Contract Publication Series 17-322

AN ARCHAEOLOGICAL SURVEY OF THE PROPOSED WESTERN KENTUCKY UNIVERSITY BIKEWAY IN WARREN COUNTY, KENTUCKY (ITEM NO. 3-594.00)

by
Thomas H. McAlpine, Jr., RPA 989402,
and
Alexandra D. Bybee, RPA 11813

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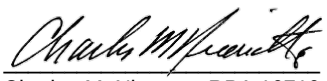

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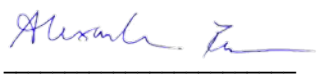

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Lead Agency: Federal Highway Administration
OSA Project Registration No.: FY18_9325

ABSTRACT

On August 30 and 31, 2017, Cultural Resource Analysts, Inc., personnel conducted an archaeological survey of a portion of the proposed Western Kentucky University Bikeway in Warren County, Kentucky (Item No. 3-594.00). The survey was conducted at the request of Jeff Arnold of Arnold Consulting Engineering Services, Inc., on behalf of Western Kentucky University. The project consists of the construction of a bikeway northeast of the center of Bowling Green, Kentucky. It will entail the construction of replacement, new, and extended sidewalks, as well as new parking facilities in the area of Center Street, College Street, and East Fourth Avenue. The project area covers a 35-x-130 m (114-x-427 ft) urban lawn, approximately .4 ha (1 acre).

Prior to the fieldwork, a records review was conducted at the Office of State Archaeology. The review indicated that 16 previous professional archaeological surveys and 2 archaeological site investigations had been conducted within a 2.0 km (1.2 mi) radius of the project area. Twenty archaeological sites have been recorded in this area. None of these surveys or sites were within the current project area.

The entire project area was subjected to intensive pedestrian survey supplemented with screened shovel testing and bucket augering. One site (15Wa193) was recorded during the survey. Site 15Wa193 is a multicomponent site consisting of materials associated with a mixture of historic residences and commercial buildings from the late nineteenth to early twenty-first centuries and a Terminal Archaic/Early Woodland prehistoric open habitation without mounds. The site area had been heavily disturbed and there was no evidence of structural remains or features. Site 15Wa193 is recommended as not eligible for inclusion on the National Register of Historic Places. No sites listed on, or eligible for listing on, the National Register of Historic Places will be affected by the project; therefore, archaeological clearance is recommended.

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I. INTRODUCTION

On August 30 and 31, 2017, Cultural Resource Analysts, Inc. (CRA), personnel conducted an archaeological survey of a portion of the proposed Western Kentucky University (WKU) Bikeway in Warren County, Kentucky (Item No. 3-594.00) (Figure 1). The survey was conducted at the request of Jeff Arnold of Arnold Consulting Engineering Services, Inc., on behalf of WKU. Thomas H. McAlpine, Jr. and Karen Clark conducted the survey, which required 16 hours to complete. Office of State Archaeology (OSA) Geographic Information Systems (GIS) data was requested by CRA on August 8, 2017, and was returned on August 14, 2017. The results were researched by Heather Barras of CRA at the OSA on August 16, 2017. The OSA project registration number is FY18_9325.

Project Description

The project consists of the construction of a bikeway northeast of the center of Bowling Green, Kentucky. It will entail the construction of replacement, new, and extended sidewalks, as well as new parking facilities in the area of Center Street, College Street, and East Fourth Avenue. The project area covers a 35-x-130 m (114-x-427 ft) urban lawn, approximately .4 ha (1.0 acre) (Figures 2 and 3).

Purpose of Study

This study was conducted to comply with Section 106 of the National Historic Preservation Act. This transportation project is federally funded, and therefore considered an undertaking subject to 106 review. The purpose of this survey was to assess any potential effects the new sidewalks and parking facilities might have on identified cultural resources. To do this, we followed these objectives:

identify prehistoric and historic archaeological sites located within the project area;

determine, to the extent possible, the age and cultural affiliation of sites;

establish the vertical and horizontal boundaries of sites; and

establish the degree of site integrity and potential for intact cultural deposits to be present.

For the purposes of this assessment, a site was defined as "any location where human behavior has resulted in the deposition of artifacts, or other evidence of purposive behavior at least 50 years of age" (Sanders 2006:2).

The following is a description of the project area, previous research and cultural history of the area, field and laboratory methods, materials recovered, and results of this study. It conforms to the *Specifications for Conducting Fieldwork and Preparing Cultural Resource Assessment Reports* (Sanders 2006). Cultural material, field notes, records, and site photographs will be curated with the William S. Webb Museum of Anthropology, University of Kentucky (UK), in Lexington.

Summary of Findings

Prior to the fieldwork, a records review was conducted at the OSA. The review indicated that 16 previous professional archaeological surveys and 2 archaeological site investigations had been conducted within a 2.0 km (1.2 mi) radius of the project area. Twenty archaeological sites have been recorded in this area. None of these surveys or sites were within the current project boundary.

The entire project area was subjected to intensive pedestrian survey supplemented with screened shovel testing and bucket augering. One site (15Wa193) was recorded during the survey. Site 15Wa193 is a multicomponent site consisting of materials associated with a mixture of historic residences and commercial buildings from the late nineteenth to early twenty-first centuries and a Terminal Archaic/Early Woodland prehistoric

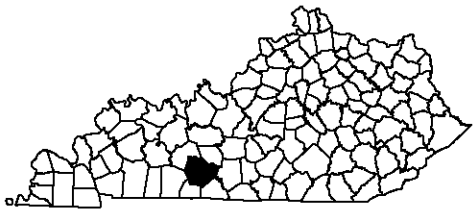

Figure 1. Map of Kentucky showing the location of Warren County.

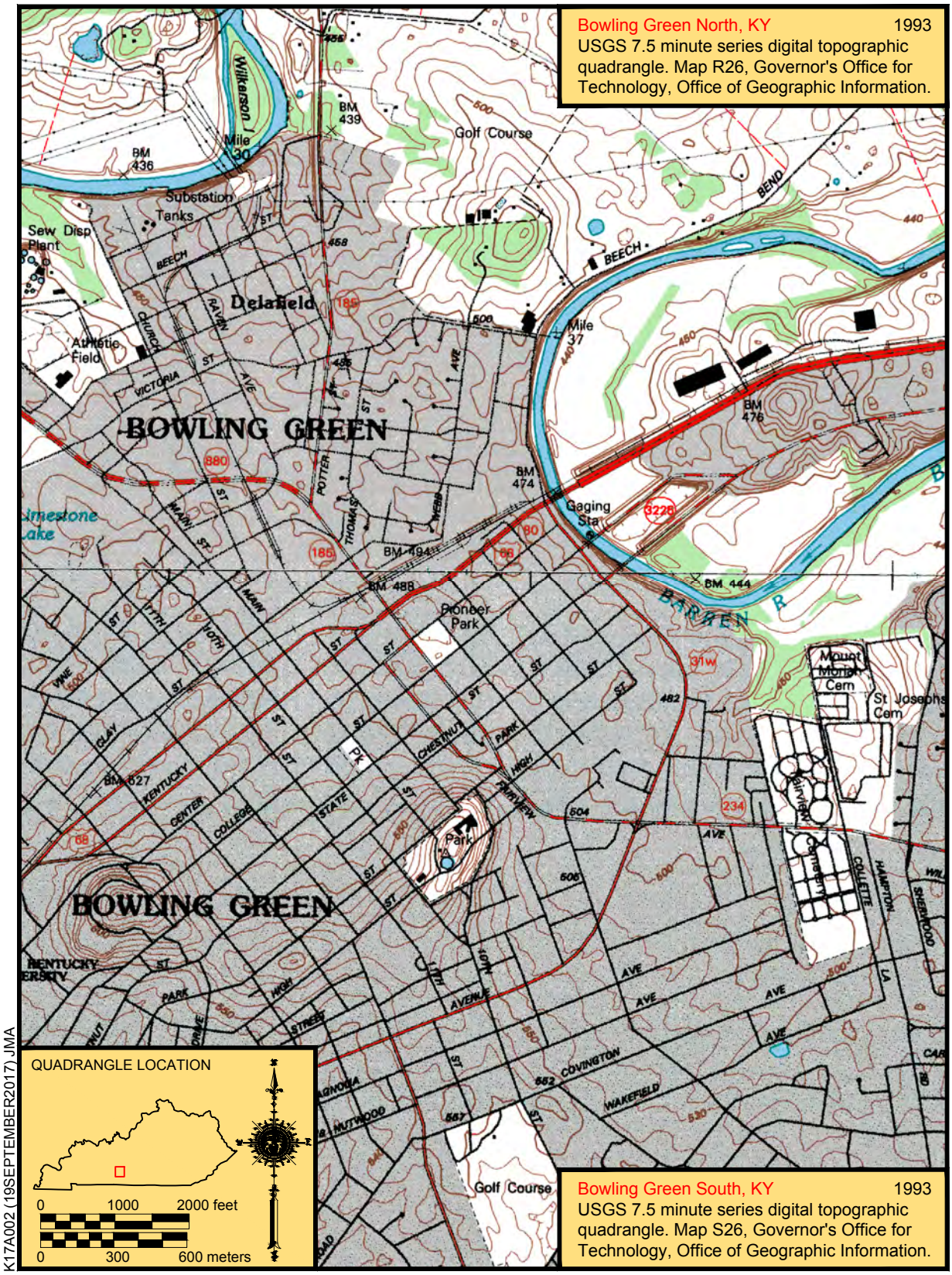

Figure 2. Location of project area on topographic quadrangle.

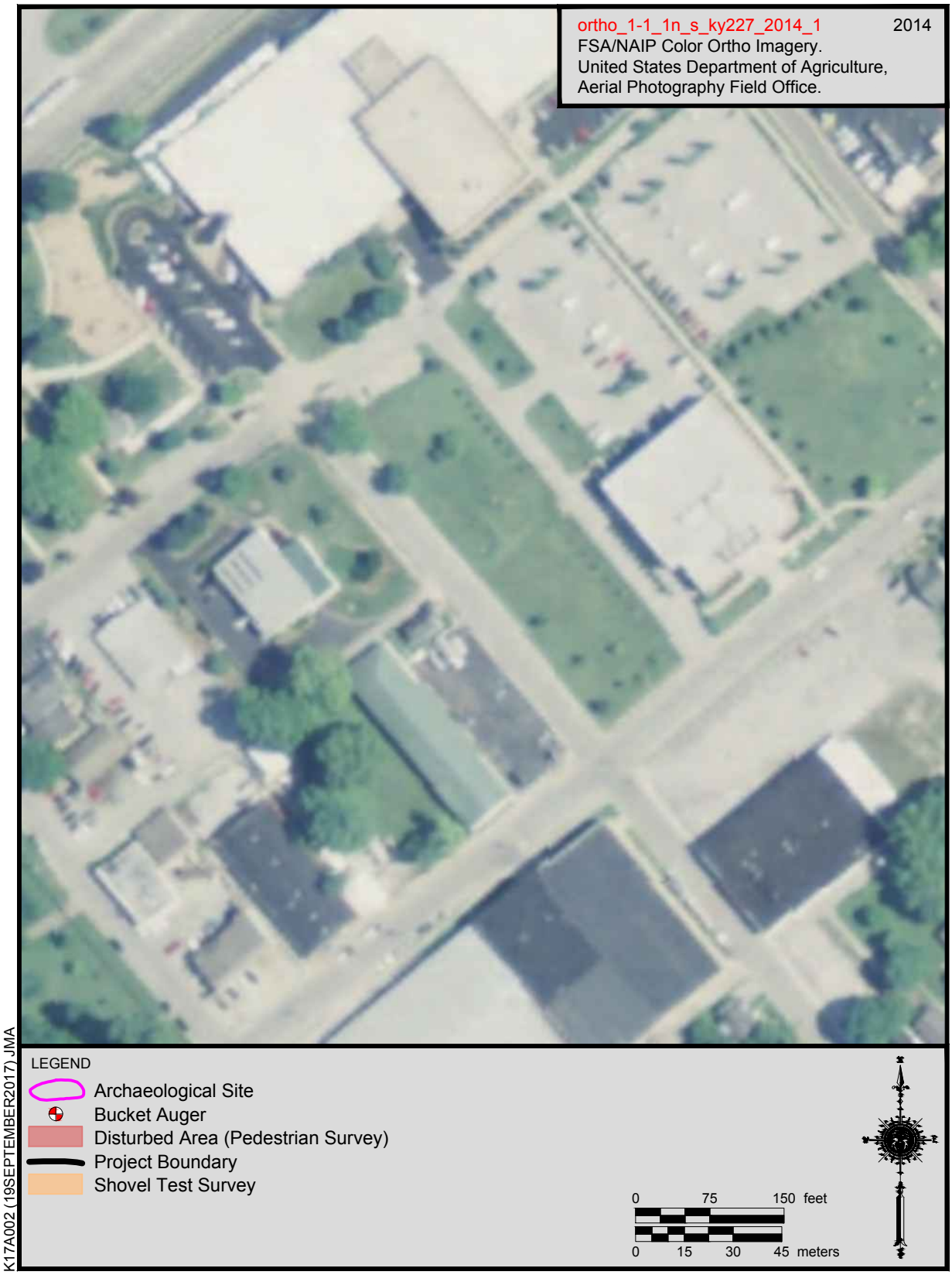

Figure 3. Project area plan map.

open habitation without mounds. The site area had been heavily disturbed and there was no evidence of structural remains or features. Site 15Wa193 is recommended as not eligible for inclusion on the National Register of Historic Places (NRHP). No sites listed on, or eligible for listing on, the NRHP will be affected by the project; therefore, archaeological clearance is recommended.

II. ENVIRONMENTAL SETTING

This section of the report provides a description of the modern and prehistoric environment and considers those aspects of the environment that may have influenced the settlement choices of past peoples. Attributes of the physical environment also often guide the methods used to discover archaeological sites. Topography, bedrock geology, vegetation, hydrology, soils, lithic resources, and climate for the region where the project is located are discussed below.

The Mississippian Plateaus region (Figure 4) is separated from the Inner and Outer Bluegrass subregions by the Knobs subregion and borders every other physiographic region in Kentucky (Sauer 1927). It is bordered to the north by the Muldraughs Hill escarpment and the Ohio River valley, to the east by the Pottsville or Cumberland Escarpment, to the west by the Western Kentucky Coal Field region and the Tennessee and Ohio River valleys, and to the south by the Tennessee state line. A triangular-shaped wedge of the Mississippian Plateaus region in northeastern Kentucky is bordered by the Knobs subregion to the west and by the Eastern Kentucky Coal Field region to the east. The valley of the Cumberland River in the southeast portion of the region contains broad bottomlands, cliffs, gorges, and knobs situated around meander bends (Newell 2017). Much of the area was known as barrens, which was a pioneer term for grassland prairies, prior to historic agricultural uses (Newell 2017).

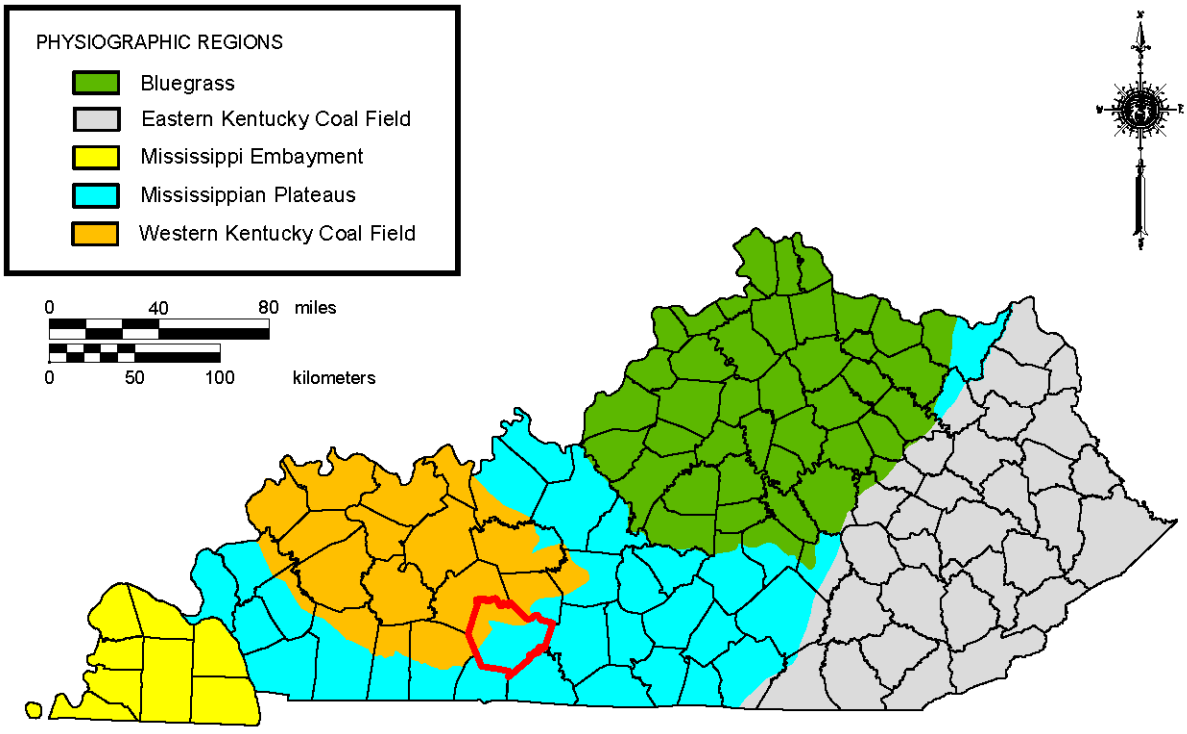

Figure 4. The Mississippian Plateaus region.

The counties located completely within the Mississippian Plateaus region consist of Adair, Allen, Barren, Cumberland, Green, Hardin, Larue, Livingston, Lyon, Meade, Metcalfe, Monroe, Russell, Simpson, Taylor, and Trigg. The following counties encompass portions of the Mississippian Plateaus and Western Kentucky Coal Field regions: Breckinridge, Caldwell, Christian, Crittenden, Edmondson, Grayson, Hart, Logan, Todd, and Warren. There are portions of Lewis and Rowan Counties in the Knobs, portions in a triangular-shaped wedge of Mississippian Plateaus, and portions in the Eastern Kentucky Coal Field region in northeastern Kentucky. Casey County encompasses portions of the Mississippian Plateaus region and the Knobs subregion in the south-central portion of the commonwealth. In the same general area, Lincoln and Marion Counties have small areas situated within the Mississippian Plateaus region, and they extend into the Knobs and Outer Bluegrass subregions. Rockcastle County is situated partially within the Mississippian Plateaus region, partially within the Knobs subregion, and partially within the Eastern Kentucky Coal Field region. Finally, portions of Clinton, Pulaski, and Wayne Counties are situated within the Mississippian Plateaus, and portions are within the Eastern Kentucky Coal Field.

The Mississippian Plateaus region has strongly developed karst topography, as evidenced by a prevalence of erosional features, including caves, glades, sinkholes, and springs (Pollack 2008:15). The part of the region spanning south and central Kentucky is strongly dissected by deep valleys underlain by Mississippian-age limestone and dolomite. Devonian to Mississippian-age shale, siltstone, and dolomite underlie the triangular-shaped wedge of Mississippian Plateaus region in northeastern Kentucky.

The Cumberland, Green, and Tradewater Rivers and their tributaries, depending on geographical location, drain the majority of the Mississippian Plateaus region, and the northern and western edges of the region are drained by the Ohio and Tennessee Rivers, respectively. The Salt and Licking Rivers drain small portions of the Mississippi Plateaus region as well (Figure 5). Mammoth Cave occurs along the Green River and is part of the most extensive cave development in Kentucky (Newell 2017).

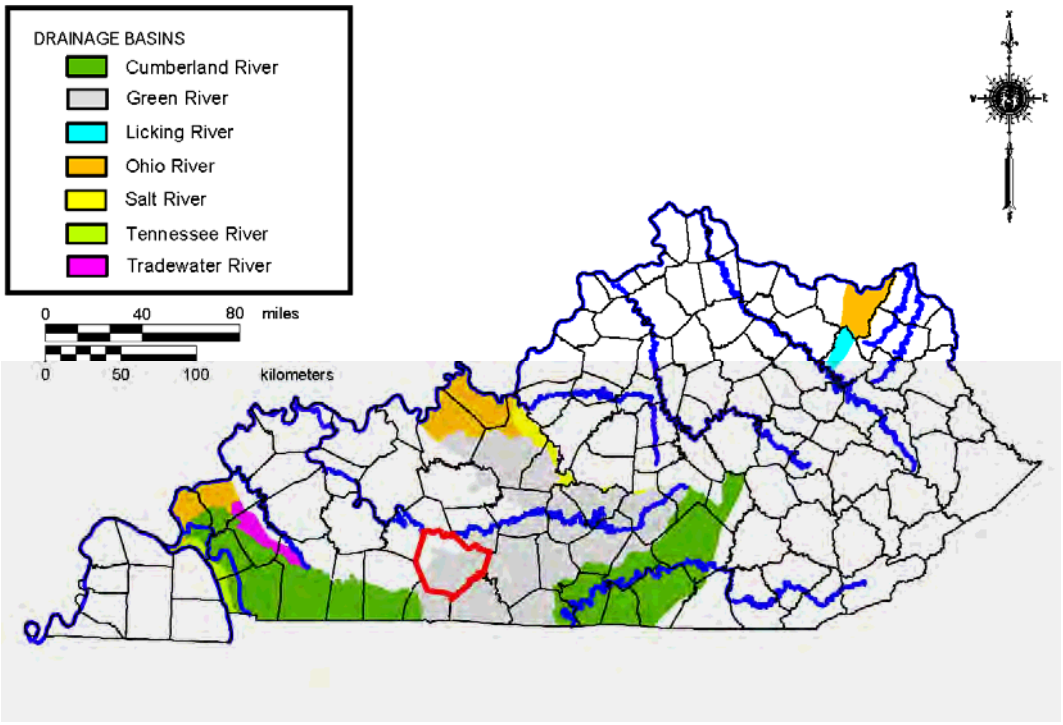

Figure 5. Rivers that drain the Mississippian Plateaus region.

The Mississippian Plateaus area of Kentucky is located within the Western Mesophytic Forest region, as defined by Braun (2001:122–161). This forest region offers a mosaic pattern of climax vegetation types that are often less luxuriant than those observed for the Mixed Mesophytic Forest region to the east (Braun 2001:122–123). The Western Mesophytic region is considered a transition zone in which the effects of local environments allow different climax types to exist in proximity. Braun states that the modern pattern of forest distribution is the result of past and present environmental influences, with changes in climate, topography, or soil bringing about changes in vegetation (Braun 2001:529).

Beech is the dominant forest in the modern dissected and hilly areas of the eastern Mississippian Plateaus region, whereas oak, oak-hickory, and oak-chestnut occupy drier slopes and ridges. The western plateau area is dominated by oak forest in topographically rolling areas, while oak-hickory forest is dominant on isolated hills. Prairie or barren areas are also present in the western plateau, where cedars dominate drier slopes, and swamp forests of herbaceous vegetation and shrub communities are dominant in low-lying areas (Braun 2001:151–152).

Soils of the Mississippian Plateaus

The Mississippian Plateaus region is predominately mapped as the Alfisols order of soils. Alfisols developed on Late Pleistocene or older surfaces or on erosional surfaces of similar age. They have a thin, dark A-horizon rich in organic matter and nutrients and a clay-enriched subsoil, and they are relatively fertile due to being only moderately leached (Soil Survey Staff 1999:163–165). Alfisols may contain intact archaeological deposits very near or on the ground surface, depending upon the landform on which they formed (e.g., sideslope vs. ridgetop).

The Alfisols order is predominately mapped as the Udalfs suborder of soils, which are the more or less freely-drained Alfisols in areas with well-distributed rainfall and seasonally varying soil temperatures. Some of the Udalfs are underlain by limestone or other calcareous sediments. Udalfs are thought to have developed under forest vegetation, and depending on temperature regime, they supported either a deciduous forest (mesic or warmer) or a mixed coniferous and deciduous forest (frigid). Many Udalfs have been cleared of trees and are intensively farmed. As a result of erosion, many now have only a clay-enriched or iron and aluminum oxide-enriched horizon below an Ap-horizon that is mostly material once part of the subsoil. Udalfs on stable surfaces retain most of their weathered or leached eluvial horizons above the subsoil. A few Udalfs have a natric, or clay and sodium-enriched, horizon, and others have a compacted zone, such as a fragipan, in or below the subsoil (Soil Survey Staff 1999).

Portions of the Mississippian Plateaus region that are predominately mapped as the Inceptisol soil order occur to a lesser extent. Inceptisols developed in silty, acid alluvium during the Late Pleistocene or Holocene time periods on nearly level to steep surfaces. Inceptisols may have deeply buried and intact archaeological deposits, depending upon the landform on which they formed (e.g., sideslope vs. alluvial terrace). Inceptisols exhibit a thick, dark colored surface horizon rich in organic matter and a weakly developed subsurface horizon with evidence of weathering and sometimes of gleying (Soil Survey Staff 1999:489–493).

These portions of the region are predominately mapped as the Udepts suborder of soils, which are mainly the more or less freely-drained Inceptisols in areas with well-distributed to excessive rainfall. In the areas with excessive rainfall, the soils formed in older deposits. Most of the soils are thought to have developed under forest vegetation, but some supported shrubs or grasses. The majority of the soils have either a thinner, or a thicker but leached, surface horizon and a weakly developed subsoil or B-horizon. Some also have a sulfuric acid–enhanced horizon that is commonly the result of artificial drainage or surface mining or other earthmoving activities. Some also exhibit a subsurface cemented zone, such as a duripan, or a compacted zone, such as a fragipan (Soil Survey Staff 1999).

Finally, there are small areas along the Ohio River predominately mapped as the Mollisols soil

order. They are grassland soils, and because of the long-term addition of organic material to the soil from plant roots, the surface horizon is thick, dark, and fertile. They can exhibit clay, sodium and/or carbonate enriched, or even leached subsoil horizons. These soils formed on level to sloping ground in Late Pleistocene to Holocene or even earlier deposits and generally under grassland that could have been previously forested. They have the potential to contain deeply buried and intact archaeological deposits on level floodplain or terrace landforms (Soil Survey Staff 1999:555–557).

These areas are predominately mapped as the Udoll suborder of soils, which are mainly the more or less freely-drained Mollisols of humid climates in areas with well-distributed rainfall. They formed mainly in Late Pleistocene or Holocene deposits or on surfaces of comparable ages (Soil Survey Staff 1999).

Lithic Resources

The Mississippian Plateaus region displays very diverse and abundant sources of lithic raw material that could have been exploited by prehistoric inhabitants. There are rings of different geologic strata underlying the Mississippian Plateaus region and expanding out from the Western Kentucky Coal Field region that have been exposed by erosion through down cutting. The various members occur at different elevations and are mostly of Mississippian age. Areas of Vienna and Menard cherts are found within the Vienna and Menard Formations on the outer edges of the Western Kentucky Coal Field region (United States Geological Survey [USGS] 2017). A more continuous and wider ring of Mississippian-age limestone formations containing Haney, Girkin, and Paoli cherts surrounds the Vienna and Menard Formations. A large ring of Muldraugh chert-bearing limestone of the Muldraugh Formation then covers much of the rest of the western portion of the region. In the eastern third of the region, Mississippian-age limestone and dolomite strata of the Ste. Genevieve and St. Louis Formations contain Ste. Genevieve and St. Louis cherts. Mississippian-age Fort Payne chert is found in underlying limestone and sandstone outcrops in some of the dissected areas in the eastern third of the region. The more dissected areas of the eastern third expose Devonian to Mississippian-age shale, siltstone, limestone, and dolomite, as does the triangular-shaped wedge of the Mississippian Plateaus region in northeastern Kentucky. These areas can contain predominately Boyle and Brassfield cherts. In northeastern Kentucky, along the eastern edge of the triangular-shaped wedge of the Mississippian Plateaus region, Mississippian-age Newman Limestone containing Newman chert is found. Some areas of Pennsylvanian-age shale, siltstone, and sandstone deposits are preserved above the Mississippian deposits. They contain Breathitt chert primarily outcropping in the southeastern corner of the region.

The upland areas in the Land Between the Lakes region are underlain by Tertiary to Quaternary-age Continental deposits of loess, sand, and gravel (USGS 2017). Within these deposits in this region, Mounds Gravel is the predominate chert and is found on river and stream terraces and, secondarily, on gravel bars. It consists of chert pebbles and cobbles found in the redeposited Pliocene/Pleistocene gravels.

Prehistoric and Historic Climate

Climatic conditions during the period of human occupation in the region (Late Pleistocene and Holocene ages) can be described as a series of transitions in temperature, rainfall, and seasonal patterns that created a wide range of ecological variation, altering the survival strategies of human populations (Anderson 2001; Niquette and Donham 1985:6–8; Shane et al. 2001). The landscape during the Pleistocene was quite different from that of today. Much of the mid-continent consisted of periglacial tundra dominated by boreal conifer and jack-pine forests. Eastern North America was populated by a variety of faunal species, including megafaunal taxa such as mastodon, mammoth, saber-toothed tiger, and Pleistocene horse, as well as by modern taxa such as white-tailed deer, raccoon, and rabbit.

The Wisconsinan glacial maximum occurred approximately 21,400 years B.P. (Anderson 2001; Delcourt and Delcourt 1987). By 15,000

B.P., following the Wisconsinan glacial maximum, a general warming trend and concomitant glacial retreat had set in (Anderson 2001; Shane 1994). Towards the end of the Pleistocene and after 14,000 B.P., the boreal forest gave way to a mixed conifer/northern hardwoods forest complex. In the Early Holocene and by 10,000 B.P., southern Indiana was probably on the northern fringes of expanding deciduous forests (Delcourt and Delcourt 1987:92–98). Pollen records from the Gallipolis Lock and Dam on the Ohio River near Putnam County, West Virginia, reveal that all the important arboreal taxa of mixed mesophytic forest had arrived in the region by 9000–8500 B.P. (Fredlund 1989:23). Similarly, Reidhead (1984:421) indicates that the generalized hardwood forests were well established in southeastern Indiana and southwest Ohio by circa 8200 B.P.

Prior to approximately 13,450 B.P., climatic conditions were harsh but capable of supporting human populations (Adovasio et al. 1998; McAvoy and McAvoy 1997). Populations were probably small, scattered, and not reproductively viable (Anderson 2001). The Inter-Allerød Cold Period, circa 13,450–12,900 B.P, brought about the dispersal of Native Americans across the continent. This period was followed by the rapid onset of a cooling event known as the Younger Dryas (circa 12,900–11,600 B.P.) during which megafauna species became extinct, vegetation changed dramatically, and temperature fluctuated markedly.

In a recent review, Meeks and Anderson (2012:111) described the Pleistocene/Holocene transition as "a period of tremendous environmental dynamism coincident with the Younger Dryas event." The Younger Dryas (circa 12,900 to 11,600 cal. B.P.) represents one of the largest abrupt climate changes that has occurred within the past 100,000 years. The onset of the Younger Dryas appears to have been a relatively rapid event that may have been driven by a freshwater influx into the North Atlantic as a result of catastrophic outbursts of glacial lakes. "The net effect of these outbursts of freshwater was a reduction in sea surface salinity, which altered the thermohaline conveyor belt; effectively slowing ocean circulation of warmer water (heat) to the north and bringing cold conditions" (Meeks and Anderson 2012:111; though see Meltzer and Bar-Yosef 2012:251–252 for a critique of this view). This resulted in significantly lower temperatures during this time. The Younger Dryas ended approximately 1,300 years later over a several decade period. The onset of the Younger Dryas coincides with the end of Clovis and the advent of more geographically circumscribed cultural traditions.

Pollen records for the Younger Dryas indicate that vegetation shifts were sometimes abrupt and characterized by oscillations. These shifts were not uniform over the entire southeast and indicate that a variety of factors were at play. At Jackson Pond in Kentucky (Wilkins et al. 1991), for example, several pronounced reciprocal oscillations occurred in a large number of spruce and oak. According to Meeks and Anderson, "these oscillations reflect shifts between boreal/deciduous forest ecotones associated with cool/wet and cool/dry conditions, respectively" (2012:113).

Meeks and Anderson (2012:126–130) define five population events for the Paleoindian–Early Holocene transition. Population Event 1 (circa 15,000–13,800 cal. B.P.) is a pre-Clovis occupation that exhibits a slow rise in population. This event may represent the initial colonization of the southeast region and may represent the basis of later Clovis occupation or a failed migration (Meeks and Anderson 2012:129). Population Event 2 represents an apparent 600 year gap between Events 1 and 3. Population Event 3 (circa 13,200–12,800 cal. B.P.) occurred just prior to, and extended into, the Younger Dryas event. This event represents the "first unequivocal evidence for widespread human occupation across the southeastern United States" (Meeks and Anderson 2012:129). Event 3 coincided with the Clovis occupation in the region. A marked decline in the population is posited for Population Event 4 (12,800–11,900 cal. B.P.). This equates with the early to middle Younger Dryas and relates to a post-Clovis occupation of the region. Meeks and Anderson (2012:129) see a fragmentation of the regional Clovis culture at this time along with "the development of geographically circumscribed subregional, cultural traditions in the

southeastern United States." A marked increase in population density is posited between 11,900 and 11,200 cal. B.P. This coincides with the late portion of the Younger Dryas and the early portion of the Holocene. Population Event 5 is represented by this time frame. Early Side Notched and Dalton are seen during this time.

During the Early Holocene, rapid increases in boreal plant species occurred on the Allegheny Plateau in response to the retreat of the Laurentide ice sheet from the continental United States (Maxwell and Davis 1972:517–519; Whitehead 1973:624). At lower elevations, deciduous species were returning after having migrated to southern Mississippi Valley refugia during the Wisconsinan advances (Delcourt and Delcourt 1981:147). The climate during the Early Holocene was still considerably cooler than the modern climate, and based on species extant at that time in upper altitude zones of the Allegheny Plateau, conditions would have been similar to the Canadian boreal forest region of today (Maxwell and Davis 1972:515–516). Conditions at lower elevations were less severe and favored the transition from boreal to mixed mesophytic species. At Cheek Bend Cave in the Nashville Basin, an assemblage of small animals from the Late Pleistocene confirms the environmental changes that took place during the Pleistocene to Holocene transition and the resulting extinction of Pleistocene megafauna and establishment of modern fauna in this area (Klippel and Parmalee 1982).

Traditionally, Middle Holocene (circa 8000–5000 B.P., also referred to as the Hypsithermal) climate conditions were thought to be consistently dryer and warmer than the present (Delcourt 1979:271; Klippel and Parmalee 1982; Wright 1968). The influx of westerly winds contributed to periods of severe moisture stress in the Prairie Peninsula and to an eastward advance of prairie vegetation (Wright 1968). More recent research (Anderson 2001; Shane et al. 2001:32–33) suggests that the Middle Holocene was marked by considerable local climatic variability. Paleoclimatic data indicate that the period was marked by more pronounced seasonality characterized by warmer summers and cooler winters.

The earliest distinguishable Late Holocene climatic episode began circa 5000 B.P. and ended around 2800 B.P. This Sub-Boreal episode is associated with the establishment of essentially modern deciduous forest communities in the southern highlands and increased precipitation across most of the mid-continental United States (Delcourt 1979:271; Maxwell and Davis 1972:517–519; Shane et al. 2001; Warren and O'Brien 1982:73). Changes in local and extra-local forests after approximately 4800 B.P. may also have been the result of anthropogenic influences. Fredlund (1989:23) reports that the Gallipolis pollen record showed increasing local disturbance of the vegetation from circa 4800 B.P. to the present, a disturbance that may have been associated with the development and expansion of horticultural activity. Based on a study of pollen and wood charcoal from the Cliff Palace Pond in Jackson County, Kentucky, Delcourt and Delcourt (1997:35–36) recorded the replacement of a red cedar–dominated forest with a forest dominated by fire-tolerant taxa (oaks and chestnuts) around 3000 B.P. The change is associated with increased local wildfires (both natural and culturally augmented) and coincided with increases in cultural utilization of upland (mountain) forests.

Beginning around 2800 B.P., generally warm conditions, probably similar to those of the twentieth century, prevailed during the Sub-Atlantic and Post–Sub-Atlantic climatic episodes, with the exception of the Neo-Boreal sub-episode, or Little Ice Age (circa 700–100 B.P.), which was coldest from circa 400 until its end. Despite the prevailing trend, brief temperature and moisture variations occurred during this period. Some of these fluctuations have been associated with adaptive shifts in Midwestern prehistoric subsistence and settlement systems (Baerreis et al. 1976; Griffin 1961; Struever and Vickery 1973; Warren and O'Brien 1982).

Studies of historic weather patterns and tree-ring data by Fritts et al. (1979) indicate that twentieth-century climatological averages were "unusually mild" when compared to seventeenth- to nineteenth-century trends (the time period used for comparison represents the coldest period of the Neo-Boreal [400–100 B.P.], or the Little Ice

Age) (Fritts et al. 1979:18). The study suggested that winters were generally colder, weather anomalies were more common, and unusually severe winters were more frequent between A.D. 1602 and A.D. 1900 than after A.D. 1900. The effects of the Neo-Boreal sub-episode, which ended during the mid- to late nineteenth century, have not been studied in detail for this region. It appears that the area experienced smaller temperature decreases during the late Neo-Boreal than did the upper Midwest and northern Plains (Fritts et al. 1979), so it follows that related changes in extant vegetation would be more difficult to detect.

Modern Climate

The modern climate of Kentucky is moderate in character and temperature, and precipitation levels fluctuate widely. The prevailing winds are westerly, and most storms cross the state in a west to east pattern. Low pressure storms that originate in the Gulf of Mexico and move in a northeasterly direction across Kentucky contribute the majority of the precipitation received by the state. Warm, moist, tropical air masses from the Gulf predominate during the summer months and contribute to the high humidity levels experienced throughout the state. As storms move through the state, occasional hot and cold periods of short duration may be experienced. During the spring and fall, storm systems tend to be less severe and less frequent, resulting in less radical extremes in temperature and rainfall (Anderson 1975).

Description of the Project Area

The project area is in downtown Bowling Green, Kentucky (see Figures 2 and 3). It is located at the intersection of East Fourth Avenue with Center Street and College Street. It consists of a 35-x-130 m (114-x-427 ft) urban lawn, approximately .4 ha (1.0 acre) (Figure 6). The flat lawn is at an approximate elevation of 153 m (502 ft) above mean seas level (AMSL). The Barren River is 500 m (1,640 ft) to the northeast.

Figure 6. Project area overview, facing southeast.

The manicured lawn provides no ground surface visibility. Various young deciduous and coniferous trees are scattered throughout the lawn, mostly along the east and south edges. At the north end of the lawn, along Center Street, is a concrete parking area. At the center of the lawn the ground has been scooped out to create a drainage pond. Two concrete culverts and a metal grate are located in this drainage pond (Figure 7). The south half of the lawn, toward College Street, has been graded down, and a buried utility line runs along the west edge of East Fourth Avenue. The area has been heavily disturbed by construction, demolition, grading, and fill activities.

Chert resources for the region have been previously discussed. For a more detailed analysis of chert resources see the Lithic Analysis section of this report.

One soil complex has been defined in the project area (Crider-Urban Land complex). The soil series are classified by the amount of time it has taken them to form and the landscape position they are found on (Birkeland 1984; Soil Survey Staff 1999). This information can provide a relative age of the soils and can express the potential for buried archaeological deposits within them (Stafford 2004). The soil order and group classifications for each soil series are used to assist with determining this potential.

The Crider-Urban Land complex is an indistinguishable mix of the Crider soil series and Urban soils. The Crider series consists of very deep, well drained soils that formed in a loess mantle and the underlying residuum from limestone. They are found on nearly level to moderately steep uplands. A typical Crider profile shows an Ap horizon of brown (10YR 4/3) silt loam extending to 20 cm (8 in) below ground surface (bgs). Below that is a Bt1 horizon of brown (7.5YR 4/4) silt loam extending to 30 cm (12 in) bgs. Below that is a Bt2 horizon of brown (7.5YR 4/4) silt loam with common distinct brown (7.5YR 4/3) clay films on faces of peds and common black (7.5YR 2.5/1) manganese concretions extending to 61 cm (24 in) bgs (Soil Survey Staff 2017). The Crider series is classified as an Alfisol, which only has archaeological deposits on or near the ground surface (Soil Survey Staff 1999). Urban soils are found in watersheds that provide drinking water, food, waste utilization, and natural resources to

Figure 7. Center of drainage area, facing north.

communities. Urban soils also are located within cities in park areas, recreation areas, community gardens, green belts, lawns, septic absorption fields, sediment basins and other uses (Soil Survey Staff 2017).

Shovel tests excavated during the survey showed heavy disturbance. A detailed description of the soils found in the shovel tests and bucket augers can be found in the Depositional Context part of the Site Description in Section 6.

III. PREVIOUS RESEARCH AND CULTURAL OVERVIEW

Prior to initiating fieldwork, a search of records maintained by the NRHP (available online at: http://nrhp.focus.nps.gov/natreghome.do?searchtype=natreghome) and the OSA (FY18_9325) was conducted to: 1) determine if the project area had been previously surveyed for archaeological resources; 2) identify any previously recorded archaeological sites that were situated within the project area; 3) provide information concerning what archaeological resources could be expected within the project area; and 4) provide a context for any archaeological resources recovered within the project area. A search of the NRHP records indicated that 50 cultural resource sites listed on the NRHP were situated within a 2.0 km (1.2 mi) radius of the project area. These sites, none of which are located inside the current project area, are listed in Table 1. The OSA file search was conducted between August 8 and 16, 2017. The work at OSA consisted of a review of professional survey reports and records of archaeological sites for an area encompassing a 2 km radius of the project footprint. To further characterize the archaeological resources in the general area, the OSA archaeological site database for the county was reviewed and synthesized. The review of professional survey reports and archaeological site data in the county provided basic information on the types of archaeological resources that were likely to occur within the project area and the landforms that were most likely to contain these resources. The results are discussed below.

Previous Archaeological Surveys

Heather D. Barras

OSA records revealed that 16 previous professional archaeological surveys and 2 archaeological site investigations have been conducted within a 2 km radius of the project area. Twenty archaeological sites have been recorded in this area also.

The records search revealed that 1 of the 20 sites in the file search area (15Wa30) is a historic farm/residence. One site (15Wa120) is a historic urban residence and one site (15Wa116) represented a historic urban residential block. One site (15Wa961) was a historic dump. One site (15Wa158) was a historic military fort. Seven of the sites (15Wa15, 15Wa29, 15Wa41, 15Wa42, 15Wa302, 15Wa315, and 15Wa945) were prehistoric open habitations without mounds. Four of the sites (15Wa118, 15Wa119, 15Wa166, and 15Wa177) were multicomponent sites with historic and prehistoric occupations. The remaining sites did not have an associated report or a site form on file in the OSA records (15Wa327, 15Wa644, 15Wa942, and 15Wa965). The OSA GIS data only revealed that these sites had indeterminate prehistoric occupations. The 2 km radius included areas within the Bowling Green North and Bowling Green South quadrangles (USGS 1993a and 1993b).

Between September 1974 and April 1976, WKU personnel conducted an archaeological survey for the proposed relocation of U.S. 31W and US 68 in Warren County, Kentucky (Schock and Foster 1976). The survey was conducted at the request of the Department of Transportation, Commonwealth of Kentucky. The proposed relocation consisted of three alternates and measured approximately 4.0 km (2.5 mi) in length with an average right-of-way width of 76 m (250 ft). Field methods consisted of interviews with local residents, pedestrian survey, and limited test unit excavation. Three previously recorded sites (15Wa15, 15Wa302, and 15Wa315) and three previously unrecorded sites (15Wa945, 15Wa961, and Baker Hill) were within 2 km of the project area. If Baker Hill was assigned a state site number, it was not mentioned in the report.

Table 1. Summary of NRHP Sites within 2 km.

Name	Type	Periods of Significance	Date Listed
Adams-Kentucky District	District	1850-1974	2008
Barren River L & N Railroad Bridge	Structure	1900-1924	1980
Cecelia Memorial Christian Church	Building	1825-1849	1979
Charles M. Moore Insurance Company	No information available	Unknown	2015
Cherry Hall	Building	1925-1949	1979
College Hill District	District	1825-1924	1979
College Street Bridge	Structure	1900-1924	1980
Confederate Monument of Bowling Green	Object	1875-1949	1997
Downtown Commercial District	District	1825-1924	1979
Edward B. Seeley House	Building	1850-1874	1979
Elouise B. Houchens Center for Women	Building	1900-1924	1979
First Colored Baptist Church	Building	1875-1924	1979
Fort C.F. Smith	Structure	1850-1874	1984
Fort Lytle	Structure	1850-1874	1984
Fort Webb	Structure	1850-1874	1984
Gordon Wilson House	Building	1925-1949	1979
Grider House	Building	1850-1874	1979
Hall House	Building	1800-1824	1979
Health Buildings-Gymnasium	Building	1925-1949	1979
Hines House	Building	1825-1849	1979
Home Economics Building	Building	1925-1949	1979
Industrial Arts Building	Building	1925-1949	1979
J.C. Givens House	Building	1925-1949	2015
J.D. Dodson House	Building	1925-1949	2017
Kentucky Building	Building	1925-1949	1979
L.K. Causey House	Building	1925-1949	2015
Louisville and Nashville Railroad Station	Building	1900-1924	1979
Magnolia Street Historic District	District	1900-1924	1989
Maria Moore House	Building	1800-1824	1972
Milliken Building	Building	1950-1974	2010
Modern Automotive District	District	1925-1949	2006
Newton-Kemp Houses	Building	1800-1849	1979
Nine Hearths	Building	1875-1924	1979
Perry Snell Hall	Building	1900-1924	1979
President's Home	Building	1925-1949	1979
Rauscher house	Building	1875-1899	1978
Saint James Apartments	Building	1900-1924	1984
Saint Joseph's District	District	1850-1924	1980
Saint Jospeh's Roman Catholic Church	Building	1850-1899	1975
Shake Rag Historic District	District	1850-1974	2000
Stadium	Building	1925-1949	1979
Standard Oil Company Filing Station	Building	1900-1974	2010
Tobias Grider House	Building	1850-1874	1979
Underwood-Jones House	Building	1875-1899	1978
Upper East Main Street District	District	1850-1924	1979
Van Meter Hall	Building	1900-1924	1979
Warren County Courthouse	Building	1850-1874	1977
W.H. Blakeley House	Building	1850-1874	1979
W.H. Everhardt House	Building	1875-1899	1979
William F. Perry Monument	Object	1900-1949	1997

Sites 15Wa15, 15Wa302, and 15Wa315 were originally recorded by WKU and were on the north side of the L&N railroad tracks in their project area. The sites were not to be affected by the proposed relocation project. Sites 15Wa15 and 15Wa302 were Late Archaic/Early Woodland open habitations without mounds. Site 15Wa315 was a prehistoric open habitation without mounds of indeterminate temporal affiliation consisting of four areas. Area D of this site was within their project area and test units recovered nondiagnostic lithic artifacts along with a scatter of historic artifacts. The historic artifacts were not given a date range, and no mention of a historic structure was included (Schock and Foster 1976).

Site 15Wa945 consisted of two areas (A and B). Based on two observed Adena points within the location of Area A, an Early Woodland occupation was noted. An Early Woodland Adena point was also recovered from Area B. Avoidance or further archaeological investigation was recommended for Site 15Wa945. Site 15Wa961 was the location of a historic dump. Testing revealed that the dump dated to the twentieth century. The site was considered ineligible for NRHP inclusion, and no further work was recommended. Baker Hill (no site number given) was one of nine hills fortified by the Confederate States of America during 1861 in an attempt to make Bowling Green a strong Confederate defense center. During 1862, after Confederate forces left Bowling Green, Union troops under the command of General Ormsley Mitchell bombarded Bowling Green from Baker Hill. The residence on Baker Hill was used as a hospital by the United States from 1862 to the end of the war. Schock and Foster (1976) recommended that Baker Hill be nominated to the NRHP.

In 1977, Jack M. Schock of WKU conducted an archaeological survey of street improvements and realignments in Bowling Green, Warren County, Kentucky (Schock 1977). At the request of Danny Whittle of the City of Bowling Green, Department of Community Development, an area of unspecified size was investigated by pedestrian survey. No archaeological sites were documented. Monitoring for potentially important historic dumps, cisterns, or other features, was recommended for the East-West Corridor L&N Railroad Underpass during initial construction and to a lesser extent during building removal.

On December 5 and 12, 1982, Janzen, Inc., personnel conducted an archaeological survey of a proposed borrow site in Bowling Green, Warren County, Kentucky (Janzen 1982). The survey was conducted at the request of Scotty's Construction, Inc., on behalf of the American National Bank of Bowling Green. Field methods consisted of pedestrian survey and surface inspection of 2.5 m (8.2 ft) wide areas scraped by a bulldozer. The proposed borrow area was located on the same property as the Baker residence, which was listed on the NRHP. However, the structure was completely destroyed by fire in the summer of 1982. The area had also been disturbed by previous construction and borrow activities. Project clearance was recommended.

In September 1983, UK's Program for Cultural Resource Assessment conducted an archaeological survey of proposed water lines in Allen, Simpson, and Warren Counties, Kentucky (O'Malley 1983). At the request of the Barren River Area Development District, 40 km (25 mi) were investigated with a pedestrian survey supplemented with shovel testing. Eighteen sites (15Wa34–15Wa48, 15Wa386, 15Al21, and 15Si10) were documented during the survey, two of those sites (15Wa41 and 15Wa42) were located within 2 km of the current project area.

Sites 15Wa41 and 15Wa42 were both prehistoric open habitations without mounds of indeterminate temporal affiliation. Neither site was considered eligible for NRHP inclusion. No further work was recommended (O'Malley 1983).

Arrow Enterprises, Inc., personnel conducted an archaeological survey intermittently from December 1984 through June 1986 of the proposed Bowling Green Bypass in Warren County, Kentucky (Schock 1986). Approximately 8.5 km (5.3 mi), with an average corridor width of 64 m (210 ft), was investigated by pedestrian survey supplemented with shovel testing. Six archaeological sites were documented during the survey (15Wa49–15Wa54). None of the sites documented were located within 2 km of the current project area.

Between August 29 and 31, 1993, Cultural Horizons, Inc., personnel conducted an archaeological survey of the proposed realignment of KY 234 (Cemetery Road) in Warren County, Kentucky (Stallings and Ross-Stallings 1994). At the request of American Engineers, 3.2 km (2.0 mi) of proposed highway corridor was investigated by pedestrian survey supplemented with shovel testing. Two archaeological sites (15Wa75 and 15Wa76) were documented during the survey. Neither site was located within 2 km of the current project area.

On April 29, 1994, Archaeology Resources Consultant Services, Inc., personnel completed an archaeological survey of the proposed Girl's Club in Bowling Green, Warren County, Kentucky (Evans 1994). The survey was conducted at the request of Gene Becker of the Barren River Area Development District and consisted of .8 ha (2.0 acres). Field methods consisted of pedestrian survey supplemented with shovel testing. No archaeological sites were encountered, and no further work was recommended.

On July 28 and 29, 1997, Arrow Enterprises personnel conducted an archaeological survey for a proposed Durbin Subdivision in Bowling Green, Warren County, Kentucky (Schock 1997). Approximately 6.9 ha (17.0 acres) were investigated at the request of E. Kenneth Duncan. Field methods consisted of shovel testing. No archaeological sites were identified, and project clearance was recommended.

From June 2 to 4, 2003, ASC Group, Inc., personnel conducted an archaeological survey of the proposed bypass extension from KY 185 to the Seventh Avenue and College Street intersection in Warren County, Kentucky (Striker 2004). The survey was conducted at the request of T.H.E. Engineers, Inc., on behalf of the Kentucky Transportation Cabinet (KYTC) (Item No. 3-310.00). Due to denial of permission by landowners, only 1.88 ha (4.65 acres) of the total 2.22 ha (5.48 acres) were investigated by pedestrian survey and screened shovel testing. Two archaeological sites (15Wa116 and 15Wa117) and one non-site locality were documented. Site 15Wa116 was located within the 2 km radius of the current project area.

Site 15Wa116 was a historic, predominantly African-American, residential block consisting of a barber shop, a three-car wood-frame garage, five sheds, a scrap metal recycling facility that was formerly a Coca-Cola bottling plant, and a church that was originally an African-American Baptist Church. The site dates from the late nineteenth to the late twentieth centuries. Twenty-two extant dwellings were also part of the historic residential block. Only two parcels within Site 15Wa116 were permitted access. Avoidance or phase II investigations were recommended. Additional phase I survey on areas denied access was also recommended (Striker 2004).

In February and March of 2004, Arrow Enterprises personnel conducted an archaeological survey of approximately 19 ha (47 acres) for a proposed housing project in Bowling Green, Warren County, Kentucky (Schock 2004). The survey was conducted at the request of Dale Eichelberger of the Housing Authority of Bowling Green. Field methods consisted of pedestrian survey, screened shovel testing, and metal detection. Two previously undocumented archaeological sites were identified (15Wa118 and 15Wa119). Both sites are located within 2 km of the current project area.

Site 15Wa118 was a multicomponent twentieth-century historic artifact scatter and prehistoric artifact scatter with an Early Woodland affiliation. Both components were thought to be redeposited from another location. Site 15Wa119 was a multicomponent site, as well. The historic component was sparse and may have dated from the nineteenth or twentieth centuries. The prehistoric component was also ephemeral with an indeterminate temporal affiliation. Neither site was considered eligible for NRHP inclusion; no further work was recommended (Schock 2004).

In July and August of 2004, Darlene Applegate conducted an archaeological survey for a proposed health care facility in Bowling Green, Warren County, Kentucky (Applegate 2004a). At the request of the Bowling Green-Warren County Primary Care Center, .50 ha (1.24 acres) were investigated by pedestrian survey and screened shovel testing. One previously

undocumented site (15Wa120) was identified. This site is within 2 km of the current project area.

Site 15Wa120 was a historic urban habitation site dating from the late nineteenth to the mid-twentieth centuries with an indeterminate prehistoric isolated find. Approximately 75 percent of the site was disturbed and the site was determined to be ineligible for NRHP inclusion. No further work was recommended (Applegate 2004a).

On November 13, 2004, Darlene Applegate completed an archaeological survey of .49 ha (1.08 acres) for a proposed bank branch in Warren County, Kentucky (Applegate 2004b). The survey was conducted at the request of DDS Engineering, PLLC, on behalf of Citizens First Bank. Field methods consisted of pedestrian survey supplemented by screened shovel testing. No archaeological sites were encountered, and project clearance was recommended.

On February 14, 2006, CRA personnel completed an archaeological survey of a proposed water-sewer corridor to connect two segments of a new water-sewer line installation east of Bowling Green in Warren County, Kentucky (Haney 2006). The survey was requested by Third Rock Consultants, LLC, on behalf of the Environmental Protection Agency (Kentucky Division of Water) and the United States Army Corps of Engineers. The project area consisted of a corridor approximately 2.7 km (1.7 mi) in length and 12 m (40 ft) in width. Field methods consisted of an intensive pedestrian survey supplemented with screened shovel testing. Although one historic non-site locality was noted, no archaeological sites were recorded. No further work was recommended.

On May 9, 2006, CRA personnel completed an archaeological survey of the proposed WCDS 1450-AM radio transmission tower site in Warren County, Kentucky (Arnold 2006). Approximately 1.13 ha (2.81 acres) were subjected to pedestrian survey supplemented with screened shovel testing at the request of Charles M. Anderson of Charles M. Anderson Associates. No archaeological sites were encountered, and project clearance was recommended.

During June and September of 2004, Kentucky Archaeology Survey personnel conducted archaeological investigations at the Center Street Site (15Wa116) and the 306 Seventh Street Site (15Wa117) due to the proposed construction of a bypass extension from KY 185 to the intersection of Seventh Avenue and College Street in Bowling Green, Warren County, Kentucky (Stottman and Stahlgren 2006). A total of 2.34 ha (5.78 acres) were investigated via backhoe trenches and test unit excavation at the request of the KYTC (Item No. 3-310.00). Site 15Wa116 was within 2 km of the current project area.

At Site 15Wa116, intact archaeological resources dating from the mid-nineteenth to the late twentieth centuries were documented. The historic features identified at Site 15Wa116 included privies, trash pits, postholes, pit cellars, a builder's trench, a robber's trench, brick walkways, and a foundation. Intact stratigraphic zones were also documented, including occupation layers and demolition middens and fills (Stottman and Stahlgren 2006).

Between May 2006 and March 2007, John Milner Associates, Inc., personnel conducted phase Ia and Ib archaeological surveys for the proposed renovation and expansion of Van Meter Hall at WKU in Bowling Green, Warren County, Kentucky (Stevens 2007). Van Meter Hall was constructed in 1910 on the location of Fort Lytle, which was originally constructed as an earthen embankment by Confederate troops in 1861. Confederate troops abandoned Bowling Green in 1862 and the fort was completed by Union soldiers. Van Meter Hall/Fort Lytle is within 2 km of the current project area. The fort consisted of five sides with massive interior cut-stone walls surrounded by thick, steeply-sloped ramparts of earth fill, rock, and natural bedrock (Stevens 2007). The construction of Van Meter Hall destroyed some of the interior stone walls and ramparts. Phase Ia investigations consisted of pedestrian survey and limited placement of split-spoon and tile probes. Phase Ib investigations included five 1-x-2 m test unit excavations. Based on the investigations, Fort Lytle was assigned state archaeological site number 15Wa158. Construction activities, as proposed, were deemed to cause no effect to the site and

expansion of Van Meter Hall to the east or west would have no impact because deposits or features in those areas have been completely destroyed.

On July 8, 2011, TRC Environmental Corporation personnel conducted an archaeological survey of a proposed Bowling Green Fossil Plant in Bowling Green, Warren County, Kentucky for the Tennessee Valley Authority (Hockersmith et al. 2011). The survey area totaled 1.6 ha (4.1 acres) and was investigated by pedestrian survey supplemented with screened shovel testing. No archaeological sites were encountered, and project clearance was recommended.

On November 2, 2011, Corn Island Archaeology, LLC, personnel conducted an archaeological survey for the proposed future development of three vacant lots in Bowling Green, Warren County, Kentucky (Wetzel and Schatz 2011). At the request of Brent Childers of the City of Bowling Green, the removal of the topsoil at lots 602, 625, and 627 Center Street were monitored. No archaeological features or sites were identified, and project clearance was recommended.

Sites 15Wa29, 15Wa30, 15Wa166, 15Wa177, 15Wa327, 15Wa644, 15Wa942, and 15Wa965 did not have associated reports. With the exception of Sites 15Wa327, 15Wa644, 15Wa942, and 15Wa965, information regarding these sites were pulled from OSA site forms on file (Table 2).

Archaeological Site Data

According to available data, 415 archaeological sites have been recorded in Warren County (Table 3). The site data indicate that the majority of archaeological sites recorded in Warren County consist of either open habitations without mounds (n = 181; 43.61 percent) or undetermined (n = 140; 33.73 percent). Other site types in the county include rockshelters (n = 36; 8.67 percent), historic farms/residences (n = 24; 5.78 percent), caves (n = 10; 2.41 percent), open habitations with mounds (n = 6; 1.45 percent), cemeteries (n = 4; .96 percent), other (n = 4; .96 percent), industrial (n = 2; .48 percent), isolated finds (n = 2; .48 percent), mound complexes (n = 2; .48 percent), quarries (n = 2; .48 percent), military (n = 1; .24 percent), and a workshop (n = 1; .24 percent).

These sites are found on a variety of landform types, including undissected uplands (n = 146; 35.18 percent), dissected uplands (n = 104; 25.06 percent), hillsides (n = 54; 13.01 percent), terraces (n = 40; 9.64 percent), floodplains (n = 34; 8.19 percent), unspecified (n = 29; 6.99 percent), and other (n = 8; 1.93 percent). These sites cover a variety of time periods, including Indeterminate Prehistoric (n = 315; 57.8 percent), Archaic (n = 62; 11.38 percent), Historic (n = 55; 10.09 percent), Woodland (n = 48; 8.81 percent), Late Prehistoric (n = 38; 6.97 percent), Paleoindian (n = 15; 2.75 percent), and unspecified (n = 12; 2.2 percent).

Map Data

In addition to the file search, a review of available maps was initiated to help identify potential historic properties (structures) or historic archaeological site locations within the proposed project area. The following maps were reviewed:

1877 Map of Warren County, Kentucky (Beers and Lanagan);

1891 Map of Warren County, Kentucky (McAdoo);

1901 Insurance Maps of Bowling Green, Warren County, Kentucky (Sanborn);

1909 Insurance Maps of Bowling Green, Warren County, Kentucky (Sanborn);

1914 Insurance Maps of Bowling Green, Warren County, Kentucky (Sanborn);

1921 Bowling Green, Kentucky, 15-minute series topographic quadrangle (USGS);

1923 Bowling Green, Kentucky, 15-minute series topographic quadrangle (USGS);

1925 Insurance Maps of Bowling Green, Warren County, Kentucky (Sanborn);

1928 Oil and Gas map of Warren County, Kentucky (Eyl);

1932 Insurance Maps of Bowling Green, Warren County, Kentucky (Sanborn);

1937 Highway and Transportation Map of Warren County, Kentucky (Kentucky Department of Highways [KDOH]);

1948 Insurance Maps of Bowling Green, Warren County, Kentucky (Sanborn);

1949 General Highway Map of Warren County, Kentucky (Kentucky State Highway Department);

1954 Bowling Green South, Kentucky, 7.5-minute series topographic quadrangle (USGS); and

1955 General Highway Map of Warren County, Kentucky (KDOH).

As the project area was inside the city limits of Bowling Green, many of the historic maps only showed an urban setting with no specific structures depicted. The most detailed and useful maps for the project area were the Sanborn Insurance Maps (Sanborn 1901, 1909, 1914, 1925, 1932, and 1948).

The earliest Sanborn map to show the project area is 1901. This map shows only the south part of the project area along College Street, but it does depict two structures (Map Structure [MS] 1 and 2) (Figure 8). MS 1 is located at 339 College Street. It is a two-story dwelling with one-story sections and two porches. MS 2 is located at 335 College Street. An alley separates the two properties. MS 2 is a one-story dwelling with two porches. The 1909 Sanborn map shows the same structures as the 1901 Sanborn (Sanborn 1901, 1909).

The 1914 Sanborn map depicts the entire project area, showing MS 1 and MS 3−10 located within it (Figure 9). MS 1 is still present, though it is now a two room dwelling with one porch instead of a three room dwelling with two porches, and the address is now 347 College Street. MS 2 has been replaced by MS 3, a one-story dwelling with one porch at 339/341 College Street. The alley between MS 1 and MS 3 is no longer present. There are two outbuildings associated with MS 3. The smaller of the two outbuildings, MS 4, is right next to MS 3. The other outbuilding, MS 5, is a two-story stable, partially within the project area, located at the back of the property along the alley that runs northeast to southwest from Third Street to Fourth Street. On the other side of the alley is MS 6, a one-story dwelling with one porch at 319 Fourth Street. On the same property as MS 6 is MS 7, a one-story dwelling at 317 Fourth Street. The next property over contains MS 8, a one-story dwelling at 316 Fourth Street. At the corner of Fourth Street and Center Street is MS 9, a one-story dwelling with one porch at 348 Center Street. Another alley runs along the back of the properties containing MS 6−9. On the other side of the alley, at 338 Center Street, is MS 10, a one-story dwelling with two porches partially within the project area. The 1925 Sanborn map shows the same structures as the 1914 Sanborn map (Sanborn 1914, 1925).

The 1932 Sanborn depicts the same area with a few changes (Figure 10). MS 1, 3, 4, 7, and 9 have not changed. MS 5, once a stable, is now an automobile garage. MS 6 and 10, while not expanding in size, have added additional rooms. MS 8 now has a porch. The only new building is MS 11, a one-story automobile garage at the back of the MS 1 property at the intersection of the alley (labeled as Minden PL.) and Fourth Street (Sanborn 1932).

The 1948 Sanborn depicts the major changes that have occurred in the project area since the 1932 map (Figure 11). MS 1 has been replaced with MS 12, a large one-story produce warehouse with a store/shop along College Street. MS 11 is no longer present. While MS 3 and 4 are unchanged, they are part of the property to the east, once a dwelling and now the Brown Ice Cream Milk Company. MS 5 has been replaced with MS 13, a large, one-story private garage. MS 14, a large, one-story raw material warehouse, is located between MS 4 and 13. Both MS 6 and 7 have added an additional room to the dwelling and two additional structures are now on the same property. MS 15 is a one-story dwelling with a porch behind MS 7, along the alley. The address associated with it is 316 Fourth Street. MS 16 is also a one-story dwelling with a porch behind MS 6, along the alley. The address associated with it is 318 Fourth Street. Two additional dwellings, MS 17 and 18, have been added to the sides of MS 8. Both are one-story with two porches. The addresses associated with the dwellings are 310 and 314

Table 2. Previously Recorded Sites without Reports.

Site	Site Name	Site Type	Cultural Affiliation	Surveyed by	Survey company	Date of survey	Investigation Type	NRHP Status	Note
15Wa29	-	Open habitation without mounds	Archaic, undefined	Not specified	Not specified	February 26, 1969	Not specified	Not specified	-
15Wa30	Mariah Moore House	Historic farm/residence	Indeterminate historic	Jason M. Fenwick	KHC	January 18, 1979	Not specified	Listed (June 20, 1972)	-
15Wa166	-	Open habitation without mounds Indeterminate historic	Indeterminate prehistoric 1900-2000	Glenn Perry Herrell, Marlon Obando, Carl Kirk, Leon Hostetler	Corn Island Archaeology, LLC	October 25-29, 2009	Reconnaissance	Inventory site	-
15Wa177	-	Open habitation without mounds Historic farm/residence	Indeterminate prehistoric 1801-1950	Chad A. Knopf, Bridget A. Mohr, Savannah L. Darr	AMEC Earth & Environmental	Not specified	Intensive	Inventory site	-
15Wa327	-	Undetermined	Indeterminate prehistoric	-	-	-	-	-	Missing from OSA site files
15Wa644	-	Undetermined	Indeterminate prehistoric	-	-	-	-	-	Missing from OSA site files
15Wa942	-	Undetermined	Indeterminate prehistoric	-	-	-	-	-	Missing from OSA site files
15Wa965	-	Undetermined	Indeterminate prehistoric	-	-	-	-	-	Missing from OSA site files

Table 3. Summary of Selected Information for Previously Recorded Archaeological Sites in Warren County, Kentucky. Data Obtained from OSA and May Contain Coding Errors.

Site Type:	N	%
Cave	10	2.41
Cemetery	4	0.96
Historic Farm/Residence	24	5.78
Industrial	2	0.48
Isolated Find	2	0.48
Military	1	0.24
Mound Complex	2	0.48
Open Habitation with Mounds	6	1.45
Open Habitation without Mounds	181	43.61
Other	4	0.96
Quarry	2	0.48
Rockshelter	36	8.67
Undetermined	140	33.73
Workshop	1	0.24
Total	415	100
Time Periods Represented	N	%
Paleoindian	15	2.75
Archaic	62	11.38
Woodland	48	8.81
Late Prehistoric	38	6.97
Indeterminate Prehistoric	315	57.8
Historic	55	10.09
Unspecified	12	2.2
Total	545*	100
Landform	N	%
Dissected Uplands	104	25.06
Floodplain	34	8.19
Hillside	54	13.01
Other	8	1.93
Terrace	40	9.64
Undissected Uplands	146	35.18
Unspecified	29	6.99
Total	415	100

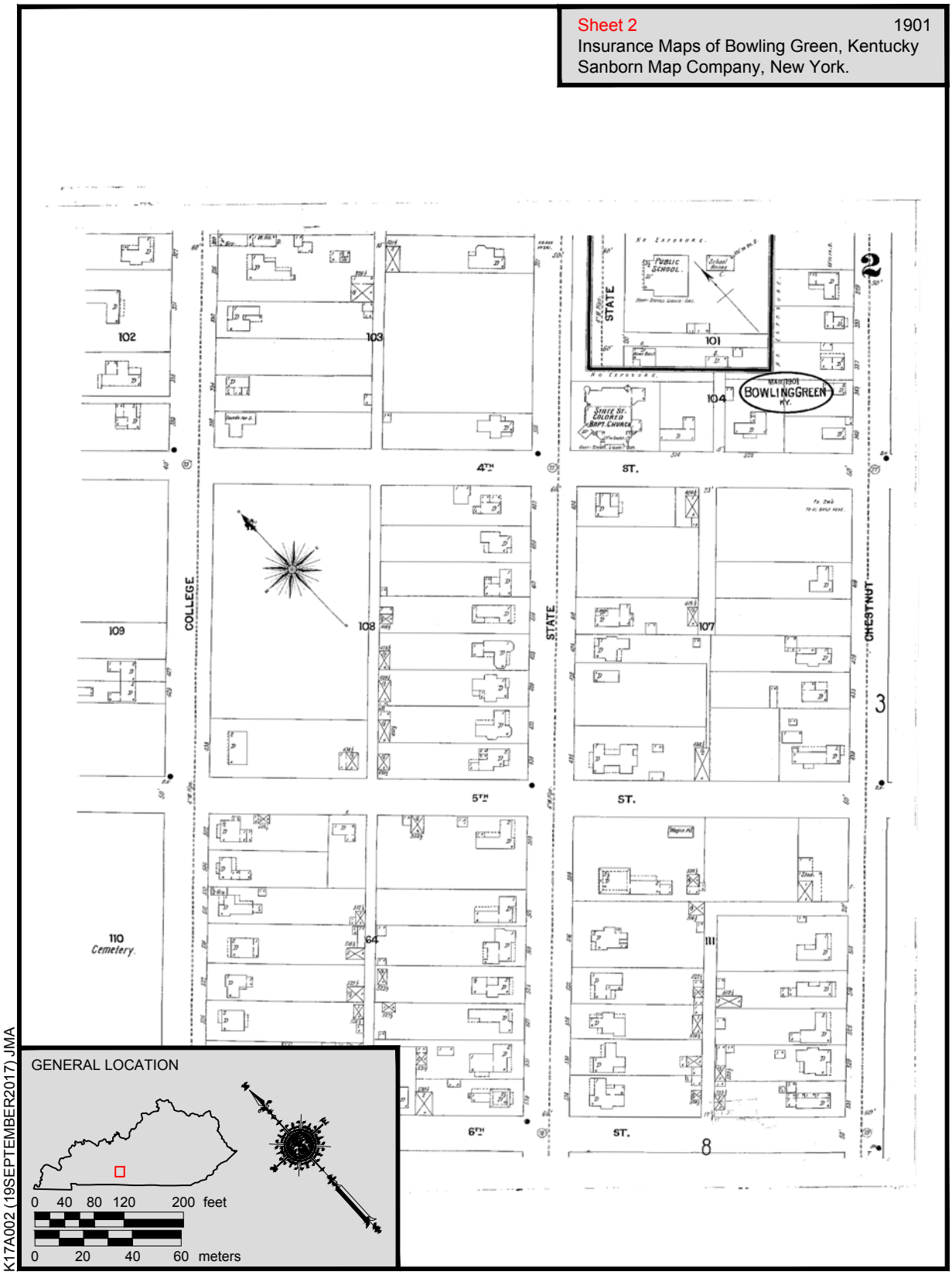

Figure 8. 1901 Sanborn Map showing MS 1 and 2.

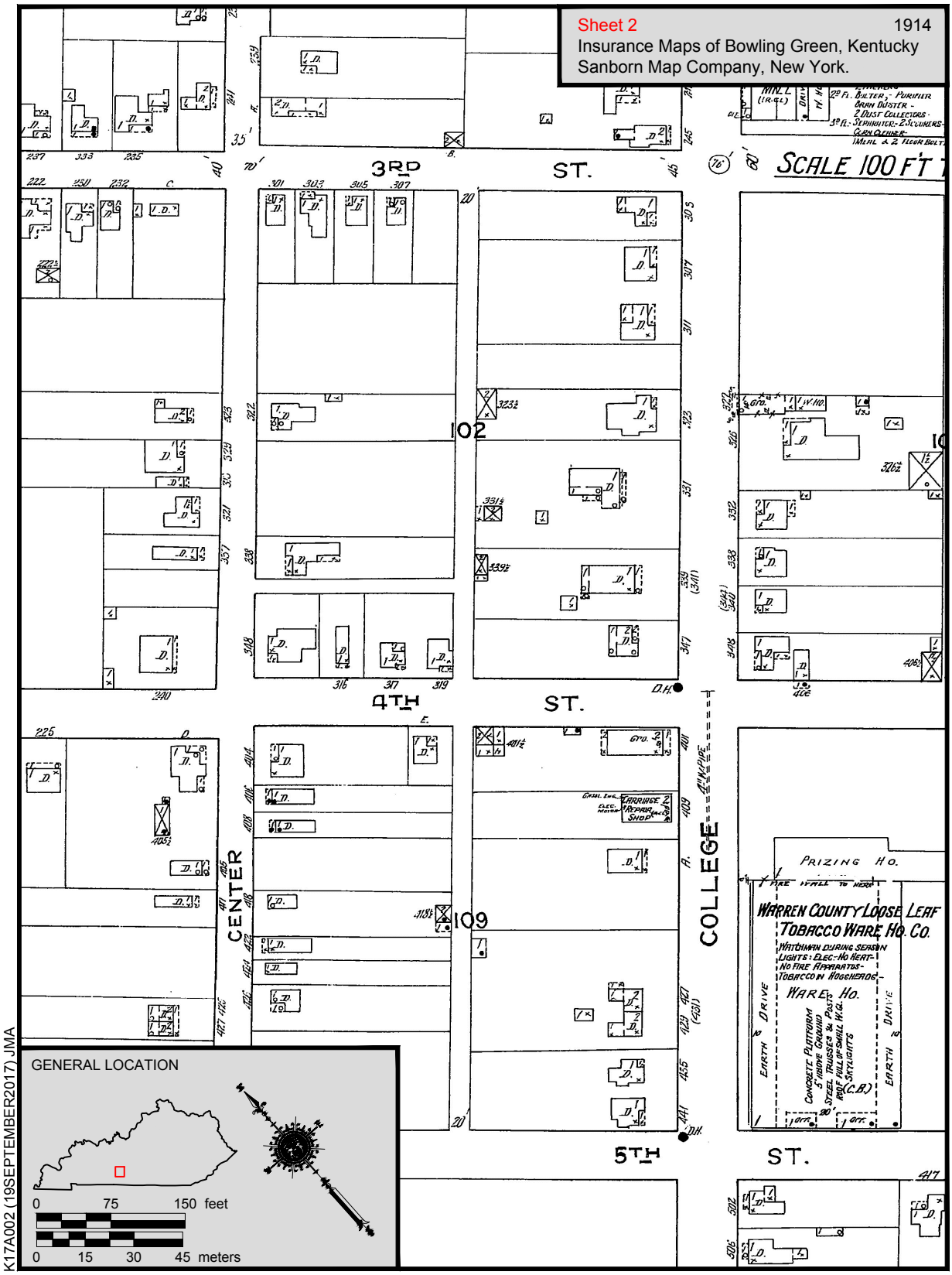

Figure 9. 1914 Sanborn Map showing MS 1, 3–10.

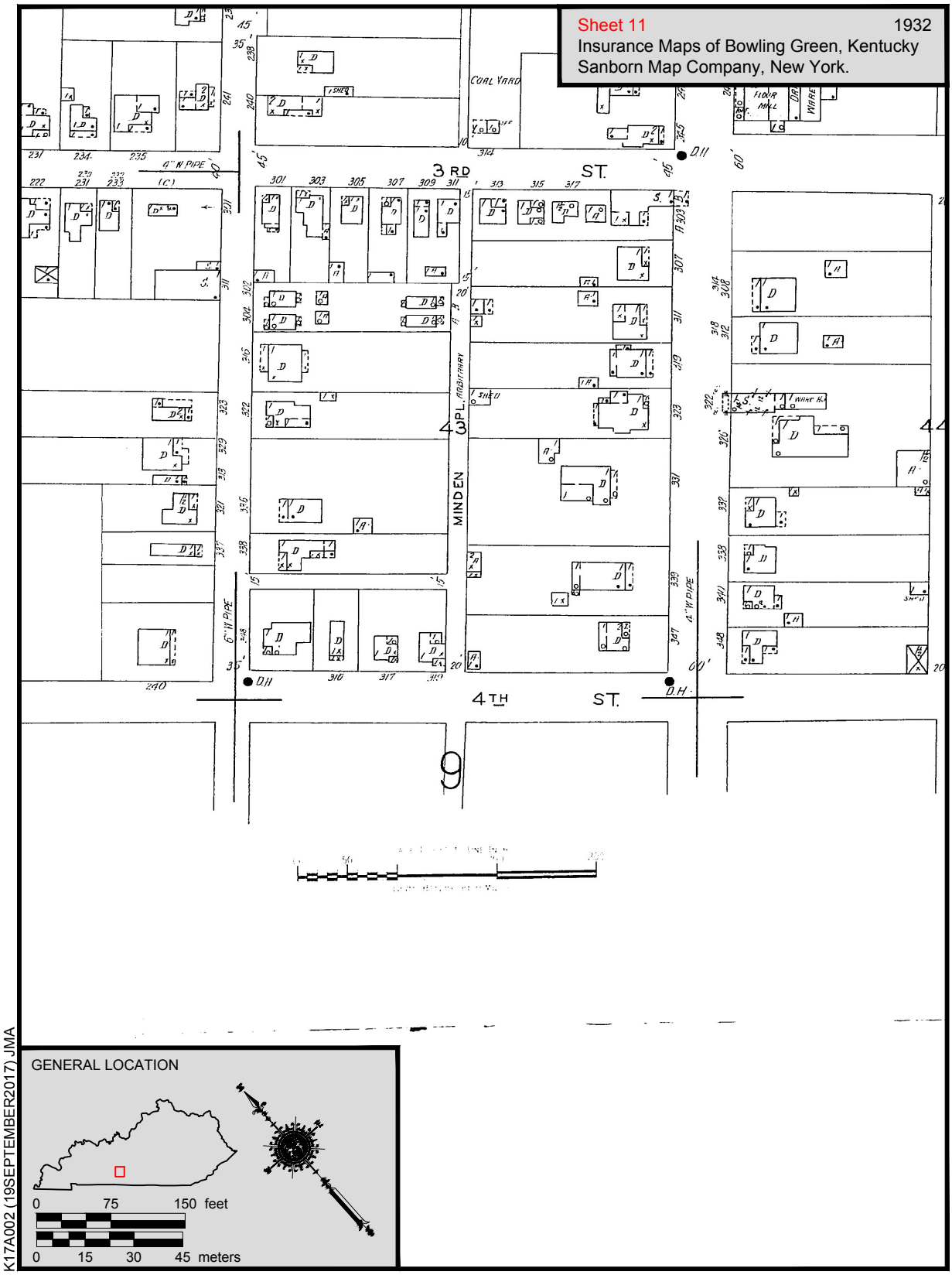

Figure 10. 1932 Sanborn Map showing MS 1, 3–11.

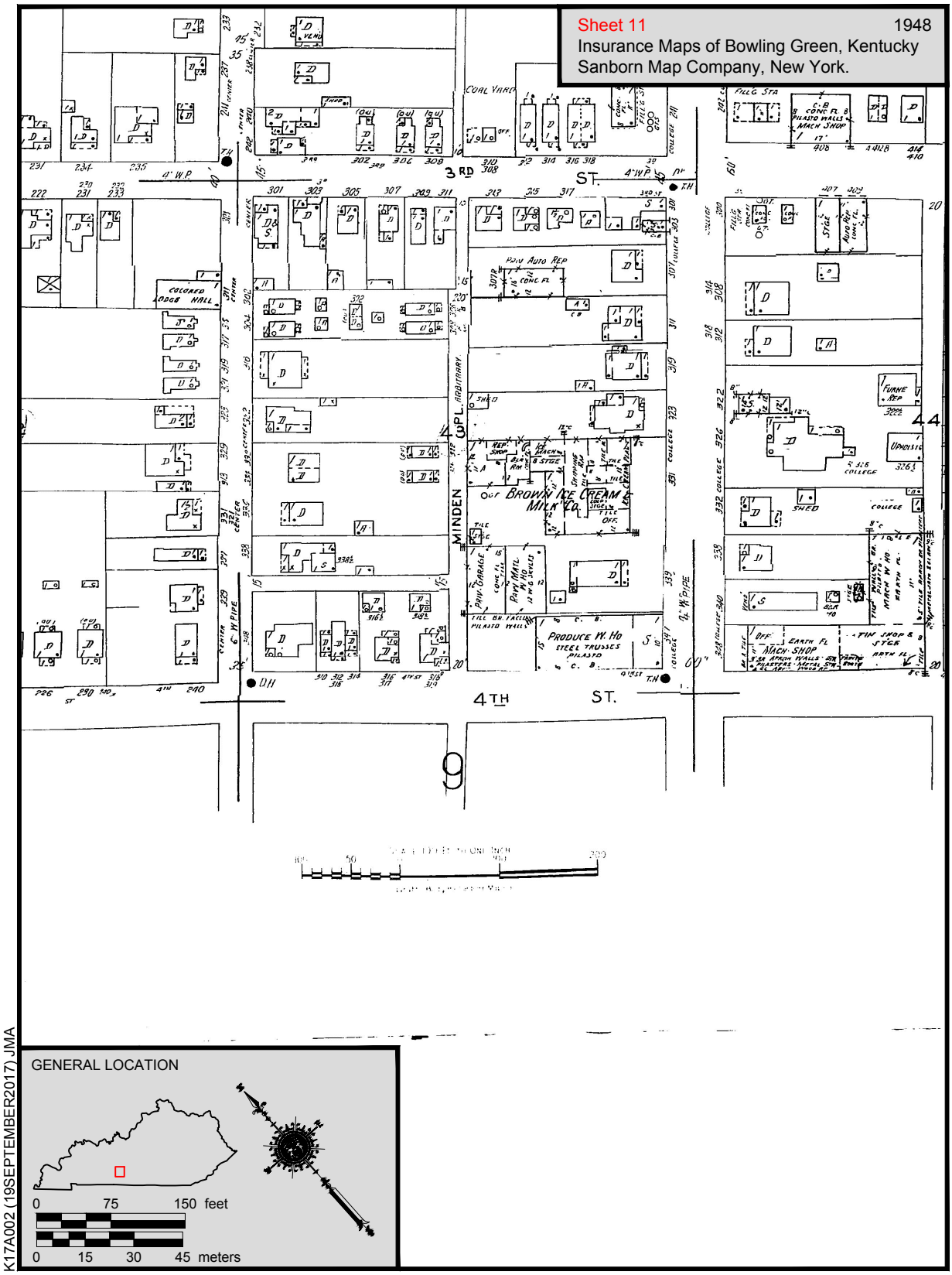

Figure 11. 1948 Sanborn Map showing MS 3, 4, 6–10, 12–19.

Fourth Street. The address for MS 8 has changed to 312 Fourth Street. MS 9 is unchanged. MS 10 has added a store/shop to the structure. Next to MS 10, along the alley, is MS 19, a one-story outbuilding (Sanborn 1948).

At the time of the current survey the project area consisted of an urban lawn with no structural remains visible aboveground or found in the shovel tests. Site 15Wa193 was located in this urban lawn and will be discussed in the results in Section 6.

Survey Predictions

Considering the known distribution of sites in the county, the available information on site types recorded, and the nature of the present project area, certain predictions were possible regarding the kinds of sites that might be encountered within the project area. As the historic maps depict several structures within the project area, a historic residence or commercial site will likely be found.

Cultural Overview

Early Human Occupation (before 11,500 B.C.)

There is an increasing amount of evidence documented over the last two decades suggesting that humans arrived in North America before what has traditionally been thought of as the first migration of peoples into the Americas. Archaeologists thought that humans first entered the Americas while following Pleistocene megafauna or other animal species over the Bering Land Bridge that once joined Siberia and Alaska no earlier than about 11,500 years ago. It was thought that after arrival, these migrants—referred to as the Clovis people—quickly spread across North and South America.

Evidence for a pre-Clovis migration is becoming stronger as additional data are collected. Furthermore, multiple entry points or routes have been suggested. Not only did entry into North America occur across a land bridge, but it may also have happened via northern coastal waterways leading to the western (Waguespack 2007), and possibly the eastern (Lowery et al. 2010), seaboards. According to Maggard and Stackelbeck (2008:110) "these discoveries have seriously challenged the Clovis-first model and force us to reconsider the timing of colonization and the processes that were involved in the initial settlement of the New World."

Paleoindian Period (11,500–8000 B.C.)

The Paleoindian cultural tradition in the northeastern United States has been recognized as part of the Clovis culture, a widespread, homogeneous New World culture typified by a distinctive lithic assemblage. The most distinctive members of this assemblage are lanceolate shaped, often fluted, hafted bifaces (Maggard and Stackelbeck 2008). The presence of other artifact types in these Paleoindian assemblages, such as chert knives, scrapers, unifacial tools, and blades, is consistent across the eastern United States. These types of artifacts have been recovered from Clovis sites such as Holcombe Beach in Michigan (Fitting et al. 1966), Debert in Nova Scotia (MacDonald 1968), Martens in Missouri (Martens et al. 2004; Morrow 1998, 2000), and Topper in South Carolina (Goodyear and Steffy 2003).

Clovis components are not well represented in Kentucky, but they have been identified at sites such as Adams, Adams Mastodon, Big Bone Lick, Clay's Ferry Crevice, and Parrish (Tankersley 1996). The artifacts in the Clovis toolkit represent predominantly hunting, butchering, and hide-working activities. Bone tools (e.g., awls, needles, flakers, and possibly shaft straighteners) and ornaments are assumed to have been used, but have not been recovered because of unfavorable environmental conditions (Griffin 1978:226).

Post-Pleistocene adaptive strategies were geared for coping with a harsh, but rapidly changing, environment. In general, Paleoindian sites are reflective of areas where small groups of people, perhaps no more than 50 individuals (Tankersley 1996:21), would perform specific tasks of short duration. This type of site casts a very low archaeological profile across the landscape. It has been argued that the earliest

subsistence strategies in the eastern United States were not typified by a focus on the harvest of megafauna, but rather by a balanced hunting economy based on the exploitation of migratory game—especially caribou—and supplemented by foraged food (Fitting et al. 1966:103–104; Gingerich 2011; Ritchie and Funk 1973:336; Tankersley 1996:22; Walker et al. 2001).

Archaic Period (8000–1000 B.C.)

As Griffin (1978:226) states, "a purely arbitrary division is made between the earlier fluted point hunter and their direct descendants," yet typological comparisons of artifact assemblages begin to take on distinctly regional characteristics with time. The Archaic period is customarily divided into three subperiods: Early (8000–6000 B.C.), Middle (6000–3500 B.C.), and Late (3500–1000 B.C.) (Jefferies 2008). By the Early Archaic, the last glaciers had retreated and the arctic-like boreal forest was developing into the eastern deciduous forest. By the Middle Archaic subperiod, the environment was much as it is today. This subperiod is marked by the introduction of groundstone tools, some of which have been interpreted as plant processing implements. At the beginning of the Late Archaic subperiod, the modern deciduous climax forest covered the entire eastern United States. In response to the changing environment and concurrent changes in plant and animal communities, Archaic period peoples developed a more diversified subsistence strategy that included a shift to exploitation of riverine ecosystems and, perhaps, the beginnings of a planned seasonal round exploitation strategy (Winters 1967:32, 1969).

The typical artifact assemblage representative of the Archaic period is composed of corner- and side-notched, or stemmed, hafted bifaces, increasing in both quantity and stylistic variation through time but accompanied by a decrease in quality of individual workmanship. Corner- and side-notched forms appear earlier in the sequence, whereas stemmed bifaces appear later (Jefferies 2008).

Judging from the greater frequency with which Late Archaic sites appear among sites that are recognized in the prehistoric record, a population increase may be postulated. Moreover, evidence of longer, more intensive site occupation suggests, in some cases, the possibility of extended habitation in parts of the state (Jefferies 2008).

Woodland Period (1000 B.C.–A.D. 900)

Griffin (1978:231) notes that during the Late Archaic subperiod there was "considerable evidence for the long distance movement of goods." The interregional movement of goods provided a structure for the transmission of information as well. During this period of interregional dynamism, there was a trend towards a more sedentary lifestyle with increasingly elaborate burial ceremonialism and, possibly, stratified social organization. These trends, along with the appearance of fired ceramic vessels, mark the transition between Archaic and Woodland peoples (Griffin 1978).

The Woodland period, like the preceding Archaic period, is divided into three subperiods: Early Woodland (1000–200 B.C.), Middle Woodland (200 B.C.–A.D. 400), and Late Woodland (A.D. 400–900) (Applegate 2008). Overall, the Woodland period witnessed a continuation and elaboration of cultural practices that began during the Late Archaic subperiod. Woodland peoples became increasingly dependent on the cultivation of plant foods, which allowed for a more sedentary lifestyle. Except for the latter part of the Late Woodland subperiod, subsistence practices remained similar to the Archaic subsistence patterns, which is to say a combination of hunting, plant food gathering, and fishing in a seasonal round exploitation pattern. It is within the Woodland period that highly visible site types, such as mounds and enclosures, were constructed (Applegate 2008).

Late Prehistoric Period (A.D. 900–1650)

In addition to an increase in cultural integration and cultural complexity, the Late Prehistoric period witnessed a rapidly growing dependence upon horticulture in the subsistence

activities of native populations. Cultural materials are assigned to the Late Prehistoric period by the presence of seemingly diagnostic artifacts, such as mixed limestone and shell or purely shell tempered pottery and triangular projectile points. Temporal assignment based on the presence of triangular points can be misleading since they first appeared during the Late Woodland period. The Late Prehistoric period in this region of Kentucky is referred to as Fort Ancient (Henderson 2008).

During the Fort Ancient period, there was an increased reliance on agriculture, an increase in sedentism, and an increase in the complexity of sociopolitical organization. Subsistence practices focused on the cultivation of corn and beans. This was supplemented with hunting, fishing, and wild plant collecting. Many Fort Ancient villages were circular or elliptical and "exhibit distinct activity areas that encircle a central plaza: domestic/habitation, storage/trash disposal, and mortuary" (Henderson 2008:745). Some, but not all, of these circular villages were surrounded by a palisade.

Cultures with a somewhat similar level of development included Pisgah in the Appalachian Summit, Mississippian in the middle Mississippi River area, and the Plaquemine culture of the lower Mississippi River area. A Late Woodland level of society continued in the Midwest, the Great Lakes, the Northeast, and the piedmont and coastal areas of the Middle Atlantic until European contact (Geier 1992:279–280). The Fort Ancient period is dated between approximately A.D. 900 and 1650.

Historic Period

The first Europeans to visit Kentucky included explorers, trappers, traders, and surveyors. It was in the 1750s, when the English Crown attempted to colonize the Ohio Valley, that the first organized attempt to settle Kentucky occurred. This attempt stimulated the formation of land companies that sent surveyors into the area (McBride and McBride 2008:909). One of these, the Ohio Land Company, sent Christopher Gist into Kentucky in 1751. The French and Indian War that erupted in 1754 disrupted this early exploration (Talbert 1992:689).

In 1763, England's King George III set aside the land west of the Appalachians for native populations and English fur traders and closed the area to permanent settlement. His decree was ignored, and further colonial exploration and development could not be stopped. One man who took advantage of the commercial expansion westward was Daniel Boone. Boone first explored Kentucky in 1767, and by 1769, he had explored much of the Red and Kentucky River valleys. Harrodsburg was established soon after in 1774 followed by Boonesboro in 1775. The western movement of the American frontier pushed the Native Americans further and further west, and Kentucky was one of the places where they decided to take a stand. In response, Governor Dunmore (of Virginia) waged two large campaigns in the Ohio Valley (later known as Dunmore's War), and the Native Americans were defeated. Dunmore's War opened Kentucky for settlement, although some hostilities continued after this time (Nickell 1992:96–98; Stone 1992:571).

Warren County History

In 1776, the Virginia General Assembly had created Kentucky County from its western lands. The newly created Kentucky County had approximately the same boundaries as the state of Kentucky does today. This county in 1780 was divided into three separate counties (Fayette, Lincoln, and Jefferson), which would collectively become the District of Kentucky in 1783 (Hammon 1992:495). Then, in 1792, the Kentucky District would dissipate in favor of the Commonwealth of Kentucky, and the counties that comprised the district would eventually be divided and subdivided into the 120 counties that presently make up Kentucky (Kleber 1992:xix).

Warren County is located in the plain section of the Pennyrile cultural landscape. Located in the south-central portion of the state, Warren County is bordered by Butler and Edmonson Counties to the north, Barren County to the east, Allen and Simpson Counties to the south, and Logan County to the west. Formed in 1797 out of a portion of Logan County, Warren County is the twenty-fourth county of Kentucky in order of formation. The county was named for General

Joseph Warren, who fell at Bunker Hill. Bowling Green is the county seat (Bryant 1992a:933).

The first pioneers in Warren County were Long Hunters who came in the 1770s. General Elijah Covington and George and Robert Moore were among the earliest landowners in the county. Rich farmland attracted settlers to Warren County during the late eighteenth and early nineteenth centuries. The construction of a series of locks and dams on the Barren and Green Rivers during the early 1800s improved river travel, and a portage railroad was built in 1832, from the Barren River to what is now the site of the Warren County courthouse. By the 1830s, the county was well populated and growing steadily. In the 1850s, the Louisville & Nashville Railroad (now CSX Transportation) completed a rail line through Warren County, linking it to northern and southern markets (Byrant 1992a, 1992b).

The Civil War divided many Warren County families between North and South. Because of its strategic position, Bowling Green was a prime target of both Confederate and Union armies, and the county was subjected to numerous raids and disruptions during the Civil War. Although most residents favored the preservation of the Union when the war began, subjection to harsh treatment from Federal authorities during the latter part of the war caused many residents to be more sympathetic to the Southern cause. This pro-Confederate bias continued into the twentieth century (Byrant 1992a:933).

By the 1870s, Warren County was one of the wealthiest in the commonwealth and Bowling Green was at the center of development. In 1868, the first waterworks system was constructed in Bowling Green, and in 1889 the first mule-drawn streetcars began operating (replaced by electric-powered cars in 1895). In 1840, Bowling Green gained one of its largest industries with the completion of the Union Underwear factory. One of the most successful businesses in Bowling Green during the nineteenth century was the dressmaking establishment of Carrie Burnam Taylor, who by 1906 employed more than two hundred women in the production of Taylor-made dresses. The completion of I-65 through the area in the late 1960s attracted many new industries, including the General Motors Corporation, Holley Automotive, and the Eaton Corporation. Bowling Green is currently the largest city in southwestern Kentucky (Byrant 1992b:106–107).

IV. METHODS

This section describes the methods used during the survey. Site specific field methods are discussed in further detail in the Site Description section of this report. Laboratory methods specific to the individual analyses are discussed in the specific analysis sections of this report.

Field Methods

The project consisted of an archaeological survey of an urban lawn in downtown Bowling Green, Kentucky (see Figures 2 and 3). The lawn was 35-x-130 m (114-x-427 ft) in size, covering approximately .4 ha (1.0 acre). The boundaries of the project area were determined using maps provided by the client and by an iPad Mini tablet coupled with a Garmin GLO Bluetooth global position system (GPS) receiver capable of real time 2−3 m (7−10 ft) horizontal accuracy.

The entire project area was subjected to intensive pedestrian survey supplemented with screened shovel testing. Due to the high number of map structures depicted on the historic maps, the entire lawn was shovel tested on a 10 m (33 ft) grid. Each shovel test measured no less than 35 cm (14 in) in diameter and was excavated well into subsoil, or when stopped by rock/gravel obstruction. All sediments were screened through .64 cm (.25 in) mesh hardware cloth, and the sidewalls and bottoms of each shovel test were examined for cultural materials and features. In order to discover if there were any deeply buried cultural deposits, three bucket augers were excavated at the bottoms of shovel tests. The bucket auger measured 8 cm (3 in) in diameter, and the contents of each bucket auger were screened through .64 cm (.25 in) mesh hardware cloth. All soil zones were recorded.

Laboratory Methods

All cultural material recovered from the project was transported to CRA for processing

and analysis. Initial processing of the recovered artifacts involved washing all artifacts, sorting the artifacts into the major material classes (i.e., historic, and lithic) for further analysis, and assigning catalog numbers. Catalog numbers consisted of the site number and a unique number for each provenience lot or diagnostic specimen. The prehistoric modified implement (e.g., biface) received a unique catalog number. Historic artifacts received a unique catalog number for each material group and class by provenience. Non-diagnostic material, such as flake debris, was cataloged by provenience lot where all flakes in the same provenience received the same number.

The methods, specifics, and results of subsequent analysis are discussed in each of the specific analysis sections of this report. All cultural materials, field notes, records, and site photographs will be curated at the William S. Webb Museum of Anthropology, University of Kentucky in Lexington, Kentucky.

V. MATERIALS RECOVERED

Prehistoric materials and historic materials were recovered from Site 15Wa193. The assemblage is described below. In addition, an inventory of materials recovered from the site listed by provenience is presented in the site descriptions section of this report.

Lithic Analysis

Brian G. DelCastello

During the current archaeological investigations at Site 15Wa193 a sparse prehistoric lithic assemblage was recovered, consisting of four artifacts (9.7 g) (Table 4). This assemblage consisted of three flakes (2.8 g) and a single Turkey Tail Cluster hafted biface. Beyond the items recovered at Site 15Wa193, no additional lithic artifacts were recovered during the current investigations.

Material type was determined by comparison with a sample collection housed at CRA. This type collection contains a variety of siliceous resources collected from known source areas throughout Kentucky, Indiana, and the greater Ohio River Valley region. Of particular note, the type collection contains abundant materials from western Kentucky.

All of the artifacts were manufactured from locally available Ste. Genevieve chert (i.e., Shawe 1963a, 1963b). While this raw material varies in terms of quality, this raw material was one of the preferred resources of the region and was used quite extensively throughout prehistory.

Flake Debris

The analysis of flake debris involved the recording of several attributes, including flake size, weight, raw material type, presence of cortex, and probable stage of lithic reduction during which the flake was produced. Reduction stage follows Magne's (1985) definitions and was determined by the number of facets on the platform or the number of flake scars on the dorsal surface. Early stage reduction is defined as core reduction, middle stage as the first half of tool production, and late stage as the second half of tool production and subsequent maintenance. For flakes that retain platforms, zero to one facet on the platform indicates early stage, two facets indicate middle stage, and three or more facets indicate late stage. Biface thinning is a specialized form of late stage reduction. A biface thinning flake is defined as a flake with a lipped platform having three or more facets. For non-

Table 4. Summary of Lithic Artifacts Recovered at Site 15Wa193.

Provenience	Zone	Depth (cm bgs)	Count	Wt(g)	Raw Material	Portion	Reduction Stage	Thermal Alt	Cortex Type
STP 16	III	24-36	1	6.9	Ste. Genevieve	missing tip	-NA--	None	None
STP 19	II	10-26	1	0.3	Ste. Genevieve	complete	Early	None	None
STP 19	II	10-26	1	0.8	Ste. Genevieve	fragment	Middle	None	None
STP 20	I	0-19	1	1.7	Ste. Genevieve	2	Early	None	None

platform bearing flakes, dorsal flake scars were counted instead of platform facets; zero to one dorsal flake scars indicate early stage, two scars middle stage, and three or more flake scars late stage. Stage of reduction was not determined for blocky debris or flakes smaller than .25 inch.

Bifacial Implements

For this analysis, biface reduction is viewed as a continuous process. A biface may have been taken out of the reduction sequence at any stage and used for a specific task. After use, it may have reentered the continuum and been further reduced. Bifacial reduction usually started with hard hammer percussion followed by soft hammer percussion. Pressure flaking was generally used for final shaping and haft modification. Generalized biface classes were defined by the type of flake scars present. The general classes are 204-1 (hard hammer scars only), 204-2 (hard hammer and soft hammer scars), 204-3 (soft hammer scars only), 204-4 (soft hammer and pressure scars), and 204-5 (pressure scars only). An indeterminate class, 204-6, was used for those implements that could not be assigned to one of the above classes, typically small fragments.

Results

During the current investigations, a sparse lithic assemblage was recovered, totaling four artifacts weighing approximately 9.7 g. Of these artifacts, only one of the items (a Turkey Tail Cluster hafted biface) was considered temporally sensitive. As mentioned below, this artifact has been assigned to the Late Archaic/Early Woodland transitional time frame.

The three flakes were all made from moderate to high quality Ste. Genevieve chert (see Table 4). Little can be said of the reduction activities associated with these flakes; although, a few generalizations can be made. These flakes represent at least one episode of lithic reduction/tool production at the site location. It is difficult, however, to determine whether these flakes were related to the same reduction episode, or whether they represent multiple activities conducted at the site. All of the flakes were considered nondiagnostic.

Turkey Tail Cluster (N = 1), Figure 12

Metrics (mm) (*denotes fragmentary measurement)

Artifact Number	K17A2-01
Weight	6.9 g
Max Length	40.57*
Max Width	24.13
Shoulder Width	24.13
Thickness	6.49
Stem Length	18.71
Neck Width	15.79
Neck Thickness	6.06
Base Width	7.8

Artifact #: K17A2-01

Raw Material: Ste. Genevieve

Class: 204-4.2

Distribution: STP 16 (Zone III, 24–36 cm bgs)

Description: This Turkey Tail Cluster hafted biface fragment was made from a piece of moderate quality Ste. Genevieve chert. It is missing the distal portion of the tip due to a lateral hinge fracture. The specimen has a flattened biconvex cross-section and bifacially retouched blade edges. The haft element exhibits a minor amount of edge grinding concentrated near the side notches. The remaining portion of haft element lacks grinding.

Comparisons: This specimen was similar to the Turkey-Tail point type (Scully 1951:11). It was grouped into this class based primarily on the triangular shaped stem and long narrow blade. Turkey-Tail distribution covers much of the Great Lakes and Midwest regions into New York state, southern Ontario, and Connecticut. They have also been found as far south as Tennessee. They date to the Late Archaic/Early Woodland transitional period (Justice 1987:178).

Interpretations

Although the recovered artifact assemblage is too small to adequately analyze the organization of lithic technology at the site, a few generalizations can be made. The presence of the flakes indicates that at least a single reduction episode involving the use of Ste. Genevieve chert had been conducted on-site. This resource, also represented by the Turkey Tail Cluster hafted biface, was available locally throughout the region, indicating that the site inhabitants

Figure 12. Turkey Tail Cluster hafted biface recovered during the current investigations.

incorporated local resources into various lithic-related activities. Unfortunately, the small size of the flake assemblage prevents an accurate determination of the range of core reduction/tool production that had likely taken place.

The presence of the Turkey Tail Cluster hafted biface indicates that this occupation likely dates sometime to the Terminal Archaic/Early Woodland transitional span. The fracture that removed the distal portion of the blade could not be assigned to use-related damage, preventing additional information concerning the activities associated with this hafted biface. Beyond the presence of lithic reduction debris, little else can be inferred of these nondiagnostic flakes.

Based on the analysis, the lithic artifacts recovered from the site appears to have been the result of short-term occupation(s), or were of a specialized, undetermined nature. The flakes were generally the result of at least one reduction episode activities involving a single lithic raw material. No fire-cracked rock (FCR), cores, or additional modified implements were recovered during the current investigations.

Historic Materials Recovered

J. Howard Beverly, Jr.

Methods

The historic assemblage includes artifacts classified and grouped according to a scheme originally developed by Stanley South (1977). South believed that his classification scheme would present patterns in historic site artifact assemblages that would provide cultural insights. Questions of historic site function, the cultural background of a site's occupants, and regional behavior patterns were topics to be addressed using this system.

South's system was widely accepted and adopted by historical archaeologists. However, some have criticized South's model on theoretical and organizational grounds (Orser 1988; Wesler 1984). One criticism is that the organization of artifacts is too simplistic. Swann (2002) observed that South's groups have the potential to be insufficiently detailed. She suggested the use of sub-groups to distinguish between, for example, candleholders used for religious purposes and those used for general lighting. Others, such as Sprague (1981), have criticized South's classification scheme for its limited usefulness on late nineteenth- and early-twentieth-century sites, sites which include an array of material culture—such as automobile parts—not considered by South.

Despite its shortcomings, most archaeologists recognize the usefulness of South's classification system to present data.

Stewart-Abernathy (1986), Orser (1988), and Wagner and McCorvie (1992) have subsequently revised this classification scheme. For the purposes of this assessment, artifacts are grouped into the following categories: domestic, architecture, arms, furnishings, clothing, personal, communication and education, maintenance and subsistence, biological, and unidentified. The artifacts recovered during this project are summarized in Table 5.

Table 5. Historic Artifacts Recovered According to Functional Group.

Group	15Wa193	Percent
Architeture	30	13.89%
Clothing	2	0.93%
Domestic	166	76.85%
Furnishings	3	1.39%
Maintenance/Subsistence	9	4.17%
Personal	1	0.46%
Undetermined	5	2.31%
Totals	216	100.00%

Grouping artifacts into these specific categories makes it more efficient to associate artifact assemblages with historic activities or site types. One primary change associated with the refinement of these categories is reassigning artifacts associated with the "Miscellaneous and Activities" under South's (1977) original system. Considering the potential variety of historic dwellings and outbuildings within the project area, a refinement of the artifact groupings was considered important to perhaps observe whether the distribution of specific artifact groups would produce interpretable patterns related to activity areas or structure types. Each one of these groups and associated artifacts is discussed in turn.

Information on the age of artifacts as described in the artifact tables is derived from a variety of sources cited in the discussion of the materials recovered. The beginning and ending dates cited need some clarification. Usually, an artifact has specific attributes that represent a technological change, an invention in the manufacturing process, or simple stylistic changes in decoration. These attribute changes usually have associated dates derived from historical and archaeological research. For example, bottles may have seams that indicate a specific manufacturing process patented in a certain year. The bottle then can be assigned a "beginning," or incept, date for the same year of the patent. New technology may eliminate the need for the same patent and the bottle would no longer be produced. The "ending," or terminal, date will be the approximate time when the new technology took hold and the older manufacturing processes are no longer in use.

Specific styles in ceramic decorations are also known to have changed. Archaeological and archival researchers have defined time periods when specific ceramic decorations were manufactured and subsequently went out of favor (e.g., Lofstrom et al. 1982; Majewski and O'Brien 1987). South's (1977) mean ceramic dating technique uses this information. The dates presented here should not be considered absolute; but rather the best estimates of an artifact's age available at this time. A blank space indicates that the artifact could not be dated or, alternately, that the period of manufacture was so prolonged that the artifact was being manufactured before North America was colonized. An open-ended terminal date was assigned for artifacts that may be acquired today. The rationale for presenting dates for the artifacts recovered is to allow a more precise estimate of the time span the site was occupied, rather than the mean occupation date of a site.

A summary of the artifacts recovered follows. A complete inventory of the historic artifacts can be found in Appendix A.

Materials Recovered by Functional Group

There were 216 historic artifacts recovered during the current project (see Table 5). The following provides a descriptive discussion of the types and age of artifacts recovered from Site 15Wa193.

Architecture Group (N = 30)

The architecture group is comprised of artifacts directly related to buildings, as well as those artifacts used to enhance the interior or exterior of buildings. These artifacts typically consist of window glass, plate glass, nails, and construction materials, such as brick and mortar. The architecture group items are discussed below.

Construction Materials (n = 13)

Construction materials refer to all elements of building construction. For this project, the building materials collected included two pieces of asphalt roofing, ten brick fragments, and one ceramic tile sherd (Table 6).

Asphalt was identified as a black cement-like material obtained artificially during the refining of petroleum. Asphalt is often used in roofing and in paving as a waterproofing agent. Asphalt can also be found in the form of asphalt cement, asphalt concrete, asphalt mastic, and asphalt felt (Harris 2000). An asphalt composition felt, usually in rolls, was often used in roofing construction during the last decades of the nineteenth century (McAlester and McAlester 1984:48). Asphalt shingles were first introduced in the United States in 1901 but did not see widespread acceptance until about 1911 (Cullen 1992:R4–R8). Popularity of asphalt roofing shingles grew after World War I and in part to the National Board of Fire Underwriters' campaign to eliminate wood roofing shingles (Wilson and Snodgrass 2008:2). Asphalt shingles are still produced and used. For this project, two asphalt roofing shingle fragments were recovered.

The brickmaking industry was one of the most localized of all nineteenth-century industries (Walters 1982:125). It was far less expensive to produce bricks on site than to pay to ship the bricks from another location. In fact, a brickmaker could transport everything needed to produce enough bricks for a large building in two wagons. Although brickmaking was present in the United States by the late eighteenth century, this industry did not become popular until circa 1800. Hand-made bricks manufactured at the construction site continued to be popular as late as the 1880s (Walters 1982:126–128).

Hand-made bricks were typically 5:1 bricks because five sides were identical and the sixth side exhibited distinctly different markings. Linear marks were usually found on the sixth side and were caused by the brickmaker when excessive clay was removed from the top of the mold. The remaining five sides of hand-made bricks usually exhibit a gritty/sandy texture from the sand-coated mold (Walters 1982:128). The paste of hand-made bricks is usually more porous than machine-made bricks. Most hand-made bricks manufactured in the nineteenth century were close in size to the standard adopted by the National Brickmakers Association. However, some irregularity did occur accidentally (Walters 1982:130).

The shift from hand-made bricks to machine-made bricks occurred circa 1880. Although machine-made bricks were produced in factories in most major cities in the United States by the mid-nineteenth century, this process was not standardized or popularized until the last two decades of the nineteenth century (Holley 2009:97). The creation of the National Brick Manufacturers Association in 1886 allowed for an industry-wide discussion of standardization. This push came mostly from architects and building contractors who needed a better standard for quantity and project cost estimations (Holley 2009:97). Machine-made bricks will often have marks in the clay related to the machine manufacturing process (Greene 1992; Gurcke 1987). This brick type is typically more uniform in shape, and the paste is more consistent throughout.

It should also be noted that firebricks and molded ornamental bricks became largely popular in the late nineteenth century. Large fires destroyed huge portions of major American cities throughout the latter half of the nineteenth century. This prompted many cities to develop building ordinances that required fireproof brick construction. Ornamental bricks became largely popular between the 1893 and 1904 world's fairs. Unfortunately, the production of these types of bricks declined after 1904 when the extruded method of brick production became more popular than the dry-press method (Broeksmit and Sullivan 2006). Paving bricks typically are heavier and larger than the other bricks described above, and they were manufactured to construct roadways. Hence, they needed to be manufactured to withstand the weight and wear of daily traffic. Brick paving became popular in the 1890s (Hockensmith 1997:158).

Table 6. Summary of Historic Materials Recovered.

Class	Type	Total
Ceramics		
	Ironstone	11
	Porcelain: hard paste	4
Construction Material		
	Brick	10
	Ceramic	1
	Asphalt Composition	2
Container Glass		
	Automatic Bottle Machine	145
Decorative Elements		
	Vase	1
Farming and Gardening		
	Hoe	1
General Hardware		
	Other	1
	Bracket / Angle	1
	Pin	1
	Screw	1
	Band	1
Nails		
	Wire Nail	4
Flat Glass		
	Window Glass	11
	Plate Glass	2
Plastic		
	Modern	3
Glass Tableware		
	Press mold: unleaded	3
	Unidentified mold	1
	Undiagnostic fragment	1
Electrical		
	Other	3
Glass		
	(blank)	1
	Amorphous	1
Other Tableware		
	Tableware (non-glass)	1
Toys and Games		
	Miniature: tableware	1
Buttons		
	Self Shank	1
Lighting		
	Lamp Chimney	2
Other Fasteners		
	Grommet	1
	Totals	216

For this project, ten brick fragments were recovered. One was a hand-made brick fragment generally dating from 1800 to 1880 (Walters 1982:128–130). Seven were machine-made brick fragments (Figure 13a) dating from 1880 to the present, and the other two were indeterminate.

Industrial wall and floor tiles became popular during the late nineteenth century and are still in production. They were used widely in certain locations such as bathrooms because they were easy to clean (McComish 2015:55). One tile was recovered during this project.

Flat Glass (n = 13)

Cylinder glass was developed in the late eighteenth century to enable the inexpensive production of window glass. With this method, glass was blown into a cylinder and then cut flat (Roenke 1978:7). This method of producing window glass replaced that of crown glass production, which dates back to the Medieval period and was capable of fabricating only very small, usually diamond-shaped, panes (Roenke 1978:5). Cylinder glass was the primary method of window glass production from the late eighteenth century through the early twentieth century, at which time cylinder glass windows were slowly replaced by plate glass windows. Plate glass window production became mechanized after 1900, but did not become a commercial success in the United States until around 1917 (Roenke 1978:11).

Cylinder window glass has been shown to gradually increase in thickness through time and can be a useful tool for dating historic sites. Several dating schemes and formulas have been devised that use average glass thickness to calculate building construction or modification dates. These include Ball (1984), Roenke (1978), and Chance and Chance (1976) to name a few. Like previously derived formulas, Moir (1987) developed a window glass dating formula to estimate the initial construction dates for structures built primarily during the nineteenth century. Although Moir (1987:80) warns that analysis on structures built prior to 1810 or later than 1915 have shown poor results, most research in this area shows the regression line extending back beyond 1810 (Moir 1977; Roenke 1978). Hence, dates calculated back to 1785 were considered plausible. Sample size is also a consideration when using the Moir window glass regression formula. According to Moir (1987:78), sample sizes also need to be "reasonable and not collected from a point or two" in order to accurately date the construction of a building. Moir (1987:80) indicates sample sizes as small as 15 sherds are acceptable, but recommends larger sample sizes for better accuracy, and we agree with his assessment. For the purposes of this assessment, a "reasonable" sample size is considered 25 window glass sherds. It should be noted that for window glass assemblages with less than 25 sherds, however, "tentative" dates based on measurements are still presented for the purpose of reporting and providing additional information regarding the material collected. Individual sherd/small assemblage measurements/dates are not presented as "absolute" dates for sites, and as a general principle, any window glass dates derived using the Moir (1987) method should be contextualized utilizing other artifact dating methods whenever possible. Although Moir (1987:80) states that dating window glass after 1915 is not as reliable for dating sites, for our purposes, window glass that measures 2.41 mm (dating to 1916) is included in our calculations because according to Roenke (1978:11), plate glass does not become widely or successfully produced in the United States until 1917.

Thirteen fragments of flat glass were recovered (see Table 6). This includes two sherds of plate glass that generally dates after 1917 (Roenke 1978:11). Eleven window glass sherds were recovered from the project. Nine fragments measured less than 2.41 mm thick. According to the Moir (1987) formula, the window glass has an average date of 1884. However, because the sample of windows glass is small, it is not considered reliable for contributing to the overall assessment of the temporal period of the site. The remaining two sherds were thicker than 2.41 mm and not suitable for use in the Moir formula.

Nails (n = 4)

There are three stages recognized in the technological chronology of nails: wrought nails, cut nails, and wire-drawn nails.

Figure 13. Examples of historic materials recovered: (A) machine-made brick; (B) complete and pulled wire nail; (C) complete and unaltered wire nail; (D) grommet; (E) button; (F) ironstone sherd; (G) hard paste porcelain sherd; (H) container glass; (I) chimney glass sherd; (J) porcelain vase body sherd; (K) plug fuse; (L) modern machine screw; and (M) plastic toy plate.

Wrought nails were handmade and were the primary type of construction fastener in the eighteenth and early nineteenth centuries. Their use ended around 1810 with the widespread use of square-cut or machine-cut nails (Nelson 1968:8).

The cut nail, introduced in approximately 1800, originally had a machine-cut body with a hand-made head. Around 1815, crude machine-made heads replaced hand-made heads on cut nails, and overall, cut nails replaced wrought nails in the construction industry. Early fully machine-cut nails exhibit a "rounded shank under the head," and therefore, often appear pinched below the head of the nail (Nelson 1968:8). By the late 1830s, these "early" fully machine-cut nails were replaced with "late" fully, or modern, machine-cut nails.

The first wire-drawn nails were introduced into the United States from Europe by the mid-nineteenth century. These early wire nails were primarily used for box construction and were not well adapted for the building industry until the 1870s. Although the cut nail can still be purchased today, the wire nail nearly universally replaced it by the turn of the twentieth century (Nelson 1968:8).

Four wire nails were recovered from the project area (see Table 6). Two were complete and pulled, both with an 8d pennyweight (Figure 13b). The other two were complete and unaltered with a pennyweight of 6d and 7d (Figure 13c). In general, smaller pennyweight nails are utilized for roofing, lathing, moulding, and finishing (2d–5d), while 6d nails are commonly used for light framing. Pennyweights of 7d–9d commonly are utilized for siding, and flooring and interior fittings, and nails with pennyweights of 10d and above are most often utilized for flooring, boarding, wooden studding, rafters, and heavy framing (Faulkner 2000; Wentworth 1979).

Clothing (N = 2)

The clothing group includes buttons, clothing fasteners, footwear, and other clothing related items, such as belts, hats, and fabric. For this project, two clothing group items were recovered. One was a grommet and the other a button (see Table 6).

Grommet (n = 1)

Grommets are used to reinforce an opening, typically in a fabric or leather (Figure 13d). They are used to prevent tearing or abrasion. One grommet was recovered from the project area. It is made of modern plastic, which dates generally after 1930 (Luscomb 1992:154).

Buttons (n = 1)

Precise dating of different types of buttons is difficult, but generalizations about the buttons within 20-year time intervals are possible. The transition from local manufacture of small quantities of buttons by hand to making large quantities of buttons by machine in specialized factories took place during the early to mid-nineteenth century. The older buttons are represented by unique, individual, varied specimens. The newer buttons are represented by similar, standardized types.

Buttons have limited value as temporal indicators, however, because they are so readily recycled. In particular, the buttons used on everyday garments are likely to persist in a domestic economy for several decades as thrifty homemakers save and re-use them. However, particularly for men‟s and women‟s dress clothing and outer wear, styles of buttons change with fashion, and one or another type of button might be associated with a different era (see Martin and Mansberger 1987).

The single button (Figure 13e) has a self–shank and is made of modern plastic and generally dates after 1930 (Luscomb 1992:154).

Domestic Group (N = 166)

Artifacts included in the domestic group consisted of ceramics (n = 15), container glass (n = 145), table glass (n = 5), and other tableware (n = 1) (see Table 6).

Ceramics (n = 15)

The ceramic recovered from the project area consisted of ironstone (n = 11) and hard paste porcelain sherds (n = 4).

Ironstone (n = 11)

Ironstone is a white or gray-bodied, refined stoneware with a clear glaze. It is often

indistinguishable from whiteware. Ironstone differs from whiteware in that the body is more vitreous and dense. In addition, a bluish tinge or a pale blue-gray cast often covers the body. In some cases, a fine crackle can be seen in the glaze; however, this condition is not as common as it is in whiteware (Denker and Denker 1982:138).

Confusion in the classification of white-bodied wares is further compounded by the use of the term as a ware type or trade name in advertising of the nineteenth century. Both ironstones and whitewares were marketed with names such as "Patent Stone China," "Pearl Stone China," "White English Stone," "Royal Ironstone," "Imperial Ironstone," "Genuine Ironstone," "White Granite," and "Granite Ware" (Cameron 1986:170; Gates and Ormerod 1982:8). These names do not imply that true ironstone was being manufactured. Some investigators avoid the distinctions entirely by including ironstones as a variety of whiteware. Others, however, such as Wetherbee (1980), refer to all nineteenth-century white-bodied earthenwares as ironstone. For this analysis, the primary determining factor in classification of a sherd as ironstone was the hardness and porosity of the ceramic paste. Sherds with a hard vitreous paste were classified as ironstone.

Charles James Mason is usually credited with the introduction of ironstone (referred to as Mason's Ironstone China) in 1813 (Dodd 1964:176). Others, including the Turners and Josiah Spode, produced similar wares as early as 1800 (Godden 1964). As a competitive response to the highly popular oriental porcelain, British potters initiated this early phase of ironstone production. The ironstone of this early phase bears a faint blue-gray tint and oriental motifs, much like Chinese porcelain. A second phase of ironstone began after 1850 in response to the popularity of hard paste porcelains produced in France. This variety of ironstone had a harder paste and reflected the gray-white color of French porcelains.

While some ironstones continued to use oriental design motifs after 1850, the general trend was toward undecorated or molded ironstones (Collard 1967:125–130; Lofstrom et al. 1982:10). Ironstone continued to be produced in England, and after 1870, it was also manufactured by numerous American companies. For many years, classic ironstone—the heavy, often undecorated ware—had been frequently advertised as being affordable and suitable for "country trade" (Majewski and O'Brien 1987:121). By the late 1800s, these thick, heavy ironstones began losing popularity and were often equated with lower socio economic status (Collard 1967:13). At the same time, ironstone manufacturers began shifting to thinner, lighter weight ironstones. As a result, this type of ironstone became popular tableware in American homes during most of the twentieth century (Majewski and O'Brien 1987:124–125). In spite of the shift towards thinner and lighter ironstones, heavy ironstone remained on the market and continues to be popular in hotel/restaurant service (hence, this heavy, twentieth-century ironstone is sometimes called "hotelware"). However, its production for home use all but ceased by the second decade of the twentieth century (Lehner 1980:11).

A total of 11 ironstone sherds were recovered from the project area (Figure 13f). One sherd is a burned molded teacup handle that postdates 1900 (Faulkner 2000), a teacup rim that generally dates between 1855 and 1950 (Majewski and O'Brien 1987:153) and nine undecorated body sherds that dates from 1830 to the present (Majewski and O'Brien 1987:122).

Porcelain (n = 4)

Porcelain is the name given to high-temperature fired, translucent ware. This ware type was first developed by the Chinese. Chinese, or hard paste, porcelain was introduced to Europe by Portuguese sailors had traveled to China during the sixteenth century. The formula for true, or feldspathic, porcelain was not discovered in Europe until 1708 and not marketed until 1713 (Boger 1971:266). The production of true porcelain was limited to three factories in England; all other products were softer porcelains made with glass, bone ash, or soapstone. Porcelain made with bone ash, often called "bone china," became the preferred product after 1800, since the paste was harder and the ware was cheaper to produce with bone than with glass or

soapstone (Mankowitz and Hagger 1957:179). Among the more affluent households in Europe and North America, porcelain was a common tableware used during the eighteenth and nineteenth centuries (Fay 1986:69).

Porcelain production in America was not successful until 1826, and the number of porcelain factories in the United States remained small throughout the nineteenth century. Bone china, which contained as much as 40 percent bone ash, was also the most common porcelain manufactured in America (Mankowitz and Hagger 1957:27). In the lab, bone china can be differentiated from hard paste porcelain by placing it under ultraviolet light. Bone china fluoresces blue-white while hard paste porcelain fluoresces magenta (Majewski and O'Brien 1987:128).

A total of four hard paste porcelain sherds were recovered from the project area. Two are undecorated and one has the remains of a decal design and the other has edge gilding (Figure 13g).

Decal decoration was rare before 1900 on ceramics other than imported porcelains (Majewski and O'Brien 1987:147). The process of decalcomania consists of applying decals—designs printed on a film or paper—to ceramic vessels. This decorative technique is often confused with transfer printing; however, decals can be distinguished from transfer prints by the sharpness of the design, the presence of shading, the use of bright colors, and the slight relief often felt when touching the edge of a decal design (Majewski and O'Brien 1987:146). Decals are applied to vessels prior to the final firing and are usually put through the decorating kiln in order to harden the decal for permanency. The decals include stipple and line-engraved motifs created using a lithographic process in an assortment of colors (Majewski and O'Brien 1984:36).

In contrast to the polychrome sprig and broadline floral style popular in the mid-nineteenth century, floral decals are characterized by their use as a border or vessel accent. Frequently, these appear as small sprays of flowers applied off-center and often were applied in conjunction with thin-line border stripes, raised-border motifs, hand painting, and gilding (Majewski and O'Brien 1984:36). Occasionally, decals were lightly touched up by hand in order to give a hand-painted appearance. Majewski and O'Brien (1987) suggest that this motif began in the late 1800s as an inexpensive alternative to multi-colored hand-painted techniques. Decals remained a popular method of decoration until the introduction of new decorating methods, including chromatic glazes and silk screening in the mid-twentieth century (Blaszczyk 2000:155). Decal decorations can occur on whiteware, ironstone, and porcelain.

There were two methods of gilding. The first was the liquid gold method, which produced a brilliant gilt that unfortunately was not wear resistant. The second gilding method was referred to as bright burnished gold. Gilded wares gained popularity around 1855. It was common during this time to find gilt-decorated bone china as well as nonvitreous earthenware (Majewski and O'Brien 1987:153).

Container Glass (n = 145)

Research by Baugher-Perlin (1982), Jones and Sullivan (1985), Lindsey (2017), and Toulouse (1971) was used to analyze and date the container glass assemblage. Glass color was the only attribute that could be used for dating those fragments that were not identifiable as to type of manufacture.

The approximate date of manufacture for bottles and bottle fragments recovered from the project area was established by determining the manufacturing process associated with the bottle (i.e., creation of the base and lip of the container) and using any patent or company manufacturing dates embossed on the bottle.

When examining glass vessels, bottle lips can be informative. A lipping tool, patented in the United States in 1856, smoothes and shapes the glass rim into a more uniform edge than a hand-smoothed lip or "laid-on ring." Certain types or styles of lips were associated with specific contents; for example, medicines were often contained in bottles with prescription lips (Jones and Sullivan 1985). A "sheared," or unfinished, bottle lip typically dates before 1880.

Lipping tools were used throughout the middle and end of the nineteenth century until the

advent of the fully automatic bottle machine (ABM) in 1903. It should be noted, however, that as automated bottle manufacture became available after the turn of the twentieth century (see below), tooled finishes continued to be produced—albeit in steadily decreasing numbers. That is, there is a lag time between tooled finishes and ABM finishes, and although ABM glass is given an incept date of 1903, most tooled-glass vessel sherds will be given a terminal date around the 1920s due to this lag time, unless other diagnostic characteristics are observed enabling one to give it an earlier terminal date.

Color also is an important aspect of container glass identification, and oftentimes it is used to date vessels/sherds in conjunction with other diagnostic characteristics. In the event that no other manufacturing characteristics are observable, glass color alone can be used to date container glass. Jones and Sullivan (1985) observed that chemicals color glass, either as natural inclusions or additions by the manufacturer. "Black glass" is one of the earliest glass colors, possibly dating back to mid-seventeenth-century Europe. It was not actually black, but more of a very dark olive green or olive amber. The coloring of the glass was usually the result of high iron concentrations as well as carbon, copper with iron, and/or magnesia (Jones and Sullivan 1985). It was called black because the color was so deep as to appear black unless held up to direct lighting (McKearin and Wilson 1978:9). "Black glass" protected contents from the effects of direct light and was strong and resilient. Typically, black glass was utilized for liquor, wine, and ale/beer, and was mass produced for ale and beer between 1840 and the 1880s (Lindsey 2017; Wilson and Wilson 1968). According to McKearin and Wilson (1978:229–232), black glass container sherds are not typically found on sites dating after 1880.

According to Lockhart (2006), amethyst glass began to be manufactured around 1870, when manganese was being added to the glass recipe. Although initially colorless, the glass will turn a distinctive purplish color when exposed to sunlight over time. It was previously thought that amethyst glass production ceased by 1914 due to a shortage of manganese from Germany during World War I; however, the change was actually a result of technological advancements in the glass industry, mainly the conversion to automatic bottle machines (Lockhart 2006:53). Although manganese was more difficult to obtain after World War I, and selenium was often less expensive, the improvement in technology was the major reason for the change. The use of selenium proved to be an inexpensive decolorant in glass production and ultimately displaced manganese as a decolorizer by 1920 (Lockhart 2006:53). Amber glass had a general application in the mid-nineteenth century, but was not widely used until after 1860. Cobalt glass is produced with the addition of the coloring agent cobalt oxide to the glass batch (Lindsey 2017). The introduction of what Lindsey (2017) calls "true blue" glass began in 1840 with the production of soda, mineral water, and ink bottles.

With the growing public desire to see the contents of the bottles, clear glass came into demand and was popular beginning in the 1860s with the burgeoning public health movements following the Civil War (Baugher-Perlin 1982:261; Wiebe 1967). However, it should be noted that clear glass was available to a limited degree before this time, especially colorless leaded glass, which dates between 1827 and 1875 (Jones 2000:149, 161; Miller and Sullivan 1984). Opaque white, or "milk," glass has been manufactured as long as glass has been made, but milk glass became common in the late nineteenth and twentieth centuries as it became frequently used in "containers, tablewares, and lighting devices" (Jones and Sullivan 1985:14). Aqua and olive colored glass were also used for many different containers, but they generally are not assigned specific dates due to their long period of use over the last several centuries. In some cases, however, aqua glass BIM sherds with no other diagnostic characteristics are assigned a date range of 1800–1920, and olive green sherds are given a date range of 1780–1920.

The manufacturing process can be roughly divided into three basic groups including free blown, blown in mold (BIM), and automatic bottle machine manufactured (ABM) vessels (Baugher-Perlin 1982:262–265). Only ABM glass was recovered during the current project.

Automatic Bottle Machine (ABM) (n = 145)

The Owens automatic bottle-making machine was patented in 1903 and creates suction scars and distinctive seams that run up the length of the bottle neck and onto the lip. Bottles were being manufactured regularly with this machine by 1905, and by 1907, it was utilized to produce significant quantities of container glass vessels (Lindsey 2017; Miller and McNichol 2002). Hence, the ABM mold provides a firm manufacturing date at the beginning of the twentieth century. Another automatic bottle machine called the Individual Section was also used in the commercial production of bottles. This machine was widely used starting in 1925 and by 1940 became the most widely used bottle manufacturing device (Jones and Sullivan 1985:39). This bottle machine was more cost effective than the Owens machine, which was no longer used after 1955.

A total of 145 glass fragments were assigned to the ABM category (see Table 6) including body (n = 136), base (n = 4), lip with neck (n = 2), lip (n = 2), and other part (n =1). Decorative attributes on the body fragments included embossing (n = 13) and enameled lettering (n = 1). The remaining body fragments (n = 122) were plain. A variety of embossing was present and none were full identifiable and datable. However, given that the glass fragments are all ABM, these sherds postdate 1903 (Jones & Sullivan 1985; Lindsey 2017). The embossing present on the ABM glass body fragments included one sherd with "…P… / …PEN… / …23…", one with "…N…", three sherds with unidentifiable miscellaneous letters and symbols, two mendable sherds with "…EAL… / …INT…", three mendable sherds with "…GISTE…/…R…/…D…", one sherd with "…EURI… / … DAIR… / …ODUC…" (Figure 13h), one sherd with "…T H…", and one with embossed rings. The single enameled label ABM body fragment dates after 1935 (Jones and Sullivan 1985; Paul and Parmalee 1973:57). Embossing was also present on two of the four ABM base fragments. One ABM base fragment was embossed with "17…" and had a knurled/stippled base (cup bottom mold) and postdates 1940 (Lindsey 2017). The other ABM base fragment had "…ONC…" present. The remaining two ABM base fragments did not have any embossing. One of the plain ABM body fragments was made from amethyst colored glass and dates from 1870 to 1920 (Lockhart 2006). Two ABM lip with neck fragments were recovered from the project area. One is a fragment with a crown closure that postdates 1892 (Jones and Sullivan 1985; Lindsey 2017; Rock 1980:12), and the other is a capseat from a milk bottle lip that postdates 1903 (Jones and Sullivan 1985; Lindsey 2017). Embossed design elements were also present on two ABM lip fragments. The other ABM glass fragment is a shoulder fragment. Identifiable vessel form fragments include indeterminate bottles and jars (n = 134), other bottles and jars (n = 3), milk bottles (n = 2), canning jars (n = 2), beer bottles (n = 2), soda (n = 1), and condiment/preserve bottle (n = 1). All but three of the ABM glass fragments date after 1903. The crown closure dates from after 1892 (Lindsey 2017; Jones and Sullivan 1985; Rock 1980:12), the knurled/stippled dates to after 1940 (Lindsey 2017), and the amethyst glass dates from 1870 to 1920 (Lockhart 2006).

Glass Tableware (n = 5)

Press molding was first used (although on a very small scale) in England in the late seventeenth century to make small solid glass objects, such as watch faces and imitation precious stones (Buckley 1934). By the end of the eighteenth century, decanter stoppers and glass feet for objects were also being produced (Jones and Sullivan 1985). The production of complete hollowware glass objects did not become possible until there were innovations in press-molded techniques in the United States during the late 1820s (Watkins 1930). Mass production of press-molded glassware was well established by the 1830s (Watkins 1930).

Earlier press-molded glass objects were predominately made of colorless lead glass (Jones and Sullivan 1985). William Leighton of the Hobbs-Brockunier Glass Works in Wheeling, West Virginia, invented lime glass. This type of glass looked like lead glass, had superior pressing attributes, and was much more inexpensive than lead glass (Revi 1964). Advancements in mold technology in the 1860s and 1870s led to the

application of steam-powered mold operation. This in turn led to increased production and reduced costs (Revi 1964). Modern press molding is conducted entirely by machine (Jones and Sullivan 1985).

Press-molded table glass was made by dropping hot pieces of glass into a mold. A plunger was then forced into the mold, pressing the hot glass against it. The outer surface of the glass took on the form of the mold, while the inner surface of the glass was shaped by the plunger. The plunger was withdrawn and the glass object was removed from the mold. The surface of the glass was often fire polished to restore the brilliance of the glass surface that was disturbed by its contact with the mold (Jones and Sullivan 1985).

Press-molded glass may be recognized by several characteristics. Usually, the glass object must be open-topped in order for the plunger to be withdrawn from the mold. Narrow mouthed vessels were produced, but additional manipulation of the glass was necessary after the plunger was removed from the mold. Evidence of this manipulation should be present on the vessel (Jones and Sullivan 1985). There is no relationship between the exterior shape and design of a press-molded vessel to the interior shape and design because the plunger shapes the interior of the object most often leaving behind a smooth surface. This differs from earlier glass vessel production techniques like blown glassware, where interior shape was related to the exterior shape and design (Jones and Sullivan 1985).

Another characteristic of press-molded containers was that mold seams were generally present. The seams were sharp and distinct, unless steps had been taken to deliberately remove them. The texture of the glass surface of press-molded glass was disturbed and often disguised by an all-over stipple design. The edges of the designs on press-molded glass had a predisposition toward rounded edges. The bases of press-molded objects were usually polished. The quality of the designs on press-molded glassware was precise and the design motifs were numerous (Jones and Sullivan 1985).

In contrast to press-molded glass, cut glass generally had a polished, smooth, and glossy surface texture. The design edges were sharp and distinct. Cut glass designs consisted mostly of panels, flutes, and miters. The designs were often slightly uneven and asymmetrical. Mold seams were usually absent; they were polished off prior to cutting (Jones and Sullivan 1985). Contact-molded glass also differs from press-molded glass in that the exterior and interior of the vessel will portray parallel patterns. The interior of the vessel is also generally much more diffuse towards the base.

A total of five pieces of glass tableware were recovered. Of the identifiable fragments, most were press molded (n = 3), undiagnostic (n = 1), and unidentified mold (n = 1). Four fragments were made from clear unleaded glass and one from amethyst glass. The clear glass dates after 1864 and the amethyst glass from 1880 to 1916 (Rock 1980:16).

Other Tableware (n = 1)

Artifacts used for food storage and other cooking needs not discussed above were included in this category. One fragment of a modern plastic yellow "Solo" cup was recovered. The cup, made of molded polystyrene, dates to after the 1970s (Dart 2017).

Furnishings Group (N = 3)

The furnishings category includes artifacts usually associated with the home or building, but that are not elements of the actual construction. A variety of artifacts associated with furnishings and household fixtures are often recovered in small numbers from historic sites. Examples of these include lamp globe or chimney parts, mirror glass, faucet parts, fireplace equipment, clock parts, draw pulls, flower pots and similar items (Thuro 1976).

Three furnishing group items were recovered from the project area (see Table 6). Two are clear lamp chimney glass sherds (Figure 13i) that generally date between 1854 and 1940 (Faulkner 2000; Pullin 1986:356) and the other is an undiagnostic porcelain vase body sherd (Figure 13j) that was not assigned a specific date.

Maintenance and Subsistence Group (N = 9)

The maintenance and subsistence group contains artifacts grouped into classes containing non-food containers, electrical, farming and gardening, hunting and fishing, stable and barn activities, general hardware, general tools, transportation, and fuel-related items such as coal. Three of these classes were represented in the historic assemblage recovered during the current project (see Table 6).

Electrical (n = 3)

Items in this class include artifacts associated with conducting electricity. One porcelain Type S plug fuse (Figure 13k), in three mending parts, was recovered from the project area. Fuses are devices containing wire or fusible metal that were used to interrupt the circuit by melting when too much current was present (Ching 1995:76). The Type S plug fuse was first introduced in 1941 and is still in production (Dini 2006:7).

Farming and Gardening (n = 1)

This class includes artifacts associated with gardening activities. The metal retaining collar from a garden hoe was recovered. This item was not assigned a specific date.

General Hardware (n = 5)

This class of artifacts includes a wide variety of hardware fasteners and items used for multiple purposes. Items recovered from the project area include a bracket, a metal pin, a modern machine screw, a retaining band, and an unidentifiable other hardware item. Other than the modern machine screw (Figure 13l), none of these items could be assigned a specific date.

Personal Group (N = 1)

The personal group includes artifacts assumed to have belonged to individuals. This category of artifacts includes health and grooming items, jewelry and beads, coins, music and art items, personal items, toys, and games. Tobacco products are also subsumed into this category.

One modern plastic toy plate (Figure 13M) was recovered from the project area and dates to after 1930 (see Table 6) (Meikle 1995).

Unidentified (N = 5)

This category contains artifacts that could not be identified beyond the material from which the artifact was made. There were eight material classes included within this group. These material classes included biological, ceramic, glass, metal, multiple materials, plastic, stone, and unidentified material. The overwhelming majority of these items were counted and weighed in the field, documented on level/zone forms, and generally not collected for curation because of their limited research potential.

The plastic class consisted of modern plastic, foam, cellophane, Bakelite, and celluloid. Celluloid was created from nitrocellulose and camphor in 1869. It was originally introduced as xylonite. This plastic type was used until the mid-twentieth century (Katz 1994:19). Bakelite was created from phenol formaldehyde and was often colored. Leo Baekeland can be credited with bringing the first "heat and pressure" process of phenolic, also known as Bakelite, to the United States in 1907. This synthetic material was particularly popular during the 1930s. Colors are limited to dark shades of brown, blue, red, or green, usually exhibiting a mottled appearance. Bakelite began to lose popularity with the advent of modern plastic, and its use was discontinued circa 1950 (Katz 1994:24–25). Cellophane, as it is known today, was invented in 1927 by William Hale Charch of the DuPont Company. Although cellophane was introduced originally at the first of the twentieth century, the 1927 enhancement made the cellophane moisture proof, so that it could be used for food packaging (Bellis 2008). Modern plastic was introduced in the 1930s. Modern plastic was more cost effective and allowed for even greater applications than celluloid and Bakelite (Meikle 1992).

A total of five unidentified artifacts were recovered (see Table 6). They include two fragments of unidentifiable burned/melted glass and three pieces of melted plastic.

Discussion

The historic artifacts recovered from Site 15Wa193 had a date range of 1785 to the late-twentieth century with an average date of 1940. While the date range suggests the site dates as early as the 1785, the site was most likely occupied during the early to late twentieth century. The initial date range is skewed by the presence of flat window glass with an inception of 1785 but with an average Moir date of 1884 and by the presence of the wide date range of some of the artifacts such as the ABM and modern architectural hardware.

The assemblage represented primarily a scatter of mostly domestic and architectural artifacts, and the presence of these items is consistent with a domestic residence. Based on the artifact types and an overall view of the assemblage, the historic materials appear to represent an early- to mid-twentieth-century domestic residential site. Little can be said regarding the lifeways of the house occupants from a historic perspective except that the occupants utilized commercially available food products, and architectural and personal materials.

VI. RESULTS

During the course of the current survey, one previously unrecorded archaeological site (15Wa193) was documented. A description of the site is presented below, and the location of the site is depicted in Figures 2 and 3.

15Wa193

Elevation: 153 m (502 ft) AMSL
Component(s): historic and prehistoric
Site type(s): residences, open habitation without mounds
Size: 3,300 sq m (35,521 sq ft)
Distance to nearest water: 500 m (1,640 ft)
Direction to nearest water: northeast
Type and extent of previous disturbance: demolition, construction, grading and fill episodes, totally destroyed
Topography: undissected uplands
Vegetation: manicured grass
Ground surface visibility: zero percent
Aspect: flat
Recommended NRHP status: not eligible

Site Description

Site 15Wa193 is a multicomponent site consisting of materials associated with historic residences and commercial buildings from the late nineteenth to early twenty-first centuries and a Terminal Archaic/Early Woodland prehistoric open habitation without mounds. The site was identified by historic and prehistoric artifacts found in shovel tests in an urban lawn in Warren County, Kentucky. The lawn is located in the city of Bowling Green, at the intersection of East Fourth Avenue with Center Street and College Street (Figure 14). This area of level, undissected uplands is at an elevation of 153 m (502 ft) AMSL. The site covers approximately 3,300 sq m (35,521 sq ft) and is 500 m (1,640 ft) southwest of the Barren River.

The manicured lawn provides no ground surface visibility; young deciduous and coniferous trees are scattered about the lawn area, mostly along the east and south edges. At the center of the lawn is a manufactured drainage pond area, roughly 28-x-24 m (92-x-79 ft) in size (see Figure 5). The south half of the lawn has been heavily graded (Figure 15) and buried utilities run along the west edge of the lawn. A cement parking area is located at the north end of the lawn.

Site 15Wa193 is located in the same location as 19 structures depicted on the Sanborn Insurance Maps (Sanborn 1901, 1909, 1914, 1925, 1932, and 1948) between 1901 and 1948 (see Figures 6−9). A review of aerial photos of the area (Nationwide Environmental Title Research [NETRonline] 2017) show that structures were present in the project area until sometime between 2004 and 2006.

Some deed research was conducted at the Warren County Clerk's Office (WCCO) to determine if some of the original land owners could be identified. A Plat Map (WCCO Deed Book [DB] 77:450) from the late 1880s was discovered that illustrated the project area (Figure 16). The project area covered 35-x-130 m (114-x-427 ft) and would have included all of Lots 13 and 14, part of Lot 12, and part of the unnumbered/named Lot across the alley.

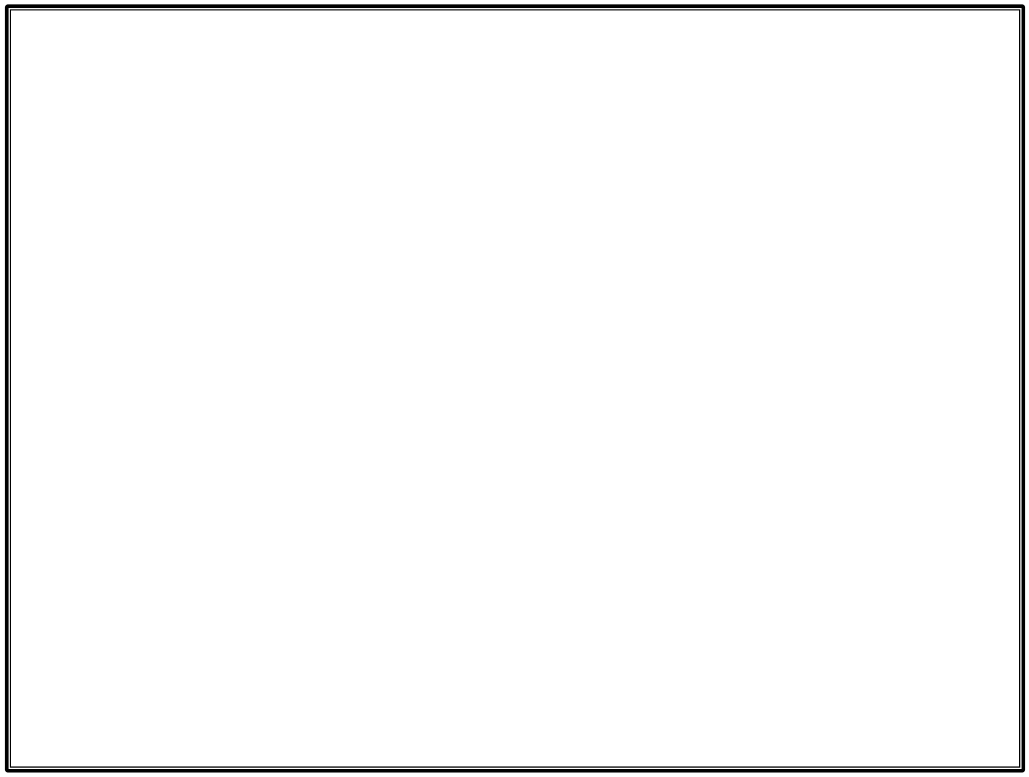

Figure 14. Site 15Wa193 north end, facing southeast.

Figure 15. Site 15Wa193 south end, facing southeast.

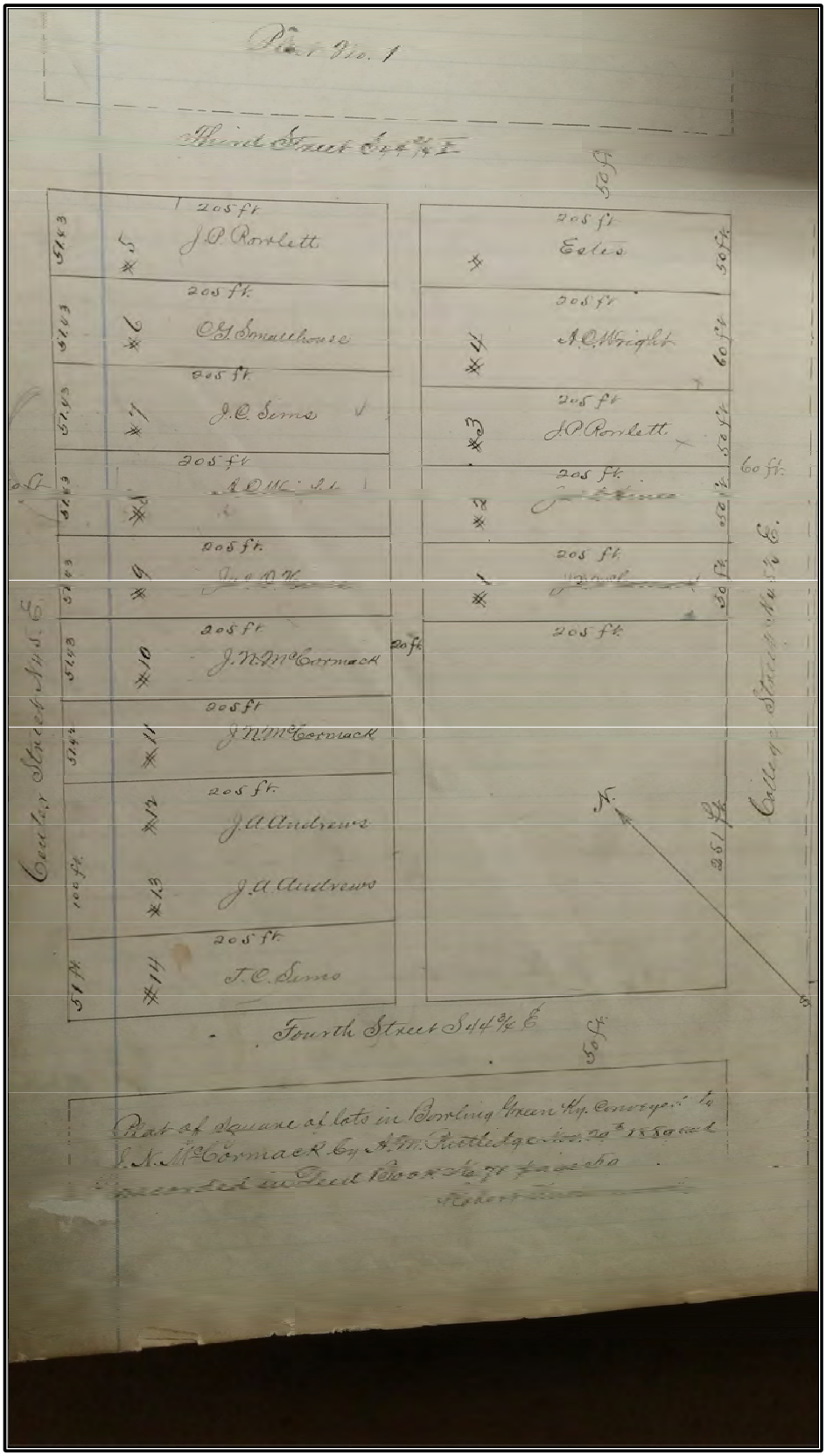

Figure 16. Late 1880s plat map.

J.A. Andrews owned Lots 12 and 13; J.C. Sims owned Lot 14. J.A. Andrews bought Lot 12 from Albert and Emma Cook for $5 in 1886 (WCCO DB 61:358) and sold it to H.P. Cartwright and S.M. Combs in 1887 for $200 (WCCO DB 63:19). Emma Cook had bought the property in 1885 from John Starr and Ell Jorelyce (WCCO DB 59:318). J.A. Andrews and his wife Betty Andrews sold Lot 13 to JM Tyler in 1888 for $147.50 (WCCO DB 50:196). For Lot 14, J.C. Simms sold the property to J.T. Beruchamp around the same time (WCCO DB 74:18).

Investigation Methods

Due to the high number of structures depicted on the historic maps, the entire lawn was shovel tested on a 10 m (33 ft) grid. Each shovel test measured no less than 35 cm (14 in) in diameter and was excavated well into subsoil, or when stopped by rock/gravel obstruction. All sediments were screened through .64 cm (.25 in) mesh hardware cloth, and the sidewalls and bottoms of each shovel test were examined for cultural materials and features.

An extra shovel test (STP 16) was excavated in the north half of the site among a concentration of positive shovel tests. When it produced a prehistoric hafted biface fragment below the main historic horizons, four extra shovel tests were excavated at 5 m (16 ft) intervals around it. One additional shovel test was excavated in the south half between two positive shovel tests with relatively high historic artifact counts. A total of 42 shovel tests were excavated, 21 of which were positive for artifacts.

In order to discover if there were any deeply buried cultural deposits, three bucket augers (Augers 1−3) were excavated at the base of three shovel tests (STPs 8, 9, and 15). The bucket auger measured 8 cm (3 in) in diameter, and the contents of each bucket auger were screened through .64 cm (.25 in) mesh hardware cloth. All soil zones were recorded. No artifacts were recovered from the bucket augers.

STPs 1 and 15 were recorded using the GPS to show the length of the site. STP 7, at the center, was recorded as the site datum (Figure 17).

Depositional Context

The soil profiles observed in the shovel tests showed a variety of profiles. Most of the soil zones observed appeared to be fill episodes. Three profiles are described here as representative samples (Figure 18). The first profile shows a Zone I of dark yellowish brown (10YR 4/4) silty loam extending to 12 cm (5 in) bgs. Zone II was a strong brown blocky, silty clay loam with common gravel extending to 24 cm (9 in) bgs. Zone III was a dark yellowish brown or strong brown (10YR 4/6 or 7.5YR 5/6) clay. Artifacts were recovered from Zones I and II.

The second profile shows a Zone I of brown (7.5YR 4/4) dry, compact, silt loam extending to 13 cm (5 in) bgs. Zone II was a dark brown dry, compact, silt loam with ≥ 75 percent gravel extending to 24 cm bgs. Zone III was a brown (7.5YR 4/4) silt loam extending to 36 cm (14 in) bgs. Zone IV was a yellowish red (5YR 5/6) clay. Artifacts were recovered from Zones I−III.

The third profile shows a Zone I of dark brown (7.5YR 3/4) silt loam with yellowish red (5YR 5/6) clay mottles and cinder extending to 25 cm (10 in) bgs, where it was stopped by dense gravel. Artifacts were recovered from Zone I.

The area is mapped as the Crider soil series, and though the shovel test profiles are similar to the Crider profile, the lack of topsoil in many area, the mottling, and the gravel inclusions provided further evidence that the site has been heavily disturbed. This disturbance is the likely cause of artifacts, historic and prehistoric, found in Zone III of the second profile. Zone III is consistent with the Bt1 and Bt2 horizons (subsoil) of the Crider series.

Artifacts were found in all the zones above the clay horizons. The prehistoric artifacts were found in the last zone above the clay mixed with historic material.

The bucket augers excavated at the site showed a fairly consistent profile. The deepest bucket auger, Auger 1, is described here in detail (Figure 19). Zone I was a reddish brown (5YR 4/4) compact loam with common gravel extending to 25 cm (10 in) bgs. Zone II was a red (2.5YR 4/6) clay loam extending to 40 cm (16 in)

bgs. Zone III was a strong brown (7.5YR 4/6) silt loam with coal fragments extending to 45 cm (18 in) bgs. Zone IV was a yellowish red (5YR 5/8) silty clay loam extending to 65 cm (26 in) bgs. Zone V was a red (2.5YR) silty clay. The bucket auger was terminated at 135 cm (53 in) bgs.

The coal fragments found in Zone III suggest there may have been another fill zone beneath the level at which the shovel tests were ended; however, no artifacts were found in any of the augers.

Artifacts

Site 15Wa193 produced 220 historic and prehistoric artifacts (Table 7). The historic artifacts (n = 216) included asphalt roofing, brick fragments, ceramic tile sherd, flat glass, wire nails, a grommet, a button, ceramics, container glass, table glass, other tableware, lamp chimney glass, a porcelain vase sherd, a plug fuse, a garden hoe collar, general hardware, and a piece of a plastic toy plate. The prehistoric artifacts (n = 4) included three flakes and a hafted biface fragment.

The historic artifacts suggest the site represents a domestic residence occupied from the early to late twentieth century. This is consistent with the domestic structures depicted on the Sanborn maps from 1901 to 1948, mentioned previously. From the Plat Map (WCCO Deed Book [DB] 77:450) we know that there were likely structures in the project area during the 1880s, and from the aerial photos (NETRonline 2017) we know that structures were present in the project area until sometime between 2004 and 2006, so the likely occupation of the site is from the late nineteenth to early twenty-first centuries.

The prehistoric artifacts suggest a short-term occupation(s), or an undetermined specialized event using a single local raw material (Ste. Genevieve chert). The Turkey Tail Cluster hafted biface dates this occupation(s) to the Terminal Archaic/Early Woodland transitional span, approximately 1500−500 B.C.

Features

No features or structural remains were observed during the investigation of the site, and no FCR, charcoal, or burned soil was observed in the shovel tests.

Summary and National Register Evaluation

Site 15Wa193 is a multicomponent site consisting of materials associated with historic residences and commercial buildings from the late nineteenth to early twenty-first centuries and a Terminal Archaic/Early Woodland prehistoric open habitation without mounds. The site was identified by historic and prehistoric artifacts found in shovel tests in an urban lawn in Warren County, Kentucky. Due to the heavily disturbed nature of the site area and the lack of any signs of intact features or structural remains, Site 15Wa193 is not considered to have the potential to provide important information about local or regional history or prehistory and is recommended as not eligible for inclusion on the NRHP under Criteria D.

VII. CONCLUSIONS, RECOMMENDATIONS, AND TREATMENT

Note that a principal investigator or field investigator cannot grant clearance to a project. Although the decision to grant or withhold clearance is based, at least in part, on the recommendations made by the field investigator, clearance may be obtained only through an administrative decision made by the lead agency in consultation with the State Historic Preservation Office (the Kentucky Heritage Council).

During the current investigation the entire project area was subjected to intensive pedestrian survey supplemented with screened shovel testing. One site (15Wa193) was recorded during the survey. Site 15Wa193 was a multicomponent site consisting of materials associated with historic residences and commercial buildings from the late nineteenth to early twenty-first centuries and a Terminal Archaic/Early Woodland prehistoric open habitation without mounds.

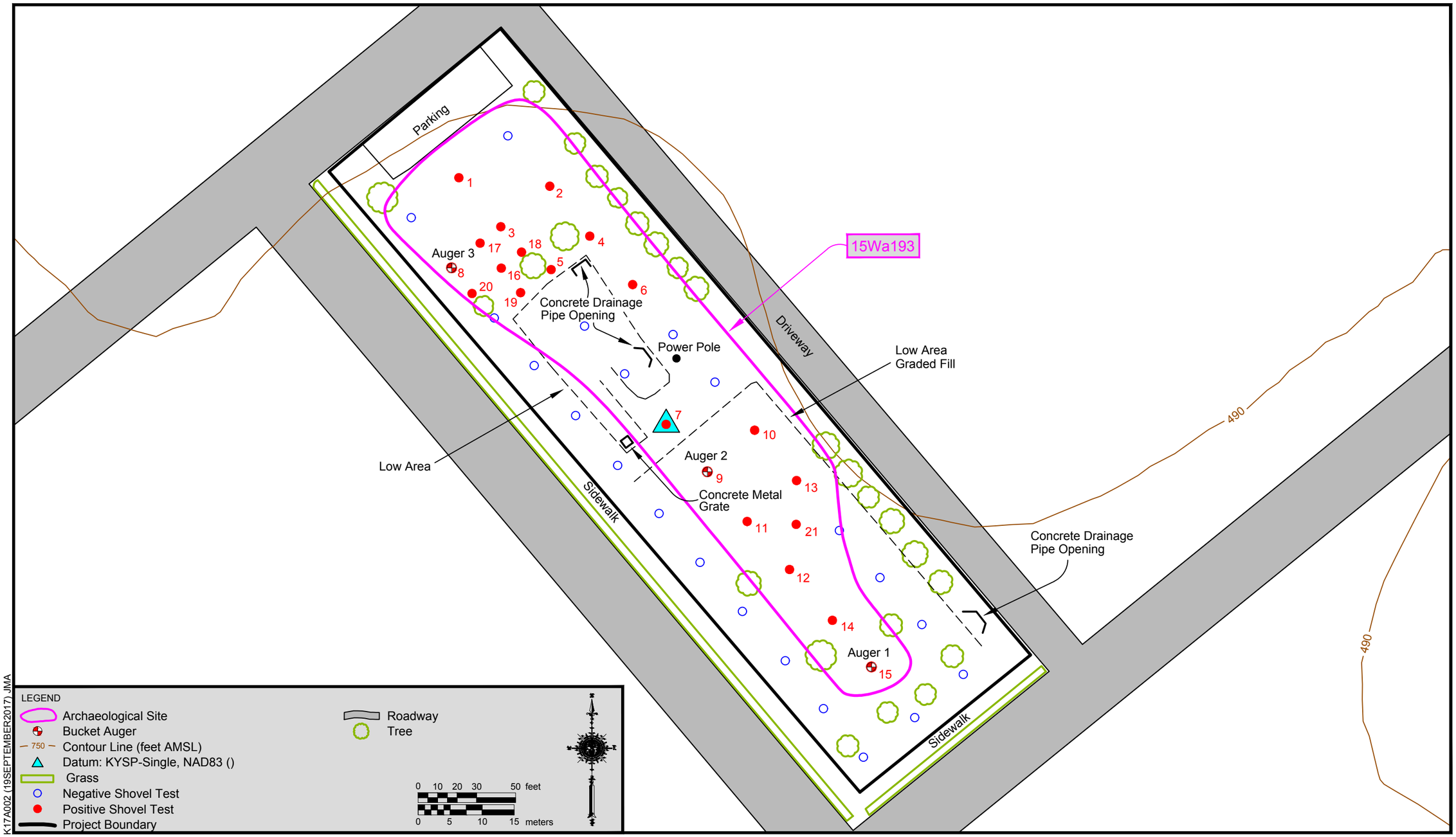

Figure 17. Schematic Plan Map of 15Wa193.

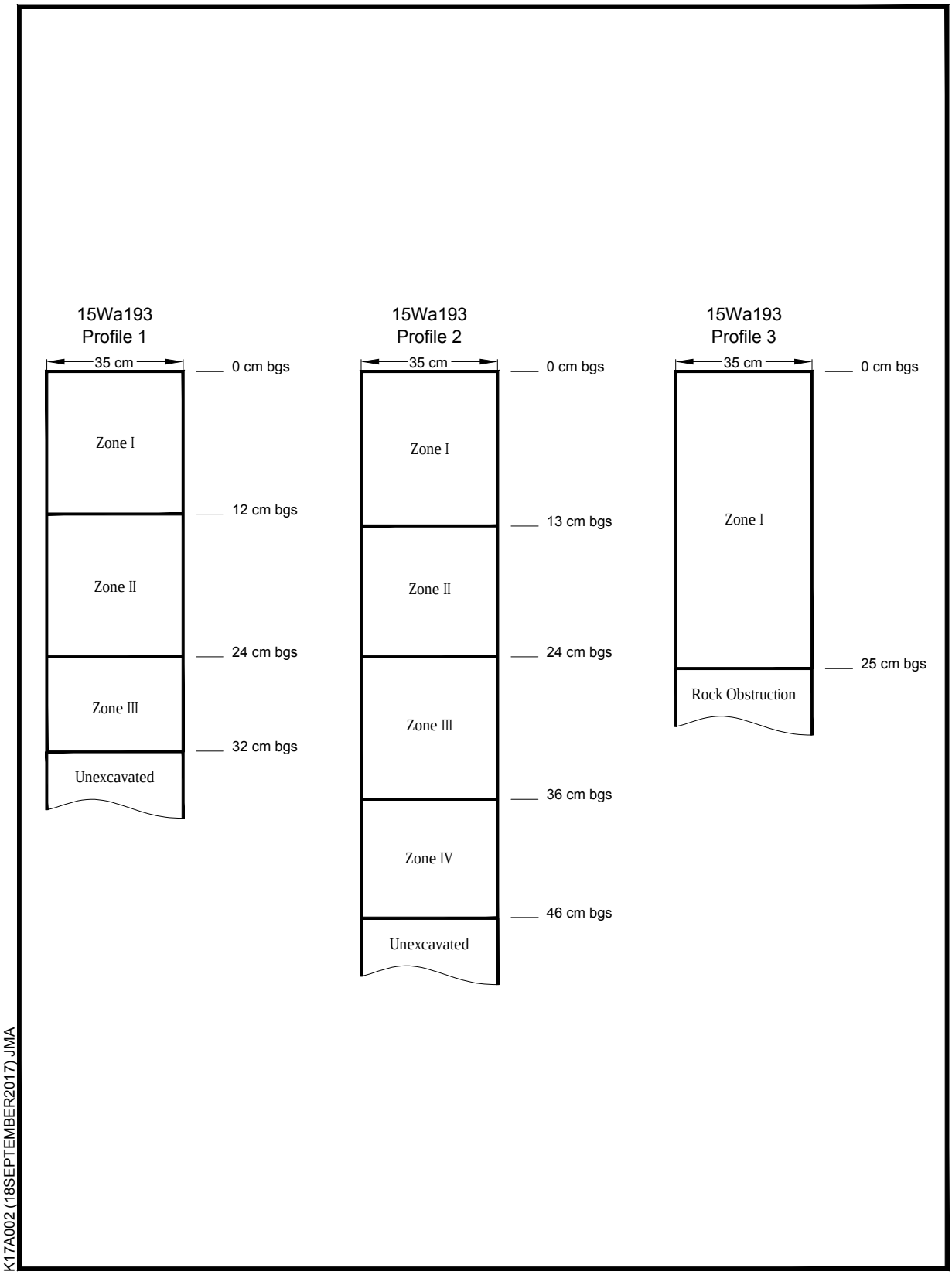

Figure 18. Representative soil profiles from Site 15Wa193.

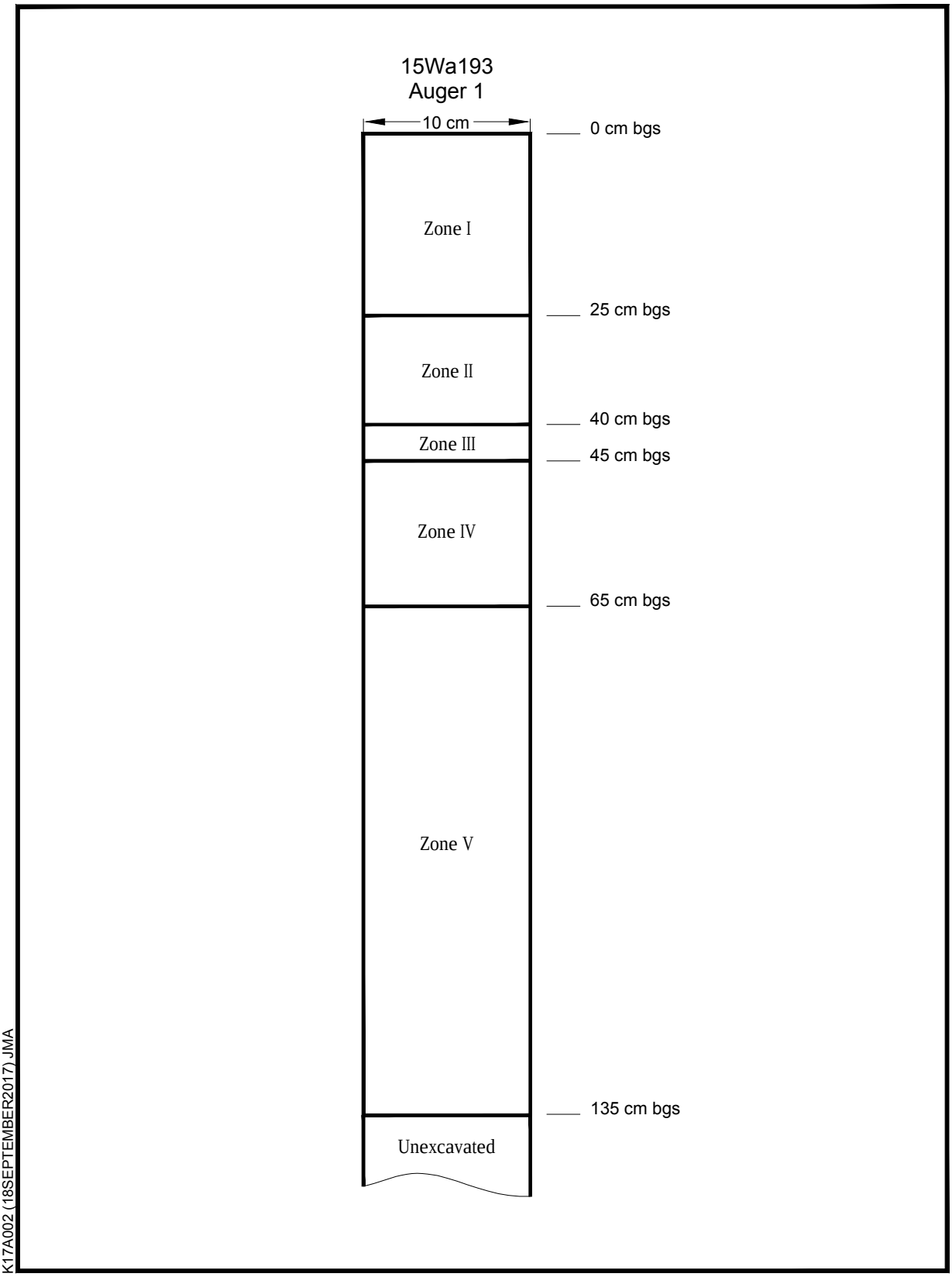

Figure 19. Representative auger profile from Site 15Wa193.

Table 7. Artifacts Recovered from Site 15Wa193.

Unit	Zone	Depth	Group	Class	N
STP 1	II	16-28 cm bgs	Unidentified	Glass	1
STP 2	II	12-20 cm bgs	Architecture	Construction Material	1
STP 2	II	12-20 cm bgs	Domestic	Container Glass	1
STP 3	II	18-31 cm bgs	Domestic	Ceramics	1
STP 3	II	18-31 cm bgs	Domestic	Container Glass	1
STP 3	II	18-31 cm bgs	Unidentified	Plastic	1
STP 4	II	9-19 cm bgs	Domestic	Container Glass	1
STP 5	I	0-26 cm bgs	Architecture	Construction Material	2
STP 5	I	0-26 cm bgs	Architecture	Flat Glass	1
STP 5	I	0-26 cm bgs	Domestic	Ceramics	1
STP 5	I	0-26 cm bgs	Domestic	Container Glass	4
STP 5	I	0-26 cm bgs	Furnishings	Decorative Elements	1
STP 6	II	12-24 cm bgs	Architecture	Construction Material	3
STP 6	II	12-24 cm bgs	Domestic	Ceramics	3
STP 6	II	12-24 cm bgs	Domestic	Container Glass	11
STP 7	I	0-25 cm bgs	Architecture	Nails	1
STP 7	I	0-25 cm bgs	Domestic	Container Glass	2
STP 8	I	6-20 cm bgs	Domestic	Container Glass	3
STP 8	I	6-20 cm bgs	Domestic	Other Tableware	1
STP 8	I	6-20 cm bgs	Personal	Toys and Games	1
STP 9	I	0-10 cm bgs	Architecture	Flat Glass	2
STP 9	I	0-10 cm bgs	Maintenance and Subsistence	General Hardware	1
STP 9	II	10-25 cm bgs	Domestic	Container Glass	2
STP 9	II	10-25 cm bgs	Maintenance and Subsistence	General Hardware	1
STP 10	I	0-26 cm bgs	Architecture	Flat Glass	1
STP 10	I	0-26 cm bgs	Domestic	Ceramics	1
STP 10	I	0-26 cm bgs	Domestic	Container Glass	5
STP 11	I	0-10 cm bgs	Architecture	Flat Glass	1
STP 12	I	0-20 cm bgs	Architecture	Construction Material	1
STP 12	I	0-20 cm bgs	Domestic	Ceramics	1
STP 12	I	0-20 cm bgs	Domestic	Container Glass	4
STP 12	I	0-20 cm bgs	Domestic	Glass Tableware	3
STP 13	I	0-26 cm bgs	Architecture	Construction Material	1
STP 13	I	0-26 cm bgs	Architecture	Flat Glass	1
STP 13	I	0-26 cm bgs	Domestic	Ceramics	1
STP 13	I	0-26 cm bgs	Domestic	Container Glass	89
STP 13	I	0-26 cm bgs	Maintenance and Subsistence	General Hardware	1
STP 14	I	0-5 cm bgs	Maintenance and Subsistence	Electrical	3
STP 15	I	10-18 cm bgs	Domestic	Glass Tableware	1
STP 16	I	0-13 cm bgs	Maintenance and Subsistence	Farming and Gardening	1
STP 16	II	13-24 cm bgs	Domestic	Container Glass	3
STP 16	III	24-36 cm bgs	Architecture	Construction Material	1
STP 16	III	24-36 cm bgs	Domestic	Ceramics	1
STP 16	III	24-36 cm bgs	Domestic	Container Glass	1
STP 16	III	24-36 cm bgs	Prehistoric	Hafted Biface Fragment	1
STP 17	II	0-14 cm bgs	Architecture	Construction Material	1
STP 18	III	24-35 cm bgs	Architecture	Flat Glass	2
STP 18	III	24-35 cm bgs	Clothing	Buttons	1
STP 18	III	24-35 cm bgs	Domestic	Ceramics	2
STP 18	III	24-35 cm bgs	Domestic	Container Glass	6
STP 18	III	24-35 cm bgs	Furnishings	Lighting	1
STP 19	I	0-10 cm bgs	Architecture	Nails	1
STP 19	I	0-10 cm bgs	Domestic	Ceramics	1
STP 19	I	0-10 cm bgs	Domestic	Container Glass	2
STP 19	I	0-10 cm bgs	Maintenance and Subsistence	General Hardware	2
STP 19	II	10-26 cm bgs	Architecture	Nails	2
STP 19	II	10-26 cm bgs	Domestic	Ceramics	1
STP 19	II	10-26 cm bgs	Domestic	Container Glass	1
STP 19	II	10-26 cm bgs	Domestic	Glass Tableware	1
STP 19	II	10-26 cm bgs	Unidentified	Glass	1
STP 19	II	10-26 cm bgs	Prehistoric	Flakes	2
STP 20	I	0-19 cm bgs	Architecture	Construction Material	3
STP 20	I	0-19 cm bgs	Architecture	Flat Glass	5
STP 20	I	0-19 cm bgs	Clothing	Other Fasteners	1
STP 20	I	0-19 cm bgs	Domestic	Container Glass	5
STP 20	I	0-19 cm bgs	Furnishings	Lighting	1
STP 20	I	0-19 cm bgs	Unidentified	Plastic	2

Unit	Zone	Depth	Group	Class	N
STP 20	I	0-19 cm bgs	Prehistoric	Flakes	1
STP 21	I	0-10 cm bgs	Domestic	Ceramics	2
STP 21	I	0-10 cm bgs	Domestic	Container Glass	4
				Total	220

The site area had been heavily disturbed and there was no sign of structural remains or features. Site 15Wa193 is recommended as not eligible for inclusion on the NRHP. No sites listed on, or eligible for listing on, the NRHP will be affected by the project, therefore archaeological clearance is recommended.

If any previously unrecorded archaeological materials are encountered during construction activities, the KHC should be notified immediately at (502) 564-6662. If human skeletal material is discovered, construction activities should cease, and the KHC, the local coroner, and the local law enforcement agency must be notified, as described in KRS 72.020.

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APPENDIX A. HISTORIC MATERIALS RECOVERED

Table A-1. Historic Materials Recovered.

Bag	Site	Unit #	Zone	Dep	Cat #	Group	Class	Type	Attr 1a Def	Attr 1b Def	Attr 1c Def	Attr 2a Def	Attr 2b Def	Burned	Count	Wt (g)	Vessel Part	Vessel Type	Min Date	Max Date	References	Comments
001	15Wa193	STP 1	II	16-28 cm bgs	1	U	Glass							TRUE	1							
002	15Wa193	STP 2	II	12-20 cm bgs	2	A	Construction Material	Brick	Indeterminate brick: non-vitrified					FALSE	1	0.1						
002	15Wa193	STP 2	II	12-20 cm bgs	3	D	Container Glass	Automatic Bottle Machine		Light green glass		Plain		FALSE	1		Body	Other bottle/jar	1903		Jones & Sullivan 1985; Lindsey 2017	
003	15Wa193	STP 3	II	18-31 cm bgs	4	D	Ceramics	Porcelain: hard paste	Decal					FALSE	1		Body	Indeterminate	1880	1940	Blaszczyk 2000:155; Majewski and O'Brien 1984:128	
003	15Wa193	STP 3	II	18-31 cm bgs	5	D	Container Glass	Automatic Bottle Machine		Clear glass		Plain		FALSE	1		Body	Indeterminate bottle/jar	1903		Jones & Sullivan 1985; Lindsey 2017	
003	15Wa193	STP 3	II	18-31 cm bgs	6	U	Plastic	Modern						FALSE	1				1930		Meikle 1995	
004	15Wa193	STP 4	II	9-19 cm bgs	7	D	Container Glass	Automatic Bottle Machine		Clear glass		Plain		FALSE	1		Body	Indeterminate bottle/jar	1903		Jones & Sullivan 1985; Lindsey 2017	
005	15Wa193	STP 5	I	0-26 cm bgs	8	A	Construction Material	Brick	Machine made brick: non-vitrified					FALSE	2	1.08			1880		Holley 2009:97	
005	15Wa193	STP 5	I	0-26 cm bgs	9	A	Flat Glass	Window Glass	0.86 - 2.41 mm thick					FALSE	1				1785	1917	Moir 1987	
005	15Wa193	STP 5	I	0-26 cm bgs	10	D	Ceramics	Ironstone	Undecorated					FALSE	1		Body	Indeterminate	1830		Majewski and O'Brien 1987:122	
005	15Wa193	STP 5	I	0-26 cm bgs	11	D	Container Glass	Automatic Bottle Machine		Clear glass		Plain		FALSE	3		Body	Indeterminate bottle/jar	1903		Jones & Sullivan 1985; Lindsey 2017	
005	15Wa193	STP 5	I	0-26 cm bgs	12	D	Container Glass	Automatic Bottle Machine		Aqua glass		Embossed		FALSE	1		Body	Canning jar	1903		Jones & Sullivan 1985; Lindsey 2017	"…T H…"
005	15Wa193	STP 5	I	0-26 cm bgs	13	F	Decorative Elements	Vase		Ceramic: porcelain				FALSE	1							
006	15Wa193	STP 6	II	12-24 cm bgs	14	A	Construction Material	Brick	Machine made brick: non-vitrified					FALSE	3	1.6			1880		Holley 2009:97	
006	15Wa193	STP 6	II	12-24 cm bgs	15	D	Container Glass	Automatic Bottle Machine		Clear glass		Plain		FALSE	6		Body	Indeterminate bottle/jar	1903		Jones & Sullivan 1985; Lindsey 2017	
006	15Wa193	STP 6	II	12-24 cm bgs	16	D	Container Glass	Automatic Bottle Machine	Knurled/stippled base (cup bottom mold)	Clear glass		Embossed		FALSE	1		Base	Indeterminate bottle/jar	1940		Lindsey 2017	"…ONC…"
006	15Wa193	STP 6	II	12-24 cm bgs	17	D	Container Glass	Automatic Bottle Machine		Aqua glass		Plain		FALSE	1		Body	Other bottle/jar	1903		Jones & Sullivan 1985; Lindsey 2017	
006	15Wa193	STP 6	II	12-24 cm bgs	18	D	Container Glass	Automatic Bottle Machine		Light green glass		Plain		FALSE	1		Lip with neck	Soda	1892		Lindsey 2017; Jones & Sullivan 1985; Rock 1980:12	
006	15Wa193	STP 6	II	12-24 cm bgs	19	D	Container Glass	Automatic Bottle Machine		Clear glass		Embossed		FALSE	1		Lip	Other bottle/jar	1903		Jones & Sullivan 1985; Lindsey 2017	
006	15Wa193	STP 6	II	12-24 cm bgs	20	D	Container Glass	Automatic Bottle Machine		Clear glass		Embossed		FALSE	1		Lip	Condiment/Preserve	1903		Jones & Sullivan 1985; Lindsey 2017	
006	15Wa193	STP 6	II	12-24 cm bgs	21	D	Ceramics	Ironstone	Molded / Embossed (late)					TRUE	1		Handle	Teacup	1900		Faulkner 2000	
006	15Wa193	STP 6	II	12-24 cm bgs	22	D	Ceramics	Ironstone	Undecorated					FALSE	1		Body		1830		Majewski and O'Brien 1987:122	
006	15Wa193	STP 6	II	12-24 cm bgs	23	D	Ceramics	Porcelain: hard paste	Gilded					FALSE	1		Rim	Teacup	1855	1950	Majewski and O'Brien 1987:153	
007	15Wa193	STP 7	I	0-25 cm bgs	24	A	Nails	Wire Nail	8d	Pulled		Common		FALSE	1				1880		Nelson 1968	
007	15Wa193	STP 7	I	0-25 cm bgs	25	D	Container Glass	Automatic Bottle Machine		Aqua glass		Plain		FALSE	1		Body	Indeterminate bottle/jar	1903		Jones & Sullivan 1985; Lindsey 2017	
007	15Wa193	STP 7	I	0-25 cm bgs	26	D	Container Glass	Automatic Bottle Machine		Clear glass		Plain		FALSE	1		Body	Indeterminate bottle/jar	1903		Jones & Sullivan 1985; Lindsey 2017	
008	15Wa193	STP 8	I	6-20 cm bgs	27	D	Container Glass	Automatic Bottle Machine		Clear glass		Plain		FALSE	3		Body	Indeterminate bottle/jar	1903		Jones & Sullivan 1985; Lindsey 2017	

Bag	Site	Unit #	Zone	Dep	Cat #	Group	Class	Type	Attr 1a Def	Attr 1b Def	Attr 1c Def	Attr 2a Def	Attr 2b Def	Burned	Count	Wt (g)	Vessel Part	Vessel Type	Min Date	Max Date	References	Comments
008	15Wa193	STP 8	I	6-20 cm bgs	28	D	Other Tableware	Tableware (non-glass)	Plastic: modern					FALSE	1			Other place setting	1970		Dary 2017	Yellow SOLO cup.
008	15Wa193	STP 8	I	6-20 cm bgs	29	P	Toys and Games	Miniature: tableware					Plastic: modern	FALSE	1				1930		Meikle 1995	
009	15Wa193	STP 9	I	0-10 cm bgs	30	A	Flat Glass	Plate Glass	Flat glass					FALSE	1				1917		Roenke 1978	Aqua
009	15Wa193	STP 9	I	0-10 cm bgs	31	A	Flat Glass	Plate Glass	Flat glass					FALSE	1				1917		Roenke 1978	Clear
009	15Wa193	STP 9	I	0-10 cm bgs	32	M	General Hardware	Bracket / Angle		Iron / Steel, Cast				FALSE	1							
010	15Wa193	STP 9	II	10-25 cm bgs	23	D	Container Glass	Automatic Bottle Machine		Clear glass		Plain		FALSE	1		Body	Indeterminate bottle/jar	1903		Jones & Sullivan 1985; Lindsey 2017	
010	15Wa193	STP 9	II	10-25 cm bgs	33	D	Container Glass	Automatic Bottle Machine		Clear glass		Embossed		FALSE	1		Body	Indeterminate bottle/jar	1903		Jones & Sullivan 1985; Lindsey 2017	
010	15Wa193	STP 9	II	10-25 cm bgs	35	M	General Hardware	Other		Iron / Steel				FALSE	1							
011	15Wa193	STP 10	I	0-26 cm bgs	36	A	Flat Glass	Window Glass	0.86 - 2.41 mm thick					FALSE	1				1785	1917	Moir 1987	Clear
011	15Wa193	STP 10	I	0-26 cm bgs	37	D	Container Glass	Automatic Bottle Machine	Indeterminate	Aqua glass		Plain		FALSE	1		Base	Canning jar	1903		Jones & Sullivan 1985; Lindsey 2017	
011	15Wa193	STP 10	I	0-26 cm bgs	38	D	Ceramics	Ironstone	Undecorated					FALSE	1		Body		1830		Majewski and O'Brien 1987:122	
011	15Wa193	STP 10	I	0-26 cm bgs	39	D	Container Glass	Automatic Bottle Machine		Clear glass		Plain		FALSE	2		Body	Indeterminate bottle/jar	1903		Jones & Sullivan 1985; Lindsey 2017	
011	15Wa193	STP 10	I	0-26 cm bgs	40	D	Container Glass	Automatic Bottle Machine		Clear glass		Embossed		FALSE	1		Other part	Indeterminate bottle/jar	1903		Jones & Sullivan 1985; Lindsey 2017	Shoulder
11	15Wa193	STP 10	I	0-26 cm bgs	41	D	Container Glass	Automatic Bottle Machine		Green glass		Plain		FALSE	1		Body	Indeterminate bottle/jar	1903		Jones & Sullivan 1985; Lindsey 2017	
012	15Wa193	STP 11	I	0-10 cm bgs	42	A	Flat Glass	Window Glass	>2.41 mm thick					FALSE	1							Clear
013	15Wa193	STP 12	I	0-20 cm bgs	43	A	Construction Material	Brick	Machine made brick: vitrified					FALSE	1	153.6			1880		Holley 2009:97	
013	15Wa193	STP 12	I	0-20 cm bgs	44	D	Ceramics	Ironstone	Undecorated					FALSE	1		Body		1830		Majewski and O'Brien 1987:122	
013	15Wa193	STP 12	I	0-20 cm bgs	45	D	Container Glass	Automatic Bottle Machine		Clear glass		Plain		FALSE	3		Body	Indeterminate bottle/jar	1903		Jones & Sullivan 1985; Lindsey 2017	
013	15Wa193	STP 12	I	0-20 cm bgs	46	D	Container Glass	Automatic Bottle Machine		Amber glass		Plain		FALSE	1		Body	Beer bottle	1903		Jones & Sullivan 1985; Lindsey 2017	
013	15Wa193	STP 12	I	0-20 cm bgs	47	D	Glass Tableware	Press mold: unleaded		Clear unleaded glass			Molded design/pattern	FALSE	1		Body					
013	15Wa193	STP 12	I	0-20 cm bgs	48	D	Glass Tableware	Unidentified mold		Clear unleaded glass			Undecorated / Plain	FALSE	1		Base		1864		Jones 2000:149; Miller & Sullivan 1984	
013	15Wa193	STP 12	I	0-20 cm bgs	49	D	Glass Tableware	Press mold: unleaded		Amethyst glass			Molded design/pattern	FALSE	1		Lip		1880	1916	Rock 1980:16	
014	15Wa193	STP 13	I	0-26 cm bgs	50	A	Flat Glass	Window Glass	>2.41 mm thick					FALSE	1							Aqua
014	15Wa193	STP 13	I	0-26 cm bgs	51	A	Construction Material	Ceramic	Tile					FALSE	1							
014	15Wa193	STP 13	I	0-26 cm bgs	52	M	General Hardware	Pin		Iron / Steel				FALSE	1							
014	15Wa193	STP 13	I	0-26 cm bgs	53	D	Ceramics	Ironstone	Undecorated					FALSE	1		Body		1830		Majewski and O'Brien 1987:122	
014	15Wa193	STP 13	I	0-26 cm bgs	54	D	Container Glass	Automatic Bottle Machine		Clear glass		Plain		FALSE	77		Body	Indeterminate bottle/jar	1903		Jones & Sullivan 1985; Lindsey 2017	
014	15Wa193	STP 13	I	0-26 cm bgs	55	D	Container Glass	Automatic Bottle Machine		Clear glass		Embossed		FALSE	1		Body	Milk	1903		Jones & Sullivan 1985; Lindsey 2017	"…EURI… / … DAIR… / …ODUC…"
014	15Wa193	STP 13	I	0-26 cm bgs	56	D	Container Glass	Automatic Bottle Machine		Clear glass		Embossed		FALSE	3		Body	Indeterminate bottle/jar	1903		Jones & Sullivan 1985; Lindsey 2017	"…GISTE…/…R…/…D…"

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014	15Wa193	STP 13	I	0-26 cm bgs	57	D	Container Glass	Automatic Bottle Machine		Clear glass		Embossed		FALSE	2		Body	Indeterminate bottle/jar	1903		Jones & Sullivan 1985; Lindsey 2017	"…EAL… / …INT…"
014	15Wa193	STP 13	I	0-26 cm bgs	58	D	Container Glass	Automatic Bottle Machine		Clear glass		Embossed		FALSE	3		Body	Indeterminate bottle/jar	1903		Jones & Sullivan 1985; Lindsey 2017	Miscellaneous embossed letters and symbols.
014	15Wa193	STP 13	I	0-26 cm bgs	59	D	Container Glass	Automatic Bottle Machine		Clear glass		Embossed		FALSE	1		Body	Indeterminate bottle/jar	1903		Jones & Sullivan 1985; Lindsey 2017	"…N…"
014	15Wa193	STP 13	I	0-26 cm bgs	60	D	Container Glass	Automatic Bottle Machine	Indeterminate	Clear glass		Plain		FALSE	1		Base	Indeterminate bottle/jar	1903		Jones & Sullivan 1985; Lindsey 2017	
014	15Wa193	STP 13	I	0-26 cm bgs	61	D	Container Glass	Automatic Bottle Machine		Clear glass		Plain		FALSE	1		Lip with neck	Milk	1903		Jones & Sullivan 1985; Lindsey 2017	
015	15Wa193	STP 14	I	0-5 cm bgs	62	M	Electrical	Other						FALSE	3				1941		Dini 2006:7	Porcelain plug fuse. Mends.
016	15Wa193	STP 15	I	10-18 cm bgs	63	D	Glass Tableware	Undiagnostic fragment		Clear unleaded glass			Undecorated / Plain	FALSE	1		Body		1864		Jones 2000:149; Miller & Sullivan 1984	
017	15Wa193	STP 16	I	0-13 cm bgs	64	M	Farming and Gardening	Hoe						FALSE	1							collar
018	15Wa193	STP 16	II	13-24 cm bgs	65	D	Container Glass	Automatic Bottle Machine		Clear glass		Plain		FALSE	3		Body	Indeterminate bottle/jar	1903		Jones & Sullivan 1985; Lindsey 2017	
019	15Wa193	STP 16	III	24-36 cm bgs	67	D	Ceramics	Ironstone	Undecorated					FALSE	1		Body		1830		Majewski and O'Brien 1987:122	
019	15Wa193	STP 16	III	24-36 cm bgs	66	D	Container Glass	Automatic Bottle Machine		Amber glass		Plain		FALSE	1		Body	Indeterminate bottle/jar	1903		Jones & Sullivan 1985; Lindsey 2017	
019	15Wa193	STP 16	III	24-36 cm bgs	68	A	Construction Material	Brick	Indeterminate brick: non-vitrified					FALSE	1	3.9						
020	15Wa193	STP 17	II	0-14 cm bgs	69	A	Construction Material	Brick	Handmade brick:non-vitrified					FALSE	1	374			1800	1880	Walters 1982:128–130	
021	15Wa193	STP 18	III	24-35 cm bgs	70	C	Buttons	Self Shank	Other	One-piece, 3D		Plastic: modern		FALSE	1				1930		Luscomb 1992:154	
021	15Wa193	STP 18	III	24-35 cm bgs	71	A	Flat Glass	Window Glass	0.86 - 2.41 mm thick					FALSE	1				1785	1917	Moir 1987	
021	15Wa193	STP 18	III	24-35 cm bgs	72	D	Ceramics	Porcelain: hard paste	Undecorated					FALSE	2		Body		1800		Faulkner 2000	
021	15Wa193	STP 18	III	24-35 cm bgs	73	D	Container Glass	Automatic Bottle Machine		Clear glass		Plain		FALSE	5		Body	Indeterminate bottle/jar	1903		Jones & Sullivan 1985; Lindsey 2017	
021	15Wa193	STP 18	III	24-35 cm bgs	74	D	Container Glass	Automatic Bottle Machine		Clear glass		Plain		TRUE	1		Body	Indeterminate bottle/jar	1903		Jones & Sullivan 1985; Lindsey 2017	
021	15Wa193	STP 18	III	24-35 cm bgs	75	F	Lighting	Lamp Chimney	Glass: clear			Plain		FALSE	1				1854	1940	Faulkner 2008; Pullin 1986:356	
022	15Wa193	STP 19	I	0-10 cm bgs	76	A	Nails	Wire Nail	7d	Unaltered		Common		FALSE	1				1880		Nelson 1968	
022	15Wa193	STP 19	I	0-10 cm bgs	77	M	General Hardware	Screw	Machine Screw	Iron / Steel				FALSE	1							
022	15Wa193	STP 19	I	0-10 cm bgs	78	D	Ceramics	Ironstone	Undecorated					FALSE	1		Body		1830		Majewski and O'Brien 1987:122	
022	15Wa193	STP 19	I	0-10 cm bgs	79	D	Container Glass	Automatic Bottle Machine		Clear glass		Plain		FALSE	2		Body	Indeterminate bottle/jar	1903		Jones & Sullivan 1985; Lindsey 2017	
022	15Wa193	STP 19	I	0-10 cm bgs	80	M	General Hardware	Band		Iron / Steel				FALSE	1							
023	15Wa193	STP 19	II	10-26 cm bgs	81	A	Nails	Wire Nail	6d	Unaltered		Common		FALSE	1				1880		Nelson 1968	
023	15Wa193	STP 19	II	10-26 cm bgs	82	A	Nails	Wire Nail	8d	Pulled		Finish		FALSE	1				1880		Nelson 1968	
023	15Wa193	STP 19	II	10-26 cm bgs	83	D	Ceramics	Ironstone	Undecorated					FALSE	1		Body					
023	15Wa193	STP 19	II	10-26 cm bgs	84	D	Glass Tableware	Press mold: unleaded		Clear unleaded glass			Undecorated / Plain	FALSE	1		Body		1864		Jones 2000:149; Miller & Sullivan 1984	
023	15Wa193	STP 19	II	10-26 cm bgs	85	D	Container Glass	Automatic Bottle Machine		Clear glass		Plain		FALSE	1		Body	Indeterminate bottle/jar	1903		Jones & Sullivan 1985; Lindsey 2017	
023	15Wa193	STP 19	II	10-26 cm bgs	86	U	Glass	Amorphous						TRUE	1							

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024	15Wa193	STP 20	I	0-19 cm bgs	95	D	Container Glass	Automatic Bottle Machine		Clear glass		Plain		FALSE	1		Body	Indeterminate bottle/jar	1903		Jones & Sullivan 1985; Lindsey 2017	
024	15Wa193	STP 20	I	0-19 cm bgs	87	U	Plastic	Modern		Amorphous				TRUE	2				1930		Meikle 1995	
024	15Wa193	STP 20	I	0-19 cm bgs	88	A	Construction Material	Asphalt Composition	Roofing / siding					FALSE	2				1903	1980	Wilson and Snodgrass 2008:2	
024	15Wa193	STP 20	I	0-19 cm bgs	89	A	Flat Glass	Window Glass	0.86 - 2.41 mm thick					FALSE	1				1785	1917	Moir 1987	
024	15Wa193	STP 20	I	0-19 cm bgs	90	F	Lighting	Lamp Chimney	Glass: clear			Plain		FALSE	1				1854	1940	Faulkner 2008; Pullin 1986:356	
024	15Wa193	STP 20	I	0-19 cm bgs	91	D	Container Glass	Automatic Bottle Machine		Clear glass		Embossed		FALSE	1		Body	Indeterminate bottle/jar	1903		Jones & Sullivan 1985; Lindsey 2017	"…P… / …PEN… / …23…"
024	15Wa193	STP 20	I	0-19 cm bgs	92	D	Container Glass	Automatic Bottle Machine		Amber glass		Plain		FALSE	1		Body	Beer bottle	1903		Jones & Sullivan 1985; Lindsey 2017	
024	15Wa193	STP 20	I	0-19 cm bgs	93	D	Container Glass	Automatic Bottle Machine		Clear glass		Enameled label		FALSE	1		Body	Indeterminate bottle/jar	1935		Jones & Sullivan 1985; Paul & Parmalee 1973:57	
024	15Wa193	STP 20	I	0-19 cm bgs	94	D	Container Glass	Automatic Bottle Machine		Amethyst glass		Plain		FALSE	1		Body	Indeterminate bottle/jar	1870	1920	Lockhart 2006	
024	15Wa193	STP 20	I	0-19 cm bgs	96	C	Other Fasteners	Grommet						FALSE	1				1930		Luscomb 1992:154	Plastic
024	15Wa193	STP 20	I	0-19 cm bgs	97	A	Construction Material	Brick	Machine made brick: vitrified					FALSE	1	531.5			1880		Holley 2009:97	
025	15Wa193	STP 21	I	0-10 cm bgs	98	D	Ceramics	Ironstone	Undecorated					FALSE	2		Body		1830		Majewski and O'Brien 1987:122	mends
025	15Wa193	STP 21	I	0-10 cm bgs	99	D	Container Glass	Automatic Bottle Machine		Clear glass		Plain		FALSE	3		Body	Indeterminate bottle/jar	1903		Jones & Sullivan 1985; Lindsey 2017	
025	15Wa193	STP 21	I	0-10 cm bgs	100	D	Container Glass	Automatic Bottle Machine	Indeterminate	Clear glass		Embossed		FALSE	1		Base	Indeterminate bottle/jar	1903		Jones & Sullivan 1985; Lindsey 2017	"17…"