AN ARCHAEOLOGICAL SURVEY FOR THE COTTONWOOD ENERGY LP PROJECT IN NEWTON AND ORANGE COUNTIES,TEXAS

By
William E. Moore

Brazos Valley Research Associates
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AN ARCHAEOLOGICAL SURVEY FOR THE COTTONWOOD ENERGY LP PROJECT IN NEWTON AND ORANGE COUNTIES, TEXAS

Project Number: BVRA 03-23

Author and Principal Investigator

William E. Moore

Prepared for

Cottonwood Energy
Post Office Box 289
Deweyville TX 77614

Prepared by

Brazos Valley Research Associates
813 Beck Street
Bryan, Texas 77803

ABSTRACT

Brazos Valley Research Associates (BVRA) performed a cultural resources survey of a 52 acre Cottonwood Energy LP power plant site and a four mile effluent discharge line in August 2003 in southern Newton and northern Orange counties, Texas. This study was required by the Texas Historical Commission in order to identify any archaeological sites in the project area that may have been adversely affected by recent construction. This investigation falls under Section 106 requirements of the National Historic Preservation Act, and no Antiquities Permit from the Texas Historical Commission was required. The project area was investigated by a 100% pedestrian surface survey accompanied by shovel testing and probing. No archaeological sites were found within the boundaries of the project area that has been virtually destroyed by construction. Although several areas appeared on the topographic maps to be good settings for prehistoric sites, soils in these locations consisted primarily of very firm clay at or near the surface.

ACKNOWLEDGMENTS

BVRA is appreciative of the assistance provided by Joe Kuebler of URS Corporation in Austin, Texas; Betty Clark of Cottonwood Energy LP in Deweyville, Texas; and Paul Jeanis of the Sabine River Authority. They provided the field crew with maps of the project area, keys to locked gates, and were available for consultation throughout the project. Jean Hughes, Assistant Curator of Records at the Texas Archeological Research Laboratory (TARL) in Austin, Texas, checked the TARL files for previously recorded sites in the project area. Lili Lyddon of Lyddon Illustrations of North Zulch, Texas prepared all figures in this report. The project archaeologist was Edward P. Baxter who is thanked for working during a time of extreme heat. Ed Baker at the Texas Historical Commission reviewed this project.

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INTRODUCTION

In 1998, an archaeological assessment of 288.75 acres in southern Newton County, Texas was performed by the consulting firm Antiquities Planning & Consulting (1998). This study was performed for American National Power, Inc. of Houston, Texas who contemplated the construction of an independent power production plant. A check of the site records at TARL and the Texas Historical Commission was conducted, and a field inspection of the site with no shovel testing was performed. Two conclusions were made regarding the potential of this site for the presence of significant archaeological sites. First, the 288.75 acre tract was viewed as a low probability area, and it was recommended that construction be allowed to proceed as planned. Second, it was noted that future conveyance lines to and from the power plant might pass through likely settings for archaeological sites. It was, therefore, recommended that the footprint of these lines be subjected to archaeological survey prior to construction. Ownership of the site was transferred to Cottonwood Energy LP who constructed a power plant on a 52 acre tract within the 288.75 acres assessed by Antiquities Planning & Consulting in 1998. In addition, an effluent discharge line connecting the plant with an outfall area at Holden Slough, approximately four miles to the south and east, was constructed. As part of a pending water quality permit action, the Texas Historical Commission requested a field survey with shovel testing of the plant site and pipeline in order to determine if significant cultural resources were affected by the construction.

In order to satisfy this requirement, BVRA was retained by Cottonwood Energy LP through URS Corporation of Austin, Texas to investigate the plant site and effluent discharge pipeline. The project was discussed with reviewer Ed Baker who requested shovel tests around the perimeter of the 52 acre plant site and along the existing four mile pipeline. This field survey was performed on August 8-9, 2003 by Edward P. Baxter, the Project Archaeologist. William E. Moore was the Principal Investigator. The power plant is located in southern Newton County, and the effluent discharge line passes through southern Newton and northern Orange counties (Figure 1). The project area is located on two 7.5' topographic quadrangles. They are Echo, dated 1954 (3093-213) and Starks, dated 1994 (3093-242) (Figure 2).

This project was performed under "Contract for Archeological Services URS 807 957.01. The project number assigned by BVRA is 03-23. This project is not under control of the State of Texas or any of its municipalities. Therefore, an Antiquities Permit from the Texas Historical Commission, Archeology Division, was not required. The federal agency overseeing this project is the Texas Commission on Environmental Quality (TCEQ).

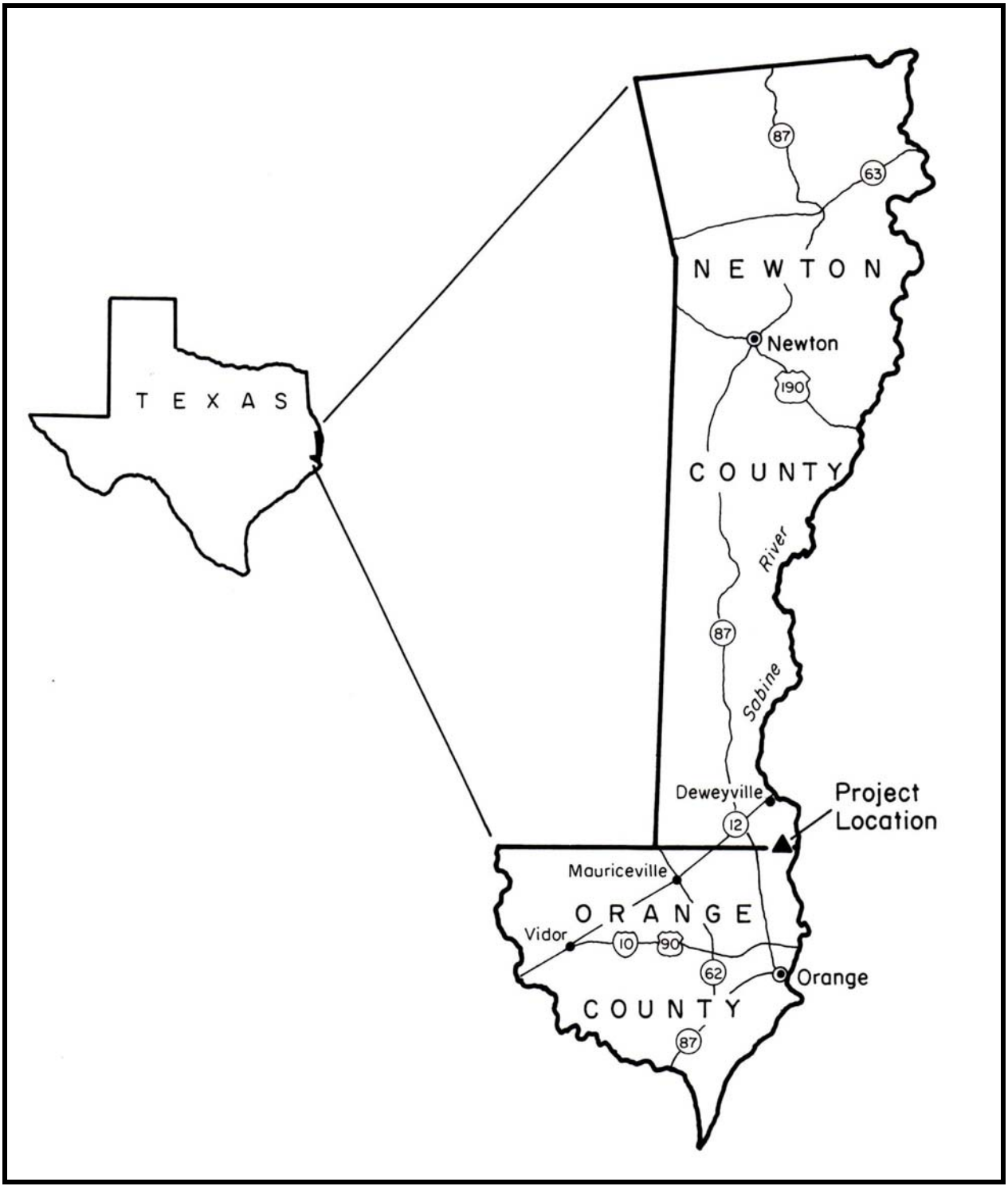

Figure 1. General Location Map

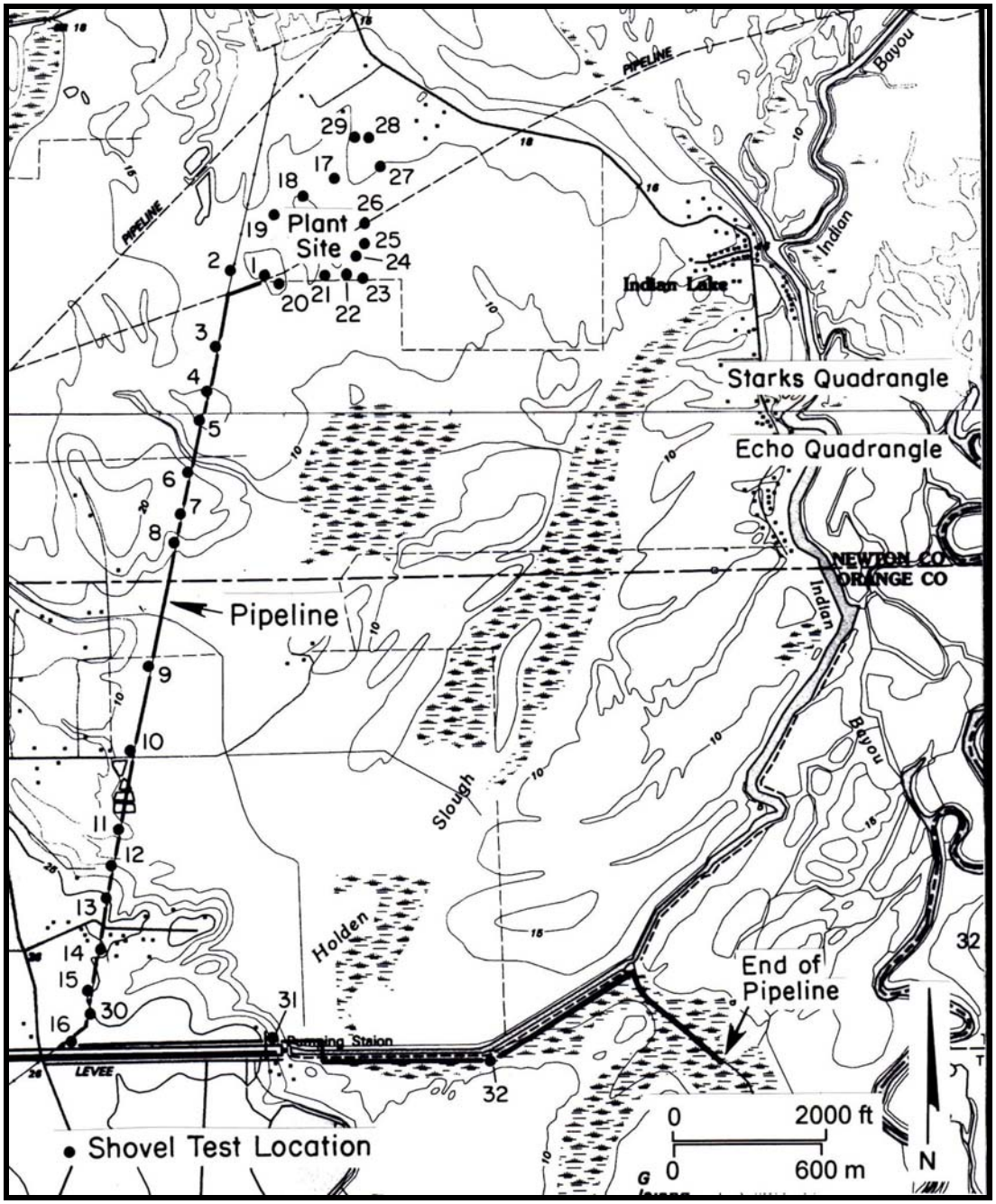

Figure 2. Project Area on Topographic Quadrangles

(Depicting Shovel Test Locations)

ENVIRONMENTAL SETTING

The following general statements regarding the environment of Newton and Orange counties were taken from the soil survey by Neitsch (1982) and the Texas Almanac (Kingston and Harris 1985). These counties are in the extreme eastern part of Texas. The landscape ranges from sandy, rolling hills in the northern part of Newton County to wet, loamy flatwoods in the southern part of Newton County and northern part of Orange County. They are drained by numerous rivers and streams such as Indian Bayou and the Sabine River just to the east of the project area. Elevation ranges from over 500 feet in the uplands to slightly less than 10 feet in the bottom lands in southern Newton and northern Orange counties. Timber is a major industry in the area with much of the area in commercial forests owned by a few large timber companies. The two counties are located within the East Texas Timberlands Land Resource Area. Much of the soil formed under forest vegetation and are dominantly light colored, sandy, and loamy. Descriptions of the soils specific to the project area are presented below.

No soil survey is available for Orange County. Therefore, only the soils in Newton County are described in this section. The power plant and 4000 feet of the wastewater discharge line contain two soil types as defined by the *Soil Survey of Jasper and Newton Counties, Texas* (Neitsch 1982). Present in the project area are the Spurger-Mollville association, gently undulating (SMB) and Waller-Evadale association, nearly level (WAA) soils.

SMB soils are described by Neitsch (1982:40-41) as deep, loamy soils on terraces and broad areas above the flood plains of major rivers. Slopes range from 0 to 3 percent, and soil areas are irregular in shape and range from 50 to 750 acres. This association is 65 to 75 percent Spurger soils and 10 to 25 percent Mollville soils. Spurger soils are on slightly convex areas, and Mollville soils are on slightly concave, lower areas that are generally long and narrow. Typically, the surface layer of Spurger soils is loam that is very strongly acid and about 9 inches thick. The subsoil extends to a depth of 65 inches. To a depth of 36 inches, it is a very strongly acid, reddish clay that has gray mottles; very strongly acid, yellowish red sandy clay loam that has gray mottles to a depth of 43 inches, and very strongly acid, yellowish-red sandy clay loam to a depth of 65 inches. The underlying material to a depth of 80 inches is brownish-yellow, very strongly acid sand.

Typically, the surface layer of Mollville soils is strongly acid, grayish silt loam about 15 inches thick. The upper part of the subsoil, to a depth of 35 inches, is a strongly acid, light brownish-gray silty clay loam that has pockets and streaks of silt loam. The lower part of the subsoil, to a depth of 68 inches, is a very strongly acid, light brownish-gray and strong brown clay loam that has pockets and streaks of light gray silt loam. The underlying material, to a depth of 75 inches, is a strongly acid, mottled light gray and strong brown sandy clay loam.

Spurger soils are moderately well drained, and Mollville soils are poorly drained. Runoff is slow on Spurger soils and very slow on Mollville soils. Permeability is slow, and the available water capacity is high. The Spurger soils have a perched water table at a depth of 2.5 to 3.5 feet during winter. The Mollville soils are ponded as much as 0.5 foot during winter and spring and have a perched water table above a depth of 1 foot most other times.

WAA soils are described by Neitsch (1982:46) as deep, loamy soils on depressional areas and drainage ways of the uplands and terraces. Slopes range from 0 to 1 percent, and soil areas are long and broad along drainage ways and irregular to oblong in shape in other areas. Soil areas range from 40 to 760 acres. This association is 60 to 80 percent Waller soils and 15 to 40 percent Evadale soils. Waller soils are on low, broad, plane areas, and Evadale soils are mostly on broad areas and are slightly higher than Waller soils. Typically, the surface layer of Waller soils is strongly acid, very fine sandy loam about 6 inches thick. The upper part of the subsoil, to a depth of 36 inches, is very strongly acid, light brownish-gray sandy clay loam that has pockets and streaks of gray very fine sandy loam. The lower part of the subsoil, to a depth of 64 inches, is very strongly acid, gray clay loam that has pockets and streaks of dark grayish-brown loam and brownish and yellowish mottles.

Typically, the surface layer of Evadale soils is a very strongly acid, dark grayish-brown silt loam about 3 inches thick. To a depth of 17 inches, it is very strongly acid, light brownish-gray silt loam. The upper part of the subsoil, to a depth of 50 inches, is a very strongly acid, gray clay that has pockets and streaks of silt loam. The lower part of the subsoil, to a depth of 72 inches, is strongly acid, very dark grayish-brown clay.

These soils are poorly drained, and runoff is slow. Permeability of the Waller soils is moderate, and permeability of the Evadale soils is very slow. The available water capacity is high. These soils are commonly saturated during the winter and spring. The water table is commonly above a depth of 2.5 feet in the Waller soils. The Evadale soils have a perched water table above a depth of 1.5 feet.

In terms of surface geology, Quaternary system (Holocene and Pleistocene series) members called the Lissie, Beaumont, Willis, Montgomery, and Bentley geological formations are present (Renfro n.d). According to the soil survey (Neitsch 1982:101), deposits of the Pleistocene Epoch are the Willis, Bentley, Montgomery, and Beaumont formations and the fluviatile terraces of the Angelina, Neches, and Sabine rivers. Evadale soils overly the Beaumont Formation, a Pleistocene Epoch soil (Neitsch 1982:Figure 5), while Waller soils overly the Beaumont and Montgomery formations, both Pleistocene Epoch layers (Neitsch 1982:figures 4-5).

ARCHAEOLOGICAL BACKGROUND

A check of the site records at TARL revealed that there are 113 archaeological sites recorded in Newton County and 88 archaeological sites recorded in Orange County as of August 8, 2003. Two previous projects have been conducted in close proximity to the project area. In 1998, an archaeological assessment of a 288.75 acre tract in Newton County, Texas was performed by Antiquities Planning & Consulting (1998). This was an assessment based on an archival search and a field inspection without shovel tests. It was recommended that the footprint of the power plant be constructed as planned; however, a field survey with shovel testing was recommended for any conveyance lines that would be connected to the power plant that might pass through high probability areas. In 2000, BVRA examined 111.236 acres approximately 1200 feet north of the current project area (Moore 2000) with negative results. A check of the site records at TARL revealed no previously recorded sites in the immediate vicinity of the current project area, and no large-scale surveys, other than those mentioned above, have been conducted nearby.

Individuals recorded the majority of sites in Newton and Orange counties. In Newton County, Gus Arnold recorded 19 sites, and W. A. Davis recorded 40 sites. Arnold (1940), a past employee of the University of Texas at Austin and the W.P.A., recorded sites 41NW38 - 41NW56 in 1940 during his reconnaissance of East Texas. Davis recorded sites 41NW1 - 41NW37 and 41NW57 - 41NW59 in 1959. There is no evidence in the site records that he wrote a formal report. In Orange County, Gus Arnold recorded 33 sites, and C. N. Bollich recorded 12 sites.

Two major reservoir studies have been conducted in the area. These are Toledo Bend and Big Cow Creek. The Toledo Bend reservoir study was conducted by Southern Methodist University in 1967 and 1968 (Benham et al. 1973). No sites in Newton County were recorded. Big Cow Creek Reservoir (western Newton County and eastern Jasper County) was examined by Southern Methodist University in the 1970s (Moir 1976). Nine sites in Newton County are discussed in the report; of this number, only four are in the reservoir. Based on the site sample from the reservoir and vicinity, it appears that prehistoric sites in the area tend to be located within the flood plain and on rises or old terraces. Only one site in the reservoir area was found on a slope adjacent to the flood plain. The greatest number of sites recorded in Orange County were identified during a navigation improvement project which recorded sites 41OR1-41OR3, 41OR8-41OR14, 41OR17-4OR33, 41OR35, 41OR37-41OR38, 41OR41-4OR77, and 41OR79.

The site records at TARL indicate that significant archaeological sites are present in Newton and Orange counties, with several listed on the National Register of Historic Places. The most recent, comprehensive document for the area is *Archeology in the Eastern Planning Region, Texas: A Planning Document* (Kenmotsu and Perttula 1993) published by the Department of Antiquities Protection, Texas Historical Commission. This work presents a very thorough overview of the archaeology of East Texas (including Newton and Orange counties) and should be consulted by anyone conducting serious research in this area.

METHODS

Prior to conducting the field survey, the Principal Investigator checked with Jean Hughes, Assistant Curator of Records at TARL, regarding previously recorded sites in the project area and vicinity. A review of relevant reports for the area was also performed. The Project Archaeologist visited the project area and consulted with Betty Clark, the environmental contact at Cottonwood Energy LP, who showed him the route of the pipeline and provided him with instructions regarding work at the plant site. The soil survey of Jasper and Newton counties (Neitsch 1982) was also checked in order to identify the types of soils present in the project area. No soil survey was available for Orange County.

The field survey relied on a 100% pedestrian survey as well as shovel testing and probing to locate buried cultural materials. The plant site and majority of the pipeline are situated on a landform believed by BVRA to be a fluviatile terrace overlooking the floodplain of Indian Bayou. Clay soils in this setting date to the Pleistocene Epoch. Therefore, shovel testing was not intended to penetrate deeply into these clay soils.

At the time of this survey, a chain-link fence surrounded the power plant. The Project Archaeologist walked the perimeter of the plant in order to locate undisturbed areas suitable for shovel testing. Shovel tests excavated within this perimeter were concentrated at the interface where disturbed and undisturbed areas joined. The majority of the area surrounding the existing power plant had been scraped to basal clay and then built up five feet. This was done to help avoid flooding since the plant is situated in a low-lying area. The Project Archaeologist identified "islands" of remaining vegetation, and thirteen shovel tests (17-29) were excavated in these areas with negative results (Figure 2). Overall, these tests were very shallow as there was very little topsoil overlying the basal clay. Ten shovel tests within the plant area were dug through hard clay and terminated at 10 cm. The remaining three tests were dug through sand to depths of 40, 50, and 70 cm.

Next, the Project Archaeologist walked the pipeline. Those areas on landforms overlooking wet areas were viewed as likely settings for prehistoric sites and were shovel tested. The entire length of the pipeline not associated with the levee had been disturbed during the construction of a transmission line. Along the route of the pipeline, the sandy mantle had been removed by the various activities associated with construction of the transmission line and pipeline. Only one location (Shovel Test 8) had sand on the surface. Here, sand was found to extend to a depth of 50 cm, and surface visibility was 80%. Along the remainder of the pipeline the Project Archaeologist observed a matrix of fill on the surface that had been removed during excavation of a trench for the pipe. This fill material represents a composite of the lower levels now deposited on the surface. On this very disturbed surface no artifacts were seen. Visibility along the pipeline was generally

good and varied from 20% to 80%. From the beginning of the pipeline at the power plant to the point where it connects to the existing levee and pumping station, 17 shovel tests (1-16, 30) were excavated (Figure 2).

At the point where the levee intersects with the pipeline, it turns to the east and parallels the Sabine River Authority's north and south levees. Only two shovel tests (31 and 32) were excavated along this route since the pipeline was situated on top of the existing levee several feet above the surrounding terrain. The levees were constructed in the 1930s and have been continually added to by dredging of nearby silt from the canal that was spread over the levees and surrounding area. The Project Archeologist observed a scatter of *Rangia* and mussel shell away from the edge of the levee and waterline and outside the project area right-of-way. The shell is recent, and live shells were observed in the channel at this location. One shovel test (31) was dug in an area; however no shell or artifacts were observed. It was dug through 20 cm of very firm clay. Additional testing or trenching was not conducted since the pipeline in this area has been totally destroyed and there is no indication that the shell is old.

Further to the east, a deposit of light, silty sand was observed. One test (32) was dug in this area, and no cultural materials were observed. This sand was probably deposited by dredging. As illustrated in Figure 2, the end of the discharge line empties into a slough just to the west of the Sabine River. No tests were excavated in this very low-lying, wet area.

In all, 32 shovel tests were excavated throughout the project area (Figure 2). Dirt from the shovel tests was screened through quarter-inch hardware cloth, each test was recorded on a shovel test log (Appendix I), and the project was documented by field notes and digital photography.

RESULTS AND CONCLUSIONS

No evidence of prehistoric or historic sites was found in the vicinity of the 52 acre power plant site or along the four mile effluent discharge line. The presence of large trees in the surrounding area suggests that no recent clearing had taken place; thus, ruling out agricultural use of the land in the recent past. Based on statements from the *Texas Almanac* dated 1928 (A. H. Belo Corporation 1928) and 1947-1948 (A. H. Belo Corporation 1947), lumbering was the chief economic activity in Newton County, especially in the southern portion of the county. According to a report by Antiquities Planning & Consulting (1998) a historic sawmill once operated approximately one mile to the northwest of the existing plant site. No site specific data regarding this sawmill was found during the archival research by Molly Godwin of the above-mentioned contract archaeology firm. Her effort consisted of a check of the *Handbook of Texas* and a search for East Texas sawmills on the Internet. Since this historic site is not in the Area of Potential Effect (APE) and a thorough discussion of the sawmill industry in the surrounding area is presented in the report by Antiquities Planning & Consulting, the interested reader is referred to this document for further information. Several areas on the high ground above Holden Slough appear on the topographic map to be likely settings for prehistoric sites. Shovel testing in these areas, however, revealed very firm clay at the surface. Landforms with shallow clays are viewed as very low probability areas for the presence of significant prehistoric sites. Overall, the entire area has been severely disturbed through construction.

Power Plant

Virtually the entire 52 acre plant site has been scraped with heavy machinery resulting in removal of the topsoil. They deliberately scraped to clay and then built up with soil and rock five feet above the existing ground to avoid flooding. A fence has been installed around the perimeter of the plant, and some subsurface excavation has taken place in the construction of the plant. The thirteen shovel tests excavated in this area produced no cultural materials. It is believed that this was area was too far from a dependable water source in prehistoric times to be selected for a campsite. This statement is reinforced by the negative findings of a 111.236 area examined by BVRA 1200 feet or less to the north in a similar setting.

Effluent Discharge Line

The pipeline line has been thoroughly disturbed as well. It is located in a bulldozed path originally cleared prior to 1994 for a transmission line. That portion of the line that runs north south crosses several high areas that appears on the topographic map to be good settings for prehistoric sites. Shovel testing and probing in these areas, however, revealed very firm clay at the surface and no cultural materials. During the excavation of the trench for the pipeline, deeply buried soils were brought to the surface. If a site had been present in this area, artifacts should be visible on the surface. At the point where the line turns to the east, one area, based on the topographic map plotting, appears to be a good location for a prehistoric site. Unfortunately, however, this section of line has been greatly disturbed by construction of two pumping stations, a levee, and canal that was completed in the 1930s.

RECOMMENDATIONS

This information will provide input to the Texas Historical Commission and TECQ regarding issuance of the Texas Pollutant Discharge Elimination System (TPDES) permit. It is recommended that construction be allowed to proceed as planned.

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APPENDIX I: SHOVEL TEST LOG

Test	Depth	Description
01	10 cm	dug through clay; area disturbed by transmission line clearing; surface visibility 30%; sterile
02	20 cm	dug through clay; area disturbed by original transmission line clearing; surface visibility 30%; sterile
03	20 cm	dug through clay; area disturbed by original transmission line clearing; surface visibility 20%; sterile
04	30 cm	dug through clay loam and clay on a small rise; area disturbed by original transmission line clearing; surface visibility 40%; sterile
05	30 cm	dug through clay on a small rise; area disturbed by original transmission line clearing; surface visibility 80%; sterile
06	30 cm	dug through clay at start of small rise; area disturbed by original transmission line clearing; surface visibility 80%; sterile
07	90 cm	dug through sand at top of small rise; area disturbed by original transmission line clearing; surface visibility 80%; sterile
08	50 cm	dug through sand and clay at end of small rise; area disturbed by original transmission line clearing; surface visibility 80%; sterile
09	20 cm	dug through clay; area disturbed by original transmission line clearing; surface visibility 30%; sterile
10	20 cm	dug through clay; area disturbed by original transmission line clearing; surface visibility 30%; sterile
11	10 cm	dug through clay; area disturbed by original transmission line clearing; surface visibility 40%; sterile
12	20 cm	dug through clay; area disturbed by original transmission line clearing; surface visibility 40%; sterile
13	20 cm	dug through clay; area disturbed by original transmission line clearing; surface visibility 40%; sterile

Test	Depth	Description
14	10 cm	dug through clay; area disturbed by original transmission line; surface visibility 40%; sterile
15	10 cm	dug through clay; area disturbed by original transmission line; surface visibility 40%; sterile
16	10 cm	dug through clay; area disturbed by original transmission line; surface visibility 30%; sterile
17	10 cm	dug through clay; scraped and bladed area within perimeter of plant site; surface visibility 20%; sterile
18	50 cm	dug through sand and clay; scraped and bladed area within perimeter of plant site; surface visibility 20%; sterile
19	10 cm	dug through clay; scraped and bladed area within perimeter of plant site; surface visibility 20%; sterile
20	70 cm	dug through sand and clay; scraped and bladed area within perimeter of plant site; surface visibility 20%; sterile
21	10 cm	dug through clay; scraped and bladed area within perimeter of plant site near fence; surface visibility 90%; sterile
22	10 cm	dug through clay; scraped and bladed area within perimeter of plant site near fence; surface visibility 90%; sterile
23	10 cm	dug through clay; scraped and bladed area within perimeter of plant site near fence; surface visibility 90%; sterile
24	40 cm	dug through sand and clay; scraped and bladed area within perimeter of plant site; surface visibility 10%; sterile
25	10 cm	dug through clay; scraped and bladed area within perimeter of plant site; surface visibility 10%; sterile
26	10 cm	dug through clay; scraped and bladed area within perimeter of plant site; surface visibility 10%; sterile
27	10 cm	dug through clay; scraped and bladed area within perimeter of plant site; surface visibility 10%; sterile

Test	Depth	Description
28	10 cm	dug through clay; scraped and bladed area within perimeter of plant site near fence; surface visibility 90%; sterile
29	10 cm	dug through clay; scraped and area within perimeter of plant site near fence; surface visibility 90%; sterile
30	10 cm	dug through clay; disturbed by original clearing of transmission line; surface visibility 20%; sterile
31	20 cm	dug through clay; area of shell scatter; surface visibility 20%; no shell found in the shovel test
32	40 cm	dug through sand; sandy area believed to be the result of dredging; surface visibility 20%; sterile