



Piscatawaytown
Burial Ground

Est. 1695

Woodbridge Ave. Edison NJ

Piscatawaytown Burial Ground GPR Project Report

October 2021

By the Edison Greenways Group

PO Box 10432, New Brunswick, NJ 08906

www.edisongreenways.org

Grant funding has been provided by the Middlesex County Board of Commissioners through a grant from the Middlesex County Cultural and Arts Trust Fund.

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The Edison Greenways Group, Inc. (EGG) a local non-profit land trust, has been doing tours and cleanups of the Piscatawaytown Burial Ground since 1995. During the COVID 19 shutdown of 2020, we were not able to do our tours or cleanups, so the organization worked on, applied for and received a grant from Middlesex County to do a Ground Penetrating Radar Study of 10 areas of the Piscatawaytown Burial Ground, and Commons, in Edison in 2021.

While we did not receive the full amount of the grant, we requested we were able to modify the project to accomplish the main task of the project, the GPR survey.

Grant funding has been provided by the Middlesex County Board of Commissioners through a grant from the Middlesex County Cultural and Arts Trust Fund.

The Goals of the Project

Beginning in 2009 Middlesex County and the Metuchen Edison Historical Society have done a series of research projects on the history of the Piscatawaytown area. This included a metal detector search of the Commons and area around the Burial Ground, research on the history and location of the Commons, a 2015 Piscatawaytown Graves registration project, and a 2015 archeological dig on a portion of the Commons. All these efforts have resulted in increasing the knowledge of the history of this area. Yet there are many

questions that remained to be answered. The goals of this project are to answer some of those questions.

1. Determine the extent of burials in the Colored Burial Ground in the south-west corner of the Burial Ground.
2. Look for the potential remains of the Colonial-era Town House in the north-east corner of the Burial Ground.
3. Study an area on the northern side of the Burial Ground to find possible remains of the earthworks, and graves that were done by the British during the occupation of 1776-1777.
- 4., 5. Study the southern boundary of the Burial Ground to identify any burials outside the historical boundary.
6. Study a section of the adjoining Commons to find the foundation remains of the Piscatawaytown School house which was on the site from 1897-1985.
- 7.,8. Study the Langstaff plot, and Foulkes Vault to determine the number of burials in those plots.
- 9.,10. Study 2 areas of the Burial Ground on the western side where there are no gravestones, but may have been burials. Or a possible location of the Town House.

Ground Penetrating Radar Survey

The Edison Greenways Group engaged a team of archeologists and technicians from Indiana University of Pennsylvania to do the Ground Penetrating Radar survey of the Piscatawaytown Burial Ground. Their report is Appendix 2 in this report. The work was done in late May 2021.

Results of the Study

1. The Colored Burial Ground area had 98 graves identified. Research identified 11 of the people buried there.

2. Town House area. No evidence of the foundation of the Colonial-Era Town House were found in the north-east corner of the Burial Ground.
3. British earthworks area. No evidence of the earthworks or British burials. A trench was identified.
- 4.,5. Southern boundary area did not show any graves. 3 sites of anomalies which are unknown were found.
6. Commons-Piscatawaytown school site, identified 2 foundations. Which are not in the location of the 1897-1985 building
- 7.,8. Langstaff plot, and Foulkes Vault do contain burials.
- 9.,10. Western side showed a number of graves in that area.

See Appendix 2 for details of the GPR Survey

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Recommendations.

As a result of this study, the Edison Greenways Group make the following recommendations:

1. An archaeological investigation of the trench, and the Piscatawaytown School site be conducted to determine the age of the foundation, and identify potential artifacts in the trench. EGG has applied for a 2022 County grant for such a study.
2. The Township should create an appropriate memorial for the Colored Burial Ground area, including the names of the identified burials there.
3. The Township should develop a preservation and management plan for the Burial Ground, this plan could include doing a GPR study of the entire Burial Ground, gravestone restoration, fencing on the south side, and leveling sunken areas.
4. The Township should activate the Edison Historic Preservation Commission and task them with creating a historic district encompassing the Commons, Burial Ground, and St. James Church.

5. The Township should begin the nomination process for the Burial Ground, Commons, and St. James Church for the National Register of Historic Places.
6. The Township should develop a plan to restore the Common and create interpretive markers about the history of the Commons, and Piscatawaytown School house.

History of the Piscatawaytown Burial Ground

The Piscatawaytown Burial Ground is located on Woodbridge Ave. in Edison at the corner of Park Way. On the Edison Tax maps it is Block 351 lots, 1, 2. The Burial Ground is 3.09 acres, and is divided into an east side and west side with St. James Church lot between the 2 halves. The Burial Ground is owned and maintained by Edison Township.

In 1666 settlers from Piscataqua New Hampshire came to this area to live. They founded a Township they called Piscataway, and created a village called Piscatawaytown.

This village contained a meeting house, which was used for community, government, and religious purposes. A common, a place to drill the militia, corral animals, and punish people in the stocks. Later a school, and cemetery were established.

The Piscatawaytown Burial Ground was set aside as a cemetery by the settlers of Piscataway in 1695, however, 2 graves are dated 1693, and there may have been other early burials. Records show that the fence around the Burial Ground was repaired in 1689 and 1693. The Burial Ground is still an active cemetery with burials continuing to this day (2021)

During the American Revolution from December 1776 to June 1777 the area was occupied by the British Army. Legend is that after the battle of Piscatawaytown, British soldiers were buried in the Burial Ground.

In June of 1835 a powerful tornado destroyed much of the village, damaging some of the gravestones in the Piscatawaytown Burial Ground.

In the 1890s residents formed the Piscatawaytown Cemetery Association or the Piscatawaytown Historic Cemetery Association, which sold burial plots and maintained the site. Some of the plots are privately maintained. When the Association ran out of money maintenance stopped, and the Burial Ground became overgrown.

In 1979 the Township began a Cemetery Research Project funded by the CETA (Comprehensive Employment and Training Assistance) Program. This project cut down the vegetation, fixed fences, painted rails and created a list and map of the gravestones. Research done by Richard Walczak proved that Edison Township was the owner for the Burial Ground.

Beginning in 1995, the Edison Greenways Group has conducted twice yearly cleanups and tours of the Burial Ground. Continuing to remove overgrowth, and litter from the site.

In 2015 the Metuchen-Edison Historical Society hired Michael Gall to do an inventory of all existing gravestones, and research into various lists of burials. Gall identified that there were 1816 burials, of which 1494 had gravestones in 2015. There are 322 known burials without gravestones.

Colored Burial Ground.

In 1880 by Dr. Ezra Mundy Hunt (1830-1894) of the Metuchen section of Raritan Township recorded all gravestones in the Piscatawaytown Burial Ground. He also recorded the gravestones in the old Presbyterian Cemetery in Metuchen, and the cemetery at Stelton Baptist Church. Dr. Hunt was a medical doctor who served in the Civil War, and was a local historian who collected information about the history of the Metuchen area, and wrote a booklet called: Metuchen and Her History. He was also active with the NJ State Board of Health. Dr. Hunt's record of the graves, is the earliest inventory of the burials in the Piscatawaytown Burial Ground.

Dr Hunt identified the south-west corner of the Burial Ground as the Colored Burial Plot and recorded 5 gravestones in that section. Dr. Hunt did not identify any gravestones in Metuchen or Stelton as being in the Colored Burial Plot.

1880 list by Dr. Hunt (In the order he recorded them)

1. John Demund Died June 13, 1843, in his 30th year.
2. Yerkus Martin Died Aug 20, 1839, age 75 years.
3. Margaret Martin, Wife of Yorkus Martin. Died April 26, 1844 in the 55th year of her age
4. Mary Dunn Died Dec 18, 1831 in the 19th year of her age.
5. Gifford Dun Died June 29, 1845 in his 22nd year

Our research has not identified when the Piscatawaytown Burial Ground was segregated. Previous studies of the Piscatawaytown Burial Ground show that there is no chronological pattern to the burials. The oldest burials are on the east side, then in 1790 they begin on the west side. The southern, and far western side do not have any 18th century (1700's) burials, so this corner may have been empty when the first burials occurred there.

The oldest gravestone in the Colored Burial Ground is of 19-year, old Mary Dunn who died on December 18, 1831. So, this segregated section had to be created before then. All of the gravestones identified by Dr. Hunt 1880 were not together in a row, nor were they on the edge of the section. They were on 2 adjoining rows near the southern boundary. This may indicate that there were burials before Mary Dunn was buried.

Donald A. Sinclair List Genealogical Society of NJ 2000

In the 1938, 1939 and 1946 Donald A. Sinclair recorded all the gravestones he could identify, but does not indicate the SW corner is the Colored Burial Ground. He found 9 gravestones.

1. Demund, John, d. June 13, 1843 in 30th year.
- 2.,3 Martin, Yorkus, d. Aug 20, 1839, age 75; wife Margaret d. April 26 1844, in 55th year. Farewell my...children all... Side by side.
4. Dunn, Mary, d. Dec. 18, 1831 in 19th year. Next to Gifford Dunn
5. Dunn, Gifford, d. June 29, 1845 in the 22nd year. Next to Mary Dunn.

6. Dunham, Peter, d. October 2, 1887, age 43. 4.27 Farewell my wife and children all.
7. Green, Rosanna, d. Feb 6, 1898 age 87 0.21
- 8.9 Campbell, Joseph. "My Husband" d. July 24, 1882 Age 53. Elizabeth "widow" d. Dec. 12, 1910 age 80 years old.
10. Dennis, John D*; wife Susan*; son Walter L., b. April 7, 1879, d. Sept. 7 1898. *(It is not known if John D., and Susan are buried here. Gravestone has Walter Dennis on it.)*
11. Rayn, Peter, d. Oct. 30 1909 age 56 years 10 mos.

1979 Cemetery Research Project

In a report dated 3/2/1979 Richard Walczak Jr with the CETA program did an inventory of all the gravestones, and a map. He identified 6 gravestones in the Colored Burial Ground.

1. John Demund
6. Peter Dunham
7. Rosanna Green
- 8.,9. Joseph & Elizabeth Campbell.
10. Walter Dennis
11. Peter Rayn

Between 1942 and 1979 five gravestones disappeared.

2015 MEHS Piscatawaytown Burial Ground Graves Registration Project

In 2015 the Metuchen Edison Historical Society hired historian/archeologist Michael Gall to take all the various lists, and inventory all existing gravestones and plot them on a map. In 2015 there were only 5 gravestones in the Colored Burial Ground.

6. Peter Dunham 2/3/1874-10/2/1887 (13 years old)

7. Rossa Green 1810-1898 (88 Years old)

8.,9. Joseph Campbell. Elizabeth Campbell December 12, 1910

10. Walter Dennis 1879-1898 (19 years old)

11. Peter Rayn 1853- 10/30/1909 (56 years old)

Between 1979 and 2015 one gravestone disappeared.

See Appendix 1 for information about the people who were buried there.

2021 Ground Penetrating Radar Survey

Ground penetrating radar was used to determine the extent and number of graves in this section. The area of the Colored Burial Ground is 98.42 feet east/west along the southern boundary, and 65.6 feet north south. (6456.352 square feet) the ground penetrating radar identified 98 graves in this section. There are 87 of unidentified graves. There may be more than 87 people buried there, because the GPR only detected the disturb soils of the graves, and not the number of people in the graves.

The graves in the Colored Burial Ground are in 14 rows that run north south, with the burials east-west. Like the rest of the cemetery the rows are not all straight. There are gaps in the rows where there are no burials. This appears to be an organized burial area, and not random graves.

The same five headstones remain from 2015.

Were any of the people buried in the Colored Burial Ground enslaved people? In 1804 New Jersey adopted a gradual emancipation, with the last slaves being freed by the 13th Amendment to the US Constitution in 1865. The 1840 US Census lists 9 slaves in Piscataway. So, it is possible that enslaved people were buried here. Our research did not come up with any specific information.

Town House Site

From the 1690s to 1835 a Town House was located in the Commons The town house was 20 feet wide by 30 feet long, and 10 feet between joints. A US Coastal Survey Map of the Valley of the Raritan from Perth Amboy to New Brunswick dated 1836 show a building in the north east corner of the Burial Ground. The Story of St. James' Church Piscatawaytown New Jersey and the Neighborhood says the Town House was located by the Skewis Plot. This plot was not found during previous studies. The Town House was reported as destroyed in the 1835 tornado, and not rebuilt.

British Earthworks/Burial Area Site.

In, The Story of St. James' Church Piscatawaytown New Jersey and the Neighborhood by Rev. W. E. Phillips (1936) says that during the British occupation in 1777 they constructed earthworks in front of the north side of the Church, and after 30 British soldiers were killed they were buried here. Also, this area was leveled when the cemetery was cleaned up in 1910, and was located six feet from the "railing" to the Cotheal plot. In 2021 this area contains numerous 20th century graves.

GPR was used on an open area east of the Cotheal plot. The results of the GPR survey showed a trench along the fence-line. No graves were identified.

Southern Boundary Line

The southern property line of the Piscatawaytown Burial Ground was GPR surveyed to determine if there are any burials beyond the historic boundary. The Commons is, and the Piscatawaytown School was, located south of this line. In the 20th century, the Township constructed 2 adjoining garage buildings at the western end of the boundary. The school building burned down in 1985, and the garages were demolished around 2002. The results of the GPR survey showed no graves in this area. 3 areas of anomalies items were discovered.

Piscatawaytown School Site.

The first school house was built in the Commons during the Colonial Era. This building may have lasted until the June 1835 tornado when it was destroyed. A new schoolhouse was built behind the Church. It is not known if it was in the

same location as the earlier school. Some reports say it was a two-story building. According to an article in the New Brunswick Daily Times, 20 May 1893 the Raritan Township Board of Education approved the building of a new school at the location of the old school, and it would be 25 feet by 35 feet.

This school opened in 1897, and was a school until 1913 when the large modern Piscatawaytown School was opened a few blocks west. The old school house then became the Raritan Township Municipal Building until 1925 when a new building was built a block west. From 1925 to 1985 the old school house was used by various Township departments. The building burned down in 1985.

GPR was used to look for the location of the 1897-1985 school house foundation which was 25 feet wide by 35 feet long and ran north-south. Plus look for the possible location of a well or out-house.

The results of the GPR survey were surprising. The foundation for the 1897-1985 school house was not found. But 2 different foundations were found. The largest was east to west. Foundation 1A is 32.808 feet long by 22.96 feet wide. Foundation 1B is 13 feet by 13 feet and is east and next to foundation 1A. We cannot determine what these foundations are. Could they be from the previous schoolhouse that burned in 1893? The 32 feet by 22 feet size is close to the size of the Colonial Town House 30 feet by 20 feet. Or could it be the Town House?

Langstaff Plot, Foulkes's Vault

There are 2 family plots on the west side of the Burial Ground that we used GPR to investigate. The Langstaff Plot has an iron fence around it with the date of 1860. There are no gravestones, but there is a slab in the middle of the plot. No early photographs of the Burial Ground show a monument on the slab. The Langstaff's are one of the early settler families of Piscatawaytown.

The results of GPR survey show 2 graves under the slab, and one small grave along the south side of the plot. Previous studies of the Burial Ground do not identify who is buried in the Langstaff Plot.

The Foulkes's Vault is a large mound just west of the church. There is a stone with "Foulke" carved into it near the base of the mound. Previous studies did not identify any burials in the Foulkes's Vault.

The results of the GPR survey show that the vault is an underground structure, with two possible coffins on platforms in the center, with a 3rd coffin on the south side of the vault. The carved stone appears to be the entranceway to the vault.

West Side Graves

There are 2 areas on the west side of the Burial Ground, that have no gravestones. We used GPR to determine if there are any burials there, or if this was the location of the Town House.

The results of the GPR survey were that there are 12 graves, and no evidence of the Town House was discovered.

Public Presentation

On October 2, 2021 the Edison Greenways Group did a public presentation of the findings at the Edison First Aid Squad #1, 33 Lakeview Blvd. Edison. 30 people attended the presentation which was videoed by Edison Cable TV. The presentation was later shown on Edison Cable TV, and the Edison YouTube channel. Copies of the GPR report were handed out. After the presentation, a walking tour of the Burial Ground was done.

A resident who attended the presentation, and who has family buried in the Burial Ground later, produced a photograph of a woman who is identified as Rosannah Green, one of the people buried in the Colored Burial Ground.

Below is a flyer for the event.



Piscatawaytown Burial Ground

Est. 1695

Woodbridge Ave. Edison NJ

Piscatawaytown Burial Ground GPR Program & Tour

Saturday October 2, 2021 1:30pm-3:30pm

Edison First Aid Squad #1

33 Lakeview Blvd. Edison, NJ 08817

The Edison Greenways Group will present a program about the results of our Ground Penetrating Radar survey of the Piscatawaytown Burial Ground. The program will start at 1:30pm and the tour of the burial ground highlighting the recent discoveries will begin after the program.

There will also be information about the Burial Ground on display.

For more information contact: Walter Stochel Jr. 732-906-0529 wstochel@earthlink.net

The Piscatawaytown Burial Ground was established in 1695 for the settlers of what was then Piscataway Township. (The earliest known grave is from 1693 before it was established.) Since then, 1816 people have been buried on this site, and continue to be buried today. However, 322 graves are not marked and gravestones that were visible in the 1880s & 1979 are now missing. There are areas where there are no headstones, or visible graves, such as the "colored burial ground" in the south-west corner.

Grant Funding has been provided by the Middlesex County Board of Commissioners through a grant award from the Middlesex County Cultural and Arts Trust Fund. 9/2021

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Appendix 1

Information about those people buried in the Colored Burial Ground

Using Ancestry.com and Newspapers.com We were to find out information about these people buried in the Colored Burial Ground.

Rosanna Green.

1810-1898 at the age of 87.

Census records from 1850, has a black female, Rosana Green living in North Brunswick age 35. In the same household is Edgar Green age 29, a laborer and 3 children, Harriet Demarest 9, Diana Green 5, Eliza M. Green 0. They lived with J.F. Perdun family. J. F. Perdun is listed as a shoemaker.

The 1860 Census has a black female, Rosannah Green age 46 living in Piscataway, along with Edgar Green, age 44. Children Margaret Green 17, Eliza M Green 10, Mary E. Green 8, Joel D. Green 6.

The 1870 Census has Rosa Green, 39, birth about 1831 living in Raritan Township her occupation was keeping house. Her spouse is Edgar Green a day laborer. Children Eliza 13, Mary 12, Margaret 10, Harriet 8, Joel 7. The family lived with a white male, Edgar Cato age 90 who's occupation was a day laborer.

In the 1880 Census, Rosa Green is a black female aged 65, widowed and a friend of the people in the household where she is living in Piscataway. She is listed as a servant. She is living with a Dunham family. Peter Dunham black Male 35 married Farmer, Harriet Dunham black female age 37 wife, who's occupation is keeping house children Frederick Dunham Black male age 5 son, and S. Redfield Dunham black female age 7. A family friend Margaret Demund black female 30 also lives there. The census notes that all born in NJ all parents born in NJ

The New Jersey 1895 Census lists Rosanna Green (age over 60) living with Harriett Dunham, Fred Dunham, and Margaret Demunn

The NJ Death and burial index 1798-1971 has Rose A. Greene Birth about 1811 death 6 Feb 1898, Piscataway NJ 87 years Black, widowed.

Joseph & Elizabeth Campbell.

Joseph Campbell died 1882. Will probated 1885.

Elizabeth Campbell died 12/12/1910 Home News obituary Dated 12/15/ 1910 of Elizabeth Campbell of Stelton. Widow of Joseph Campbell

John Demund.

Died 6/13/1843 No other information found.

Peter Dunham.

2/3/1874-10/2/1887

Courier News article October 6, 1887. Killed on Lehigh Valley Railroad in New Brooklyn (South Plainfield) Jumped from the train and was killed.

Peter Rayn.

1853-10/30/1909 56 years old.

1905 New Jersey State Census. Male, colored, 60. Born 1845 in Maryland. Lived in the 2nd district of Piscataway. Laborer, who could read and write English.

Harriett A. Rayn Female, 58 years old, born May 1847 in NJ. Domestic, who could read and write English. *Possible wife of Peter Rayn.*

Walter Dennis.

1879-1898

Article in the New Brunswick Daily Times. September 9, 1898. Lived in Stelton, and was 19 years old died after becoming insane from the effects of excessive heat. He laid down on the tracks of the railroad, the train stopped, and he was removed from the tracks, carried home and died the next day.

Walter Dennis's parents, John D. Dennis, and Susie Dennis may be buried next to him in the Piscatawaytown Burial Ground. Their information indicates they lived with the Letson family in Stelton.

The 1850 Census has John D. Dennis, male, black age 6, born about 1844. In the household, are Edward Dennis 40, Phillis Dennis 35, Charles 13, Susan 11, John D 6, Hemey 1. Also says John D attended school.

In 1860 the Census says John Dennis age 15, male, black, living in Piscataway. Attended school. Lives with Edward 50, Phillis 50, Henry 11, Eliza 8

In 1877 at age 33 married Susan Willis age 26 in Morristown NJ.

1880 Census says John Dennis born about 1846 in NJ. Black, Male, Married. Age 34. Lives in Stelton with the Letson Family, and is a servant.

In the 1900 Census. John Dennis, 58 born May 1842 in NJ. Black, Male, servant, Married 1879, 21 years. Occupation: Hostler. Lives with Peter Letson.

1905 NJ Census. John D. Dennis. Male, white 60. Born May 1845. Lives in Raritan Township. Laborer, can read and write. Lives with Peter Letson.

1910 Census. John Dennis living in Raritan Middlesex County, Stelton. Age 64, birth 1846 NJ. Colored (Black), Male, Married. Hired Man. Can read and write. Lives in the household of Charles Letson.

1915 NJ Census. John Dennis. Born July 1846. Colored. Lives in New Brunswick NJ, Hendry St., can read, write English. Married. Gardiner.

Susan Dennis age 47, colored, housewife.

1918 John Dennis dies 1918

1920 Census. Susan Dennis, Black widow, age 75, house cleaner. Lives on Handy St. in New Brunswick.

June 1923 Susan Dennis dies

Yerkus Martin. No information. Margaret Martin. No information. Mary Dunn. No information. Gifford Dun. No information.

Appendix 2
Ground Penetrating Radar Study

**GEOPHYSICAL SURVEY OF
THE PISCATAWAYTOWN BURIAL GROUND
IN EDISON, NEW JERSEY**

Prepared for
Edison Greenways Group, Inc.

By
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June 2021

Abstract

The Archaeological Services Center (ARCSERV) of Indiana University of Pennsylvania (IUP) conducted a geophysical survey of the landscapes associated with the Piscatawaytown Burial Ground in Edison, New Jersey from May 24 to 26, 2021 to determine the probable presence or absence of potential archaeological features and burials within several survey areas. The possibility of archaeological features and burials within the geophysical survey areas is based on documentation and personal communication with Edison Greenways Group, Inc. The geophysical survey was within nearly a 0.77-acre (approximately 3095 sqm) discontinuous area of cemetery. The discontinuous geophysical survey areas were surveyed using ground penetrating radar (GPR). Ten (10) GPR geophysical grids, ranging in size from 3 meters by 78 meters to 20 meters by 30 meters were placed within the cemetery.

Based on the results of the geophysical survey, numerous geophysical anomalies were identified. Most of the anomalies are probable burials while the remainder are other potential archaeological features. The geophysical anomalies that are likely related to archaeological features are interpreted as two (2) areas of disturbance likely related to potential structures previously suggested on the landscape. Only ground truthing the geophysical anomalies will provide resolution on if they are archaeological features and what these interpreted archaeological features represent temporally and culturally.

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Figure 22. Interpreted 2D depth map and radargram of geophysical Grid 10 showing the geophysical data and the interpretation of the data depicting eight potential burials.

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Plate 2. General view of the landscape without gravestones.

Plate 3. IUP Field Technician using GSSI SIR-4000 GPR system.

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Table 1. Potential archaeological features within the survey grids at Piscatawaytown Burial Ground. Centroid coordinates are in NAD 83 UTM 18N.

1.0 INTRODUCTION

The Archaeological Services Center of Indiana University of Pennsylvania (ARCSERV) was tasked by Edison Greenways Group, Inc. with conducting a geophysical survey of the landscapes associated with the Piscatawaytown Burial Ground in Edison, New Jersey. This survey was undertaken using a grant. Grant funding has been provided by the Middlesex County Board of County Commissioners through a grant award from the Middlesex County Cultural and Arts Trust Fund. The field survey was conducted from May 24 to 26, 2021 to determine the probable presence or absence of potential archaeological features and burial within several survey areas (Figure 1, Plate 1 and Plate 2). The likely presence of archaeological features is based on presence or absence of anomalies within the geophysical data. The use of geophysics has become a method to narrow down areas that are likely to contain potential burials archaeological features from those areas that do not.

Geophysics is used to determine where on a landscape the soils have been disturbed to identify potential burials and archaeological features. The excavation, placement, and filling related to building a structure, excavating a privy or a burial is a case where the soils have been disturbed. However, this is not the only way in which soils and landscapes have been disturbed. Soils can also be disturbed by other human actions and by nature. Human activity greatly alters the natural landscape through time. The building of structures and digging holes are landscape altering activities that create deviation from the natural landscape. These deviations are what geophysical systems can identify. Thus, the identification of disturbances related to structures, burials, or other features that are no longer on the landscape is based on the identification of these disturbances that are similar in morphology. However, the identification of these potential features is based on deviations (anomalies) from the natural landscape and natural processes and animals can disturb natural deposits. Thus, the true interpretation of these potential features can only be accomplished through the archaeological excavation, interpretation, and recordation of these features.

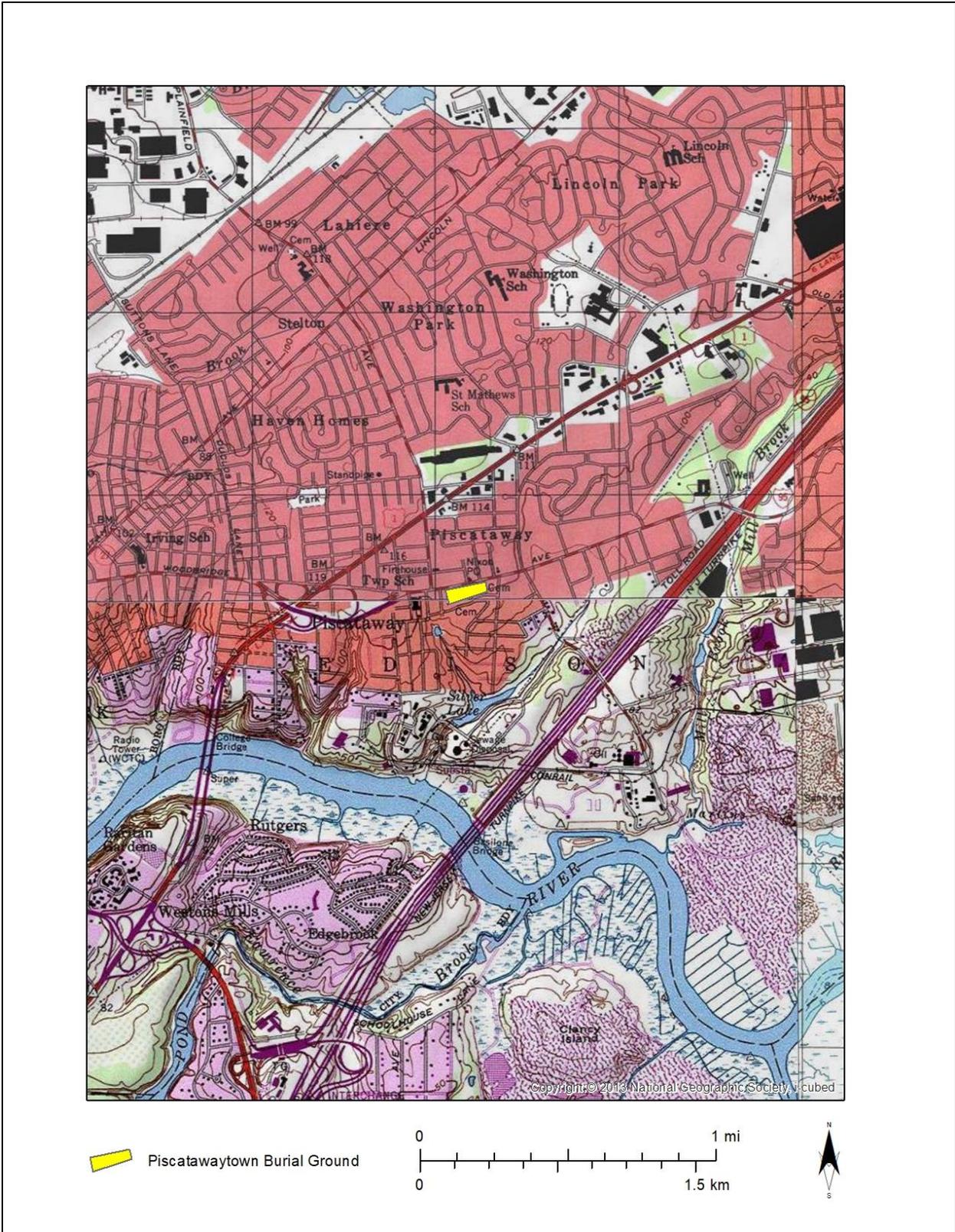


Figure 1. Piscatawaytown Burial Ground on 7.5-minute USGS Quadrangle.



Plate 1. General view of the landscape within the survey area with gravestones.



Plate 2. General view of the landscape without gravestones.

2.0 BACKGROUND

The Piscatawaytown Burial Ground lay within the Piedmont Physiographic Province New Jersey (Figure 2). The Coastal Plain extends from Northern New Jersey to Florida. The Piedmont in New Jersey tends to be a region of low relief with gently rolling landscapes containing dendritic drainage patterns with elevations ranging between 0 feet and 180 feet. The geologic deposit associated with Piscatawaytown Burial Ground is the Passaic Formation (JTrp). The Passaic Formation is Lower Jurassic and Upper Triassic in age (Figure 3). The formation consists of reddish-brown to brownish-purple and grayish-red siltstone and shale (Olsen 1980).

The Soils within the Geophysical Survey Area are mapped as Nixon-Urban land complex, 0 to 5 percent slopes (NkpB) (Web Soil Survey, 2021; Figure 4). Nixon-Urban land includes deposits that have frequently been graded, disturbed, or filled based on the historic development of the urban landscape. Because of the nature of the soils, traditional archaeological methods are difficult and necessitate the use of mechanical removal of the materials related to the changing urban landscape to find intact archaeological features. The geophysical survey proposed is used to determine the location of potential archaeological features.

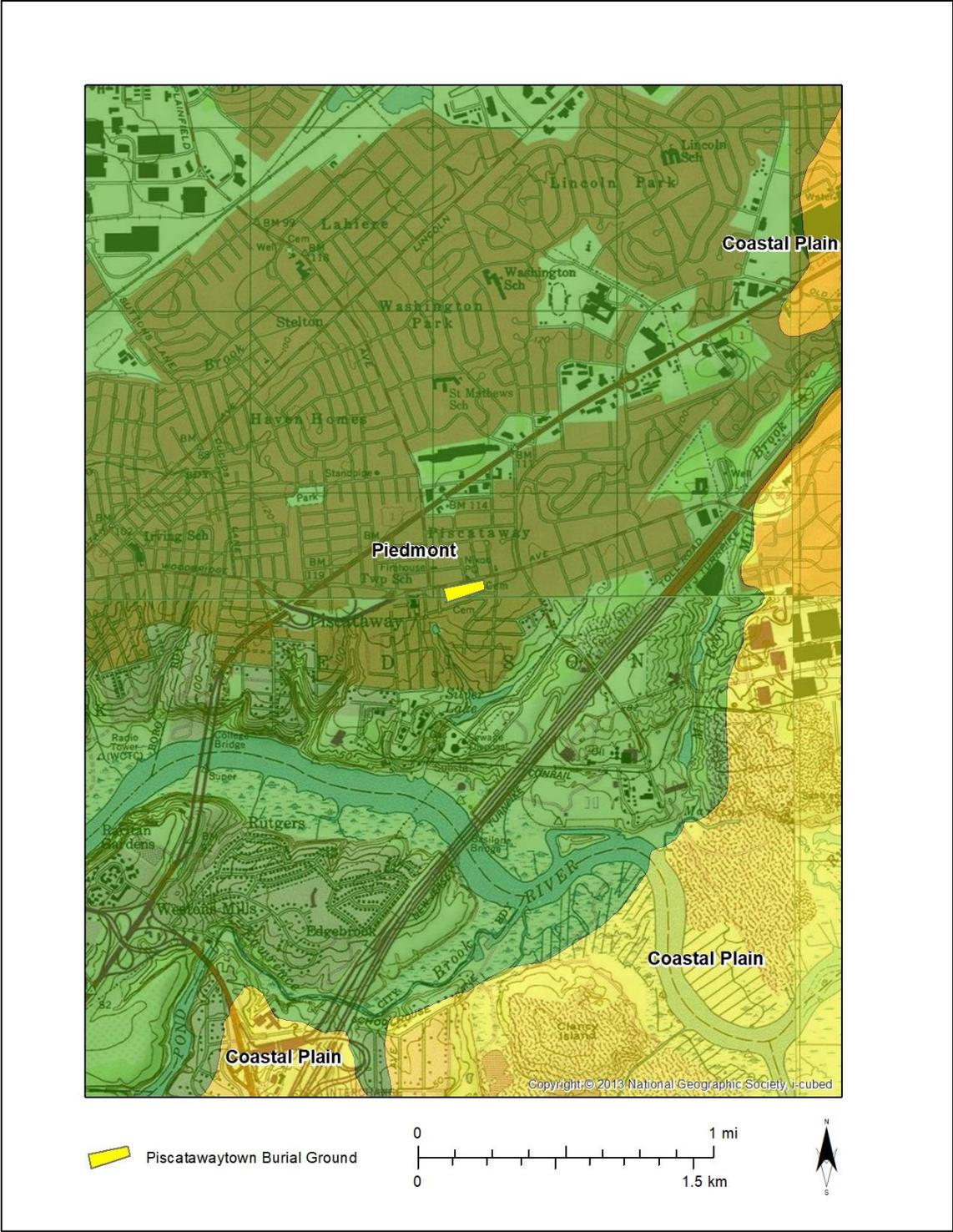


Figure 2. Piscatawaytown Burial Ground in relation to New Jersey Physiographic Provinces.

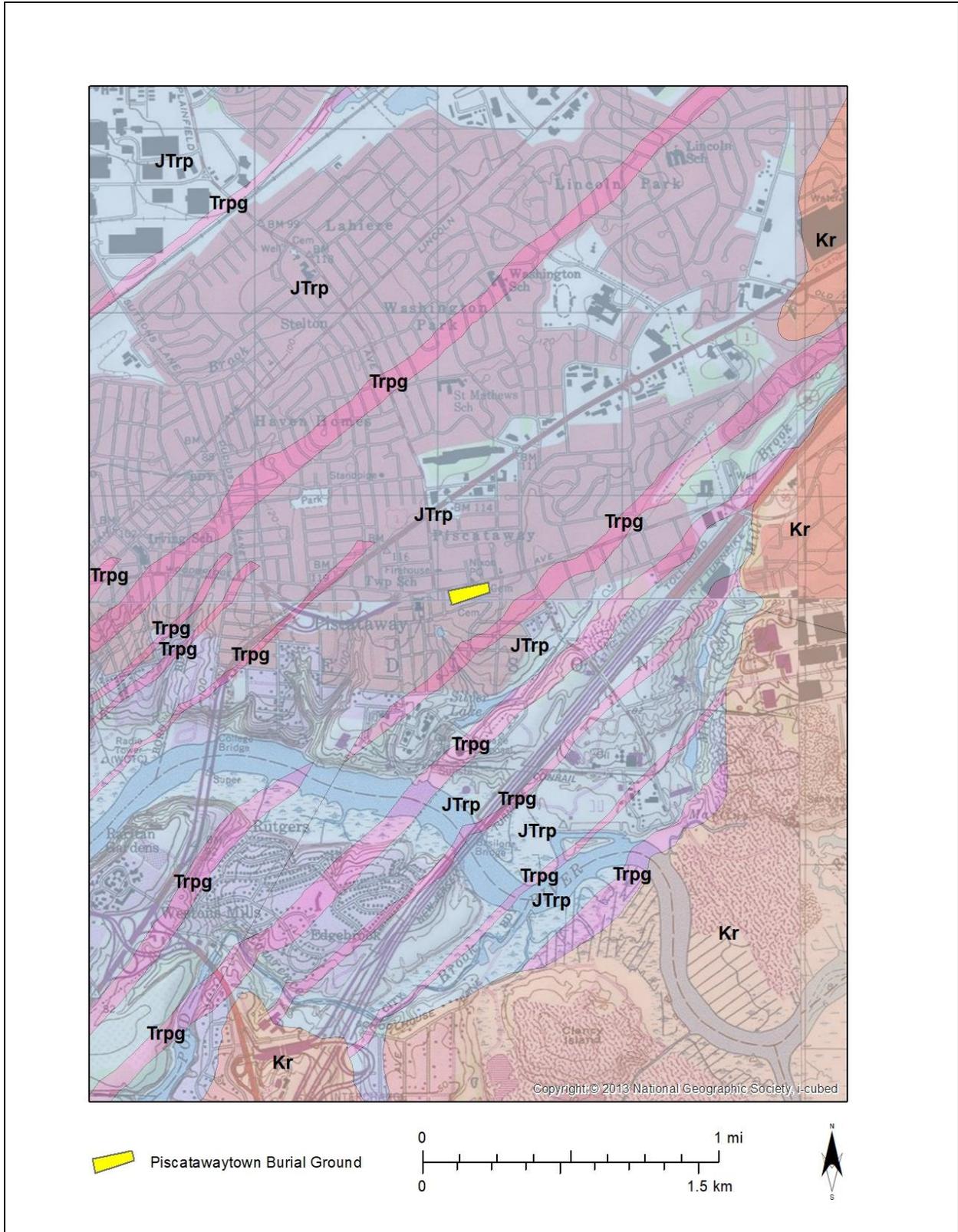


Figure 3. The bedrock geology related to the Piscatawaytown Burial Ground.



Figure 4. The soils related to the Piscatawaytown Burial Ground.

3.0 GEOPHYSICAL METHODS

3.1 Ground Penetrating Radar

Ground penetrating radar (GPR) is an active, non-invasive geophysical method that records contrasts in the dielectric properties of subsurface materials. A pulse of transmitted electromagnetic energy is reflected or absorbed by dielectric contrasts and the intensity and two-way travel-time of the response is recorded to produce a vertical profile. Reflections are generated from deviations in propagation velocity at interfaces between materials of differing relative dielectric permittivity. A two-dimensional GPR profile consists of individual traces, resulting from a single pulse of energy and the resulting reflections at a given location, that are stitched together horizontally to produce an image of dielectric contrasts. In this sense GPR is not providing a stratigraphic profile, rather it is generating a vertical representation (radargram) of local dielectric contrasts which provides a proxy for subsurface stratigraphic changes.

GPR is an excellent technique for non-invasive prospection for historic archeological features, including wells, privies, graves, and other shaft features, as well as buried building foundations, trenches, and stratigraphic features. GPR excels at identifying these features due to the dielectric contrasts that often exist between feature fill and surrounding sediment, visible truncation of internal stratigraphic layers, or high reflection amplitude from intense signal reflection from bricks or stones.

The depth of penetration for GPR depends on numerous factors, including but not limited to the antenna frequency, sediment type, moisture content, compaction, and salt content. Higher frequency antennas can resolve smaller targets and interfaces, though depth penetration is sacrificed. Moisture content increases sediment density through filling of interstitial pore spaces, while compaction causes a similar effect through compressing spaces between particles. The presence of water, salts, and clay particles results in an increase in conductivity and thus a reduction in the quality of GPR data. Clays, shale, and other high conductivity materials may attenuate or absorb GPR signals.

For the survey, ARCSERV utilized a GSSI SIR-4000 GPR system with a 400 MHz central-frequency antenna (Plate 3). The system is mounted on a Utility Cart and utilizes odometer-triggered collection of 50 traces per meter (1 reading every 2 centimeters). GPR data were collected within several geophysical survey grids. Post-processing routines for the GPR data were conducted

in GSSI's RADAN 7 Software included position correction (time zero), background removal, and high and low pass filtering. The data were interpreted in both cross-section view (2D), map view (2D) and 3D view. The cross-section and map views allow an analysis of the vertical and horizontal patterning between subsurface anomalies. The 3D view allows visualization of the relationship between cross-section and map views.



Plate 3. IUP Field Technician using GSSI SIR-4000 GPR system.

3.2 Survey Grids

The IUP ARCSERV conducted a survey within the Piscatawaytown Burial Ground that encompasses approximately 0.77-acre (approximately 3095 sqm) of discontinuous area. The burial ground includes open areas, areas with headstones and footstones, plot marking stones, fences plots and trees. Ten (10) GPR geophysical grids ranging in size from 3 meters by 4 meters to 5 meters by 78 meters were placed within the cemetery. These were placed in consultation with a representative from the Edison Greenways Group, Inc on the first day of the survey (Figure 12). The individual grids were surveyed in directions based on the orientation of the area being surveyed. The direction of travel was either generally south to north or north to south in order to traverse individual graves perpendicular to their trend. The geophysical grids were surveyed as individual units with a 0.25-meter (approximately 0.8ft) step intervals. All geophysical data was collected in one direction except where barriers were encountered (headstones and footstones,

trees, etc.). This methodology facilitated the post-processing of results and the production of geophysical maps.



Figure 5. GPR survey grids on 2016 aerial photograph.

4.0 GEOPHYSICAL RESULTS

Radargrams and the composite 3D ground penetrating radar (GPR) data from each geophysical grid was examined to identify any anomalies that may represent potential burials and potential archeological features based on the presence, absence, and structure of anomalies. Based on this analysis, a series of anomalies, interpreted as potential burials and potential archaeological features were identified within the individual geophysical grids. The identification of the potential archaeological features is based on the examination of both the radargrams and time slices related to the GPR data within the geophysical grids. (Table 1 and Figure 6).

Grid 1 is the area identified as representing the area of the “Colored Burial Ground” within the southwest corner of the larger burial ground (Figure 5 and Plate 1). The upper image of Figure 7 depicts the composite data collected from geophysical transects of data that were collected generally from south to north. The map is from an interpreted 0.40 meters below ground surface. The lower image of Figure 7 depicts the interpreted potential burials within the grid. Figure 8 depicts the relationship between an individual vertical radargram and a horizontal the same map from Figure 7. The same potential burials from the radargram and the map are circled in orange to show the general trend of an anomaly that is identified as a burial. A review of the data from Grid 1 led to the identification of 98 potential burials.

Grid 2 began just south of Grid 1 and extended to Grid 6, the area of the potential school (Figure 5). Figure 9 depicts the composite data collected from geophysical transects of data that were collected generally from north to south. The map is from an interpreted 0.20 meters below ground surface. The lower image of Figure 9 depicts the three interpreted potential archaeological features within the grid. Within Grid 2, three potential archaeological features are identified although no potential burials were identified. Feature 3 is approximately six meters east-west, extends north beyond the edge of the grid, and extends to approximately 25 centimeters below the ground surface (Figure 10). Feature 3 has an unknown interpretation. Feature 4 is approximately five meters east-west, is approximately one meter wide, and extends to approximately 20 centimeters below the ground surface (Figure 11). Feature 4 has an unknown interpretation. Feature 6a and 6b are a pair of linear features that run approximately three and a half meters east to west and are approximately 2 meters apart and extend from 0.10 to 0.35 meters below ground surface (Figure 12). Feature 6a and 6b have unknown interpretations.

Table 1. Potential archaeological features within the survey grids at Piscatawaytown Burial Ground. Centroid coordinates are in NAD 83 UTM 18N.

Feature Number	NAD 83 UTM 18N		Potential Feature Interpretation	Approximate Interpreted Depth Range (m)
	Northing	Easting		
1a	4483440.913	551158.474	structure	0.00 – 0.50±
1b	4483441.552	551162.750	structure	0.00 – 0.50±
2	4483521.658	551233.494	oblong pit	0.00 – 0.30±
3	4483433.656	551114.871	unknown	0.00 – 0.25±
4	4483435.017	551127.007	unknown	0.00 – 0.20±
5	4482473.948	551265.651	drainage swale	0.00 – 0.15±
6a	4483437.252	551135.099	linear wall	0.10 – 0.35±
6b	4483438.223	551134.721	linear wall	0.10 – 0.35±

Grid 3 is the area identified as representing the area that may contain potential burials near the northeast corner of the larger burial ground (Figure 5 and Figure 13). Grid 3 did not contain any identified potential burials although a large feature was identified. Feature 2 is an oblong pit approximately five meters long east-west and two meters north-south. The purpose of this apparent oblong pit is unknown.

Grid 4 is the area identified as representing the area that was suggested to contain a potential structure and potential burials in the northeast corner of the burial ground (Figure 5 and Figure 14). Grid 4 did contain potential burials in the eastern half of the grid but did not exhibit any geophysical evidence for a structure.



Figure 6. Piscatawaytown Burial Ground potential archaeological features identified on 2016 aerial photograph.

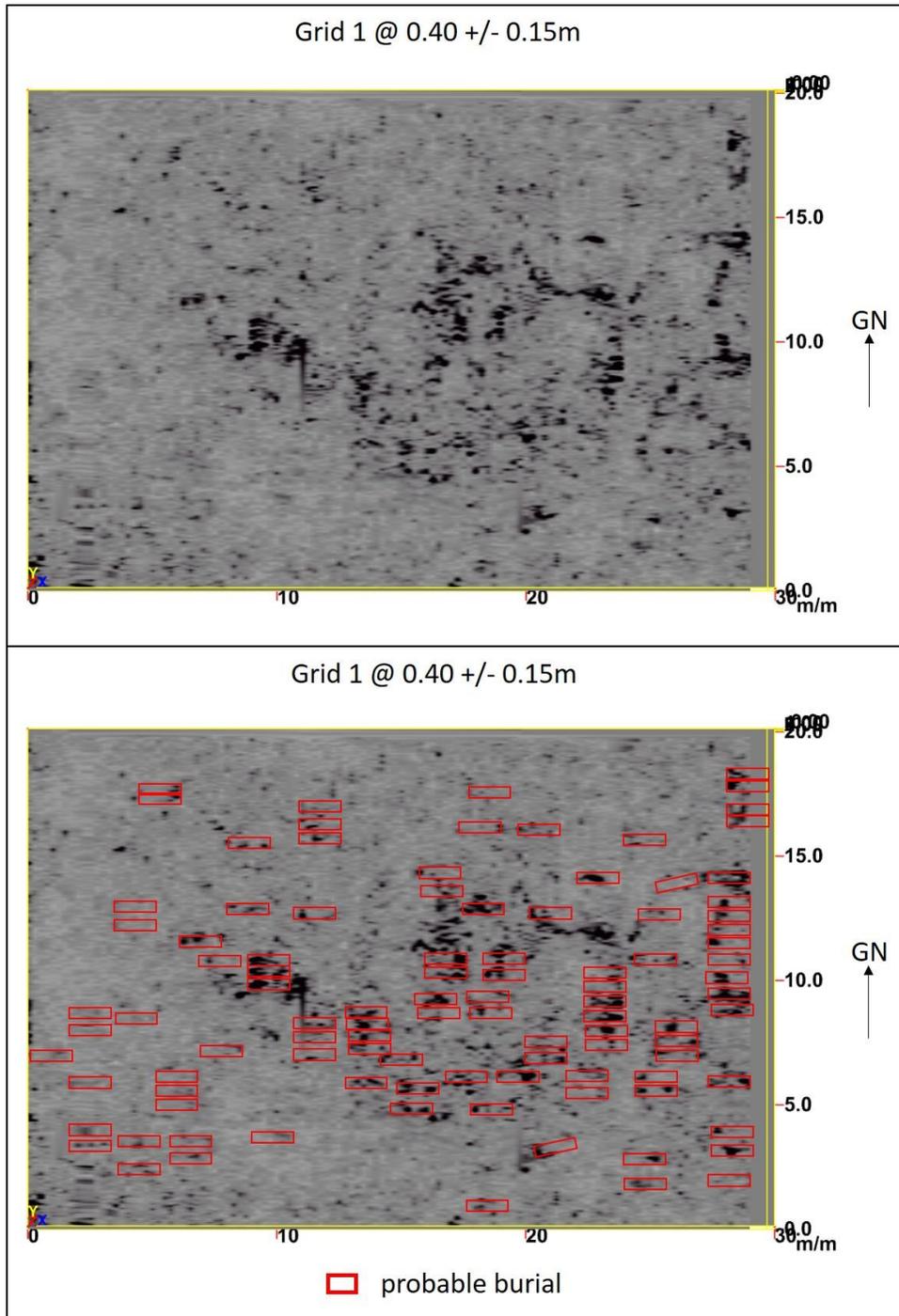


Figure 7. 2D depth map of geophysical Grid 1 showing the geophysical data and the interpretation of the data.

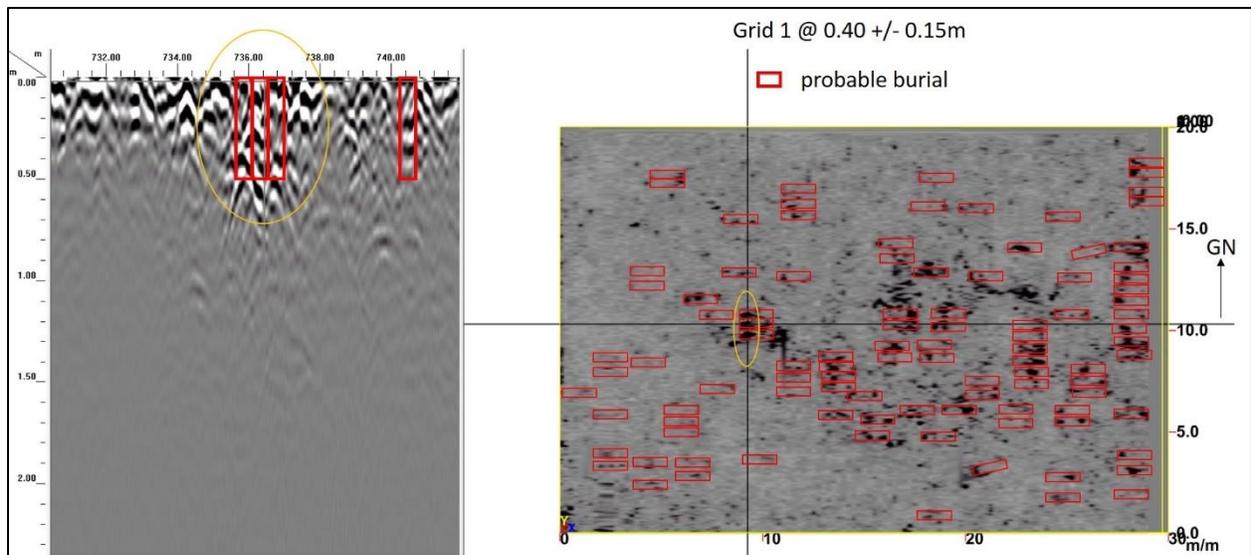


Figure 8. Interpreted radargram (vertical slice) of the GPR data from Grid 1 showing the identification of different potential burials and the same potential burials on the 2D depth map.

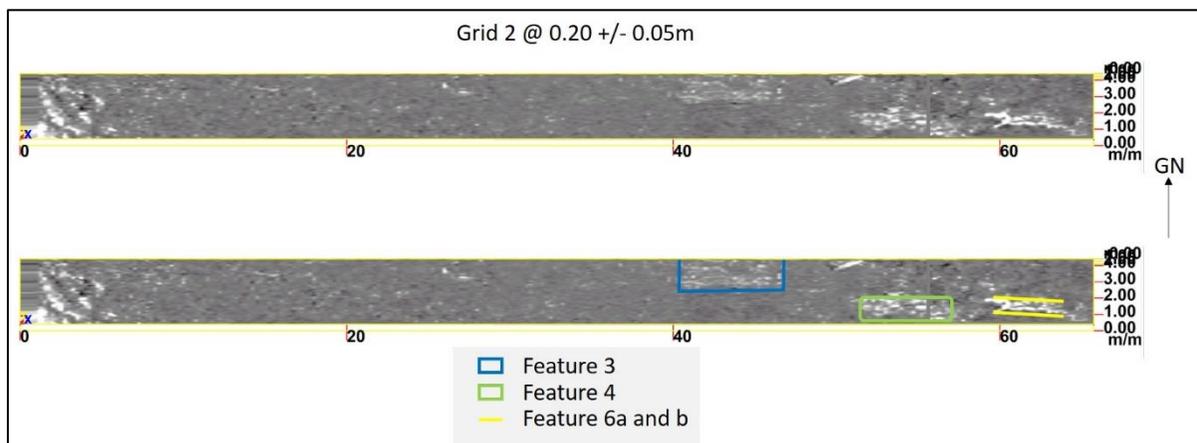


Figure 9. 2D depth map of geophysical Grid 2 showing the geophysical data and the interpretation of the data.

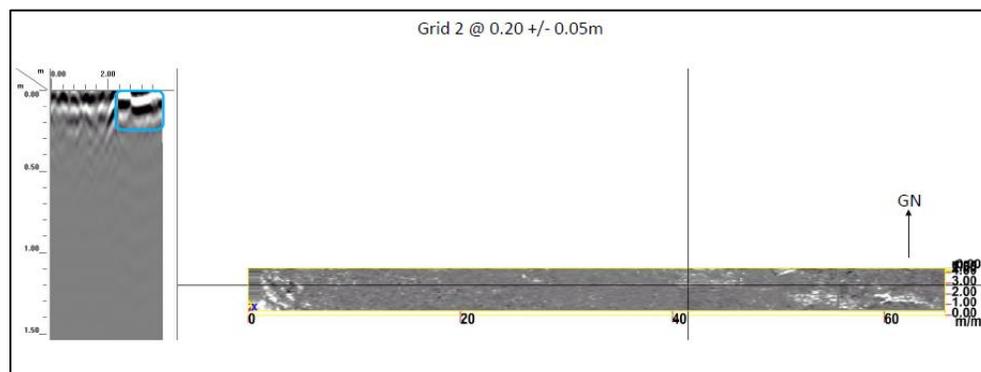


Figure 10. Interpreted radargram (vertical slice) of the GPR data from Grid 2 showing the identification of Feature 3 and the feature on the 2D depth map.

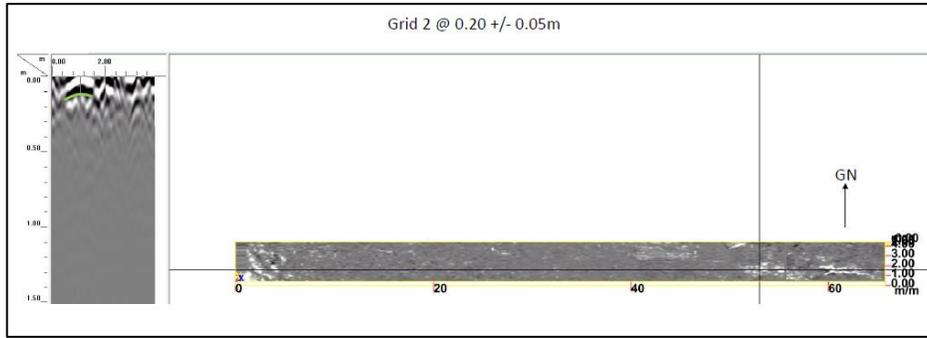


Figure 11. Interpreted radargram (vertical slice) of the GPR data from Grid 2 showing the identification of Feature 4 and the feature on the 2D depth map.

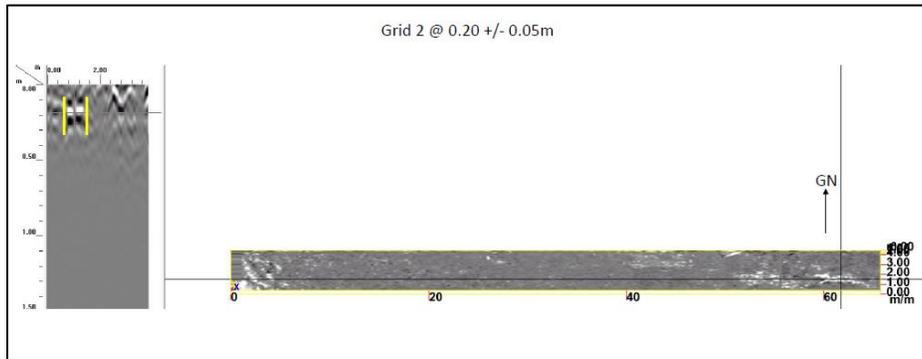


Figure 12. Interpreted radargram (vertical slice) of the GPR data from Grid 2 showing the identification of Feature 6a and Feature 6b and the features on the 2D depth map.

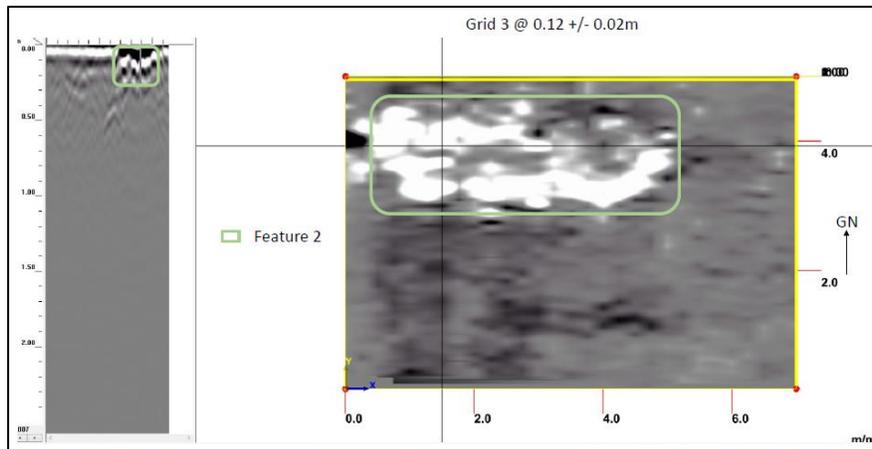


Figure 13. Interpreted 2D depth map and radargram of geophysical Grid 3 showing the geophysical data and the interpretation of the data depicting Feature 2.

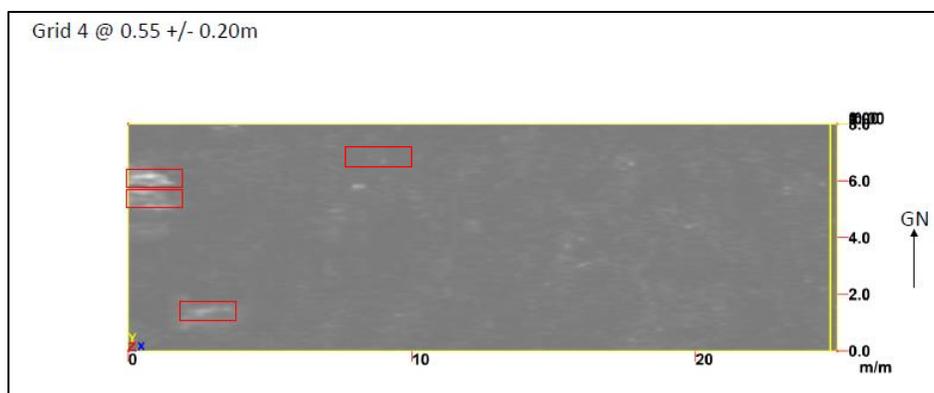


Figure 14. Interpreted 2D depth map of geophysical Grid 4 showing the geophysical data with the interpretation of the data.

Grid 5 is in the southeastern corner of the burial ground and runs along the edge of the existing access road (Figure 5 and Figure 15). The area was surveyed to determine the presence or absence of burials. No burials were identified during the survey, although one potential archaeological feature (Feature 5) was identified. Feature 5 appears to be a potential drainage swale that extends approximately eight meters east-west and one meter wide north-south.

Grid 6 is along the south-central section of the burial ground and is identified as a likely area of a former schoolhouse (Figure 5 and Figure 16). The area was also surveyed to determine the presence or absence of burials. No burials were identified during the survey, although one potential archaeological feature (Feature 1a and 1b) was identified. Feature 1a and 1b appear to be a potential single structure or a composite structure that has two intersecting parts. Feature 1a is larger and is approximately ten meters by seven meters and is oriented generally east west. Feature 1b is approximately 4 meters square and intersect Feature 1a near the center of the eastern edge of Feature 1a. approximately one and one-half of a meter of Feature 1b extends into Feature 1a. Figure 17 and Figure 18 exhibit the vertical extent of Feature 1a and Feature 1b.

Grid 7 is located slightly northwest of the present church building. It is surrounded by a cast iron plot fence (Figure 5 and Figure 19). Three burials were identified within this survey area. Two associated with the center of the plot and one along the southern edge of the fence.

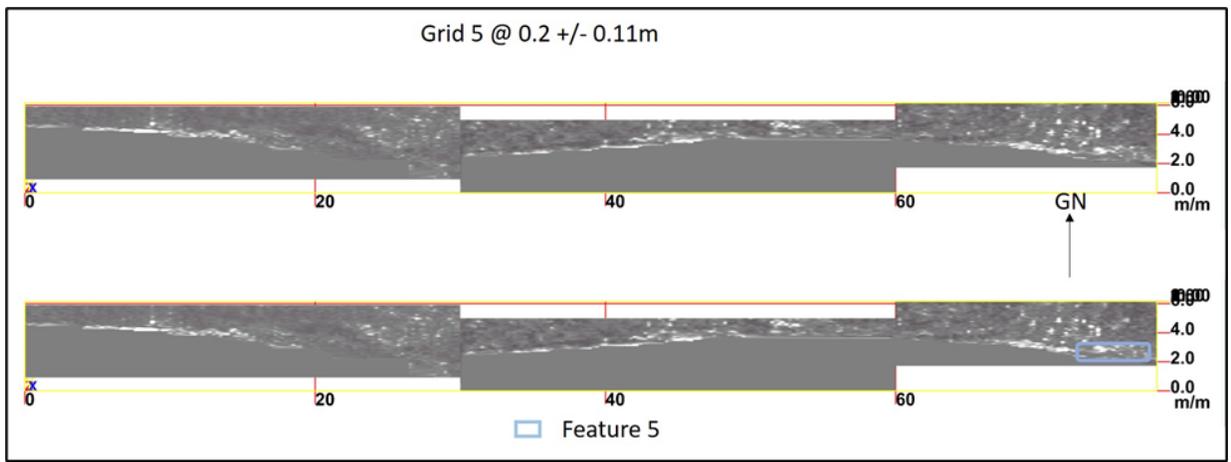


Figure 15. Uninterpreted and interpreted 2D depth map of the GPR data showing the identification of Feature 5 in southwest corner of the grid.

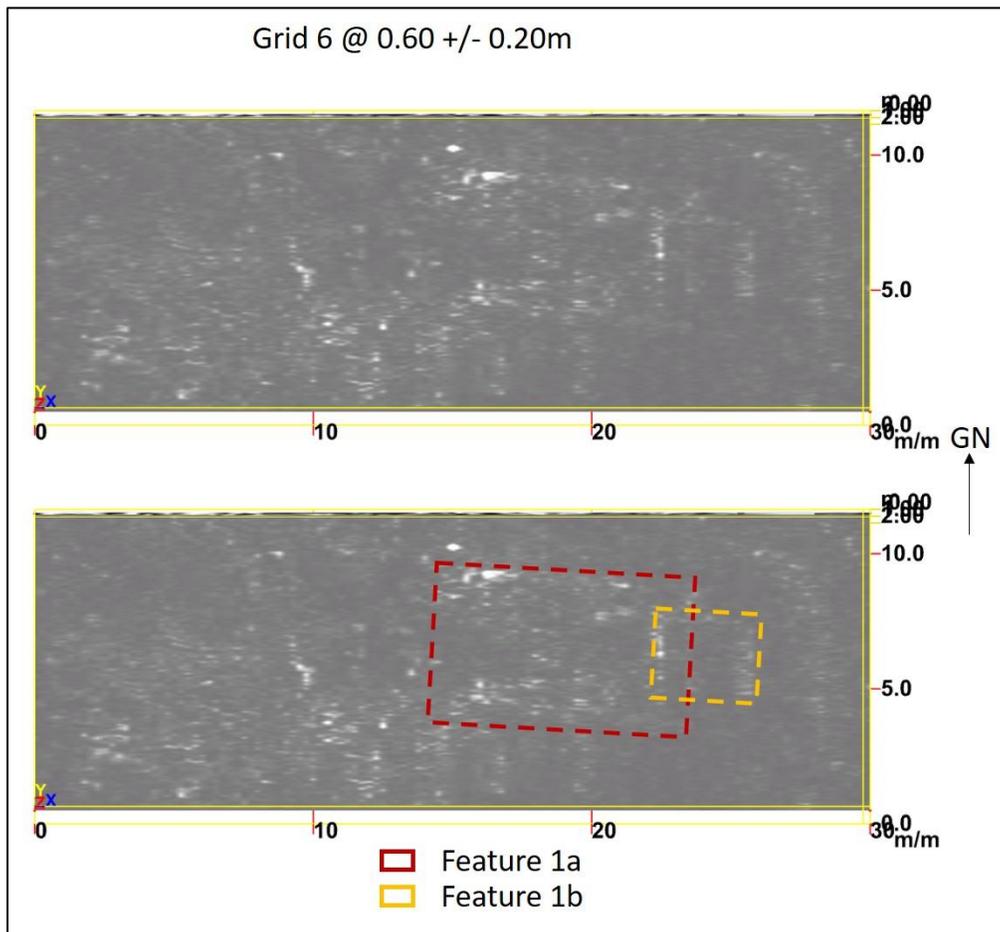


Figure 16. Uninterpreted and interpreted 2D depth map of the GPR data showing the identification of Feature 1a and Feature 1b in Grid 6.

Grid 8 is located slightly west of the existing church building (Figure 5 and Figure 20). The area is the location of Foulkes Vault, a mound approximately 12 feet square. The geophysical data revealed what appears to be an inner space (yellow dotted line) with an open entry way (solid yellow square) and three interior features that may be some type of platforms or potentially coffins (Figure 20).

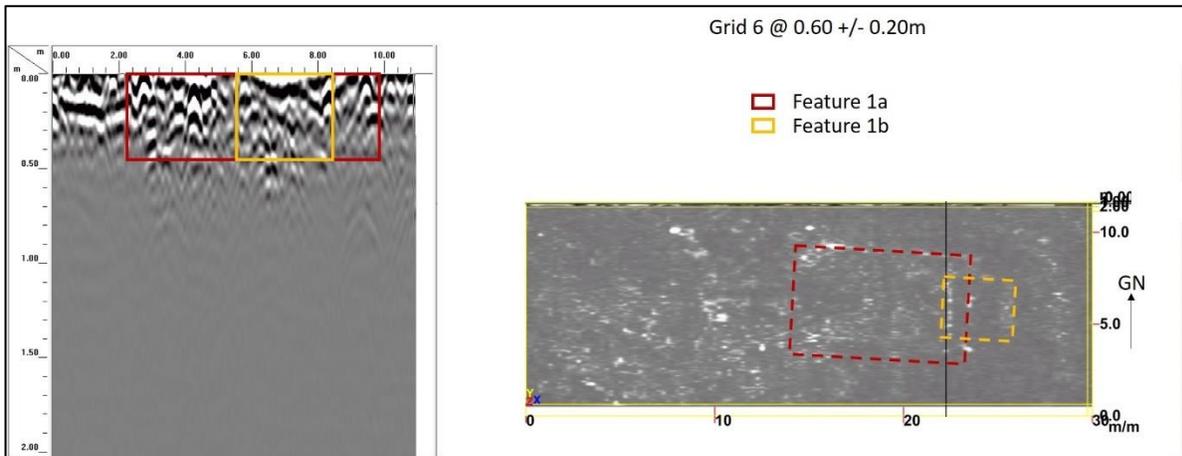


Figure 17. Interpreted 2D depth map and radargram of geophysical Grid 6 showing the geophysical data and the interpretation of the data depicting Feature 1a and Feature 1b.

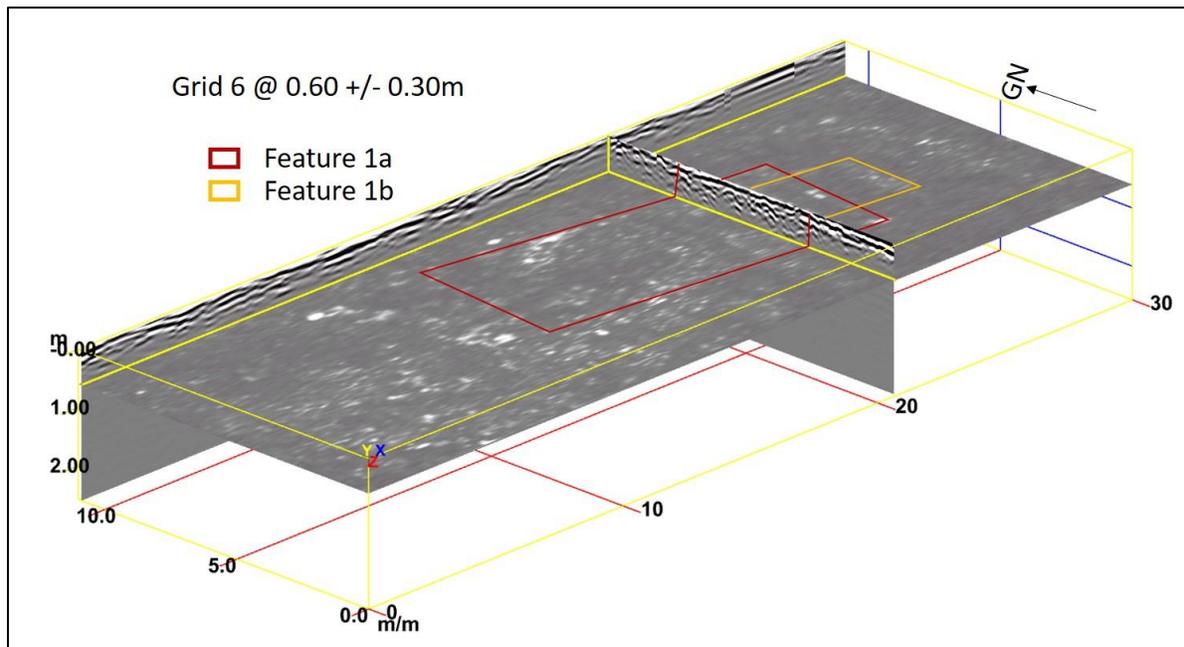


Figure 18. Interpreted 3d view of geophysical Grid 6 showing the relationship between a radargram and depth map for Feature 1a and Feature 1b.

Grid 9 is the most northwestern geophysical grid. (Figure 5 and Figure 21). The area is an open area where there are no existing gravestones. The geophysical data revealed what appears to be four potential burials within the area.

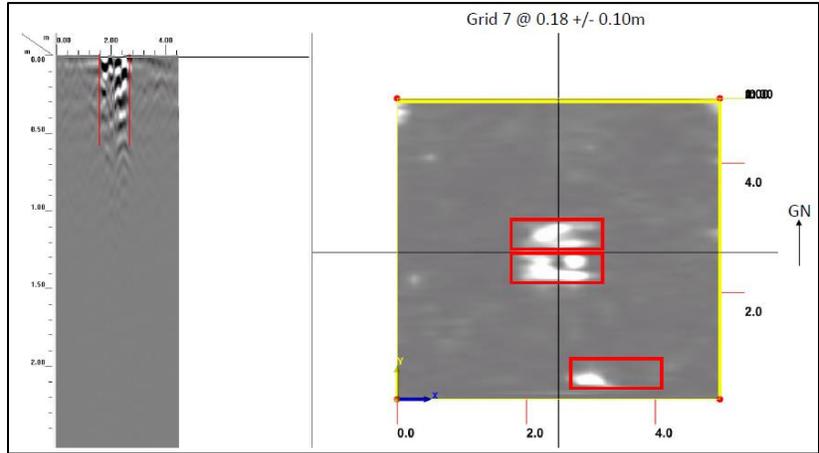


Figure 19. Interpreted 2D depth map and radargram of geophysical Grid 7 showing the geophysical data and the interpretation of the data depicting potential burials.

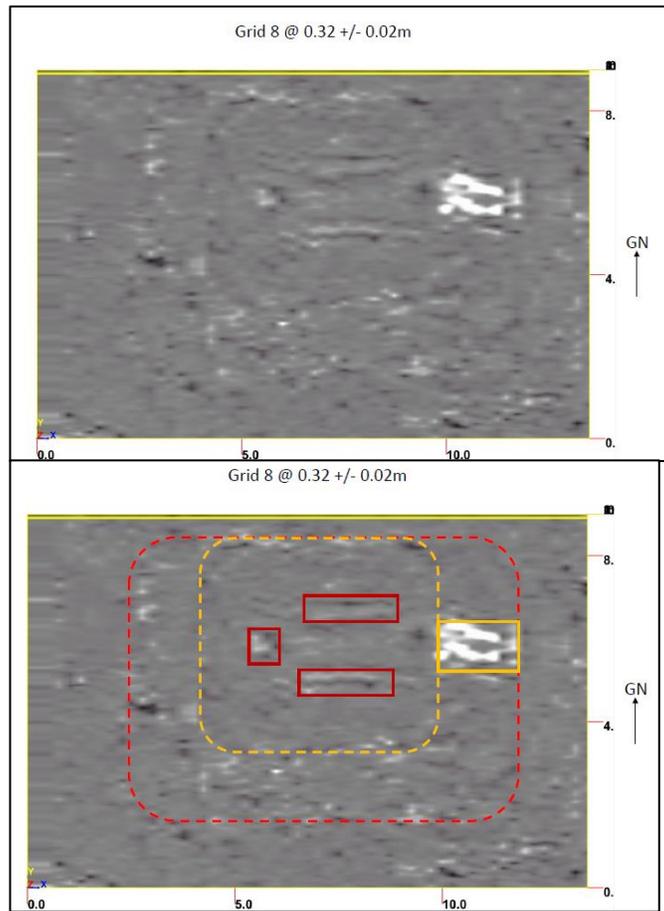


Figure 20. Original and interpreted 2D depth map geophysical Grid 8 showing the geophysical data and the interpretation of the data depicting the interpreted general morphology of the Foulkes Vault.

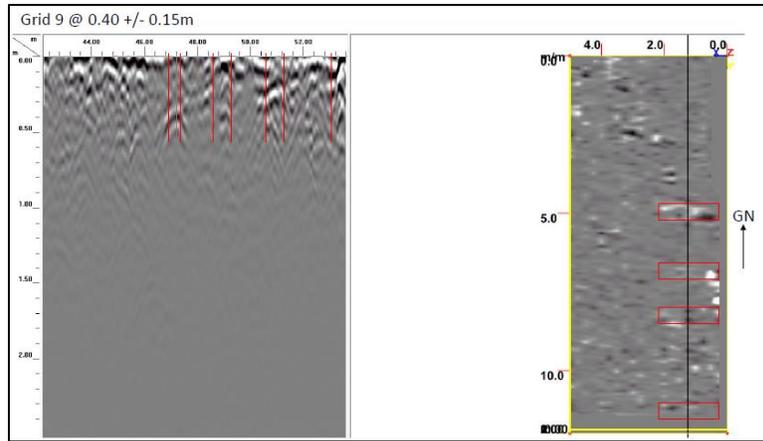


Figure 21. Interpreted 2D depth map and radargram of geophysical Grid 9 showing the geophysical data and the interpretation of the data depicting potential burials.

Grid 10 is located in the west-central portion of the burial ground (Figure 5 and Figure 22). The area is an open area where there are no existing gravestones. The geophysical data revealed what appears to be eight potential burials within the grid.

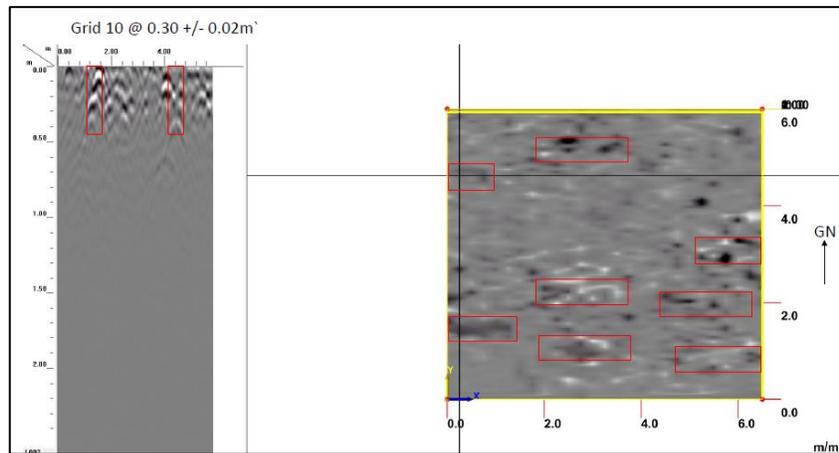


Figure 22. Interpreted 2D depth map and radargram of geophysical Grid 10 showing the geophysical data and the interpretation of the data depicting eight potential burials.

6.0 CONCLUSIONS

The focus of this survey was to identify the potential for unmarked burials and archeological features within ten discontinuous geophysical grids within the Piscatawaytown Burial Ground in Edison, New Jersey. Based on the examination of the Ground Penetrating Radar (GPR) radargrams, and depth (time) slice data from the ten geophysical grids, six (6) potential archaeological features have been identified. The interpreted archeological features include two (2) potential structures, one (1) potential feature with two (2) parallel linear walls, one (1) oblong potential pit, one interpreted drainage swale, and two (2) potential features of unknown origin. Within Grid 1, the survey revealed 98 potential burials. Other potential burials were identified in Grid 3, Grid 4, Grid 7, Grid 9, and Grid 10. The survey of Grid 8 revealed that the Foulkes Vault has an intact open space and entry. The survey of Grid also revealed that there are at least three structural features or coffins within Foulkes Vault.

In conclusion, the geophysical survey of Piscatawaytown Burial Ground did reveal, based on the size, orientation, and spatial relationship between the interpreted anomalies, potential burials within Grid 1, the “Colored Burial Ground. Within Grid 6, there is the archaeological potential for features related to one composite or two individual structures that intersect each other. There was no geophysical evidence within the geophysical data to suggest definitively that there is a structure in Grid 3 and Grid 4, the suggested location of a meeting house. The only grids that did not exhibit evidence for potential graves were Grid 2, Grid 5, and Grid 6. Only ground truthing the identified geophysical anomalies interpreted as archaeological features and potential burials will provide resolution on what these interpreted features truly represent temporally and culturally.

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