Delaware Division of Historical and Cultural Affairs
State Historic Preservation Office
21 The Green
Dover, DE 19901
302-736-7400
302-739-5660 (fax)

Archaeological Survey Report Form

(For use when NO archaeological sites were identified; see *Guidelines and Instructions*.)

1. Report title: Phase I Archaeological Identification Survey for State Bridge 503, St. Anne's Church Road over the Norfolk Southern Railroad; Appoquinimink Hundred, New Castle County, Delaware

2. Date: 10/13/2008

3. Author(s): Robert H. Eiswert

4. Consulting firm name and address: McCormick Taylor, Inc. 200 Continental Drive Newark, DE 19713

5. Client agency: Delaware Department of Transportation

LOCATION

6. County (check as many as apply): ☒ **New Castle** ☐ **Kent** ☐ **Sussex**

7. Nearest town(s): Middletown, DE

8. Physiographic and geographic zone(s): High Coastal Plain Section of the Atlantic Coastal Plain Physiographic Province

PROJECT DESCRIPTION

9. Dates of fieldwork: July 9-21, 2008

10. Size of area covered: unit used: ☒ **acres** ☐ **hectares**
project area: 4.43 **surveyed area**: 4.43

11. Project description (describe location and nature of project): The State Bridge 503 over the Norfolk Southern Railroad project involves the replacement of the existing three span, plate girder bridge on a new alignment to the north of its existing position. In addition, the stormwater

retention basin in the southeast quadrant of the bridge will be upgraded and a construction staging area in the northwestern quadrant of the bridge is proposed; both of these areas were included as part of the archaeological area of potential effects (APE). The APE extends a maximum of approximately 1400 feet to the west, 900 feet to the east, 225 feet to the north and 350 feet to the south of the existing bridge. The APE includes both upland landforms and the T1 terrace of Deep Creek. Deep Creek is located approximately 500 feet north of the existing bridge (outside of the APE). The landforms in the northwest quadrant included an upland agricultural field and the disturbed Middletown landfill; the southwest quadrant contained an agricultural field and lawns; the northeast quadrant contained an upland lawn and the T1 terrace of Deep Creek; the southeast quadrant contained lawns that exhibited disturbances associated with the construction of a modern subdivision and its associated infrastructure. Soils within the project area include Matapeake silt loam, 2-5% slopes (MeB2) on the uplands and Fallsington loam (Fs) on the alluvial settings.

RESEARCH DESIGN

12. **Survey objectives:** The objective of the survey was to identify all archaeological sites that may exist within the APE.

13. **Survey methods (describe both field and background research methods):** Prior to the archaeological fieldwork, background research was undertaken to assess the potential for findings sites. This involved the review of site data obtained at the Delaware SHPO, historic maps obtained at the Delaware Public Archives, aerial photographs provided by DelDOT, and published works and CRM reports relevant to archaeological site locations. A geomorphological evaluation of the State Bridge 503 APE was also undertaken to provide data regarding archaeological potential. Based on the results of this research, prehistoric archaeological potential was considered high, therefore the State Bridge 503 APE was investigated through the excavation of STPs at a 15 meter interval or TUs at a 30 meter interval. (Ground surface visibility was low due to the presence of corn or hay in the agricultural fields and the forested nature of the Deep Creek T1 terrace.) Areas exhibiting modern disturbances were not subjected to subsurface archaeological investigations. All of these tests were hand excavated by natural stratigraphy. The STPs measured 0.57 meter in diameter. Arbitrary 0.10 meter (0.3 foot) levels were employed in the TUs excavated within the APE for greater control of stratigraphic contexts and artifact distribution. All of the excavated soils were screened through ¼ inch hardware cloth. All subsurface excavations extended to at least 0.10 meters (0.3 feet) into the sterile subsoil. Radial STPs were placed at 5 meter intervals around shovel tests containing prehistoric artifacts.

14. **Expected site types for this area (cite earlier surveys & known nearby resources, information from historic maps or research):** Examination of the Delaware SHPO's archaeological site maps indicated that no archaeological sites are recorded within or adjacent to the APE for the State Bridge 503 APE. The nearest recorded archaeological sites in the vicinity of the APE are 7NC-F-32 and 7NC-F-33. These sites are located between 0.8 and 1.3 kilometers (0.5 and 0.8 miles) east of the State Bridge 503 APE on lower slope settings within 100 meters (328 Feet) of Deep Creek, a third-order tributary of the Appoquinimink River.

Although both sites produced Native American artifacts, temporally diagnostic artifacts were not recovered. In order to assess the likelihood that a Native American site would be located within the APE, data on 21 archaeological sites mapped in the Appoquinimink drainage on the Middletown U.S.G.S. quadrangle was examined. This sample includes 17 Native American sites which were all identified through surface collection. The temporal affiliation of most of these sites is unknown (N=11). For the remaining six sites, Woodland I occupations are known for two, unspecified Woodland period occupations are known for three, and Archaic occupations are known for one. In terms of site setting with respect to permanent streams, 10 of the 17 sites are located within 100 to 300 meters (328 to 984 feet) of first-order Appoquinimink River tributaries. Landscape settings for these 10 sites include lower and middle slopes (N=6) and interfluvial flats overlooking these tributary streams. A portion of the State Bridge 503 APE is located on the floodplain of a first order segment of Deep Creek. Although none of the 17 archaeological sites examined appear to be located on floodplains, regional models of site location suggest these landforms were favored Native American settlement areas if they were well drained. In terms of previous predictive models for Native American site locations, the APE is mapped in an area of high site probability in Custer et al. (1984). Based on LANDSAT imaging, this predictive model assigned higher probability values to areas of well drained soils adjacent to 1) poorly drained soils (i.e. wetlands, bay/basin features), and 2) permanent water sources. A more recent GIS-based predictive model (Baublitz et al. 2006) utilized many of the same criteria. Highest probability weighting was assigned to areas with 150 meters (492 feet) of a permanent stream, areas within 100 meters (328 feet) of a springhead, areas within 100 meters (328 feet) of a confluence, and areas within 100 meters (328 feet) of a wetland. Although the APE would not receive the highest probability ratings within Baublitz et al's model, it should be noted that this model has not been thoroughly evaluated through field testing. The background research regarding the potential for locating historic archaeological resources focused on the history and development of the project area. Review of the 1849 Ray and Price map of Appoquinimink Hundred, the 1868 Beers maps of Appoquinimink Hundred, and the 1931 Smyrna, Delaware USGS Quadrangle indicate that no historic buildings lie within the APE. The landform between the existing St. Anne's Church and the project APE currently contains a cemetery that is located within the original 10 acre tract of land that was granted to the St. Anne's Episcopal Church in 1704 (Scharf 1888: 1020). According to the original deed in possession of St. Anne's Church, the vacant parcel of land which lies between the existing cemetery and the project APE was acquired by the church from the Delaware Railroad Company in 1919. For this reason it is unlikely that unmarked graves lie within the archaeological APE, although the sensitivity of locating historic archaeological resources in the northeast quadrant is heightened due to the presence of the cemetery and the long standing presence of the church.

RESULTS and RECOMMENDATIONS

15. Fieldwork (describe survey; add maps as needed): A total of 98 STPs and two 1x1 meter units were excavated within the State Bridge 503 APE. Areas exhibiting modern disturbances were not subjected to subsurface archaeological investigations (see attachment C). The northwestern quadrant of the APE was planted in corn at the time of the Phase I survey. Shovel tests 1-49, 42A, 42B, 42C and TUs 1 and 2 were excavated

in this area. The profiles for STPs 1-49 and TU 2 consisted of a yellowish brown (10YR 5/4) sandy silt loam plowzone overtop a gravelly light yellowish brown (10YR 6/4) sand loam C horizon. The profile for TU 1 exhibited an initial yellowish brown (10YR 5/4) plowzone which was underlain by a 0.47 meter thick silt loam Bw horizon and relict lateral accretion deposits, respectively. Shovel tests 51-65 were excavated in the northeastern quadrant of the APE on the T1 terrace of Deep Creek. This landform was forested and/or covered in thick brush at the time of the Phase I survey. Pedestrian reconnaissance of this landform during the geomorphological evaluation revealed that the ground surface of the T1 terrace is flood scoured. This is evidenced by the presence of a number of deep swales that cut through the terrace, especially in proximity to Deep Creek. The swales are bounded by higher, preserved portions of the terrace. Shovel testing on the T1 terrace investigated both the swales (STPs 53 and 54) and the higher preserved ridges (STPs 51-52 and 55-65) of the T1 terrace. Shovel test 57 is representative of the tests excavated on the preserved ridges. It contained an initial brown (10YR 4/3) silt loam A horizon that was 0.06 meter (0.2 foot) in thickness that, in turn, overlaid the 0.26 meter (0.85 foot) thick dark yellowish brown (10YR 4/6) silty sand Bw horizon and the brownish yellow (10YR 6/8) gravel laden lateral accretion deposits, respectively. Shovel test 54 is representative of the STPs excavated within the swales. It revealed a thick (0.27 meter [0.89 foot] in depth) very dark grayish brown (10YR 3/2) cobble laden A horizon that rested on the yellow (10YR 7/8) sand subsoil. Shovel tests 66-71 were excavated within the lawn to the southwest of the St. Anne's Church Cemetery. This set of STPs revealed a profile consisting of a relatively thin A horizon (0.10 meter [0.32 foot] in average thickness) overtop the brownish yellow (10YR 6/6) silty sand C horizon. Shovel tests 72 - 95 were excavated in the southwest quadrant of the APE. Shovel tests 72-78 fell in the front yard of residential properties and STPs 79-95 were excavated on the northern edge of a recently harvested hay field. This set of STPs exhibited a dark yellowish brown (10YR 4/4) to yellowish brown (10YR 5/4) silt loam Ap horizon overtop the gravelly light yellowish brown (10YR 6/4) to brownish yellow (10YR 6/6) sand loam C horizon.

16. **Artifacts (describe any found; identify location; explain why determined not to be a site):** A total of 824 historic artifacts and one prehistoric artifact were recovered from the State Bridge 503 APE. A total of 369 artifacts were recovered from the STPs excavated in the northwest quadrant. All of these artifacts were recovered from the Ap horizon (Stratum I). The vast majority (91%) of these finds consisted of either modern or unidentifiable bottle glass (n=246), coal (n= 69), or slag (n=20). Obviously modern artifacts such as plastic (n=1), Styrofoam (n=3), and aluminum can fragments (n=2) were also bagged. A light scatter of nineteenth century domestic artifacts was recovered. These included one piece of pearlware and one piece of whiteware in STP 1; one piece of whiteware in STP 2; five fragments of oyster shell in STP 7; one piece of whiteware in STP 9; one piece of whiteware in STP 36; and one piece of whiteware in STP 40. Architectural items included four pieces of brick in STP 2; two pieces of window glass and one piece of brick in STP 4; two pieces of brick in STP 7; one cut nail in STP 8; one piece brick and one piece of window glass in STP 9; one piece of brick and two pieces of window glass in STP 11; and one piece of brick in STP 40. All of the artifacts in TUs 1 and 2 were recovered from the Ap horizon as well. A total of 30 artifacts were recovered TU 1; these included 18 coal fragments, seven pieces of slag and five pieces of modern bottle glass. Test Unit 2 contained 12 pieces of coal, one piece of bottle glass, and one sherd of whiteware. The majority of the historic artifacts recovered in the northwest quadrant were manufactured in the

twentieth century. In addition, the artifacts attributable to the nineteenth century were low in density and not associated with any historic resources or features. Therefore, the recovered historic artifacts were interpreted as either random twentieth century discard or as historic field scatter and were not considered to constitute an archaeological site. Just one prehistoric artifact was recovered in the northwest quadrant. This was an untyped incomplete/broken straight stemmed jasper projectile point found in STP 42. Due to the recovery of the projectile point, STP 42 was then bracketed with STPs spaced at 5 meter (~16.4 foot) intervals to the west (STP 42A), to the north (STP 42B), and to the east (STP 42 C). (No radial STP was excavated to the south due to St. Anne's Church Road.) No additional prehistoric artifacts were recovered from the radial shovel tests, therefore the projectile point was considered an isolated find, and did not constitute an archaeological site. In the northeast quadrant, the artifacts recovered from the T1 terrace included two pieces of coal, one piece of slag, and one piece of window glass from Stratum I and one piece of redware and two railroad spikes from Stratum II in STP 50; 15 pieces of slag, five pieces of colorless glass, and two pieces of coal from Stratum I in STP 51; four pieces of charcoal, one piece of coal, and one piece of slag from Stratum I in STP 52; three pieces of coal, two pieces of brick, one chunk of mortar, one piece of slag, and one piece of colorless bottle glass from Stratum I in STP 54; 58 pieces of brick and eight pieces of coal from Stratum II in STP 55; 13 pieces of coal and nine pieces of slag from Stratum II in STP 56; two pieces of coal from Stratum II in STP 57; eight pieces of coal, seven pieces of brick, and one chunk of mortar from Stratum II in STP 58; 11 pieces of coal, six pieces of charcoal, three pieces of brick, and two pieces of slag from Stratum I in STP 59; and 17 pieces of bottle glass from Stratum II in STP 62. Due to the lack of known historic resources in this area, these finds were interpreted as being associated with the adjacent railroad, the Middletown dump, or random discard; therefore the artifacts recovered from this portion of the APE were not considered to constitute an archaeological site. Shovel tests 66-71 were excavated with the lawn to the southwest of the St. Anne's Church Cemetery. All of the artifacts were recovered from the A horizon. These included four pieces of bottle glass and three pieces of coal from STP 66; three brick fragments and two pieces of bottle glass from STP 69; and three pieces of bottle glass from STP 69. Because the recovered artifacts appear to represent random discard, they were not considered to constitute an archaeological site. A total of 211 artifacts were recovered from the southwest quadrant. Aside from one piece of whiteware in STP 78, one piece of whiteware and one piece redware in STP 94, and three pieces of whiteware and a pipe bowl fragment found in STP 95, the recovered artifacts dated mostly to the twentieth century and consisted primarily consisted of bottle glass (n=186). Other artifacts included coal, bottle caps, brick, window glass, a rubber ring, and beer cans. Because the nineteenth century artifacts recovered in the southwest quadrant were low in density and not associated with any historic resources or features, they were interpreted as historic field scatter and were not considered to constitute an archaeological site.

17. **Recommendations:** No archaeological sites were identified within the State Bridge 503 over the Norfolk Southern Railroad APE, therefore no additional archaeological investigations are recommended for the project. McCormick Taylor, Inc. recommends that the jasper projectile point, nineteenth century ceramics, and a 5% sample of the brick be retained for curation. Based on consultation with the Delaware SHPO and DelDOT, it was determined that the mortar, nails, window glass, lighting and tumbler glass, and a sample of indeterminate vessel glass should be submitted with the collection as well.

ATTACHMENTS

18. Attachments checklist:

- **a. ☒ bibliography**
- **b. ☒ location map (USGS or equivalent)**
- **c. ☒ detailed map(s) (project plans and/or field survey map)**
- **d. ☒ historic map(s) (list)** 1849 Rhea & Price; 1868 Pomeroy and Beers; 1931 Smyrna, DE USGS Quadrangle
- **e. ☒ photographs of general project/surveyed area**
- **f. ☒ table of collection units and/or excavated tests**
- **g. ☒ soils map(s)**

Others (list, if any): Attachment h. Geomorphological Evaluation; Appendix i. Tetra Tech's Summary of Test Pit Investigations; Attachment j. artifact inventory

Attachment A

Bibliography

V. References

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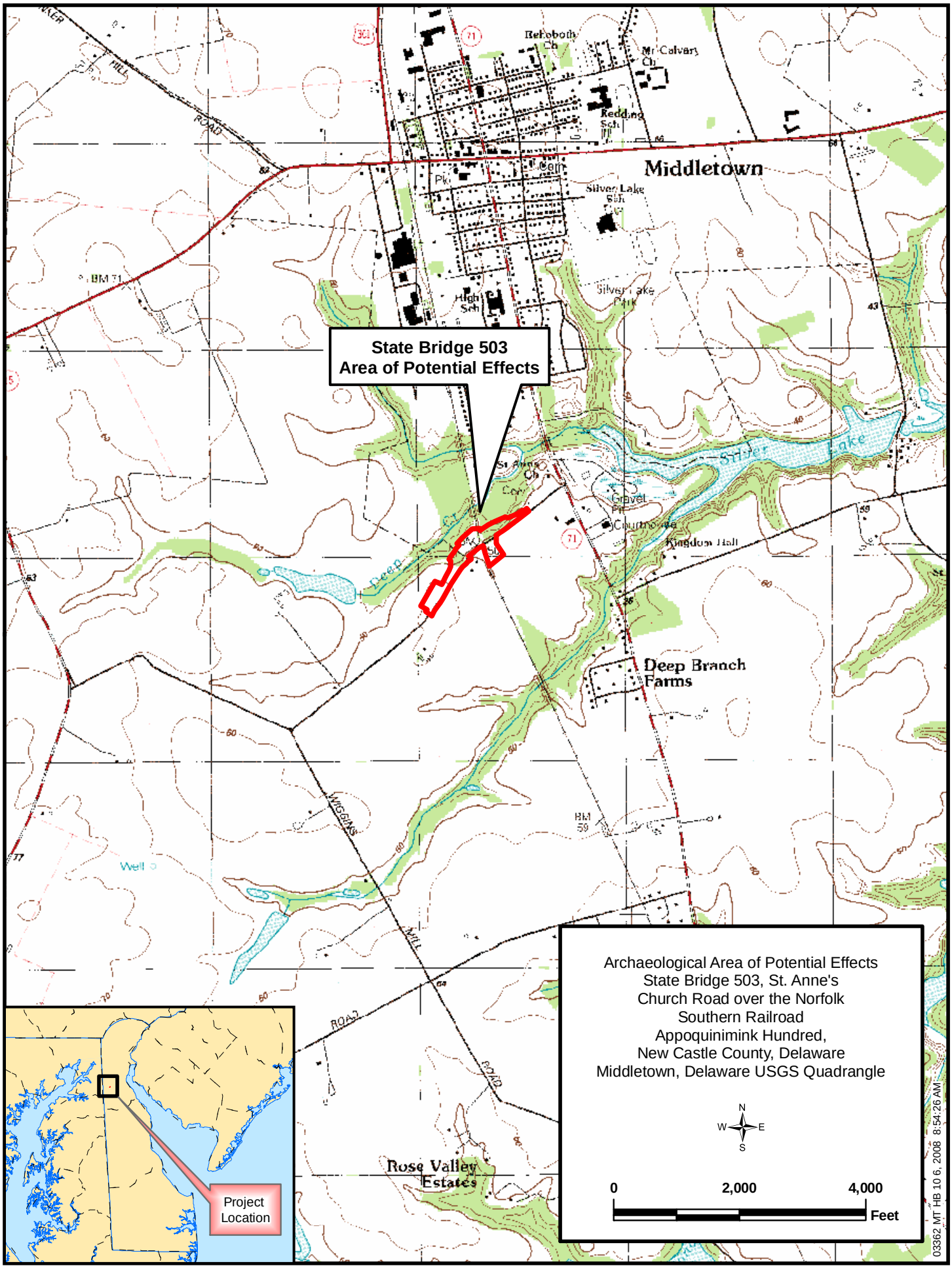
Attachment B

Location Map


State Bridge 503
Area of Potential Effects
Middletown
Deep Branch
Farms
Rose Valley
Estates
Project
Location
Archaeological Area of Potential Effects
State Bridge 503, St. Anne's
Church Road over the Norfolk
Southern Railroad
Appoquinimink Hundred,
New Castle County, Delaware
Middletown, Delaware USGS Quadrangle
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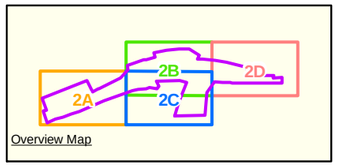
Attachment C

Detailed Survey Maps

Geomorphological Auger Boring Location
STPs Not Containing Artifacts
STPs Containing Artifacts
Test Unit Location
Archaeological Area of Potential Effects
Landform Exhibiting Disturbance or Slopes in Excess of 15%



Overview Map

Auger Probe 3
Auger Probe 4
Auger Probe 5
TU 1
TU 2
Existing St. Anne's Church Road

Area of Potential Effects and Phase I Test Locations for the State Bridge 503 over the Norfolk Southern Railroad Appoquinimink Hundred, New Castle County, Delaware

0 10 20 30 40 50 100 Feet

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Area of Potential Effects and
Phase I Test Locations for
the State Bridge 503 over
the Norfolk Southern Railroad
Appoquinimink Hundred,
New Castle County, Delaware

0 10 20 30 40 50 100
Feet

Geomorphological Auger Boring Location
STPs Not Containing Artifacts
STPs Containing Artifacts
Test Unit Location
Archaeological Area of Potential Effects
Landform Exhibiting Disturbance
or Slopes in Excess of 15%

Auger Probe 6
51
53
55
50
52
54
Existing St. Anne's Church Road
72
74
73
75
76
77
78
1

Overview Map
2A
2B
2C
2D

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Existing St. Anne's Church Road

Auger Probe 3

U 1

72

73

74

75

76

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78

Area of Potential Effects and
Phase I Test Locations for
the State Bridge 503 over
the Norfolk Southern Railroad
Appoquinimink Hundred,
New Castle County, Delaware

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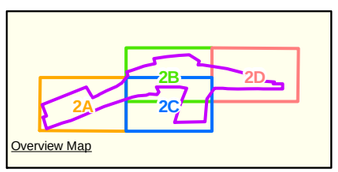

Overview Map

Geomorphological Auger Boring Location

STPs Not Containing Artifacts

STPs Containing Artifacts

Test Unit Location

Archaeological Area of Potential Effects

Landform Exhibiting Disturbance
or Slopes in Excess of 15%

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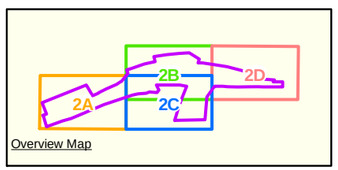
Geomorphological Auger Boring Location
STPs Not Containing Artifacts
STPs Containing Artifacts
Test Unit Location
Archaeological Area of Potential Effects
Landform Exhibiting Disturbance or Slopes in Excess of 15%

57
59
61
63
56
Auger Probe 2
60
64
58
62
65
67
Auger Probe 1
69
66
68
70
71
Existing St. Anne's Church Road



Overview Map

Area of Potential Effects and
Phase I Test Locations for
the State Bridge 503 over
the Norfolk Southern Railroad
Appoquinimink Hundred,
New Castle County, Delaware

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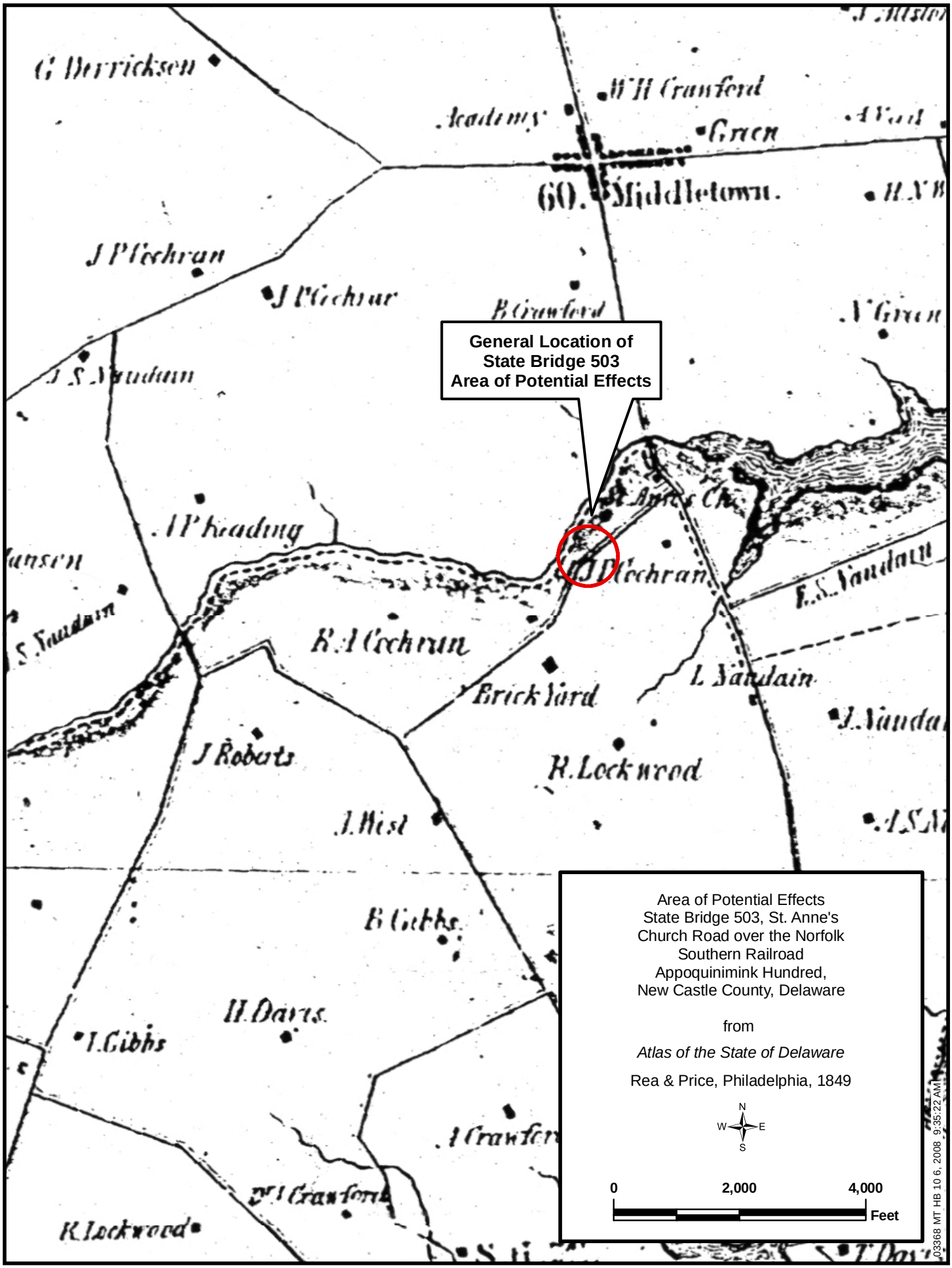
Attachment D

Historic Maps


General Location of
State Bridge 503
Area of Potential Effects
Area of Potential Effects
State Bridge 503, St. Anne's
Church Road over the Norfolk
Southern Railroad
Appoquinimink Hundred,
New Castle County, Delaware
from
Atlas of the State of Delaware
Rea & Price, Philadelphia, 1849
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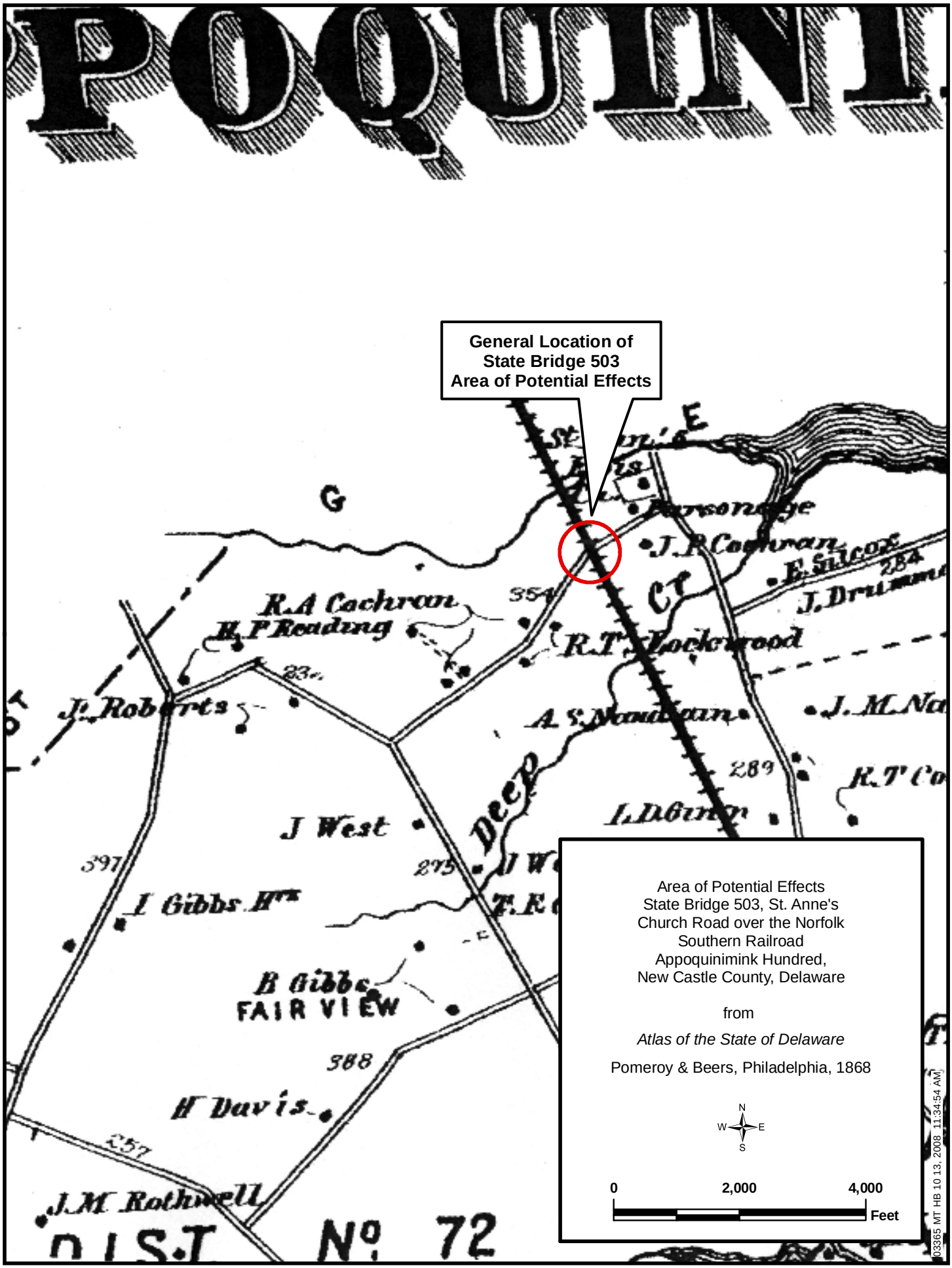
POQUINI
General Location of
State Bridge 503
Area of Potential Effects
Parsonage
J.R.Cochran
E.Silcox
284
J.Drumm
R.A Cochran
H.P Reading
354
R.T. Lockwood
J. Roberts
A.S. Houghan
J.M.Na
289
R.T Co
Deep
J West
L.D.Gunn
397
275
I Gibbs Hrs
B Gibbs
FAIR VIEW
388
H Davis
257
J.M. Rothwell
DIST
No 72
Area of Potential Effects
State Bridge 503, St. Anne's
Church Road over the Norfolk
Southern Railroad
Appoquinimink Hundred,
New Castle County, Delaware
from
Atlas of the State of Delaware
Pomeroy & Beers, Philadelphia, 1868
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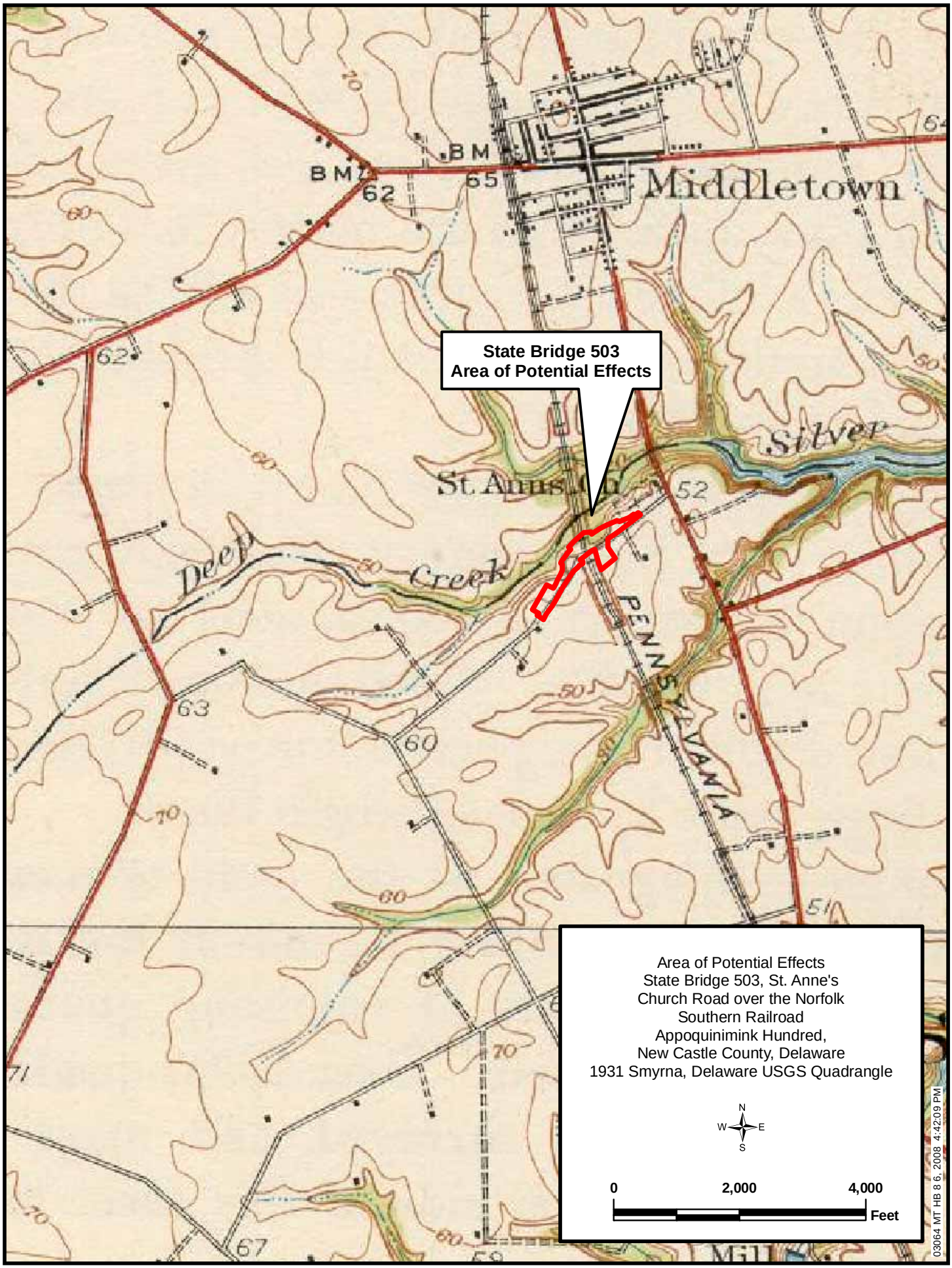
State Bridge 503
Area of Potential Effects
Middletown
Silver
Deep
Creek
PENNSYLVANIA
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BM
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65
63
60
70
67
52
51
Area of Potential Effects
State Bridge 503, St. Anne's
Church Road over the Norfolk
Southern Railroad
Appoquinimink Hundred,
New Castle County, Delaware
1931 Smyrna, Delaware USGS Quadrangle
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Attachment E

Photographs of the Project Area

Photograph 1: Lawn west of the St. Anne's Church Cemetery in the northeast quadrant, facing northeast.

Photograph 2: T1 floodplain in the northeast quadrant, facing north.

Photograph 3: Disturbance associated with the Cricklewood Subdivision in the southeast quadrant, facing west.

Photograph 4: Disturbance associated with the storm water management pond in the southeast quadrant, facing east.

Photograph 5: Natural gas testing station in the southeast quadrant, facing south.

Photograph 6: Landfill in the northwest quadrant, facing northwest.

Photograph 7: Landfill in the northwest quadrant, facing northwest.

Photograph 8: Agricultural field in the northwest quadrant, facing west.

Photograph 9: Lawns in the southwest quadrant, facing northeast.

Photograph 10: Agricultural field in the southwest quadrant, facing southwest.

Attachment F

Table Summarizing Testing Results

Attachment F: Table of Collection Units and Excavated Tests

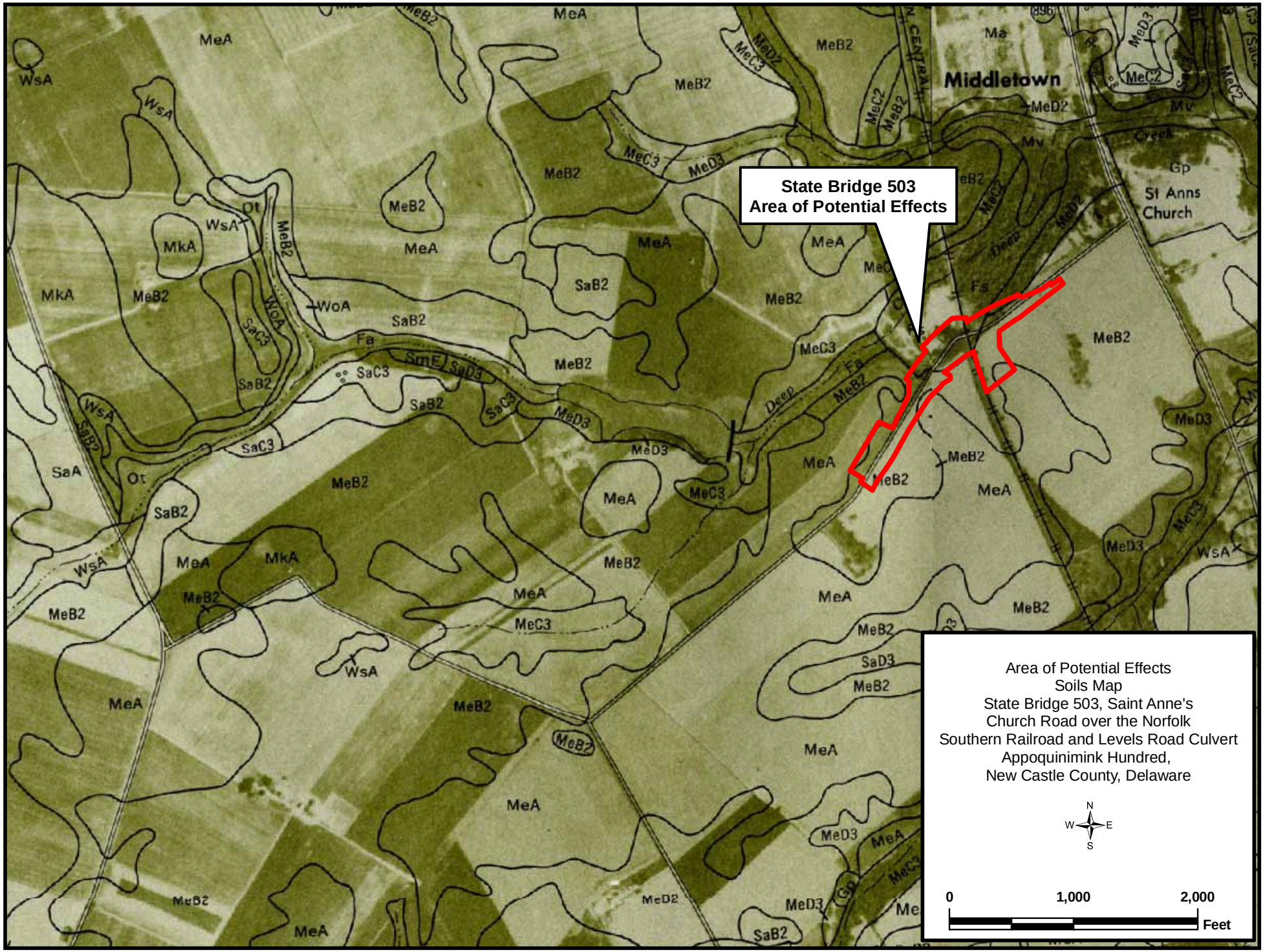
Project: Phase I Archaeological Identification Survey for the State Bridge 503, St. Anne's Church Road over the Norfolk Southern Railroad Project; Appoquinimink Hundred, New Castle County, Delaware

Survey Unit/Test Type*	Testing Interval	Representative Unit/Test	Representing Units/Tests	Data
STP	15 meter	STP 1	STPs 1-49, 42A, 42B, 42C, TU 2	10YR 5/4 sandy silt loam Ap; depth 0-0.33 meter bgs 10YR 6/4 sand loam C; depth 0.33-0.43 meter bgs
STP	15 meter	STP 85	STPs 66-71, 79-95	10YR 5/4 silt loam Ap; depth 0-0.29 meter 10YR 6/6 sandy loam C; depth 0.29-0.39 meter bgs
STP	15 meter	STP 54	STPs 53, 54	10YR 3/2 silt loam cobble laden A; depth 0-0.27 meter bgs 10YR 7/8 sand C; depth 0.27-0.37 meter bgs
STP	15 meter	STP 57	STPs 51, 52, 55-65	10 YR 4/3 silt loam A; depth 0-0.06 meter bgs 10 YR 4/6 silty sand Bw; depth 0.06-0.32 meter bgs 10 YR 6/8 gravel laden lateral accretion deposits; depth 0.32-0.42 meter bgs
TU	30 meter	TU 1	TU 1	10YR 5/4 silt loam Ap; depth 0-0.34 meter bgs 5YR 5/6 silt loam Bw; depth 0.34-0.81 meter bgs 10YR 5/8 cobbly sand lateral accretion deposits; depths 0.81-0.91 meter bgs

*Controlled Surface Collection (CSC), Shovel Test Pit (STP), Test Unit (TU), Mechanical Strip (MS), Backhoe Trench (BT), Below Ground Surface (bgs)

Attachment G

Soils Map


State Bridge 503
Area of Potential Effects
Middletown
St Anns
Church
Area of Potential Effects
Soils Map
State Bridge 503, Saint Anne's
Church Road over the Norfolk
Southern Railroad and Levels Road Culvert
Appoquinimink Hundred,
New Castle County, Delaware
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Attachment H

Geomorphological Evaluation

Geomorphological Investigations at the Proposed St. Annes Church Road and Bridge Renovation and Relocation Project, New Castle County, Delaware

Prepared by

Dr. Frank J. Vento (PG-001831-G) and Ms. Patty Stahlman, B.S., M.S.

Clarion University of Pennsylvania

Clarion, Pennsylvania 16214

Submitted to

McCormick-Taylor, Inc.

May 19, 2008

TABLE OF CONTENTS

LIST OF FIGURES

1.0 INTRODUCTION

1.1 General

This study involved a geological/geomorphological examination of the proposed DelDOT 1-503 St. Annes Church Road and Bridge Renovation and Relocation Project, New Castle County, Delaware. Geoarchaeological investigations were completed under the direction of Dr. Frank J. Vento, PG-001831-G, Clarion University of Pennsylvania, Clarion, Pa. 16214, subconsultant for McCormick-Taylor, Inc.

1.2 Location and Description of Project Area

The St. Annes Church Road and Bridge Renovation and Relocation Project is situated in the town of Middletown, Delaware (Figure 1). The project entails realignment of the existing road to the northwest and construction of a new bridge to the north of the existing span. The principal landforms within the project area include the valley bottom of Deep Creek and a rolling upland surface capped by Pleistocene age sands and gravels of the Columbia Formation. Locally, the Columbia Formation is disconformably underlain by glauconitic sands of the Paleocene Age. Elevations within the project area range from 18.3 m (60 ft) just west of the cemetery along St. Annes Church Road to approximately 3 m (10 ft) above sea level along the thalweg of Deep Creek.

Deep Creek proper, the principal drainage line within the project area, flows due east to its confluence with Silver Creek/Lake. From its artificial impoundment just downstream from its confluence with Deep Creek, Silver Creek continues flowing east to its confluence with Delaware Bay. The gradient along Deep Creek is approximately 1.5 m (5 ft) per mile. The steep entrenched (or incised) character of Deep Creek is resultant from the low (91.4

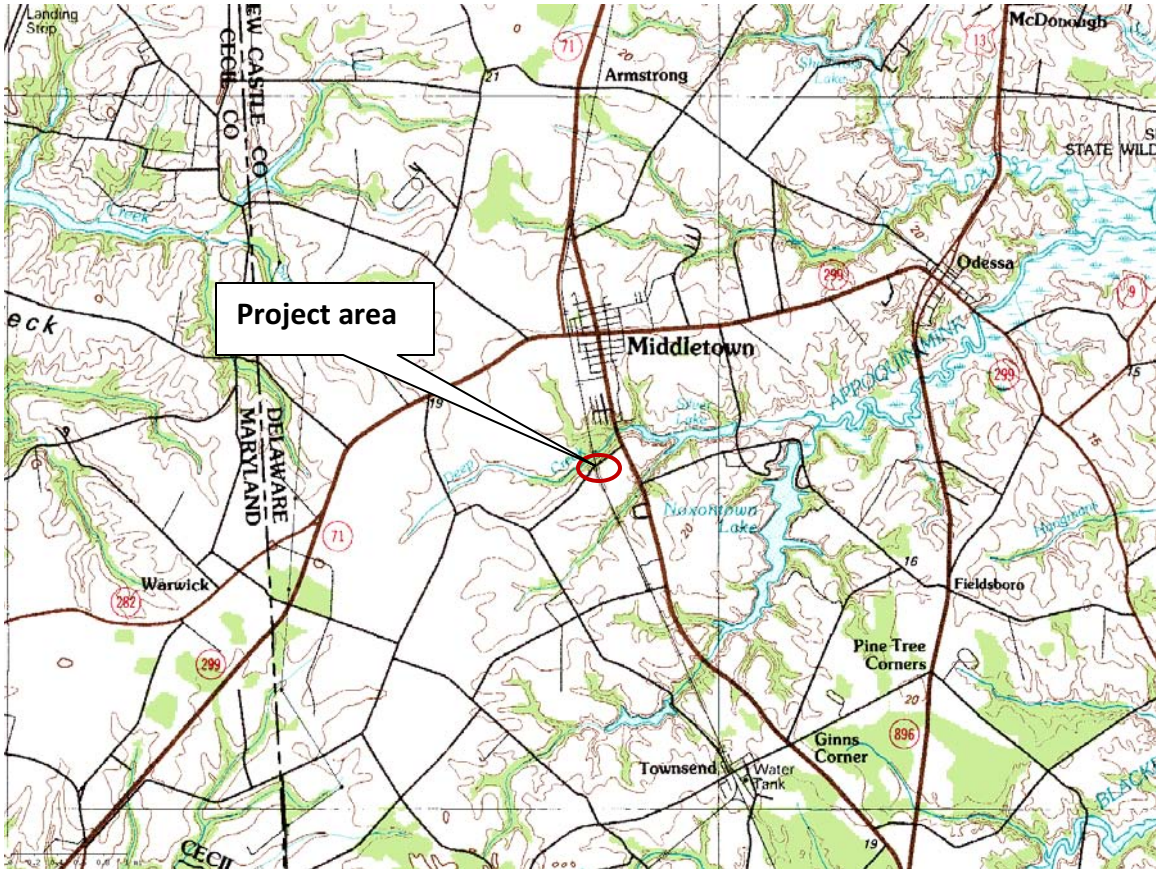


Figure 1. Map showing project area location along St. Annes Church Road and Deep Creek. (Map adapted from www.trails.com).

m/300 ft or more) late Wisconsin age sea level stand present during the Woodfordian Stade. In response to rapid sea level lowering, Deep Creek and Silver Creek responded by deeply incising their channels to keep pace with the drop in sea level. Since the initial phase of deglaciation (circa. 15,000 yrs B.P.), sea level has risen resulting in the drowning of Delaware Bay. Given the downstream control on Deep Creek and Silver Creek by Delaware Bay, these streams also stabilized their channels by approximately 6,000 yrs. B.P. This stabilization or graded condition allowed for a lower gradient, the development of a meandering channel habit, and the initiation of Holocene vertical accretion/aggradation of the valley bottom zone of Deep Creek.

1.3 Purpose of Investigation

The objectives of the geomorphology study was to: 1) identify the various landforms and associated soils present within the project area, 2) discuss sediment supply, sediment provenance (aeolian vs. fluvial) and modes of sediment transport that have operated, and are operating, within the study area, 3) determine the age(s) of the soils present on the valley bottom of Deep Creek, as well as on the flat upland surface bordering St. Anne's road, 4) identify areas of prior disturbance, if present, and 5) determine the depths to which testing should extend to ensure the recovery of any and all potentially significant cultural resources.

1.4 Scope of Investigation

This investigation was performed by Dr. Frank J. Vento, Professor, Department of Geography and Geology, Clarion University of Pennsylvania. The study included a review of both general and specific references of the bedrock geology and quaternary history of the project area. In addition, topographic maps, geologic reports, hydrologic information and aerial photographs were reviewed. Field investigations were initiated on 21 April 2008 and included a pedestrian surface reconnaissance of the study area. In addition to the pedestrian walk-over, a number of deep, 4 inch bucket auger probes were emplaced along the project area corridor (Figure 2). The objective of the auger probes was to examine the full range of soils present on the various landforms identified during the pedestrian reconnaissance. All of the auger probes were excavated into culturally sterile lithostratigraphic units of the Columbia Formation or, in the case of the valley bottom zone, into coarse grained vertical and lateral accretion deposits which have no potential to contain in situ prehistoric cultural resources.

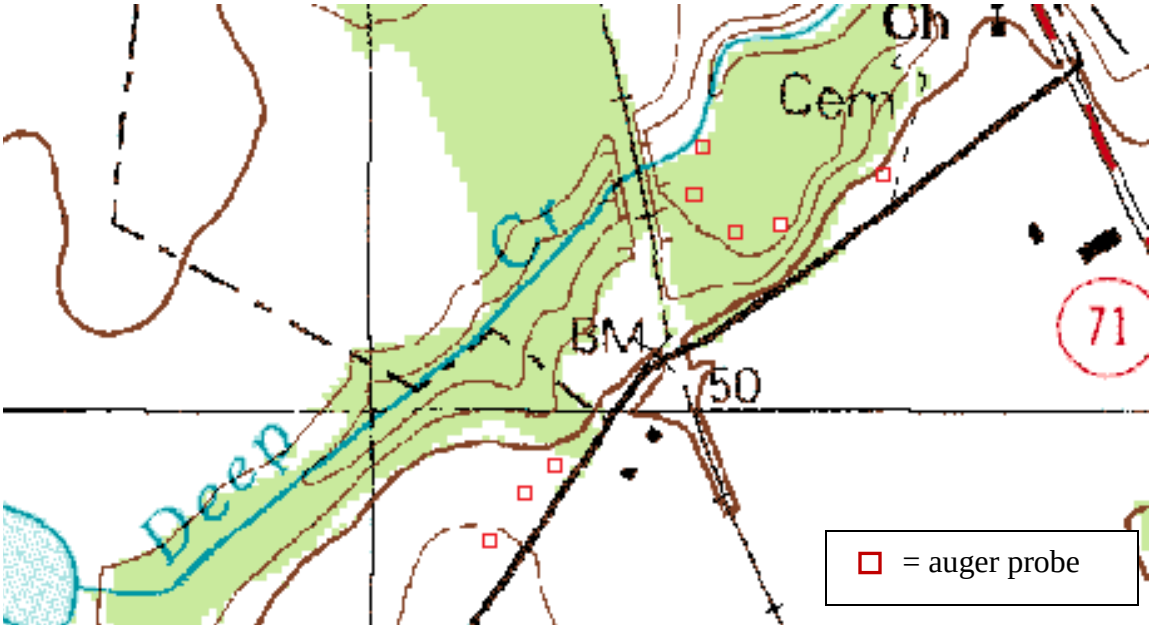


Figure 2. Note the approximate locations of auger probes emplaced throughout the project area.

2.0 PERTINENT ENVIRONMENTAL BACKGROUND INFORMATION

2.1 Physiography and Geomorphology

The St. Annes Church Road and Bridge Renovation and Relocation project area is situated in the Embayed Section (Lower Shore of Delaware) of the Atlantic Coastal Plain physiographic province. The Embayed Section extends from north of the Neuse River in North Carolina to a somewhat debatable boundary near Cape Cod, Massachusetts (Thornbury 1965), and is defined by the occurrences of submerged river valleys. From Long Island, south to the James River in Virginia, this embayment reaches inland to the Fall Line, which marks the contact of Coastal Plain sediments with older lithologies of the New England and Piedmont physiographic provinces.

Post-glacial submergence along this reach of the Atlantic Coastal Plain resulted from isostatic adjustments of the crust level due to ice-loading, concomitant with a rise in base

level due to ablation of the late Wisconsin ice sheet. The degree of submergence diminishes from north to south as evidenced by a northward decrease in the width of the Coastal Plain and the altitude of its inner edge. North of Cape Cod, the Coastal Plain is completely submerged and has become a portion of the continental shelf (Thornbury 1965:36).

2.2 Drainage and Hydrology

The drainage pattern of the Eastern Shore zone of the Embayed section is clearly dendritic, with numerous external and internal links supplying the main stem of Delaware Bay. The few streams in the region are deeply incised and exhibit valley bottom zones which are often swampy or extensively flood scoured. The extensive flood scouring observed along the valley bottom of Deep Creek is due to historic deforestation of the upland surface which promoted rapid surface runoff, high discharges, and increased sediment yields to stream in the region. In addition, there is a marked asymmetry in stream length within the region, with the east-flowing drainage lines exhibiting a distinctively longer course than those which flow in a westerly direction. This occurrence is due to the fact that the east-flowing streams follow the east/southeast dip of the geologic units in the region. Homoclinal shifting of drainage divides on the Eastern and Western Shores occurs along the down dip direction.

As noted above, Deep Creek flows eastward to its confluence with Silver Creek. The Holocene marine transgression, beginning approximately 11,000 years ago and continuing today at a rate of 2 mm per year, was responsible for the drowning of Delaware Bay and the lower reaches of Silver Creek. Until sea level stabilized around 6000 yrs. B.P., aggradation of the valley bottom of Deep Creek could not have been accomplished.

Flooding within the study area is dependent upon variations in precipitation. The highest discharges along Deep Creek occur during the late winter and early spring when there is a water surplus and lowered rates of evapotranspiration, while lowest flow volumes occur during the late summer and fall in association with decreased effective precipitation. Sea level rise during the Holocene and historic deforestation of the study area has allowed for increased surface runoff, higher sediment yields, and more frequent overbank discharges. These conditions allowed for the emplacement of a variably thick package of middle to late Holocene age, vertical-accretionary and colluvial deposits along the valley bottom and lower valley slopes of the Deep Creek. Due to the effects of historic deforestation, flooding along Deep Creek has removed much of the original middle to late Holocene age vertical accretion deposits. Presently, on the valley bottom zone, long linear erosional swales cut the terrace surface bordering Deep Creek. The terrace surface today consists of elevated erosional outliers, which still contain some of the late to middle Holocene age overbank deposits, but are then bound by deep, erosional swales comprised of coarse grained sands and gravels.

2.3 General Geology

The Coastal Plain in New Castle County is composed wholly of generally unconsolidated sedimentary deposits ranging in age from late Cretaceous to Holocene. The strike of the deposits is generally northeast-southwest with dips of typically less than several degrees to the east-southeast. Within the study area, the surficial deposits consist of more than 20 m (66 ft) of oxidized sands and gravels of the Pleistocene age Columbia Formation (Figure 3). The Columbia Formation is then underlain by a thick package of glauconitic

sands ascribable to the Hornerstown Formation of Tertiary (Paleocene/Eocene) Age. Based upon isopach thicknesses for the Columbia Formation, the Tertiary age glauconitic sands occur between 3 m and 4 m (10 ft to 13.1 ft) below the active channel of Deep Creek, and are not exposed in the project area.

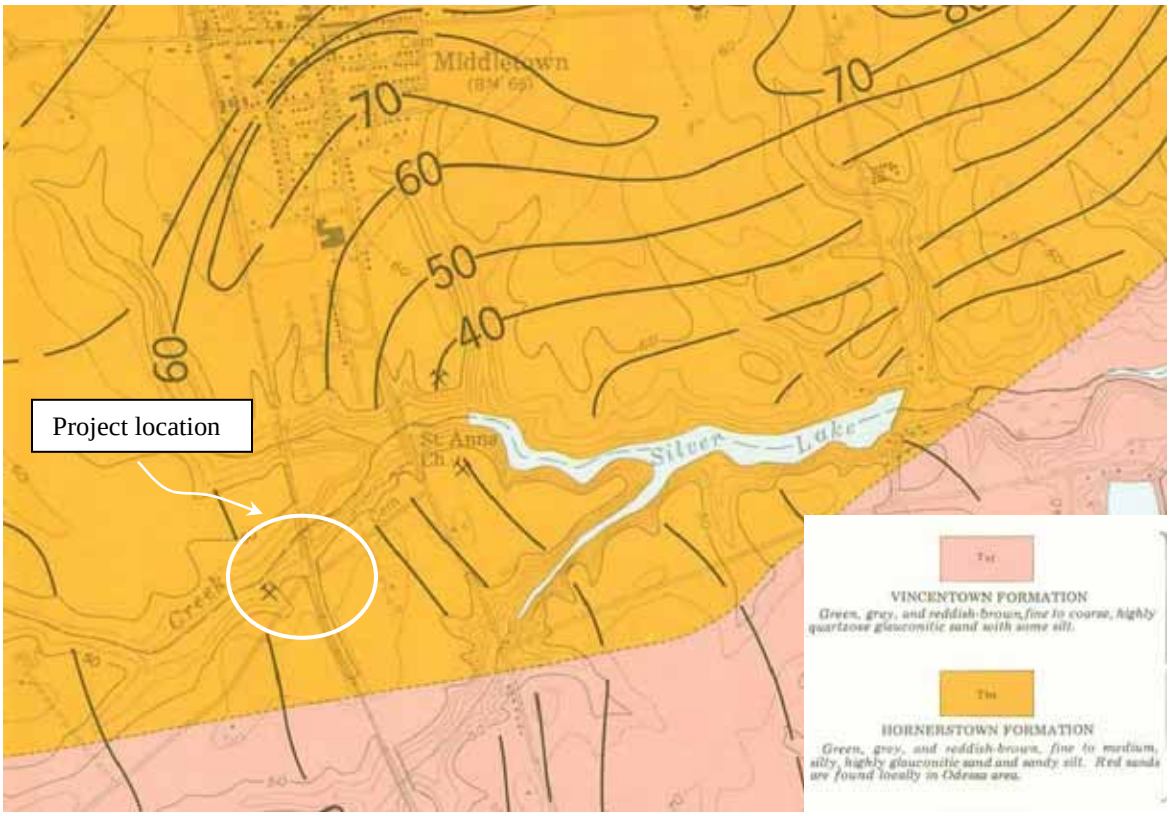


Figure 3. Geologic map of the project vicinity. Isopach thicknesses (in feet) of the overlying Pleistocene Columbia Formation are shown. (Adapted from *Geology of the Middletown-Odessa Area, Delaware*, by Pickett and Spoljarie, 1971. Delaware Geological Survey, Geologic Map Series, No. 2)

2.4 Soils

Two mapped soil units occur within the project area. These include the mixed alluvial land unit (Mv) and the Matapeake series. The mixed alluvial land soil unit occurs

along the lower reach of Deep Creek and consists of variably textured alluvium. The source of the alluvial material along the valley bottom of Deep Creek is material washed from the Pleistocene Columbia Formation. Based upon the field study, it is clear that the mixed alluvial soil unit on the valley bottom of Deep Creek is susceptible to flooding and has been frequently inundated by historic flooding.

The Matapeake soil series is classed as prime farmland. This soil is well drained. The slowest permeability within 60 inches is moderately slow. Available water capacity is very high and shrink swell potential is low. This soil is not flooded and is not ponded. The water table is deeper than 1.8 meters (6 feet).

2.6 Paleoenvironmental Reconstruction

2.6.1 Late Pleistocene

The major expansion of the Laurentide ice sheet took place beginning in the Late Wisconsin stage at about 23,000 years B.P. In most of the northeastern United States the ice sheet was in full retreat by approximately 14,500 years B.P. Over the next four thousand years, there were several short-lived, small advances or pulses of the Laurentide ice sheet. While New Castle County, Delaware was never glaciated, full-glacial and then late-periglacial climatic conditions to the north and west would have had a profound impact on eustatic sea-level changes, rates of weathering and mass-wasting, vegetation patterns, and stream regime.

Bloom (1983) has proposed that during the late glacial maximum (18,000 B.P.) sea level was lowered by 120 m +/- 60 m (394 ft +/- 197 ft), exposing large portions of the continental shelves. In response to a lowered base level, streams like Deep Creek and Silver Creek would have rapidly downcut (through temporary base level adjustment) to keep pace

with the lower base level of Delaware Bay/River. The steep, entrenched valley profiles in the region indicate a rapid phase of incision with minor lateral channel migration. The sandy parent material, greater effective precipitation, and heightened stream competence/capacity would have allowed for rapid rates of incision. This is clearly evidenced at Deep Creek where the stream has down cut nearly 15 m (50 ft) in response to the late Wisconsin low sea level stand. All of this incision was through unconsolidated sands and gravels of Pleistocene and Tertiary age. Given the absence of any ice within New Castle County, isostatic adjustments relating to ablation of the Laurentide ice sheet would not have affected late Wisconsin or early Holocene rates of incision.

At the peak of glaciation, changes in radiation and insolation caused the jet stream to split into two portions, with strong easterly winds occurring at the southern margin of the ice sheet (COHMAP 1987; Ebright 1992). As noted by Ebright et al. (1988) these late glacial weather patterns would have resulted in a decrease in sea water temperatures, increase in sea-ice areas, and a decrease in seasonality in eastern North America. Brush (1986) places the average land temperatures at 3 to 8 degrees Centigrade lower than present near the end of the glaciation in the Chesapeake Bay area. Other authors have argued (Webb and Bartlein 1988; Knox 1983; Vento, Rollins, Raber et al. 1992) that it was not until 9,000 - 8,000 yrs. B.P. that the continental ice mass no longer affected continental atmospheric circulation (occurrence of meridional flow) and vegetation patterns.

Late glacial forest-vegetation communities consisted of boreal species dominated by jack pine and spruce, with lesser amounts of birch, fir, hemlock, and alder (Brush 1986; Delcourt and Delcourt 1981, Davis 1983; Sirkin et al. 1977). Pleistocene-age peats from eastern Pennsylvania and the Delmarva Peninsula exhibit a diverse spectrum of forest taxa

including pine, spruce, birch, alder, willow, oaks, heaths, grasses, and sedges (Sirkin et al. 1977; Crowl and Sevon 1980). Like the flora, Pleistocene fauna was equally diverse including such fauna as mastodon, mammoth, bison, horses, and camel (Guilday et al. 1966; Semken 1983; Eschelman and Grady 1986). The cause for the Late Pleistocene extinctions generally follows one of three models: 1) overkill; 2) environmental change, and 3) combined effects of overkill-environmental change. Specific details regarding Pleistocene extinctions are reviewed by Lundelius and others (1983). It might be argued that the late glacial fauna (11,000 - 10,000 yrs. B.P.) of New Castle County, Delaware was a mosaic of both megafauna and more modern Carolinian species.

2.6.2 Early Holocene (10,000 - 8,000 B.P.)

By the start of the Holocene (circa. 10,000 yrs. B.P.) the Laurentide ice sheet had ablated to a position just south of present day Hudson Bay. The stagnant ice sheet effectively restricted the mixing of warm-moist air masses from the Gulf of Mexico with cold Canadian air. In effect, the flow during the early Holocene was clearly zonal or westerly. Prior to 7,000 yrs. B.P. flood intensity in the mid Atlantic States would have been greatly reduced. Also, during this time, rapid, eustatic sea-level adjustments along the Atlantic coast caused drowning of numerous river valleys. Kutzbach's (1983) notes that the radiation curves for tilt and precession reinforced each other at 10,000 - 9,000 yrs. B.P. resulting in the global average solar radiation for July being 7% greater than today and that precipitation was 7% greater and temperatures 0.7 degrees Celsius warmer.

As relates to the drainage lines within the general study area, the early Holocene would have been a time of rapid alluviation-aggradation. Aggradation would have been caused by a base-level adjustment due to eustatic sea level rise. During this time, gradients

were much reduced from the earlier late Wisconsinan as were sediment load and overall discharge. The probable braided reaches of these drainage lines changed their channel habit to one of a meandering form. In the interior part of the mid-Atlantic region, infrequent large floods during the early Holocene would have been promoted by strong zonal/westerly flow and greater rates of potential evapotranspiration.

Within segments of the Delaware and Susquehanna River basins, the major drainage lines experienced several episodes of rapid, vertical accretion followed by several hundred-year periods of relative flood-plain stability (see Figure 3). The multiple, dated occurrence of cumulic, buried A-horizons from the period 9,000 - 8,000 yrs. B.P. indicates a relatively lengthy period of flood plain stability (Vento, Rollins, Raber et al. 1992). During the early Holocene, the spruce and pine forest of the late glacial stage was rather quickly replaced by mixed conifers and northern hardwoods (Delcourt and Delcourt 1981; Davis 1983; Brush 1986). Both Brush (1986) and Davis (1983) note oak as occurring within the general study area by 10,000 yrs. B.P. Pollen cores from the southern Chesapeake Bay region document the rapid expansion of mixed deciduous-conifer forests at 10,000 B.P. (Harrison et al. 1965; Whitehead 1972).

2.6.3 Middle Holocene (7,000 - 5,000 B.P.)

The Middle Holocene along the Middle Atlantic coast is a period during which sea level rise rapidly increased (Kraft 1985). The head of the Chesapeake Bay at this time was in the vicinity of Annapolis (Brush 1986). Continued ablation and retreat of the ice sheet by 7,000 - 6,000 yrs. B.P. allowed for the penetration and mixing of warm-moist, maritime-tropical air masses with cold Canadian/arctic air (Knox 1983). This mixing created the potential for large cyclonic storms and, in turn, large floods. At this time there is a rapid

shift from zonal to more meridional circulation. In the Delaware and Susquehanna River drainage basins most medium to small-sized streams clearly lack any intact mid- to early-Holocene alluvium. The occurrence may be due to the effects of large floods spawned from cyclonic storms removing these earlier vertical accretionary deposits. Also during this time, there is a marked shift from the warm-dry conditions of the late Early Holocene (circa. 9,000 B.P.) period to one of alternating cool-wet and warm-moist conditions. These conditions favored incision and minor active lateral channel migration.

According to Kraft (1985), between 8,000 - 4,000 yrs. B.P. sea level rose at a rate of approximately 0.4 cm per century in the Mid-Atlantic. Joyce (1988) proposes that the warm-dry Hypsithermal Interval prevailed between 9,000 - 5,000 B.P. in the Mid-Atlantic. This period fits well with vegetation shifts observed in the Midwestern Prairie Peninsula and Great Plains. These dates are considerably earlier than estimates based upon pollen core data from Hack Pond which restrict the period of warmth and dryness to the Subboreal (ca. 5,100 – 2,800 B.P., cf. Carbone 1976; Custer 1984; Custer and Curry 1982). These later dates also conform well to dated soils located on low terraces (Port Huron) within the upper and central Susquehanna and upper Delaware River Valleys (Figure 3). Vento, Rollins, Vega et al. (2008) would place the period of warmth and dryness between 4,500 – 3,000 yrs. B.P.). These dates are based upon dated, buried A-horizons which consistently bracket a cambic B-horizon which contains Transitional Archaic artifacts (e.g., broad-spear projectile points, steatite). As relates to vegetation, the mixed conifers and northern hardwood forests of the early Holocene were quickly replaced by an oak-hickory-southern pine association that was firmly in place by 5,000 yrs. B.P. in Maryland (Ebright et al. 1992).

2.6.4 Late Holocene (4,500 - Present)

The opening of the late Holocene is marked by an episode of extreme warmth and dryness known as the Sub-Boreal climatic phase. The warm-dry conditions are in marked contrast to the generally wet-moist conditions of the preceding Atlantic climatic phase. During this period (4,500 – 3,000 yrs. B.P.) a persistent mean-westerly atmospheric circulation expanded a mid-continent climatic regime of warmth and aridity (Bryson et al. 1970; Delcourt and Delcourt 1985; Knox 1983; Vento, Rollins, Raber et al. 1992; Vento, Rollins, Vega et al. 2008). In the upper and central Susquehanna River drainage basin, the stratigraphic evidence indicates that in response to these warm-dry conditions, streams entered a phase of active lateral channel migration and along specific reaches, active vertical accretion. These events may relate to a decreased vegetation cover associated with higher sediment yields. The general absence of any buried A-horizons at this time on dated terraces would appear to indicate that floodplains were receiving enough sediment from flooding to preclude their development.

Recent fossil pollen data, from Dan's Bog, Prince George's County, Maryland, indicates an increase in herbaceous taxa in the oak-dominated forests between 5,000 and 1770 B.P. (Leedecker and Koldehoff 1991). Davis (1983) and Winkler (1985) note that annual average temperatures may have been as much as 2 degrees Celsius warmer than at present.

Following the end of the Sub-Boreal climatic phase, streams along the eastern shore would have experienced a rather pronounced episode of warm and moist climatic conditions (3,000 – 1,750 B.P.) of the Sub-Atlantic climatic phase. These warm-moist conditions allowed for relative flood plain stability and in places, the development of a thick, surficial A-horizon. The Sub-Atlantic phase was then followed by a period of cool-moist conditions

of the Scandic climatic phase (circa. 1,750 – 1,150 B.P.). Locally, streams would have entered into a phase of active lateral channel migration and incision with more active rates of vertical accretion, which would have precluded A-horizon development. The Scandic phase was then followed by another warm-moist interval termed the Neo-Atlantic climatic phase (1,100 - 700 B.P.). Warm-moist conditions would have again favored relative floodplain stability. Once again, it might be expected that lower lying terraces should contain, along select reaches, buried A-horizons from this period. If present along the lower terraces, these A-horizons should be overlain by variably thick sola which have been emplaced during the cool-wet, Pacific climatic phase (700 B.P. - 300 B.P.) and as a result of increased surface runoff/sediment yields to streams from historic deforestation. According to Brush (1986), sea level continued to rise but at a much slower rate, and Delaware and Chesapeake Bays had essentially attained their present form at approximately 3,000 yrs. B.P. Kraft (1985) estimates sea level rise of the last 2,000 years at 15 cm per century.

The oak-hickory, southern pine forests typical of early Holocene times remained stable until, as noted above, Euro-American settlement. Brush (1986) notes an especially wet period between 4,700 – 3,400 yrs. B.P. and an extremely dry period between 1,000 - 1,200 A.D. This latter dry period is based upon the presence of holly, chestnut, and ericaceous shrubs. These dates and the associated climatic conditions are exactly the reverse of those proposed for the central and upper Susquehanna River valley (Vento, Rollins, Raber et al. 1992). The high quantities of metallic elements found in cores at this time has led Brush (1986) to postulate that this proposed dry period was characterized by intermittent fires. An alternative hypothesis for the occurrence of abundant free carbon and higher levels

of metallic elements might be from aboriginal clearing of land for horticultural/agricultural use.

3.0 RESULTS OF INVESTIGATION

Based upon a detailed geomorphic analysis of the study area, and for ease of discussion, the project area can be separated into four distinct areas or zones. These include: 1) upland surface east of the bridge and west of the cemetery, 2) area of corridor which crosses the former Middletown landfill site, 3) upland surface west of the landfill area, and 4) valley bottom zone along Deep Creek.

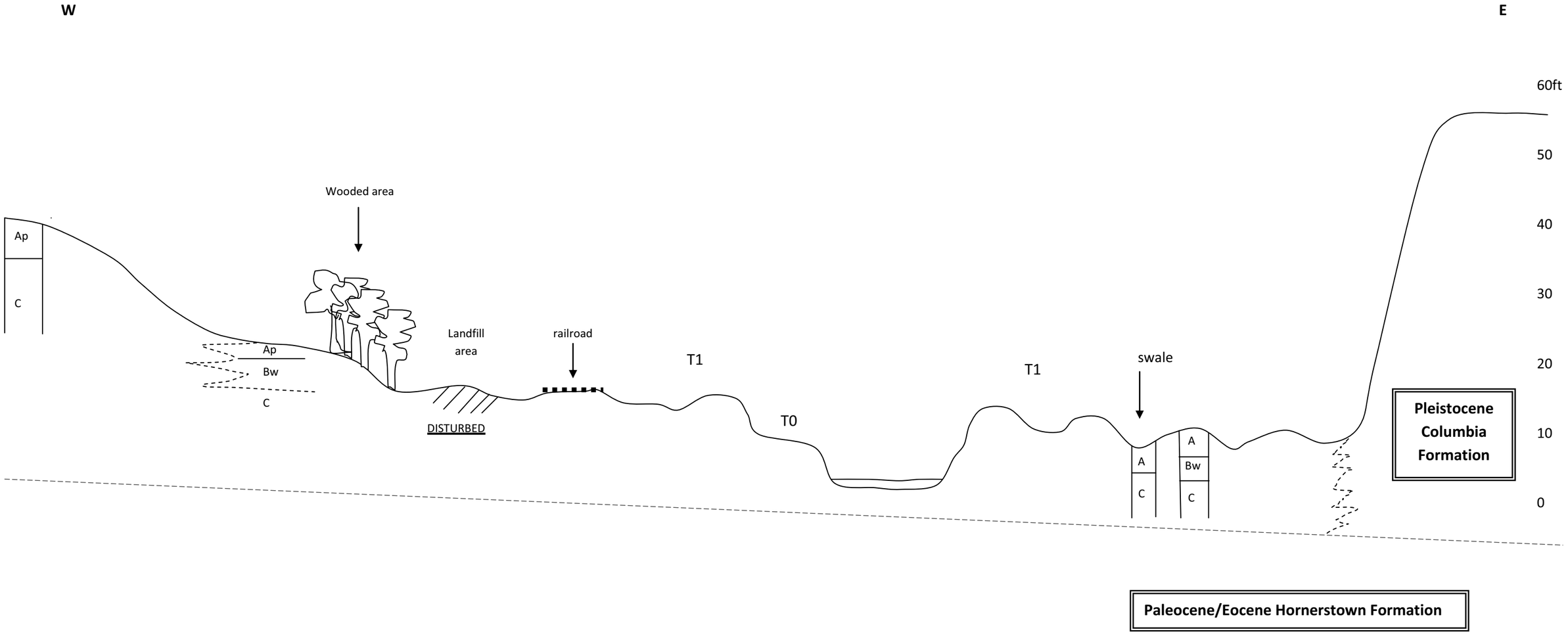
Eastern Upland Segment:

The eastern upland segment is situated immediately north of St. Annes Church Road and southwest of the St. Annes Cemetery (Figure 4). From this area, the proposed new roadway will then cross the upper reach of Deep Creek. The soils (Matapeake Series) examined along this segment have formed in sands and gravels of the Pleistocene age Columbia Formation. A typical profile consists of a thin (8 cm thick) fill horizon which disconformably overlies a 20 cm thick, dark brown gravelly sand A horizon (Figure 5). The A horizon is then conformably underlain by a gravelly sand (C horizon). The Columbia Formation along the project area corridor attains a nominal thickness of 20 m (66 ft) and is then disconformably underlain by Tertiary age glauconitic sands (Figure 6).

Figure 4. Photo showing a view (at 260°) of the eastern upland section of the project area and auger probe location.

Figure 5. Soils encountered at the eastern upland location consist of a fill horizon overlying sands of the Columbia Formation. Note that no overlying Holocene age aeolian sands cap or mantle the Columbia Formation within the project area.

Figure 6: Idealized stratigraphic cross section at the proposed St. Annes Church Road and Bridge Renovation and Relocation Project, New Castle County, Delaware



Note: Generalization only; not drawn to scale

Phase I testing along the eastern upland segment can be accomplished by standard shovel test probes. The probes should extend at least 20 cm into the C horizon. There is no evidence of any Holocene age wind blown deposits capping the Columbia Formation along the eastern segment of the roadway corridor.

Former Landfill Segment

The former Middletown landfill segment of the proposed roadway corridor lies southwest of an active railway grade. Based upon the recent geologic field study, as well as an examination of the Tetra Tech field report and borings at the landfill site, it is clear that no archaeological investigations are warranted or recommended. (See Tetra Tech 2008 report for images clearly defining the boundary of the landfill area.)

Western Upland Segment

The western upland of the proposed new roadway will lie essentially southwest of the mapped landfill area. The roadway in this area will cross a wooded area (part of which lies in the landfill area), while the remaining part of the roadway will extend to the north of St. Annes Church Road in a large plowed field area (Figure 7). The soils identified throughout this area are of two distinctly different parent materials. The soils along the extreme southwest segment occur in an area where the land surface is gently rising to a well-defined knoll. In this area the soils have formed in sands and gravels of the Pleistocene age Columbia Formation. A typical profile consists of a 20 cm thick gravelly sand Ap horizon which is then underlain by a strongly oxidized reddish brown gravelly sand C horizon (see Figure 6). Given the absence of any Holocene age alluvial, colluvial, or eolian materials

capping the Pleistocene sands and gravels in this area, testing can be accomplished by standard shovel test probes. As one proceeds downslope toward the tree line, the soil profile is distinctly different. The soils have formed in Holocene age alluvial deposits emplaced by backflooding along the main stem and tributaries of Deep Creek. These alluvial deposits comprise a rather small area (approximately 20 m/66 ft) along the roadway corridor. A typical profile in this area consists of a 20 cm to 25 cm thick dark brown silt loam Ap horizon which is then underlain by an 80 cm thick moderate subangular blocky brown silt loam Bw horizon. The Bw horizon is then underlain by relict lateral accretion deposits.

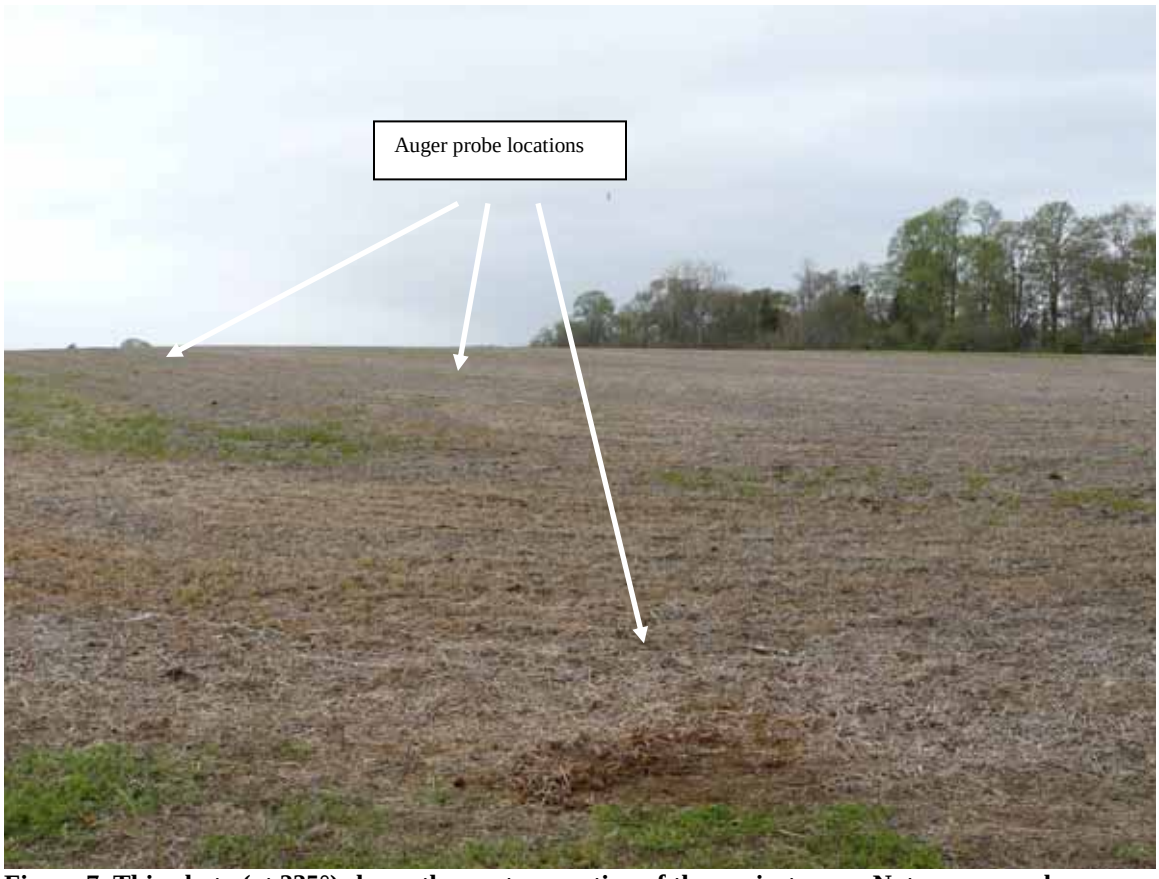


Figure 7. This photo (at 235°) shows the western section of the project area. Note auger probe locations. The distal probes in photo encountered sands of Columbia Fm. The probe at bottom of photo encountered Holocene age alluvium from Deep Creek.

Testing might best be accomplished by the excavation of several 1 m by 1 m deep excavation units. Testing should extend to the top of the relict lateral accretion deposits at 1 m (3.3 ft) below ground surface.

Valley Bottom Zone of Deep Creek

During the course of the geologic field investigations only a single T1 terrace could be identified along the south valley bottom zone bordering Deep Creek. On the north bank, both the T1 terrace as well as a low floodplain zone was noted; however, the north bank lies outside the project area (Figure 8). The most distinct feature of the T1 terrace is that it has been extensively flood scoured such that large, deep swales cut the terrace, roughly paralleling the main stem of Deep Creek (Figure 9). These swales are often bound by higher, preserved segments of the T1 terrace (Figure 10). Auger probes in the swales failed to identify any fine grained overbank alluvium. In fact, all of the auger probes emplaced in these swales consistently encountered coarse sands and gravels of recent to late Holocene age. On the higher outliers of the terrace, the soil profiles did contain a finer grained package of overbank alluvium. A typical profile on these higher outliers consisted of a 10 cm thick A horizon which was then underlain by a 20 cm to 40 cm thick brown silt to sandy loam, subangular blocky Bw horizon. The Bw horizon was then underlain by relict coarse grained vertical and lateral accretion deposits of probable late middle Holocene age. Testing on the valley bottom zone of Deep Creek should be restricted to those preserved higher portions of the terrace that still retain some fine grained Holocene age vertical accretion deposits (see Figure 6).

Figure 8. Note the T1 terrace and the floodplain zone on the north side of Deep Creek; photo at 10°.

Figure 9. A series of ridges and swales occur roughly parallel to Deep Creek throughout the T1 terrace; photo at 63°.

Figure 10. Fine grained overbank alluvium is preserved on these high outliers of the T1 terrace; photo at 335°.

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Attachment I

Tetra Tech's Summary of Test Pit Investigations

TETRA TECH

November 13, 2007
T19602-22
Tetra Tech Project No. 112C01017

Mr. Paul Welsh
HAZMAT Coordinator
Delaware Department of Transportation
800 Bay Road
P.O. Box 778
Dover, Delaware 19903

Dear Mr. Welsh:

Subject: ***Summary of Test Pit Environmental Site Investigation Field Activities in Support of DelDOT's Bridge 1-503 on St. Anne's Church Road Project, Middletown, Delaware; DelDOT Contract No. 25-071-01***

This letter report summarizes the procedures and findings of the Phase II Environmental Investigation performed in support of DelDOT's Bridge 1-503 Replacement Project, Middletown, Delaware (Figure 1). This Phase II Environmental Investigation included excavating multiple test pits in the area of the proposed storm water retention pond. The goal of the test pitting work was to help further delineate the lateral and vertical extent of fill material in the wooded area located on the western portion of the former Middletown Landfill site. Due to the heavy vegetation found currently existing on this section of the property, no data was collected from the location where the proposed storm water retention pond is to be constructed, during the geophysical survey previously performed at the site.

TEST PIT EXCAVATION PROCEDURE

Tetra Tech subcontracted with Lewis Environmental Group to provide a track excavator and operator to install the test pits at locations specified by Tetra Tech's supervising environmental scientist at the site. A total of 17 test pits was dug at the site on October 23 and 24, 2007 (Figure 2). The location of these test pits were placed to either complete a basic grid pattern sampling scheme for the subject property or biased to any observed visual cues of historical dumping locations on the subject property. The locations of the test pits were surveyed by the supervising Tetra Tech environmental scientist using a Trimble Geo-Explorer 3 Global Positioning System with a 1-meter resolution. A summary of the coordinates for the test pit locations based on the Geographic Coordinate Systems 1984 World Geodetic Survey are included in Table 1.

The depth of each test pit varied from 2 to 16 feet below ground surface, based on visual observations of the supervising environmental scientist in the field. These visual observations were focused on identifying the presence of any fill material within each test pit location. The location, thickness, and depth of any fill material observed were recorded, along with all pertinent information regarding the interface between the fill materials and the native soils. Once native soils were observed in each of the 17 test pits, further excavation was halted to limit any cross-contamination of the shallow fill materials to deeper, native soils. No soil samples were collected for laboratory analyses at any of the test pit locations.

Tetra Tech NUS, Inc.
240 Continental Drive, Suite 200, Newark, DE 19713
Tel 302-738-7551 Fax 302-454-5988 www.tetratech-de.com

TETRA TECH

OBSERVATIONS AND LANDFILL DELINEATION

Copies of Tetra Tech's test pit logs are included with this letter report. Landfill material consisting of ash, broken glass bottles, terra-cotta pipe, and pieces of brick, was encountered at test pit locations TP-1, TP-3, TP-10, TP-11, TP-12, and TP-16 at depths of 0.5 to 1 foot below existing grade and at thicknesses ranging from 2 to 4.5 feet. The landfill material also appears to extend to the northwest into the wetland area adjacent to Deep Creek. No test pits were dug in the wetland area during this investigation.

The first native soil layer encountered consisted of orange, tan, and light brown, fine to medium grained sand with some gravel.

Based on the results of this field investigation, Tetra Tech was able to generate a map showing the approximate extent of landfill area at the site (Figure 3). Due to undetermined extent of landfill material along the northwestern section of the property, Tetra Tech cannot accurately estimate the volume of landfill material currently found on the DelDOT property.

CONCLUSIONS

This environmental site investigation confirmed the existence of landfill material on the subject DelDOT property where the proposed storm water retention pond is to be constructed. This landfill material was encountered at approximately 0.5 to 1 foot below the existing grade and 2 to 4.5 feet thick. The landfill material also appears to extend to the northwest into the wetland area adjacent to Deep Creek.

Sincerely,

Jason Daliessio
Geologist

Christopher Geiger, P.G.
Project Manager

jp
Enclosures

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Source: Roads from DelDOT; Tax Parcel from New Castle Co.; Topo from USGS DLGs; USGS State and County Boundaries from National Atlas (nationalatlas.gov).

0 5 10 20 30 40
Miles

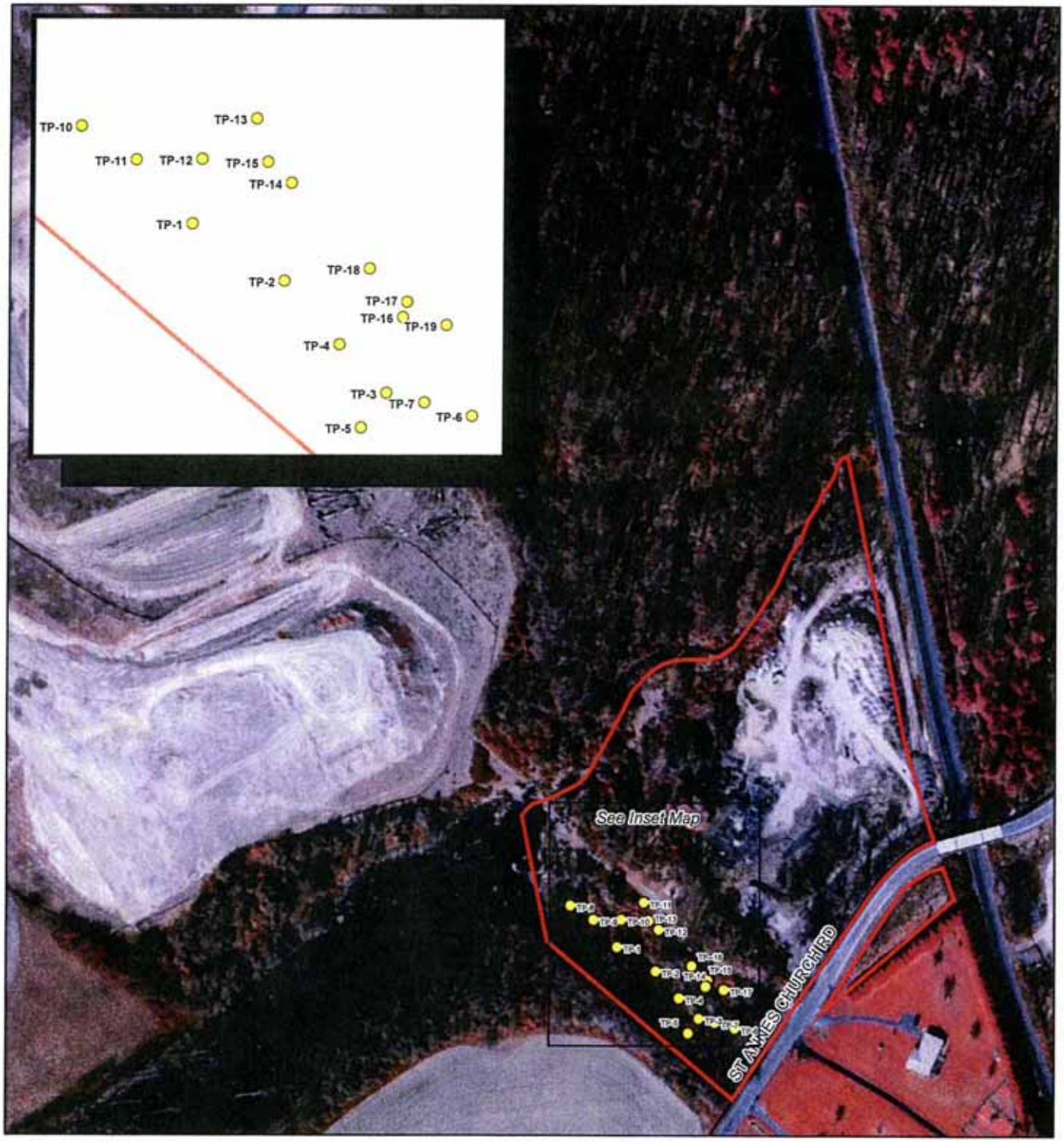
1:2,877,900

Legend

Subject parcel

Figure 1
General Location
St. Annes Church Road/Bridge I-503 DelDOT Site
Middletown, New Castle County, DE

TetraTech, Inc.
240 Continental Drive, Suite 200
Newark, DE 19713
Phone: (302) 738-7551
Toll Free: (800) 462-0910
www.tetratech.com www.tetratech-de.com



Source: Roads from DelDOT; Tax Parcel from New Castle Co.; Topo from USGS DLGs; USGS State and County Boundaries from National Atlas (nationalatlas.gov).

Legend
- Subject parcel
- Test Pit Location

037.575 150 225 300
Feet
1:1,060

Figure 2
Test Pit Location
St. Annes Church Road/Bridge I-503 DelDOT Site
Middletown, New Castle County, DE

TetraTech, Inc.
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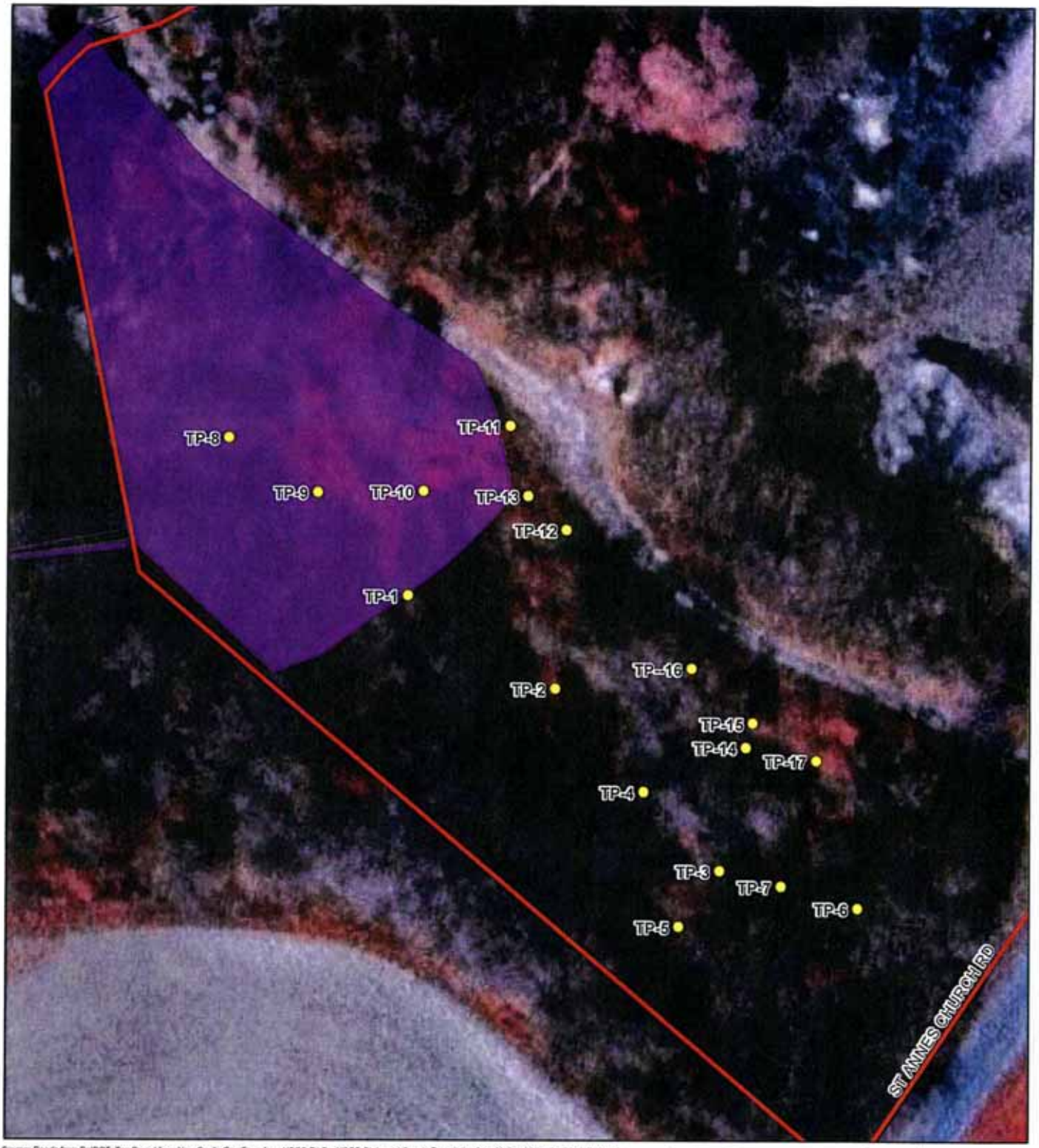
www.tetratech.com www.tetratech-de.com

CAA N:\Projects\100000\114000\114777_707_S_Market\Data\GIS\Fig1_SiteLocationMap.mxd



Source: Roads from DelDOT; Tax Parcel from New Castle Co.; Topo from USGS DLGs; USGS State and County Boundaries from National Atlas (nationalatlas.gov).

0 10 20 40 60 80 Feet

1:10,000

Legend
- Subject parcel
- Test Pit Location
- Fill Material (Estimated)

N
W E
S

Figure 3
Estimated Location of Fill Materal
St. Annes Church Road/Bridge I-503 DelDOT Site
Middletown, New Castle County, DE

TetraTech, Inc.
240 Continental Drive, Suite 200
Newark, DE 19713
Phone: (302) 738-7551
Toll Free: (800) 462-0910
www.tetratech.com www.tetratech-de.com

TETRA TECH - TEST PIT LOG

Project Name: St. Annes Church Road/Bridge I-503		Project No.:112C01017
Project Location:Middletown, Delaware		
Test Pit No.:1	Date Excavated: 10/23/2007	Inspector: Jason Daliessio
Contractor:Lewis Environmental	Excavation Method: Track Excavator	
Surface Elevation (ft):Unknown	Groundwater Depth (ft): 8	Total Depth (ft): 10

Sample	Sample Depth (ft)	PID readings Depth (ft)	PID readings PPM	Strata Depth (ft) From	Strata Depth (ft) To	Description of Materials	Moisture
				0.0	0.5	Light brown silty sand with moderate pebble content and fill material (glass, brick)	D
				0.5	3.5	Fill material (ash, glass bottles, terra-cotta pipe)	D
				3.5	9.0	Orange to light brown medium-grained sand, clean, native	M
				9.0	10.0	Yellow to orange fine grained sand with moderate rounded coarse gravels	S
				10.0		End of boring	

Notes and comments Moisture codes: D-dry, M-moist, W-wet, S-saturated

Groundwater observed at approximately 8' below ground surface.

To limit cross-contamination with shallower fill material, deeper native soils were not disturbed during the test pit investigation.

Samples Collected

Time	Designation	Time	Designation

TETRA TECH - TEST PIT LOG

Project Name: St. Annes Church Road/Bridge I-503		Project No.:112C01017
Project Location:Middletown, Delaware		
Test Pit No.:2	Date Excavated: 10/23/2007	Inspector: Jason Daliessio
Contractor:Lewis Environmental	Excavation Method: Track Excavator	
Surface Elevation (ft): Unknown	Groundwater Depth (ft):	Total Depth (ft):2

		PID readings		Strata Depth (ft)			
Sample	Sample Depth (ft)	Depth (ft)	PPM	From	To	**Description of Materials**	Moisture
				0.0	0.5	Light brown silty sand with trace fill material (glass, brick)	D
				0.5	2.0	Orange to yellow fine to meduim grained sand; clean; native	D
				2.0		End of boring	

Notes and comments Moisture codes: D-dry, M-moist, W-wet, S-saturated

To limit cross-contamination with shallower fill material, deeper native soils were not disturbed during the test pit investigation.

Samples Collected

Time	Designation	Time	Designation

N:\Projects\NUS\112C01017_DelDOT Middletown_Landfill\Documents\Testpit logs

TETRA TECH - TEST PIT LOG

Project Name: St. Annes Church Road/Bridge I-503		Project No.:112C01017
Project Location:Middletown, Delaware		
Test Pit No.:3	Date Excavated: 10/23/2007	Inspector: Jason Daliessio
Contractor:Lewis Environmental	Excavation Method: Track Excavator	
Surface Elevation (ft):Unknown	Groundwater Depth (ft):	Total Depth (ft):8

		PID readings		Strata Depth (ft)			
Sample	Sample Depth (ft)	Depth (ft)	PPM	From	To	Description of Materials	Moisture
				0.0	2.0	Light brown silty sand with trace fill material (glass, brick)	D
				2.0	5.0	Rounded coarse gravels with trace fine-to-medium grained sands	D
				5.0	6.5	Rounded coarse gravels with trace fine-to-medium grained sands	D
						and black cobble (rounded coarse gravel conglomerates)	
				6.5	8.0	Light brown to orange fine-grained sand, clean, native	M
				8.0		End of boring	

Notes and comments Moisture codes: D-dry, M-moist, W-wet, S-saturated

Samples Collected

Time	Designation	Time	Designation

TETRA TECH - TEST PIT LOG

Project Name: St. Annes Church Road/Bridge I-503		Project No.:112C01017
Project Location:Middletown, Delaware		
Test Pit No.: 4	Date Excavated: 10/23/2007	Inspector: Jason Daliessio
Contractor:Lewis Environmental	Excavation Method: Track Excavator	
Surface Elevation (ft): Unknown	Groundwater Depth (ft):	Total Depth (ft): 6

Sample	Sample Depth (ft)	PID readings Depth (ft)	PID readings PPM	Strata Depth (ft) From	Strata Depth (ft) To	Description of Materials	Moisture
				0.0	0.5	Light brown silty sand with trace fill material (glass, brick)	D
				0.5	4.0	Rounded coarse gravels with trace fine-to-medium grained sands	D
				4.0	6.0	Light brown to orange fine-grained sand; clean; native	M
				6.0		End of boring	

Notes and comments Moisture codes: D-dry, M-moist, W-wet, S-saturated

Samples Collected

Time	Designation	Time	Designation

TETRA TECH - TEST PIT LOG

Project Name: St. Annes Church Road/Bridge I-503		Project No.:112C01017
Project Location:Middletown, Delaware		
Test Pit No.: 5	Date Excavated: 10/23/2007	Inspector: Jason Daliessio
Contractor:Lewis Environmental	Excavation Method: Track Excavator	
Surface Elevation (ft): Unknown	Groundwater Depth (ft):	Total Depth (ft): 8

		PID readings		Strata Depth (ft)			
Sample	Sample Depth (ft)	Depth (ft)	PPM	From	To	Description of Materials	Moisture
				0.0	1.0	Light brown silty sand with trace fill material (glass, brick)	D
				1.0	3.0	Orange silty sand with moderate rounded coarse gravels	D
				3.0	6.0	Rounded coarse gravels with trace fine-to-medium grained sands	D
				6.0	7.0	Rounded coarse gravels with trace fine-to-medium grained sands	D
						and black cobble (rounded coarse gravel conglomerates)	
				7.0	8.0	Light brown to orange fine-grained sand; clean; native	M
				8.0		End of boring	

Notes and comments Moisture codes: D-dry, M-moist, W-wet, S-saturated

Samples Collected

Time	Designation	Time	Designation

TETRA TECH - TEST PIT LOG

Project Name: St. Annes Church Road/Bridge I-503		Project No.:112C01017
Project Location:Middletown, Delaware		
Test Pit No.: 6	Date Excavated: 10/23/2007	Inspector: Jason Daliessio
Contractor:Lewis Environmental	Excavation Method: Track Excavator	
Surface Elevation (ft): Unknown	Groundwater Depth (ft):	Total Depth (ft): 16

Sample	Sample Depth (ft)	PID readings Depth (ft)	PID readings PPM	Strata Depth (ft) From	Strata Depth (ft) To	Description of Materials	Moisture
				0.0	1.0	Light brown silty sand with trace fill material (glass, brick)	D
				1.0	4.0	Light brown to orange silty snd, clean	D
				4.0	6.5	Rounded coarse gravels with moderate fine-to-medium grained sands	D
				6.5	12.0	Rounded coarse gravels; clean	D
				12.0	16.0	Rounded coarse gravels and fine-to-medium grained sands	D
				16.0		End of boring	

Notes and comments Moisture codes: D-dry, M-moist, W-wet, S-saturated

Samples Collected

Time	Designation	Time	Designation

TETRA TECH - TEST PIT LOG

Project Name: St. Annes Church Road/Bridge I-503		Project No.:112C01017
Project Location:Middletown, Delaware		
Test Pit No.: 7	Date Excavated: 10/24/2007	Inspector: Jason Daliessio
Contractor:Lewis Environmental	Excavation Method: Track Excavator	
Surface Elevation (ft): Unknown	Groundwater Depth (ft):	Total Depth (ft): 5

Sample	Sample Depth (ft)	PID readings Depth (ft)	PID readings PPM	Strata Depth (ft) From	Strata Depth (ft) To	Description of Materials	Moisture
				0.0	1.0	Light brown silty sand with trace fill material (glass, brick)	
				1.0	4.0	Rounded coarse gravels with moderate fine-to-medium grained sands	
				4.0	5.0	Tan to light brown fine-to-medium grained sands; clean; native	
				5.0		End of boring	

Notes and comments Moisture codes: D-dry, M-moist, W-wet, S-saturated

Samples Collected

Time	Designation	Time	Designation

TETRA TECH - TEST PIT LOG

Project Name: St. Annes Church Road/Bridge I-503		Project No.:112C01017
Project Location:Middletown, Delaware		
Test Pit No.: 8	Date Excavated: 10/24/2007	Inspector: Jason Daliessio
Contractor:Lewis Environmental	Excavation Method: Track Excavator	
Surface Elevation (ft): Unknown	Groundwater Depth (ft):	Total Depth (ft): 8

Sample	Sample Depth (ft)	PID readings Depth (ft)	PID readings PPM	Strata Depth (ft) From	Strata Depth (ft) To	Description of Materials	Moisture
				0.0	0.5	Light brown silty sand with trace fill material (glass, brick)	
				0.5	3.0	Fill material (ash, glass bottles (clear, blue and amber), terra-cotta pipe, brick)	
				3.0	4.0	Tan to light brown fine-to-medium grained sands with trace fill material	
				4.0	8.0	Gray sandy clay; clean; soft	
				8.0		End of boring	

Notes and comments Moisture codes: D-dry, M-moist, W-wet, S-saturated

Samples Collected

Time	Designation	Time	Designation

N:\Projects\NUS\112C01017_DelDOT Middletown_Landfill\Documents\Testpit logs

TETRA TECH - TEST PIT LOG

Project Name: St. Annes Church Road/Bridge I-503		Project No.:112C01017
Project Location:Middletown, Delaware		
Test Pit No.:9	Date Excavated: 10/24/2007	Inspector: Jason Daliessio
Contractor:Lewis Environmental	Excavation Method: Track Excavator	
Surface Elevation (ft): Unknown	Groundwater Depth (ft):	Total Depth (ft):4

		PID readings		Strata Depth (ft)			
Sample	Sample Depth (ft)	Depth (ft)	PPM	From	To	Description of Materials	Moisture
				0.0	1.0	Light brown silty sand with moderate fill material (glass, brick)	D
				1.0	3.0	Fill material (ash, glass bottles, terra-cotta pipe, brick)	D
				3.0	4.0	Tan to light brown fine-to-medium grained sands; clean; native	M
				4.0		End of boring	

Notes and comments Moisture codes: D-dry, M-moist, W-wet, S-saturated

Samples Collected

Time	Designation	Time	Designation

TETRA TECH - TEST PIT LOG

Project Name: St. Annes Church Road/Bridge I-503		Project No.:112C01017
Project Location:Middletown, Delaware		
Test Pit No.: 10	Date Excavated: 10/24/2007	Inspector: Jason Daliessio
Contractor:Lewis Environmental	Excavation Method: Track Excavator	
Surface Elevation (ft): Unknown	Groundwater Depth (ft):	Total Depth (ft):6

Sample	Sample Depth (ft)	PID readings Depth (ft)	PID readings PPM	Strata Depth (ft) From	Strata Depth (ft) To	Description of Materials	Moisture
				0.0	0.5	Light brown silty sand with moderate fill material (glass, brick)	D
				0.5	4.5	Fill material (ash, glass bottles, terra-cotta pipe, brick)	D
				4.5	6.0	Tan to light brown fine-to-medium grained sands; clean; native	D
				6.0		End of boring	

Notes and comments Moisture codes: D-dry, M-moist, W-wet, S-saturated

Samples Collected

Time	Designation	Time	Designation

N:\Projects\NUS\112C01017_DelDOT Middletown_Landfill\Documents\Testpit logs

TETRA TECH - TEST PIT LOG

Project Name: St. Annes Church Road/Bridge I-503		Project No.:112C01017
Project Location:Middletown, Delaware		
Test Pit No.: 11	Date Excavated: 10/24/2004	Inspector: Jason Daliessio
Contractor:Lewis Environmental	Excavation Method: Track Excavator	
Surface Elevation (ft):	Groundwater Depth (ft):	Total Depth (ft): 2

		PID readings		Strata Depth (ft)			
Sample	Sample Depth (ft)	Depth (ft)	PPM	From	To	**Description of Materials**	Moisture
				0.0	0.5	Light brown silty sand with moderate fill material (glass, brick)	D
				0.5	2.0	Tan to light brown fine-to-medium grained sands; clean; native	D
				2.0		End of boring	

Notes and comments Moisture codes: D-dry, M-moist, W-wet, S-saturated

An interface consisting of fill material and native clean soil was observed at this location. This was interpreted in the field as as identifing the outermost extent of the fill material.

Samples Collected

Time	Designation	Time	Designation

TETRA TECH - TEST PIT LOG

Project Name: St. Annes Church Road/Bridge I-503		Project No.:112C01017
Project Location:Middletown, Delaware		
Test Pit No.:12	Date Excavated: 10/24/2007	Inspector: Jason Daliessio
Contractor:Lewis Environmental	Excavation Method: Track Excavator	
Surface Elevation (ft):Unknown	Groundwater Depth (ft):	Total Depth (ft): 3

		PID readings		Strata Depth (ft)			
Sample	Sample Depth (ft)	Depth (ft)	PPM	From	To	Description of Materials	Moisture
				0.0	0.5	Light brown silty sand with moderate fill material (glass, brick)	D
				0.5	3.0	Tan to light brown fine-to-medium grained sands; clean; native	D
				3.0		End of boring	

Notes and comments Moisture codes: D-dry, M-moist, W-wet, S-saturated

Samples Collected

Time	Designation	Time	Designation

TETRA TECH - TEST PIT LOG

Project Name: St. Annes Church Road/Bridge I-503		Project No.:112C01017
Project Location:Middletown, Delaware		
Test Pit No.:13	Date Excavated: 10/24/2007	Inspector: Jason Daliessio
Contractor:Lewis Environmental	Excavation Method: Track Excavator	
Surface Elevation (ft):Unknown	Groundwater Depth (ft):	Total Depth (ft). :3

		PID readings		Strata Depth (ft)			
Sample	Sample Depth (ft)	Depth (ft)	PPM	From	To	Description of Materials	Moisture
				0.0	0.5	Light brown silty sand with moderate fill material (glass, brick)	D
				0.5	2.0	Tan to light brown fine-to-medium grained sands; clean; native	D
				2.0		End of boring	

Notes and comments Moisture codes: D-dry, M-moist, W-wet, S-saturated

An interface consisting of fill material and native clean soil was observed at this location. This was interpreted in the field as as identifing the outermost extent of the fill material.

Samples Collected

Time	Designation	Time	Designation

TETRA TECH - TEST PIT LOG

Project Name: St. Annes Church Road/Bridge I-503		Project No.:112C01017
Project Location:Middletown, Delaware		
Test Pit No.: 14	Date Excavated: 10/24/2007	Inspector: Jason Daliessio
Contractor:Lewis Environmental	Excavation Method: Track Excavator	
Surface Elevation (ft): Unknown	Groundwater Depth (ft):	Total Depth (ft): 4

		PID readings		Strata Depth (ft)			
Sample	Sample Depth (ft)	Depth (ft)	PPM	From	To	Description of Materials	Moisture
				0.0	0.5	Light brown silty sand with moderate fill material (glass, brick)	D
				0.5	4.5	Fill material (ash, glass bottles, terra-cotta pipe, brick)	D
				4.5		End of boring	

Notes and comments Moisture codes: D-dry, M-moist, W-wet, S-saturated

Samples Collected

Time	Designation	Time	Designation

TETRA TECH - TEST PIT LOG

Project Name: St. Annes Church Road/Bridge I-503		Project No.:112C01017
Project Location:Middletown, Delaware		
Test Pit No.: 15	Date Excavated: 10/24/2007	Inspector: Jason Daliessio
Contractor:Lewis Environmental	Excavation Method: Track Excavator	
Surface Elevation (ft): Unknown	Groundwater Depth (ft):	Total Depth (ft): 4

		PID readings		Strata Depth (ft)			
Sample	Sample Depth (ft)	Depth (ft)	PPM	From	To	**Description of Materials**	Moisture
				0.0	0.5	Light brown silty sand with moderate fill material (glass, brick)	D
				0.5	4.0	Tan to light brown fine-to-medium grained sands; clean; native	D
				4.0		End of boring	

Notes and comments Moisture codes: D-dry, M-moist, W-wet, S-saturated

An single isolated area of fill material was observed at this test pit location.

Samples Collected

Time	Designation	Time	Designation

TETRA TECH - TEST PIT LOG

Project Name: St. Annes Church Road/Bridge I-503		Project No.:112C01017
Project Location:Middletown, Delaware		
Test Pit No.:16	Date Excavated: 10/24/2007	Inspector: Jason Daliessio
Contractor:Lewis Environmental	Excavation Method: Track Excavator	
Surface Elevation (ft): Unknown	Groundwater Depth (ft):	Total Depth (ft): 4

		PID readings		Strata Depth (ft)			
Sample	Sample Depth (ft)	Depth (ft)	PPM	From	To	Description of Materials	Moisture
				0.0	0.5	Light brown silty sand with moderate fill material (glass, brick)	D
				0.5	4.0	Tan to light brown fine-to-medium grained sands; clean; native	D
				4.0		End of boring	

Notes and comments Moisture codes: D-dry, M-moist, W-wet, S-saturated

Samples Collected

Time	Designation	Time	Designation

TETRA TECH - TEST PIT LOG

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Contractor:Lewis Environmental	Excavation Method: Track Excavator	
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Samples Collected

Time	Designation	Time	Designation

Attachment J

Artifact Inventory

State Bridge 503 over the Norfolk Southern Railroad

Provenience STP 1 Stratum I

Class	Material	Artifact Type	Mfg Method	Artifact Traits	Mfg, origin	Begin Date	End Date	Quantity	Comments
Domestic	pearlware	miscellaneous deep vessel		ribbed		1770	1840	1	
Domestic	whiteware	indeterminate vessel		plain		1805	2008	1	
Heating By-Product	coal					0	0	6	

Summary for 'Provenience' = STP 1 Stratum I (3 detail records)

Sum 8

Provenience STP 2 Stratum I

Class	Material	Artifact Type	Mfg Method	Artifact Traits	Mfg, origin	Begin Date	End Date	Quantity	Comments
Architectural	brick					0	0	4	
Domestic	glass	indeterminate vessel	mold	clear		1810	2008	1	
Domestic	glass	indeterminate vessel	unidentifiable	clear		0	0	2	
Domestic	whiteware	indeterminate vessel		plain		1805	2008	1	
Heating By-Product	coal					0	0	1	
Heating By-Product	slag					0	0	4	
Personal	glass	bottle	machine	brown		1930	2008	1	
Personal	glass	bottle	machine	brown, embossed		1930	2008	1	

Personal	glass	bottle	unidentifiable	brown		0	0	4

Summary for 'Provenience' = STP 2 Stratum I (9 detail records)

Sum 19

Provenience STP 3 Stratum I

Class	Material	Artifact Type	Mfg Method	Artifact Traits	Mfg, origin	Begin Date	End Date	Quantity	Comments
Heating By-Product	coal					0	0	3	
Personal	glass	bottle	unidentifiable	brown		0	0	2	

Summary for 'Provenience' = STP 3 Stratum I (2 detail records)

Sum 5

Provenience STP 4 Stratum I

Class	Material	Artifact Type	Mfg Method	Artifact Traits	Mfg, origin	Begin Date	End Date	Quantity	Comments
Architectural	brick					0	0	1	
Architectural	glass	window pane		aqua		0	0	2	
Domestic	glass	indeterminate vessel	unidentifiable	olive		0	0	2	
Heating By-Product	coal					0	0	5	
Heating By-Product	slag					0	0	3	

Summary for 'Provenience' = STP 4 Stratum I (5 detail records)

Sum 13

Provenience STP 6 Stratum I

Class	Material	Artifact Type	Mfg Method	Artifact Traits	Mfg, origin	Begin Date	End Date	Quantity	Comments
Heating By-Product	coal					0	0	1	

Summary for 'Provenience' = STP 6 Stratum I (1 detail record)

Sum 1

Provenience STP 7 Stratum I

Class	Material	Artifact Type	Mfg Method	Artifact Traits	Mfg, origin	Begin Date	End Date	Quantity	Comments
Architectural	brick					0	0	2	
Heating By-Product	slag					0	0	4	
Personal	glass	bottle	mold	brown		1810	2008	2	
Personal	glass	bottle	unidentifiable	brown		0	0	8	
Personal	glass	bottle	unidentifiable	clear		0	0	2	
Personal	glass	bottle	unidentifiable	olive		0	0	2	
Subsistence	mollusc shell	oyster				0	0	5	

Summary for 'Provenience' = STP 7 Stratum I (7 detail records)

Sum 25

Provenience STP 8 Stratum I

Class	Material	Artifact Type	Mfg Method	Artifact Traits	Mfg, origin	Begin Date	End Date	Quantity	Comments
Hardware	iron	nail	cut or wrought			0	0	1	
Heating By-Product	cinder					0	0	1	
Heating By-Product	slag					0	0	2	

Summary for 'Provenience' = STP 8 Stratum I (3 detail records)

Sum 4

Provenience STP 9 Stratum I

Class	Material	Artifact Type	Mfg Method	Artifact Traits	Mfg, origin	Begin Date	End Date	Quantity	Comments
Architectual	brick					0	0	1	
Architectural	glass	window pane		aqua		0	0	1	

Domestic	whiteware	indeterminate vessel		plain		1805	2008	1
Heating By-Product	coal					0	0	10
Personal	glass	bottle	unidentifiable	amber		0	0	1

Summary for 'Provenience' = STP 9 Stratum I (5 detail records) 14

Sum

Provenience STP 10 Stratum I

Class	Material	Artifact Type	Mfg Method	Artifact Traits	Mfg, origin	Begin Date	End Date	Quantity	Comments
Indeterminate	plastic	unidentifiable		ivory		1869	2008	1	
Personal	glass	beer bottle	machine	brown, embossed Anheuser-Busch logo	Anheuser-Busch Co.	1950	2008	2	
Personal	glass	bottle	machine	brown, applied color label, blue		1934	1970	1	
Personal	glass	bottle	machine	brown, stippled		1930	2008	2	
Personal	glass	bottle	machine	clear, stippled		1903	2008	1	
Personal	glass	bottle	mold	brown		1810	2008	3	
Personal	glass	bottle	mold	brown, embossed circle		1860	2008	1	
Personal	glass	bottle	unidentifiable	clear		0	0	2	
Personal	glass	bottle	unidentifiable	brown		0	0	10	
Personal	glass	bottle	unidentifiable	aqua		0	0	1	

Summary for 'Provenience' = STP 10 Stratum I (10 detail records) 24

Sum

Provenience STP 11 Stratum I

Class	Material	Artifact Type	Mfg Method	Artifact Traits	Mfg, origin	Begin Date	End Date	Quantity	Comments
Architectural	brick					0	0	1	
Architectural	glass	window pane		clear		0	0	2	
Personal	glass	bottle	machine	green, crown finish		1892	2008	1	
Summary for 'Provenience' = STP 11 Stratum I (3 detail records)								4	
Sum									

Provenience STP 12 Stratum I

Class	Material	Artifact Type	Mfg Method	Artifact Traits	Mfg, origin	Begin Date	End Date	Quantity	Comments
Personal	glass	bottle	mold	aqua, embossed		1860	2008	1	"...D"
Summary for 'Provenience' = STP 12 Stratum I (1 detail record)								1	
Sum									

Provenience STP 14 Stratum I

Class	Material	Artifact Type	Mfg Method	Artifact Traits	Mfg, origin	Begin Date	End Date	Quantity	Comments
Domestic	glass	indeterminate vessel	unidentifiable	clear		0	0	5	
Domestic	glass	indeterminate vessel	unidentifiable	green		0	0	1	
Indeterminate	styrofoam	unidentifiable		white		1962	2008	3	
Personal	glass	bottle	machine	brown, screw thread finish		1930	2008	1	
Summary for 'Provenience' = STP 14 Stratum I (4 detail records)								10	
Sum									

Provenience STP 15 Stratum I

Class	Material	Artifact Type	Mfg Method	Artifact Traits	Mfg, origin	Begin Date	End Date	Quantity	Comments
Heating By-Product	coal					0	0	5	

Summary for 'Provenience' = STP 15 Stratum I (1 detail record)

Sum 5

Provenience STP 16 Stratum I

Class	Material	Artifact Type	Mfg Method	Artifact Traits	Mfg, origin	Begin Date	End Date	Quantity	Comments
Heating By-Product	slag					0	0	1	

Summary for 'Provenience' = STP 16 Stratum I (1 detail record)

Sum 1

Provenience STP 18 Stratum I

Class	Material	Artifact Type	Mfg Method	Artifact Traits	Mfg, origin	Begin Date	End Date	Quantity	Comments
Heating By-Product	slag					0	0	1	
Personal	glass	beer bottle	machine	brown, embossed Anheuser-Busch logo	Anheuser-Busch Co.	1950	2008	2	
Personal	glass	bottle	unidentifiable	brown		0	0	4	

Summary for 'Provenience' = STP 18 Stratum I (3 detail records)

Sum 7

Provenience STP 19 Stratum I

Class	Material	Artifact Type	Mfg Method	Artifact Traits	Mfg, origin	Begin Date	End Date	Quantity	Comments
Heating By-Product	coal					0	0	2	

Summary for 'Provenience' = STP 19 Stratum I (1 detail record)

Sum 2

Provenience STP 20 Stratum I

Class	Material	Artifact Type	Mfg Method	Artifact Traits	Mfg, origin	Begin Date	End Date	Quantity	Comments
Heating By-Product	slag					0	0	1	

Summary for 'Provenience' = STP 20 Stratum I (1 detail record)

Sum 1

Provenience STP 21 Stratum I

Class	Material	Artifact Type	Mfg Method	Artifact Traits	Mfg, origin	Begin Date	End Date	Quantity	Comments
Heating By-Product	coal					0	0	3	

Summary for 'Provenience' = STP 21 Stratum I (1 detail record)

Sum 3

Provenience STP 22 Stratum I

Class	Material	Artifact Type	Mfg Method	Artifact Traits	Mfg, origin	Begin Date	End Date	Quantity	Comments
Domestic	glass	indeterminate vessel	mold	clear		1810	2008	4	
Domestic	glass	indeterminate vessel	mold	brown, faceted		1810	2008	1	
Domestic	glass	indeterminate vessel	unidentifiable	clear		0	0	16	
Heating By-Product	coal					0	0	1	
Heating By-Product	slag					0	0	2	
Personal	glass	beer bottle	machine	brown, embossed, Anheuser-Busch logo	Anheuser-Busch Co.	1950	2008	2	
Personal	glass	bottle	machine	brown, embossed		1930	2008	1	"PL..."
Personal	glass	bottle	machine	clear		1903	2008	2	

Personal	glass	bottle	machine	brown, residue of paper label	1930	2008	4	paper label worn off
Personal	glass	bottle	machine	green, stippled, embossed	1903	2008	1	"...EFILLED" on body near base, "20" on base
Personal	glass	bottle	machine	clear, stippled	1903	2008	1	
Personal	glass	bottle	machine	brown, stippled	1930	2008	1	
Personal	glass	bottle	machine	brown, stippled	1930	2008	1	
Personal	glass	bottle	machine	brown, screw thread finish	1930	2008	1	
Personal	glass	bottle	machine	brown, screw thread finish	1930	2008	1	
Personal	glass	bottle	machine	brown, embossed	1970	2008	1	"...N"T"
Personal	glass	bottle	machine	brown	1930	2008	1	
Personal	glass	bottle	machine	green, stippled	1903	2008	1	
Personal	glass	bottle	mold	brown, embossed, indeterminate design	1860	2008	2	
Personal	glass	bottle	mold	brown, embossed circle	1860	2008	1	
Personal	glass	bottle	mold	brown	1810	2008	4	
Personal	glass	bottle	mold	brown, embossed	1860	2008	3	
Personal	glass	bottle	mold	brown, embossed	1860	2008	1	"...OS..."
Personal	glass	bottle	mold	brown, embossed	1860	2008	2	"I PL..."
Personal	glass	bottle	mold	green, embossed	1810	2008	1	
Personal	glass	bottle	mold	brown, embossed	1860	2008	1	"4" on base, "PER DEP" on body near base
Personal	glass	bottle	mold	green	1810	2008	3	

Personal	glass	bottle	unidentifiable	brown		0	0	43
Personal	glass	bottle	unidentifiable	clear		0	0	1
Personal	glass	bottle	unidentifiable	green		0	0	10

Summary for 'Provenience' = STP 22 Stratum I (30 detail records)

Sum 114

Provenience STP 23 Stratum I

Class	Material	Artifact Type	Mfg Method	Artifact Traits	Mfg, origin	Begin Date	End Date	Quantity	Comments
Heating By-Product	coal					0	0	2	

Summary for 'Provenience' = STP 23 Stratum I (1 detail record)

Sum 2

Provenience STP 25 Stratum I

Class	Material	Artifact Type	Mfg Method	Artifact Traits	Mfg, origin	Begin Date	End Date	Quantity	Comments
Heating By-Product	coal					0	0	5	
Heating By-Product	slag					0	0	1	
Personal	glass	bottle	unidentifiable	light green		0	0	1	

Summary for 'Provenience' = STP 25 Stratum I (3 detail records)

Sum 7

Provenience STP 26 Stratum I

Class	Material	Artifact Type	Mfg Method	Artifact Traits	Mfg, origin	Begin Date	End Date	Quantity	Comments
Domestic	glass	indeterminate vessel	machine	clear, stippled, embossed band		1903	2008	1	
Domestic	glass	indeterminate vessel	unidentifiable	clear		0	0	3	
Personal	glass	beer bottle	machine	brown, embossed, Anheuser-Busch logo	Anheuser-Busch Co.	1950	2008	1	

Personal	glass	bottle	machine	brown	1930	2008	2	
Personal	glass	bottle	machine	brown, embossed	1970	2008	1	"...EASE DO..."
Personal	glass	bottle	machine	brown, residue of paper label	1930	2008	1	paper label worn off
Personal	glass	bottle	machine	clear, stippled	1903	2008	1	
Personal	glass	bottle	machine	brown, stippled, embossed	1930	2008	1	"...EPO..."
Personal	glass	bottle	mold	brown	1810	2008	2	
Personal	glass	bottle	mold	green, embossed	1810	2008	1	"...B . OZ. PA"
Personal	glass	bottle	unidentifiable	brown	0	0	6	
Summary for 'Provenience' = STP 26 Stratum I (11 detail records)								
Sum							20	

Provenience STP 30 Stratum I

Class	Material	Artifact Type	Mfg Method	Artifact Traits	Mfg, origin	Begin Date	End Date	Quantity	Comments
Domestic	glass	indeterminate vessel	unidentifiable	clear		0	0	1	
Heating By-Product	coal					0	0	1	
Personal	glass	bottle	machine	brown stippled		1930	2008	2	
Personal	glass	bottle	mold	green, embossed, indeterminate design		1860	2008	1	
Personal	glass	bottle	mold	brown, embossed, indeterminate design		1860	2008	1	
Personal	glass	bottle	mold	clear		1810	2008	1	
Personal	glass	bottle	unidentifiable	brown		0	0	2	
Summary for 'Provenience' = STP 30 Stratum I (7 detail records)									
Sum								9	

Provenience STP 31 Stratum I

Class	Material	Artifact Type	Mfg Method	Artifact Traits	Mfg, origin	Begin Date	End Date	Quantity	Comments
Domestic	glass	indeterminate vessel	unidentifiable	clear		0	0	1	

Summary for 'Provenience' = STP 31 Stratum I (1 detail record)

Sum 1

Provenience STP 34 Stratum I

Class	Material	Artifact Type	Mfg Method	Artifact Traits	Mfg, origin	Begin Date	End Date	Quantity	Comments
Domestic	glass	indeterminate vessel	unidentifiable	clear		0	0	1	
Heating By-Product	coal					0	0	2	
Personal	aluminum	can-push top				1980	2008	1	
Personal	glass	bottle	unidentifiable	brown		0	0	4	

Summary for 'Provenience' = STP 34 Stratum I (4 detail records)

Sum 8

Provenience STP 35 Stratum I

Class	Material	Artifact Type	Mfg Method	Artifact Traits	Mfg, origin	Begin Date	End Date	Quantity	Comments
Heating By-Product	coal					0	0	6	

Summary for 'Provenience' = STP 35 Stratum I (1 detail record)

Sum 6

Provenience STP 36 Stratum I

Class	Material	Artifact Type	Mfg Method	Artifact Traits	Mfg, origin	Begin Date	End Date	Quantity	Comments
Domestic	whiteware	indeterminate vessel		embossed		1805	2008	1	

Summary for 'Provenience' = STP 36 Stratum I (1 detail record)

Sum								1	

Provenience STP 40 Stratum I

Class	Material	Artifact Type	Mfg Method	Artifact Traits	Mfg, origin	Begin Date	End Date	Quantity	Comments
Architectural	brick					0	0	1	
Domestic	glass	indeterminate vessel	unidentifiable	aqua		0	0	2	
Domestic	glass	indeterminate vessel	unidentifiable	green		0	0	1	
Domestic	whiteware	indeterminate vessel		plain		1805	2008	1	
Heating By-Product	coal					0	0	4	
Personal	glass	bottle	machine	brown, stippled		1930	2008	1	

Summary for 'Provenience' = STP 40 Stratum I (6 detail records)

Sum								10	

Provenience STP 41 Stratum I

Class	Material	Artifact Type	Mfg Method	Artifact Traits	Mfg, origin	Begin Date	End Date	Quantity	Comments
Heating By-Product	coal					0	0	10	

Summary for 'Provenience' = STP 41 Stratum I (1 detail record)

Sum								10	

Provenience STP 42 Stratum I

Class	Material	Artifact Type	Mfg Method	Artifact Traits	Mfg, origin	Begin Date	End Date	Quantity	Comments
Chipped Stone Tool	unknown jasper	projectile point		broken/incomplete straight-stemmed		0	0	1	
Domestic	glass	indeterminate vessel	unidentifiable	clear		0	0	2	

Heating By-Product	coal					0	0	2
Personal	glass	beer bottle	machine	brown, stippled, embossed Anheuser-Busch logo	Anheuser-Busch Co.	1950	2008	1
Personal	glass	beer bottle	machine	brown, embossed Anheuser-Busch logo	Anheuser-Busch Co.	1950	2008	3
Personal	glass	bottle	machine	brown, stippled		1930	2008	2
Personal	glass	bottle	machine	brown, screw thread finish		1930	2008	1
Personal	glass	bottle	mold	brown		1810	2008	2
Personal	glass	bottle	unidentifiable	brown		0	0	8
Summary for 'Provenience' = STP 42 Stratum I (9 detail records)								22
Sum								

Provenience STP 44 Stratum I

Class	Material	Artifact Type	Mfg Method	Artifact Traits	Mfg, origin	Begin Date	End Date	Quantity	Comments
Personal	glass	bottle	machine	brown, stippled		1930	2008	2	
Personal	glass	bottle	unidentifiable	brown		0	0	2	
Summary for 'Provenience' = STP 44 Stratum I (2 detail records)								4	
Sum									

Provenience STP 46 Stratum I

Class	Material	Artifact Type	Mfg Method	Artifact Traits	Mfg, origin	Begin Date	End Date	Quantity	Comments
Domestic	glass	indeterminate vessel	unidentifiable	clear		0	0	1	
Personal	glass	bottle	machine	clear		1903	2008	1	
Personal	glass	bottle	unidentifiable	brown		0	0	2	
Summary for 'Provenience' = STP 46 Stratum I (3 detail records)								4	
Sum									

Provenience STP 48 Stratum I

Class	Material	Artifact Type	Mfg Method	Artifact Traits	Mfg, origin	Begin Date	End Date	Quantity	Comments
Indeterminate	aluminum	unidentifiable		printed decoration in white and red		0	0	1	possible beverage can
Indeterminate	glass	unidentifiable	unidentifiable	clear		0	0	1	melted
Personal	glass	bottle	machine	brown		1930	2008	1	
Personal	glass	bottle	unidentifiable	brown		0	0	1	
Summary for 'Provenience' = STP 48 Stratum I (4 detail records)								4	
Sum									

Provenience STP 50 Stratum I

Class	Material	Artifact Type	Mfg Method	Artifact Traits	Mfg, origin	Begin Date	End Date	Quantity	Comments
Architectural	glass	window pane		aqua		0	0	1	
Heating By-Product	coal					0	0	2	
Heating By-Product	slag					0	0	1	
Summary for 'Provenience' = STP 50 Stratum I (3 detail records)								4	
Sum									

Provenience STP 51 Stratum I

Class	Material	Artifact Type	Mfg Method	Artifact Traits	Mfg, origin	Begin Date	End Date	Quantity	Comments
Domestic	glass	indeterminate vessel	unidentifiable	clear		0	0	5	
Heating By-Product	coal					0	0	2	
Heating By-Product	slag					0	0	15	
Summary for 'Provenience' = STP 51 Stratum I (3 detail records)								22	
Sum									

Provenience STP 50 Stratum II

Class	Material	Artifact Type	Mfg Method	Artifact Traits	Mfg, origin	Begin Date	End Date	Quantity	Comments
Domestic	redware	indeterminate vessel	unidentifiable	spalled exterior, trace of glaze interior		1627	1880	1	
Transportation	iron	spike-railroad	cut			1791	1890	2	
Summary for 'Provenience' = STP 50 Stratum II (2 detail records)									
Sum								3	

Provenience STP 52 Stratum I

Class	Material	Artifact Type	Mfg Method	Artifact Traits	Mfg, origin	Begin Date	End Date	Quantity	Comments
Heating By-Product	charcoal					0	0	4	
Heating By-Product	coal					0	0	1	
Heating By-Product	slag					0	0	1	
Summary for 'Provenience' = STP 52 Stratum I (3 detail records)									
Sum								6	

Provenience STP 54 Stratum I

Class	Material	Artifact Type	Mfg Method	Artifact Traits	Mfg, origin	Begin Date	End Date	Quantity	Comments
Architectural	brick					0	0	2	
Architectural	mortar					0	0	1	
Heating By-Product	coal					0	0	3	
Heating By-Product	slag					0	0	1	
Personal	glass	bottle	unidentifiable	clear		0	0	1	
Summary for 'Provenience' = STP 54 Stratum I (5 detail records)									
Sum								8	

Provenience STP 55 Stratum II

Class	Material	Artifact Type	Mfg Method	Artifact Traits	Mfg, origin	Begin Date	End Date	Quantity	Comments
Architectural	brick					0	0	58	
Heating By-Product	coal					0	0	8	

Summary for 'Provenience' = STP 55 Stratum II (2 detail records)

Sum 66

Provenience STP 56 Stratum II

Class	Material	Artifact Type	Mfg Method	Artifact Traits	Mfg, origin	Begin Date	End Date	Quantity	Comments
Heating By-Product	coal					0	0	13	
Heating By-Product	slag					0	0	9	

Summary for 'Provenience' = STP 56 Stratum II (2 detail records)

Sum 22

Provenience STP 57 Stratum II

Class	Material	Artifact Type	Mfg Method	Artifact Traits	Mfg, origin	Begin Date	End Date	Quantity	Comments
Heating By-Product	coal					0	0	2	

Summary for 'Provenience' = STP 57 Stratum II (1 detail record)

Sum 2

Provenience STP 58 Stratum II

Class	Material	Artifact Type	Mfg Method	Artifact Traits	Mfg, origin	Begin Date	End Date	Quantity	Comments
Architectural	brick					0	0	7	
Architectural	mortar					0	0	1	
Heating By-Product	coal					0	0	8	

Summary for 'Provenience' = STP 58 Stratum II (3 detail records)

Sum 16

Provenience STP 59 Stratum I

Class	Material	Artifact Type	Mfg Method	Artifact Traits	Mfg, origin	Begin Date	End Date	Quantity	Comments
Architectural	brick					0	0	3	
Heating By-Product	charcoal					0	0	6	
Heating By-Product	coal					0	0	11	
Heating By-Product	slag					0	0	2	

Summary for 'Provenience' = STP 59 Stratum I (4 detail records)

Sum 22

Provenience STP 62 Stratum II

Class	Material	Artifact Type	Mfg Method	Artifact Traits	Mfg, origin	Begin Date	End Date	Quantity	Comments
Domestic	glass	indeterminate vessel	unidentifiable	clear		0	0	1	
Personal	glass	bottle	machine	brown, stippled		1930	2008	1	
Personal	glass	bottle	machine	clear, stippled		1903	2008	1	
Personal	glass	bottle	mold	brown		1810	2008	2	
Personal	glass	bottle	unidentifiable	brown		0	0	12	

Summary for 'Provenience' = STP 62 Stratum II (5 detail records)

Sum 17

Provenience STP 66 Stratum I

Class	Material	Artifact Type	Mfg Method	Artifact Traits	Mfg, origin	Begin Date	End Date	Quantity	Comments
Domestic	glass	indeterminate vessel	mold	clear		1810	2008	1	

Domestic	glass	indeterminate vessel	unidentifiable	clear	0	0	1	
Heating By-Product	coal				0	0	3	
Personal	glass	bottle	mold	brown	1810	2008	1	
Personal	glass	bottle	unidentifiable	brown	0	0	1	

Summary for 'Provenience' = STP 66 Stratum I (5 detail records)

Sum 7

Provenience STP 69 Stratum I

Class	Material	Artifact Type	Mfg Method	Artifact Traits	Mfg, origin	Begin Date	End Date	Quantity	Comments
Architectural	brick					0	0	3	
Domestic	glass	indeterminate vessel	unidentifiable	clear		0	0	1	
Personal	glass	bottle	unidentifiable	brown		0	0	1	

Summary for 'Provenience' = STP 69 Stratum I (3 detail records)

Sum 5

Provenience STP 72 Stratum I

Class	Material	Artifact Type	Mfg Method	Artifact Traits	Mfg, origin	Begin Date	End Date	Quantity	Comments
Domestic	glass	indeterminate vessel	unidentifiable	clear		0	0	1	
Personal	glass	bottle	unidentifiable	brown		0	0	2	

Summary for 'Provenience' = STP 72 Stratum I (2 detail records)

Sum 3

Provenience STP 73 Stratum I

Class	Material	Artifact Type	Mfg Method	Artifact Traits	Mfg, origin	Begin Date	End Date	Quantity	Comments
Domestic	glass	indeterminate vessel	unidentifiable	clear		0	0	1	

Heating By-Product	coal					0	0	1	
Personal	glass	bottle	machine	brown		1930	2008	1	
Personal	glass	bottle	unidentifiable	brown		0	0	1	
Summary for 'Provenience' = STP 73 Stratum I (4 detail records)								4	
Sum									

Provenience STP 74 Stratum I

Class	Material	Artifact Type	Mfg Method	Artifact Traits	Mfg, origin	Begin Date	End Date	Quantity	Comments
Domestic	glass	indeterminate vessel	unidentifiable	clear		0	0	1	
Personal	aluminum	bottle cap		plastic lined		1892	2008	3	
Personal	glass	bottle	machine	brown, embossed		1970	2008	1	"...TTER T..."
Personal	glass	bottle	machine	light green, fluted		1916	1980	1	probable Coca-Cola
Personal	glass	bottle	machine	brown, embossed, Anheuser-Busch logo	Anheuser-Busch Co.	1950	2008	2	
Personal	glass	bottle	machine	brown, embossed		1970	2008	1	"...TER 84"
Personal	glass	bottle	machine	brown, applied color label		1934	1970	1	
Personal	glass	bottle	machine	brown		1930	2008	1	
Personal	glass	bottle	machine	brown, embossed		1970	2008	1	"DON'T LI..."
Personal	glass	bottle	mold	brown		1810	2008	1	
Personal	glass	bottle	unidentifiable	brown		0	0	15	
Summary for 'Provenience' = STP 74 Stratum I (11 detail records)								28	
Sum									

Provenience STP 75 Stratum I

Class	Material	Artifact Type	Mfg Method	Artifact Traits	Mfg, origin	Begin Date	End Date	Quantity	Comments
Domestic	glass	indeterminate vessel	unidentifiable	clear		0	0	1	
Heating By-Product	coal					0	0	1	

Summary for 'Provenience' = STP 75 Stratum I (2 detail records)

Sum 2

Provenience STP 76 Stratum I

Class	Material	Artifact Type	Mfg Method	Artifact Traits	Mfg, origin	Begin Date	End Date	Quantity	Comments
Domestic	glass	indeterminate vessel	mold	clear		1810	2008	1	
Ecological	bone	mammal-medium				0	0	1	
Heating By-Product	coal					0	0	1	
Personal	glass	bottle	unidentifiable	brown		0	0	2	

Summary for 'Provenience' = STP 76 Stratum I (4 detail records)

Sum 5

Provenience STP 77 Stratum I

Class	Material	Artifact Type	Mfg Method	Artifact Traits	Mfg, origin	Begin Date	End Date	Quantity	Comments
Domestic	glass	indeterminate vessel	unidentifiable	clear		0	0	2	
Personal	glass	beer bottle	machine	brown, embossed, Anheuser-Busch logo	Anheuser-Busch Co.	1950	2008	1	
Personal	glass	bottle	unidentifiable	brown		0	0	2	

Summary for 'Provenience' = STP 77 Stratum I (3 detail records)

Sum 5

Provenience STP 78 Stratum I

Class	Material	Artifact Type	Mfg Method	Artifact Traits	Mfg, origin	Begin Date	End Date	Quantity	Comments
Domestic	glass	indeterminate vessel	machine	clear		1903	2008	1	
Domestic	glass	indeterminate vessel	unidentifiable	clear		0	0	5	
Domestic	whiteware	indeterminate vessel		plain		1805	2008	1	
Heating By-Product	coal					0	0	1	
Indeterminate	rubber	miscellaneous ring		black		1880	2008	1	
Personal	glass	bottle	machine	brown, embossed, Anheuser-Busch logo	Anheuser-Busch Co.	1950	2008	1	
Personal	glass	bottle	machine	brown, screw thread finish		1930	2008	2	
Personal	glass	bottle	machine	brown, stippled		1930	2008	1	
Personal	glass	bottle	mold	green, embossed, indeterminate design		1860	2008	1	
Personal	glass	bottle	unidentifiable	green		0	0	1	
Personal	glass	bottle	unidentifiable	brown		0	0	6	

Summary for 'Provenience' = STP 78 Stratum I (11 detail records)

Sum 21

Provenience STP 80 Stratum I

Class	Material	Artifact Type	Mfg Method	Artifact Traits	Mfg, origin	Begin Date	End Date	Quantity	Comments
Heating By-Product	coal					0	0	1	
Personal	aluminum	beer can		partial Coors logo printed in black	Coors	1959	2008	1	

Personal	glass	bottle	machine	brown, screw thread finish	1930	2008	1	
Personal	glass	bottle	machine	clear, stippled, embossed	1903	2008	1	"33"
Personal	glass	bottle	unidentifiable	brown	0	0	5	
Personal	glass	bottle	unidentifiable	clear	0	0	1	
Personal	glass	bottle	unidentifiable	green	0	0	1	

Summary for 'Provenience' = STP 80 Stratum I (7 detail records)

Sum 11

Provenience STP 81 Stratum I

Class	Material	Artifact Type	Mfg Method	Artifact Traits	Mfg, origin	Begin Date	End Date	Quantity	Comments
Domestic	glass	indeterminate vessel	unidentifiable	clear		0	0	3	
Heating By-Product	coal					0	0	1	
Personal	glass	bottle	machine	brown, stippled, embossed		1930	2008	1	"...G U.S. PA..."
Personal	glass	bottle	machine	brown, stippled, embossed		1930	2008	1	"...ER"
Personal	glass	bottle	machine	brown, screw thread finish		1930	2008	1	
Personal	glass	bottle	machine	brown, embossed		1970	2008	1	"PLEA..."
Personal	glass	bottle	machine	brown, residue of paper label		1930	2008	2	paper label worn off
Personal	glass	bottle	mold	brown, embossed		1860	2008	1	
Personal	glass	bottle	mold	clear, embossed		1860	2008	1	"4"
Personal	glass	bottle	unidentifiable	green		0	0	2	
Personal	glass	bottle	unidentifiable	brown		0	0	7	

Summary for 'Provenience' = STP 81 Stratum I (11 detail records)

Sum 21

Provenience STP 82 Stratum I

Class	Material	Artifact Type	Mfg Method	Artifact Traits	Mfg, origin	Begin Date	End Date	Quantity	Comments
Domestic	glass	indeterminate vessel	unidentifiable	clear		0	0	1	
Personal	glass	beer bottle	machine	brown, embossed, Anheuser-Busch logo	Anheuser-Busch Co.	1950	2008	2	
Personal	glass	bottle	machine	brown, residue of paper label		1930	2008	1	paper label worn off
Personal	glass	bottle	machine	brown, stippled, embossed		1930	2008	1	"RET..."
Personal	glass	bottle	mold	brown		1810	2008	1	
Personal	glass	bottle	unidentifiable	brown		0	0	16	
Personal	glass	bottle	unidentifiable	green		0	0	4	

Summary for 'Provenience' = STP 82 Stratum I (7 detail records)

Sum 26

Provenience STP 83 Stratum I

Class	Material	Artifact Type	Mfg Method	Artifact Traits	Mfg, origin	Begin Date	End Date	Quantity	Comments
Domestic	glass	indeterminate vessel	mold	clear		1810	2008	1	
Domestic	glass	indeterminate vessel	unidentifiable	clear		0	0	3	
Personal	glass	bottle	machine	brown, remnant of paper label, silver with black printing		1930	2008	1	
Personal	glass	bottle	unidentifiable	brown		1810	2008	4	

Summary for 'Provenience' = STP 83 Stratum I (4 detail records)

Sum 9

Provenience STP 84 Stratum I

Class	Material	Artifact Type	Mfg Method	Artifact Traits	Mfg, origin	Begin Date	End Date	Quantity	Comments
Domestic	glass	indeterminate vessel	unidentifiable	clear		0	0	3	
Personal	aluminum	beer can		Budweiser logo printed in blue and red	Budweiser	1958	2008	1	
Personal	glass	bottle	machine	brown, stippled		1930	2008	3	
Personal	glass	bottle	machine	clear, stippled		1903	2008	1	
Personal	glass	bottle	unidentifiable	brown		0	0	7	

Summary for 'Provenience' = STP 84 Stratum I (5 detail records)

Sum 15

Provenience STP 85 Stratum I

Class	Material	Artifact Type	Mfg Method	Artifact Traits	Mfg, origin	Begin Date	End Date	Quantity	Comments
Domestic	glass	indeterminate vessel	unidentifiable	clear		0	0	3	
Personal	glass	bottle	machine	brown, embossed, Anheuser-Busch logo	Anheuser-Busch Co.	1950	2008	1	
Personal	glass	bottle	machine	brown		1930	2008	1	
Personal	glass	bottle	mold	brown		1810	2008	1	
Personal	glass	bottle	mold	brown, embossed		1860	2008	1	"...T..."
Personal	glass	bottle	mold	brown, embossed		1860	2008	1	"RE..."
Personal	glass	bottle	mold	brown, embossed, indeterminate design		1960	2008	1	
Personal	glass	bottle	mold	brown, screw thread finish		1930	2008	2	
Personal	glass	bottle	mold	green		1810	2008	1	

	Personal	glass	bottle	unidentifiable	brown		0	0	5

Summary for 'Provenience' = STP 85 Stratum I (10 detail records)

Sum 17

Provenience STP 87 Stratum I

Class	Material	Artifact Type	Mfg Method	Artifact Traits	Mfg, origin	Begin Date	End Date	Quantity	Comments
Domestic	glass	indeterminate vessel	mold	clear		1810	2008	1	
Heating By-Product	slag					0	0	1	
Personal	glass	beer bottle	machine	brown, embossed, Anheuser-Busch logo	Anheuser-Busch Co.	1950	2008	1	
Personal	glass	bottle	unidentifiable	brown		0	0	1	

Summary for 'Provenience' = STP 87 Stratum I (4 detail records)

Sum 4

Provenience STP 88 Stratum I

Class	Material	Artifact Type	Mfg Method	Artifact Traits	Mfg, origin	Begin Date	End Date	Quantity	Comments
Personal	glass	bottle	mold	clear, frosted, impressed		1810	2008	1	"AN"
Personal	glass	bottle	unidentifiable	clear, frosted				1	

Summary for 'Provenience' = STP 88 Stratum I (2 detail records)

Sum 2

Provenience STP 89 Stratum I

Class	Material	Artifact Type	Mfg Method	Artifact Traits	Mfg, origin	Begin Date	End Date	Quantity	Comments
Architectural	glass	window pane		aqua		0	0	1	
Personal	glass	bottle	unidentifiable	brown		0	0	1	

Summary for 'Provenience' = STP 89 Stratum I (2 detail records)

Sum 2

Provenience STP 90 Stratum I

Class	Material	Artifact Type	Mfg Method	Artifact Traits	Mfg, origin	Begin Date	End Date	Quantity	Comments
Domestic	glass	indeterminate vessel	unidentifiable	light green		0	0	1	
Heating By-Product	coal					0	0	2	

Summary for 'Provenience' = STP 90 Stratum I (2 detail records)

Sum 3

Provenience STP 91 Stratum I

Class	Material	Artifact Type	Mfg Method	Artifact Traits	Mfg, origin	Begin Date	End Date	Quantity	Comments
Personal	glass	bottle	machine	brown, residue of paper label		1930	2008	1	paper label worn off
Personal	glass	bottle	machine	light green, fluted		1916	2008	1	probable Coca Cola
Personal	glass	bottle	unidentifiable	brown		0	0	1	

Summary for 'Provenience' = STP 91 Stratum I (3 detail records)

Sum 3

Provenience STP 92 Stratum I

Class	Material	Artifact Type	Mfg Method	Artifact Traits	Mfg, origin	Begin Date	End Date	Quantity	Comments
Personal	glass	bottle	unidentifiable	brown		0	0	1	

Summary for 'Provenience' = STP 92 Stratum I (1 detail record)

Sum 1

Provenience STP 94 Stratum I

Class	Material	Artifact Type	Mfg Method	Artifact Traits	Mfg, origin	Begin Date	End Date	Quantity	Comments
Architectural	brick					0	0	1	
Domestic	glass	indeterminate vessel	unidentifiable	aqua		0	0	1	

Domestic	glass	indeterminate vessel	unidentifiable	clear	0	0	4
Domestic	redware	indeterminate vessel	unidentifiable	red-brown glaze interior and exterior	1627	1880	1
Domestic	whiteware	miscellaneous deep vessel		transfer printed-purple	1828	2008	1
Personal	glass	bottle	machine	clear, screw thread finish	1903	2008	1
Personal	glass	bottle	unidentifiable	brown	0	0	2

Summary for 'Provenience' = STP 94 Stratum I (7 detail records)

Sum 11

Provenience STP 95 Stratum I

Class	Material	Artifact Type	Mfg Method	Artifact Traits	Mfg. origin	Begin Date	End Date	Quantity	Comments
Architectural	brick					0	0	3	
Architectural	glass	window pane		aqua		0	0	2	
Domestic	glass	indeterminate lighting	unidentifiable	clear		0	0	1	
Domestic	glass	indeterminate vessel	unidentifiable	clear		0	0	2	
Domestic	glass	tumbler-Packer's	machine	clear		1908	1914	1	sun purpled
Domestic	stoneware-buff bodied	indeterminate vessel		ridged		0	0	1	possible pipe bowl
Domestic	whiteware	indeterminate vessel		plain		1805	2008	2	
Domestic	whiteware	miscellaneous deep vessel		painted underglaze-red band		1830	1900	1	
Personal	glass	bottle	mold	aqua, embossed		1860	2008	2	
Personal	glass	bottle	unidentifiable	aqua		0	0	2	

Personal	glass	bottle	unidentifiable	brown	0	0	1	

Summary for 'Provenience' = STP 95 Stratum I (11 detail records)

Sum 18

Provenience TU 1 Stratum I Level 1

Class	Material	Artifact Type	Mfg Method	Artifact Traits	Mfg, origin	Begin Date	End Date	Quantity	Comments
Heating By-Product	coal					0	0	5	
Personal	glass	bottle	machine	brown, embossed		1970	2008	1	"PL..."
Personal	glass	bottle	machine	clear, screw thread finish		1903	2008	1	
Personal	glass	bottle	mold	brown		1810	2008	1	
Personal	glass	bottle	unidentifiable	brown		0	0	2	

Summary for 'Provenience' = TU 1 Stratum I Level 1 (5 detail records)

Sum 10

Provenience TU 1 Stratum I Level 2

Class	Material	Artifact Type	Mfg Method	Artifact Traits	Mfg, origin	Begin Date	End Date	Quantity	Comments
Heating By-Product	coal					0	0	5	
Heating By-Product	slag					0	0	3	

Summary for 'Provenience' = TU 1 Stratum I Level 2 (2 detail records)

Sum 8

Provenience TU 1 Stratum I Level 3

Class	Material	Artifact Type	Mfg Method	Artifact Traits	Mfg, origin	Begin Date	End Date	Quantity	Comments
Heating By-Product	coal					0	0	5	
Heating By-Product	slag					0	0	4	

Summary for 'Provenience' = TU 1 Stratum I Level 3 (2 detail records)

Sum 9

Provenience TU 1 Stratum I Level 4

Class	Material	Artifact Type	Mfg Method	Artifact Traits	Mfg, origin	Begin Date	End Date	Quantity	Comments
Heating By-Product	coal					0	0	3	

Summary for 'Provenience' = TU 1 Stratum I Level 4 (1 detail record)

Sum 3

Provenience TU 2 Stratum I Level 1

Class	Material	Artifact Type	Mfg Method	Artifact Traits	Mfg, origin	Begin Date	End Date	Quantity	Comments
Domestic	glass	indeterminate vessel	unidentifiable	clear		0	0	1	
Domestic	whiteware	indeterminate vessel		plain		1805	2008	1	
Heating By-Product	coal					0	0	12	

Summary for 'Provenience' = TU 2 Stratum I Level 1 (3 detail records)

Sum 14

Grand Total 824