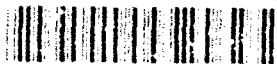


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ARCHEOLOGICAL SURVEY AND TESTING OF AREAS
ALONG MAIN DITCH AND DITCH 9, PEMISCOT COUNTY,
MISSOURI

by

Michael C. Sierzchula

Robert H. Lafferty III

and

Kathleen M. Hess

January 15, 1987



FINAL REPORT

Report prepared by Mid-Continental Research Associates for the
Memphis District Corp of Engineers in accordance with
Contract DACW66-86-R-0018

ABSTRACT

An Archeological survey of 13.31 miles of channel improvement work along Main Ditch and Ditch 9 in Pemiscott County, Missouri was conducted by Mid-Continental Research Associates for the Memphis District Corp of Engineers. One prehistoric site was located on Ditch 9 and tested to determine its potential eligibility for nomination to the National Register of Historic Places (Federal Register 1976:1595). A surface collection, nine shovel tests, and a 1m x 1m test unit were carried out at site 23PM573. The surface collection yielded a unique lithic assemblage, primarily from the spoil pile. Historic materials found were probably a dump site. The shovel tests and 1m x 1m test unit did not contain cultural materials below the spoil. National Register of Historic Places Eligibility was not recommended for this low density site situated on Sharkey clay. Mid-Continental Research Associates was not able to demonstrate presence of intact cultural deposits. Due to the unique lithic assemblage, avoidance is recommended, with work being carried out from the west side of the Ditch.

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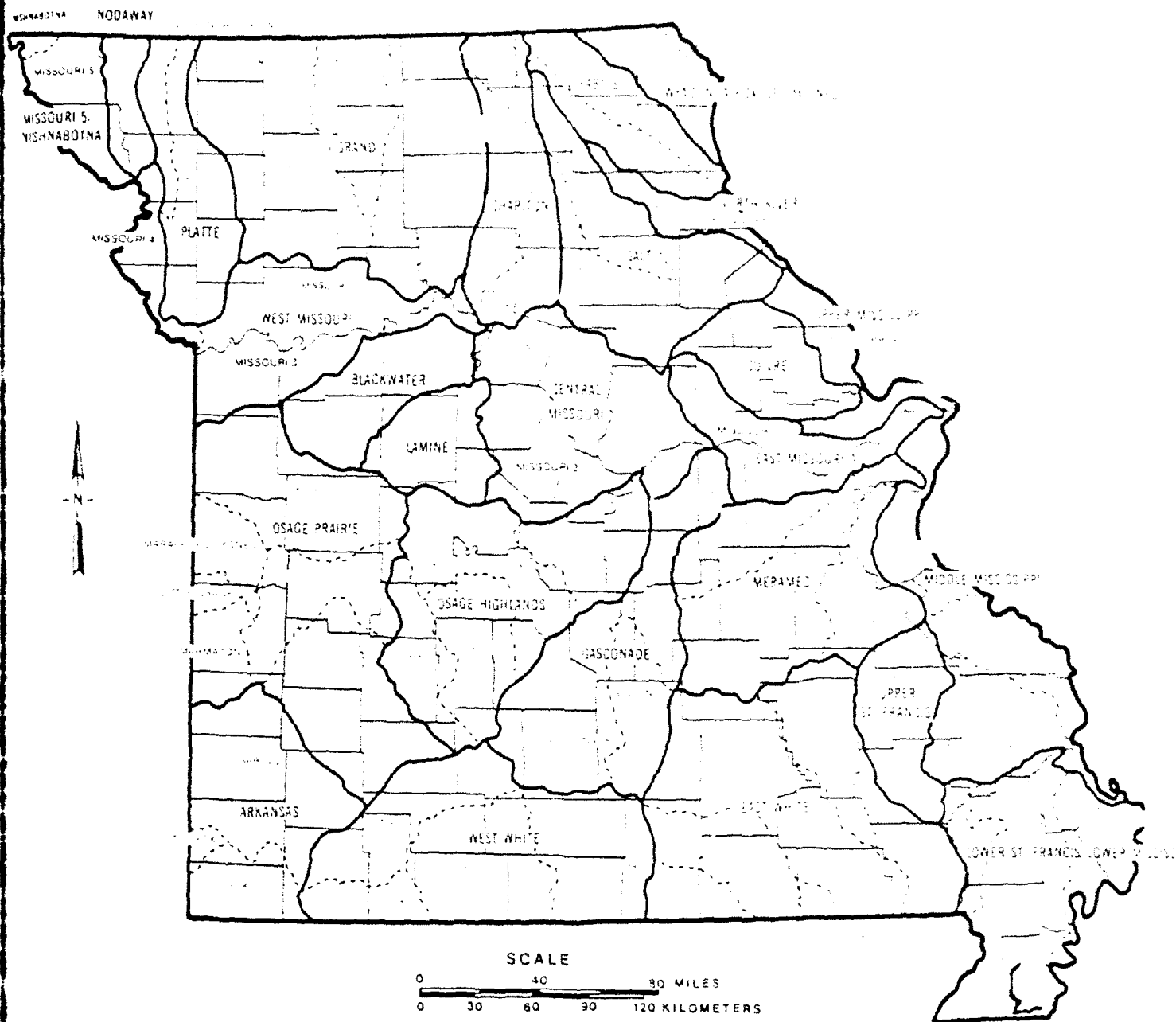
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Study Units and Watersheds

——— PRINCIPAL DRAINAGE BASINS
 - - - - - WATERSHEDS

Project Area

Frontispiece: Project Area Location (Missouri Historic Preservation Program Watershed Map).

INTRODUCTION

The Memphis District Corp of Engineers contracted with Mid-Continental Research Associates to carry out a survey and testing project on 13.31 miles (11.7 kilometers) of channel improvement work along Main Ditch and Ditch 9 in Pemiscott County, Missouri (Figure 1). An intensive survey, beginning on July 8, 1988 was made of six miles along Main Ditch and 7.31 miles along Ditch 9. One site was found and was tested to determine its potential eligibility for nomination to the National Register of Historic Places (Federal Register 1976:1595).

PROJECT LOCATION

The Main Ditch and Ditch 9 areas are located in the southwest corner of Pemiscott County, just north of the Missouri/Arkansas state line. The study area extends from the juncture of Belle Fountain Ditch northward on Ditch 9, from the top east bank eastward for 300 feet. Main Ditch extends from the juncture of Ditch 9 east along Belle Fountain Ditch. It consists of a transect paralleling Main Ditch and extending from the top south bank southward for 300 feet.

ENVIRONMENT

The modern environment of the project area bears little resemblance to its natural state. The swamps have been drained and the natural levees have been precision-land leveled to a three percent grade. Today the perfectly flat fields covered with wheat, beans or milo bear little resemblance to the Southern Floodplain forest which once covered this project area.

The project area is in what is perhaps one of the most highly modified rural landscapes in North America. The major modifications to the landscape include: (1) timbering, which has totally changed the biota, (2) drainage of the swamps, which has made agriculture possible in many parts of the watershed, and (3) land-leveling, which is changing the topography making agriculture more efficient and productive. These changes make it difficult to perceive, much less measure, certain facets of the environment and often obscure the locations of cultural resources. Therefore, the methods of measuring certain past environmental variation must be indirect, because natural topography, flora, and fauna are no longer present in the landscape (Seadles 1976, Figures 5 & 6).

The Relict Braided Surface

The Relict Braided Surface (RBS) was deposited in terminal Pleistocene times by the meltwater from the continental glaciers. Saucier (1974) divides the Braided Stream Surface into two main terraces. The older terrace (T1) is primarily located west of

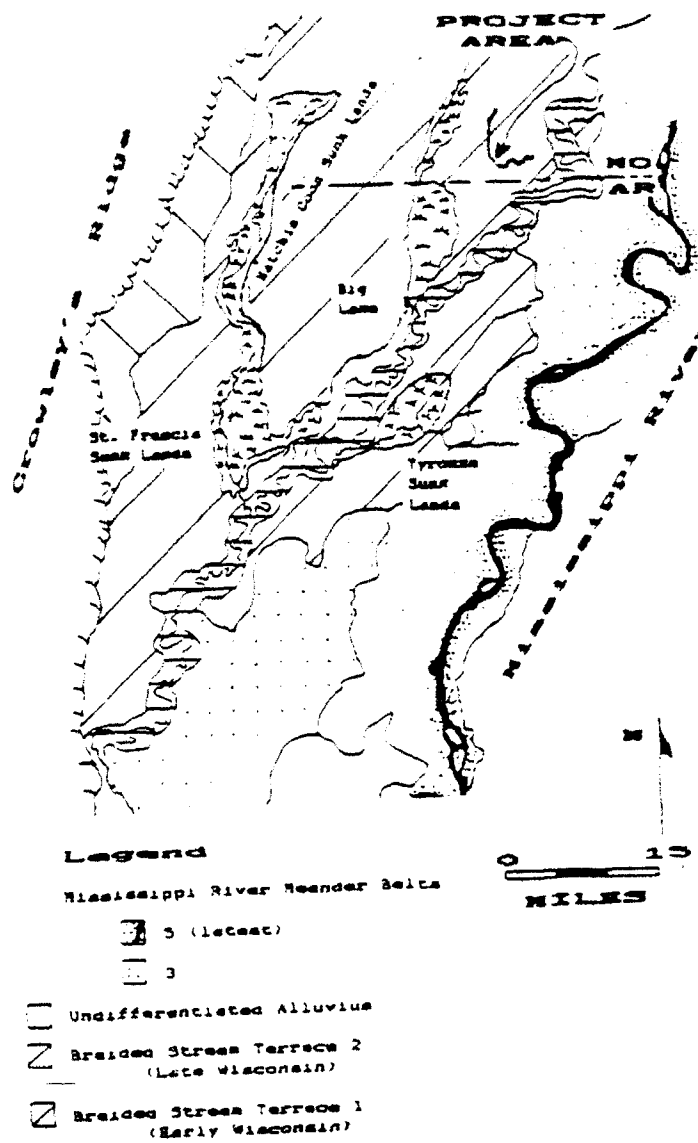


Figure 1. Project Area and the Sunk Lands (after Saucier 1972 and USGS Evadale Quad)

Crowley's Ridge, but a small patch exists east of the ridge in the St. Francis Basin (Figure 1). This terrace is sandier and has greater relief than does the later Terrace 2. Sauzier divides Terrace 2 into two sublevels. The project area is within the lower eastern subterrace (Figure 1); however, it appears to be in the more recent backwater swamp clays of the Little River, Big Lake and Pemiscott Bayou which appear to overlay the Braided Surface sands. Recent geomorphic work carried out by MORA for the Memphis District COE suggest that Big Lake may be a deep abandoned clay-filled channel. This work is still in progress and is made difficult due to the masking of features by the aggradation by the Mississippi River, which has reduced relief and obscured older channel scars with clayey backswamp soils. Therefore, the soils in the project area are recent, and site location predictions based on this dimension may not be valid for the past 8,000 to 10,000 years. However, the deep channel incision (24 feet below surface (from 234 to 210 feet above MSL) found at the south end of Big Lake suggests that Big Lake has been in place for a long time and there is virtually no chance for archeological sites to be located there.

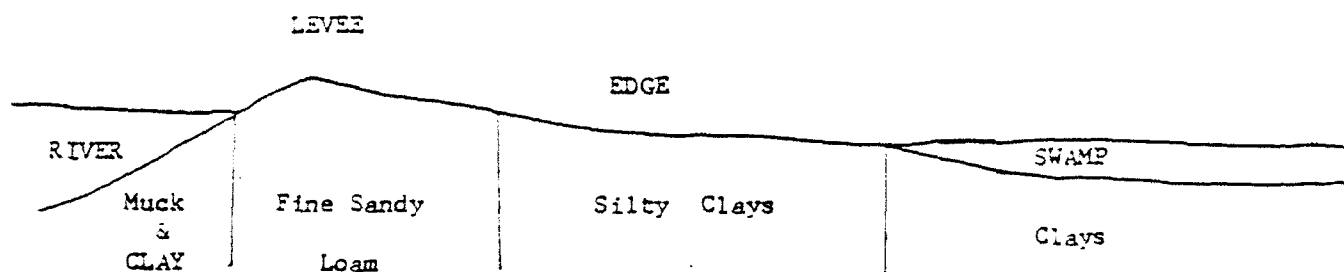


Figure 2. Cross Section of Riverine Soils and Plant Communities after Lewis 1974).

The Old Meander Belt

The Old Meander Belt was incised into the Relict Braided Surface sometime after the latter was deposited. This is located 4 km. to the southeast of the project area and apparently contributed much (some?) of the sediments deposited in the project area through periodic flooding and crevasse breaks in the natural levee. One of these crevasse breaks formed Pemiscot Bayou located 3 km. southeast of the project area. Other crevasse breaks to the north in the headwaters of Little River were apparently the cause of the Mississippi River flowing backwards during the New Madrid earthquake of 1807 to 1809. Present archeological data from this surface suggest that the silting of the Old Meander Belt by the Mississippi River started in the Late Archaic period (ca. 3000 - 500 BC). It appears likely that this happened before the Ohio was captured by the Mississippi River. The wave length of the meanders is about 3.2 km. (ca. 2 miles) with a meander radius of about 800m (ca. 1/2 mile). This compares to the modern wave lengths of about 11km (ca. 7 miles) with 5 km. (ca. 3 mile) meander radii. The shorter wave lengths indicate a much smaller flow than the current flow. The Old Meander Belt's course appears to have been abandoned sometime in the Woodland period (ca. 500 BC- AD 800); however, there have been crevasse breaks in the past century (USGS 1939), and this area was inundated during the 1927 flood. The earliest quadrangle maps for the project area show the mid-19th-century meander line of the Mississippi River well above the modern river banks in Pemiscott Bayou.

SOILS

Soils are the best indicators of past environments in the lower Mississippi Valley. This is due to two characteristics of riverine bottomland: (1) the manner of deposition effectively sorts different-sized particles by elevation, and (2) relative elevation and the water table determine the kinds of biota which can inhabit a particular econiche. These relationships are well established by archeological, geological, and ecological research in the Lower Mississippi Valley (Lewis 1974; Beadles 1976; Harris 1980; Delcourt et al. 1980; King 1981). These relationships are briefly discussed below and related to the basic dimensions used in this research: soils and plant communities.

Figure 2 presents a diagrammatic cross section of a riverine deposit. The river moves in the channel to the left. When it floods, the load capacity of the river is increased. When the river spills over its bank, its velocity is immediately reduced, which lowers its load capacity causing the largest particles it is carrying to be deposited. The repeated flooding will gradually build up a natural levee composed of the largest particles available, sands and silts under the current gradient. This process can be fairly rapid. For example, there are documented instances of as much as 2m of sand being deposited in one flood (Trubowitz 1984). As the levee builds up, a backswamp forms away from the river and smaller particles, clays, are deposited under more slowly flowing slackwater conditions. Under a meandering regime,

the river channel will be cut off, eventually forming an oxbow lake. This will fill with a clay plug in time. Many of these features are still directly observable on soil maps (Ferguson and Grey 1971) and in a few instances on topographic maps; however under the current land-leveling practices these are disappearing rapidly.

SOILS AND BIOTIC COMMUNITIES

The relationship of biota to riverine features in the Lower Mississippi Valley is well known (Lewis 1974; Lafferty 1977; Butler 1978; Morse 1981). Because of the radical changes in the environment in the past century, all of these are reconstructions based on named witness trees in the GLO survey notes. These studies have consistently identified plant communities associated with particular soil types which are diagrammatically presented in Figure 2.

There are two plant communities associated with the levees, the Sweetgum-Elm Cane Ridge Forest and the Cottonwood-Sycamore Natural Levee Forest. These plant communities were the driest environments in the natural landscape and had a high potential for human settlement. They are, in fact, successional stages, with the Cottonwood-Sycamore forest being found along active river channel, while the Cane Ridge Forest is found on the levees of abandoned courses.

There are four aquatic biotic communities: river, lake, marsh and swamp. These low lying areas are unsuitable for human occupation. Several of these are involved in successional sequences; however, since about the Middle Woodland period all were present at any given time prior to drainage. The project area is located in an area which was a swamp and/or previous to that a lake.

Between these two extremes are the river edge communities and the seasonal swamps. In drier times the latter contained areas suitable for occupation. The former is a line-like interface with a steep slope and little substantial flat area.

The correlation between soils and plant communities is not a 1:1 ratio. These deposits are building up and what was at one time a swamp may in a few decades become a dry levee. This process brings about biotic successional changes. However, there is a high correlation between soils and last successional stage plant communities. Because the surface is aggrading, the widest possible extent of habitable dry land, as it was prior to levee construction and drainage, is modeled. This correlation combines the two successional stages of levee biotic communities which are indistinguishable with the synchronic perspective embodied in our data. The edge communities are lumped together, as are the aquatic environments. These communities, all modeled from the last stages of deposition, cannot be distinguished in further detail with our present level of data, and it is probable that greater precision may be spurious.

Research studies using soils and plant communities to model prehistoric occupation in Northeast Arkansas (Dekin et al. 1978; Morse 1981; Lafferty et al. 1984), in the adjacent portions of the Missouri Bootheel (Lewis 1974; Price and Price 1980), and in the lower Ohio Valley (Muller 1978, Lafferty 1977, Butler 1978) have all suggested that sites are preferentially located on levee soils and are not found in aquatic deposits.

MACROBIOTIC COMMUNITIES

"Macrobiotic" communities - levee, ecotone, and swamp - are composed of different species of plants and animals. Table 1 presents an arboreal species composition reconstructed in Mississippi County, Missouri (Lewis 1974:19-28).

Levee

The Levee Macrobiotic Community, which does not occur in the project area, includes two plant communities: (1) the Cottonwood-Sycamore community found along the active river channel and (2) the Sweetgum-Elm Cane Ridge forest on abandoned courses. The arboreal species found in the Sweetgum-Elm community include all of the species found along the natural levee, however, their mix is considerably different. These two communities are in the highest topographic position in the county and these areas also support a dense understory of plants including cane (*Arundinaria gigantea*), spice bush (*Lindera Benzoin*), pawpaw (*Asimina triloba*), trumpet creeper (*Campsis radicans*), red bud (*Cercis canadensis*), greenbrier (*Smilax* sp.), poison ivy (*Rhus radicans*) and a number of less frequent herbaceous plants. The most common of these was cane, which often formed nearly impenetrable canebrakes. These provided cover for many of the larger species of land animals and were an important source of weaving and construction material.

The major mammals included in this biotic community included white-tailed deer (*Odocoileus virginianus*), cougar (*Felis concolor*), black bear (*Ursus americanus*), elk (*Cervus canadensis*), skunk (*Mephitis mephitis*), opossum (*Didelphis marsupialis*), raccoon (*Procyon lotor*), eastern cottontail rabbit (*Sylvilagus floridanus*), gray fox (*Urocyon cinereoargenteus*), and gray squirrel (*Sciurus carolinensis*). Important avian species included the wild turkey (*Meleagris gallopavo*), the prairie chicken (*Tympanuchus cupido*), ruffed grouse (*Bonasa umbellus*), passenger pigeon (*Ectopistes migratorius*) and Carolina parakeet (*Conuropsis carolinensis*).

Prior to artificial levee construction the natural levees were the best farmland in this environment, due to their location at the highest elevations from which the spring floods rapidly receded and drained. This environment provided for a large number of useful species of plants and animals, making it an attractive place for settlement at virtually all times (except during floods) since the levees were laid down.

Table 1. Arboreal species composition of three biotic communities in Mississippi County, Missouri: (percent per community)

Species	Levee	Edge	Swamp
American Elm (<i>Ulmus</i> sp.)	23	19	
Ash (<i>Fraxinus</i> sp.)	11	14	2
Bald Cypress (<i>Taxodium distichum</i>)		7	50
Black Gum (<i>Nyssa sylvatica</i>)	T	1	
Blackhaw (<i>Viburnum</i> sp.)	T		
Black Walnut (<i>Juglans nigra</i>)	2		
Box Elder (<i>Acer Negundo</i>)	2		
Cherry (<i>Prunus</i> sp.)	T		
Cottonwood (<i>Populus</i> sp.)	1	3	
Dogwood (<i>Cornus</i> sp.)	1		
Hackberry (<i>Celtis occidentalis</i>)	12	9	
Hickory, (<i>Carya</i> sp.)	5	4	
Shellbark (<i>Carya laciniosa</i>)	T		
Hornbeam (<i>Ostrya virginiana</i>)	2		
Kentucky Coffee Tree (<i>Gymnocladus dioica</i>)	T		
Locust, ?	T		
Black (<i>Robinia pseudo-acacia</i>)	T		
Honey (<i>Gleditsia triacanthos</i>)	T	1	14
Maple, (<i>Acer</i> sp.)	3	8	
Sugar (<i>Acer Saccharum</i>)	1		
Oak, Black (<i>Quercus velutina</i>)	5	2	
Burr (<i>Quercus macrocarpa</i>)	1	3	2
Overcup (<i>Quercus lyrata</i>)	1		
Post (<i>Quercus stellata</i>)	T		
Red (<i>Quercus rubra</i>)	1	1	
Spanish (<i>Quercus falcata</i>)	1		
Swamp (<i>Quercus bicolor</i>)	T	1	
White (<i>Quercus alba</i>)	1	1	
Pecan (<i>Carya illinoensis</i>)	1	1	
Persimmon (<i>Diospyros virginiana</i>)	T	2	2
Plum (<i>Prunus</i> sp.)	T		
Red Haw (<i>Crataegus</i> sp.)	T	1	11
Red Mulberry (<i>Morus rubra</i>)	T		
Sassafras (<i>Sassafras albidum</i>)	T		
Sweetgum (<i>Liquidambar styraciflua</i>)	20	18	
Sycamore (<i>Platanus occidentalis</i>)	1		
Willow (<i>Salix</i> sp.)	1	2	18

Abbreviations: T=Trace (i.e. (1%); W=known preferred wood; F=known Food Resource; D=Known drink resource. Data based on Lewis 1974:18-28.

Levee/Swamp Ecotone

The macrobiotic community Lewis (1974:24-25) has called the Sweetgum-Elm-Cypress Seasonal Swamp may have been in parts of the project area. This ecotone had few species present at any one time and a noticeably clear understory. The arboreal species composition (Table 1) includes more-water tolerant species (Cypress, Willow and Red Haw) and at times had aquatic animal species. Flooded regularly every year for several weeks to several months, the clay soils retained the moisture longer than on the levees. These locations were clearly much less desirable for year round occupation than were the levees, but were easy to traverse in dry periods.

Different fauna occupied the area seasonally, drawn from the adjacent swamps and levees. In addition the levee/swamp ecotone was a preferred habitat of the giant swamp rabbit (*Sylvilagus aquaticus*) and crawfish. It is probable that many aquatic species, such as fish, were stranded and scavenged by the omnivores of the forest during the changing of this environment from a wetland to a dry open swampscape. These soils are characteristically poorly drained due to the presence of clays in the upper horizons. In this environment normally aquatic trees, especially cypress, would have been exploitable with land-based technology.

Swamp

Included in this stratum are all of the different environments which were underwater prior to drainage. This is defined by all of the soils deposited in slackwater conditions, which are all low lying comprising the whole project area. The following different ecozones were included under this rubric before the drainage: river channels, lakes, marsh and cypress deep swamp. These are different successional stages in this environment, but all are aquatic. The only one of the three which has arboreal species is the Cypress Deep Swamp (Table 1).

Several important herbaceous species were found in these aquatic environments. These included cattails (*Typha latifolia*), various grape vines (*Vitis* sp.), button bush (*Cephalanthus occidentalis*), and hibiscus (*Hibiscus* sp.). The latter was an important source of salt (Morse and Morse 1980).

The fauna of the aquatic environment were quite different from the terrestrial species, which seldom penetrated beyond the edge of the swamp. Beaver, mink and otter were important swamp mammals. Of special interest were fish and waterfowl which were in large quantities in this great riverine flyway. In order to exploit these resources a means of water transportation is necessary, such as dugout canoes. They have been dated to at least 3000 BC and it is likely that they are a great deal earlier.

Archeological research has been carried out in Northeast Arkansas and Southeast Missouri for nearly a century (Table 3). As with much of the Mississippi Valley the earliest work was done by the Smithsonian Mound Exploration Project (Thomas 1894) which recorded the first site in the region. Most of these were the large mound groups. Since that time a great deal of work has been done in the Central Mississippi Valley area (cf. Willey and Phillips 1958 for definitions of technical terms) which has resulted in several extensive syntheses of the region's prehistory (Morse and Morse 1983; Chapman 1975, 1980). In this section we summarize the archeological research which has taken place, summarize what is known of the prehistory of the region and limits in these data as they apply to the project area. Finally we discuss what is known about the distribution of archeological sites in the region.

PREVIOUS ARCHEOLOGICAL RESEARCH

The earliest professional archeological work in the region was the work carried out by the mound exploration project of the Smithsonian Institution (Table 2). Thomas (1894) and his associates excavated at three sites near the project area: Taylor's Shanty, Tyronza Station and the Jackson Mounds. These were all Mississippi period sites located outside the project area. This work was principally excavation in large mound sites, and identified the American Indians as the authors of the great earthworks of the eastern United States.

Most of the early work was concerned with the collection of specimens for museums (e.g., Potter 1880; Moore 1910; Fowke 1912). Some of these data were used to define the great ceramic traditions in the eastern United States (Holmes 1903), including Mississippian. Many of these original conceptualizations are still the basis on which our current chronologies are structured (eg. Ford and Willey 1941; Griffin 1952; Chapman 1952, 1980).

There was a hiatus in the archeological work in the region until the 1940's when Adams and Walker began doing the first modern archeological work for the University of Missouri (Adams and Walker 1942; Walker and Adams 1946). Beginning in 1939 the Lower Mississippi Valley Survey (LMVS) conducted a number of test excavations at many of the large sites in the region (Phillips, Ford, and Griffin 1951; S. Williams 1954). This work has continued to the present in different parts of the valley (e.g., Phillips 1970; S. Williams 1984). The LMVS has produced definitions of many of the ceramic types in the Lower Mississippi Valley area and produced the first phase definitions for many of the archeological manifestations known in the latter part of the archeological record, particularly the Barnes, Baytown, and Mississippian traditions of the north (S. Williams 1954). The sites discovered on the Missouri side of the St. Francis River in the project area are all of the known sites in the Missouri portion of the project area.

 Table 2. Previous Archeological Investigations in Northeast
 Arkansas and Southeast Missouri.

<u>Investigator</u>	<u>Location and Contribution</u>
Potter 1880	Archeological investigations in Southeast Missouri
Evers 1880	Study of pottery of southeast Missouri
Thomas 1894	Mound exploration in many of the large mound sites in SE Missouri, and northeast Arkansas
Fowke 1910	Mound excavation in the Morehouse Lowlands.
Moore 1910, 1911 1916	Excavation of large sites along the Mississippi, St. Francis, White and Black Rivers.
Adams and Walker 1942	Survey of New Madrid County
Walker and Adams 1946	Excavation of houses and palisade at the Mathews site
Phillips, Ford, and Griffin 1951; Phillips 1970	Mapped and sampled selected sites in SE Missouri, and NE Arkansas Lower Mississippi Valley Survey (LMVS), proposed ceramic chronology.
S. Williams 1954	Survey and excavation at several major sites in SE Missouri, original definition of several Woodland and Mississippi phases
Chapman and Anderson 1955	Excavation at the Campbell site, a large Late Mississippian Village in SE Missouri
Moselage 1962	Excavation at the Lawhorn site, a large Middle Mississippian Village in NE Arkansas
J. Williams 1964	Synthesis of fortified Indian villages in S. E. Missouri
Marshall 1965	Survey along I55 route, located and tested many sites east of project area
Morse 1968	Initial testing of Zebree and Buckeye Landing Sites

 Table 2 (Continued). Previous Archeological Investigations

Reference	Location and Contribution
J. Williams 1968	Salvage of sites in connection with land leveling, Little River Lowlands
Redfield 1971	Dalton survey in Arkansas and Missouri Morehouse Lowlands
Schiffer & House 1975	Cache River survey
Price et al 1975	Little Black River survey
Morse and Morse 1976	Preliminary report on Zebree excavations
Chapman et al. 1977	Investigations at Lilbourn, Sixeston Ridge
Harris 1977	Survey along Ditch 19, Dunklin County, Missouri
Klinger and Mathis 1978	St. Francis II cultural resource survey in Craighead and Poinsett County, Arkansas
LeeDecker 1978	Cultural resources survey, Wappallo to Crowleys Ridge
Padgett 1978	Initial cultural resource survey of the Arkansas Power and Light Company transmission line from Keo to Dell, Arkansas
I. R. I. 1978	Cultural resources survey and testing, Castor River enlargement project.
Dekin et al 1978	Cultural resources overview and predictive model, St. Francis Basin
LeeDecker 1979	Cultural resources survey, Ditch 29, Dunklin Co, Missouri.
Morse 1979	Cultural resource survey inside Big Lake National Wildlife Refuge
J. Price 1979	Survey of Missouri and Arkansas Power Corporation power line in Dunklin County, Missouri
LeeDecker 1980a	Cultural resource survey, Ditch 81 control structure repairs

Table 2 (Continued). Previous Archeological Investigations

Reference	Location and Contribution
LeeDecker 1980b	Cultural resources survey, Upper Buffalo Creek Ditch, Dunklin County, Missouri and Mississippi County, Arkansas
Morse and Morse 1980	Final report to COE on Zebree project
J. Price 1980	Archeological investigations at 23DU244, limited activity Barnes site, Dunklin County Missouri
J. Price 1980	Cultural survey, near St. Francis River, Dunklin County, Missouri
Price and Price 1980	A predictive model of archeological site frequency, transmission line, Dunklin County, Missouri
C. Price 1982	Cultural resource survey, runway extension, Kennett Airport, Dunklin County Missouri
Lafferty 1981	Cultural resource survey of route changes in AP&L Keo-Dell transmission line
J. Price and Perttula	Cultural resource survey of areas disturbed by sewer system, Arbyrd, Missouri
Klinger 1982	Mitigation of Mangrum site
Santeford 1982	Testing of 30G713
Bennett and Higginbotham 1983	Mitigation at 23DU227, Late Archaic thru Mississippian site
Keller 1983	Cultural resources survey and literature review of Belle Fountain Ditch and tributaries
J. Price 1983	Phase II testing of Roo sites, Kennett Airport, Dunklin County, Missouri
J. & C Price 1984	Testing Shell Lake Site, Lake Wappapello

Table 2 (Continued). Previous Archeological Investigations

Reference	Location and Contribution
Chapman 1975, 1980	Synthesis of Archeology of Missouri
Morse and Morse 1983	Synthesis of Central Mississippi Valley pre-history
Lafferty et al. 1984, 1985	Cultural resource survey, testing and predictive model, Tynonia Watershed, Mississippi County, Arkansas

Beginning in the 1960's there has been an increase in the tempo and scope of archeological work carried out in the region. This has included a large number of survey and testing projects carried out with respect to proposed Federally funded projects (Marshall 1965; Williams 1968; Hopgood 1969; Knakker 1977; Gilmore 1979; IRI 1978, Dekin et al. 1978, Lafferty 1981; Morse and Morse 1976, 1980; Morse 1979; Klinger and Mathis 1978; Klinger 1982; Padgett 1978; C. Price 1976, 1979, 1980; J. Price 1976a, 1976b, 1978; Greer 1978; LeeDecker 1979; Price, Morrow and Price 1978; Price and Price 1980; Santeford 1982; Sjoberg 1976; McNeil 1980, 1982, 1984; Klinger et al 1981). These projects are generally referred to as Cultural Resources Management studies and have greatly expanded the number of known sites from all periods of time. These projects have also produced a large body of data on the variation present, on a range of different sites, and have greatly increased our knowledge of this area.

Along with these small scale archeological projects there was a continuation of the large scale excavation projects carried out in the region. Major excavations at the Campbell site (Chapman and Anderson 1955), Lawhorn (Moselage 1962), Snodgrass site (Price 1973; Price and Griffin 1979), Lilbourn (Chapman et al 1977; Cottier 1977a, 1977b; Cottier and Southard 1977), and Zebree (Morse and Morse 1976, 1980) have greatly expanded our understanding of the Mississippian cultures. This understanding has resulted in the definition of the temporal/spatial borders between different Woodland and Mississippian manifestations, and resulted in definitions of assemblages. Several major syntheses have resulted (Chapman 1975, 1980; Morse 1982a, 1982b; Morse and Morse 1983) which provide up-to-date summaries and interpretations of the work that has been carried out in the region.

PREVIOUS ARCHEOLOGICAL WORK IN DITCH 9 AND MAIN DITCH

In 1978 Iroquois Research Institute conducted a reconnaissance survey of the Belle Fountain Ditch and Tributaries (LeeDecker 1978). A random stratified sample of areas to be impacted were surveyed. These areas included abandoned channels, point bars, and braided stream terraces. Three historic sites were located within the current project area: M91, a small scatter of historic material, including architectural elements. No structure was located; M92 and M93--Probably modern refuse piles, small scatters of historic material.

STATUS OF REGIONAL KNOWLEDGE

The above and other work in adjacent regions have resulted in the definition of the broad pattern of cultural history and prehistory in the region; however, knowledge of the region is still sketchy with few Archaic and Woodland sites having been excavated. This status has seriously constrained our understanding of settlement systems. Therefore, while this region may be fairly well known with respect to the Mississippi period, much more work needs to be done before the basic contents and definitions of many archeological units in space and time are adequate (cf. Morse 1982a). Presently we have a few key diagnostic types associated with some cultural units; however, the range of artifact assemblage variation across chronological and spatial boundaries are not yet defined, nor are the ranges of site types known for any of the defined units. The adequate definition and resolution of these fundamental questions and problems are necessary before we can begin to reconstruct and use the data for understanding more abstract cultural processes as is possible in better known archeological areas such as the American Southwest.

The Paleo-Indian period (12,000-8,500 B.C.) is known in the region from scattered projectile point finds over most of the area. These include nine Clovis and Clovis-like points from the Bootheel (Chapman 1975:93). No intact sites have yet been identified from this period, and the basal deposits of the major bluff shelters thus far excavated in the nearby Ozark Mountains have contained Dalton period assemblages. Lanceolate points are known from bluff shelters and high terraces (Sabo et al. 1982:54) which may represent different kinds of activities or extractive sites, as they have been shown to have been in other parts of the country. For the present any Paleo-Indian site in the region is probably significant.

The Dalton period (8,500-7,500 B.C.) is fairly well known in the Ozarks with modern controlled excavations from Rogers, Albertson, Tom's Brook, and Breckennridge shelters (McMillan 1971, Kay 1980; Dickson 1982; Logan 1952; Bartlett 1963, 1964; Wood 1963; Thomas 1963). Adjacent areas of the Lower Mississippi Valley have produced some of the better known Dalton components and sites in the central continent. These include the Sloan site (Morse 1973) and the Brand site (Goodyear 1974). These and other more limited or specialized excavations and analyses have result-

ted in the identification of a number of important Dalton tools (i.e. Dalton points with a number of resharpening stages, a distinctive adze, spokeshaves and several varieties of unifacial scrapers, stone abraders, bone awls and needles, mortars, grinding stones and pestles. At least three different site types have been excavated: the bluff shelters, which were seasonal habitation sites, a butchering station (the Brand site) and a cemetery (Sloan site). Presently we do not have the other part(s) of the seasonal pattern which should be present in the region, nor have any other specialized activity sites been excavated. Dalton sites are known in a number of locations, especially on the edge of the Relict Braided Surface, on Crowley's Ridge, and the edge of the Ozark Escarpment. Given the present resource base there are a number of important questions which have been posed concerning the early widespread adaptation to this environment (Price and Krakker 1975; Morse 1982a, 1976).

The Early to Middle Archaic periods (7,500 - 3,000 B.C.) are best known from bluff shelter excavations in the Ozarks (Rogers, Jakie's, Calf Creek, Albertson, Breckenridge and Tom's Brook shelters). During this long period a large number of different projectile point types were produced (i.e. Rice Lobed, Big Sandy, White River Archaic, Hidden Valley Stemmed, Hardin Barbed, Searcy, Rice Lanceolate, Jakie Stemmed, and Johnson). No controlled excavations have been done at any Early or Middle Archaic site in southeast Missouri or northeast Arkansas (Chapman 1975:152). There are no radiocarbon dates for any of the Archaic period from southeast Missouri (Dekin et al 1978:78-79; Chapman 1980:234-238). The Middle Archaic archeological components are rare to absent in the Central Mississippi Valley (Morse and Morse 1983). Therefore, much of what we know of the archeological manifestations of this period is based on work in other regions, which has been extrapolated to the Mississippi Valley based on surface finds of similar artifacts. At present, phases have not been defined.

The Late Archaic (3,000 B.C. - 1,500 B.C.) appears to be a continuing adaptation to the wetter conditions following the dry Hypsithermal. This corresponds to the sub-Boreal climatic episode (Sabo et al. 1982). The lithic technologies appear to run without interruption through these periods with ceramics added about the beginning of the present era. Major excavations of these components have taken place at Poverty Point, and Jaketown in Louisiana and Mississippi (Ford, Phillips and Haag 1955, Webb 1968). A fairly large number of Late Archaic sites are known in eastern Arkansas and Missouri (Chapman 1975:177-179, 224; Morse and Morse 1983:114-135). Major point types include Big Creek, Delhi, Pandale, Gary and Uvalde points. Other tools include triangular bifaces, manos, grinding basins, grooved axes, atlatl parts and a variety of tools carried over from the earlier periods such as scrapers, perforators, drills, knives and spokeshaves. Excavations at the Phillips Spring site has documented the presence of tropical cultigens (squash and gourd) by ~2,300 B.C. (Kay et al. 1980). The assemblages recovered in the bluff shelters from this time period indicate that there was a change in the use from

general occupation to specialized hunting/butchering stations (Sabo et al. 1982:63). There are some indications of increasing sedentariness in this period, however, the range of site types have not been defined. Late Archaic artifacts are well known from the region, with artifacts usually present on any large multicomponent site. Our understanding of this period is limited to excavations from a few sites (Morse and Morse 1983; Lafferty 1981). At present we do not know the spatial limits of any phases (which have not been defined), nor do we have any control over variation in site types and assemblages.

Early Woodland (500 B.C.(?) - 150 B.C.). During this period there appears to have been a continuation of the lithic traditions from the previous period with an addition of pottery. As with the previous period this is a very poorly known archaeological period with no radiocarbon dates for the early or beginning portions of the sequence. The beginning of the period is not firmly established and the termination is based on the appearance of Middle Woodland ceramics dated at the Burkett site (Williams 1974:21). The original definition of the Tchula period was made by Phillips, Ford and Griffin (1951:431-436). In the intervening time a fair amount of work has been done on Woodland sites. Chapman concludes that we are not yet able to separate the Early Woodland assemblages from the components preceding and following. At present there is considerable question if there is an Early Woodland period in S. E. Missouri (Chapman 1980:16-18). Recent work in northeast Arkansas, however, has identified ceramics which appear to be stylistically from this time period (Morse and Morse 1983; Lafferty et al 1985) and J. Price (personal communication) has identified a similar series of artifacts in the Bootheel region. Artifacts include biconical "Poverty Point objects," cordmarked pottery with noded rims similar to Crab Orchard pottery in Southern Illinois and the Alexander series pottery in the Lower Tennessee Valley, and Hickory Ridge points.

Middle - Late Woodland periods (150 B.C.- A.D. 850) was a period of change. There is evidence of participation in the "Hopewell Interaction Sphere" (dentate and zone-stamped pottery, exotic shell; Ford 1963) and horticulture is increasing (corn, hoe chips and farmsteads). There is some mound construction notably the Helena mounds at the south end of Crowley's Ridge (Ford 1963) indicating greater social complexity. Typical artifacts include Snyder, Steuben, Dickson and Waubesa projectile points, and an increasing number of pottery types (cf. Rolingson 1984; Phillips 1970; Morse and Morse 1983). In the late Woodland there is an apparent population explosion as evidenced by a great number of sites with plain grog-tempered pottery in the east and Barnes sand-tempered pottery in the west of the Central Valley (Morse and Morse 1983; Chapman 1980). There is some evidence of architecture (cf. Morse and Morse 1983; Spears 1978) in this period as well as mound center construction (Rolingson 1984). A number of large open sites have not been excavated. There appears, therefore, to be a rather large bias in what we know about this important period toward the spectacular mound centers. There is still a great deal which is not understood about the

cultural sequence and changes which came about during this important period. The Late Woodland in this area has been suggested as the underlaying precursor to the Mississippian, which came crashing into the area with the introduction (Invention ?; cf. Price and Price 1981) of shell-tempered pottery and the introduction of the bow and arrow around A. D. 850.

The Mississippi period (A.D. 850-1673) is known from the earliest investigations in the region (Thomas 1894; Holmes 1903; Moore 1916), and has been the most intensively investigated portion of the prehistoric record in northeast Arkansas and southeast Missouri (Chapman 1980; Morse and Morse 1983; Morse 1982; Morse 1981; House 1982). There has been enough work done that the spatial limits of phases have been defined (cf. Chapman 1980; Morse and Morse 1983; Morse 1981). During this period the native societies reached their height of development with fortified towns, organized warfare, more highly developed social organization, corn, bean and squash agriculture and extensive trade networks. The bow and arrow is common and there is a highly developed ceramic technology (cf. Lafferty 1977; Morse and Morse 1980; Smith 1978). This was abruptly terminated by the DeSoto entrada in the mid-16th century (Hudson 1984, 1985; Morse and Morse 1983) which probably passed through the project area.

Historic Period (1673-present). After the DeSoto expedition the area was not visited until the French opened the Mississippi valley in the last quarter of the 17th century. The Indian societies were a mere skeleton of their former glory and the population a fraction of those described by the DeSoto Chronicles.

During the French occupation most of the settlements were restricted to the major river courses with trappers and hunters living isolated lives in the headwaters of the many smaller creeks and rivers. The St. Francis River was one of the earliest explored tributaries of the Mississippi River in the Lower Mississippi Valley and appears on some of the earliest French maps.

The Euro-American occupation proceeded overland down Crowley's Ridge spreading out from the rivers. Ports were established at Piggott on the high ground of Crowley's Ridge in the St. Francis Gap in 1835. It was located on the Helena-Wittsburg road which ran down Crowley's Ridge (Dekin et al. 1978:358). All of the settlements in the 1830's between Piggott and Helena in the St. Francis Basin were either along the rivers or on Crowley's Ridge. Towns continued to be founded in these environments into the early 1900's. Settlements away from the rivers along overland roads began in the 1850's and greatly accelerated with the construction of the railroads, levees and drainage ditches in the late 19th century.

PROJECT METHODS

Investigative techniques employed during the project along Main Ditch 1 and Ditch 9 were essentially the same. With two crews of three individuals available for this project, each survey transect was assigned a crew to complete the work within that transect. Prior to proceeding with the fieldwork, each crew chief was given a xerox of the topographic map (day map) for the project area. Soil types present, the areal extent of each, and the probability for their possessing archeological sites were noted on the day maps. In addition, these maps served as a basis on which to record surface visibility, vegetation or crops present within the project area, and other information which might have been of interest.

During the survey of each transect crew members were instructed to maintain a 30m spacing. If crops present in the area surveyed were sufficiently short to preclude damage or disturbance, crew members walked an elongated zig-zag pattern. This procedure gives maximum surface coverage within the constraints of the budget and proposal. If crops were of sufficient height to rule out a zig-zag pattern, crew members simply walked down the existing rows.

Particular attention was paid to exposed areas on the spoil pile during the survey. Spoil piles allow individuals to inspect what amounts to a cross section of the project area. Previous research has demonstrated that this procedure is an effective means for locating buried cultural deposits beyond the reach of conventional archeological techniques (Lafferty et al 1984, 1985).

Crew members were instructed to excavate shovel tests in areas that possessed less than 10 percent surface visibility. Soil excavated from each shovel test was to be screened through 1/4" hardware cloth. Ten percent surface visibility coupled with the fact that the survey area was entirely on Sharkey clays was considered adequate to find all cultural resources.

During the course of the survey, if a site was located, its location was plotted on the day map and marked with flagging tape in the field. When the project area had been surveyed, the entire crew (six individuals) returned to the site to record and complete the investigation.

Depending on the nature of the site, a number of the crew lined up no more than 10m apart and proceed across the site flagging each artifact observed on the surface. Each individual continued their survey transect until they had gone approximately 50m beyond the last flag. Flagging each artifact observed allowed immediate visual identification of artifact concentrations, orientation of the site, and site limits.

Shovel tests were excavated at the site investigated to aid in determining the areal extent of any subsurface deposits present. The number excavated was determined by the nature of the site. Depth of each shovel test was to 50cm below the surface or to Sharkey clay. The soil removed from each shovel test was screened through 1/4" mesh hardware cloth. Any artifacts recovered were assigned a number identifying them with the shovel test in which they were located and the depth at which they occurred.

One 1m² test unit was excavated at the site recorded during the project. Levels were excavated by natural stratum. Soil removed from the test unit was passed through 1/4" mesh screen. Artifacts recovered were assigned a number identifying them with the test unit and the depth at which they were recovered.

A permanent datum was established at site 23PM573 as part of the contract requirements. The datum consisted of a two foot long piece of aluminum tubing driven flush with the ground.

A records search of the land within the project area was conducted at the county courthouse. This procedure had three functions. First, any individual that owned land within the project area and was an important figure in terms of local, regional, or national history would be recorded in the tax records. Second, the increase or decrease in the taxes on a particular piece of land may signify the building or removal of a structure. Finally, the potential age of any historic sites recorded in the project area could be determined by the tax records.

A records check and literature search of previously recorded archeological sites within the project area was conducted by Thomas Holland and Christopher Pulliam at the Missouri Archeological Survey at Columbia, Missouri in September 1986, and Missouri Historic Preservation Office at Jefferson City, Missouri, on 23 October 1986.

RESULTS

Survey Conditions

The survey conditions within the project area along Ditch 9 can be described as excellent. Excessive moisture earlier in the year had delayed spring planting of row crops, resulting in a wide range of immature growth. Row crops present in the project area are soybeans, milo and cotton. Soybean maturity, which was the major crop in the project area, ranged from seedlings just breaking the ground surface to plants in the initial stages of blooming. Surface visibility on the southern portion of Ditch 9 was 100%. From ca. 3.6 miles north of the junction of Main Ditch and Ditch 9 visibility ranged from 40% in one low-lying fallow field with vegetation adapted to a wet environment, to greater than 75% in most locations. The west side of the area had a predominance of fallow fields with excellent visibility (Figure

3).

The survey conditions present along the Main Ditch section of the project area were essentially the same as those along Ditch 9. Surface visibility ranged from 50% to 100%, with new crops of soybeans, cotton and milo (Figure 4).

One previously unrecorded archeological site was located on Ditch 9 during the course of this project. This occurrence was totally unexpected given the prevalence of Sharkey soils in this portion of the project area. The soils in the site area are Sharkey silty clay loam/Sharkey sandy loam transition (USDA 1971). Site 23PM573 is primarily located on the Sharkey silty clay loam.

No archeological sites were recorded during the survey of Main Ditch.

Testing

Since site 23PM573 was primarily located on the spoil pile of a field lateral, a brief description of the area is in order. The field lateral runs north/south and empties into Ditch 8 which in turn empties into Ditch 9. The area of the lateral on which the site is located is approximately 68 m east of Ditch 9.

The spoil from the field lateral is located on the west side and has been plowed down to increase the plantable acreage in the field. The east side of the lateral is lower in elevation with no evidence that spoil has been deposited on this side.

Surface visibility of Site 23PM573 at the time of the investigation was 100 percent on the west side. Soybean plants were just beginning to come through the ground surface and in large areas plants were not yet visible. Soybeans were also planted on the east side of the field lateral and surface visibility was 75 percent or greater.

Surface inspection of Site 23PM573 indicated that the artifacts were primarily located near the field lateral on the west side. There was an obvious decrease in artifact density the further west one surveyed. Inspection of the east side of the lateral recorded the presence of only four flakes. These were located within two meters of the edge (Figure 5). Surface artifacts indicated Site 23PM573 measured 79m north/south and 44m east/west.

Nine shovel tests ranging in depth from 35cm to 50cm below the surface were excavated at Site 23PM573. Three of these were located on the east side of the field lateral. The shovel tests on the east side ranged in depth from 47cm to 50cm below the surface and a single stratum (Sharkey clay) was recorded. No artifacts or potential features were present in these shovel tests.

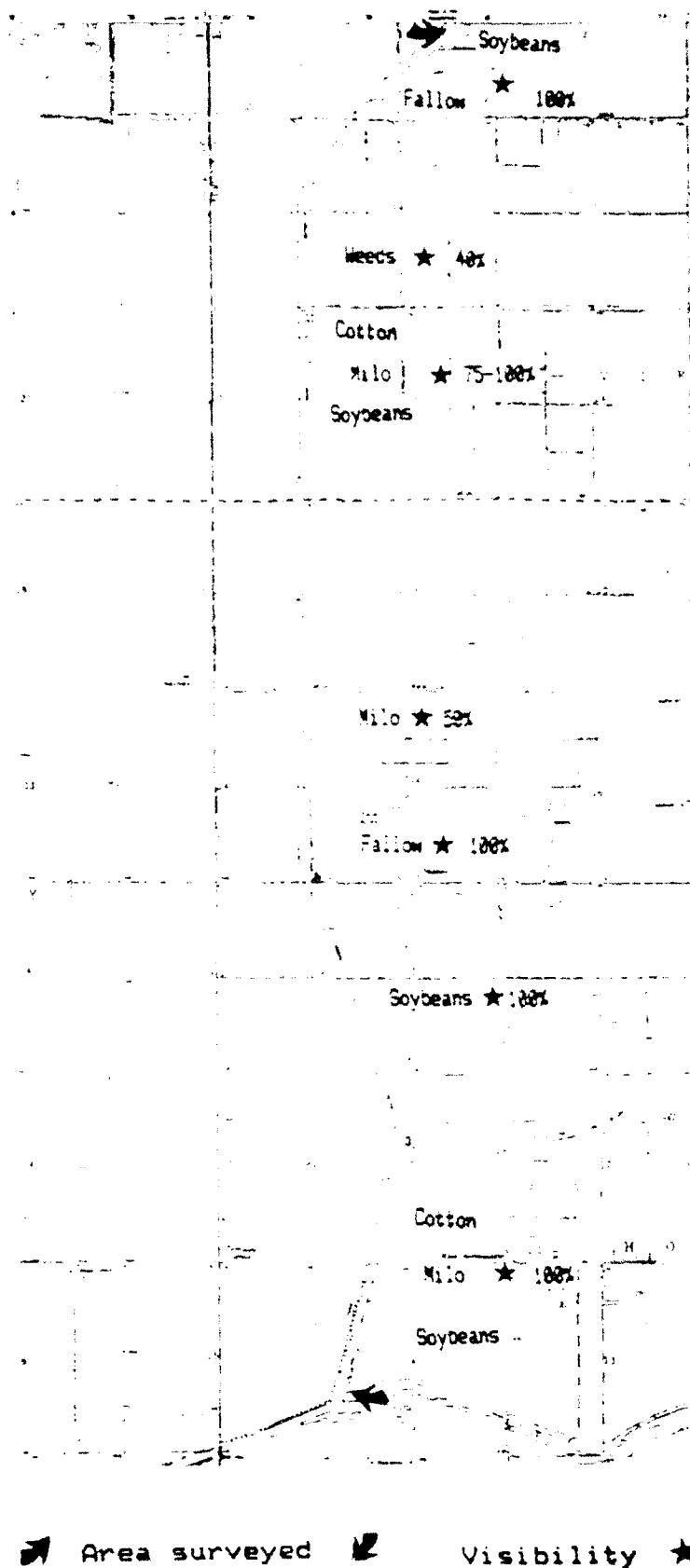


Figure 3. Area Surveyed, Ditch 9 (after U.S.G.S. 7.5 minute Denton, Missouri Topographic Map).

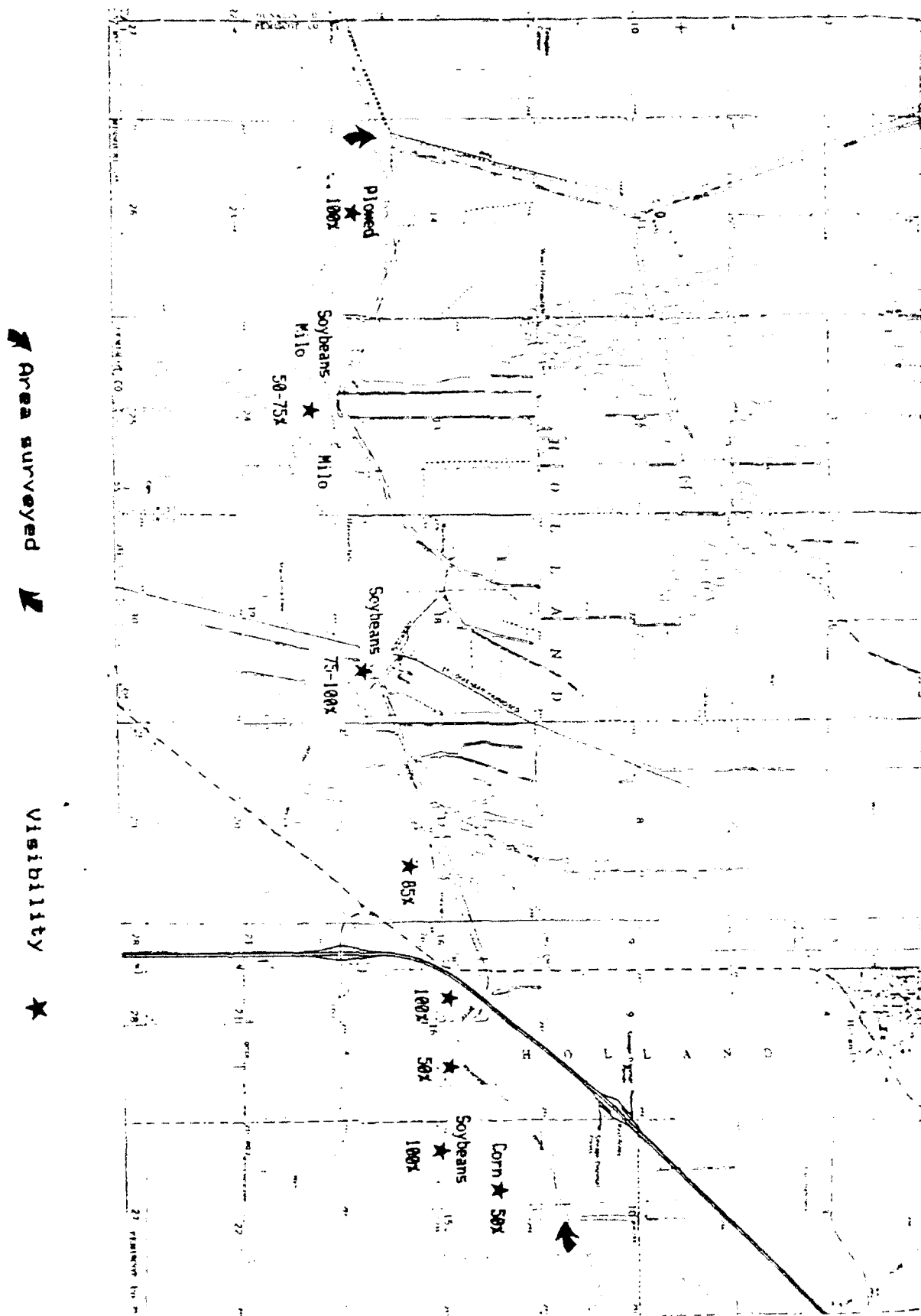


Figure 4. Area Surveyed, Main Ditch (after U.S.G.S. 7.5 minute Denton, Missouri Topographic Map).

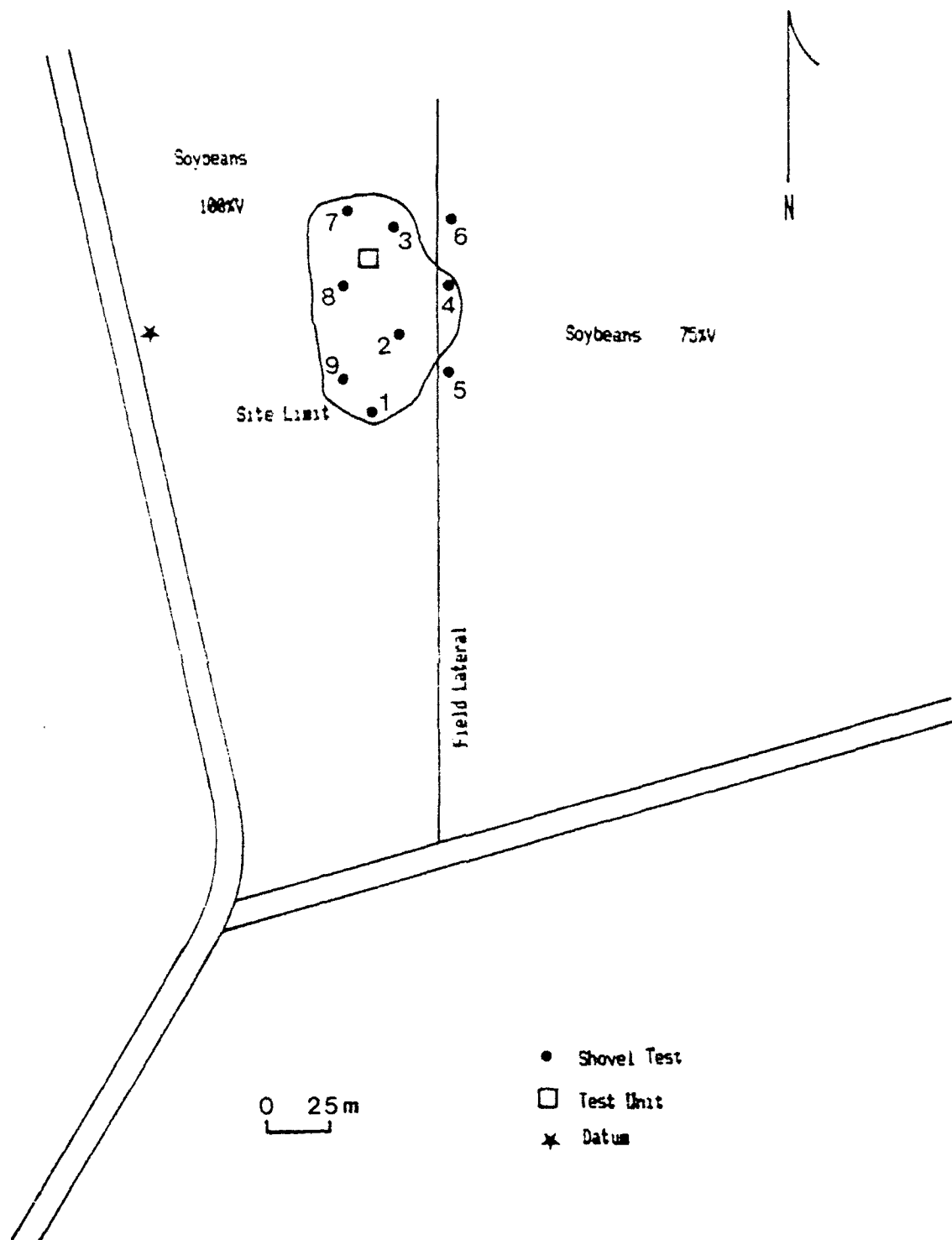


Figure 5. Site Map, 23PM573.

Six shovel tests were excavated on the west side of the field lateral. These ranged in depth from 35cm to 50cm below the surface. Each of these shovel tests was located on the spoil pile. These shovel tests recorded approximately 15cm of spoil in the western transect and up to 40cm in the central transect along the field lateral (Figure 5). In each instance the soil underlying the spoil was a clay and had a Munsell reading of 10YR3/2. No artifacts or potential features were present in the six shovel tests excavated in this area. The presence of spoil was based on two main points. First, the ground height on the west side of the field lateral was approximately 50cm higher than that on the east. Second, the top layer of soil was slightly mottled, had a higher organic content, and very small lenses of sand. The variation in soils and degree of mottling present in spoil piles along major ditches was not evident in this instance.

One 1m² test unit was excavated to a depth of 56cm below the surface. The spoil was removed as a unit and not screened. The original ground surface was located 35cm below the surface (Figure 5). Three flakes were recovered in the upper 20cm of this unit. No features were recorded during excavation of this test unit, nor were any artifacts recovered below the spoil level.

The records search at the county courthouse did not reveal the presence of any historic sites which would require investigation. In addition, no individuals or occurrences which might be tied to land within the project area were on record.

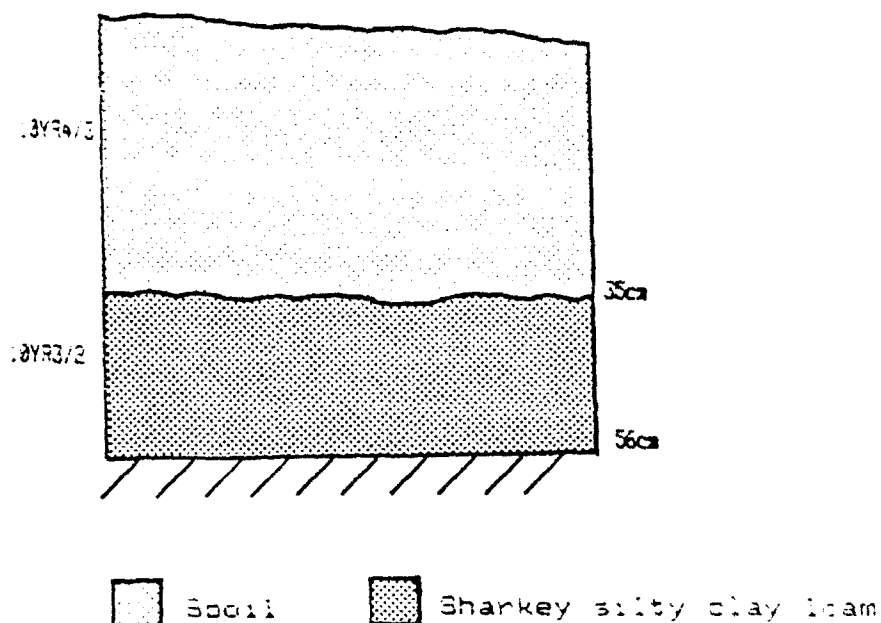


Figure 6. Test Unit 1, North Wall Profile.

Site Significance

No evidence of buried cultural deposits or intact features were recorded during the investigations conducted at 23PM573. In most instances, this situation would result in a determination of non significance. However, given the nature of this site, several points need to be evaluated briefly before a recommendation can be made. These points include past environmental conditions, artifact content and potential site function, and potential level of past disturbances. Site 23PM573 is located on a Sharkey silty, clay loam/Sharkey sandy loam, overwash. Previous research in northeast Arkansas and Southeast Missouri indicated the the above soils have an extremely low potential for possessing prehistoric sites. In the event a site is located on these types of soils, one can assume it is of a specialized nature (Lafferty et al. 1984, 1985; Price and Price 1979)

The prehistoric artifacts recovered from Site 23PM573 entirely consisted of lithics. The total absence of ceramics and the recovery of an expanding stemmed projectile point indicated a preceramic occupation, though use of this area during Woodland and Mississippian periods can not be presently ruled out. The artifacts recovered were disproportionately skewed toward bifaces when one considers the amount of debitage recovered (Table 3). Raw material types represented include primarily Crowley's Ridge Gravels, with small amounts of Penters chert, and Crescent Quarry chert (Table 3).

Historic artifacts consisted of a scattering of glass, whiteware, a metal railroad spike, and rubber shoe sole. The threaded bottle neck and clear bottle neck date after 1902. No evidence of historic features was present. The artifacts were possibly washed in by the railroad or were a historic dump.

The most important fact concerning Site 23PM573 is its potential function. It is obvious that based on the type of prehistoric artifacts recovered and its environmental location it functioned as a specialized site. What resource was being exploited or the site's specific function is presently unknown.

It has been pointed out elsewhere that specialized sites are the most fragile element documenting prehistoric settlement/subsistence patterns through time (Medford 1972). As such, these resources are the first type of site to be destroyed by present farming practices in northeast Arkansas and southeast Missouri creating a void in one's understanding of past cultures. In light of this situation, any site that can be considered a specialized site in this region should be preserved if the potential for further cultural deposits can be demonstrated to exist.

ARTIFACT TABLE

See Appendix B for artifact codes.

When considering the history of disturbances at an archeological site one is really attempting to determine the extent, if any, of intact cultural deposits. Since no intact deposits were recorded during subsurface investigations at Site A, the potential for these deposits existing will be addressed.

Initial disturbances in the area centered around the draining of the swamp and subsequent clearing of timber. Logging in the area often required railroad spurs be built to remove timber that otherwise could not be extracted. A single railroad spike was found along the north edge of the site.

The greatest potential for disturbance of Site 23PM573 centers around the level and extent of farming prior to the field lateral being dug. This is unknown and would require interviewing long-standing residents of the area in order to establish a potential date. Based on the topographic and soils maps, it appears that water would flow toward and concentrate in this area requiring a field lateral to remove it in order to plant row crops.

The field lateral, along which Site 23PM573 is located, ranges from 1m to 1.25m in depth and is approximately 2m wide. This feature has obviously impacted the site based on the presence of artifacts on the spoil pile. To what degree the site was destroyed is unknown since no evidence of cultural deposits was recovered during subsurface testing. However, given the length of artifact dispersion along the field lateral (79m north/south) and taking into consideration artifact movement it is unlikely that a single lateral two meters wide completely destroyed Site 23PM573. It is believed further cultural deposits may be present under and being protected by the spoil pile. A small number of flakes (4) were present on the surface on the east side of the lateral. While shovel tests in this area failed to recover any artifacts below the surface, they also documented the absence of spoil on this side of the lateral. Based on this, it is possible that Site 23PM573 is an extremely thin site, depth-wise, that is being protected by the spoil pile on the west side of the field lateral.

All but a few artifacts (Table 3) recovered from this site were from a low spoil pile along a field lateral. No artifacts were recovered from the shovel tests, nor were any features recorded. Approximately .87 cubic meters of deposits were excavated into the site and only three flakes were recovered from the plowzone in the spoil of the test unit. If the site is located in the area indicated by the surface dispersion on the spoil pile, as has been found to be the case in other sites investigated in such situations (cf. Lafferty et al 1984; 1985) then the artifacts are in extremely low densities. Therefore, based on the work conducted, we have not been able to demonstrate presence of intact cultural deposits. It is Mid-Continental Research Associates' opinion that this site lacks integrity of

intact cultural deposits usually considered a prerequisite for determining a site to be significant in terms of the National Register of Historic Places criteria (36CFR60.3), and that this further work at this site is not likely to produce information important to prehistory (36CFR60.4(c)).

However, consideration should be given the rather unique lithic assemblage produced from this site. To the author's knowledge and experience there are very few, if any, small sites in this part of the Lower Mississippi Valley which have produced such a varied lithic assemblage with so few sherds. The presence of this site on Sharkey Clay, while not unique, is rather rare and these possible uniquenesses should be given consideration even though we have not been able to demonstrate that there are significant deposits.

RECOMMENDATIONS

It is recommended that this site be avoided. If it is possible, feasible, and prudent, any work planned in the area of this site should be carried out from the west side of the ditch. If this is not possible and planned work is to be executed from the east side, movement of machinery in the vicinity of the site should be restricted to the spoil pile of Ditch 3.

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APPENDIX A

SCOPE OF WORK

SECTION C - DESCRIPTION/SPECIFICATIONS (SCOPE OF WORK)

C-1. GENERAL.

C-1.1. The Contractor shall conduct a background and literature search, an intensive survey investigation and initial site testing along Ditch 9 and Main Ditch in Pemiscot County, Missouri. Reports of these investigations shall be submitted. These tasks are in partial fulfillment of the Memphis District's obligations under the National Historic Preservation Act of 1966 (P.L. 89-665), as amended; the National Environment Policy Act of 1969 (P.L. 91-190); Executive Order 11593, "Protection and Enhancement of Cultural Environment," 13 May 1971 (36 CFR Part 800); Preservation of Historic and Archeological Data, 1974 (P.L. 93-291), as amended; and the Advisory Council on Historic Preservation, "Procedures for the Protection of Historic and Cultural Properties" (36 CFR Part 800).

C-1.2. Personnel Standards.

a. The Contractor shall utilize a systematic, interdisciplinary approach to conduct the study. Specialized knowledge and skills will be used during the course of the study to include expertise in archeology, history, architecture, geology and other disciplines as required to fulfill requirements of this Scope of Work. Techniques and methodologies used for the study shall be representative of the state of current professional knowledge and development.

b. The following minimal experiential and academic standards shall apply to personnel involved in investigations described in this Scope of Work:

(1) Archeological Project Directors or Principal Investigator(s) (PI). Individuals in charge of an archeological project or research investigation contract, in addition to meeting the appropriate standards for archeologist, must have a publication record that demonstrates extensive experience in successful field project formulation, execution and technical monograph reporting. It is mandatory that at least one individual acting as Principal Investigator or Project Director under this contract have demonstrated competence and ongoing interest in comparable cultural resources or archeological research in the Central Mississippi Valley. Extensive prior research experience as Principal Investigator or Project Director in immediately adjacent areas will also satisfy this requirement. The requirement may also be satisfied by utilizing consulting Co-principal Investigators averaging no less than 24 paid hours per month for the duration of contract activities. Changes in any Project Director or Principal Investigator must be approved by the Contracting Officer. The Contracting Officer may require suitable professional references to obtain estimates regarding the adequacy of prior work.

(2) Archeologist. The minimum formal qualifications for individuals practicing archeology as a profession are a B.A. or B.S. degree from an accredited college or university, followed by a minimum of two years of successful graduate study or equivalent with concentration in anthropology and specialization in archeology and at least two summer field schools or their equivalent under the supervision of archeologists of recognized

competence. A Master's thesis or its equivalent in research and publication is highly recommended, as is the M.A. degree.

(3) Architectural Historian. The minimum professional qualifications in architectural history are a graduate degree in architectural history, historic preservation, or closely related fields, with course work in American architectural history; or a bachelor's degree in architectural history, historic preservation, or closely related field plus one of the following:

(a) At least two years full-time experience in research, writing, or teaching in American history or restoration architecture with an academic institution, historical organization or agency, museum, or other professional institution; or

(b) Substantial contribution through research and publication to the body of scholarly knowledge in the field of American architectural history.

(4) Other Professional Personnel. All other personnel utilized for their special knowledge and expertise must have a B.A. or B.S. degree from an accredited college or university, followed by a minimum of two years of successful graduate study with concentration in appropriate study and a publication record demonstrating competing in the field of study.

(5) Other Supervisory Personnel. Persons in any supervisory position must hold a B.A., B.S. or M.A. degree with a concentration in the appropriate field of study and a minimum of 2 years of field and laboratory experience in tasks similar to those to be performed under this contract.

(6) Crew Members and Lab Workers. All crew members and lab workers must have prior experience compatible with the tasks to be performed under this contract. An academic background in the appropriate field of study is highly recommended.

c. All operations shall be conducted under the supervision of qualified professionals in the discipline appropriate to the data that is to be discovered, described or analyzed. Vitae of personnel involved in project activities may be required by the Contracting Officer at anytime during the period of service of this contract.

C-1.3. The Contractor shall designate in writing the name or names of the Principal Investigator(s). Participation time of the Principal Investigator(s) shall average a minimum of 50 hours per month during the period of service of this contract. In the event of controversy or court challenge, the Principal Investigator shall be available to testify with respect to report findings. The additional services and expenses would be at Government expense, per paragraph 1.8 below.

C-1.4. The Contractor shall keep standard field records which may be reviewed by the Contracting Officer. These records shall include field notes, appropriate state site survey forms and any other cultural resource forms and/or records, field maps and photographs necessary to successfully implement requirements of this Scope of Work.

C-1.5. To conduct the field investigation, the Contractor will obtain all necessary permits, licenses, and approvals from all local, state and Federal authorities. Should it become necessary in the performance of the work and services of the Contractor to secure the right of ingress and egress to perform any of the work required herein on properties not owned or controlled by the Government, the Contractor shall secure the consent of the owner, his representative, or agent, prior to effecting entry on such property.

C-1.6. Innovative approaches to data location, collection, description and analysis, consistent with other provisions of this contract and the cultural resources requirements of the Memphis District, are encouraged.

C-1.7. No mechanical power equipment shall be utilized in any cultural resource activity without specific written permission of the Contracting Officer.

C-1.8. The Contractor shall furnish expert personnel to attend conferences and furnish testimony in any judicial proceedings involving the archeological and historical study, evaluation, analysis and report. When required, arrangements for these services and payment therefor will be made by representatives of either the Corps of Engineers or the Department of Justice.

C-1.9. The Contractor, prior to the acceptance of the final report, shall not release any sketch, photograph, report or other material of any nature obtained or prepared under this contract without specific written approval of the Contracting Officer.

C-1.10. The extent and character of the work to be accomplished by the Contractor shall be subject to the general supervision, direction, control and approval of the Contracting Officer. The Contracting Officer may have a representative of the Government present during any or all phases of Scope of Work requirements.

C-1.11. The Contractor shall obtain Corps of Engineers Safety Manual (EM 385 -1-1) and comply with all appropriate provisions. Particular attention is directed to safety requirements relating to the deep excavation of soils.

C-1.12. There will be two categories of meetings between Contractor and Contracting Officer: (1) scheduled formal conferences to review contract performance, and (2) informal, unscheduled meetings for clarification, assistance, coordination and discussion. The initial meeting shall be held prior to the beginning of field work. Category (1) meetings will be scheduled by the Contracting Officer and will be held at the most convenient location, to be chosen by the Contracting Officer. This may sometimes be on the project site, but generally will be at the office of the Contracting Officer.

C-2. STUDY AREA.

The construction project area consists of 7.31 miles (11.7 kilometers) of channel improvement work along Ditch 9 (M9C1) in Pemiscot County, Missouri

and 6.0 miles (9.6 kilometers) of channel work along Main Ditch (M-6), also in Pemiscot County, Missouri (see attached maps). The following are study areas associated with each construction segment.

1. Ditch 9 (M9C1). Ditch 9 (M9C1) extends from the juncture of Belle Fountain northward for a distance of 7.31 miles (11.7 kilometers). The study area consists of an area paralleling Ditch 9 and extending from the top east bank eastward for 300 feet (91.4 meters).

2. Main Ditch (m-6). Main Ditch (M-6) consists of that portion of Belle Fountain Ditch extending from the juncture of Ditch 9 (M9C1) 6.0 miles (9.6 kilometers) eastward. The study area consists of a transect paralleling Main Ditch (M-6) and extending from the top south bank southward for 300 feet (91.5 meters).

C-3. DEFINITIONS.

C-3.1. "Cultural resources" are defined to include any building, site, district, structure, object, data, or other material relating to the history, architecture, archeology, or culture of an area.

C-3.2. "Background and Literature Search" is defined as a comprehensive examination of existing literature and records for the purpose of inferring the potential presence and character of cultural resources in the study area. The examination may also serve as collateral information to field data in evaluating the eligibility of cultural resources for inclusion in the National Register of Historic Places or in ameliorating losses of significant data in such resources.

C-3.3. "Intensive Survey" is defined as a comprehensive, systematic, and detailed on-the-ground survey of an area, of sufficient intensity to determine the number, types, extent and distribution of cultural resources present and their relationship to project features.

C-3.4. "Mitigation" is defined as the amelioration of losses of significant prehistoric, historic, or architectural resources which will be accomplished through preplanned actions to avoid, preserve, protect, or minimize adverse effect upon such resources or to recover a representative sample of the data they contain by implementation of scientific research and other professional techniques and procedures. Mitigation of losses of cultural resources includes, but is not limited to, such measures as: (1) recovery and preservation of an adequate sample of archeological data to allow for analysis and published interpretation of the cultural and environmental conditions prevailing at the time(s) the area was utilized by man; (2) recording, through architectural quality photographs and/or measured drawings of buildings, structures, districts, sites and objects and deposition of such documentation in the Library of Congress as a part of the National Architectural and Engineering Record; (3) relocation of buildings, structures and objects; (4) modification of plans or authorized projects to provide for preservation of resources in place; (5) reduction or elimination of impacts by engineering solutions to avoid mechanical effects of wave wash, scour, sedimentation and related processes and the effects of saturation.

C-3.5. "Reconnaissance" is defined as an on-the-ground examination of selected portions of the study area, and related analysis adequate to assess the general nature of resources in the overall study area and the probable impact on resources of alternate plans under consideration. Normally reconnaissance will involve the intensive examination of not more than 15 percent of the total proposed impact area.

C-3.6. "Significance" is attributable to those cultural resources of historical, architectural, or archeological value when such properties are included in or have been determined by the Secretary of the Interior to be eligible for inclusion in the National Register of Historic Places after evaluation against the criteria contained in 36 CFR 63.

C-3.7. "Testing" is defined as the systematic removal of the scientific, prehistoric, historic, and/or archeological data that provide an archeological or architectural property with its research or data value. Testing may include controlled surface survey, shovel testing, profiling, and limited subsurface test excavations of the properties to be affected for purposes of research planning, the development of specific plans for research activities, excavation, preparation of notes and records, and other forms of physical removal of data and the material analysis of such data and material, preparation of reports on such data and material and dissemination of reports and other products of the research. Subsurface testing shall not proceed to the level of mitigation.

C-3.8. "Analysis" is the systematic examination of material data, environmental data, ethnographic data, written records, or other data which may be prerequisite to adequately evaluating those qualities which contribute to their significance.

C-4. GENERAL PERFORMANCE SPECIFICATIONS.

C-4.1. Research Design.

Survey and testing will be conducted within the framework of a regional research design including, where appropriate, questions discussed in the State Plan. All typological units not generated in these investigations shall be adequately referenced. It should be noted that artifactual typologies constructed for other areas may or may not be suitable for use in the study area. It is, therefore, of great importance that considerable effort be spent in recording and describing artifactual characteristics treated as diagnostic in this study as well as explicit reasons for assigning (or not assigning) specific artifacts to various classificatory units.

C-4.2. Background and Literature Search.

a. This task shall include an examination of the historic and prehistoric environmental setting and cultural background of the study area and shall be of sufficient magnitude to achieve a detailed understanding of the overall cultural and environmental context of the study area. It is axiomatic that the background and literature search shall normally precede the initiation of all fieldwork.

b. Information and data for the literature search shall be obtained, as appropriate, from the following sources: (1) Scholarly reports - books, journals, theses, dissertations and unpublished papers; (2) Official Records - Federal, state, county and local levels, property deeds, public works and other regulatory department records and maps; (3) Libraries and Museums - both regional and local libraries, historical societies, universities, and museums; (4) Other repositories - such as private collections, papers, photographs, etc.; (5) Archeological site files at local universities, the State Historic Preservation Office, the office of the State Archeologist, etc. Consultation with qualified professionals familiar with the cultural resources in the area, as well as consultation with professionals in associated areas such as history, sedimentology, geomorphology, agronomy, and ethnology.

c. The Contractor shall include as an appendix to the draft and final reports, written evidence of all consultation and any subsequent responses, including the dates of such consultation and communications.

d. The background and literature search shall be performed in such a manner as to facilitate the construction of predictive statements (to be included in the study report) concerning the probable quantity, character, and distribution of cultural resources within the project area. In addition, information obtained in the background and literature search should be of such scope and detail as to serve as an adequate data base for subsequent field work and analysis in the study area undertaken for the purpose of discerning the character, distribution and significance of specific identified cultural resources.

C-4.3. Intensive Survey.

a. Intensive survey shall include the on-the-ground examination of the study areas described in paragraph C-2 with examination intervals no greater than 30 meters.

b. Unless excellent ground visibility and other conditions conducive to the observation of cultural evidence occurs, shovel test pits, or comparable subsurface excavation units, shall be installed at intervals no greater than 30 meters throughout the study area. Note that auger samples, probes, and coring tools will not be considered comparable subsurface units. Shovel test pits shall be minimally 30 x 30 centimeters in size and extend to a minimum depth of 50 centimeters. Unit fill material shall be screened using 1/4" mesh hardware cloth. Additional shovel test pits shall be excavated in areas judged by the Principal Investigator to display a high potential for the presence of cultural resources. If, during the course of intensive survey activities, areas are encountered in which disturbance or other factors clearly and decisively preclude the possible presence of significant cultural resources, the Contractor shall carefully examine and document the nature and extent of the factors and then proceed with survey activities in the remainder of the study area. Documentation and justification of such action shall appear in the survey report. The location of all shovel test units and surface observations shall be recorded.

c. When cultural remains are encountered, horizontal site boundaries shall be derived by the use of surface observation procedures (including controlled surface collection procedures described in Paragraph C-4.4.1. below) in such a manner as to allow precise location of site boundaries on Government project drawings and 7.5 minute U.S.G.S. quad maps when available. Methods used to establish site boundaries shall be discussed in the survey report together with the probable accuracy of the boundaries. The Contractor shall establish a datum at the discovered cultural loci which shall be precisely related to the site boundaries as well as to a permanent reference point (in terms of azimuth and distance) by means of a transit level. If possible, the permanent reference point used shall appear on Government blueprint (project) drawings and/or 7.5 minute U.S.G.S. quad maps. If no permanent landmark is available, a permanent datum shall be established in a secure location for use as a reference point. The permanent datum shall be precisely plotted and shown on U.S.G.S. quad maps and project drawings. All descriptions of site location shall refer to the location of the primary site datum.

d. All standing buildings and structures (other than those patently modern, i.e., less than 50 years old) shall be recorded and described. For a building to be considered "standing" it must retain four walls and at least a skeletal roof structure. A building or structure found in the field to be partially or totally collapsed will be considered an archeological site. In these cases, data concerning construction materials and techniques and floor plan, if discernible, must be collected. The Contractor shall supply preliminary information concerning the suitability of a structure or building for relocation and restoration (structural soundness for example).

C-4.4. Testing Activities.

a. Initial Site Testing.

(1) Surface collection of the site area shall be accomplished in order to obtain data representative of total site surface content. Both historic and prehistoric items shall be collected. The Contractor shall carefully note and record descriptions of surface conditions of the site including ground cover and the suitability of soil surfaces for detecting cultural items (ex: recent rainfall, standing water or mud). If ground surfaces are not highly conducive to surface collection, screened shovel tests units shall be used to augment surface collection procedures. It should be noted, however, that such units should be substituted for total surface collection only where the presence of ground cover requires such techniques.

(2) Care should be taken to avoid bias in collecting certain classes of data or artifact types to the exclusion of others (ex: debitage or faunal remains) so as to insure that collections accurately reflect both the full range and the relative proportions of data classes present (ex: the proportion of debitage to finished implements or types of implements to each other). Such a collecting strategy shall require the total collection of quadrat or other sample units in sufficient quantities to reasonably assure that sample data are representative of such discrete site subareas as may exist. Since the number and placement of such sample units will depend, in part, on the subjective evaluation of intrasite variability, and the amount

of ground cover, the Contractor shall describe the rationale for the number and distribution of collection units. In the event that the Contractor utilizes systematic sampling procedures in obtaining representative surface samples, care should be taken to avoid periodicity in recovered data. No individual sample unit type used in surface data collection shall exceed 36 square meters in area. Unless a smaller fraction is approved by the Contracting Officer, surface collected areas shall constitute no less than 25 percent of total site areas. Detailed results of controlled surface collections shall be graphically depicted in plan view in the report of investigations.

(3) The Contractor shall undertake (in addition and subsequent to sample surface collecting) a general site collection in order to increase the sample size of certain classes of data which the Principal Investigator may deem prerequisite to an adequate site-specific and intersite evaluation of data.

(4) As an alternative to surface collecting procedures discussed above, where surface visibility is excellent, the Contractor may collect all visible artifacts. If such a procedure is undertaken, the precise proveniences of all individual artifacts shall be related to the primary site datum by means of a transit level.

(5) Unless it can be conclusively demonstrated that no significant subsurface cultural resources occur at a site, the Contractor shall install in each appropriate site a minimum of one 1 X 1 meter subsurface test unit to determine the general nature of subsurface deposits.

(6) Subsurface test units (other than shovel cut units) shall be excavated in levels no greater than 10 centimeters. Where cultural zonation or plow disturbance is present however, excavated materials shall be removed by zones (and in 10 cm. levels within zones where possible). Subsurface test units shall extend to a depth of at least 20 centimeters below artifact bearing soils. A portion of each test unit, measured from one corner (of a minimum 30 X 30 centimeters), shall be excavated to a depth of 40 centimeters below artifact bearing soils. All excavated material (including plow zone material) shall be screened using a minimum of 1/4" hardware cloth. Representative profile drawings shall be made of excavated units. Subsequent to preparation of profile drawings for each test unit, the unit shall be backfilled and compacted to provide reasonable pedestrian safety.

(7) Stringent horizontal spatial control of testing shall be maintained by relating the location of all collection and test units (including those used in controlled surface collection) to the primary site datum either by means of a grid system or by azimuth and distance.

(8) Other types of subsurface units may, at the Contractor's option, be utilized in addition to those units required by this Scope of Work.

(9) Cultural Resource Recording and Numbering. For each archeological site or architectural property recorded during the survey, the Contractor shall complete and submit the standard Missouri archeological site or architectural property survey form, respectively. The Contractor shall be

responsible for reproducing or obtaining a sufficient quantity of these forms to meet the needs of the project. The Contractor shall be responsible for coordinating with the appropriate state agency to obtain state site-file numbers for each archeological site and architectural property recorded.

b. Additional Investigations.

(1) Additional subsurface test units may be required at many loci. The proposed number and distribution of such test units shall be recommended by the Principal Investigator on a site specific basis. This recommendation shall be made based on such variables as site size and potential intrasite variability, including, physiographic and geomorphic characteristics of the loci which may suggest variability in the presence or distribution of subsurface cultural deposits. The Contractor shall detail the rationale(s) for the placement and numbers of proposed test units in the management summary and report of field activities. Additional reporting requirements, examination of background literature and examination of standing buildings and structures may also be required at some sites. The exact nature of additional examination, the schedule, and the price of the work shall be negotiated with the Contracting Officer, and if an agreement is reached, a Change Order shall be issued prior to conduct of the work. Additional investigations will provide a data base of sufficient nature to allow determination of site eligibility to the National Register of Historic Places consistent with C-5.3.j.12) and (3) of this Scope of Work.

(2) In order to accurately relate a site to research domains, (i.e. assess significance or insignificance), a variety of data gathering techniques may be required to insure recovery of the various types of data which may be present at the site. These techniques may include radiocarbon dating, flotation and excavation of cultural features. When appropriate, these types of data gathering activities should be integral elements of the testing strategy.

C-4.5. Laboratory Processing, Analysis, and Preservation.

All cultural materials recovered will be cleaned and stored in deterioration resistant containers suitable for long term curation. Diagnostic artifacts will be labeled and catalogued individually. A diagnostic artifact is defined herein as any object which contributes individually to the needs of analysis required by this Scope of Work or the research design. All other artifacts recovered must minimally be placed in labeled, deterioration resistant containers, and the items catalogued. The Contractor shall describe and analyze all cultural materials recovered in accordance with current professional standards. Artifactual and non-artifactual analysis shall be of an adequate level and nature to fulfill the requirements of this Scope of Work. All recovered cultural items shall be catalogued in a manner consistent with Missouri state requirements. The Contractor shall consult with appropriate state officials as soon as possible following the conclusion of field work in order to obtain information (ex: accession numbers) prerequisite to such cataloging procedures.

C-4.6. Curation.

Efforts to insure the permanent curation of properly cataloged cultural resources materials and project documentation in an appropriate institution shall be considered an integral part of the requirements of this Scope of Work. The Contractor shall pay all cost of the preparation and permanent curation of records and artifacts. An arrangement for curation shall be confirmed by the Contractor, subject to the approval of the Contracting Officer, prior to the acceptance of the final report.

C-5. GENERAL REPORT REQUIREMENTS.

C-5.1. The primary purpose of the cultural resources report is to serve as a planning tool which aids the Government in meeting its obligations to preserve and protect our cultural heritage. The report will be in the form of a comprehensive, scholarly document that not only fulfills mandated legal requirements but also serves as a scientific reference for future cultural resources studies. As such, the report's content must be not only descriptive but also analytic in nature.

C-5.2. Upon completion of all field investigation and research, the Contractor shall prepare a report detailing the work accomplished, the results, and recommendations for each project area. Copies of the draft and final reports of investigation shall be submitted in a form suitable for publication and be prepared in a format reflecting contemporary organizational and illustrative standards for current professional archeological journals. The final report shall be typed on standard size 8-1/2" x 11" bond paper with pages numbered and with page margins one inch at top, bottom, and sides. Photographs, plans, maps, drawings and text shall be clean and clear.

C-5.3. The report shall include, but not necessarily be limited to, the following sections and items:

a. Title Page. The title page should provide the following information; the type of task undertaken, the study areas and cultural resources which were assessed; the location (county and state), the date of the report; the contract number; the name of the author(s) and/or the Principal Investigator; and the agency for which the report is being prepared. If a report has been authored by someone other than the Principal Investigator, the Principal Investigator must at least prepare a foreword describing the overall research context of the report, the significance of the work, and any other related background circumstances relating to the manner in which the work was undertaken.

b. Abstract. an abstract suitable for publication in an abstract journal shall be prepared and shall consist of a brief, quotable summary useful for informing the technically-oriented professional public of what the author considers to be the contributions of the investigation to knowledge.

c. Table of Contents.

d. Introduction. This section shall include the purpose of the report, a description of the proposed project, a map of the general area, a project map, and the dates during which the investigations were conducted. The

introduction shall also contain the name of the institution where recovered materials and documents will be curated.

e. Environmental Context. This section shall contain, but not be limited to, a discussion of probable past floral, faunal, and climatic characteristics of the project area. Since data in this section may be used in the evaluation of specific cultural resource significance, it is imperative that the quantity and quality of environmental data be sufficient to allow subsequent detailed analysis of the relationship between past cultural activities and environmental variables.

f. Previous Research. This section shall describe previous research which may be useful in deriving or interpreting relevant background data, problem domains, or research questions and in providing a context in which to examine the probability of occurrence and significance of cultural resources in the study area.

g. Literature Search and Personal Interviews. This section shall discuss the results of the literature search, including specific data sources, and personal interviews which were conducted during the course of investigations.

i. Survey, Testing and Analytical Methods. This section shall contain an explicit discussion of the research design, and shall demonstrate how environmental data, previous research data, the literature search and personal interviews have been utilized in constructing the strategy. Specific research domains and questions as well as methodological strategies employed to address those questions should be included where possible.

j. Recommendations.

(1) This section should contain, where possible, assessments of the eligibility of specific cultural properties in the study area for inclusion in the National Register of Historic Places.

(2) Significance should be discussed explicitly in terms of previous regional and local research and relevant problem domains. Statements concerning significance shall contain a detailed, well-reasoned argument for the property's research potential in contributing to the understanding of cultural patterns, processes or activities important to the history or prehistory of the locality, region or nation, or other criteria of significance. Conclusions concerning insignificance likewise, shall be fully documented and contain detailed and well-reasoned arguments as to why the property fails to display adequate research potential or other characteristics adequate to meet National Register criteria of significance. For example, conclusions concerning significance or insignificance relating solely to the lack of contextual integrity due to plow disturbance or the lack of subsurface deposits will be considered inadequate. Where appropriate, due consideration should be given to the data potential of such variables as site functional characteristics, horizontal intersite or intrasite spatial patterning of data and the importance of the site as a representative systemic element in the patterning of human behavior. All report conclusions and recommendations shall be logically and explicitly derived from data discussed in the report.

(3) The significance or insignificance of cultural resources can be determined adequately only within the context of the most recent available local and regional data base. Consequently the evaluation of specific individual cultural loci examined during the course of contract activities shall relate these resources not only to previously known cultural data but also to a synthesized interrelated corpus of data including those data generated in the present study.

(4) Where appropriate, the Contractor shall provide alternative mitigation measures for significant resources which will be adversely impacted. Data will be provided to support the need for mitigation and the relative merits of each mitigation design will be discussed. Preservation of significant cultural resources is nearly always considered preferable to recovery of data through excavation. When a significant site can be preserved for an amount reasonably comparable to, or less than the amount required to recover the data, full consideration shall be given to this course of action.

k. References (American Antiquity Style).

1. Appendices (Maps, Correspondence, etc.). A copy of this Scope of Work and, when stipulated by the Contracting Officer, review comments shall be included as appendices to the final report of investigations.

C-5.4. The above items do not necessarily have to be discrete sections; however, they should be readily discernible to the reader.

C-5.5. In order to prevent potential damage to cultural resources, no information shall appear in the body of the report which would reveal precise resource location. All maps which indicate or imply precise site locations shall be included in reports as a readily removable appendix (e.g. envelope).

C-5.6. No logo or other such organizational designation shall appear in any part of the report (including tables or figures) other than the title page.

C-5.7. Unless specifically otherwise authorized by the Contracting Officer, all reports shall utilize permanent site numbers assigned by the state in which the study occurs.

C-5.8. All appropriate information (including typologies and other classificatory units) not generated in these contract activities shall be suitably referenced.

C-5.9. Reports shall contain site specific maps. Site maps shall indicate site datum(s), location of data collection units (including shovel cuts, subsurface test units and surface collection units), site boundaries in relation to proposed project activities, site grid systems (where appropriate), and such other items as the Contractor may deem appropriate to the purposes of this contract.

C-5.10. Information shall be presented in textual, tabular, and graphic forms, whichever are most appropriate, effective and advantageous to communicate necessary information. All tables, figures and maps appearing in the report shall be of publishable quality.

C-5.11. Any abbreviated phrases used in the text shall be spelled out when the phrase first occurs in the text. For example use "State Historic Preservation Officer (SHPO)" in the initial reference and thereafter "SHPO" may be used.

C-5.12. The first time the common name of a biological species is used it should be followed by the scientific name.

C-5.13. In addition to street addresses or property names, sites shall be located on the Universal Transverse Mercator (UTM) grid.

C-5.14. Generally, all measurements should be metric.

C-5.15. As appropriate, diagnostic and/or unique artifacts, cultural resources or their contexts shall be shown by drawings or photographs.

C-5.16. Black and white photographs are preferred except when color changes are important for understanding the data being presented. No instant type photographs may be used.

C-5.17. Negatives of all black and white photographs and/or color slides of all plates included in the final report shall be submitted to the Contracting Officer.

C-6. SUBMITTALS.

C-6.1. An extensive management summary shall be submitted, in accordance with the schedule in paragraph C-7.1, to the Contracting Officer within 14 days of the completion of survey and initial testing. The management summary shall describe survey and initial testing methods and the data yielded by those methods. Where survey data, initial testing data and other sources of data are adequate, the Contractor shall evaluate cultural resources identified during survey activities in terms of eligibility for inclusion in the National Register of Historic Places. The evaluation shall be consistent with requirements in paragraph C-5.3.j. of this Scope of Work. Where inadequate data exist for such an evaluation, the Contractor shall recommend specific additional studies, as described in paragraph C-4.4.b. of this Scope of Work, necessary to obtain adequate data for such National Register evaluation. The management summary shall include project maps showing boundaries of discovered cultural resources relative to project rights-of-way.

C-6.2. The Contractor shall submit 6 copies of the draft report and one original and 75 copies with high quality binding, of the final report which include appropriate revisions in response to the Contracting Officer's comments.

C-6.3. The Contractor shall submit under separate cover 5 copies of appropriate 15' quadrangle maps (7.5' when available) or other site drawings which show exact boundaries of all cultural resources within the project area and their relationship to project features.

C-6.4. The Contractor shall submit to the Contracting Officer completed National Register forms including photographs, maps, and drawings in accordance with the National Register Program, if any sites inventoried during the survey are found to meet the criteria of eligibility for nomination and for determination of significance. The completed National Register forms shall be submitted with the final report.

C-6.5. At any time during the period of service of this contract, upon the written request of the Contracting Officer, the Contractor shall submit, within 15 calendar days, any portion or all field records described in paragraph C-1.4 without additional cost to the Government.

C-6.6. When cultural resources are located during intensive survey activities, the Contractor shall supply the appropriate State Historic Preservation Office with completed site forms, survey report summary sheets, maps or other forms as appropriate. Blank forms may be obtained from the State Historic Preservation Office. Copies of such completed forms and maps shall be submitted to the Contracting Officer within 30 calendar days of the end of fieldwork.

C-6-7. The Contractor shall prepare and submit with the final report, a site card for each identified resource or aggregate resource. These site cards do not replace state approved prehistoric, historic, or architectural forms or Contractor designed forms. These 5 X 8 inch cards shall be color-coded. White cards shall be used for prehistoric sites, blue cards for historic sites, green for architectural sites and yellow cards for potentially significant sites. Sites fitting two or more categories will have two or more appropriate cards. This site card shall contain the following information, to the degree permitted by the type of study authorized:

- a. Site number
- b. Site name
- c. Location: section, township, and UTM coordinates (for procedures in determining UTM coordinates, refer to How to Complete National Register Forms, National Register Program, Volume 2.
- d. County and state
- e. Quad maps
- f. Date of record
- g. Description of site
- h. Condition of site
- i. Test excavation results

- j. Typical artifacts
- k. Chronological position (if known)
- l. Relation to project
- m. Previous studies and present contract number
- n. Additional remarks

C-6.8. Documentation. The Contractor shall submit detailed monthly progress reports to the Contracting Officer by the 7th day of every month for the duration of the contract. These reports will contain an accurate account of all field work, laboratory procedures and results in sufficient detail to allow monitoring of project progress.

C-7. SCHEDULE.

C-7.1. The Contractor shall, unless delayed due to causes beyond his control and without his fault or negligence, complete all work and services under this contract within the following time limitations.

<u>Activity</u>	<u>Completion Time</u> (In calendar days beginning with acknowledged date of receipt of notice to proceed)
Survey/Initial Testing Fieldwork	60
Submittal Management Summary	74
Submittal of Draft Report of Investigations	164
Submittal of Final Report of Investigations	244

C-7.2. The Contractor shall make any required corrections after review by the Contracting Officer. The Contracting Officer may defer Government review comments pending receipt of review comments from the State Historic Preservation Officer or other reviewing agencies. More than one series of draft report corrections may be required. In the event that the government review period (50 days) is exceeded and upon request of the Contractor, the contract period will be extended automatically on a calendar day for day basis. Such extension shall be granted at no additional cost to the Government.

APPENDIX B

ARTIFACT KEY

Bifk = Biface	Bneck = Bottle neck	CL = Chipped Lithic
CR = Crescent	Crt = Chert	Decal = Decalomania
Decort = Decortication flake		Earthw = Earthenware
Exprst = Expanding stem		Fla = Flake
Fers = Ferrous metal		Ind = Indeterminate
Lav = Lavendar	Lblue = Light blue	Milk = Milk glass
Miller = Mill Creek		Mlid = Mason jar lid
Mold = Molded	Monog = Monochromatic glaze	Peb1 = Pebble
Porce = Porcelain	RTR = Rim treatment	
Rum = Retouched/utilized/modified	Shat = Shatter	
SFTLP = Soft hammer lip	Spoks = Spokshave	
ST2 = Stage II biface	ST3 = Stage III biface	
Syn = Synthetic	Thread = Threaded	
Urm = Unmodified Raw material	White = Whiteware	
Yelloww = Yellowware		