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AN ARCHAEOLOGICAL RECORDS REVIEW AND RECONNAISSANCE OF THE LOST CITY SOLAR PROJECT IN MUHLENBERG COUNTY, KENTUCKY

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Not for public review

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Project Description

On May 13, 2024, Cultural Resource Analysts, Inc. (CRA), personnel completed an archaeological records review for the Lost City Solar Project in Muhlenberg County, Kentucky. In addition, a reconnaissance of the proposed property was conducted on March 20 and 21, 2024. The purpose of the inspection was to identify locations that might contain potentially significant, intact archaeological deposits. Locations of structures shown on historic maps were visited during the investigation. The records review and reconnaissance were requested by Marty Marchaterre of Copperhead Consulting, Inc., for due diligence regarding the cultural resources located within the proposed study area.

The study area covers approximately 526.09 ha (1,300.00 acres), and the elevations within the study area range from 126 m to 221 m above mean sea level.

Records Review

A search of records maintained by the Office of State Archaeology (OSA) (FY24-12748) and the National Register of Historic Places (NRHP) was conducted to: 1) determine if the study area had been previously surveyed for archaeological resources; 2) identify any previously recorded archaeological sites that were situated within the study area; 3) provide information concerning what archaeological resources could be expected within the study area; and 4) provide a context for any archaeological resources that may be identified within the study area.

OSA Geographic Information Systems data requested by CRA on March 13, 2024, were returned on March 18, 2024. Jennie VanMeter of CRA researched the results at the OSA on March 19, 2024. The work at the OSA consisted of a review of professional survey reports and records of archaeological sites located within a 2 km radius of the study area; however, Figure 1 depicts only the results that are directly adjacent to the study area.

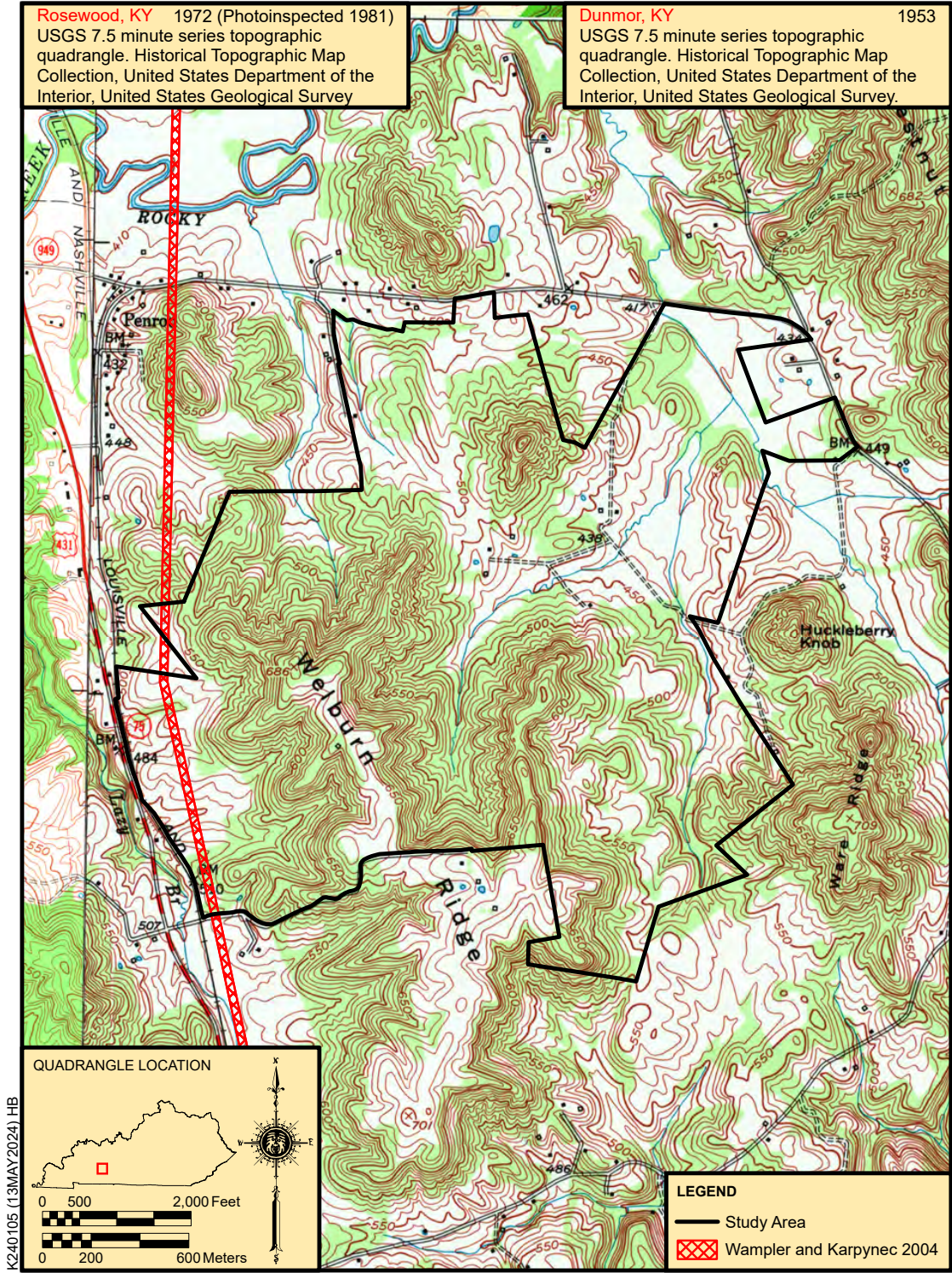


Figure 1. Topographic quadrangle depicting previous archaeological survey within the study area.

Archaeological Resource Review Results

Jennie VanMeter

In total, four previous professional archaeological surveys and archaeological site investigations have been conducted within a 2 km radius of the study area (Beck 1982; Bradley et al. 2017; Stallings and Ross-Stallings 1991; Wampler and Karpynek 2004). In addition, two archaeological sites have been recorded in this area (15Mu133 and 15Mu246). One no-find report (Stallings and Ross-Stallings 1991) was not accessible at the OSA library because all no-find reports are boxed up and no longer available; more specific details could not be obtained about this survey.

One survey falls within the boundaries of the current study area (Wampler and Karpynek 2004). Previously surveyed portions of the study area investigated prior to 2006 may not have employed methods that meet the current State Historic Preservation Office (SHPO) specifications; therefore, if an archaeological survey of the study area is required, these areas may need to be revisited and surveyed using presently accepted methods (Sanders 2017). The 2 km radius included areas within the Drakesboro, Dunmor, Rochester, and Rosewood, Kentucky quadrangles (United States Geological Survey [USGS] 1953a, 1953b, 1972 [Photoinspected 1981], 1997).

A search of the NRHP records indicated that no archaeological sites listed in the NRHP were situated within the current study area or within a 2 km radius of the study area (National Park Service 2024).

In the summer of 1982, Owensboro Area Museum personnel conducted an archaeological investigation of a double petroglyph site (Site 15Mu133, referred to as Muhlenberg Site #1 by Beck) to determine a material context that might be associated with the petroglyphs (Beck 1982). An area of unspecified size was investigated by test unit excavation. Site 15Mu133 was recorded as a multicomponent rockshelter containing Late Archaic and Early Woodland components, along with a historic pine tar kiln base dating from 1851 to 1950. Beck recommended further analysis of Site 15Mu133. The NRHP status of the site was not specified in the report.

The site was revisited on July 20, 1985, by Charles D. Hockensmith and Donald Boarman of the Kentucky Heritage Council. Following this investigation, for which no report was produced, the historic component of Site 15Mu133 was considered eligible for NRHP inclusion, but was not nominated by the SHPO. The site could not be found currently listed in the NRHP.

In July and August 2004, TRC, Inc., personnel conducted an archaeological survey of the 69 kV Tennessee Valley Authority (TVA) Kirkmansville-Clifty transmission line corridor and two proposed substation tracts in Christian, Muhlenberg, and Todd Counties, Kentucky (Wampler and Karpynek 2004). At the request of Richard Yarnell of the TVA, 118.1 ha (291.8 acres), which included the proposed transmission line, access roads, and substation construction areas, were investigated by systematic pedestrian survey supplemented with screened shovel testing. As a result of this survey, six sites (15Mu243–15Mu248) were identified within the project area. Outside of the project area, five previously recorded sites (15Mu19, 15Mu38, 15Mu55, 15Mu83, and 15Mu135) were revisited, and one previously unrecorded site (15To23) was documented. Of these, only Site 15Mu246 is located within 2 km of the current study area. The site was a prehistoric open habitation without mounds of indeterminate temporal affiliation. It was not considered eligible for NRHP inclusion, and no further work was recommended.

In October 2017, AMEC Foster Wheeler personnel conducted an archaeological survey for the proposed PRECC Substation conveyances in Caldwell, Christian, Muhlenberg, Todd, and Trigg Counties, Kentucky (Bradley et al. 2017). At the request of the TVA, 12.60 ha (31.11 acres) were investigated by pedestrian survey supplemented with screened shovel testing. One site (15To75) and two isolated finds were identified as a result of this survey. Site 15To75 is not located within 2 km of the current study area.

Archaeological Site Data

Muhlenberg County

According to available data, 301 archaeological sites have been recorded in Muhlenberg County (Table 1). The site data indicate that the majority of archaeological sites recorded in the county consist of open habitations without mounds (n = 173; 57.48 percent) followed by historic farmsteads/residences (n = 63; 20.93 percent). Other sites in the county consist of undetermined sites (n = 31; 10.31 percent), cemeteries (n = 6; 1.99 percent), earth mounds (n = 6; 1.99 percent), rockshelters (n = 6; 1.99 percent), mound complexes (n = 3; 1.00 percent), stone mounds (n = 3; 1.00 percent), other site types (n = 3; 1.00 percent), other special activity areas (n = 2; 0.66 percent), an industrial site (n = 1; 0.33), an isolated find (n = 1; 0.33 percent), an open habitation with mounds (n = 1; 0.33 percent), a petroglyph/pictograph (n = 1; 0.33 percent), and a workshop (n = 1; 0.33 percent).

These sites are located on a variety of landforms consisting of dissected uplands (n = 162; 53.82 percent), hillsides (n = 51; 16.95 percent), floodplains (n = 42; 13.95 percent), undissected uplands (n = 23; 7.64 percent), terraces (n = 18; 5.98 percent), and unspecified landforms (n = 5; 1.66 percent). They also cover a variety of time periods including Paleoindian (n = 14; 3.25 percent), Archaic (n = 82; 19.03 percent), Woodland (n = 32; 7.42 percent), late prehistoric (n = 29; 6.73 percent), Protohistoric (n = 1; 0.23 percent), indeterminate prehistoric (n = 110; 25.52 percent), historic (n = 98; 22.74 percent), and unspecified time periods (n = 65; 15.08 percent).

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

Site Type:	N	%
Cemetery	6	1.99%
Earth mound	6	1.99%
Historic farm / residence	63	20.93%
Industrial	1	0.33%
Isolated find	1	0.33%
Mound complex	3	1.00%
Open habitation w/ mounds	1	0.33%
Open habitation w/o mounds	173	57.48%
Other special activity area	2	0.66%
Petroglyph / pictograph	1	0.33%
Rockshelter	6	1.99%
Stone mound	3	1.00%
Workshop	1	0.33%
Other	3	1.00%
Undetermined	31	10.31%
Total	301	100.00%
Time Periods Represented	N	%
Paleoindian	14	3.25%
Archaic	82	19.03%
Woodland	32	7.42%
Late Prehistoric	29	6.73%
Protohistoric	1	0.23%
Indeterminate Prehistoric	110	25.52%
Historic	98	22.74%
Unspecified	65	15.08%
Total	431*	100.00%
Landform	N	%
Dissected Uplands	162	53.82%
Floodplain	42	13.95%
Hillside	51	16.95%
Terrace	18	5.98%
Undissected Uplands	23	7.64%
Unspecified	5	1.66%
Total	301	100.00%

*One site may represent more than one time period.

Map Data

In addition to the file search, a review of available maps was conducted to help identify potential historic structures or historic archaeological site locations within the study area. Because of their small scale, general highway maps dating to the 1930s–1950s (Kentucky Department of Highways [KDOH] 1937, 1950, 1957) are difficult to correlate to more accurate USGS topographic quadrangles. As such, these maps were only briefly consulted to document the presence of structures in the general area. Only the more detailed, topographic maps that better show structure locations are illustrated in this overview. The following maps were reviewed:

- 1914 Dunmor, Kentucky, 15-minute series topographic quadrangle (USGS)
- 1937 Highway and Transportation Map of Muhlenberg County, Kentucky (KDOH)
- 1950 General Highway Map of Muhlenberg County, Kentucky (KDOH)
- 1953a Dunmor, Kentucky, 7.5-minute series topographic quadrangle (USGS)
- 1957 General Highway Map of Muhlenberg County, Kentucky (KDOH)

The historic maps reviewed showed approximately 19 map structure locations (MS) within the study area. The 1914 Dunmor, Kentucky, 15-minute series topographic quadrangle showed 10 structures (MS 1–MS 10) within the study area (USGS) (Figure 2). On the 1953 Dunmor, Kentucky, 7.5-minute series topographic quadrangle, nine additional map structures (MS 11–MS 19) were observed within the study area (USGS) (Figure 3). None of the structures shown on the 1914 quadrangle (MS 1–MS 10) were present on the 1953 quadrangle except for MS 3, which appeared to have remained in its original location (USGS).

Reconnaissance Observations

A reconnaissance of the study area was conducted on March 20 and 21, 2024, to determine the potential for archaeological sites situated within the study area (Figure 4). A visual inspection was conducted which gave insight into the various landforms and land usage present in the study area. Wooded sections and harvested cornfields occupied the majority of the study area (Figures 5 and 6), with livestock pastures being present mainly in the northwestern portion (Figures 7 and 8). Small ponds and streams were scattered throughout lower areas of the study area, and some grassy fields were located along broad ridgetops in the southern portion (Figures 9–12). Modern houses and structures were also observed throughout the study area (Figures 13–15).

Historic map structure locations (MS 1–MS 19) were inspected to ascertain which structures were still extant within the study area, and to determine the potential for archaeological sites that may be associated with any of the structures. The review of recent aerial imagery indicated that four historic map structures (MS 5, MS 14, and two structures at the location of MS 15) were likely extant within the study area or had modern buildings in their locations. During the reconnaissance, MS 5, MS 14, and the two structures at the location of MS 15 (MS 15a and MS 15b) were observed as barns (Figures 16–19). After historic aerial research, it was determined that the current structure at the location of MS 5 was constructed sometime between 1981 and 1983 (Nationwide Environmental Title Research [NETR] 2024). Similarly, MS 15a was built between 1972 and 1981, and MS 15b was built shortly after 1981 (NETR 2024). MS 15a, while not the original structure at MS 15, could potentially be considered historic in its own right if it was constructed between 1972 and 1974, though arials were not available between those years. The same can be said for the current structure at the location of MS 14 as it also appeared to have been constructed sometime between 1972 and 1981 (NETR 2024). Located east of the MS 14 location was a house (Figure 20) that was determined to have been constructed between 1972 and 1981 (NETR 2024). The house was not assigned a map structure number.

Additionally, two cemeteries (the Gardner Farm Cemetery and the Welborn Cemetery) were observed during the reconnaissance. Observations at the Gardner Farm Cemetery consisted of three grave markers

(two dual headstones and one footstone) containing three graves in two rows, encompassing approximately 267 sq m (Figures 21 and 22). Gardner was the only surname present at this cemetery. The earliest death date was that of Helen P. Gardner who died on March 5, 2017, and the latest death date was that of Adam D. Gardner who died on December 18, 2019. Observations at the Welborn Cemetery consisted of 37 grave markers (18 headstones, 9 footstones, and 10 box tombs) containing approximately 30 graves in 6 rows, encompassing approximately 456 sq m (Figures 23–25). Common surnames were Uncel, Wilcox, and the namesake of this cemetery, Welborn. The earliest death date was that of A.E. Welborn who died on January 14, 1860, and the latest death year was that of J.E. and Nannie Uncel who both died in 1918.

Located on an upland in the northeastern section of the study area was a small lithic scatter of three prehistoric flakes (Figure 26). It is possible more artifacts are present in this area, and if a survey were to be conducted, a site would likely be encountered here and in other areas of similar topographic setting.

Soil Review

The soils mapped within the study area were also reviewed to define areas that may contain buried cultural deposits (Figure 27). There are seven soil series (Belknap, Bonnie, Clifty, Sadler, Sharon, Wellston, and Zanesville) and one soil complex (Frondorf-Lenberg) mapped within the study area (Soil Survey Staff 2024). The soils are classified by the amount of time it has taken them to form and the landscape position on which they are found (Birkeland 1984; Soil Survey Staff 1999). This information can provide a relative age of the soils and can express the potential for buried archaeological deposits within them (Stafford 2004). The soil order and group classifications for each soil series are used to assist with determining this potential.

Bonnie series soils are classified as Entisols, which formed very recently in unconsolidated parent material, such as sandy or recent water-deposited sediments or disturbed soil and rock material, and have not been in place long enough for pedogenic processes to form distinctive horizons except an A horizon (Soil Survey Staff 1999:389–391). Because of their recent age, Entisols rarely have buried and intact prehistoric archaeological deposits.

The Frondorf, Lenberg, Sadler, Wellston, and Zanesville soil series are classified as Alfisols, which formed during the late Pleistocene or earlier (Soil Survey Staff 1999:163–165). Archaeological deposits would generally only be found on or very near the ground surface on landforms mapped with Alfisols.

Belknap, Clifty, and Sharon soil series are classified as Inceptisols. Inceptisols are found on landforms that formed during the late Pleistocene or Holocene time periods (Soil Survey Staff 1999:489–493). These may have deeply buried and intact archaeological deposits, depending upon the landform on which they formed (e.g., sideslope vs. alluvial terrace). Because of this, areas of Belknap, Clifty, and Sharon soils contain the highest probability of buried cultural deposits of the soil series present in the study area.

A 1.00-inch (2.54 cm) diameter Oakfield tube sampler was utilized judgmentally within the study area to assess soil conditions, and the potential for archaeological sites. Oakfield probes sampled in the northwestern section of the study area typically showed a dark yellowish-brown (10YR 4/4) silty clay loam 0–7 cm below ground surface (bgs) followed by a dark yellowish-brown (10YR 4/6) silty clay loam 7–89 cm bgs, and the soil usually became moist around 20 cm bgs. Oakfield probes sampled in the southwestern section of the study area typically showed a dark yellowish-brown (10YR 4/4) silty clay loam 0–11 cm bgs followed by a yellowish-brown (10YR 5/6) clay loam 11–19 cm bgs. In the southeastern section of the study area, Oakfield probes sampled typically showed a dark-yellowish brown (10YR 4/4) silty clay loam 0–14 cm bgs, followed by a strong brown (7.5YR 5/6) clay loam 14–64 cm bgs. In the northeastern section of the study area, Oakfield probes sampled typically showed a brown (10YR 5/3) silty clay loam 0–20 cm bgs, followed by a light brownish-gray (10YR 6/2) clay loam with iron masses 20–77 cm bgs, and contained wet clay at depths of approximately 62 cm bgs. When compared to the mapped soil series in the study area, the Oakfield samples were all somewhat consistent with their soil series in terms of color and texture.

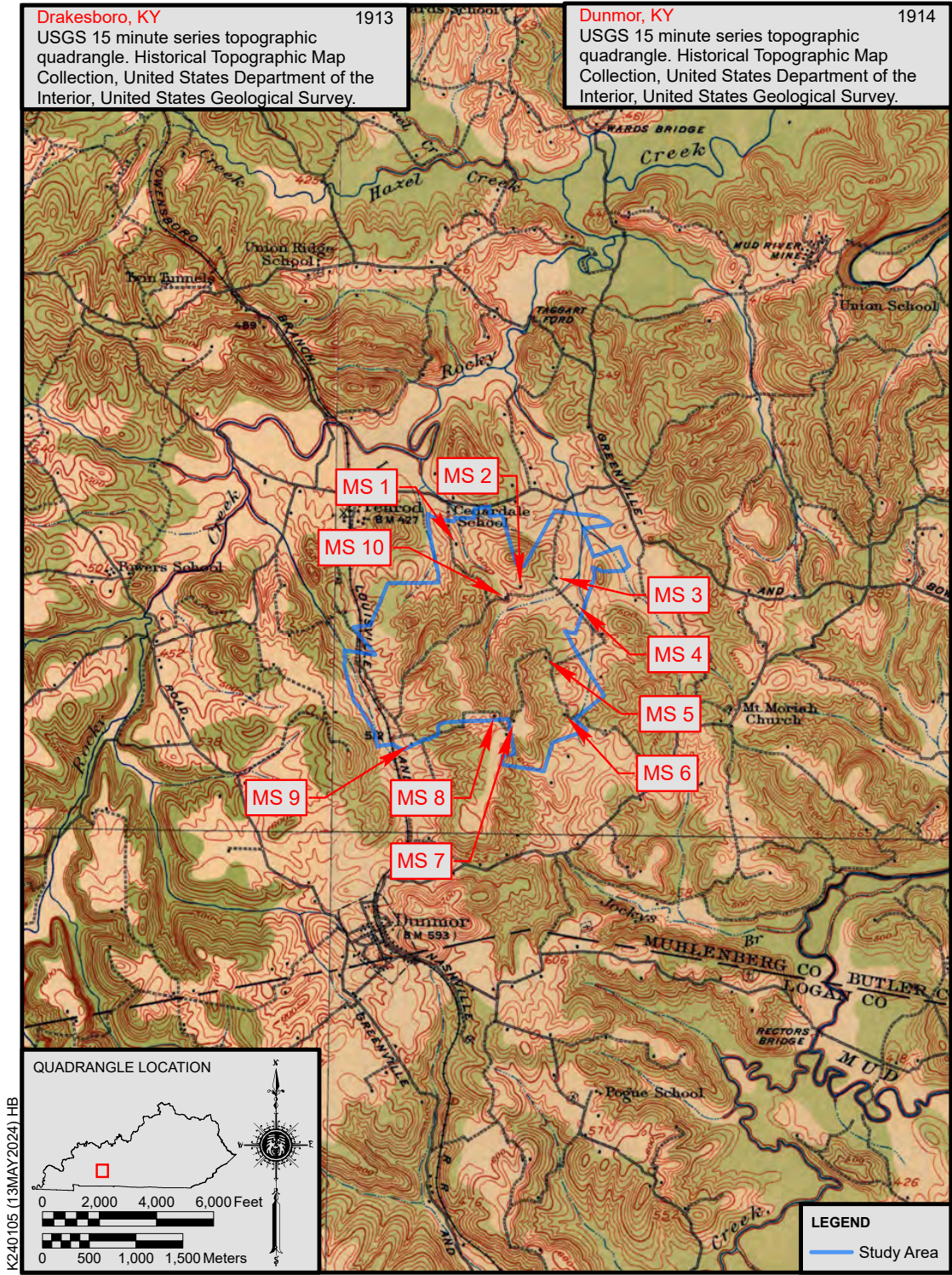


Figure 2. 1914 Dunmor, Kentucky, 15-minute series topographic quadrangle depicting MS 1–MS 10.

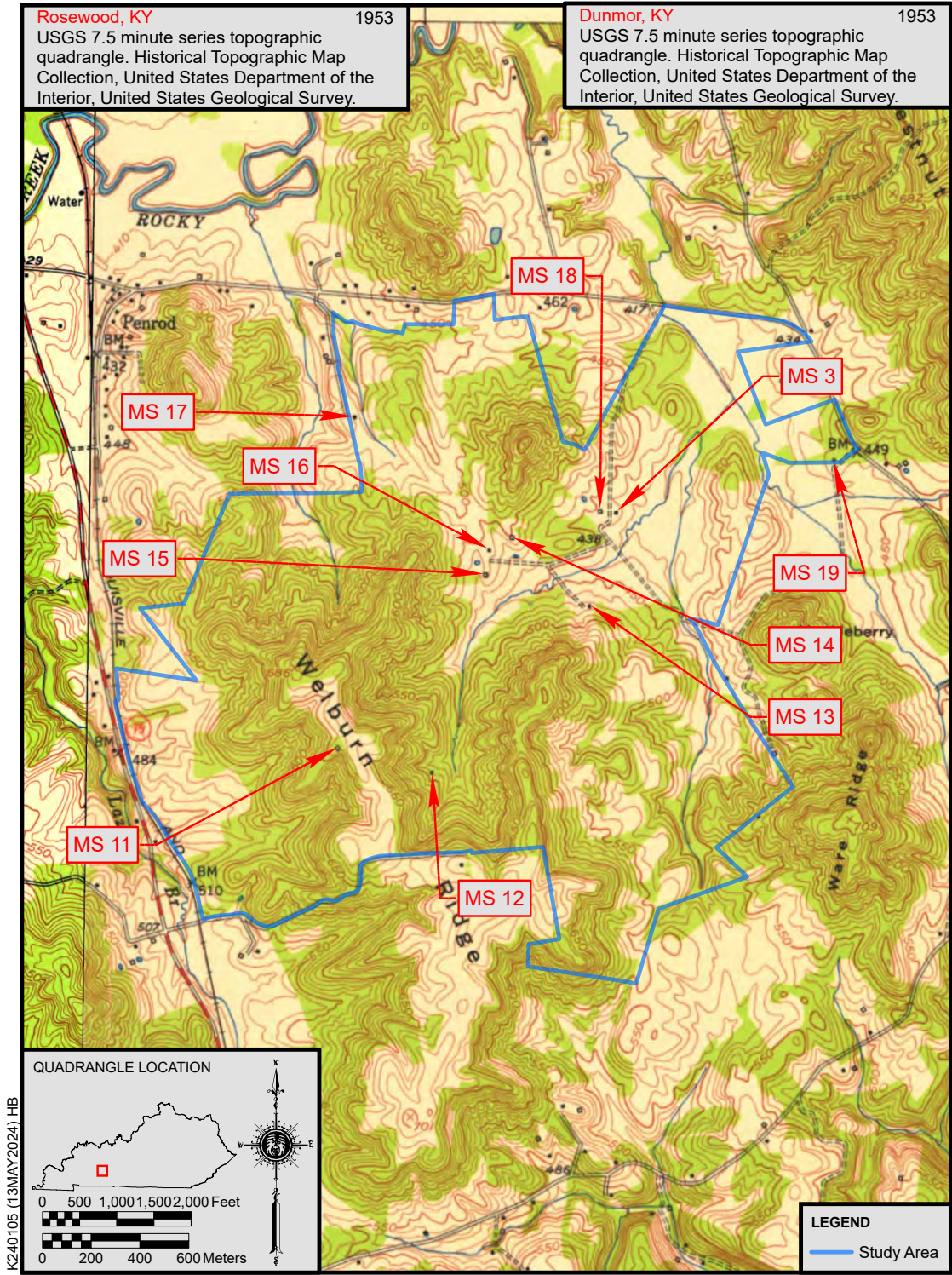


Figure 3. 1953 Dunmor, Kentucky, 7.5-minute series topographic quadrangle depicting MS 3 and MS 11–MS 19.

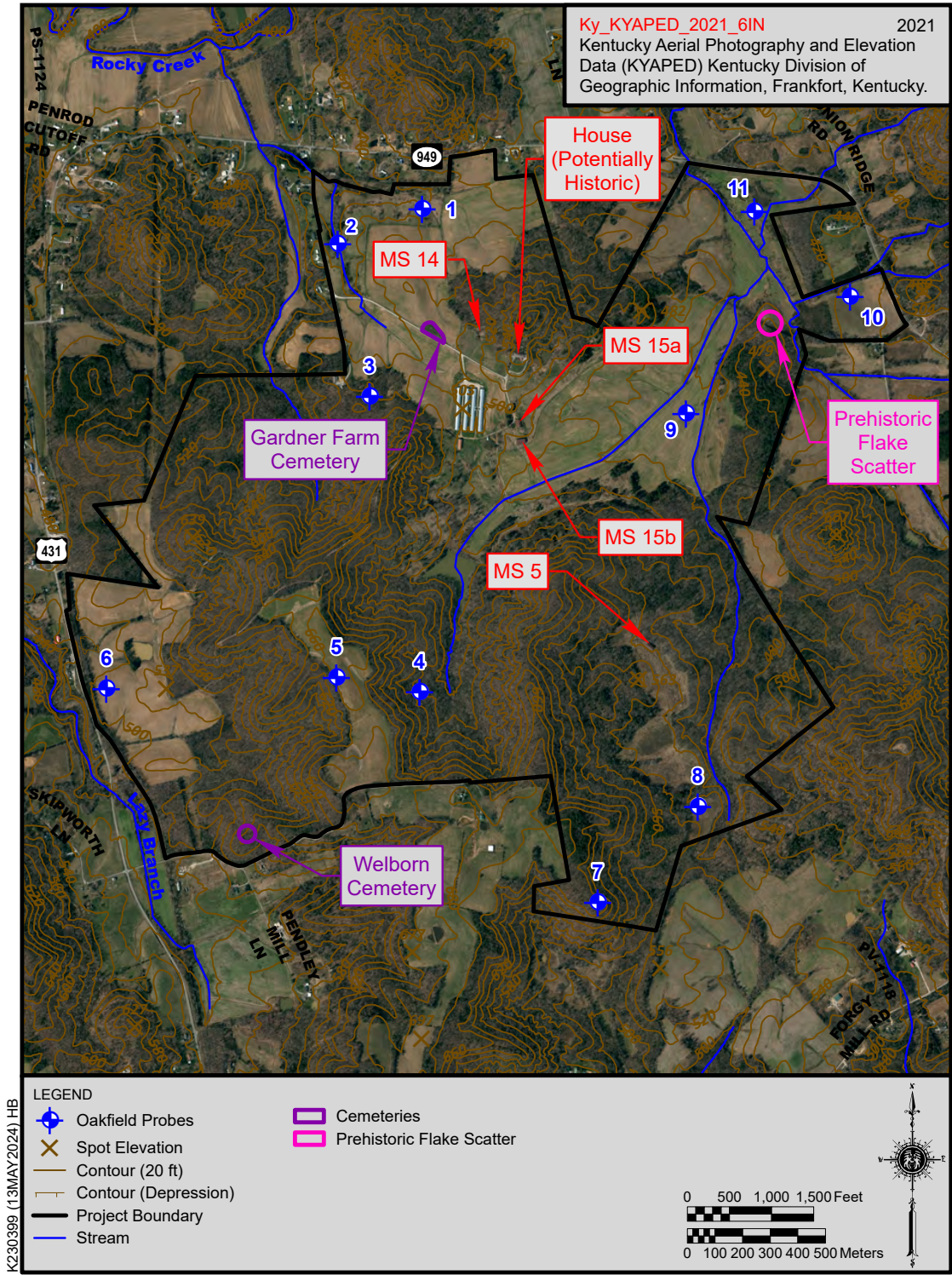


Figure 4. Aerial map of study area depicting Oakfield probe locations, extant map structure locations, cemeteries, and prehistoric flake scatter.



Figure 5. Example of vegetation in wooded sections within study area, facing southeast.



Figure 6. Example of cornfield within study area, facing west.



Figure 7. Goats in pasture in northwestern section of study area, facing northwest.



Figure 8. Cows in pasture in northwestern section of study area, facing north.



Figure 9. Small pond in northwestern section of study area, facing west.



Figure 10. Large pond in central section of study area with camper and pile of pallets, facing north.



Figure 11. Stream in northwestern section of study area, facing southeast.



Figure 12. Broad grassy ridgetop in southeastern section of study area, facing east.



Figure 13. Modern house in western section of study area, facing west.



Figure 14. Silos in central section of study area, facing northeast.



Figure 15. Chicken barns in central section of study area, facing southwest.



Figure 16. Structure at location of MS 5, western corner, facing east.



Figure 17. Structure at location of MS 14, western corner, facing east.



Figure 18. Structure at location of MS 15a, northwest corner, facing southeast.



Figure 19. Structure at location of MS 15b, southwest corner, facing northeast.



Figure 20. House located east of MS 14 location in northern section of study area, facing northeast.



Figure 21. Gardner Farm Cemetery entrance, facing northeast.



Figure 22. Overview of grave markers at Gardner Farm Cemetery, facing west.



Figure 23. Overview of Welborn Cemetery from northeast corner, facing south.



Figure 24. Overview of Welborn Cemetery from southern border, facing north.



Figure 25. Grave markers in overgrowth at Welborn Cemetery, facing west.



Figure 26. Example of a flake found in the northeastern section of the study area.

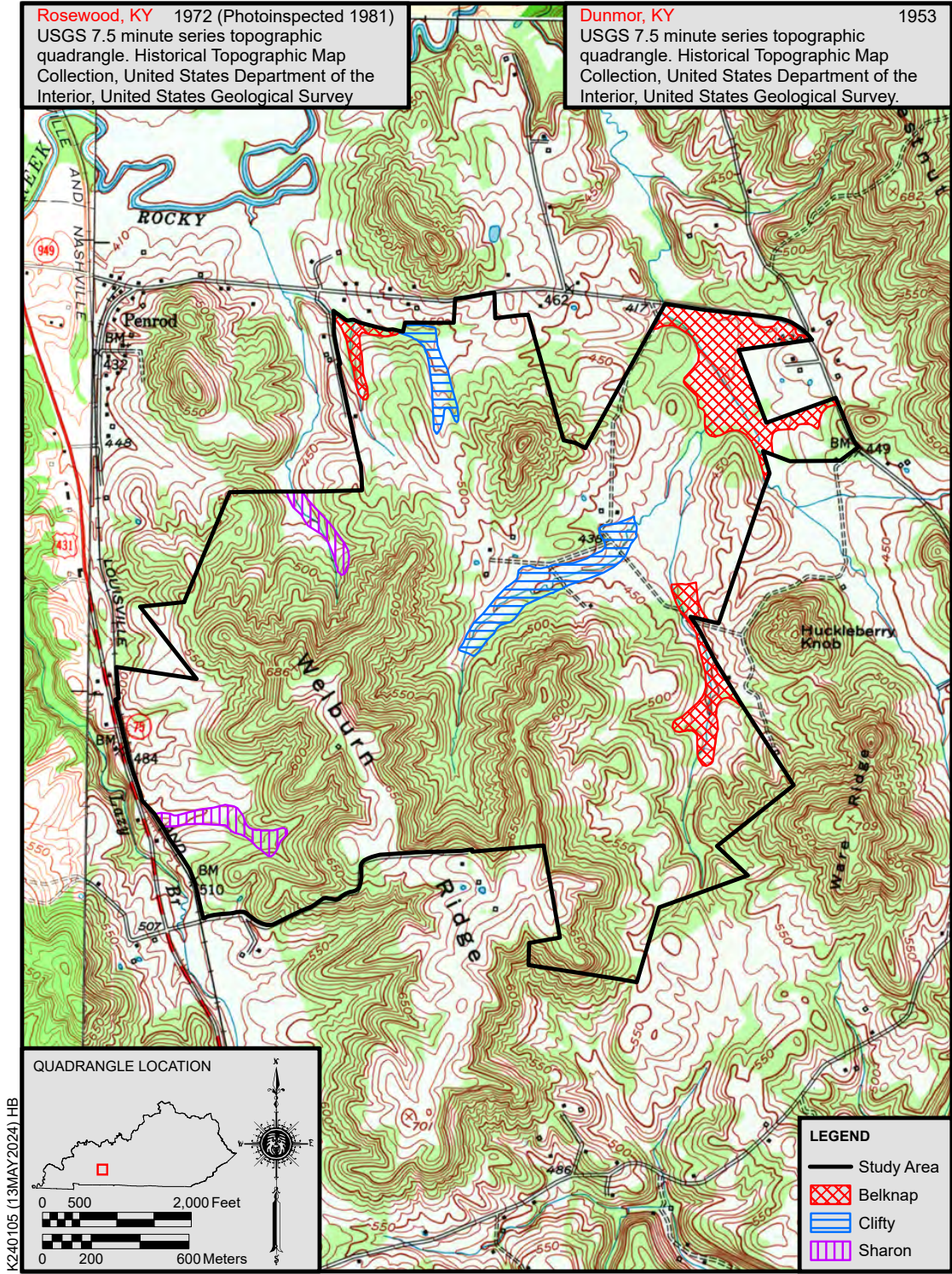


Figure 27. Topographic map depicting the location of Inceptisols within the study area.

Summary

OSA data revealed that one previous professional archaeological survey was conducted within a portion of the study area (Wampler and Karpynek 2004). The data further indicated that no archaeological sites were recorded within or adjacent to the study area. The review of historic maps showed 19 historic structure locations within the study area, all of which likely date to the twentieth century. Of these, four structures (MS 5, MS 14, and two structures at the location of MS 15) were observed during the reconnaissance. While none of these are likely the original structures at these locations, the structure at MS 14 and the structure at MS 15a have the potential to be historic in their own right if constructed before 1974. Additionally, a house observed during the reconnaissance was also determined to be potentially historic (not assigned a map structure number) if constructed before 1974. Although these structures may be relatively recent, they are still potentially over 50 years of age, and cultural deposits found in association with any of them might be considered archaeological sites, some of which could be significant. Furthermore, two cemeteries (the Gardner Farm Cemetery and the Welborn Cemetery) were observed during the reconnaissance. The Gardner Farm Cemetery contained three graves and dated to 2017–2019, and the Welborn Cemetery contained approximately 30 graves and dated to 1860–1918. A small prehistoric lithic scatter was also observed in a cornfield in the northeastern section of the study area. It is likely that more artifacts are present in this area, and if a survey were to be conducted, a site would likely be documented here and possibly in other areas of similar topographic setting. The soil data showed three Inceptisols (Belknap, Clifty, and Sharon) present within the study area, and these have the potential to contain deeply buried archaeological deposits.

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