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NAD83 UTM 15N Meters	Date: January, 2020

Aerial Map Orbit Pipeline Project Energy Transfer Company Liberty County, Texas	
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NAD83 UTM 15N Meters	Date: January, 2020

Aerial Map
Orbit Pipeline Project
Energy Transfer Company
Liberty County, Texas

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NAD83 UTM 15N Meters

Date: January, 2020

**Aerial Map
Orbit Pipeline Project
Energy Transfer Company
Liberty County, Texas**

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NAD83 UTM 15N Meters	Date: January, 2020

**Aerial Map
Orbit Pipeline Project
Energy Transfer Company
Liberty County, Texas**

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NAD83 UTM 15N Meters

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Aerial Map
Orbit Pipeline Project
Energy Transfer Company
Liberty County, Texas

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NAD83 UTM 15N Meters	Date: January, 2020

PERENNIAL

Aerial Map
Orbit Pipeline Project
Energy Transfer Company
Liberty County, Texas

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NAD83 UTM 15N Meters	Date: January, 2020

● Milepost	— Centerline	Stream
⦿ HDD/Bore Entry/Exit	▭ Project APE	PEM Wetland
● Avoid via HDD/Bore	▭ Archaeological Monitoring Area	PFO Wetland
■ Inundation	▭ Code-permitted Tract	PFO Cypress Wetland
⊙ Negative Shovel Test	▭ Avoid via HDD/Bore	PSS Wetland
● Positive Shovel Test	▭ Disturbed Area	Open Water
◆ Disturbance		

**Aerial Map
Orbit Pipeline Project
Energy Transfer Company
Liberty County, Texas**

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NAD83 UTM 15N Meters

Date: January, 2020

Aerial Map
Orbit Pipeline Project
Energy Transfer Company
Liberty County, Texas

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NAD83 UTM 15N Meters	Date: January, 2020

Aerial Map
Orbit Pipeline Project
Energy Transfer Company
Liberty County, Texas

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NAD83 UTM 15N Meters	Date: January, 2020

Aerial Map
Orbit Pipeline Project
Energy Transfer Company
Liberty County, Texas

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Aerial Map
Orbit Pipeline Project
Energy Transfer Company
Liberty County, Texas

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NAD83 UTM 15N Meters	Date: January, 2020

Aerial Map
Orbit Pipeline Project
Energy Transfer Company
Liberty County, Texas

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NAD83 UTM 15N Meters	Date: January, 2020

**Aerial Map
Orbit Pipeline Project
Energy Transfer Company
Liberty County, Texas**

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NAD83 UTM 15N Meters

Date: January, 2020

Aerial Map
Orbit Pipeline Project
Energy Transfer Company
Liberty County, Texas

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NAD83 UTM 15N Meters	Date: January, 2020

<p>Aerial Map Orbit Pipeline Project Energy Transfer Company Liberty County, Texas</p>	
Page 21 of 82	Scale: 1:6,000
NAD83 UTM 15N Meters	Date: January, 2020

● Milepost	— Centerline	Stream
⦿ HDD/Bore Entry/Exit	▭ Project APE	PEM Wetland
● Avoid via HDD/Bore	▭ Archaeological Monitoring Area	PFO Wetland
■ Inundation	▭ Code-permitted Tract	PFO Cypress Wetland
○ Negative Shovel Test	▭ Avoid via HDD/Bore	PSS Wetland
● Positive Shovel Test	▭ Disturbed Area	Open Water
◆ Disturbance		

**Aerial Map
Orbit Pipeline Project
Energy Transfer Company
Liberty County, Texas**

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NAD83 UTM 15N Meters

Date: January, 2020

Aerial Map
Orbit Pipeline Project
Energy Transfer Company
Liberty County, Texas

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NAD83 UTM 15N Meters	Date: January, 2020

Aerial Map
Orbit Pipeline Project
Energy Transfer Company
Liberty County, Texas

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NAD83 UTM 15N Meters	Date: January, 2020

● Milepost	— Centerline	Stream
⦿ HDD/Bore Entry/Exit	Project APE	PEM Wetland
● Avoid via HDD/Bore	Archaeological Monitoring Area	PFO Wetland
■ Inundation	Code-permitted Tract	PFO Cypress Wetland
⊙ Negative Shovel Test	Avoid via HDD/Bore	PSS Wetland
● Positive Shovel Test	Disturbed Area	Open Water
◆ Disturbance		

**Aerial Map
Orbit Pipeline Project
Energy Transfer Company
Liberty County, Texas**

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Scale: 1:6,000

NAD83 UTM 15N Meters

Date: January, 2020

Aerial Map
Orbit Pipeline Project
Energy Transfer Company
Liberty County, Texas

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NAD83 UTM 15N Meters	Date: January, 2020

Aerial Map
Orbit Pipeline Project
Energy Transfer Company
Liberty County, Texas

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NAD83 UTM 15N Meters	Date: January, 2020

**Aerial Map
Orbit Pipeline Project
Energy Transfer Company
Liberty County, Texas**

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● Milepost	— Centerline	Stream
● HDD/Bore Entry/Exit	Project APE	PEM Wetland
● Avoid via HDD/Bore	Archaeological Monitoring Area	PFO Wetland
■ Inundation	Code-permitted Tract	PFO Cypress Wetland
○ Negative Shovel Test	Avoid via HDD/Bore	PSS Wetland
● Positive Shovel Test	Disturbed Area	Open Water
◆ Disturbance		

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● Milepost	— Centerline	Stream
⦿ HDD/Bore Entry/Exit	Project APE	PEM Wetland
● Avoid via HDD/Bore	Archaeological Monitoring Area	PFO Wetland
■ Inundation	Code-permitted Tract	PFO Cypress Wetland
○ Negative Shovel Test	Avoid via HDD/Bore	PSS Wetland
● Positive Shovel Test	Disturbed Area	Open Water
◆ Disturbance		

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Jefferson County, Texas

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● Milepost	— Centerline	Stream
⦿ HDD/Bore Entry/Exit	▭ Project APE	PEM Wetland
● Avoid via HDD/Bore	▭ Archaeological Monitoring Area	PFO Wetland
■ Inundation	▭ Code-permitted Tract	PFO Cypress Wetland
○ Negative Shovel Test	▭ Avoid via HDD/Bore	PSS Wetland
● Positive Shovel Test	▭ Disturbed Area	Open Water
◆ Disturbance		

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● Milepost	— Centerline	Stream
⦿ HDD/Bore Entry/Exit	▭ Project APE	PEM Wetland
● Avoid via HDD/Bore	▭ Archaeological Monitoring Area	PFO Wetland
■ Inundation	▭ Code-permitted Tract	PFO Cypress Wetland
○ Negative Shovel Test	▭ Avoid via HDD/Bore	PSS Wetland
● Positive Shovel Test	▭ Disturbed Area	Open Water
◆ Disturbance		

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● Milepost	— Centerline	Stream
⦿ HDD/Bore Entry/Exit	Project APE	PEM Wetland
● Avoid via HDD/Bore	Archaeological Monitoring Area	PFO Wetland
■ Inundation	Code-permitted Tract	PFO Cypress Wetland
⊙ Negative Shovel Test	Avoid via HDD/Bore	PSS Wetland
● Positive Shovel Test	Disturbed Area	Open Water
◆ Disturbance		

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● Milepost	— Centerline	Stream
● HDD/Bore Entry/Exit	Project APE	PEM Wetland
● Avoid via HDD/Bore	Archaeological Monitoring Area	PFO Wetland
■ Inundation	Code-permitted Tract	PFO Cypress Wetland
○ Negative Shovel Test	Avoid via HDD/Bore	PSS Wetland
● Positive Shovel Test	Disturbed Area	Open Water
◆ Disturbance		

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APPENDIX C: WETLAND AND WATERBODY DATA TABLES

Appendix C 1- Survey Data in the Vicinity of Wetland Features

Wetlands Located within the Orbit Project Pipeline APE							
Wetland ID	Milepost (Approximate)	Wetland Type	Probability	Shovel Tests	Surveys Results	Recommendations	Comments
Chambers County							
WP3CH096	0.1	PEM	Low	None	No Cultural Resources	No further work recommended	Inundated; not located within workspace
WP3CH115	0.1	PEM	Low	None	No Cultural Resources	No further work recommended	Inundated; not located within workspace
WP3CH120	0.1	PEM	Low	None	No Cultural Resources	No further work recommended	Inundated; not located within workspace
WP1CH056_PFO	0.2	PFO	Low	2	No Cultural Resources	No further work recommended	Inundation
WP3CH095	0.4	PEM	Low	1	No Cultural Resources	No further work recommended	Partially avoided via non- Section 10 HDD/Bore
WP3CH054	0.5	PEM	Low	None	No Cultural Resources	No further work recommended	Inundation
WP3CH055	0.5	PEM	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non- Section 10 HDD/Bore
WP3CH063	0.5	PEM	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP3CH056	0.6	PEM	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP3CH057_PEM	0.6	PEM	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP3CH057_PEM_B	0.6	PEM	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP3CH062	0.6	PEM	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP3CH057_PSS	0.6	PSS	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area

Appendix C 1- Survey Data in the Vicinity of Wetland Features

Wetland ID	Milepost (Approximate)	Wetland Type	Probability	Shovel Tests	Surveys Results	Recommendations	Comments
WP3CH058	0.7	PEM	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP3CH059	0.7	PEM	Low	None	No Cultural Resources	No further work recommended	Inundation
WP3CH060	0.7	PEM	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non-Section 10 HDD/Bore
WP3CH061	0.7	PEM	Low	None	No Cultural Resources	No further work recommended	Inundation
WP3CH064	0.7	PEM	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP3CH094	0.7	PEM	Low	None	No Cultural Resources	No further work recommended	Partially avoided via non-Section 10 HDD/Bore
WP3CH065	0.7	PFO	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP3CH066	0.7	PFO	Low	None	No Cultural Resources	No further work recommended	Covered under previously conducted survey
WP3CH093_PEM	0.8	PEM	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non-Section 10 HDD/Bore
WP3CH093_PFO	0.8	PFO	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP3CH044	0.9	PEM	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP3CH091	0.9	PEM	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP3CH092_PEM	0.9	PEM	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP3CH092_PSS	0.9	PSS	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP3CH090	1.1	PEM	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area

Appendix C 1- Survey Data in the Vicinity of Wetland Features

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Appendix C 1- Survey Data in the Vicinity of Wetland Features

Wetland ID	Milepost (Approximate)	Wetland Type	Probability	Shovel Tests	Surveys Results	Recommendations	Comments
WP3LI041	3.8	PFO	Low	19	No Cultural Resources	No further work recommended	Inundation
WP3LI042_PFO	3.9	PFO	Low	2	No Cultural Resources	No further work recommended	None
WP3LI042_PSS	3.9	PSS	Low	3	No Cultural Resources	No further work recommended	None
WP3LI043_PEM	4.1	PEM	Low	None	No Cultural Resources	No further work recommended	Mostly inundated
WP3LI043_PFO	4.1	PFO	Low	None	No Cultural Resources	No further work recommended	Mostly inundated
WP3LI043_PSS	4.1	PSS	Low	None	No Cultural Resources	No further work recommended	Mostly inundated
WP3LI043_PSS_B	4.2	PSS	Low	None	No Cultural Resources	No further work recommended	Mostly inundated
WP3LI043_PSS_C	4.2	PSS	Low	None	No Cultural Resources	No further work recommended	Mostly inundated
WP3LI043_PFO_B	4.3	PFO	Low	2	No Cultural Resources	No further work recommended	Mostly inundated
WP5LI024	4.5	PEM	Low	None	No Cultural Resources	No further work recommended	Mostly inundated
WP5LI023	5.1	PEM	Low	None	No Cultural Resources	No further work recommended	Mostly inundated
WP5LI022	5.2	PEM	Low	None	No Cultural Resources	No further work recommended	Mostly inundated
WP5LI021	5.9	PEM	Low	None	No Cultural Resources	No further work recommended	Mostly inundated
WP5LI020	6.1	PEM	Low	None	No Cultural Resources	No further work recommended	Mostly inundated
WP5LI019	6.3	PFO	Low	None	No Cultural Resources	No further work recommended	Mostly inundated
WP6LI003	6.6	PEM	Low	None	No Cultural Resources	No further work recommended	Mostly inundated

Appendix C 1- Survey Data in the Vicinity of Wetland Features

Wetland ID	Milepost (Approximate)	Wetland Type	Probability	Shovel Tests	Surveys Results	Recommendations	Comments
WP6LI002_PFO	6.7	PFO	Low	None	No Cultural Resources	No further work recommended	Mostly inundated
WP6LI002_PFO_B	6.7	PFO	Low	None	No Cultural Resources	No further work recommended	Mostly inundated
WP6LI002_PEM	6.8	PEM	Low	None	No Cultural Resources	No further work recommended	Mostly inundated
WP6LI001	7	PEM	Low	None	No Cultural Resources	No further work recommended	Mostly inundated
WP6LI001_PFO	7.3	PFO	Low	None	No Cultural Resources	No further work recommended	Partially avoided via non-Section 10 HDD/Bore
WP6LI001_PSS	7.3	PSS	Low	None	No Cultural Resources	No further work recommended	Partially avoided via non-Section 10 HDD/Bore
WP2LI066_PEM	7.4	PEM	Low	None	No Cultural Resources	No further work recommended	Partially avoided via non-Section 10 HDD/Bore
WP2LI066_PFO	7.4	PFO	Low	None	No Cultural Resources	No further work recommended	Mostly inundated
WP2LI067	7.8	PEM	Low	None	No Cultural Resources	No further work recommended	Mostly inundated
WP2LI068	8.2	PEM	Low	None	No Cultural Resources	No further work recommended	Mostly inundated
WP2LI069	8.9	PEM	Low	None	No Cultural Resources	No further work recommended	Mostly inundated
WP2LI070	9.5	PEM	Low	14	No Cultural Resources	No further work recommended	Inundation
WP6LI006	9.9	PEM	Low	3	No Cultural Resources	No further work recommended	Partially avoided via non-Section 10 HDD/Bore
WP6LI004	10.3	PEM	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP6LI005	10.3	PSS	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP3LI028_PEM	10.8	PEM	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area

Appendix C 1- Survey Data in the Vicinity of Wetland Features

Wetland ID	Milepost (Approximate)	Wetland Type	Probability	Shovel Tests	Surveys Results	Recommendations	Comments
WP3LI029	10.8	PEM	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP3LI026	10.9	PEM	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP3LI027_PEM	10.9	PEM	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP3LI027_PSS	10.9	PSS	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP3LI028_PSS	10.9	PSS	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP3LI013	12.5	PEM	Low	None	No Cultural Resources	No further work recommended	Partially avoided via non-Section 10 HDD/Bore
WP3LI014	12.5	PEM	Low	None	No Cultural Resources	No further work recommended	conducted survey and mostly inundated
WP3LI015	12.7	PEM	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP3LI016	13	PEM	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP3LI017	13.3	PEM	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP3LI018	13.9	PEM	Low	2	No Cultural Resources	No further work recommended	Inundation
WP3LI019	14	PEM	Low	2	No Cultural Resources	No further work recommended	None
WP3LI020	14.1	PEM	Low	1	No Cultural Resources	No further work recommended	None
WP3LI021	14.1	PEM	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP3LI022	14.1	PEM	Low	1	No Cultural Resources	No further work recommended	None
WP3LI023	14.1	PEM	Low	1	No Cultural Resources	No further work recommended	None

Appendix C 1- Survey Data in the Vicinity of Wetland Features

Wetland ID	Milepost (Approximate)	Wetland Type	Probability	Shovel Tests	Surveys Results	Recommendations	Comments
WP3LI024	14.2	PEM	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP3LI025	14.3	PEM	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non-Section 10 HDD/Bore
WP2LI010_PEM	14.5	PEM	Low	None	No Cultural Resources	No further work recommended	Partially avoided via non-Section 10 HDD/Bore
WP2LI010_PSS	14.5	PSS	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP2LI010_PSS_B	14.6	PSS	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP2LI010_PEM_B	14.7	PEM	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP2LI010_PSS_C	14.7	PSS	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP2LI010_PEM_C	14.8	PEM	Low	None	No Cultural Resources	No further work recommended	Mostly inundated
WP2LI011	15.6	PEM	Low	None	No Cultural Resources	No further work recommended	Mostly inundated
WP2LI010_PFO	15.6	PFO	Low	None	No Cultural Resources	No further work recommended	Mostly inundated
WP2LI012	15.7	PEM	Low	None	No Cultural Resources	No further work recommended	Mostly inundated
WP2LI013_PEM	15.7	PEM	Low	None	No Cultural Resources	No further work recommended	Mostly inundated
WP2LI013_PSS	15.7	PSS	Low	None	No Cultural Resources	No further work recommended	Mostly inundated
WP2LI014_PFO	15.8	PFO	Low	None	No Cultural Resources	No further work recommended	Mostly inundated
WP4LI010_PEM	15.9	PEM	Low	None	No Cultural Resources	No further work recommended	Mostly inundated

Appendix C 1- Survey Data in the Vicinity of Wetland Features

Wetland ID	Milepost (Approximate)	Wetland Type	Probability	Shovel Tests	Surveys Results	Recommendations	Comments
WP4LI010_PSS	15.9	PSS	Low	None	No Cultural Resources	No further work recommended	Mostly inundated
WP4LI009_PFO_D	16	PFO	Low	None	No Cultural Resources	No further work recommended	Mostly inundated
WP4LI009_PEM	16.3	PEM	Medium	8	No Cultural Resources	No further work recommended	Completely avoided via non-Section 10 HDD/Bore
WP4LI009_PFO_C	16.1	PFO	Medium	None	No Cultural Resources	No further work recommended	Mostly inundated
WP4LI009_PFO_B	16.2	PFO	Medium	3	No Cultural Resources	No further work recommended	None
WP4LI008_PEM	16.3	PEM	Medium	1	No Cultural Resources	No further work recommended	No Impacts - Completely avoided via Section 10 HDD/Bore
WP4LI008_PFO	16.3	PFO	Medium	1	No Cultural Resources	No further work recommended	No Impacts - Completely avoided via Section 10 HDD/Bore
WP4LI009_PFO	16.4	PFO	Medium	2	No Cultural Resources	No further work recommended	No Impacts - Completely avoided via Section 10 HDD/Bore
WP4LI001_PFO	16.6	PFO	High	34	No Cultural Resources	No further work recommended	No Impacts - Completely avoided via Section 10 HDD/Bore
WP4LI001_PEM	16.7	PEM	High	24	No Cultural Resources	No further work recommended	Located in Heavily Inundated Area within Trinity River Floodplain
WP4LI001_PFO_CYP	16.6	PFO_CYP	High	4	No Cultural Resources	No further work recommended	No Impacts - Completely avoided via Section 10 HDD/Bore
WP4LI001_PFO_C	16.7	PFO	High	3	No Cultural Resources	No further work recommended	No Impacts - Completely avoided via Section 10 HDD/Bore

Appendix C 1- Survey Data in the Vicinity of Wetland Features

Wetland ID	Milepost (Approximate)	Wetland Type	Probability	Shovel Tests	Surveys Results	Recommendations	Comments
WP4LI002_PFO	16.9	PFO	High	7	No Cultural Resources	Archeological Monitor Needed	Located in Heavily Inundated Area within Trinity River Floodplain
WP4LI002_PFO_B	17	PFO	High	6	No Cultural Resources	No further work recommended	Located in Heavily Inundated Area within Trinity River Floodplain
WP4LI002_PSS	17.1	PSS	High	9	No Cultural Resources	No further work recommended	Located in Heavily Inundated Area within Trinity River Floodplain
WP4LI002_PFO_C	17.2	PFO	High	26	No Cultural Resources	Archeological Monitor Needed	Located in Heavily Inundated Area within Trinity River Floodplain
WP4LI002_PEM	17.8	PEM	High	23	No Cultural Resources	No further work recommended	Located in Heavily Inundated Area within Trinity River Floodplain
WP3LI007_PEM	17.9	PEM	High	6	No Cultural Resources	No further work recommended	Located in Heavily Inundated Area within Trinity River Floodplain
WP3LI007_PFO	17.9	PFO	High	13	No Cultural Resources	No further work recommended	Area within Trinity River Floodplain
WP3LI006_PSS	18.3	PSS	High	None	No Cultural Resources	No further work recommended	Heavily Inundated
WP3LI006_PEM	18.4	PEM	High	None	No Cultural Resources	No further work recommended	Area within Trinity River Floodplain
WP3LI006_PEM_B	18.4	PEM	High	1	No Cultural Resources	No further work recommended	Located in Heavily Inundated Area within Trinity River Floodplain
WP3LI006_PFO	18.6	PFO	High	2	No Cultural Resources	No further work recommended	Located in Heavily Inundated Area within Trinity River Floodplain

Appendix C 1- Survey Data in the Vicinity of Wetland Features

Wetland ID	Milepost (Approximate)	Wetland Type	Probability	Shovel Tests	Surveys Results	Recommendations	Comments
WP3LI001	19	PSS	High	None	No Cultural Resources	No further work recommended	Completely avoided via non- Section 10 HDD/Bore; Outside of workspace
WP3LI002_PSS	19	PSS	High	None	No Cultural Resources	No further work recommended	Completely avoided via non- Section 10 HDD/Bore
WP3LI003	19	PSS	High	None	No Cultural Resources	No further work recommended	Completely avoided via non- Section 10 HDD/Bore; Outside of workspace
WP9LI002_PSS_DT ^a	19	PSS	High	None	No Cultural Resources	No further work recommended	Completely avoided via non- Section 10 HDD/Bore; Outside of workspace
WP3LI002_PEM	19.1	PEM	High	None	No Cultural Resources	No further work recommended	Completely avoided via non- Section 10 HDD/Bore
WP3LI002_PFO	19.1	PFO	High	None	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore; Outside of workspace
WP3LI005_PFO_CYP	19.1	PFO_CYP	High	None	No Cultural Resources	No further work recommended	Completely avoided via non- Section 10 HDD/Bore
WP3LI002_PSS_B	19.1	PSS	High	None	No Cultural Resources	No further work recommended	Completely avoided via non- Section 10 HDD/Bore
WP3LI004	19.1	PSS	High	None	No Cultural Resources	No further work recommended	Completely avoided via non- Section 10 HDD/Bore
WP3LI005_PEM	19.2	PEM	High	None	No Cultural Resources	No further work recommended	Completely avoided via non- Section 10 HDD/Bore
WP3LI005_PFO_CYP _B	19.2	PFO_CYP	High	2	No Cultural Resources	No further work recommended	Completely avoided via non- Section 10 HDD/Bore
WP3LI005_PSS	19.2	PSS	High	None	No Cultural Resources	No further work recommended	Section 10 HDD/Bore; Outside of workspace
WP4LI003_PEM_B	19.3	PEM	High	None	No Cultural Resources	No further work recommended	Completely avoided via non- Section 10 HDD/Bore
WP3LI010	19.3	PSS	High	1	No Cultural Resources	No further work recommended	None

Appendix C 1- Survey Data in the Vicinity of Wetland Features

Wetland ID	Milepost (Approximate)	Wetland Type	Probability	Shovel Tests	Surveys Results	Recommendations	Comments
WP4LI003_PEM_C	19.4	PEM	High	2	No Cultural Resources	No further work recommended	None
WP4LI003_PFO	19.4	PFO	High	5	No Cultural Resources	No further work recommended	None
WP4LI003_PEM	19.5	PEM	High	8	No Cultural Resources	No further work recommended	None
WP4LI004_PFO	19.7	PFO	High	2	No Cultural Resources	No further work recommended	None
WP4LI004_PEM_B	19.8	PEM	High	5	No Cultural Resources	No further work recommended	None
WP4LI004_PEM_C	19.8	PEM	High	4	No Cultural Resources	No further work recommended	None
WP4LI004_PEM_D	19.8	PEM	High	3	No Cultural Resources	No further work recommended	None
WP4LI004_PFO_B	19.8	PFO	High	7	No Cultural Resources	No further work recommended	Inundation
WP4LI005_PFO	19.8	PFO	High	3	No Cultural Resources	No further work recommended	None
WP4LI004_PEM	19.9	PEM	High	2	No Cultural Resources	No further work recommended	None
WP4LI006_PEM	19.9	PEM	High	3	No Cultural Resources	No further work recommended	None
WP4LI006_PFO	19.9	PFO	High	2	No Cultural Resources	No further work recommended	None
WP4LI004_PFO_C	20	PFO	High	3	No Cultural Resources	No further work recommended	None
WP4LI007_PFO	20	PFO	High	1	No Cultural Resources	No further work recommended	None
WP4LI007_PEM	20.1	PEM	High	4	No Cultural Resources	No further work recommended	None
WP3LI012	20.2	PEM	High	6	No Cultural Resources	No further work recommended	None

Appendix C 1- Survey Data in the Vicinity of Wetland Features

Wetland ID	Milepost (Approximate)	Wetland Type	Probability	Shovel Tests	Surveys Results	Recommendations	Comments
WP3LI011_PEM_B	20.3	PEM	High	7	No Cultural Resources	No further work recommended	Inundation
WP3LI011_PEM	20.4	PEM	High	3	No Cultural Resources	No further work recommended	None
WP3LI011_PFO	20.4	PFO	High	6	No Cultural Resources	No further work recommended	None
WP3LI010_PEM_D	20.5	PEM	Medium	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP3LI010_PSS_B	20.5	PSS	Medium	1	No Cultural Resources	No further work recommended	None
WP3LI010_PFO_B	20.6	PFO	Medium	13	No Cultural Resources	No further work recommended	None
WP3LI010_PEM_C	20.7	PEM	Medium	3	No Cultural Resources	No further work recommended	None
WP3LI009	20.9	PEM	Medium	1	No Cultural Resources	No further work recommended	None
WP3LI010_PEM	20.9	PEM	Medium	10	No Cultural Resources	No further work recommended	None
WP3LI010_PEM_B	20.9	PEM	Medium	1	No Cultural Resources	No further work recommended	None
WP3LI010_PFO_CYP	20.9	PFO_CYP	Medium	10	No Cultural Resources	No further work recommended	None
WP3LI010_PSS	20.9	PSS	Medium	1	No Cultural Resources	No further work recommended	None
WP3LI008	21	PFO	Medium	1	No Cultural Resources	No further work recommended	Completely avoided via non- Section 10 HDD/Bore
WP2LI015	21.2	PEM	High	31	No Cultural Resources	No further work recommended	None
WP2LI016	21.4	PEM	High	11	No Cultural Resources	No further work recommended	None

Appendix C 1- Survey Data in the Vicinity of Wetland Features

Wetland ID	Milepost (Approximate)	Wetland Type	Probability	Shovel Tests	Surveys Results	Recommendations	Comments
WP2LI017	21.5	PEM	High	33	No Cultural Resources	No further work recommended	Inundation
WP4LI014	21.7	PEM	High	6	No Cultural Resources	No further work recommended	None
WP4LI013	21.8	PEM	High	8	No Cultural Resources	No further work recommended	None
WP4LI011_PEM	22	PEM	High	23	No Cultural Resources	No further work recommended	Inundation
WP4LI011_PSS	22	PSS	High	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP4LI015_PEM	23.8	PEM	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non- Section 10 HDD/Bore
WP4LI015_PFO	23.8	PFO	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP4LI015_PFO_B	23.8	PFO	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non- Section 10 HDD/Bore
WP4LI016	24	PEM	Low	5	No Cultural Resources	No further work recommended	Inundation
WP2LI019	24.2	PEM	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP2LI018	24.3	PEM	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non- Section 10 HDD/Bore
WP2LI020	24.3	PEM	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non- Section 10 HDD/Bore
WP2LI021	24.4	PEM	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area

Appendix C 1- Survey Data in the Vicinity of Wetland Features

Wetland ID	Milepost (Approximate)	Wetland Type	Probability	Shovel Tests	Surveys Results	Recommendations	Comments
WP2LI022	24.4	PEM	Low	2	No Cultural Resources	No further work recommended	Completely avoided via non- Section 10 HDD/Bore
WP2LI023	24.7	PEM	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP2LI024	24.7	PEM	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP2LI025	24.8	PEM	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP2LI026	24.9	PEM	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP2LI027	25.2	PEM	Low	1	No Cultural Resources	No further work recommended	Inundation
WP2LI031	25.3	PFO	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP2LI032	25.3	PFO	Low	3	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP2LI033_PEM	25.7	PEM	Low	1	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP2LI033_PFO	25.8	PFO	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP2LI033_PFO_B	25.8	PFO	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP2LI029_PEM	25.9	PEM	Low	1	No Cultural Resources	No further work recommended	Completely avoided via non- Section 10 HDD/Bore
WP2LI029_PFO	25.9	PFO	Low	1	No Cultural Resources	No further work recommended	None
WP2LI029_PSS	25.9	PSS	Low	1	No Cultural Resources	No further work recommended	Partially avoided via non- Section 10 HDD/Bore

Appendix C 1- Survey Data in the Vicinity of Wetland Features

Wetland ID	Milepost (Approximate)	Wetland Type	Probability	Shovel Tests	Surveys Results	Recommendations	Comments
WP2LI028_PEM	26	PEM	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non-Section 10 HDD/Bore
WP2LI030	26	PEM	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP2LI028_PFO	26	PFO	Low	2	No Cultural Resources	No further work recommended	Inundation
WP4LI017	26.2	PEM	Low	3	No Cultural Resources	No further work recommended	Partially avoided via non-Section 10 HDD/Bore
WP4LI019	26.4	PEM	Low	4	No Cultural Resources	No further work recommended	None
WP4LI018	26.4	PSS	Low	5	No Cultural Resources	No further work recommended	None
WP4LI020_PEM	26.5	PEM	Low	1	No Cultural Resources	No further work recommended	Completely avoided via non-Section 10 HDD/Bore
WP4LI020_PSS_B	26.5	PSS	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non-Section 10 HDD/Bore
WP4LI020_PSS	26.5	PSS	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non-Section 10 HDD/Bore
WP4LI021_PEM	29.5	PEM	Low	2	No Cultural Resources	No further work recommended	Completely avoided via non-Section 10 HDD/Bore
WP4LI021_PFO	29.5	PFO	Low	2	No Cultural Resources	No further work recommended	Completely avoided via non-Section 10 HDD/Bore
WP4LI021_PSS	29.5	PSS	Low	2	No Cultural Resources	No further work recommended	Completely avoided via non-Section 10 HDD/Bore
WP4LI023	29.8	PEM	Low	2	No Cultural Resources	No further work recommended	None
WP4LI022	29.8	PFO	Low	2	No Cultural Resources	No further work recommended	None

Appendix C 1- Survey Data in the Vicinity of Wetland Features

Wetland ID	Milepost (Approximate)	Wetland Type	Probability	Shovel Tests	Surveys Results	Recommendations	Comments
WP4LI024	30	PFO	Low	4	No Cultural Resources	No further work recommended	None
WP4LI025	30.3	PFO	Low	16	No Cultural Resources	No further work recommended	Inundation
WP4LI027_PEM	30.5	PEM	Low	2	No Cultural Resources	No further work recommended	None
WP4LI027_PFO	30.6	PFO	Low	21	No Cultural Resources	No further work recommended	None
WP4LI026_PEM	30.7	PEM	Low	1	No Cultural Resources	No further work recommended	None
WP4LI026_PFO	30.7	PFO	Low	26	No Cultural Resources	No further work recommended	None
WP4LI028_PFO	31.1	PFO	Low	32	No Cultural Resources	No further work recommended	None
WP4LI028_PEM	31.3	PEM	Low	2	No Cultural Resources	No further work recommended	None
WP2LI042	31.4	PEM	Low	4	No Cultural Resources	No further work recommended	None
WP2LI040_PEM	31.6	PEM	Low	3	No Cultural Resources	No further work recommended	None
WP2LI041	31.6	PEM	Low	3	No Cultural Resources	No further work recommended	None
WP2LI040_PSS	31.6	PSS	Low	2	No Cultural Resources	No further work recommended	None
WP2LI040_PEM_B	31.7	PEM	Low	1	No Cultural Resources	No further work recommended	None
WP2LI040_PFO	31.7	PFO	Low	13	No Cultural Resources	No further work recommended	None
WP2LI040_PFO_B	31.7	PFO	Low	4	No Cultural Resources	No further work recommended	None
WP2LI040_PEM_C	31.8	PEM	Low	6	No Cultural Resources	No further work recommended	None

Appendix C 1- Survey Data in the Vicinity of Wetland Features

Wetland ID	Milepost (Approximate)	Wetland Type	Probability	Shovel Tests	Surveys Results	Recommendations	Comments
WP2LI040_PFO_C	31.8	PFO	Low	6	No Cultural Resources	No further work recommended	None
WP2LI039	31.9	PEM	Low	6	No Cultural Resources	No further work recommended	Inundation
WP2LI038	32.1	PEM	Low	10	No Cultural Resources	No further work recommended	Inundation
WP2LI037	32.3	PEM	Low	6	No Cultural Resources	No further work recommended	Inundation
WP2LI036_PEM_B	32.4	PEM	Low	1	No Cultural Resources	No further work recommended	Inundation
WP2LI036_PEM	32.5	PEM	Low	1	No Cultural Resources	No further work recommended	None
WP2LI036_PFO	32.5	PFO	Low	11	No Cultural Resources	No further work recommended	Inundation
WP2LI035	32.8	PEM	Low	3	No Cultural Resources	No further work recommended	Inundation
WP2LI034	32.9	PEM	Low	2	No Cultural Resources	No further work recommended	Inundation
WP4LI046	33	PEM	Low	2	No Cultural Resources	No further work recommended	None
WP4LI047	33.1	PEM	Low	2	No Cultural Resources	No further work recommended	None
WP4LI048	33.2	PEM	Low	2	No Cultural Resources	No further work recommended	None
WP4LI049	33.2	PEM	Low	2	No Cultural Resources	No further work recommended	None
WP2LI064	34.1	PEM	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP2LI063	34.7	PEM	Low	2	No Cultural Resources	No further work recommended	Inundation
WP2LI061	34.9	PEM	Low	4	No Cultural Resources	No further work recommended	Inundation

Appendix C 1- Survey Data in the Vicinity of Wetland Features

Wetland ID	Milepost (Approximate)	Wetland Type	Probability	Shovel Tests	Surveys Results	Recommendations	Comments
WP2LI062	34.9	PEM	Low	6	No Cultural Resources	No further work recommended	Inundation
WP2LI055	35.3	PEM	Low	11	No Cultural Resources	No further work recommended	None
WP2LI056	35.7	PEM	Low	11	No Cultural Resources	No further work recommended	Inundation
WP2LI057	36.3	PEM	Low	12	No Cultural Resources	No further work recommended	None
WP2LI058	36.7	PFO	Low	4	No Cultural Resources	No further work recommended	Completely avoided via non-Section 10 HDD/Bore
WP2LI059	37.1	PEM	Low	2	No Cultural Resources	No further work recommended	Inundation
WP2LI060	37.1	PEM	Low	2	No Cultural Resources	No further work recommended	Inundation
WP4LI043	37.2	PEM	Low	3	No Cultural Resources	No further work recommended	None
WP4LI044	37.2	PEM	Low	2	No Cultural Resources	No further work recommended	None
WP4LI045	37.2	PEM	Low	2	No Cultural Resources	No further work recommended	Inundation
WP4LI042	37.3	PEM	Low	5	No Cultural Resources	No further work recommended	Inundation
WP4LI041	37.6	PEM	Low	2	No Cultural Resources	No further work recommended	Inundation
WP4LI040	37.7	PEM	Low	4	No Cultural Resources	No further work recommended	Inundation
WP4LI039_PEM	37.8	PEM	Low	2	No Cultural Resources	No further work recommended	None
WP4LI039_PSS	37.8	PSS	Low	2	No Cultural Resources	No further work recommended	None

Appendix C 1- Survey Data in the Vicinity of Wetland Features

Wetland ID	Milepost (Approximate)	Wetland Type	Probability	Shovel Tests	Surveys Results	Recommendations	Comments
WP4LI037	37.9	PEM	Low	4	No Cultural Resources	No further work recommended	Inundation
WP4LI038	37.9	PEM	Low	1	No Cultural Resources	No further work recommended	None
WP4LI061	38	PEM	Low	2	No Cultural Resources	No further work recommended	Completely avoided via non- Section 10 HDD/Bore
WP4LI036	38	PFO	Low	1	No Cultural Resources	No further work recommended	None
WP4LI059	38.3	PEM	Low	1	No Cultural Resources	No further work recommended	None
WP4LI050_PEM	38.6	PEM	Low	2	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP4LI050_PSS	38.6	PSS	Low	2	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP4LI050_PSS_B	38.6	PSS	Low	3	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP4LI050_PSS_C	38.7	PSS	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP4LI050_PSS_D	38.7	PSS	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP4LI050_PSS_E	38.7	PSS	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
Jefferson County, Texas							
WP2JE065	39.2	PEM	Low	None	No Cultural Resources	No further work recommended	Partially avoided via non- Section 10 HDD/Bore
WP2JE048	40.1	PEM	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP2JE050	40.1	PEM	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area

Appendix C 1- Survey Data in the Vicinity of Wetland Features

Wetland ID	Milepost (Approximate)	Wetland Type	Probability	Shovel Tests	Surveys Results	Recommendations	Comments
WP2JE051	40.2	PEM	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP2JE052	40.2	PEM	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP2JE053	40.3	PFO	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP3JE030	45.3	PEM	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP3JE031	45.5	PEM	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP3JE032	45.6	PEM	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP9JE010_PEM_DT ^a	47.6	PEM	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non- Section 10 HDD/Bore
WP9JE010_PFO_DT ^a	47.5	PFO	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non- Section 10 HDD/Bore
WP4JE060	47.7	PEM	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non- Section 10 HDD/Bore
WP4JE062	50.1	PEM	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP4JE063	50.2	PEM	Low	None	No Cultural Resources	No further work recommended	Inundation
WP4JE064_PFO	50.5	PFO	Low	None	No Cultural Resources	No further work recommended	Partially avoided via non- Section 10 HDD/Bore
WP4JE064_PSS	50.5	PSS	Low	None	No Cultural Resources	No further work recommended	None
WP4JE064_PEM	50.6	PEM	Low	None	No Cultural Resources	No further work recommended	Partially avoided via non- Section 10 HDD/Bore
WP3JE033_PEM	50.8	PEM	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non- Section 10 HDD/Bore

Appendix C 1- Survey Data in the Vicinity of Wetland Features

Wetland ID	Milepost (Approximate)	Wetland Type	Probability	Shovel Tests	Surveys Results	Recommendations	Comments
WP4JE065	50.8	PEM	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non-Section 10 HDD/Bore
WP3JE036	50.9	PEM	Low	None	No Cultural Resources	No further work recommended	None
WP3JE033_PFO	50.9	PFO	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non-Section 10 HDD/Bore
WP3JE037	51.1	PEM	Low	None	No Cultural Resources	No further work recommended	None
WP3JE038	51.2	PEM	Low	None	No Cultural Resources	No further work recommended	None
WP4JE071	51.3	PEM	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP4JE070	51.5	PEM	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP4JE067	51.8	PEM	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP4JE066	52.1	PEM	Low	None	No Cultural Resources	No further work recommended	Partially avoided via non-Section 10 HDD/Bore
WP3JE034	52.7	PEM	Low	None	No Cultural Resources	No further work recommended	None
WP3JE035	52.7	PEM	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non-Section 10 HDD/Bore
WP4JE072_PSS	52.7	PSS	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP4JE072_PFO	52.8	PFO	Low	None	No Cultural Resources	No further work recommended	Inundation
WP4JE073	52.9	PFO	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP5JE001	53	PEM	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area

Appendix C 1- Survey Data in the Vicinity of Wetland Features

Wetland ID	Milepost (Approximate)	Wetland Type	Probability	Shovel Tests	Surveys Results	Recommendations	Comments
WP5JE002	53.3	PEM	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP5JE003	53.4	PEM	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP5JE004	53.6	PEM	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP5JE005	53.7	PEM	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP5JE006	53.9	PEM	Low	1	No Cultural Resources	No further work recommended	Inundation
WP5JE007	54.1	PEM	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non-Section 10 HDD/Bore
WP4JE074_PSS	54.3	PSS	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP4JE074_PEM	54.4	PEM	Low	2	No Cultural Resources	No further work recommended	Completely avoided via non-Section 10 HDD/Bore
WP4JE074_PSS_B	54.8	PSS	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP4JE075_PEM	54.9	PEM	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non-Section 10 HDD/Bore
WP4JE075_PFO	54.9	PFO	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non-Section 10 HDD/Bore
WP4JE075_PFO_B	54.9	PFO	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non-Section 10 HDD/Bore
WP5JE015	55.1	PEM	Low	2	No Cultural Resources	No further work recommended	Completely avoided via non-Section 10 HDD/Bore

Appendix C 1- Survey Data in the Vicinity of Wetland Features

Wetland ID	Milepost (Approximate)	Wetland Type	Probability	Shovel Tests	Surveys Results	Recommendations	Comments
WP5JE014	55.6	PEM	Low	8	No Cultural Resources	No further work recommended	Completely avoided via non-Section 10 HDD/Bore
WP5JE013	56.2	PEM	Low	8	No Cultural Resources	No further work recommended	Inundation
WP5JE012_PEM	56.3	PEM	Low	None	No Cultural Resources	No further work recommended	Inundation
WP5JE012_PFO	56.3	PFO	Low	None	No Cultural Resources	No further work recommended	Inundation
WP5JE011	56.4	PEM	Low	None	No Cultural Resources	No further work recommended	Inundation
WP5JE009	56.5	PEM	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP5JE010	56.7	PEM	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP1JE012_PEM	56.8	PEM	Low	3	No Cultural Resources	No further work recommended	Partially avoided via non-Section 10 HDD/Bore
WP1JE012_PFO_B	56.8	PFO	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP1JE012_PFO_C	56.8	PFO	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP1JE012_PFO_E	56.9	PFO	Low	4	No Cultural Resources	No further work recommended	Inundation
WP1JE012_PFO_D	57	PFO	Low	9	No Cultural Resources	No further work recommended	Inundation
WP1JE012_PSS_B	57.2	PSS	Low	3	No Cultural Resources	No further work recommended	None
WP1JE012_PFO	57.3	PFO	Low	2	No Cultural Resources	No further work recommended	Partially avoided via non-Section 10 HDD/Bore
WP1JE012_PSS	57.3	PSS	Low	1	No Cultural Resources	No further work recommended	Inundation

Appendix C 1- Survey Data in the Vicinity of Wetland Features

Wetland ID	Milepost (Approximate)	Wetland Type	Probability	Shovel Tests	Surveys Results	Recommendations	Comments
WP4JE085	57.4	PEM	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP4JE086	57.4	PEM	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non-Section 10 HDD/Bore
WP4JE084_PEM	57.5	PEM	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP4JE084_PSS	57.5	PSS	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non-Section 10 HDD/Bore
WP4JE084_PSS_B	57.5	PSS	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non-Section 10 HDD/Bore
WP4JE082	57.7	PEM	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP4JE083	57.9	PEM	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non-Section 10 HDD/Bore
WP2JE078_PEM	58.1	PEM	Low	1	No Cultural Resources	No further work recommended	Completely avoided via non-Section 10 HDD/Bore
WP2JE078_PEM_B	58.1	PEM	Low	1	No Cultural Resources	No further work recommended	None
WP2JE078_PFO	58.1	PFO	Low	1	No Cultural Resources	No further work recommended	None
WP2JE078_PFO_B	58.1	PFO	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non-Section 10 HDD/Bore
WP2JE078_PSS_B	58.2	PSS	Low	6	No Cultural Resources	No further work recommended	Inundation
WP2JE078_PEM_C	58.4	PEM	Low	7	No Cultural Resources	No further work recommended	Inundation

Appendix C 1- Survey Data in the Vicinity of Wetland Features

Wetland ID	Milepost (Approximate)	Wetland Type	Probability	Shovel Tests	Surveys Results	Recommendations	Comments
WP2JE078_PSS	58.4	PSS	Low	1	No Cultural Resources	No further work recommended	Inundation
WP2JE078_PSS_C	58.4	PSS	Low	3	No Cultural Resources	No further work recommended	None
WP2JE079_PEM_B	58.5	PEM	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP2JE078_PSS_D	58.5	PSS	Low	2	No Cultural Resources	No further work recommended	Inundation
WP2JE079_PSS	58.6	PSS	Low	2	No Cultural Resources	No further work recommended	Inundation
WP2JE079_PSS_B	58.6	PSS	Low	2	No Cultural Resources	No further work recommended	Inundation
WP6JE009_PSS_B	58.7	PSS	Low	None	No Cultural Resources	No further work recommended	Inundation
WP6JE009_PEM_B	58.8	PEM	Low	None	No Cultural Resources	No further work recommended	Inundation
WP6JE010_PEM	58.9	PEM	Low	None	No Cultural Resources	No further work recommended	Inundation
WP6JE009_PFO	58.9	PFO	Low	None	No Cultural Resources	No further work recommended	Inundation
WP6JE009_PFO_C	58.9	PFO	Low	None	No Cultural Resources	No further work recommended	Inundation
WP6JE009_PEM_C	59	PEM	Low	None	No Cultural Resources	No further work recommended	Inundation
WP6JE009_PFO_E	59	PFO	Low	None	No Cultural Resources	No further work recommended	Inundation
WP6JE009_PSS	59	PSS	Low	None	No Cultural Resources	No further work recommended	Inundation
WP6JE008_PEM	59.1	PEM	Low	None	No Cultural Resources	No further work recommended	Inundation
WP6JE009_PEM	59.1	PEM	Low	None	No Cultural Resources	No further work recommended	Inundation

Appendix C 1- Survey Data in the Vicinity of Wetland Features

Wetland ID	Milepost (Approximate)	Wetland Type	Probability	Shovel Tests	Surveys Results	Recommendations	Comments
WP6JE008_PFO	59.1	PFO	Low	None	No Cultural Resources	No further work recommended	Partially avoided via non-Section 10 HDD/Bore
WP6JE008_PFO_B	59.1	PFO	Low	None	No Cultural Resources	No further work recommended	Inundation
WP6JE008_PSS	59.1	PSS	Low	None	No Cultural Resources	No further work recommended	Partially avoided via non-Section 10 HDD/Bore
WP4JE076_PEM	59.2	PEM	Low	None	No Cultural Resources	No further work recommended	Partially avoided via non-Section 10 HDD/Bore
WP4JE076_PFO	59.2	PFO	Low	None	No Cultural Resources	No further work recommended	Partially avoided via non-Section 10 HDD/Bore
WP4JE076_PFO_D	59.2	PFO	Low	None	No Cultural Resources	No further work recommended	Partially avoided via non-Section 10 HDD/Bore
WP4JE076_PSS_B	59.2	PSS	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP4JE076_PFO_B	59.3	PFO	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP4JE076_PFO_C	59.3	PFO	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP4JE076_PSS	59.3	PSS	Low	3	No Cultural Resources	No further work recommended	None
WP1JE010	59.4	PEM	Low	2	No Cultural Resources	No further work recommended	None
WP1JE011	59.4	PEM	Low	2	No Cultural Resources	No further work recommended	None
WP1JE009	59.8	PEM	Low	16	No Cultural Resources	No further work recommended	None
WP4JE078_PEM	60	PEM	Low	2	No Cultural Resources	No further work recommended	None
WP4JE078_PSS	60	PSS	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP1JE008_PSS	60.1	PSS	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area

Appendix C 1- Survey Data in the Vicinity of Wetland Features

Wetland ID	Milepost (Approximate)	Wetland Type	Probability	Shovel Tests	Surveys Results	Recommendations	Comments
WP1JE008	60.6	PEM	Low	14	No Cultural Resources	No further work recommended	None
WP2JE009	60.7	PEM	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP2JE006	60.8	PEM	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP2JE007_PEM	60.9	PEM	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP2JE008	61	PEM	Low	5	No Cultural Resources	No further work recommended	None
WP2JE007_PSS	61	PSS	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP2JE004	61.2	PEM	Low	3	No Cultural Resources	No further work recommended	None
WP2JE005	61.5	PEM	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP2JE003	61.6	PEM	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP1JE001	61.9	PEM	Low	1	No Cultural Resources	No further work recommended	Completely avoided via non-Section 10 HDD/Bore
WP1JE002	61.9	PEM	Low	1	No Cultural Resources	No further work recommended	Completely avoided via non-Section 10 HDD/Bore
WP1JE003	61.9	PEM	Low	1	No Cultural Resources	No further work recommended	None
WP1JE004_PEM	61.9	PEM	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non-Section 10 HDD/Bore

Appendix C 1- Survey Data in the Vicinity of Wetland Features

Wetland ID	Milepost (Approximate)	Wetland Type	Probability	Shovel Tests	Surveys Results	Recommendations	Comments
WP1JE004_PSS	61.9	PSS	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non-Section 10 HDD/Bore
WP1JE005	62	PEM	Low	None	No Cultural Resources	No further work recommended	Inundation
WP1JE006	62	PEM	Low	None	No Cultural Resources	No further work recommended	Inundation
WP1JE007	62	PEM	Low	None	No Cultural Resources	No further work recommended	Inundation
WP4JE087	62.3	PEM	Low	None	No Cultural Resources	No further work recommended	Inundation
WP2JE071	62.5	PEM	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non-Section 10 HDD/Bore
WP2JE072	62.7	PEM	Low	6	No Cultural Resources	No further work recommended	Partially avoided via non-Section 10 HDD/Bore
WP7JE009	63.2	PEM	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non-Section 10 HDD/Bore
WP7JE008	63.2	PEM	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non-Section 10 HDD/Bore
WP7JE006	63.2	PEM	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non-Section 10 HDD/Bore
WP7JE010_PEM	63.2	PEM	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non-Section 10 HDD/Bore
WP7JE010_PSS	63.2	PEM	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non-Section 10 HDD/Bore

Appendix C 1- Survey Data in the Vicinity of Wetland Features

Wetland ID	Milepost (Approximate)	Wetland Type	Probability	Shovel Tests	Surveys Results	Recommendations	Comments
WP7JE007	63.2	PEM	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non-Section 10 HDD/Bore
WP4JE089	63.2	PEM	Low	None	No Cultural Resources	No further work recommended	Inundation
WP4JE090	63.2	PEM	Low	None	No Cultural Resources	No further work recommended	Inundation
WP7JE013	63.2	PEM	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non-Section 10 HDD/Bore
WP7JE012	63.2	PEM	Low	None	No Cultural Resources	No further work recommended	Inundation
WP4JE091	63.2	PEM	Low	None	No Cultural Resources	No further work recommended	Inundation
WP7JE011_PEM	63.2	PEM	Low	None	No Cultural Resources	No further work recommended	Partially avoided via non-Section 10 HDD/Bore
WP7JE011_PFO	63.2	PFO	Low	1	No Cultural Resources	No further work recommended	Inundation
WP7JE014_PEM	63.4	PEM	Low	None	No Cultural Resources	No further work recommended	Inundation
WP7JE014_PSS	63.9	PSS	Low	None	No Cultural Resources	No further work recommended	Inundation
WP7JE001	63.9	PEM	Low	5	No Cultural Resources	No further work recommended	Inundation
WP7JE014_PSS_B	63.9	PSS	Low	None	No Cultural Resources	No further work recommended	Inundation
WP7JE014_PEM_B	63.9	PEM	Low	None	No Cultural Resources	No further work recommended	Inundation
WP4JE092	n/a	PEM	Low	None	No Cultural Resources	No further work recommended	Mostly inundated
WP4JE093	n/a	PEM	Low	None	No Cultural Resources	No further work recommended	Mostly inundated

Appendix C 1- Survey Data in the Vicinity of Wetland Features

Wetland ID	Milepost (Approximate)	Wetland Type	Probability	Shovel Tests	Surveys Results	Recommendations	Comments
WP4JE094	n/a	PEM	Low	None	No Cultural Resources	No further work recommended	Mostly inundated
WP4JE095	n/a	PEM	Low	None	No Cultural Resources	No further work recommended	Mostly inundated
WP7JE015	n/a	PEM	Low	4	No Cultural Resources	No further work recommended	Mostly inundated
WP4JE097_PFO_B	n/a	PFO	Low	None	No Cultural Resources	No further work recommended	Mostly inundated
WP7JE017	n/a	PEM	Low	None	No Cultural Resources	No further work recommended	Mostly inundated
WP4JE096	63.9	PEM	Low	None	No Cultural Resources	No further work recommended	Inundation
WP4JE097_PEM	64.1	PEM	Low	None	No Cultural Resources	No further work recommended	Inundation
WP4JE097_PSS	64.1	PSS	Low	None	No Cultural Resources	No further work recommended	Inundation
WP4JE097_PSS_B	64.1	PSS	Low	None	No Cultural Resources	No further work recommended	Inundation
WP7JE018_PSS	n/a	PSS	Low	2	No Cultural Resources	No further work recommended	Inundation
WP4JE097_PFO	64.5	PFO	Low	None	No Cultural Resources	No further work recommended	Inundation
WP7JE018_PFO	n/a	PFO	Low	1	No Cultural Resources	No further work recommended	Inundation
WP7JE018_PEM	n/a	PEM	Low	None	No Cultural Resources	No further work recommended	Inundation
WP7JE019	n/a	PEM	Low	None	No Cultural Resources	No further work recommended	Inundation
WP7JE002_PFO	n/a	PFO	Low	None	No Cultural Resources	No further work recommended	Inundation
WP7JE002_PSS	n/a	PSS	Low	None	No Cultural Resources	No further work recommended	Inundation

Appendix C 1- Survey Data in the Vicinity of Wetland Features

Wetland ID	Milepost (Approximate)	Wetland Type	Probability	Shovel Tests	Surveys Results	Recommendations	Comments
WP7JE002_PEM	n/a	PEM	Low	None	No Cultural Resources	No further work recommended	Inundation
WP4JE098_PSS	64.7	PSS	Low	None	No Cultural Resources	No further work recommended	Inundation
WP4JE098_PEM	64.8	PEM	Low	None	No Cultural Resources	No further work recommended	Inundation
WP4JE097_WET_PSS	64.8	PSS	Low	None	No Cultural Resources	No further work recommended	Inundation
WP7JE003	n/a	PEM	Low	None	No Cultural Resources	No further work recommended	Inundation
WP7JE023	n/a	PEM	Low	None	No Cultural Resources	No further work recommended	Inundation
WP7JE022	n/a	PEM	Low	None	No Cultural Resources	No further work recommended	Inundation
WP7JE021	n/a	PEM	Low	None	No Cultural Resources	No further work recommended	Inundation
WP7JE020	n/a	PSS	Low	None	No Cultural Resources	No further work recommended	Inundation
WP7JE004_PEM	n/a	PEM	Low	None	No Cultural Resources	No further work recommended	Inundation
WP7JE004_PSS	n/a	PSS	Low	None	No Cultural Resources	No further work recommended	Inundation
WP7JE005_PFO	65.8	PFO	Low	None	No Cultural Resources	No further work recommended	Inundation
WP7JE005_PEM	65.8	PEM	Low	None	No Cultural Resources	No further work recommended	Inundation
WP6JE007_PFO_D	65.1	PFO	Low	None	No Cultural Resources	No further work recommended	Inundation
WP7JE005_PFO_B	65.8	PFO	Low	1	No Cultural Resources	No further work recommended	Inundation
WP6JE007_PFO_C	65.2	PFO	Low	None	No Cultural Resources	No further work recommended	Inundation

Appendix C 1- Survey Data in the Vicinity of Wetland Features

Wetland ID	Milepost (Approximate)	Wetland Type	Probability	Shovel Tests	Surveys Results	Recommendations	Comments
WP6JE007_PSS_F	65.2	PSS	Low	None	No Cultural Resources	No further work recommended	Inundation
WP6JE007_PEM	66.1	PEM	Low	None	No Cultural Resources	No further work recommended	Inundation
WP6JE007_PFO_E	66.1	PFO	Low	None	No Cultural Resources	No further work recommended	Inundation
WP6JE007_PSS_E	65.6	PSS	Low	None	No Cultural Resources	No further work recommended	Inundation
WP6JE007_PEM_B	65.7	PEM	Low	3	No Cultural Resources	No further work recommended	Inundation
WP6JE007_PSS_D	65.7	PSS	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP6JE007_PFO	65.8	PFO	Low	3	No Cultural Resources	No further work recommended	None
WP6JE007_PFO_B	65.8	PFO	Low	None	No Cultural Resources	No further work recommended	Inundation
WP6JE007_PSS_B	65.8	PSS	Low	None	No Cultural Resources	No further work recommended	Inundation
WP6JE007_PSS_C	65.8	PSS	Low	None	No Cultural Resources	No further work recommended	Inundation
WP2JE071_PEM	65.9	PEM	Low	None	No Cultural Resources	No further work recommended	Inundation
WP6JE007_PSS	65.9	PSS	Low	None	No Cultural Resources	No further work recommended	Inundation
WP2JE073_PEM	66	PEM	Low	None	No Cultural Resources	No further work recommended	Inundation
WP2JE072_PEM	66.2	PEM	Low	None	No Cultural Resources	No further work recommended	Inundation
WP2JE074_PEM	66.2	PEM	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non-Section 10 HDD/Bore

Appendix C 1- Survey Data in the Vicinity of Wetland Features

Wetland ID	Milepost (Approximate)	Wetland Type	Probability	Shovel Tests	Surveys Results	Recommendations	Comments
WP2JE074_PFO	66.3	PFO	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non-Section 10 HDD/Bore
WP2JE075_PEM	66.4	PEM	Low	None	No Cultural Resources	No further work recommended	Inundation
WP2JE076_PEM	66.4	PEM	Low	None	No Cultural Resources	No further work recommended	Inundation
WP4JE088_PFO_B	66.5	PFO	Low	None	No Cultural Resources	No further work recommended	Inundation
WP4JE088_PFO	66.6	PFO	Low	None	No Cultural Resources	No further work recommended	Inundation
WP4JE088_PEM	67.4	PEM	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non-Section 10 HDD/Bore
WP4JE088_PSS	67.4	PSS	Low	None	No Cultural Resources	No further work recommended	Inundation
WP4JE100_WET_PEM_B	67.5	PEM	Low	None	No Cultural Resources	No further work recommended	Inundation
WP4JE100_WET_PSS_D	67.5	PSS	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP4JE100_WET_PSS_E	67.5	PSS	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP4JE100_WET_PEM_C	67.6	PEM	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP4JE100_WET_PSS_C	67.6	PSS	Low	None	No Cultural Resources	No further work recommended	Inundation
WP4JE101_WET_PEM_M	67.7	PEM	Low	4	No Cultural Resources	No further work recommended	Inundation
WP4JE102	67.7	PEM	Low	3	No Cultural Resources	No further work recommended	None
WP4JE101_PFO	67.7	PFO	Low	3	No Cultural Resources	No further work recommended	None

Appendix C 1- Survey Data in the Vicinity of Wetland Features

Wetland ID	Milepost (Approximate)	Wetland Type	Probability	Shovel Tests	Surveys Results	Recommendations	Comments
WP4JE100_WET_PSS	67.7	PSS	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP4JE101_WET_PSS	67.7	PSS	Low	1	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP4JE101_WET_PSS_B	67.7	PSS	Low	1	No Cultural Resources	No further work recommended	None
WP4JE100_WET_PEM	67.8	PEM	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
WP4JE100_WET_PSS_B	67.8	PSS	Low	1	No Cultural Resources	No further work recommended	Inundation
WP4JE099_PEM_C	68.3	PEM	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non-Section 10 HDD/Bore
WP4JE099_PSS	68	PSS	Low	5	No Cultural Resources	No further work recommended	Inundation
WP4JE099_PEM_B	68.6	PEM	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non-Section 10 HDD/Bore
WP4JE099_PEM	68.7	PEM	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non-Section 10 HDD/Bore
WP4JE103	0	PEM	Low	3	No Cultural Resources	No further work recommended	Inundation

Appendix C2 - Survey Data in the Vicinity of Waterbody Features

[illegible]

Appendix C2 - Survey Data in the Vicinity of Waterbody Features

Waterbody ID	Milepost (Approximate)	Waterbody Name	Waterbody Type	Probability	Shovel Tests	Surveys Results	Recommendations	Comments
SP3LI050	3.8	UT to Hickory Island Gully	Ephemeral	Low	28	No Cultural Resources	No further work recommended	Inundation
SP3LI051	3.8	UT to Hickory Island Gully	Ephemeral	Low	6	No Cultural Resources	No further work recommended	Inundation
SP5LI020	5.1	UT to Hickory Island Gully	Ephemeral	Low	None	No Cultural Resources	No further work recommended	Inundation
SP5LI021	5.1	UT to Hickory Island Gully	Ephemeral	Low	None	No Cultural Resources	No further work recommended	Inundation
SP5LI022	5.1	UT to Hickory Island Gully	Ephemeral	Low	None	No Cultural Resources	No further work recommended	Inundation
SP5LI023	5.1	UT to Hickory Island Gully	Ephemeral	Low	None	No Cultural Resources	No further work recommended	Inundation
SP5LI019	5.5	UT to Hickory Island Gully	Ephemeral	Low	None	No Cultural Resources	No further work recommended	Inundation
SP5LI018	6.1	UT to Hickory Island Gully	Ephemeral	Low	None	No Cultural Resources	No further work recommended	Inundation
SP6LI002	6.5	UT to Hickory Island Gully	Ephemeral	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP6LI001	6.5	UT to Hickory Island Gully	Ephemeral	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
OWP6LI001	6.7	N/A	Manmade Pond	Low	None	No Cultural Resources	No further work recommended	Mostly Inundated
SP2LI300	7.4	Hickory Island Gully	Intermittent	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
SP2LI029	7.7	UT to Hickory Island Gully	Ephemeral	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
SP2LI030_DT	9.3	UT to Dayton Canal	Perennial	Low	None	No Cultural Resources	No further work recommended	Inundation
SP2LI033_DT	9.7	UT to Dayton Canal	Intermittent	Low	None	No Cultural Resources	No further work recommended	Inundation
SP2LI030	9.3	Dayton Canal	Perennial	Low	6	No Cultural Resources	No further work recommended	Inundation
SP2LI032	9.9	UT to Dayton Canal	Ephemeral	Low	10	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP6LI008	9.9	UT to Dayton Canal	Ephemeral	Low	10	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore

Appendix C2 - Survey Data in the Vicinity of Waterbody Features

Waterbody ID	Milepost (Approximate)	Waterbody Name	Waterbody Type	Probability	Shovel Tests	Surveys Results	Recommendations	Comments
SP6LI007	9.9	UT to Dayton Canal	Ephemeral	Low	10	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP6LI006	10.2	UT to Dayton Canal	Ephemeral	Low	None	No Cultural Resources	No further work recommended	Inundation
SP6LI099	10.2	UT to Dayton Canal	Ephemeral	Low	None	No Cultural Resources	No further work recommended	Inundation
SP6LI005	10.3	Dayton Canal	Intermittent	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP6LI004	10.4	UT to Dayton Canal	Ephemeral	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
OWP6LI002	10.4	N/A	Manmade Pond	Low	None	No Cultural Resources	No further work recommended	Inundation
SP3LI027	10.6	UT to West Prong	Ephemeral	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP6LI003	10.6	UT to West Prong	Ephemeral	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP3LI026	10.9	West Prong	Ephemeral	Low	None	No Cultural Resources	No further work recommended	Inundation
SP3LI024	11	UT to Old River	Ephemeral	Low	None	No Cultural Resources	No further work recommended	Inundation
SP3LI023	11	UT to Old River	Ephemeral	Low	None	No Cultural Resources	No further work recommended	Inundation
SP3LI021	11.5	UT to Old River	Ephemeral	Low	7	No Cultural Resources	No further work recommended	Inundation
SP3LI020	11.6	East Prong	Ephemeral	Low	3	No Cultural Resources	No further work recommended	Inundation
SP3LI005	12.1	UT to Old River	Ephemeral	Low	1	No Cultural Resources	No further work recommended	Inundation
SP3LI006	12.1	UT to Old River	Ephemeral	Low	1	No Cultural Resources	No further work recommended	Inundation
SP3LI009	12.5	Old River Drain	Ephemeral	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP3LI007	12.5	Old River Drain	Ephemeral	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP3LI008	12.6	Old River Drain	Ephemeral	Low	None	No Cultural Resources	No further work recommended	Inundation

Appendix C2 - Survey Data in the Vicinity of Waterbody Features

Waterbody ID	Milepost (Approximate)	Waterbody Name	Waterbody Type	Probability	Shovel Tests	Surveys Results	Recommendations	Comments
SP3LI010	13	UT to Old River	Ephemeral	Low	None	No Cultural Resources	No further work recommended	Inundation
SP3LI011	13.1	UT to Coastal Water Authority Canal	Ephemeral	Low	None	No Cultural Resources	No further work recommended	Inundation
SP3LI012	13.3	UT to Coastal Water Authority Canal	Ephemeral	Low	None	No Cultural Resources	No further work recommended	Inundation
SP3LI013	13.5	UT to Coastal Water Authority Canal	Ephemeral	Low	4	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP3LI015	13.7	UT to Coastal Water Authority Canal	Ephemeral	Low	6	No Cultural Resources	No further work recommended	Inundation
SP3LI016	13.9	UT to Coastal Water Authority Canal	Ephemeral	Low	7	No Cultural Resources	No further work recommended	Inundation
SP3LI017	13.9	UT to Coastal Water Authority Canal	Ephemeral	Low	7	No Cultural Resources	No further work recommended	Inundation
SP3LI019	14.1	UT to Coastal Water Authority Canal	Ephemeral	Low	5	No Cultural Resources	No further work recommended	Inundation
SP3LI018	14.4	UT to Coastal Water Authority Canal	Ephemeral	Low	6	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP2LI004	15.3	UT to Coastal Water Authority Canal	Intermittent	Low	4	No Cultural Resources	No further work recommended	Inundation
SP2LI005	15.6	UT to Coastal Water Authority Canal	Ephemeral	Low	None	No Cultural Resources	No further work recommended	Inundation
SP2LI006	15.6	UT to Coastal Water Authority Canal	Ephemeral	Low	None	No Cultural Resources	No further work recommended	Inundation

Appendix C2 - Survey Data in the Vicinity of Waterbody Features

Waterbody ID	Milepost (Approximate)	Waterbody Name	Waterbody Type	Probability	Shovel Tests	Surveys Results	Recommendations	Comments
SP2LI007	15.8	UT to Coastal Water Authority Canal	Intermittent	Low	None	No Cultural Resources	No further work recommended	Inundation
SP4LI001	16.4	Trinity River	Perennial	High	50	No Cultural Resources	No further work recommended	Located in Heavily Inundated Area within Trinity River Floodplain
OWP4LI001	16.4	N/A	Manmade Pond	Medium	10	No Cultural Resources	No further work recommended	No Impacts - Completely avoided via Section 10 HDD/Bore
SP4LI002	16.7	Trinity River	Perennial	High	9	No Cultural Resources	No further work recommended	No - Avoided via HDD/Bore
SP4LI003	16.9	UT to Trinity River	Ephemeral	High	1	No Cultural Resources	No further work recommended	Located in Heavily Inundated Area within Trinity River Floodplain
SP4LI004	17	UT to Trinity River	Ephemeral	High	1	No Cultural Resources	Archeological Monitor Needed	Located in Heavily Inundated Area within Trinity River Floodplain
SP3LI004	17.8	UT to Trinity River	Intermittent	High	6	No Cultural Resources	No further work recommended	Located in Heavily Inundated Area within Trinity River Floodplain
SP3LI003	18.3	UT to Trinity River	Intermittent	High	3	No Cultural Resources	No further work recommended	Located in Heavily Inundated Area within Trinity River Floodplain
SP3LI001	19	Self Bayou	Ephemeral	High	None	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP3LI002	19.1	Self Bayou	Perennial	High	17	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP6LI012	19.3	UT to Self Bayou	Ephemeral	High	17	No Cultural Resources	No further work recommended	Inundation
SP6LI011	19.3	UT to Black Gully	Ephemeral	High	17	No Cultural Resources	No further work recommended	Inundation
OWP3LI001	20.9	N/A	Manmade Pond	High	8	No Cultural Resources	No further work recommended	Inundation
SP2LI008	21.6	UT to Black Gully	Ephemeral	High	43	No Cultural Resources	No further work recommended	Inundation

Appendix C2 - Survey Data in the Vicinity of Waterbody Features

Waterbody ID	Milepost (Approximate)	Waterbody Name	Waterbody Type	Probability	Shovel Tests	Surveys Results	Recommendations	Comments
SP4LI154	21.8	Black Gully	Perennial	High	29	No Cultural Resources	No further work recommended	Inundation
SP4LI005	22	UT to Black Gully	Intermittent	High	11	No Cultural Resources	No further work recommended	Inundation
SP9LI018_DT	22.7	UT to West Branch Devers Canal	Intermittent	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP9LI016_DT	23	Pignut Gully	Intermittent	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP9LI017_DT	23.4	UT to West Branch Devers Canal	Intermittent	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP4LI006	23.8	UT to West Branch Devers Canal	Intermittent	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP4LI007	23.9	UT to West Branch Devers Canal	Perennial	Low	5	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
OWP4LI002	23.9	N/A	Manmade Pond	Low	5	No Cultural Resources	No further work recommended	Inundation
SP2LI010	25.3	UT to West Branch Devers Canal	Ephemeral	Low	3	No Cultural Resources	No further work recommended	Inundation
SP2LI009	25.3	Turtle Bayou	Perennial	Low	4	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP2LI011	25.6	UT to Turtle Bayou	Ephemeral	Low	4	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP2LI012	25.6	UT to Turtle Bayou	Intermittent	Low	4	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP4LI013	25.9	UT to Turtle Bayou	Ephemeral	Low	3	No Cultural Resources	No further work recommended	Inundation
SP4LI014	26	UT to Turtle Bayou	Ephemeral	Low	5	No Cultural Resources	No further work recommended	Partially avoided via non Section 10 HDD/Bore
OWP2LI001	25.9	N/A	Manmade Pond	Low	5	No Cultural Resources	No further work recommended	Inundation

Appendix C2 - Survey Data in the Vicinity of Waterbody Features

Waterbody ID	Milepost (Approximate)	Waterbody Name	Waterbody Type	Probability	Shovel Tests	Surveys Results	Recommendations	Comments
SP4LI008	26.3	UT to West Branch Devers Canal	Intermittent	Low	17	No Cultural Resources	No further work recommended	Inundation
SP4LI009	26.5	West Branch Devers Canal	Perennial	Low	8	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP4LI010	27	UT to West Branch Devers Canal	Ephemeral	Low	7	No Cultural Resources	No further work recommended	Inundation
SP4LI011	27.1	UT to West Branch Devers Canal	Ephemeral	Low	7	No Cultural Resources	No further work recommended	Inundation
SP4LI012	27.4	UT to West Branch Devers Canal	Intermittent	Low	6	No Cultural Resources	No further work recommended	Inundation
SP3LI033	28	UT to West Branch Devers Canal	Ephemeral	Low	7	No Cultural Resources	No further work recommended	Inundation
SP3LI034	28.4	UT to West Branch Devers Canal	Ephemeral	Low	3	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP3LI035	28.7	UT to West Branch Devers Canal	Ephemeral	Low	3	No Cultural Resources	No further work recommended	Inundation
SP3LI038	28.9	UT to West Branch Devers Canal	Ephemeral	Low	3	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP3LI037	29	UT to West Branch Devers Canal	Intermittent	Low	3	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP3LI036	29	UT to West Branch Devers Canal	Ephemeral	Low	3	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP4LI016	29.8	UT to Whites Bayou	Intermittent	Low	24	No Cultural Resources	No further work recommended	Inundation
SP4LI017	30.1	Whites Bayou	Perennial	Low	22	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore

Appendix C2 - Survey Data in the Vicinity of Waterbody Features

Waterbody ID	Milepost (Approximate)	Waterbody Name	Waterbody Type	Probability	Shovel Tests	Surveys Results	Recommendations	Comments
SP4LI020	30.1	UT to Whites Bayou	Ephemeral	Low	22	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP4LI019	30.1	UT to Whites Bayou	Ephemeral	Low	22	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP4LI018	30.3	UT to Whites Bayou	Ephemeral	Low	26	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP4LI021	30.6	UT to Whites Bayou	Ephemeral	Low	19	No Cultural Resources	No further work recommended	Inundation
SP2LI014	31.4	UT to Whites Bayou	Ephemeral	Low	22	No Cultural Resources	No further work recommended	Inundation
SP4LI032	33	UT to East Branch Devers Canal	Ephemeral	Low	8	No Cultural Resources	No further work recommended	Inundation
SP2LI013	33	UT to Willis Marsh	Ephemeral	Low	8	No Cultural Resources	No further work recommended	Inundation
SP4LI033	33.3	UT to Willis Marsh	Intermittent	Low	10	No Cultural Resources	No further work recommended	Inundation
SP4LI034	33.4	UT to Willis Marsh	Intermittent	Low	9	No Cultural Resources	No further work recommended	Inundation
SP4LI035	34	UT to Willis Marsh	Ephemeral	Low	10	No Cultural Resources	No further work recommended	Inundation
SP4LI036	34	UT to Willis Marsh	Ephemeral	Low	10	No Cultural Resources	No further work recommended	Inundation
SP2LI028	35	UT to Willis Marsh	Perennial	Low	14	No Cultural Resources	No further work recommended	Inundation
SP2LI024	36.3	UT to Willis Marsh	Intermittent	Low	27	No Cultural Resources	No further work recommended	Inundation
SP2LI026	36.7	Nolte Canal	Perennial	Low	21	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP2LI025	36.8	Nolte Canal	Intermittent	Low	21	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP2LI027	36.7	UT to Nolt Canal	Intermittent	Low	21	No Cultural Resources	No further work recommended	Inundation
SP4LI047	38	UT to Nolt Canal	Ephemeral	Low	15	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore

Appendix C2 - Survey Data in the Vicinity of Waterbody Features

Waterbody ID	Milepost (Approximate)	Waterbody Name	Waterbody Type	Probability	Shovel Tests	Surveys Results	Recommendations	Comments
SP4LI031	38	UT to Nolty Canal	Ephemeral	Low	15	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP4LI030	38	Nolte Canal	Perennial	Low	15	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP4JLI048	38.2	UT to Nolty Canal	Ephemeral	Low	13	No Cultural Resources	No further work recommended	Inundation
Jefferson County, Texas								
SP4JE037	38.8	UT to Nolty Canal	Ephemeral	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
SP4JE038	39	UT to Nolty Canal	Ephemeral	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
SP4JE039	39.1	UT to Nolty Canal	Ephemeral	Low	None	No Cultural Resources	No further work recommended	Located within or adjacent to Rice Field
SP4JE040	39.1	UT to Nolty Canal	Ephemeral	Low	None	No Cultural Resources	No further work recommended	Located within or adjacent to Rice Field
SP2JE029	39.5	UT to Lower Neches Valley Authority Canal	Ephemeral	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP2JE015	39.5	Lower Neches Valley Authority Canal	Perennial	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP2JE016	39.5	UT to Lower Neches Valley Authority Canal	Intermittent	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP2JE017	39.8	UT to Lower Neches Valley Authority Canal	Perennial	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP2JE020	40.1	UT to Lower Neches Valley Authority Canal	Intermittent	Low	None	No Cultural Resources	No further work recommended	Located within or adjacent to Rice Field
SP2JE019	40.2	UT to Lower Neches Valley Authority Canal	Ephemeral	Low	None	No Cultural Resources	No further work recommended	Located within or adjacent to Rice Field
SP2JE018	40.3	UT to Lower Neches Valley Authority Canal	Ephemeral	Low	None	No Cultural Resources	No further work recommended	Located within or adjacent to Rice Field

Appendix C2 - Survey Data in the Vicinity of Waterbody Features

Waterbody ID	Milepost (Approximate)	Waterbody Name	Waterbody Type	Probability	Shovel Tests	Surveys Results	Recommendations	Comments
SP2JE021	40.3	UT to Lower Neches Valley Authority Canal	Intermittent	Low	None	No Cultural Resources	No further work recommended	Located within or adjacent to Rice Field
SP2JE022	40.5	UT to Lower Neches Valley Authority Canal	Perennial	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP2JE023	40.5	UT to Lower Neches Valley Authority Canal	Perennial	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP4JE041	41	UT to Lower Neches Valley Authority Canal	Ephemeral	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP4JE029	41	UT to Lower Neches Valley Authority Canal	Ephemeral	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP4JE042	41.9	UT to Lower Neches Valley Authority Canal	Intermittent	Low	18	No Cultural Resources	No further work recommended	Inundation
SP4JE043	42.2	UT to Lower Neches Valley Authority Canal	Ephemeral	Low	17	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP3JE031	42.2	UT to Lower Neches Valley Authority Canal	Ephemeral	Low	17	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP3JE030	42.2	UT to Lower Neches Valley Authority Canal	Ephemeral	Low	17	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP3JE029	42.9	UT to Lower Neches Valley Authority Canal	Ephemeral	Low	None	No Cultural Resources	No further work recommended	Located within or adjacent to Rice Field
SP3JE028	43.2	UT to Pignut Gully	Ephemeral	Low	2	No Cultural Resources	No further work recommended	Inundation
SP4JE024	43.2	UT to Pignut Gully	Ephemeral	Low	2	No Cultural Resources	No further work recommended	Inundation
SP4JE025	43.5	UT to Lower Neches Valley Authority Canal	Ephemeral	Low	None	No Cultural Resources	No further work recommended	Located within or adjacent to Rice Field

Appendix C2 - Survey Data in the Vicinity of Waterbody Features

Waterbody ID	Milepost (Approximate)	Waterbody Name	Waterbody Type	Probability	Shovel Tests	Surveys Results	Recommendations	Comments
SP4JE027	43.8	UT to Pignut Gully	Ephemeral	Low	None	No Cultural Resources	No further work recommended	Located within or adjacent to Rice Field
SP4JE026	44.2	UT to Pignut Gully	Ephemeral	Low	6	No Cultural Resources	No further work recommended	Inundation
SP4JE028	44.2	UT to Pignut Gully	Ephemeral	Low	6	No Cultural Resources	No further work recommended	Inundation
SP4JE022	44.2	UT to Pignut Gully	Ephemeral	Low	6	No Cultural Resources	No further work recommended	Inundation
SP4JE044	44.9	UT to Pignut Gully	Ephemeral	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP4JE045	45	UT to Pignut Gully	Perennial	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP4JE046	45	UT to Pignut Gully	Perennial	Low	None	No Cultural Resources	No further work recommended	Located within or adjacent to Rice Field
SP3JE032	45.8	UT to Pignut Gully	Ephemeral	Low	None	No Cultural Resources	No further work recommended	Located within or adjacent to Rice Field
SP9JE012_DT	46.3	UT to Pond Gully	Intermittent	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP9JE011_DT	46.5	UT to Pond Gully	Intermittent	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP9JE010_DT	46.9	UT to Pond Gully	Intermittent	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP9JE009_DT	47	UT to Pond Gully	Intermittent	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP9JE008_DT	47.2	UT to Pond Gully	Intermittent	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP9JE007_DT	47.4	UT to Pond Gully	Intermittent	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP9JE019_DT	47.5	UT to Green Pond Gully	Intermittent	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP4JE049	47.6	UT to Green Pond Gully	Intermittent	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP9JE050_DT	47.8	UT to Green Pond Gully	Ephemeral	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP9JE001_DT	48.1	Green Pond Gully	Intermittent	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore

Appendix C2 - Survey Data in the Vicinity of Waterbody Features

Waterbody ID	Milepost (Approximate)	Waterbody Name	Waterbody Type	Probability	Shovel Tests	Surveys Results	Recommendations	Comments
SP9JE003_DT	48.4	UT to Pond Gully	Intermittent	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP9JE004_DT	48.8	UT to Pond Gully	Intermittent	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP9JE005_DT	49	UT to Pond Gully	Intermittent	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP9JE006_DT	49.2	UT to Pond Gully	Intermittent	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP4JE051	50.2	UT to Bayou Din	Ephemeral	Low	5	No Cultural Resources	No further work recommended	Inundation
SP3JE039	50.9	Gallier Canal	Perennial	Low	4	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
OWP3JE002	50.9	N/A	Manmade Pond	Low	3	No Cultural Resources	No further work recommended	Inundation
SP4JE054	51.2	UT to Kid Gully	Ephemeral	Low	1	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP4JE053	51.7	UT to Kid Gully	Perennial	Low	1	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP4JE052	51.7	Kid Gully	Intermittent	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP3JE043	52.2	UT to Smith Levee	Ephemeral	Low	1	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP3JE042	52.2	UT to Smith Levee	Ephemeral	Low	1	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP3JE041	52.2	UT to Smith Levee	Ephemeral	Low	1	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP3JE040	52.2	Smith Levee	Intermittent	Low	1	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP4JE055	52.7	UT to Pevitot Gully	Ephemeral	Low	7	No Cultural Resources	No further work recommended	Partially avoided via non Section 10 HDD/Bore
SP3JE045	52.7	UT to Pevitot Gully	Ephemeral	Low	7	No Cultural Resources	No further work recommended	Inundation
SP3JE044	52.7	UT to Pevitot Gully	Perennial	Low	7	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
OWP4JE006	52.7	N/A	Manmade Pond	Low	7	No Cultural Resources	No further work recommended	Inundation

Appendix C2 - Survey Data in the Vicinity of Waterbody Features

Waterbody ID	Milepost (Approximate)	Waterbody Name	Waterbody Type	Probability	Shovel Tests	Surveys Results	Recommendations	Comments
OWP5JE001	53.1	N/A	Manmade Pond	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
SP5JE001	53.2	UT to Pevitot Gully	Ephemeral	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
SP5JE002	53.5	UT to Pevitot Gully	Intermittent	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
SP5JE004	53.6	UT to Pevitot Gully	Ephemeral	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
SP5JE003	53.6	UT to Pevitot Gully	Ephemeral	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
SP5JE005	53.6	UT to Pevitot Gully	Perennial	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
SP5JE006	54.1	Willow Marsh Bayou	Perennial	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP4JE058	54.2	UT to Willow Marsh Bayou	Ephemeral	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP4JE056	54.2	UT to Willow Marsh Bayou	Ephemeral	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP4JE057	54.8	Spoil Bank	Intermittent	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
SP5JE015	55	UT to Willow Marsh Bayou	Intermittent	Low	2	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP5JE012	55.4	UT to Willow Marsh Bayou	Ephemeral	Medium	9	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP5JE013	55.4	UT to Willow Marsh Bayou	Ephemeral	Medium	9	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP5JE014	55.4	UT to Willow Marsh Bayou	Ephemeral	Medium	9	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP5JE011	55.7	UT to Willow Marsh Bayou	Intermittent	Low	2	No Cultural Resources	No further work recommended	Inundation
SP5JE010	56.2	UT to Willow Marsh Bayou	Ephemeral	Low	4	No Cultural Resources	No further work recommended	Inundation
SP5JE009	56.4	UT to Willow Marsh Bayou	Perennial	Low	None	No Cultural Resources	No further work recommended	Covered under previously conducted survey
SP5JE007	56.7	UT to Willow Marsh Bayou	Ephemeral	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area

Appendix C2 - Survey Data in the Vicinity of Waterbody Features

Waterbody ID	Milepost (Approximate)	Waterbody Name	Waterbody Type	Probability	Shovel Tests	Surveys Results	Recommendations	Comments
SP5JE008	56.7	UT to Willow Marsh Bayou	Intermittent	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
OWP4JE009	57.6	N/A	Manmade Pond	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
OWP4JE007	57.9	N/A	Manmade Pond	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
OWP4JE008	57.9	N/A	Manmade Pond	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
OWP4JE010	57.9	N/A	Manmade Pond	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
SP4JE064	58	Hilderbrandt Bayou	Perennial	Low	9	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP4JE065	58	Hilderbrandt Bayou	Intermittent	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP2JE039	58.5	UT to Hilderbrandt Bayou	Intermittent	Low	8	No Cultural Resources	No further work recommended	Inundation
SP2JE040	58.5	UT to Hilderbrandt Bayou	Intermittent	Low	8	No Cultural Resources	No further work recommended	Inundation
SP6JE010	58.7	UT to Hilderbrandt Bayou	Ephemeral	Low	4	No Cultural Resources	No further work recommended	Inundation
SP4JE060	59.1	UT to Hilderbrandt Bayou	Perennial	Low	None	No Cultural Resources	No further work recommended	Inundation
SP6JE009	59.1	UT to Hilderbrandt Bayou	Intermittent	Low	None	No Cultural Resources	No further work recommended	Inundation
SP4JE059	59.2	Hilderbrandt Bayou	Perennial	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP4JE061	60	UT to Hilderbrandt Bayou	Perennial	Low	17	No Cultural Resources	No further work recommended	Inundation
SP1JE005	60	UT to Hilderbrandt Bayou	Ephemeral	Low	31	No Cultural Resources	No further work recommended	Inundation

Appendix C2 - Survey Data in the Vicinity of Waterbody Features

Waterbody ID	Milepost (Approximate)	Waterbody Name	Waterbody Type	Probability	Shovel Tests	Surveys Results	Recommendations	Comments
SP1JE004	60.3	UT to Hilderbrandt Bayou	Ephemeral	Low	5	No Cultural Resources	No further work recommended	Inundation
SP2JE003	60.8	UT to Hilderbrandt Bayou	Ephemeral	Low	7	No Cultural Resources	No further work recommended	Inundation
SP2JE002	61.1	UT to Hilderbrandt Bayou	Ephemeral	Low	11	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP2JE001	61.8	UT to Hilderbrandt Bayou	Ephemeral	Low	10	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP1JE001	61.9	UT to Hilderbrandt Bayou	Ephemeral	Low	10	No Cultural Resources	No further work recommended	Inundation
SP1JE002	62	UT to Hilderbrandt Bayou	Ephemeral	Low	6	No Cultural Resources	No further work recommended	Inundation
SP9JE300_DT ^a	62	UT to Hilderbrandt Bayou	Intermittent	Low	6	No Cultural Resources	No further work recommended	Inundation
SP1JE003	62.3	UT to Johns Gully	Ephemeral	Low	None	No Cultural Resources	No further work recommended	Located Within Heavily Inundated Area
SP3JE047	62.4	UT to Johns Gully	Ephemeral	Low	7	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP3JE046	62.5	UT to Johns Gully	Ephemeral	Low	7	No Cultural Resources	No further work recommended	Inundation
SP2JE300	62.5	Johns Gully	Intermittent	Low	7	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP4JE066	62.7	Johns Gully	Intermittent	Low	None	No Cultural Resources	No further work recommended	Inundation
SP9JE015_DT	63	UT to Rhodair Gully	Ephemeral	Low	None	No Cultural Resources	No further work recommended	Inundation
SP4JE067	63.3	UT to Rhodair Gully	Intermittent	Low	None	No Cultural Resources	No further work recommended	Inundation
SP4JE068	64.6	UT to Rhodair Gully	Intermittent	Low	None	No Cultural Resources	No further work recommended	Inundation

Appendix C2 - Survey Data in the Vicinity of Waterbody Features

Waterbody ID	Milepost (Approximate)	Waterbody Name	Waterbody Type	Probability	Shovel Tests	Surveys Results	Recommendations	Comments
SP7JE17		UT to Rhodair Gully	Intermittent	Low	None	No Cultural Resources	No further work recommended	Inundation
SP7JE012	65.8	UT to Rhodair Gully	Ephemeral	Low	1	No Cultural Resources	No further work recommended	Inundation
SP4JE069	64.6	Rhodair Gully	Intermittent	Low	None	No Cultural Resources	No further work recommended	Inundation
SP7JE013	65.2	UT to Rhodair Gully	Ephemeral	Low	None	No Cultural Resources	No further work recommended	Inundation
SP7JE002	64.9	UT to Rhodair Gully	Ephemeral	Low	None	No Cultural Resources	No further work recommended	Inundation
SP7JE014	65.3	UT to Rhodair Gully	Ephemeral	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP7JE003	n/a	UT to Rhodair Gully	Ephemeral	Low	None	No Cultural Resources	No further work recommended	Inundation
SP7JE004	n/a	UT to Rhodair Gully	Ephemeral	Low	None	No Cultural Resources	No further work recommended	Inundation
SP7JE016	65.4	UT to Rhodair Gully	Ephemeral	Low	None	No Cultural Resources	No further work recommended	Inundation
SP4JE070	64.9	UT to Rhodair Gully	Ephemeral	Low	None	No Cultural Resources	No further work recommended	Inundation
SP7JE015	65.4	UT to Rhodair Gully	Intermittent	Low	None	No Cultural Resources	No further work recommended	Inundation
SP7JE005	n/a	UT to Rhodair Gully	Ephemeral	Low	None	No Cultural Resources	No further work recommended	Inundation
SP7JE006	n/a	UT to Rhodair Gully	Ephemeral	Low	None	No Cultural Resources	No further work recommended	Inundation
SP7JE007	n/a	UT to Rhodair Gully	Intermittent	Low	1	No Cultural Resources	No further work recommended	Inundation
SP2JE037	65.1	Rhodair Gully	Perennial	Low	None	No Cultural Resources	No further work recommended	Inundation
SP2JE038	65.1	UT to Rhodair Gully	Intermittent	Low	None	No Cultural Resources	No further work recommended	Inundation
SP7JE009	65.8	UT to Port Arthur Canal	Ephemeral	Low	None	No Cultural Resources	No further work recommended	Inundation
SP7JE010	65.8	UT to Port Arthur Canal	Ephemeral	Low	None	No Cultural Resources	No further work recommended	Inundation

Appendix C2 - Survey Data in the Vicinity of Waterbody Features

Waterbody ID	Milepost (Approximate)	Waterbody Name	Waterbody Type	Probability	Shovel Tests	Surveys Results	Recommendations	Comments
SP7JE008	65.8	UT to Port Arthur Canal	Perennial	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP7JE011	65.8	UT to Port Arthur Canal	Ephemeral	Low	1	No Cultural Resources	No further work recommended	Inundation
SP2JE034	65.9	Port Arthur Canal	Perennial	Low	3	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP2JE033	65.9	UT to Port Arthur Canal	Ephemeral	Low	3	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP6JE008	65.9	UT to Port Arthur Canal	Ephemeral	Low	3	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP2JE036	66.3	UT to Port Arthur Canal	Ephemeral	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP2JE035	66.3	UT to Port Arthur Canal	Ephemeral	Low	None	No Cultural Resources	No further work recommended	Inundation
OWP9JE002_DT	66.6	N/A	Manmade Pond	Low	None	No Cultural Resources	No further work recommended	Inundation
OWP9JE001_DT	66.9	N/A	Manmade Pond	Low	None	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
OWP9JE003_DT	67.4	N/A	Manmade Pond	Low	None	No Cultural Resources	No further work recommended	Inundation
OWP4JE012	67.7	N/A	Manmade Pond	Low	22	No Cultural Resources	No further work recommended	Inundation
SP4JE072	67.9	UT to Smith Bluff	Perennial	Low	9	No Cultural Resources	No further work recommended	Completely avoided via non Section 10 HDD/Bore
SP4JE073	67.9	UT to Smith Bluff	Perennial	Low	9	No Cultural Resources	No further work recommended	Inundation
SP4JE071	68.1	UT to Smith Bluff	Intermittent	Low	5	No Cultural Resources	No further work recommended	Inundation
OWP4JE011	68.3	N/A	Manmade Pond	Low	3	No Cultural Resources	No further work recommended	Inundation

APPENDIX D: SHOVEL TEST DATA FOR USACE PERMIT AREAS

Appendix D - Shovel Test Data

Shovel Test #	Level (Strat)	Depth (cmbs)	GSV %	Positive or Negative	Munsell Color	Soil Texture Description	Description (Area; Vegetation)	Reason for Termination
0815HS01	1	0-20	10	Negative	10YR 4/3	Loam	In grassy field; beside Stream; redoxed; very compact soil; no A horizon; hard to firm soil	Subsoil
0815HS03	1	0-15	10	Negative	10YR 3/1	Loam	In grassy field; cow pasture; friable soil	Soil change
0815HS03	2	15-30	10	Negative	10YR 3/1	Clay loam	In grassy field; cow pasture; firm soil	Subsoil
0815HS06	1	0-15	10	Negative	10YR 3/1	Loam	In grassy field; cow pasture; friable soil	Soil change
0815HS06	2	15-30	10	Negative	10YR 3/1	Clay loam	In grassy field; cow pasture; friable soil	Subsoil
0815HS08	1	0-15	10	Negative	10YR 3/1	Loam	In grassy field; cow pasture; friable soil	Soil change
0815HS08	2	15-30	10	Negative	10YR 3/1	Clay loam	In grassy field; cow pasture; firm soil	Subsoil
0815HS10	1	0-15	10	Negative	10YR 3/1	Loam	In grassy field; cow pasture; friable soil	Soil change
0815HS10	2	15-30	10	Negative	10YR 3/1	Clay loam	In grassy field; cow pasture; firm soil	Subsoil
0815HS11	1	0-15	10	Negative	10YR 4/1	Clay	In grassy field with high grass; wetland feature; previously used as a sugarcane field	Soil change
0815HS11	2	15-30	10	Negative	10YR 3/1	Clay	In grassy field with high grass; wetland feature; previously used as a sugarcane field	Subsoil
0815HS13	1	0-15	10	Negative	10YR 4/1	Clay	In grassy field with high grass; wetland feature; previously used as a sugarcane field	Soil change
0815HS13	2	15-30	10	Negative	10YR 3/1	Clay	In grassy field with high grass; wetland feature; previously used as a sugarcane field	Subsoil
0815HS14	1	0-15	10	Negative	10YR 4/1	Clay	In grassy field with high grass; wetland feature; previously used as a sugarcane field	Soil change
0815HS14	2	15-30	10	Negative	10YR 3/1	Clay	In grassy field with high grass; wetland feature; previously used as a sugarcane field	Subsoil
0815HS15	1	0-15	10	Negative	10YR 4/1	Clay	In grassy field with high grass; wetland feature; previously used as a sugarcane field	Soil change
0815HS15	2	15-30	10	Negative	10YR 3/1	Clay	In grassy field with high grass; wetland feature; previously used as a sugarcane field	Subsoil
0815HS18	1	0-15	10	Negative	10YR 4/1	Clay	In grassy field with high grass; wetland feature; previously used as a sugarcane field	Soil change
0815HS18	2	15-30	10	Negative	10YR 3/1	Clay	In grassy field with high grass; wetland feature; previously used as a sugarcane field	Subsoil
0815HS27	1	0-15	10	Negative	10YR 4/1	Clay	In grassy area beside wetland and gravel road	Soil change
0815HS27	2	15-30	10	Negative	10YR 3/1	Clay	In grassy area beside wetland and gravel road	Subsoil
081518HS73	1	0-20	10	Negative	10YR 4/1	Clay	In grassy field; cow pasture; friable soil	Soil change
081518HS73	2	20-50	10	Negative	10YR 3/1	Clay	In grassy field; cow pasture; friable soil	Subsoil
081518HS71	1	0-20	10	Negative	10YR 4/1	Clay	In grassy field; cow pasture; friable soil	Soil change
081518HS71	2	20-30	10	Negative	10YR 3/1	Clay	In grassy field; cow pasture; friable soil	Subsoil
081518HS69	1	0-15	10	Negative	10YR 4/1	Clay	In grassy field; cow pasture; friable soil	Soil change
081518HS69	2	15-20	10	Negative	10YR 3/1	Clay	In grassy field; cow pasture; friable soil	Subsoil
081518HS67	1	0-20	10	Negative	10YR 4/1	Clay	In grassy field; cow pasture; friable soil	Soil change
081518HS67	2	20-25	10	Negative	10YR 3/1	Clay	In grassy field; cow pasture; friable soil	Subsoil
081518HS66	1	0-20	10	Negative	10YR 4/1	Clay	In grassy field; cow pasture; friable soil	Soil change
081518HS66	2	20-50	10	Negative	10YR 3/1	Clay	In grassy field; cow pasture; friable soil	Subsoil
081518HS63	1	0-20	10	Negative	10YR 4/1	Clay	In grassy field; cow pasture; friable soil	Soil change
081518HS63	2	20-30	10	Negative	10YR 3/1	Clay	In grassy field; cow pasture; friable soil	Subsoil
081518HS61	1	0-15	10	Negative	10YR 4/1	Clay	In grassy field; cow pasture; friable soil	Soil change
081518HS61	2	15-20	10	Negative	10YR 3/1	Clay	In grassy field; cow pasture; friable soil	Subsoil
081518HS58	1	0-20	10	Negative	10YR 4/1	Clay	In grassy field; cow pasture; friable soil	Soil change
081518HS58	2	20-25	10	Negative	10YR 3/1	Clay	In grassy field; cow pasture; friable soil	Subsoil
081518HS53	1	0-15	10	Negative	10YR 4/1	Clay	In grassy field; cow pasture; friable soil	Soil change

Appendix D - Shovel Test Data

Shovel Test #	Level (Strat)	Depth (cmts)	GSV %	Positive or Negative	Munsell Color	Soil Texture Description	Description (Area; Vegetation)	Reason for Termination
081518HS53	2	15-30	10	Negative	10YR 3/1	Clay	In grassy field; cow pasture; friable soil	Subsoil
081518HS51	1	0-15	10	Negative	10YR 4/1	Clay	In grassy field; cow pasture; friable soil	Soil change
081518HS51	2	15-30	10	Negative	10YR 3/1	Clay	In grassy field; cow pasture; friable soil	Subsoil
081518HS49	1	0-15	10	Negative	10YR 4/1	Clay	In grassy field; cow pasture; friable soil	Soil change
081518HS49	2	15-30	10	Negative	10YR 3/1	Clay	In grassy field; cow pasture; friable soil	Subsoil
081518HS48	1	0-15	10	Negative	10YR 4/1	Clay	In grassy field; cow pasture; friable soil	Soil change
081518HS48	2	0-20	10	Negative	10YR 3/1	Clay	In grassy field; cow pasture; friable soil	Subsoil
081518HS46	1	20-25	10	Negative	10YR 4/1	Clay	In grassy field; cow pasture; friable soil	Soil change
081518HS46	2	0-20	10	Negative	10YR 3/1	Clay	In grassy field; cow pasture; friable soil	Subsoil
081518HS44	1	20-50	10	Negative	10YR 4/1	Clay	In grassy field; cow pasture; friable soil	Soil change
081518HS44	2	0-20	10	Negative	10YR 3/1	Clay	In grassy field; cow pasture; friable soil	Subsoil
081518HS41	1	0-20	10	Negative	10YR 4/1	Clay	In grassy field; cow pasture; friable soil	Soil change
081518HS41	2	20-25	10	Negative	10YR 3/1	Clay	In grassy field; cow pasture; friable soil	Subsoil
081518HS40	1	0-20	10	Negative	10YR 4/1	Clay	In grassy field; cow pasture; friable soil	Soil change
081518HS40	2	20-50	10	Negative	10YR 3/1	Clay	In grassy field; cow pasture; friable soil	Subsoil
081518HS39	1	0-20	10	Negative	10YR 4/1	Clay	In grassy field; cow pasture; friable soil	Soil change
081518HS39	2	20-30	10	Negative	10YR 3/1	Clay	In grassy field; cow pasture; friable soil	Subsoil
081518HS36	1	0-15	10	Negative	10YR 4/1	Clay	In grassy field; cow pasture; friable soil	Soil change
081518HS36	2	15-20	10	Negative	10YR 3/1	Clay	In grassy field; cow pasture; friable soil	Subsoil
081518HS34	1	0-20	10	Negative	10YR 4/1	Clay	In grassy field; cow pasture; friable soil	Soil change
081518HS34	2	20-25	10	Negative	10YR 3/1	Clay	In grassy field; cow pasture; friable soil	Subsoil
081518HS32	1	0-15	10	Negative	10YR 4/1	Clay	In grassy field; cow pasture; friable soil	Soil change
081518HS32	2	15-30	10	Negative	10YR 3/1	Clay	In grassy field; cow pasture; friable soil	Subsoil
081518HS30	1	0-15	10	Negative	10YR 4/1	Clay	In grassy field; cow pasture; friable soil	Soil change
081518HS30	2	15-30	10	Negative	10YR 3/1	Clay	In grassy field; cow pasture; friable soil	Subsoil
081518HS29	1	0-15	10	Negative	10YR 4/1	Clay	In grassy field; cow pasture; friable soil	Soil change
081518HS29	2	15-30	10	Negative	10YR 3/1	Clay	In grassy field; cow pasture; friable soil	Subsoil
1002JL02	1	0-20	10	Negative	10YR 4/1	Silty clay	Knee high grass; mostly inundated	Soil change
1002JL02	2	20-30	10	Negative	10YR 3/1	Clay loam	Knee high grass; mostly inundated	Subsoil
1002JL303	1	0-15	3	Negative	Disturbed	Disturbed	Next to gate opening onto highway; semi-inundated	Disturbed

Appendix D - Shovel Test Data

Shovel Test #	Level (Strat)	Depth (cmbs)	GSV %	Positive or Negative	Munsell Color	Soil Texture Description	Description (Area; Vegetation)	Reason for Termination
1002JL305	1	0-8	10	Negative	10YR 4/1	Silty clay	In cow pasture; mostly inundated	Inundation
1002JL307	1	0-20	10	Negative	10YR 4/1	Silt loam	In cow pasture; mostly inundated	Soil change
1002JL307	2	20-50	10	Negative	10YR 3/1	Silty clay	In cow pasture; mostly inundated	Subsoil
1002JL309	1	0-20	100	Negative	10YR 4/1	Clay	Next to soybean field and canal; surface gravel	Soil change
1002JL309	2	20-50	100	Negative	10YR 3/1	Clay	Next to soybean field and canal; surface gravel	Subsoil
1002JL310	1	0-20	100	Negative	10YR 4/1	Clay	Next to soybean field; iron deposits at 20cm	Soil change
1002JL310	2	20-50	100	Negative	10YR 3/1	Clay	Next to soybean field; 20% iron deposits	Subsoil
1002JL312	1	0-20	100	Negative	10YR 4/1	Clay	Next to soybean field; 20% iron deposits	Soil change
1002JL312	2	20-50	100	Negative	10YR 3/1	Clay	Next to soybean field; 20% iron deposits	Subsoil
1002JL314	1	0-20	100	Negative	10YR 4/1	Clay	In between two soybean rows; 10% iron deposits	Soil change
1002JL314	2	20-30	100	Negative	10YR 3/1	Clay	In between two soybean rows; 10% iron deposits	Subsoil
1002WE304	1	0-15	2-5	Negative	10YR 3/2	Clay loam	Open cow pasture; short grass; trees around fence line; scattered inundations; friable soil	Soil change
1002WE304	2	15-20	2-5	Negative	10YR 3/4	Clay loam	Open cow pasture; short grass; trees around fence line; scattered inundations; friable soil	Subsoil
1002WE308	1	0-20	0	Negative	10YR 5/2	Clay	Soy bean field; muddy; adjacent to fence line and ditch	Soil change
1002WE308	2	20-25	0	Negative	10YR 5/2	Clay loam	Soy bean field; muddy; adjacent to fence line and ditch	Subsoil
1002WE315	1	0	0	Negative	0	0	Inundation	Inundation
1002RK04	1	0-25	0	Negative	10YR 3/1	Silty clay	In tall grass on high ground; soil is very firm with plants; hit water at 25cmbs	Soil change
1002RK04	2	25-35	0	Negative	10YR 4/1	Silty clay	In tall grass on high ground; soil is very firm with plants; hit water at 25cmbs	Subsoil
1002RK301	1	0-25	0	Negative	10YR 3/1	Silty clay	In short grass	Soil change
1002RK301	2	25-35	0	Negative	10YR 4/1	Silty clay	In short grass	Subsoil
1002RK302	1	0-20	0	Negative	10YR 3/1,6/1	Silty clay	In high grass on high ground	Soil change
1002RK302	2	20-30	0	Negative	10YR 4/1	Silty clay	In high grass on high ground	Subsoil
1002RK07	1	0-25	0	Negative	10YR 3/2	Silty loam	In short grass	Soil change
1002RK07	2	25-35	0	Negative	10YR 5/4	Silty clay	In short grass	Subsoil
1002RK09	1	0-25	0	Negative	10YR 3/2	Silty loam	In short grass	Soil change
1002RK09	2	25-35	0	Negative	10YR 5/4	Silty clay	In short grass	Subsoil
1002RK11	1	0-30	40	Negative	10YR 4/1,3/1	Clay	Disturbed by soy bean field	Soil change
1002RK11	2	0-30	40	Negative	10YR 4/1,3/1	Clay	Disturbed by soy bean field	Subsoil
1002RK13	1	0-30	40	Negative	10YR 4/1,3/1	Clay	Disturbed by soy bean field	Soil change
1002RK13	2	0-30	40	Negative	10YR 4/1,3/1	Clay	Disturbed by soy bean field	Subsoil
1002RK15	1	0-30	40	Negative	10YR 4/1,3/1	Clay	Disturbed by soy bean field	Soil change
1002RK15	2	0-30	40	Negative	10YR 4/1,3/1	Clay	Disturbed by soy bean field	Subsoil
1002HS300	1	0-20	10	Negative	10YR 3/1	Silty clay	Open grassy field; in row corridor	Soil change
1002HS300	2	20-30	10	Negative	10YR 3/1	Silty clay loam	Open grassy field; in row corridor; massive soil	Subsoil
100218RC313	1	0-25	10	Negative	10YR 4/1	Sandy clay loam	Grassy pasture; very inundated; some disturbance evident in row corridor	Soil change
1002HS06	1	0-25	10	Negative	10YR 4/1	Sandy clay loam	Grassy pasture; very inundated; some disturbance evident in row corridor	Soil change
1002HS06	2	25-40	10	Negative	10YR 3/1	Clay loam	Grassy pasture; very inundated; some disturbance evident in row corridor	Subsoil
1002HS08	1	0-15	90	Negative	10YR 4/1	Clay	In soy bean field; very inundated; mixed A and B	Soil change
1002HS08	2	15-25	90	Negative	10YR 3/1	Clay	In soy bean field; very inundated; mixed A and B	Subsoil
1002HS10	1	0-15	90	Negative	10YR 4/1	Clay	In soy bean field; very inundated; mixed A and B	Soil change
1002HS10	2	15-25	90	Negative	10YR 3/1	Clay	In soy bean field; very inundated; mixed A and B	Subsoil
1002HS12	1	0-10	90	Negative	10YR 4/1	Clay	In soy bean field; very inundated; mixed A and B	Inundation
1002HS14	1	0-10	90	Negative	10YR 3/1	Clay	In soy bean field; very inundated; mixed A and B	Inundation
1002RC05	1	0-10	0	Negative	10YR 3/1	Clay	Tall grass; wetland; trees along property line; cow pasture	Subsoil
1002RC05	2	10-15	0	Negative	10YR 3/2	Clay loam	Tall grass; wetland; trees along property line; cow pasture	Subsoil
1002RC305	1	0-30	0	Negative	10YR 7/4	Loam	Open cow pasture; trees along fence line; short grass	Subsoil
1002RC305	2	30-60	0	Negative	10YR 7/2	Silty loam	Open cow pasture; trees along fence line; short grass	Subsoil

Appendix D - Shovel Test Data

Shovel Test #	Level (Strat)	Depth (cmbs)	GSV %	Positive or Negative	Munsell Color	Soil Texture Description	Description (Area; Vegetation)	Reason for Termination
1002RC311	1	0-10	0	Negative	10YR 5/2	Clay loam	Soybean field; mature growth; trees along fence line	Subsoil
1002RC311	2	10-20	0	Negative	10YR 5/1	Clay	Soybean field; mature growth; trees along fence line	Subsoil
1003RK200	1	0-20	5	Negative	10YR 3/1	Clay	In cleared corridor; mostly grasses; moist; upland	Soil change
1003RK200	2	20-30	5	Negative	10YR 3/1	Clay	In cleared corridor; mostly grasses; moist; upland; In transmission+utility row	Impenetrable
1003RK201	1	0-20	5	Negative	10YR 3/1	Clay	In cleared corridor; mostly grasses; moist; upland pea gravel inclusions	Disturbed
1003RK202	1	0-30	5	Negative	10YR 3/1	Clay	In cleared corridor; mostly grasses; moist; upland	Impenetrable
1003RK203	1	0-25	5	Negative	10YR 3/1	Clay	In cleared corridor; mostly grasses; moist; upland; mixed A and B horizons	Disturbed
1003HS205	1	0-30	5	Negative	10YR 3/1	Silty clay loam	In cleared corridor; mostly grasses; moist; upland; In transmission+utility row	Soil change
1003HS205	2	30-40	5	Negative	10YR 3/1	Clay	In cleared corridor; mostly grasses; moist; upland; In transmission+utility row	Subsoil
1003HS206	1	0-20	5	Negative	10YR 3/1	Clay	In cleared corridor; mostly grasses; moist; upland; pea gravel inclusions	Disturbed
1003HS207	1	0-20	5	Negative	10YR 3/1	Silty clay	In cleared corridor; mostly grasses; moist; upland; pea gravel inclusions	Disturbed
1003RK208	1	0-20	5	Negative	10YR 3/1	Silty clay	In cleared corridor; mostly grasses; moist; upland; mixed A and B horizons	Disturbed
1003RK209	1	0-30	5	Negative	10YR 4/2	Silty clay loam	In cleared corridor; mostly grasses; moist; upland; mixed A and B horizons	Disturbed
1003HS210	1	0-20	5	Negative	10YR 4/2	Silty clay loam	In cleared corridor; mostly grasses; moist; upland; mixed A and B horizons	Disturbed
1003HS211	1	0-30	5	Negative	10YR 4/2	Silty clay loam	In cleared corridor; mostly grasses; moist; upland; In transmission+utility row; Pieces of plastic at 30cmbs; sand	Disturbed
1003RK212	1	0-20	5	Negative	10YR 4/2	Silty clay loam	In cleared corridor; mostly grasses; moist; upland; sand	Disturbed
1003HS213	1	0-20	5	Negative	10YR 4/2	Silty clay loam	In cleared corridor; mostly grasses; moist; upland; sand	Disturbed
1003HS214	1	0-20	5	Negative	10YR 4/2	Silty clay loam	In cleared corridor; mostly grasses; moist; upland; sand	Disturbed
1003HS215	1	0-60	5	Negative	10YR 4/2	Sandy loam	In cleared corridor; mostly grasses; moist; upland; very deep disturbed sandy deposit	Disturbed
1003HS216	1	0-60	5	Negative	10YR 4/2	Sandy loam	In cleared corridor; mostly grasses; moist; upland	Disturbed
1003HS217	1	0-60	10	Negative	10YR 4/2	Sandy loam	Very deep sandy deposit	Disturbed
1003HS218	1	0-30	5	Negative	10YR 4/2	Sandy loam	Very deep sandy deposit	Disturbed
1003HS219	1	0-30	5	Negative	10YR 4/2	Sandy loam	Very deep sandy deposit	Disturbed
1003HS220	1	0-30	5	Negative	10YR 4/2	Sandy loam	Very deep sandy deposit	Disturbed
1003RK221	1	0-30	5	Negative	10YR 4/2	Sandy loam	Very deep sandy deposit	Disturbed
1003RK222	1	0-30	5	Negative	10YR 4/2	Sandy loam	Very deep sandy deposit	Disturbed
1003HS223	1	0-30	5	Negative	10YR 4/2	Sandy loam	Very deep sandy deposit	Disturbed
1003RK224	1	0-30	5	Negative	10YR 4/2	Sandy loam	Very deep sandy deposit	Disturbed
1003RK225	1	0-30	5	Negative	10YR 4/2	Sandy loam	Very deep sandy deposit	Disturbed
1003HS226	1	0-30	5	Negative	10YR 4/2	Sandy loam	Very deep sandy deposit	Disturbed
1003RK227	1	0-30	5	Negative	10YR 4/2	Sandy loam	Very deep sandy deposit	Disturbed
1003HS228	1	0-30	5	Negative	10YR 4/2	Sandy loam	Very deep sandy deposit	Disturbed
1003WE02	1	0-20	0	Negative	10YR 5/2	Clay loam	Wetland; tall grass; within utility corridor; trees lining corridor	Soil change
1003WE02	2	20-25	0	Negative	10YR 5/2	Clay loam	Wetland; tall grass; within utility corridor; trees lining corridor	Subsoil
1003WE05	1	0-10	0	Negative	10YR 5/2	Clay loam	Wetland; tall grass; within utility corridor; trees lining corridor	Impenetrable
1003WE05	2	10-40	0	Negative	10YR 5/2	Clay loam	Wetland; tall grass; within utility corridor; trees lining corridor	Impenetrable
1003WE08	1	0-10	0	Negative	10YR 3/1	Loam	Wetland; tall grass and brush; south of corridor	Impenetrable
1003WE08	2	10-15	0	Negative	10YR 3/1	Loam	Wetland; tall grass and brush; south of corridor	Impenetrable
1003WE11	1	0-15	0	Negative	10YR 3/1	Loam	Wetland; tall grass	Subsoil
1003WE11	2	15-20	0	Negative	10YR 3/1	Loam	Wetland; tall grass	Subsoil
1003WE17	1	0-10	10	Negative	10YR 3/1	Loam	Aspen forest; many roots; muddy	Subsoil
1003WE17	2	10-15	10	Negative	10YR 3/1	Loam	Aspen forest; many roots; muddy	Subsoil
1003WE22	1	0-2	0	Negative	10YR 3/1	Loam	Wetland; edge of trees; tall brush and grass	Subsoil
1003WE22	2	2-5	0	Negative	10YR 3/1	Loam	Wetland; edge of trees; tall brush and grass	Subsoil
1003RC03	1	0-50	0	Negative	10YR 3/1	Clay	Wetland; tall grass; large inundated patches; briars; brush; thick forest cover heavy vegetation.	Impenetrable
1003RC03	2	50-60	0	Negative	10YR 3/2	Clay loam	Wetland; tall grass; large inundated patches; briars; brush; thick forest cover heavy vegetation.	Impenetrable
1003RC06	1	0-50	0	Negative	10YR 3/1	Loamy clay	Wetland; tall grass; large inundated patches; briars; brush; thick forest cover heavy vegetation.	Impenetrable
1003RC09	1	0-50	0	Negative	10YR 3/1	Loamy clay	Wetland; tall grass; large inundated patches; briars; brush; thick forest cover heavy vegetation.	Impenetrable
1003RC12	1	0-50	0	Negative	10YR 3/1	Loamy clay	Wetland; tall grass; large inundated patches; briars; brush; thick forest cover heavy vegetation.	Impenetrable
1003RC15	1	0-50	0	Negative	10YR 3/1	Loamy clay	Wetland; tall grass; large inundated patches; briars; brush; thick forest cover heavy vegetation.	Impenetrable

Appendix D - Shovel Test Data

Shovel Test #	Level (Strat)	Depth (cmts)	GSV %	Positive or Negative	Munsell Color	Soil Texture Description	Description (Area; Vegetation)	Reason for Termination
1003RC18	1	0-50	0	Negative	10YR 3/1	Loamy clay	Wetland; tall grass; large inundated patches; briars; brush; thick forest cover heavy vegetation.	Impenetrable
1003RC20	1	0-50	0	Negative	10YR 3/1	Loamy clay	Wetland; tall grass; large inundated patches; briars; brush; thick forest cover heavy vegetation.	Impenetrable
1003JL01	1	0-15	0	Negative	10YR 3/1	Clay	Off the two-track; dense brush/rose thorns; wetland	Soil change
1003JL01	2	15-20	0	Negative	10YR 2/1	Clay	Off the two-track; dense brush/rose thorns; wetland	Soil change
1003JL04	1	0-10	0	Negative	10YR 3/1	Clay	Off the two-track; tall grass; wetland	Soil change
1003JL04	2	10-15	0	Negative	10YR 2/1	Clay	Off the two-track; tall grass; wetland	Soil change
1003JL07	1	0-2	0	Negative	10YR 3/1	Clay	In dense brush; wetland	Soil change
1003JL07	2	2-5	0	Negative	10YR 2/1	Clay	In dense brush; wetland	Soil change
1003JL10	1	0-15	0	Negative	10YR 3/1	Clay	In dense brush; wetland	Soil change
1003JL10	2	15-20	0	Negative	10YR 2/1	Clay	In dense brush; wetland	Soil change
1003JL13	1	0-10	0	Negative	10YR 3/1	Clay	Semi dense brush; wetland	Soil change
1003JL13	2	10-15	0	Negative	10YR 2/1	Clay	Semi dense brush; wetland	Soil change
1003JL19	1	0-2	0	Negative	10YR 3/1	Clay	Semi dense brush; wetland	Soil change
1003JL19	2	2-5	0	Negative	10YR 2/1	Clay	Semi dense brush; wetland	Soil change
1003JL21	1	0-50	0	Negative	Disturbed	clay	Knee high grass; next to wooded area	Disturbed
1003JL21	2	50-60	0	Negative	Disturbed	clay	Knee high grass; next to wooded area	Disturbed
1004RK01	1	0-30	5	Negative	10YR 3/1	Clay	Berm and soils disturbed	Disturbed
1004JL02	1	0-10	100	Negative	10YR 3/1	Clay	Berm and soils disturbed	Disturbed
1004JL04	1	0-10	100	Negative	10YR 3/1	Clay	Berm and soils disturbed	Disturbed
1004JL06	1	0-10	100	Negative	10YR 3/1	Clay	Berm and soils disturbed	Disturbed
1004JL08	1	0-10	100	Negative	10YR 3/1	Clay	Berm and soils disturbed	Disturbed
1004JL10	1	0-10	100	Negative	10YR 3/1	Clay	Berm and soils disturbed	Disturbed
1004RK04	1	0-30	5	Negative	10YR 3/1	Clay	Berm and soils disturbed	Disturbed
1004RK06	1	0-30	5	Negative	10YR 3/1	Clay	Berm and soils disturbed	Disturbed
1004RK08	1	0-30	5	Negative	10YR 3/1	Clay	Berm and soils disturbed	Disturbed
1004RK09	1	0-30	5	Negative	10YR 3/1	Clay	Berm and soils disturbed	Disturbed
1004WE02	1	0-15	0	Negative	10YR 3/2	Clay	Upland; tall grass; areas of inundation	Inundation
1004WE04	1	0-20	0	Negative	10YR 4/3	Silty clay	Upland; horse pasture; areas of inundation	Inundation
1004RC01	1	0-20	0	Negative	10YR 3/1	Clay loam	Open field; tall grass; partially inundated; trees along fence line	Inundation
1004RC03	1	0-20	0	Negative	10YR 3/2	Clay loam	Open field; tall grass; partially inundated; trees along fence line	Inundation
1004RC05	1	0-30	0	Negative	10YR 3/1	Clay loam	Open field; tall grass; partially inundated; trees along fence line	Inundation
1005RC01	1	0-30	0	Negative	10YR 3/1	Silty loam	Heavy vegetation; wetland; large inundated areas; forest cover; vines; brush	Impenetrable
1005RC05	1	0-30	0	Negative	10YR 3/1	Loam	Heavy vegetation; wetland; large inundated areas; forest cover; vines; brush	Impenetrable
1005RC08	1	0-40	0	Negative	10YR 3/1	Loam	Heavy vegetation; wetland; large inundated areas; forest cover; vines; brush	Subsoil
1005RC10	1	0-30	0	Negative	10YR 3/1	Loam	Heavy vegetation; wetland; large inundated areas; forest cover; vines; brush	Subsoil
1005RC11	1	0-40	0	Negative	10YR 3/1	Loam	Heavy vegetation; wetland; large inundated areas; forest cover; vines; brush	Subsoil
1005RC13	1	0-40	0	Negative	10YR 3/1	Loam	Heavy vegetation; wetland; large inundated areas; forest cover; vines; brush	Subsoil
1005RC15	1	0-30	0	Negative	10YR 3/1	Silty loam	Heavy vegetation; wetland; large inundated areas; forest cover; vines; brush	Subsoil
1005RC17	1	0-40	0	Negative	10YR 2/1	Silty loam	open field; wetland; forest cover	Subsoil
1005RC19	1	0-30	0	Negative	10YR 3/1	Silty loam	open field; wetland; forest cover	Subsoil
1005RC20	1	0-30	0	Negative	10YR 3/1	Silty loam	open field; wetland; forest cover	Subsoil
1005RC21	1	0-30	0	Negative	10YR 3/1	Silty loam	open field; wetland; forest cover	Subsoil
1005RC23	1	0-10	0	Negative	10YR 2/1	Clay loam	Cow pasture; some wetland; tall grass	Inundation
1005RC24	1	0-10	0	Negative	10YR 2/1	Clay loam	Cow pasture; some wetland; tall grass	Inundation
1005RC26	1	0-15	0	Negative	10YR 2/1	Clay loam	Cow pasture; some wetland; tall grass	Inundation
1005RC28	1	0-15	0	Negative	10YR 2/1	Clay loam	Cow pasture; some wetland; tall grass	Inundation
1005RC30	1	0-30	0	Negative	10YR 2/1	Clay	Cow pasture; tall grass; scattered Trees	Impenetrable
1005RC32	1	0-20	0	Negative	10YR 2/1	Clay	Cow pasture; tall grass; scattered Trees	Impenetrable
1005RC34	1	0-20	0	Negative	10YR 2/1	Clay	Cow pasture; tall grass; scattered Trees	Impenetrable
1005RC36	1	0-30	0	Negative	10YR 2/1	Clay	Cow pasture; tall grass; scattered Trees	Impenetrable
1005RC37	1	0-30	0	Negative	10YR 2/1	Clay	Cow pasture; tall grass; scattered Trees	Impenetrable
1005RC39	1	0-30	0	Negative	10YR 2/1	Clay	Cow pasture; tall grass; scattered Trees	Impenetrable
1005RC40	1	0-30	0	Negative	10YR 2/1	Clay	Cow pasture; tall grass; scattered Trees	Impenetrable
1005RC42	1	0-30	0	Negative	10YR 2/1	Clay	Cow pasture; tall grass; scattered Trees	Impenetrable
1005RC43	1	0-30	0	Negative	10YR 2/1	Clay	Cow pasture; tall grass; Inundation in patches	Impenetrable

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Shovel Test #	Level (Strat)	Depth (cmts)	GSV %	Positive or Negative	Munsell Color	Soil Texture Description	Description (Area; Vegetation)	Reason for Termination
1005WE02	1	0-10	0	Negative	10YR 3/1	Silty loam	Wetland; high grass; roots	Soil change
1005WE02	2	10-15	0	Negative	10YR 3/1	Silty loam	Wetland; high grass; roots	Subsoil
1005WE06	1	0-10	0	Negative	10YR 3/1	Clay loam	Forest; many roots; wetland	Soil change
1005WE06	2	10-20	0	Negative	10YR 3/1	Clay loam	Forest; many roots; wetland	Subsoil
1005WE07	1	0-10	0	Negative	10YR 3/1	Loam	Wetland; tall grass; trees on edge of corridor	Soil change
1005WE07	2	10-15	0	Negative	10YR 3/1	Loam	Wetland; tall grass; trees on edge of corridor	Subsoil
1005WE09	1	0-10	0	Negative	10YR 3/1	Clay loam	Wetland; tall grass; trees on edge of corridor	Soil change
1005WE09	2	10-15	0	Negative	10YR 3/1	Clay loam	Wetland; tall grass; trees on edge of corridor	Subsoil
1005WE11	1	0-25	0	Negative	10YR 3/1	Loam	Wetland; cow pasture	Subsoil
1005WE14	1	0-20	5	Negative	10YR 3/1	Loam	Wetland; cow pasture; tall grass; near a shed	Soil change
1005WE14	2	20-25	5	Negative	10YR 3/1	Loam	Wetland; cow pasture; tall grass; near a shed	Subsoil
1005WE16	1	0-15	0	Negative	10YR 3/1	Loam	Wetland; cow pasture	Soil change
1005WE16	2	15-20	0	Negative	10YR 3/1	Loam	Wetland; cow pasture	Subsoil
1005WE18	1	0-10	0	Negative	10YR 3/1	Loam	Cow pasture; tall grass	Soil change
1005WE18	2	10-15	0	Negative	10YR 3/1	Loam	Cow pasture; tall grass	Subsoil
1005WE22	1	0-10	0	Negative	10YR 3/1	Clay loam	Cow pasture; tall grass	Soil change
1005WE22	2	10-15	0	Negative	10YR 3/1	Clay loam	Cow pasture; tall grass	Subsoil
1005WE25	1	0-10	0	Negative	10YR 3/1	Clay loam	Cow pasture; tall grass	Inundation
1005WE27	1	0-10	0	Negative	10YR 3/1	Clay	Cow pasture; close to dirt road	Impenetrable
1005WE27	2	10-15	0	Negative	10YR 3/1	Clay	Cow pasture; close to dirt road	Impenetrable
1005WE29	1	0-5	0	Negative	10YR 3/1	Clay loam	Cow pasture; tall grass	Inundation
1005WE31	1	0-10	0	Negative	10YR 3/1	Silty loam	Cow pasture; tall grass	Subsoil
1005WE31	2	10-15	0	Negative	10YR 3/1	Silty loam	Cow pasture; tall grass	Subsoil
1005WE33	1	0-15	0	Negative	10YR 2/1	Clay	Cow pasture; tall grass; iron inclusions	Impenetrable
1005WE35	1	0-10	0	Negative	10YR 2/1	Clay	Cow pasture; tall grass	Impenetrable
1005WE35	2	10-15	0	Negative	10YR 2/1	Clay	Cow pasture; tall grass	Impenetrable
1005WE38	1	0-5	1	Negative	10YR 3/1	Clay	Cow pasture; tall Grass; Open field	Impenetrable
1005WE38	2	5-10	1	Negative	10YR 3/1	Silty clay	Cow pasture; tall Grass; Open field	Impenetrable
1005WE41	1	0-5	0	Negative	10YR 3/1	Clay	Cow pasture; tall Grass; Open field	Impenetrable
1005WE41	2	5-10	0	Negative	10YR 3/1	Clay	Cow pasture; tall Grass; Open field	Impenetrable
1005WE44	1	0-10	0	Negative	10YR 3/1	Clay loam	Cow pasture; tall Grass; Open field	Soil change
1005WE44	2	10-15	0	Negative	10YR 3/1	Clay loam	Cow pasture; tall Grass; Open field	Subsoil
1005JL01	1	0-30	5	Negative	10YR 4/2	Silty sand	Disturbed by road sand	Disturbed
1005JL02	1	0-30	5	Negative	10YR 4/2;6/2	Silty clay	Disturbed by road sand; mottled with pea gravel	Disturbed
1005JL03	1	0-30	5	Negative	10YR 4/2;6/2	Silty clay	Disturbed next to dug out berm	Disturbed
1005JL04	1	0-30	5	Negative	10YR 4/2	Sandy clay	Imported sand mixed with berm clay	Disturbed
1005RK05	1	0-30	0	Negative	10YR 4/2	Clay	A and B horizon is mixed; near two-track	Disturbed
1005RK06	1	0-30	0	Negative	10YR 4/2	Clay	Disturbed; next to artificial berm	Disturbed
1005JL07	1	0-30	15	Negative	10YR 3/2	Silty clay	In tree line; hit water at 35cmts	Inundation
1005JL07	2	0-30	15	Negative	10YR 4/1	Clay	In tree line; hit water at 35cmts	Inundation
1005JL08	1	0-30	5	Negative	10YR 4/2;3/2	Sandy clay	Imported sand mixed with clay	Disturbed
1005JL09	1	0-60	5	Negative	10YR 4/2	Silty sand	Imported sand from dirt road	Disturbed
1005RK10	1	0-30	10	Negative	10YR 4/2	Silty loam	Inside treeline; near artificial berm	Soil change
1005RK10	2	30-40	10	Negative	10YR 5/2	Silty clay	Inside treeline; near artificial berm	Disturbed
1005RK11	1	0-60	5	Negative	10YR 5/2	Silty clay	Imported sand from road	Disturbed
1005RK12	1	0-60	5	Negative	10YR 5/2	Silty clay	Surface clay	Disturbed
1005JL13	1	0-15	5	Negative	10YR 4/2	Sand	Top is imported sand	Impenetrable
1005JL13	2	15-40	5	Negative	10YR 4/1	Silty clay	Top is imported sand	Impenetrable
1005JL14	1	0-30	5	Negative	10YR 3/2	Silty loam	Near wetland	Impenetrable
1005JL14	2	30-40	5	Negative	10YR 4/1	Silty clay	Near wetland	Disturbed
1005JL15	1	0-40	0	Negative	10YR 4/2	Silty sand	Old road bed	Disturbed
1005RK16	1	0-40	10	Negative	10YR 3/1;4/1	Silty clay	Disturbed; on berm near treeline	Disturbed

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Shovel Test #	Level (Strat)	Depth (cmbs)	GSV %	Positive or Negative	Munsell Color	Soil Texture Description	Description (Area; Vegetation)	Reason for Termination
1005RK17	1	0-40	0	Negative	10YR 3/1;4/1	Silty clay	Disturbed; cow pasture (land owner bulldozes the area)	Disturbed
1005JL18	1	0-30	0	Negative	10YR 3/1;4/1	Silty clay	Disturbed in cow pasture	Disturbed
1005JL19	1	0-30	0	Negative	10YR 3/1;4/1	Silty clay	In cow pasture	Impenetrable
1005JL20	1	0-30	0	Negative	10YR 3/1;4/1	Silty clay	In cow pasture	Impenetrable
1005JL20	2	0-30	0	Negative	10YR 3/1;4/1	Silty clay	In cow pasture	Impenetrable
1005JL21	1	0-30	0	Negative	10YR 3/1;4/1	Silty clay	In cow pasture	Impenetrable
1005JL21	2	0-30	0	Negative	10YR 3/1;4/1	Silty clay	In cow pasture	Impenetrable
1005JL22	1	0-30	5	Negative	10YR 3/2;6/4	Silty clay	In bulldozed cow pasture	Disturbed
1005JL23	1	0-15	5	Negative	10YR 4/1	Silty loam	On 10% slope	Soil change
1005JL23	2	0-15	5	Negative	10YR 6/4	Silty clay	On 10% slope	Subsoil
1005JL24	1	0-10	5	Negative	10YR 2/1	Silty clay	5m from swamp	Inundation
1005JL24	2	0-10	5	Negative	10YR 2/1	Silty clay	5m from swamp	Inundation
1005JL25	1	0-40	5	Negative	10YR 3/1;4/1	Silty clay	Disturbed from bulldozer	Disturbed
1005JL26	1	0-30	5	Negative	10YR 3/1;4/1	Silty clay	Disturbed from bulldozer	Disturbed
1005JL26	2	0-30	5	Negative	10YR 3/1;4/1	Silty clay	Disturbed from bulldozer	Disturbed
1005JL27	1	0-10	5	Negative	10YR 4/2	Sand	Disturbed with sand on top	Disturbed
1005JL27	2	10-40	5	Negative	10YR 3/1;4/1	Silty clay	Disturbed with sand on top	Disturbed
1005RK29	1	0-30	0	Negative	10YR 3/2	Silty loam	In cow pasture	Soil change
1005RK29	2	30-40	0	Negative	10YR 3/1	Silty clay	In cow pasture	Subsoil
1005RK31	1	0-15	0	Negative	10YR 3/1	Silty clay	Inundation at 10cmbs	Inundation
1005RK31	2	0-15	0	Negative	10YR 3/1	Silty clay	Inundation at 10cmbs	Inundation
1005RK34	1	0-15	0	Negative	10YR 3/1	Silty clay	Water at 15cmbs	Inundation
1005RK34	2	0-15	0	Negative	10YR 3/1	Silty Clay	Water at 15cmbs	Inundation
1005RK36	1	0-25	0	Negative	10YR 2/1	Silty clay	Very compact and wet soils	Inundation
1005RK36	2	0-25	0	Negative	10YR 3/1	Silty clay	Very compact and wet soils	Inundation
1005RK38	1	0-25	0	Negative	10YR 3/2+7.5yr5 /3	Silty loam	In cow pasture; has a few iron concretions	Soil change
1005RK38	2	25-35	0	Negative	10YR 2/1	Silty clay	In cow pasture; has a few iron concretions	Subsoil
1005RK40	1	0-25	0	Negative	10YR 3/2+7.5yr5 /3	Silty loam	In cow pasture; has a few iron concretions	Soil change
1005RK40	2	25-35	0	Negative	10YR 2/1	Silty clay	In cow pasture; has a few iron concretions	Subsoil
1005RK42	1	0-30	0	Negative	10YR 2/1	Silty clay	Inundated	Inundation
1005RK44	1	0-30	0	Negative	10YR 3/2;6/4;3/1	Silty clay	Disturbed	Inundation
1005RK46	1	0-30	0	Negative	10YR 3/2;6/4;3/1	Clay	Disturbed by line	Disturbed
1005RK48	1	0-30	0	Negative	10YR 3/1	Silty clay	In cow pasture	Soil change
1005RK48	2	30-45	0	Negative	10YR 4/1;6/4	Silty clay	In cow pasture	Subsoil
1005RK50	1	0-30	0	Negative	10YR 3/1	Silty clay	In cow pasture	Soil change

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Shovel Test #	Level (Strat)	Depth (cmbs)	GSV %	Positive or Negative	Munsell Color	Soil Texture Description	Description (Area; Vegetation)	Reason for Termination
1005RK50	2	30-45	0	Negative	10YR 4/1;6/4	Silty clay	In cow pasture	Subsoil
1005JL28	1	0-28	5	Negative	10YR 3/1	Clay	Cow pasture; ankle high grass; near highway	Impenetrable
1005JL30	1	0-28	5	Negative	10YR 3/1	Clay	Cow pasture; ankle high grass	Impenetrable
1005JL33	1	0-20	5	Negative	10YR 4/1	Clay	Cow pasture; ankle high grass; wet	Inundation
1005JL35	1	0-30	5	Negative	10YR 2/1	Clay	Cow pasture; ankle high grass	Impenetrable
1005JL37	1	0-30	5	Negative	10YR 2/1	Clay	Cow pasture; ankle high grass	Impenetrable
1005JL39	1	0-30	5	Negative	10YR 2/1	Clay	Cow pasture; ankle high grass	Impenetrable
1005JL41	1	0-30	5	Negative	10YR 4/1	Clay	Cow pasture; ankle high grass; iron inclusions	Impenetrable
1005JL43	1	0-30	5	Negative	10YR 4/1	Clay	Cow pasture; ankle high grass	Impenetrable
1005JL45	1	0-30	5	Negative	10YR 2/1	Clay	Cow pasture; iron inclusions	Impenetrable
1005JL47	1	0-30	5	Negative	10YR 2/1	Clay	Cow pasture; iron inclusions	Impenetrable
1005JL49	1	0-15	5	Negative	10YR 4/1	Clay	cow pasture; hit water table	Inundation
1005JL51	1	0-28	5	Negative	10YR 3/1	Clay	Cow pasture; ankle high grass	Impenetrable
1006WE01	1	0-5	0	Negative	10YR 3/1	Clay	Pasture; tall grass; near wetland	Inundation
1006WE03	1	0-5	0	Negative	10YR 3/1	Clay	Pasture; tall grass; near wetland	Inundation
1006WE05	1	0-5	0	Negative	10YR 3/1	Clay	Pasture; tall grass; near wetland	Inundation
1006WE07	1	0-10	0	Negative	10YR 3/1	Clay	Pasture; tall grass	Soil change
1006WE07	2	10-15	0	Negative	10YR 3/1	Clay loam	Pasture; tall grass	Subsoil
1006WE09	1	0-20	0	Negative	10YR 6/4	Clay	Red and grey color; cow pasture; tall grass	Impenetrable
1006WE11	1	0-15	0	Negative	10YR 3/1	Clay	Wetland area	Inundation
1006WE13	1	0-15	0	Negative	10YR 3/1	Clay	Wetland area; close to stream; near trees along fence line; sticky soil	Impenetrable
1006WE15	1	0-15	0	Negative	10YR 3/1	Clay	Pasture; Tall grass; close to fence line; sticky soil	Impenetrable
1006WE18	1	0-10	0	Negative	10YR 4/1	Silty loam	Pasture; open field; barn nearby	Soil change
1006WE18	2	10-25	0	Negative	10YR 4/1	Silty loam	Pasture; open field; barn nearby	Subsoil
1006WE20	1	0-15	0	Negative	10YR 4/1	Silty loam	Pasture	Soil change
1006WE20	2	15-20	0	Negative	10YR 4/1	Silty loam	Pasture	Subsoil
1006WE23	1	0-5	0	Negative	10YR 3/1	Clay	Wetland	Inundation
1006WE25	1	0-15	0	Negative	10YR 3/1	Clay	Pasture between wetland and stream	Impenetrable
1006WE29	1	0-15	0	Negative	10YR 3/1	Clay	Pasture; near stream	Impenetrable
1006WE35	1	0-20	0	Negative	10YR 6/4	Clay	Pasture; tall grass; red-grey clay	Impenetrable
1006RK02	1	0-30	0	Negative	10YR 3/1;5/1;6/4	Silty clay	Disturbed	Disturbed
1006RK04	1	0-40	0	Negative	10YR 3/1;4/1	Silty clay	In cow pasture; very sticky soil	Impenetrable
1006RK06	1	0-40	0	Negative	10YR 3/1;4/1	Silty clay	In cow pasture; very sticky soil	Impenetrable
1006RK08	1	0-40	0	Negative	10YR 3/1;4/1	Silty clay	In cow pasture; very sticky soil	Impenetrable
1006RK10	1	0-40	0	Negative	10YR 3/1;4/1	Silty clay	In cow pasture; very sticky soil	Impenetrable
1006RK12	1	0-40	0	Negative	10YR 3/1;4/1	Silty clay	In cow pasture; very sticky soil	Impenetrable
1006RK14	1	0-30	10	Negative	10YR 3/1;2/1	Silty clay	In cow pasture; very sticky soil; 2m west of creek	Impenetrable
1006RK16	1	0-40	0	Negative	10YR 4/1;3/1	Silty clay	In cow pasture with tall grasses	Impenetrable
1006RK18	1	0-30	0	Negative	10YR 2/1;3/1	Clay	In tall grass; hit water at 25cmbs	Inundation
1006RK20	1	0-40	0	Negative	10YR 2/1;3/1	Clay	In tall grass; A and A2 mixed with iron inclusions	Impenetrable
1006RK26	1	0-40	0	Negative	10YR 2/1;3/1	Clay	In tall grass; A and A2 mixed with iron inclusions	Impenetrable
1006RK30	1	0-10	0	Negative	10YR 2/1	Clay	Water at 5cmbs	Inundation

Appendix D - Shovel Test Data

Shovel Test #	Level (Strat)	Depth (cms)	GSV %	Positive or Negative	Munsell Color	Soil Texture Description	Description (Area; Vegetation)	Reason for Termination
1006RK32	1	0-30	0	Negative	10YR 3/1;4/1;6/4	Clay	Disturbed	Disturbed
1006RC02	1	0-30	0	Negative	10YR 3/1	Clay	Open cow pasture; adjacent to wetland; tall grass; trees along fence line	Impenetrable
1006RC04	1	0-15	0	Negative	10YR 3/1	Clay	Open cow pasture; adjacent to wetland; tall grass; trees along fence line	Inundation
1006RC06	1	0-15	0	Negative	10YR 3/1	Clay	Open cow pasture; adjacent to wetland; tall grass; trees along fence line	Inundation
1006RC08	1	0-20	0	Negative	10YR 3/1	Clay	Open cow pasture; adjacent to wetland; tall grass; trees along fence line	Inundation
1006RC10	1	0-30	0	Negative	10YR 3/1	Clay	Open cow pasture; adjacent to wetland; tall grass; trees along fence line	Inundation
1006RC12	1	0-30	0	Negative	10YR 3/1	Clay	Open cow pasture; adjacent to wetland; tall grass; trees along fence line	Inundation
1006RC14	1	0-30	0	Negative	10YR 3/1	Clay	Open cow pasture; adjacent to canal; trees along fence line	Impenetrable
1006RC16	1	0-30	0	Negative	10YR 3/1	Clay	Open cow pasture; adjacent to canal; trees along fence line	Impenetrable
1006RC17	1	0-50	0	Negative	10YR 3/1	Clay loam	Open field; tall grass; trees along fence line; scattered brush	Subsoil
1006RC19	1	0-50	0	Negative	10YR 3/1	Clay loam	Open field; tall grass; trees along fence line; scattered brush	Subsoil
1006RC22	1	0-15	0	Negative	10YR 3/1	Clay loam	Open field; tall grass; trees along fence line; scattered brush	Inundation
1006RC24	1	0-30	0	Negative	10YR 3/1	Clay loam	Open field; tall grass; trees along fence line; scattered brush	Impenetrable
1006RC28	1	0-30	0	Negative	10YR 3/1	Clay loam	Open field; tall grass; trees along fence line; scattered brush	Impenetrable
1006RC34	1	0-30	0	Negative	10YR 3/1	Clay loam	Open field; tall grass; trees along fence line; scattered brush	Impenetrable
1006JL01	1	0-30	5	Negative	10YR 3/1;2/1	Clay	Cow pasture; ankle high grass; next to dug out ditch	Impenetrable
1006JL03	1	0-30	5	Negative	10YR 3/1;2/1	Clay	Cow pasture; ankle high grass; next to dug out ditch	Impenetrable
1006JL05	1	0-10	5	Negative	10YR 2/1;4/1	Clay	Cow pasture; ankle high grass; next to dug out ditch; Disturbed	Disturbed
1006JL07	1	0-30	5	Negative	10YR 3/1;6/4	Clay	Cow pasture; ankle high grass	Impenetrable
1006JL09	1	0-12	5	Negative	10YR 3/1;4/1	Clay	Cow pasture; disturbed	Disturbed
1006JL11	1	0-12	5	Negative	10YR 3/1;4/1	Clay	Cow pasture; disturbed	Disturbed
1006JL13	1	0-15	5	Negative	10YR 2/1	Clay	Cow pasture; disturbed; charcoal	Disturbed
1006JL15	1	0-30	5	Negative	10YR 4/1	Clay	Cow pasture near stream	Impenetrable
1006JL17	1	0-8	5	Negative	10YR 4/1	Clay	Cow pasture; hit water table	Inundation
1006JL19	1	0-10	5	Negative	10YR 4/1	Clay	Cow pasture; hit water table	inundation
1006JL21	1	0-35	5	Negative	10YR 3/1;4/1	Clay	Cow pasture; slight slope; waist high grass	Impenetrable
1006JL22	1	0-12	5	Negative	10YR 2/1;4/1	Clay	near pipeline; disturbed	Disturbed
1006JL27	1	0-15	5	Negative	10YR 2/1;4/1	Clay	near pipeline; disturbed	Disturbed
1006JL31	1	0-8	5	Negative	10YR 3/1	Clay	Inundation	Inundation
1006JL33	1	0-10	5	Negative	10YR 3/1;6/4	Clay	Disturbed; imported gravel	Disturbed
1008RC01	1	0-40	0	Negative	10YR 3/3	Clay loam	Open field; wetland and upland areas; trees along boundary; tall grass; scattered brush; large inundation spots.	Soil change
1008RC01	2	40-50	0	Negative	10YR 5/6	Silty clay	Open field; wetland and upland areas; trees along boundary; tall grass; scattered brush; large inundation spots.	Subsoil
1008RC03	1	0-30	0	Negative	10YR 3/3	Clay loam	Open field; wetland and upland areas; trees along boundary; tall grass; scattered brush; large inundation spots.	Soil change
1008RC03	2	30-40	0	Negative	10YR 5/6	Clay loam	Open field; wetland and upland areas; trees along boundary; tall grass; scattered brush; large inundation spots.	Subsoil
1008RC04	1	0-30	0	Negative	10YR 3/3	Clay loam	Open field; wetland and upland areas; trees along boundary; tall grass; scattered brush; large inundation spots.	Soil change
1008RC04	2	30-40	0	Negative	10YR 5/6	Clay loam	Open field; wetland and upland areas; trees along boundary; tall grass; scattered brush; large inundation spots.	Subsoil
1008WE02	1	0-10	0	Negative	10YR 3/10	Clay loam	Wetland; tall grass; thick brush	Soil change
1008WE02	2	10-15	0	Negative	10YR 5/6	Clay loam	Wetland; tall grass; thick brush	Subsoil

Appendix D - Shovel Test Data

Shovel Test #	Level (Strat)	Depth (cmts)	GSV %	Positive or Negative	Munsell Color	Soil Texture Description	Description (Area; Vegetation)	Reason for Termination
1008WE05	1	0-5	0	Negative	10YR 3/10	Clay loam	Wetland; tall grass; thick brush; close to forest	Inundation
1008WE06	1	0-10	0	Negative	10YR 5/6	Clay	Open field; tall grass	Impenetrable
1009WE02	1	0-10	0	Negative	10YR 4/1	Clay loam	Cow pasture	Soil change
1009WE02	2	10-15	0	Negative	10YR 4/1	Clay loam	Cow pasture	Subsoil
1009WE03	1	0-10	0	Negative	10YR 3/2	Silty loam	Forest; tall trees; short grass; little brush; adjacent to pasture	Soil change
1009WE03	2	10-15	0	Negative	10YR 3/2	Silty loam	Forest; tall trees; short grass; little brush; adjacent to pasture	Subsoil
1009WE06	1	0-5	0	Negative	10YR 3/2	Loam	Near a trail; adjacent to ditch and field; gravel inclusions	Disturbed
1009WE10	1	0-15	0	Negative	10YR 3/2	Silty loam	Next to treeline; tall grass; open field	Soil change
1009WE10	2	15-20	0	Negative	10YR 3/2	Silty loam	Next to treeline; tall grass; open field	Subsoil
1009WE13	1	0-25	0	Negative	10YR 3/2	Silty loam	Next to creek; tall grass; open field	Inundation
1009WE17	1	0-35	0	Negative	10YR 3/2	Silty clay	Open field	Inundation
1009WE20	1	0-30	0	Negative	10YR 3/2	Silty clay	Open field; tall grass	Soil change
1009WE20	2	30-35	0	Negative	10YR 3/2	Silty clay	Open field; tall grass	Subsoil
1009WE24	1	0-30	0	Negative	10YR 3/2	Silty loam	Open field; tall grass	Inundation
1009WE27	1	0-35	0	Negative	10YR 3/2	Silty loam	Open field; tall grass	Inundation
1009TR04	1	0-30	0	Negative	10YR 4/1	Clay	Swampy oak woodlands; dry on surface	Subsoil
1009TR07	1	0-20	0	Negative	10YR 3/2	Loam	Grassy pasture; heavy-moderate inundation	Inundation
1009TR09	1	0-35	0	Negative	10YR 3/2	Loam	Grassy pasture 12-24 inch grass; dry on surface	Subsoil
1009TR11	1	0-35	0	Negative	10YR 3/2	Loam	Grassy pasture 12-24 inch grass; dry on surface	Subsoil
1009TR15	1	0-35	0	Negative	10YR 3/2	Loam	Grassy pasture 6-12 inch grass; dry on surface	Subsoil
1009TR19	1	0-40	0	Negative	10YR 3/2	Loam	Grassy pasture 12-18 inch grass; dry on surface	Subsoil
1009TR23	1	0-35	0	Negative	10YR 3/2	Loam	Grassy pasture 12-18 inch grass; dry on surface	Subsoil
1009TR26	1	0-35	0	Negative	10YR 3/2	Loam	Grassy pasture 24-36 inch grass; moderately inundation; some riparian grasses	Subsoil
1009TR29	1	0-35	0	Negative	10YR 3/2	Loam	Grassy pasture 36-72 inch grass; dry on surface	Subsoil
1009RC01	1	0-30	0	Negative	10YR 4/1	Clay	Cow pasture; tract LI-47; short grass; scattered brush	Subsoil
1009RC05	1	0-50	0	Negative	10YR 3/2	Loam	Forest cover; tall pine trees; thick rose briar; heavy vegetation	Subsoil
1009RC05	2	50-60	0	Negative	10YR 3/2	Loam	Forest cover; tall pine trees; thick rose briar; heavy vegetation	Soil change
1009RC08	1	0-40	0	Negative	10YR 3/2	Loam	Open pasture; tall grass; trees along property line; some inundation	Inundation
1009RC12	1	0-50	0	Negative	10YR 3/2	Loam	Open pasture; tall grass; trees along property line; some inundation	Soil change
1009RC12	2	50-60	0	Negative	10YR 3/2	Loam	Open pasture; tall grass; trees along property line; some inundation	Inundation
1009RC14	1	0-30	0	Negative	10YR 3/2	Loam	Open pasture; tall grass; trees along property line; some inundation	Inundation
1009RC16	1	0-30	0	Negative	10YR 3/2	Loam	Open pasture; tall grass; trees along property line; some inundation	Inundation
1009RC18	1	0-40	0	Negative	10YR 3/3	Loam	Open pasture; tall grass; trees along property line; some inundation	Inundation
1009RC21	1	0-30	0	Negative	10YR 3/2	Loam	Open pasture; tall grass; trees along property line; some inundation	Inundation
1009RC22	1	0-40	0	Negative	10YR 3/3	Loam	Open grass pasture; some inundation	Subsoil
1009RC25	1	0-30	0	Negative	10YR 3/3	Loam	Open grass pasture; some inundation	Subsoil
1009RC28	1	0-60	0	Negative	10YR 3/3	Loam	Open grass pasture; some inundation	Subsoil
1010TR03	1	0-4	100	Negative	10YR 4/1	Silty clay	Swampy woodland; thin briar understory	Soil change
1010TR03	2	4-10	100	Negative	10YR 3/1	Silty clay	Swampy woodland; thin briar understory	Subsoil
101018WE12	1	0-10	0	Negative	10YR 3/1	Silty clay	Swampy woodland; thin briar understory	Subsoil
1010TR13	1	0-8	0	Negative	10YR 5/2	Loam	Grassy field surrounded by pines; utility poles and berm through field; grass 36-48 inches tall	Soil change
1010TR13	2	8-18	0	Negative	7.5YR 6/8	Loam	Grassy field surrounded by pines; utility poles and berm through field; grass 36-48 inches tall	Subsoil
1010TR16	1	0-8	5	Negative	10YR 5/2	Loam	Grassy field adjacent to yard and home; grass 12-48 inches tall	Soil change
1010TR16	2	8-18	5	Negative	7.5YR 6/8	Loam	Grassy field adjacent to yard and home; grass 12-48 inches tall	Subsoil
1010TR19	1	0-4	10	Negative	10YR 5/2	Loam	Moderately dense woodland with moderately dense understory	Subsoil
1010TR21	1	0-5	0	Negative	10YR 5/2	Loam	Moderately dense woodland with moderately dense understory	Soil change
1010TR21	2	5-18	0	Negative	7.5YR 6/8	Loam	Moderately dense woodland with moderately dense understory	Subsoil
1010TR24	1	0-10	0	Negative	10YR 5/2	Loam	Grassy field adjacent to yard and home; grass 12-36 inches tall	Soil change
1010TR24	2	10-20	0	Negative	7.5YR 6/8	Loam	Grassy field adjacent to yard and home; grass 12-36 inches tall	Subsoil
1010TR28	1	0-5	0	Negative	10YR 5/2	Loam	Grassy field with utility line and berm. 12-60 inch grass	Soil change
1010TR28	2	5-20	0	Negative	7.5YR 6/8	Loam	Grassy field with utility line and berm. 12-60 inch grass	Subsoil
1010TR32	1	0-20	0	Negative	10YR 5/2	Loam	Grassy field with utility line and berm. 12-60 inch grass; mixed A and B horizons	Inundation
1010TR32	2	20-22	0	Negative	7.5YR 6/8	Clay	Grassy field with utility line and berm. 12-60 inch grass; mixed A and B horizons	Inundation

Appendix D - Shovel Test Data

Shovel Test #	Level (Strat)	Depth (cmbs)	GSV %	Positive or Negative	Munsell Color	Soil Texture Description	Description (Area; Vegetation)	Reason for Termination
1010TR35	1	0-10	0	Negative	10YR 5/2	Loam	Grassy field with utility line and berm. 12-60 inch grass; mixed A and B horizons	Subsoil
1010TR35	2	10-22	0	Negative	7.5YR 6/8	Clay	Grassy field with utility line and berm. 12-60 inch grass; mixed A and B horizons	Subsoil
1010WE02	1	0-15	0	Negative	10YR 4/1	Clay	Adjacent to stream; tall grass; red-gray color	Impenetrable
1010WE02	2	15-20	0	Negative	10YR 3/1	Clay	Adjacent to stream; tall grass; red-gray color	Impenetrable
1010WE11	1	0-20	0	Negative	10YR 5/2	Clay	Open field; adjacent to berm	Impenetrable
1010WE15	1	0-20	0	Negative	10YR 5/2	Clay	Open field; adjacent to road	Impenetrable
1010WE17	1	0-15	0	Negative	10YR 5/2	Clay	Pine forest	Impenetrable
1010WE22	1	0-15	0	Negative	10YR 5/2	Clay	Pine forest; wide O horizon	Impenetrable
1010WE25	1	0-20	0	Negative	10YR 5/2	Clay	Open field	Impenetrable
1010WE29	1	0-20	0	Negative	10YR 5/2	Clay	Open field; tall grass	Impenetrable
1010WE31	1	0-5	0	Negative	10YR 5/2	Loamy clay	Open field; tall grass	Inundation
1010WE31	2	5-15	0	Negative	10YR 5/2	Loamy clay	Open field; tall grass	Inundation
1010WE34	1	0-20	0	Negative	10YR 5/2	Clay	Open field; tall grass	Impenetrable
1010RC01	1	0-30	0	Negative	10YR 5/1	Clay	TX-LI-055.000; short grass; cow pasture; heavy rooted soil; large Inundation areas.	Soil change
1010RC01	2	30-40	0	Negative	10YR 3/1	Clay	TX-LI-055.000; short grass; cow pasture; heavy rooted soil; large Inundation areas.	Subsoil
1010RC04	1	0-30	0	Negative	10YR 5/1	Clay	TX-LI-055.000; short grass; cow pasture; heavy rooted soil; large Inundation areas.	Soil change
1010RC04	2	30-40	0	Negative	10YR 3/1	Clay	TX-LI-055.000; short grass; cow pasture; heavy rooted soil; large Inundation areas.	Subsoil
1010RC08	1	0-20	0	Negative	10YR 5/1	Clay	TX-LI-055.000; short grass; cow pasture; heavy rooted soil; large Inundation areas.	Inundation
1010RC10	1	0-15	0	Negative	10YR 5/2	Clay	TX-LI-062/063; medium-tall grass; centerline has scattered brush; some forest cover	Soil change
1010RC10	2	15-20	0	Negative	7.5YR 6/8	Clay	TX-LI-062/063; medium-tall grass; centerline has scattered brush; some forest cover	Subsoil
1010RC14	1	0-20	0	Negative	10YR 5/2	Clay	TX-LI-062/063; medium-tall grass; centerline has scattered brush; some forest cover	Soil change
1010RC14	2	20-25	0	Negative	7.5YR 6/8	Clay	TX-LI-062/063; medium-tall grass; centerline has scattered brush; some forest cover	Subsoil
1010RC17	1	0-15	0	Negative	10YR 5/2	Clay	TX-LI-062/063; medium-tall grass; centerline has scattered brush; some forest cover	Soil change
1010RC17	2	15-20	0	Negative	7.5YR 6/8	Clay	TX-LI-062/063; medium-tall grass; centerline has scattered brush; some forest cover	Subsoil
1010RC20	1	0-15	0	Negative	10YR 5/2	Clay	TX-LI-062/063; medium-tall grass; centerline has scattered brush; some forest cover	Soil change
1010RC20	2	15-20	0	Negative	7.5YR 6/8	Clay	TX-LI-062/063; medium-tall grass; centerline has scattered brush; some forest cover	Subsoil
1010RC23	1	0-15	0	Negative	10YR 5/2	Clay	TX-LI-062/063; medium-tall grass; centerline has scattered brush; some forest cover	Soil change
1010RC23	2	15-20	0	Negative	7.5YR 6/8	Clay	TX-LI-062/063; medium-tall grass; centerline has scattered brush; some forest cover	Subsoil
1010RC26	1	0-15	0	Negative	10YR 5/2	Clay	Very sticky clay; tall grass; some forest cover; some thick vegetation	Soil change
1010RC26	2	15-20	0	Negative	7.5YR 6/8	Clay	Very sticky clay; tall grass; some forest cover; some thick vegetation	Subsoil
1010RC27	1	0-15	0	Negative	10YR 5/2	Clay	Very sticky clay; tall grass; some forest cover; some thick vegetation	Soil change
1010RC27	2	15-20	0	Negative	7.5YR 6/8	Clay	Very sticky clay; tall grass; some forest cover; some thick vegetation	Subsoil
1010RC30	1	0-15	0	Negative	10YR 5/2	Clay	Very sticky clay; tall grass; some forest cover; some thick vegetation	Soil change
1010RC30	2	15-20	0	Negative	7.5YR 6/8	Clay	Very sticky clay; tall grass; some forest cover; some thick vegetation	Subsoil
1010RC33	1	0-15	0	Negative	10YR 5/2	Clay	Very sticky clay; tall grass; some forest cover; some thick vegetation	Soil change
1010RC33	2	15-20	0	Negative	7.5YR 6/8	Clay	Very sticky clay; tall grass; some forest cover; some thick vegetation	Subsoil
1011WE18	1	0-10	0	Negative	10YR 4/1	Clay	Open field; tall grass; cow pasture	Soil change
1011WE18	2	10-15	0	Negative	10YR 3/1	Clay	Open field; tall grass; cow pasture	Subsoil
1011RC16	1	0-15	0	Negative	10YR 4/1	Clay	Open cow pasture; rutted soil; tall unmanicured grass; scattered brush	Subsoil
1011TR17	1	0-12	0	Negative	10YR 4/1	Clay	Grassy field; 4-8 inch grass; 12-24 inch shrubs; near a small artificial drain; fence; berm and 2 exposed pipelines	Soil change
1011TR17	2	12-22	0	Negative	10YR 3/1	Clay	Grassy field; 4-8 inch grass; 12-24 inch shrubs; near a small artificial drain; fence; berm and 2 exposed pipelines	Subsoil
1012RC03	1	0-8	10	Negative	10YR 4/2	Clay	Tract TX-LI-064.000; row cleared; shot grass; scattered tree limbs	Subsoil
1012RC06	1	0-10	10	Negative	10YR 4/2	Clay	Heavily forested; thick vines; palmettos; south of row	Subsoil
1012RC09	1	0-10	10	Negative	10YR 4/2	Clay	Row cleared; short grass; trees along south edge	Subsoil
1012RC12	1	0-15	0	Negative	10YR 4/2	Clay	Heavy forest; mature tree cover; palmettos; thick vines	Subsoil
1012RC15	1	0-10	10	Negative	10YR 4/2	Clay	Heavy forest; mature tree cover; palmettos; thick vines	Subsoil
1012RC17	1	0-15	10	Negative	10YR 4/2	Clay	Heavy forest; mature tree cover; palmettos; thick vines	Subsoil
1012RC20	1	0-20	10	Negative	10YR 4/2	Clay	Heavy forest; mature tree cover; palmettos; thick vines	Subsoil
1012RC22	1	0-15	10	Negative	10YR 4/2	Clay	Heavy forest; mature tree cover; palmettos; thick vines	Subsoil
1012RC25	1	0-10	10	Negative	10YR 4/2	Clay	Heavy forest; mature tree cover; palmettos; thick vines	Subsoil
1012RC27	1	0-15	10	Negative	10YR 3/1	Clay	Heavy forest; mature tree cover; palmettos; thick vines	Subsoil
1012RC30	1	0-15	10	Negative	10YR 4/2	Clay	Heavy forest; mature tree cover; palmettos; thick vines	Subsoil
1012RC33	1	0-10	10	Negative	10YR 4/2	Clay	Heavy forest; mature tree cover; palmettos; thick vines	Subsoil
1012RC36	1	0-20	10	Negative	10YR 7/4	Clay	Heavy forest; mature tree cover; palmettos; thick vines	Subsoil
1012RC38	1	0-15	10	Negative	10YR 7/4	Clay	Heavy forest; mature tree cover; palmettos; thick vines	Subsoil

Appendix D - Shovel Test Data

Shovel Test #	Level (Strat)	Depth (cmbs)	GSV %	Positive or Negative	Munsell Color	Soil Texture Description	Description (Area; Vegetation)	Reason for Termination
1012RC41	1	0-20	10	Negative	10YR 7/4	Clay	Heavy forest; mature tree cover; palmettos; thick vines	Subsoil
1012RC44	1	0-30	10	Negative	10YR 7/1	Clay	Heavy forest; mature tree cover; palmettos; thick vines	Subsoil
1012RC47	1	0-30	10	Negative	10YR 7/4	Clay	Forest cover; mature trees; palmettos; leaf ground cover	Subsoil
1012RC50	1	0-40	10	Negative	10YR 7/4	Clay	Forest cover; mature trees; palmettos; leaf ground cover	Subsoil
1012RC52	1	0-30	10	Negative	10YR 7/4	Clay	Row cleared; short grass; scattered brush	Subsoil
1012RC55	1	0-15	10	Negative	10YR 7/4	Clay	Row cleared; short grass; scattered brush	Subsoil
1012RC58	1	0-30	10	Negative	10YR 7/4	Silt	Row cleared; short grass; scattered brush	Soil change
1012RC58	2	30-40	10	Negative	10YR 7/4	Silt	Row cleared; short grass; scattered brush	Subsoil
1012RC60	1	0-40	10	Negative	10YR 7/4	Silt	Row cleared; short grass; scattered brush	Subsoil
1012RC63	1	0-20	10	Negative	10YR 7/4	Clay	Row cleared; short grass; scattered brush	Subsoil
1012RC66	1	0-10	10	Negative	10YR 7/4	Silt	Row cleared; short grass; scattered brush	Disturbed
1012RC68	1	0-10	0	Negative	10YR 4/4	Clay loam	Row cleared; cut short grass	Subsoil
1012RC71	1	0-10	0	Negative	10YR 7/4	Clay loam	Row cleared; cut short grass	Soil change
1012RC71	2	10-15	0	Negative	10YR 7/4	Clay loam	Row cleared; cut short grass	Subsoil
1012RC73	1	0-10	10	Negative	10YR 4/1	Clay loam	Forest cover	Subsoil
1012RC76	1	0-10	10	Negative	10YR 4/1	Clay loam	Forest cover	Soil change
1012RC76	2	10-20	10	Negative	10YR 5/1	Clay loam	Forest cover	Subsoil
1012RC77	1	0-10	10	Negative	10YR 4/1	Clay loam	Forest cover	Soil change
1012RC77	2	10-30	10	Negative	10YR 5/1	Clay loam	Forest cover	Subsoil
1012TR01	1	0-15	10	Negative	10YR 4/2	Loamy clay	Grassy road corridor between two wooded areas	Subsoil
1012TR01	2	15-25	10	Negative	10YR 5/2	Loamy clay	Grassy road corridor between two wooded areas	Subsoil
1012TR04	1	0-7	5	Negative	10YR 4/2	Loamy clay	Mixed oak woodland; thin understory; thick leaf duff	Soil change
1012TR04	2	7-24	5	Negative	10YR 5/2	Loamy clay	Mixed oak woodland; thin understory; thick leaf duff	Subsoil
1012TR08	1	0-10	5	Negative	10YR 4/2	Loamy clay	Mixed oak woodland; thin understory; thick leaf duff; friable soil	Soil change
1012TR08	2	10-20	5	Negative	10YR 5/2	Loamy clay	Mixed oak woodland; thin understory; thick leaf duff; friable soil	Subsoil
1012TR11	1	0-15	0	Negative	10YR 4/2	Loam	Mixed oak woodland; thin understory; thick leaf duff; root disturbance	Soil change
1012TR11	2	15-25	0	Negative	10YR 5/2	Loam	Mixed oak woodland; thin understory; thick leaf duff; root disturbance	Subsoil
1012TR14	1	0-35	0	Negative	10YR 4/1	Loam	Mixed pine forest; thick pine needle and leaf duff	Roots
1012TR19	1	0-60	0	Negative	10YR 4/1	Clay loam	Mixed pine forest; thick pine needle and leaf duff	Impenetrable
1012TR32	1	0-20	5	Negative	10YR 4/1	Loam	Mixed oak and pine woodland; moderate understory; some palms	Roots
1012TR34	1	0-20	70	Negative	10YR 4/2	Sandy clay	Mixed oak and pine woodland; moderate understory; some palms	Soil change
1012TR34	2	20-40	70	Negative	10YR 5/2	Clay	Mixed oak and pine woodland; moderate understory; some palms	Subsoil
1012TR43	1	0-15	10	Negative	10YR 4/2	Sandy loam	Mixed oak and pine woodland; moderate understory; moderate growth of palms	Soil change
1012TR43	2	15-30	10	Negative	10YR 5/2	Sandy clay	Mixed oak and pine woodland; moderate understory; moderate growth of palms	Subsoil
1012TR51	1	0-15	0	Negative	10YR 4/2	Sandy loam	Mixed oak woodland; thin understory; thick leaf duff	Soil change
1012TR51	2	15-30	0	Negative	10YR 5/2	Sandy loam	Mixed oak woodland; thin understory; thick leaf duff	Subsoil
1012TR57	1	0-50	90	Negative	10YR 7/4	Sandy loam	Within row; soil is very homogenous; likely imported fill	Disturbed
1012TR61	1	0-30	0	Negative	10YR 7/4	Sandy loam	Within row; soil is very homogenous; likely imported fill	Disturbed
101218WE42	1	0-10	50	Negative	10YR 4/2	Silty loam	Grassy row between two forested areas	Soil change
101218WE42	2	10-25	50	Negative	10YR 5/2	Silty clay	Grassy row between two forested areas	Subsoil
1012TR71	1	0-25	100	Negative	10YR 4/2	Silty loam	Grassy row between two forested areas	Soil change
1012TR71	2	25-35	100	Negative	10YR 5/2	Silty loam	Grassy row between two forested areas	Subsoil
101218RC64	1	0-10	10	Negative	10YR 4/2	Silty loam	Mixed oak and pine woodland; thin understory; some palms	Soil change
101218RC64	2	10-30	10	Negative	10YR 5/2	Silty clay	Mixed oak and pine woodland; thin understory; some palms	Subsoil
1012WE05	1	0-10	2	Negative	10YR 4/1	Clay	Utility corridor; edge of forest; short grass	Soil change
1012WE05	2	10-15	2	Negative	10YR 3/1	Clay	Utility corridor; edge of forest; short grass	Subsoil
1012WE07	1	0-10	1	Negative	10YR 4/1	Clay loam	Utility corridor; edge of forest; short grass	Soil change
1012WE07	2	10-15	1	Negative	10YR 3/1	Clay loam	Utility corridor; edge of forest; short grass	Subsoil
1012WE10	1	0-10	10	Negative	10YR 4/1	Clay loam	Forest; roots	Soil change
1012WE10	2	10-15	10	Negative	10YR 3/1	Clay loam	Forest; roots	Subsoil
1012WE13	1	0-10	10	Negative	10YR 4/1	Sandy clay	Forest; roots	Soil change
1012WE13	2	10-15	10	Negative	10YR 3/1	Sandy clay	Forest; roots	Subsoil
1012WE17	1	0-10	5	Negative	10YR 4/1	Clay loam	Pine forest	Soil change

Appendix D - Shovel Test Data

Shovel Test #	Level (Strat)	Depth (cmbs)	GSV %	Positive or Negative	Munsell Color	Soil Texture Description	Description (Area; Vegetation)	Reason for Termination
1012WE17	2	10-15	5	Negative	10YR 3/1	Clay loam	Pine forest	Subsoil
1012WE18	1	0-10	2	Negative	10YR 4/1	Clay loam	Forest	Soil change
1012WE18	2	10-20	2	Negative	10YR 3/1	Clay loam	Forest	Subsoil
1012WE21	1	0-8	2	Negative	10YR 4/1	Clay loam	Pine forest	Soil change
1012WE21	2	8-15	2	Negative	10YR 3/1	Clay loam	Pine forest	Subsoil
1012WE24	1	0-10	5	Negative	10YR 4/1	Loamy clay	Forest	Soil change
1012WE24	2	10-15	5	Negative	10YR 3/1	Loamy clay	Forest	Subsoil
1012WE26	1	0-10	2	Negative	10YR 4/1	Sandy clay	Forest; roots	Soil change
1012WE26	2	10-15	2	Negative	10YR 3/1	Sandy clay	Forest; roots	Subsoil
1012WE28	1	0-20	1	Negative	10YR 4/1	Sand	Forest; roots; sandy hill	Soil change
1012WE28	2	20-25	1	Negative	10YR 3/1	Sand	Forest; roots; sandy hill	Subsoil
1012WE31	1	0-10	0	Negative	10YR 4/1	Clay	Cleared path in forest area	Soil change
1012WE31	2	10-15	0	Negative	10YR 3/1	Clay	Cleared path in forest area	Subsoil
1012WE35	1	0-15	5	Negative	10YR 4/1	Sand	Forest; thick brush and thorns; roots	Soil change
1012WE35	2	15-25	5	Negative	10YR 3/1	Sand	Forest; thick brush and thorns; roots	Subsoil
1012WE38	1	0-40	2	Negative	10YR 7/4	Loam	Forest; thick brush and thorns; roots; likely imported fill	Soil change
1012WE41	1	0-10	3	Negative	10YR 4/1	Clay loam	Forest; thick brush and thorns; roots	Subsoil
1012WE41	2	10-15	3	Negative	10YR 3/1	Clay loam	Forest; thick brush and thorns; roots	Soil change
1012WE45	1	0-10	5	Negative	10YR 4/1	Clay loam	Forest; thick brush; roots	Subsoil
1012WE45	2	10-15	5	Negative	10YR 3/1	Clay loam	Forest; thick brush; roots	Soil change
1012WE48	1	0-10	2	Negative	10YR 4/1	Clay loam	Forest; thick brush; roots	Subsoil
1012WE48	2	10-15	2	Negative	10YR 3/1	Clay loam	Forest; thick brush; roots	Soil change
1012WE50	1	0-10	1	Negative	10YR 4/1	Clay loam	Forest; thick brush; roots	Subsoil
1012WE50	2	10-15	1	Negative	10YR 3/1	Clay loam	Forest; thick brush; roots	Soil change
1012WE53	1	0-10	0	Negative	10YR 4/1	Clay	Utility corridor; edge of forest; short grass	Subsoil
1012WE53	2	10-15	0	Negative	10YR 3/1	Clay	Utility corridor; edge of forest; short grass	Soil change
1012WE54	1	0-8	1	Negative	10YR 4/1	Clay	Utility corridor; edge of forest; short grass	Subsoil
1012WE54	2	8-15	1	Negative	10YR 3/1	Clay	Utility corridor; edge of forest; short grass	Soil change
1012WE56	1	0-5	1	Negative	10YR 4/1	Silty clay	Utility corridor; short grass	Subsoil
1012WE56	2	5-10	1	Negative	10YR 3/1	Silty clay	Utility corridor; short grass	Soil change
1012WE58	1	0-50	1	Negative	10YR 7/4	Sandy loam	Utility corridor; homogenous soil; likely imported fill	Subsoil
1012WE63	1	0-10	1	Negative	10YR 4/1	Clay loam	Utility corridor; short grass	Soil change
1012WE63	2	10-15	1	Negative	10YR 3/1	Clay loam	Utility corridor; short grass	Subsoil
1012WE65	1	0-30	1	Negative	10YR 7/4	Sandy loam	Utility corridor; homogenous soil; likely imported fill	Disturbed
1012WE69	1	0-10	0	Negative	10YR 4/1	Clay loam	Utility corridor; short grass	Subsoil
1012WE69	2	10-20	0	Negative	10YR 3/1	Clay	Utility corridor; short grass	Subsoil
101218TR74	1	0-10	0	Negative	10YR 4/1	Clay loam	Utility corridor; short grass	Soil change
101218TR74	2	10-20	0	Negative	10YR 3/1	Clay	Utility corridor; short grass	Subsoil
101218TR67	1	0-10	0	Negative	10YR 4/1	Clay loam	Utility corridor; short grass	Soil change
101218TR67	2	10-15	0	Negative	10YR 3/1	Clay	Utility corridor; short grass	Subsoil
101218TR39	1	0-10	0	Negative	10YR 4/1	Clay loam	Utility corridor; short grass	Soil change
101218TR39	2	10-20	0	Negative	10YR 3/1	Clay	Utility corridor; short grass	Subsoil
101218TR35	1	0-10	0	Negative	10YR 4/1	Clay loam	Utility corridor; short grass	Soil change
101218TR35	2	10-15	0	Negative	10YR 3/1	Clay	Utility corridor; short grass	Subsoil
101218TR23	1	0-10	0	Negative	10YR 4/1	Clay loam	Utility corridor; short grass	Soil change
101218TR23	2	10-20	0	Negative	10YR 3/1	Clay	Utility corridor; short grass	Subsoil
1012WE73	1	0-10	0	Negative	10YR 4/1	Clay	Utility corridor; short grass	Soil change

Appendix D - Shovel Test Data

Shovel Test #	Level (Strat)	Depth (cmbs)	GSV %	Positive or Negative	Munsell Color	Soil Texture Description	Description (Area; Vegetation)	Reason for Termination
1012WE73	2	10-15	0	Negative	10YR 3/1	Clay	Utility corridor; short grass	Subsoil
1012WE76	1	0-10	2	Negative	10YR 4/1	Clay loam	Forest	Soil change
1012WE76	2	10-15	2	Negative	10YR 3/1	Clay loam	Forest	Subsoil
1013WE02	1	0-15	0	Negative	10YR 7/2	Clay	Cow pasture; grassy field	Soil change
1013WE02	2	15-20	0	Negative	10YR 7/2	Clay	Cow pasture; grassy field	Subsoil
1013WE05	1	0-10	0	Negative	10YR 7/2	Clay	Cow pasture; grassy field	Inundation
1013WE05	2	10-15	0	Negative	10YR 7/2	Clay	Cow pasture; grassy field	Inundation
1013WE07	1	0-5	0	Negative	10YR 7/2	Clay	Cow pasture; grassy field	Soil change
1013WE07	2	5-10	0	Negative	10YR 7/2	Clay	Cow pasture; grassy field	Subsoil
1013WE10	1	0-10	0	Negative	10YR 7/2	Clay	Cow pasture; tall grass; between fence and forest	Soil change
1013WE10	2	10-15	0	Negative	10YR 7/2	Clay	Cow pasture; tall grass; between fence and forest	Subsoil
1013WE12	1	0-10	1	Negative	10YR 7/2	Clay	Forest; Short trees	Soil change
1013WE12	2	10-15	1	Negative	10YR 7/2	Clay	Forest; Short trees	Subsoil
1013WE15	1	0-10	0	Negative	10YR 7/4	Clay loam	Utility corridor between trees; short grass	Soil change
1013WE15	2	10-15	0	Negative	10YR 7/4	Clay loam	Utility corridor between trees; short grass	Subsoil
1013WE19	1	0-10	0	Negative	10YR 7/4	Silty clay	Field between forest and fence	Soil change
1013WE19	2	10-15	0	Negative	10YR 7/4	Silty clay	Field between forest and fence	Subsoil
1013WE21	1	0-15	0	Negative	10YR 7/4	Sandy loam	Cow pasture; short grass	Soil change
1013WE21	2	15-20	0	Negative	10YR 7/4	Sandy loam	Cow pasture; short grass	Subsoil
1013WE24	1	0-15	0	Negative	10YR 7/4	Silty clay	Cow pasture adjacent to wetland	Soil change
1013WE24	2	15-20	0	Negative	10YR 7/4	Silty clay	Cow pasture adjacent to wetland	Subsoil
1013WE26	1	0-20	0	Negative	10YR 7/4	Sandy loam	Open cow pasture	Soil change
1013WE26	2	20-30	0	Negative	10YR 7/4	Sandy loam	Open cow pasture	Subsoil
1013WE28	1	0-50	0	Negative	10YR 7/4	Sandy loam	Cow pasture; deep homogenous soil	Subsoil
1013WE31	1	0-30	0	Negative	10YR 7/4	Sandy clay	Open cow pasture	Soil change
1013WE31	2	30-40	0	Negative	10YR 7/4	Sandy clay	Open cow pasture	Subsoil
1013WE35	1	0-10	0	Negative	10YR 7/2	Clay	Forest; cleared area	Soil change
1013WE35	2	10-20	0	Negative	10YR 7/2	Clay	Forest; cleared area	Subsoil
1013WE37	1	0-15	0	Negative	10YR 7/2	Sandy clay	Open field between fence and forest	Soil change
1013WE37	2	15-25	0	Negative	10YR 7/2	Sandy clay	Open field between fence and forest	Subsoil
1013WE40	1	0-15	0	Negative	10YR 7/2	Clay	Open cow pasture	Soil change
1013WE40	2	15-25	0	Negative	10YR 7/2	Clay	Open cow pasture	Subsoil
1013TR01	1	0-10	50	Negative	10YR 4/2	Loamy Clay	Grassy field boarded by woods grass 6 inches tall, lots of tracks	Soil change
1013TR01	2	10-25	50	Negative	10YR 4/3	Loamy Clay	Grassy field boarded by woods grass 6 inches tall, lots of tracks	Subsoil
1013TR04	1	0-25	30	Negative	10YR 4/2	Loamy Clay	Grassy field boarded by woods grass 3 inches tall, lots of tracks	Soil change
1013TR04	2	25-35	30	Negative	10YR 4/3	Clay	Grassy field boarded by woods grass 3 inches tall, lots of tracks	Subsoil
1013TR09	1	0-15	30	Negative	10YR 4/2	Loamy Clay	Grassy field boarded by woods grass 3 inches tall, lots of tracks	Soil change
1013TR09	2	15-25	30	Negative	10YR 4/3	Clay	Grassy field boarded by woods grass 3 inches tall, lots of tracks	Subsoil
1013TR14	1	0-15	0	Negative	10YR 4/2	Loamy Clay	Grassy open canopy surrounded by woods, grass 6-12 inches	Soil change
1013TR14	2	15-25	0	Negative	10YR 4/3	Clay	Grassy field boarded by woods grass 3 inches tall, lots of tracks	Subsoil
1013TR18	1	0-15	0	Negative	10YR 4/2	Loamy Clay	Grassy open canopy surrounded by woods, grass 6-12 inches	Soil change
1013TR18	2	15-25	0	Negative	10YR 4/3	Clay	Grassy field boarded by woods grass 3 inches tall, lots of tracks	Subsoil
1013TR22	1	0-55	0	Negative	10YR 7/4	Sandy loam	Grassy field, surrounded by woods grass 6-12 inches tall, thin shrubbery	Subsoil
1013TR27	1	0-55	0	Negative	10YR 7/4	Sandy loam	Grassy field, surrounded by woods grass 6-12 inches tall, thin shrubbery	Subsoil
1013TR30	1	0-40	0	Negative	10YR 7/5	Sandy loam	Grassy field, surrounded by woods grass 6-12 inches tall, thin shrubbery	Subsoil
1013TR33	1	0-15	50	Negative	10YR 7/4	Clay	Grassy field, surrounded by woods grass 6-12 inches tall, thin shrubbery	Soil change
1013TR33	2	15-25	50	Negative	10YR 7/2	Clay	Grassy field, surrounded by woods grass 6-12 inches tall, thin shrubbery	Subsoil
1013TR38	1	0-10	0	Negative	10YR 7/4	Clay	Grassy field, surrounded by woods grass 6-12 inches tall, thin shrubbery	Soil change
1013TR38	2	10-30	0	Negative	10YR 7/2	Clay loam	Grassy field, surrounded by woods grass 6-12 inches tall, thin shrubbery	Subsoil
1013TR41	1	0-25	0	Negative	10YR 7/4	Clay loam	Grassy field, surrounded by woods grass 6-12 inches tall, thin shrubbery	Subsoil
1013RC03	1	0-20	0	Negative	10YR 7/4	Clay loam	Open cow pasture; short-medium grass; trees along property line	Subsoil
1013RC06	1	0-30	0	Negative	10YR 7/4	Clay loam	Open cow pasture; short-medium grass; trees along property line	Subsoil
1013RC08	1	0-20	0	Negative	10YR 7/4	Clay loam	Open cow pasture; short-medium grass; trees along property line	Subsoil
1013RC11	1	0-20	0	Negative	10YR 7/4	Clay loam	Open cow pasture; short-medium grass; trees along property line	Subsoil
1013RC12	1	0-15	0	Negative	10YR 7/4	Clay loam	Open cow pasture; short-medium grass; trees along property line	Subsoil
1013RC15	1	0-20	0	Negative	10YR 7/4	Clay loam	Open cow pasture; short-medium grass; trees along property line	Subsoil
1013RC17	1	0-15	0	Negative	10YR 7/4	Clay loam	Open cow pasture; short-medium grass; trees along property line	Subsoil

Appendix D - Shovel Test Data

Shovel Test #	Level (Strat)	Depth (cmbs)	GSV %	Positive or Negative	Munsell Color	Soil Texture Description	Description (Area; Vegetation)	Reason for Termination
1013RC20	1	0-15	0	Negative	10YR 7/4	Clay loam	Open cow pasture; short-medium grass; trees along property line	Subsoil
1013RC23	1	0-20	0	Negative	10YR 7/4	Clay loam	Open grass cow pasture; short grass	Subsoil
1013RC25	1	0-20	0	Negative	10YR 7/4	Clay loam	Open grass cow pasture; short grass	Subsoil
1013RC28	1	0-60	0	Negative	10YR 7/4	Silty loam	Open grass cow pasture; short grass	Subsoil
1013RC31	1	0-50	0	Negative	10YR 7/4	Silty loam	Open grass cow pasture; short grass	Subsoil
1013RC34	1	0-30	0	Negative	10YR 7/4	Clay loam	Forest cover; thick brush	Subsoil
1013RC36	1	0-30	0	Negative	10YR 7/4	Clay loam	Forest cover; thick brush	Subsoil
1013RC39	1	0-30	0	Negative	10YR 7/4	Clay loam	Open grass pasture; short grass	Subsoil
1018RC03	1	0-30	10	Negative	10YR 4/1	Silty loam	Cow pasture very wet ground, trees along property live, snorf grass	Soil change
1018RC03	2	30-50	10	Negative	10YR 4/2	Silty loam	Cow pasture very wet ground, trees along property live, snorf grass	Subsoil
1018RC06	1	0-15	10	Negative	10YR 4/1	Silty loam	Cow pasture very wet ground, trees along property live, snorf grass	Soil change
1018RC06	2	15-20	10	Negative	10YR 4/2	Silty loam	Cow pasture very wet ground, trees along property live, snorf grass	Subsoil
1018RC10	1	0-15	10	Negative	10YR 4/1	Silty loam	Cow pasture very wet ground, trees along property live, snorf grass	Soil change
1018RC10	2	15-20	10	Negative	10YR 4/2	Silty loam	Cow pasture very wet ground, trees along property live, snorf grass	Subsoil
1018RC13	1	0-15	10	Negative	10YR 4/1	Silty loam	Forest cover, tall grass brush vines	Subsoil
1018RC17	1	0-10	10	Negative	10YR 4/1	Silty loam	Forest cover, tall grass brush vines	Subsoil
1018RC19	1	0-15	10	Negative	10YR 4/2	Silty loam	Cow pasture, very rutty, trees along, property	Soil change
1018RC19	2	15-20	10	Negative	10YR 5/1	Silty loam	Cow pasture, very rutty, trees along, property	Subsoil
1018RC22	1	0-10	10	Negative	10YR 4/1	Silty loam	Open cow pasture; short-medium grass; trees along property line	Soil change
1018RC22	2	10-15	10	Negative	10YR 5/1	Silty loam	Open cow pasture; short-medium grass; trees along property line	Subsoil
1018RC24	1	0-10	10	Negative	10YR 4/1	Silty loam	Cow pasture short-med, grass. Some inundation	Soil change
1018RC24	2	10-15	10	Negative	10YR 4/2	Silty loam	Cow pasture short-med, grass. Some inundation	Subsoil
1018RC32	1	0-15	10	Negative	10YR 4/1	Clay loam	Cow pasture short-med, grass. Some inundation	Soil change
1018RC32	2	15-20	10	Negative	10YR 4/1	Clay loam	Cow pasture short-med, grass. Some inundation	Subsoil
1018RC47	1	0-10	0	Negative	10YR 4/1	Silty loam	Cow pasture short-med, grass. Some inundation	Soil change
1018RC47	2	10-20	0	Negative	10YR 4/1	Silty loam	Cow pasture short-med, grass. Some inundation	Subsoil
1018WE01	1	0-30	0	Negative	10YR 4/2	Sandy loam	Cow Pasture	Soil change
1018WE01	2	30-60	0	Negative	10YR 4/2	Sandy loam	Cow Pasture	Subsoil
1018WE04	1	0-10	0	Negative	10YR 4/2	Sandy loam	Cow Pasture	Soil change
1018WE04	2	10-40	0	Negative	10YR 4/2	Sandy loam	Cow Pasture	Subsoil
1018WE07	1	0-15	0	Negative	10YR 4/2	Sandy loam	Cow Pasture	Soil change
1018WE07	2	15-30	0	Negative	10YR 4/2	Sandy loam	Cow Pasture	Subsoil
1018WE09	1	0-15	0	Negative	10YR 4/2	Silty loam	Clear cow pasture	Soil change
1018WE09	2	15-30	0	Negative	10YR 4/2	Silty loam	Clear cow pasture	Subsoil
1018WE12	1	0-10	0	Negative	10YR 4/2	Silty clay	Edge of forest utility corridor	Soil change
1018WE12	2	10-20	0	Negative	10YR 4/2	Silty clay	Edge of forest utility corridor	Subsoil
1018WE14	1	0-10	0	Negative	10YR 4/2	Silty clay	Edge of forest utility corridor	Soil change
1018WE14	2	10-20	0	Negative	10YR 4/2	Silty clay	Edge of forest utility corridor	Subsoil
1018WE16	1	0-10	0	Negative	10YR 4/2	Silty clay	Edge of forest utility corridor	Soil change
1018WE16	2	10-25	0	Negative	10YR 4/2	Silty clay	Edge of forest utility corridor	Subsoil
1018WE18	1	0-10	0	Negative	10YR 4/2	Silty loam	Open cow pasture	Soil change
1018WE18	2	10-15	0	Negative	10YR 4/2	Silty loam	Open cow pasture	Subsoil
1018WE20	1	0-15	0	Negative	10YR 4/2	Silty clay	Open cow pasture	Soil change
1018WE20	2	15-25	0	Negative	10YR 4/2	Silty clay	Open cow pasture	Subsoil
1018WE23	1	0-10	0	Negative	10YR 4/2	Silty clay	Disturbed, next to pump station	Soil change
1018WE23	2	10-15	0	Negative	10YR 4/2	Silty clay	Disturbed, next to pump station	Subsoil
1018WE25	1	0-15	0	Negative	10YR 4/2	Silty clay	Open cow pasture	Soil change
1018WE25	2	15-25	0	Negative	10YR 4/2	Silty clay	Open cow pasture	Subsoil
1018WE26	1	0-20	0	Negative	10YR 4/2	Silty clay	Open cow pasture	Soil change
1018WE26	2	20-40	0	Negative	10YR 4/2	Silty clay	Open cow pasture	Subsoil
1018WE27	1	0-15	0	Negative	10YR 4/2	Silty clay	Open cow pasture	Soil change
1018WE27	2	15-35	0	Negative	10YR 4/2	Silty clay	Open cow pasture	Subsoil
1018WE28	1	0-15	0	Negative	10YR 4/2	Silty clay	Open cow pasture	Soil change
1018WE28	2	15-30	0	Negative	10YR 4/2	Silty clay	Open cow pasture	Subsoil
1018WE30	1	0-10	0	Negative	10YR 4/2	Clay	Open cow pasture, near canal	Soil change
1018WE30	2	10-15	0	Negative	10YR 4/2	Clay	Open cow pasture, near canal	Subsoil
1018WE34	1	0-15	0	Negative	10YR 4/2	Sandy clay	Open cow pasture	Soil change

Appendix D - Shovel Test Data

Shovel Test #	Level (Strat)	Depth (cmbs)	GSV %	Positive or Negative	Munsell Color	Soil Texture Description	Description (Area; Vegetation)	Reason for Termination
1018WE34	2	15-25	0	Negative	10YR 4/2	Sandy clay	Open cow pasture	Subsoil
1018WE36	1	0-10	0	Negative	10YR 4/1	Clay	Open cow pasture	Soil change
1018WE36	2	10-15	0	Negative	10YR 4/1	Clay	Open cow pasture	Subsoil
1018WE42	1	0-15	0	Negative	10YR 4/2	Silty clay	Open cow pasture	Soil change
1018WE42	2	15-25	0	Negative	10YR 4/2	Silty clay	Open cow pasture	Subsoil
101818TR8	1	0-15	0	Negative	10YR 4/1	Silty clay	Open cow pasture	Soil change
101818TR8	2	15-25	0	Negative	10YR 4/2	Clay	Open cow pasture	Subsoil
101818TR5	1	0-10	0	Negative	10YR 4/1	Silty clay	Open cow pasture	Soil change
101818TR5	2	10-15	0	Negative	10YR 4/2	Clay	Open cow pasture	Subsoil
101818TR11	1	0-15	0	Negative	10YR 4/1	Silty clay	Open cow pasture	Soil change
101818TR11	2	15-25	0	Negative	10YR 4/2	Clay	Open cow pasture	Subsoil
101818TR2	1	0-15	0	Negative	10YR 4/1	Silty clay	Open cow pasture	Soil change
101818TR2	2	15-25	0	Negative	10YR 4/2	Clay	Open cow pasture	Subsoil
101818RC43	1	0-10	0	Negative	10YR 4/1	Silty clay	Open cow pasture	Soil change
101818RC43	2	10-15	0	Negative	10YR 4/2	Clay	Open cow pasture	Subsoil
101818RC41	1	0-15	0	Negative	10YR 4/1	Silty clay	Open cow pasture	Soil change
101818RC41	2	15-25	0	Negative	10YR 4/2	Clay	Open cow pasture	Subsoil
101818RC39	1	0-15	0	Negative	10YR 4/1	Silty clay	Open cow pasture	Soil change
101818RC39	2	15-25	0	Negative	10YR 4/2	Clay	Open cow pasture	Subsoil
101818RC37	1	0-10	0	Negative	10YR 4/1	Silty clay	Open cow pasture	Soil change
101818RC37	2	10-15	0	Negative	10YR 4/2	Clay	Open cow pasture	Subsoil
101818RC21	1	0-15	0	Negative	10YR 4/1	Silty clay	Open cow pasture	Soil change
101818RC21	2	15-25	0	Negative	10YR 4/2	Clay	Open cow pasture	Subsoil
1018WE48	1	0-15	0	Negative	10YR 4/2	Silty clay	Wet, marshlands, wild grasses cattle turbation	Soil change
1018WE48	2	15-25	0	Negative	10YR 4/2	Silty clay	Wet, marshlands, wild grasses cattle turbation	Subsoil
1018WK31	1	0-20	0	Negative	10YR 4/2	Silty clay loam	Wet, marshlands, wild grasses cattle turbation	Subsoil
1018WK35	1	0-25	0	Negative	10YR 4/2	Silty clay loam	Wet, marshlands, wild grasses cattle turbation	Soil change
1018WK35	2	25-35	0	Negative	10YR 6/2	Silty clay loam	Wet, marshlands, wild grasses cattle turbation	Subsoil
1018WK45	1	0-40	5	Negative	7.5 YR 5/4	Silty loam	Stp location ~ 100m west of forest margin. B horizon looked "washed out of hydric"	Subsoil
1018WK45	2	40-50	5	Negative	10YR 4/1	Silty loam	Stp location ~ 100m west of forest margin. B horizon looked "washed out of hydric"	Subsoil
1018WK49	1	0-15	5	Negative	10YR 4/2	Silty loam	Wet marshland, wild grasses cattle turbation	Soil change
1018WK49	2	15-35	5	Negative	10YR 6/2	Silty clay loam	Wet marshland, wild grasses cattle turbation	Subsoil
1018JL29	1	0-10	100	Negative	10YR 4/1	Clay	Inundation, cow pasture	Inundation
1018JL33	1	0-12	100	Negative	10YR 4/2	Clay	Grass two- track, near canal	Soil change
1018JL33	2	12-35	100	Negative	10YR 4/2	Clay	Grass two- track, near canal	Subsoil
1018JL38	1	0-10	5	Negative	10YR 4/2	Silty clay loam	Cow pasture semi-inundation	Subsoil
1018JL40	1	0-12	10	Negative	10YR 4/2	Silty clay loam	Cow pasture semi-inundation	Soil change
1018JL40	2	12-35	10	Negative	10YR 6/2	Silty clay loam	Cow pasture semi-inundation	Subsoil
1018JL44	1	0-12	10	Negative	10YR 4/2	Silty clay loam	Cow pasture semi-inundation	Soil change
1018JL44	2	12-35	10	Negative	10YR 6/2	Silty clay loam	Cow pasture semi-inundation	Subsoil
1018JL46	1	0-12	10	Negative	10YR 4/2	Silty clay loam	Cow pasture semi-inundation	Soil change
1018JL46	2	12-35	10	Negative	10YR 6/2	Silty clay loam	Cow pasture semi-inundation	Subsoil
1018JL50	1	0-20	10	Negative	10YR 4/2	Silty clay loam	Cow pasture semi-inundation	Soil change
1018JL50	2	20-30	10	Negative	10YR 6/2	Silty clay loam	Cow pasture semi-inundation	Subsoil

Appendix D - Shovel Test Data

Shovel Test #	Level (Strat)	Depth (cmbs)	GSV %	Positive or Negative	Munsell Color	Soil Texture Description	Description (Area; Vegetation)	Reason for Termination
1019RC04	1	0-15	0	Negative	10YR 4/1	Clay loam	Cow pasture, short-med. Grass, rutted soil, trees along property line	Subsoil
1019RC09	1	0-15	0	Negative	10YR 4/1	Clay loam	Cow pasture, short-med. Grass, rutted soil, trees along property line	Inundation
1019RC10	1	0-15	0	Negative	10YR 4/1	Clay loam	Cow pasture, short-med. Grass, rutted soil, trees along property line	Soil change
1019RC10	2	15-20	0	Negative	10YR 4/2	Clay loam	Cow pasture, short-med. Grass, rutted soil, trees along property line	Subsoil
1019RC14	1	0-30	0	Negative	10YR 4/1	Clay loam	Cow pasture, short-med. Grass, rutted soil, trees along property line	Soil change
1019RC14	2	30-40	0	Negative	10YR 4/2	Clay loam	Cow pasture, short-med. Grass, rutted soil, trees along property line	Subsoil
1019RC22	1	0-10	0	Negative	10YR 4/1	Clay loam	Cow pasture, short-med. Grass, rutted soil, trees along property line	Soil change
1019RC22	2	10-20	0	Negative	10YR 4/2	Clay loam	Cow pasture, short-med. Grass, rutted soil, trees along property line	Subsoil
1019RC26	1	0-10	0	Negative	10YR 4/1	Clay loam	Cow pasture, short-med. Grass, rutted soil, trees along property line	Soil change
1019RC26	2	10-20	0	Negative	10YR 4/2	Clay loam	Cow pasture, short-med. Grass, rutted soil, trees along property line	Subsoil
101918RC35	1	0-30	0	Negative	10YR 4/1	Clay loam	Cow pasture, short-med. Grass, rutted soil, trees along property line	Soil change
101918RC30	1	0-30	0	Negative	10YR 4/1	Clay loam	Cow pasture, short-med. Grass, rutted soil, trees along property line	Subsoil
1019RC40	1	0-30	0	Negative	10YR 4/1	Clay loam	Cow pasture, short-med. Grass, rutted soil, trees along property line	Soil change
1019RC44	1	0-50	0	Negative	10YR 4/1	Clay loam	Cow pasture	Subsoil
1019RC52	1	0-10	0	Negative	10YR 4/1	Clay loam	Cow pasture	Soil change
1019RC52	2	10-30	0	Negative	10YR 4/2	Clay loam	Cow pasture	Subsoil
1019RC56	1	0-15	0	Negative	10YR 4/1	Clay loam	Cow pasture	Inundation
1019RC60	1	0-20	0	Negative	10YR 4/1	Clay loam	Cow pasture	Inundation
1019RC63	1	0-10	0	Negative	10YR 4/1	Clay	Cow pasture	Subsoil
1019WK02	1	0-25	0-5	Negative	10YR 4/2 5/2	Silty clay loam	Wet marsh/ pasture. Forest median ~150m Stp	Inundation
1019WK06	1	0-10	0-5	Negative	10YR 4/2 5/2	Silty clay loam	Wet marsh/ pasture. Standing water <4m west of stp	Inundation
1019WK08	1	0-25	0-5	Negative	10YR 4/2	Silty clay loam	Wet marsh/ pasture	Soil change
1019WK08	2	25-30	0-5	Negative	10YR 5/6	Silty clay loam	Wet marsh/ pasture	Subsoil
1019WK14	1	0-10	0	Negative	10YR 4/2 5/2	Silty clay loam	Wet marsh/ pasture. Raised two-track ~7m south of stp. Fence and canal ~10-20m north. High grass	Soil change
1019WK14	2	10-30	0	Negative	10YR 4/1	Silty clay loam	Wet marsh/ pasture. Raised two-track ~7m south of stp. Fence and canal ~10-20m north. High grass	Subsoil
1019WK18	1	0-15	70-75	Negative	10YR 4/2 5/2	Silty clay loam	Area is a small storage area for hay and tractors/ farming equipment. Area washed out/ subject to periods of inundation	Soil change
1019WK18	2	15-30	70-75	Negative	10YR 4/1	Silty clay loam	Area is a small storage area for hay and tractors/ farming equipment. Area washed out/ subject to periods of inundation	Subsoil
1019WK20	1	0-25	10-15	Negative	10YR 4/2 5/2	Silty clay loam	Wet marshy pasture	Soil change
1019WK20	2	25-35	10-15	Negative	10YR 4/1	Silty clay loam	Wet marshy pasture	Subsoil
1019WK24	1	0-25	0-5	Negative	10YR 4/2 5/2	Silty clay loam	Wet marshy pasture	Soil change
1019WK24	2	25-45	0-5	Negative	10YR 4/1	Silty clay loam	Wet marshy pasture	Subsoil
1019WK28	1	0-5	0-5	Negative	10YR 4/2 5/2	Silty clay loam	Wet marshy pasture. Stp was in a deflated area - grass was different/ poor growth	Soil change
1019WK28	2	5-30	0-5	Negative	10YR 4/1	Silty clay loam	Wet marshy pasture. Stp was in a deflated area - grass was different/ poor growth	Subsoil
1019WK32	1	0-30	45	Negative	10YR 4/2 5/2	Silty clay loam	Wet marshy pasture/ deflated area	Soil change
1019WK32	2	30-40	45	Negative	10YR 4/1	Silty clay loam	Wet marshy pasture/ deflated area	Subsoil
1019WK36	1	0-5	20	Negative	10YR 4/2 5/2	Silty clay loam	Wet marshy pasture/ deflated area sandstone ~12cmbs	Soil change
1019WK36	2	5-30	20	Negative	10YR 4/1	Silty loam	Wet marshy pasture/ deflated area sandstone ~12cmbs	Subsoil
1019WK39	1	0-30	0	Negative	10YR 4/2 5/2	Clay loam	Wet marshy pasture - very high grass	Inundation
1019WK43	1	0-35	0	Negative	10YR 4/2 5/2	Silty clay loam	Wet marshy pasture - very high grass	Inundation
1019WK47	1	0-20	0	Negative	10YR 4/2 5/2	Silty clay loam	Wet marshy pasture - very high grass	Inundation

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Shovel Test #	Level (Strat)	Depth (cmbs)	GSV %	Positive or Negative	Munsell Color	Soil Texture Description	Description (Area; Vegetation)	Reason for Termination
1019WK50	1	0-10	0	Negative	10YR 4/2 5/2	Silty clay loam	Wet marshy pasture - very high grass	Subsoil
1019WK54	1	0-10	0-5	Negative	10YR 4/2 5/2	Silty clay loam	Wet marshy pasture - very high grass	Soil change
1019WK54	2	10-30	0-5	Negative	10YR 4/1	Silty clay loam	Wet marshy pasture - very high grass	Subsoil
1019WK58	1	0-5	70-75	Negative	10YR 4/2 5/2	Silty clay loam	Wet marshy pasture - very high grass	Soil change
1019WK58	2	5-30	70-75	Negative	10YR 4/1	Silty clay loam	Wet marshy pasture - very high grass	Subsoil
1019WK62	1	0-10	0-5	Negative	10YR 4/2	Silty clay loam	Wet marshy pasture, stp is ~5m south of two-track	Soil change
1019WK62	2	10-30	0-5	Negative	10YR 4/1	Silty clay loam	Wet marshy pasture, stp is ~5m south of two-track	Subsoil
1019WE01	1	0-10	0	Negative	10YR 4/1	Clay	Open cow pasture	Inundation
1019WE05	1	0-15	0	Negative	10YR 4/1	Clay	Open cow pasture	Soil change
1019WE05	2	15-30	0	Negative	10YR 4/1	Clay loam	Open cow pasture	Subsoil
1019WE13	1	0-10	0	Negative	10YR 4/1	Clay	Open cow pasture, near fence line & stream	Soil change
1019WE13	2	10-20	0-5	Negative	10YR 4/1	Clay	Open cow pasture, near fence line & stream	Subsoil
1019WE17	1	0-20	0	Negative	10YR 4/2	Silty clay	Hay yard, viney plants	Soil change
1019WE17	2	20-30	0	Negative	10YR 4/2	Silty clay	Hay yard, viney plants	Subsoil
1019WE21	1	0-15	0	Negative	10YR 4/1	Clay	Open field	Soil change
1019WE21	2	15-25	0	Negative	10YR 4/1	Clay	Open field	Subsoil
1019WE25	1	0-15	0-5	Negative	10YR 4/1	Clay	Open cow pasture	Soil change
1019WE25	2	15-20	0	Negative	10YR 4/1	Clay	Open cow pasture	Subsoil
1019WE31	1	0-10	0	Negative	10YR 4/1	Clay	Open cow pasture	Soil change
1019WE31	2	10-15	0	Negative	10YR 4/1	Clay	Open cow pasture	Subsoil
1019WE34	1	0-15	0	Negative	10YR 4/2	Clay	Open cow pasture	Soil change
1019WE34	2	15-25	0-5	Negative	10YR 4/2	Clay loam	Open cow pasture	Subsoil
1019WE38	1	0-15	0	Negative	10YR 4/1	Clay	Open cow pasture	Soil change
1019WE38	2	15-20	0	Negative	10YR 4/1	Clay	Open cow pasture	Subsoil
1019WE42	1	0-15	0	Negative	10YR 4/1	Clay	Open cow pasture	Soil change
1019WE42	2	15-20	0	Negative	10YR 4/1	Clay	Open cow pasture	Subsoil
1019WE46	1	10-20	0	Negative	10YR 4/1	Clay	Open cow pasture	Soil change
1019WE46	2	0-20	0	Negative	10YR 4/1	Clay	Open cow pasture	Subsoil
1019WE49	1	0-10	0	Negative	10YR 4/1	Clay	Open cow pasture	Soil change
1019WE49	2	10-15	0	Negative	10YR 4/1	Clay	Open cow pasture	Subsoil
1019WE53	1	0-20	0	Negative	10YR 4/2	Clay loam	Open cow pasture	Soil change
1019WE53	2	20-25	0	Negative	10YR 4/2	Clay loam	Open cow pasture	Subsoil
1019WE59	1	0-5	0	Negative	10YR 4/2	Silty clay	Open cow pasture, near pump station	Soil change
1019WE59	2	5-20	0	Negative	10YR 4/2	Silty clay	Open cow pasture, near pump station	Subsoil
1019WE61	1	0-15	0	Negative	10YR 4/2	Silty clay	Open cow pasture, wetland area	Soil change
1019WE61	2	15-25	0	Negative	10YR 4/2	Silty clay	Open cow pasture, wetland area	Subsoil
1019JL03	1	0-20	10	Negative	10YR 4/1	Silty clay	Cow pasture, semi-inundated area	Inundation
1019JL07	1	0-20	10	Negative	10YR 4/1	Silty clay	Cow pasture, near dirt road	Soil change
1019JL07	2	20-30	10	Negative	10YR 4/2	Clay	Cow pasture, near dirt road	Subsoil
1019JL16	1	0-20	10	Negative	10YR 4/1	Silty clay	In between road and canal	Soil change
1019JL16	2	20-30	10	Negative	10YR 4/2	Clay	In between road and canal	Subsoil
1019JL19	1	0-20	10	Negative	10YR 4/1	Silty clay	off of gravel road, 60m from pump station	Soil change
1019JL19	2	20-30	10	Negative	10YR 4/2	Clay	off of gravel road, 60m from pump station	Subsoil
1019JL23	1	0-20	10	Negative	10YR 4/1	Silty clay	Cow pasture, semi-inundated area	Soil change
1019JL23	2	20-30	10	Negative	10YR 4/2	Clay	Cow pasture, semi-inundated area	Subsoil
1019JL27	1	0-30	10	Negative	10YR 4/1	Silty clay	Cow pasture, semi-inundated area	Soil change
1019JL27	2	30-40	10	Negative	10YR 4/2	Clay	Cow pasture, semi-inundated area	Subsoil
1019JL29	1	0-20	10	Negative	10YR 4/1	Silty clay	Cow pasture, semi-inundated area	Soil change
1019JL29	2	20-30	10	Negative	10YR 4/2	Clay	Cow pasture, semi-inundated area	Subsoil
1019JL33	1	0-20	10	Negative	10YR 4/1	Silty clay	Cow pasture, semi-inundated area	Soil change
1019JL33	2	20-30	10	Negative	10YR 4/1	Clay	Cow pasture, semi-inundated area	Subsoil
1019JL37	1	0-10	10	Negative	10YR 4/1	Clay	In wetland, cow pasture	Inundation
1019JL41	1	0-10	10	Negative	10YR 4/1	Clay	In wetland, cow pasture	Inundation

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Shovel Test #	Level (Strat)	Depth (cmbs)	GSV %	Positive or Negative	Munsell Color	Soil Texture Description	Description (Area; Vegetation)	Reason for Termination
1019JL45	1	0-10	10	Negative	10YR 4/1	Clay	In wetland, cow pasture	Inundation
1019JL48	1	0-10	10	Negative	10YR 4/1	Clay	In wetland, cow pasture	Inundation
1019JL51	1	0-10	10	Negative	10YR 4/1	Clay	In wetland, cow pasture	Inundation
1019JL55	1	0-10	10	Negative	10YR 4/1	Clay	In wetland, cow pasture	Inundation
1019JL59	1	0-15	10	Negative	10YR 4/1	Clay	Near gravel road, semi-inundated area, disturbed	Disturbed
1020JL03	1	0-20	10	Negative	10YR 4/1	Silty clay	Cow pasture	Soil change
1020JL03	2	20-30	10	Negative	10YR 4/2	Clay	Cow pasture	Subsoil
1020JL14	1	0-20	10	Negative	10YR 4/1	Silty clay	Cow pasture	Soil change
1020JL14	2	20-30	10	Negative	10YR 4/2	Clay	Cow pasture	Subsoil
1020JL22	1	0-20	10	Negative	10YR 4/1	Silty clay	Cow pasture	Soil change
1020JL22	2	20-30	10	Negative	10YR 4/2	Clay	Cow pasture	Subsoil
1020JL26	1	0-10	10	Negative	10YR 4/1	Silty clay, wet	Cow pasture, inundated	Inundation
1020JL29	1	0-10	10	Negative	10YR 4/1	Silty clay, wet	Open field, knee-high grass, wetland	Inundation
1020JL32	1	0-10	10	Negative	10YR 4/1	Clay, wet	Open field, wetland	Disturbed
1020JL36	1	0-20	10	Negative	10YR 4/1	Silty clay	Open field, wetland	Soil change
1020JL36	2	20-30	10	Negative	10YR 4/2	Clay	Open field, wetland	Subsoil
1020JL40	1	0-20	10	Negative	10YR 4/1	Silty clay	Open field, wetland	Soil change
1020JL40	2	20-30	10	Negative	10YR 4/2	Clay	Open field, wetland	Subsoil
1020JL44	1	0-20	10	Negative	10YR 4/1	Silty clay	Open field, wetland	Soil change
1020JL44	2	20-30	10	Negative	10YR 4/2	Clay	Open field, wetland	Subsoil
1020JL48	1	0-20	10	Negative	10YR 4/1	Silty clay	Open field, knee-high grass,	Soil change
1020JL48	2	20-30	10	Negative	10YR 4/2	Clay	Open field, knee-high grass,	Subsoil
1020JL52	1	0-20	10	Negative	10YR 4/1	Silty clay	Open field, knee-high grass, inundated	Soil change
1020JL52	2	20-30	10	Negative	10YR 4/2	Clay	Open field, knee-high grass, inundated	Subsoil
1020WK01	1	0-15	0-5	Negative	10YR 4/2 5/2	Silty clay loam	Wet marshy pasture	Soil change
1020WK01	2	15-30	0-5	Negative	10YR 4/1	Silty clay loam	Wet marshy pasture	Subsoil
1020WK15	1	0-20	0	Negative	10YR 4/2 5/2	Silty clay loam	Gravel inclusions/sandstone small ~4m east of canal berm, not clustered, disturbed	Soil change
1020WK15	2	20-30	0	Negative	10YR 4/1	Silty clay loam	Gravel inclusions/sandstone small ~4m east of canal berm, not clustered, disturbed	Subsoil
1020WK21	1	0-25	0	Negative	10YR 4/2 5/2	Silty clay loam	Wet marsh, thigh-high grasses	Soil change
1020WK21	2	25-35	0	Negative	10YR 4/1	Loamy clay	Wet marsh, thigh-high grasses	Subsoil
1020WK25	1	0-5	0	Negative	10YR 4/2 5/2	Silty clay loam	Wet marsh	Inundation
1020WK28	1	0-25	0	Negative	10YR 4/2 5/2	Silty clay loam	Wet marsh, thigh-high grasses	Soil change
1020WK28	2	25-35	0	Negative	10YR 4/1	Loamy clay	Wet marsh, thigh-high grasses	Subsoil
1020WK33	1	0-25	0	Negative	10YR 4/2 5/2	Silty clay loam	Wet marsh, thigh-high grasses	Inundation
1020WK37	1	0-13	0	Negative	10YR 4/2	Silty clay loam	Wet marshy area	Soil change
1020WK37	2	13-20	0	Negative	10YR 4/1	Loamy clay	Wet marshy area	Soil change
1020WK37	3	20-30	0	Negative	10YR 5/6	Silty clay	Wet marshy area	Subsoil
1020WK41	1	0-20	5-10	Negative	10YR 4/2 5/2	Silty clay loam	Wet marshy area. Found gravel bits in both horizons - disturbed area	Soil change
1020WK41	2	20-30	5-10	Negative	10YR 4/1	Silty clay loam	Wet marshy area. Found gravel bits in both horizons - disturbed area	Subsoil
1020WK45	1	0-13	0-5	Negative	10YR 4/2 5/2	Silty clay loam	Wet marshy area. Sandstone bits found in A horizons	Soil change
1020WK45	2	13-30	0-5	Negative	10YR 4/1	Silty clay loam	Wet marshy area. Sandstone bits found in A horizons	Subsoil
1020WK49	1	0-20	10-15	Negative	10YR 4/2 5/2	Silty clay loam	Wet marshy area	Soil change
1020WK49	2	20-25	10-15	Negative	10YR 4/1	Silty clay loam	Wet marshy area	Inundation
1020WK53	1	0-14	0-5	Negative	10YR 4/2 5/2	Silty clay loam	Wet marshy area	Soil change
1020WK53	2	14-30	0-5	Negative	10YR 4/1	Silty clay loam	Wet marshy area	Subsoil
1020WE01	1	0-10	0	Negative	10YR 4/1	Clay	Open cow pasture	Soil change

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Shovel Test #	Level (Strat)	Depth (cmbs)	GSV %	Positive or Negative	Munsell Color	Soil Texture Description	Description (Area; Vegetation)	Reason for Termination
1020WE01	2	10-15	0	Negative	10YR 4/1	Clay	Open cow pasture	Subsoil
1020WE13	1	0-10	0	Negative	10YR 4/1	Clay	Cow pasture, near canal	Soil change
1020WE13	2	10-15	0	Negative	10YR 4/1	Clay	Cow pasture, near canal	Subsoil
1020WE20	1	0-10	0	Negative	10YR 4/1	Clay	Open field, wetland area	Soil change
1020WE20	2	10-15	0	Negative	10YR 4/1	Clay	Open field, wetland area	Subsoil
1020WE24	1	0-5	0	Negative	10YR 4/1	Clay	Open field, wetland area	Inundation
1020WE27	1	0-10	0	Negative	10YR 4/1	Clay	Open field, wetland area	Soil change
1020WE27	2	10-15	0	Negative	10YR 4/1	Clay	Open field, wetland area	Subsoil
1020WE31	1	0-10	0	Negative	10YR 4/1	Clay	Wetland, open field, tall grass	Soil change
1020WE31	2	10-15	0	Negative	10YR 4/1	Clay	Wetland, open field, tall grass	Subsoil
1020WE35	1	0-15	0	Negative	10YR 4/1	Clay	Wetland, open field, tall grass	Soil change
1020WE35	2	15-25	0	Negative	10YR 4/1	Clay	Wetland, open field, tall grass	Subsoil
1020WE39	1	0-10	0	Negative	10YR 4/1	Clay	Wetland, open field, tall grass	Soil change
1020WE39	2	10-20	0	Negative	10YR 4/1	Clay	Wetland, open field, tall grass	Subsoil
1020WE42	1	0-20	0	Negative	10YR 4/1	Clay	Wetland area, cow pasture	Soil change
1020WE42	2	20-25	0	Negative	10YR 4/2	Sandy clay	Wetland area, cow pasture	Subsoil
1020WE46	1	0-15	0	Negative	10YR 4/1	Clay	Cow pasture, open field	Soil change
1020WE46	2	15-20	0	Negative	10YR 4/1	Clay	Cow pasture, open field	Subsoil
1020WE50	1	0-15	0	Negative	10YR 4/1	Clay	Open field, tall grass	Soil change
1020WE50	2	15-20	0	Negative	10YR 4/1	Clay	Open field, tall grass	Subsoil
1020WE55	1	0-10	0	Negative	10YR 4/1	Clay	Open field, wetland	Soil change
1020WE55	2	10-15	0	Negative	10YR 4/1	Clay	Open field, wetland	Subsoil
1020RC12	1	0-30	0	Negative	10YR 4/1	Clay loam	Cow pasture, open field, tall grass. Scattered brush, occasional tree	Subsoil
1020RC19	1	0-30	0	Negative	10YR 4/1	Clay loam	Cow pasture, open field, tall grass. Scattered brush, occasional tree	Subsoil
1020RC23	1	0-15	0	Negative	10YR 4/1	Clay loam	Cow pasture, open field, tall grass. Scattered brush, occasional tree	Subsoil
1020RC30	1	0-10	0	Negative	10YR 4/1	Clay loam	Cow pasture, open field, tall grass. Scattered brush, occasional tree	Subsoil
1020RC34	1	0-15	0	Negative	10YR 4/1	Clay loam	Cow pasture, open field, tall grass. Scattered brush, occasional tree	Subsoil
1020RC38	1	0-15	0	Negative	10YR 4/1	Clay loam	Cow pasture. Med-tall grass. Scattered brush, trees along tree line	Subsoil
1020RC38	2	15-25	0	Negative	10YR 4/2	Clay loam	Cow pasture. Med-tall grass. Scattered brush, trees along tree line	Subsoil
1020RC43	1	0-40	0	Negative	10YR 4/1	Clay loam	Cow pasture. Med-tall grass. Scattered brush, trees along tree line	Subsoil
1020RC47	1	0-30	0	Negative	10YR 4/1	Clay loam	Cow pasture. Med-tall grass. Scattered brush, trees along tree line	Subsoil
1020RC51	1	0-30	0	Negative	10YR 4/1	Clay loam	Cow pasture. Med-tall grass. Scattered brush, trees along tree line	Subsoil
1020RC54	1	0-30	0	Negative	10YR 4/1	Clay loam	Cow pasture. Med-tall grass. Scattered brush, trees along tree line	Subsoil
1022WE01	1	0-10	0	Negative	10YR 4/2	Clay loam	Cow pasture, near fence	Soil change
1022WE01	2	10-20	0	Negative	10YR 4/2	Clay loam	Cow pasture, near fence	Subsoil
1022WE05	1	0-10	0	Negative	10YR 4/2	Clay loam	Cow pasture	Soil change
1022WE05	2	10-20	0	Negative	10YR 4/2	Clay loam	Cow pasture	Subsoil
1022WE08	1	0-25	0	Negative	10YR 4/2	Loamy clay	Cow pasture	Soil change
1022WE08	2	25-30	0	Negative	10YR 4/2	Clay	Cow pasture	Subsoil
1022WE12	1	0-15	0	Negative	10YR 4/1	Clay	Cow pasture	Soil change
1022WE12	2	15-25	0	Negative	10YR 4/1	Clay	Cow pasture	Subsoil
1022WE16	1	0-15	0	Negative	10YR 4/1	Clay	Cow pasture	Soil change
1022WE16	2	15-25	0	Negative	10YR 4/1	Clay	Cow pasture	Subsoil
1022WE20	1	0-15	0	Negative	10YR 4/1	Clay	Cow pasture	Soil change
1022WE20	2	15-25	0	Negative	10YR 4/1	Clay	Cow pasture	Subsoil
1022WE29	1	0-20	0	Negative	10YR 4/2	Sandy clay	Cow pasture, wetland area	Soil change
1022WE29	2	20-25	0	Negative	10YR 4/2	Sandy clay	Cow pasture, wetland area	Subsoil
1022WE33	1	0-10	0	Negative	10YR 4/2	Silty clay	Cow pasture, wetland area	Soil change
1022WE33	2	10-20	0	Negative	10YR 4/2	Silty clay	Cow pasture, wetland area	Subsoil
1022WE36	1	0-10	0	Negative	10YR 4/1	Clay	Open field, close to reeds	Soil change
1022WE36	2	10-20	0	Negative	10YR 4/1	Clay	Open field, close to reeds	Subsoil
1022WE40	1	0-5	0	Negative	10YR 4/2	Clay	Open field, wetland	Inundation
1022WE44	1	0-5	0	Negative	10YR 4/2	Clay	Open field, wetland	Inundation
1022WE50	1	0-10	0	Negative	10YR 4/2	Silty clay	Open field, wetland	Soil change
1022WE50	2	10-20	0	Negative	10YR 4/2	Silty clay	Open field, wetland	Subsoil
1022WE54	1	0-10	0	Negative	10YR 4/2	Clay loam	Forest, many roots	Soil change
1022WE54	2	10-15	0	Negative	10YR 4/2	Clay loam	Forest, many roots	Subsoil

Appendix D - Shovel Test Data

Shovel Test #	Level (Strat)	Depth (cmbs)	GSV %	Positive or Negative	Munsell Color	Soil Texture Description	Description (Area; Vegetation)	Reason for Termination
1022WE58	1	0-20	0	Negative	10YR 4/1	Clay	Open field	Soil change
1022WE58	2	20-25	0	Negative	10YR 4/1	Clay	Open field	Subsoil
1022WE65	1	0-5	0	Negative	10YR 4/2	Clay	Wetland, reeds & tall brush	Inundation
1022WE69	1	0-20	0	Negative	10YR 4/2	Sandy clay	Cow pasture	Soil change
1022WE69	2	20-25	0	Negative	10YR 4/2	Sandy clay	Cow pasture	Subsoil
1022RC04	1	0-20	10	Negative	10YR 4/1	Silt loam	Cow pasture, fenced. Scattered trees, tall-med grass	Soil change
1022RC04	2	20-30	0	Negative	10YR 4/2	Silt loam	Cow pasture, fenced. Scattered trees, tall-med grass	Subsoil
1022RC10	1	0-10	0	Negative	10YR 4/1	Silt loam	Cow pasture, fenced. Scattered trees, tall-med grass	Soil change
1022RC10	2	10-30	0	Negative	10YR 4/2	Silt loam	Cow pasture, fenced. Scattered trees, tall-med grass	Subsoil
1022RC15	1	0-10	0	Negative	10YR 4/1	Clay loam	Cow pasture, fenced. Scattered trees, tall-med grass	Inundationlogged @ 10cm
1022RC19	1	0-15	0	Negative	10YR 4/1	Clay loam	Cow pasture, fenced. Scattered trees, tall-med grass	Subsoil
1022RC21	1	0-15	0	Negative	10YR 4/1	Clay loam	Cow pasture. Open field, trees along fence line short-med grass	Soil change
1022RC21	2	15-20	0	Negative	10YR 4/2	Clay loam	Cow pasture. Open field, trees along fence line short-med grass	Subsoil
1022RC26	1	0-10	0	Negative	10YR 4/1	Clay loam	Cow pasture. Open field, trees along fence line short-med grass	Soil change
1022RC26	2	10-20	0	Negative	10YR 4/2	Clay loam	Cow pasture. Open field, trees along fence line short-med grass	Subsoil
1022RC32	1	0-10	0	Negative	10YR 4/1	Silt loam	Cow pasture. Open field, trees along fence line short-med grass	Soil change
1022RC32	2	10-25	0	Negative	10YR 4/2	Silt loam	Cow pasture. Open field, trees along fence line short-med grass	Subsoil
1022RC38	1	0-10	0	Negative	10YR 4/1	Clay loam	Cow pasture. Open field, trees along fence line short-med grass	Inundationlogged
1022RC43	1	0-15	0	Negative	10YR 4/1	Clay loam	Open pasture, cow pasture. Short-medium grass	Inundationlogged
1022RC45	1	0-10	0	Negative	10YR 4/1	Silt loam	Open pasture, cow pasture. Short-medium grass	Soil change
1022RC45	2	10-20	0	Negative	10YR 4/2	Silt loam	Open pasture, cow pasture. Short-medium grass	Subsoil
1022RC48	1	0-40	0	Negative	10YR 4/1	Silt loam	Open pasture, cow pasture. Short-medium grass	Soil change
1022RC48	2	40-50	0	Negative	10YR 4/2	Silt loam	Open pasture, cow pasture. Short-medium grass	Subsoil
1022RC52	1	0-30	0	Negative	10YR 4/1	Silt loam	Open pasture, cow pasture. Short-medium grass	Soil change
1022RC52	2	30-60	0	Negative	10YR 4/2	Silt loam	Open pasture, cow pasture. Short-medium grass	Subsoil
1022RC55	1	0-30	0	Negative	10YR 4/1	Silt loam	Open pasture, cow pasture. Short-medium grass	Soil change
1022RC55	2	30-60	0	Negative	10YR 4/2	Silt loam	Open pasture, cow pasture. Short-medium grass	Subsoil
1022RC59	1	0-15	0	Negative	10YR 4/1	Clay loam	Open pasture, cow pasture. Short-medium grass	Inundationlogged
1022RC63	1	0-15	0	Negative	10YR 4/1	Clay loam	Open pasture, cow pasture. Short-medium grass	Inundationlogged
1022RC67	1	0-30	0	Negative	10YR 4/1	Silt loam	Open pasture, cow pasture. Short-medium grass	Soil change
1022RC67	2	30-60	0	Negative	10YR 4/1	Silt loam	Open pasture, cow pasture. Short-medium grass	Subsoil
1022JL03	1	0-20	10	Negative	10YR 4/1	Silt loam	Open cow pasture	Soil change
1022JL03	2	20-30	10	Negative	10YR 4/2	Silty clay	Open cow pasture	Subsoil
1022JL07	1	0-20	10	Negative	10YR 4/1	Silt loam	Open cow pasture	Soil change
1022JL07	2	20-30	10	Negative	10YR 4/2	Silty clay	Open cow pasture	Subsoil
1022JL10	1	0-20	10	Negative	10YR 4/1	Silt loam	Open cow pasture	Soil change
1022JL10	2	20-30	10	Negative	10YR 4/2	Silty clay	Open cow pasture	Subsoil
1022JL13	1	0-15	10	Negative	10YR 4/1	Silt clay	Open cow pasture	Soil change
1022JL13	2	15-30	10	Negative	10YR 4/2	Clay	Open cow pasture	Subsoil
1022JL18	1	0-10	10	Negative	10YR 4/1	Silt clay	Open cow pasture, semi-inundated	Soil change
1022JL18	2	10-25	10	Negative	10YR 4/3	Clay	Open cow pasture, semi-inundated	Subsoil
1022JL27	1	0-20	10	Negative	10YR 4/1	Silt loam	Open cow pasture	Soil change
1022JL27	2	20-30	10	Negative	10YR 4/2	Silty clay	Open cow pasture	Subsoil
1022JL31	1	0-20	10	Negative	10YR 4/1	Silt loam	Open cow pasture	Soil change
1022JL31	2	20-30	10	Negative	10YR 4/2	Silty clay	Open cow pasture	Subsoil
1022JL35	1	0-20	10	Negative	10YR 4/1	Silt loam	Open cow pasture, near wetland	Soil change
1022JL35	2	20-30	10	Negative	10YR 4/3	Silty clay	Open cow pasture, near wetland	Subsoil
1022JL39	1	0-10	10	Negative	10YR 4/1	Silty clay	Open cow pasture, near wetland	Inundation
1022JL42	1	0-10	10	Negative	10YR 4/1	Silty clay	Open cow pasture, near wetland	Inundation
1022JL47	1	0-15	10	Negative	10YR 4/1	Silt loam	Open cow pasture, near wetland	Soil change
1022JL47	2	15-25	10	Negative	10YR 4/3	Silty clay	Open cow pasture, near wetland	Subsoil
1022JL51	1	0-30	10	Negative	10YR 4/1	Silt loam	Open cow pasture, near wetland	Soil change
1022JL51	2	30-40	10	Negative	10YR 4/3	Silty clay	Open cow pasture, near wetland	Subsoil
1022JL56	1	0-20	10	Negative	10YR 4/1	Silt loam	Open field, semi-inundated	Soil change
1022JL56	2	20-30	10	Negative	10YR 4/3	Silty clay	Open field, semi-inundated	Subsoil
1022JL60	1	0-10	10	Negative	10YR 4/1	Silty clay	Open field, semi-inundated	Inundation
1022JL61	1	0-10	10	Negative	10YR 4/1	Silty clay	Open field, semi-inundated	Inundation

Appendix D - Shovel Test Data

Shovel Test #	Level (Strat)	Depth (cmbs)	GSV %	Positive or Negative	Munsell Color	Soil Texture Description	Description (Area; Vegetation)	Reason for Termination
1022JL62	1	0-10	10	Negative	10YR 4/1	Silty clay	Open field, semi-inundated	Inundation
1022JL66	1	0-15	10	Negative	10YR 4/1	Silt loam	Open field, semi-inundated. At edge of wetland	Soil change
1022JL66	2	15-30	10	Negative	10YR 4/2	Silty clay	Open field, semi-inundated. At edge of wetland	Subsoil
1022JL71	1	0-30	10	Negative	10YR 4/1	Silt loam	Open cow pasture	Soil change
1022JL71	2	30-40	10	Negative	10YR 4/2	Silty clay	Open cow pasture	Subsoil
102218RC71	1	0-30	10	Negative	10YR 4/1	Silt loam	Open cow pasture	Subsoil
1022WK68	1	0-20	0	Negative	10YR 4/2	Silt loam	Marshy pasture w/grass and rose briars	Soil change
1022WK68	2	20-35	0	Negative	10YR 4/1	Silt loam	Marshy pasture w/grass and rose briars	Soil change
1022WK68	3	35-45	0	Negative	10YR 5/6	Sand	Marshy pasture w/grass and rose briars	Subsoil
1022WK02	1	0-35	25-30	Negative	10YR 4/2	Silty clay loam	Pasture w/ wild grass. Iron 2nd strat had orange deposits	Soil change
1022WK02	2	35-45	25-30	Negative	10YR 5/6	Silty clay loam	Pasture w/ wild grass. Iron 2nd strat had orange deposits	Subsoil
1022WK06	1	0-17	5-10	Negative	10YR 4/2	Silty loam	Pasture w/ wild grass - areas of inundation	Soil change
1022WK06	2	17-40	5-10	Negative	10YR 4/1 5/2	Silty clay	Pasture w/ wild grass - areas of inundation	Subsoil
1022WK09	1	0-40	0-5	Negative	10YR 4/2	Silty loam	Pasture w/ wild grass - areas of inundation	Soil change
1022WK09	2	40-50	0-5	Negative	10YR 4/1	Silty loam	Pasture w/ wild grass - areas of inundation	Subsoil
1022WK14	1	0-25	0-5	Negative	10YR 4/2	Silty clay loam	Pasture w/ wild grass - areas of inundation	Inundation
1022WK17	1	0-15	0-5	Negative	10YR 4/2	Silty clay loam	Pasture w/ wild grass - areas of inundation	Soil change
1022WK17	2	15-25	0-5	Negative	10YR 4/1	Silty clay loam	Pasture w/ wild grass - areas of inundation. Mottling occurred just before inundation	Inundation
1022WK26	1	0-15	0-5	Negative	10YR 4/2 5/2	Silty clay loam	Marshy pasture w/ wild grasses	Soil change
1022WK26	2	15-30	0-5	Negative	10YR 4/1	Silty clay loam	Marshy pasture w/ wild grasses	Subsoil
1022WK30	1	0-28	20-25	Negative	10YR 4/2 5/2	Silty clay loam	Marshy pasture w/ wild grasses	Soil change
1022WK30	2	28-40	20-25	Negative	10YR 5/6	Silt	Marshy pasture w/ wild grasses	Subsoil
1022WK34	1	0-30	0-5	Negative	10YR 4/2	Silty loam	Marshy pasture w/wild grasses. STP ~3m east of inundated area	Soil change
1022WK34	2	30-40	0-5	Negative	10YR 4/1	Clay	Marshy pasture w/wild grasses. STP ~3m east of inundated area	Subsoil
1022WK37	1	0-20	0-5	Negative	10YR 4/2	Silty clay loam	Marshy pasture - STP located in large patch (20x20m) of rose briar	Soil change
1022WK37	2	20-30	0-5	Negative	10YR 4/1	Clay	Marshy pasture - STP located in large patch (20x20m) of rose briar	Subsoil
1022WK41	1	0-15	0-5	Negative	10YR 4/2	Silty clay loam	Marshy pasture w/wild grasses and rose briar	Inundation
1022WK46	1	0-15	0-5	Negative	10YR 4/2	Silty loam	Marshy pasture w/wild grasses and rose briar	Soil change
1022WK46	2	15-35	0-5	Negative	10YR 5/6 4/1	Silty clay	Marshy pasture w/wild grasses and rose briar	Subsoil
1022WK49	1	0-10	0-5	Negative	10YR 4/2	Silty loam	Marshy pasture w/wild grasses and rose briar	Soil change
1022WK49	2	10-30	0-5	Negative	10YR 4/1	Silty clay	Marshy pasture w/wild grasses and rose briar	Subsoil
1022WK53	1	0-30	0-5	Negative	10YR 4/2	Silty loam	Marshy pasture w/wild grasses and rose briar	Soil change
1022WK53	2	30-40	0-5	Negative	10YR 5/6 4/1	Silty clay	Marshy pasture w/wild grasses and rose briar	Subsoil
1022WK57	1	0-25	0	Negative	10YR 4/2	Silty clay loam	Marshy pasture w/wild grasses	Inundation
1022WK64	1	0-10	0	Negative	10YR 4/2	Silty clay loam	Marshy pasture w/wild grasses	Soil change
1022WK64	2	10-30	0	Negative	10YR 4/1	Clay	Marshy pasture w/wild grasses	Subsoil
1023WK02	1	0-20	0-5	Negative	10YR 4/2	Silty clay loam	Wetland w/wild grasses and briars	Soil change
1023WK02	2	20-35	0-5	Negative	10YR 4/1	Silty clay loam	Wetland w/wild grasses and briars	Subsoil
1023WK06	1	0-15	0-5	Negative	10YR 4/2	Silty clay loam	Wetland w/wild grasses and briars	Soil change
1023WK06	2	15-30	0-5	Negative	10YR 4/1	Silty clay loam	Wetland w/wild grasses and briars	Subsoil
1023WK13	1	0-20	0-5	Negative	10YR 4/2	Silty clay loam	Wetland w/wild grasses and briars	Soil change
1023WK13	2	20-30	0-5	Negative	10YR 4/1	Silty clay loam	Wetland w/wild grasses and briars	Subsoil
1023RC04	1	0-30	0	Negative	10YR 4/1	Clay loam	Open cow pasture. Tall grass	Subsoil
1023RC08	1	0-20	0	Negative	10YR 4/1	Clay loam	Open cow pasture. Tall grass	Subsoil
1023RC12	1	0-30	0	Negative	10YR 4/1	Clay loam	Open cow pasture. Tall grass	Subsoil
1023JL03	1	0-40	10	Negative	10YR 4/1	Clay	Open field, semi-inundated	Subsoil
1023JL07	1	0-10	10	Negative	10YR 4/1	Clay	Open field, semi-inundated	Inundation
1023JL10	1	0-10	10	Negative	10YR 4/1	Clay	Open field, semi-inundated	Inundation

Appendix D - Shovel Test Data

Shovel Test #	Level (Strat)	Depth (cmbs)	GSV %	Positive or Negative	Munsell Color	Soil Texture Description	Description (Area; Vegetation)	Reason for Termination
1023WE01	1	0-20	0	Negative	10YR 4/2	Silty clay	Cow pasture	Soil change
1023WE01	2	20-25	0	Negative	10YR 4/2	Silty clay	Cow pasture	Subsoil
1023WE05	1	0-15	0	Negative	10YR 4/1	Clay	Cow pasture	Soil change
1023WE05	2	15-20	0	Negative	10YR 4/1	Clay	Cow pasture	Subsoil
1023WE09	1	0-10	0	Negative	10YR 4/1	Clay	Tall reeds, wetland	Inundation
1023WE11	1	0-20	0	Negative	10YR 4/1	Clay	Cow pasture	Soil change
1023WE11	2	20-25	0	Negative	10YR 4/1	Clay	Cow pasture	Subsoil
1024JL10	1	0-18	0	Negative	10YR 3/2	Sandy loam	Inside wooded area. Dense vegetation	Soil change
1024JL10	2	18-35	0	Negative	10YR 3/3	Loam	Inside wooded area. Dense vegetation	Subsoil
1024WK02	1	0-20	0	Negative	10YR4/1	Silty clay loam	Wetland with intermediate amounts of grass and briars. Area subject to periods of inundation.	Inundation
1024WK09	1	0-40	0	Negative	10YR 3/3	Sandy clay	Stp 15M off road (north). Wetland area overgrown with grasses, vines and hardwoods	Soil change
1024WK09	2	40-50	0	Negative	10YR 5/6	Sandy loam	Stp 15M off road (north). Wetland area overgrown with grasses, vines and hardwoods	Subsoil
1024WE01	1	0-10	0	Negative	10YR 4/2	Clay	Tall vegetation, open field, wetland area	Soil change
1024WE01	2	10-15	0	Negative	10YR 4/2	Clay	Tall vegetation, open field, wetland area	Subsoil
1024WE08	1	0-10	0	Negative	10YR 4/2	Silty clay	Forest, thick with brush	Soil change
1024WE08	2	10-15	0	Negative	10YR 4/1	Clay	Forest, thick with brush	Subsoil
1024RC11	1	0-30	0	Negative	10YR 5/2	Silt loam	Forest corner. Thick vegetation adjacent to wetland. Wet & inundated	Subsoil
1025WK01	1	0-25	0	Negative	10YR 3/1	Silty clay loam	Wetland area with wild grasses. Acting as pasture. STP 5M east of road and fencing	Soil change
1025WK01	2	25-40	0	Negative	10YR 3/1 & 5/6	Clay loam	Wetland area with wild grasses. Acting as pasture. STP 5M east of road and fencing	Subsoil
1025WK04	1	0-15	0	Negative	10YR 3/1	Silty clay loam	Wetland area with wild grasses. Acting as pasture. About 5M from berm	Soil change
1025WK04	2	15-30	0	Negative	10YR 3/1 & 5/6	Clay	Wetland area with wild grasses. Acting as pasture. About 5M from berm	Subsoil
1025WK05	1	0-10	0	Negative	10YR 4/1	Clay loam	STP is on wetland on corridor with swamp on either side	Soil change
1025WK05	2	10-30	0	Negative	10YR 3/1	Clay	STP is on wetland on corridor with swamp on either side	Subsoil
1025WK07	1	0-10	0	Negative	10YR 4/1	Clay loam	STP is on wetland on corridor with swamp on either side	Soil change
1025WK07	2	10-30	0	Negative	10YR 3/1	Clay	STP is on wetland on corridor with swamp on either side	Subsoil
1025WK09	1	0-15	0	Negative	10YR 4/1	Clay loam	STP is on wetland on corridor with swamp on either side	Soil change
1025WK09	2	15-30	0	Negative	10YR 3/1	Clay	STP is on wetland on corridor with swamp on either side	Subsoil
1025WK11	1	0-35	0	Negative	10YR 3/1	Silty clay loam	STP is on wetland on corridor with swamp on either side. Inundated at 35cmbs	Inundation
1026WK10	1	0-25	0	Negative	10YR 4/1	Silty clay loam	Wetland/ pasture with inundation everywhere but in high areas	Soil change
1026WK10	2	25-40	0	Negative	10YR 5/1	Clay	Wetland/ pasture with inundation everywhere but in high areas	Subsoil
1026JL02	1	0-10	10	Negative	10YR 4/1	Clay	Inundated cow pasture. Slight upland area	Inundation
1026JL04	1	0-10	10	Negative	10YR 4/1	Clay	Inundated cow pasture. Slight upland area	Inundation
102618RC4		0-10	10	Negative	10YR 4/1	Clay	Inundated cow pasture. Slight upland area	Inundation
1026JL06	1	0-15	10	Negative	10YR 4/1	Clay	Inundated cow pasture. Slight upland area	Soil change
1026JL06	2	15-30	10	Negative	10YR 3/1	Clay	Inundated cow pasture. Slight upland area	Subsoil
1026JL08	1	0-15	10	Negative	10YR 4/1	Clay	Inundated cow pasture. Slight upland area	Soil change
1026JL08	2	15-30	10	Negative	10YR 3/1	Clay	Inundated cow pasture. Slight upland area	Subsoil
1026JL11	1	0-15	10	Negative	10YR 4/1	Clay	Inundated cow pasture. Slight upland area	Soil change
1026JL11	2	15-30	10	Negative	10YR 3/1	Clay	Inundated cow pasture. Slight upland area	Subsoil
1026WE01	1	0-15	0	Negative	10YR 4/2	Silty clay	Wetland area, cow pasture, grasses	Soil change
1026WE01	2	15-30	0	Negative	10YR 4/1	Clay	Wetland area, cow pasture, grasses	Subsoil
1026WE03	1	0-15	0	Negative	10YR 4/2	Silty clay	Wetland area, cow pasture, grasses	Soil change
1026WE03	2	15-30	0	Negative	10YR 4/1	Clay	Wetland area, cow pasture, grasses	Subsoil
1026WE05	1	0-10	0	Negative	10YR 4/2	Silty clay	Wetland area, cow pasture, grasses	Soil change
1026WE05	2	10-25	0	Negative	10YR 4/1	Clay	Wetland area, cow pasture, grasses	Subsoil
1026WE09	1	0-20	0	Negative	10YR 4/2	Silty clay	Wetland area, cow pasture, grasses	Soil change
1026WE09	2	20-25	0	Negative	10YR 4/1	Clay	Wetland area, cow pasture, grasses	Subsoil
1027RC04	1	0-10	0	Negative	10YR 4/1	Clay loam	Cow pasture. Short Grasses. Water at 10 cmbs	Inundation
1027JL01	1	0-10	0	Negative	10YR 4/1	Clay loam	Semi-wooded area, inundated area, high ground	Inundation
1027JL05	1	0-10	0	Negative	10 YR 4/1	Clay loam	Open cow pasture, mostly inundated	Inundation
1027JL05	2	10-20	0	Negative	10YR 4/6	Clay	Open cow pasture, mostly inundated	Inundation
1027WK06	1	0-25	0	Negative	10 YR 4/1	Clay loam	Wetland being utilized as a pasture inundated throughout most of area	Soil change
1027WK06	2	25-35	0	Negative	10YR 4/6	Clay	Wetland being utilized as a pasture inundated throughout most of area	Subsoil
102718JL8	1	0-10	0	Negative	10 YR 4/1	Clay loam	Open cow pasture, mostly inundated	Inundation

Appendix D - Shovel Test Data

Shovel Test #	Level (Strat)	Depth (cmbs)	GSV %	Positive or Negative	Munsell Color	Soil Texture Description	Description (Area; Vegetation)	Reason for Termination
1027WK09	1	0-25	0	Negative	10 YR 4/1	Clay loam	Wetland being utilized as a pasture inundated throughout most of area	Soil change
1027WK09	2	25-35	0	Negative	10YR 4/6	Clay	Wetland being utilized as a pasture inundated throughout most of area	Subsoil
1027WE02	1	0-15	0	Negative	10YR 4/1	Clay	Tall grass	Inundation
1027WE07	1	0-15	0	Negative	10 YR 4/1	Clay loam	Wetland and cow pasture.	Inundation
1027WE07	2	15-25	0	Negative	10YR 4/6	Clay	Wetland and cow pasture.	Inundation
1027WE10	1	0-10	0	Negative	10 YR 4/1	Clay loam	Wetland and cow pasture.	Inundation
1027WE10	2	10-20	0	Negative	10YR 4/6	Clay	Wetland and cow pasture.	Inundation
1027TR03	1	0-10	0	Negative	10YR 5/1	Clay	Clear-cut zone containing tall grasses and shrubs, lightly inundated	Soil change
1027TR03	2	10-20	0	Negative	10YR 4/1	Clay	Clear-cut zone containing tall grasses and shrubs, lightly inundated	Subsoil
1029TR02	1	0-15	0	Negative	10YR 4/1	Clay	Grassy field surrounded by mature trees (mesquite, Japanese maple, American Elm, Chinese Tallow	Soil change
1029TR02	2	15-25	0	Negative	10YR 5/1	Clay	Grassy field surrounded by mature trees (mesquite, Japanese maple, American Elm, Chinese Tallow	Subsoil
1029WK03	1	0-15	0	Negative	10YR 5/1	Clay	Area was wetland/ pasture; areas of inundation around STP	Soil change
1029WK03	2	15-30	0	Negative	10YR 4/1	Clay	Area was wetland/ pasture; areas of inundation around STP	Subsoil
1029JL04	1	0-10	0	Negative	10YR 4/1	Clay	In open field; inundated at 10cmbs	Inundation
1029WE01	1	0-10	0	Negative	10YR 4/2	Clay	Cow pasture. Open field; tall grasses	Soil change
1029WE01	2	10-15	0	Negative	10YR 4/2	Clay	Cow pasture. Open field; tall grasses	Subsoil
1030TR01	1	0-15	0	Negative	10YR 4/2	Clay	Rice field; near dirt road	Soil change
1030TR01	2	15-25	0	Negative	10YR 5/2	Clay	Rice field; near dirt road	Subsoil
1030TR03	1	0-15	0	Negative	10YR 4/2	Clay	Rice field; lightly inundated, surrounded by berms	Soil change
1030TR03	2	15-25	0	Negative	10YR 5/2	Clay	Rice field; lightly inundated, surrounded by berms	Subsoil
1030TR06	1	0-15	0	Negative	10YR 4/2	Clay	Rice field; lightly inundated, surrounded by berms	Soil change
1030TR06	2	15-25	0	Negative	10YR 5/2	Clay	Rice field; lightly inundated, surrounded by berms	Subsoil
1030TR08	1	0-12	0	Negative	10YR 4/2	Clay	Rice field; lightly inundated, surrounded by berms	Soil change
1030TR08	2	12-25	0	Negative	10YR 5/2	Clay	Rice field; lightly inundated, surrounded by berms	Subsoil
1030TR10	1	0-8	100	Negative	10YR 4/2	Clay	Sparsely vegetated field, heavily disturbed by machinery	Soil change
1030TR10	2	8-18	100	Negative	10YR 5/2	Clay	Sparsely vegetated field, heavily disturbed by machinery	Subsoil
1030TR12	1	0-5	100	Negative	10YR 4/2	Clay	Sparsely vegetated field, heavily disturbed by machinery	Soil change
1030TR12	2	5-15	100	Negative	10YR 5/2	Clay	Sparsely vegetated field, heavily disturbed by machinery	Subsoil
1030TR14	1	0-5	100	Negative	10YR 4/2	Clay	Sparsely vegetated field, heavily disturbed by machinery	Soil change
1030TR14	2	5-15	100	Negative	10YR 5/2	Clay	Sparsely vegetated field, heavily disturbed by machinery	Subsoil
1030TR16	1	0-5	100	Negative	10YR 4/2	Clay	Sparsely vegetated field, heavily disturbed by machinery	Inundation
1030TR18	1	0-5	100	Negative	10YR 4/2	Clay	Sparsely vegetated field, heavily disturbed by machinery	Soil change
1030TR18	2	5-15	100	Negative	10YR 5/2	Clay	Sparsely vegetated field, heavily disturbed by machinery	Subsoil
1030TR20	1	0-10	100	Negative	10YR 4/2	Clay	Sparsely vegetated field, heavily disturbed by machinery	Soil change
1030TR20	2	10-20	100	Negative	10YR 5/2	Clay	Sparsely vegetated field, heavily disturbed by machinery	Subsoil
1030TR22	1	0-15	50	Negative	10YR 4/2	Clay	Sparsely vegetated field, heavily disturbed by machinery	Soil change
1030TR22	2	15-25	50	Negative	10YR 5/2	Clay	Sparsely vegetated field, heavily disturbed by machinery	Subsoil
1030TR24	1	0-3	100	Negative	10YR 4/2	Clay	Sparsely vegetated field, heavily disturbed by machinery	Soil change
1030TR24	2	3-15	100	Negative	10YR 5/2	Clay	Sparsely vegetated field, heavily disturbed by machinery	Subsoil
1030TR26	1	0-10	100	Negative	10YR 4/2	Clay	Sparsely vegetated field, heavily disturbed by machinery	Soil change
1030TR26	2	10-20	100	Negative	10YR 5/2	Clay	Sparsely vegetated field, heavily disturbed by machinery	Subsoil
1030TR28	1	0-5	100	Negative	10YR 4/2	Clay	Sparsely vegetated field, heavily disturbed by machinery	Soil change
1030TR28	2	5-15	100	Negative	10YR 5/2	Clay	Sparsely vegetated field, heavily disturbed by machinery	Subsoil
1030TR10	1	0-10	50	Negative	10YR 4/2	Clay	Elm woodland with some pine and oak	Soil change
1030TR10	2	10-20	50	Negative	10YR 5/2	Clay	Elm woodland with some pine and oak	Subsoil
1030TR14	1	0-10	0	Negative	10YR 4/2	Clay	Marsh vegetated land between woods and modified grassy area	Soil change
1030TR14	2	10-25	0	Negative	10YR 5/2	Clay	Marsh vegetated land between woods and modified grassy area	Subsoil
1030TR17	1	0-10	0	Negative	10YR 4/2	Clay	Marsh vegetated land between woods and modified grassy area. Lightly inundated with American elm, pine, black oak	Soil change
1030TR17	2	10-20	0	Negative	10YR 5/2	Clay	Marsh vegetated land between woods and modified grassy area. Lightly inundated with American elm, pine, black oak	Subsoil
1030WE01	1	0-20	0	Negative	10YR 3/1	Clay	Cow pasture, short grass	Soil change
1030WE01	2	20-30	0	Negative	10YR 3/1	Clay	Cow pasture, short grass	Subsoil
1030WE04	1	0-20	0	Negative	10YR 4/1	Clay	Cow pasture, short grass	Soil change
1030WE04	2	20-30	0	Negative	10YR 4/2	Clay	Cow pasture, short grass	Subsoil

Appendix D - Shovel Test Data

Shovel Test #	Level (Strat)	Depth (cmbs)	GSV %	Positive or Negative	Munsell Color	Soil Texture Description	Description (Area; Vegetation)	Reason for Termination
1030WE07	1	0-20	0	Negative	10YR 4/1	Clay	Cow pasture, short grass	Subsoil
1030WE09	1	0-20	0	Negative	10YR 4/1	Clay	Cow pasture, short grass	Soil change
1030WE09	2	20-30	0	Negative	10YR 4/1	Clay	Cow pasture, short grass	Subsoil
1030WE11	1	0-20	0	Negative	10YR 5/2	Clay	Disturbed area by river	Soil change
1030WE11	2	20-30	0	Negative	10YR 4/2	Clay	Disturbed area by river	Subsoil
1030JL02	1	0-10	20	Negative	10YR 4/1	Clay	Rice field	Inundation
1030JL04	1	0-10	20	Negative	10YR 4/1	Clay	Rice field	Inundation
1030JL05	1	0-10	20	Negative	10YR 4/1	Clay	Rice field	Inundation
1030JL07	1	0-15	20	Negative	10YR 4/1	Clay	Rice field	Inundation
1030JL07	2	15-25	20	Negative	10YR 3/1	Clay	Rice field	Inundation
1030JL09	1	0-15	90	Negative	10YR 4/1	Clay	Open field, cut field	Soil change
1030JL09	2	15-25	90	Negative	10YR 3/1	Clay	Open field, cut field	Subsoil
1030JL11	1	0-15	90	Negative	10YR 4/1	Clay	Open field, cut field	Soil change
1030JL11	2	15-25	90	Negative	10YR 3/1	Clay	Open field, cut field	Subsoil
1030JL13	1	0-15	90	Negative	10YR 4/1	Clay	Open field, cut field	Soil change
1030JL13	2	15-25	90	Negative	10YR 3/1	Clay	Open field, cut field	Subsoil
1030JL15	1	0-15	90	Negative	10YR 4/1	Clay	Open field, cut field	Soil change
1030JL15	2	15-25	90	Negative	10YR 3/1	Clay	Open field, cut field	Subsoil
1030JL17	1	0-10	90	Negative	10YR 4/1	Clay	Open field, cut field	Subsoil
1030JL19	1	0-10	90	Negative	10YR 4/1	Clay	Open field, cut field	Soil change
1030JL19	2	10-20	90	Negative	10YR 3/1	Clay	Open field, cut field	Subsoil
1030JL21	1	0-10	90	Negative	10YR 4/1	Clay	Open field, cut field	Soil change
1030JL21	2	10-20	90	Negative	10YR 3/1	Clay	Open field, cut field	Subsoil
1030JL23	1	0-10	90	Negative	10YR 4/1	Clay	Open field, cut field	Subsoil
1030JL27	1	0-15	90	Negative	10YR 4/1	Clay	Open field, cut field	Soil change
1030JL27	2	15-25	90	Negative	10YR 3/1	Clay	Open field, cut field	Subsoil
1030JL29	1	0-15	90	Negative	10YR 4/1	Clay	Open field, cut field	Soil change
1030JL29	2	15-25	90	Negative	10YR 3/1	Clay	Open field, cut field	Subsoil
1030JL12	1	0-10	0	Negative	10YR 4/1	Clay	In semi-inundated wooded area, charcoal present	Soil change
1030JL12	2	10-20	0	Negative	10YR 3/1	Clay	In semi-inundated wooded area, charcoal present	Subsoil
1030JL16	1	0-10	0	Negative	10YR 4/1	Clay	Tall grass; waist high	Subsoil
1030WK02	1	0-20	10	Negative	10YR 3/1	Silty clay loam	Wetland with several areas of inundation; utilized as pasture	Soil change
1030WK02	2	20-30	10	Negative	10YR 4/1	Silty clay	Wetland with several areas of inundation; utilized as pasture	Subsoil
1030WK05	1	0-20	10	Negative	10YR 4/1	Silty clay	Wetland with several areas of inundation; utilized as pasture	Soil change
1030WK08	1	0-25	10	Negative	10YR 4/1	Loam	Wetland with several areas of inundation; utilized as pasture	Soil change
1030WK08	2	25-35	10	Negative	10YR 5/1	Clay loam	Wetland with several areas of inundation; utilized as pasture	Subsoil
1030WK13	1	0-25	10	Negative	10YR 4/2	Loam	Wetland with several areas of inundation; very disturbed from construction	Soil change
1030WK13	2	25-35	10	Negative	10YR 5/2	Clay loam	Wetland with several areas of inundation; very disturbed from construction	Subsoil
1030WK18	1	0-15	10	Negative	10YR 4/1	Loam	Wetland; however it is forested with hardwoods, lots of leaf litter	Soil change
1030WK18	2	15-30	10	Negative	10YR 4/6	Clay loam	Wetland; however it is forested with hardwoods, lots of leaf litter	Subsoil
1030RC03	1	0-15	0	Negative	10YR 4/1	Clay loam	TX-Je -030 open cow pasture; short grass; scattered trees	Inundation
1030RC06	1	0-15	0	Negative	10YR 4/1	Clay	TX-Je -030 open cow pasture; short grass; scattered trees	Inundation
1030RC15	1	0-20	0	Negative	10YR 4/1	Clay	Open grass pasture. Tx Li-025 short grass. Wetlands and rolling terrain	Inundation
1030RC18	1	0-20	0	Negative	10YR 4/1	Clay	Open grass pasture. Tx Li-025 short grass. Wetlands and rolling terrain	Inundation
1031RC02	1	0-20	0	Negative	10YR 4/1	Clay loam	Tall brush, difficult to walk through	Inundation
1031RC05	1	0-10	0	Negative	10YR 4/1	Clay loam	Tall brush, difficult to walk through	Inundation
1031RC08	1	0-15	0	Negative	10YR 4/1	Clay loam	Tall brush, difficult to walk through	Inundation
1031RC13	1	0-20	0	Negative	10YR 4/1	Clay loam	Tall brush, difficult to walk through	Inundation
1031RC15	1	0-10	0	Negative	10YR 4/1	Clay loam	Tall brush, difficult to walk through	Inundation
1031WK04	1	0-25	0	Negative	10YR 3/1	Loam	STP near existing pipeline; area is disturbed and inundated	Soil change
1031WK04	2	25-35	0	Negative	10YR 4/1	Clay loam	STP near existing pipeline; area is disturbed and inundated	Subsoil
1031WK09	1	0-25	0	Negative	10YR 3/1	Loam	STP near existing pipeline; area is disturbed and inundated	Soil change
1031WK12	1	0-30	0	Negative	10YR 3/1	Loam	STP near existing pipeline; area is disturbed and inundated	Soil change
1031WK12	2	30-40	0	Negative	10YR 4/1	Clay loam	STP near existing pipeline; area is disturbed and inundated	Subsoil
1031WK16	1	0-15	0	Negative	10YR 3/1	Loam	STP near existing pipeline; area is disturbed and inundated	Soil change
1031TR03	1	0-20	0	Negative	10YR 2/1	Clay	Marshland surrounded by mature trees	Soil change
1031TR03	2	20-30	0	Negative	10YR 3/1	Clay	Marshland surrounded by mature trees	Subsoil

Appendix D - Shovel Test Data

Shovel Test #	Level (Strat)	Depth (cmbs)	GSV %	Positive or Negative	Munsell Color	Soil Texture Description	Description (Area; Vegetation)	Reason for Termination
1031TR07	1	0-20	0	Negative	10YR 2/1	Clay	Marshland surrounded by mature trees	Soil change
1031TR07	2	20-30	0	Negative	10YR 3/1	Clay	Marshland surrounded by mature trees	Subsoil
1031TR13	1	0-20	0	Negative	10YR 2/1	Clay	Marshland surrounded by mature trees	Soil change
1031TR13	2	20-30	0	Negative	10YR 3/1	Clay	Marshland surrounded by mature trees	Subsoil
1031TR17	1	0-15	0	Negative	10YR 2/1	Clay	Marshland surrounded by mature trees	Soil change
1031TR17	2	15-25	0	Negative	10YR 3/1	Clay	Marshland surrounded by mature trees	Subsoil
1031WE01	1	0-10	0	Negative	10YR 4/1	Clay	Wetland area with tall grass	Soil change
1031WE01	2	10-20	0	Negative	10YR 3/1	Clay	Wetland area with tall grass	Subsoil
1031WE06	1	0-15	0	Negative	10YR 4/1	Clay	Heavy rush with wild flowers. Wetland area	Soil change
1031WE06	2	15-25	0	Negative	10YR 3/1	Clay	Heavy rush with wild flowers. Wetland area	Subsoil
1031WE10	1	0-10	0	Negative	10YR 4/1	Clay	Short grass with open field	Soil change
1031WE10	2	10-20	0	Negative	10YR 3/1	Clay	Short grass with open field	Subsoil
1031WE14	1	0-15	0	Negative	10YR 4/1	Clay	Short grass with open field	Soil change
1031WE14	2	15-25	0	Negative	10YR 3/1	Clay	Short grass with open field	Subsoil
1031CK02	1	0-30	0	Negative	10YR 4/1 & 3/1	Clay	Tall grass. Evidence of inundation. Clay inclusions denote subsoil	Soil change
1031CK02	2	30-40	0	Negative	10YR 5/1	Clay	Tall grass. Evidence of inundation. Clay inclusions denote subsoil	Subsoil
1031CK04	1	0-30	0	Negative	10YR 3/1	Clay	Tall grass. Evidence of inundation. Clay inclusions denote subsoil	Soil change
1031CK04	2	30-40	0	Negative	10YR 5/1	Clay	Tall grass. Evidence of inundation. Clay inclusions denote subsoil	Subsoil
1031CK06	1	0-20	0	Negative	10YR 4/1 & 3/1 & 7/1	Clay	Hydric soil. H2O @ 20cmbs	Inundation
1031CK08	1	0-20	0	Negative	10YR 4/1 & 3/1 & 7/1	Clay	Hydric soil. H2O @ 20cmbs	Inundation
1031CK11	1	0-30	0	Negative	10YR 4/1 & 3/1 & 7/1	Clay	In hydric soils. Clay inclusions denote sub	Soil change
1031CK11	2	30-40	0	Negative	10YR 4/3	Clay	In hydric soils. Clay inclusions denote sub	Subsoil
1031CK12	1	0-30	0	Negative	10YR 4/1 & 3/1 & 7/1	Clay	In hydric soils. Clay inclusions denote sub. Heavy mottling	Soil change
1031CK12	2	30-40	0	Negative	10YR 4/3	Clay	In hydric soils. Clay inclusions denote sub. Heavy mottling	Subsoil
1031CK13	1	0-50	0	Negative	10YR 4/1 & 3/1 & 7/1	Clay	In hydric soils. Clay inclusions denote sub. Heavy mottling	Soil change
1031CK13	2	50-70	0	Negative	10YR 4/3	Clay	In hydric soils. Clay inclusions denote sub. Heavy mottling	Subsoil
1031CK14	1	0-50	0	Negative	10YR 4/1 & 3/1 & 7/1	Clay	In hydric soils. Clay inclusions denote sub. Heavy mottling	Soil change
1031CK14	2	50-70	0	Negative	10YR 4/3	Clay	In hydric soils. Clay inclusions denote sub. Heavy mottling	Subsoil
1031CK15	1	0-70	0	Negative	10YR 4/3	Sand	120M south of shoreline. Very loose and medium grain sand. Clay inclusions denote subsoil	Soil change
1031CK15	2	70-80	0	Negative	10YR 6/5	Clay	120M south of shoreline. Very loose and medium grain sand. Clay inclusions denote subsoil	Subsoil
1031CK17	1	0-70	0	Negative	10YR 4/3	Sand	120M south of shoreline. Very loose and medium grain sand. Clay inclusions denote subsoil	Soil change
1031CK17	2	70-80	0	Negative	10YR 6/5	Clay	120M south of shoreline. Very loose and medium grain sand. Clay inclusions denote subsoil	Subsoil
1031CK18	1	0-70	0	Negative	10YR 4/3	Sand	120M south of shoreline. Very loose and medium grain sand. Clay inclusions denote subsoil	Soil change
1031CK18	2	70-80	0	Negative	10YR 6/5	Clay	120M south of shoreline. Very loose and medium grain sand. Clay inclusions denote subsoil	Subsoil
1031CK20	1	0-70	0	Negative	10YR 4/3	Sand	120M south of shoreline. Very loose and medium grain sand. Clay inclusions denote subsoil	Soil change
1031CK20	2	70-80	0	Negative	10YR 6/5	Clay	120M south of shoreline. Very loose and medium grain sand. Clay inclusions denote subsoil	Subsoil

Appendix D - Shovel Test Data

Shovel Test #	Level (Strat)	Depth (cmbs)	GSV %	Positive or Negative	Munsell Color	Soil Texture Description	Description (Area; Vegetation)	Reason for Termination
1031CK22	1	0-70	0	Negative	10YR 4/3	Sand	120M south of shoreline. Very loose and medium grain sand. Clay inclusions denote subsoil	Soil change
1031CK22	2	70-80	0	Negative	10YR 6/5	Clay	120M south of shoreline. Very loose and medium grain sand. Clay inclusions denote subsoil	Subsoil
1031CK23	1	0-70	0	Negative	10YR 4/3	Sand	120M south of shoreline. Very loose and medium grain sand. Clay inclusions denote subsoil	Soil change
1031CK23	2	70-80	0	Negative	10YR 6/5	Clay	120M south of shoreline. Very loose and medium grain sand. Clay inclusions denote subsoil	Subsoil
1031CK26	1	0-70	0	Negative	10YR 4/3	Sand	120M south of shoreline. Very loose and medium grain sand. Clay inclusions denote subsoil	Soil change
1031CK26	2	70-80	0	Negative	10YR 6/5	Clay	120M south of shoreline. Very loose and medium grain sand. Clay inclusions denote subsoil	Subsoil
1031CK27	1	0-70	0	Negative	10YR 4/3	Sand	120M south of shoreline. Very loose and medium grain sand. Clay inclusions denote subsoil	Soil change
1031CK27	2	70-80	0	Negative	10YR 6/5	Clay	120M south of shoreline. Very loose and medium grain sand. Clay inclusions denote subsoil	Subsoil
1031HS1	1	0-10	0	Negative	10YR 4/3	Sand	Open, grassy area btw heavy veg. brush + standing family	Soil change
1031HS1	2	10-30	0	Negative	10YR 6/5	Clay	Open, grassy area btw heavy veg. brush + standing family	Subsoil
1031HS3	1	0-35	30	Negative	10YR 4/3	Sand	Forested area with scarce leaf ground cover	Soil change
1031HS3	2	35-45	30	Negative	10YR 6/5	Clay	Forested area with scarce leaf ground cover	Subsoil
1031HS5	1	0-35	0	Negative	10YR 4/3	Sand	Open grassy area, next to heavily forested area	Soil change
1031HS5	2	35-45	0	Negative	10YR 6/5	Clay	Open grassy area, next to heavily forested area	Subsoil
1031HS7	1	0-20	0	Negative	10YR 4/3	Sand	Open grassy area, next to heavily forested area	Subsoil
1031HS9	1	0-20	0	Negative	10YR 6/5	Sand	Open grassy area, next to heavily forested area	Soil change
1031HS9	2	20-30	0	Negative	10YR 4/3	Clay	Open grassy area, next to heavily forested area	Subsoil
1031HS16	1	0-100	0	Negative	10YR 4/4	Sand	Open grassy area, next to heavily forested area	Subsoil
1031CK29	1	0-30	0	Negative	10 YR 4/3	Clay loam	Thick vegetation, surrounded by inundation	Soil change
1031CK29	2	30-40	0	Negative	10 YR 3/2	Clay	Thick vegetation, surrounded by inundation	Subsoil
103118HS30	1	0-25	0	Negative	10 YR 3/2	Clay	Located in heavily wooded	Subsoil
103118HS28	1	0-20	0	Negative	10 YR 3/2	Clay	Located in heavily wooded	Subsoil
103118HS25	1	0-20	0	Negative	10 YR 3/2	Clay	Located in heavily wooded	Subsoil
103118HS24	1	0-30	0	Negative	10 YR 3/2	Clay	Located in heavily wooded	Subsoil
103118HS21	1	0-25	0	Negative	10 YR 3/2	Clay	Located in heavily wooded	Subsoil
103118HS19	1	0-20	0	Negative	10 YR 3/2	Clay	Located in heavily wooded	Subsoil
1031CK31	1	0-20	0	Negative	10 YR 3/2	Clay	Located in heavily wooded area surrounded by inundation	Subsoil
1217CK03	1	0-5	0	Negative	10YR 5/1	Clay loam	Located in heavily wooded area surrounded by inundation	Inundation
1217WK02	1	0-15	0	Negative	10YR 4/1	Clay	Area is a creek/ drainage with dense vegetation, older timber, brush, and grasses. Herbaceous ground cover obscure GSV	Inundation
1217JI01	1	0-10	0	Negative	10YR 4/1	Clay	Within powerline corridor. Possible disturbed	Inundation
1219WK38	1	0-20	30-35	Negative	N 5/0	Clay	Area is a forested wetland; lots of older timbers, understory primarily palmettos, briar, grasses. Tree litter is primary GSV obfuscation- inundated	Soil change
1219WK38	2	20-35	30-35	Negative	10YR 4/1	Clay	Area is a forested wetland; lots of older timbers, understory primarily palmettos, briar, grasses. Tree litter is primary GSV obfuscation- inundated	Subsoil
1219WK41	1	0	30-35	Negative	Inundated	Inundated	Area is a forested wetland; lots of older timbers, understory primarily palmettos, briar, grasses. Tree litter is primary GSV obfuscation- inundated	Inundation
1219WK43	1	0-25	0-5	Negative	N 5/0	Clay	Area is a right-of-way with tall grasses and briars. Signs of A.H. disturbances and primarily inundated	Soil change
1219WK43	2	25-35	0-5	Negative	10YR 4/1	Clay	Area is a right-of-way with tall grasses and briars. Signs of A.H. disturbances and primarily inundated	Subsoil
1219WK45	1	0-20	5-10	Negative	N 5/0	Clay	Area is a right of way with tall grasses and briars. Signs of A.H. disturbances and primarily inundated	Inundation

Appendix D - Shovel Test Data

Shovel Test #	Level (Strat)	Depth (cmbs)	GSV %	Positive or Negative	Munsell Color	Soil Texture Description	Description (Area; Vegetation)	Reason for Termination
1219WK51	1	0-15	0-5	Negative	N 5/0	Clay	Area is a right of way near an ag ditch. Clear of timber, but with short grasses.	Soil change
1219WK51	2	15-35	0-5	Negative	10YR 4/1	Clay	Area is a right of way near an ag ditch. Clear of timber, but with short grasses.	Subsoil
1219WK54	1	0-20	10-15	Negative	N 5/0	Clay	Area is forested/wooded with juvenile to old timber and dense with saw palmettos. Area most likely subject to periods of inundation - soil oxygenation	Soil change
1219WK54	2	20-35	10-15	Negative	10YR 4/1	Clay	Area is forested/wooded with juvenile to old timber and dense with saw palmettos. Area most likely subject to periods of inundation - soil oxygenation	Subsoil
1219WK59	1	0-15	0-5	Negative	N 5/0	Clay	Area is forested/wooded with juvenile to old timber and dense with saw palmettos. Area most likely subject to periods of inundation - soil oxygenation	Soil change
1219WK59	2	15-30	0-5	Negative	10YR 4/1	Clay	Area is forested/wooded with juvenile to old timber and dense with saw palmettos. Area most likely subject to periods of inundation - soil oxygenation	Subsoil
1219WK62	1	0-15	0-5	Negative	N 5/0	Clay	Area is forested/wooded with juvenile to old timber and dense with saw palmettos. Area most likely subject to periods of inundation - soil oxygenation	Soil change
1219WK62	2	15-30	0-5	Negative	10YR 4/1	Clay	Area is forested/wooded with juvenile to old timber and dense with saw palmettos. Area most likely subject to periods of inundation - soil oxygenation	Subsoil
1219WK64	1	0-25	0-5	Negative	N 5/0	Clay	Area is forested/wooded with juvenile to old timber and dense with saw palmettos. Area most likely subject to periods of inundation - soil oxygenation	Inundation
1219WK69	1	0-15	0-5	Negative	N 5/0	Clay	Area is forested/wooded with juvenile to old timber and dense with saw palmettos. Area most likely subject to periods of inundation - soil oxygenation	Inundation
1219WK71	1	0	0	Negative	Inundated	Inundated	Area is a powerline right of way	Inundation
1219WK74	1	0-30	5-10	Negative	Disturbed	Disturbed	Area is a powerline right of way with lots of dense grasses (chest height), pockets of standing water, and signs of pig turbation	Dusturbed
1219CK40	1	0-20	0	Negative	N 5/0	Clay loam	Survey area located in woods. Heavily inundated. Subsoil by compact clay. Bevil clay series	Soil change
1219CK40	2	20-35	0	Negative	10YR 4/1	Clay	Survey area located in woods. Heavily inundated. Subsoil by compact clay. Bevil clay series	Subsoil
1219CK42	1	0-20	0	Negative	N 5/0	Clay loam	Survey area located in woods. Heavily inundated. Subsoil by compact clay. Bevil clay series	Soil change
1219CK42	2	20-35	0	Negative	10YR 4/1	Clay	Survey area located in woods. Heavily inundated. Subsoil by compact clay. Bevil clay series	Subsoil
1219CK46	1	0-20	0	Negative	N 5/0	Clay loam	Survey area located in woods. Heavily inundated. Subsoil by compact clay. Bevil clay series	Soil change
1219CK46	2	20-35	0	Negative	10YR 4/1	Clay	Survey area located in woods. Heavily inundated. Subsoil by compact clay. Bevil clay series	Subsoil
1219CK50	1	0-20	0	Negative	N 5/0	Clay loam	Survey area located in woods. Heavily inundated. Subsoil by compact clay. Bevil clay series	Soil change
1219CK50	2	20-35	0	Negative	10YR 4/1	Clay	Survey area located in woods. Heavily inundated. Subsoil by compact clay. Bevil clay series	Subsoil
1219CK52	1	0-20	0	Negative	N 5/0	Loamy clay	Heavily wooded & inundation. Bevil clay. H20 @ 22~25 cmbs	Soil change
1219CK52	2	20-25	0	Negative	10YR 4/1	Clay	Heavily wooded & inundation. Bevil clay. H20 @ 22~25 cmbs	Subsoil
1219CK55	1	0-20	0	Negative	N 5/0	Loamy clay	Heavily wooded & inundation. Bevil clay. H20 @ 22~25 cmbs	Soil change
1219CK55	2	20-25	0	Negative	10YR 4/1	Clay	Heavily wooded & inundation. Bevil clay. H20 @ 22~25 cmbs	Subsoil
1219CK57	1	0-20	0	Negative	N 5/0	Loamy clay	Heavily wooded & inundation. Bevil clay. H20 @ 22~25 cmbs	Soil change
1219CK57	2	20-25	0	Negative	10YR 4/1	Clay	Heavily wooded & inundation. Bevil clay. H20 @ 22~25 cmbs	Subsoil
1219CK60	1	0-20	0	Negative	N 5/0	Loamy clay	Heavily wooded & inundation. Bevil clay. H20 @ 22~25 cmbs	Soil change
1219CK60	2	20-25	0	Negative	10YR 4/1	Clay	Heavily wooded & inundation. Bevil clay. H20 @ 22~25 cmbs	Subsoil
1219CK63	1	0-20	0	Negative	N 5/0	Loamy clay	Heavily wooded & inundation. Bevil clay. H20 @ 22~25 cmbs	Soil change
1219CK63	2	20-25	0	Negative	10YR 4/1	Clay	Heavily wooded & inundation. Bevil clay. H20 @ 22~25 cmbs	Subsoil
1219CK66	1	0-20	0	Negative	N 5/0	Loamy clay	Heavily wooded & inundation. Bevil clay. H20 @ 22~25 cmbs	Soil change
1219CK66	2	20-25	0	Negative	10YR 4/1	Clay	Heavily wooded & inundation. Bevil clay. H20 @ 22~25 cmbs	Subsoil
1219CK70	1	0-40	0	Negative	10YR 4/1 5/1 4/3 and gravel	Clay	Within open powerline corridor. Heavily disturbed & undulating surface.	Disturbed
1219CK73	1	0-40	0	Negative	10YR 4/1 5/1 4/3	Clay w/ gravel	Within open powerline corridor. Heavily disturbed & undulating surface.	Disturbed

Appendix D - Shovel Test Data

Shovel Test #	Level (Strat)	Depth (cmbs)	GSV %	Positive or Negative	Munsell Color	Soil Texture Description	Description (Area; Vegetation)	Reason for Termination
1219CK76	1	0-40	0	Negative	10YR 4/1 5/1 4/3	Clay w/ gravel	Within open powerline corridor. Heavily disturbed & undulating surface.	Disturbed
1219JL39	1	0-10	20	Negative	10YR 4/6	Clay	Forested area. Inundated	Inundation
1219JL46	1	0-10	10	Negative	10YR 4/6	Clay	Inundated powerline corridor	Inundation
1219JL48	2	0-10	10	Negative	10YR 4/6	Clay	Inundated powerline corridor	Inundation
1219JL49	1	0-23	10	Negative	10YR 4/6	Clay	On corridor between wooded area & powerline corridor	Soil change
1219JL49	2	23-58	10	Negative	10YR 4/1	Clay	On corridor between wooded area & powerline corridor	Subsoil
1219JL53	1	0-15	20	Negative	10YR 4/6	Clay	Inundated forest	Inundation
1219JL56	1	0-15	20	Negative	10YR 4/6	Clay	Inundated forest	Inundation
1219JL58	1	0-15	20	Negative	10YR 4/6	Clay	Inundated forest	Inundation
1219JL61	1	0-23	20	Negative	10YR 4/6	Clay	Forest, near small waterbody	Soil change
1219JL61	2	23-58	20	Negative	10YR 4/1	Clay	Forest, near small waterbody	Subsoil
1219JL65	1	0-20	30	Negative	10YR 4/6	Clay	Inundated forest	Inundation
1219JL68	1	0-20	10	Negative	10YR 4/6	Clay	Inundated powerline corridor	Inundation
1219JL72	1	0-20	20	Negative	10YR 4/6	Clay	Inundated powerline corridor	Inundation
1219JL75	1	0-20	40	Negative	10YR 4/6	Clay	Inundated powerline corridor	Inundation
1219JL77	1	0-20	10	Negative	10YR 4/6	Clay	Inundated powerline corridor	Inundation
1220CK06	1	0-15	0	Negative	10YR 4/1	Clay	South of 41jf66. Surrounded by inundation. Open field/ not heavily modified.	Soil change
1220CK06	2	15-30	0	Negative	10YR 5/1	Clay	South of 41jf66. Surrounded by inundation. Open field/ not heavily modified.	Subsoil
1220CK09	1	0-10	0	Negative	10YR 4/1	Clay	South of 41jf66. Surrounded by inundation. Open field/ not heavily modified.	Inundation
1220CK13	1	0-10	0	Negative	10YR 3/1	Sandy clay	Located in marshland. Surrounded by water. H20 @ 10 cmbs.	Inundation
1220CK14	1	0-10	0	Negative	10YR 3/1	Sandy clay	Located in marshland. Surrounded by water. H20 @ 10 cmbs.	Inundation
1220CK16	1	0-10	0	Negative	10YR 3/1	Sandy clay	Located in marshland. Surrounded by water. H20 @ 10 cmbs.	Inundation
1220CK18	1	0-10	0	Negative	10YR 3/1	Sandy clay	Located in marshland. Surrounded by water. H20 @ 10 cmbs.	Inundation
122018JL21		0-10	0	Negative	10YR 3/1	Sandy clay	Located in marshland. Surrounded by water. H20 @ 10 cmbs.	Inundation
1220CK23	1	0-10	0	Negative	10YR 3/1	Sandy clay	Located in marshland. Surrounded by water. H20 @ 10 cmbs.	Inundation
1220CK27	1	0-10	0	Negative	10YR 3/1	Sandy clay	Located in marshland. Surrounded by water. H20 @ 10 cmbs.	Inundation
1220CK29	1	0-40	0	Negative	10YR 3/1	Sandy clay loam	Open cow pasture/ knee-high grass. Surrounded by inundation. West of ag ditch	Soil change
1220CK29	2	40-50	0	Negative	10YR 5/1	Sandy clay loam	Open cow pasture/ knee-high grass. Surrounded by inundation. West of ag ditch	Subsoil
1220CK32	1	0-40	0	Negative	10YR 3/1	Sandy clay loam	Open cow pasture/ knee-high grass. Surrounded by inundation. West of ag ditch	Soil change
1220CK32	2	40-50	0	Negative	10YR 5/1	Sandy clay loam	Open cow pasture/ knee-high grass. Surrounded by inundation. West of ag ditch	Subsoil
1220CK35	1	0-15	0	Negative	10YR 3/1	Clay	Open field, knee-high grass. Undisturbed. H20 @ 15cmbs	Inundation
1220CK38	1	0-17	0	Negative	10YR 3/1	Clay	Open field, knee-high grass. Undisturbed. H20 @ 15cmbs	Inundation
1220JL01	1	0-23	10	Negative	10YR 3/1 4/1	Clay	On cut grass, near sports complex & paved road	Soil change
1220JL01	2	23-50	10	Negative	10YR 3/1 4/1	Clay	On cut grass, near sports complex & paved road	Subsoil
1220JL04	1	0-20	10	Negative	Disturbed	Clay	Inundated grass, near sports complex parking lot	Disturbed
1220JL07	1	0-23	10	Negative	10YR 4/1	Clay	Inundated pasture. Near historic farmstead	Soil change
1220JL07	2	23-48	10	Negative	10YR 5/1	Clay	Inundated pasture. Near historic farmstead	Subsoil
1220JL10	1	0-23	10	Negative	10YR 4/1	Clay	Inundated pasture. Near historic farmstead	Soil change
1220JL10	2	23-48	10	Negative	10YR 5/1	Clay	Inundated pasture. Near historic farmstead	Subsoil
1220JL11	1	0-15	10	Negative	Disturbed	Clay	Near gravel road & gated station	Disturbed
1220JL17	1	0-13	10	Negative	10YR 4/1	Clay	Pipeline corridor, inundated	Inundation
1220JL19	1	0-13	10	Negative	10YR 4/1	Clay	Pipeline corridor, inundated	Inundation
1220JL24	1	0-13	10	Negative	10YR 4/1	Clay	Pipeline corridor, inundated	Inundation
1220JL25	1	0-15	10	Negative	10YR 4/1	Clay	Waist-high grass, inundated	Inundation
1220JL30	1	0-23	10	Negative	10YR 4/1	Clay	Open cow pasture	Soil change
1220JL30	2	23-48	10	Negative	10YR 5/1	Clay	Open cow pasture	Subsoil
1220JL33	1	0-23	10	Negative	10YR 4/1	Clay	Open cow pasture	Soil change
1220JL33	2	23-48	10	Negative	10YR 5/1	Clay	Open cow pasture	Subsoil
1220JL40	1	0-15	10	Negative	10YR 4/1	Clay	Wooded area, near powerline corridor	Soil change
1220JL40	2	15-28	10	Negative	10YR 3/1	Clay	Wooded area, near powerline corridor	Subsoil
1220WK02	1	0-15	0	Negative	10YR 3/1	Clay	Area is manicured lawn adjacent to a very large parking lot and sports compound.	Soil change
1220WK02	2	15-35	0	Negative	10YR 4/1	Clay	Area is manicured lawn adjacent to a very large parking lot and sports compound.	Subsoil
1220WK03	1	0-20	0	Negative	10YR 3/1	Clay	Area is manicured lawn adjacent to a very large parking lot and sports compound.	Soil change
1220WK03	2	20-35	0	Negative	10YR 4/1	Clay	Area is manicured lawn adjacent to a very large parking lot and sports compound.	Subsoil

Appendix D - Shovel Test Data

Shovel Test #	Level (Strat)	Depth (cmbs)	GSV %	Positive or Negative	Munsell Color	Soil Texture Description	Description (Area; Vegetation)	Reason for Termination
1220WK05	1	0-25	0	Negative	10YR 4/1	Clay	Area in an upland/wetland with close-cut grass. Areas of inundated and gravel road bisecting ESA	Soil change
1220WK05	2	25-40	0	Negative	10YR 5/1 & 4/6	Clay	Area in an upland/wetland with close-cut grass. Areas of inundated and gravel road bisecting ESA	Subsoil
1220WK08	1	0-15	0	Negative	10YR 4/1	Clay	Area in an upland/wetland with close-cut grass. Areas of inundated and gravel road bisecting ESA	Disturbed
1220WK08	2	15-40	0	Negative	10YR 5/1 & 4/6	Clay	Area in an upland/wetland with close-cut grass. Areas of inundated and gravel road bisecting ESA	Disturbed
1220WK12	1	0-30	30	Negative	10YR 4/1	Clay	Area is thoroughly inundated wetland. STP spot is on a dry patch with young pine.	Soil change
1220WK12	2	30-40	30	Negative	10YR 5/1	Clay	Area is thoroughly inundated wetland. STP spot is on a dry patch with young pine.	Subsoil
1220WK15	1	0-20	30	Negative	10YR 3/1	Clay	Area is thoroughly inundated wetland. STP spot is on a dry patch with young pine.	Soil change
1220WK15	2	20-30	30	Negative	10YR 4/1	Clay	Area is thoroughly inundated wetland. STP spot is on a dry patch with young pine.	Subsoil
1220WK20	1	0-25	15	Negative	10YR 5/1	Clay	Area subject to frequent periods of inundation	Inundation
1220WK22	1	0-15	15	Negative	10YR 4/1	Clay	Area subject to frequent periods of inundation	Inundation
1220WK26	1	0-5	0	Negative	10YR 4/1	Clay	Area is a tall-grass pasture with standing water throughout; tread going through area has disturbed soil	Inundation
1220WK28	1	0-20	0	Negative	10YR 4/1 & 5/1	Clay	Area is a tall-grass pasture with standing water throughout; tread going through area has disturbed soil	Disturbed
1220WK31	1	0-25	20	Negative	10YR 3/1 & 5/6	Silty clay loam	Area is mostly open field with dense green grasses	Soil change
1220WK31	2	25-35	20	Negative	10YR 3/1	Silty clay	Area is mostly open field with dense green grasses	Subsoil
1220WK34	1	0-20	0	Negative	10YR 3/1	Silty clay loam	Area is mostly open field with dense green grasses	Inundation
1220WK39	1	0-15	0	Negative	10YR 3/1	Clay	Area is a forested/ wooded area wetland.	Soil change
1220WK39	2	15-30	0	Negative	10YR 4/1	Clay	Area is a forested/ wooded area wetland.	Subsoil
1221CK02	1	0-10	0	Negative	10YR 5/1	Clay	Open field with knee high grass. H2O at 10cmbs	Inundation
1221CK03	1	0-10	0	Negative	10YR 5/1	Clay	Open field with knee high grass. H2O at 10cmbs	Inundation
1221CK06	1	0-10	0	Negative	10YR 5/1	Clay	Open field with knee high grass. H2O at 10cmbs	Inundation
1221CK08	1	0-10	0	Negative	10YR 5/1	Clay	Open field with knee high grass. H2O at 10cmbs	Inundation
1221CK11	1	0-10	0	Negative	10YR 5/1	Clay	Open field with knee high grass. H2O at 10cmbs	Inundation
1221CK14	1	0-15	0	Negative	10YR 5/1	Clay	Open field with knee high grass.	Soil change
1221CK14	2	15-30	0	Negative	10YR 3/1	Clay	Open field with knee high grass.	Subsoil
1221CK15	1	0-15	0	Negative	10YR 5/1	Clay	Open field with knee high grass.	Soil change
1221CK15	2	15-30	0	Negative	10YR 3/1	Clay	Open field with knee high grass.	Subsoil
1221CK18	1	0-15	0	Negative	10YR 5/1	Clay	Open field with knee high grass.	Soil change
1221CK18	2	15-30	0	Negative	10YR 3/1	Clay	Open field with knee high grass.	Subsoil
1221CK22	1	0-5	0	Negative	10YR 5/1	Clay	Open field- fallow. Heavily inundated with tall grass. Water at 5 cmbs.	Inundation
1221CK25	1	0-5	0	Negative	10YR 5/1	Clay	Open field- fallow. Heavily inundated with tall grass. Water at 5 cmbs.	Inundation
1221CK28	1	0-5	0	Negative	10YR 5/1	Clay	Open field- fallow. Heavily inundated with tall grass. Water at 5 cmbs.	Inundation
1221CK31	1	0-5	0	Negative	10YR 5/1	Clay	Open field- fallow. Heavily inundated with tall grass. Water at 5 cmbs.	Inundation
1221CK33	1	0-5	0	Negative	10YR 5/1	Clay	Open field- fallow. Heavily inundated with tall grass. Water at 5 cmbs.	Inundation
1221CK34	1	0-5	0	Negative	10YR 5/1	Clay	Open field- fallow. Heavily inundated with tall grass. Water at 5 cmbs.	Inundation
1221JL09	1	0-15	0	Negative	10YR 4/1 & 5/1	Clay	Waist-high grasses and brush	Inundation
1221JL10	1	0-15	0	Negative	10YR 4/1 & 5/1	Clay	Waist-high grasses and brush	Inundation
1221JL13	1	0-15	0	Negative	10YR 4/1 & 5/1	Clay	Waist-high grasses and brush	Inundation
1221JL16	1	0-15	0	Negative	10YR 4/1 & 5/1	Clay	Waist-high grasses and brush	Inundation
1221JL19	1	0-15	0	Negative	10YR 4/1 & 5/1	Clay	Waist-high grasses and brush	Inundation
1221JL20	1	0-15	0	Negative	10YR 4/1 & 5/1	Clay	Open field	Soil change
1221JL20	2	15-25	0	Negative	10YR 3/1	Clay	Open field	Subsoil
1221JL24	1	0-15	100	Negative	Disturbed	Clay	Open field	Disturbed
122127	1	0-10	100	Negative	10YR 4/1 & 5/1	Clay	Open field. Inundated	Inundation

Appendix D - Shovel Test Data

Shovel Test #	Level (Strat)	Depth (cmbs)	GSV %	Positive or Negative	Munsell Color	Soil Texture Description	Description (Area; Vegetation)	Reason for Termination
1221JI30	1	0-15	10	Negative	10YR 4/1 & 5/1	Clay	Open field. Inundated	Inundation
1221JL32	1	0-15	10	Negative	10YR 4/1 & 5/1	Clay	Open field.	Inundation
1221JL32	1	15-28	10	Negative	10YR 4/1 & 5/1	Clay	Open field.	Inundation
1221JL36	1	0-10	10	Negative	10YR 4/1 & 5/1	Clay	Open field.	Inundation
1221WK01	1	0-25	30	Negative	10YR 4/1	Granular clay	Area is a two track adjacent to wetland; very disturbed.	Disturbed
1221WK04	1	0-20	0	Negative	10YR 4/1	Granular clay	Wetland with standing water throughout. Briar and grass obscure GSV	Soil change
1221WK04	2	20-30	0	Negative	10YR 3/1	Angular clay	Wetland with standing water throughout. Briar and grass obscure GSV	Subsoil
1221WK05	1	0-25	0	Negative	10YR 4/1	Granular clay	Wetland with standing water throughout. Briar and grass obscure GSV	Soil change
1221WK05	2	25-35	0	Negative	10YR 5/1	Angular clay	Wetland with standing water throughout. Briar and grass obscure GSV	Subsoil
1221WK07	1	0-15	0	Negative	10YR 4/1	Granular clay	Wetland with standing water throughout. Briar and grass obscure GSV	Soil change
1221WK07	2	15-30	0	Negative	7.5YR 5/1 & 5/6	Angular clay	Wetland with standing water throughout. Briar and grass obscure GSV	Subsoil
1221WK12	1	0-20	0	Negative	10YR 4/1	Granular clay	Wetland with standing water throughout. Briar and grass obscure GSV	Soil change
1221WK12	2	20-25	0	Negative	7.5YR 5/1 & 5/6	Angular clay	Wetland with standing water throughout. Briar and grass obscure GSV	Subsoil
1221WK17	1	0-15	0	Negative	10YR 4/1	Granular clay	Wetland with standing water throughout. Briar and grass obscure GSV	Soil change
1221WK17	2	15-30	0	Negative	7.5YR 5/1 & 5/6	Angular clay	Wetland with standing water throughout. Briar and grass obscure GSV	Subsoil
1221WK21	1	0-25	0	Negative	10YR 4/1	Granular clay	Area is an Ag. Field (rice) and inundated	Inundation
1221WK23	1	0-15	10	Negative	10YR 4/1	Granular clay	Area is adjacent to gravel road and inundated with overgrowth. Area is very disturbed	Inundation
1221WK26	1	0-15	0	Negative	10YR 4/1	Granular clay	Area is adjacent to gravel road and inundated with overgrowth. Area is very disturbed	Inundation
1221WK29	1	0-15	0	Negative	10YR 4/1	Granular clay	Area is adjacent to gravel road and inundated with overgrowth. Area is very disturbed	Inundation
1221WK35	1	0-15	0	Negative	10YR 4/1	Granular clay	Area is adjacent to gravel road and inundated with overgrowth. Area is very disturbed	Inundation
0125WE01	1	0-30	5	Negative	10 YR 5/4	Clay loam	Mixed horizon disturbed by pigs and temporary log road, open field, tall grass	Disturbed
0125RK01	1	0-23	0	Negative	10 YR 4/1	Sandy clay loam	In cow pasture with light inundation surrounding,. Soil is very wet, short grasses	Soil change
0125RK01	2	23-33	0	Negative	10 YR 5/2	Clay loam	In cow pasture with light inundation surrounding,. Soil is very wet, short grasses	Subsoil
0125RK03	1	0-23	0	Negative	10 YR 4/1	Sandy clay loam	In cow pasture with light inundation surrounding,. Soil is very wet, short grasses	Soil change
0125RK03	2	23-33	0	Negative	10 YR 5/2	Clay loam	In cow pasture with light inundation surrounding,. Soil is very wet, short grasses	Subsoil
0125RK05	1	0-2	0	Negative	10 YR 3/1	Sandy Clay	Water just under grass at 2 cmbs	Inundation
0125RK08	1	0-20	0	Negative	10 YR 4/1	Sandy clay loam	in dense briar with mature pine, complete inundation to the south	Soil change
0125RK08	2	20-30	0	Negative	10 YR 5/2	Clay loam	In cow pasture with light inundation surrounding,. Soil is very wet, short grasses	Subsoil
0125RK10	1	0-20	0	Negative	10 YR 4/1	Sandy clay loam	In cow pasture with light inundation surrounding,. Soil is very wet, short grasses	Soil change
0125RK10	2	20-30	0	Negative	10 YR 5/2	Clay loam	In cow pasture with light inundation surrounding,. Soil is very wet, short grasses	Subsoil
0125RK12	1	0-20	0	Negative	10 YR 4/1	Sandy clay loam	In cow pasture with light inundation surrounding,. Soil is very wet, short grasses	Soil change
0125RK12	2	20-30	0	Negative	10 YR 5/2	Clay loam	In cow pasture with light inundation surrounding,. Soil is very wet, short grasses	Subsoil
0125RK15	1	0-20	0	Negative	10 YR 4/1	Sandy clay loam	In cow pasture with light inundation surrounding,. Soil is very wet, short grasses	Soil change
0125RK15	2	20-30	0	Negative	10 YR 5/2	Clay loam	In cow pasture with light inundation surrounding,. Soil is very wet, short grasses	Subsoil
0125RC02	1	0-15	0	Negative	10 YR 5/2	Clay loam	Tall grass, rase, briar	Subsoil
0125RC04	1	0-15	0	Negative	10 YR 5/2	Clay loam	Tall grass, rase, briar	Subsoil
0125RC06	1	0-10	0	Negative	10 YR 5/2	Clay loam	Tall grass, rase, briar	Subsoil
0125RC07	1	0-20	0	Negative	10 YR 5/2	Clay loam	Tall grass, rase, briar	Subsoil
0125RC09	1	0-20	0	Negative	10 YR 5/2	Clay loam	Tall grass, rase, briar	Subsoil
0125RC11	1	0-20	0	Negative	10 YR 5/2	Clay loam	Tall grass, rase, briar	Subsoil
0125RC13	1	0-20	0	Negative	10 YR 5/2	Clay loam	Tall grass, rase, briar	Subsoil
0125RC14	1	0-10	0	Negative	10 YR 5/2	Clay loam	Tall grass, rase, briar	Subsoil
0125RC15	1	0-10	0	Negative	10 YR 5/2	Clay loam	Tall grass, rase, briar	Subsoil
092619WE02	1	0-15	10	Negative	10 YR 4/1	Clay	Forest with trash piles, mixed soil horizons	Disturbed
092619WE02	2	15-35	10	Negative	10YR 5/4	Clay	Forest with trash piles, mixed soil horizons	Disturbed
092619WE04	1	0-30	10	Negative	10YR 4/3	Clay	Tall grasses near wetlands, mottled clay	Disturbed

Appendix D - Shovel Test Data

Shovel Test #	Level (Strat)	Depth (cmbs)	GSV %	Positive or Negative	Munsell Color	Soil Texture Description	Description (Area; Vegetation)	Reason for Termination
092619WE06	1	0-20	10	Negative	10YR 4/1	Clay loam	Lawn in front of prison, mottled subsoil	Disturbed
092619WE06	2	20-50	10	Negative	10YR 4/3	Clay	Lawn in front of prison, mottled subsoil	Disturbed
092619WE08	1	0-20	10	Negative	10YR 4/3	Clay	Open field, medium sized grasses, scattered trees, mottled soil	Inundation
092619AM01	1	0-15	0	Negative	10YR 4/1	Clay	Wooded area with a laye of leaves on ground	Impenetrable
092619AM01	2	15-28	0	Negative	10YR 3/1	Clay	Wooded area with a laye of leaves on ground	Impenetrable
092619AM03	1	0-15	0	Negative	10YR 4/1	Clay	Heavily vegetated	Soil change
092619AM03	2	15-28	0	Negative	10YR 3/1	Clay	Heavily vegetated	Soil change
092619SB5	1	0-15	10	Negative	10YR 4/1	Clay loam	Lawn in front of prison, mottled subsoil	Disturbed
092619SB5	2	15-35	10	Negative	10YR 4/3	Clay	Lawn in front of prison, mottled subsoil	Disturbed
092619SB7	1	0-15	10	Negative	10YR 4/1	Clay loam	Lawn in front of prison, mottled subsoil	Disturbed
092619SB7	2	15-35	10	Negative	10YR 4/3	Clay	Lawn in front of prison, mottled subsoil	Disturbed
092619SB9	1	0-15	10	Negative	10YR 4/1	Clay loam	Lawn in front of prison, mottled subsoil	Disturbed
092619SB9	2	15-35	10	Negative	10YR 4/3	Clay	Lawn in front of prison, mottled subsoil	Disturbed
092719AM04	1	0-15	15	Negative	10YR 4/1	Clay	Heavily vegetated, Beaumont soil	Disturbed
092719WE1	1	0-15	15	Negative	10YR 4/1	Clay	Forest, damp soil, dense briar	Inundation
092719WE2	1	0-15	0	Negative	10YR 3/1	Clay	Open Field, med/ tall grasses, mixed horizons	Disturbed
092719WE2	2	15-30	0	Negative	10YR 6/2	Clay	Open Field, med/ tall grasses, mixed horizons	Disturbed
092719WE4	1	0-10	0	Negative	10 YR 5/4	Clay	Open Field, med/ tall grasses,	Disturbed
092719WE4	2	10-20	0	Negative	10YR 6/2	Clay	Open Field, med/ tall grasses,	Disturbed
092719WE5	1	0-25	0	Negative	10YR 4/4	Clay	Short grass by fence adjacent to wetland	Soil change
092719WE5	2	25-50	0	Negative	10YR 3/1	Clay	Short grass by fence adjacent to wetland	Subsoil
092719WE8	1	0-30	0	Negative	10YR 4/1	Clay	Short grass by fence adjacent to wetland	Soil change
092719WE8	2	30-50	0	Negative	10YR 3/1	Clay	Short grass by fence adjacent to wetland	Subsoil
092719WE10	1	0-30	0	Negative	10YR 4/1	Clay	Short grass by fence adjacent to wetland	Soil change
092719WE10	2	30-45	0	Negative	10YR 3/1	Clay	Short grass by fence adjacent to wetland	Subsoil
092719WE11	1	0-30	0	Negative	10YR 4/1	Clay	Short grass by fence adjacent to wetland	Soil change
092719WE11	2	30-45	0	Negative	10YR 3/1	Clay	Short grass by fence adjacent to wetland	Subsoil
092719WE13	1	0-15	0	Negative	10YR 4/1	Clay	Short grass by fence adjacent to wetland	Soil change
092719WE13	2	15-40	0	Negative	10YR 3/1	Clay	Short grass by fence adjacent to wetland	Subsoil
092719WE15	1	0-25	0	Negative	10YR 4/1	Clay	Short grass by fence adjacent to wetland	Soil change
092719WE15	2	25-35	0	Negative	10YR 3/1	Clay	Short grass by fence adjacent to wetland	Subsoil
092719SB9	1	0-15	0	Negative	10YR 4/1	Clay	Short grass by fence adjacent to wetland	Soil change
092719SB9	2	15-40	0	Negative	10YR 3/1	Clay	Short grass by fence adjacent to wetland	Subsoil
092719SB7	1	0-15	0	Negative	10YR 4/1	Clay	Short grass by fence adjacent to wetland	Soil change
092719SB7	2	15-40	0	Negative	10YR 3/1	Clay	Short grass by fence adjacent to wetland	Subsoil
092719SB6	1	0-15	0	Negative	10YR 4/1	Clay	Short grass by fence adjacent to wetland	Soil change
092719SB6	2	15-40	0	Negative	10YR 3/1	Clay	Short grass by fence adjacent to wetland	Subsoil
092719SB22	1	0-15	0	Negative	10YR 4/1	Clay	Short grass by fence adjacent to wetland	Soil change
092719SB22	2	15-40	0	Negative	10YR 3/1	Clay	Short grass by fence adjacent to wetland	Subsoil

Appendix D - Shovel Test Data

Shovel Test #	Level (Strat)	Depth (cmbs)	GSV %	Positive or Negative	Munsell Color	Soil Texture Description	Description (Area; Vegetation)	Reason for Termination
092719SB21	1	0-15	0	Negative	10YR 4/1	Clay	Short grass by fence adjacent to wetland	Soil change
092719SB21	2	15-40	0	Negative	10YR 3/1	Clay	Short grass by fence adjacent to wetland	Subsoil
092719SB20	1	0-15	0	Negative	10YR 4/1	Clay	Short grass by fence adjacent to wetland	Soil change
092719SB20	2	15-40	0	Negative	10YR 3/1	Clay	Short grass by fence adjacent to wetland	Subsoil
092719SB19	1	0-15	0	Negative	10YR 4/1	Clay	Short grass by fence adjacent to wetland	Soil change
092719SB19	2	15-40	0	Negative	10YR 3/1	Clay	Short grass by fence adjacent to wetland	Subsoil
092719SB18	1	0-15	0	Negative	10YR 4/1	Clay	Short grass by fence adjacent to wetland	Soil change
092719SB18	2	15-40	0	Negative	10YR 3/1	Clay	Short grass by fence adjacent to wetland	Subsoil
092719SB17	1	0-15	0	Negative	10YR 4/1	Clay	Short grass by fence adjacent to wetland	Soil change
092719SB17	2	15-40	0	Negative	10YR 3/1	Clay	Short grass by fence adjacent to wetland	Subsoil
092719SB16	1	0-15	0	Negative	10YR 4/1	Clay	Short grass by fence adjacent to wetland	Soil change
092719SB16	2	15-40	0	Negative	10YR 3/1	Clay	Short grass by fence adjacent to wetland	Subsoil
092719SB14	1	0-15	0	Negative	10YR 4/1	Clay	Short grass by fence adjacent to wetland	Soil change
092719SB14	2	15-40	0	Negative	10YR 3/1	Clay	Short grass by fence adjacent to wetland	Subsoil
092719SB12	1	0-15	0	Negative	10YR 4/1	Clay	Short grass by fence adjacent to wetland	Soil change
092719SB12	2	15-40	0	Negative	10YR 3/1	Clay	Short grass by fence adjacent to wetland	Subsoil
081518SB9	1	0-30	10	Negative	10YR 3/1	Clay	In grassy cow pasture; smaller grasses	Subsoil
081518SB72	1	0-35	10	Negative	10YR 3/1	Clay	In grassy cow pasture; smaller grasses	Subsoil
081518SB70	1	0-30	10	Negative	10YR 3/1	Clay	In grassy cow pasture; smaller grasses	Subsoil
081518SB7	1	0-30	10	Negative	10YR 3/1	Clay	In grassy cow pasture; smaller grasses	Subsoil
081518SB68	1	0-35	10	Negative	10YR 3/1	Clay	In grassy cow pasture; smaller grasses	Subsoil
081518SB65	1	0-30	10	Negative	10YR 3/1	Clay	In grassy cow pasture; smaller grasses	Subsoil
081518SB64	1	0-30	10	Negative	10YR 3/1	Clay	In grassy cow pasture; smaller grasses	Subsoil
081518SB62	1	0-35	10	Negative	10YR 3/1	Clay	In grassy cow pasture; smaller grasses	Subsoil
081518SB60	1	0-35	10	Negative	10YR 3/1	Clay	In grassy cow pasture; smaller grasses	Subsoil
081518SB59	1	0-30	10	Negative	10YR 3/1	Clay	In grassy cow pasture; smaller grasses	Subsoil
081518SB57	1	0-30	10	Negative	10YR 3/1	Clay	In grassy cow pasture; smaller grasses	Subsoil
081518SB56	1	0-35	10	Negative	10YR 3/1	Clay	In grassy cow pasture; smaller grasses	Subsoil
081518SB54	1	0-30	10	Negative	10YR 3/1	Clay	In grassy cow pasture; smaller grasses	Subsoil

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Shovel Test #	Level (Strat)	Depth (cmbs)	GSV %	Positive or Negative	Munsell Color	Soil Texture Description	Description (Area; Vegetation)	Reason for Termination
081518SB52	1	0-35	10	Negative	10YR 3/1	Clay	In grassy cow pasture; smaller grasses	Subsoil
081518SB50	1	0-30	10	Negative	10YR 3/1	Clay	In grassy cow pasture; smaller grasses	Subsoil
081518SB5	1	0-30	10	Negative	10YR 3/1	Clay	In grassy cow pasture; smaller grasses	Subsoil
081518SB47	1	0-35	10	Negative	10YR 3/1	Clay	In grassy cow pasture; smaller grasses	Subsoil
081518SB45	1	0-35	10	Negative	10YR 3/1	Clay	In grassy cow pasture; smaller grasses	Subsoil
081518SB43	1	0-30	10	Negative	10YR 3/1	Clay	In grassy cow pasture; smaller grasses	Subsoil
081518SB42	1	0-30	10	Negative	10YR 3/1	Clay	In grassy cow pasture; smaller grasses	Subsoil
081518SB4	1	0-35	10	Negative	10YR 3/1	Clay	In grassy cow pasture; smaller grasses	Subsoil
081518SB38	1	0-30	10	Negative	10YR 3/1	Clay	In grassy cow pasture; smaller grasses	Subsoil
081518SB37	1	0-35	10	Negative	10YR 3/1	Clay	In grassy cow pasture; smaller grasses	Subsoil
081518SB35	1	0-30	10	Negative	10YR 3/1	Clay	In grassy cow pasture; smaller grasses	Subsoil
081518SB33	1	0-30	10	Negative	10YR 3/1	Clay	In grassy cow pasture; smaller grasses	Subsoil
081518SB31	1	0-35	10	Negative	10YR 3/1	Clay	In grassy cow pasture; smaller grasses	Subsoil
081518SB28	1	0-35	10	Negative	10YR 3/1	Clay	In grassy cow pasture; smaller grasses	Subsoil
081518SB25	1	0-30	10	Negative	10YR 3/1	Clay	In grassy cow pasture; smaller grasses	Subsoil
081518SB2	1	0-30	10	Negative	10YR 3/1	Clay	In grassy cow pasture; smaller grasses	Subsoil
081518SB17	1	0-35	10	Negative	10YR 3/1	Clay	In grassy cow pasture; smaller grasses	Subsoil
081518SB16	1	0-30	10	Negative	10YR 3/1	Clay	In grassy cow pasture; smaller grasses	Subsoil
081518SB12	1	0-30	10	Negative	10YR 3/1	Clay	In grassy cow pasture; smaller grasses	Subsoil
101019SB01	1	0-20	0	Negative	10YR 5/2	Clay	Disturbed; within pipeline corridor	Disturbed
101019SB02	1	0-25	0	Negative	10YR 5/3	Clay	Disturbed; within pipeline corridor	Disturbed
101019SB03	1	0-20	0	Negative	10YR 5/4	Clay	Disturbed; within pipeline corridor	Disturbed
101019SB04	1	0-20	0	Negative	10YR 5/5	Clay	Disturbed; within pipeline corridor	Disturbed
101019SB05	1	0-20	0	Negative	10YR 5/6	Clay	Disturbed; within pipeline corridor	Disturbed
101019SB06	1	0-10	1	Negative	10YR 5/7	Clay	Soil wet; inundation at 10 cmbs	Inundation
101019SB07	1	0-10	2	Negative	10YR 5/8	Clay	Soil wet; inundation at 10 cmbs	Inundation
101019SB08	1	0-10	3	Negative	10YR 5/9	Clay	Soil wet; inundation at 10 cmbs	Inundation
101019SB09	1	0-10	4	Negative	10YR 5/10	Clay	Soil wet; inundation at 10 cmbs	Inundation
101019SB10	1	0-10	5	Negative	10YR 5/11	Clay	Soil wet; inundation at 10 cmbs	Inundation
1106WE1	1	0-25	3	Negative	10YR 6/1	Sandy Clay Loam	Thin brush forest, short grass by trinity River	Subsoil
1106WE1	2	25-30		Negative	10YR 5/1	Sandy Clay Loam	Thin brush forest, short grass by trinity River	Subsoil

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Shovel Test #	Level (Strat)	Depth (cmbs)	GSV %	Positive or Negative	Munsell Color	Soil Texture Description	Description (Area; Vegetation)	Reason for Termination
1106WE1	3	30-50		Negative	10YR 3/1	Sandy Loam	Thin brush forest, short grass by trinity River	Subsoil
1106MT2	1	0-50	0	Negative	10YR 5/4	Sandy Clay Loam	Low grasses and weeds; mixed hardwoods	Subsoil
1106WE3	1	0-25	3	Negative	10YR 6/1	Sandy Clay Loam	Thin brush forest, short grass by trinity River	Subsoil
1106WE3	2	25-35		Negative	10YR 2/1	Sandy Clay Loam	Thin brush forest, short grass by trinity River	Subsoil
1106WE3	3	35-50		Negative	10YR 4/2	Sandy Loam	Thin brush forest, short grass by trinity River	Subsoil
1106JT4	1	0-25	0	Negative	10YR 5/1	Sandy Clay Loam	River valley mixed hardwood, thin understory	Subsoil
1106JT4	2	25-50		Negative	10YR 3/1	Clay	River valley mixed hardwood, thin understory	Subsoil
1106MT6	1	0-20	0	Negative	10YR 5/4	Sandy Clay Loam	Low grasses and weeds; mixed hardwoods	Subsoil
1106MT6	2	20-45		Negative	10YR 5/4	Sand	Low grasses and weeds; mixed hardwoods	Subsoil
1106MT6	3	45-65		Negative	10YR 5/4	Sandy Clay Loam	Low grasses and weeds; mixed hardwoods	Subsoil
1106WE7	1	0-30	0	Negative	10YR 8/1	Sand	Tall grass, thin brush and forest by Trinity River	Subsoil
1106WE7	2	30-50		Negative	10YR 5/1	Sandy Loam	Tall grass, thin brush and forest by Trinity River	Subsoil
1106JT8	1	0-40	0	Negative	10YR 6/1	Sandy Clay Loam	River valley mixed hardwood, thin understory	Subsoil
1106JT8	2	40-50		Negative	10YR 4/1	Clay	River valley mixed hardwood, thin understory	Subsoil
1106MT9	1	0-20	0	Negative	10YR 5/4	Sandy Clay Loam	Low grasses and weeds; mixed hardwoods	Subsoil
1106MT9	2	20-60		Negative	10YR 5/4	Sandy Clay Loam	Low grasses and weeds; mixed hardwoods	Subsoil
1106WE10	1	0-25	10	Negative	10YR 6/1	Sand	Short grass, forest, thin brush by Trinity River	Subsoil
1106WE10	2	25-35		Negative	10YR 7/1	Sand	Short grass, forest, thin brush by Trinity River	Subsoil
1106WE10	3	35-50		Negative	10YR 5/1	Sandy Loam	Short grass, forest, thin brush by Trinity River	Subsoil
1106JT11	1	0-40	0	Negative	10YR 6/3	Sandy Clay Loam	River valley mixed hardwood, thin understory	Subsoil
1106JT11	2	40-50		Negative	10YR 5/1	Sandy Clay Loam	River valley mixed hardwood, thin understory	Subsoil
1106WE12	1	0-25	5	Negative	10YR 6/1	Sand	Short grass, forest, thin brush by Trinity River	Subsoil
1106WE12	2	25-50		Negative	10YR 4/1	Sandy Loam	Short grass, forest, thin brush by Trinity River	Subsoil
1106JT13	1	0-10	0	Negative	10YR 6/1	Sandy Clay Loam	River valley mixed hardwood, thin understory	Subsoil
1106JT13	2	10-30		Negative	10YR 5/1	Clay loam	River valley mixed hardwood, thin understory	Subsoil
1106WE14	1	0-25	5	Negative	10YR 6/1	Sand	Short grass, forest, thin brush by Trinity River	Subsoil
1106WE14	2	25-50		Negative	10YR 4/1	Sandy Loam	Short grass, forest, thin brush by Trinity River	Subsoil
1106MT15	1	0-30	0	Negative	10YR 5/4	Sandy Clay Loam	Low grasses and weeds shrubby hardwoods	Subsoil
1106MT15	2	30-70		Negative	10YR 5/4	Sandy Clay Loam	Low grasses and weeds shrubby hardwoods	Subsoil
1106MVR16	1	0-100	0	Negative	10YR 5/4	Sandy Clay Loam	Low grasses and weeds mixed hardwoods	Subsoil
1106WE17	1	0-25	5	Negative	10YR 7/1	Sand	Tall grass, thin chrush, young forest	Subsoil
1106WE17	2	25-50		Negative	10YR 5/1	Sandy Clay Loam	Tall grass, thin chrush, young forest	Subsoil
1106WE18	1	0-20	0	Negative	10YR 7/1	Sand	Tall vegetation near swamp	Subsoil
1106WE18	2	20-50		Negative	10YR 4/1	Sandy Loam	Tall vegetation near swamp	Subsoil
1106MVR19	1	0-60	0	Negative	10YR 5/4	Sand	Low grasses and weeds mixed hardwoods	Subsoil
1106MVR19	2	60-80		Negative	10YR 5/4	Sandy Clay Loam	Low grasses and weeds mixed hardwoods	Subsoil
1106MT20	1	0-60	0	Negative	10YR 5/4	Sandy Clay Loam	Low grasses and weeds, mid story willows with cottonwoods	Subsoil
1106WE21	1	0-30	0	Negative	10YR 6/1	Sand	Tall grass, saplings between older forest	Subsoil
1106WE21	2	30-50		Negative	10YR 4/1	Sandy Clay Loam	Tall grass, saplings between older forest	Subsoil
1106JT22	1	0-20	0	Negative	10YR 6/1	Sandy Clay Loam	River valley mixed hardwood, thin understory	Subsoil
1106JT22	2	20-50		Negative	10YR 4/2	Sandy Clay Loam	River valley mixed hardwood, thin understory	Subsoil
1106WE23	1	0-20	0	Negative	10YR 6/1	Sand	Tall grass, saplings between older forest, frequent flooding	Subsoil
1106WE23	2	20-50		Negative	10YR 5/1	Sandy Clay Loam	Tall grass, saplings between older forest, frequent flooding	Subsoil
1106MVR24	1	0-60	0	Negative	10YR 5/4	Sand	Low grasses and weeds mixed hardwoods	Subsoil
1106MVR24	2	60-80		Negative	10YR 5/4	Sandy Clay Loam	Low grasses and weeds mixed hardwoods	Subsoil
1106MT25	1	0-20	0	Negative	10YR 5/4	Sandy Clay Loam	Low grasses, hardwoods	Subsoil
1106WE26	1	0-30	0	Negative	10YR 6/1	Sand	Tall grass, saplings between older forest, frequent flooding	Subsoil
1106WE26	2	30-50		Negative	10YR 5/2	Sandy Clay Loam	Tall grass, saplings between older forest, frequent flooding	Subsoil
1106MT27	1	0-60	0	Negative	10YR 5/4	Sandy Clay Loam	Some mixed vines mixed hardwoods	Subsoil
1106JT28	1	0-10	0	Negative	10YR 4/2	Sandy Clay Loam	River valley mixed hardwood, thin understory	Subsoil
1106JT28	2	10-60		Negative	10YR 6/2	Sandy Loam	River valley mixed hardwood, thin understory	Subsoil
1106MVR29	1	0-100	0	Negative	10YR 5/4	Sandy Clay Loam	Low grasses and weeds mixed hardwoods	Subsoil
1106WE30	1	0-25	0	Negative	10YR 2/1	Sand	Lilly pads/ marsh plants between forest and Bayou	Subsoil
1106WE30	2	25-50		Negative	10YR 4/1	Sandy Clay Loam	Lilly pads/ marsh plants between forest and Bayou	Subsoil
1106MY31	1	0-65	0	Negative	10YR 5/4	Sandy Clay Loam	Ground vines and shrubs, grasses	Subsoil

Appendix D - Shovel Test Data

Shovel Test #	Level (Strat)	Depth (cmbs)	GSV %	Positive or Negative	Munsell Color	Soil Texture Description	Description (Area; Vegetation)	Reason for Termination
1106WE32	1	0-30	10	Negative	10YR 6/1	Sand	Tall grass, saplings	Subsoil
1106WE32	2	30-50		Negative	10YR 4/1	Sandy Clay Loam	Tall grass, saplings	Subsoil
1106JT33	1	0-40	0	Negative	10YR 6/2	Sandy Clay Loam	River valley mixed hardwood, thin understory	Subsoil
1106JT33	2	40-60		Negative	10YR 4/1	Sandy Clay Loam	River valley mixed hardwood, thin understory	Subsoil
1106WE34	1	0-30	0	Negative	10YR 6/1	Sand	Forest by River frequent flooding / Sand deposits	Subsoil
1106WE34	2	30-55		Negative	10YR 4/1	Sandy Clay Loam	Forest by River frequent flooding / Sand deposits	Subsoil
1106MVR35	1	0-100	0	Negative	10YR 4/3	Sandy Clay Loam	Low grasses and weeds mixed hardwoods	Subsoil
1106WE36	1	0-30	0	Negative	10YR 6/1	Sand	Tall grass, edge of ROW	Subsoil
1106WE36	2	30-50		Negative	10YR 4/1	Sandy Clay Loam	Tall grass, edge of ROW	Subsoil
1106MT37	1	0-60	0	Negative	10YR 5/4	Sandy Clay Loam	Ground vines and shrubs, grasses	Subsoil
1106WE38	1	0-30	0	Negative	10YR 6/1	Sand	Tall grass, saplings	Subsoil
1106WE38	2	30-55		Negative	10YR 4/1	Sandy Clay Loam	Tall grass, saplings	Subsoil
1106MVR39	1	0-100	0	Negative	10YR 5/3	Sandy Loam	Low grasses and weeds mixed hardwoods	Subsoil
1106JT40	1	0-20	0	Negative	10YR 6/2	Sandy Clay Loam	River valley mixed hardwood, thin understory	Subsoil
1106JT40	2	20-60		Negative	10YR 5/2	Sandy Clay Loam	River valley mixed hardwood, thin understory	Subsoil
1106WE41	1	0-25	0	Negative	10YR 6/1	Sand	Thin brush in forest between River and creek, frequent flooding	Subsoil
1106WE41	2	25-50		Negative	10YR 4/2	Sandy Clay Loam	Thin brush in forest between River and creek, frequent flooding	Subsoil
1106MVR42	1	0-80	0	Negative	10YR 4/3	Sandy Clay Loam	Low grasses and weeds mixed hardwoods	Subsoil
1106MVR42	2	80-100		Negative	10YR 3/3	Sandy Clay Loam	Low grasses and weeds mixed hardwoods	Subsoil
1106WE43	1	0-15	0	Negative	10YR 3/3	Sandy Clay Loam	Tall grass and rose vines in ROW	Subsoil
1106WE43	2	15-50		Negative	10YR 5/3	Sandy Clay Loam	Tall grass and rose vines in ROW	Subsoil
1106JT44	1	0	0	Negative	10YR 5/2	Sandy Clay Loam	River valley mixed hardwood, thin understory	Subsoil
1106MVR45	1	0-70	0	Negative	10YR 6/3	Sandy Clay Loam	Low grasses and weeds mixed hardwoods	Subsoil
1106WE46	1	0-30	0	Negative	10YR 6/1	Sandy Clay Loam	Forest , thin brush, frequent flooding, mottled soil	Subsoil
1106WE46	2	30-45		Negative	10YR 5/1	Sandy Clay Loam	Forest , thin brush, frequent flooding, mottled soil	Subsoil
1106WE46	3	45-55		Negative	10YR 3/1	Sandy Clay Loam	Forest , thin brush, frequent flooding, mottled soil	Subsoil
1106WE47	1	0-30	0	Negative	10YR 6/1	Sandy Clay Loam	Tall grass, saplings, edge of ROW	Subsoil
1106WE47	2	30-50		Negative	10YR 4/2	Sandy Clay Loam	Tall grass, saplings, edge of ROW	Subsoil
1107WE1	1	0-30	0	Negative	10YR 6/1	Sandy Clay Loam	Forest, thin brush, frequent flooding	Subsoil
1107WE1	2	30-50		Negative	10YR 4/1	Sandy Clay Loam	Forest, thin brush, frequent flooding	Subsoil
1107JT2	1	0-10	0	Negative	10YR 5/2	Sandy Clay Loam	River valley mixed hardwood, thin understory	Subsoil
1107JT2	2	10-50		Negative	10YR 5/1	Sandy Clay Loam	River valley mixed hardwood, thin understory	Subsoil
1107MVR3	1	0-100	0	Negative	10YR 6/3	Sandy Clay Loam	Low grasses and weeds, mixed hardwoods, beside drainage	Subsoil
1107MT4	1	0-30	0	Negative	10YR 5/2	Sandy Clay Loam	Low grasses and shrubs mixed hardwoods	Subsoil
1107MT4	2	30-70		Negative	10YR 5/2	Sandy Clay Loam	Low grasses and shrubs mixed hardwoods	Subsoil
1107WE5	1	0-30	0	Negative	10YR 7/1	Sandy Clay Loam	Tall grass , line of trees in ROW	Subsoil
1107WE5	2	30-50		Negative	10YR 5/1	Sandy Clay Loam	Tall grass , line of trees in ROW	Subsoil
1107WE6	1	0-25	0	Negative	10YR 7/1	Sandy Clay Loam	Thin brush, forest	Subsoil
1107WE6	2	25-50		Negative	10YR 4/1	Sandy Clay Loam	Thin brush, forest	Subsoil
1107JT7	1	0-15	0	Negative	10YR 4/2	Sandy Clay Loam	River valley mixed hardwood, thin understory	Subsoil
1107MT8	1	0-55	0	Negative	10YR 5/4	Sandy Clay Loam	Low ground vines and shrubs; mixed hardwoods	Subsoil
1107WE09	1	0-25	0	Negative	10YR 5/1	Sandy Clay Loam	Tall grass, trees in ROW	Subsoil
1107WE09	2	25-50		Negative	10YR 3/1	Sandy Clay Loam	Tall grass, trees in ROW	Subsoil
1107MVR10	1	0-25	0	Negative	10YR 5/3	Sandy Clay Loam	Beside drainage, no vegetation	Subsoil
1107MVR10	2	25-100		Negative	10YR 6/3	Sandy Clay Loam	Beside drainage, no vegetation	Subsoil
1107JT11	1	0-50	0	Negative	10YR 5/1	Sandy Clay Loam	River valley mixed hardwood, thin understory	Subsoil
1107JT11	2	50-60		Negative	10YR 5/2	Sandy Clay Loam	River valley mixed hardwood, thin understory	Subsoil
1107WE12	1	0-30	0	Negative	10YR 7/1	Sandy Clay Loam	Forest by creek bank, thin brush	Subsoil
1107WE12	2	30-50		Negative	10YR 4/2	Sandy Clay Loam	Forest by creek bank, thin brush	Subsoil
1107MT13	1	0-20	0	Negative	10YR 5/4	Sandy Clay Loam	Grasses and Shrubs	Subsoil
1107MT13	2	20-50		Negative	10YR 5/2	Sandy Clay Loam	Grasses and Shrubs	Subsoil
1107MVR14	1	0-20	0	Negative	10YR 5/3	Sandy Clay Loam	Wooded area, heavy leaf litter, low grasses/weeds	Subsoil
1107MVR14	2	20-80		Negative	10YR6/3	Sandy Clay Loam	Wooded area, heavy leaf litter, low grasses/weeds	Subsoil
1107WE15	1	0-40	0	Negative	10YR 7/1	Sandy Clay Loam	Forest by creek bank, thin brush	Subsoil

Appendix D - Shovel Test Data

Shovel Test #	Level (Strat)	Depth (cmbs)	GSV %	Positive or Negative	Munsell Color	Soil Texture Description	Description (Area; Vegetation)	Reason for Termination
1107WE15	2	40-55		Negative	10YR 4/2	Sandy Clay Loam	Forest by creek bank, thin brush	Subsoil
1107JT16	1	0-10	0	Negative	10YR 4/2	Sandy Clay Loam	River valley mixed hardwood, thin understory	Subsoil
1107MT17	1	0-20	0	Negative	10YR 5/4	Sandy Clay Loam	Grasses and ground vines	Subsoil
1107MT17	2	20-30		Negative	10YR 5/4	Sandy Clay Loam	Grasses and ground vines	Subsoil
1107WE18	1	0-30	0	Negative	10YR 7/1	Sandy Clay Loam	Forest, thin brush, frequent flooding	Subsoil
1107WE18	2	30-50	0	Negative	10YR 5/1	Sandy Clay Loam	Forest, thin brush, frequent flooding	Subsoil
1112MVR1	1	0-20	40	Negative	10YR 5/2	Sandy Loam	Low grasses and weeds, mixed hardwoods	Soil Change
1112MVR1	2	20-40		Negative	10YR 5/3	Sandy Clay Loam	Low grasses and weeds, mixed hardwoods	Root Impasse
1112JJ2	1	0-22	100	Negative	10YR 5/1	Silty Clay Loam	Grass coverage	Soil Change
1112JJ2	2	22-60		Negative	10YR 5/1	Silty Clay	Grass coverage	Subsoil
1112TI3	1	0-16	70	Negative	10YR 5/1	Silty Clay Loam	Blue mist flower, Periscaria, Iva Annua	Soil Change
1112TI3	2	16-40		Negative	10YR 4/1	Silty Clay Loam	Blue mist flower, Periscaria, Iva Annua	Root Impasse
1112WE4	1	0-30	0	Negative	10YR 6/1	Sandy Loam	Tall grass and saplings, edge of forest	Soil Change
1112WE4	2	30-55		Negative	10YR 4/1	Sandy Clay Loam	Tall grass and saplings, edge of forest	Subsoil
1112MVR5	1	0-50	30	Negative	10YR 6/2	Sandy Loam	Low grass and weeds, mixed hardwoods, beside stream	Soil Change
1112MVR5	2	50-65		Negative	10YR 5/3	Sandy Clay Loam	Low grass and weeds, mixed hardwoods, beside stream	Root Impasse
1112JJ6	1	\	95	Negative	\	\	Stream	Inundation
1112WE7	1	0-30	0	Negative	10YR 5/1	Sandy Clay Loam	Tall grass in R.O.W.	Soil Change
1112WE7	2	30-50		Negative	10YR 6/1	Sandy Clay Loam	Tall grass in R.O.W.	Subsoil
1112JJ8	1	0-45	0	Negative	10YR 5/1	Silty Clay	Shrub layer	Root Impasse
1112MVR9	1	0-40	0	Negative	10YR 4/1	Clay	High shrubs and low grasses	Subsoil
1112TI10	1	0-12	60	Negative	10YR 5/1	Silty Clay Loam	Iva Annua, Bunge's Hackberry, Dwarf Palmetto	Soil Change
1112TI10	2	12-17		Negative	10YR 4/1	Silty Clay Loam	Iva Annua, Bunge's Hackberry, Dwarf Palmetto	Inundation
1112WE11	1	0-35	20	Negative	10YR 6/1	Sand	Forest by creek, thin brush	Soil Change
1112WE11	2	35-60		Negative	10YR 4/3	Sandy Loam	Forest by creek, thin brush	Subsoil
1112JJ12	1	0-50	20	Negative	10YR 5/1	Silty Clay	Trees and shrubs, forested wetland	Inundation
1112WE13	1	0-25	0	Negative	10YR 5/1	Clay Loam	Tall grass in R.O.W.	Inundation
1112MVR14	1	0-40	0	Negative	10YR 3/1	Clay	High shrubs and low grasses, compact soil	Subsoil
1112TI15	1	0-10	80	Negative	10YR 5/1	Silty Clay Loam	Cocklebur, Spring Chloracantha, Sumpweed, Swamp Smartweed, R.O.W.	Soil Change
1112TI15	2	10-16		Negative	10YR 4/1	Silty Clay Loam	Cocklebur, Spiny Chloracantha, Sumpweed, Swamp Smartweed, R.O.W.	Inundation
1112WE16	1	0-15	20	Negative	10YR 5/1	Clay Loam	Forest, thin brush, damp soil	Inundation
1112JJ17	1	0-20	100	Negative	10YR 5/1	Silty Clay	Trees and grasses, forested wetland	Inundation
1112WE18	1	0-15	0	Negative	10YR 5/1	Clay Loam	Tall grass in R.O.W.	Inundation
1112JJ19	1	0-5	95	Negative	10YR 5/3	Silty Clay	Trees and grasses, forested wetland	Inundation
1112JJ20	1	0-10	95	Negative	10YR 5/1	Silty Clay	30% tree coverage, 65% herb coverage	Inundation
1112WE21	1	0-20	15	Negative	10YR 5/1	Clay	Forest, thin brush	Soil Change
1112WE21	2	20-45		Negative	10YR 3/1	Clay	Forest, thin brush	Subsoil
1112TI22	1	0-10	10	Negative	10YR 5/1	Silty Clay Loam	American Elm, Green Ash	Soil Change
1112TI22	2	10-16		Negative	10YR 4/1	Silty Clay Loam	American Elm, Green Ash	Inundation
1112WE23	1	\	0	Negative	\	\	R.O.W.	Inundation
1112WE24	1	0-5	15	Negative	10YR 5/1	Clay	Forest, thin brush	Inundation
1112JJ25	1	0-40	100	Negative	10YR 5/6	Silty Clay	Herbaceous layer dominated by Cockleburs	Subsoil
1112TI26	1	0-9	60	Negative	10YR 5/1	Silty Clay Loam	Spiny Chloracantha, Tallow, Green Ash, woodland	Soil Change
1112TI26	2	9-15		Negative	10YR 4/1	Silty Clay Loam	Spiny Chloracantha, Tallow, Green Ash, woodland	Inundation
1112MVR27	1	0-20	25	Negative	10YR 4/1	Clay	Low grasses and weeds, mixed hardwoods, saturated soil	Subsoil
1112WE28	1	0-20	25	Negative	10YR 4/1	Clay	Forest, thin brush	Soil Change
1112WE28	2	20-40		Negative	10YR 3/1	Clay	Forest, thin brush	Subsoil
1112MVR29	1	0-20	25	Negative	10YR 4/1	Clay	Low grasses, weeds, mixed hardwoods, saturated soil	Subsoil
1112WE30	1	0-20	2	Negative	10YR 4/1	Clay	Forest, thin brush	Soil Change
1112WE30	2	20-40		Negative	10YR 3/1	Clay	Forest, thin brush	Subsoil
1112JJ31	1	0-16	30	Negative	10YR 5/4	Clay	Forested wetland, herbaceous layer	Inundation
1112TI32	1	0-9	40	Negative	10YR 5/1	Silty Clay Loam	Button bush, Green Ash	Inundation
1112WE33	1	0-15	5	Negative	10YR 4/1	Clay	Forest, thin brush	Soil Change
1112WE33	2	15-40		Negative	10YR 3/1	Clay	Forest, thin brush	Subsoil
1112TI34	1	0-10	40	Negative	10YR 4/1	Silty Clay Loam	Cocklebur 100%	Inundation
1112WE35	1	0-20	5	Negative	10YR 4/1	Clay	Edge of forest near R.O.W.	Soil Change
1112WE35	2	20-40		Negative	10YR 3/1	Clay	Edge of forest near R.O.W.	Subsoil

Appendix D - Shovel Test Data

Shovel Test #	Level (Strat)	Depth (cmbs)	GSV %	Positive or Negative	Munsell Color	Soil Texture Description	Description (Area; Vegetation)	Reason for Termination
1112JJ36	1	0-45	35	Negative	10YR 5/4	Clay	Forested wetland	Subsoil
1112TI37	1	0-3	90	Negative	10YR 4/1	Silty Clay Loam	Button bush, Green Ash, forest	Inundation
1112JJ38	1	0-24	85	Negative	10YR 5/1	Silty Clay	Dominated by grasses	Inundation
1112WE39	1	0-20	5	Negative	10YR 4/1	Clay	Edge of forest near R.O.W.	Soil Change
1112WE39	2	20-35		Negative	10YR 3/1	Clay	Edge of forest near R.O.W.	Inundation
1112TI40	1	0-10	90	Negative	10YR 4/1	Silty Clay Loam	Green Ash, Black Willow, Balloon Vine	Inundation
1112MVR41	1	0-25	70	Negative	10YR 4/2	Clay	Low grasses and weeds, mixed hardwoods, highly saturated Clay	Subsoil
1112TI42	1	0-10	50	Negative	10YR 4/1	Silty Clay Loam	Green Ash, Black Willow, Balloon Vine	Inundation

APPENDIX E: SHOVEL TEST DATA FOR CODE-PERMITTED TRACTS

Appendix E - Shovel Test Data for Code-Permitted Tracts

Shovel Test #	Level (Strat)	Depth (cmbs)	GSV %	Positive or Negative	Munsell Color	Soil Texture Description	Description (Area; Vegetation)	Reason for Termination
092619AM1	I	0-10	0	Negative	10YR 4/1	Clay	Forested area; mixed soil horizons	Soil change
092619AM1	II	10-30	0	Negative	10YR 5/4	Clay	Forested area; mixed soil horizons	Subsoil
092619WE2	I	0-15	0	Negative	10YR 4/1	Clay	Forested area; mixed soil horizons	Soil change
092619WE2	II	15-20	0	Negative	10YR 5/4	Clay	Forested area; mixed soil horizons	Subsoil
092619AM3	I	0-10	0	Negative	10YR 4/1	Clay	Open field; scattered trees	Soil change
092619AM3	II	10-40	0	Negative	10YR 5/4	Clay	Open field; scattered trees	Subsoil
092619WE4	I	0-20	0	Negative	10YR 4/1	Clay	Tall grass near wetland	Soil change
092619WE4	II	20-50	0	Negative	10YR 5/4	Clay	Tall grass near wetland	Subsoil
092619SB5	I	0-10	0	Negative	10YR 4/1	Clay	Manicured grass; underground utilities	Soil change
092619SB5	II	10-30	0	Negative	10YR 5/4	Clay	Manicured grass; underground utilities	Subsoil
092619WE6	I	0-20	0	Negative	10YR 4/1	Clay	In front of prison; no ground visibility	Soil change
092619WE6	II	20-50	0	Negative	10YR 5/4	Clay	In front of prison; no ground visibility	Subsoil
092619SB7	I	0-10	0	Negative	10YR 4/1	Clay	Open field; scattered trees	Soil change
092619SB7	II	10-40	0	Negative	10YR 5/4	Clay	Open field; scattered trees	Subsoil
092619WE8	I	0-30	0	Negative	10YR 4/1	Clay	Open field; scattered trees	Subsoil
092619SB9	I	0-45	0	Negative	10YR 4/1	Clay	Open field; scattered trees	Subsoil
092719WE1	I	0-15	0	Negative	10YR 4/1	Clay	Forest; damp soil; dense brush	Inundation
092719WE2	I	0-20	0	Negative	10YR 3/1	Clay	Open field; medium to tall grass	Disturbed
092719AM3	I	0-20	0	Negative	10YR 4/1	Clay	0% ground visibility; field is wet; vegetation is covering the ground	Soil change
092719AM3	II	20-30	0	Negative	10YR 3/1	Clay	0% ground visibility; field is wet; vegetation is covering the ground	Subsoil
092719WE4	I	0-10	0	Negative	10YR 5/4	Clay	0% ground visibility; field is wet; vegetation is covering the ground	Soil change
092719WE4	II	10-20	0	Negative	10YR 6/2	Clay	0% ground visibility; field is wet; vegetation is covering the ground	Subsoil
092719WE5	I	0-25	0	Negative	10YR 4/4	Clay	0% ground visibility; field is wet; vegetation is covering the ground	Soil change
092719WE5	II	25-50	0	Negative	10YR 3/1	Clay	0% ground visibility; field is wet; vegetation is covering the ground	Subsoil

Appendix E - Shovel Test Data for Code-Permitted Tracts

Shovel Test #	Level (Strat)	Depth (cmbs)	GSV %	Positive or Negative	Munsell Color	Soil Texture Description	Description (Area; Vegetation)	Reason for Termination
092719SB6	I	0-20	0	Negative	10YR 4/4	Clay	0% ground visibility; field is wet; vegetation is covering the ground	Soil change
092719SB6	II	20-30	0	Negative	10YR 3/1	Clay	0% ground visibility; field is wet; vegetation is covering the ground	Subsoil
092719SB7	I	0-20	0	Negative	10YR 4/4	Clay	0% ground visibility; field is wet; vegetation is covering the ground	Soil change
092719SB7	II	20-40	0	Negative	10YR 3/1	Clay	0% ground visibility; field is wet; vegetation is covering the ground	Subsoil
092719WE8	I	0-30	0	Negative	10YR 4/4	Clay	0% ground visibility; field is wet; vegetation is covering the ground	Soil change
092719WE8	II	30-50	0	Negative	10YR 3/1	Clay	0% ground visibility; field is wet; vegetation is covering the ground	Subsoil
092719SB9	I	0-20	0	Negative	10YR 4/4	Clay	0% ground visibility; field is wet; vegetation is covering the ground	Soil change
092719SB9	II	20-40	0	Negative	10YR 3/1	Clay	0% ground visibility; field is wet; vegetation is covering the ground	Subsoil
092719WE10	I	0-30	0	Negative	10YR 4/4	Clay	0% ground visibility; field is wet; vegetation is covering the ground	Soil change
092719WE10	II	30-45	0	Negative	10YR 3/1	Clay	0% ground visibility; field is wet; vegetation is covering the ground	Subsoil
092719WE11	I	0-30	0	Negative	10YR 4/4	Clay	0% ground visibility; field is wet; vegetation is covering the ground	Soil change
092719WE11	II	30-45	0	Negative	10YR 3/1	Clay	0% ground visibility; field is wet; vegetation is covering the ground	Subsoil
092719SB12	I	0-20	0	Negative	10YR 4/4	Clay	0% ground visibility; field is wet; vegetation is covering the ground	Soil change
092719SB12	II	20-40	0	Negative	10YR 3/1	Clay	0% ground visibility; field is wet; vegetation is covering the ground	Subsoil
092719WE13	I	0-15	0	Negative	10YR 4/4	Clay	0% ground visibility; field is wet; vegetation is covering the ground	Soil change
092719WE13	II	15-40	0	Negative	10YR 3/1	Clay	0% ground visibility; field is wet; vegetation is covering the ground	Subsoil
092719SB14	I	0-20	0	Negative	10YR 4/4	Clay	0% ground visibility; field is wet; vegetation is covering the ground	Soil change
092719SB14	II	20-40	0	Negative	10YR 3/1	Clay	0% ground visibility; field is wet; vegetation is covering the ground	Subsoil

Appendix E - Shovel Test Data for Code-Permitted Tracts

Shovel Test #	Level (Strat)	Depth (cmbs)	GSV %	Positive or Negative	Munsell Color	Soil Texture Description	Description (Area; Vegetation)	Reason for Termination
092719WE15	I	0-25	0	Negative	10YR 4/4	Clay	0% ground visibility; field is wet; vegetation is covering the ground	Soil change
092719WE15	II	25-35	0	Negative	10YR 3/1	Clay	0% ground visibility; field is wet; vegetation is covering the ground	Subsoil
092719SB16	I	0-15	0	Negative	10YR 4/4	Clay	0% ground visibility; field is wet; vegetation is covering the ground	Soil change
092719SB16	II	15-40	0	Negative	10YR 3/1	Clay	0% ground visibility; field is wet; vegetation is covering the ground	Subsoil
092719SB17	I	0-15	0	Negative	10YR 4/4	Clay	0% ground visibility; field is wet; vegetation is covering the ground	Soil change
092719SB17	II	15-40	0	Negative	10YR 3/1	Clay	0% ground visibility; field is wet; vegetation is covering the ground	Subsoil
092719SB18	I	0-20	0	Negative	10YR 4/4	Clay	0% ground visibility; field is wet; vegetation is covering the ground	Soil change
092719SB18	II	20-40	0	Negative	10YR 3/1	Clay	0% ground visibility; field is wet; vegetation is covering the ground	Subsoil
092719SB19	I	0-25	0	Negative	10YR 4/4	Clay	0% ground visibility; field is wet; vegetation is covering the ground	Soil change
092719SB19	II	25-35	0	Negative	10YR 3/1	Clay	0% ground visibility; field is wet; vegetation is covering the ground	Subsoil
092719SB20	I	0-30	0	Negative	10YR 4/4	Clay	0% ground visibility; field is wet; vegetation is covering the ground	Soil change
092719SB20	II	30-45	0	Negative	10YR 3/1	Clay	0% ground visibility; field is wet; vegetation is covering the ground	Subsoil
092719SB21	I	0-20	0	Negative	10YR 4/4	Clay	0% ground visibility; field is wet; vegetation is covering the ground	Soil change
092719SB21	II	20-40	0	Negative	10YR 3/1	Clay	0% ground visibility; field is wet; vegetation is covering the ground	Subsoil
092719SB22	I	0-25	0	Negative	10YR 4/4	Clay	0% ground visibility; field is wet; vegetation is covering the ground	Soil change
092719SB22	II	25-35	0	Negative	10YR 3/1	Clay	0% ground visibility; field is wet; vegetation is covering the ground	Subsoil
101019SB1	I	0-5	0	Negative	-	Clay	Buried pipeline	Disturbed
101019SB2	II	0-5	0	Negative	-	Clay	Buried pipeline	Disturbed
101019SB3	I	0-5	0	Negative	-	Clay	Buried pipeline	Disturbed
101019SB4	II	0-5	0	Negative	-	Clay	Buried pipeline	Disturbed
101019SB5	I	0-5	0	Negative	-	Clay	Buried pipeline	Disturbed

Appendix E - Shovel Test Data for Code-Permitted Tracts

Shovel Test #	Level (Strat)	Depth (cmbs)	GSV %	Positive or Negative	Munsell Color	Soil Texture Description	Description (Area; Vegetation)	Reason for Termination
101019SB6	II	0-5	0	Negative	-	Clay	Ground is saturated with water	Inundation
101019SB7	I	0-5	0	Negative	-	Clay	Ground is saturated with water	Inundation
101019SB8	II	0-5	0	Negative	-	Clay	Ground is saturated with water	Inundation
1220JL01	I	0-10	10	Negative	10YR 3/1	Clay	On cut grass, near sports complex & paved road	Arbitrary
		10-20		Negative	10YR 3/1	Clay		Soil change
	II	20-30		Negative	10YR 4/1	Clay		Arbitrary
		30-40		Negative	10YR 4/1	Clay		Arbitrary
		20-50		Negative	10YR 4/1	Clay		Subsoil
1220WK02	I	0-10	0	Negative	10YR 3/1	Subangular clay	Area is manicured lawn adjacent to a very large parking lot and sports compound	Arbitrary
	II	10-20		Negative	10YR 4/1	Blocky clay		Soil change
		20-30		Negative	10YR 4/1	Blocky clay		Subsoil
1220WK03	I	0-10	0	Negative	10YR 3/1	Subangular clay	Area is manicured lawn adjacent to a very large parking lot and sports compound	Arbitrary
	II	10-20		Negative	10YR 4/1	Blocky clay		Soil change
		20-30		Negative	10YR 4/1	Blocky clay		Subsoil
1220JL04	I	0-10	10	Negative	Disturbed	Clay	Inundated grass, near sports complex parking lot	Arbitrary
	I	10-20		Negative	Disturbed	Clay		Disturbed
1220WK12	I	0-10	30	Negative	10YR 4/1	Granular clay	Area is thoroughly inundated Wetland. STP spot is on a dry patch with young pine	Arbitrary
		10-20		Negative	10YR 4/1	Granular clay		Arbitrary
		20-30		Negative	10YR 4/1	Granular clay		Soil change
	II	30-40		Negative	10YR 5/1	Angular clay		Subsoil
1220CK13	I	0-10	0	Negative	10YR 3/1	Sandy clay	Located in marshland. Surrounded by water. H2O @ 10 cmbs	Inundation
1220CK14	I	0-10	0	Negative	10YR 3/1	Sandy clay	Located in marshland. Surrounded by water. H2O @ 10 cmbs	Inundation
1220WK15	I	0-20	30	Negative	10YR 3/1	Granular clay	Area is thoroughly inundated Wetland. STP spot is on a dry patch with young pine	Arbitrary
		10-20		Negative	10YR 3/1	Granular clay		Soil change
	II	20-30		Negative	10YR 4/1	Angular clay		Subsoil
1220CK16	I	0-10	0	Negative	10YR 3/1	Sandy clay	Located in marshland. Surrounded by water. H2O @ 10 cmbs.	Inundation

Appendix E - Shovel Test Data for Code-Permitted Tracts

Shovel Test #	Level (Strat)	Depth (cmbs)	GSV %	Positive or Negative	Munsell Color	Soil Texture Description	Description (Area; Vegetation)	Reason for Termination
1220JL17	I	0-10	10	Negative	10YR 4/1	Clay	Pipeline corridor, inundated	Inundation
1220CK18	I	0-10	0	Negative	10YR 3/1	Sandy clay	Located in marshland. Surrounded by water. H2O @ 10 cmbs.	Inundation
1220JL19	I	0-10	10	Negative	10YR 4/1	Clay	Pipeline corridor, inundated	Inundation
1220WK20	I	0-10	15	Negative	10YR 5/1	Granular clay	Area subject to frequent periods of inundation	Arbitrary
		10-20		Negative	10YR 5/1	Granular clay		Inundation
1220JL21	I	0-25	15	Negative	10YR 5/1	Granular clay	Area subject to frequent periods of inundation	Inundation
1220WK22	I	0-10	15	Negative	10YR 4/1	Granular clay	Area subject to frequent periods of inundation	Inundation
1220CK23	I	0-10	0	Negative	10YR 3/1	Sandy clay	Located in marshland. Surrounded by water. H2O @ 10 cmbs.	Inundation
1220JL24	I	0-10	10	Negative	10YR 4/1	Clay	Pipeline corridor, inundated	Inundation
1221WK01	I	0-10	30	Negative	10YR 4/1	Granular clay	Area is a two track adjacent to Wetland; very disturbed.	Arbitrary
		10-20		Negative	10YR 4/1	Granular clay		Disturbed
1221CK02	I	0-10	0	Negative	10YR 5/1	Clay	Open field with knee high grass. H2O at 10cmbs	Inundation
1221CK03	I	0-10	0	Negative	10YR 5/1	Clay	Open field with knee high grass. H2O at 10cmbs	Inundation
1221WK04	I	0-10	0	Negative	10YR 4/1	Granular clay	Wetland with standing water throughout. Briar and grass obscure ground surface visibility	Arbitrary
		10-20		Negative	10YR 4/1	Granular clay		Soil change
	II	20-30		Negative	10YR 3/1	Angular clay		Subsoil
1221WK05	I	0-10	0	Negative	10YR 4/1	Granular clay	Wetland with standing water throughout. Briar and grass obscure ground surface visibility	Arbitrary
		10-20		Negative	10YR 4/1	Granular clay		Soil change
	II	20-30		Negative	10YR 5/1	Angular clay		Arbitrary
		30-40		Negative	10YR 5/1	Angular clay		Subsoil
1221CK06	I	0-10	0	Negative	10YR 5/1	Clay	Open field with knee high grass. H2O at 10cmbs	Inundation
1221WK07	I	0-10	0	Negative	10YR 4/1	Granular clay	Wetland with standing water throughout. Briar and grass	Arbitrary
	II	10-20		Negative	7.5YR 5/1	Angular clay		Soil change
		20-30		Negative	7.5YR 5/1	Angular clay		Subsoil

Appendix E - Shovel Test Data for Code-Permitted Tracts

Shovel Test #	Level (Strat)	Depth (cmbs)	GSV %	Positive or Negative	Munsell Color	Soil Texture Description	Description (Area; Vegetation)	Reason for Termination
1221CK08	I	0-10	0	Negative	10YR 5/1	Clay	Open field with knee high grass. H2O at 10cmbs	Inundation
1221JL09	I	0-10	0	Negative	10YR 4/1 & 10YR 5/1	Clay	Waist-high grasses and brush	Inundation
1221JL10	I	0-10	0	Negative	10YR 4/1 & 10YR 5/1	Clay	Waist-high grasses and brush	Inundation
1221CK11	I	0-10	0	Negative	10YR 5/1	Clay	Open field with knee high grass. H2O at 10cmbs	Inundation
1221WK12	I	0-10	0	Negative	10YR 4/1	Granular clay	Wetland with standing water throughout. Briar and grass obscure ground surface visibility	Arbitrary
		10-20		Negative	10YR 4/1	Granular clay		Soil change
	II	20-25		Negative	7.5YR 5/1	Angular clay		Subsoil
1221JL13	I	0-10	0	Negative	10YR 4/1	Clay	Waist-high grasses and brush	Inundation
1221CK14	I	0-10	0	Negative	10YR 5/1	Clay	Open field with knee high grass.	Arbitrary
	II	10-20		Negative	10YR 3/1	Clay		Soil change
		20-30		Negative	10YR 3/1	Clay		Subsoil
1221CK15	I	0-10	0	Negative	10YR 5/1	Clay	Open field with knee high grass.	Arbitrary
	II	10-20		Negative	10YR 3/1	Clay		Soil change
		20-30		Negative	10YR 3/1	Clay		Subsoil
1221JL16	I	0-10	0	Negative	10YR 4/1	Clay	Waist-high grasses and brush	Inundation
1221WK17	I	0-10	0	Negative	10YR 4/1	Granular clay	Wetland with standing water throughout. Briar and grass obscure ground surface visibility	Arbitrary
	II	10-20		Negative	7.5YR 5/1	Angular clay		Soil change
		20-30		Negative	7.5YR 5/1	Angular clay		Subsoil
1221CK18	I	0-10	0	Negative	10YR 5/1	Clay	Open field with knee high grass.	Arbitrary
	II	10-20		Negative	10YR 3/1	Clay		Soil change
		20-30		Negative	10YR 3/1	Clay		Subsoil
1221JL19	I	0-10	0	Negative	10YR 4/1	Clay	Waist-high grasses and brush	Inundation

APPENDIX F: ARCHEOLOGICAL MONITORING PLAN

Energy Transfer Company

Archeological Monitoring Plan

Orbit Pipeline Project

January 2020

Archeological Monitoring Plan for the Orbit Pipeline Project

A. INTRODUCTION

Energy Transfer Company (ETC) is proposing to construct the Orbit Pipeline Project (Project) located in Jefferson, Liberty, and Chambers counties, Texas. The Project consists of approximately 68.7 miles (mi) (110.6 kilometer [km]) of new 20.0-inch (in) (50.8 centimeter [cm]) diameter pipeline that will be used to transmit ethane and propane. This document describes the procedures for archeological monitoring during the construction phase of the Project at select areas (herein defined as Permit Areas) as defined by the US Army Corps of Engineers (USACE), and outlined in Table 1. It is intended to:

- Maintain compliance with applicable Federal and State laws and regulations during construction of the Project; and,
- Describe the procedure the archeological monitor and construction personnel will follow in the event that archeological resources are identified during the construction phase of the Project.

The Archeological Monitor will be a Secretary of the Interior (SOI) qualified archeologist, and would work collaboratively with the Environmental Inspection team to ensure compliance with Section 106 of the National Historic Preservation Act (NHPA), and USACE permitting provisions.

The Environmental Project Manager, Construction Supervisor, or Lead Environmental Inspector (EI) will be responsible for providing ample notice (i.e. 48 to 72 hours) to the archeological monitor when ground disturbing activities are anticipated to occur within the Permit Areas. For purposes of this Plan, ground disturbing activities are defined as any activities that have the potential to impact cultural resources. These include vegetation clearing, grading, and trenching activities. Certain activities during construction would not require monitoring such as the lowering in of the pipe, clean up or back-filling, transportation of equipment, or installation of temporary fencing.

The Archeological Monitor would actively observe ground disturbing activities to look for evidence of cultural materials exposed by construction equipment, and would be required to follow all safety procedures and protocols while on site. For safety purposes, the monitor would not be allowed to enter any trenches at any point unless approval is provided by the Construction Supervisor and proper shoring is in place. Instead, the monitor would inspect excavated soils behind construction equipment at a safe distance in accordance with safety protocols.

At Horizontal Direction Drill (HDD) workspaces, monitoring will take place at the entry and exit drill points. In the event that an inadvertent return occurs, the monitor would be present to inspect clean-up activities.

The Archeological Monitor would be responsible for submitting daily reports to the EI team and the Archeological Principal Investigator that details the areas monitored, results of monitoring activities, and representative photographs. Upon completion of the monitoring responsibilities, a monitoring report would be produced for review by the USACE and the Texas Historical Commission (THC) to conclude Section 106 consultations for the Project.

B. PROCEDURES FOR THE DISCOVERY OF CULTURAL RESOURCES

In the event that a cultural resource is discovered within a Permit Area, the following plan will be implemented:

1. All work within 100 feet of both sides of the discovery will immediately stop and the EI will be notified. The area of work stoppage will be adequate to provide for the security, protection, and integrity of the materials.
2. The EI and Archeological Monitor will take appropriate steps to protect the discovery site. This will include flagging the immediate area of discovery and stop work or exclusion zone as well as notifying the Environmental Project Manager. All cultural materials will be fully delineated in accordance with THC guidelines within the project area by the archaeologist, and possibly additional personnel, in order to determine if further work and/or avoidance is recommended. If the monitor determines that the find constitutes an archeological site, then additional evaluation and assessment may be necessary.
3. Work in the immediate area will not resume until treatment of the discovery has been completed.
4. If the discovery is determined to have the potential for eligibility, the archaeologist will consult with the USACE and SHPO on how best to avoid, minimize, or otherwise mitigate further impacts. Treatment measures may include, but are not limited to, mapping, photography, sample collection, or excavation activity.

C. PROCEDURES FOR THE DISCOVERY OF HUMAN REMAINS

In the event that human remains, possible human remains, or grave goods are encountered during either construction or maintenance activities, the following plan outlines the specific procedures to be followed. These procedures meet or exceed the Policy Statement Regarding Treatment of Burial Sites, Human Remains, and Funerary Objects adopted by the Advisory Council on Historic Preservation, "Protection of Historic and Cultural Properties" (36 CFR Part 800); Procedures for the Protection of Historic Properties (33 CFR 325 Appendix C); the Archaeological and Historic Preservation Act, and Texas Health and Safety Code (Title 8, Chapters 711-714).

All activity that might disturb the remains shall cease and may not resume until authorized by appropriate law enforcement officials, the USACE Staff Archeologist, or the State Archaeologist. Any human remains, burial sites, or burial related materials that are discovered during construction will at all times be treated with dignity and respect.

1. The Lead EI or archaeologist, will notify the Environmental Project Manager, the Texas Historical Commission Regional Archaeologist, the law enforcement agency and the coroner of the jurisdiction where the site or remains are located within 24 hours of the discovery. The USACE Staff Archeologist also be contacted to assist with identifying the remains, as required.
2. Any activity that may disturb the unmarked burial site, human skeletal remains, or burial artifacts associated with the site will immediately cease on discovery. The site will be carefully covered and secured for protection from degradation by weather or unauthorized

individuals.

3. The EI will be responsible for taking appropriate steps to protect the discovery. This will include fencing off the immediate area of discovery and flagging the area as an exclusion zone. No activity may resume until authorized by the agency authority governing the disposition of the human remains.
4. If the unmarked burial site, human skeletal remains, or funerary objects can be shown to have ethnic affinity with a living Native American tribe, the USACE would take necessary steps to assist in determining the tribe(s), if any, who may have historic ties to the region and represent descendants of any Native American remains.
5. If the District Coroner finds that the unmarked burial site is over 50 years old and that there is no need for a legal inquiry by their office or for a criminal investigation, and if no direct relations to any Native American tribe are found, then the USACE will have jurisdiction of the site, human skeletal remains, and the burial artifacts.

Should the find be determined to constitute a cemetery, a notice of existence of a cemetery will be filed within 10 days of the discovery per requirement under Ch 711 of the Texas Health & Safety Code.

D. PROJECT CONTACTS

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Orbit Permit Areas						
Feature ID	Milepost	Tract ID	Land Ownership	Reason Surveys Not conducted	Archeological Monitor Needed	Appendix B Aerial Map Pg. No.
WP9CH004_DT	2.7	TX-CH-019.200	Private	Survey permission denied	No-Workspace change; feature will not be impacted	5
WP4LI002_PFO (First Crossing)	16.9	TX-LI-029.000	Private	Flooded tract	Yes	23
WP4LI002_PFO_C (First Crossing)	17	TX-LI-029.000	Private	Flooded tract	Yes	23
WP4LI002_PFO (Second Crossing)	17	TX-LI-029.000	Private	Flooded tract	Yes	23
WP4LI002_PFO_C (Second Crossing)	17.2	TX-LI-029.000	Private	Flooded tract	Yes	23
WP3LI007_PFO (First Crossing)	17.8	TX-LI-029.000	Private	Originally flooded tract	No – survey has been completed	24
WP3LI007_PFO (Second Crossing)	17.8	TX-LI-029.000	Private	Originally flooded tract	No – survey has been completed	24
WP3LI007_PFO (Third Crossing)	17.8	TX-LI-029.000	Private	Originally flooded tract	No – survey has been completed	24
WP4LI002_PEM (Second Crossing)	17.8	TX-LI-029.000	Private	Originally flooded tract	No – survey has been completed	24
WP3LI007_PEM	17.9	TX-LI-029.000	Private	Originally flooded tract	No – survey has been completed	24
WP3LI007_PFO (Fourth Crossing)	17.9	TX-LI-029.000	Private	Originally flooded tract	No – survey has been completed	24
WP3LI007_PFO (Fifth Crossing)	17.9	TX-LI-029.000	Private	Originally flooded tract	No – survey has been completed	24
WP3LI007_PFO (Sixth Crossing)	18	TX-LI-029.000	Private	Originally flooded tract	No – survey has been completed	24
WP3LI007_PFO (Seventh Crossing)	18	TX-LI-029.000	Private	Originally flooded tract	No – survey has been completed	24
WP3LI007_PFO (Eighth Crossing)	18	TX-LI-029.000	Private	Originally flooded tract	No – survey has been completed	24
WP3LI007_PFO (Ninth Crossing)	18.1	TX-LI-029.000	Private	Originally flooded tract	No – survey has been completed	24
WP3LI007_PFO (Tenth Crossing)	18.2	TX-LI-029.000	Private	Originally flooded tract	No – survey has been completed	24
WP3LI007_PFO (Eleventh Crossing)	18.3	TX-LI-029.000	Private	Originally flooded tract	No – survey has been completed	25
WP3LI006_PSS	18.3	TX-LI-029.000	Private	Originally flooded tract	No – survey has been completed	25
WP3LI006_PFO (First Crossing)	18.3	TX-LI-029.000	Private	Originally flooded tract	No – survey has been completed	25
WP3LI006_PFO (Second Crossing)	18.4	TX-LI-029.000	Private	Originally flooded tract	No – survey has been completed	25
WP3LI006_PEM	18.4	TX-LI-029.000	Private	Originally flooded tract	No – survey has been completed	25

Orbit Permit Areas						
Feature ID	Milepost	Tract ID	Land Ownership	Reason Surveys Not conducted	Archeological Monitor Needed	Appendix B Aerial Map Pg. No.
WP3LI006_PFO (Third Crossing)	18.5	TX-LI-029.000	Private	Originally flooded tract	No – survey has been completed	25
WP3LI006_PFO (Fourth Crossing)	18.6	TX-LI-029.000	Private	Originally flooded tract	No – survey has been completed	25
WP3LI006_PFO (Fifth Crossing)	18.6	TX-LI-029.000	Private	Originally flooded tract	No – survey has been completed	25
WP3LI006_PFO (Sixth Crossing)	18.8	TX-LI-029.000	Private	Originally flooded tract	No – survey has been completed	25
WP3LI006_PFO (Seventh Crossing)	18.9	TX-LI-029.000	Private	Originally flooded tract	No – survey has been completed	25
WP3LI002_PEM (First Crossing)	19	TX-LI-031.000	Private	Originally flooded tract	No - Avoided via HDD/Bore	26
WP3LI002_PSS_B	19.1	TX-LI-031.000	Private	Originally flooded tract	No - Avoided via HDD/Bore	26
WP3LI002_PEM (Second Crossing)	19.1	TX-LI-031.000	Private	Originally flooded tract	No - Avoided via HDD/Bore	26
WP3LI002_PEM (Third Crossing)	19.1	TX-LI-031.000	Private	Originally flooded tract	No - Avoided via HDD/Bore	26
WP3LI004	19.1	TX-LI-031.000	Private	Originally flooded tract	No - Avoided via HDD/Bore	26
WP3LI005_PEM (First Crossing)	19.1	TX-LI-031.000	Private	Originally flooded tract	No - Avoided via HDD/Bore	26
WP3LI005_PFO_CYP	19.2	TX-LI-031.000	Private	Originally flooded tract	No - Avoided via HDD/Bore	26
WP4LI020_PSS_B	26.5	TX-LI-054.910	Private	Originally flooded tract	No - Avoided via HDD/Bore	33
WP4LI020_PSS (First Crossing)	26.5	TX-LI-054.910	Private	Originally flooded tract	No - Avoided via HDD/Bore	33
WP4LI020_PEM (First Crossing)	26.5	TX-LI-054.910	Private	Originally flooded tract	No - Avoided via HDD/Bore	33
WP4LI020_PSS (Second Crossing)	26.6	TX-LI-054.910	Private	Originally flooded tract	No - Avoided via HDD/Bore	33
WP4LI020_PSS (Third Crossing)	26.6	TX-LI-054.910	Private	Originally flooded tract	No - Avoided via HDD/Bore	33
WP4LI020_PEM (Second Crossing)	26.7	TX-LI-054.910	Private	Originally flooded tract	No - Avoided via HDD/Bore	33
WP4LI021_PSS	29.5	TX-LI-063.000	Private	None	No - Avoided via HDD/Bore	36
WP4LI021_PEM	29.5	TX-LI-063.000	Private	None	No - Avoided via HDD/Bore	36
WP9JE010_PFO_DT (First Crossing)	47.5	TX-JE-018.000	Private	Originally flooded tract	No - Avoided via HDD/Bore	55
WP9JE010_PEM_DT	47.6	TX-JE-018.000	Private	Originally flooded tract	No - Avoided via HDD/Bore	56
WP9JE010_PFO_DT (Second Crossing)	47.6	TX-JE-018.000	Private	Originally flooded tract	No - Avoided via HDD/Bore	56

Orbit Permit Areas						
Feature ID	Milepost	Tract ID	Land Ownership	Reason Surveys Not conducted	Archeological Monitor Needed	Appendix B Aerial Map Pg. No.
WP4JE060	47.7	TX-JE-018.000	Private	Originally flooded tract	No - Avoided via HDD/Bore	56
SP9CH002_DT	2.5	TX-CH-017.000	Private	Originally flooded tract	No - Avoided via HDD/Bore	5
SP9CH013_DT	2.9	TX-CH-019.200	Private	Survey permission denied	No - Avoided via HDD/Bore	5
SP4LI004 (First Crossing)	17	TX-LI-029.000	Private	Flooded tract	Yes	23
SP3LI004	17.8	TX-LI-029.000	Private	Originally flooded tract	No – survey has been completed	24
SP3LI003	18.3	TX-LI-029.000	Private	Originally flooded tract	No – survey has been completed	25
SP3LI001 (First Crossing)	19	TX-LI-031.000	Private	Originally flooded tract	No - Avoided via HDD/Bore	26
SP3LI001 (Second Crossing)	19	TX-LI-031.000	Private	Originally flooded tract	No - Avoided via HDD/Bore	26
SP3LI002 (First Crossing)	19.1	TX-LI-031.000	Private	Originally flooded tract	No - Avoided via HDD/Bore	26
SP3LI002 (Second Crossing)	19.1	TX-LI-031.000	Private	Originally flooded tract	No - Avoided via HDD/Bore	26
SP9LI018_DT	22.7	TX-LI-041.000	Private	Survey permission denied	No - Avoided via HDD/Bore	29
SP9LI016_DT	23	TX-LI-041.000	Private	Survey permission denied	No - Avoided via HDD/Bore	30
SP9LI017_DT	23.4	TX-LI-041.000	Private	Survey permission denied	No - Avoided via HDD/Bore	30
SP4LI009	26.5	TX-LI-054.910	Private	Flooded tract	No - Avoided via HDD/Bore	33
SP9JE012_DT	46.3	TX-JE-014.110	Private	Flooded tract	No - Avoided via HDD/Bore	54
SP9JE011_DT	46.5	TX-JE-016.900	Public - Jefferson County Drainage District 6	Survey permission denied	No - Avoided via HDD/Bore	54
SP9JE010_DT	46.9	TX-JE-017.000	Private	Survey permission denied	No - Avoided via HDD/Bore	55
SP9JE009_DT	47	TX-JE-017.000	Private	Survey permission denied	No - Avoided via HDD/Bore	55

Orbit Permit Areas						
Feature ID	Milepost	Tract ID	Land Ownership	Reason Surveys Not conducted	Archeological Monitor Needed	Appendix B Aerial Map Pg. No.
SP9JE008_DT	47.2	TX-JE-017.902	Public - Jefferson County Drainage District 6	Survey Permission denied	No - Avoided via HDD/Bore	55
SP9JE007_DT	47.4	TX-JE-018.000	Private	Survey permission denied	No - Avoided via HDD/Bore	55
SP9JE019_DT	47.5	TX-JE-018.000	Private	Survey permission denied	No - Avoided via HDD/Bore	55
SP4JE049	47.6	TX-JE-018.000	Private	Survey permission denied	No - Avoided via HDD/Bore	56
SP9JE050_DT	47.8	TX-JE-018.000	Private	Survey permission denied	No - Avoided via HDD/Bore	56
SP9JE001_DT (First Crossing)	48.1	TX-JE-018.000	Private	Survey permission denied	No - Avoided via HDD/Bore	56
SP9JE001_DT (Second Crossing)	48.1	TX-JE-018.000	Private	Survey permission denied	No - Avoided via HDD/Bore	56
SP9JE003_DT	48.4	TX-JE-021.000	Private	Survey permission denied	No - Avoided via HDD/Bore	56
SP9JE004_DT	48.8	TX-JE-021.000	Private	Survey permission denied	No - Avoided via HDD/Bore	57
SP9JE005_DT	49	TX-JE-021.000	Private	Survey permission denied	No - Avoided via HDD/Bore	57
SP9JE006_DT	49.2	TX-JE-022.000	Private	Survey permission denied	No - Avoided via HDD/Bore	57

APPENDIX G: UNANTICIPATED DISCOVERY PLAN

Energy Transfer Company

Plan for the Unanticipated Discovery of Cultural Resources and Human Remains

Orbit Pipeline Project

October 2019

PLAN FOR THE UNANTICIPATED DISCOVERY OF CULTURAL RESOURCES AND HUMAN REMAINS

A. INTRODUCTION

Energy Transfer Company (ETC) proposes to construct the Orbit Pipeline Project (Project) located in Jefferson, Liberty, and Chambers counties, Texas. The Project consists of approximately 68.7 miles (mi) (110.6 kilometer [km]) of new 20.0 inch (in) (50.8 centimeter [cm]) diameter pipeline that will be used to transmit ethane and propane. This document describes the procedures for dealing with unanticipated discoveries during the course of project construction. It is intended to:

- Maintain compliance with applicable Federal and State laws and regulations during construction of the Project;
- Describe to regulatory and review agencies the procedure the Project or its representative will follow to prepare for and deal with unanticipated discoveries; and
- Provide direction and guidance to project personnel as to the proper procedure to be followed should an unanticipated discovery occur.

B. PROCEDURES FOR THE DISCOVERY OF CULTURAL RESOURCES

In the event that any member of the construction work force believes that a cultural resource discovery is encountered the following plan will be implemented:

1. All work within 100 feet both sides of the discovery will immediately stop and the Environmental Inspector will be notified. The area of work stoppage will be adequate to provide for the security, protection, and integrity of the materials. A cultural resource can be prehistoric or historic and could consist of, but not be limited to:
 - An accumulation of shell, burned rocks, ceramics or other subsistence related materials
 - An area of charcoal or very dark soil with artifacts
 - Stone tools, arrowheads, or dense concentrations of stone artifacts
 - A cluster of bones in association with shell, charcoal, burned rocks, stone artifacts, ceramics, or other culturally-modified items. A historic structure or assemblage of historic materials older than 50 years
2. If the Environmental Inspector believes that the discovery is a cultural resource, the Environmental Inspector will take appropriate steps to protect the discovery site. This will include flagging the immediate area of discovery and stop work or exclusion zone, as well as notifying the Environmental Project Manager and/or Company Representative. Work in the immediate area will not resume until treatment of the discovery has been completed.
3. ETC or its representative will arrange for the discovery to be evaluated by a qualified archaeologist who meets the Secretary of Interior Standards for archeology. The archaeologist will evaluate the remains and provide recommendations for how to manage the resource under the State's Historic Preservation Plan.

4. The archaeologist will seek consultation with the SHPO and US Army Corps of Engineer (USACE) staff archaeologist regarding the National Register eligibility status of the discovery. If the discovery is determined to have the potential for eligibility, the archaeologist will consult with the SHPO on how best to avoid, minimize, or otherwise mitigate further impacts. Treatment measures may include mapping, photography, sample collection, or excavation activity.
5. The archaeologist will implement the appropriate treatment measure(s) and provide a report on its methods and results. The investigation and technical report will be performed in compliance with the Secretary of the Interior's Standards and Guidelines for Archaeological Documentation (48 CFR 44734—44737); the Advisory Council on Historic Preservation (ACHP) publication "Treatment of Archaeological Properties" (ACHP 1980); and follow the guidelines set forth by the Texas State Historic Preservation Office.

C. PROCEDURES FOR THE DISCOVERY OF HUMAN REMAINS

In the event that human remains are encountered during either construction or maintenance activities, the following plan outlines the specific procedures to be followed. These procedures meet or exceed the Policy Statement Regarding Treatment of Burial Sites, Human Remains, and Funerary Objects adopted by the ACHP, "Protection of Historic and Cultural Properties" (36 CFR Part 800); Procedures for the Protection of Historic Properties (33 CFR 325 Appendix C); the Archaeological and Historic Preservation Act, and Texas Health and Safety Code (Title 8, Chapters 711-714).

All activity that might disturb the remains shall cease and may not resume until authorized by appropriate law enforcement officials or the State Archaeologist. Any human remains, burial sites, or burial related materials that are discovered during construction will at all times be treated with dignity and respect.

1. The Site Manager- or archaeologist, if present, will notify ETC's Environmental Project Manager, the law enforcement agency and the coroner of the jurisdiction where the site or remains are located within two days of the discovery. The State Archaeologist will also be contacted to assist with identifying the remains, as required. The USACE archeologist (Galveston District) will also be notified.
2. Any activity that may disturb the unmarked burial site, human skeletal remains, or burial artifacts associated with the site will immediately cease on discovery. The site will be carefully covered and secured for protection from degradation by weather or unauthorized individuals.
3. The Environmental Inspector will be responsible for taking appropriate steps to protect the discovery. This will include fencing off the immediate area of discovery and flagging the area as an exclusion zone. No activity may resume until authorized by the agency authority governing the disposition of the human remains.
4. If the unmarked burial site, human skeletal remains, or funerary objects can be shown to have ethnic affinity with a living Native American tribe, the Project's Environmental Manager will notify the SHPO and USACE to assist in determining the tribe(s), if any,

who may have historic ties to the region and represent descendants of any Native American remains. If direct relations to a Native American tribe are verified, the tribe will have control of the disposition of the human skeletal remains.

5. If the District Coroner finds that the unmarked burial site is over 50 years old and that there is no need for a legal inquiry by their office or for a criminal investigation, and if no direct relations to any Native American tribe are found, then the SHPO will have jurisdiction of the site, human skeletal remains, and the burial artifacts.

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