Figure 23. Southeasterly view of the church located at West Second Street and Oak Street. Note the addition to the rear (south) of the historic mass.

Of the residential resources, the typical resource in this grouping is a circa 1922, one-story bungalow set on a concrete block foundation beneath a front or side-gabled roof with walls primarily of exposed brick. Gabled ends are commonly clad in vinyl siding. One-story residences are the most commonly represented form (approximately 47 percent; n = 7). One-and-one-half-story dwellings comprise approximately 29 percent (n = 5) of all resources, while two-story residences account for approximately 24 percent (n = 4).

Approximately 76 percent (n = 13) of all residential resources exhibit concrete block foundations. Two dwellings (approximately 12 percent) have poured concrete foundations, while one building (approximately 6 percent) rests on a concrete slab. The remaining house (approximately 6 percent) exhibits a brick foundation.

Both front-gabled and side-gabled roofs represent approximately 29 percent (number = 5) of all resources. Cross-gabled and gambrel roofs are each found on three (approximately 18 percent) dwellings. Two houses (approximately 12 percent) have hipped roofs. Walls are primarily brick (approximately 94 percent; n = 16), although most have either vinyl (approximately 53 percent; n = 9) or aluminum (approximately 18 percent; n = 3) siding in the gable end or as secondary claddings. One resource (approximately 6 percent) has wood shingles in the gable end, while another resource (approximately 6 percent) has composite siding. One resource (approximately 6 percent) is completely clad in vinyl siding.

According to Campbell County assessment records, most resources (approximately 47 percent; number = 8) date to 1922. Four resources (approximately 24 percent) date to 1920. Two resources date to 1925 (approximately 12 percent) and to 1926 (approximately 12 percent). The earliest resource dates to 1911 (approximately 6 percent), while the most recent dwelling dates to 1956 (approximately 6 percent).

The one religious resource is the Silver Grove Christian Church, constructed 1917–18 at the southeast corner of West Second Street and Oak Street. The building rests on a pargeted foundation beneath an asphalt, shingle-clad, cross-gabled roof. Walls are exposed brick, and all windows have leaded

glass. An addition adjoins the rear (south) elevation, extending along Oak St.

NRHP Evaluation: Not Eligible. Sites 18–35 do not appear to be individually or collectively eligible for inclusion in the NRHP. The buildings date to the early years of Silver Grove, which was established as a planned railroad town in in the 1910s. The town was established by the Chesapeake and Ohio Railway Company (C&O), which made plans to establish a rail yard and terminal. On October 18, 1911, the Silver Grove Land and Building Company was incorporated in order to buy, sell, trade, and rent land, as well as to build and sell residences and associated buildings. The C&O purchased all the stock in this company for the cost of $919,373, after which it offered lots to railroad employees and then to the public (Chesapeake and Ohio Historical Society 1992:10). By 1914, Silver Grove was noted as the "most modern city in Northern Kentucky," based largely on the availability of electric lights, city water, and a dedicated sewage plant (City of Silver Grove).

The buildings along West Second Street followed as part of the early growth that characterized the burgeoning town and, as such, are representative of the early land development and community growth patterns of Silver Grove. However, although the buildings are locally important as part of the story of Silver Grove's history, they do not rise to the level of significance warranting inclusion in the NRHP under Criterion A. They do not represent significant or distinctive patterns of community planning theory, nor do they retain their association with the rail yard, which historically spurred the residential development of the town. Research has indicated no association between Sites 18–35 and persons of historical significance. They have not been credited to a particular planner or individual at the C&O Railroad. Architecturally, the resources do not warrant inclusion under Criterion C. The residential resources are common examples of a prolific building form—the bungalow—which was built throughout the region and the country in large swaths during the early twentieth century. In addition, these resources do not possess the architectural integrity necessary for NHRP eligibility. Nearly all of the houses exhibit replacement windows. Although many retain their primary brick claddings, they have also been compromised by the introduction of modern materials, such as aluminum and vinyl siding, which detract from the natural qualities historically associated with the building form. Research has not indicated any association with master architects, builders, or craftsmen.

The church likewise does not appear to be eligible for inclusion in the NRHP. Ordinarily properties owned by religious institutions or used for religious purposes are not considered eligible for the NRHP unless they derive their primary significance from architectural or artistic distinctions or historical importance (Criterion Consideration A). Although this church retains a fair amount of architectural integrity, its historic form has been altered by the construction of a substantial addition. In addition, research indicated no association between the church and persons or events of historical significance. Therefore, CRA recommends that Sites 18–35 are not eligible for listing in the NRHP under Criterion A, B, or C.

Determination of Effect: N/A.

Site 36

KHC Survey #: CP-60

Photographs: Figure 24

Property Address: Four Mile Road, Camp Springs

Map: Figures 2 and 3

Zone: 16

Quad: New Richmond, KY 1982

UTMs: E: 728333 N: 4319613

Description: Site 36 contains a round stone smokehouse, constructed circa 1880 (Figure 24), that was formerly assessed as part of the Reitman's St. Joseph House (CP-60), which was listed in the NRHP as part of the German Settlement Properties of the Four Mile Creek Multiple Property Nomination (MPDF). It was listed as a contributing element to the Reitman

House site. The smokehouse is located on the west side of Four Mile Road, approximately 70 ft southwest of its intersection with Gresskamp Road.

According to the nomination, the smokehouse, located across Four Mile Road from the Reitman House, was historically associated with a farmhouse that is no longer extant. It is characterized by its round form, constructed of uncoursed stone with a parged exterior. The form is punctuated by a single-leaf pedestrian entry, which is occupied by a hinged, vertical board door. A narrow, rectangular ventilation opening lies at either side. The conical roof is clad in composite shingles. Modern, freestanding informational signs noting the smokehouse as the information center for Historic Camp Springs Kentucky abut the structure. Modern pole-frame buildings are located to the north and west.

NRHP Evaluation: Listed. Reitman's Smokehouse was listed in the NRHP as part of the nomination for Reitman's St. Joseph House, a two-and-one-half-story stone structure that historically functioned as a dwelling and tavern. The house is located across Four Mile Road from the smokehouse. According to the nomination, the house with which the smokehouse was historically associated has been demolished (Torma and Chappel 1982:2).

Three smokehouses were listed as part of the German Settlement Properties in the Four Mile Creek Area MPDF. This nomination included 30 historic properties that were significant for their association with German settlement in this part of Campbell County. While the nomination is primarily concerned with primary structures, such as houses and commercial buildings, it also draws special attention to outbuildings that were historically associated with German settlement. According to the nomination, these structures are "significant by virtue of their rarity and ethnic associations" (Gordon 1982:8). Currently, the smokehouse continues to possess those qualities that associate it with its German origins, including its iconic uncoursed stone construction. Modern intrusions such as pole-frame storage buildings have compromised the setting of the structure but not to the extent that they compromise the structure's ability to convey its significance. Indeed, one of the outbuildings was already present at the time of the original boundary delineation and did not diminish the ability of the structure to reflect its significance as a symbolic and rare example of an intact German outbuilding.

The boundaries for the collective Reitman House site, depicted in Figure 25, are described as follows in the nomination:

> Beginning at the intersection of Four Mile Pike (Route 547) and St. Joseph's Church Road, proceed south 400' along the west side of latter road, then turning west to proceed down hill 175' along fencerow to Four Mile Pike, then proceed north 250' along said road, crossing Four Mile Pike so as to include round smokehouse, then return to east side of road, proceeding north 150' to the point of origin. [Torma and Chappel 1982:3]

Determination of Effect: No Adverse Effect. The stone smokehouse will not be adversely affected by the proposed installation of the force main pipeline. Modern intrusions will be placed completely underground, and as such, there will be no visual impact on Site 36. In addition, although the proposed pipeline will be installed in the immediate vicinity of the smokehouse at Site 36 as it travels along Four Mile Road, it will not result in an adverse effect to Site 36. No physical alteration or destruction will occur to the site that might change those characteristics that make it eligible for listing in the NRHP. If necessary, installation of the pipeline at this site will be completed via a directional bore, which entails the drilling of a small tunnel from a launch site at the surface that in turn exits at a terminal site farther down the proposed line. This will minimize any disturbance at the site and ensure that Site 36 is not subjected to any modification, alteration, or demolition that might adversely affect its inclusion in the NRHP.

Figure 24. Westerly view of the smokehouse at Site 36.

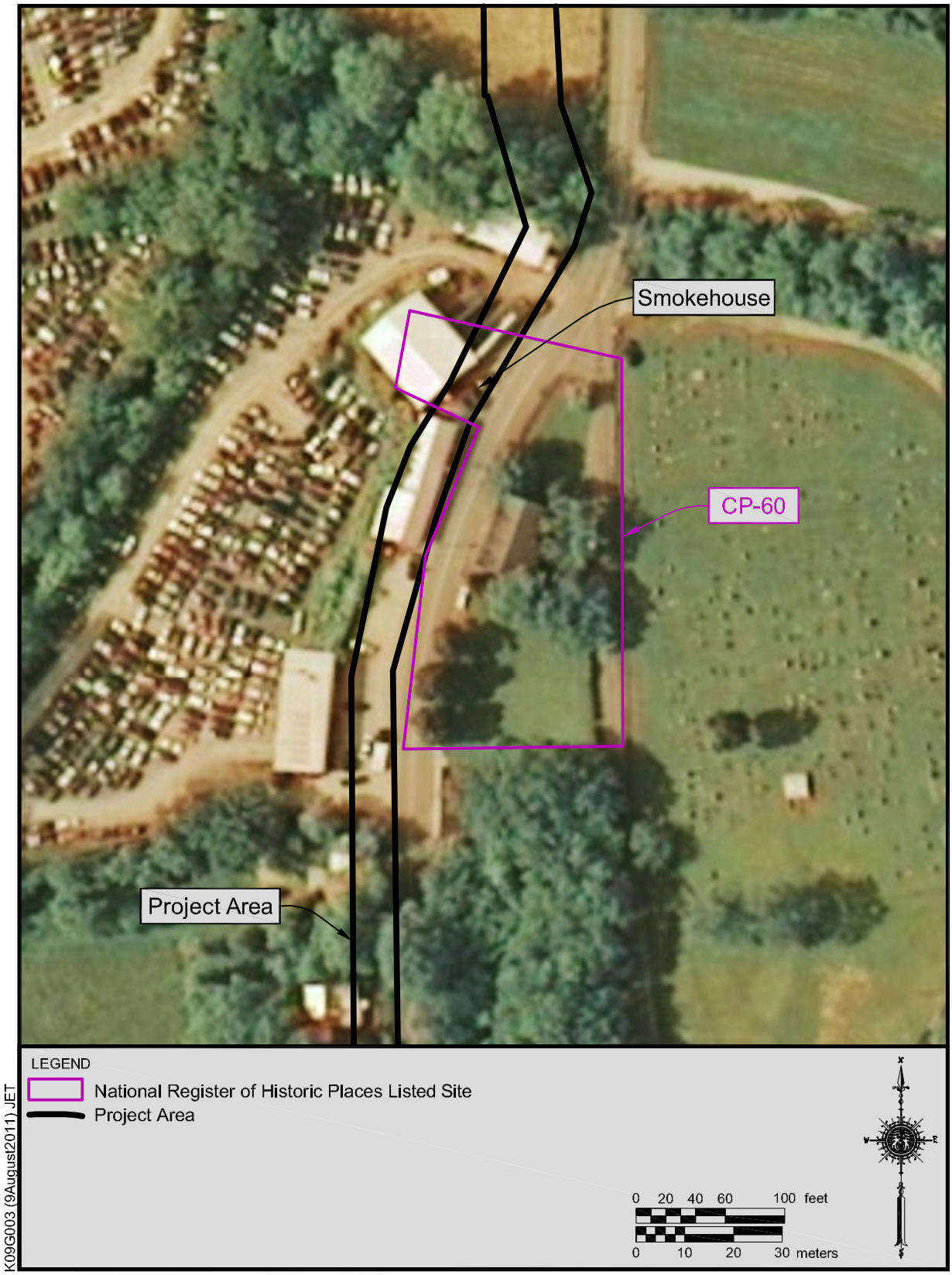

Figure 25. NRHP Boundary of Reitman House Site.

Site 37

KHC Survey #: CP-201

Photographs: Figures 26–27

Property Address: Four Mile Road, Camp Springs

Map: Figures 2 and 3

Zone: 16

Quad: New Richmond, KY 1982

UTMs: E: 728178 N: 4320310

Description: Site 37 contains the remnants of a partially collapsed dry-laid stone fence that likely functioned as a boundary delineator and drain dam for the adjacent creek (Figures 26–27). The fence remnants are located on the west side of Four Mile Road at its intersection with Nine Mile Road. It is heavily overgrown with brush and trees, which have grown on and around the fence structure.

The fence is comprised of a combination of ledge rock and coursed, weathered field rock laid with dry joints, both running and covered. It appears to be random-coursed without apparent patterns in the thickness of courses. A water gap is evident at the eastern end of the fence.

NRHP Evaluation: Not Eligible. The rock fence at Site 037 does not retain the integrity necessary to warrant inclusion in the NRHP. In its currently deteriorated state, the fence structure no longer exhibits its intact historic form. Furthermore, as a result of the site having become overgrown, the fence's spatial relationship with the encompassing landscape has been compromised, thus alleviating the site of functional and associative significance. Research revealed no association between Site 037 and persons or events of historical significance. As such, CRA recommends that Site 037 is ineligible for inclusion in the NRHP under Criterion A, B, or C.

Determination of Effect: N/A.

Figure 26. Northwesterly view of the remnants of the rock fence at Site 037.

Figure 27. Northwesterly view of the remnants of the rock fence at Site 037.

Site 38

KHC Survey #: CP-202

Photographs: Figures 28–29

Property Address: 5757 Four Mile Road, Melbourne

Map: Figures 2 and 3

Zone: 16

Quad: New Richmond, KY 1982

UTMs: E: 726905 N: 4322213

Description: Site 38 consists of a dry-laid stone fence that functions as a boundary delineator and retaining wall (Figures 28–29). It encompasses the steeply-sloped property at 5757 Four Mile Road, which contains a circa 1873 farmhouse. The fence and property are situated on the east side of Four Mile Road approximately 350 ft northwest of its intersection with Lower Tug Fork Road. Private driveways extending northeast and northwest to the south and west of the fence lead to a house and bank barn.

The fence, which wraps the corner of the property and extends northwest and northeast, is comprised of block-shaped quarried stone tightly laid with dry, covered joints. It exhibits courses of varying height without apparent patterns. A layer of thin, flat rock comprises the capping course. It is partially overgrown in various places along the wall structure.

NRHP Evaluation: Not Eligible. The rock fence at Site 038 does not rise to the level of significance warranting inclusion in the NRHP. Although the structure remains fairly intact and representative of early settlement, it does not comprise an element of a significant, associated landscape. The structure is not associated with an intact farmstead and does not convey any immediate association with similar structures. The house on the encompassed property has witnessed severe alteration as a result of additions and re-cladding. As an isolated example of a rock fence, it does not possess enough significance to warrant listing in the NRHP. CRA recommends that Site 038 is ineligible for listing in the NRHP under Criterion A, B, or C.

Determination of Effect: N/A.

Figure 28. North-northeasterly view of the rock fence at Site 38.

Figure 29. East-northeasterly view of the rock fence at Site 38.

Site 39

KHC Survey #: CP-203

Photographs: Figure 30

Property Address: 6830 Four Mile Road, Melbourne

Map: Figures 2 and 3

Zone: 16

Quad: New Richmond, KY 1982

UTMs: E: 728312 N: 4319489

Description: Site 39 consists of a modified 1953 house located on a .58-acre parcel on the west side of Four Mile Road approximately 650 ft northwest of its intersection with Stonehouse Road (Figure 30). A split-rail fence fronts the property along the road. A concrete driveway abuts the house to the north.

The house exhibits a one-and-one-half-story, three-bay (ww/d/ww), side-gabled, frame form with a front-gabled façade wing. The house, totaling 1,040 sq ft, rises from a continuous concrete block foundation and is sheltered beneath a composite shingle-clad roof. An exterior brick chimney rises above the roofline on the north elevation, and a metal stovepipe pierces the roof of the enclosed façade porch. A front-gabled dormer with a one-over-one, double-hung sash window fronts the façade roof slope. Walls are clad in a combination of vinyl siding and asbestos shingles; gable ends are clad in vertical board.

The primary entrance is centrally-located on the façade within an enclosed porch. It is occupied by a half-light replacement door. To the south lies a pair of twelve-light fixed sash windows. North of the entry, within the front-facing gabled mass, is another pair of windows; these exhibit one-over-one, double-hung replacement sashes.

The side elevations are each punctuated by multiple first-story window openings that each have a one-over-one, double-hung replacement sash. An identical window fronts the half story on either gable end. A full-width addition spans the rear (west) elevation.

Figure 30. West-southwesterly view of the house at Site 39.

NRHP Evaluation: Not Eligible. The house at Site 39 does not possess the architectural significance or integrity to warrant inclusion in the NRHP under Criterion C. It is an undistinguished example of a common building form that proliferated in the early to mid-twentieth century and does not separate itself from like examples. Furthermore, its integrity has been compromised by the construction of additions, the enclosure of the façade porch, and replacement of historic window and door components. Research indicated no association between Site 39 and events or persons of historical significance. As such, CRA recommends that Site 39 is ineligible for inclusion in the NRHP under Criterion A, B, or C.

Determination of Effect: N/A.

VI. CONSULTING PARTIES

In addition to the information acquired by CRA during the field survey, Anna Zinkhon, a Campbell County citizen representing the Camp Springs Initiative, contacted the KHC to request consulting party status for this project. CRA contacted Ms. Zinkhon to invite her to share any information that she had on historic resources that she feels may be impacted by the proposed project. To date, Ms. Zinkhon has not responded to CRA; however, in a letter to Judge Steve Pendery, Judge/Executive of Campbell County, she expressed her concerns with the preliminary cultural resource surveys conducted by CRA.

Briefly, her concerns are these: 1) the proposed raw sewage pipeline will introduce "incompatible visual, atmospheric, or audible elements" that will adversely affect the Camp Springs community, which contains 27 properties listed in the NHRP; 2) that the initial Cultural Historic Records Review (Joseph 2009) contained "major inconsistencies" because it stated that resource CP-72, the "Buttermilk" John Weber Farm and its historic home (CP-107), were not listed on the NRHP; and 3) that initial records review conducted by CRA (Kerr and Stephenson 2009) is contradictory because it states that "few significant archaeological resources, if present, will be impacted…if the proposed force main is placed within the existing public right-of-ways (i.e., the roadways)" (Kerr and Stephenson 2009). Ms. Zinkhon also requested that an archaeological field investigation be completed.

As noted earlier, it was determined during CRA's consultation with Jill Howe, environmental review coordinator for KHC, that because the sewer line is located entirely below ground, the project will have no adverse effect on any historic resources unless the construction of the force main directly impacts a building or structure. Any visual, audible, or atmospheric effects during construction of the force main will be temporary and will have no lasting impact on the qualities of the properties that qualify them for listing in the NRHP. The field survey only recorded resources located directly within the APE for the current alignment. Seven cultural resources were recorded during the current project, four of which (CP-60, CP-201–CP-203) are located in the Camp Springs area. Three of these four were not previously recorded and are recommended not eligible for listing in the NRHP. The fourth (CP-60) is listed in the NRHP, but GRW has proposed a construction method (direct boring) that will avoid any physical impact to this building, resulting in a recommendation of no adverse effect.

In every instance, except for the smokehouse discussed above (CP-60), the proposed alignment avoids NRHP listed properties by crossing to the opposite side of the street or running well outside of the property boundaries (see Figures 2 and 3). CRA's initial records review (Joseph 2009) reflected the information available at the time and therefore omitted both the "Buttermilk" Farm (CP-72) and its historic house (CP-107) because KHC records had not been updated to reflect the listed status of these properties. The sewer line does not directly impact these properties because the current alignment is on the opposite side of the street, resulting in a recommendation of no adverse effect.

With regards to cultural resources within, or directly adjacent to, public right-of-ways, CRA's initial cultural resources survey (Kerr and Stephenson 2009) specifically mentioned that if the pipeline was placed in the public right-of-ways (i.e., the roadways), then it likely would not impact intact resources. However, while not specifically mentioned in the report, public right-of-ways also include sidewalks, drainage ditches, and previously existing utilities along those roadways. According to the currently proposed alignment, the pump station and large portions of the pipeline will be constructed in these existing right-of-ways. Only a records review and a visual examination of these areas to verify disturbance was required during the archaeological fieldwork. The few portions of the force main outside the right-of-ways required intensive archaeological survey. As documented in this report, the records review and visual examination of existing right-of-ways and the intensive archaeological survey of the remainder of the proposed force main corridor have been completed, and no archaeological sites were identified. Provided that the proposed pipeline is placed in the public right-of-ways and intensively surveyed portions of the corridor, it is unlikely that the project will impact intact archaeological resources; cultural resource clearance is, therefore, recommended.

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 lead federal agency in consultation with the State Historic Preservation Office (the KHC).

The records search revealed no previously recorded archaeological sites or historic properties within the project area. No archaeological sites were identified as a result of this investigation. Cultural Historic Site 36 (CP-60), a round smokehouse within the NRHP boundaries of the Reitman's St. Joseph House, lies within the project area but will not be adversely affected by the proposed force main sewer line. Because no sites listed in, or eligible for, the NRHP will be adversely affected by the proposed construction, cultural resource clearance is recommended.

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

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APPENDIX A. SCOPE OF WORK

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cultural resource analysts, inc

Proposal for Cultural Resource Survey

July 20, 2009

Submitted to:

Bob Smallwood
GRW Engineers, Inc.
801 Corporate Drive
Lexington, KY 40503

Project Identification

Sanitation District No. 1 of Northern Kentucky
Ash Street Pump Station and Force Main
CIP No. C-414-46 & C-414-48
RFP Issued: June 11, 2009

Study Scope

The RFP states: *Consultant shall perform a preliminary evaluation of the potential level of impacts to wetlands, archaeological and cultural resources, flood plains, streams and stream banks, and endangered species for the sewer alignments. Findings from this survey shall be summarized in the brief technical memorandum as described below and shall be used in the final selection of an alignment.*

Once an alignment has been chosen for final design, Consultant shall perform a more detailed evaluation on the level of impacts to wetlands, archaeological and cultural resources, flood plains, streams and stream banks, and endangered species as necessary to meet regulatory requirements. Consultant shall prepare all letters and submittals related to the environmental assessment for the project. This includes, as a minimum, Phase I Environmental Site Assessment, Phase I Archaeological Survey and Wetlands Assessment. In the event Phase II and Phase III Environmental and/or Archaeological Investigations are required by the regulatory agencies, these services will be negotiated and paid for as an amendment to the Consultant's original design contract.

For purposes of the initial scope and fee proposal, Consultant shall also assume that a general nationwide Clean Water Act 404 permit from the US Army Corps of Engineers (USACE) will be permissible for this project. If an individual permit is required, these services will be negotiated and paid for as an amendment to the Consultant's original design contract.

Scope of Services for the Archaeological Survey

The cultural resource investigations will be conducted in accordance with current Kentucky State Historic Preservation Office specifications. For our proposal we have made the following assumptions for the Phase I archaeological survey:

1.) New Ash St. PS will be build on previously disturbed ground, only a records review and visual examination to verify disturbance will be required,

2.) New force main to convey flow from the new Ash St. Pump Station to the existing Riley Road Pump Station, only a records review and a visual examination to verify disturbance will be required on about 8,000 LF and 20,000 LF will require intensive survey,
3.) New force main from the existing Silver Grove Pump Station to the new Ash St Pump Station will be constructed in exiting right-of-way, only a records review and a visual examination to verify disturbance will be required,
4.) Design a new low pressure sewer system to service the designated properties along Route 8 and convey the flow to the new Ash St Pump Station, only a records review and a visual examination to verify disturbance will be required on about 3,000 LF and about 3,000 LF will require intensive survey,
5.) Rehabilitate or replace approximately 750 LF of existing sewer and manholes influent to the existing Silver Grove Pump Station, only a records review and a visual examination to verify disturbance will be required.

Task 1: File Search/Archival Research

For the preliminary evaluation of potential project impacts, CRA will conduct review of the archaeological and cultural historic site files at the Kentucky Office of the State Archaeologist (OSA) and the Kentucky Heritage Council (KHC) for all project elements. The results of the records review will documented in a technical memorandum.

Task 2: Field Research

An intensive study will be conducted for the final design. We have assumed that the study will focus on 23,000 LF of force main and low pressure. The field research will consist of an intensive survey of the final design following standard archaeological methods (i.e., pedestrian, shovel testing, augering). The portions of the project area that cross terrain with good surface visibility (for example plowed/cultivated fields) or characterized by steep slopes (creek bank) will be subject to pedestrian survey. This entails a walking, visual inspection of the ground surface to identify historic and prehistoric artifacts. Portions of the project that are located on relatively flat terrain with poor surface visibility will have to be shovel tested. This assessment method requires the excavation of screened shovel tests measuring 35 cm in diameter at intervals of 20 m. The phase I investigation will survey only the undisturbed ground within the project area (i.e., areas outside the existing construction rights-of-way). Limited bucket augering may be conducted on alluvial landforms to determine the nature and extent of Holocene alluvium and the potential for the presence of significant deeply buried archaeological sites. All archaeological sites and historic structures discovered within the intensive survey area will be recorded following current SHPO specifications.

Task 3: Report

The results of the archival and field research will be documented in a detailed written report. The report will conform to Kentucky SHPO specifications. In addition, site survey forms will be prepared for each archaeological site recorded and submitted to OSA. A historic structure form will be completed for each historic structure documented and submitted to the Kentucky Heritage Council (KHC).

Deliverables

CRAI will provide eight printed copies of the Phase I survey report, including six copies for agency review. CRAI will also provide one copy of the report on CD in pdf format. CRAI will make one set of revisions to the report requested by the agencies.

To Be Provided By Client

The Client will provide CRA the following:

1. Project description
2. The name of the permitting or funding agency
3. Permitting or funding agency identification number
4. Project mapping in electronic format (Autocad, Microstation, or Arch View shape files). If electronic mapping is not provided additional fees will be accrued on a time and materials basis.

Signed:_____

Name: Steven D. Creasman, RPA

Position: Executive Vice President

Contract Publication Series 09-255

AN ARCHAEOLOGICAL SURVEY OF THE PROPOSED ASH STREET PUMP STATION AND FORCE MAIN PROJECT IN CAMPBELL COUNTY, KENTUCKY

by
Russell S. Quick, Ph.D.

With a contribution by Jennifer M. Faberson

Prepared for

and

Kentucky Infrastructure Authority
Office of the Governor

Prepared by

cra
cultural resource analysts, inc

Kentucky | West Virginia | Ohio
Wyoming | Illinois | Indiana | Louisiana | Tennessee
New Mexico | Virginia | Colorado | Maryland

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AN ARCHAEOLOGICAL SURVEY OF THE PROPOSED ASH STREET PUMP STATION AND FORCE MAIN PROJECT IN CAMPBELL COUNTY, KENTUCKY

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April 17, 2012

Lead Agency: Kentucky Infrastructure Authority
OSA Project Registration No.: FY12_7196

ABSTRACT

On November 15–18, 2010, May 2–4, 2011, and February 28–March 1, 2012, Cultural Resource Analysts, Inc., personnel conducted an archaeological survey of the proposed corridor for a force main sewer line and pump station in Campbell County, Kentucky. The survey was conducted at the request of Joe Henry of GRW Engineers, Inc., in Lexington, Kentucky, on behalf of Sanitation District No. 1 of Northern Kentucky. The project area begins at an existing pump station adjacent to Mary Ingles Highway in Silver Grove, Kentucky, encompasses three alternate locations for the proposed new pump station near Ash Street, and continues south-southeast, paralleling Four Mile Road through the community of Camp Springs to the existing Riley Road Pump Station northeast of the community of Alexandria. The proposed project area consisted of approximately 48 ha (119 acres). Prior to conducting the field research, a records review was conducted at the Office of State Archaeology. The review indicated that no archaeological sites and no investigations had been documented within the project area. Survey methods, which included intensive pedestrian survey supplemented by shovel testing and auger cores, varied according to topographic setting and past and current land use practices. Most of the proposed right-of-way crossed farmland and residential areas. Minor portions passed through commercial properties. Some portions of the project area were extensively disturbed by previous construction or landscaping activities, confirmation of which only required visual inspection and randomly placed shovel tests.

One archaeological site was documented during this survey. Site 15Cp87 is a historic residence dating from before 1900 through at least 1993. Within the current project area, the site consists of a concrete block outbuilding foundation and artifact scatter dating to before 1960. This outbuilding was probably associated with a house that stood on the same long residential lot from at least 1898 through at least 1993. The majority of the site, including the former house location, is outside of the current project area. Within the project area, the site has been heavily disturbed by demolition, the clearance of a right-of-way, and modern trash dumping. All artifacts were found on the surface around the partial foundation. No subsurface artifacts or features were found. The portion of Site 15Cp87 that lies within the project area has little depositional integrity and is recommended as not eligible for the National Register of Historic Places.

The proposed force main passes through several areas with standing structures over 50 years of age. These structures were documented either individually or in groups as historic resources. They are discussed in a separate report (McMahan et al. 2012). No cultural historic clearance is implied by the current archaeological report. The sole archaeological site documented by the project, Site 15Cp87, is recommended as not eligible for listing on the National Register of Historic Places. Therefore, archaeological clearance for the proposed project is recommended.

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I. INTRODUCTION

On November 15–18, 2010, May 2–4, 2011, and February 28–March 1, 2012, Cultural Resource Analysts, Inc. (CRA), personnel conducted a cultural resource survey of the proposed corridor for a force main sewer line and pump station in Campbell County, Kentucky (Figure 1). The survey was conducted at the request of Joe Henry of GRW Engineers, Inc. (GRW), in Lexington, Kentucky, on behalf of Sanitation District No. 1 of Northern Kentucky. The project area begins at an existing pump station adjacent to Mary Ingles Highway in Silver Grove, Kentucky, encompasses the location of three proposed alternate locations for a new pump station near Ash Street, and continues south-southeast, paralleling Four Mile Road through the community of Camp Springs to the existing Riley Road Pump Station northeast of the community of Alexandria. The proposed project area consisted of approximately 48 ha (119 acres). Russell Quick supervised the fieldwork and was assisted by Karen Taylor, Mike Curran, and Ken Case. Approximately 150 person hours were required to complete the fieldwork. Geographic Information Systems (GIS) data was requested by CRA on two occasions. The most recent OSA search was requested on March 1, 2012, and returned on March 2, 2012. The results were researched by Heather Barras of CRA at the OSA on March 5, 2012. The OSA project registration number is FY12_7196. The scope of work is included as Appendix A.

Project Description

Sanitation District No. 1 of Northern Kentucky proposes to construct a new pump station and force main sewer line between an existing pump station adjacent to Mary Ingles Highway in Silver Grove, Kentucky, continuing south-southeast and paralleling Four Mile Road through the community of Camp Springs to the existing Riley Road Pump Station northeast of the community of Alexandria (Figures 2 and 3). Approximately 48 ha was surveyed.

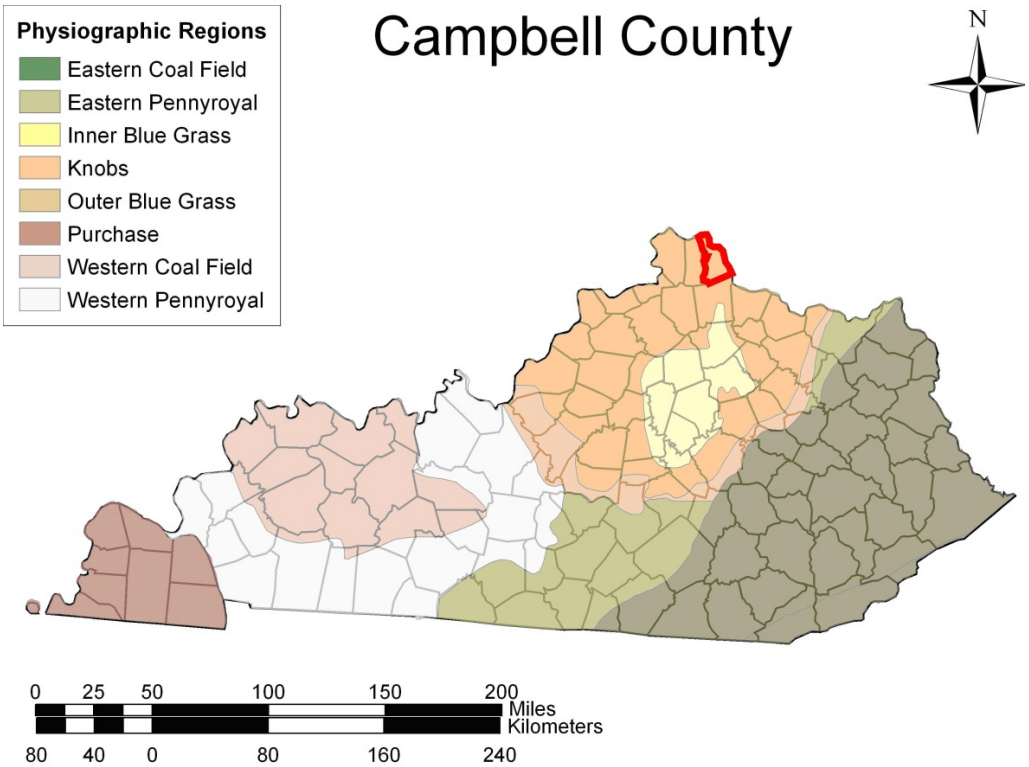

Figure 1. Map of Kentucky showing the location of Campbell County.

Purpose of Study

The study was conducted to comply with Section 106 of the National Historic Preservation Act. This project requires a Section 404 permit under the Clean Water Act from the United States Army Corps of Engineers (USACE) and is therefore considered an undertaking subject to Section 106 review.

The purpose of this survey was to assess any potential effects the proposed connector might have on identified cultural resources. To do this, we followed these objectives:

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

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

establish the vertical and horizontal boundaries of sites;

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

identify aboveground resources 50 years of age or older located in the project easement and viewshed and evaluate their eligibility for listing in the National Register of Historic Places (NRHP).

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: the Secretary of the Interior's Standards and Guidelines" and were not assessed as part of this study (National Park Service 1983).

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

Summary of Findings

In conjunction with the field research, a records review was conducted at OSA. The review indicated that no archaeological sites had previously been recorded and no archaeological surveys had previously taken place within the current project area.

The proposed force main passes through several areas with standing structures over 50 years of age. These structures were documented and discussed in a separate report (McMahan et al. 2012). No cultural historic clearance is implied by the current archaeological report.

One archaeological site was documented during this survey. Site 15Cp87 is a historic residence dating from before 1900 through at least 1993. Within the current project area, the site consists of a concrete block outbuilding foundation and artifact scatter dating to before 1960. This outbuilding was probably associated with a house that stood on the same long residential lot from at least 1898 through at least 1993. The majority of the site, including the former house location, is outside of the current project area. Within the project area, the site has been heavily disturbed by demolition, the clearance of a right-of-way, and modern trash dumping. All artifacts were found on the surface around the partial foundation. No subsurface artifacts or features were found. The portion of Site 15Cp87 that lies within the project area has little depositional integrity and is recommended as not eligible for the National Register of Historic Places. Therefore, archaeological clearance for the proposed project is recommended. Should future project changes impact that portion of Site 15Cp87 outside of the current project area, further testing may be necessary.

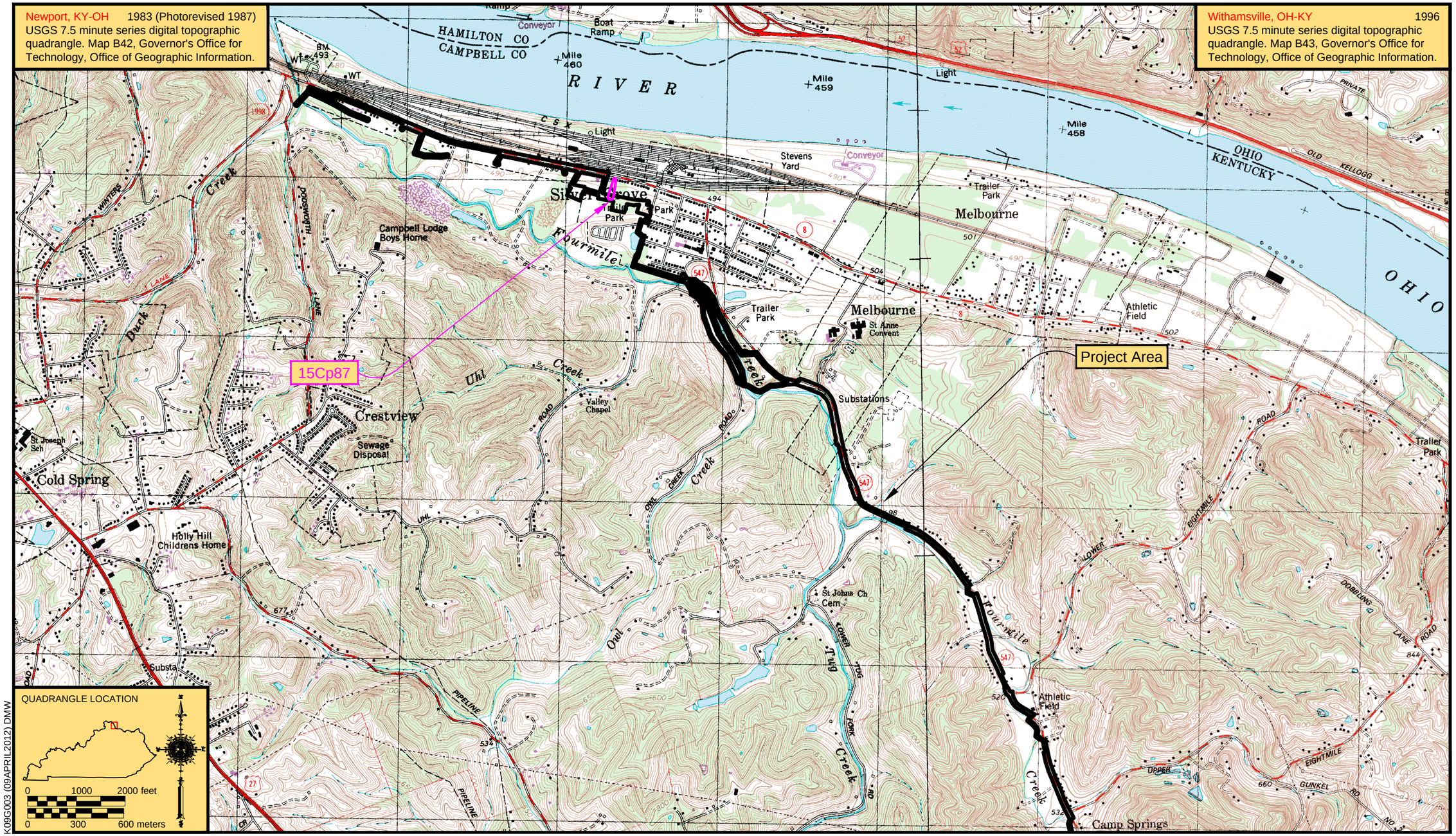

Figure 2a. Location of project area on topographic quadrangle.

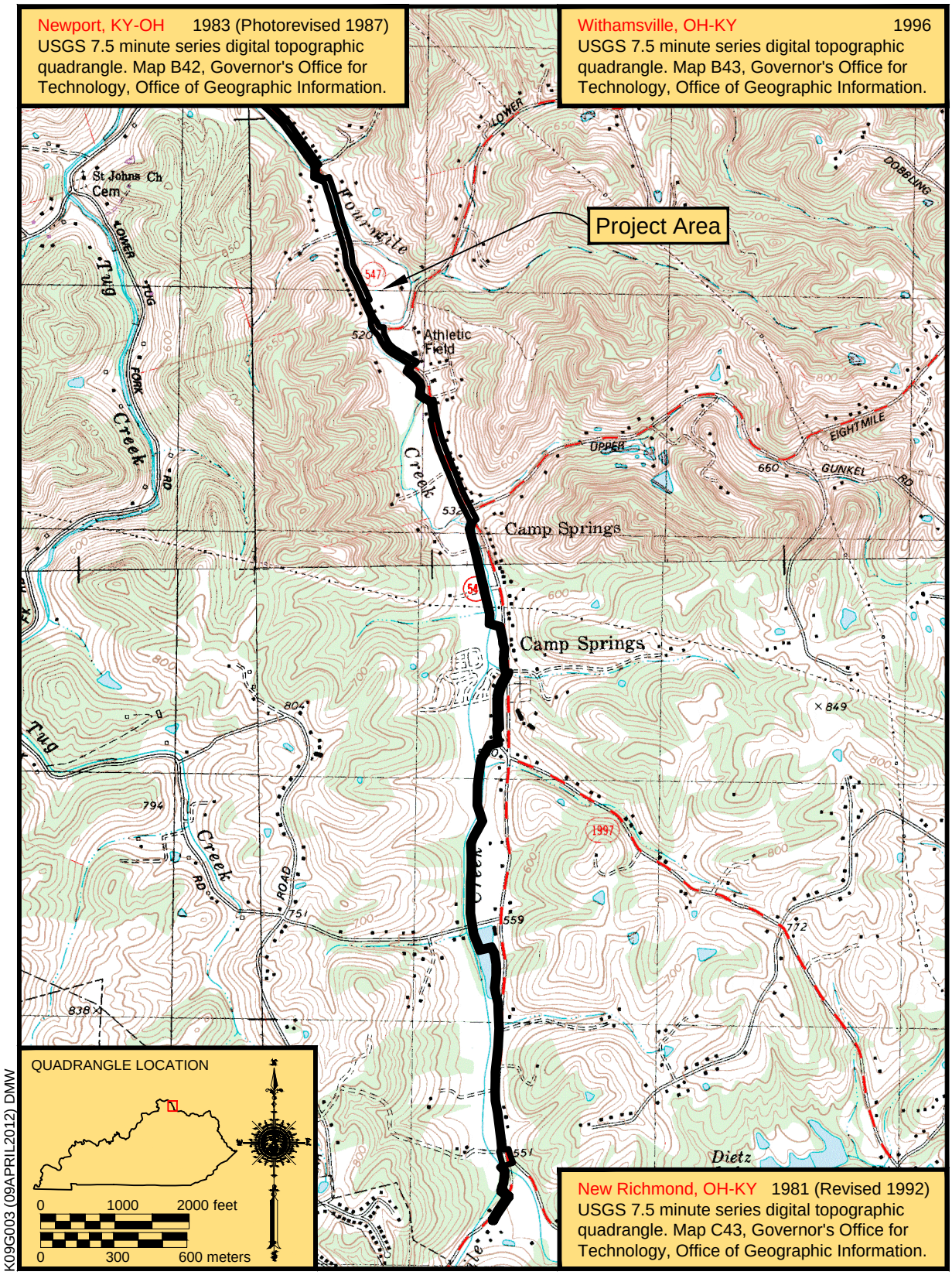

Figure 2b. Location of project area on topographic quadrangle.

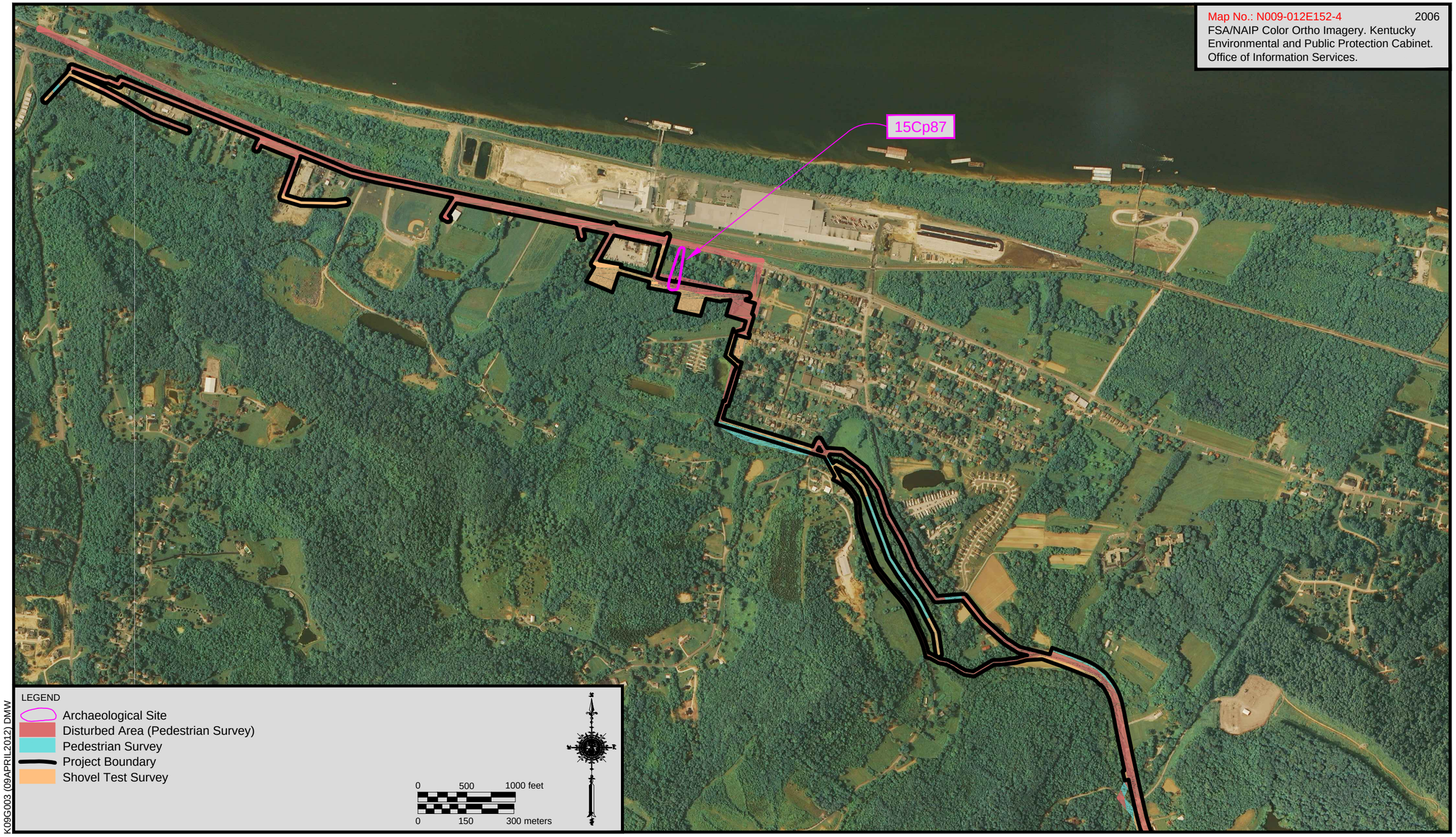

Figure 3a. Project area plan map.

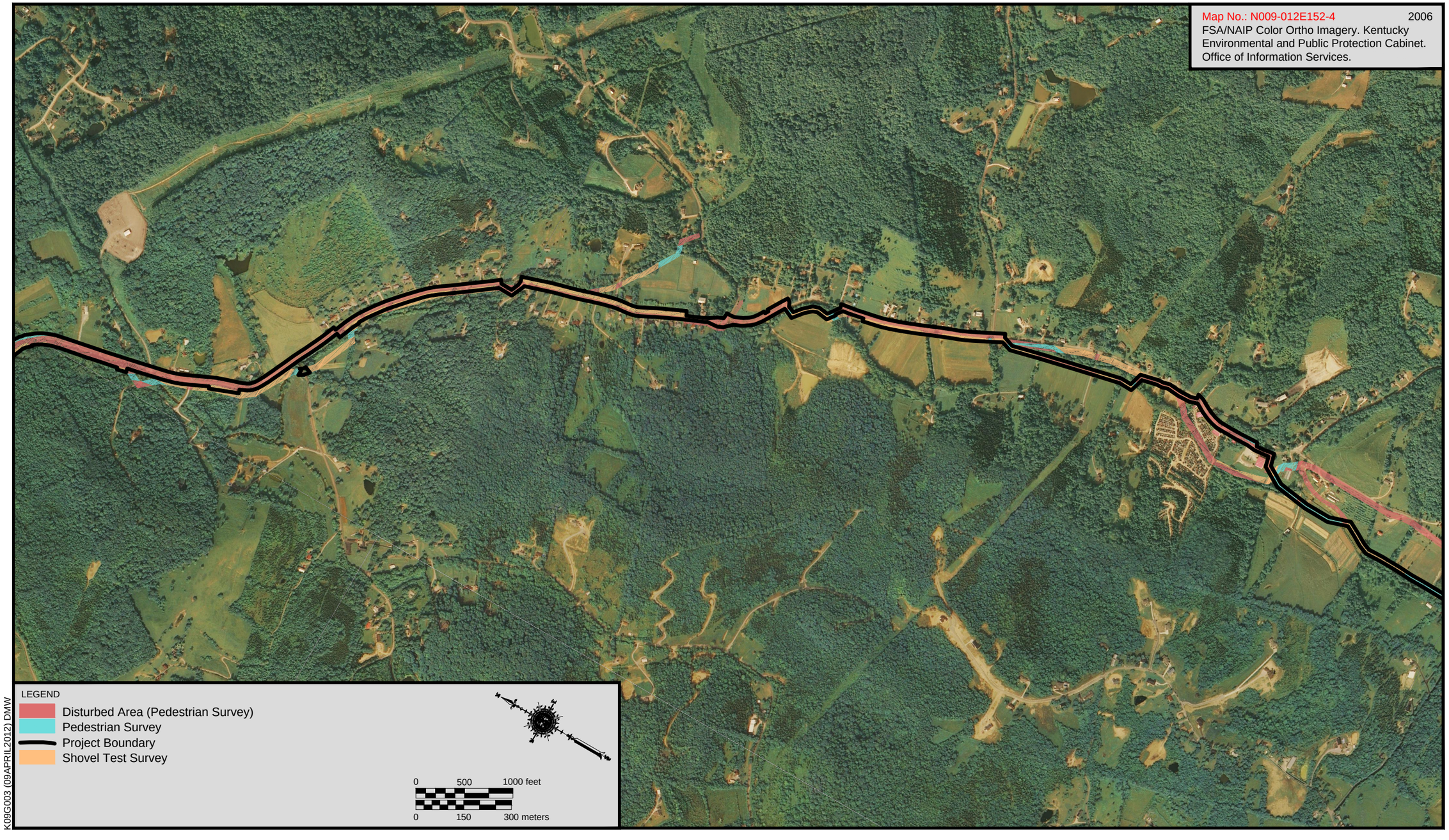

Figure 3b. Project area plan map.

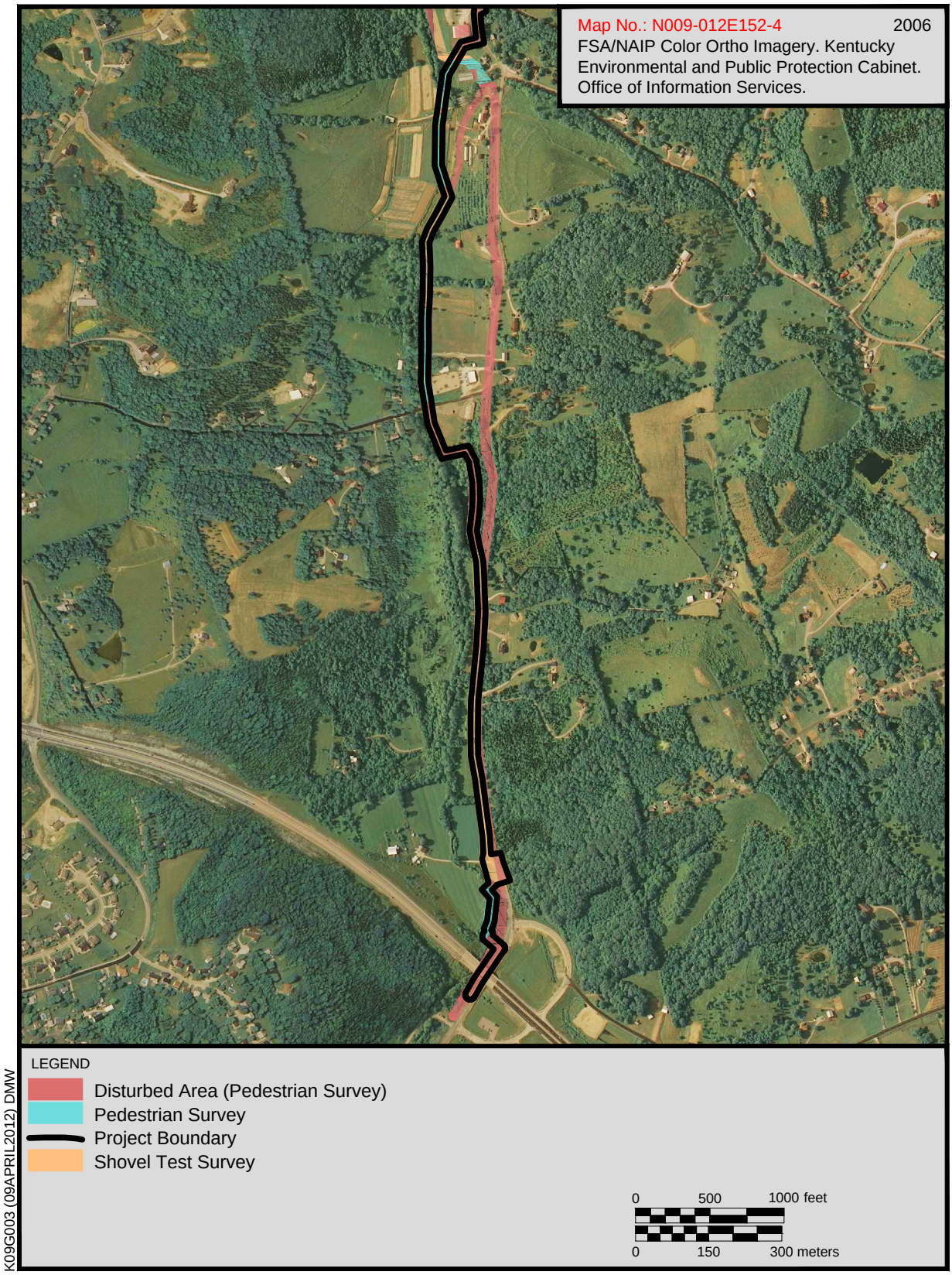

Figure 3c. Project area plan map.

II. ENVIRONMENTAL SETTING

This section of the report provides a description of the modern and prehistoric environment and considers those aspects of the physical environment that may have influenced the location and methods for finding archaeological sites. The discussion of the modern environment specifically provides information regarding the topography, soils, vegetation, and climate. In addition, the general prehistoric environmental conditions are discussed to place the archaeological record of the region within a relative environmental context.

Topography

The project area is located in the eastern portion of Campbell County in the Outer Bluegrass region of Kentucky (McGrain and Currens 1978). The topography of the Outer Bluegrass is characterized by rolling, high-grade limestone uplands that are slightly to moderately dissected (McGrain and Currens 1978). The majority of the project area consisted of floodplains and terraces with a few ridgetop, hillside, and dissected upland settings. Slopes ranged from nearly level to moderate. Elevations within the project area ranged between approximately 162 and 190 m (530 and 623 ft) above mean sea level (AMSL) (see Figures 2 and 3). The project area lies within the Licking River drainage (Figure 4).

Soils

Five soil associations are mapped within Campbell County: the Eden-Cynthiana, Faywood-Nicholson, Rossmoyne-Jessup, Licking-Captina, and Wheeling-Huntington-Alluvial land, steep (Weisenberger et al. 1973). Each soil association is comprised of one or more soil series. Every soil association and soil series represented within the project area is described in more detail below.

The proposed project area was located primarily within the Licking-Captina and Wheeling-Huntington-Alluvial land soil associations. The Licking-Captina association is found on stream terraces and is comprised of gently sloping soils with a clayey to loamy subsoil. Wheeling-Huntington-Alluvial land soils are found on stream terraces and bottoms along the Ohio River and some of its tributaries. These soils have loamy subsoil (Weisenberger et al. 1973:5–6).

Fourteen soil series were mapped for the project area (Table 1) and include Ashton, Avonburg, Brashear, Captina, Eden, Egam, Huntington, Lakin, Licking, Lindside, Newark, Nolin, Rossmoyne, and Wheeling (Weisenberger et al. 1973).

The Ashton series (Mollic Hapludalfs) consists of silt loam that is very deep, well drained, and moderately permeable. These soils formed in loamy alluvium on low stream terraces and alluvial fans, and slopes range from 0 to 15 percent. A typical soil profile consists of a dark brown (10YR 3/3) silt loam Ap horizon to a depth of 23 cm (9 in) over a brown (7.5YR 4/4) silt loam BA horizon to a depth of 38 cm (15 in) over a brown (7.5YR 4/4) silt loam Bt horizon. A C horizon extends between 102 and 203 cm (40 and 80 in) (Soil Survey Staff 2011).

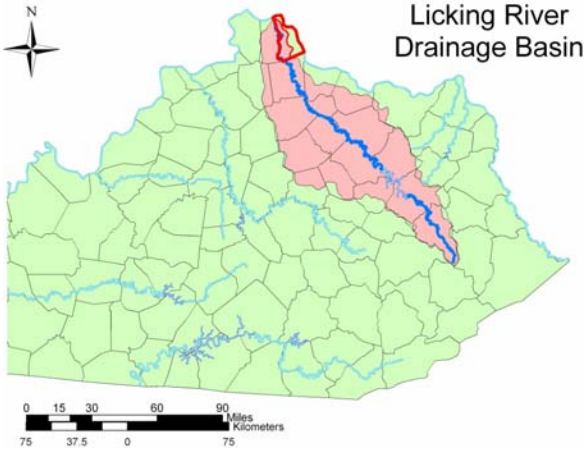

Figure 4. Map of the Licking River drainage basin.

Table 1. Summary of Soil Information for Project Area.

Symbol	Series Name	geomdesc	Taxonomic Order	Age
AsA	Ashton silt loam, 0 to 2 percent slopes (occasionally flooded)	stream terraces on river valleys	Alfisols	late Pleistocene deposits or surfaces
Av	Avonburg silt loam (0 to 4 percent slopes)	flats on uplands	Alfisols	late Pleistocene deposits or surfaces
BrC	Brashear silty clay loam, 6 to 12 percent slopes	ridges on uplands	Alfisols	late Pleistocene deposits or surfaces
BsD3	Brashear silty clay, 12 to 20 percent slopes, severely eroded	hills on uplands	Alfisols	late Pleistocene deposits or surfaces
CaB	Captina silt loam, 2 to 6 percent slopes	stream terraces on river valleys	Ultisols	Pleistocene to late Pliocene or older
EdE2	Eden silty clay loam, 20 to 35 percent slopes, eroded	hills on uplands	Alfisols	late Pleistocene deposits or surfaces
Eg	Egam silty clay loam, (woolper 0 to 4 percent slopes)	flood plains on valleys	Mollisols	late Wisconsin age deposits or surfaces
Hu	Huntington silt loam (0 to 4 percent slopes, occasionally flooded)	flood plains on river valleys	Mollisols	Holocene or late Pleistocene deposits
LaC	Lakin loamy fine sand, 2 to 12 percent slopes	stream terraces on river valleys	Entisols	on surfaces of any age from recent Historic to Pliocene (Udipsamments are generally on late Pleistocene or younger age)
LkA	Licking silt loam, 0 to 2 percent slopes	stream terraces on valleys	Alfisols	late Pleistocene deposits or surfaces
LkB	Licking silt loam, 2 to 6 percent slopes	stream terraces on valleys	Alfisols	late Pleistocene deposits or surfaces
LlD	Licking silty clay loam, 12 to 20 percent slopes	stream terraces on valleys	Alfisols	late Pleistocene deposits or surfaces
LlC	Licking silty clay loam, 6 to 12 percent slopes	stream terraces on valleys	Alfisols	late Pleistocene deposits or surfaces
Ln	Lindside silt loam (0 to 3 percent slopes, occasionally flooded)	flood plains on valleys	Inceptisols	developed in Holocene or late Pleistocene age deposits
Nk	Newark silt loam (0 to 2 percent slopes, occasionally flooded)	flood plains on river valleys	Inceptisols	developed in late Pleistocene or younger deposits
No	Nolin silt loam (0 to 3 percent slopes, occasionally flooded)	flood plains on river valleys	Inceptisols	Holocene or late Pleistocene deposits
RsB	Rossmoyne silt loam, 0 to 6 percent slopes	ridges on uplands	Alfisols	late Pleistocene age deposits
AlD	Wheeling (Alluvial land, steep, 25 to 30 percent slopes, rarely flooded)	stream terraces on river valleys	Alfisols	late Pleistocene deposits or surfaces
WhA	Wheeling silt loam, 0 to 2 percent slopes	stream terraces on river valleys	Alfisols	late Pleistocene deposits or surfaces
WhB	Wheeling silt loam, 2 to 6 percent slopes	stream terraces on river valleys	Alfisols	late Pleistocene deposits or surfaces

Avonburg series (Fragic Glossaqualfs) soils consist of very deep, somewhat poorly drained silt loams. These soils are found on the summits of loess-covered till plains and were formed in loess and the underlying paleosol and till. A typical profile consists of a yellowish brown (10YR 5/4) silt loam Ap horizon to a depth of 28 cm (11 in) over a brownish yellow (10YR 6/6) silt loam BE horizon to a depth of 53 cm (21 in). These surface soils overlie a complex series of four Bt horizons to a total depth of 229 cm (90 in) (Soil Survey Staff 2011).

The Brashear series (Typic Hapludalfs) consists of deep, well drained and moderately well drained soils that are moderately permeable and were formed in the residuum or colluvium of interbedded shale, siltstone, and limestone. These soils are typically found on footslopes and benches but can be found on upslopes with slopes ranging from 2 to 20 percent (Soil Survey Staff 2011). A typical profile consists of an Ap horizon between 0 and 18 cm (0 and 7 in) consisting of brown (10YR 4/3) silt loam over two Bt horizons: a yellowish brown (10YR 5/4) silty clay loam Bt1 and a yellowish brown (10YR 5/6) silty clay Bt2 to a total depth of 86 cm (34 in). These Bt horizons are followed by a Bc horizon of yellowish brown (10YR 5/4) silty clay to a depth of 114 cm (45 in) and a light olive brown (2.5Y 5/4) clay C horizon to a depth of 254 cm (100 in) (Soil Survey Staff 2011; Weisenberger et al. 1973:9–10).

Captina series (Typic Fragiudults) consist of very deep, moderately well drained silt loams. They are found on nearly level to moderately sloping uplands and formed in a thin mantle of silt, colluvium, and residuum weathered from limestone, cherty limestone and dolomite, or siltstone. Slopes range from 1 to 15 percent. A typical profile consists of a brown (10YR 4/3) silt loam Ap horizon to a depth of 23 cm (9 in) over a yellowish brown (10YR 5/4) silt loam BE horizon to a depth of 36 cm (14 in). These are followed by a complex series of five Bt horizons to a total depth of 203 cm (80 in) (Soil Survey Staff 2011).

The Eden series (Typic Hapludalfs) consists of moderately deep, well-drained soils that are slowly permeable and that were formed in residuum from interbedded calcareous shale, siltstone, and limestone. These soils are usually found on hillsides and narrow ridgetops with slopes ranging from 2 to 70 percent but are predominantly found on slopes of 20 and 30 percent (Soil Survey Staff 2011). A typical profile contains an Ap horizon between 0 and 15 cm (0 and 6 in) consisting of brown (10YR 4/3) silty clay loam over a Bt horizon characterized by light olive brown (2.5Y 5/4) silty clay with a few fine faint yellowish brown (10YR 5/6) mottles between 15 and 46 cm (6 and 18 in). The Bt horizon also contains 15 percent weathered shale and siltstone fragments. A BC horizon of light olive brown (2.5Y 5/4) flaggy silty clay with common fine faint olive brown (2.5Y 4/4) light yellowish brown (2.5Y 6/4) and olive (5Y 5/3) mottles can be found between 46 and 61 cm (18 and 24 in). The BC horizon also contains 25 percent weathered shale and siltstone fragments. The last two zones of the Eden series profile are a Cr1 horizon of olive gray (5Y 5/2) slightly weathered interbedded calcareous shale and siltstone with some strata of fractured limestone found between 61 and 127 cm (24 and 50 in) over a Cr2 horizon found between 127 and 203 cm (50 and 80 in) characterized by interbedded soft gray (N 5/0) calcareous shales and siltstones and thin-bedded gray hard fossiliferous limestone (Soil Survey Staff 2011; Weisenberger et al. 1973:13–14).

The Egam series (Cumulic Hapludolls) consists of silty clay loam soils that are “very deep, well drained or moderately well drained soils that formed in clayey alluvium on flood plains and in depressions” (Soil Survey Staff 2011). Slopes are typically less than 2 percent but can be as high as 5 percent. A typical profile consists of a dark brown (10YR 3/3) silty clay loam Ap horizon to a depth of 18 cm (7 in) followed by a very dark grayish brown (10YR 3/2) silty clay loam A horizon to a depth of approximately 56 cm (22 in). The subsoil consists of three very dark grayish brown (10YR 3/2) to brown (10YR 4/3) silty

clay Bw horizons to a total depth of 190 cm (75 in) (Soil Survey Staff 2011).

Huntington series soils consist of deep, well drained soils that are on first bottoms along rivers and small creeks. These Hapludoll soils, which are located along the Ohio River, formed in mixed sediment of Holocene or late Pleistocene age that washed from the upper part of the Ohio River basin. Those along the creeks formed in sediment that washed mostly from soils of limestone origin (Soil Survey Staff 2011).

The Lakin series soils (Lamellic Udipsamments) are excessively-drained soils formed from sandy materials deposited by wind or water and are generally found in hummocky areas on stream terraces and uplands along the Ohio River. These soils typically have a dark brown (10YR 3/3) loamy sand Ap-horizon overlying a brown (10Y 4/3) loamy sand A-horizon followed by a dark yellowish brown (10YR 4/4) loamy sand B-horizon (Weisenberger et al. 1973:6, 18; Soil Survey Staff 2011).

Licking series soils (Aquic Hapludalfs) consist of very deep, moderately well drained silt loams. They formed in a silty mantle over clayey lacustrine deposits on terraces and slopes ranging between 0 and 25 percent. A typical profile consists of a brown (10YR 4/3) silt loam Ap horizon to a depth of 18 cm (7 in) over a yellowish brown (10YR 5/6) silt loam BE horizon to a depth of 28 cm (11 in). These near-surface soils overlie a series of 3 Bt horizons to a depth of 91 cm (36 in) over a series of three C horizons to a total depth of 213 cm (84 in) (Soil Survey Staff 2011).

Lindside series (Fluventic Endoaquepts) consists of very deep, moderately well drained soils formed in alluvium washed mainly from lime-influenced soils on uplands. These soils occur on nearly level floodplains. They typically have a dark grayish brown (10YR 4/2) silt loam A-horizon overlying a brown (10YR 4/3) silt loam BA horizon to approximately 43 cm (17 in). A brown (10YR 4/3) silty clay loam Bw-horizon with many fine and medium distinct yellowish red (5YR 4/6) masses of oxidized iron and few fine and medium distinct grayish brown (10YR 5/2) iron depletions commonly underlies these surface soils (Soil Survey Staff 2011).

The Newark series (Fluventic Endoaquepts) soils consist of very deep, somewhat poorly drained soils formed in mixed alluvium from limestone, shale, siltstone, sandstone, and loess (Whitaker and Waters 1986:94). The soil is on nearly level floodplains and in depressions. These soils are widely scattered throughout creek and river valleys and developed in late Pleistocene or younger deposits. Those soils along small creeks formed in sediment that washed mostly from soils of limestone origin, and those in the Ohio Valley formed in mixed sediment that washed from the upper part of the Ohio River basin. These soils typically have a brown (10YR 4/3) silt loam A-horizon over a brown (10YR 5/3) silt loam Bw-horizon that has many fine and medium faint light brownish gray (10YR 6/2) iron depletions. Commonly, the sediments are gleyed below 15 inches in these soils as a result of a high water table (Soil Survey Staff 2011).

Nolin series (Fluventic Eutrudepts) soils consist of very deep, well drained soils formed in alluvium derived from limestones, sandstones, siltstones, shales, and loess (Whitaker and Waters 1986:95–96). These nearly level to moderately steep soils are on floodplains, in depressions which receive runoff from surrounding slopes, or on natural levees of major streams and rivers. Nolin soils are weakly developed and typically have a brown (10YR 4/3) silt loam A-horizon over a brown (10YR 4/3) silt loam Bw-horizon with few, medium faint yellowish brown (10YR 5/4) mottles of highly weathered siltstone (Soil Survey Staff 2011).

The Rossmoyne soil series consists of “deep, moderately well drained soils that contain a fragipan” (Weisenberger et al. 1973:3). These soils were formed in either loess or glacial till and occur mostly on the broad glaciated ridges in the region. This soil series has been classified as a fine-silty, mixed, super active, mesic Aquic Fragiudalfs (Soil Survey Staff 2011). In a representative

profile, the topsoil is a dark brown silt loam to a depth of 18 cm (7 in) and is underlain by a dark brown silt loam to a depth of 28 cm (11 in). These soil horizons are then underlain by yellowish brown silty clay loam to a depth of 53 cm (21 in) (Weisenberger et al. 1973:24–25).

The Wheeling series (Ultic Hapludalfs) is comprised of deep and well drained soils that formed in loamy material underlain by sand or sand and gravel. Wheeling soils are associated with the Nolin soils on nearby floodplains. Slopes range from 0 to 55 percent. A typical Wheeling soil profile consists of a brown (10YR 4/3) silt loam Ap horizon to 23 cm. This is underlain by a strong brown (7.5YR 5/6) silty clay loam subsoil (Soil Survey Staff 2011).

Observed Soils

The soil profiles revealed in shovel test probes (STPs) within the project area varied depending on the topographic situation. Soils observed were generally associated with their mapped soil series. The typical profile for agricultural pastures that had been subjected to plowing revealed a dark brown (10YR 3/3) sandy loam topsoil that ranged in depth from 0 to 20 cm (0 to 8 in) below ground surface (bgs). The underlying subsoil generally consisted of yellowish brown (10YR 5/6) or brownish yellow (10YR 6/6) sandy loam or sandy clay loam. On hillsides and slopes, the topsoil had been extensively eroded. The profile typically consisted of a thin yellowish brown (10YR 5/6) clayey silt loam extending to approximately 5–7 cm (2–3 in) bgs. The underlying subsoil was characterized by brownish yellow (10YR 6/8) clay loam or clay. Soils situated within drainages and in floodplains usually indicated brown (10YR 4/3) silty clay loam topsoil extending to approximately 5–10 cm (2–4 in) bgs with an underlying gray (10YR 6/1) clay subsoil. Soils noted within previously disturbed areas that included mostly commercial and residential yards contained mixtures of strong brown (7.5YR 4/6), gray (10YR 5/1), and yellowish brown (10YR 5/8) clay subsoil that was mixed with gravel or rock.

Vegetation

The Outer Bluegrass physiographic province is located within the Western Mesophytic Forest (Braun 1950:146). The major vegetation types in this region form a complex mosaic strongly influenced by underlying geologic strata. This is in strong contrast to the situation in the Mixed Mesophytic Forest to the east. Forests in the Inner Bluegrass are generally less luxuriant than those in the Appalachian Plateau and have a greater tendency toward dominance of a few species (Braun 1950:122-123).

The transition from extensive, mixed Mesophytic communities in the far eastern part of the state to extensive oak and oak-hickory communities in central and western Kentucky is well marked despite the more generalized mosaic pattern and the presence of large prairie areas (Braun 1950:123). While old forest trees remain on large estates, there are no extensive areas of original vegetation outside of the river gorges in the Bluegrass and it is impossible to reconstruct a picture of the original forest conditions (Braun 1950:125). Beech trees are not represented naturally in the Inner Bluegrass forest however; beech trees are part of the forested areas in the Outer Bluegrass. The western Mesophytic forest is dominated by oak and hickory, but a wide variety of other species are represented.

Oak, oak-hickory, and oak-chestnut communities occupy many of the drier slopes and uplands while an oak-tuliptree type is represented in areas of low relief. Pine woods, more extensive in secondary than in primary growth, cover many of the Devonian age shale slopes (Braun 1950:137–138; Niquette and Henderson 1984).

Modern Climate

The climate of Kentucky is continental in character. As a result, temperature and precipitation levels throughout the state fluctuate widely. The prevailing surface winds originate in the Gulf of Mexico and are southerly and weak, allowing upper-level westerly winds to steer weather systems across

the state. These factors result in warm, moist air coming from the south, while cooler and drier air is derived from the north. Mean annual temperatures across the state range from 53 degrees Fahrenheit in the northeast to 59 degrees Fahrenheit in the southwest. Overall, there is significant seasonal variation in temperature, with approximately 20 degree differences possible during summer and winter months, as well as up to 25 degree shifts in the spring and fall. Average annual precipitation across the state ranges from 106.68 cm (42 in) in the north to 132.08 cm (52 in) in the south. Warm, moist tropical air masses derived from the Gulf of Mexico are most common during the summer months and contribute to the high humidity levels experienced in the state. During the spring and fall, storm systems tend to be less severe and less frequent, resulting in less radical climate extremes (Foster and Conner 2008).

In Campbell County, Kentucky, the average daily maximum temperature in January is 36 degrees Fahrenheit. July is the warmest month with an average daily maximum temperature of 85 degrees Fahrenheit. The total annual precipitation in the Kenton, Campbell, and Boone County area is 41.5 in (Weisenberger et al. 1973).

Description of the Project Area

The current project area begins at an existing pumping station in the community of Silver Grove on the north end, passes through the community of Camp Springs in the center, and terminates at another existing pump station 2.7 km (1.7 mi) northeast of the community of Alexandria on the south end. For most of its length, the proposed force main parallels the Mary Ingles Highway and Four Mile Road (KY 547) (see Figures 2 and 3).

Terrain within the current project area consisted of floodplains and terraces with a few small dissected upland ridges. Elevations ranged between 162 m (530 ft) AMSL along the Mary Ingles Highway in the northern portion of the project area and approximately 190 m (623 ft) AMSL along upland ridges in the southern portion of the project area along Four Mile Road.

Land within the project area was used for agricultural, commercial, and residential purposes (Figures 5–10). The agricultural areas included pastures that typically held short grass and weeds, as well as occasional stands of deciduous trees. The majority of commercial and residential properties had extensive ground surface disturbance due to landscaping and access roads. The proposed alternate locations for the pump station were primarily modern fill surrounding swampy lowlands.

III. PREVIOUS RESEARCH AND CULTURAL OVERVIEW

Prior to initiating fieldwork, two searches of records maintained by the OSA (Registration Numbers FY10_0749 and FY12_7196) were 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. 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. The following review utilizes the data obtained during the 2012 records search (FY12_7196). To characterize the archaeological resources in the general area further, the OSA archaeological site database for the county was reviewed and synthesized. The review of professional survey reports and archaeological site data for 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.

Figure 5. General overview of project area depicting commercial area, facing east.

Figure 6. General overview of project area depicting typical terrain and vegetation, facing south.

Figure 7. General overview of project area depicting utility disturbance, facing north.

Figure 8. General overview of typical ground surface disturbance associated with residential properties, facing north.

Figure 9. General overview of western project area depicting disturbance from dumping, facing east.

Figure 10. General overview of alternate pump station area depicting swampy terrain, facing southeast.

OSA records revealed that no previous professional archaeological surveys have been conducted within the proposed project area. Five previous archaeological surveys have been conducted within a 2 km radius of the current project area. One previously recorded archaeological site (15Cp63) is located within a 2 km radius of the current project area, but it is not within or adjacent to the proposed force main or pump station area.

Previous Archaeological Surveys

Between July 15 and August 9, 1968, The University of Louisville Archaeological Survey conducted an archaeological survey and preliminary test excavations for the proposed Section 9 of Interstate 275 in Boone, Kenton, and Campbell Counties, Kentucky (Rodeffer 1968). The survey was conducted at the request of the Commonwealth of Kentucky Highway Department. The project area measured 39.4 km (24.5 mi) in length and was surveyed in its entirety. Fieldwork consisted of intensive pedestrian survey supplemented with local informant interviews. Ten archaeological sites (15Be11, 15Be64–15Be66, and 15Be69–15Be74) were identified during the survey (Rodeffer 1968). None of the sites are located within a 2 km radius of the current project area.

On October 2, 1991, CRA personnel conducted a cultural resource survey of three alternative pumping station locations in Campbell County, Kentucky (Niquette 1991). The survey was conducted at the request of the Northern Kentucky Area Development District on behalf of the City of Melbourne, Kentucky. The project consisted of three possible water tank locations, each measuring .02 ha (.05 acres) in size. Fieldwork consisted of intensive pedestrian survey supplemented with shovel testing. No sites or historic properties were located as a result of the survey, and cultural resource clearance was recommended (Niquette 1991).

On July 20, 1998, Gray & Pape, Inc. conducted an archaeological survey of a proposed cellular tower location in Campbell County, Kentucky (Purtill 1998). The survey was conducted at the request of Tilford, Dobbins, Alexander, Buckaway, & Black, Attorneys at Law. The project area measured approximately 418 sq m (4,500 sq ft) in size and was surveyed in its entirety. Fieldwork consisted of intensive pedestrian survey supplemented with shovel testing. No sites or historic properties were located as a result of the survey, and cultural resource clearance was recommended (Purtill 1998).

During April, May, and September of 2003, Gray & Pape, Inc., conducted an archaeological survey of a proposed sewer line in Alexandria and Campbell Counties, Kentucky (Picklesimer II and Pritchard 2003). The survey was conducted at the request of Tetra Tech, Inc., on behalf of the Northern Kentucky Sanitation District No. 1. The project area consisted of 13.1 km (8.2 mi) of gravity fed sewer lines, 3.4 km (2.1 mi) of force main lines, and 6 pumping stations. The survey acreage was not specified. Fieldwork consisted of intensive pedestrian survey supplemented with shovel testing. Four previously unrecorded archaeological sites (15Cp62–15Cp65) were identified during the survey. One of the sites, 15Cp63, is located within a 2 km radius of the current project area. Site 15Cp63 consisted of an isolated stone foundation that appeared to be the remains of an outbuilding. A low density historic artifact scatter associated with the foundation was also identified. Due to the paucity of artifacts and the lack of integrity, Site 15Cp63 was recommended as not eligible for inclusion in the NRHP, and cultural resource clearance was recommended (Picklesimer II and Pritchard 2003).

During November 2007, the University of Kentucky Program for Archaeological Research, Department of Anthropology conducted an archaeological survey of a proposed bridge replacement in Campbell County, Kentucky (Swintosky and Ahler 2007). The survey was conducted at the request of the Kentucky Transportation Cabinet (KYTC). The project area measured 1.25 ha (3.09 acres) in size and was surveyed in its entirety. Fieldwork consisted of intensive

pedestrian survey supplemented with shovel testing. One previously unrecorded archaeological site (15Cp80) was identified during the survey (Swintosky and Ahler 2007). The site is not located within a 2 km radius of the current project area.

Archaeological Site Data

According to site information obtained from the OSA, 73 archaeological sites have been recorded in Campbell County, Kentucky. Table 2 provides a summary of selected information for previously recorded sites in the county. The table indicates that the majority of archaeological sites recorded in Campbell County consist of historic farm/residences (n = 28; 38.36 percent) and prehistoric open habitations without mounds (n = 25; 34.25 percent). The remaining site types in Campbell County include cemeteries (n = 4; 5.48 percent), earth mounds (n = 2; 2.74 percent), other special activity areas (n = 1; 1.37 percent), other (n = 6; 8.22 percent), and undetermined (n = 4; 5.48 percent).

Table 2. Summary of Selected Information for Previously Recorded Archaeological Sites in Campbell County, Kentucky. Data Obtained from OSA and May Contain Coding Errors.

Site Type:	N	%
Cemetery	4	5.48
Earth Mound	2	2.74
Historic Farm/Residence	28	38.36
Military	3	4.11
Open Habitation Without Mounds	25	34.25
Other	6	8.22
Other Special Activity Area	1	1.37
Undetermined	4	5.48
Total	73	100
Time Periods Represented:	**N**	**%**
Paleoindian	0	0
Archaic	10	12.5
Woodland	4	5
Late Prehistoric	4	5
Indeterminate Prehistoric	21	26.25
Historic	40	50
Unspecified	1	1.25
Total	80*	100
Landform:	**N**	**%**
Dissected Uplands	10	13.7
Floodplain	12	16.44
Terrace	33	45.21
Undissected Uplands	2	2.74
Unspecified	16	21.92
Total	73	100

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

The landform locations of sites in Campbell County were also examined to determine the likelihood of encountering sites on similar landforms within the project area. The majority of sites in Campbell County are located along terraces (n = 33; 45.21 percent), followed by unspecified (n = 16; 21.92 percent), floodplains (n = 12; 16.44 percent), dissected uplands (n = 10; 13.7 percent), and undissected uplands (n = 2; 2.74 percent).

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:

1883 *Atlas of Boone, Kenton, and Campbell Counties, Kentucky* (D.J. Lake & Co. 1888);

1898 East Cincinnati, Ohio-Kentucky, 15-minute series topographic quadrangle (United States Geological Survey [USGS]);

1900 East Cincinnati, Ohio-Kentucky, 15-minute series topographic quadrangle (USGS);

1914 East Cincinnati, Ohio-Kentucky, 15-minute series topographic quadrangle (USGS);

1936 Alexandria, Ohio-Kentucky, 15-minute series topographic quadrangle (USGS);

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

1952 General Highway Map of Campbell County, Kentucky (Kentucky State Highway Department [KSHD]);

1952 Newport, Kentucky-Ohio, 7.5-minute series topographic quadrangle (USGS);

1953a New Richmond, Kentucky-Ohio, 7.5-minute series topographic quadrangle (USGS);

1953b Withamsville, Ohio-Kentucky, 7.5-minute series topographic quadrangle (USGS).

The historic maps indicated that 45 structures (MS 1–45) were located within or directly adjacent to the project area (Figure 11; Table 3). MS 1–10 originally appear on the *1883 Atlas of Boone, Kenton, and Campbell Counties, Kentucky*. MS 11–21 originally appear on the 1898 East Cincinnati, Ohio-Kentucky, 15-minute series topographic

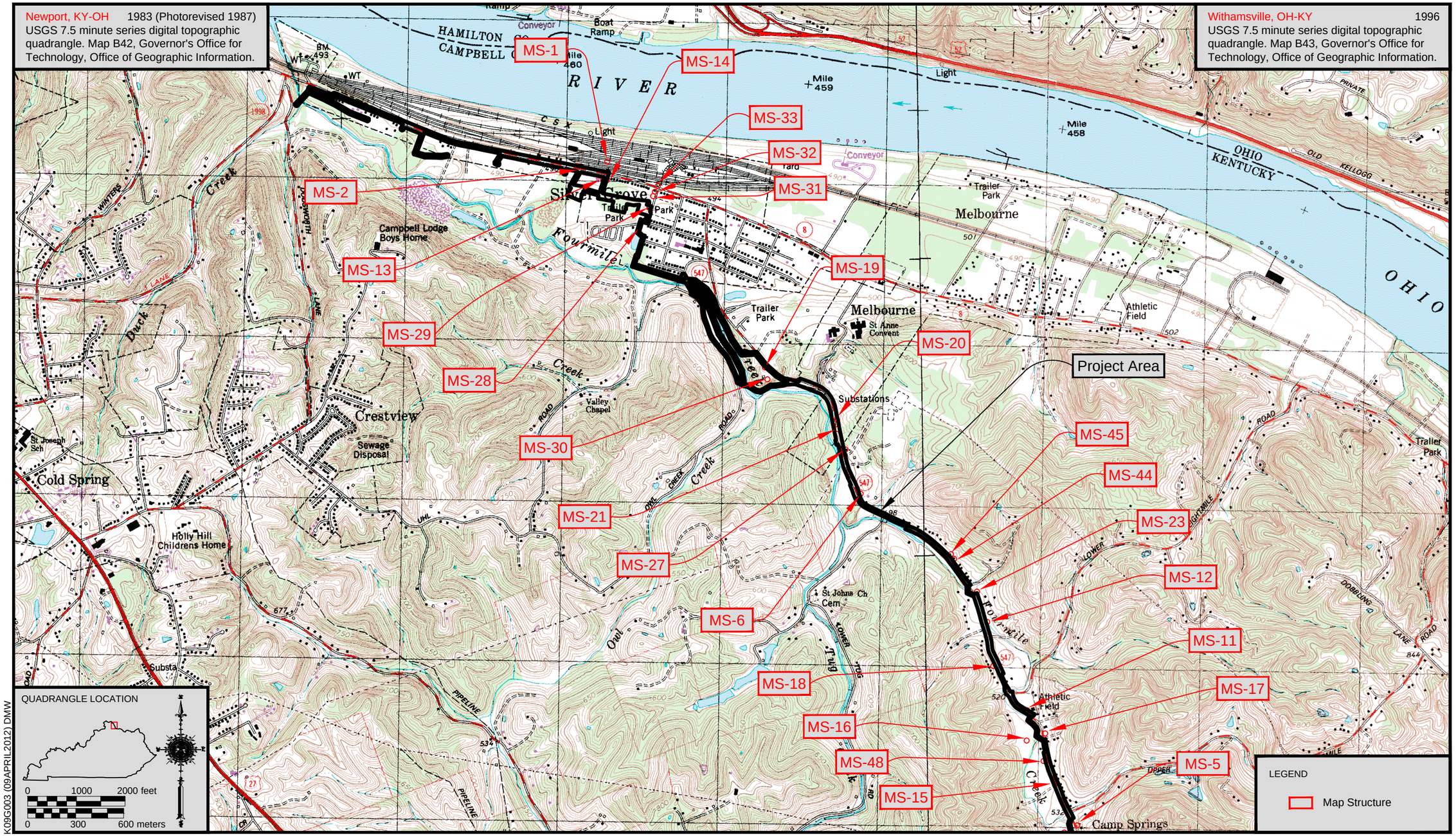

Figure 11a. Topographic map indicating the locations of map structures.

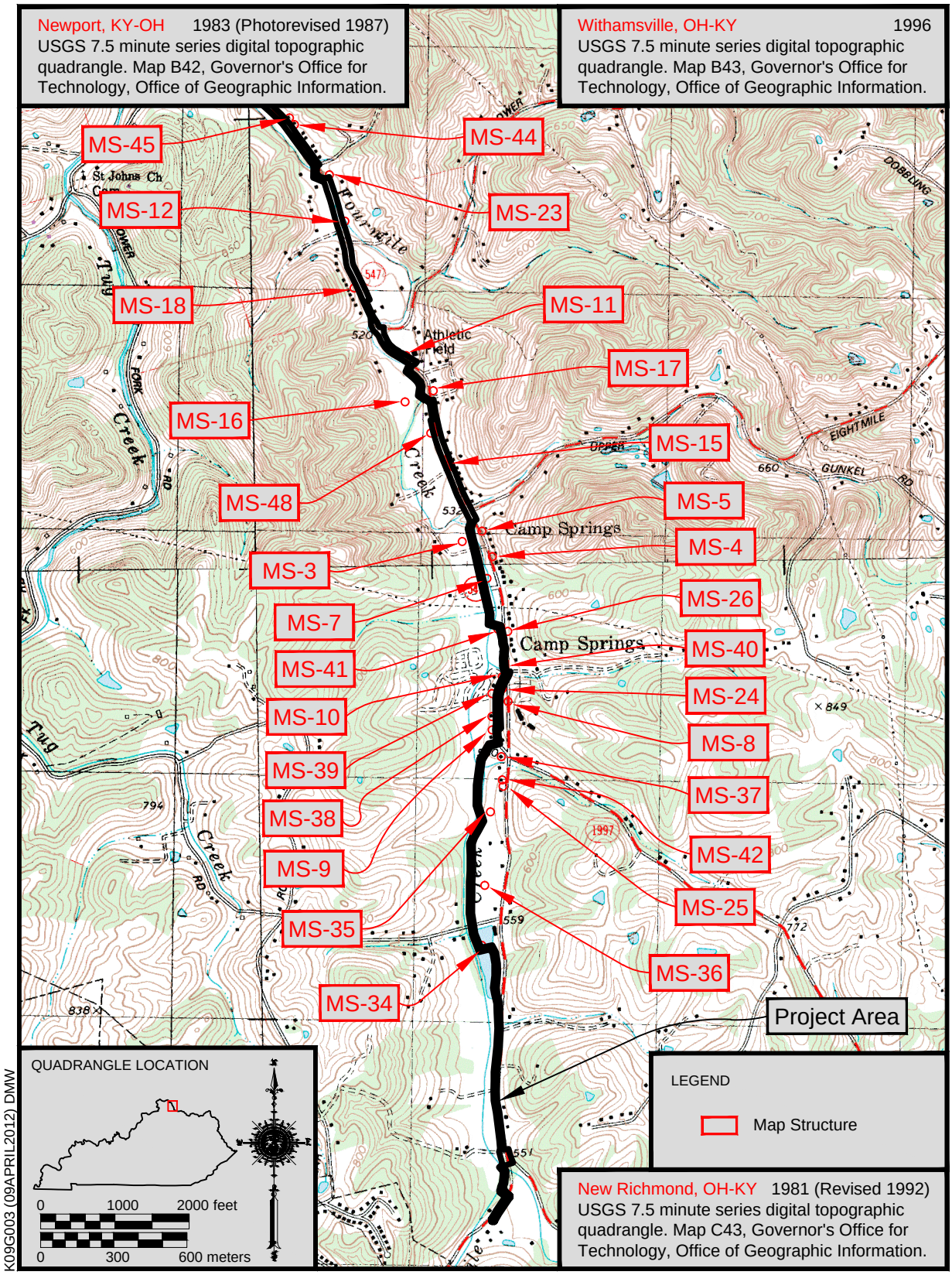

Figure 11b. Topographic map indicating the locations of map structures.

quadrangle map. MS 22 originally appears on the 1914 reprint of the East Cincinnati, Ohio-Kentucky, 15-minute series topographic quadrangle map. MS 23–25 were originally depicted on the Highway and Transportation Map of Campbell County, Kentucky. MS 26–32 were first depicted on the 1952 Newport, Kentucky-Ohio, 7.5-minute series topographic quadrangle. MS 33–35 were originally depicted on the 1952 General Highway Map of Campbell County, Kentucky. MS 36–41 were first depicted on the 1953 New Richmond, Kentucky-Ohio, 7.5-minute series topographic quadrangle. MS 42–45 were originally depicted on the 1953 Withamsville, Ohio-Kentucky, 7.5-minute series topographic quadrangle. Where possible, the current disposition of each MS and its depiction on subsequent maps is given in Table 3.

Table 3. Historic Map Structures.

Name	MS Num	CH Resource	1888	1898	1900	1914	1936	1937H	1952	1953H	1953NR	1953W	Extant	1888_Owner
1888 Atlas of Boone, Campbell, etc	1		X					X					No	C. Webber
1888 Atlas of Boone, Campbell, etc	2		X		X								No	H. Helm
1888 Atlas of Boone, Campbell, etc	3		X	X									No	W. Nagel
1888 Atlas of Boone, Campbell, etc	4		X		X									F. Kort
1888 Atlas of Boone, Campbell, etc	5	313	X		X								Yes	N. Einhaus
1888 Atlas of Boone, Campbell, etc	6	277	X	X	X								Yes (house)	J. Wittmann
1888 Atlas of Boone, Campbell, etc	7		X											N. Reitmann
1888 Atlas of Boone, Campbell, etc	8	324?	X										Yes	St. Joseph's Catholic
1888 Atlas of Boone, Campbell, etc	9		X										No	J. Blenke
1888 Atlas of Boone, Campbell, etc	10		X										No	N. Reitmann
1898 East Cincinnati, OH-KY, 15-min	11			X										
1898 East Cincinnati, OH-KY, 15-min	12			X									No	
1898 East Cincinnati, OH-KY, 15-min	13			X										
1898 East Cincinnati, OH-KY, 15-min	14			X									No	
1898 East Cincinnati, OH-KY, 15-min	15	304		X									Yes (house)	
1898 East Cincinnati, OH-KY, 15-min	16			X									No	
1898 East Cincinnati, OH-KY, 15-min	17	71?		X									Yes	
1898 East Cincinnati, OH-KY, 15-min	18	294		X									Yes	
1898 East Cincinnati, OH-KY, 15-min	19	274		X									Yes (house)	
1898 East Cincinnati, OH-KY, 15-min	20			X									No (Modern)	
1898 East Cincinnati, OH-KY, 15-min	21			X									No (Modern)	
1914 East Cincinnati, OH-KY, 15-min	22					X								
1936 Alexandria, KY-OH, 15-min	23						X						Yes	
1936 Alexandria, KY-OH, 15-min	24	60					X						Yes	
1936 Alexandria, KY-OH, 15-min	25	325					X						Yes (house)	
1952 Newport, KY-OH, 7.5-min	26								X				No	
1952 Newport, KY-OH, 7.5-min	27								X				Yes	
1952 Newport, KY-OH, 7.5-min	28								X					
1952 Newport, KY-OH, 7.5-min	29	236							X				Yes (WPA PS)	
1952 Newport, KY-OH, 7.5-min	30								X				No (fndtn)	
1952 Newport, KY-OH, 7.5-min	31								X				Yes	
1952 Newport, KY-OH, 7.5-min	32	235?							X					
1952 Highway Map of Campbell County	33									X				
1952 Highway Map of Campbell County	34									X				
1952 Highway Map of Campbell County	35									X				
1953 New Richmond, KY, 7.5-min	36										X			
1953 New Richmond, KY, 7.5-min	37										X			
1953 New Richmond, KY, 7.5-min	38	322									X		Yes	
1953 New Richmond, KY, 7.5-min	39	319									X		Yes	
1953 New Richmond, KY, 7.5-min	40	318									X		Yes	
1953 New Richmond, KY, 7.5-min	41										X			
1953 Withamsville, KY, 7.5-min	42											X		
1953 Withamsville, KY, 7.5-min	43											X		
1953 Withamsville, KY, 7.5-min	44	281										X	Yes	
1953 Withamsville, KY, 7.5-min	45	280										X	Yes	

Cultural Historic Resources

In December 2009, CRA completed a cultural historic records review of a 500 ft buffer surrounding the proposed route of the force main and of a .5 mi radius surrounding the proposed pump station site (FY10_0749) (Joseph 2009; Kerr and Stephenson 2009). The records review revealed that a total of 15 cultural historic sites (CP-51, CP-52, CP-59, CP-60, CP-61, CP-62, CP-63, CP-71, CP-72, CP-81, CP-83, CP-91, CP-94, CP-107, and CP-173) located within the study area had been previously surveyed. Ten of these sites (CP-51, CP-52, CP-59, CP-60, CP-61, CP-62, CP-63, CP-71, CP-81, and CP-91) are listed in the National Register of Historic Places (NRHP) as contributing resources to the German Settlement Properties in the Four Mile Creek Area of Campbell County, Kentucky, Thematic Group Resources (TR) nomination. Five of the sites (CP-72, CP-83, CP-94, CP-107, and CP-173) have not been evaluated for listing in the NRHP. Following the records review, the specific alignment of the force main was designed to avoid impacts to historic properties. Thus only one of the previously-recorded sites identified by the records review (CP-60) fell within the project area easement and viewshed surveyed in 2011. Cultural historic resources are discussed in a separate report (McMahan et al. 2012).

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. Historic residences were the primary site types expected since several structures appeared on historic maps. Prehistoric open habitation sites were also considered a possibility.

Cultural Overview

Early Human Occupation

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

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

One case supporting the pre-Clovis occupation of North America has been documented at Meadowcroft Rockshelter in western Pennsylvania. Excavations at the site have produced radiocarbon dates earlier than 17,000 B.C. through material recovered from the deepest microstrata in Stratum IIa associated with pebble tool artifacts, such as choppers, scrapers, and planes (Adovasio et al. 1978:638–639).

More recently, the Monte Verde site in northern Chile in South America has provoked much discussion because of an occupational surface (MV-II) dating to approximately 12,500 years ago that was documented at the site. The Monte Verde occupation includes wooden huts, hearths, and associated stone artifacts. The site dates approximately 1,000 years earlier than the generally accepted dates for Clovis, but it is situated approximately 16,000 km (9,942 mi) south of the Bering Land Bridge (Dillehay 1989, 1997; Meltzer et

al. 1997). In fact, the Monte Verde data have compelled Meltzer and other archaeologists to back off from proclamations concerning a "Clovis Barrier" that had not been breached (Meltzer et al. 1997).

Several additional thoroughly investigated sites in the southeastern United States have also been suggested as pre-Clovis candidates. Among these are the Cactus Hill site located in southeast Virginia (McAvoy and McAvoy 1997; Wagner and McAvoy 2004) and the Topper site in South Carolina (Chandler 2001; Goodyear 1999; Goodyear and Steffy 2003). McAvoy and McAvoy (1997) have recovered fairly good data on pre-Clovis activity at the Cactus Hill site. This site has produced evidence that it was used between 11,000 and 15,000 years ago, the most compelling of which was recovered from a thermal feature that contained a few core blade tools and returned a radiocarbon date of 15,070 ± 70 B.P. (McAvoy and McAvoy 1997:179). Two additional dates for this occupation were 16,670 ± 730 B.P., which was associated with a thermal feature and prismatic blade clusters, and 16,940 ± 50 B.P., which was associated with another thermal feature (McAvoy and McAvoy 1997; Wagner and McAvoy 2004). Thin, lanceolate-shaped hafted bifaces, core blades, blade cores, and worked flakes were found in occupation levels at the site below Clovis-aged occupations (McAvoy and McAvoy 1997).

At another southeastern United States site, the Topper site in South Carolina, a number of lithic artifacts, such as burin- and blade-like tools, have been recovered from beneath Clovis period layers. These artifacts have been dated by optically stimulated luminescence to approximately 13,500 ± 1000 B.P. (Goodyear 1999; Marshall 2001:1730) and "the pre-Clovis artifact-bearing alluvial sands …are at least 16,000 to 20,000 years old" (Goodyear 2006:108). To date, no definitive pre-Clovis occupations or materials have been found in Kentucky (Maggard and Stackelbeck 2008:114).

The Paleoindian Period (before 8000 B.C.)

The Paleoindian period is the earliest cultural period conclusively documented in the Kentucky Bluegrass. Dragoo (1976:5) dated this period in the eastern United States from about 10,500 B.C. to 8000 B.C.; however, Mason (1962:236) has suggested that it may have begun as early as 11,550 B.C.

The arrival of humans in the Bluegrass 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. Although the glaciers never actually extended south of the Ohio River, the climatic effects probably did. This cooler, moister climate would affect the composition and distribution of floral and faunal communities (Delcourt and Delcourt 1982; Klippel and Parmalee 1982).

In the Plains area, Paleoindian points recovered from subsurface contexts have been found in direct association with extinct Pleistocene megafauna (Jennings 1978:27). Often these sites have been interpreted as kill sites, leading archaeologists to hypothesize that early Americans were engaged full time in hunting big game Pleistocene mammals, such as mammoth, mastodon, giant beaver, bison, and horse, to the exclusion of plant resource utilization (e.g., Bonnichsen et al. 1987; Kelly and Todd 1988; Stoltman and Baerreis 1983).

An alternative interpretation is supported by the many species of plants and small mammals that have been recovered from Clovis-age sites, including Lubbock Lake (Johnson 1987), Shawnee-Minisink (Dent and Kaufman 1985; Gingerich 2011;), and Aubrey (Ferring 1989). At Dust Cave in northern Alabama, faunal material associated with the Late Paleoindian levels was more highly represented by birds than mammals (Walker 1996). In a 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.

In the eastern United States, few sites have definite associations of fluted points and extinct Pleistocene fauna. Associations of chipped stone tools and mastodon remains have been reported for several regional sites. At the Adams mastodon site in Harrison County, Kentucky, 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). In opposition to the characterization of Paleoindians hunting megafauna, MacDonald (1985) has proposed that caribou were the preferred game. Evidence to support this suggestion has been found at Holcomb Beach in Michigan (Fitting et al. 1966).

Distinctive lanceolate, often fluted hafted bifaces called "Clovis points" 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. One exception is a "carved, incised, and beveled-based osseous point" recovered from the Sheriden Cave site in Wyandot County, Ohio (Tankersley 1997:713). An additional bone point was recovered from the site in 2000. In Florida, where preservation is better, a number of bone and ivory tools associated with Paleoindian remains have been described (Dunbar and Webb 1996). Many of these tools were manufactured from the bones and tusks of now extinct fauna, including megafauna.

Paleoindian sites in the eastern United States where Clovis points have been recovered from subsurface contexts include Bull Brook in Massachusetts (Byers 1954); the Shawnee-Minisink site in Pennsylvania (Marshall 1978); Wells Creek Crater (Dragoo 1973); the Johnson-Hawkins, Johnson, and Carson-Conn-Short sites (Broster and Norton 1992) in Tennessee; the Debert site in Nova Scotia (MacDonald 1985); and Modoc Rockshelter in Illinois (Fowler 1959). At Meadowcroft, despite the lack of diagnostic fluted hafted bifaces, subsurface remains that date to the Paleoindian period were recovered, including Mungai knives, bifaces, flake blades, and flake debris, as well as four fire-pit features (Adovasio et al. 1977). Although the date is far from being universally accepted, the earliest dated Paleoindian component in North America (14,225 ± 975 B.C.) (Adovasio et al. 1977:Table 7) was recovered from Stratum II at this site.

Radiometrically dated Paleoindian material in the Bluegrass region is limited. A date from one Bluegrass site is worth noting, although a direct association between the date and Paleoindian material unfortunately cannot be demonstrated. An alluvial stratum at Big Bone Lick in Boone County that contained sloth, horse, mastodon, and mammoth yielded a date of 8650 ± 250 B.C. (Tankersley 1985:41, 1987:36–37, 1990:Table 1). Clovis points found at the site over the years indicate that the date may be an accurate assessment for Paleoindian use of this locale (Maggard and Stackelbeck 2008).

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 environment began to change, and Pleistocene

megafauna became extinct. Regional archaeological complexes began to develop (Dragoo 1976:10), and new hafted bifaces replaced the Clovis point tradition. In the Southeast, Clovis fluted points gave way to Plainview, Agate Basin, Cumberland, Quad, Dalton (Meserve), Beaver Lake, and Hardaway-Dalton hafted bifaces. These hafted biface types are representative of the transition from the Late Paleoindian to the Early Archaic subperiod.

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). Hunting remained an important source of subsistence during this time period; however, Dalton peoples probably based their economy around the hunting of animals such as the white-tailed deer instead of large game animals (Morse 1973). This is probably also the case for other Late Paleoindian/Early Archaic groups. According to Williams and Stoltman (1965:678), "available evidence suggests an increasing Dalton concentration into the Tennessee River Valley of northwest Alabama and western Tennessee, and the Green River in Kentucky." With the depletion of the big-game herds, old supplementary subsistence patterns were intensified, signaling the beginning of an Archaic subsistence pattern (Williams and Stoltman 1965). 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).

Many sites that contained Paleoindian material also contained components representative of the transition from the Paleoindian to Archaic periods. There appears to be an increase in the number of sites that may reflect a population increase as part of the transition. Hunting remained important; however, there is evidence for the use of wild plants as a dietary supplement. At the Hester site, Lentz (1986) recovered the remains of wild plum, hickory nut, hackberry, walnut, and acorn in association with Dalton, Big Sandy, Decatur, and Pine Tree horizons. According to Lentz (1986:272) "Most of the foods [recovered in these early horizons] can be consumed fresh without any required grinding, soaking, or cooking." Few food processing artifacts were recovered from the site.

Goodyear (1982:382–392) has argued, based on radiocarbon dates and contexts of Dalton points across the Southeast, that Dalton points consistently date earlier and are not contemporary with later Archaic side-notched and corner-notched forms. Goodyear places this transitional phase between 8500 and 7900 B.C.

The Archaic Period (8000–1000 B.C.)

The Archaic period includes a long span of time during which important cultural changes took place. As Funk states (1978:19) "it is generally agreed that Archaic cultures evolved from Late Paleoindian expressions of the Southeast and Midwest, because there is growing evidence for the existence of transitional cultural manifestations. It is very unlikely that new migrations from Asia were represented." These manifestations probably occurred in response to environmental changes that took place at the close of the Pleistocene epoch. 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.). As of 2006, 720 Archaic period sites had been identified in the Bluegrass (Jefferies 2008:260).

During the Early Archaic subperiod, the last glaciers retreated, and the arctic-like boreal forest began developing into the eastern deciduous forest. By the Middle Archaic subperiod, the environment had become warmer and drier than it is today. In response to the changing environment, with its associated changes in plant and animal life,

Late Archaic peoples developed a more diversified subsistence strategy based on local choices from a variety of subsistence options that included hunting, plant gathering, fishing, and, in some areas, the beginnings of plant domestication in a planned seasonal round exploitation strategy (Winters 1967:32, 1969). Caldwell (1958:6–18) has called this Archaic subsistence approach "primary forest efficiency." This strategy appears to have continued well into the Woodland period.

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 believed 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 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.

In the middle Ohio Valley there appear to be at least two Middle Archaic horizons, although the second is not particularly well documented. The first is the North Carolina sequence, first defined by Coe (1964). The second manifestation is represented by corner-notched and side-notched Brewerton-like points that are typically thought of as Late Archaic points, although they may well have first appeared during the Middle Archaic subperiod (Hemmings 1977, 1985; United States Army Corps of Engineers 1980; Wilkins 1978).

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.

A series of related Late Archaic sites that define the Skidmore phase have been investigated in Rowan and Powell Counties adjacent to the Bluegrass. These sites include the Bluestone site complex (15Ro35-36) (Brooks et al. 1979) and the Skidmore (15Po17) (Cowan 1976) and Zilpo sites (Rolingson and Rodeffer 1968). Diagnostic hafted bifaces have been described in a variety of ways but are generally broad bladed with stubby, contracting stems. Turnbow and Jobe (1981) suggest a maximum age range of 2400 to 1650 B.C. for the Skidmore phase.

The Grayson site, also outside the Bluegrass, covered about 6.00 ha (14.82 acres) of a broad second terrace overlooking the Little Sandy River near Grayson, Kentucky (Ledbetter and O'Steen 1991, 1992). Machine stripping and block excavation revealed a relatively discrete Maple Creek base camp that was occupied during the fall and winter. The site was far less substantial than the Maple Creek site described by Vickery (1976) at the Ohio River near Cincinnati. Diagnostic artifacts recovered included small Merom-Trimble points, and absolute dates spanned the period from 1700 to 1250 B.C. Two rectangular pit houses with rounded corners, one 6.00-x-7.00 m (19.68-x-22.97 ft) and the other 10.00-x-11.00 m (32.81-x-36.09 ft) in size, had been constructed with unevenly spaced posts around an open area. In each was a single large pit containing a small central hearth. The houses were surrounded by medium-size to large pits. Similar structures occur at Late Archaic sites (9Wr4 and 9Wr11) in Warren County, Georgia (Ledbetter 1990).

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 Carlson 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 use of these plants as subsistence resources. Early cultigens have been documented at such sites as Koster in central Illinois (Brown 1977:168), the Carlson 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).

Struever and Vickery (1973) have defined two plant complexes domesticated at the close of the Archaic period that continued to be used into the Woodland period. One consisted of non-native plants, such as gourd and squash, occurring sporadically but early, and corn, which did not become important in the Ohio Valley until circa A.D. 1000. The other was a group of native plants, including *chenopodium*, marsh elder, and sunflower. Recent research in Missouri, Kentucky, and Tennessee suggests that squash was under cultivation in the mid-South by the late third millennium B.C., and that by the second half of the second millennium B.C., evidence from Illinois, Kentucky, and Tennessee demonstrates that squash, gourd, and sunflower were well established (Adovasio and Johnson 1981:74). 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, and then were transported up the Mississippi River and its tributaries. The native cultigens consist of local species whose seeds, recovered from archaeological contexts, are much larger than those that grow in a natural state; thus, cultivation is inferred.

Plant domestication became an important factor in Late Archaic cultural development. Recent research at Cloudsplitter shelter in the Knobs region has documented early plant domestication. Desiccated squash rind was found in a Late Archaic deposit associated with a radiocarbon date of 1778 ± 80 B.C. (Cowan et al. 1981:71, Table 1). Seeds of the Eastern Agricultural Complex (sunflower, sumpweed, maygrass, and erect knotweed) are sparse in the Late Archaic levels at the site. According to Cowan et al. (1981:71), after 1050 B.C., however, "all members of the Eastern [Agricultural] Complex undergo a sudden and dramatic increase in the rate at which they were being deposited in the site," perhaps "indicative of a wholesale introduction of the complex into the region at this time." They (Cowan et al. 1981:71) go on to say "the Late Archaic and Early Woodland inhabitants of Cloudsplitter seem to have followed a similar trajectory in cultivated plant usage experienced in several other river drainages in the East."

The Cloudsplitter data suggest that squash may not have diffused into the East or Southwest from Mexico as previously thought (Struever and Vickery 1973), but that it 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 2000–500 B.C. [see below]). 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 Ohio Valley sharply diverged from their Archaic beginnings. The Kentucky Bluegrass and the adjacent Knobs region shared in this development that produced, in burial mounds and earthwork enclosures, some of the more notable prehistoric monuments in the Ohio Valley of Kentucky. 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 is customarily divided into Early (1000–300 B.C.), Middle (300 B.C.–A.D. 400), and Late (A.D. 400–1000) subperiods. Of these, the Early Woodland is the least known. Burial mound and earthwork complexes termed "Adena," which have counterparts north of the Ohio River, characterized the Bluegrass region at the time of the Middle Woodland subperiod. Toward the end of this subperiod a few sites reflect the subsequent Hopewellian cultural fluorescence, best known from Ohio in the major earthworks of the Scioto and Little Miami Valleys. In the Late Woodland, a distinctive cultural adaptation developed with similar variants throughout the middle Ohio River valley (Railey 1996). As of 2006, 780 sites with Woodland period components had been recorded for the Bluegrass (Applegate 2008:454).

Early Woodland (1000–300 B.C.)

Some of the earliest known Early Woodland sites in the Bluegrass and adjoining Outer Bluegrass Ohio Valley to the north

include Peter Village in Fayette County (Clay 1984, 1985, 1987) and the West Runway site in Boone County (Duerksen et al. 1995). The two sites were quite different. Peter Village was an enclosure first surrounded by a post stockade and later by a ditch and internal bank; the West Runway site was a campsite with multiple hearths, suggesting a series of short-term occupations. Radiocarbon dates place the occupation at West Runway possibly as early as 600 B.C. and Peter Village at about 350–400 B.C. Subsequent dates from the Argosy Casino project across the river in southeastern Indiana confirm that the type of pottery that occurs at West Runway does indeed date as early as 700 B.C. (Clay 2002a). Such early dates have not yet been obtained for the Inner Bluegrass. Although West Runway, in the types of features and their clustering, is not that much different from a Late Archaic site, the site does occur in uplands as opposed to a bank-side location. The Peter Village enclosure, however, marks a sharp break with Archaic settlement systems.

At both sites, thick and relatively crude pottery representing large containers appears. First called Fayette Thick (Griffin 1943) from its occurrence at the Peter Village site, the pottery occurs widely, though sparsely, across the Bluegrass (cf. Clay 1980), with some variation suggesting different pottery-making groups. It even occurs in small and early burial mounds, for example the Hartman Mound in Boone County (Webb 1943), where it may date to around 400 B.C., although the association is not definite. It is hypothesized (Clay 1987) that groups gathered at the Peter Village enclosure to mine barite and galena, which was then fashioned into pigments and artifacts (atlatl weights and cone-shaped barite "buttons") for personal use and for intergroup trading. The large pots may have been "feast containers" made as needed to serve specific work crews. As a result, they may have been difficult to transport between sites and abandoned at the conclusion of a particular project.

Outside of the few sites that have been excavated, artifacts belonging to the Early Woodland subperiod occur widely in the Bluegrass. Chipped chert bifaces are large and of a type known as "Adena Stemmed." Polished, ungrooved stone axes were widely used in woodworking—for example, for cutting stockade posts at the Peter Village enclosure. Finally, the existence of worked weights made from barite/galena suggests the use of improved atlatl or throwing sticks (Clay 1985, 1987).

Middle Woodland (300 B.C.–A.D. 400)

The Bluegrass Middle Woodland subperiod is known by its burial mounds, which have been called Adena after a site excavated in the early twentieth century (Mills 1902) in southern Ohio (Dragoo 1963; Webb and Baby 1957; Webb and Snow 1945). Major mound excavations of the Fischer, Drake, Mt. Horeb, Morgan Stone, Wright, Ricketts, Camargo Mounds, and many others, have given archaeologists a detailed picture of burial customs during this period (Clay 1986, 1998). Excavations at the small Auvergne mound in Bourbon County (Clay 1983) suggest that Native Americans from a larger area came together at the time of a death to feast at the graveside. Some of the large mounds containing multiple burials suggest that these groups often returned to the same mound to add further burials to the structure. At times, the burial mound could, like the Wright Mound in Montgomery County (Webb 1940), grow to imposing size.

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 Bluegrass 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, of which the Mount Horeb site in Fayette County (Webb 1941) is an excavated example. Late in the Middle Woodland subperiod, hilltop enclosures, such as Indian Fort Hill near Berea in Madison County, Kentucky, were constructed. Still, daily domestic sites are very poorly understood,

although examples dating to the time period have been found to the south on the Cumberland Plateau (Kerr and Creasman 1995), and off-mound domestic areas have been identified adjacent to the mounds (Clay 1983). Although hunting was important in the Middle Woodland subperiod, finds from rockshelters in the adjoining Knobs region 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).

Late Woodland (A.D. 400–1000)

After circa A.D. 400, earthen burial mounds went out of style in the Bluegrass. Some of the latest examples are the Auvergne mound in Bourbon County (Clay 1983), dating circa A.D. 200, and the Wright Mound in Montgomery County (Webb 1940), with a single date after A.D. 200. 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. Sites such as Rodgers in Boone County (Kreinbrink 1992) and Pyles in Mason County (Railey 1984) indicate 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 2002b:174–182). The economy continued to emphasize hunting, gathering, and the utilization of a variety of locally domesticated plants. Corn was not an economic resource until the very end of the Late Woodland subperiod but would become a hallmark of the following Late Prehistoric period, with significant consequences for human cultures in the Bluegrass.

Late Prehistoric Period (A.D. 1000–1700)

The Late Prehistoric archaeological complex of the middle Ohio Valley, dating from approximately A.D. 1000 through circa A.D. 1700, is called Fort Ancient, again after a site in southern Ohio. Fort Ancient extends from western West Virginia to southeastern Indiana, and from south-central Ohio to north-central and northeastern Kentucky (Griffin 1978:551). In the Bluegrass, Fort Ancient is divided into Early (circa A.D. 1000–1200), Middle (A.D. 1200–1400), and Late (A.D. 1400–1700) subperiods (Applegate 2008). In the central Bluegrass, the Early Fort Ancient is defined as the Osborne Phase, known from the Muir (Turnbow and Sharp 1988) and Dry Run sites (Sharp 1984) in Jessamine and Scott Counties. Middle Fort Ancient sites include Buckner, Gilfoil (Fassler 1987), and Florence. In this area, the Late Fort Ancient is also referred to as the Madisonville Horizon, observed at the Larkin site in Bourbon County and the Goolman site in Clark County. In the eastern Bluegrass, the Manion Phase has been defined as a Middle Fort Ancient component at the Fox Farm site, and the Late Fort Ancient or Madisonville Horizon has been subdivided into the Gist (A.D. 1400–1550) and Montour (A.D. 1550–1750) Phases (Applegate 2008; Henderson 1990; Henderson and Turnbow 1987).

The development of Fort Ancient culture and its relationship to Late Woodland cultures has been a debated issue. Two hypotheses have been offered for the relationship between Fort Ancient and Late Woodland cultures. One suggests that Fort Ancient represents the fluorescence of an indigenous Late Woodland culture (Graybill 1980:55–56; Rafferty 1974). Others suggest that Fort Ancient represents an influx of Mississippian peoples from the lower Ohio River Valley (Essenpries 1978:154–155). Although the question has yet to be resolved, it is possible that both of these hypotheses may be correct, depending upon the data set and region one employs to address the problem. Essenpries (1978), for example, has suggested that these two hypotheses are appropriate for explaining Fort Ancient manifestations at different times during the Late Prehistoric period. In this scenario, Fort Ancient is viewed as a fluorescence of Mississippian-influenced Late Woodland

culture during the early (Baum, Anderson, and Feurt) phases and as an influx of Mississippian peoples during the later Madisonville Phase (Essenpries 1978:164).

Other archaeologists argue that not all local Late Woodland groups chose to participate in, or accepted, the Mississippian cultural complex (i.e., horticulture and sedentism), and instead they continued to follow their essentially Woodland (Late Archaic) way of life. The very few absolute dates from Fort Ancient sites and the almost complete lack of stratigraphic data and intersite comparative studies contribute to the confusion (Griffin 1978:557).

Regardless of the causal factors, Fort Ancient does reflect an elaboration of Late Woodland subsistence activities and social organization. Settlements were much more nucleated, as evidenced by large village sites (Mayer-Oakes 1955) 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 (Graybill 1978, 1979). A number of sites along the Ohio River, or close to it, were fortified, and many have central courtyards or plaza areas (Griffin 1978:552).

Fort Ancient subsistence is characterized by a reliance on the cultivation of maize, coupled with beans and squash. Despite the increased importance of horticulture, hunting provided an important source of food. Deer was the main source of meat; at some sites, up to 80 percent of the game consumed was deer (Griffin 1978:552). The cultural material assemblage, including elaborately decorated pottery vessels (usually tempered with crushed mussel shell, although limestone and grit tempered ceramics also occurred), triangular arrow points, mussel shell tools (e.g., knives, scrapers, and hoes), and bone tools (e.g., bone beamers), also serves to distinguish Fort Ancient cultures from Late Woodland occupations (Griffin 1978; Sharp 1996).

Although Fort Ancient subsistence, like that of Mississippian populations, was based on the cultivation of corn and other cultigens, other aspects of Fort Ancient culture clearly distinguish it from the contemporary Mississippian occupations (i.e., Fort Ancient sites lack large ceremonial centers and earthworks, although some Early and Middle Fort Ancient sites [through circa A.D. 1250] had burial mounds). The Rowena site, for example, which was flooded by Lake Cumberland, was described as a small Mississippian regional center, possibly occupied from A.D. 1300 to 1400 (Weinland 1980:133). The artifact assemblage indicated that the site was strongly influenced by eastern Tennessee cultures, especially the Dallas cultures (Weinland 1980:131), throughout most of its history. Other Mississippian sites along the Cumberland River, such as Crowley-Evans (Jefferies 1995; Jefferies and Flood 1996), were built around a low platform/mound on which stood the house of a local chief. However, the complex settlement hierarchy found in Mississippian cultures does not seem as prevalent in Fort Ancient culture. Very few Fort Ancient settlements have mounds (n = 12)—the overwhelming majority (n = 476) of them do not—and few other site types (e.g. workshops, cemeteries, rockshelters) are known in the Bluegrass (Henderson 2008:808).

Protohistoric and Historic Period (A.D. 1700)

The Protohistoric period begins with the first indications of contact between Native-American groups and expanding western European populations after A.D. 1492. The evidence for this contact exists principally in the form of glass beads of European manufacture and metal artifacts (first brass, and later iron) of both European (e.g., bells) and Native-American (e.g., tinklers) manufacture (Drooker 1997).

In the middle Ohio Valley and the neighboring Cumberland Plateau, these artifacts appear in the Late Prehistoric, Madisonville Horizon of the Fort Ancient culture (Drooker 1997). They occur at the Madisonville site near Cincinnati and then

widely at other Fort Ancient sites of the phase, some of which occur on the plateau. They reflect indirect contact between Native-American groups and the French via their occupation of the St. Lawrence Valley to the north and the Spanish to the south. In other words, the European goods were obtained by trade where Native Americans were living in direct contact with Europeans (Drooker 1997).

An exhaustive analysis of Madisonville Horizon Fort Ancient culture suggests that this final Fort Ancient occupation of the region may have been on the decline by the end of the first quarter of the seventeenth century, reflecting the movement of its Native-American peoples both west and east in order to maintain closer contact with the French settlements of the Mississippi Valley and the Dutch and English settlements of the east coast, both being developing points of European trade. As a result, this portion of the Ohio Valley may have been largely vacated by Native Americans before the onset of the Iroquois depredations after A.D. 1640, themselves a product of intensifying commercial links between the tribes of the Iroquois Confederacy and the French (Drooker 1997:336–337).

After A.D. 1724, Native-American tribes, who we can identify as the Shawnee, were present in the region, having been pushed westward from the east (i.e., from the Susquehanna drainage of Pennsylvania) by the expansion of European settlement (McConnell 1992:21). The origins of the Shawnee are not clear, but they can be identified on the Ohio River by A.D. 1750 or later at sites such as Bentley and Old Fort Earthworks (named for the nearby Middle Woodland earthworks) (Henderson et al. 1986:131–137, 1992:270–278; Pollack and Henderson 1984). By this time, like their European competitors, the native residents possessed a full range of iron tools and arms. Currently, there is little good evidence to indicate that these Shawnee were the cultural descendants of the last Fort Ancient Native Americans of the Madisonville Horizon (Drooker 1997:104–105).

The conflicts between the Shawnee and other groups of the middle Ohio (i.e., Delaware, Miami, Piankashaw, and Wyandot) 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).

Kentucky was originally a part of Virginia called the Kentucky District. The Kentucky District contained three counties, Fayette,

Lincoln, and Jefferson, which became the Commonwealth of Kentucky on June 1, 1792 (Clark 1992). These three counties were later divided and subdivided into the 120 counties that presently make up the Commonwealth of Kentucky.

Historical Overview of Campbell County, Kentucky

Campbell County was created by the Kentucky General Assembly on December 17, 1794, from portions of Harrison, Mason, and Scott Counties. The nineteenth county created in the state, Campbell County was named for Colonel John Campbell, an Irishman who served in the Revolutionary War. Located in northern Kentucky, Campbell County is part of the Bluegrass region cultural landscape. The county covers 394 sq km (152 sq mi) and is bordered by the Ohio River on the north and east, Pendleton County on the south, and Kenton County on the west. The county seat is Alexandria (Bryant 1992:155).

In 1750, Christopher Gist surveyed a 404,685-ha (500,000-acre) grant in the area on behalf of the Ohio Company, but because of the rugged topography, Native-Amerian threats, and inaccessibility, the area was not settled. Later, the U.S. Congress preempted the claims made by the company (Belue 1992:375–376). In 1789, Major David Leitch established the first permanent settlement in present day Campbell County by constructing a station near the river. In 1803, Newport Barracks, an army outpost, was established in Newport to supply soldiers during European-American and Native-American conflicts (Campbell County Historical Society [CCHS] 1994:3; Kleber 1992a:12).

In the 1790s, Frank Spilman and his family left King George County, Virginia, and settled on land near modern day Alexandria. The city of Alexandria was incorporated in 1834 (Kleber 1992a:12). James Taylor, Jr., brought several settlers to the confluence of the Licking and Ohio Rivers and settled Newport in the 1790s. This city was named after Christopher Newport, the commander of the first ship to reach Jamestown, Virginia (Steely 1992a:680). Early on, Newport served as a major military center for the War of 1812. This city also experienced a large influx of German and Irish immigrants in the 1840s (CCHS 1994:3;Kleber 1992a:12; Steely 1992a:680).

Throughout the nineteenth century, Newport continued to grow and was positioned to dominate the river trade along that section of the Ohio. Cincinnati, however, eclipsed the Kentucky town, but Newport remained an important river port throughout the nineteenth century. The Newport Barracks continued to be an important military facility for processing soldiers during the War for Texas Independence and the Mexican War (Bryant 1992:155; CCHS 1994:4).

Newport served as the seat of government until 1827, when it was moved to Visalia, which is on the west bank of the Licking River. It was too isolated, however, and the seat was returned to Newport after just a few months. In 1840, Alexandria was made the county seat, and its citizens financed the construction of a new courthouse in 1842. In 1883, the citizens of Newport raised money to construct another courthouse, and the county offices were then split between the two towns (Bryant 1992:155; Kleber 1992a:12). The two county seats were finally consolidated into one when a 2009 court ruling affirmed that Alexandria is indeed the county seat (The Kentucky Enquirer [TKE] 12 May 2009).

Campbell County enjoyed steady growth throughout the first half of the nineteenth century. Five years after its creation it had only 1,534 inhabitants, but by 1810 it had 3,608. Over the next decade the population more than doubled when it reached 7,022 people, and it grew another 40.7 percent in the next decade, reaching 9,883 inhabitants in 1830. Campbell County lost a large percentage of its population when Kenton County was created on the west side of the Licking River. In 1840, the county's population slipped to 5,214 people, a 47.2 percent drop (United States Bureau of the Census [USBC], Washington, D.C., 1800–1840).

Fueled by industrialization and immigration, Campbell County grew rapidly after 1840. Much of the growth was around Newport, which was a village of 717 people in 1830 but had grown to a city of 5,895 residents by 1850. Between 1840 and 1850 the county grew more than 150 percent to 13,127 inhabitants, and it grew another 59.2 percent to a population of 20,909 by 1860. In 1850 the population included 177 enslaved African Americans, and in 1860 it included 116 slaves and 88 free African Americans, which constituted less than 1 percent of the population (Collins 1882:260, 263; USBC 1840–1860).

The Civil War had little direct effect on Campbell County because of its extreme northern location. The Union Army constructed several fortifications to defend and protect the southern approaches to Cincinnati. Fort Thomas was built in the northern portion of the county near the Ohio River. Several hundred civilian militiamen occupied the trenches when the Confederates invaded Kentucky in 1862, but the area was never seriously threatened by Rebel forces (Bryant 1992:155; Kleber 1992b:347).

The war did little to slow the industrial growth of Campbell County. Industries such as steel, meat processing, and brewing were created. This gave residents of Campbell County steady employment. The Swift Iron and Steel Company was formed during the war, and it manufactured armor for the iron-clad gunboats used on the Ohio and Mississippi River systems. The business grew rapidly, and the company was able to produce all types of products in its 32 puddling furnaces, rail mills, blast furnaces, and foundry (Bryant 1992:155; CCHS 1994:110).

In 1880, the company was purchased by a Cincinnati pig iron merchant named E.L. Harper, but financial misdealing resulted in Harper being sent to the Ohio state penitentiary. Swift Iron was forced to cool its furnaces. The mill was then purchased by H.B. Schriver and Adam Wagner, but financial problems continued to plague the company. In 1889 it was purchased by a group of businessmen that included brewing magnate George Wiedemann. They renamed it Newport Rolling Mill Company and transformed it into a successful manufacturing firm (CCHS 1994:110).

In 1866, John Butcher opened the Jefferson Street Brewery in Newport and developed it into a successful business. In 1870, George Wiedemann, Sr., became Butcher's partner, and in 1878, Wiedemann bought out the company's founder. Later in 1882, he bought out Constans Brewery, a rival operation in Newport. Wiedemann continued to expand his brewery until it was one of the largest in the nation (CCHS 1994: 121).

In the 1830s, a road between Newport and Winchester was built by the state. This road was very crude, and residents of Campbell County formed a turnpike association to promote better road construction. A road was completed in the 1850s and was eventually called Alexandria Pike. This road contained two toll-gates until the 1900s, when farmers and other residents fought for a free road for access to markets in Newport, Covington, and Cincinnati (Kleber 1992a:12).

The completion of the Covington-Cincinnati Bridge (today it is known as the Roebling Suspension Bridge, named for its designer and builder John A. Roebling) across the Ohio River had a major impact on Newport and northern Kentucky. The bridge, which opened on January 1, 1867, connected Cincinnati and Covington, and although it was not a direct link to Newport, it allowed many to work in Ohio and live in Kentucky. When streetcar service was provided across the bridge, the influx of suburban dwellers into Newport and Campbell County increased. In the 1880s and 1890s bridges were built across the river that connected Newport directly to Cincinnati, further enhancing the county's growth (Steely 1992a:680; Tenkotte 1992:779–780).

The county's population increased throughout the last half of the nineteenth century until it was among the largest in the state. By 1870, the county had 27,406

inhabitants, and it grew by over 36 percent in the next decade to a population of 37,440. In the last 20 years of the century, Campbell County's population grew another 44.8 percent until it was 54,223 by 1900 (USBC 1870–1900).

In the twentieth century, Campbell County continued to develop as a manufacturing area and as a residential community. The region along the river expanded into a larger industrial area, while the highlands in the northern section of the county developed into suburbs of Newport and Cincinnati. Many of the residential areas had their origins in the nineteenth century (Bryant 1992:155).

The Wiedemann Brewery expanded until the ratification of the Eighteenth Amendment prohibited the manufacture, distribution, and sale of alcoholic beverages. During Prohibition (1919–1933), organized crime became a dominant force in Campbell County. Illegal gambling was prevalent, and illicit liquor was widely available in Newport. After the repeal of Prohibition in 1933, many of the crime syndicates turned solely to illegal bookmaking and casino style gambling. Under the pressure of the Protestant Ministerial Association and a group of local businessmen called the Committee of 500, the Commonwealth of Kentucky finally prosecuted and shut down the syndicates in the early 1960s (Steely 1992a :680).

The Wiedemann Brewing Company resumed operation after prohibition ended and expanded into distilling scotch, vodka, and gin. G. Heilman Brewing purchased Wiedemann, which had developed into the largest brewery in the South, in 1967 and operated it until 1983 (CCHS 1994:121; Kleber 1992b:680).

The Beverly Hills Supper Club at Southgate had once been one of the largest organized gambling establishments at the height of the organized crime era, but the zealous prosecution and eradication of the illegal operations forced the establishment to close. In 1970, Richard Schilling, a local developer, reopened the club, featuring fine food and Las Vegas-style entertainment. On May 28, 1977, 165 people lost their lives in a massive fire that resulted from faulty wiring and construction. It was the second worst fire disaster in U.S. history, beside the 1942 Coconut Grove fire in Boston that killed over 400 people (Wallace 1992:74).

In 1968, the Kentucky General Assembly created Northern Kentucky State College, which replaced the University of Kentucky's Northern Community College in Covington. In 1971, the college started to develop a campus in Campbell County, and it added a third year of academic classes. That year it had an enrollment of more than 3,000 students, and by 1975 it had topped 6,000. The next year, the institution received university status from the state legislature, and by 1989 its enrollment had exceeded 10,000 students (Steely 1992b:684–685).

The current public school system in Campbell County is run by both the Campbell County school district and the Newport Independent school system. Each of these systems contains several elementary schools, middle schools, and high schools (Campbell County Schools 2009; Newport Kentucky Independent Schools 2009).

Campbell County has grown steadily throughout much of the twentieth century. By 1910, 59,369 people were living in the county, and by 1920, it had grown to 61,868. By 1930, it had grown another 18.6 percent to 73,391 inhabitants. After dropping slightly to 71,918 people in 1940, the county's population rebounded to 76,196 in 1950, and it grew by nearly 14 percent to 86,803 inhabitants by 1960. In 1970, the county achieved its largest population with 88,704 residents, and it was the fourth most populated county in the state behind Jefferson, Fayette, and Kenton Counties. Its population dropped to 83,317 in 1980 but rebounded to 83,866 in 1990. In 2000, the population of Campbell County was 86,616 and in 2006 it was 86,866 (USBC 1910–2006).

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 entire project area was subjected to intensive pedestrian survey supplemented by screened shovel testing, which was conducted by walking parallel transects along natural contours. Dirt roads and all exposed areas were walked and visually examined for indications of cultural material and features. If the ground visibility was less than 50 percent and slope was less than 15 percent, STPs were excavated on a 20 m grid. Several STPs were excavated within previously disturbed areas to confirm disturbance. In all cases, STPs measured not less than 35 cm in diameter and extended well into the subsoil. All fill removed from the tests was screened through .64 cm (.25 in) mesh hardware cloth, and the sidewalls and bottoms were examined for cultural material and features. Approximately 220 STPs were excavated throughout the project area.

Bucket Augering

Stafford (1995) notes the usefulness of bucket augering in the examination of site sediments and determination of buried cultural materials. Bucket augers are useful because they: 1) allow access to areas that might not be accessible for trenching with a backhoe; 2) are capable of obtaining samples to a considerable depth (greater than 3 m); 3) are less destructive than backhoe trenching; 4) extract measurable intervals of sediment; 5) are useful for examining the strata; and 6) allow for the recovery of artifacts, especially in areas with low artifact density (Stafford 1995:86–87). Stein (1986) advocates the use of Oakfield probes on sites to examine subsurface sediments; however, the small size of the probes (1.6 cm) precludes their usefulness for extracting sufficient quantities of artifactual material. With respect to the current project, bucket augering is a more appropriate method than Oakfield probes. One problem Stafford notes with bucket augers, however, is that they are less useful in evaluating some sediment and soil characteristics because they extract disturbed samples (Stafford 1995:87). For the current project, this was not a major concern. The main objectives of the current project were to identify major soil horizons, locate possible site areas, and recover samples of cultural material from these deposits.

For this project, bucket augering was not employed as a site discovery method. The main goal was to determine the depositional characteristics of the sediments in the area in order to determine the potential for buried archaeological materials. The examination of buried deposits for archaeological sites is best conducted with a deep testing program consisting of close interval (5–10 m) systematic bucket augering, systematic backhoe trenching, or both. Subsurface investigation of complex depositional environments should be done in consultation with a geomorphologist or geoarchaeologist. Such investigation was beyond the scope of the current project.

Bucket augering during the current survey was conducted primarily in alluvial soils to determine the possibility of buried deposits. A hand-operated bucket auger with a 4 inch opening was used to excavate augers on transects with 20 m intervals between tests. Sediments were removed in approximately 10 cm levels. All soil was screened through .25 inch mesh hardware cloth. The presence of charcoal and general soil characteristics (e.g., texture, Munsell colors) were recorded by individual level.

Map Structures

As previously mentioned, 45 map structures (MS 1–45) were depicted on the reviewed historic maps. During the course of the field survey, these areas were investigated using accepted archaeological methods. The majority of the structures were determined to be well outside the proposed project area and only appeared to be close to it due to the scale of the maps involved. Those structures that were

within, or directly adjacent to, the project area are discussed in Section V below.

Universal Transverse Mercator (UTM) coordinates were recorded with a MobileMapper 6 global positioning system (GPS) unit manufactured by Magellan to verify locations within the project area. All UTM positions recorded by the GPS unit during the project were taken under both very cloudy and sunny conditions, with typically three to five satellites being tracked. This unit is capable of accuracy to less than 3 m.

Cultural Historic Resources

As noted, the proposed force main passes through several areas with standing structures over 50 years in age. These structures were documented either individually or in groups as historic resources. They are discussed in a separate report (McMahan et al. 2012). No cultural historic clearance is implied by the current archaeological report.

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., ceramic, faunal, historic, and lithic) for further analysis, and assigning catalog numbers. Catalog numbers consisted of the site number and a unique number for each provenience lot or diagnostic specimen. 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 with the Department of Anthropology at the University of Louisville, Kentucky.

V. MATERIALS RECOVERED

Jennifer M. Faberson

Historic materials were recovered from one site (15Cp87). The assemblage from the site is described below. In addition, an inventory of materials recovered from the site listed by provenience is presented 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, 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. In this report, artifacts were grouped into the following categories: domestic, architecture, and

maintenance and subsistence. The artifacts recovered during this project are summarized in Table 4.

Table 4. Historic Artifacts Recovered According to Functional Group.

Group	Total	Percent
Architecture	2	11.8
Domestic	10	58.8
Maint/Subsist	5	29.4
Totals	17	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 are 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 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 B.

Materials Recovered by Functional Group

There were 17 historic artifacts recovered during the investigation. The following provides a descriptive discussion of the types and age of artifacts recovered from Site 15Cp87.

Architecture Group (N = 2)

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 consisted of brick and plate glass.

Construction Materials (n = 1)

Construction materials refer to all elements of building construction. One hand-made brick fragment was recovered from the project area (Table 5). Hand-made or early machine-made bricks often have a glaze, resulting from the sand in the clay turning to glass in the kiln. The paste is usually more porous, and the shape of the early bricks is more irregular. The later machine-made bricks have a harder, more consistent paste

and are uniform in shape. Machine-made bricks will often have marks in the clay related to the machine manufacturing process (Greene 1992; Gurcke 1987). Since no research has been conducted regarding the local history of brick-making facilities near the project area, the brick fragments recovered were not assigned specific dates.

Flat Glass (n = 1)

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. For the purposes of this investigation, a "reasonable" sample size is considered 25 window glass sherds.

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 were 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 our purposes, window glass that measured 2.41 mm (dating to 1916) was 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. One flat glass sherd was recovered during the current survey (Table 5). This sherd was plate glass dating after 1917.

Table 5. Summary of Architecture Group.

Class	Type	Total
Const material		
	Brick	1
Flat glass		
	Plate glass	1
Ceramics		
	Ironstone	2
	Late majolica	1
	Porcelain	1
	Stoneware	3
Closures		
	Home canning	2
	Commercial	1
Fuels		
	Coal	4
	Cinder/slag	1
	Totals	17

Domestic Group (N = 10)

Artifacts included in the domestic group consisted of ceramics (n = 7) and container closures (n = 3).

The ceramic inventory consisted of a variety of refined and utilitarian wares dating from the mid-nineteenth century through the twentieth century. A full description of ceramic types recovered from the project area is listed below, followed by descriptions of other domestic group artifacts.

Ceramics (n = 7)

The ceramics recovered were grouped into four major ware types: ironstone (n = 2), porcelain (n = 1), stoneware (n = 3), and late majolica (n = 1). Ceramics within each of these ware groups were separated into decorative types that have temporal significance. Each of these ware groups is reviewed below, followed by discussions of associated decorative types.

Ironstone (n = 2)

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

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

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

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

Two ironstone sherds were recovered from the project area (Table 5). Embossed ironstone (n = 1) was available beginning in 1860 and was also recovered from the project area (Faulkner 2000). One chromatic-glazed ironstone sherd also was recovered. This sherd dated from 1930 to 1970 (Figure 12a) (Blaszczyk 2000:121).

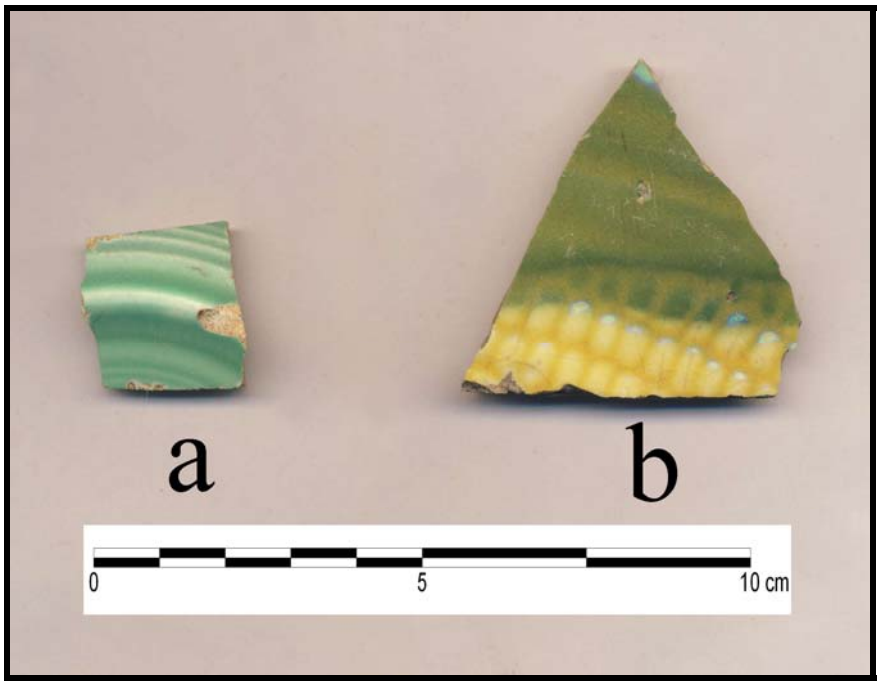

Figure 12. Historic material recovered: (a) green chromatic-glazed ironstone from GSC 1; (b) late majolica sherd from GSC 1.

Porcelain (n = 1)

Porcelain is the name given to high-temperature fired, translucent ware. This ware type was first developed by the Chinese. Chinese, or hard paste, porcelain was introduced to Europe by Portuguese sailors that had traveled to China during the sixteenth century. The formula for true, or feldspathic, porcelain was not discovered in Europe until 1708 and not marketed until 1713 (Boger 1971:266). The production of true porcelain was limited to three factories in England; all other products were softer porcelains made with glass, bone ash, or soapstone. Porcelain made with bone ash, often called "bone china," became the preferred product after 1800, since the paste was harder and the ware was cheaper to produce with bone than with glass or soapstone (Mankowitz and Haggar 1957:179). Among the more affluent households in Europe and North America, porcelain was a common tableware used during the eighteenth and nineteenth centuries (Fay 1986:69). Porcelain production in America was not successful until 1826, and the number of porcelain factories in the United States remained small throughout the nineteenth century.

In the lab, bone china can be differentiated from hard paste porcelain by placing it under ultraviolet light. Bone china fluoresces blue-white while hard paste porcelain fluoresces magenta (Majewski and O'Brien 1987:128). One porcelain sherd was recovered during the current project (Table 5). One modern hand-painted porcelain sherd was recovered dating from 1880 to 1940 (Blaszczyk 2000).

Stoneware (n = 3)

Stoneware served as the "daily use" pottery of America, particularly rural America, after its introduction during the last decade of the eighteenth century. By 1850, this ware generally replaced coarse redware as the primary utilitarian ware used in American households. Stoneware is a semi-vitreous ware manufactured of a naturally fine, but dense, clay. The pottery was fired longer and to a higher temperature than earthenwares; a kiln temperature of at least 1,200 to 1,250 degrees celsius had to be obtained (Cameron 1986:319; Dodd 1964:274–275). As a result, stoneware generally exhibits a hard body and a very homogeneous texture. The paste may vary from gray to brown, depending on the clay source, and length and intensity of the firing.

Because this ware is fired at such high temperatures, its body is nonporous and well suited to liquid storage. Stoneware, as mentioned, was not typically manufactured as a refined ware (such as its cousin, ironstone, or eighteenth-century refined white salt-glazed stoneware), and hence, it was, for the most part, utilized for utilitarian activities associated with jars, churns, crocks, tubs, jugs, mugs, pans, and pots. These vessels were typically glazed, with salt glazing and slip glazing most common.

Although refined salt glazing was practiced in England during the eighteenth century, by 1780, the production of English salt-glazed tableware had been virtually supplanted by the manufacture of cream colored earthenwares (Lewis 1950:29). The salt-glazing technique continued to be utilized for utilitarian vessels, however, and was eventually introduced to the United States in the early-nineteenth century. Salt glazing was accomplished by introducing sodium chloride into the kiln during the firing process, at which point the salt quickly volatilized. The vapor reacted with the clay to form a sodium aluminum silicate glaze (see Billington 1962:210; Dodd 1964:239). The surface of the glaze is typically pitted, having what is commonly known as an "orange peel" effect.

Stoneware may also be coated with a colored slip (a suspension of fine clay and pigment). The Albany slip—named after the rich brown clay found near Albany, New York—first appeared in the 1820s. Initially, it was mainly used for the interior of stoneware vessels. However, by the 1850s, it was also used as an exterior glaze. Bristol glaze, an opaque white slip, was introduced late in the nineteenth century. When used in combination with Albany slip, Bristol-glazed stoneware vessels have a general date range of 1880–1925 (Ketchum 1983:19; Raycraft and Raycraft 1990:5).

A third glaze often used on stoneware is the alkaline glaze. Like the Albany slip, it was developed in the 1820s. The basic alkaline glaze is made up of wood ash, clay, and sand. Other additions may be slaked lime, ground glass, iron foundry cinders, or salt. These additions affected the color and texture of the glaze. Colors vary from olive to brown to a gray-green or yellowish hue, depending on adjustments in proportion of ingredients (Ketchum 1991:9). Although not as prevalent, alkaline glazing has been used in combination with salt glazing. This causes the stoneware vessel to exhibit the colors of alkaline glazing with the pitted texture of a salt glaze.

The stoneware sherds recovered reflect one of the three glazes described above (Table 5). Three Bristol-slip sherds were identified dating from 1880 to 1925.

Late Majolica (n = 1)

Majolica is best described as a soft-bodied molded earthenware exhibiting a broad palette of lead-glazed colors. This ceramic type was originally introduced to the consumer market in 1851 by Herbert Minton, and experienced great popularity through the mid-1880s. This ceramic type came in numerous forms, mostly natural, and was found throughout the Victorian home. Majolica, with the exception of a few early examples, was relatively inexpensive and could be attained by nearly everyone. Vessel types consisted of a wide variety of forms, including umbrella stands, pitchers, figurines, tea sets, and platters. Virtually every room of the home may have displayed a majolica vessel (Snyder 2004).

Minton borrowed the term "majolica" from an early tin-glazed pottery imported from Italy to Spain during the Renaissance. This early ceramic type was transported from the western Mediterranean island of Majorca and was called Maiolica. Italian potters began creating their own tin-glazed wares that eventually spread to England, France and Holland. The French termed their pottery "faience," and the Dutch and English called theirs "Delft," or "Delftware." French faience, especially that created by Bernard Palissy, sparked the interest of Minton. Palissy used a lead glaze instead of a tin glaze, which changed the appearance of the pottery from opaque to clear. He also portrayed natural themes and developed an appliqué technique, making his pottery three dimensional. Minton soon realized that he could imitate this high demand pottery at a reasonable price and London's Crystal Palace Exhibition was the perfect place for his consumer introduction (Schneider 2006).

By the late 1880s, the quality of majolica had greatly declined, and it could be found in the American market inexpensively. This ware type was also distributed as carnival prizes. Majolica continued to be produced until circa 1930 (Snyder 2004).

One late majolica sherd was recovered from the project area (Figure 12b). This sherd dated from 1880 to 1940.

Closures (n = 3)

Bottle closures serve both to prevent the spilling of a bottle's contents and to protect a bottle's contents from contamination and evaporation (Berge 1980). Closures have been used almost as long as animal skins and bottles have been employed to contain liquids. Closures range from a utilitarian piece of paper or cloth stuffed into the mouth of a bottle to a delicately crafted crystal stopper for a decanter. There are three primary closure types: caps, stoppers, and seals (Berge 1980).

Caps are secured to a bottle by overlapping the outside edge of the finish or mouth. Common cap types include external screw, lugs, crown, and snap-on. External screw caps were first introduced in the mid-nineteenth century (Jones and Sullivan 1985; Toulouse 1977). External thread caps were attached to bottles by means of grooves in the cap that screwed down on continuous glass threads on the finished exterior of a bottle. External thread caps were first produced using metal in 1858 (Jones and Sullivan 1985; Toulouse 1977). Advances in technology led to the introduction of a Bakelite external thread cap around 1922 (Berge 1980; Meikle 1995), an aluminum shell roll-on cap in 1924 (Berge 1980; Rock 1980), and modern plastic caps in the mid-1930s (Meikle 1995). Examples of the external thread cap include canning jar, mayonnaise jar, and pickle jar lids.

The crown cap was patented on February 2, 1892, by William Painter of Baltimore, Maryland (Rock 1980). The crown cap was placed over the finish, and then crimped around a lip or groove in the finish to seal the container. This closure was lined with cork from 1892 until circa 1965 (IMACS 2001; Riley 1958; Rock 1980). Crown caps with composition liners appeared in 1912, and both cork and composition liners were gradually phased out following the introduction of the plastic liner in 1955 (IMACS 2001; Riley 1958). The majority of commercially produced glass soda bottles have crown cap closures.

Stoppers, the second major closure type, are secured to the finish interior of bottles, usually by forcing a portion of the stopper into the bore of the finish. Stopper types include cork, glass, inside screw, porcelain-top, Hutchinson Spring, Electric, Pittsburgh, and Lightning. Cork stoppers were the most common historic closure type.

Most glass stoppers use ground or roughened tapered stems along with a roughened finish inside to seal bottles. The "modern" ground and tapered glass stopper was developed in Europe around 1725 (Holscher 1965). Glass stoppers came in many shapes, sizes, and styles and were used as closures in many different types of bottles. As with the cork stopper, the glass stopper was phased out in the 1920s with the advent of the crown cap closure (Berge 1980; Jones and Sullivan 1985).

Seal closures utilized the vacuum on the interior of the glass container. The heating and then cooling of the bottle's contents created the vacuum. Seal closures, although dating back to 1810, did not become popular until the mid-twentieth century. These closures were most often used in food jars (Berge 1980). There were several types of seal closures including Phoenix, Sure Seal, Giles, spring seal, and disc seal.

The disc seal was used as early as 1810 by Nicholas Appert (Berge 1980). John L. Mason used this type of closure on his patented fruit jar in 1858 (Berge 1980). Mason's closure was made of zinc and was held in place with an exterior screw cap ring. Unfortunately, the zinc reacted with the contents of the jars, giving the contents an unpleasant metal taste (Jones and Sullivan 1985). Glass liners were then developed and added to the disc around 1869 by Lewis R. Boyd (Toulouse 1969, 1977). These liners prevented the zinc from reacting with the contents of the jar. To aid in opening, Boyd added a handle to the disc circa 1900 (Toulouse 1977). Both of these disc seal types were used

until around 1950 (Jones and Sullivan 1985; Toulouse 1969, 1977). In 1865, the Kerr two piece seal was patented. This system utilized a metal seal disc held in place by an exterior screw cap with no center. This seal and cap type system is still in use today.

The closure artifacts recovered from the project areas date from the 1860s to last half of the twentieth century (Table 5). The closures were divided into two specific categories. The first was the commercial closures category which contained a threaded iron/steel cap. The second category was the home canning jar closures. Two glass mason zinc canning jar lid liners were identified in this category.

Maintenance and Subsistence Group (n = 5)

The maintenance and subsistence group contains artifacts related to general maintenance activities on a farmstead. These artifacts were grouped into classes containing non-food containers, electrical, farming and gardening, hunting and fishing, stable and barn activities, general hardware, general tools, transportation, and fuel-related items such as coal. One of these classes were represented in the historic assemblage recovered from this site (Table 5).

Fuels (n = 5, 30.1 g)

This group of artifacts includes charcoal, coal, cinder, slag, and containers indicative of fuel. One cinder/slag fragment and four coal fragments were collected from the project area. These artifacts were not assigned specific dates.

Discussion

There were 17 historic artifacts recovered during the investigation. The material collected is described in detail above, and summarized below.

Two architecture group items were recovered from this site: 1 hand-made brick fragment and 1 plate glass fragment. The plate glass dated after 1917. The brick fragment was not assigned a specific date.

The domestic group consisted of ceramics (n = 7) and container closures (n = 1). The ceramic inventory included ironstone (n = 2), porcelain (n = 1), stoneware (n = 3), and late majolica (n = 1). The ironstone was 1 embossed sherd dating after 1860 and 1 chromatic-glazed sherd dating from 1930 to 1970. One saucer was identified in the ironstone assemblage. The porcelain sherd exhibited modern hand-painting dating from 1880 to 1940. The stoneware sherds were Bristol slipped and dated from 1880 to 1930. The late majolica fragment dated from 1880 to 1940. Four container closures were recovered from this site. These included 2 glass mason zinc lid liners and 1 iron/steel threaded cap. The container closures dated after 1860.

The maintenance and subsistence group artifacts were fuel-related items. These were 4 coal fragments and 1 cinder/slag fragment. No specific dates were assigned to these items.

The artifacts recovered from this site were manufactured from the mid-nineteenth century through the mid-twentieth century. For the most part, these artifacts were most popular at the turn of the twentieth century. These artifacts likely are associated with former historic structures located in the vicinity of this site as shown on the 1898 historic map of the project area. Due to the long use period of this site and the paucity of artifacts recovered, a further site interpretation based solely on the historic material cannot be made.

VI. RESULTS

During the course of the current survey, one previously unrecorded archaeological site (15Cp87) was documented. A description of the site is presented below and its location is depicted in Figure 2.

Site 15Cp87

Elevation: 140 m (490 ft) AMSL
Component(s): historic
Site type(s): residence
Size: 2,443 sq m (26,293 sq ft)
Distance to nearest water: 435 m (1,425 ft)
Direction to nearest water: North
Type and extent of previous disturbance: 75–90 percent disturbed

Topography: Artificial terrace
Vegetation: Scrub growth with a few older trees
Ground surface visibility: 75–100 percent
Aspect: Flat
Recommended NRHP status: not eligible

Site Description

Site 15Cp87 was a historic residence dating from the early to mid-twentieth century. The site was located approximately .35 km (.21 mi) east-southeast of the intersection of Mary Ingles Highway with Messer Road (east branch) and .29 km (.18 mi) northwest of the intersection of Ash Street with Second Street in the community of Silver Grove, Kentucky (see Figures 2 and 3). Topographically, the area appears to be an artificial terrace or dike constructed to raise building sites above the normal flood level of Four Mile Creek. Within the project area, the site consisted of a partially demolished concrete block outbuilding foundation, probably a garage or workshop, dating from before 1960 (Figure 13) and a low density scatter of historic materials collected from the ground surface.

This outbuilding was probably associated with a house that stood on Mary Ingles Highway at the front of the same long residential lot. The house is depicted on the 1898 East Cincinnati 15-minute series topographic quadrangle and on a 1993 aerial photograph (USGS 1898; 1993). The house is also depicted on the 1914 East Cincinnati 15-minute series topographic quadrangle, and the 1952, 1955, and 1983 Newport, Kentucky-Ohio, 7.5-minute series topographic quadrangles (USGS 1952; 1955; 1983) (see Figure 2). The associated house was demolished between 1993 and 2004. A local informant stated that no building had stood on the partial concrete block foundation since approximately 1962. The majority of the site, including the former house location, is outside of the current project area. A scatter of historic materials was observed, but not collected, outside of the project area in the direction of the former house. These artifacts were similar to those recovered from within the current project area. The site dimensions, established by the location of artifacts recovered from ground surface around the foundation at the back of the lot and the former house location, were 114 m (374 ft) north to south and 47 m (154 ft) east to west (Figure 14). The site covered .27 ha (.68 acres).

Figure 13. Overview of Site 15Cp87, looking northeast.

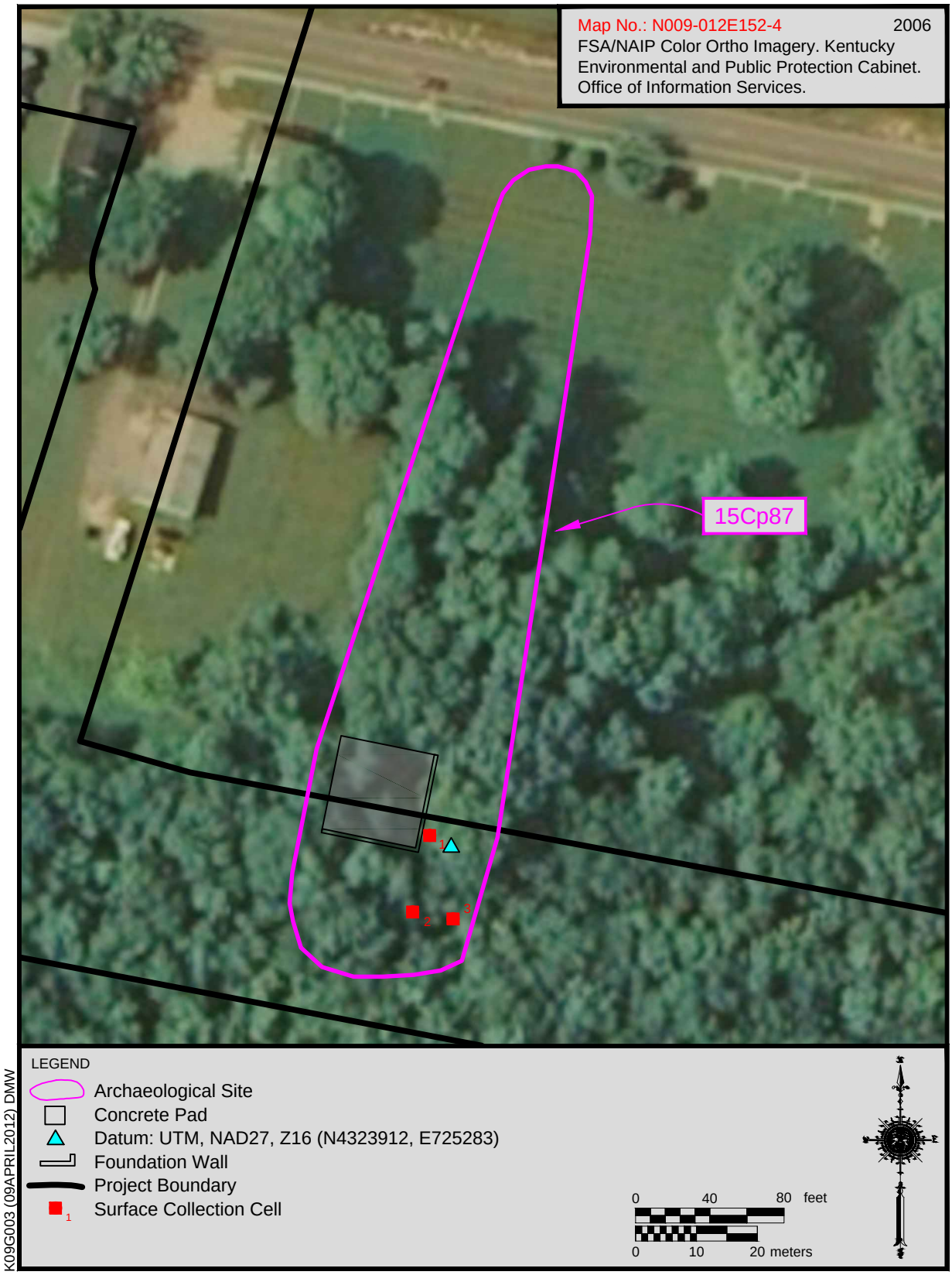

Figure 14. Schematic plan map of Site 15Cp87.

Within the project area, the site has been heavily disturbed by demolition, the clearance of a right-of-way, and modern trash dumping. All artifacts were found on the surface around the partial foundation.

Vegetation at Site 15Cp87 consisted primarily of scrub brush with a few older deciduous and evergreen trees. Leaf litter partially obscured the ground surface, but visibility was good around the foundation.

Investigation Methods

Materials from the site were recovered from three collection cells with good surface visibility (Figure 14). Four screened shovel tests were attempted at the site, but were immediately terminated due to a thick gravel layer surrounding the partial foundation. The locations of all surface artifacts were recorded using a hand-held GPS.

Depositional Context

Newark silt loam was mapped for the site area; however, all attempted shovel tests around the partial foundation contained very thin disturbed soils that terminated within 5–10 cm (2–4 in) at a gravel layer. Shovel tests approximately 15 m away from the foundation (outside of the site boundaries), the soil profile consisted of an Ap horizon of dark brown (10YR 3/3) silt loam to depths between 10 and 15 cm bgs followed by a gray (7.5YR 5/1) silty clay loam subsoil (Figure 15). The soils at Site 15Cp87 were more consistent with Urban Land than Newark series soils.

The soils at Site 15Cp87 appeared to have been heavily mixed and disturbed. The Ap horizon at the site consisted primarily of mixed surface and subsoils (former B and C horizons). All artifacts at the site were recovered from the ground surface and, as such, have poor depositional integrity.

Artifacts

The artifacts recovered from this site were manufactured from the middle nineteenth century through the middle twentieth century. Seventeen historic artifacts were recovered during the investigation. The assemblage consisted of two architectural items (brick, n = 1; plate glass, n = 1), ceramics (n = 7), four container closures, four coal fragments, and one piece of slag/cinder (Table 6). These artifacts were most popular at the turn of the twentieth century. These artifacts likely are associated with former historic structure depicted on the 1898 historic map of the project area. Based on aerial photographs, this structure was extant through at least 1993 (USGS 1993).

Features

Apart from the partial outbuilding foundation, no features were observed during the investigation of the site.

Summary and National Register Evaluation

Site 15Cp87 consisted of a very low density scatter of historic artifacts dating from the nineteenth through the middle of the twentieth centuries. The ceramics found at the site range in date from the 1860s through 1970. The plate glass dates to after 1917 and the canning jar closures and seals range in date between 1869 and 1950 (Table 6). The cultural material tended to be scattered near the southeast corner of the partial foundation.

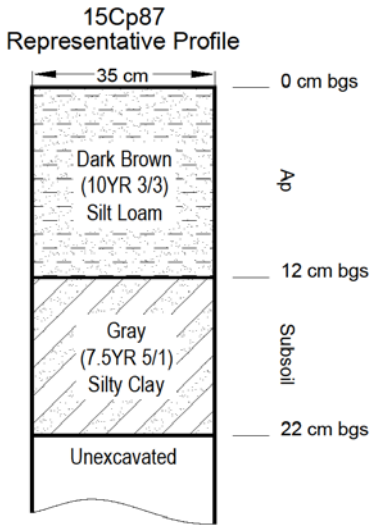

Figure 15. Representative soil profile from Site 15Cp87.

Table 6. Artifacts Recovered from Site 15Cp87.

Unit	Depth	Group	Class Definition	Type Definition	N	Dates
GSC 1	Surface	Architecture	Flat Glass	Plate Glass	1	1917-
GSC 1	Surface	Domestic	Ceramics	Ironstone	1	1930-1970
GSC 1	Surface	Domestic	Ceramics	Late Majolica	1	1910-1940
GSC 1	Surface	Domestic	Ceramics	Stoneware	2	1880-1925
GSC 1	Surface	Domestic	Container Closures	Home Canning Jars	1	1869-1950
GSC 1	Surface	Maintenance	Fuels	Coal	3	-
GSC 2	Surface	Domestic	Ceramics	Stoneware	1	1880-1925
GSC 2	Surface	Domestic	Container Closures	Commercial Containers	1	1900-
GSC 2	Surface	Domestic	Container Closures	Home Canning Jars	1	1869-1950
GSC 2	Surface	Maintenance	Fuels	Cinder / Slag	1	-
GSC 2	Surface	Maintenance	Fuels	Coal	1	-
GSC 3	Surface	Architecture	Construction Material	Brick	1	-
GSC 3	Surface	Domestic	Ceramics	Ironstone	1	1860-
GSC 3	Surface	Domestic	Ceramics	Porcelain: hard paste	1	1880-1940

The portion of Site 15Cp87 located within the project boundaries is not considered to have the potential to provide important information about local or regional history; therefore, 15Cp87 is recommended as not eligible for the NRHP (Criterion D). No further work is recommended for the portion of Site 15Cp87 located within the project area. It is unlikely that further investigation of this portion of Site 15Cp87 would produce information beyond that recorded during the current survey. The remains have poor depositional integrity—all artifacts were confined to disturbed contexts within the Ap horizon. In addition, there is no evidence suggesting the potential for sub–Ap horizon features to be located at the site. Should future project changes impact that portion of Site 15Cp87 outside of the current project area, further testing may be necessary.

VII. CONSULTING PARTIES

In addition to the information acquired by CRA during the field surveys, Anna Zinkhon, a Campbell County citizen representing the Camp Springs Initiative, contacted the KHC to request consulting party status for this project. In a letter to Judge Steve Pendery, Judge/Executive of Campbell County, Ms. Zinkhon expressed her concerns with the preliminary cultural resource surveys conducted by CRA. The majority of her concerns were with cultural historic resources located in and around Camp Springs. These are discussed in the separate cultural historic report (McMahan et al. 2012).

With regard to the archaeological survey, Ms. Zinkhon's comments were limited to requesting that an archaeological field investigation be completed. As documented in this report, the records review and visual examination of existing right-of-ways and the intensive archaeological survey of the remainder of the proposed force main corridor have been completed, and one historic archaeological site, 15Cp87, was identified. Provided that the proposed pipeline is placed in the public right-of-ways and intensively surveyed portions of the corridor, it is unlikely that the project will impact intact archaeological resources; archaeological clearance is, therefore, recommended.

VIII. CONCLUSIONS AND RECOMMENDATIONS

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 lead federal agency in consultation with

the State Historic Preservation Office (the Kentucky Heritage Council [KHC]).

The records search revealed no previously recorded archaeological sites or historic properties within the project area. One archaeological site was documented during this survey. Site 15Cp87 is a historic residence dating from before 1900 through at least 1993. Within the current project area, the site consists of a concrete block outbuilding foundation and artifact scatter dating to before 1960. This outbuilding was probably associated with a house that stood on the same long residential lot from at least 1898 through at least 1993. The majority of the site, including the former house location, is outside of the current project area. Within the project area, the site has been heavily disturbed by demolition, the clearance of a right-of-way, and modern trash dumping. All artifacts were found on the surface around the partial foundation. No subsurface artifacts or features were found. The portion of Site 15Cp87 that lies within the project area has little depositional integrity and is recommended as not eligible for the National Register of Historic Places. Therefore, archaeological clearance for the proposed project is recommended. Should future project changes impact that portion of Site 15Cp87 outside of the current project area, further testing may be necessary.

Because no sites listed in, or eligible for, the NRHP will be adversely affected by the proposed construction, archaeological clearance for the project is recommended.

The proposed force main passes through several areas with standing structures over 50 years of age. These structures were documented and discussed in a separate report (McMahan et al. 2012). No cultural historic clearance is implied by the current archaeological report.

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

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