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APPENDIX A

ENVIRONMENTAL ASSESSMENT

I. INTRODUCTION

The purpose of the following Environmental Assessment is to present a brief overview of the present environmental status of the area in and around the proposed Caddo/Bossier Port Industrial Park development site, and to provide a fundamental idea of the relationship of the proposed development with the environment.

This is not intended to be an environmental impact statement which is a vastly more complex and detailed study.

Frequent reference is made to the "Shreveport area" in the text. The content of sections containing this reference is general enough in nature to make the proposed project site and the "Shreveport area" equal in meaning.

In the following text a single asterisk(*) denotes that the Bossier Red River Parkway Draft Environmental Impact Statement (a separate document by others) was used as a reference source for text preceeding the single asterisk.

Furthermore, a double asterisk(**) means that the Comprehensive Water and Sewer Plan - Shreveport Standard Metropolitan Statistical Area (also a separate document by others) was also a reference source.

II. PROJECT DESCRIPTION

Name. The Project shall be termed the Caddo/Bossier Port Industrial Park.

Location. The Project site is situated about fifteen miles south of downtown Shreveport, Louisiana on Louisiana State Highway No. 1. The site lies between Highway 1 and the inside of a bend of the Red River on lands commonly known as Wilkerson Point and Peace Point. The Caddo-Bossier Parish line follows the meanders of an old river channel which loops between Wilkerson and Peace Point thereby placing the project site partly in both Parishes.

Acreage and ownership. The ultimate size of the project site is approximately 2,000 acres of which 829 acres are currently owned by the Caddo-Bossier Port Commission and which lie mainly landside of an existing levee. Recommended first stage land acquisition calls for the purchase of lands lying riverside of the levee up to the bank of the proposed relocated river channel. This acquisition comprises about 549 total acres and is currently under various private ownerships. Future land acquisition calls for the purchase of the remaining 633 acres of land which lies mainly in two parcels. Both parcels are currently under various private ownerships.

Items of work. The following lists items of work over the life of this Master Plan. The list is not arranged in any particular order nor is it intended to be exhaustive:

1. Acquisition of lands.
2. Construction of off-site water extension.
3. Construction of a slack water harbor extending inland from the river bank. See Exhibit 2.
4. Construction of a new river channel across Wilkerson Point and Peace Point. This would be done by the U.S. Army Corps of Engineers. See Exhibit 2.
5. Landfill of approximately 130 acres of land to an elevation of 154.0 MSL. Fill material would come from excavation of the slack water harbor and the proposed relocated river channel.
6. Construction of roads, railroads, utility lines, wastewater treatment facility, ditches and drainage structures.
7. Construction of a public terminal facility, dock, and storage facility.

The South Shreveport Outer Loop which is a road between the project site and the proposed Interstate Highway 49 is also being considered (by others). Subsequent development would establish industrial and transportation plants within the site. These would be established by private concerns to suit their own particular needs.

Slack water harbor. The proposed slackwater harbor would be about 3,800 feet long and would have a typical bottom width of 400 feet. The sides would slope upward from the bottom elevation of 133.0 M.S.L. at a rate of (1) one vertical foot to (3) three horizontal feet giving a typical top bank width of 526 feet at elevation 154.0. The harbor would widen toward its junction with the river requiring removal of about 1,800 linear feet of

natural river bank. The harbor banks would be stabilized with riprap over the entire bank along the harbor entrance. The harbor side slopes away from the river would be stabilized with riprap extending five feet below and five feet above the normal pool elevation of 145.0. The side slopes above the riprap will be stabilized with topsoil and seeded with grass.

Landfill. Material excavated from the proposed relocated river channel excavation and the slackwater harbor excavation would be used to raise most of the low-lying areas riverside of the levee to elevation 154.0. This is above the post-project 100 year flood elevation of 153.0.

Fill From Excavation of Slackwater Harbor:	520,000 (cubic yards)
Fill From Excavation of River Channel:	780,000 (cubic yards)
Total:	1,300,000 (cubic yards)

The areas to be filled are immediately adjacent to the excavation areas, thereby minimizing hauling operations. In the event that the river channel and the slack water harbor are not excavated simultaneously, the filling operations would begin at high ground and procede toward the river bank as fill material becomes available.

III. ENVIRONMENTAL SETTING

Population. The project site is located partly in Caddo Parish and partly in Bossier Parish. These two parishes combined comprise the Shreveport Standard Metropolitan Statistical Area (SMSA). Table 5 on page A - 6 presents the population history since 1940 and the population forecast through the year 2000.

As shown in Table 5, the Shreveport SMSA has shown a steady growth rate over the past forty years. This indicates a trend of continued growth due in part to increasing industrial development.

Existing land use. The land on which the proposed development is to take place is currently used mainly for agricultural purposes. The land currently under Port Commission ownership is farmed through a lease agreement, except for approximately three acres near the center of the property which contains an active natural gas well operated by Arkansas-Louisiana Gas Company (see Exhibit 2 for location).

The Wilkerson Point land and the Peace Point land - which are both parts of the recommended first stage land acquisition - are presently unused for crop raising. These lands are owned by the Gardner family and Frank B. Lachle, et. al. respectively.

TABLE 5

Population History and Forecast
Shreveport SMSA

	1940	1950	1960	1970	1980	1990	2000
Shreveport	98,167	127,206	164,372	182,064	233,423	278,948	324,190
Balance of Caddo Parish	52,036	49,341	59,487	48,120	25,834	15,832	17,772
Sub-total	150,203	176,547	223,859	230,184	259,257	294,780	341,962
Bossier City	5,786	15,470	32,776	41,595	61,800	83,100	110,104
Balance of Bossier Parish	27,376	24,669	24,846	22,108	30,638	41,823	50,898
	33,162	40,139	57,622	63,703	92,438	124,923	161,002
Shreveport SMSA	183,365	216,686	281,481	293,887	351,695	419,703	502,964

Note: Balance of Caddo and Bossier Parishes figures include the lump sum of all other rural and urban areas in their respective parishes. Figures in this table are from the Comprehensive Water and Sewer Plan for the Shreveport S.M.S.A.

Olin Matheson Chemical Company owns the land proposed for the Public Terminal Facility. This site is riverside of the existing levee and is open grassland.

The portion of land marked for future land acquisition which lies on the western side of the project site is currently owned by Whittington, et. al. This land is used for annual crops.

The eastern part of the project site which is designated as future land acquisition is also used for annual crop raising. This property is currently under two separate ownerships: Julia Foy Martin owning approximately 45 acres and Tensas Delta Land Company owning the remainder.

Premetco, a manufacturing company producing pre-formed industrial insulation products, owns ten acres fronting on Louisiana Highway 1, but this property is not included in the development project.

Water supply to project area. Water is currently supplied to the Olin and Premetco properties through an 8 inch main from and by the City of Shreveport. There is, however, no plan to use this 8 inch main to supply any proposed project development. A 20 inch main with a booster pump and a one million gallon on-site elevated storage tank are planned to provide water to the site. Water for the proposed development will be supplied by the City of Shreveport.

The City of Shreveport Water and Sewerage Department owns and operates the off-site water system. Responsibility of the water system within the proposed project development would fall to the Water and Sewerage Department when the system becomes operational.

Sanitary sewer system. The off-site sanitary sewer system is owned and operated by the City of Shreveport Water and Sewerage Department. The Lucas Sewage Treatment Plant is nearest the project site located approximately three miles north of the site on Highway 1.

Sewage generated on the site is however not proposed to connect with off-site collection and treatment facilities. Indeed, on-site treatment using modular type package treatment plants is recommended.

Operation and maintenance of the on-site sewerage facilities would become the responsibility of the City of Shreveport Water and Sewerage Department when the system becomes operational.

It should be recognized that orderly expansion will extend the off-site sewerage system toward the project site as the needs of the Shreveport area advance in that direction, and that some future interconnection with off-site facilities is possible.

Future land use. The Caddo/Bossier Port Industrial Park development is a project that is compatible with future land use plans of The Shreveport Plan (a master plan for metropolitan Shreveport by others).

The City of Shreveport has zoning authority over the proposed development area and the present zoning is consistent with the needs of the port/industrial park complex. Land within the proposed development falls into one or another of the following categories: R-A (rural agricultural); I-1 (light industrial); or I-2 (heavy industrial).

Land outside the proposed project development will continue to support the orderly growth and expansion of roads, railroads, and airport facilities. It should be remembered that the development of the port/industrial park complex is compatible with these other expansions and each will serve to enhance the other.

Navigation on the Red River is anticipated in the Shreveport area by 1988. This is also complementary to the proposed project development.

Topography. The ground at the project site landside of the levee is very flat except for the levee slopes. Elevations are approximately in the 154 to 159 M.S.L. range, but high and low points are far enough apart so as to make the grade of the land very slight. Exhibit 2 of this Master Plan indicates existing land contours. Elevations along the top of the levee are in the 160-165 M.S.L. range.

The land riverside of the levee is also very flat up to the river bank and is in the same elevation range as that landside of the levee.

The outer Peace Point land is relatively low and is subject to periodic flooding. The elevations here are presently in the 148-150 M.S.L. range,

but future plans call for filling this land to elevation 154 M.S.L. with material excavated from channel and slack water habor construction.

Climate. The Shreveport area climate is influenced by both the sub-tropical systems of the South and the continental systems associated with the Great Plains of mid-America. Precipitation varies by month, but generally the late summer and early fall are relatively dry. Winter and spring are usually the wettest seasons. The average annual precipitation is 44.72 inches with monthly ranges from 2.68 inches in August to 5.19 inches in April. Winters are normally mild and any cold weather is short-lived. The area usually has about 252 frost-free days. Snowfall plays a minor role in the area's climate, but locally damaging ice storms do occur in the Shreveport area. The summers are generally warm. Humidity remains generally high year-round. Although tropical hurricanes are usually well dispersed by the time they reach the Shreveport area, heavy rains associated with these storms can and do promote conditions favorable for localized flooding.*

Air quality. In 1970 Congress enacted the Federal Clean Air Act of 1970, which required the adoption of ambient air quality standards and rules and regulations with which to achieve and maintain those standards. The standards prescribe pollutant levels that cannot be exceeded during a specified time. Primary standards were established to protect human health; secondary standards were established to prevent other adverse effects of air pollution.*

In accordance with the Clean Air Act Amendments of 1977, states are required to submit to the U. S. Environmental Protection Agency a list

identifying those air quality control regions, and portions thereof, which meet the national standards, exceed the standards or cannot be classified due to insufficient data. Portions of air quality control regions which are shown by monitoring data or which are calculated by air quality modeling to exceed any national ambient air quality standard are designated "nonattainment" areas.*

The proposed project is in the Shreveport-Texarkana-Tyler Air Quality Control Region. This region is designated a nonattainment area for ozone, an attainment area for particulate matter and sulfur dioxide and "cannot be classified" or "better than the standards" for carbon monoxide and nitrogen dioxide.*

Vegetation. Natural vegetation is quite limited at the project site. This is due mainly to agricultural development. What natural vegetation that does remain is limited mostly to discontinuous patches of grass bordering the Red River. There are however some isolated plant communities occuring mostly on the upper banks and old sand bars of the inner alluvial floodplain of the river. These plant communities are typical of frequently disturbed riparian environments throughout the area. Principal tree species are black willow (Salis nigra), eastern cottonwood (Populus deltoides) and sycamore (Plantanus occidentalis). Associated tree species include honey locust Gleditsia tricanthos), sugarberry (Celtis laevigata) and species of ash (Fraximus sp.) and hickory (Carya sp.). Common shrubs and vines include rough-leafed dogwood (Cornus drummondii), blackberry (Rubus sp.), poison ivy (Rhus radicans), wild grape (Vitis sp.) and trumpet creep (Campsis radicans). Ground cover herbs include cocklebur (Xanthium pungens), morning glory

(Ipomean sp.), and goldenrod (Solidago sp.) and a number of other herbs and grasses.*

Riverfront forest stands of the study area vary considerably with respect to age, density and species composition. This has resulted from both natural disturbance related to river flooding and recent colonization of areas formerly cleared for agriculture or utilized for gravel strip mining operations. Young aged stands of uniform height, high tree density and nearly pure composition of black willow and cottonwood occupy these sites. Older aged sites are less dense and contain a greater species diversity.*

A number of pastures and field border areas in the study area have been invaded by Chinaberry (Melia azedarach). This is a small to moderate size introduced tree which has often escaped cultivation and readily invades pastures and border areas.*

Wildlife. The climate and availability of food, water and suitable habitat combined to promote and maintain the variety of wildlife which can be found in Shreveport and its environs. As in any urban setting, those species of wildlife best able to adapt to man and his resultant urban surroundings stand the best chance for survival.

There are numerous species of birds that have been reported in Shreveport urban areas as well as the rural surroundings. There are some species of birds, such as the English sparrow (Passer domesticus), European starling (Sturnus vulgaris) and rock pigeon (Columba livia), that not only survive

but also thrive in an urban environment. The numerous oak and pine trees found in the Shreveport area are extensively used by songbirds, such as the blue jay (Cyanocitta cristata), northern cardinal (Cardinalis cardinalis) and American robin (Turdus migratorius), for nesting areas. Due to the proximity to the Red River and several nearby lakes, many species of migratory ducks and other waterfowl are sighted during their seasonal flights. However, only small populations of resident waterflow utilize the area. The old fields in the area provide suitable habitats for game birds, such as the bobwhite quail (Colinus virginianus) and mourning dove (Zenaida macroura).*

Many species of mammals also inhabit both urban and rural areas. Mammals such as the eastern cottontail rabbit (Sylvilagus floridanus), red fox (Vulpes fulva), gray fox (Urocyon cinereoargentus), gray squirrel (Sciurus carolinensis), northern raccoon (Procyon lotor) and Virginia oppossum (Didelphis virginiana) tolerate man and do well in urban environments. These mammals, as well as the striped skunk (Memphitis mephitis) and swamp rabbit (Sylvilagus aquaticus), are found around Shreveport and surrounding areas.*

The generally moist conditions in the Shreveport area could support a diverse reptilian and amphibian population especially where there is abundant cover in close proximity to permanent water. Many terrestrial and semi-aquatic salamander and frog species, as well as box turtles and many lizards and snakes may be found in the Shreveport area.*

Based on investigation by researchers and biologists, the Red River around the proposed project area is very limited in diversity of fishes.

Although a large number of species could possibly occur in the Shreveport area, there seems to be an apparent lack of preferred habitat. What few species that are found appear to be those which are adapted to silt-laden water.*

Analysis of bottom samples taken from the Red River within the Shreveport area indicated that this area has a low benthic population. Only five organisms were found in the vicinity of the proposed project. The low number of benthic organisms in the study area is primarily a result of poor benthic habitat. The substrate of the Red River within the Shreveport area is composed almost entirely of fine, silty sand, which is very low in organic matter or detritus. Detritus serves as nutrient for bottom-dwelling invertebrate organisms and is lacking in this area due to the strong, swift current of the river, which keeps material in the water column and subsequently prevents its accumulation.*

The silt and substrate is in itself generally poor habitat for organisms because as moving water drains through sand grains, the substrate tends to take oxygen. The establishment of a stable benthic community is also prevented by the abrasive action of the sand and shifting of the substrate caused by scouring effect of the strong, swift current.*

Special consideration must be given to endangered or threatened species by federal law. An endangered species is one in danger of extinction throughout all or a significant portion of its range. A threatened species is one which is likely to become endangered within the foreseeable future throughout all or a significant portion of its range. Presently, the

United States List of Endangered Fauna, published by the Office of Endangered Species and International Activities, U. S. Department of the Interior lists several endangered or threatened species which could occur in the Shreveport area. This list follows; all are animal species:

American Alligator (Alligator mississippiensis)
Southern Bald Eagle (Haliaeetus leucocephalus leucocephalus)
American Peregrine Falcon (Falco peregrinus anatum)
Artic Peregrine Falcon (Falco peregrinue tundrius)
Ivory-billed Woodpecker (Campephilus principalis principalis)
Bachman's Warbler (Vermivora bachmanii)
Red Wolf (Canis rufus gregoryi)
Florida Panther (Felis concolor coryi)
Red-cockaded Woodpecker (Dendrocopos borealis)

There are currently eleven endangered plant species and two threatened plant species on the federal list of endangered plants and animals. However, none of these is known in Louisiana or expected in the Shreveport area.*

Soils and geology. Recent alluvian soils make up most of the major associations in the proposed project area. These soils are generally moist, poorly drained clay and silt loam associations and have a fairly high shrink/swell potential due to the clayey nature of the subsoil. The main soil series in the project area are the Miller and Yahola with the Miller being the larger. The Miller silt loam soils usually occupy the natural levees at a slightly lower elevation than the Yahola soils. The Miller is character-

ized by reddish-brown silt loam surface soils and by reddish-brown silty clay or clay subsoil.*

The Yahola soils occupy the highest elevations in the bottomland and are often adjacent to the river. The Yahola soils have reddish-brown, very fine, sandy loam or silt loam; fine, sandy loam; or silty clay loam subsoils.*

Geologically, Louisiana lies at the north end of the Gulf Coastal Province, which borders the Gulf of Mexico sedimentary basin. The Gulf Coastal Province, as we know it now, probably originated during the Permian, Triassic and earlier Jurrasic times when the continental plateaus were elevated and the sedimentary basin fell.*

The Sabine Uplift is one of the most important positive features of the Gulf Coastal Province and underlies northwest Louisiana, northeast Texas and southwest Arkansas. The proposed project area overlies the northern part of the Sabine Uplfit.*

Surface stratiography refers to all strata which come to the surface at some point within a given area. In Bossier Parish, surface deposits are those of the Tertiary and Quaternary periods. The earliest surface deposits are the Midway Group, which come to the surface over the Sabine Uplift in the vicinity of Mooringsport.*

Tertiary deposits of Eocene age overlie the Midway Group and include the Wilcox sands and the Claiborne Group. The Cane River, Sparta Sands and

Cook Mountain formations form the Claiborne Group. Cane River is the lowest formation and is overlain by the Sparta Sands.*

The Quaternary system includes the Pleistocene Terrace deposits and the Recent Alluvial deposits. The Terrace deposits document ancient floodplains of the Red River and contain a wide range of sediments. The Alluvial deposits are confined to the present day floodplains of the Red River. They are sands and gravels overlain by silts and clays.*

Hydrology. Although the elevations of the existing low-lying portions of Wilkerson Point and Peace Point in the proposed project development area imply that these areas are prone to periodic flooding, investigation of long-time area residents maintains that there has been no flooding of these areas in approximately sixty years.

Some major sources of surface water in the area surrounding the project site are the Red River, Caddo Lake, Cross Lake, Wallace Lake, Bodcau Bayou, and Bayou Pierre. About 14 inches of annual precipitation over the Caddo-Bossier Parish area runs off in small streams that flow into the Red River. This is only a small percentage of available water in Red River when compared to the total runoff area of about 56,000 square miles. The Red River has an average flow of about 25,000 cubic feet per second.**

The chemical characteristics of the waters of the Red River and Caddo Lake varies considerably from other surface water sources at certain times. The brine content is high at low water elevations.**

On the proposed project development site, surface water presently drains into several parallel shallow ditches which flow overland principally to the southeast. Drainage then collects to run under Louisiana Highway 1 and into Bayou Pierre. There is presently very little runoff from the project site. Most of the rainfall ponds in local low areas and either is absorbed into the ground or evaporates.

Ground water is available from the alluvial deposits in the Shreveport area but is generally unsatisfactory for most domestic and industrial uses because of the extreme hardness and iron content. Several irrigation wells have been drilled in the alluvium. They have been used as much as thirty days per year in the driest years pumping five to six million gallons per day at their peak.**

Aside from the alluvial deposits, fresh ground water is available nearly everywhere else in Caddo and Bossier Parishes. Soft to moderately hard water is found in the sands of the Wilcox Group, Carrizo Sand, Cane River Formation, and Sparta Sand. The base of fresh ground water ranges from 50 to 900 feet below the land surface with the shallowest near Elm Grove, Bellevue, Dixie, Mooringsport, and Longwood; the deepest in areas north of Vivian and Plain Dealing.**

It is estimated that about 3.5 million gallons per day of ground water were pumped during 1960. This is far below the estimated potential yield of the aquifers. The possibility of obtaining additional quantities of ground water from relatively undeveloped sands of Tertiary age are excellent.**

Future environment if the proposed project is abandoned. The property would remain in agricultural use and would continue much as it is at the present. If the area were abandoned in the future, it would succeed to the eventual climax vegetation type for the area. The area would be subject to the continued influence of the river.

IV. RELATIONSHIP OF PROPOSED ACTION TO OTHER LAND USE PLANS

The proposed project development does not conflict with any other present or future land use plans. Indeed, it is an attractive complement to the planned orderly expansion of utilities, roads, railroads, commerce, and services of the Shreveport-Bossier City area.

The proposed public terminal and port facility coordinates directly with the U. S. Army Corps of Engineers plans to make the Red River navigable to the Shreveport area in 1988.

V. PROBABLE IMPACT ON THE ENVIRONMENT

General impacts would result from the development of the proposed project. These impacts are discussed as follows:

Soils. The soils in the project area are primarily of the Miller and Yahola soil series, with the majority being the Miller. Both groups show moderate suitability for the proposed development.

Periodic dredging in the mouth of the proposed slack water harbor would disturb the river bottom and cause temporary turbidity in the dredging area. The dredging would also cause a spoil disposal problem.

Natural environment. The area to be landfilled would create a terrestrial habitat out of the present habitat which is adapted to periodic flooding. Also the slack water harbor would create an aquatic habitat out of the present terrestrial habitat. Relocation of the existing river channel would disturb the ecosystem in the area of its construction in much the same way as the slack water harbor construction.

There is very little natural vegetation presently in the project area. However, the proposed project would prevent the process of natural succession to the climax vegetation type for the area. Furthermore, any wildlife which would naturally associate with the climax vegetation type would not migrate to the area.

Air and water quality. Emissions from vehicles and industrial tennants and runoff from industrial and port properties could have a detrimental effect on air and water quality. However, proper enforcement of environmental regulations with respect to industrial park tenants would reduce the impacts on air and water quality to an acceptable level.

Landfill operations and bank stabilization operations along the river bank would cause temporary turbidity in the river, but this impact would vanish when construction is completed.

Hydrology. The placement of landfill would decrease water storage and the subsequent placement of impervious surface will increase the overland flow. The proposed slack water harbor would increase water storage but not to a degree that compensates for the loss of storage in the landfill area.

The development of land in the area that is riverside of the existing levee would decrease water retention and displace floodwater downstream. However, the amount of displacement would be negligible. The backwater effect of the proposed landfilling action would increase upstream water levels, but this increase would also be negligible.

Land use. The construction of the slack water harbor and industrial park would change the land use from an agricultural base to an urban base. The amount of other lands which might need to be cleared to compensate for the loss of agricultural land is negligible but the cumulative effect of the proposed project with other future projects displacing agricultural land may be significant.

Aesthetics. The visual character of the area would be changed from a pastoral setting to an industrial setting.

Transportation. The proposed slackwater harbor and industrial park would increase river traffic in the immediate area as well as other river reaches upstream and downstream.

Additional truck, automobile, and rail traffic would be generated by tenants in the industrial park. Two on site roads connecting to Louisiana

Highway No. 1 and a rail connection with the Missouri Pacific Railroad line would be adequate for such a traffic increase when the industrial park is operating at full capacity.

VI. REMEDIAL, PROTECTIVE AND MITIGATING MEASURES

The project involves raising low lands by the placement of fill material, and to use these raised lands for industrial development. Material excavated during the construction of the slack water harbor and the relocated river channel would be used for this purpose.

The banks of the slack water harbor and the proposed relocated river channel would be stabilized with riprap and grass seeding.

To minimize the impact of flood, all development would be at or above elevation 154.0 M.S.L. which is above the post-project 100 year flood elevation.

Material from the periodic dredging of the slack water harbor mouth will be placed on Port Commission property and seeded to prevent erosion.

In addition to the measures already listed, all contractors involved in the project construction would be required to adhere to extensive construction specifications. These specifications deal with all phases of construction and would include the following:

Methods of clearing and grubbing

Excavations

Response to incidental archaeological finds

Construction of embankments

Construction near waterways

Minimization of erosion

Temporary earthwork

Cleaning of construction equipment

Discharges into waterways

Water pollution control

Use of herbicides, and

Regulation of blowing dust and burning.

The probability exists that an incidental archaeological find may be made. Appendix B of this report is an extensive archaeological and historical report (by others). If such a find is made, construction would cease until appropriate mitigating measures can be taken.

VII. PROBABLE ADVERSE ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED

Soil will be excavated, graded and compacted for development of new facilities. Some additional fill material will be dredged from the Red River, placed on the project site, drained of water, and compacted. Additional adjacent soil will be compacted during normal construction operations. Soil erosion will occur during the construction period.

Impervious surfaces such as roofs, parking lots, and streets will decrease water storage and increase runoff. Compaction of surface soil will also alter the pattern and volume of surface drainage.

There will be a reduction of habitat for both plant and animal life.

The the necessity of periodic dredging at the mouth of the slack water harbor will cause an increase turbidity in the Red River, but only for the duration of dredging operations.

VIII. ALTERNATIVES TO THE PROPOSED ACTION

The proposed project would pose the much same impact on any site regardless to the location. The degree of impact would, of course, vary from site to site. However, because of the necessary zoning, the availability of road and rail transportation, and good port facility location, no other location was considered.

As far as eliminating any part of the proposed project or modifying any of the construction is concerned, it is thought that while design might vary, construction methods would remain essentially the same. Therefore it is believed that the only significant alternative is the "no project" alternative.

The "no project" alternative implies that no action other than to maintain existing conditions will be taken. A decision for this alternative

would come only after determining that the proposed project would seriously endanger adjacent property, the river, or the natural environment.

Probable impacts of the "No Project" alternative. The present land use at the proposed project site is primarily agricultural, however Arkansas-Louisiana Gas Company operates a natural gas well near the center of the Port Commission property.

The environmental impact of a "no project" alternative may be significant since any presently adverse conditions could worsen unless action is taken. There would be no soil erosion due to construction, but natural soil erosion and rutting would continue on the site. Erosion of the river bank would continue particularly if stabilizing vegetation is prevented from coming into the area.

Continued maintenance of agricultural activities would prevent the reestablishment of natural vegetation and this would continue to prevent the return of non-migratory wildlife.

Since agricultural crop raising requires fertilization for production, there would be continued pollution in the Red River from chemical nutrients, herbicides, and pesticides.

There would be no change in water storage capacity or runoff rate from the present, but the areas riverside of the levee would continue to be flood prone.

There would be no change in present land use. There would be no effect on air quality except for dust production during agricultural activities and from unprotected soil.

IX. RELATIONSHIP BETWEEN SHORT-TERM USE OF MAN'S ENVIRONMENT AND MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

The development of the Caddo/Bossier Port Industrial Park represents a gradual decrease in acreage currently being used for crop raising as expansion of commercial facilities occurs. Implicit in this is the reduction of natural habitat and wildlife. This loss however, does not represent a significant impact when compared to the total biotic inventory of the region.

The natural gas well on site will remain in service.

In short, the long-term gains of increased commerce, additional revenue, and services to the region will more than outweight the short-term adverse environmental impacts.

X. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

The development of a port and industrial park facility is a fundamental commitment to the commerical, financial, and service improvements of the Shreveport-Bossier City area. Development and construction of this facility would involve the irreversible commitments of materials and manpower.

However, this would not significantly decrease the regions supply of construction materials.

Though it is realized that the facility could be physically abandoned at some time in the future, its contribution to the general commerce and welfare of the region is itself irreversible.

APPENDIX B

CULTURAL AND HISTORICAL RESOURCES ASSESSMENT

INTRODUCTORY NOTE

This type of investigation is usually incorporated into an Environmental Assessment; however, due to the possibility of an archaeologically significant find in the Caddo/Bossier Port Industrial Park project area, the Port Commission deemed it necessary and desirable to carry out this investigation as an independent study.

The investigation was conducted by a research team from Northwest Louisiana State University which included H. F. Gregory, Ph.D.; George A. Stokes, Ph.D; and Clint Pine, M.S. The report is a complete document including table of contents, appendix, and bibliography. The report is reproduced verbatim for Appendix B.

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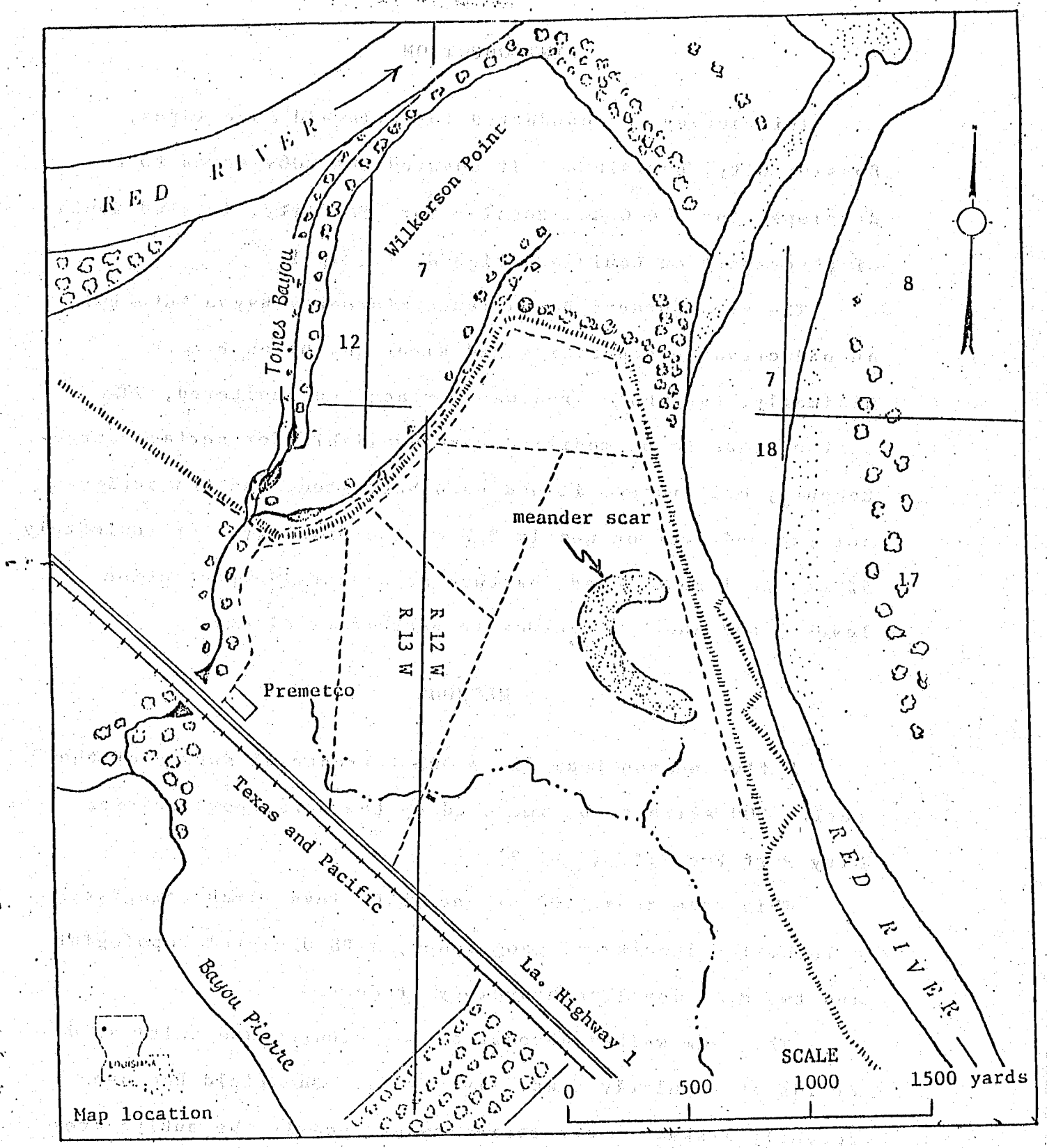


LOCATION MAP

CULTURAL - HISTORICAL RESOURCES SURVEY

CADDO-BOSSIER
PORT FACILITY PROPERTIES

1980

INTRODUCTION

This survey was conducted for Griswald Associates, Bossier City, Louisiana. It covered the 800+ acres to be developed for the Caddo-Bossier Port Facility, located south of Shreveport on Louisiana Highway 1 (Map 1).

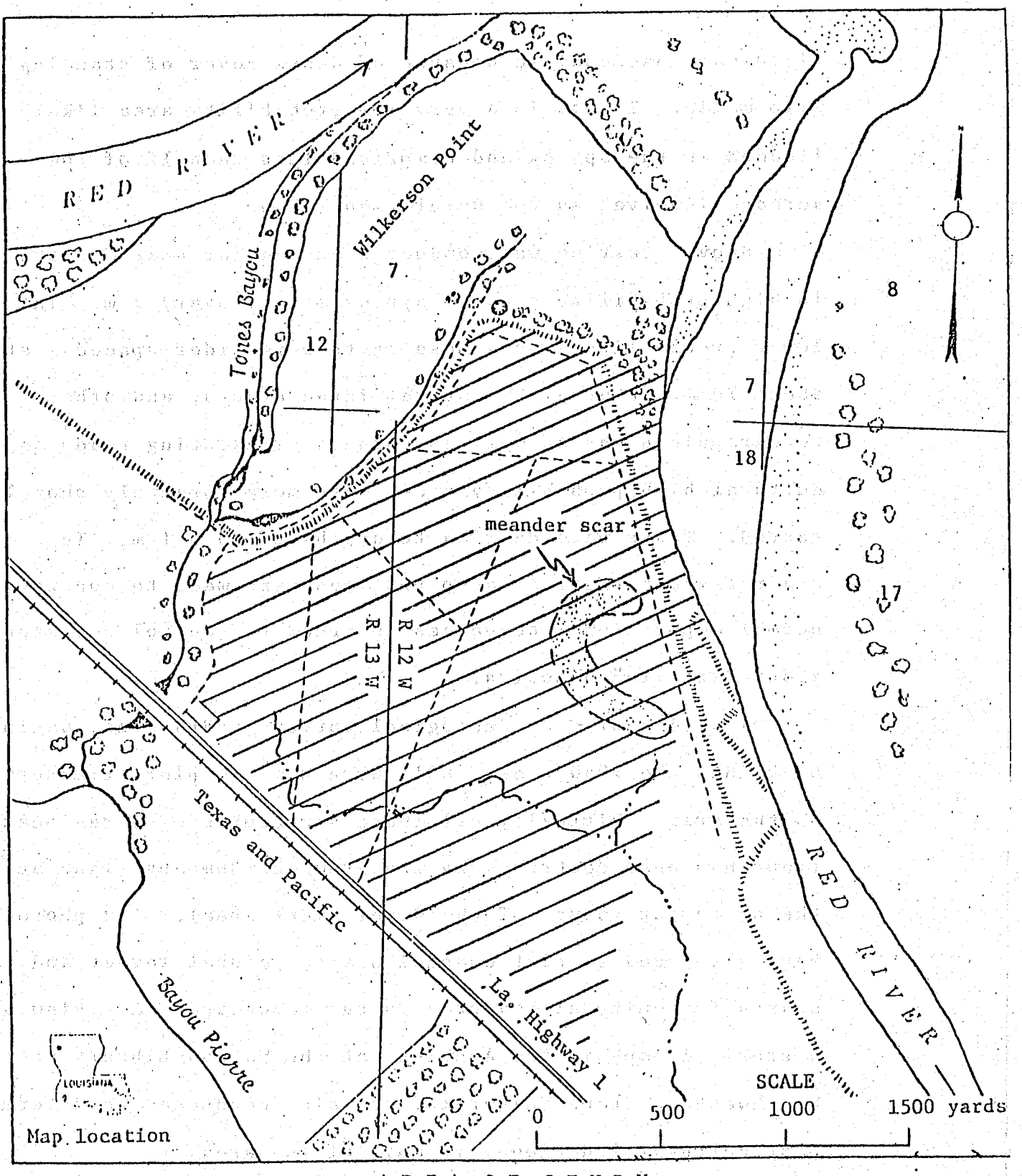
The area borders Bayou Tones (formerly Bayou Antonio) an old crevasse connecting Red River and Bayou Pierre. Minimally, the whole area was surface reconnoitered, 90% of the areas to be modified were available for surface survey. Recently cultivated, it had been harvested, and the surface not grassed over on nearly 80% of the property. Approximately 5% was in forest cover (batture areas outside protection levees) and another 15% was in pasture or silage.

METHODS

A five person team did a 90% terrestrial survey of the entire 800 acres to be impacted by the Shreveport-Bossier City Port Facility (Fig. 2).

This team consisted of one Ph.D.-level archaeologist, a Ph.D.-level cultural geographer, a Ph.D.-level topologist and two M.A.-level anthropology students.

The team walked abreast across cleared and cultivated fields at regularly spaced intervals. One field had been recently disked by the former owner, nearly the entire area was in row crops or in pasture. A small strip of batture climax woodland remained outside the artificial levee. One



AREA OF STUDY

CULTURAL - HISTORICAL RESOURCES SURVEY

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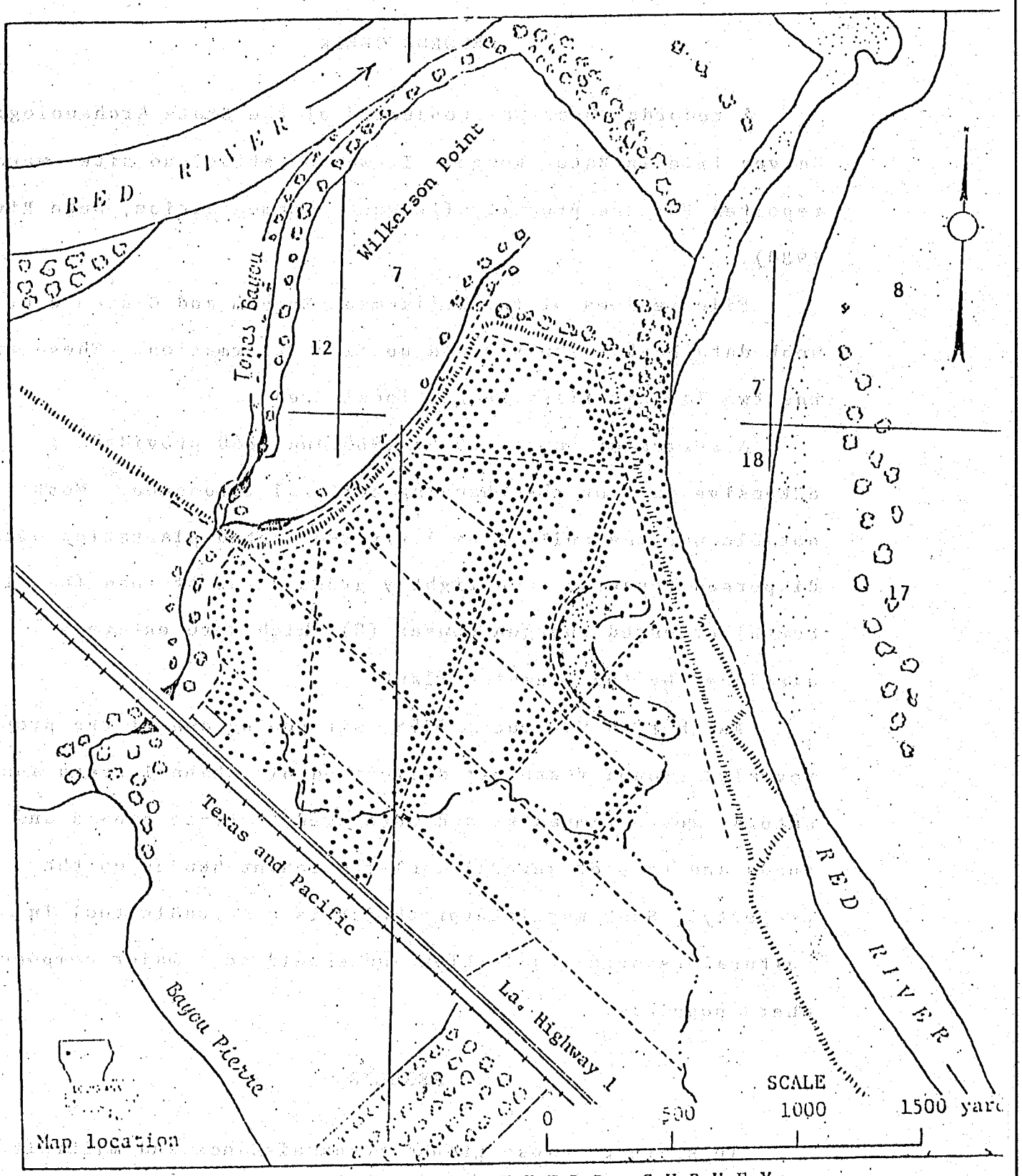
1980

Area of study

field was inaccessible because of dense cover of standing milo maize. It was in a very low probability area likely flooded in the Spring and comprised less than 1% of the acreage involved in the development plans.

Shovel testing was conducted at regular spaced intervals in high probability areas - approximately every 3 m. In lower probability areas these tests were wider spaced - at about 10 m. intervals. Natural levee crests, and other topographic highs as well as corners of existing roads (a cultural high probability area) were more intensely shovel-tested. Tests were carried to depths of .5 - 1 m. In several areas (Fig. 3) deep profiles were made to control normal depositional sequences in order to control decisions about "sterile" deposits.

A series of U.S. Geological Survey quadrangles, dating back into the 1950's and '60's were used to plot structures on the area. Virtually all these structures were re-located (four had been destroyed by the Premetco Company Plant at the northwest corner of the development area). Air photographs were also used to plot channel scars, natural levees and to search for cultural features on the landscape. A review of historical maps in the Archives at the Watson Library at Northwestern State University was also conducted to determine past cultural functions, if any, of the area.



FIELD SURVEY

areas inspected on foot;

extensive shovel testing in high probability areas

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RECORDS CHECK

A records check was conducted of the State Archaeological Survey file in Baton Rouge. It was negative, no sites were reported for the property (Personal Communication, Duke Rivet, 1980).

File reviews of the Williamson Museum and Clarence H. Webb data banks also yielded no site information. These are the two largest files in the local area.

A series of maps: 1955, 1965 and 1840 provided extensive data on the changing cultural landscape. Most notable was the shift from a river-oriented plantation with dispersed tenants, to a tightly grouped row of road (La. 1 South) oriented shotgun houses (8) which were entirely displaced by the Premetco Plant.

Further, a November, 1955, air photograph of the property revealed ground features; delineated old channel scars and natural levee remnants, and were used to trace canals and roads and to plot several isolated tenant houses on the property. Such map interpretation is a valuable tool in cultural resource evaluation and should be a major component where possible.

RESULTS

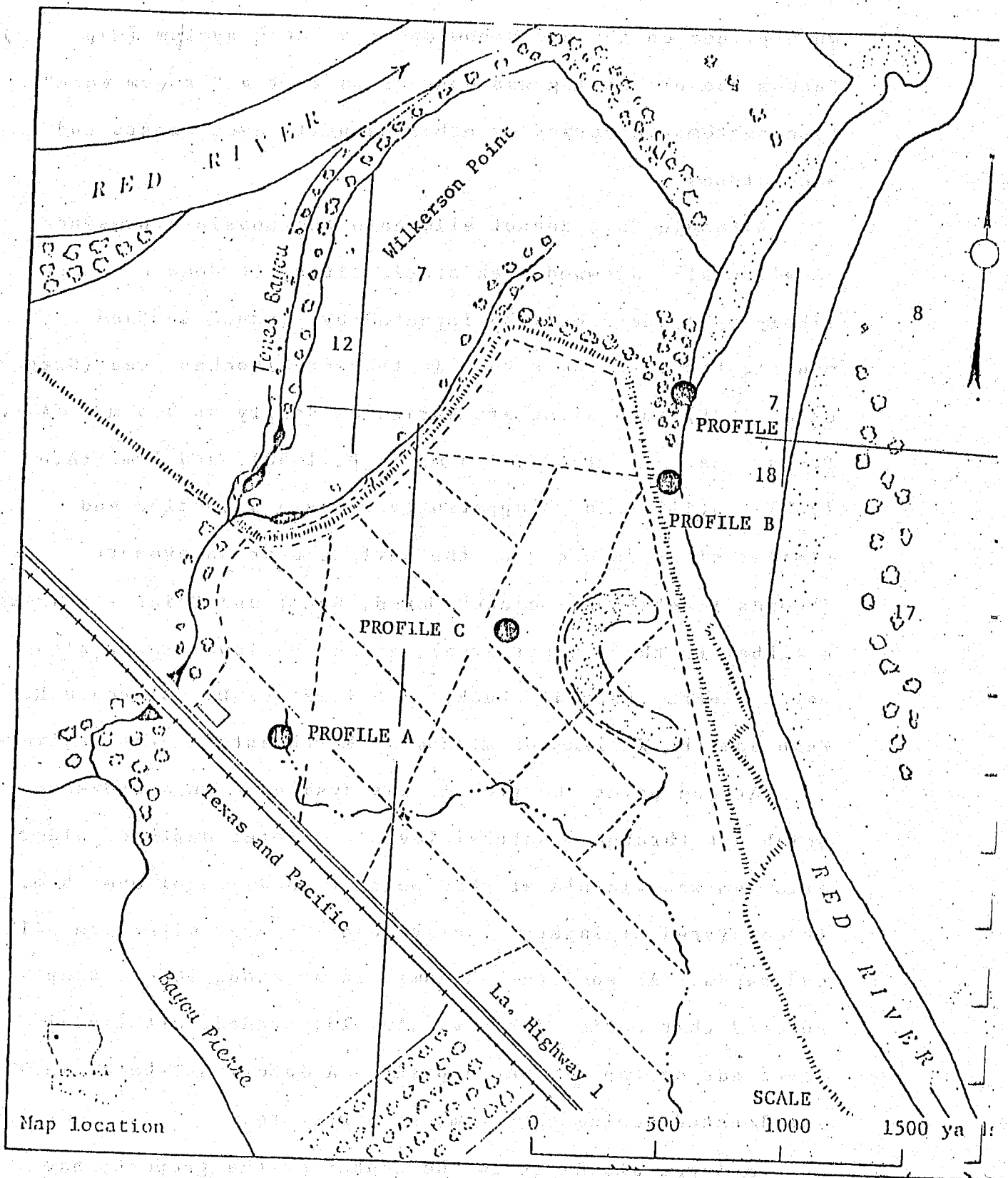
In spite of close ground reconnaissance and multiple shovel tests, over 200 in one deeply disked test sample, no prehistoric sites were located. At least another 30 shovel tests, to a depth of a half meter to a meter in some cases,

were placed on the old oxbow and its levee system (Map). Random shovel testing was done as part of a "random walk" type systematic survey of other natural levee crests and back slopes.

Although this cannot eliminate the possible presence of alluvially drowned prehistoric sites, it does not seem likely that these will be impacted by planned surface modifications at the site. In the Natchitoches area (Gregory et al 1979) such sites are buried as deeply as 3.5 m. (Alto Focus - ca. A.D. 1000), 1.5 m. (A.D. 1450), and 1 m. (A.D. 1700). Still this is apparently a basin situation and similar sites do occur on the surface near Shreveport (Mounds Plantation, Belcher Mound, Sunnyland Point - nearest neighbor to the project area), and at various places along Bayou Pierre (Records check, site files of Dr. Clarence H. Webb and the Williamson Museum at Northwestern State University).

At one point the profile was available in a crevasse which cut through a natural levee - a total depth of older alluvium was visible at that point to a depth of over 5 m. It consisted of layers of clay interfingered with fine silts and sands. An undisturbed humic layer about 10 cm. deep covered that entire deposit. An old, eroded, artificial levee sat on top of that deposit. A later "set-back" levee was located behind that remnant structure.

A large slush-pit in the center of the property had exposed approximately 2 m. of normal soil profile: a white sand was overlain at that point with a heavy deposit of organic



SOIL PROFILE LOCATIONS

profile locations

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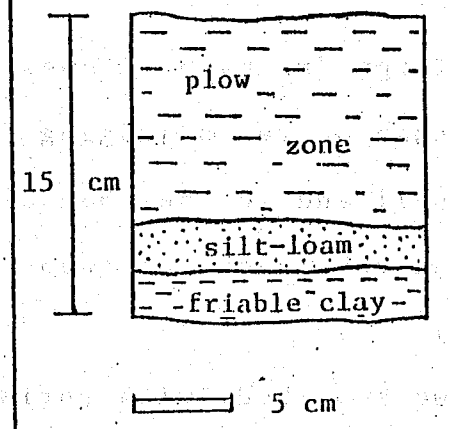
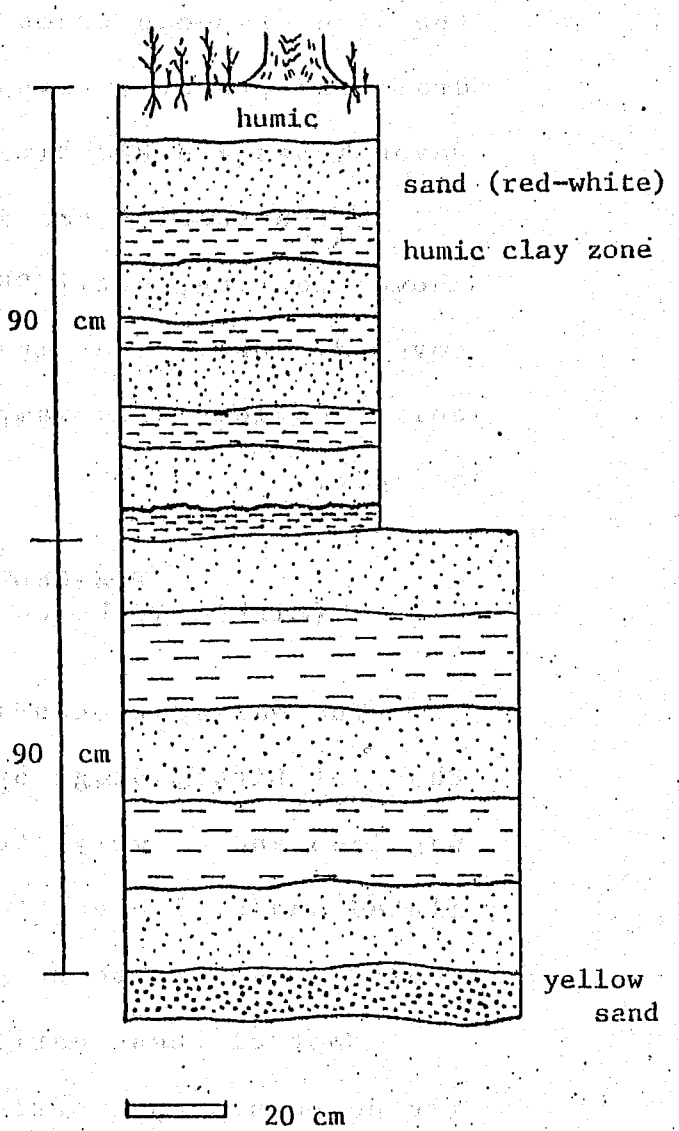
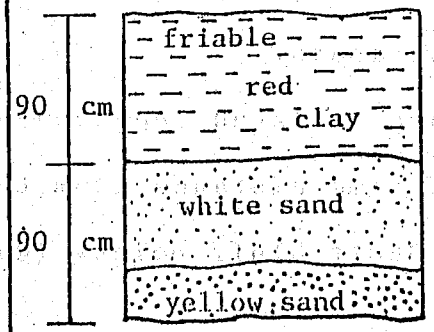
PROFILE "A"



COMPOSITE PROFILE "B"



PROFILE "C"



S O I L P R O F I L E S

CULTURAL - HISTORICAL RESOURCES SURVEY

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1980

red clay backswamp deposit. Apparently this profile resulted from the natural levee of an abandoned meander loop located on the SE corner of the property.

An ephemeral bayou and two large drainage ditches and one segment of old canal (older than 50 years judging from the size of pecan trees on the spoil and in the channel) drain the property trapped between the levees of Bayou Pierre, Bayou Tones and Red River (Map 2).

All natural levee deposits were walked, with periodic shovel testing, until 98% of the higher elevations were covered. Shovel testing was less frequent on friable clay soils, obvious backswamp deposit, but they were placed there as well.

PRE-CADDOAN PREHISTORY
(Lithic-Archaic-Lower Valley Occupations)

The earliest occupations of the Red River Valley are those of Lithic Stage or Paleo-Indian hunters (Webb 1948, Gagliano and Gregory 1965). These sites contain distinctive fluted and/or lanceolate projectile points, and a few other tools thought to be knives and scrapers.

Most of these early finds are isolated occurrences of fluted points apparently lost at some distance from the base camp. These include Clovis and Scottsbluff points (Gagliano and Gregory 1965).

Immediately southwest of the survey area on the terraces along the valley a dual component site was excavated by

Clarence Webb and others (Webb, Shiner, and Roberts 1971). The earliest, and heaviest, occupations were by people making and using a unique assemblage of stone tools: small fluted projectile points - like San Patrice in all its variations, denticulates, side and "thumbnail" end-scrapers. A notched knife or spokeshave (Albany Spokeshave) was also common. The later occupation began with Edgewood points and lasted much later. However, these were Archaic Stage (gathering-hunting of local resources) occupations.

All these early occupations of the Red River area were located on older alluvial surfaces. Had they been present on the active floodplain they likely would be deeply buried, at more than 3 - 5 m. or completely obliterated by meandering stream.

Probabilities of sites in the survey area that could contribute to understanding these early occupants of the Red River are extremely low.

Three early ceramic (pottery-making) complexes have been reported from the Red River area. These all pre-date the widespread occupations of the area by Caddoan groups (A.D. 1000-1835). Depending on the age of the various meander belts that crossed the survey area, it is reasonable to expect that some of these sites might be in the area.

To date these are defined from Ceramic forms and decoration (Webb 1959) and most seem to have been the products of people moving up the Red River from the southeast,

likely the Lower Mississippi Valley. Tchefuncte, Marksville-Troyville (Bellvue), and Coles Creek ceramics are noted on sites from the Caddo-Bossier Parish area. Little is known about the date and distribution of these sites, but should any evidence of Indian occupation from these periods (300 B.C.-1? A.D.) the site(s) would be of extreme importance.

At the Mounds Plantation Site, north of Shreveport, Clarence Webb and Ralph McKinney (1975:39-127) noted that both Coles Creek and another complex related to sites in southern Arkansas, seem to pre-date Caddo I occupations. This Arkansas derived complex (?), Fourche Maline, seems extremely limited in Louisiana, and finds of even minimal remains would be extremely important. Mounds Plantation is located on alluvium exactly like that of the survey area, so this possible occurrence should be noted.

CADDOAN PREHISTORIC SEQUENCE

Shreveport and Bossier City are located in the Caddoan archaeological area. The ancestors of the contemporary Caddo Indians lived in this region for nearly 1000 years (Webb and Gregory 1978).

Archaeologically that long sequence of occupation has been divided into five culture periods: Caddo I, II, III, IV and V. Each period has distinctive markers, both artifactual types and in terms of settlement, subsistence and socio-cultural variation (Gregory 1974, Webb and Gregory 1978).

Briefly, these periods will be summarized here, in terms of problem definition, for this portion of the Red River Valley.

First, it should be pointed out that through the efforts of Dr. Clarence H. Webb of Shreveport, the foundation for the Caddoan archaeological sequence in Louisiana was first developed in the Red River region.

The excavation data forming the basis for Caddo I (Alto-Gahagan Focus) came primarily from Gahagan (Webb and Dodd) in Red River Parish and from Mounds Plantation in Caddo Parish (Webb and McKinney 1975). A generalized pattern of small settlements in the hills - likely no more than kin-based hamlets - with large multiple mound-plaza centers along the major waterways developed around A.D. 1000. Its closest similarities are to East Texas and Southwestern Arkansas. An elaborate burial complex with log tombs or special pits is a hall mark of this period. Influences from Mexico - engraved decoration on carinated bowls, tapered spout waterbottles, along with Mississippian cult symbolism (hand-eye, "long-nosed" God masks, the use of the bow, and elaborate ceremonial pipes) are linked to the southwest as well as the rest of the Southeastern United States. Maize agriculture seems a basic subsistence element.

A mound, likely representing Caddo I, II occupations is located on Sunnyland Plantation just north of this survey area. It seemed logical for Caddo I sites (hamlets) to exist on the natural levee system associated with the old oxbow

scar on the survey area. This seemed wholly in order with the pattern of Caddo I settlement further south near Hanna and Gahagan (Thomas et al 1977). So far only one such alluvial bottomland (Hanna Site) has been excavated.

Caddo II sites (Belcher-Bossier Focus) are very common in the Shreveport-Bossier area. Large village sites with, or without, truncate burial mounds, are reported from Belcher (Webb 1959), and a number of sites in the Shreveport-Bossier metropolitan areas (Field Notes: Dr. Clarence H. Webb, 1959). Sites with a different ceramic complex are common in this period (A.D. 1200-1450) in northwestern Louisiana. Maize is clearly a subsistence element, but deer hunting was also important. Sites are hamlet to single or multiple mound centers, with cemeteries in the village debris and elaborate multiple burials in truncate mounds. It was predicted that such sites might occur in this area, depending on the age of this meander scar.

Caddo III, IV (Haley Focus) sites are not as common here as they are north of Ida, Louisiana. It would be possible that they do exist, but have not been located or adequately investigated. That possibility also existed for the survey area, but the probability was low.

Caddo V (Lawton Phase or Historic, Glendora Focus) was the latest Caddoan period (A.D. 1690-1835). It ended only in 1835-40 with the cession of the northwest Louisiana lands by the Caddo to the United States. By 1840 they had migrated west of Louisiana (Webb and Gregory 1978).

Mound construction had disappeared by this time, and scattered hamlets with contiguous cemeteries were the rule. Natchitoches Engraved, Hodges Engraved and Keno Trailed vessels, sherds are often associated with trade beads and other European goods. To date no such sites, with European trade goods in association, have been located near Shreveport-Bossier. Tones Bayou was once the major water connection between Red River and Bayou Pierre. It allowed boat traffic to the vicinity of the American Agency and trading post for the Caddo near modern Forbing. It was hoped that some physical evidence of historic Caddoan Indian occupations might be present in the survey area. Similar settings have yielded sites up the Red River. On one site nearer Bossier City, materials are identical to the later ceramic complexes, but still lack European trade goods. Inasmuch as the trading post-Agency house was near the survey area it was hoped that at least temporary camp sites would be located.

All these expectations seemed in order because of the location of the survey area. Had any of them been realized the sites would have contributed to the general knowledge of the region and specific information about the periods would be significant at some level.

HISTORY

Early references to exploration in the Red River flood-plain north of Natchitoches, Louisiana, are sketchy and irregular.

Although it may have begun as early as the voyages of De Soto, travel up the River was "haphazard" until the time of the Louisiana Purchase (Lowrey 1968).

The obstacles to exploration and settlement in the vicinity of what is now southern Caddo Parish were formidable, even by frontier standards. One was political. The area belonged to France, and American colonists were not interested in locating where the future was so uncertain. A second impediment was the presence of a large and healthy native population - the Caddo Indian - a factor that also might have contributed to a white settler's feeling of uncertainty about his future. Finally, the only practicable route of travel, the Red River itself, was blocked above Natchitoches by a series of massive log jams collectively referred to as the "Red River Raft."

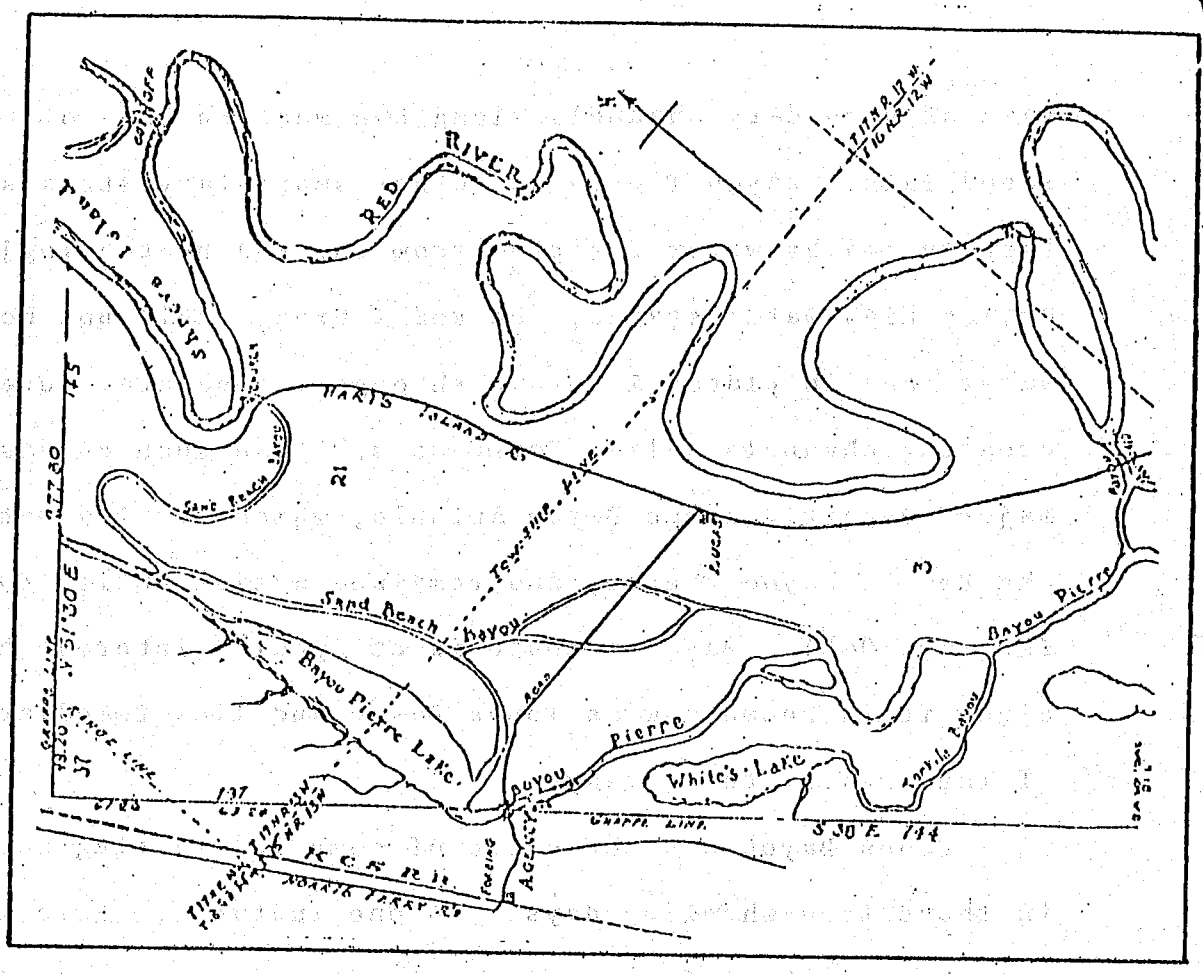
In time, the barriers to settlement fell. Louisiana was purchased by the United States in 1803, and the Caddo Cession of 1835 solved the second problem (Neely 1965). The days of the Raft, too, were numbered. The powerful new United States now had a compelling strategic interest in improving communications to the southwest, where difficulties with Mexico were mounting, and a powerful new tool was brought into action - the steam engine. Snagboats ripped the Raft apart for the last time in 1873 (Dethloff 1967).

River traffic in earliest times left the log-choked main channel of the Red above Natchitoches and moved up a shifting

maze of secondary channels along the western side of the floodplain. Bayou Pierre and other subsidiary streams were largely fed by water diverted from the Red by the logjams. During high water stages, the Red's banks could not hold the water, and in places it broke through the natural levees, creating channels called "crevasses." One such crevasse of major proportions was Bayou Antonio, which carried water from the Red to Bayou Pierre, and remained active until 1890 (Murray 1948). Bayou Antonio is of special interest here, since it is known now as Tones Bayou and lies immediately west of the area of this study.

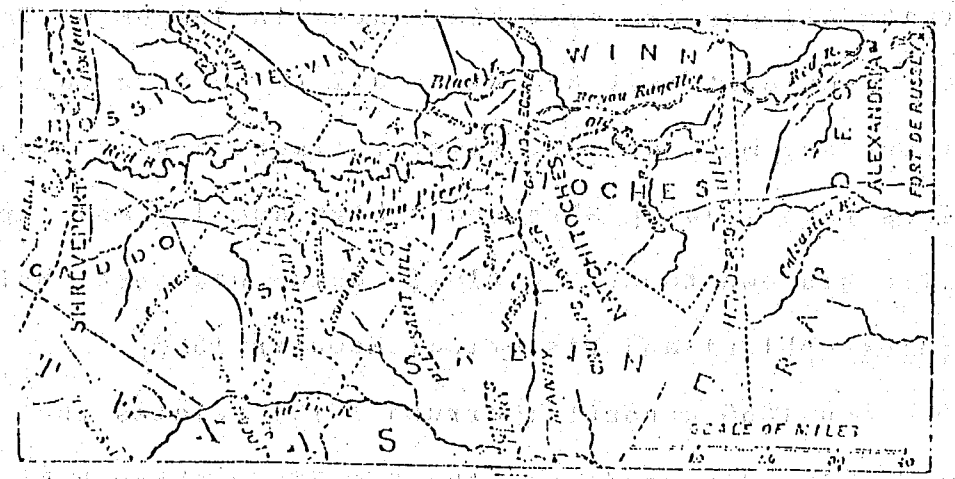
Tones Bayou was the scene of some interesting activity in those free-wheeling days. In one instance, James B. Gilmore brought a number of slave mechanics to Shreveport in 1850 for the purpose of hiring them out to people who wished to build. Viewing this form of competition as unfair, the town's white mechanics prevailed upon the city council to require a license tax of all black mechanics. In retaliation, the irate Gilmore employed his slaves in deepening Tones Bayou from where it left Red River all the way to Bayou Pierre, about one mile at that time. Gilmore had in mind nothing less than leaving Shreveport high and dry and replacing it with his own town, Red Bluff, which was never built. (Biographical and Historical Memoirs 1890).

An 1860 account (Carruth 1970) relates that so much water was being diverted from the Red River through Tones Bayou into Bayou Pierre that an artificial cutoff was being planned



LA STATE LAND OFFICE
GEO. MORSE SURVEY 1842
SHOWING SITE OF CADDO INDIAN AGENCY
SCENE OF TREATY OF CESSION OF JULY 1 1835.

From J. Fair Hardin, Northwestern Louisiana
Vol. 2, p. 9. Shreveport



RED RIVER VALLEY - ALEXANDRIA TO SHREVEPORT, ABOUT 1860
From Harpers Pictorial History of the Civil
War. Part Second, p. 578. Chicago, 1868

across the neck of the meander which had formed the big crevasse, a distance of only 300 yards. The same account mentions that improved plantation land in the Red River bottoms brought "extraordinary fancy prices," perhaps as much as $75.00 or $100.00 per acre.

River travel until 1815 was accomplished by canoe, flatboat, raft and pirogue. The next hundred years was the steamboat era. Operating first through the devious backwaters of the Raft days, and later along the Red itself, the steamers carried upstream the settlers and their needs and brought down the endless cargoes of cotton so typical of the times.

With the establishment of fairly reliable river transport, the transition of the upper Red River Valley from frontier to farm and factory had begun (Dethloff 1967). As Wells has indicated (1967), northwest Louisiana was one of the last American frontiers into which the slave-plantation system entered. After the Caddo Cession, cotton "plantations" of 500 to 1,500 acres were quickly set up as self-sustaining units. Plantation buildings in these early days usually were of logs, those of the slaves being smaller and frequently moved.

The typical plantation of southern Caddo grew cotton for market and otherwise was largely self-supporting. Salt for curing meat was brought from Lake Bistineau, and a ride to Shreveport every few months brought shoe leather, needles, coffee, and medicines. While keeping healthy was a serious

matter, the very isolation of the plantation folk often served to protect them from disease.

By 1860, Caddo Parish ranked fourth in the state in number of business establishments and second in annual value of products manufactured (Snyder 1972).

The Civil War had no significant impact on the upper Red River landscape. Of more importance, in this respect, was the removal of the Raft. This feat restricted the Red to a single channel and allowed the draining of thousands of acres of backswamp land. Although freed from the Raft, the Red at its best remained of limited use, as it is today. Growing settlement and consequent transportation requirements demanded something better than the hard-working little steamboats, and it was not long in coming.

Various railroads had been interested in a Shreveport connection, even before the Civil War. The completion of track from Shreveport to Cheneyville was accomplished on May 1, 1882, and by September 12 of that year it had reached Baton Rouge (Griffith 1967). Dallas had been reached in 1873, and New Orleans was linked to Shreveport by rail in 1884. Within one year of its construction, the Texas and Pacific was carrying sixty per cent of Red River valley cotton shipped to the Crescent City. (Lowrey 1968).

The South is sometimes characterized as "unchanging," but this is a highly inaccurate concept and is especially false in southern Caddo Parish. The Red River valley in northwest Louisiana has undergone many changes reflected in

area cultural landscapes, and more are to come. Among the more forceful agents of change have been the search for energy, changes in farming technologies, altered economic and social circumstances, and the people themselves.

A well producing gas for lighting purposes was drilled at Shreveport in 1870, but the industry did not develop immediately. By 1906 eleven gas wells were producing in the Caddo area in spite of the enormous pressures encountered there. Opening the new fields led to increased rail and highway development and the coming of yet another new industry -pipelining (Davis 1970).

The old plantation sites of the Red River floodplain themselves bear witness to a more recent landscape change of major proportions: the migration of farm workers to urban areas. The small tenant houses that once dotted the land have been abandoned and allowed to fall down, or have been moved or destroyed. A dozen or so such houses stood within the area of this study as late as 1946.

The tenant houses in many instances have been succeeded by tall sheds built to shelter the farm machines that have replaced the field hands. Traditional crops, such as cotton, have yielded widely to cattle and soybeans, and the grain elevator has become commonplace. More land is being cleared for farming every year.

Of particular interest now is the imminence of changes likely to dwarf anything experienced heretofore: the

construction of a great north-south highway, the completion of the Red River waterway, and the opening of lignite mines across northwest Louisiana. This unique combination of energy resources and communications, coupled with the greatest pressure for their full exploitation, inevitably will bring changes of massive and enduring proportions.

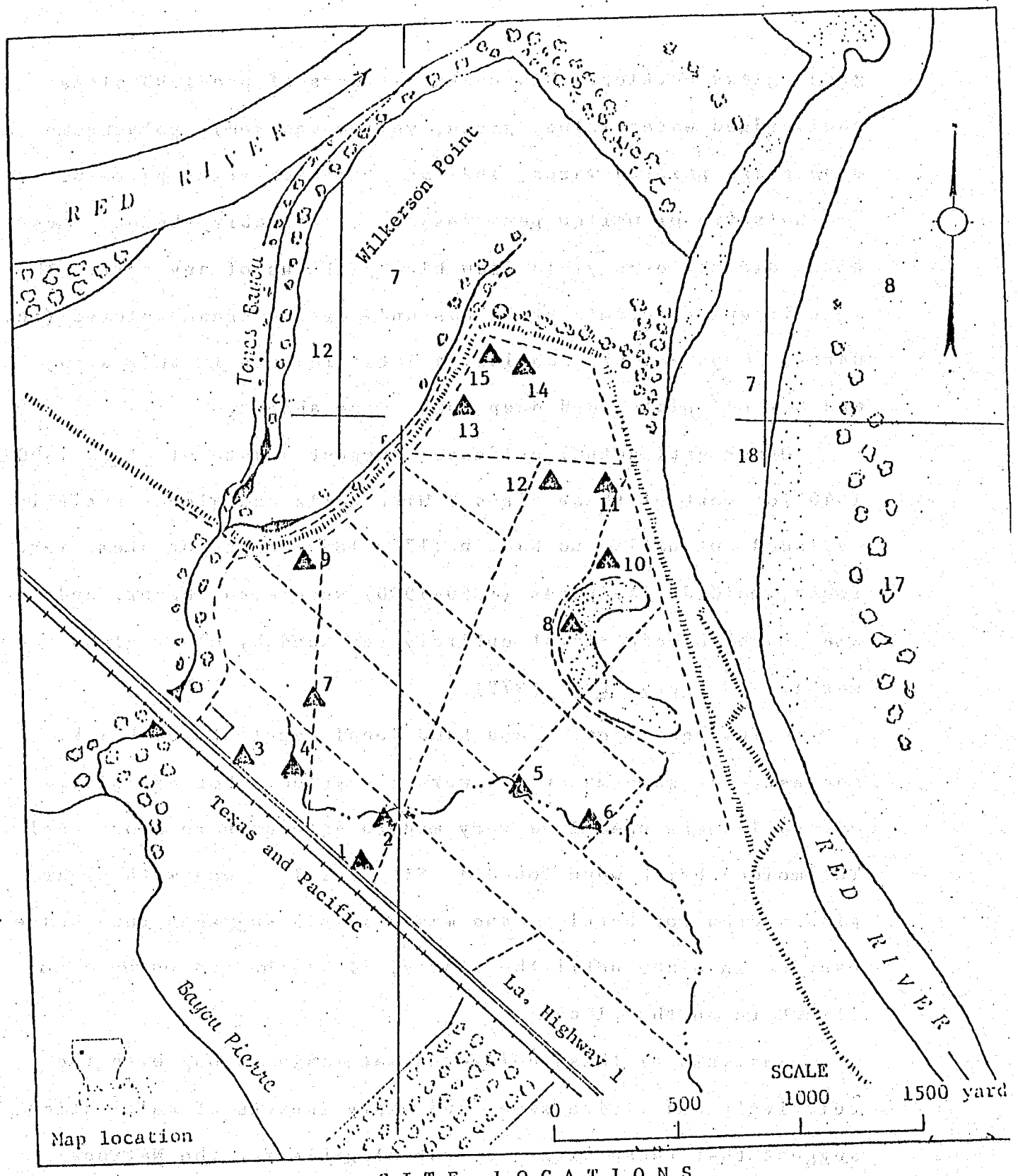
SITE RECOVERY

A total of 13 sites were located within this survey area. All were represented by midden debris, and all were late post-European, historic, occupations.

The average site was small (30 $m.^2$) and scattered ceramic and glass sherds were the most common artifacts. Food remains: mammal (cow, hog), fish, turtle and garfish were present in most cases.

One site (No. 13) covered over a hectare and shovel testing indicated the midden was approximately .5 m. in depth. This was the largest midden encountered. No standing remains; foundations, cistern curbs, or fireplaces were noted. One area (No. 1) did have a pile of loose brick, but no architectural features were *in situ*, the whole area having apparently been cropped over for at least a decade.

Site surface collection inventories are given here (Appendix 1). An overview suggests that only one of these sites, No. 13, dated much prior to 1900 if at all. That site had low frequencies of flow blue pottery and some molded dark



SITE LOCATIONS

CULTURAL - HISTORICAL RESOURCES SURVEY

site locations

CADDO-BOSSIER
PORT FACILITY PROPERTIES

1980

green glass bottles. Diagnostic markers of pre-1890 sites: shell-edged wares (blue, green, yellow and red), polychrome underglaze painted wares, and even transfer print patterns (Chinoiserie or willow patterns) were noticably absent. Most sites did not even yield flow blue patterns of any sort. The most frequent ceramic style was undecorated cream-colored (cc.) wares. Cups all had handles, a later feature in this area, and brimmed plates and deep bowls were absent.

Other artifactual evidences suggest a date of circa 1900-1940 for most of these sites. Wire nails had almost entirely replaced cut nails, no Kaolin (1790-1850) pipes or stems were found, molded clay pipes (1850-1900) were also absent, and clay marbles were almost entirely replaced by clear glass marbles (Gregory et al 1979).

A few square nails and hand local manufactured brick suggest that some materials were re-cycled. For example, cut nails were used in a very modern gate or barn door hasp! The molded brick were found at Site No. 1, along with clear glass screw top bottles, and map evidence suggests that house was not in place until the 1950's, likely having moved from elsewhere on the place.

Analysis of these collected materials, along with the relatively small site sizes and heavy impacts of cultivation, suggest that these sites are not eligible for the National Register. It is not likely either that these deeply plowed sites, with so few visible structural remains (not even concentrations of brick fragments representing cisterns or

foundations were present!), can offer much more cultural information than has been recovered in this survey.

This apparently was a moderate-sized plantation complex, the largest site, No. 13, probably was the house of an overseer or manager. All the other sites apparently represented small, probably shotgun houses, like those removed from the Premetco Plant site.

RECOMMENDATIONS

On the basis of these observations it is strongly felt that no additional work is necessary on the project area, and that there are no cultural or historical sites of significance which will be impacted by the planned development of the area.

APPENDIX 1

SITE DESCRIPTIONS

A total of sixteen sites were located during pedestrian survey of the proposed port location. These have been filed with the Division of Archaeology, Office of Culture, Tourism and Recreation, State of Louisiana, Baton Rouge. Official site numbers have been assigned and are appended to the field survey numbers. Map locations are shown in text.

Site 1 (16 CD 140). . . . NW¼, W½, Sect. 30, T 16 N, R 12 W Caspiana Quad.

This site was a thin midden, approximately 10 m^2. It was located on silt-loam levee deposits, likely originally hardwood bottomland. There were scattered brick, a mixture of handmade and modern molded commercial brick. It may have been a chimney. It clearly was part of the row of shotgun houses cleared for the construction of the Premetco Plant.

Cultural affiliation is rent tenant and/or sharecropper between 1935 and 1965. The site has been effectively destroyed by construction and cultivation. No further work is recommended, and the site is not eligible for the National Register of Historic Sites.

ARTIFACT INVENTORY

Factory-made clear glass. . . . . 5 sherds

Total . 5 sherds

Site 2 (16 CD 141). . . . W½, W¼, of W½, Sect. 18, T 16 N, R 12 W, Caspiana Quad.

This is a thin midden approximately 30 m^2 oriented n-s on a field road. Glass and chinaware scattered along a road to the vicinity of a dilapidated midwestern style barn.

The site has been impacted by road, a canal, and barn construction. It likely dates between 1940 and 1930. Not eligible for the National Register because of date and condition, no further work is recommended.

ARTIFACT INVENTORY

Coke bottle	1
Jug ware "milk" bowl sherds	3
Fruit jar (factory-made), screw top	11
Beer bottle (amber) sherds	2
Bleach bottle sherds	1
Softpaste lead-glazed sherds (cream colored)	10
Ironstone	2
Porcelain sherds	7
Green earthernware	1
Headlight sherd (clear, molded)	1
Shoe side fragment	1
Carbon rod	1
Bottle cap (pewter)	1
Brick/mortar fragments (not collected)	1
Plastic sherd	1
Total	44

Site 3 (16 CD 142). . . . N½ of the N½ of the W½ of irregular Section 30, T 16 N, R 12 W, Caspiana Quad.

This is a thin midden situated adjacent to La. Highway 1 and about 50 m. SE of the Premetco Plant. Artifacts were found in light to moderate density over an area approximately 30 m^2.

The site is presently part of a cotton field and has been heavily impacted by plowing. It likely dates between 1930 and 1940. It is not eligible for the National Register because of the date and its condition. No further work is recommended.

ARTIFACT INVENTORY

Molded decoration milk glass sherds	1
Softpaste white glazed sherds	1
Carnival glass sherds	1
Clear glass (molded)	2
Red plastic fragment	1
Stone (limestone?)	1
Total	7

Site 4 (16 CD 143). . . . W½ of the W½ of the N½ of irregular Section 30, T 16 N, R 12 W, Caspiana Quad.

This is a thin midden covering an area approximately 30 m^2. Sherds of glass, cream colored ceramics, and "jugware" occurred in light to moderate density over the site.

The site is presently part of a cotton field and has been heavily impacted by plowing. It likely dates around 1940. Because of this date and the condition of the site, it is not eligible for the National Register. No further work is recommended.

ARTIFACT INVENTORY

Light green molded glass sherds	1
Clear molded glass sherds	3
Milk glass sherds	2
Beer or bleach bottle sherds	2
Brick fragments (modern)	2
Softpaste white ware sherds	6
Ironstone sherds	2
Dogwood bloom motif underglaze sherds	1
Red glass reflector	1
Jug ware sherds	1
Total	21

Site 5 (16 CD 144). . . . SW¼ of the S½ of the W½ of irregular Section 30, T 15 N, R 12 W, Caspiana Quad.

This site is a thin midden covering an area approximately 30 m^2. Artifacts occurred in moderate density over the site.

The site is presently part of a cotton field and has been heavily impacted by plowing. It appears likely to have been a medium sized tenant house. It may date as early as the 1920's. Because of the condition of the site, it is not eligible for the National Register. No further work is recommended.

ARTIFACT INVENTORY

Softpaste plain white clear glaze sherds	28
Semi-porcelain sherds	8
Porcelain doll fragment	1
Light green glass sherds	11
Pale blue glass sherds	1
Milk glass sherds	1
Clear glass sherds	4
Bottles with stoppers	2
Blue glass bottle (triangle impressed)	1
Snuff bottle	1
Beer bottle	1
Banded ware (late?) sherds	1
Jug ware sherds	30
Rouge cap (brass)	1

Cast iron fragments	2
Hinges	2
Square nails	2
Total	97

Site 6 (16 CD 145). . . . . W½ of the S½ of the S½ of irregular Section 30, T 15 N, R 12 W, Caspiana Quad.

This site is a thin midden situated in the edge of a backswamp of Red River. Artifacts were found in moderate density scattered over an area approximately 30 m^2.

The site is presently part of a cotton field and has been heavily impacted by plowing. This site may date back to 1900, but most of the occupation is later and the site is not deemed eligible for the National Register. No further work is recommended.

ARTIFACT INVENTORY

Cream paste sherds	36
Pearl ware sherds	2
Jugware sherds	3
Ironstone sherds	1
Flow blue sherds	3
Sponge ware sherds	3
Transfer printed sherds (late)	1
Japanese porcelain sherds	1
Door knob	1
Milk glass	2
Shell (freshwater)	2
Blue glass sherds	5
Amber glass sherds	20
Snuff bottle fragments	2
Green glass sherds	1

Clear glass sherds	31
Bottle sherds (stoppered)	3
Bottle sherds (screw on cap)	1
Unidentified metal plate	1
Square (?) nails	1
Total	120

Site 7 (16 CD 146). . . . NE¼ of the SW½ of the W½ of irregular Section 30, T 15 N, R 12 W, Caspiana Quad.

This site is a thin midden covering an area approximately 30 m^2. Artifacts occurred in light to moderate density over the site.

The site is presently part of a cotton field and has been heavily impacted by plowing. It may date back to 1900, but it has been so severely impacted by cultivation that it is not deemed eligible for the National Register. No further work is recommended.

ARTIFACT INVENTORY

Transfer printed ware sherds	1
Yellow glaze sherds	1
Jugware sherds	13
Cream paste sherds	11
Pearl ware sherds	3
Amber glass sherds	4
Bottle (stoppered) sherds	5
Milk glass sherds	2
Green glass sherds	2
Blue glass sherds	1
Clear glass sherds	4
Clear glass bottle sherds	1
Metal fragment	1
Nails (1 square)	3
Buttons	2
Total	54

Site 8 (16 CD 147). . . . S½, E½, S½, T 16 N, R 12 W, Section 30, Caspiana Quad.

This site comprised a very light scattering of glass and various wares over an area some 30 m^2. Aerial photographs located the site atop a clay plug representing an abandoned and filled Red River meander. Surface material is predominantly sandy silt and the locality is subject to frequent flooding and attendant deposition.

Prior to settlement the site locality was no doubt covered by the mixed hardwoods so typical of river bottom lands.

The artifacts found here were limited to the surface in occurrence; nothing further was yielded by shovel testing. Artifacts so few in number - a total of 9 - raise some doubt as to whether this spot was actually occupied or was a trash dump. It is here judged to have been the short-term site of a tenant house.

The site has been destroyed by extensive cultivation and nothing observed suggests further investigation. The site is not eligible for the National Register of Historic Places.

ARTIFACT INVENTORY

Clear glass sherds. 3

Green glass sherds. 1

Amber glass sherds. 1

Cream paste sherds. 1

Pearl ware sherds	1
Total	9

Site 9 (16 CD 148). . . . NE¼, N½, W½, T 16 N, R 12 W, Section 30, Caspiana Quad.

The placement of this site a few meters away from the stream bank suggests that a road separated the dwelling from the bank. The road is now under the artificial levee along Tone's Bayous.

The site is near the crest of a major natural levee, usually the best-drained part of a flood plain, and covers the silty sands of an area of some 30 m^2. Surface artifacts were badly scattered, probably due to work connected with artificial levee construction, road building, and extensive agriculture. Natural levees were typically locales of bottom-land hardwoods, and are usually desirable for agriculture.

The artifacts found here reflect the presence of a tenant house of fairly recent occupance. Heavy cultivation and other work have destroyed the site and further investigation is not recommended. The site is not eligible for inclusion in the National Register of Historic Places.

ARTIFACT INVENTORY

Cream ware	22
Door know (?)	1
Bone	1
Brick	1
Shell	2
Clear glass	8

Green glass	3
Milk glass	1
Amber glass	1
Nail (round)	1
Total	41

Site 10 (16 CD 149). . . . S½, E½, S½, T 16 N, R 12 W, Section 30, Caspiana Quad.

This site is located on the crest of a natural levee sloping away from a filled oxbow lake (clay plug). Prior to artificial levee construction, flooding of the hardwood-covered ground was frequent.

Artifacts were scattered widely over the site area of some 30 m^2, no doubt resulting from extensive cultivation and making site orientation impossible. It is to be noted that gourds grow as "volunteers" among cotton at the site.

Surface examination yielded comparatively few artifacts, while more was found with shovel testing to a depth of some 6 cm.

Material collected indicate the site to have been the locale of a tenant cabin probably occupied sometime after 1900, perhaps 1920-1930. Site damage by repeated cultivation through the years amounts to destruction, and so no further examination is recommended. The site is not eligible for naming to the National Register of Historic Places.

ARTIFACT INVENTORY

Cream ware	5
Semi-porcelain	1
Tr. print ("J. & G. M. handl. engl.)	1
Green glass	4
Clear glass	2
Metal fragment	1

Round nails	2
Square nails	1
Chain	1
Total	18

Site 11 (16 CD 150). . . . S½, E½, E½, Section 30, T 16 N, R 12 W, Caspiana Quad.

This site consists of a midden about 6 cm. deep and covering about a 50 m^2 area. It was apparently oriented east-west.

The site is deeply plowed and no in situ structural remains were observed. Artifact density was moderate (20/m^2) and the site seems unlikely to contain many, if any, deep subsurface features.

The artifacts suggest a late twentieth-century house hereabouts, and one house did show near here on air photos (1950-60 period). Ceramics suggest a 1930-1940 initial occupation date.

Site condition, coupled to the late dates, suggests no eligibility in terms of the National Register requirements. No further work is recommended.

ARTIFACT INVENTORY

Cream colored sherds	11
Semi-porcelain sherds	6
Transfer print	4
Yellow glaze	1
Jug ware	6
Model T Ford Electrical Insulator	1
Fragment of ceramic figurine	1
Clear glass marble	1

Amber glass sherds	1
Green opaque glass sherd	1
Clear glass sherd (1 screw-top bottle)	7
Total	43

Site 12 (16 CD 151). . . . S½, E½, E½, T 16 N, R 12 W, irregular Section 30, Caspiana Quad.

This site was about a 50 m^2 midden located on the high natural levee of the old relect oxbow. About 6 cm. deep, the site showed a moderate artifact density (20/m^2).

Associated with an old field levee road, the site was likely a tenant house in the late twentieth century. A heavy growth of gourds was associated with the midden, these "escapes" were good size markers.

Glass, ceramics and metal artifacts suggest a post 1900 date. Sites like this occur at many points in the Red River Valley, are late and likely lack any significant artifact content. Architectural features were likely obliterated with the standing structure. The site is not eligible for the National Register, and no further work is recommended.

ARTIFACT INVENTORY

Semi-porcelain sherds	3
Cream colored wares	16
Spongeware	1
Transfer Print	1
Canary yellow glazed sherd	1
Blue glass sherds	5
Green glass sherds	5
Clear glass marble	1
Milk glass sherds	3

Clear glass sherds (3 with screw caps)	12
Amber glass sherds	9
Soft drink bottle sherds	3
Spark plug	1
Carbon rod (battery part)	1
Amorphous fragments of iron	5
Wire nails	5
Glass buttons	3
Fish bone	1
Total	88

Site 13 (16 CD 152). . . . NE¼, N½, W½, T 16 N, R 12 W, irregular Section 30, Caspiana Quad.

An approximate 30 m^2 midden lay next to the levee and road on the north side of the property along Bayou Tone. This midden scatter likely represents a tenant house area. At least a portion of it is under the road and/or levee, while the rest has been heavily plowed. A moderate number of artifacts were observed (30/m^2), but the bulk of the site likely had been destroyed by the levee and road track.

Although the site collection suggests the possibility of a pre-1900 date for at least a component of this site, it does not seem to meet the criteria for the National Register. No further work is felt necessary.

ARTIFACT INVENTORY

Cream colored ware sherds (1 cup handle)	14
Semi-porcelain sherds	2
Pearl ware sherds	5
Transfer printed polychrome sherds (1940?)	1
Flown blue sherds	1
Lead glazed/salt glazed jug sherds	6
Yellow glazed sherds	1
Clear glass sherds (stopper bottle neck)	7
Green glass sherds (mold blown)	1
Amber glass sherds	3
Porcelain button	1

Brick fragments	2
Total	44

Site 14 (16 CD 153). . . . E½, E½, E½, T 16 N, R 12 W, irregular Section 30, Caspiana Quad.

This was a large midden concentration, the biggest found in the survey. The midden was deposited on a natural levee crest parallel to the active Red River. A large crevasse apparently out across the north end of the site.

Artifacts were relatively abundant (50/m^2), but no *in situ* features could be located, not even brick concentrations. A depression near the crevasse scar appeared to be a possible cistern, but shoevel-testing could not confirm that.

Artifact styles suggest an 1870-1900's "big house" was at least the initial structure here. It was likely either the owner or the overseer's house. The crevasse, intensive cultivation and sheet erosion have seriously impacted this site. It is not eligible for the National Register at this point due to this condition. In as much as random shovel testing yielded no indication of *in situ* features, no further no further work is recommended.

ARTIFACT INVENTORY

Semi-porcelain sherds	4
Cream colored ware sherds("Adams" mark 1770-present)	31
Sponge ware	1
Flown blue sherds	4
Transfer print (blue) sherds	8
Polychrome underglaze sherds	2

Yellow glazed ware sherd	1
Salt/lead glazed jug wares	31
Green glass (blown in mold or molded)	8
Blue glass sherds	1
Amber glass sherds	19
Clear glass (seven stoppered bottles to one screw top)	38
Molded red glass bead	1
Mortar fragments	1
Stone (unmodified)	1
Bone (Beef)	1
Fragment of Mill Bastard File	1
Nails (wire)	5
Metal patch	1
Metal fragments	3
Metal stock (buggies)	1
Total	154

Site 15 (16 CD 154). . . . E½, E½, W½, T 16 N, R 12 W, irregular Section 30, Caspiana Quad.

This is a medium-sized midden (50 m^2) located north of the crevasse that cut across site 14. It may represent a tenant house or even a dump. Not many artifacts were recovered, and the collection was field mixed with those from site 16.

Both these sites are most probably trash areas resulting from four houses still show on a 1966 air photo of the site (11-3-66, CET 5#H-255).

Artifacts suggest a post 1930 date. No further work is recommended. It is not eligible for the National Register.

ARTIFACT INVENTORY

(See Site 16)

Site 16 (16 CD 155). . . . NE¼, N½, W½, T 16 N, R 12 W, irregular Section 30, Caspiana Quad.

This is a relatively small concentration of midden (20 artifacts/m^2) scattered brick and an ash lens along the road. Scattered to the west margin of Site 15. No *in situ* structural remains are present. Again this site may be a component in dumps from the tenant houses standing on this area in 1966. Impacted by the levee, road track, cultivation, the crevasse, and moving the structures or obliterating them, this site hardly exists. It is not eligible for the National Register and no further work is required.

ARTIFACT INVENTORY
(Sites 15-16 pooled)

Cream colored ware sherds	20
Amber glass sherds	8
Clear glass sherds	10
Lead glazed jug ware sherds	2
Ironstone sherds	5
Iron gate hinge (post-1940)	1
Cut nail (re-cycled into gate hinge)	1
Wire nail	1
Total	48

BIBLIOGRAPHY

Carruth, Viola

1970. Caddo: 1000. Shreveport Magazine, Shreveport.

Davis, Edwin A.

1970. Louisiana: A Narrative History (3rd ed.). Claitor's, Baton Rouge.

Dethloff, Henry C.

1967. Paddlewheels and Pioneers on Red River, 1815-1915, and the Reminiscences of Captain M. L. Scovell. Louisiana Studies, Vol. VI, No. 2, Summer, Pp. 91-134.

Gagliano, Sherwood and Hiram F. Gregory

1965. A Preliminary Survey of Paleo-Indian Points from Louisiana. Louisiana Studies, 4 (1), Pp. 2-35, Natchitoches.

Gregory, Hiram F.

1967. An Evaluation of the Basin's Resources - Louisiana. The Archaeological, Historical and Natural Resources of the Red River Basin (Hester A. Davis, ed.) Fayetteville, Pp. 43-51, mimeographed.

Gregory, Hiram F. and Hugh K. Curry

1978. Prehistory, Natchitoches Parish Cultural and Historical Resources (Ted Brasher, ed.) Natchitoches Parish Planning Commission, Natchitoches.

Gregory, Hiram F., Pamela Fesperman and James Matthews

1979. Excavations at the Fort St. Jean Baptiste Replication Site, Natchitoches Parish. The Williamson Museum, Natchitoches.

Griffith, Emilia Gay

1967. "The Texas and Pacific Railway Company In Louisiana." Research Paper No. 129, Louisiana Room, Watson Library, Northwestern State University, Natchitoches.

Kniffen, Fred B.

1968. Louisiana: Its Land and People. Louisiana State University Press, Baton Rouge.

Lowrey, Walter M.

1968. Red River. In The Rivers and Bayous of Louisiana (Edwin A. Davis, ed.) Louisiana Education Resource Association, Baton Rouge, Pp. 54-60.

Murray, Grover E.

1948. Geology of De Soto and Red River Parishes. Department of Conservation, Louisiana Geological Survey. Baton Rouge.

Neely, Lalon Greer

1965. "The Early Settlement of the Shreveport Area." Research Paper No. 245, Louisiana Room, Watson Library, Northwestern State University, Natchitoches.

Newman, Robert

1970. Archaeological and Historical Assessment of the Red River Basin in Louisiana. Archaeological and Historical Resources of the Red River Basin (Hester A. Davis, ed.) Fayetteville, Arkansas Archaeological Society.

Newkirk, Judy

1979. A Cultural Resources Survey of the Red River Waterway from Shreveport, Louisiana to the Mississippi River. (2 vols.) Commonwealth Associates Inc., Jackson, Michigan.

Snyder, Perry A.

1972. Shreveport, Louisiana: 1861-1865; From Secession to Surrender. Louisiana Studies, Vol. XI, No. 1, Spring, 1972. Pp. 50-70.

Thomas, Prentice M., Janice Campbell and Steven Ahler

1977. The Hanna Site: An Alto Village in Red River Parish, New World Research Report of Investigations No. 3, New Orleans.

Webb, Clarence H.

1946. Two Unusual Types of Chipped Stone Artifacts from Northwest Louisiana. Bulletin of the Texas Archaeological and Paleontological Society Vol. 17, Abilene.

_____

1948. Caddoan Prehistory: The Bossier Focus. Bulletin of the Texas Archaeological and Paleontological Society 19:100-147, Abilene.

_____

1948. Evidences of Pre-Pottery Cultures in Louisiana. American Antiquity 13:3, Menasha.

_____

1959. The Belcher Mound, A Stratified Caddoan Site in Caddo Parish, Louisiana. Memoirs of the Society for American Archaeology 16, Menasha.

_____

1961. Relationships Between the Caddoan Area and Central Louisiana Sequences. Bulletin of the Texas Archaeological Society 31:11-20.

_____

1963. The Smithport Landing Site: An Alto Focus Component in De Soto Parish, Louisiana. Bulletin of the Texas Archaeological Society 34:144-187, Austin.

Webb, Clarence H. and Hiram F. Gregory

1978. The Caddo Indians of Louisiana. Anthropological Study No. 2, Department of Culture, Recreation and Tourism, Baton Rouge.

_____, Joel Shiner and E. Wayne Roberts

1971. The John Pearce Site (16 CD 56): A San Patrice Site in Caddo Parish, Louisiana. Bulletin of the Texas Archaeological Society 42:1-50.

_____ and Monroe Dodd, Jr.

1939. Further Excavations of the Gahagan Mound: Connections with a Florida Culture. Bulletin of the Texas Archaeological and Paleontological Society, Vol. 1:92-127.

_____ and Ralph McKinney

1975. Mounds Plantation (16 CD 12), Caddo Parish, Louisiana. Louisiana Archaeology 2:39-127.

Wells, Tom H.

1967. "Moving A Plantation To Louisiana." Louisiana Studies, Vol. VI, No. 3, Fall, Pp. 279-289.

1890 Biographical and Historical Memoirs of Northwest Louisiana. Vol. 1, Southern Publishing Co., Nashville.