Contract Publication Series 15-420

AN ARCHAEOLOGICAL SURVEY FOR THE PROPOSED RECONSTRUCTION OF A RAILROAD BRIDGE, GRANT COUNTY, KENTUCKY

by
Richard L. Herndon, RPA

Prepared for

KENTUCKY TRANSPORTATION CABINET

Prepared by

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Prepared for

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ABSTRACT

On November 12 and 19, 2015, Cultural Resource Analysts, Inc., personnel completed an archaeological survey for the proposed reconstruction of a railroad bridge in Grant County, Kentucky. The survey was conducted at the request of David Waldner of the Kentucky Transportation Cabinet. The project area encompassed approximately 1.5 ha (3.6 acres) of slope and upland ridge landforms. The entire project area was subject to pedestrian survey and systematic shovel testing. Land within the project area was primarily residential properties, woods, and some public right-of-way.

A records review was conducted at the Office of State Archaeology prior to fieldwork. The review found that no previously recorded archaeological sites were located within a 2 km radius of the project area. One archaeological site (15Gr73) was recorded as a result of this survey. It was a late-nineteenth to early-twenty-first-century farmstead/residence with a low density artifact scatter and a mix of historic and modern standing structures. Given the sparse assemblage and disturbed context, the site was not recommended for further work. However, the site may extend north outside the project area. If the project area expands in that direction in the future then additional survey work may be needed. No archaeological sites listed in or eligible for the National Register of Historic Places will be affected by the proposed construction activities. Therefore, archaeological clearance is recommended.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

I. INTRODUCTION

On November 12 and 19, 2015, Cultural Resource Analysts, Inc. (CRA), personnel completed an archaeological survey for the proposed reconstruction of a railroad bridge in Grant County, Kentucky.

The survey was conducted at the request of David Waldner of the Kentucky Transportation Cabinet (KYTC).

The project area encompassed approximately 1.5 ha (3.6 acres) of slope and upland ridge landforms.

The fieldwork was completed by Richard Herndon and Karen Taylor in 18 work hours, and the field methods consisted of pedestrian survey supplemented with systematic screened shovel testing. Office of State Archaeology (OSA) Geographic Information Systems (GIS) data requested by CRA on October 27, 2015, was returned on October 30, 2015. The OSA project registration number is FY16_8661.

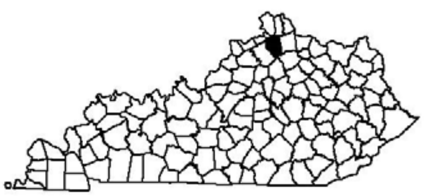

Figure 1. Map of Kentucky showing the location of Grant County.

Project Description

The project consists of an archaeological survey for the reconstruction of an antiquated bridge over a wide railroad corridor in Grant County, Kentucky. As seen in Figure 3, the proposed new right-of-way (ROW) occurs along both sides of the road for approximately 305 m (1,000 ft). Land within the project area consisted primarily of residential properties, woods, and some public ROW. Disturbance within the project area was associated with the initial construction of the existing road and the railroad as well as residential buildings.

Purpose of Study

The study was conducted to comply with Section 106 of the National Historic Preservation Act. This transportation project is federally funded and is therefore considered an undertaking subject to 106 review. The purpose of this assessment was to locate, describe, evaluate, and make appropriate recommendations for the future treatment of any historic properties or sites that may be affected by the project. 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). Cultural deposits less than 50 years of age were not considered sites in accordance with “Archeology and Historic Preservation: Secretary of the Interior’s Standards and Guidelines” (National Park Service 1983).

A description of the project area, the field methods used, and the results of this investigation follow. The investigation is intended to conform to the *Specifications for Conducting Fieldwork and Preparing Cultural Resource Assessment Reports* (Sanders 2006).

Summary of Findings

Prior to conducting the field research, a records review was conducted at OSA. The review indicated that no archaeological sites or investigations had been documented within the project area. One archaeological site (15Gr73) was recorded during the survey. It was a late-nineteenth to early-twenty-first-century farmstead/residence with a low density artifact scatter and a mix of historic and modern standing structures. Given the sparse assemblage and disturbed context, the site was not recommended for further work. However, the site may extend north outside the project area. If the project area expands in that direction in the future then additional survey work may be needed. No archaeological sites listed in or eligible for listing in the National Register of Historic Places (NRHP) will be affected by the proposed construction, and archaeological clearance is recommended.

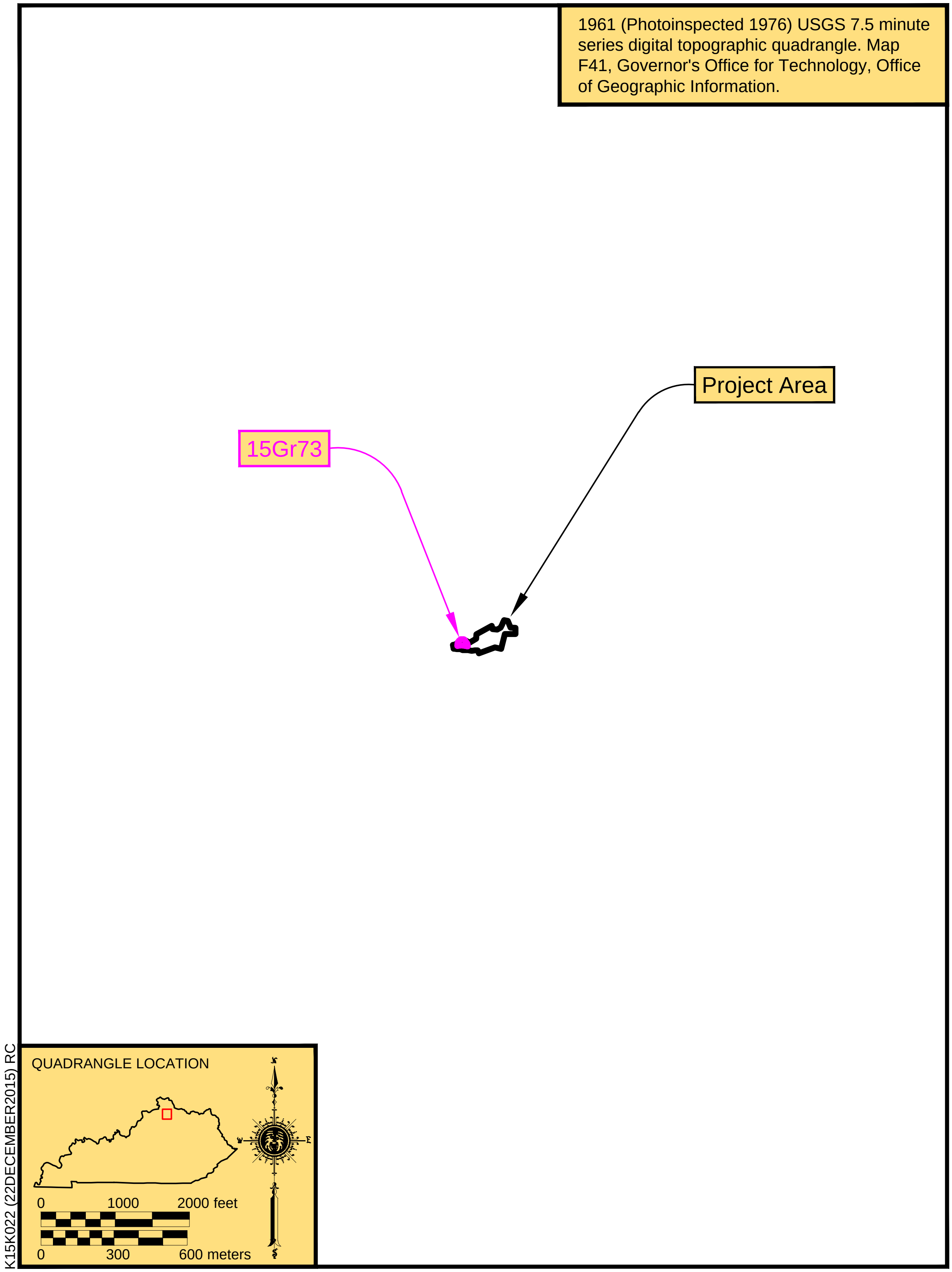

Figure 2. Location of project area on topographic quadrangle.

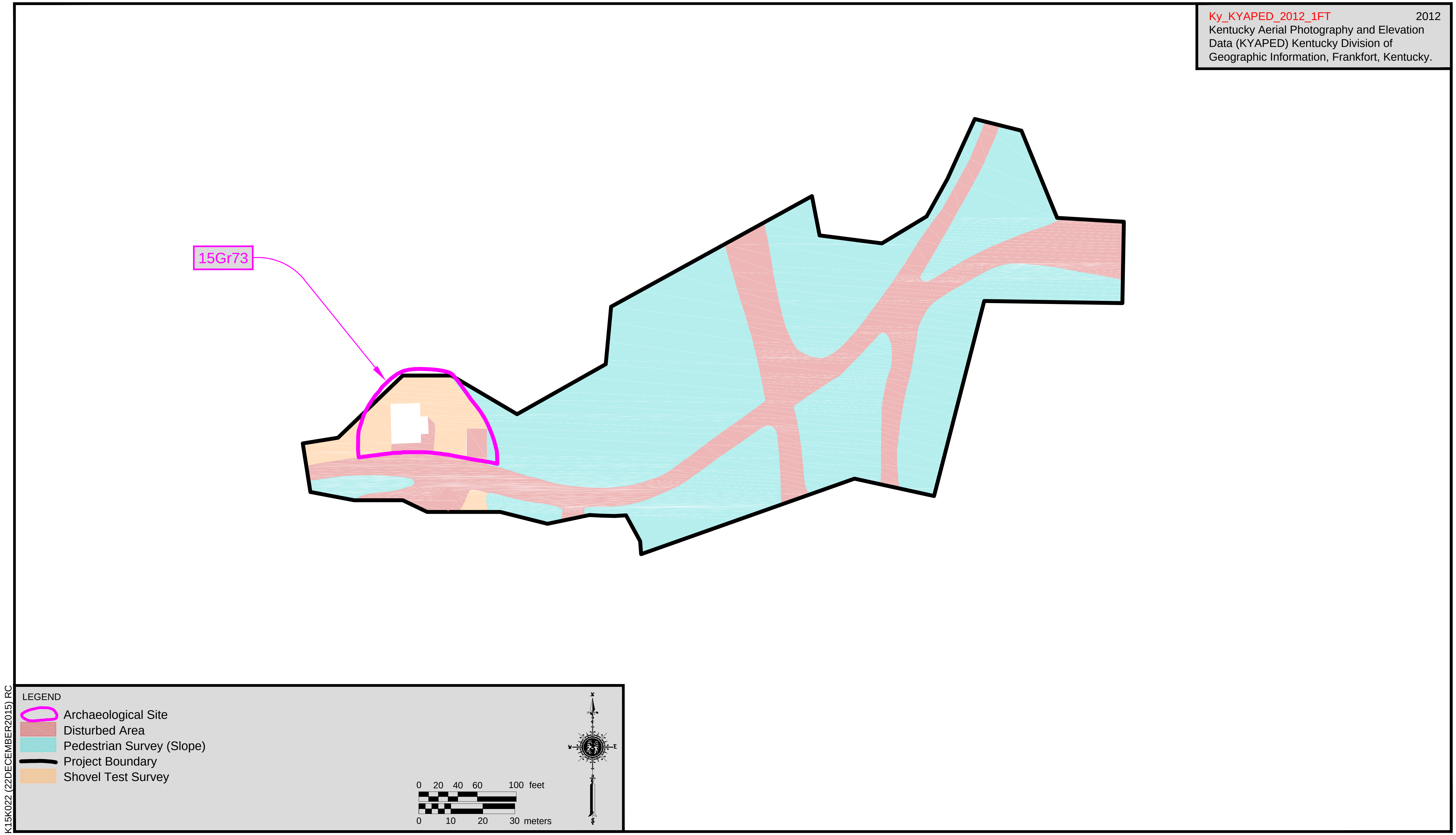

Figure 3. Project area plan map.

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 Bluegrass region are discussed below.

The Bluegrass region of Kentucky (Figure 4) is third in size behind the Mississippian Plateaus and Eastern Kentucky Coal Field regions, but it is larger than the Western Kentucky Coal Field and Mississippi Embayment regions (Raitz 1973:53; Schwendeman 1979:28). The Bluegrass region acquired its name from the appearance of a bluish colored grass that is known botanically as *Poa pratensis* and commonly as Kentucky Bluegrass, and the region is referred to as the "Heart of Kentucky" (Davis 1927:3; Raitz 1973:53). The Bluegrass region is divided into three subregions: the Inner Bluegrass, Outer Bluegrass, and the Knobs. Each of these subregions has unique physical differences that distinguish them from each other. Grant County is located within the Outer portion of the Bluegrass region.

The Outer Bluegrass

The Outer Bluegrass subregion of Kentucky is similar topographically and geologically to the Inner Bluegrass subregion in that it is somewhat karst and gently rolling, but it is also more rugged and is underlain by Ordovician siltstone, limestone, and shale, as well as by Silurian dolomite on its western edge (Newell 2001; O'Brien 1984:61; Pollack 2008a:17). Situated between the Inner and Outer Bluegrass is a belt of shale commonly known as the Eden Shale Belt or Eden Shale Hills (O'Brien 1984:61; Raitz 1973:54; Schwendeman 1979:30). This area has been extensively eroded over time, which has contributed to the exposure of an underlying shale bed that is less resistant than other rocks (O'Brien 1984:61). The counties located completely within the Outer Bluegrass consist of Boone, Bracken, Campbell, Carroll, Gallatin, Grant, Henry, Kenton, Mason, Oldham, Owen, Robertson, Shelby, Spencer, Trimble, and Washington. Anderson, Clark, Harrison, Mercer, Nicholas, and Pendleton Counties encompass portions of both the Inner and Outer Bluegrass. Portions of Bath, Bullitt, Fleming, Jefferson, and Nelson Counties overlap with the Knobs. Portions of Boyle, Garrard, Madison, and Montgomery Counties are within the Inner Bluegrass, Outer Bluegrass, and Knobs subregions. Finally, Lincoln and Marion Counties overlap with the Knobs subregion, and small portions extend into the Mississippian Plateaus region.

Like the Inner Bluegrass subregion, rivers that cross the Outer Bluegrass flow through meandering courses that are entrenched well below the plains and low hills. River bottoms within the Outer Bluegrass are narrow, discontinuous, and confined by limestone cliffs and wooded slopes, although they widen at their confluence with the Ohio Valley (Newell 2001). The Outer Bluegrass is bordered to the north and west by the Ohio River and to the south and east by the Knobs region. The Outer Bluegrass circumscribes the Inner Bluegrass region on all sides. The Kentucky, Licking, Ohio, and Salt Rivers and their tributaries drain this region (Figure 5).

Vegetation in the Bluegrass

The Inner and Outer Bluegrass and the western portion of the Knobs are located within the Western Mesophytic Forest region as defined by Braun (2001:122–161), whereas the eastern portion of the Knobs is situated within the Mixed Mesophytic Forest region. The Western Mesophytic Forest region offers a mosaic pattern of climax vegetation types that are often less luxuriant than those observed for the Mixed Mesophytic Forest region (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.

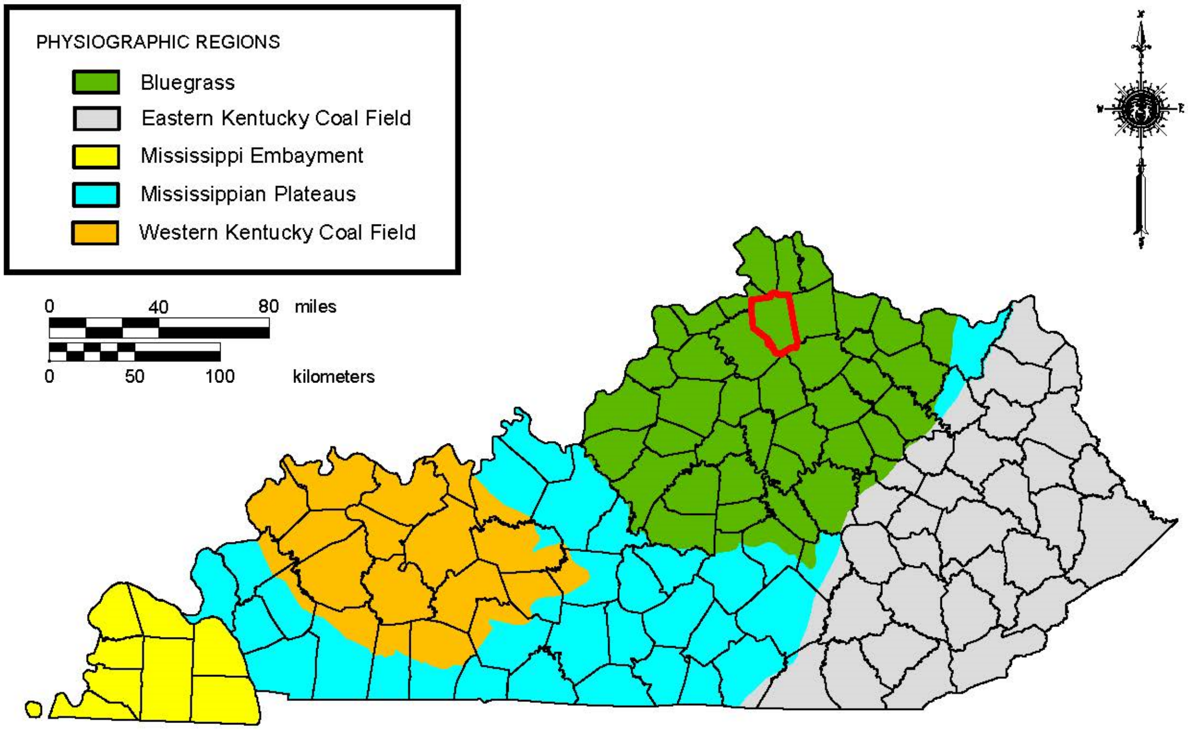

Figure 4. The Bluegrass region.

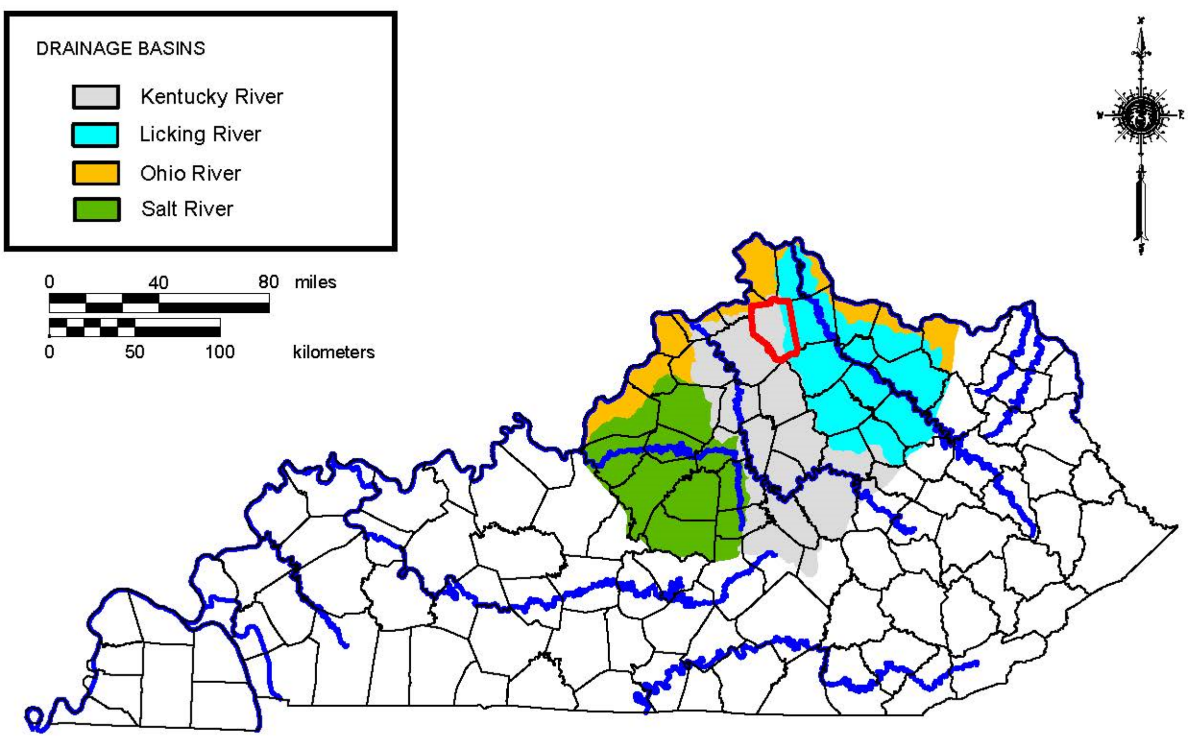

Figure 5. Rivers that drain the Bluegrass region.

Braun (2001:529) states that the modern pattern of forest distribution is the result of past and present environmental influences, such as changes in climate, topography, or soil, bringing about changes in vegetation.

The Mixed Mesophytic Forest region is described as the most complex and oldest association of the Deciduous Forest Formation (Braun 2001:39). Mixed mesophytic refers to a climax association in which dominance is shared by a number of species, and the dominant trees are beech, tulip tree, basswood, sugar maple, chestnut, sweet buckeye, red oak, white oak, and hemlock (Braun 2001:40). The composition and abundance of dominants in the Mixed Mesophytic Forest region vary by geographic location and correlate to soil moisture, humidity, and the character of underlying rock (Braun 2001:119). Oak-hickory and oak-chestnut communities are typically located along dry slopes and ridges, while scrubby oak thickets and groves of pine can be found along low slopes of wide valleys (Braun 2001:121). Secondary white oak forest occupies much of the valley floors not in pasture or cultivation, whereas swampy valley flats are composed primarily of pin oak, sweet gum, and red maple (Braun 2001:121).

A historic account from 1784 indicates that a variety of vegetation types were abundant in the Bluegrass region in general, including sugar maple, honey locust, mulberry, wild cherry, laurel, buckeye, cane, wild rye, clover, buffalo grass, wild lettuce, and pepper grass (Braun 2001:127–128). Mid-nineteenth-century accounts indicate that at least 25 species of trees were present in the Inner Bluegrass region, including sugar maple, walnut, several oaks, hickories, ash, wild cherry, black locust, honey locust, and mulberry. Notably, beech was not mentioned in the early accounts (Braun 2001:129). Blue ash and bur oak are the dominant tree types in the modern Inner Bluegrass. Interestingly, the bluegrass for which the region is named is not considered an indigenous species (Davis 1927).

Locust, sugar maple, hickory, black walnut, ash, wild cherry, white oak, and an undergrowth of cane were reported for the Outer Bluegrass during the mid-nineteenth century, and unlike the Inner Bluegrass, the presence of beech was noted in some communities (Braun 2001:130). In areas of the subregion that have a more rolling topography, beech, tulip tree, sugar maple, white oak, and red oak were abundant (Braun 2001:130).

Burroughs (1926:93) states that a late-nineteenth-century account indicated maples and white oak were historically common in the Knobs subregion; that beech and red cedar were common in areas underlain by limestone; that pine, hemlock, laurel, and holly were located along cliffs and peaks; and that chestnut and oak forests were located along plateaus. During the 1920s, the natural forest growth consisted of oaks, hickory, chestnut, and Virginia pine, and sycamores were found along streams. Redbud and dogwood were found along knob slopes, and mistletoe was often seen along the limestone belts (Burroughs 1926:93–94).

Soils of the Bluegrass

The inner and outer portions of the Bluegrass region are predominantly 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 high in fertility 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 Inner and Outer Bluegrass subregions are predominantly 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 made up of 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).

The Knobs portion of the Bluegrass region is predominantly mapped as the Inceptisol soil order. 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).

The Knobs subregion is predominantly 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 these areas of 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, Gallatin and Trimble Counties make up a small area that is predominantly mapped as the Mollisols soil order. They are grassland soils, and because of 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).

Gallatin and Trimble Counties are predominantly 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 Bluegrass region displays diverse and abundant sources of lithic raw material that could have been exploited by prehistoric inhabitants. Silurian- and Ordovician-age dolomite, limestone, siltstone, and shale deposits outcrop in various areas of the region (United States Geological Survey [USGS] 2011). These deposits contain Grier cherts, which predominate in the Inner Bluegrass area, and Gilbert, Tyrone, and Salvisa cherts, which predominate in the Outer Bluegrass. In the Knobs area, the Devonian to Mississippian-age limestone and shale deposits contain predominantly Boyle and Brassfield cherts. Pleistocene to Holocene-age glacial deposits in the Louisville area contain a variety of cherts. Grier chert is a low to moderate quality chert; however, it is abundant in some areas and was often used as a source of tool stone for prehistoric groups. Gilbert, Tyrone, and Salvisa cherts exhibit a more restricted geographic range than Grier chert; therefore, they are not as commonly recovered on prehistoric sites in the region. Boyle and Brassfield cherts are both high quality cherts and are abundant in the Outer Bluegrass region. Both of these materials were used by prehistoric people in the region.

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 12,900–11,650 B.P.) during which megafauna species became extinct, vegetation changed dramatically, and temperature fluctuated markedly. It was also a period of noticeable settlement shift that marked the appearance of a variety of subregional cultures across eastern North America (Anderson 2001).

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 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 located in southwestern Grant County, Kentucky (see Figures 2 and 3). It is 1.5 ha in size and included both the north and south sides of the existing road. Elevations in the project area ranged from 280 m (920 ft) above mean sea level (AMSL) to around 299 m (980 ft). An intermittent stream south of the project area is a tributary of Fork Lick Creek, which eventually empties into the Licking River.

Ground surface visibility within many portions of the project area was obscured by leaf litter and forests (Figure 6), although a few areas were grassy fields (Figure 7) or manicured lawns (Figure 8). Other portions of the project area had been previously disturbed by the construction of a railroad (Figure 9). The last two figures also document the slope that was present. In fact, much of the area north of the road was composed of steep hillslope.

Figure 6. General overview depicting wooded areas north of the road and west of the bridge, facing east.

Figure 7. General overview of grassy field north of the road on the east side of the bridge, facing northeast.

Figure 8. Overview of a manicured lawn in the project area, facing northeast.

Figure 9. Railroad corridor that bisects the project area.

One soil series has been defined in the project area, Eden (Froedge and Weisenburger 1980). The soil series are classified by the amount of time it has taken them to form and the landscape position they are found in (Birkeland 1984; Soil Survey Staff 1999).

The Eden series consists of moderately deep, well drained soils found on narrow ridge tops and hillsides. They formed from residuum of calcareous shale interbedded with layers of limestone and siltstone. A typical Eden profile shows an Ap horizon of brown (10YR 4/3) silty clay loam with patches of yellowish brown (10YR 5/4) silty clay, extending 0–15 cm (0–6 in) below ground surface (bgs). Below that is a B2t horizon of yellowish brown (10YR 5/4) silty clay with few yellowish brown (10YR 5/6) mottles, 5 percent silt stone and 5 percent limestone fragments, extending 15–31 cm (6–12 in) bgs. Below that is a B3 horizon of light olive brown (2.5Y 5/4) flaggy silty clay with common light brownish gray (2.5Y 6/2), grayish brown (2.5Y 5/2), and dark yellowish brown (10YR 4/4) mottles. This horizon also contains 5 percent siltstone, 5 percent limestone and 10 percent shale fragments (Froedge and Weisenburger 1980:40).

Sediments observed in shovel probes closely conformed to the description given above. The top zone was a dark brown (10YR 3/3) silty clay loam that extended to approximately 24 cm (9 in) bgs although in some locations it was 10 cm (4 in) bgs. The underlying subsoil was a brownish yellow (10YR 6/6) silty clay with many fine iron/manganese concretions. Shovel probes at Site 15Gr73 were very similar, but the top zone had moderate amounts of cinder and coal present as well.

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 (FY16_8661) 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 no archaeological sites listed in the NRHP were situated within the current project area or within a 2 km radius of the project area. The OSA file search was conducted between October 27 and 30, 2015. 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.

Archaeological Site Data

According to available data, 54 archaeological sites have been recorded in Grant County (Table 1). The site data indicate that the majority of archaeological sites recorded in the county are open habitation sites without mounds followed distantly by historic farm/residences. The remaining few sites were a cemetery, a site labeled other, and four sites that were undetermined. Nearly all of the sites were located either on terraces or dissected uplands.

Table 1. Summary of Selected Information for Previously Recorded Archaeological Sites in Grant County, Kentucky. Data Obtained from OSA and May Contain Coding Errors.

Site Type:	N	%
Cemetery	1	1.85
Historic Farm/Residence	9	16.67
Open Habitation Without Mounds	39	72.22
Other	1	1.85
Undetermined	4	7.41
Total	54	100
Time Periods Represented:	N	%
Paleoindian	0	0
Archaic	11	17.46
Woodland	10	15.87
Late Prehistoric	9	14.29
Indeterminate Prehistoric	22	34.92
Historic	10	15.87
Unspecified	1	1.59
Total	63*	100
Landform:	N	%
Dissected Uplands	15	27.78
Terrace	35	64.81
Undissected Uplands	1	1.85
Unspecified	3	5.56
Total	54	100

**One site may represent more than one time period.*

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.

1942 General Highway Map of Grant County, Kentucky (Kentucky State Highway Department [KSHD]);

1950 Mason, Kentucky, 7.5-minute series topographic quadrangle (USGS);

1954 Highway and Transportation Map of Grant County, Kentucky (Kentucky Department of Highways [KDOH]).

The 1942 and 1954 highway maps were not particularly useful in the identification of historic map structures given the scale at which they were drawn. There does appear to be structures, probably residences, close to the project area in both, but it is difficult to be sure. The 1950 topographic map, however, clearly shows four structures located in or immediately adjacent to the project footprint.

Map Structure 1 was located on the north side of the road west of the bridge spanning the railroad corridor. This structure is located within the proposed project area and corresponds to Site 15Gr73, a historic late nineteenth to early-twenty-first-century farmstead/residence (Figure 10). Map Structure 2 is depicted south of the road on the east side of the bridge. It was likely a barn or abandoned residence. A modern metal garage is now located over this area and no archaeological evidence of the former building was noted during the survey. Map Structure 3 is located south of Map Structure 1 across CR 1138 and appears to be just outside the project area. A modern residence is now located in this area and no archaeological evidence of the former structure, a residence, was noted. Lastly, Map Structure 4 is located northeast of Map Structure 2 on the same side of CR 1138. It was a residence as well and was located just outside the project footprint. This building is still present. No archaeological evidence associated with this structure was noted. Map Structures 2, 3, and 4 were investigated for archaeological deposits according to accepted methodology, as described in the Methods section of the report.

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. Prehistoric open habitation sites were the primary site types expected, but historic residences were also considered a possibility.

Cultural Overview

Early Human Occupation (Before 11,050 B.C.)

The timing and actual entry point of the first humans into North America are still topics for debate. The general consensus remains that humans entered North America from Asia via the Bering Strait. Waters and Stafford

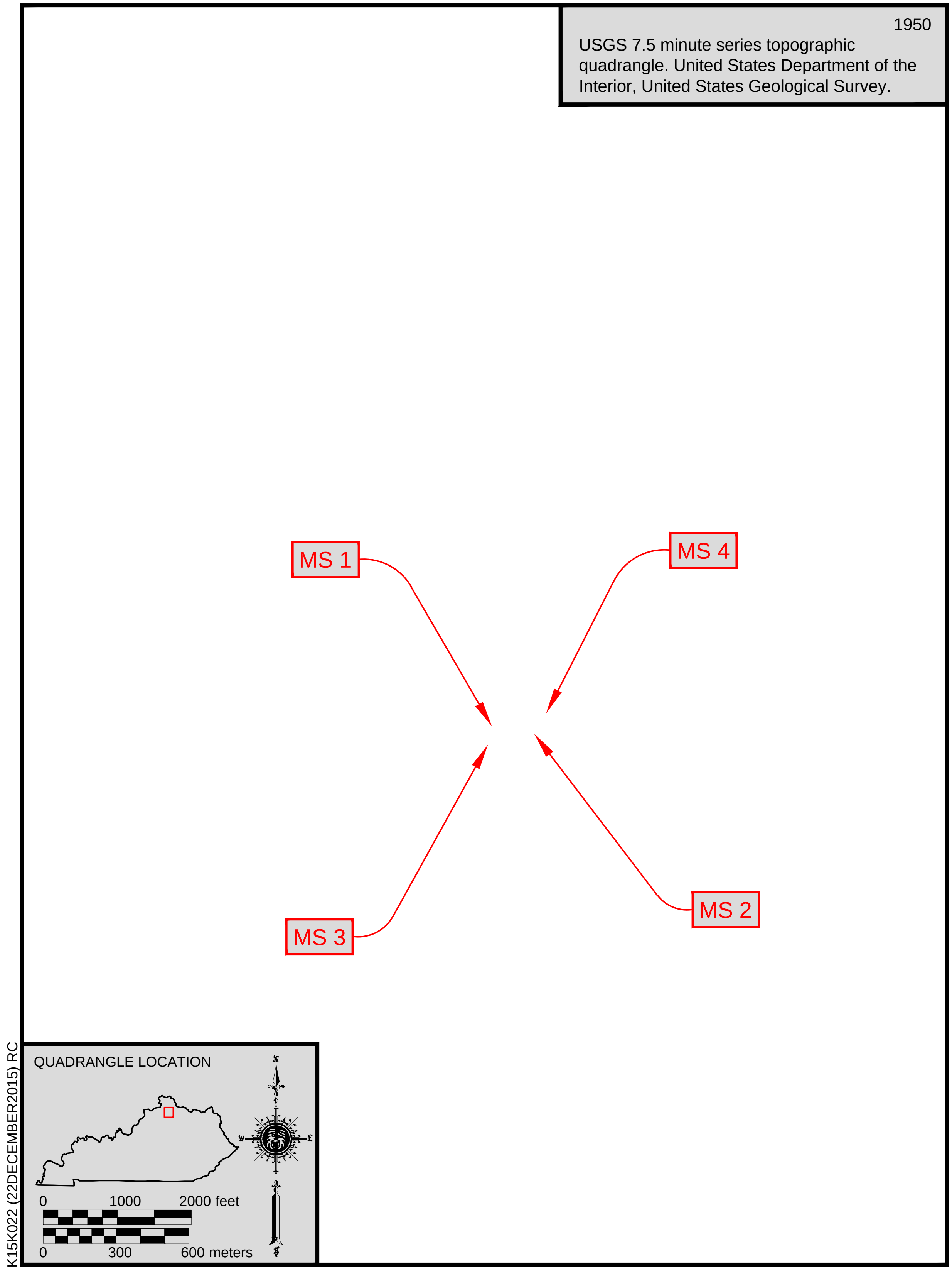

Figure 10. The 1950 topographic map showing the location of map structures.

(2013:557) summarized the currently available data and conclude that the First Americans originated in Central Asia and started entering the New World circa 16,000 B.P. Clovis developed later and was a New World construct.

Several sites in the southeastern United States have been suggested as pre-Clovis candidates. Among these are the Cactus Hill site in southeast Virginia (McAvoy and McAvoy 1997; Wagner and McAvoy 2004), the Topper site in South Carolina (Chandler 2001; Goodyear 1999; Goodyear and Steffy 2003), and the Debra L. Friedkin site in Texas (Waters et al. 2011). Despite the evidence of pre-Clovis occupations in many areas, to date, no definitive pre-Clovis occupations or materials have been found in Kentucky (Maggard and Stackelbeck 2008:114).

The Paleoindian Period (11,050–8000 B.C.)

The Paleoindian period is the earliest cultural period conclusively documented in Kentucky. The arrival of humans in the region was probably linked to the movements of the Pleistocene glaciers. During the Paleoindian period, the last of these glacial advances and retreats, called the Greatlakean Stadial (post-9900 B.C.), occurred.

Distinctive lanceolate, often fluted, hafted bifaces called "Clovis" are the hallmark of the early part of the Paleoindian period (Maggard and Stackelbeck 2008). Unifacially and bifacially chipped tools, such as knives, scrapers, spokeshaves, drills, gravers, and endscrapers with spurs, have also been recovered. Archaeologists infer that artifacts and tools of wood, bone, and shell were also used, although they were rarely preserved. While a number of archaeologists have argued that Paleoindians were predominately big game hunters (e.g., Bonnichsen et al. 1987; Kelly and Todd 1988; Stoltman and Baerreis 1983), more recent review of the topic (Meltzer 1993) concluded that there is no widespread evidence for the specialized hunting of big game species (i.e., megafauna). Several authors (e.g., Davis 1993; Dincauze 1993; Meltzer 1993) now argue that the Paleoindian diet was more generalized and relied on a number of faunal and floral species. Megafauna would have been taken when encountered, but not to the exclusion of other species. Such indications of exploitation of megafauna in Kentucky are present at the Adams mastodon site in Harrison County, Kentucky. Here, the remains of a single mastodon with cut marks on the bones were found in association with large limestone slabs. The configuration of the skeletal remains, in addition to the above evidence, has been interpreted as representative of a possible butchering site (Duffield and Boisvert 1983; Walters 1988).

According to Freeman et al. (1996:402), most Paleoindian sites in Kentucky "represent short, ephemeral occupations that occur in shallow, deflated, or severely disturbed deposits" and larger sites are in "areas that provide high-quality lithic raw material, or topographic features or resources that would have attracted and concentrated game." Away from lithic source areas, for example, larger sites often "occur in association with ponded or slow-moving water, at stream confluences and fords, along major game trails, and at mineral springs" (Freeman et al. 1996:402).

With the retreat of the glaciers, the Transitional Paleoindian/Early Archaic sites of the Dalton culture are slightly more numerous than the earlier Paleoindian sites. Sites dating to this period show many resemblances to those with Paleoindian material (i.e., lanceolate projectile point knives, uniface tools) and those reflecting Early Archaic lifeways (i.e., more diverse subsistence, the introduction of many bifacial tool forms, and several types of sites). Morse (1973) has described two basic kinds of Dalton sites: base settlements and butchering camps. In addition, the first systematic use of rockshelters is seen during the Dalton period (Walthall 1998). Hunting remained important; however, there is evidence for the use of wild plants (fruits and nuts) as a dietary supplement during Dalton times.

The Archaic Period (8000–1000 B.C.)

The Archaic period includes a long span of time during which important cultural changes took place. These manifestations probably occurred in response to environmental changes that took place at the close of the Pleistocene epoch (Anderson 2001). The Archaic period is customarily divided into three subperiods: Early (8000–6000 B.C.), Middle (6000–4000 B.C.), and Late (4000–1000 B.C.).

Early Archaic (8000–6000 B.C.)

Except for the adoption of new hafted biface styles, Early Archaic tool kits are nearly identical to Paleoindian. The fact that these hafted biface styles are found over a very large area suggests that little regional subsistence diversity occurred during the Early Archaic subperiod. Subsistence strategies are thought to have been similar to those employed by Paleoindian peoples, although a greater variety of game was hunted. The scarcity of tools associated with the preparation of plant foods and fishing in the early part of the Archaic period indicates that hunting was probably still the major subsistence activity (Dragoo 1976:11). Archaeological investigations at a number of deeply buried sites in the Southeast, such as the Longworth-Gick site near Louisville, Kentucky (Collins 1979), have provided important information about Archaic lifeways and their changes through time.

Middle Archaic (6000–4000 B.C.)

The climate during the Middle Archaic subperiod was dryer and warmer than the modern environment. Increasing regionalization of artifact assemblages, with the addition of new artifact classes and hafted biface styles, implies the development of extensive resource exploitation strategies. The Middle Archaic is marked by the introduction of groundstone artifacts manufactured through pecking, grinding, and polishing. A number of these groundstone tools (e.g., manos, mortars and pestles, and nutting stones) are interpreted as plant food processing artifacts and indicate an increasing utilization of plant foods during the Middle Archaic subperiod (Jefferies 2008:203–206).

New hafted biface styles appeared during this subperiod. Stemmed, side-notched, and corner-notched points and a variety of bone tools, including antler hafted bifaces, fishhooks, and gouges, suggest an improved efficiency in exploiting local resources. Middle Archaic sites tend to contain larger accumulations of materials than those of earlier periods, "suggesting increasing group size and either increased sedentism or carefully scheduled seasonal reoccupation of selected locations" (Cohen 1977:191). Chapman (1975) has suggested that hafted bifaces were probably used in conjunction with the atlatl, a device that increases the distance and accuracy of a spear throw. The recovery in Middle Archaic contexts of bone and groundstone objects (bannerstones) interpreted as atlatl weights tends to support his suggestion (cf., Neuman 1967:36–53). Certain classes of chipped stone tool artifacts, such as scrapers, unifaces, drills, and gouges, indicate a continuation of their importance from the Paleoindian period.

Late Archaic (4000–1000 B.C.)

The Late Archaic subperiod was a time of continued cultural expansion and growing complexity. Dragoo (1976:12–15) has discussed several Late Archaic traditions for the Eastern Woodlands. Their distinctiveness stems from varied regional responses reflected in material culture. Straight-stemmed, basal-notched, or contracted-base hafted bifaces characterize the Late Archaic subperiod. Judging from the greater number of Late Archaic sites that have been recorded, an increase in population can be postulated. In some cases, evidence of longer and more intensive site occupation suggests extended habitation within an area.

Population increase and, in some parts of Kentucky, evidence of an increase in mortuary ceremonialism have led some to suggest that a more complex social organization was developing in some areas of the eastern United States. Along the Green River in west-central Kentucky, large shell-mound sites, such as Chiggerville (Webb and Haag 1939), Indian

Knoll (Webb 1946), and Carlston Annis (Webb 1950), contain hundreds of human burials and evidence of complex mortuary practices and a rich ceremonial life. The development of interregional trading networks is indicated by the recovery of copper, marine shell, and other nonlocal artifacts from Late Archaic burials (Winters 1968), which testify to the growing complexity of burial ritual and the interaction of many groups (Dragoo 1976:17).

The appearance of cultigens in Late Archaic contexts has been interpreted as evidence of early plant domestication and of use of these plants as subsistence resources. Early cultigens have been documented at such sites as Koster in central Illinois (Brown 1977:168), the Carlston Annis and Bowles sites along the Green River in west-central Kentucky (Marquardt and Watson 1976:17), and Cloudsplitter shelter in Menifee County (Cowan et al. 1981). Two plant complexes were domesticated towards the end of the Archaic: non-native plants (e.g., squash and gourd) and native plants (e.g., chenopodium, marsh elder, sunflower) (Struever and Vickery 1973). Watson (1985) views these plants as two different groups of cultigens—the East Mexican Agricultural Complex and the Eastern United States Agricultural Complex. The first includes squash (*Cucurbita pepo*), bottle gourd (*Legenaria siceraria*), and maize (*Zea mays*). The latter includes sunflower (*Helianthus annus*), sumpweed (*Iva annua*), chenopod (*Chenopodium sp*.), maygrass (*Phalaris sp*.), and knotweed (*Polygonum sp*.). Watson, like Struever and Vickery (1973), suggests that corn, squash, and bottle gourd were domesticated in Mexico and imported into the eastern United States by way of the Gulf of Mexico before being transported up the Mississippi River and its tributaries. Cowan et al. (1981:71), however, suggest that squash may "have evolved in situ from some distinctive North American stock" (Cowan et al. 1981:71). This interpretation seems to be substantiated by more recent investigations conducted throughout the Southeast and Midwest.

A number of hafted biface styles are considered terminal Late Archaic and appear in the Early Woodland subperiod (i.e., from approximately 2000 to 500 B.C.). They usually have been found in contexts without Woodland pottery, a situation that leads archaeologists to place them in the Late Archaic rather than the Early Woodland subperiod, which may not be the case.

The Woodland Period (1000 B.C.–A.D. 1000)

Over the two millennia of the Woodland period, cultures in the region sharply diverged from their Archaic beginnings. Kentucky shared in this development, which produced in burial mounds and earthwork enclosures some of the more notable prehistoric monuments in the area. Alongside this development came the intensification of plant domestication, the introduction and spread of pottery—first used as specialized containers and later used more widely—and the intensification of trade with distant regions of the Midwest for exotic materials used in personal life, including burial offerings (Applegate 2008).

The Woodland period, like the preceding Archaic period, is divided into three subperiods: Early Woodland (1000–300 B.C.), Middle Woodland (300 B.C.–A.D. 400), and Late Woodland (A.D. 400–1000) (Applegate 2008). Overall, and despite its distinctive features, the period witnessed a continuation and elaboration of many technologies and cultural practices that had begun during the Late Archaic subperiod. Woodland peoples became increasingly dependent on the cultivation of native plant foods, which allowed for a more sedentary lifestyle. Yet, with the exception of the latter part of the Late Woodland subperiod, subsistence practices remained similar to those of the Archaic period (i.e., a combination of hunting, plant food gathering, and fishing in a seasonal round exploitation pattern). But it is within the Woodland period that highly visible site types, such as mounds and enclosures, were constructed (Applegate 2008).

Early Woodland (1000–300 B.C.)

The Early Woodland subperiod is taxonomically separated from the preceding Late Archaic subperiod by the presence of pottery. Pottery vessels possibly first appear in central and eastern Kentucky around 1000–800 B.C. (Creasman 1995; Creasman et al. 1996) and certainly by circa 600 B.C. (Creasman 1995; Creasman et al. 1996; Niquette 1989:124). Ceramic trends in this region of Kentucky generally follow the patterns of technological evolution and elaboration observed elsewhere in the Midwest and Northeast. Most sherds recovered from Early Woodland sites in the region are small and fragmentary. These are generally thick and coarsely tempered. Cordmarked, plain, and fabric impressed surface treatments are common (Applegate 2008:343). In contrast, Kerr (1995) recovered a relatively thin and well-made Early Woodland ceramic from the Main site in Bell County, Kentucky. The pottery is densely tempered with crushed quartzite, and the exterior surface is either plain or cordmarked. Early Woodland sites are most easily recognized by a collection of related stemmed hafted biface types. Plant domestication is evident, with squash, gourd, sunflower, maygrass, sumpweed, and giant ragweed being recovered from Early Woodland sites (Cowan 1985), although their use and cultivation had intensified from the Late Archaic subperiod.

Separate ritual (individual burials, earthen enclosures, and burial mounds) and domestic sites, each with distinctive, possibly regional, characteristics, also appear during this time (Clay 1991, 1998, 2002). Widely scattered domestic sites have been identified on the floodplains along all the major watercourses across Kentucky (Cole et al. 1951; Creasman 1995; Creasman et al. 1996) and in the adjacent uplands (Adovasio 1982; Mocas 1988; Stokes and Shields 1999). Characteristic features of the sites are deep, probable storage pits. There is some evidence for the presence of both permanent and temporary domestic structures (Cole et al. 1951:Plate XXa; Creasman 1995).

In the mountainous region of Kentucky, a rise in the use of natural rockshelters as habitation sites is noticed and may reflect the growing importance of plant cultivation during Early Woodland times. Caves were also extensively used for domestic, extractive (mining of gypsum, mirabilite, and epsomite), and ritualistic (burial and art) purposes during this subperiod, just as they were during the previous Late Archaic subperiod.

Middle Woodland (300 B.C.–A.D. 400)

The Middle Woodland subperiod is known by its burial mounds, except along the lower Ohio River and in the interior Mississippi Embayment. Major mound excavations have given archaeologists a detailed picture of burial customs during this period (Clay 1986, 1998). Although we have considerable excavated evidence for burial customs, the settlement system is not well understood (Clay 1998:13–19). Those responsible for the mounds may have been widely dispersed throughout the region in relatively small groups. Seen in this light, the elaborate burial sites (the burial mounds) offered essential foci for scattered groups to meet and interact. There were also small, circular enclosures, called ceremonial circles, and hilltop enclosures. Still, daily domestic sites are very poorly understood, although examples dating to the time period have been found (Kerr and Creasman 1995) and off-mound domestic areas have been identified adjacent to the mounds (Clay 1983). Small open-air domestic sites are increasingly being discovered and investigated (Kerr and Creasman 1995; Niquette and Boedy 1986; Niquette et al. 1987). Although hunting was important in the Middle Woodland subperiod, finds from rockshelters suggest that manipulation of native plants, by this time domesticated, intensified. Despite this change, the additional food supply did not create significant changes in the way people lived (Railey 1996).

For the most part, early Middle Woodland ceramics tend to have plain exterior surfaces, except in the Mississippi Embayment, where fabric marking persists, and the hafted bifaces consist of Adena and other similar stemmed forms (Applegate 2008; Niquette 1989). Late Middle Woodland pots are commonly cordmarked or plain, but small numbers of Hopewellian style simple stamped or checked stamped sherds from this period are also known (Webb 1942). Crosshatched rims and cord-impressed decoration were added to the earlier fabric-impressed surfaces. Late Middle Woodland hafted bifaces are weakly shouldered, expanded, or shallow side-notched forms. Alongside these other changes, a decline in the building of burial mounds was seen during the Middle Woodland (Applegate 2008).

Middle Woodland peoples continued the technologies developed in the Archaic and Early Woodland subperiods; however, there were changes as well. A chert bladelet industry developed exclusively during the Middle Woodland period. It produced small and sharp chert tools that were used in fine work. In addition, exotic materials—copper, mica, and on rare occasions, obsidian—were obtained through trade from distant sources. These artifacts are typically known from mortuary sites in Kentucky (Applegate 2008:352).

Late Woodland (A.D. 400–1000)

After circa A.D. 400, earthen burial mounds went out of style in the region. The construction and use of earthen or stone enclosures also ceases by approximately A.D. 500. Simpler communal burial sites, generally involving stone constructions or coverings, became widespread, perhaps as a replacement for the mounds (Brown 1981; Clay 1984). The nature of human settlement also changed. Evidence from sites of the subperiod indicates that Native-American groups often returned repeatedly to the same location or congregated in larger groups. However, the possible lack of permanent shelter at these sites suggests that the use of these places was sporadic, possibly seasonal, perhaps still related to certain group ceremonies (Clay 2002:174–182). Rockshelters continued to be used during this subperiod as short-term habitations or temporary hunting locales.

The economy continued to emphasize hunting, gathering, and the utilization of a variety of locally domesticated plants. While maize (i.e., corn) was introduced in the region during the Middle Woodland period, it did not become an important part of the diet until around A.D. 800. The importance of maize is more pronounced in the western portions of Kentucky at this time.

Like the Middle Woodland subperiod, the Late Woodland subperiod is often divided into early and late subdivisions. Early Late Woodland ceramic assemblages are generally cordmarked and are similar to late Middle Woodland assemblages; however, there is usually a lack of Hopewellian style decorated ceramics. Ceramics consist mainly of subconical and subglobular cordmarked jars (Applegate 2008:345–346). Early Late Woodland hafted bifaces are typically expanding stem or crude side-notched forms.

The late Late Woodland subperiod saw increased regional variability in ceramic styles, subsistence strategies, and social organization (Applegate 2008), although there are distinct continuities expressed in settlement organization (Clay 2002). Ceramics exhibit cordmarked and now some plain surface treatments; some vessels have angular shoulders; and rims display special treatments, like collars, carinations, and castellations. In the lower Ohio River valley and far western Kentucky, necks of vessels exhibit zoned, incised, geometric designs; pan-shaped vessels are present; and red slipping occurs, but only rarely. Late Late Woodland projectile point forms include corner-notched, side-notched, and large triangular forms. Small triangular projectile points appear in artifact assemblages by A.D. 800 and may represent the first appearance of the bow and arrow.

Late Prehistoric Period (A.D. 1000–1650)

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 assigned to the Late Prehistoric period include pottery that incorporated mussel shell as tempering material and small triangular projectile points. Some of the pottery is also much more elaborately decorated, has special attributes such as the addition of handles, and increasingly new vessels forms are introduced.

The Late Prehistoric period in far western Kentucky has been associated with Mississippian cultures easily recognized in the Mississippi and Illinois River valleys, although Mississippian influences were seen in a much larger geographic area (Pollack 2008b). The Mississippian period was characterized by chiefdoms and intensive agriculture. Maize (*Zea mays*), beans (*Phaseolus vulgaris*), and squash (*Cucurbita sp*.) were the principal crops. Nevertheless, hunting and gathering continued to be important (Smith 1978).

Settlements were arranged in a hierarchical manner, were fortified, contained substructure mounds that were either for ceremonial purposes or dwellings for the elite, and were occupied year-round. Mississippian structures were built using wattle and daub construction, and the wall posts were set in trenches. Although there were continuously occupied villages in the settlement system, much of the Mississippian population lived in smaller hamlets and farmsteads scattered up and down the major rivers and secondary streams (Smith 1978). The Upper Cumberland region contains several Mississippian mound centers and smaller hamlets or farmsteads (Pollack 2008b:684–694).

In the middle Ohio River area, a culture with a similar level of development has been called Fort Ancient (Henderson 2008). Subsistence practices of this culture also focused on the cultivation of maize, beans, and squash. This was supplemented with hunting, fishing, and wild plant collecting. Many Fort Ancient villages were circular or elliptical and "exhibit[ed] 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. Unlike Mississippian sites, however, Fort Ancient sites lack large ceremonial centers and earthworks, although some had burial mounds. Large village sites are usually situated in valley bottoms along the main stems of the region's larger drainages. On the other hand, smaller sites tend to be located throughout tributary drainages and are thought to represent seasonal camps and resource procurement activity stations. Again, rockshelters continued to be used as short-term habitation sites during this subperiod, or at least as temporary hunting locales.

Protohistoric and Historic Period (A.D. 1650–1800s)

At the beginning of the seventeenth century A.D., Kentucky was populated by several sedentary Native-American cultural groups (Schwartz 1967). However, the Beaver Wars of the mid-seventeenth century had almost completely disrupted and uprooted these groups by about 1680 (Hunt 1940). Even prior to the Beaver Wars, Native-American residential populations were affected by European diseases and technology through indirect contact with Europeans from the eastern seaboard. Afterwards, the area was used primarily as hunting land, and later the use of the region was reshaped in the wake of shifting fur trade patterns. Resident aboriginal groups were increasingly being displaced by newly arriving Native-American groups as a result of this shifting pattern (Hunter 1978:588).

In the early eighteenth century, Native-American tribes, who we can identify as the Shawnee, were present in most areas of Kentucky, having been pushed westward from the east (i.e., from the Susquehanna drainage of Pennsylvania) by the expansion of European settlement (McConnell 1992:21). Other established tribes in Kentucky at the time include the Cherokee in the Upper Cumberland River valley area and the Chickasaw in the Lower Tennessee and Cumberland River valleys and far western Kentucky. Conflicts between these and other groups in the region lasted through the War of 1812. They were a part of the conflict between the French and British and later the British and the new American colonies (Hammack 1992:928–929;

McBride and McBride 2008; O'Donnell 1992:815).

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 a surveyor 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 Indians and English fur traders and closed the area to permanent settlement. His decree was ignored, however, 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).

Historical Overview of Grant County, Kentucky

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.

Grant County is located in the outer section of the Bluegrass cultural landscape. Located in the northern portion of the state, the county is bordered by Boone and Kenton Counties to the north, Pendleton County to the east, Harrison and Scott Counties to the south, and Owen and Gallatin Counties to the west. Formed in 1820 out of a portion of Pendleton County, Grant County is the sixty-seventh Kentucky county in order of formation. The county was named for Samuel Grant, an early frontiersman. Williamstown is the county seat (Kleber 1992:383).

Grant County's most prominent feature is the "dry ridge," which separates the Kentucky River watershed from that of the Licking River. The ridge stretches from the Ohio River through the county into the central bluegrass region, and it has provided an unobstructed travel route for buffalo, Native Americans, white settlers, railroads, and interstate highways (Conrad 1992:3).

Because of the rugged topography, the region was relatively uninhabited until late in Kentucky's settlement period. James Littell arrived in 1790 and constructed a cabin or fortification along Forklick Creek near present day Williamstown. Settlers constructed a blockhouse at Dry Ridge later in the year and established a Baptist Church in 1791. The last massacre by Native Americans in Kentucky took place in the Grant County area in 1805 along Bullock Pen Creek just west of modern day Crittenden (Conrad 1992:8–9; Kleber 1992:383).

The area which is now Grant County developed very slowly. The Dry Ridge Trace developed into an important road, and a stagecoach service was started over the road in 1818 by a local man named Abner Gaines. Settlements along the dry ridge started to grow, and in 1819, William Littell won a seat in the state house of representatives by campaigning for the creation of a new county. He was elected by only 40 votes (Conrad 1992:12).

Littell, a son of pioneer James Littell, steered a resolution through the General Assembly creating the new county. William Arnold donated 2.5 acres of land to the new county on which to build its public buildings. The seat of the new county was originally called Philadelphia, but a Kentucky town already had that name. They settled on Williamstown to honor the donor of the land (Conrad 1992:12–13; Kleber 1992:957).

The turnpike through Grant County connecting Lexington and Covington developed into a heavily used thoroughfare. Drovers moving livestock from bluegrass farms to markets on the Ohio River and in Cincinnati used the road to move their herds. They often let the animals roam free to find water and food along the dry ridge, but as more and more property owners settled along the road, their ranging was curtailed. In the 1840s, the state made significant improvements to the road to accommodate the heavy use (Conrad 1992:257).

When Grant County was founded in 1820, it had only 1,085 inhabitants, and by 1830, it only had 2,986. It was among the least populated counties in the state. In 1840, the population reached 4,192 people and grew to 6,531 people by 1850, giving it a 55.7 percent population increase. Over the next decade, it grew another 27.9 percent to 8,356 people in 1860. In 1840, there were 348 slaves in Grant County, making up 8.3 percent of the population. In 1850, the number of slaves increased by 65 percent to 532, but still only made up 8.1 percent of the total population. In 1860, 696 African American slaves and 30 free African Americans made up 8.6 percent of the county's inhabitants (Collins 1882:260; Lucas 1992:xx).

The Civil War divided the county. Many of its citizens supported the Rebel cause and several joined the Confederate army, but more sided with the Union. During Confederate General Braxton Bragg's invasion of Kentucky in the summer of 1862, General Henry Heth led a force of 5,000 confederates into northern Kentucky to capture Covington. They abandoned the effort and retreated down the Lexington Pike through Grant County.

In August 1864, Union General Stephen G. Burbridge ordered the execution of three spies in retaliation for the killing of two Union soldiers by Rebel guerillas. George W. Wainscott, William Lingenfelter, and his brother, John W. Lingenfelter, were taken to Williamstown, where they were hanged. Then, on November 1, 1864, Colonel Robert J. Breckinridge led a Confederate force of 32 men into Williamstown to capture U.S. government money they thought was being stored in the town, but it had been removed before they arrived (Conrad 1992:422; Kleber 1992:957).

In 1867, the Louisville, Cincinnati, and Lexington Railway Company started construction of a line to connect Lexington and Cincinnati. Construction was completed in 1869, and stations were built at Elliston and Zion Station. The railroad was known as the "Short Line," and it was purchased by the Louisville and Nashville Railroad in 1881. In 1873, the city of Cincinnati issued $6 million in bonds to build a rail line connecting the "Queen City" with Chattanooga in southeastern Tennessee. By 1877, the Cincinnati Southern Railroad was operating through Grant County, and once the Kentucky River was bridged, the line became a major north-south artery for passengers and for freight. It was leased to the Cincinnati, New Orleans, and Texas Pacific Railroad, which increased the market outlets for Grant County produce (Conrad 1992:48–49).

Grant County remained predominantly rural and agricultural throughout the entire nineteenth century. Several grist mills operated in the county, but circa 1877, Charles W. Hutcherson started operating a portable saw mill along Crooked Creek in the southeastern section of the county. He moved the mill to Corinth where, along with his brother James, he expanded the mill into a grist mill. Later they added a carding factory and looms for weaving wool and cotton. Farmers from around the region brought their grain to be milled at

Corinth, and the mill operated around the clock, six days a week. The mill was a mainstay of Corinth's economy throughout the rest of the century (Conrad 1992:199).

The county's population reached 9,529 residents in 1870, and increased 37.2 percent to 13,083 residents by 1880. After decreasing to 12,671 residents in 1890, the county's population once again increased to 13,239 residents by 1990. However, over the next six decades, Grant County's population slowly decreased, reaching 9,876 residents in 1940 and 9,489 residents in 1960.

In 1911, J.B. Sanders connected the old Dry Ridge town hall, an old mill, and an old store and opened a hotel in the little town. He also pumped mineral water from a deep well in town, and the hotel provided hot mineral baths for the guests. Despite the water being pumped from a well, Sanders' operation was called the Carlsbad Springs Hotel. In 1915, the hotel was sold to the Lake View Sanitarium Hotel Company in Lexington. The hotel burned in 1927, but other spas operated until circa 1960 (Conrad 1992:293, 295, 299).

In 1913, J.M. Riley, owner of the Williamstown Roller Mills, electrified his mill with a generator. At night he distributed electricity to the city for street lights and to a handful of local residents for personal use. Soon, his service was in demand, and in 1922, he sold the mill, the generator, and power lines to Edward J. Glass, who developed it into a power company (Conrad 1992:124–125).

Interstate 75 was completed through the county in the 1960s, and the county entered into a period of transformation. Residents could easily commute to jobs in the Lexington area to the south or northward to the Cincinnati area. The interstate also enabled people to move away from those cities into a more residential or rural environment. Growth returned to Grant County. By 1970, the population reached 9,999 inhabitants and between 1970 and 1980 the population increased 33 percent to 13,308 inhabitants. It continued to grow until the population reached 15,737 inhabitants in 1990 (Kleber 1992:383, 957).

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 area was determined by maps provided by the client. No portion of the project footprint was flagged prior to the survey. Landowner permission was requested and granted before initiating fieldwork.

The entire project was surveyed (see Figure 3). An intensive pedestrian survey was carried out over disturbed areas (e.g., the railroad corridor) as well as the steep hillsides north of the existing road. This latter area had more than 15 percent slope. The pedestrian survey was conducted by walking parallel transects spaced 20 m apart. Steep sideslopes were inspected for natural benches and overhangs. Dirt roads and all exposed areas were visually examined for indications of cultural material and features.

Shovel test probes were excavated at 10 m intervals where the slope was less than 15 percent and ground surface visibility less than 50 percent. In all cases, shovel tests measured not less than 35 cm in diameter and extended well into subsoil. Shovel tests were excavated in zones. With the top zone being removed and screened separately from the underlying subsoil. All fill removed from the tests was screened through .25 inch mesh hardware cloth, and the sidewalls and bottoms were examined for cultural material and features. All artifacts recovered from shovel tests were bagged by shovel test number and level.

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) 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. Historic artifacts received a unique catalog number for each material group and class by provenience.

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 University of Kentucky's William S. Webb Museum of Anthropology.

V. MATERIALS RECOVERED

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Historic materials were recovered from Site 15Gr73. The assemblage from the site is described below. An inventory of materials recovered from the site is listed by provenience in the individual site description section of this report.

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, 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 our purposes, 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 2.

Table 2. Historic Artifacts Recovered According to Functional Group.

Group	FS1	Percent
Architecture	12	44.44
Domestic	12	44.44
Furnishings	3	11.12
Totals	27	100

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 27 historic artifacts recovered during the current survey. The following provides a descriptive discussion of the types and age of artifacts recovered from Site 15Gr73.

Architecture Group (N = 12)

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 usually 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 = 2)

Construction materials refer to all elements of building construction. For this project, the building materials collected consisted of brick fragments (Table 3). 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).

Table 3. Summary of Architecture Group Items.

Class	Type	FS1
Construction material	Brick	2
Fittings and hardware	Stoneware water pipe	1
Flat glass	Window glass	7
Nails	Wire	2
	Totals	12

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. However, 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).

Two machine-made brick fragments were recovered during the current survey. They were assigned a date range of 1880 to the present.

Fittings and Hardware (n = 1)

This class of artifacts includes fittings for structures, such as plumbing pipes and other architectural hardware. One stoneware water pipe fragment was recovered (see Table 3). It was not assigned a specific date.

Flat Glass (n = 7)

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. For the purposes of this report, 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.

Each fragment of flat glass was measured for thickness and recorded to the nearest hundredth of a millimeter using digital calipers. The differences between cylinder window glass, mirror glass, and plate glass are in part determined by the thickness and wear of each flat glass fragment. Although Moir (1987:80) states that dating window glass after 1915 is not as reliable for dating sites, for the purposes of this report, window glass that measures 2.41 mm (dating to 1916) is included in the calculations because according to Roenke (1978:11), plate glass does not become widely or successfully produced in the United States until 1917. Seven flat glass sherds were recovered during the current project, and all were window glass (see Table 3). Moir's window glass technique was used to date the sherds, which ranged from 1858 to 1912. The technique also was used to calculate a very tentative mean date of 1890 for the window glass sherds in the survey assemblage.

Nails (n = 2)

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

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).

Two nails were recovered from the project area, and both were wire drawn (see Table 3). Both also were complete and pulled. One had a 7d pennyweight, and the other was a 9d nail (Figure 11a). 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).

Domestic Group (N = 12)

Artifacts included in the domestic group consisted of ceramics (n = 2), container glass (n = 7), cookware (n = 1), metal food containers (n = 2) (Table 4).

Figure 11. Historic materials recovered from 15Gr73: (a) 9d pulled wire-drawn nail from STP 02, Zone I; (b) gilt decal-decorated and embossed/molded ironstone bowl rim from STP 06, Zone I; (c) aqua ABM canning jar body sherd from STP 04, Zone I; (d) steel drawn and ironed beverage can rim fragment from STP 04, Zone I; and (e) iron/steel door hinge pin from STP 08, Zone I.

Table 4. Summary of Domestic and Furnishings Groups.

Class	Type	FS1
Ceramics		
	Whiteware	1
	Ironstone	1
Container glass		
	ABM	7
Cookware		
	Pie plate	1
Metal food containers		
	Food can	1
	Beverage can	1
Lighting		
	Lamp chimney glass	1
	Lamp shade	1
Furniture		
	Door hinge pin	1
	Totals	15

Ceramics (n = 2)

The ceramics recovered were grouped into two major ware types: whiteware (n = 1) and ironstone (n = 1).

Whiteware (n = 1)

As a ware type, whiteware includes all refined earthenware that possesses a relatively non-vitreous, white to grayish-white clay body. Undecorated areas on dishes exhibit a white finish under clear glaze. This glaze is usually a variant combination of feldspar, borax, sand, nitre, soda, and china clay (Wetherbee 1980:32). Small amounts of cobalt were added to some glazes, particularly during the period of transition from pearlware to whiteware and during early ironstone manufacture. Some areas of thick glaze on whiteware may, therefore, exhibit bluish or greenish-blue tinting. Weathered paste surfaces are often buff or off-white and vary considerably in color from freshly exposed paste (Majewski and O'Brien 1987).

Most whiteware produced before 1840 had some type of colored decoration. These decorations are often used to designate ware groups (i.e., edgeware, polychrome, and colored transfer print). Most of the decorative types are not, however, confined to whiteware. Therefore, decoration alone is not a particularly accurate temporal indicator or actual ware group designator (Price 1981).

The most frequently used name for undecorated whiteware is the generic "ironstone," which derives from "Ironstone China" patented by Charles Mason in 1813 (Mankowitz and Haggar 1957). For purposes of clarification, ironstone will not be used when referring to whiteware. Ironstone is theoretically harder and denser than whiteware produced prior to circa 1840. Manufacturer variability is, however, considerable and precludes using paste as a definite ironstone identifier or as a temporal indicator. Consequently, without independent temporal control, whiteware that is not ironstone is difficult to identify, as is early vs. later ironstone. For our analysis, the primary determining factor in classification of a sherd as whiteware was the hardness and porosity of the ceramic paste.

Plain/Undecorated (n = 1)

This decorative type includes vessels with no decoration. While some researchers such as Lofstrom et al. (1982:10) and Wetherbee (1980) include molded designs with "plain" whiteware, we agree with Majewski and O'Brien (1987:153) that molded vessels should be grouped on their own. Plain whiteware vessels became very popular following the Civil War and continued in popularity throughout the late nineteenth and early twentieth centuries (Faulkner 2000). Bacteriological research emerged after the Civil War, and it was not long before it became widely known in the medical community that there was a link between bacteria and disease (Duffy 1978:395). Bacteria could not be seen with the naked eye, however, and in spite of efforts by health officials to educate the public with regard to the connection between illness and bacteria, most people still held to the filth and miasmic theories of disease (Rogers 1997:550). As the public became more educated on the subject, these ideas merged, and it became commonly thought that plain, undecorated wares were best suited for maintaining and serving bacteria-free food. That is, the public equated the simple, "clean" appearance of undecorated wares with the purity (i.e., bacteria-free) and cleanliness of what they were eating. The ceramic manufacturing industry followed suit in this line of thinking and met market demands, producing primarily plain wares, which resulted in increased competition between whiteware and ironstone manufacturers.

Purity crusades also indirectly helped increase the popularity of plain, white vessels in the late nineteenth and early twentieth centuries as social reformers—many of whom were white and middle class—focused on cleaning up city streets, improving sanitation, and ridding cities of disease epidemics. Part of this crusade was the public promotion of purity at the dinner table. Unfortunately, many of these white public health reformers were also motivated by Social Darwinist ideas, and sanitation problems and disease epidemics were often blamed on African Americans and East-European immigrants who were stereotyped as being the harbingers of disease and social decay (Friedman 1970:123).

One undecorated whiteware sherd, which had been part of a bowl at one time, was recovered during the current project (see Table 4). It is unknown if it had been a plain vessel or if the sherd represented an undecorated part of a decorated vessel. It was assigned a date range of 1830 to the present (Majewski and O'Brien 1987:119).

Ironstone (n = 1)

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 socioeconomic 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).

Decal (n = 1)

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 appeared 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.

One gilt decal-decorated ironstone bowl sherd was recovered during the current project (Figure 11b). It also had been molded/embossed. It dates from 1890 to 1940 (Blaszczyk 2000:155; Majewski and O'Brien 1987:147; Wegars and Carley 1982).

Container Glass (n = 7)

Container glass was recovered during the current survey. Research by Baugher-Perlin (1982), Jones and Sullivan (1985), Lindsey (2015), and Toulouse (1972) was used to date glass containers. 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.

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

Automatic Bottle Machine (ABM) (n = 7)

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 2015; 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. Seven glass fragments were assigned to the ABM category during the current project, and all were body sherds (see Table 4). Colors included aqua (n = 1) (Figure 11c) and clear (n = 6). Identifiable vessel forms included a liquor bottle (n = 1), a canning jar (n = 1), and miscellaneous bottles (n = 2). They were assigned dates from 1903 to the present.

Cookware (n = 1)

Artifacts used primarily for the preparation and cooking of food, such as bakeware, pots and pans, and kitchen utensils, are included in the cookware category. One crimped aluminum pie plate rim was recovered during the current project (see Table 4). It dates after 1962 (Kepos 1993:430–431; Olver 2000).

Metal Food Containers (n = 2)

The first tinned goods were packaged in hand-cut, shaped, and soldered can bodies made of tin or iron plate. These "tin canisters" were patented in England in 1810 and in the United States in 1818 (Clark 1977; Rock 1984). The cans often swelled, burst, and then reacted with goods they held.

Another can type, termed "hole-and-cap can(s)" because of the filling process, either had flush or hand-crimped ends (Rock 1984). The cans' side seams, either a lap side seam or a plumb joint, were soldered, fusing the gaps closed. The cans were filled through an orifice in the center of one end of the can. After the can was filled, a cap was soldered over the hole, sealing the can, hence the name "hole-and-cap" (Rock 1984). The hole-and-cap can came into use about the same time as the tin canister, but was quickly improved upon. These cans were likewise plagued by swelling and bursting incidents.

The first improvement was the addition of a small hole in the center of the soldered cap, implemented around 1820. This small hole allowed moisture to escape from the cans when heated, after the cans were filled and sealed. This process reduced the number of cans that swelled or burst. After heating, the hole was sealed with solder. Hole-in-cap cans were still handmade, and a good tinsmith could produce 60 per day (Sacharow and Griffin 1970). These cans were the first cans used for commercially produced foods in the United States (Rock 1984).

In 1847, Allen Taylor invented a machine that converted flat metal disks into stamped or flanged can ends. This machine was improved upon over the next two years, yielding a machine that stamped both can ends and cut a filler hole in the cap (Rock 1984). Most canneries in the United States used these stamped-end cans until the 1880s.

The key-wind can was introduced in 1866. The opening system consisted of a scored band on either the side or top of the can, which could be removed by rolling it back with a key. The sardine can is a familiar example of this can type.

The tapered tin was patented in 1875 by two Chicago entrepreneurs for their processed meat products. These tins were either rectangular or had a base larger than the top. Another Chicago manufacturer combined and perfected the tapered tin and key-wind cans in 1895.

As the demand for canned goods rose, a separate can producing industry evolved. Max Ams, a New York machine-made can company owner, developed a "double-side seam" in 1888 that locked the parts of the cans together (Collins 1924; May 1937). By 1898, the company had perfected this technique with the introduction of the "Ams Can" (Collins 1924; May 1937). This can eliminated the need for interior seam soldering by closing the top, bottom, and side seams with double seams. These innovations reduced the manufacture time of the cans and significantly reduced can failure (i.e., swelling and bursting) due to the superior strength of the seam.

The hole-in-top can, an improvement of the hole-in-cap can, used a small pinhole, no larger than .125 inches in diameter. The hole was sealed with solder. By 1920, evaporated milk was found almost exclusively in hole-in-top cans (Rock 1984).

In 1904, the Sanitary Can Company of New York developed the first airtight solderless can (Rock 1984). The cans were completely machine made and were produced at a rate of almost 25,000 cans a day (May 1937). By the early 1960s, the tin can was almost completely replaced by a steel body, which was stronger and more durable than tin. Aluminum tops were added to beverage cans in order to make opening the cans easier. Modern cans are steel or alloys, usually lined with plastic on the interior to prevent chemical reactions between the contents of the can and the can itself.

Two can fragments were recovered from the project area (see Table 4). One was part of a steel drawn and ironed beverage can top (Figure 11d). The seal and opening were indeterminate. It dates from 1940 to 1955 (Busch 1981; Rock 1980, 1984, 1987). A tin cylindrical food can fragment also was recovered. It was not assigned a specific date.

Furnishings Group (N = 3)

The furnishings category includes artifacts that are usually associated with the home or building, but that are not elements of the actual construction. Examples of furnishings include decorative elements, furniture, heating, lighting, and wall decorations. Artifacts were collected from two of the above categories (see Table 4).

Two lighting items were recovered. One was a piece of clear lamp chimney glass dating from 1854 to 1940 (Faulkner 2008:100; Pullin 1986). The other was an opaque white "milk" glass lamp shade fragment. It dates after 1880 (Belknap and McKearin 1949). The furniture item recovered consisted of an iron/steel door hinge pin (Figure 11e). It was not assigned a specific date.

Discussion

There were 27 historic artifacts recovered from 15Gr73 during the current survey. The material collected is discussed in detail above and summarized below.

The artifacts recovered from 15Gr73 were classified into the architecture (n = 12), domestic (n = 12), and furnishings (n = 3) groups. The architecture group items included construction materials (n = 2), fittings and hardware (n = 1), flat glass (n = 7), and nails (n = 2). Two machine-made brick fragments dating after 1880 represented the construction materials. The fittings and hardware artifact consisted of a stoneware water pipe fragment. All seven flat glass fragments were window glass. The Moir (1987) window glass formula was utilized to measure these glass fragments, resulting in a date range of 1858–1912 for the sherds with a tentative mean window glass date of 1890. The two nails in the assemblage were wire drawn. Pennyweights included 7d and 9d, and both were pulled. The pennyweights of the wire nails suggest the fastening of flooring, boarding, and/or interior fittings.

The domestic artifacts recovered from 15Gr73 included ceramics (n = 2), container glass (n = 7), cookware (n = 1), and metal food containers (n = 2). The ceramics consisted of whiteware (n = 1) and ironstone (n = 1). The whiteware was undecorated and dates after 1830. The ironstone was decorated with a gilt decal and also was molded/embossed. It dates between 1890 and 1940. Both the whiteware and ironstone sherds had been parts of bowls at one time. All of the container glass artifacts were ABM body sherds. Colors included aqua (n = 1) and clear (n = 6). Vessel forms included a liquor bottle (n = 1), a canning jar (n = 1), and miscellaneous bottles (n = 2). The cookware item was an aluminum pie plate fragment dating after 1962. Metal food containers included a steel drawn and ironed beverage can fragment dating between 1940 and 1955, and a cylindrical food can fragment that could not be dated.

The furnishings group artifacts consisted of a piece of lamp chimney glass (n = 1), a milk glass lamp shade fragment (n = 1), and a door hinge pin (n = 1). The lamp chimney glass dates between 1854 and 1940, and the lamp shade dates after 1880.

The historic artifacts recovered from 15Gr73 had an average date range of 1893–1961, and the mean is 1927. The dominance of the architectural and domestic group artifacts supports the known use of the site as a domestic farmstead/residence. According to archival research, the site was first occupied by the 1890s, and it is shown on a 1950s historic map. The dwelling at the site was occupied until roughly 2007. The historic materials recovered from the site are temporally consistent with the historic documentation, and based on the architectural materials, there is little indication that the site was occupied much before the 1890s. The few domestic materials recovered indicate the use of refined ceramics and the purchase of container glass and canned foods and beverages in the twentieth century. The presence of the lamp chimney glass suggests that the house utilized oil lamps in the late nineteenth and/or early twentieth century, and it is possible that electricity was not installed immediately upon construction of the house. Since there were few materials recovered from the site that could provide insight with regard to the daily lifeways of the former site occupants, little more can be said about 15Gr73 based solely on the cultural materials.

VI. RESULTS

During fieldwork for the proposed project one archaeological site was identified and recorded. Site 15Gr73 was a late-nineteenth to early-twenty-first-century farmstead/residence. The site also included four standing structures, including a residence and three associated outbuildings. A description of the site is given below. Its location within the project area is depicted in Figures 2 and 3.

Site 15Gr73

Elevation: 299 m (980 ft) AMSL
Component(s): late nineteenth to early twenty-first century historic
Site type(s): farmstead/residence
Size: 1,000 sq m (10,763 sq ft)
Distance to nearest water: 200 m (656 ft)
Direction to nearest water: south
Type and extent of previous disturbance: less than 25 percent
Topography: dissected uplands
Vegetation: manicured lawn
Ground surface visibility: less than 10 percent
Aspect: north
Recommended NRHP status: not eligible

Site Description

Site 15Gr73 is situated in the southwest corner of Grant County, at a point where an existing county road crosses an active rail line.

It is located on a relatively flat portion of an extensive ridge system in Grant County, Kentucky (Figure 12; also see Figure 8). Elevation in this area was approximately 299 m (980 ft) AMSL. In addition to the archaeological site, a series of four standing structures were identified as well as the remains of a collapsed garage. Based on the archival data presented below, one of the structures, a residence, was built in the 1890s. The remaining structures were much more recent in construction and consisted of workshops and a trailer.

The site measured approximately 40 m east to west and 25 m north to south within the project area, encompassing approximately 1,000 sq m (10,763 sq ft) in total area. It is likely that the site continues outside the project area to the north and east. Site dimensions were defined by the presence of the structures and a light density of historic artifacts on the ground and in shovel tests. Vegetation consisted primarily of a manicured lawn, although some trees were present as well. Ground surface visibility was low due to grass and leaf litter.

Archival Data

Based on research of deed books the earliest owner of the land in and around Site 15Gr73 was A.D. Black (Table 5). He acquired the land, which was approximately 1 acre in size, sometime prior to 1895. On January 23, 1895, A.D. Black sold the land to David W. William for the sum of $25 (Grant County Clerk's Office [GCCO] Deed Book [DB] 11:16). No mention of a house or other structure was given. In 1898, David and Eliza Williams sold that acre to James Rodgers for the sum of $45 (GCCO DB 18:586). In that deed, it was noted that David and Eliza resided on the property.

On October 11, 1929, James Rodgers conveyed the parcel as part of an inheritance to his children for the sum of $375. Individuals were Hattie O'Hara and her husband, R.L. O'Hara, William Rodgers and his wife, Sarah E. Rodgers, and Lula Peneck (GCCO DB 49:212). That same day, the heirs of James Rodgers conveyed the property to James Sheets for an unknown sum of money (GCCO DB 49:212). Sometime between 1929 and 1936 James Sheets lost the property to the Corinth Bank. This conveyance actually involved two separate tracts that combined were purchased for $6,000. Tract 1 was for 132 acres and Tract 2 was the 1 acre parcel in question. The purchase price of Tract 2 was not separately given.

Figure 12. Overview of Site 15Gr73, facing north.

Table 5. Archival Data from Site 15Gr73.

Date	Owner	Acreage	Cost
		1	
		1	$
		1	
		1	$
		1	
		1	Unknown; part of 2 tract purchase for $6,000
?-1936	Corinth Bank	1	Unknown
1929	James Sheets	1	Unknown
1929	Hattie O'Hara, R.L. O'Hara, William Rogers, and Lula Peneck	1	Inheritance; $375
1898-1929	James Rodger	1	$45
1895-1898	David W. and Eliza Williams	1	$25
Unknown-1895	A.D. Black	1	Unknown

Investigation Methods

Fourteen screened shovel tests were excavated at the site with nine being positive (Figure 13). Shovel tests were spaced 5 m apart and were placed east, west, and north of the main residence. No shovel tests were attempted south (front) of the main residence since this area was under compact gravel or blacktop associated with Blanchett Lane. All positive shovel tests were located west (side yard) and north (backyard) of the main residence. The majority of the artifacts, however, were recovered from the shovel tests from the backyard and among the outbuildings located behind the main residence.

Depositional Context

Shovel tests revealed a dark brown (10YR 3/3) silty clay loam from ground surface to approximately 24 cm bgs. This zone does not appear to be an Ap horizon. Underlying this zone was a brownish yellow (10YR 6/6) silty clay with manganese concentrations (Figure 14). Cultural material was restricted to the top 10–15 cm of the solum. All shovel test profiles were similar regardless of location on the site with most showing some disturbance due to the construction of the main residence, one of the out-buildings, or sewer and water lines.

Artifacts

A total of 27 historic artifacts were recovered during shovel testing (Table 6). These were classified into architecture (n = 12), domestic (n = 12), and furnishings (n = 3) groups. The architecture group items included construction materials, fittings and hardware, flat glass, and nails. The domestic artifacts included ceramics, container glass, cookware, and metal food containers. The ceramics consisted of whiteware and ironstone. The furnishings group artifacts consisted of a piece of lamp chimney glass, a milk glass lamp shade fragment, and a door hinge pin.

The artifacts had an average date range of 1893–1961 with a mean of 1927. The dominance of the architectural and domestic group artifacts supports the known use of the site as a domestic farmstead/residence. According to archival research, the site was first occupied by the 1890s, and it is shown on a 1950 topographic map (see Figure 10). The dwelling at the site was occupied until roughly 2007. The historic materials recovered from the site are temporally consistent with the historic documentation, and based on the architectural materials there is little indication that the site was occupied much before the 1890s.

The few domestic materials recovered indicate the use of refined ceramics and the purchase of container glass and canned foods and beverages in the twentieth century. The presence of the lamp chimney glass suggests that the house utilized oil lamps in the late nineteenth and/or early twentieth century, and it is possible that electricity was not installed immediately upon construction of the house. Since there were few materials recovered from the site that could provide insight with regard to the daily lifeways of the former site occupants, little more can be said.

Table 6. Artifacts recovered from the site.

Unit #	Zone	Depth	Group	Class/Type	N =
STP 01	I	0–32 cm bgs	Domestic	ABM	1
STP 02	I	0–35 cm bgs	Architecture	Nail	1
STP 03	I	0–24 cm bgs	Architecture	Brick, window glass	2
STP 03	I	0–24 cm bgs	Domestic	ABM	3
STP 04	I	0–24 cm bgs	Architecture	Brick, window glass	3
STP 04	I	0–24 cm bgs	Domestic	ABM, beverage can, aluminum bakeware	4
STP 04	I	0–24 cm bgs	Furnishing	Lamp chimney glass	1
STP 05	I	0–24 cm bgs	Architecture	Window glass, nail	4
STP 05	I	0–24 cm bgs	Furnishing	Lamp shade	1
STP 06	I	0–20 cm bgs	Domestic	Ironstone	1
STP 07	I	0–25 cm bgs	Architecture	Stoneware water pipe	1
STP 07	I	0–25 cm bgs	Domestic	Whiteware	1
STP 08	I	0–20 cm bgs	Furnishing	Hinge pin	1
STP 09	I	0–22 cm bgs	Architecture	Window glass	1
STP 09	I	0–22 cm bgs	Domestic	ABM, food can	2
				Total	27

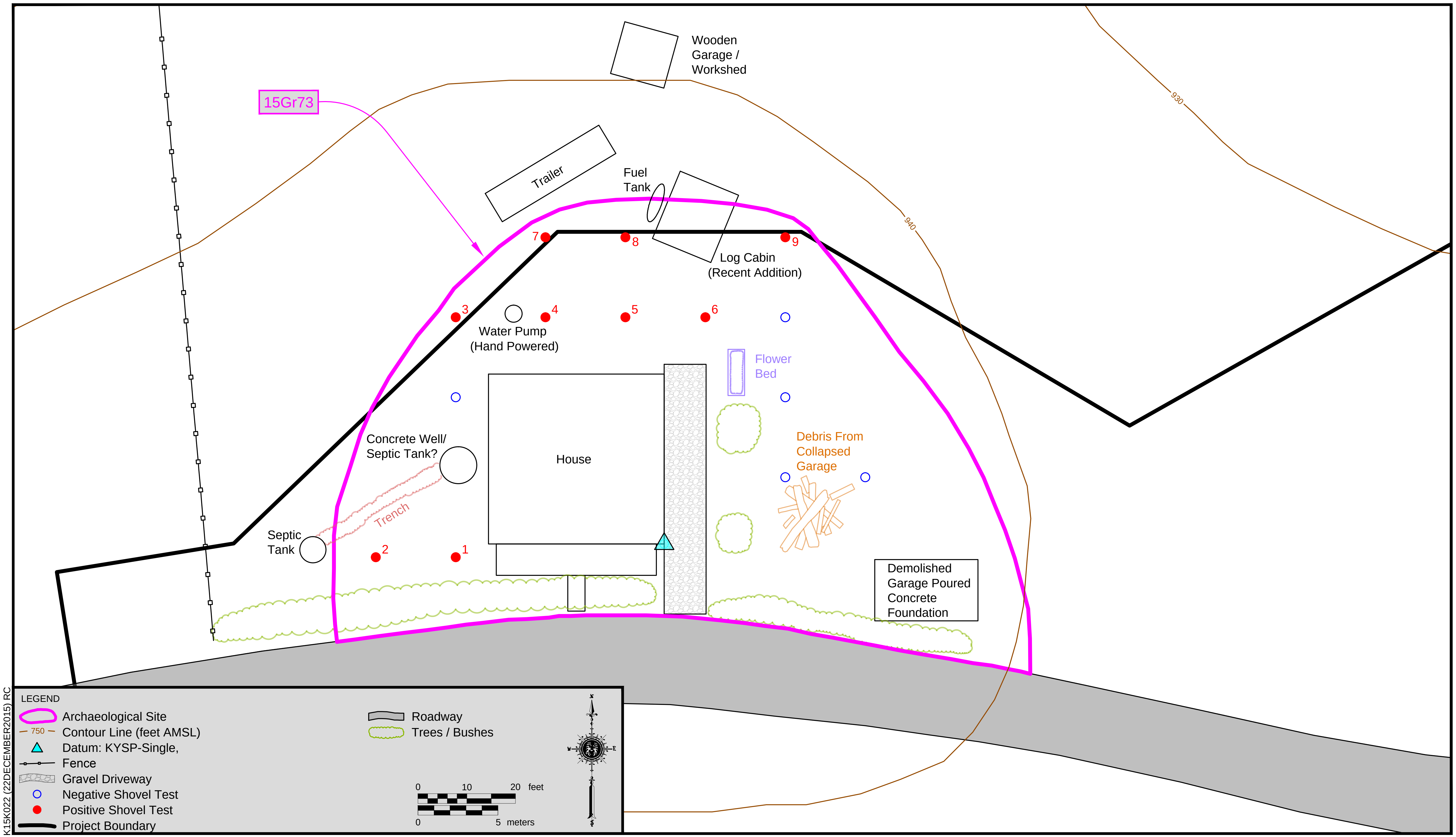

Figure 13. Schematic plan map of Site 15Gr73.

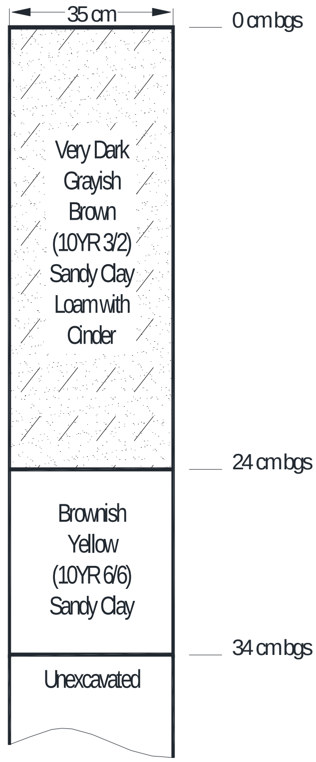

Figure 14. Representative soil profile from Site 15Gr73.

Features

No archaeological features were observed during the investigation of the site. Four standing structures and one collapsed building were present. As noted above, the main residence dates to the late 1890s, while the other outbuildings appear to date more recently.

Summary and National Register Evaluation

The historic component of Site 15Gr73 was represented by a low density artifact scatter restricted mainly to the backyard of the main residence. Based on archival and artifact data, the occupation occurred from the late 1890s to as late as 2007. The majority of the artifacts were restricted to the top 10–15 cm of the solum and in mostly disturbed contexts. No evidence of buried or intact deposits was noted. In addition to the main residence, three more recent outbuildings were located north of it in the backyard area as was a collapsed building, a garage, to its east. The site likely extends outside the project area to the north.

Site 15Gr73 is not considered to have the potential to provide important information about local or regional history and does not appear to be eligible for the NRHP (Criterion D). For this reason no further work is recommended. It is unlikely that further investigation of the site would result in information beyond that recorded during the current survey. In addition, there is no evidence suggesting the potential for buried deposits to be located at the site. However, if the project boundaries change in the future to the north it may become necessary to document the uninvestigated portion of the site.

Project Impacts

The proposed reconstruction of the bridge will have no effect on archaeological site 15Gr73 because it is not listed in or considered eligible for the NRHP.

VII. CONCLUSIONS, RECOMMENDATIONS, AND TREATMENT

Note that a principal investigator or field archaeologist 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 Federal Highway Administration and KYTC, Division of Environmental Analysis, in consultation with the State Historic Preservation Office (the Kentucky Heritage [KHC] Council).

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.

A total of 1.5 ha of area were surveyed as part of the proposed project. The project included portions of both sides of an existing county road leading to and from the bridge. No previously recorded sites were located in or within 2 km of the project area. The survey resulted in the documentation of one site, 15Gr73, a late-nineteenth to early-twenty-first-century farmstead/residence. In addition to the site, four standing structures were present, including a main residence dating to the late 1890s. To the north, behind the residence, were three outbuildings of more recent construction. To the east of the residence was a collapsed building that likely functioned as a garage in the past. It is likely that the site continues outside the project area to the north.

Site 15Gr73 is not considered to have the potential to provide important information about local or regional history and does not appear to be eligible for the NRHP (Criterion D). For this reason no further work is recommended. It is unlikely that further investigation of the site would result in information beyond that recorded during the current survey. In addition, there is no evidence suggesting the potential for buried deposits to be located at the site. However, if the project boundaries change in the future to the north, it may become necessary to document the uninvestigated portion of the site.

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APPENDIX A. HISTORIC ARTIFACTS DATABASE

Table A-1. Historic Artifacts.

Site	Unit #	Zone	Dep	Cat #	Group	Class	Type	Attr 1a	Attr 1b	Attr 2a	Burned	Count	Wt (g)	Vessel Part	Vessel Type	Min Date	Max Date	References	Comments
FS1	STP 01	I	0–32 cm bgs	1	D	Container Glass	Automatic Bottle Machine		Clear glass		FALSE	1		Body	Miscellaneous bottle	1903		Jones & Sullivan 1985; Lindsey 2015	
FS1	STP 02	I	0–35 cm bgs	2	A	Nails	Wire Nail	9d	Pulled		FALSE	1				1880		Nelson 1968	
FS1	STP 03	I	0–24 cm bgs	3	A	Construction Material	Brick	Machine made brick: vitrified			FALSE	1	2.2			1880		Holley 2009:97	
FS1	STP 03	I	0–24 cm bgs	5	A	Flat Glass	Window Glass				FALSE	1				1858	1858	Moir 1987	
FS1	STP 03	I	0–24 cm bgs	4	D	Container Glass	Automatic Bottle Machine		Clear glass		FALSE	1		Body	Liquor bottle	1903		Jones & Sullivan 1985; Lindsey 2015	
FS1	STP 03	I	0–24 cm bgs	4	D	Container Glass	Automatic Bottle Machine		Clear glass		FALSE	2		Body		1903		Jones & Sullivan 1985; Lindsey 2015	
FS1	STP 04	I	0–24 cm bgs	8	A	Construction Material	Brick	Machine made brick: vitrified	Low fired brick		FALSE	1	1.9			1880		Holley 2009:97	
FS1	STP 04	I	0–24 cm bgs	10	A	Flat Glass	Window Glass				FALSE	1				1894	1894	Moir 1987	
FS1	STP 04	I	0–24 cm bgs	10	A	Flat Glass	Window Glass				FALSE	1				1896	1896	Moir 1987	
FS1	STP 04	I	0–24 cm bgs	6	D	Container Glass	Automatic Bottle Machine		Clear glass		FALSE	1		Body		1903		Jones & Sullivan 1985; Lindsey 2015	
FS1	STP 04	I	0–24 cm bgs	6	D	Container Glass	Automatic Bottle Machine		Aqua glass		FALSE	1		Body	Canning jar	1903		Jones & Sullivan 1985; Lindsey 2015	
FS1	STP 04	I	0–24 cm bgs	7	D	Beverage Cans	Steel, drawn and ironed	Indeterminate seal	Indeterminate opening		FALSE	1		Rim		1940	1955	Busch 1981; Rock 1980, 1984, 1987	
FS1	STP 04	I	0–24 cm bgs	9	D	Cookware	Bakeware		Aluminum		FALSE	1		Rim	Pie plate	1962		Kepos 1993:430–431; Olver 2000	Al 3+ crimped pie plate rim
FS1	STP 04	I	0–24 cm bgs	11	F	Lighting	Lamp Chimney	Glass: clear		Plain	FALSE	1				1854	1940	Faulkner 2008; Pullin 1986:356	
FS1	STP 05	I	0–24 cm bgs	12	A	Flat Glass	Window Glass				FALSE	1				1912	1912	Moir 1987	
FS1	STP 05	I	0–24 cm bgs	12	A	Flat Glass	Window Glass				FALSE	1				1879	1879	Moir 1987	
FS1	STP 05	I	0–24 cm bgs	12	A	Flat Glass	Window Glass				FALSE	1				1896	1896	Moir 1987	
FS1	STP 05	I	0–24 cm bgs	13	A	Nails	Wire Nail	7d	Pulled		FALSE	1				1880		Nelson 1968	
FS1	STP 05	I	0–24 cm bgs	14	F	Lighting	Lamp Shade				FALSE	1				1880		Belknap and McKearin 1949	milk glass lamp shade frag; plain
FS1	STP 06	I	0–20 cm bgs	15	D	Ceramics	Ironstone	Gilt decal, molded			FALSE	1		Rim	Bowl	1890	1940	Blaszczyk 2000:155; Majewski & O'Brien 1987:147; Wegars & Carley 1982	molded with gilt decal
FS1	STP 07	I	0–25 cm bgs	17	A	Fittings and Hardware	Stoneware Water Pipe (weigh)				FALSE	1							
FS1	STP 07	I	0–25 cm bgs	16	D	Ceramics	Whiteware	Undecorated			FALSE	1		Footring with base	Bowl	1830		Majewski and O'Brien 1987:119	
FS1	STP 08	I	0–20 cm bgs	18	F	Furniture	Hinge pin	Metal: ferrous			FALSE	1							door hinge pin
FS1	STP 09	I	0–22 cm bgs	21	A	Flat Glass	Window Glass				FALSE	1				1893	1893	Moir 1987	
FS1	STP 09	I	0–22 cm bgs	19	D	Container Glass	Automatic Bottle Machine		Clear glass		FALSE	1		Body	Miscellaneous bottle	1903		Jones & Sullivan 1985; Lindsey 2015	
FS1	STP 09	I	0–22 cm bgs	20	D	Metal Food Containers	Cylindrical Food Can	Indeterminate		Indeterminate opening	FALSE	1							tin can lid frag; corroded