Geophysical Investigations at the Hanna's Town Cemetery, Westmoreland County, Pennsylvania

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GEOPHYSICAL INVESTIGATIONS AT THE HANNA’S TOWN CEMETERY,
WESTMORELAND COUNTY, PENNSYLVANIA

A Thesis
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Master of Arts

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Hanna’s Town (36WM203), an 18th century site located in Westmoreland County, Pennsylvania, was a major frontier settlement that was attacked and destroyed by a force of British and Native Americans in 1782. The town never fully recovered, and by the early 1800s, no buildings remained from the settlement. The land was repurposed for agricultural use until it was purchased by the Westmoreland County Historical Society, who reconstructed the town for tourism and educational purposes. In addition to the town, the site also contains a cemetery that currently has five headstones. There are several stone fragments in storage that are no longer associated with burials, providing evidence that the cemetery may contain unmarked graves. Geophysical investigations using ground penetrating radar, magnetometry, and electrical resistance were performed to examine the presence of additional grave shafts in and adjacent to the present-day cemetery.
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CHAPTER I
RESEARCH OVERVIEW

This thesis presents the results of historical research, geophysical surveys, and field excavations at the cemetery associated with historic Hanna’s Town (36WM203) in Westmoreland County, Pennsylvania. Hanna’s Town, a Revolutionary War era site, was a major settlement on the Forbes military road; the town ultimately was destroyed in 1782 (Carlisle 2005:v, 1). In 1969 the land was purchased by Westmoreland County, and it was placed on the National Register of Historic Places in 1972. Since the property’s purchase in the late 1960s, Hanna’s Town has been the site of numerous archaeological investigations, but the cemetery has been given little attention (Carlisle 2005:vi). The goals of this research were to gain a thorough knowledge of the cemetery’s history, determine when it was founded, locate its boundaries, and find where unmarked graves are located through geophysical investigations.

Significance

Hanna’s Town has been reconstructed for tourism and educational purposes with the cemetery as the only extant original above-ground feature. Locating the graves at the Hanna’s Town Cemetery is important for the local history of Westmoreland County because of the potential information it could yield about burial practices of Europeans living on the frontier. The geophysical surveys performed for this research can potentially reveal information about burial features such as depth, size, the number of graves, and the spatial distribution of those graves within the cemetery. These characteristics have changed over time in most Euro-American cemeteries and they can indicate “economic background, ethnicity, and religious, social, or aesthetic values”
(Conyers 2006:64). Under ideal conditions, geophysical data can then be joined with historical documents to supply information about “the lives and the behaviors of the individuals buried there,” which cannot be learned without the methods proposed here (Conyers 2006:64).

If the Westmoreland County Historical Society should choose to implement preservation practices or conduct further research, having unmarked grave locations mapped will allow them to perform this study more efficiently. Data presented in this thesis can then be joined with historical documents to supply information about the individuals buried there, which can add a different dimension to the history of Hanna’s Town’s residents (Conyers 2006:64). Locating graves also has practical implications for the historical society, by helping them manage the site for any future construction.

**Research Questions**

The following three questions were developed to supplement existing information about the cemetery and determine the usefulness of the geophysical investigations at the site:

*Question 1: How many burials does the cemetery contain?*

The cemetery at Hanna’s Town currently contains four headstones, one possible headstone, and three footstones. The Westmoreland County Historical Society, who administers the site, has grave markers\ fragments and unworked stone in their possession that are no longer associated with burials. The number of individuals these stones represent is unknown and may indicate the presence of unmarked burials in the Hanna’s Town Cemetery.
Question 2: Where are the graves located and what are the boundaries of the cemetery?

Although there is evidence that the cemetery may contain unmarked graves, it is unclear whether they are located within the current boundaries of the cemetery or extend onto the surrounding land. Locating the graves will help determine where the historical society can perform preservation practices and potentially provide a starting point for further research.

Question 3: Which geophysical methods were the most helpful for identifying unmarked graves?

A comparison of the data provided through ground penetrating radar (GPR), magnetometry, and electrical resistance were performed to determine which methods were best able to identify grave shafts in this setting.

To address these research questions three geophysical instruments were used to survey approximately 0.51 acres administered by the Westmoreland County Historical Society. Four grids were placed on this land to perform ground penetrating radar (GPR) and magnetometry surveys to determine which grid contained the largest concentration of graves. After GPR and magnetometry data were collected and processed, that information was used as a base to compare against electrical resistance data taken on the grid believed to contain the most unmarked burials. Once all geophysical data were processed, excavation was done to determine the efficacy of the geophysical survey results and their interpretation.
Organization of Research

This thesis is organized into eight chapters. Chapter I presents a short overview of Hanna’s Town and the cemetery, and it explores why both are significant for the history of Westmoreland County. Chapter II elaborates on the project’s environmental setting, while Chapter III provides the history of Hanna’s Town and the cemetery, and offers information about previous investigations and current grave markers.

Chapter IV provides information on the use of geophysics in archaeology and a more specific description of their role in cemetery studies. The chapter continues by offering information on GPR, magnetometry, and electrical resistance, and how each method can detect burials. Characteristics of graves that geophysical methods can detect is also discussed. Chapter V describes the processes used in the collection of the geophysical data, excavation, and laboratory work. Chapter VI provides the results of the geophysical surveys while Chapter VII details excavation results for test units that contained features. Lastly, Chapter VIII readdresses the previously described research questions and offers recommendations for future research.
CHAPTER II
ENVIRONMENTAL SETTING

Project Location and Environmental Setting

Hanna’s Town Cemetery is located west of the Hanna’s Town historical site along Forbes Trail Road in Greensburg, Westmoreland County, Pennsylvania (see Figures 1-3). The survey area covers approximately 2,092 square meters of land that is mowed and maintained by Westmoreland County. The site is located within the Appalachian Plateau Province and the Pittsburgh Low Plateau Section, which “consists of a smooth undulating upland surface cut by numerous, narrow, relatively shallow valleys” (Pennsylvania Department of Conservation and Natural Resources 2016a) (see Figure 4). The uplands are situated on rocks that hold bituminous coal, and the relief between those uplands and valleys can be up to 600 feet (Pennsylvania Department of Conservation and Natural Resources 2016a).

The Appalachian Plateau region is composed mostly of a mix of mesophytic climax plant communities, or plants that have adapted to very dry or wet environments. Species in these communities include red oak, basswood, white ash, and tulip poplar (Braun 1947:213; United States Forest Service 2017).
Figure 1. Location of Hanna’s Town Cemetery within Westmoreland County, PA.
Figure 2. Aerial photo showing Historic Hanna’s Town, Hanna’s Town Cemetery, and the Steel Family Cemetery.
Figure 3. Topographic map showing location of the Hanna’s Town Cemetery.
Figure 4. Physiographic provinces of Pennsylvania. The location of the Hanna’s Town Cemetery is marked by the black star (Pennsylvania Department of Conservation and Natural Resources 2016b).
The site is situated within the Sewickley Creek watershed, which encompasses 168 square miles in Westmoreland County, Pennsylvania. It is drained by Sewickley Creek and includes cities such as Greensburg (1799), New Stanton (ca. 1800), and Madison (1876) (Sewickley Creek Watershed Association 2016). Sewickley Creek Watershed is located within the Youghiogheny River Watershed, which is part of the Ohio River Basin (Pennsylvania Department of Conservation and Natural Resources 2016b).

Soil at the Hanna’s Town Cemetery is comprised solely of Matewan channery loam (MeB). Matewan soils are well drained soils formed into gray and/or brown acid sandstone that are typically found on the back-slope, shoulder, or summit of hills. Matewan soils can be found on these land formations with 7 to 8 percent slope (USDA 2016). The Oe horizon is 0-1.5 cm and is 10 YR 2/2 organic rich material comprised of decomposed leaf litter. The A horizon is 1.5 to 10 cm and is 10 YR 3/2. The Ap is 0 to 25 cm (0 to 9.8 in) and is 10 YR 3/2 channery sandy loam and 10 YR 5/1 dry. Soils in this horizon tend to be non-sticky and crumbly and typically have very fine and fine roots throughout. The BA horizon is 10-20 cm and 10 YR 5/4 very channery sandy loam. Soils in the BA horizon are crumbly and have fine, medium, and coarse roots. The Bw horizon is 20 to 76 cm and is 10 YR 6/6 very channery loam. Soils are typically crumbly and include coarse roots (National Cooperative Soil Survey 2017; USDA 2017).
CHAPTER III
HISTORICAL BACKGROUND

History of Hanna’s Town

Hanna’s Town was founded in western Pennsylvania at a time when it was the frontier of western Euro-American expansion. During the colonial period, the frontier was a dangerous area due to the political developments involving the British, French, and Native Americans. The first half of the 18th century saw relative peace, but the latter half was fraught with hostility as England and France vied for power in North America. The situation in the New World continued to worsen as aggression swelled between the Native Americans and European settlers, the colonies competed against each other for land, and the American quest for independence transpired (Carlisle 2005:9). As the situation between the two European superpowers culminated in the French and Indian War, southwestern Pennsylvania became a major theatre for the conflict. As the war began to subside, renewed violence between the colonists and Native Americans began, but these events were soon absorbed into the beginnings of the American Revolution (Carlisle 2005:15-18, 51).

Hanna’s Town, founded by Robert Hanna in 1769, became one of the few major settlements on Pennsylvania’s western frontier to thrive during this tumultuous time. The town gained importance as a last stop for travelers entering the Ohio wilderness, and as a result of its location, Hanna’s Town grew (Carlisle 2005:v). The settlement, containing about 30 log structures, sprung up around Robert Hanna’s tavern, and in 1773 it became the county seat of Westmoreland County, rivaling nearby Pittsburgh (Carlisle 2005:1; Hassler 1900:176). Hanna’s Town continued to prosper as the new “political
The attack on Hanna’s Town is believed to have primarily been a revenge act led by Sayengaragta because his village, Canadassaga, was burned to the ground in 1779 by a militia comprised of Westmoreland County men (Carlisle 2005:53; Richardson 2007). In May of 1782 Sayengaragta led a party of Native American and British soldiers on a mission to “‘cut off’” a settlement located near Fort Pitt. Military documents pertaining to the mission suggest that present day Wheeling, West Virginia was the original target, but at some point the objective of the expedition turned to Hanna’s Town (Carlisle 2005:55-56).

The attack on Hanna’s Town occurred on July 13, 1782, resulting in the death of two residents, and several people were taken prisoner. During the raid, the town was looted, all but the fort and two houses were burned, and several hundred head of cattle were killed. The attack took place ten months after the Revolutionary War had ended, but most of the forces on the frontier had not yet been notified of the Treaty of Paris, which already had ended the conflict (Carlisle 2005:58-60).

Hanna’s Town never recovered from the attack, and the county seat was moved to Greensburg in 1787. By the early 1800s there were no buildings associated with Hanna’s Town and the land was repurposed for agricultural use. The significance of the site and the role it played in early American history was recognized in the 1960s, and the land was purchased by Westmoreland County and turned into an outdoor museum (Carlisle 2005:vi). Today, the site has been reconstructed for tourism purposes, with
nothing original to the settlement remaining above ground except some markers in the cemetery.

**The Hanna’s Town Cemetery**

Presently, Historic Hanna’s Town and the cemetery are administered by the Westmoreland County Historical Society. In its current condition, the cemetery is bounded by a split-rail fence that measures 39 feet by 40 feet (Figure 3). The area designated as the cemetery contains four headstones, one possible headstone, and three footstones. Although the current state of the cemetery suggests only a few individuals are buried there, one historic document referenced in two modern sources suggests the cemetery once contained 150 burials (Dick 1950:13; Kaufman 1988:4). This document could not be located, but both modern sources reference the *Art Work of Westmoreland County, Pennsylvania*, published by the Gravure Illustration Company of Chicago in 1905, for the number of burials they claim are in the cemetery.

It should be noted that documentary evidence is scarce regarding the Hanna’s Town Cemetery. The only documents to provide some detail are the two modern sources referenced above and photo documentation taken in 2007. The cemetery has been referred as the Pioneer Cemetery, the Primitive Cemetery, the Hanna’s Town Cemetery (with an apostrophe), the Hannas Town Cemetery (without an apostrophe), and the Hannastown Cemetery (written as one word). Documents describing the cemetery’s original layout, its original name, the date of its founding, or a list of who is buried there could not be located.
Previous Research

One of the few sources regarding the cemetery was written circa 1950 by Alta Dick and it is housed at the Westmoreland County Historical Society in Greensburg, PA. She wrote, “In the little cemetery at the top of the hill there were about one hundred fifty graves, but they bore no marks to indicate who was buried beneath the markers” (Dick 1950:13). For the burial number, Dick references *Art Work of Westmoreland County, Pennsylvania*.

A second source was written by Jean Troxell Kaufman in 1988, and can also be found at the Westmoreland County Historical Society. In the history portion of her report, Kaufman wrote that the cemetery had a fence in 1940, but it is unclear if that is referencing the establishment of the current split rail fence. Kaufman then briefly describes a discussion she had with Robert Haile, the groundskeeper at Hanna’s Town in the 1970s, who had worked for the Steel Family while the farm was still operational. In their conversation Haile mentioned “there were many more standing headstones
then, some only protruding above ground level an inch or two” (Kaufman 1988:4). Where Haile claimed these headstones were located was not mentioned in the report.

Turning her focus to the condition of the cemetery at the time of her report, Kaufman wrote several “primitive stones” had broken or sunken into the soil, so she and her team retrieved loose stones found on the surface. She noted that of the stones found, one had rounded edges, another had a fish carved on the face, and a third had deteriorated carvings of leaves. It is unclear where these stones were taken, but the Westmoreland County Historical Society staff believes they were taken to the attic of the Tenant House, located on Historic Hanna’s Town property (Kaufman 1988:5).

Kaufman then described how she and a team cleared brush to lay out a grid for a pedestrian survey of the cemetery. The report claims “some 20 graves” were found, basing their decision upon depressions in the ground. There is no map and no other language to help decipher where her pedestrian survey occurred and where the graves are located (Kaufman 1988:4). During the survey Kaufman believed she found evidence of a cairn burial, which is a pile of rocks built over graves. Sometimes they served as markers, as a base to hold ornamentation, or to protect the burial (Indiana Department of Natural Resources 2016). No evidence currently exists of a cairn, and Kaufman does not elaborate on where it was located (Kaufman 1988:5).

The remaining portion of her report describes the excavation of two graves by Kaufman and a team in 1979. Her reasoning for excavation was “for scientific research and for actual proof of the cemetery’s existence” (Kaufman 1988:6). The first burial they unearthed was a child’s grave, which she wrote “lay[s] parallel and adjacent to the roadside fence under an apple tree.” The bottom of the grave was approximately 17
inches deep. No human remains, clothing, or wood were present, but 18 nails outlined where the coffin once was (Kaufman 1988:6).

The second excavated burial was an adult’s, which was located “just outside and parallel to the enclosed section by the southeast corner under several immature trees.” The bottom of the grave was reached at 30 inches, where they found a tooth, skull fragments, a lower jaw, and one long bone. Her report says the tooth was removed, and it is unclear if the other human remains were, as well. It is not mentioned where the tooth was housed (Kaufman 1988:7).

The location of these excavations, the 20 graves, and the pedestrian survey is vague, and the lack of mapping, photography, and drawings makes Kaufman’s report hard to decipher for someone trying to locate these features on the ground. Although much of the information in her report is not helpful because no proveniences were provided, it appears to describe more burials than are currently present, providing further evidence for unmarked burials. Her report also shows that at least some of the graves are quite shallow.

The third investigation was conducted in 2007 by Ellis Michaels for a US Gen Web cemetery documentation project (Pennsylvania USGenWeb Archives 2011). During Michaels’ investigation, measurements, photos, and stone descriptions were taken to document the condition of the cemetery at that time. Since 2007, the stones at the Hanna’s Town Cemetery have been reset, which can be seen when comparing Michaels’ overview photo shown below (Figure 6) to the current conditions of the stones shown in Figure 5 (Pennsylvania USGenWeb Archives 2011).
Current Grave Markers

Of the present grave markers, all are directed east, which is a common burial practice among Christian populations (Patch 2010:9; Yalom 2008:12) (Figure 7). Out of the eight grave markers, only two are completely legible. Of the legible stones, one marks the grave of Mary Stephenson, who died April 12, 1813 at the age of 56 (Figure 8). Her headstone is made of slate, dressed on all sides, and faces east. Biogrowth, or the presence of algae, lichen, mold, or moss, is present on the front and back (Architectural Conservation Laboratory and Research Center, University of Pennsylvania 2006:17). Some spalling is evident on the bottom of the headstone.
Figure 7. Location of split rail fence and grave markers in Grid 2.
Mary Stephenson’s grave also has a footstone, which faces west towards the headstone. It is also made of slate, but it is smaller in size and less ornately carved at the top than the headstone. Most of the face of the footstone has spalled off, but the initial of her first name is still visible. A small amount of biogrowth is visible on the footstone, and the top right corner has fractured (Figure 9).

There is a second headstone directly north of Mary Stephenson’s that is identical in material, shape, dressing, and directional facing. This stone has a high degree of spalling on the face, leaving no trace of its inscription (Figure 10). This grave also has a footstone, which is identical to the footstone for Mary Stephenson’s grave. The footstone has some spalling and biogrowth, but the initials “S. S.” are still visible (Figure 11). Because this individual shares an identical marker to Mary Stephenson’s and their footstones reveal their last names began with an S, it is likely the two were related.
Figure 8. Mary Stephenson's headstone. Photo direction facing west.
Figure 9. Mary Stephenson’s footstone. Photo direction facing east.
Figure 10. Headstone with significant spalling. Photo direction facing west.
The second completely legible stone is for Robert Bell, a servant for the Steel family who lived from 1841 to 1915 (Figure 12). His marker is made of granite that was placed on a large, unworked stone. This marker is a wedge stone, meaning the bottom of the stone is flush with the ground but the top is slanted, making the granite sit at an
angle (Indiana Department of Natural Resources 2016). Bell’s stone is in very good condition with no biogrowth, chips, fractures, or spalling.

![Figure 12. Robert Bell's headstone. Photo direction facing west.](image)

One semi-legible stone was placed for William Macoy, who died on March 27 (Figure 13). The year of his death is partly illegible and the very bottom of his stone has more inscription, but it is unclear what it says. Macoy’s headstone is a simple rectangular marker with no ornamentation that was placed in an undressed stone base. The headstone has broken in the middle and contains chips along the sides. It has experienced a mild level of erosion and contains biogrowth.

There is another stone directly east of Macoy’s headstone, and it may be the footstone associated with his burial (Figure 14). It is smaller than the headstone, has no inscription on either side, and is made of the same stone. The footstone exhibits some biogrowth and significant mower abrasion. In 2007, at the time of Ellis Michaels’ photos,
this stone was photographed with a base and did not have the significant mower abrasion it exhibits today (Figures 15). Because the stone was tipped out of its base, Michaels was able to photograph numbering on the bottom of the stone, which was likely added by the carver (Figure 16). The base the stone once sat in is no longer in the cemetery.

Figure 13. William Macoy’s headstone. Photo direction facing west.
Figure 14. William Macoy’s footstone with headstone in the background. Photo direction facing west.
Figure 15. Ellis Michaels’ photo of William Macoy’s footstone in base.
The last marker currently present within the cemetery is lying flat on the ground (Figure 17). The marker shows evidence of chipping and there is significant biogrowth on the side touching the ground. It is a simple rectangular marble marker that does not appear to be inscribed on either side. However, based on Ellis Michaels’ photos, this stone likely belongs to Kizia Mason (Pennsylvania USGenWeb Archives) (Figure 18). This stone and the one in Michaels’ photo are the same shape, both made of marble, and exhibit the same curves and chips on the edges.
Figure 17. Possible headstone of Kizia Mason.

Figure 18. Ellis Michaels’ photo of Kizia Mason’s stone, referenced by white arrow. Also photographed with William Macoy’s headstone.
In addition to the markers located in and near the cemetery, a fragmented slate headstone held together by a concrete backing has been stored in the ‘milk house’ at Hanna’s Town. This marker was placed in memory of John Shields, Esquire who died in 1891 at 82 years of age (Figure 19).

Lastly, there are 20 pieces of stones and stone fragments in paper boxes in the attic of the Tenant House at Hanna’s Town (Figure 20). Of the fragments, only one is dressed with “rs.” carved on the face, possibly referencing “Yrs.” for years (Figure 21).

Figure 19. John Shields’ headstone.
In the box containing the stones, there was a hand-written letter that indicated Anne Warren went to an uprooted tree after a tornado went through the area in 1983 (Figure 22). The letter, written on June 11, 1983, reads:

“Following tornado damage in Pioneer Cemetery, Ed Hahn and I went up to check the roots of the tree that was uprooted (See photo). This piece of
limestone was in the up-rooted section so we brought it down to put with the other stones. A. Warren”

Staff at the Westmoreland County Historical Society believe the stones packed in paper boxes were taken from the cemetery, and Warren’s letter may confirm that. It should be noted that no limestone fragment was located and neither was the photo referenced in the letter.

Figure 22. Letter found in boxes of stones in the attic of the Tenant House.
CHAPTER IV

ARCHAEOLOGICAL GEOPHYSICS

In recent years, geophysical methodology for archaeological work has been recognized as an acceptable survey method within the archaeological community (Conyers 2010b:117). Its popularity in the field stems from the method’s ability to examine the subsurface with little to no disturbance, allowing archaeologists to see before they dig (King et al. 1993:4).

Geophysical survey instruments include several near-surface imaging methods that measure physical and chemical changes in the soil to show where archaeological features may be located below the ground’s surface (Conyers 2010a:176; Conyers 2006:65; Burks 2010a:2; Burks 2010b:7). Archaeological deposits can produce “subtle but detectable, differences,” and research has demonstrated that geophysical instruments are capable of identifying those changes (Burks 2010a:2).

Seeing below the surface without disturbing the ground is preferable when working on projects pertaining to sensitive subject matter, such as cemeteries (Sutton and Conyers 2013:783). The limited ground disturbance geophysical surveys provide has proven to be especially helpful for surveying historical cemeteries, aiding in the identification of unmarked burials and their possible preservation (Johnson 2003:1).

Over time, graves, cemeteries, and portions of cemeteries can leave little surface evidence of their existence due to abandonment, neglect, and vandalism. Markers can become displaced or deteriorated, leaving only landscape features such as fences and certain types of vegetation as clues to where graves may be located (Conyers 2006; Dalan 2007; Johnson 2003:1; Jones 2006). Even if there is some evidence to suggest a
cemetery is present, once the markers are gone it becomes very difficult to identify burials by looking at the ground surface alone. Rather than relying on traditional archaeological methods, which can be quite destructive, non-invasive geophysical techniques can be employed as an alternative to traditional excavation, or as a preliminary survey meant to guide targeted excavation (Sutton and Conyers 2013:783).

The Instruments

The three most commonly applied geophysical techniques for locating graves include ground penetrating radar (GPR), magnetometry, and electrical resistance (Conyers 2006; Dalan 2007; Johnson 2003; Jones 2006). Graves are often “subtle and difficult to detect” when viewing processed geophysical data, creating the need for a multi-device survey to produce the best results and increase interpretability (Burks 2010b:7). All three instruments have been able to identify unmarked graves by detecting contrasts in the soil and reading those contrasts to produce images of the subsurface (Burks 2010b:4, 7; Jones 2006). Additionally, bases for headstones and footstones, and “remains of objects placed at the graveside” can be detectable with geophysical survey (Burks 2013:20).

Ground-Penetrating Radar

To determine soil contrasts, GPR measures the time it takes for electromagnetic waves emitted from a surface antenna to reflect off anomalies and come back to the surface (Burks 2010b; Chadwick and Klein 2006:5; Patch et al. 2012:47; Sutton and Conyers 2013:793-794). As these reflections travel through the soil their velocity changes “depending on the physical and chemical properties of the material through which they are traveling.” Each change in velocity “generates a reflected wave” and
bounces back to the surface to be recorded by the machine (Sutton and Conyers 2013:793-794). These reflections are then recorded in vertical profiles layers and spatially mapped for easier visualization and data processing (Conyers 2004:1-2; Conyers 2006:65-66; Sutton and Conyers 2013:783).

In GPR data, these reflections can be viewed in two ways; radargrams or time slices. Radargrams are created when each pass of the radar across the ground is compiled to show a profile view of the subsurface. In this view, radargrams allow the user to see the shape and location of each reflection, which are typically flat or hyperbolic (Burks 2013:16-17; Burks 2010b:9). Flat reflections are typically created by a “flat, reflective surface,” while hyperbolic reflections (an upside down “U” or “V”) are associated with pipes, tree roots, and vaults/coffins (Burks 2010b:9; Sutton and Conyers 2013:797). Relying solely on radargrams, however, can make it difficult to interpret the anomalies found. Time slices, or the plan view of the survey grid, are created from horizontally stacked radargrams. The processing software is then used to interpolate, or “fill in the gaps,” between each radargram to create a solid block of data that can be sliced horizontally to create top-down views of the data that can be used in conjunction with the radargrams (Burks 2013:17).

*Magnetometry*

Magnetometry measures variations in the earth’s magnetic field by detecting levels of low magnetism and high magnetism in relation to surrounding soils. Magnetometers are sensitive to materials that have a high susceptibility to magnetization, or ferromagnetic materials (Burks 2009:2-3; Burks 2010a:4), and can detect “subtle changes in the soil,” particularly if there have been changes to the topsoil.
Magnetometers can generally detect ferromagnetic materials and soil contrasts up to three feet, but that depth may increase if highly magnetic materials are buried more deeply (Burks 2013:14).

Electrical Resistance

Electrical resistance also detects differences in the soil, but by emitting an electrical current through metal electrodes to generate its readings. By releasing the current into the ground, electrical resistance measures the soil’s ability to let that current pass, measuring the data in terms of high resistance and low resistance. Walls, roads, and rubble are examples of high resistance, while ditches and pits will read as low resistance (Gaffney and Gater 2003:26; Burks 2013:17-18).

Detection of Graves

Ground-penetrating radar, magnetometry, and electrical resistance’s ability to detect various contrasts in the soil lends to their ability to detect historic-era graves by three characteristics: the grave shaft and its fill, the presence of burial vaults, and coffins and their state of decomposition (Burks 2010b: 4; Burks 2013:15, 17).

Grave Shaft and Fill

One of the more common ways to identify historic graves is by identifying a contrast between the grave shaft’s fill and the surrounding soils. Shafts are oval or rectangular shaped holes that typically range from two to six feet deep and vary in size based on the individual and the size of the vault and/or coffin. Adult graves are generally 6-8 feet long and 1.5-2.5 feet wide and are typically more detectable by geophysical instruments than a child’s grave because of their larger size (Burks 2010b:4-5).
Supplemental to grave size is the fill soil within the grave shaft. When a grave shaft is dug it is typically refilled with the same soil, mixing the horizons and creating a noticeable difference between the surrounding, intact soils. However, if the soil lacks differentiation between the horizons the grave shaft will be less detectable than a shaft dug into well-developed soils with several distinctive layers. If the shaft is filled with soil that was brought in from another source then a magnetometer might detect the change in soil type at the top of grave. However, iron and markers made of magnetic stone can keep the magnetometer from detecting a grave (Burks 2010b:5; Jones 2006).

Another factor for grave shaft fill is a change in porosity. When the shaft is dug and refilled the removed soil is no longer as compact as the surrounding soil, which can be detected with geophysical instruments, especially GPR (Burks 2010b:5). Porosity can also cause the grave shaft to hold more moisture than the surrounding soils, which can be detected with GPR and electrical resistance (Burks 2010b:5).

*Burial Vaults*

Graves dating to the nineteenth century sometimes contained vaults. These structures can have an effect on moisture levels in the soil, which can be detected by GPR and electrical resistance (Burks 2010b:6; Jones 2006). Concrete vaults with rebar and brick vaults are highly magnetic and detectable with a magnetometer, and GPR has the capability of detecting a vault if the structure has not filled with soil (Burks 2010b:6).

*Coffins*

The type of coffin an individual was buried in can affect the detectability of a grave during a geophysical survey. Wood coffins that have collapsed are typically not detectable with any of the methods, but intact coffins that still contain an air pocket can
be detected with GPR. Cast iron coffins, however, are highly detectable and can be identified with magnetometers and GPR. Coffin hardware is not typically detected because their small size cannot often be identified at the depth which they are typically buried (Burks 2010b:6).

Complications and Additional Comments

It should be noted that locating unmarked burials can also occur by detecting buried headstones, footstones, or graveside objects with GPR or magnetometers. However, these items can prevent the detection of the grave shaft itself by hindering a GPR or magnetometer’s ability to detect anything below those items, essentially hiding a grave shaft’s geophysical signature. This can be problematic because a stone does not necessarily mark a grave (Burks 2010b:4, 7).

Human remains are not usually detectable by GPR because there is not enough contrast with the surrounding soils (Conyers 2013:797; Burks 2013:23). However, if the remains are wrapped in a material that “produces a velocity contrast with the surrounding soil,” then that may be discernable with a reflection (Conyers 2013:797).

Trees can also be problematic while collecting geophysical data due to their roots, especially for electrical resistance and GPR. Roots are close to the surface and easily detectable with these machines, making it difficult to discern what is beneath them (Burks 2010b:6, 13).
CHAPTER V

METHODOLOGY

Research was conducted in three phases: background research, data collection, and ground truthing. The first phase of the project included documentary research pertaining to the Hanna’s Town cemetery and the settlement. These sources were gathered primarily from the Westmoreland County Historical Society to obtain more information about the site.

The second phase consisted of geophysical data collection to determine if there were additional graves in and around the cemetery. Ground penetrating radar and magnetometry data were collected for four grids to use as a base to determine which grid contained the most potential graves. Selective sampling of electrical resistance data was taken from the grid that presented the most grave-like features to test the visibility of possible graves with this method. To gather these geophysical data, the following equipment was used: GSSI SIR-3000 GPR system with a 400 MHz central-frequency antenna, Geoscan Research FM256 Fluxgate Gradiometer (magnetometer), and the Geoscan Research RM15 earth resistance meter. Data gathered during these surveys were compared to professional geophysical cemetery surveys to help identify grave-like anomalies.

The last phase of research consisted of traditional archaeological methods. Test units were placed where processed data showed grave-like features to be, and over areas void of grave-like anomalies to act as control data. Excavation occurred over the course of three days to determine if the grave-like geophysical anomalies were associated with graves or some other type of soil anomaly.
Maps and drawings of the excavation units and locations of grave-like features were made into shape files and given to the Indiana University of Pennsylvania Anthropology Department to be added to the Hanna’s Town master archaeological excavation map, as required by the Westmoreland County Historical Society (Westmoreland County Historical Society [2000]). In addition to providing a hard copy of this research to the Westmoreland County Historical Society, a CD containing a digital PDF copy of this thesis, ArcGIS shape files, and digital photographs was also provided.

**Survey Grids**

To perform the geophysical surveys, four grids were placed to include what is currently identified as the Hanna’s Town Cemetery and surrounding land that was free of shrubbery and trees (Figure 23). Areas without vegetation were preferred so the best geophysical data could be recorded. Due to a historic document estimating 150 individuals buried at the cemetery, a large survey area was created to determine if the cemetery covered land to the north or south of the existing cemetery boundaries.

Large survey grids were placed in an attempt to locate the boundaries of the Hanna’s Town Cemetery, but also to help with GPR data collection and processing. Small grids (under 2x3 meters) make it difficult to recognize reflections and leave no room to compare “surrounding materials” (Conyers 2012:197).

Grid 1 (20x20 meters) was placed south of the existing Hanna’s Town cemetery in a lawn bounded to the north by the cemetery’s fence line, and to the east and south by a wooded area. The western limit of Grid 1 stopped approximately 9 meters east of the neighbor’s property line to provide ample space in the event excavation would occur on the western side of Grid 1.
Grid 2 (28x14 meters) encompassed the entirety of the Hanna’s Town Cemetery, as marked by the fence. It is bounded to the north by Forbes Road and to the east by the cemetery fence. The southern boundary of Grid 2 ran south of the split rail fence and shared its line with the northern boundary of Grid 1. Identical to Grid 1, Grid 2’s western boundary stopped approximately 9 meters east of the neighbor’s property line.

Grid 3 (30x30 meters) was created to cover a large portion of the mowed lawn north of Forbes Road. It shares a portion of its eastern edge with Grid 4 (20x20 meters), which was placed south of the Steel Family Cemetery. Grid 4 was not only created to determine if the Hanna’s Town Cemetery extended that far north, but to also examine if the Steel Family Cemetery may have been formed out of the Hanna’s Town Cemetery.

Figure 23. Survey grids and their locations.

Ground-Penetrating Radar Survey Methods
The survey was conducted with a GSSI SIR-3000 GPR system with a 400 MHz antenna, mounted on a three-wheeled utility cart. A 400 MHz antenna was chosen for this survey because it allows electromagnetic waves to penetrate between 2 and 4 meters. However, the depth the waves can penetrate is dependent upon soil conditions. For example, clay can be a problem for GPR because it typically absorbs the waves before they can return to the surface, resulting in shallower penetration (Burks 2010b:9; Patch et al. 2012:48). Moist soils can also absorb radar energy and the presence of large metal objects, such as pipes, can “obscure” the soils underneath those objects (Burks 2013:15).

Each grid was separated into transects spaced 25 centimeters apart, running north to south and perpendicular to the existing headstones; data were collected in a zig-zag pattern along the transects. Historic-era graves are better detected when data are gathered over tight survey transects because it produces “high-density data” by allowing the antenna to make multiple passes over grave shafts, making them more noticeable (Burks 2013:16; Burks 2010b:9; Sutton and Conyers 2013:795).

Data gathered with the GPR were downloaded from the unit onto a laptop and processed with GSSI’s RADAN software. Processing methods included position correction (time zero), high and low pass filtering, and migration. The time zero function allows the user to tell the software where the ground surface is to accurately determine depths of anomalies. Velocity was then determined by creating a velocity profile in Radan. High and low pass filter reduces background noise outside of 800 MHz and 200 MHz frequencies. Lastly, migrate reduces hyperbolas to points, helping to eliminate
distortion in the reflection profiles to create a more accurate depiction of the size, depth, and orientation of anomalies (Chadwick and Leach 2011:4; Patch 2010:9).

GPR data were processed into radargrams and then into time slices. All grids were processed separately and then the time slices from Grids 1 and 2 were combined into one image for better processing. The same was done for Grids 3 and 4. This allowed for the detection of “horizontal patterning” that may have been missed in the reflection profiles (Chadwick and Leach 2011:4). Time slices were then exported to ArcGIS and georectified to survey grids in NAD 1983 UTM Zone 17N.

**Magnetometry Survey Methods**

The magnetic survey was undertaken with a Geoscan Research FM256 fluxgate gradiometer. Transects were laid 50 centimeter apart and the author intended to take eight readings every meter while walking each transect. However, due to a setup error in the field only two readings were taken every meter. Data were collected in a zig-zag pattern and collected perpendicular to the existing headstones (Burks 2009:4; Burks 2010b:8).

Data gathered from the magnetometer were downloaded from the unit to a laptop and processed with Geoscan Research’s Geoplot software. Processing methods included zero mean traverse, interpolation, and low pass filter (Burks 2009:4; Burks 2010b:8). A second processing method was used on Grids 3 and 4 to correct for operator error and determine if subtle anomalies could be revealed in the data. The second processing methods included zero mean traverse, spectrum/periodic filter, interpolation, and low pass filter. Zero mean traverse helps set all the traverses to a similar background and removes striping while interpolation modifies the data density
along and between transects through addition or subtraction of data points. Low pass filter removes spikes created by high frequency readings to smooth the data, and spectrum/period filter removes the regularly spaced defects caused by operator error (Geoscan Research 2005:A-5, A-6,5-19). Images produced from Geoplot were exported to ArcGIS and georectified to survey grids in NAD 1983 UTM Zone 17N.

**Electrical Resistance Survey Methods**

Electrical resistance survey data were gathered only on Grid 1 with a Geoscan Research RM15 electrical resistance meter. Four metal electrodes attached to a battery and a voltmeter were hooked to a frame and inserted into the ground every 50 cm along transects spaced 50 cm apart. Electrodes were configured in the twin-electrode array at 50 cm apart, which allowed an alternating electrical current to penetrate the ground to a depth of 50-75 cm (Jones 2006; Burks 2013:17-18). Wider probe spacing can reach a greater depth, but the resolution significantly decreases, which can be problematic when trying to detect “subtle patterning” created by graves (Jones 2006). Data gathered from the electrical resistance survey were downloaded from the unit to a laptop using Prosys II and then exported to Surfer. The Surfer grid file was then imported into Geoplot. Processing methods included zero mean traverse and spectrum/period filter. Zero mean traverse is not usually used for electrical resistance data, but severe striping in the data required it. This process helps set all of the traverses to a similar background and period/spectrum filter removes the regular defects caused by operator error. Images produced from Geoplot were exported to ArcGIS and georectified to survey grids in NAD 1983 UTM Zone 17N.
Excavation Methods

Excavation took place on November 15, 16, and 21 of 2015 (Figure 24). Fiberglass tape measures were used to plot where burials were located within Grid 1 and used to lay out each test unit. Units were then triangulated and a datum was placed in the highest area of each unit at 10 centimeters above the ground surface to measure depths in centimeters below datum (CMBD). Each unit was recorded on a standardized test unit form, and features were documented on a feature form. Excavators used the forms to document each unit and feature’s provenience, strata, depth, and Munsell color.

To begin, each unit’s sod was cut into squares, removed, and checked for artifacts. Using shovels and trowels, levels were excavated primarily by soil horizons, but each level did not pass 10 centimeters to create a controlled excavation. This was implemented after initial excavation revealed a shallow A horizon at the site. Excavation continued to the B horizon, but did not proceed past 30 centimeters into the B horizon to safeguard against unintentional grave disturbance. At the end of every level, units were cleaned and prepped for photography.

During excavation, volunteers were instructed to watch for differences in soil color with hard edges, which may be indicative of grave shafts. All excavated soils were sifted through ¼-inch wire mesh to recover possible artifacts. All artifacts found during screening or excavation were placed into plastic bags with a provenience tag that included the unit number, depth, stratum, date, and excavator’s initials. A different bag was used for every unit’s level and was assigned a unique bag number that was recorded in a bag log.
Photographs were taken at the end of every level and uncovered grave shafts were given a unique number and listed in a photography log. To produce the best photos, especially for units containing features, water was sprayed over the floor of the unit to make the soil colors more vibrant and help create a differentiation between soil colors. In addition to photographs, plan view drawings were made to record the exact placement of features within the units and their measurements.

The locations of survey grids, test units, and features were plotted onto a map created with ArcGIS to document and create visual aids to help reveal patterns from processed data at the Hanna’s Town Cemetery (Meyers 2013). Shape files of test units were created and submitted to Dr. Ford with Indiana University of Pennsylvania to place on the Hanna’s Town GIS master archaeological map to create a second method for relocating the test units and survey grids.

Because excavation was possibly taking place over burials, special safety precautions were implemented to protect excavators. Biological hazards do not typically pose a risk to excavators, but there are certain instances when this can occur. The most toxic chemical to be aware of when excavating in cemeteries is arsenic, but mercury and formaldehyde can be problematic if burials post-date ca. 1850. Additionally, some pathogens can be troublesome if they are capable of surviving in the soil (Borstel and Niquette 2000).

During archaeological investigations, excavators can become exposed to these chemicals through skin contact, ingestion, and inhalation of dust particles (Borstel and Niquette 2000). As a precaution, latex gloves were provided to wear under nitrile gloves and excavators were asked to wear long sleeves. Saline solution was provided as a
rinse to remove dust from eyes, and soap and water was kept on site so excavators could wash their hands before eating. Excavators were also asked to keep food and drinks away from their units so they did not accidentally ingest dirt removed from burials.

![Cemetery excavation](image)

**Figure 24. Cemetery excavation.**

**Laboratory Methods**

All artifacts recovered were taken to the archaeology lab at Indiana University of Pennsylvania and cleaned. Durable artifacts were washed with wet brushes while fragile artifacts were dry-brushed. Artifacts were then placed into screens separated by bag log number and given 24 hours to dry. After proper drying time, artifacts were inventoried with an artifact log to record the provenience, stratum, level, feature, excavators, date, and number of items. A list of artifacts was provided to Dr. Ford with Indiana University of Pennsylvania to record in the Access database created for artifacts recovered from Hanna’s Town. Accession numbers were created in the database for artifact bags to coincide with the system already established for documenting Hanna’s Town artifacts.
After the artifacts had been recorded on the forms and the database, they were placed into polyethylene bags and labeled with the site number, provenience, feature number, stratigraphic layer, level, depth in centimeters below datum (CMBD), excavation date, excavator’s initials, material type, and artifact number. All artifacts were returned to the Westmoreland County Historical Society for storage after the completion of this thesis.
CHAPTER VI

GEOPHYSICAL SURVEY RESULTS

Ground-Penetrating Radar Results

The GPR data for Grids 1 and 2 were combined to help identify patterns in both grids. At 0.4 meters below the surface, one ring anomaly (8) appears in the bottom right corner of Grid 1, and also four possible graves (4, 5, 6, and 7). In Grid 2 three possible graves (1, 2, and 3) are visible in a row near the top right corner of the grid. Roots are visible throughout the data slice at this depth (Figure 25). By 0.56 meters 10 more possible grave shafts are visible in Grid 1 (9, 11, 12, 13, 14, 15, 16, 17, 18, and 19), as well as an oval-shaped anomaly in the bottom left corner (10). Grid 2 does not appear to show more possible graves, but roots from a tree are more visible at this depth (Figure 26). In Grids 1 and 2, possible grave shafts were more visible in the data slices than in the radargrams. Data in the radargrams only produced two possibilities to help identify grave shafts in the slices (Figures 27 and 28).
Image 25. Ring-shaped anomaly and possible grave shafts at 0.4 meters below the surface, indicated by red triangles. Grids 1 and 2.
Figure 26. Oval-shaped anomaly and possible grave shafts at .56 meters below the surface, indicated by red triangles. Grids 1 and 2.
Image 27. Possible grave shaft that correlates with a hyperbolic reflection in the radargram in Grid 1.
Figure 28. Possible grave shaft that correlates with a hyperbolic reflection in the radargram in Grid 2.
GPR data for Grids 3 and 4 were also combined to identify patterns. The data are very cluttered, but three anomalies are visible at 0.45 meters deep. The first is a large utility line shown as a dark black line running south to north (21). The second anomaly is another utility line running diagonally from the southwest corner of Grid 4 to the lower western wall of Grid 3 (20). The third anomaly is a ring at the eastern edge of Grid 4 that is an old horse corral from when the Steel Farm was still operational (22) (Figure 29).

![Figure 29. Two utility trenches and ring anomaly at .45 meters in the slice data for Grids 3 and 4.](image)

**Magnetometry Results**

In magnetometry data black indicates high magnetic readings, white are lower magnetic readings, and gray represents the background magnetic levels. White will likely represent grave shafts, unless a highly magnetic casket is detected by the
gradiometer. From the data, Grid 1 exhibits dipolar anomalies, which are areas of black and white next to each other, indicating ferrous material (Burks 2010b:11; Burks 2013:34). Additionally, Grid 1 appears to show possible grave shafts referenced by red arrows. However these are a product of the data processing steps used in the first pass of data processing, which caused the data to appear as though grave shafts are present in the grid (Figure 30).

Figure 30. Grid 1 magnetometer data showing a processing error causing the data to show false grave-like anomalies (referenced by red arrows). Black indicates highly magnetic materials while white references less magnetic.
Grid 2 exhibits a strong gray background with some white and black signatures and weak dipolar anomalies. Five black signatures (referenced by red arrows) are highly magnetic materials that appear to be in an arc (Figure 31), but there is not enough information to conclude they were purposely placed to create that shape. The anomalies could be (1) randomly placed iron objects that appear to make a shape, (2) clutter related to the cemetery, or (3) historic artifacts related to the site.

Figure 31. Grid 2 magnetometer data showing highly magnetic ring feature. Black indicates highly magnetic materials while white references less magnetic.

Grid 3 also contains highly magnetic materials and shows areas where the machine may have become unbalanced or was tilted while gathering data, as referenced by the red arrow (Figure 32). Two images of Grid 3 were produced with different processing methods to correct for operator error and to determine if there would be a different outcome. Initial processing methods included zero mean traverse,
interpolation, and low pass filter, while the second data processing added
spectrum/periodic filter to remove regular defects caused by operator error (Burks
2009:4; Burks 2010b:8). Both images for Grid 3 show very similar results, but the
second processing method produced a cleaner image (Figure 32).

Grid 4 was also processed with the same two processing methods as Grid 3 to
correct for operator error and determine if there would be different outcomes between
the two processes. Two images of Grid 4 were produced and show similar results, but
the second processing method produced a cleaner image (Figure 33). The blue arrows
indicate distinctive anomalies, which are more noticeable with the second processing
than the first. In both processing methods there is a strong dipolar anomaly in the
bottom left of the grid, referenced by red arrows. This anomaly is connected to the small
utility line shown in the GPR data for Grid 3 (Figures 33).
Figure 32. Grid 3 magnetometer data processed by two different processing methods. Both images show highly magnetic data, as referenced by the red arrow. Black indicates highly magnetic materials while white references less magnetic.
Figure 33. Grid 4 magnetometer data processed by two different processing methods. Both images show similar results, including a highly magnetic data anomaly, referenced by a red arrow. The blue arrows indicate distinctive anomalies that are more noticeable after the second processing. Black indicates highly magnetic materials while white references less magnetic.
Electrical Resistance Results

Electrical resistance data exhibited bad striping and high-low resistance problems from point to point. Two areas of low resistance marked by red arrows, and two areas of high resistance marked by yellow arrows were located within Grid 1. (Figure 34). While there are possible anomalies found in Grid 1 through electrical resistance survey, it appears that that data has been corrupted.

Figure 34. Electrical resistance data gathered from Grid 1. Black indicates high areas of resistance while white show less resistance.

Compiled Data

Data from all three geophysical methods were compiled to spatially locate where grave shafts may be located and where anomalies are in relation to one another (Figures 35, 36, 37, 38).
Figure 35. GPR, magnetometry, and electrical resistance data on Grids 1 through 4.
Figure 36. Close-up of anomalies and possible grave shafts in Grid 1.
Figure 37. Close-up of anomalies, grave marker locations, and possible grave shafts in Grid 2.
Figure 38. Close-up of anomalies and possible grave shafts in Grids 3 and 4.
CHAPTER VII
EXCAVATION

Test Units

With the geophysical data showing the locations of grave-like anomalies, the XY coordinates of the anomalies were plotted to determine where excavation units should be placed (Figure 39). Test Units were originally placed based on initial interpretation of geophysical results, but based on subsequent processing and interpretation, some anomalies were removed from consideration. The test units that no longer correspond to anomalies are considered as control data.

Figure 39. Location of test units and their corresponding numbers in relation to anomalies.
Excavation Results

Excavation resulted in locating five features, one of which is highly likely to be a grave while the remaining four are possible graves. Features were found in Test Units 2, 4, 7, and 8. Of these test units, 2, 4 and 7 had potential grave features, and 8 contained a highly probable grave feature. Test Units 1, 3, 5, and 6 did not contain any noticeable features.

Although units 1, 3, 5, and 6 were negative for features, they did contain artifacts. Stratum I, level 1 of Unit 1 contained two unglazed sherds of redware. Stratum II, Level 2 of the same unit contained five sherds of manganese glazed redware. Stratum I, Level 1 of Unit 3 contained two redware sherds, both lead glazed. A third sherd of redware was found in Stratum II, Level 2 of Unit 3, but it is wheel thrown with a slip on the interior of the vessel. Lastly, Stratum I, Level 1 of Unit 6 produced two shards of colorless, curved glass, one piece of colorless flat glass, and one uncollected brick fragment.

Test Unit 2, Feature 3

Test Unit 2 contained a possible grave shaft at approximately 31 CMBD in the transition between Level 1 and Level 2. Feature soil primarily consisted of 10 YR 3/4 silt loam, but was mottled with small circular lenses of 2.5 YR 3/2 silt loam and 10 YR 5/6 silty clay loam. The feature was initially amorphous, but as excavation continued the feature changed to an oblong shape with hard edges on the left side of the feature (Figure 40). Due to the incredibly shallow nature of graves at this site (Kaufman 1988:6-7), excavation was stopped to prevent grave disturbance on the chance this feature held a burial.
Test Unit 2 did produce artifacts, but none came directly from the feature. In Level 1, one wheel thrown Bristol glaze stoneware sherd with Albany slip applied to the vessel's interior was uncovered (Figure 41 and 42). Bristol glaze dates from 1835 to present and Albany slip dates from 1805 to 1920 (Miller et al. 2000:10). One piece of wood and one small shard of amber glass, which occurs from the 19th century to present, were also found in Level 1 (Society for Historical Archaeology 2016; United States Bureau of Land Management 2016). In Level 2, one chert flake was uncovered (Figure 43).
Figure 41. Bristol glaze stoneware on exterior.

Figure 42. Albany slip on interior of wheel thrown stoneware.
Test Unit 4, Feature 5

Test Unit 4 contained a potential feature at approximately 34 CMBD in Level 2. The feature began near the southeast corner and extended away from the wall, diagonally, to the north wall (Figure 44). The feature was subtle and was not noticed until after examining the photo. The feature consisted of 10 YR 4/3 silt clay loam and is mottled with 10 YR 5/6 silt clay loam. No artifacts were recovered from Unit 4.
Test Unit 7, Features 1 and 2

Test Unit 7 contained two potential grave features at approximately 30 CMBD in Level 2. Feature 1 was towards the northern wall and crossed the entirety of the unit form east to west. It consisted mostly of 10 YR 5/6 clay loam, and had a lense of 10 YR 3/2 silt clay loam and 10 YR 4/4 clay loam (Figure 45). The second feature was in the northwest corner and was not noticed until the photo was taken. It consisted of 10 YR 4/3 silt clay loam (Figure 39). No artifacts were recovered from this unit.

Figure 45. Test Unit 7, Features 1 and 2.
Test Unit 8, Feature 4

Test Unit 8 contained a feature that has the highest probability to be a grave shaft. The feature was located at 27 CMBD in Level 2. The feature exhibited dark soil that was marked by a hard line, running the entirety of the western wall and seemingly oriented north-south. Feature soil consisted solely of 10 YR 3/1 silt loam with no mottling. Unlike the other features encountered during excavation, this was not subtle, exhibiting characteristics that were expected of a grave shaft (Figure 46).

![Figure 46. Test Unit 8, Feature 4.](image)

Test Unit 8 produced artifacts from Stratum I, Level 1, but none were recovered directly from Feature 8. Of the artifacts recovered, two were manganese glazed redware sherds and an unglazed redware sherd. There was also an amber, curved glass shard and a flat, colorless glass shard. In this unit, six brick fragments and three pieces of
plastic were uncovered but they were not collected. It should be noted that the paperwork associated with the unit in Appendix B lists a piece of slag, but this was a misidentified piece of plastic. Also in the paperwork, some of the brick fragments were listed as redware.

As previously noted, amber glass dates from the 19th century to present day (Society for Historical Archaeology 2016; United States Bureau of Land Management 2016). Although the color of the glass does provide a date range, it is too large to glean much information from. The redware also poses a similar problem, with a date range of 1725 to present (Stelle 2001). A lack of artifacts with smaller date ranges makes it impossible to provide a good date for this feature. Future excavation to a deeper depth may provide more artifacts with a tighter date range.
CHAPTER VIII
CONCLUSIONS AND RECOMMENDATIONS

Research Questions

The three research questions this thesis sought to answer were (1) to identify how many burials the cemetery contains, (2) to determine where the graves and the cemetery’s boundaries are located, and (3) to determine which geophysical method was the most helpful for identifying unmarked graves. A total of 15 possible graves were located in Grid 1, and 3 were located in Grid 2 with ground penetrating radar only.

Magnetometry did not locate possible grave shafts because the density at which the data were gathered was not appropriate for locating burial features. The display ranges were too low to detect graves and any potential grave-like features the magnetometer might have identified were glossed over. After processing, the electrical resistance data appeared to have been corrupted, which may have caused the machine to also miss grave-like features. Because the magnetic and electrical resistance data had some data collection issues, it is impossible to evaluate which of the geophysical methods was most productive in identifying possible graves at this location. It is also impossible to determine how many graves the cemetery contains, but the GPR data do seem to indicate there may be more to the south of the present boundaries of the Hanna’s Town Cemetery. If this is the case, it is possible that the cemetery may extend to the east into the wooded area. If the cemetery does enter the wooded area, it is very unlikely these additional graves will be located without a full archaeological excavation.

Locations of features believed to be grave shafts within the data did not always match with what was discovered during excavation. This could have been caused by an
error in measuring the locations of these anomalies, or that features marked as grave shafts are associated with a non-burial anomaly. Of the four features found during excavation that are believed to be graves, only two were easily distinguishable between the shaft and surrounding soils. If all 18 features marked as possible graves really are burials, the inability to easily differentiate a shaft from the surrounding soil could be caused by homogenization in the soil over time.

In addition to unmarked burials, seventeen other anomalies were found in the four survey grids. Ground penetrating radar detected 2 anomalies in Grid 1, 2 anomalies in Grid 3, and 1 anomaly in Grid 4. Magnetic survey located 5 anomalies in Grid 2 and 3 in Grid 4, while electrical resistance located 4 anomalies in Grid 1.

**Future Research and Recommendations**

Data gathered with GPR indicates that the grave shafts are quite shallow, showing that the Westmoreland County Historical Society should consider creating a management plan to protect the graves from disturbance and erosion (Sutton and Conyers 2013:803). Due to the current state of some of the grave markers in the fenced section of the cemetery, a management plan for their protection should also be considered. Additionally, a thorough examination and documentation of the stones and markers should also be performed to retain as much information about the cemetery as possible. Lastly, it may be helpful for another geophysical survey to be conducted at the Hanna’s Town Cemetery to produce higher density data that could supplement management plans the historical society may choose to perform in the future.
References

Architectural Conservation Laboratory and Research Center, University of Pennsylvania

Borstel, Christopher L., and Charles M. Niquette

Braun, Lucy E.

Burks, Jarrod
2009    Large Scale Magnetic Gradient and Magnetic Susceptibility Survey at Sites 36AD500 and 36AD501, Near Gettysburg, PA.

2010(a) Geophysical Survey Results at 33BU1110 and 33BU1112, Two Multicomponent Prehistoric Native American Sites in Butler County, Ohio.


Carlisle, Ronald C.

Chadwick, William J. and Joel I. Klein
Chadwick, William J. and Peter A. Leach

Conyers, Lawrence B.

2004 *Ground-Penetrating Radar for Archaeology.* AltaMira Press, Lanham, Maryland.


Dalan, Rinita A.


Dick, Alta


Gaffney, Chris and John Gater


Geoscan Research

Hassler, Edgar W.

Indiana Department of Natural Resources

Johnson, William J.

Jones, Geoffrey

Kaufman, Jean Troxell

King, Julia A., Bruce W. Bevan, and Robert J. Hurry
1993 The Reliability of Geophysical Surveys at Historic-Period Cemeteries: An Example from the Plains Cemetery, Mechanicsville, Maryland. Historical Archaeology 27(3):4-16.

Stelle, Lenville J.

Meyers, Katy
Miller, George L., Patricia Samford, Ellen Shlasko, and Andrew Madsen

National Cooperative Soil Survey

Patch, Shawn M.

Patch, Shawn M., Sarah Lowry, Mark T. Swanson, Valerie Davis, and Christopher T. Espenshade

Pennsylvania Department of Conservation and Natural Resources


Pennsylvania USGenWeb Archives

Richardson, James B.
2007 Destruction of Hanna’s Town, Part I. *Western Pennsylvania History.*

Sewickley Creek Watershed Association.

Society for Historical Archaeology and the United States Bureau of Land Management
Sutton, Mary-Jean, and Lawrence B. Conyers

United States Department of Agriculture (USDA)

United States Department of Agriculture (USDA)

United States Forest Service

Westmoreland County Historical Society

Westmorland County PAGenWeb

Yalom, Marilyn
Appendix A

Test Unit Records, Feature Records, and Drawings

TEST UNIT RECORD

Munsell Soil Color: 2.5YR 3/4

Soil Texture: Clay 5% Loam

The layer contained: Rocks ☒ Cobbles ☐ Gravel ☐ Roots ☐ Rodent Burrows

Features observed within layer? ☐ Yes ☒ No (If yes, list feature number, describe the feature and sketch it in the plan view)

Excavation Techniques and Controls: Hand excavation with small shovel, dust pans, and trowel.  Backfilling using room shovelful with decomposition through the test ditch, above fill line.

Historic Artifacts: Ceramic ☐ Nail (wire, cast, wrought) ☐ Brick ☐ Window Glass ☐ Bottle Glass ☐ Bone ☐ Shell ☐ Pipe ☐ Button ☐ Gun Flint ☐ Metal ☐ Toys ☐ Plastic ☐ Other ☐

Prehistoric Artifacts: Projectile Point ☐ Tool ☐ Ceramic ☐ Debitage ☐ FCR ☐ Other ☐

Estimated Number of Artifacts in Layer: 1

General Observations: A group of artifacts was found in level 2. They were embedded in the soil, which was then removed from the site. The artifacts included ceramics, metal fragments, and bone pieces. The excavation revealed a small hearth structure in level 2.

Elevations (opening / closing)

Plan View Sketch (optional)

Scale:

Horizontal Dimensions: 2 x 1 m

Checked by: ___________________________ Date: ___________________________

Photo #: 10

Architect: Copy #: 7
TEST UNIT RECORD

Munsell Soil Color: 10YR 4/4
Soil Texture: Clay Size Loam (more clay content than silt, however)
The layer contained: ☒ Rocks ☐ Cobble ☐ Gravel ☐ Roots ☐ Rodent Burrows
Features observed within layer? ☐ Yes ☒ No (if yes, list feature number, describe the feature and sketch it in the plan view)

Excavation Techniques and Controls: Hand excavation with chart, brush, and Etch-a-Sketch

Historic Artifacts: ☒ Ceramic ☐ Nail (wire, cut, wrought) ☐ Brick ☐ Window Glass
☐ Bottle Glass ☐ Bone ☐ Shell ☐ Pipe ☐ Button ☐ Gun Flints ☐ Metal
☐ Toys ☐ Plastic ☐ Other

Prehistoric Artifacts: ☐ Projectile Point ☐ Tool ☐ Ceramic ☐ Debitage
☐ FCR ☐ Other

Estimated Number of Artifacts in Layer: 5 - visual

General Observations: The artifacts are mainly concentrated in the west. Also, clay content of the second stratum was much higher than the first.

Elevations (opening / closing)

Plan View Sketch (optional)

Horizontal Dimensions: (6 ft)

Checked by: ___________________ Date: _______
## TEST UNIT RECORD

<table>
<thead>
<tr>
<th>Munsell Soil Color</th>
<th>10YR 4/1</th>
<th>Soil Texture</th>
<th>S:Lo</th>
</tr>
</thead>
</table>

- The layer contained: □ Rocks □ Cobble □ Gravel □ Roots □ Rodent Burrows

- Features observed within layer? □ Yes □ No (if yes, list feature number, describe the feature and sketch it in the plan view)

### Excavation Techniques and Controls:
- Hand vbc, shovel, quartered soil
- Shovel sieved into an уровне, screen through 1/4" wire mesh, 100% collection

### Historic Artifacts:
- ☑ Ceramic □ Nail (wire, cut, wrought) □ Brick □ Window Glass
- ☑ Bottle Glass □ Bone □ Shell □ Pipe □ Button □ Gun Flint □ Metal
- □ Toys □ Plastic □ Other → **wood**

### Prehistoric Artifacts:
- □ Projectile Point □ Tool □ Ceramic □ Debitage
- □ FCR □ Other

### Estimated Number of Artifacts in Layer:

### General Observations:
- Organic material, strat TF visible in some areas.
- Poss. rodent burrow in S.E. corner

---

### Elevations (opening / closing)

- Plan View Sketch (optional)

- Scale:

- Horizontal Dimensions: **1 x 1m**

- Art. Bag 3
- Photo 4

---

Checked by: ____________________  Date: ____________________
TEST UNIT RECORD

Munsell Soil Color: 5YR 4/3 Brown
Soil Texture: 5YR 5/4 Yellowish Brown

The layer contained: Rocks ☑ Cobbles ☐ Gravel ☑ Roots ☐ Rodent Burrows

Features observed within layer? Yes ☑ No ☐
(if yes, list feature number, describe the feature and sketch it in the plan view)


Historic Artifacts: ☐ Ceramic ☐ Nail (wire, cut, wrought) ☐ Brick ☐ Window Glass
☐ Bottle Glass ☐ Bone ☐ Shell ☐ Pipe ☐ Button ☐ Gun Flint ☐ Metal
☐ Toys ☐ Plastic ☐ Other

Prehistoric Artifacts: ☐ Projectile Point ☐ Tool ☐ Ceramic ☑ Debitage
☐ FCR ☐ Other

Estimated Number of Artifacts in Layer: 1

General Observations: Strat 1 observed until final 1 cm of level. Ovoid soil stain (not likely grave) gets less distinct as excavations continue.

Elevations (opening / closing)

Plan View Sketch (optional)

Horizontal Dimensions: 1 x 1m

Artefact Bag: 5
Feature 3
Photo: 9

Checked by: ___________________ Date: ____________
ARCHAEOLOGY

FEATURE RECORD

Open Date: 11-15-15
Close Date: 
Excavators: KA

Feature shape/appearance/general description: Oblong stain extending from middle east wall to NE corner on E side of unit 8 to SE portion

Unit: 8

Maximum dimensions: Length: 5.0 Width: 8.0 Depth: N/A

Datum Corner: NE NW SW SE

Opening depths: A 19.8 cm B 20.6 cm C 21.9 cm D 22.0 cm E 20.2 cm

Closing depths: A 21.5 cm B 23.9 cm C 31.0 cm D 31.0 cm E 31.0 cm

Soil Texture:
(circle one) Loam Silt Loam Sandy Loam Clay Loam Silty Clay Loam Sandy Clay Loam

Loamy Sand Silt Sand Clay Silty Clay Sandy Clay

Munsell #: 10YR 3.14 Color: brown

Munsell #: 2.5Y 3.12 Color: Very dark gray brown

Munsell #: 10YR 5.14 Color: Yellowish brown

Soil Notes/Nature of Fill: Soil is primarily 10YR 3.14 silt loam mantled throughout with small circular lenses of 2.5Y 3.12 silt loam and 10YR 5.14 silty clay loam (likely strata 12).

Artifacts: none
Artifact Bag #s: N/A

Plan View: () Yes No Profile: Yes No Wall/Direction: 

Photographs: B/W Roll Exp. COLOR SLIDE Roll Exp. DIGITAL Roll Exp. 

NOTES/GENERAL METHODOLOGY: (Internal stratigraphy, associated features/structures, artifact preservation, interpretation, etc.)

Feature is oblong shaped in a NE to SW direction. Has shape and general direction of a grave, but feature is becoming less distinct with continued excavation. Original distinct boundary near South wall became less distinct, not likely a grave.

Additional Sheets Attached? Yes No

Approved by: __________________ Page ______ of ______
Hannas Town Cemetery
36 W M 203
Unit D
Section 11/18
Feature 3
11.11.15
KA

Layer X 10YR 5/6
Feature 10YR R 3/4
with 2.5Y 3/2
with 10YR 5/6
A, B, C, D, E = Depths (sec.
feature form)
TEST UNIT RECORD

Project: Hannah Town Cemetery
Site #: ABW 803
Unit #: 3
Coordinates: Grid 1
Stratum: 1
Level: 4
Date: 11/15/15
Initials: ASK

Munsell Soil Color: G4.5-10YR 4/3
Soil Texture: Clay Loam

The layer contained: ☒ Rocks ☐ Cobbles ☐ Gravel ☒ Roots ☐ Rodent Burrows

Features observed within layer? ☐ Yes ☒ No (if yes, list feature number, describe the feature and sketch it in the plan view)

Excavation Techniques and Controls: [Hand scraping with shovel & scrap unit. Soil was short & stirred. Soil was thrown around. Tops were put on a clay shelf]

Historic Artifacts: ☒ Ceramic ☐ Nail (wire, cut, wrought) ☐ Brick ☐ Window Glass
☐ Bottle Glass ☐ Bone ☐ Shell ☐ Pipe ☐ Button ☐ Gun Flint ☐ Metal
☐ Toys ☐ Plastic ☐ Other

Prehistoric Artifacts: ☐ Projectile Point ☐ Tool ☐ Ceramic ☐ Debitage
☐ FCR ☐ Other

Estimated Number of Artifacts in Layer: 2 (Redundant)

General Observations: A handily, I believe this layer. Soil was stirred. Soil was thrown around. Bone during excavation was stained. Some organic decomposition was found. Some charcoal was also found.

Elevations (opening/closing)

Plan View Sketch (optional)

Scale:

Horizontal Dimensions:

Photo #: 1
Artifact Bag #: 1

Checked by: __________________ Date: ______________
# TEST UNIT RECORD

**Munsell Soil Color:** 10R 5/6

**Soil Texture:** Clay Loam

The layer contained: □ Rocks □ Cobbles □ Gravel □ Roots □ Rodent Burrows

Features observed within layer? □ Yes □ No (if yes, list feature number, describe the feature and sketch it in the plan view) Negative

**Excavation Techniques and Controls:** spoon, brush, plastic sheeting, grid, soil notation, soil samples through horizons, thorough mapping, unit identification

**Historic Artifacts:** □ Ceramic □ Nail (wire, cut, wrought) □ Brick □ Window Glass □ Bottle Glass □ Bone □ Shell □ Pipe □ Button □ Gun Flint □ Metal □ Toys □ Plastic □ Other

**Prehistoric Artifacts:** □ Projectile Point □ Tool □ Ceramic □ Debitage □ FCR □ Other

**Estimated Number of Artifacts in Layer:** 4 brown glass bottle shards, 1 bottle cap

**General Observations:** Soil is slightly wet and has organic decay. Soil is moist in the western half.

---

**Elevations (opening / closing):**

- **Ground: 5 cm**
- **Bottom: 3 cm**

---

**Plan View Sketch (optional):**

- **Scale:**

---

**Horizontal Dimensions:**

- **Width:** 5
- **Artifact Bag:** 4

---

**Checked by: ___________________**

**Date: ___________________**
### TEST UNIT RECORD

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</tr>
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<tbody>
<tr>
<td>10YR 3/2 (Strat 1)</td>
<td>Silt loam</td>
</tr>
</tbody>
</table>

- The layer contained: □ Rocks  □ Cobbles  □ Gravel  □ Roots  □ Rodent Burrows
- Features observed within layer?: □ Yes  □ No
  (If yes, list feature number, describe the feature and sketch it in the plan view)

**Excavation Techniques and Controls:** 
Hand excavation with a single shovel and bucket, handclearing, 10 cm levels, lab identification, recorded through the use of a lab notebook.

<table>
<thead>
<tr>
<th>Historic Artifacts:</th>
<th>Prehistoric Artifacts:</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ Ceramic  □ Nail (wire, cut, wrought)  □ Brick  □ Window Glass</td>
<td></td>
</tr>
<tr>
<td>□ Bottle Glass  □ Bone  □ Shell  □ Pipe  □ Button  □ Gun Flint  □ Metal</td>
<td></td>
</tr>
<tr>
<td>□ Toys  □ Plastic  □ Other</td>
<td></td>
</tr>
<tr>
<td>□ FCR  □ Other</td>
<td></td>
</tr>
</tbody>
</table>

**Estimated Number of Artifacts in Layer:**

**General Observations:** 
I started it was yep yep in the field, so we stuck it up and it was through it.

**Elevations (opening / closing):**

- Plan View Sketch (optional)

**Horizontal Dimensions:** 2x1 m

**Checked by:** ___________________________  **Date:** ___________________________
TEST UNIT RECORD

Munsell Soil Color 10YR 5/6 10YR 6/3  Soil Texture 5.1 / 1.0

The layer contained: □ Rocks □ Cobble □ Gravel □ Roots □ Rodent Burrows

Features observed within layer? □ Yes □ No (if yes, list feature number, describe the feature)

and sketch it in the plan view)

Excavation Techniques and Controls: (Additional notes or photographs added in the field)

Historic Artifacts: □ Ceramic □ Nail (wire, cut, wrought) □ Brick □ Window Glass
□ Bottle Glass □ Bone □ Shell □ Pipe □ Button □ Gun Flint □ Metal
□ Toys □ Plastic □ Other

Prehistoric Artifacts: □ Projectile Point □ Tool □ Ceramic □ Debitage
□ FCR □ Other

Estimated Number of Artifacts in Layer: 0

General Observations:

Elevations (opening / closing)

Plan View Sketch (optional)

Horizontal Dimensions: 2x1m

Checked by: __________________ Date: ____________
ARCHEOLOGY
FEATURE RECORD

Open Date: 11-21-15
Close Date: 11-21-15
Excavators: DA/ADT

Feature shape/ appearance/ general description: Triangle shaped stain in the east wall visible only after the photo was later examined.

Maximum dimensions: Length: Width: Depth: 91 cm

Datum Corner: NE NW SW SE

Opening depths: A 21 cm B 7 cm C 15 cm D 21 cm E 26 cm
Closing depths: A 32 cm B 24 cm C 21 cm D 24 cm E 23 cm

Soil Texture: (circle one) Loam Silt Loam Sandy Loam Clay Loam Silty Clay Loam Sandy Clay Loam

Munsell #: 10 YR 3/2 (Straw 3 2) Color:
Munsell #: 10 YR 7/5 (Straw 7 5) Color:
Munsell #: 10 YR 5/2 (possible gray stain) Color:

Soil Notes/Nature of Fill:

Artifacts: No

Plan View: Yes No Profile: Yes No Wall/ Direction:

Photographs: B/W Roll Exp. COLOR SLIDE Roll Exp. DIGITAL Roll Exp.

NOTES/ GENERAL METHODOLOGY: (internal stratigraphy, associated features/structures, artifact preservation, interpretation, etc.)

Additional Sheets Attached? Yes No

Approved by: Page of
AECOM

TEST UNIT RECORD

Munsell Soil Color: Hrnt: 10YR 3/12

Soil Texture: 90% Lo

The layer contained: 💡 Rocks ☐ Cobbles ☐ Gravel ☐ Roots ☐ Rodent Burrows

Features observed within layer? ☐ Yes ☒ No (if yes, list feature number, describe the feature and sketch it in the plan view)

Excavation Techniques and Controls: Hand excavating with shovel, screens & buckets

Historic Artifacts: ☐ Ceramic ☐ Nail (wire, cut, wrought) ☐ Brick ☐ Window Glass
☐ Bottle Glass ☐ Bone ☐ Shell ☐ Pipe ☐ Button ☐ Gun Flint ☐ Metal
☐ Toys ☐ Plastic ☐ Other ☒

Prehistoric Artifacts: ☐ Projectile Point ☐ Tool ☐ Ceramic ☐ Debitage
☐ FCR ☐ Other ☐

Estimated Number of Artifacts in Layer: ☐

General Observations: Depth was brought to 1.35 ft on the northwest, last view taken 6-1-15. Excavation began in Unit 3 and stopped due as unit is completely gone through Unit 3. Unit 2 is visible in the plan of photo 12.

Elevations (opening / closing)

Plan View Sketch (optional)

Scale:

Horizontal Dimensions:

Checked by: ____________________________ Date: ____________________________
# Test Unit Record

<table>
<thead>
<tr>
<th>Munsell Soil Color</th>
<th>10YR 5/4b</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soil Texture</td>
<td>S.1 C.16</td>
</tr>
</tbody>
</table>

The layer contained: [ ] Rocks  [ ] Cobbles  [ ] Gravel  [ ] Roots  [ ] Rodent Burrows

Features observed within layer?  [ ] Yes  [x] No
(if yes, list feature number, describe the feature and sketch it in the plan view)

**Excavation Techniques and Controls:**

- Hand excavation with rubber trowel and dustpan
- Dye lines with a large flat brush, revealed through 7/16" siliconized 50:50 solution

**Historic Artifacts:**

- [ ] Ceramic  [ ] Nail (wire, cut, wrought)  [ ] Brick  [ ] Window Glass
- [ ] Bottle Glass  [ ] Bone  [ ] Shell  [ ] Pipe  [ ] Button  [ ] Gun Flint  [ ] Metal
- [ ] Toys  [ ] Plastic  [ ] Other

**Prehistoric Artifacts:**

- [ ] Projectile Point  [ ] Tool  [ ] Ceramic  [ ] Debitage
- [ ] FCR  [ ] Other

**Estimated Number of Artifacts in Layer:**

- [ ]

**General Observations:**

Small bench mark found, and some organic decay is visible. Other than that, no artifacts were located.

**Elevations (opening / closing):**

<table>
<thead>
<tr>
<th>Depth</th>
<th>Elevation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surface</td>
<td>35 cm</td>
</tr>
<tr>
<td>Surface</td>
<td>30 cm</td>
</tr>
<tr>
<td>Surface</td>
<td>29 cm</td>
</tr>
<tr>
<td>15 cm</td>
<td>25 cm</td>
</tr>
</tbody>
</table>

**Plan View Sketch (optional):**

- [ ]

**Horizontal Dimensions:**

- [ ]

**Checked by:**

- [ ]

**Date:**

- [ ]
TEST UNIT RECORD

Munsell Soil Color: 10 YR 3/3 dark brown
Soil Texture: Sandy clay loam

The layer contained: [ ] Rocks [x] Cobbles [ ] Gravel [ ] Roots [ ] Rodent Burrows

Features observed within layer? [ ] Yes [x] No (if yes, list feature number, describe the feature and sketch it in the plan view)

Excavation Techniques and Controls: Shovel top soil, shovel edge, very soft bottom between A - B horizon, patch wise finish scoring

Historic Artifacts: [ ] Ceramic [x] Nail (wire, cut, wrought) [x] Brick [ ] Window Glass
 [x] Bottle Glass [ ] Bone [ ] Shell [ ] Pipe [ ] Button [ ] Gun Flint [ ] Metal
 [ ] Toys [ ] Plastic [ ] Other

Prehistoric Artifacts: [ ] Projectile Point [ ] Tool [ ] Ceramic [ ] Debitage
 [ ] FCR [ ] Other

Estimated Number of Artifacts in Layer: 4 - 3 Clear glass, 1 large brick fragment

General Observations: photo #: 3 artifact bag #: 2

Elevations (opening / closing)

Plan View Sketch (optional)

Horizontal Dimensions:
SE: 85cm NE: 92cm
SW: 17cm center: 12cm
NW: 165cm

Checked by: ____________________ Date: ____________________

photo # 3 artifact bag # 2
TEST UNIT RECORD

Munsell Soil Color 10YR 5/8 yellowish brown  Soil Texture silty clay loam

The layer contained:  □ Rocks  □ Cobbles  □ Gravel  □ Roots  □ Rodent Burrows

Features observed within layer?  □ Yes  □ No  (if yes, list feature number, describe the feature and sketch it in the plan view)

Excavation Techniques and Controls:  [Hand survey, shovel, scraping, leveling, end]

Historic Artifacts:  □ Ceramic  □ Nail (wire, cut, wrought)  □ Brick  □ Window Glass

□ Bottle Glass  □ Bone  □ Shell  □ Pipe  □ Button  □ Gun Flint  □ Metal

□ Toys  □ Plastic  □ Other  [Other]

Prehistoric Artifacts:  □ Projectile Point  □ Tool  □ Ceramic  □ Debitage

□ FCR  □ Other  [Other]

Estimated Number of Artifacts in Layer:  None

General Observations:  A dark thin layer appears from horizon A to C along the west wall. A bone came under surface level.

Elevations (opening / closing)  □ 0  □ 0  □ 0  □ 0

Plan View Sketch (optional)  [Sketch of a site plan]

Horizontal Dimensions:  □ 0  □ 0  □ 0  □ 0

Photo #6

Checked by:  ____________________  Date:  ________________
TEST UNIT RECORD

Munsell Soil Color: 10YR 4/3, 10YR 5/6
Soil Texture: Silt Loam, clay loam

The layer contained: ☒ Rocks ☐ Cobble ☐ Gravel ☒ Roots ☒ Rodent Burrows

Features observed within layer? ☐ Yes ☒ No (if yes, list feature number, describe the feature and sketch it in the plan view)

Excavation Techniques and Controls: Soil was shoveled/hand picked/ scraped through 7/8" wire mesh. 10 cm levels or by stratum.

Historic Artifacts: ☐ Ceramic ☐ Nail (wire, cut, wrought) ☐ Brick ☐ Window Glass
☐ Bottle Glass ☐ Bone ☐ Shell ☐ Pipe ☐ Button ☐ Gun Flint ☐ Metal
☐ Toys ☐ Plastic ☐ Other

Prehistoric Artifacts: ☐ Projectile Point ☐ Tool ☐ Ceramic ☐ Debitage
☐ FCR ☐ Other

Estimated Number of Artifacts in Layer: 0

General Observations: Saw some coal and organic stains throughout.

Elevations (opening/closing)

Plan View Sketch (optional)

Scale: 1cm x 1cm

Horizontal Dimensions:

Checked by: ____________________ Date: ____________________

Photo # 2
Munsell Soil Color: 10YR 5/6 Yellowish Brown

Soil Texture: Clay Loam

The layer contained: ☑ Rocks ☐ Cobble ☑ Gravel ☑ Roots ☑ Rodent Burrows

Features observed within layer? ☑ Yes ☐ No
(if yes, list feature number, describe the feature and sketch it in the plan view)

Kind of rectangular through center and along north wall

Excavation Techniques and Controls: Hand collected with shovel and trowel and bucket.
Soil was shovel-trimmed and screened through 1/4 wire mesh, 10 cm levels of lysimeter

Historic Artifacts: ☑ Ceramic ☑ Nail (wire, cut, wrought) ☑ Brick ☐ Window Glass
☐ Bottle Glass ☐ Bone ☐ Shell ☐ Pipe ☝ Button ☐ Gun Flint ☜ Metal
☐ Toys ☐ Plastic ☐ Other

Prehistoric Artifacts: ☐ Projectile Point ☐ Tool ☐ Ceramic ☐ Debitage
☐ FCR ☐ Other

Estimated Number of Artifacts in Layer: 0

General Observations: Saw coal, sandstone modeling, a medium/small rock in the center of unit, also saw dark line in wall (left wall forebark)

Elevations (opening/closing)

Plan View Sketch (optional)

Horizontal Dimensions:

Checked by: __________________ Date: ____________

Photo: 7

Feature: 1, 2
ARCHAEOLOGY
FEATURE RECORD

Open Date: 11-15-2015
Close Date: 11-15-2015
Excavators: SAH, SJD

Feature shape/ appearance/ general description:

Provenience: Grid 1, TU
Layer: II
Level: 2

Feature #: 1 and 2

2 Kind of rectangular Features one in the center going across left to right. Dark in color.

Maximum dimensions

Datum Corner | NE | NW | SW | SE
Opening depths: A 19.5cm  B 85cm  C 27cm  D 30cm  E 23cm
Closing depths: A 86.5cm  B 31cm  C 31cm  D 26.5cm  E 30cm

Soil Texture:
(circle one)
Loam  Silt Loam  Sandy Loam  Clay Loam  Silty Clay Loam  Sandy Clay Loam
Loamy Sand  Silt  Sand  Clay  Silty Clay  Sandy Clay

Munsell #: 10YR 4/3
Munsell #: 10YR 4/1, 10YR 3/2

Color:
Brown
Dark Yellowish Brown, Very Dark Grayish Brown

Soil Notes/Nature of Fill:

Artifacts:  
Artifact Bag #s:

Plan View: Yes  No  Profile: Yes  No  Wall/ Direction:

Photographs:

B/W  Roll  Exp.
COLOR SLIDE  Roll  Exp.
DIGITAL  Roll  7  Exp.

NOTES/ GENERAL METHODOLOGY: (internal stratigraphy, associated features/structures, artifact preservation, interpretation, etc.)

Additional Sheets Attached? Yes  No

Approved by:  Page  of
TEST UNIT RECORD

Munsell Soil Color: Strat # 1: 10 YR 9/3

Strat # 2: 10 YR 9/4

Soil Texture: Silty

The layer contained:

- [ ] Rocks
- [ ] Cobbles
- [ ] Gravel
- [x] Roots
- [ ] Rodent Burrows

Features observed within layer?  [x] Yes  [ ] No

(If yes, list feature number, describe the feature and sketch it in the plan view)

- Feature 1, along entire west wall; 25 cm to the east

Excavation Techniques and Controls:

- Hand excavated with torch, trowel,筛, and basket.

Historic Artifacts:

- [x] Ceramic
- [ ] Nail (wire, cut, wrought)
- [x] Brick
- [ ] Window Glass
- [ ] Bottle Glass
- [ ] Bone
- [ ] Shell
- [ ] Pipe
- [ ] Button
- [ ] Gun Flint
- [ ] Metal
- [ ] Toys
- [ ] Plastic
- [x] Other - Shag

Prehistoric Artifacts:

- [ ] Projectile Point
- [ ] Tool
- [ ] Ceramic
- [ ] Debitage
- [ ] FCR
- [ ] Other

Estimated Number of Artifacts in Layer:

General Observations:

Elevations (opening / closing):

Plan View Sketch (optional):

Scale:

Horizontal Dimensions:

Checked by: __________________________ Date: __________

100
ARCHAEOLOGY
FEATURE RECORD

Open Date: 11-15-15
Close Date: 11-15-15
Excavators: ERM, CAF

Feature shape/appearance/general description: Linear feature along entire west wall. Feature extends ~25 cm from west wall to the east.

Maximum dimensions: Length: 100 cm, Width: 25 cm, Depth: 27 cm

Datum Corner: NE NW SW SE

Opening depths: A 10 cm, B 9 cm, C 10 cm, D 24 cm, E 15.5 cm
Closing depths: A 25.5 cm, B 19.5 cm, C 21 cm, D 28.5 cm, E 24.5 cm

Indicate elevation locations on plan drawing.

Soil Texture:
Loam, Silt Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Sandy Clay Loam
Loamy Sand, Silt, Sand, Clay, Silty Clay, Sandy Clay

Munsell #: 10 YR 3/1
Color: Very Dark Gray

Munsell #: 
Color: 
Munsell #: 
Color: 

Soil Notes/Nature of Fill:

Artifacts: 

Artifact Bag #: 

Plan View: (Yes) No
Profile: Yes No
Wall/Direction: 

Photographs: B/W Roll Exp.

COLOR SLIDE Roll Exp.

DIGITAL Roll Exp.

NOTES/GENERAL METHODOLOGY: (internal stratigraphy, associated features/structures, artifact preservation, interpretation, etc.)

Additional Sheets Attached? (Yes) No

Approved by: ___________________ Page ____ of ___
Hanne's Town Cemetery
36 W4 N 203
Test Unit B (1x1 m)
Feature 41

ERM, 11/15/15

Feature 41
Strat II Interface
## Appendix B

### Feature Log

Table 1. Feature Log.

<table>
<thead>
<tr>
<th>Feature #</th>
<th>Test Unit</th>
<th>Strat</th>
<th>Level</th>
<th>Depth</th>
<th>Date</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>TU 7</td>
<td>II</td>
<td>Lvl 2</td>
<td>23-30 cmbd</td>
<td>15-Nov-15</td>
<td>Potentially a grave. Slightly amorphous in spots, however. Could be the feet of the grave.</td>
</tr>
<tr>
<td>2</td>
<td>TU 7</td>
<td>II</td>
<td>Lvl 2</td>
<td>23-30 cmbd</td>
<td>15-Nov-15</td>
<td>Might be the corner of a grave in the NW corner of the test unit.</td>
</tr>
<tr>
<td>3</td>
<td>TU 2</td>
<td>II</td>
<td>Lvl 2</td>
<td>22-31 cmbd</td>
<td>15-Nov-15</td>
<td>Soil is more congruent with grave shaft soil, but it's oddly shaped and the edges are not definitive. After further excavation the feature started to disappear and became slanted in the hole. This feature may not be a grave.</td>
</tr>
<tr>
<td>4</td>
<td>TU 8</td>
<td>I and transition to II</td>
<td>Lvl 1</td>
<td>18-27 cmbd</td>
<td>15-Nov-15</td>
<td>This feature has soft, dark soil and hard lines. More than likely a grave shaft.</td>
</tr>
<tr>
<td>5</td>
<td>TU 4</td>
<td>II</td>
<td>Lvl 2</td>
<td>23-34 cmbd</td>
<td>21-nov-15</td>
<td>This feature was only noticeable after photos were taken. Distinction between surrounding soil is difficult to discern.</td>
</tr>
</tbody>
</table>
## Appendix C

### Artifact Log

Table 2. Artifact Log.

<table>
<thead>
<tr>
<th>Test Unit</th>
<th>Feature</th>
<th>Strat</th>
<th>Level</th>
<th>Depth</th>
<th>Date</th>
<th>Excavators</th>
<th>Artifact</th>
<th>Count</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>-</td>
<td>I</td>
<td>1</td>
<td>13-23 cmbd</td>
<td>Nov. 16, 2015</td>
<td>KA/ADT</td>
<td>Redware</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>-</td>
<td>II</td>
<td>2</td>
<td>23-35 cmbd</td>
<td>Nov. 16, 2015</td>
<td>KA/ADT</td>
<td>Redware, lead glazed</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>-</td>
<td>I</td>
<td>1</td>
<td>12-22 cmbd</td>
<td>Nov. 15, 2015</td>
<td>KA</td>
<td>Amber glass</td>
<td>1</td>
<td>Artifacts were not recovered from feature</td>
</tr>
<tr>
<td>2</td>
<td>-</td>
<td>I</td>
<td>1</td>
<td>12-22 cmbd</td>
<td>Nov. 15, 2015</td>
<td>KA</td>
<td>Wood</td>
<td>1</td>
<td>Artifacts were not recovered from feature</td>
</tr>
<tr>
<td>2</td>
<td>-</td>
<td>I</td>
<td>1</td>
<td>12-22 cmbd</td>
<td>Nov. 15, 2015</td>
<td>KA</td>
<td>Stoneware, Bristol and Albany</td>
<td>1</td>
<td>Artifacts were not recovered from feature</td>
</tr>
<tr>
<td>2</td>
<td>-</td>
<td>I/II</td>
<td>2</td>
<td>22-31 cmbd</td>
<td>Nov. 15, 2015</td>
<td>KA</td>
<td>Chert flake</td>
<td>1</td>
<td>Artifacts were not recovered from feature</td>
</tr>
<tr>
<td>3</td>
<td>-</td>
<td>I</td>
<td>1</td>
<td>20-26 cmbd</td>
<td>Nov. 15, 2015</td>
<td>ADT/ERM</td>
<td>Redware, lead glazed</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>-</td>
<td>II</td>
<td>2</td>
<td>26-36 cmbd</td>
<td>Nov. 15, 2015</td>
<td>ERM</td>
<td>Redware, glazed</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>-</td>
<td>I</td>
<td>1</td>
<td>13-17.5 cmbd</td>
<td>Nov. 15, 2015</td>
<td>CAF</td>
<td>Colorless, curved glass</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>4</td>
<td>I</td>
<td>1</td>
<td>18-27 cmbd</td>
<td>Nov. 15, 2015</td>
<td>ERM</td>
<td>Amber glass</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>4</td>
<td>I</td>
<td>1</td>
<td>18-27 cmbd</td>
<td>Nov. 15, 2015</td>
<td>ERM</td>
<td>Colorless, curved glass</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>4</td>
<td>I</td>
<td>1</td>
<td>18-27 cmbd</td>
<td>Nov. 15, 2015</td>
<td>ERM</td>
<td>Redware, lead glazed</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>
Appendix D

Test Unit Photos

Figure 47. Test Unit 1, Strat II, Level 1, 13-23 cmbd.
Figure 48. Test Unit 1, Strat II, Level 2, 23-35 cmbd.
Figure 49. Test Unit 2, Strat I, Level 1, 12-22cmbd.
Figure 50. Test Unit 2, Feature 3, Strat I and II, Level 2, 22-31 cmbd.
Figure 51. Close-up of Feature 3, Test Unit 2.
Figure 52. Test Unit 3, Strat I, Level 1, 20-26 cmbd.
Figure 53. Test Unit 3, Strat II, Level 2, 12-22 cmbd.
Figure 54. Test Unit 4, Strat I, Level 1, 15-23 cmbd.
Figure 55. Test Unit 4, Strat II, Level 2, 23-24 cmbd. Note, feature was not seen until after viewing the photos and was not placed on the board.
Figure 56. Test Unit 5, Strat I, Level 1, 15-25 cmbd. Note, the arrow was placed incorrectly. Photo orientation is facing north.
Figure 57. Test Unit 5, Strat I, Level 1, 25-35 cmbd.
Figure 58. Test Unit 6, Strat I and II, Level 1, 13-17.5 cmbd.
Figure 59. Test Unit 6, Strat II, Level 2, 17.5-31 cmbd.
Figure 60. Test Unit 7, Strat I and II, Level 1, 16-23 cmbd.
Figure 61. Test Unit 7, Features 1 and 2, Strat II, Level 2, 23-30 cmbd. Note, Feature 2 is not listed on the board.
Figure 62. Test Unit 8, Feature 4, Strat I and II, Level 2, 18-27 cmbd.