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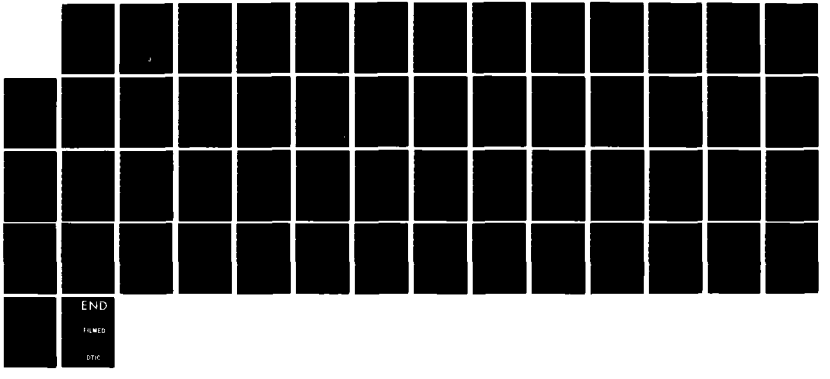

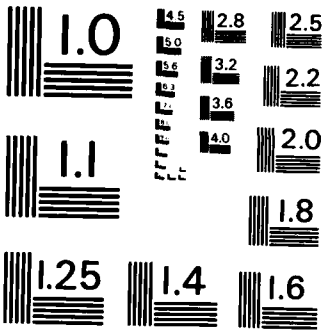

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Report No. 36
April 1, 1985

An Archeological Overview and Management Plan for the St. Louis Army Ammunition Plant, St. Louis County, Missouri

Under Contract CX-5000-3-0771
with the

National Park Service
U.S. Department of Interior
Atlanta, Georgia 30303

for the
U.S. Army Materiel Development and
Readiness Command

by

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16. Abstract (Limit: 200 words)

The St. Louis Army Ammunition Plant (AAP) is a facility of the U. S. Department of the Army DARCOM (Materiel Development and Readiness Command), with responsibilities for the management of the prehistoric and historic archeological resources that are retained within the installation lands. This report summarizes the archeological resources presently identified on the installation, the culture history of the area that provides a context for the interpretation and evaluation of those resources, an assessment of the total archeological resource base likely to be found on installation lands, and recommendations for the future management of those resources within the overall context of DARCOM missions and public responsibilities. No archeological investigations have been conducted on the St. Louis AAP and no sites are presently known to exist within facility boundaries. The entire surface of the AAP has been impacted by modern construction; however, subsurface archeological deposits may exist. If construction occurs on the facility, proposed impact areas will need further review of any archeological materials and their mitigation needs.

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MANAGEMENT SUMMARY

The St. Louis Army Ammunition Plant (AAP) is a facility of the U. S. Department of the Army DARCOM (Materiel Development and Readiness Command), with responsibilities for the management of the prehistoric and historic archeological resources that are retained within the installation lands. This report is a summary of the archeological resources presently identified on the installation, the culture history of the area that provides a context for the interpretation and evaluation of those resources, an assessment of the total archeological resource base likely to be found on installation lands, and recommendations for the future management of those resources within the overall context of DARCOM missions and public responsibilities.

No archeological investigations have been conducted on the St. Louis AAP and no sites are known to exist within the facility boundaries. The entire surface of the facility has been impacted by modern construction; however, subsurface archeological deposits may exist. If construction occurs on the facility, proposed impact areas will need further review of any archeological materials and their mitigation needs.

A-1

PREPARERS AND QUALIFICATIONS

Barbara D. Stafford is the principal author of this report. She holds a BS summa cum laude in Sociology (minors in Anthropology and Psychology), and an MA and PhD in Anthropology. She has participated in archeological investigations across the United States and in Europe. Presently, she is a Research Archeologist with the Center for American Archeology, serving as a Principal Investigator.

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ACKNOWLEDGEMENTS

A number of people have been extremely generous with their time and effort in the preparation of this management report. Among these are Ms. Meryl Humphreys at the St. Louis facility; and Mr. James Batura and Ms. Frieda Vereecken-Odell of the Center for American Archeology. Ruth Sperry, Ruth Kissell and Beverly Sexauer typed and edited the initial manuscript draft.

Additional thanks go to Dr. Mark R. Barnes, NPS, SERO; Mr. Jake Hoffman, RMRO, NPS; and the Missouri SHPO, for reviewing the draft; and Ms. Susan Cleveland, Contracting Officer, NPS, SERO.

Final report editing and production, including graphics, has been completed by Woodward-Clyde Consultants, with editorial review (particularly of management recommendations) and text preparation completed by Dr. Ruthann Knudson and Ms. Betty Schmucker. Woodward-Clyde Consultants appreciates the assistance of Ms. Gail Snyder O'Dea of St. Louis, who consulted extensive archival sources in St. Louis and at the SHPO's office in Jefferson City, MO, for information regarding the prehistory and history of St. Louis and the AAP area.

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FOREWORD

As a federal agency with large public land holdings, the U. S. Army is responsible for the stewardship of a variety of natural and cultural resources that are part of its installations' landscapes. The Army's Materiel Development and Readiness Command (DARCOM) presently manages a nationwide network of 65 installations and 101 subinstallations and separate units, which range in size from one acre to over one million acres. As part of its programs of environmental and property management, DARCOM has requested that the U. S. Department of the Interior's National Park Service provide technical guidance to develop programs for managing installation cultural resources.

NPS is thus conducting the DARCOM Historical/Archeological Survey (DHAS), which has two major disciplinary elements. The architectural review and planning function is being directed by the Service's Historic American Buildings Survey (HABS), while the prehistoric and historic archeological resource assessment and planning function is the responsibility of the Service's Interagency Resource Division (IRD). IRD has contracted with Woodward-Clyde Consultants (WCC) for the development of guidelines for the DARCOM archeological management planning effort, and for the completion of 41 overviews and plans throughout the United States. WCC has in turn subcontracted the technical studies to several regional subcontractors, with final editorial review of reports and preparation of text and illustrations handled by WCC.

This overview and recommended management plan for the archeological resources of the St. Louis Army Ammunition Plant was prepared by the

Center for American Archeology, Kampsville, Illinois, under subcontract to WCC. It follows the guidance of "A Work Plan for the Development of Archeological Overviews and Management Plans for Selected U. S. Department of the Army DARCOM Facilities," prepared by Ruthann Knudson, David J. Fee, and Steven E. James as Report No. 1 under the WCC DARCOM contract. A complete list of DHAS project reports is available from the National Park Service, Washington, DC.

The DHAS program marks a significant threshold in American cultural resource management. It provides guidance that is nationally applicable, is appropriately directed to meeting DARCOM resource management needs within the context of the Army's military mission, and is developed in complement to the state Resource Protection Planning Process (the RP3 process, through State Historic Preservation Offices). All of us participating in this effort, particularly in the development of this report, are pleased to have had this opportunity. Woodward-Clyde Consultants appreciates the technical and contractual guidance provided by the National Park Service in this effort, from the Atlanta and Washington, DC offices and also from other specialists in NPS regional offices in Philadelphia, Denver, and San Francisco.

Woodward-Clyde Consultants

Ruthann Knudson

Table 2 1. A SUMMARY OF THE CULTURAL CHRONOLOGY OF THE AREA OF THE ST. LOUIS AAP (concluded)

Cultural Unit: Tradition	Period or Phase	Date[a]	General Settlement Patterns	General Subsistence Systems	Kinds of Archeological Remains Representative of Period
Woodland (cont)	Middle	AD 300 to 300 BC	Population increase with small seasonal or base camps, habitation sites, earthwork, and mortuary related sites located in full spectrum of ecological zones	Dependence on cultivated plants (starchy and oily seeded species: squash, bottle gourd); hunting particularly deer); gathering of wild plants; trade in exotic items	Habitation sites with variable numbers of structures and pit features; large mortuary-related sites including mounds and charnel houses; small, seasonally occupied sites dependent upon available plant and animal resources
	Early	200 BC to 1000 BC	Small seasonal or base camps with possible increased sedentism; villages; mortuary site and burial mounds	Hunting and gathering; increased reliance on plant resources	First evidence for ceramic technology; diagnostic ceramics include Marion Thick, Schultz Thick, Fayette Thick Stemmed and side-notched points; diagnostics include Kramer, Liverpool Stemmed, and Dickson; increased evidence for mortuary behavior
Archaic	Late	1000 BC *to* 4000 BC	Small seasonal or base camps with *increased exploitation* of locally occurring resources, particularly aquatics; shell mounds; sites located throughout uplands, terraces and levees; mortuary related sites possible in mounds on bluffs bordering river valleys	Hunting and gathering of small game animals; use of nut and aquatic resources in cooler, moister environmental conditions	Lithic scatters with a variety of projectile points; ground stone; general purpose tool kits; heavy concentrations of artifacts possible in some locations
	Early & Middle	4000 BC to 8000 BC	Small seasonal or base camps in riverine and forest areas; probably semi-permanent or repeatedly occupied special activity sites and utilization of rock-shelters increased; in addition to site types found in Paleo-Indian, isolated burials and open campsites are found	Hunting and gathering of smaller game animals, more diversified economy, increase in use of vegetal foods, exploitation of more local resources during Hypsithermal	Lithic scatters with ground stone, side-notched and stemmed points, side-notched scrapers; utilization of local cherts
Paleo-Indian		10,000 BC to 8000 BC	Low population density located in small seasonal encampments or base camps	Utilization of megafauna (mastodon, mammoth, bison, muskox, giant beaver); utilization of smaller animals; gathering	Diagnostic projectile points include large fluted points and large, unfluted lanceolate points: points may occur as isolated finds

[a] Dates for prehistoric periods based on Kelly, Linder, and Cartmell (1979); references for historic information include Gerlach (1976), Peterson (1949), and Primm (1981).

Table 2-1. A SUMMARY OF THE CULTURAL CHRONOLOGY OF THE AREA OF THE ST. LOUIS AAP (continued)

Cultural Unit					
Tradition	Period or Phase	Date[a]	General Settlement Patterns	General Subsistence Systems	Kinds of Archeological Remains Representative of Period
Colonial (cont)	Early Exploration	AD 1754 to AD 1673	First Europeans into area were French explorers followed by fur traders and missionaries; sites left by them would be short-term camps along rivers; later outposts were established in the same vicinity; Native American groups were the Osage, Missouri, Kansas, and Peoria who had semi-permanent summer villages and winter hunting camps	Hunting, gathering, trading (French); corn and bean agriculture; trading, hunting, gathering (Native American)	Small temporary log structures, cache pits, faience ceramics, free-blown glass containers, glass beads, kettle brass, iron knives, gun parts and gunflints (French); small villages with house remains, pit features, middens, stone tools, French trade goods such as glass beads, brass kettles, steel knives and axes, silver ornaments, guns (Native American)
Mississippian	Late	AD 1600 to AD 1300	Agricultural villages after decline of Cahokia	Subsistence based on bison, deer, small mammals, fishing, plant collecting and corn, beans and squash; subsistence determined by local availability	Few diagnostic artifacts recovered; Oneota artifacts present, but may represent trade items
	Early	AD 1300 to AD 1000	Population increase with permanently occupied settlements acting as socio-political centers (e.g., Cahokia) for surrounding villages, hamlets, farmsteads and camps	Intensive cultivation of maize, beans, and squash; or cultivation of seed crops and tobacco; hunting and gathering still practiced	Large sites with community buildings erected on mounds with smaller towns and farmsteads surrounding (e.g., Cahokia); wide variety of artifactual remains including stone pipes, negative painted ceramics, salt pans, chert hoes, shell tempered pottery, and small triangular projectile points
Woodland	Late-Late Bluff	AD 1000 to AD 800	Continuation of villages, agricultural and non-agricultural sites; towns and platform mounds probable; increased population	Maize cultivation in addition to cultivation of species in earlier times with more intensive exploitation of seeds, aquatics	Diagnostic artifacts include triangular points, Mill Creek chert hoes; stumpware; cord-marked jars and bowls
	Late-Early Bluff	AD 800 to AD 300	Population consolidation occupying small seasonal or base camps, habitation sites, mortuary sites (burial mounds); village sites restricted to bluff tops and terraces	Probable maize cultivation; intensive utilization of seeds, aquatics	Diverse ceramic styles, small triangular points; diagnostic ceramics include cordmarked jars and bowls with rounded or tapered lips

Table 2-1. A SUMMARY OF THE CULTURAL CHRONOLOGY OF THE AREA OF THE ST. LOUIS AAP

Cultural Unit					
Tradition	Period or Phase	Date[a]	General Settlement Patterns	General Subsistence Systems	Kinds of Archeological Remains Representative of Period
American	Late Industrial	AD 1884 to Present	Small farms consolidated into large farms; small towns diminish as automobile transportation creates access to regional centers for marketing goods	Agriculture and livestock raising	Dominance of American manufactured goods; automatic machine-made bottles, decal decorated ceramics, plastic disposable packaging
	Early Industrial	AD 1884 to AD 1850	New markets for agricultural produce and access to manufactured goods; in 1852, the first locomotive was run in St. Louis which opened new markets west of the Mississippi River	Agriculture and livestock raising	English handpainted, transfer-printed, and annular wares dominate at the beginning of the period with English white ironstone dominating at the end of this period; clay marbles, semi-automatic mold-blown bottles, canning jars with metal rims and glass liners, machine-cut nails
	Homestead	AD 1850 to AD 1830	American settlement and German immigration rapidly increased the population; beginnings of transportation networks and industrial and urban centers with steam power	Agriculture and livestock raising	Log and post and beam structures during early part of period; by end of period ballon frame being built; English ceramics dominate: whitewares with decoration such as handpainted, slip-banded, etc.; hand-forged nails (early) to machine-cut (late); free-blown glass containers
	Frontier	AD 1830 to AD 1803	With the Louisiana Purchase, America gains control of the region with a slight infiltration of American settlers into the region; French as well as British traders still occupy region; population increases after the War of 1812; historic Native American groups, such as as the Osage, Peoria, and Missouri occupy the region	Hunting, gathering, trading, and limited agriculture	Log and post and beam structures; English creamware and pearlware ceramics; hand-wrought nails; free-blown bottles; kettle brass; trade silver; glass beads
Colonial	European Competition	AD 1803 to AD 1754	Spanish, French, and English compete for the loyalty of Native American groups and furs they collect; a shift in settlement patterns in that a number of independent traders establish more permanent trading centers	Hunting, gathering, trading, and limited agriculture	French faience ceramics and English salt-glazed and creamware ceramics, free-blown bottles, gun-flints, metal knives, hand-forged nails, kettle brass, glass beads, trade silver

Wisconsinan full glacial period (20,000-16,500 BP) the vegetation type shifted from pine dominated forest to spruce boreal forest. At the end of this same period there was a decrease in spruce pollen and an increase in thermophilous deciduous tree pollen. The pollen record at Chatsworth bog in east-central Illinois (King 1981), dates the decline of spruce pollen after 13,800 BP as temperatures slowly increased and black ash expanded onto wet lowlands. Continued warming temperatures from 11,600 to 10,600 BP allowed the development of other temperate deciduous species with oak, hickory, and maple on the uplands and birch, alder, elm, and ash on the lower, wetter areas. By 10,600 BP to 8300 BP further warming and drying effected the complete transition to oak-dominated deciduous forest, with accompanying increases in elm, ironwood, oak and hickory. The forest cover in the lowlands has persisted into the present, but an increase in herbaceous pollen in 8300 BP is interpreted as an expansion of prairie species into the drier uplands in Illinois.

Pollen records from Old Field Swamp in southeast Missouri are available for dates after 9000 years BP (King and Allen 1977). As at Chatsworth Bog, the trend of increased warmth and/or dryness is evidenced in the pollen record at Old Field Swamp; this is seen in the decrease in pollen of species associated with open-water swamps and the increase in grass community species by 8700 BP. Between 8700 and 5000 BP drought conditions were sufficient to cause the remaining swamp vegetation to be replaced by grasses and herbs. However, after 5000 years BP, pollen percentages at Old Field indicate renewed development of arboreal vegetation in the bottomlands.

2.2 THE CULTURAL ENVIRONMENT

An overview of the cultural chronology of the St. Louis AAP and surrounding region, within a radius of approximately 100 miles (160 km), is presented in Table 2-1. This discussion is brief because modern disturbance has eliminated the possibility of any surface archeological remains still present on the AAP. However, subsurface cultural deposits

2.1.4 Plant Resources

Vegetation zones in the vicinity of the American Bottom tend to be linearly arranged (Emerson and McElrath 1983). The pre-settlement bottomlands near the facility on the edge of the Mississippi River were occupied by cottonwood, willow, birch, and sycamore, and by stands of silver maple, hackberry, and pecan. Slough, pond, and lake edges supported black willow, ash, and box elder with lotus, cattails, arrowhead, rushes, and sedges standing in or near the water. Higher ground was occupied by a mixed forest of oak, elm, and ash with associated species consisting of sycamore, pecan, kingnut hickory, mulberry, and honey locust, a woodland-brush context primarily (Benchley 1976:1). Lowland prairie occurred in some areas. The prairies around the facility in the uplands on the western side of the Mississippi River were probably a poor source of plant foods for people; on the other hand, the open grown oak and hickory trees on the margin of the prairie and the forest would produce acorn and nut masts at many times the rate of interior forest trees. Gill (1952a:294) noted that there "were groves and springs and pond" in an area that probably was west of, and may have included, the land of the St. Louis AAP.

2.1.5 Animal Resources

Regional presettlement faunal resources probably consisted of large and small mammals, such as deer, rabbit, muskrat, bison (after AD 1000), squirrel, raccoon, beaver, groundhog, opposum, and skunk; reptiles and shellfish and several species of fish. The location of the facility adjacent to the American Bottom, a major flyway of waterfowl, affords a large number of migratory birds available seasonally and also provides niches for several permanent species (Emerson and McElrath 1983:224).

2.1.6 Paleoenvironment

Data for reconstructing the paleoenvironment of the region prior to 16,500 BP is based on pollen cores from the western Ozarks (King 1975). The vegetation type of the mid-Wisconsinan interstade, from 40,000 BP to about 25,000 BP was open pine-parkland. At the onset of the late

subsequently been dissected by modern drainages that reflect the underlying limestone bedrock erosional features. The predominant bedrock in the hilly uplands is the Burlington Keokuk limestone with included chert deposits. Drainage is toward the Mississippi River.

Soil maps for St. Louis City and St. Louis County (Benham 1982) indicate that all the soils in the vicinity of the St. Louis AAP are Urban land units. The Urban land unit is characterized by an 85-percent surface covering of asphalt, concrete, buildings, or other impervious materials. Much of the area has been cut and filled, ranging in depths up to six feet. Nixon, Browman, and Hamilton (1984:15), summarizing other studies, note that the forested uplands generally have deep (80-100 feet thick) loess deposits with soils and paleosols formed in them.

2.1.2 Water Resources

The St. Louis AAP is located two to three miles west of the juncture of the Chain of Rocks Canal and the Mississippi River (river mile 184). There are neither ponds nor tributary streams on the facility grounds at present.

2.1.3 Modern Climate

The pattern of climate in St. Louis County (Benham 1982) is cold winters with average January temperatures of 33°F. (.6°C) and long, hot summers with an average temperature of 77°F. (25°C) in July. Two years in ten will have maximum temperatures higher than 101°F. (38.3°C) and minimum temperatures lower than -7°F. (-26.7°C). The last freezing temperature in spring is usually April 20th; the first freezing temperature in the fall is usually October 17th. The total annual precipitation is 33.8 inches (86 cm). Sixty percent of the precipitation usually falls in April through September. Two years out of ten the rainfall for the same period is less than 16 inches (41 cm). Average seasonal snowfall is 18 inches (46 cm), average relative humidity in midafternoon is about 60 percent.

2.0 AN OVERVIEW OF THE CULTURAL AND RELEVANT NATURAL HISTORY OF THE ST. LOUIS AAP

A discussion of the physical and cultural environment of the area of the St. Louis AAP is presented to provide baseline data for incorporation of known land use, assessments of the cultural and natural environments, and archeological site information into a program of effective management of installation resources. Integration of all these types of data enables the management of any existing archeological resources within the facility boundaries. In addition, the archeological research directions pertinent to the region are discussed. A more detailed overview of the cultural and natural history of the AAP vicinity is available in Nixon, Hamilton, and Kling (1982).

2.1 THE PHYSICAL ENVIRONMENT

This section describes the modern earth, water, climatic, plant and animal resources that were probably available for human use during the historic period. These data can be used as a baseline against which paleoenvironmental resources may be inferred.

2.1.1 Earth Resources

The St. Louis AAP lies in the Lincoln Hills Section of the Central Lowland physiographic division (Fenneman 1938; Harris 1983). The AAP area is approximately one mile west of the Mississippi River floodplain, thus only one to two miles west of to the American Bottom of Illinois, on the Mississippi River. The topography in the vicinity of the facility is generally level upland, with Pleistocene-age loess deposits that have

and early twentieth-century Euroamerican activities. Surficial, and probably most buried Historic Euroamerican cultural resources, probably were obliterated by the construction of the present facility. The possibility that subsurface remains may still be intact could be verified only by testing beneath the plant buildings and paved grounds. If any archeological resources were to remain on the St. Louis facility, their major value would probably lie in their significance to scientific researchers.

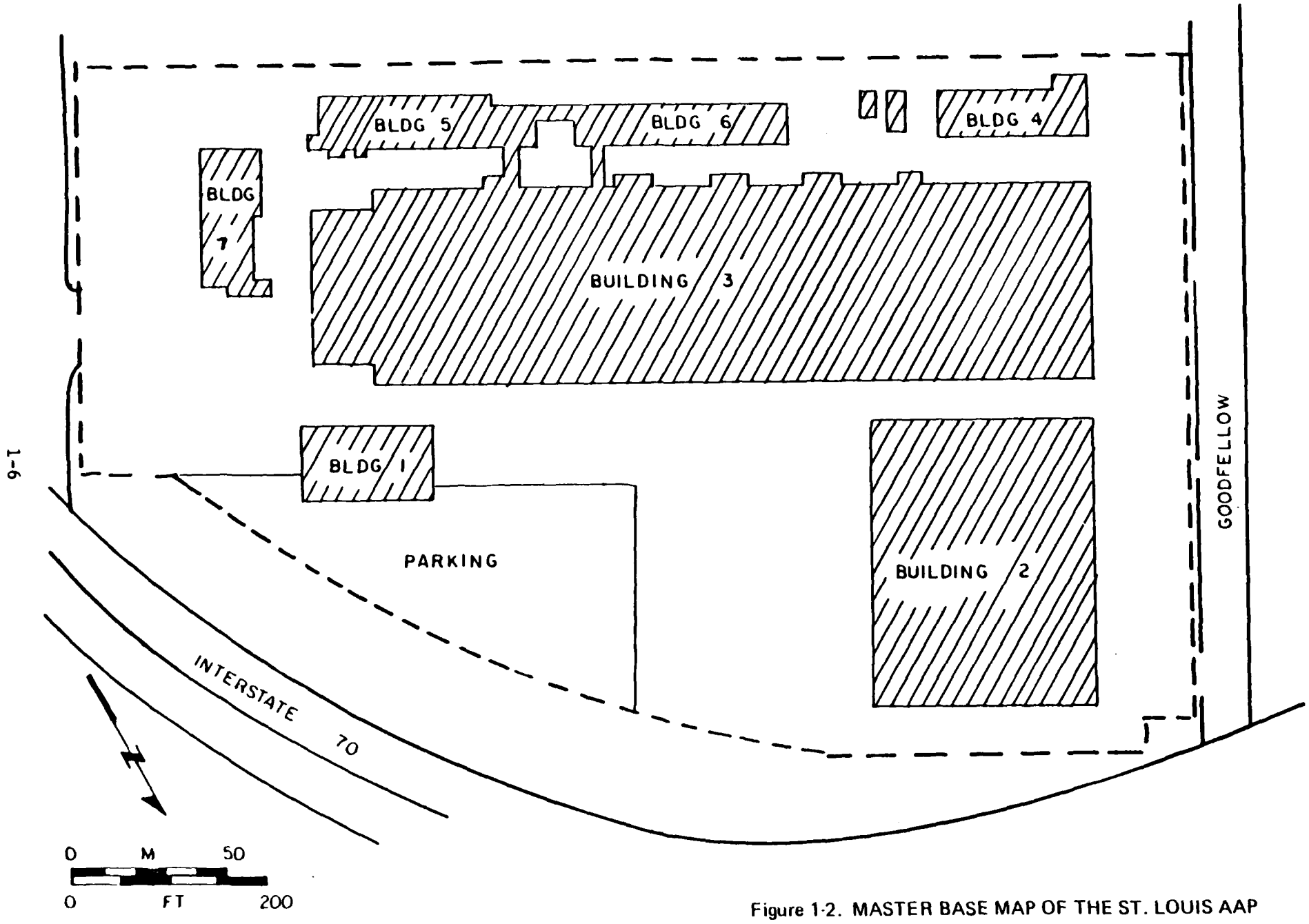


Figure 1-2. MASTER BASE MAP OF THE ST. LOUIS AAP

These procedures should be integrated with planning and management to insure continuous compliance during operations and management at each facility. This can best be achieved by an understanding of the procedures implied by the regulations and an awareness of the cultural resources potential at each facility.

1.2 THE ST. LOUIS ARMY AMMUNITION PLANT

The 21-acre (8.5 ha) St. Louis Army Ammunition Plant is located at 4800 Goodfellow Boulevard, St. Louis, Missouri. The installation is now a separate military facility and was originally the northernmost part of the 276 acres (112 ha) St. Louis Ordnance Plant and was commissioned 5 May 1941. Currently, it is operated by the Donovan Construction Company of Minneapolis, Minnesota, and has as its sole mission 105 mm ammunition production. The entire facility has been impacted by construction of buildings or parking lots, with small open areas scattered throughout (Figure 1-2).

1.3 SUMMARY OF PREVIOUS ARCHEOLOGICAL WORK CONDUCTED ON THE ST LOUIS AAP

No archeological work has been conducted on the St. Louis AAP and no archeological sites are known to exist within the facility boundaries. Since 100 percent of the facility has been impacted through some sort of ground disturbance, it is doubtful that any surficial archeological sites remain on the AAP. However, the existence of subsurface archeological deposits is possible.

1.4 THE SOCIOCULTURAL CONTEXT OF THE ARCHEOLOGICAL RESOURCES ON THE ST. LOUIS AAP

The documentary evidence suggests that the St. Louis AAP is located in an area that was developed early in the historic period. Had there been surficial archeological remains of interest to the Native American community, they most certainly would have been destroyed by nineteenth-

- The Archeological and Historic Preservation Act of 1974 (88 Stat. 174, 16 USC 469), which requires that notice of an agency project that will destroy a significant archeological site be provided to the Secretary of the Interior; either the Secretary or the notifying agency may support survey or data recovery programs to preserve the resource's information values

- The Archeological Resources Protection Act of 1979 (93 Stat. 721, 16 USC 470aa; this supersedes the Antiquities Act of 1906 [93 Stat. 225, 16 USC 432-43]), with provisions that effectively mean that

  - The Secretary of the Army may issue excavation permits for archeological resources on DARCOM lands (Sec. 4)

  - No one can damage an archeological resource on DARCOM lands without a permit, or suffer criminal (Sec. 6) or civil penalties (Sec. 7)

- 36 CFR 800, "Protection of Historic and Cultural Properties" (44 FR 6068, as amended in May 1982); these regulations from the Advisory Council on Historic Preservation set forth procedures for compliance with Section 106 of the National Historic Preservation Act

- Regulations from the Department of the Interior for determining site eligibility for the National Register of Historic Places (36 CFR 60, 36 CFR 63), and standards for data recovery (proposed 36 CFR 66)

- United States Department of the Army procedures and standards for preserving historic properties (32 CFR 650.181-650.193; Technical Manual 5-801-1; Technical Note 78-17; Army Regulation 420-40); and procedures for implementing the Archaeological Resources Protection Act (32 CFR 229).

This section introduces the St. Louis AAP archeological overview and management planning effort. Federal regulations requiring such work and effort are briefly summarized. Also included are brief introductions to the St. Louis facility, the lack of previous archeological work there, and the sociocultural context of the archeological resources that might merit management consideration.

1.1 PURPOSE AND NEED

A corpus of Federal laws and regulations mandate cultural resources management on DARCOM facilities. Briefly these are:

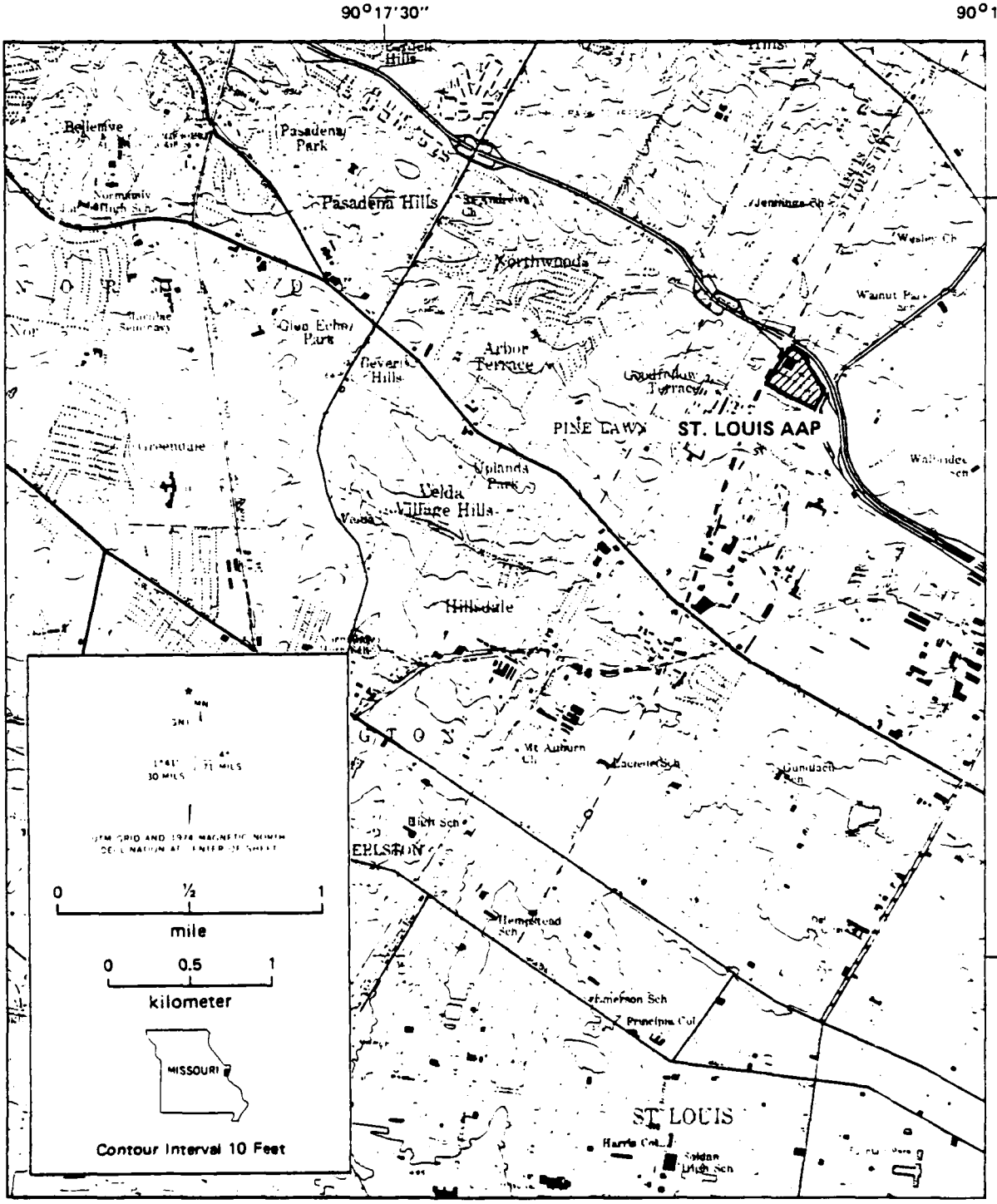
- The National Historic Preservation Act of 1966 as amended (80 Stat. 915, 94 Stat. 2987; 16 USC 470), with requirements to,

  - inventory, evaluate, and where appropriate nominate to the National Register of Historic Places all archeological properties under agency ownership or control (Sec. 110(a)(2))

  - prior to the approval of any ground-disturbing undertaking, take into account the project's effect on any National Register-listed or eligible property; afford the Advisory Council on Historic Preservation a reasonable opportunity to comment on the proposed project (Sec. 106)

  - complete an appropriate data recovery program on an eligible or listed National Register archeological site prior to its being heavily damaged or destroyed (Sec. 110(b), as reported by the House Committee on Interior and Insular Affairs [96th Congress, 2nd Session, House Report No. 96-1457, p. 36-37])

- Executive Order 11593 (36 FR 8921), whose requirements for inventory, evaluation, and nomination, and for the recovery of property information before site demolition, are codified in the 1980 amended National Historic Preservation Act



Note: Base map is the Clayton, MO, 7.5 minute topographic quad (1954, photorevised 1968 and 1974)

Figure 1-1. MAP OF THE GENERAL VICINITY OF THE ST. LOUIS AAP

1.0
INTRODUCTION

The following report is an overview of and recommended management plan for the prehistoric and historic archeological resources that are presently known or likely to occur on the St. Louis Army Ammunition Plant (AAP) in St. Louis City, Missouri, just south of the community of Pine Lawn (Figure 1-1). This facility is an installation of the U. S. Department of the Army DARCOM (Materiel Development and Readiness Command), which as a reservation of public land has responsibilities for the stewardship of the cultural resources that are located on it. The assessments and recommendations reported here are part of a larger command-wide cultural resource management program (the DARCOM Historical/Archeological Survey, or DHAS), which is being conducted for DARCOM by the U. S. Department of the Interior's National Park Service. The following is that portion of the facility-specific survey that is focused on the prehistoric and historic resource base of the St. Louis Army Ammunition Plant, and was developed in accordance with the Level A requirements as set forth in the archeological project Work Plan (Knudson, Fee, and James 1983). Because there are no presently recorded or archivally-determined potential archeological sites on the St. Louis AAP, the required Sections 4.0 and 5.0 are minimal statements only in this report. A companion historic architectural study is in preparation under a contract with the National Park Service's Historic American Buildings Survey (HABS) (William Brenner, personal communication 1984). In addition, an archeological overview and management plan has been developed for the U. S. Army's St. Louis Army Support Center (ASC) (Stafford et al. 1985), just one to two miles east of the St. Louis AAP in the Mississippi River floodplain on the Illinois side of the river.

may be preserved beneath the ground disturbance area. Sites dating from the Paleo-Indian to protohistoric and historic Indian groups have been recorded within this region of Missouri. Prehistoric site types are varied and range from single activity loci to large village sites and towns to mortuary areas.

2.2.1 Prehistory

The St. Louis AAP is located adjacent to the American Bottom archeological region which has been the site of intensive archeological investigations (Bareis and Porter 1984). Four prehistoric traditions are recognized within east-central Ilinois: Paleo-Indian, Archaic, Woodland, and Mississippian. See Table 2-2 for a detailed discussion of each.

The earliest inhabitants of the St. Louis area were Paleo-Indian big game hunters and gatherers (Benchley 1976). Population density appears to have been extremely low at this time (10,000 to 8000 BC). Possible Paleo-Indian finds on the facility would likely be limited to isolated artifacts (probably representing hunting losses).

Population increased during the Archaic tradition (8000 to 1000 BC) with small base or seasonal camps being used. The economic base of the Archaic hunters and gatherers became more diversified with the use of more vegetal foods, nuts, and aquatic resources.

Population again increased during the Woodland tradition (1000 BC to AD 1000). Ceramics were first manufactured during the Early Woodland period, while dependence on cultivated plants occurred during the Middle Woodland period and maize was grown in Late Woodland times. A Late Woodland habitation site was recorded in O'Fallon Park, which is approximately two miles east of the AAP along the edge of the Mississippi Valley bluffs (Browman, Horn, and Clark 1977).

The St. Louis area is noted for large towns with community buildings erected on mounds and surrounded by farming hamlets which were occupied

during the Mississippian tradition (AD 1000 to 1600). Mississippian tradition populations were primarily supported by maize, bean, and squash agriculture. Cahokia, 6.5 air miles southeast of St. Louis, is one of the best known socio-political centers dating to the Mississippian tradition. Population in the American Bottom region at that time is estimated to have been about 50,000, with some 30,000 living in Cahokia alone (Pfeiffer 1977:425).

Within the City of St. Louis, there were at least three "large earthen mounds," one at least 20 feet high and 50 or more feet long (Faherty 1978:56, lower illustration), and thus the city was called "Mound City" (see also Gill 1952b). A more detailed description of the mounds was compiled by Bushnell (1904), including over a dozen in present-day Forest Park and several probably in Sherman Park. All of these are at about 500 feet elevation. In various places the mounds included burials, and in others just charcoal and ceramic and lithic artifacts were associated; the latter were interpreted as the remains of collapsed earthen lodges, rather than burial mounds (Bushnell 1904:15). Hamilton and Nixon (1984) have located all of the Bushness sites on U. S. Geological Survey topographic quadrangles. Kent, Nelson, and Harl (1980:16) note that the most common prehistoric materials reported in the City of St. Louis area date from 5000 BC to AD 1450.

2.2.2 Ethnohistory

Western Illinois and eastern Missouri were occupied during the ethnohistoric period by the Illinois Indians (Callender 1978:673-680; Bauxar 1978:594-601). Sites of this period consist of semi-permanent summer villages, summer hunting camps, and winter camps, with summer villages situated along riverbanks (Callender 1978:674). Subsistence pursuits included agriculture, hunting, fishing, and gathering (Callender 1978:674). In the early nineteenth century William Rogers Clark, on behalf of the U. S. Government, signed Castor Hill treaties with the Cahokia, Tamarois, Kaskaskia, and Peoria tribes (the Illinois nation) (Gill 1952a:295).

There is no known specific documentation of any village or other historic Native American site in the vicinity of the St. Louis AAP.

2.2.3 History

Three cultural traditions are recognized during the historic period for the St. Louis region: Historic Native American, Colonial, and American. The Historic Native American tradition would be represented archeologically by remains left behind by any of the Native American groups that may have lived in the region between the late seventeenth and the mid-nineteenth centuries. The Colonial and American traditions comprise cultural resources attributable to peoples of Euroamerican origin that date before and after the American Revolution, respectively. The Colonial Tradition is divided into an Early Exploration Period and a European Competition Period. Within the American Tradition, four periods are recognized: Frontier, Homestead, Early Industrial, and Late Industrial. See Table 2-1 for a more detailed discussion.

The Joliet and Marquette expedition in 1673 marked the beginning of the historic period in the St. Louis area. This period saw early French exploration of and missionary expeditions into the Illinois Country, and in 1682 LaSalle claimed the entire Mississippi basin for France, naming it Louisiana (Primm 1981:3). In order to fortify their imperial claims the French built a string of forts between their St. Lawrence bases and the Mississippi Valley. Fort St. Louis, erected in 1682, was the first French outpost established in the project vicinity. Later the villages of Kaskaskia and Cahokia were founded, and the outposts at Fort de Chartres and Ste. Genevieve soon followed (Primm 1981:3-4).

The intercolonial struggle between France and Great Britain for control of North America resulted in France's relinquishing the Louisiana territory west of the Mississippi to Spain and the land east of the river to Great Britain under terms of the Treaty of Paris in 1763. French settlers abandoned the settlements east of the Mississippi River and began to extend their settlements on the west bank. St. Louis was

established as a town in 1764 after the Spanish took possession, but remained essentially French in character (Gerlach 1976:11; Peterson 1949:2). In 1770 the Spanish began to exert control over the area, as they were mainly concerned with exploiting the frontier and protecting the area from the English and the growing American competition and expansion. The American Revolution heightened antagonism between Spain and England who continued to compete after the war for Native American alliance, hoping to gain a monopoly of the thriving fur trade.

Sometime late in the eighteenth century the land in the vicinity of (and perhaps including) the AAP was assigned by the Spanish government to the family of Joseph Alvarez Hortiz (Gill 1952a:294), who subsequently sold the acreage to one Pierre Choteau. Choteau subsequently sold the land, perhaps including the modern AAP, to William Rogers Clark (Gill 1952a:294-295; 1952c:54) who used the land as a Indian camping area while negotiating treaties.

The most serious issue confronting the Spanish rulers was the relatively slow pace of development. In order to rectify the situation, the Spanish governor induced Americans to emigrate from Illinois through dispensation of land grants. St. Louis now began its transformation from an outpost of European nations into an American frontier town.

With the Louisiana Purchase in 1803, the region came under American control but St. Louis grew slowly. The town, still an urban outpost on the far western frontier, was shaped more by traditional French factors than by development due to accession by the United States. Immigration into Missouri increased rapidly within the next decade; the immigrants were predominately American settlers who tended to settle along the Missouri River (Gerlach 1976:24). American troops stationed at Fort Bellefontaine on the Missouri River remained in the area after the War of 1812, and by 1830 the population of Missouri was more than 90 percent American (Gerlach 1976:26).

During the Homestead period most of Missouri's American settlers, many of whom were slave-owning farmers, were from Tennessee, Kentucky, and Virginia. They tended to settle along the Missouri River and other waterways that provided direct access to the St. Louis market (Gerlach 1976:29-32). German immigration reached a high point in the state at this time; the town and its outlying areas were marked by a proliferation of German parishes and parochial schools. The second largest immigrant group was the Irish. St. Louis grew as a transportation center, becoming a major collecting point for the entire state's agricultural products as well as a center for the army's western operations. In 1837 St. Louis received a small appropriation from Congress to stabilize its harbor, which resulted in increased river trade with other American states and European countries (Primm 1981:156).

The basic settlement pattern of the preceding Homestead Period continued into the Early Industrial period, but the density of farmstead distribution became greater due to a general population increase. The railroad and river connections allowed St. Louis to grow rapidly as a manufacturing point. Food processing, sugar refining, and meat packing dominated the city's early industrial economy (Primm 1981:201). To broaden its industrial base, St. Louis began a shift from water transport to railroad traffic. River trade remained essentially stable early in the period but it rapidly declined as the railroads expanded.

By the mid 1880s St. Louis had made the transition from a commercial city dependent on the river, to a mature, diversified, industrial metropolis. St. Louis had become a city that had a large, discrete, industrial and residential section as well as satellite communities in the metropolitan region. A shift from the heavy industries of the previous period to newer and lighter domestic industries, such as dress manufacturing, furniture making, and book publishing, occurred at this time.

2.3 ARCHEOLOGICAL RESEARCH DIRECTIONS

2.3.1 Regional Concerns

A preliminary master plan for archeological resource protection has been completed for Missouri (Environmental Systems Analysis, Inc., and others 1983) with the state divided up into geographical management units and cultural study units with the following cultural units: Paleo-Indian; Early, Middle, and Late Archaic; Woodland; and Mississippian. Based on this and other work, a research design applicable to the St. Louis AAP archeological resources can be developed.

Paleo-Indian research in the St. Louis area has been sporadic because of the isolated nature of the archeological remains. During the Archaic period, it appears that the distribution of grasslands expanded in western Illinois and eastern Missouri. Archaic hunters and gatherers may have responded by abandoning upland regions and locating sites in floodplain areas; evidence of such adaptations may be retained in archeological sites on the St. Louis facility. In addition to changes in settlement location, resource exploitation, and mobility, later Archaic peoples participated in more visible mortuary behavior and trade. These patterns were elaborated and intensified during the post-Archaic Woodland and Mississippian traditions. Investigations of regional Archaic sites can provide a baseline against which to analyze later changes in prehistoric patterns of resource exploitation and in other religious, economic, and social behavior.

One of the major research questions relating to Early Woodland sites is the development and effect of ceramic production on other prehistoric cultural systems. In addition, cultural-ecological adaptations and social and religious patterns previously evident during the Archaic seem to have been intensified. It has been postulated that Early Woodland people lived in semi-permanent villages or hamlets and used the natural resources according to a wide, seasonal round of exploitation (Munson 1982). Middle Woodland sites located in Illinois were related to a

larger socio-religious-political unit known as Hopewell. There was an apparent increase in mortuary-related behavior (i.e., more burial mounds) during the Middle Woodland. Corn, squash, amaranth, and chenopod horticulture occurred during the Middle Woodland in surrounding areas, and its effects on the sites of this region is an important research consideration that might be able to be addressed.

During the Late Woodland period economic and social changes are apparent in the present archeological record. These consist of the increased use of aquatic resources and seeds, and a decrease in artifactual and social complexity. Investigations of any such sites present in this region may be critical in understanding the transition between Middle Woodland cultural complexity and succeeding Mississippian developments.

The height of prehistoric complexity in the central Midwest was reached during the Mississippian period. Permanent Mississippian towns such as Cahokia were located in the immediate vicinity of and perhaps even within (Bushnell 1904) present-day St. Louis. In addition, smaller towns and hamlets surrounded these large socio-political centers. Maize, beans, squash, seed, crops, and tobacco were cultivated, though hunting and gathering were still practiced. Archeological investigations of Mississippian sites are critical to the understanding of a large socio-political-religious unit and interactions with smaller villages and hamlets.

Due to the presence of Cahokia, a large Mississippian town several miles east of the facility, portions of the American Bottom have been subjected to more intensive archeological investigations (see Fortier 1981:88-89 for an overview of this work; Fowler 1969; Fowler and Hall 1975). Also, the FAI-270 surveys and excavations conducted by the University of Illinois (Kelly, Lindner, and Cartmell 1979) have increased the archeological data base for this area (Bareis and Porter 1984) and an overview of the archeological resources of metropolitan St. Louis has

been completed (Benchley 1975) as well as a recent overview of the resources of the River des Peres drainage basin (Nixon, Hamilton, and Kling 1982).

Contact with early traders and trappers produced a profound change in the social, political, and economic adaptations of Native Americans in the region in the seventeenth and eighteenth centuries. As a result of these early explorations and later settlements, disease, trade goods, and different economic pursuits were introduced. In addition, inter-tribal hostilities may have been accentuated. The relationship between early Euroamericans and Native Americans may be examined within the St. Louis area. Proto-historic or early historic Native American sites are as yet undocumented in the study facility.

Historic archeological research can be extremely varied. Major questions for regional investigation may include the following: the impact of early trapping and trading on Native American populations and on European political rivalries; the use of rivers and later of railroads for transport, and its effect on surrounding industry and populations; the early settlement of the area and subsequent economic changes resulting from technological advances in agriculture and mining; and the effect of a decreased mining activity on the area and the development of St. Louis as a modern commerce center.

2.3.2 Installation-Specific Archeological Research Directions

No prehistoric or historic sites are presently known to exist on the St. Louis AAP; if any are found their research values should reflect any of the regional concerns (see 2.3.1).

3.0

AN ASSESSMENT OF ARCHEOLOGICAL RESOURCE PRESERVATION AND SURVEY ADEQUACY

In this section the environmental and historic constraints that may limit the amount and kind of archeological site preservation are considered in this chapter as they apply to the St. Louis AAP, along with an assessment of the coverage of previously conducted archeological surveys. In addition, assessment is also made about the adequacy of data collection, and any gaps that may exist are documented.

3.1 ENVIRONMENTAL CONSTRAINTS TO SITE PRESERVATION

Historic and recent modifications of the St. Louis AAP are likely to have removed or obliterated any intact surface archeological remains. Buried archeological deposits may exist beneath paved or construction areas of the facility.

3.2 HISTORIC AND RECENT LAND USE PATTERNS

Prior to federal purchase the St. Louis AAP was platted as a residential subdivision and was purchased from individual land owners, but there are no historic documents available which indicate the presence of individual residences prior to 1941 (Margaret Beavers, personal communication 1984). In addition, no buildings exist on the facility that were built prior to the 1940s (Meryl Humphreys, personal communication 1984).

A summary of all ground disturbance information for the St. Louis facility is presented in Table 3-1 and Figure 3-1. The entire facility

Table 3 1. A SUMMARY OF HISTORIC AND/OR MODERN GROUND DISTURBANCE THAT MIGHT LIMIT THE PRESENT ARCHEOLOGICAL RESOURCE BASE ON THE ST. LOUIS AAP

GDA No.	Type of Disturbance	Date Conducted (yr)	Reference	Area Disturbed (acres)	Estimated Depth Below Surface (ft)	Ratio of Disturbed to Total Area	Location of Disturbed Area						Coincidental Sites
							UTM		Legal Reference[a]			USGS Quad Map[b]	
							Northing	Easting	Township	Range	Section		
1	Plant Buildings, Parking lot	1941-1944	DARCOM Activity Brochure	21	0-10 av. 6	1:1	4286600 4286600 4286830 4286490	738300 737900 738100 738240	-	--	--	CT54	

[a] St. Louis proper has no township/range information.

[b] CT54 = Clayton, MO, 7.5 min. sheet (1954, photorevised 1968 and 1974).

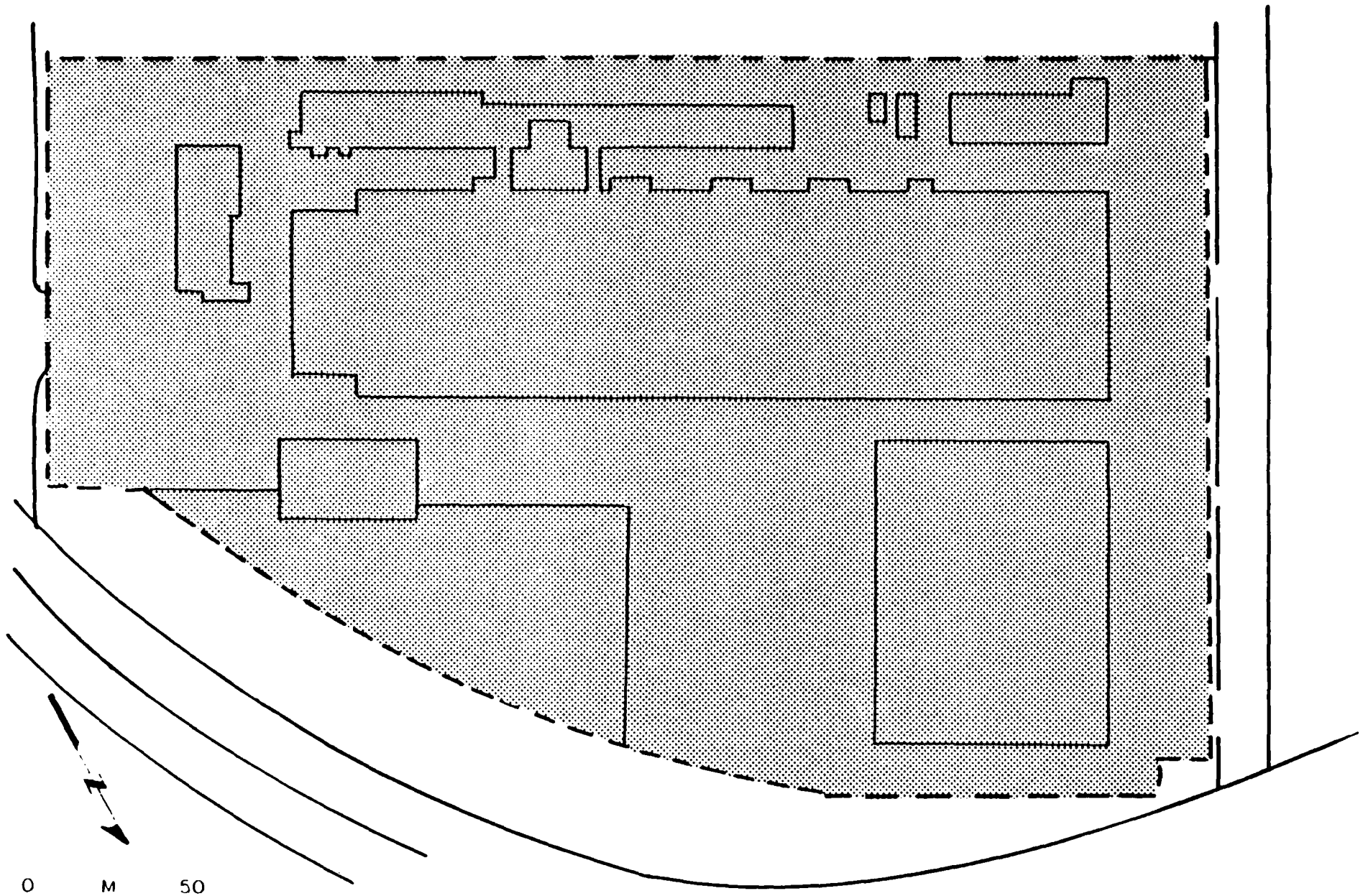


Figure 3-1. MAP OF AREAS OF HISTORIC AND/OR MODERN GROUND DISTURBANCE THAT MIGHT LIMIT THE PRESENT ARCHEOLOGICAL RESOURCE BASE ON THE ST. LOUIS AAP

appears to have been impacted by plant buildings and parking lots with an estimated ratio of disturbed to total area of 90 to 100 percent. Depth of ground disturbance within the facility varies between 0 and 10 feet, with an average of six feet.

3.3 PREVIOUS CULTURAL RESOURCE INVESTIGATIONS; COVERAGE AND INTENSITY

No archeological surveys were conducted on the St. Louis AAP prior to its construction in 1941, nor have any been conducted to date. No archeological sites are presently known to exist within the facility boundaries. A survey of the historic architectural resources on the AAP is in progress (William Brenner, personal communication 1984). However, within the past few years there have been several field or desk cultural resource management projects addressing lands within a few miles of the AAP (e.g., Browman 1980; Browman, Horn, and Clark 1977; Hamilton and Nixon 1984; Nixon, Hamilton, and Kling 1983).

3.4 SUMMARY ASESSMENT OF ARCHEOLOGICAL DATA ADEQUACY AND GAPS

The lack of information on archeological resources on the St. Louis AAP is due to a lack of survey and to the all-encompassing nature of the apparent ground disturbance on the facility such that surficial survey is difficult.

4.0
KNOWN ARCHEOLOGICAL RESOURCES ON THE ST. LOUIS AAP

There are no known or identifiable potential archeological sites on the St. Louis AAP at present. "Potential" sites would be those identified in the historic archives or rumored to exist, but not yet field-identified. Nixon, Hamilton, and Kling (1982:18) note that there is some evidence of Late Woodland or Early Mississippian remains on the bluff tops overlooking river valleys in the St. Louis area. The St. Louis AAP is not along such a bluffline, but is on the south side of a prehistoric drainageway and at the same elevation as prehistoric materials found in Forest Park, Sherman Park, and O'Fallon Park.

The facility is located on a modern surface in an upland topographic situation. Construction and modification of the St. Louis AAP has removed any surface historic remains to a depth of up to 10 feet (3.05 m). Subsurface cultural deposits may be preserved beneath paved areas or areas with minimal disturbance.

5.0
AN ASSESSMENT OF THE SIGNIFICANCE OF THE ARCHEOLOGICAL RESOURCE BASE ON THE ST. LOUIS AAP

No archeological sites are known on the St. Louis AAP, even though significant prehistoric and historic sites exist in the vicinity. The surface of the facility appears to have been totally impacted by modern construction or paving, though intact soils may remain beneath. These soils could still contain prehistoric or historic archeological materials.

It is recommended that the St. Louis AAP facility personnel develop a close coordination with the Missouri SHPO in the event of any future development project at the facility.

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7.0
SUMMARY

As a manager of public lands, the St. Louis AAP has responsibilities for the management of the natural and cultural resources held on those lands, for the general benefit of the American people. This report documents the lack of known or archivally-determined potential archeological resources on the facility and recommends compliance procedures if any archeological resources are identified that could be impacted by any future construction.

No construction is planned for the St. Louis AAP that would modify the current surface of the facility. To date the entire facility is covered by the manufacturing and administrative buildings and parking lots. However, intact subsurface deposits may remain beneath the parking area and the buildings and could contain signficant archeological materials.

Consultation with the Missouri State Historic Preservation Officer is recommended either for (1) the filing of (and acquiring written concurrence with) a negative declaration of preservation management needs, or for (2) completion of a Historic Preservation Plan. Such a plan should be in compliance with Army Regulation 420-40 and be based on information available from this report and from the historic architectural study presently being conducted by the Historic American Buildings Survey, to provide the basis for an affirmative cultural resource management program appropriate to a land-managing agency whose fundamental mission is support for America's military.

determine the importance of the materials. If deemed important, the Army should then implement appropriate measures as recommended by the DCA.

6.3 ESTIMATED SCOPE OF WORK AND COST LEVELS FOR PRESENTLY IDENTIFIABLE MANAGEMENT NEEDS

Because no management work outside of DARCOM in-house activities should be required, the Section 6.2.2 resource protection options are recommended to incur no contractor costs.

In the event the installation has accomplished its Section 106 procedures and finds a previously unidentifiable resource during its ground disturbance and/or construction phase, it will effect compliance using 36 CFR 800.7 procedures, as follows:

- Notification will be accomplished by the facility of the emergency discovery to the Departmental Consulting Archeologist (DCA), who is responsible for making an investigation within 48 hours, to determine the importance of the resource, and defining appropriate mitigation measures

- Consultation with the Missouri State Historic Preservation Officer (SHPO), DARCOM, National Park Service (Rocky Mountain Regional Office, Denver, Colorado), and the National Register, will be accomplished by the DCA or DCA's designee

- If the site is evaluated as being important by the DCA or DCA's designee, the Department of the Army is responsible for implementing and funding the mitigation measures.

6.2.3 A Summary of Recommended Management Directions and Priorities for Effective Compliance and Program Management

As discussed in 6.2.1, there is presently no documentation of known or potential cultural resources on the St. Louis AAP, nor is there a negative declaration to this effect on file. This report should serve as the basis for such a declaration, following consultation with the Missouri SHPO and the ACHP in Denver, Colorado.

It is possible that intact subsurface cultural resources remain on the AAP. Presently, no construction is planned on the facility, but should archeological materials be encountered in any future ground-disturbing process, construction should halt until consultation and evaluation with the Departmental Consulting Archeologist (DCA) can

objectives for archeological resources on the St. Louis AAP. The information provided here can be used to determine if any activities of the on-going facility mission (or any special mission) will damage or have adverse effects on any "likely to occur" archeological resources; it thus can be used to develop alternatives for the mitigation of those effects. Consultation with the SHPO and ACHP about the preservation program as outlined in the HPP will ensure compliance with the historic preservation laws and regulations outlined in Section 1.0. Further, it will integrate preservation considerations into general facility and future project planning in a timely and cost-effective manner.

6.2.2 Project-Specific Resource Protection or Treatment Options

No archeological sites have been documented on the St. Louis AAP. The entire surface of the facility has been impacted by construction and/or paving. Thus, any future ground-disturbing activities in the AAP is unlikely to need pre-construction review of its potential adverse impacts to significant archeological resources (the exception might be deep new excavation into previously undisturbed deposits bweneath moverd buildings, structures, or paving). However, new ground-disturbing construction in AAP land would be a federal undertaking requiring compliance with Section 106 of the National Historic Preservation Act (see Section 1.1 of this report). Section 106 requires that DARCOM consult with the Missouri SHPO and the federal Advisory Council on Historic Preservation about the effects of such an undertaking on significant archeological sites. Without a SHPO-accepted facility preservation plan, it is DARCOM's responsibility to either complete such an evaluation and consultation program for each project or to have on file documentation of the completion of adequate survey and evaluation so as to confirm the absence or lack of significance of any archeological site that might be affected by the proposed activity. Such project-specific evaluation and preservation pr[illegible]ms require consultation with several federal agencies, and are frequently time-consuming. However, such a project-specific program can usually be expedited if the appropriate preservation planning or negative declaration has been completed and reviewed by the SHPO.

The Department of the Army Regulation 420-40 prescribes Army policy, procedures, and responsibilities for compliance with the National Historic Preservation Act of 1966, as amended; for the maintenance of state-of-the-art standards for preservation, personnel and projects; and for accomplishment of the historic preservation program. As outlined in those regulations, an HPP has the following objectives:

- Integration of historic preservation requirements with the planning and execution of military undertakings such as training and construction and real property or land use decisions

- Implementation of a legally acceptable compliance procedure with the Advisory Council on Historic Preservation (ACHP) and State Historic Preservation Officer (SHPO)

- Outline priorities for acquiring additional information to determine if there may be additional projects not yet located or identified

- Establishment of a procedure for the evaluation of historic properties

- Ranking of facility projects by their potential to damage historic properties

- Provision of guidelines for the management of historic properties

- Provision of historic and archeological data for the installation's information systems

- Identification of funding, staffing, and milestones needed to implement the plan.

This document provides the necessary information for meeting these

6.0 A RECOMMENDED ARCHEOLOGICAL MANAGEMENT PLAN FOR THE ST. LOUIS AAP

6.1 FACILITY MASTER PLANS AND PROPOSED IMPACTS

No long-term planning document is available for the St. Louis AAP. Facility personnel state that no further construction or modification is planned there (Meryl Humphreys, personal communication 1984).

6.2 APPROPRIATE ARCHEOLOGICAL MANAGEMENT GOALS WITHIN THE ST. LOUIS AAP'S MASTER PLAN

6.2.1 General Facility Planning

This report documents the lack of any presently known archeological investigations on the St. Louis AAP, but the possibility that significant prehistoric or historic buried materials may be retained there. This information can be used as the basis for developing an archival and field inventory program to demonstrate the absence of sites on the facility, or the presence and hence the need for the preparation of a Historic Preservation Plan (HPP) to be implemented on the facility.

Army Regulation 420-40, drafted pursuant to the National Historic Preservation Act, and 36 CFR 800 (Section 1.1), require that each DARCOM facility have a Historic Preservation Plan (HPP) or have documentation on file indicating whether there are any known archeological resources appropriate to such management planning. At present, there is no such negative declaration or Plan.

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