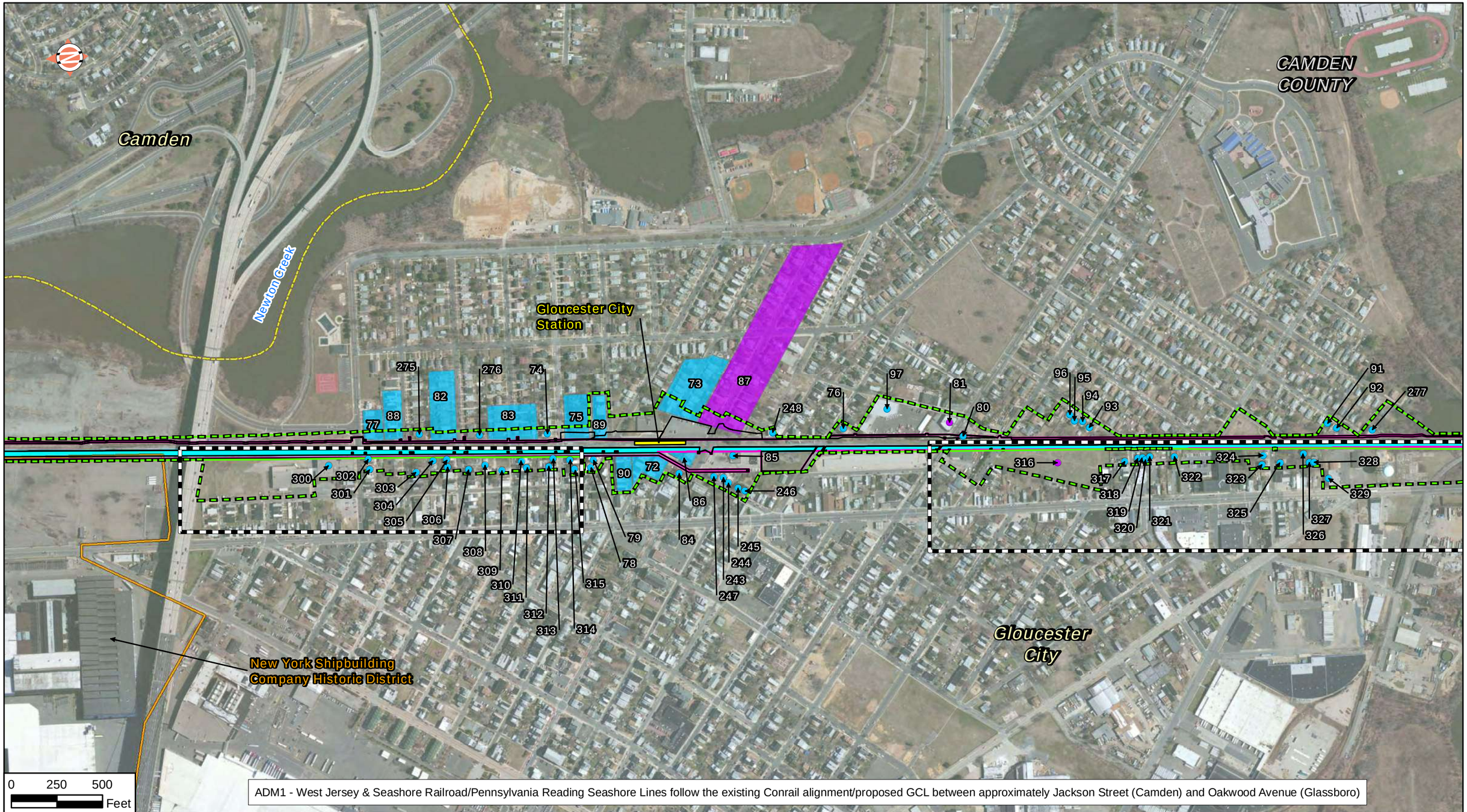

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Figure 2 - Addendum 03 (November 2018)
Area of Potential Effects (APE) and Resource Location Map
Glassboro-Camden Line Light Rail Project
Camden and Gloucester Counties, New Jersey
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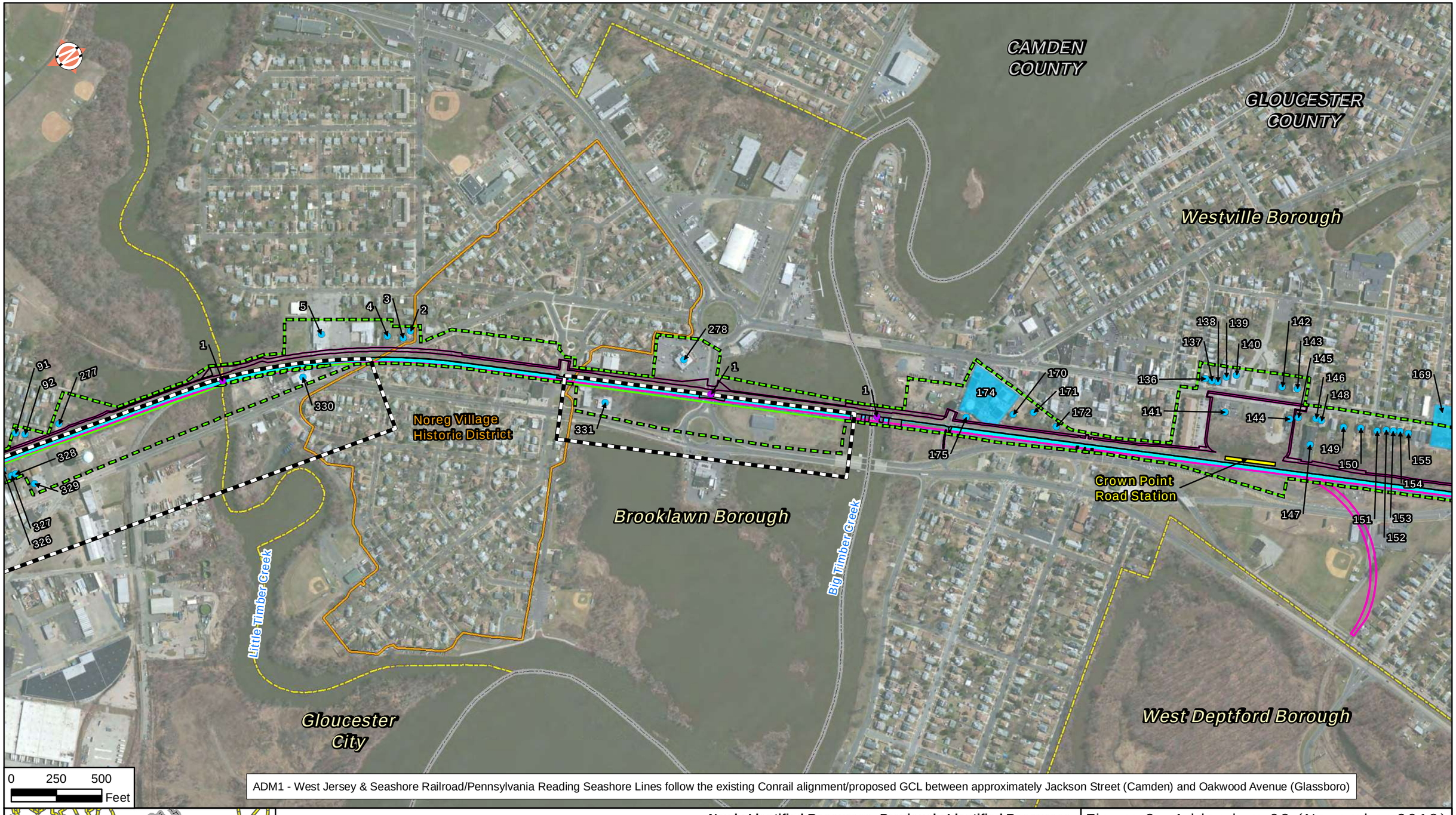
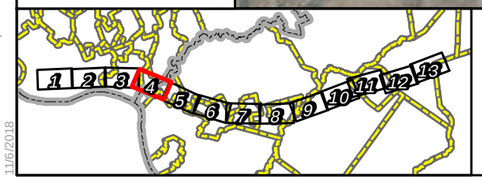
Map Source: ArcGIS Map Service "World_Imagery" via https://clarity.maptiles.arcgis.com/arcgis/rest/services



ADM1 - West Jersey & Seashore Railroad/Pennsylvania Reading Seashore Lines follow the existing Conrail alignment/proposed GCL between approximately Jackson Street (Camden) and Oakwood Avenue (Glassboro)



- Current Area of Potential Effects (APE)
- Former Area of Potential Effects (APE)
- Expanded APE Areas
- GCL Facilities
- Proposed VMF Site Locations
- Updated Limit of Disturbance
- Previous Limit of Disturbance
- Expanded LOD Areas

Newly Identified Resources
- Intensive Survey Form
- Not Eligible
- Intensive Survey Form
- Not Eligible

Previously Identified Resources
- NR Listed
- NR Eligible/ SR Listed NR Eligible
- SR/NR Listed - Individual
- NR Eligible - Individual

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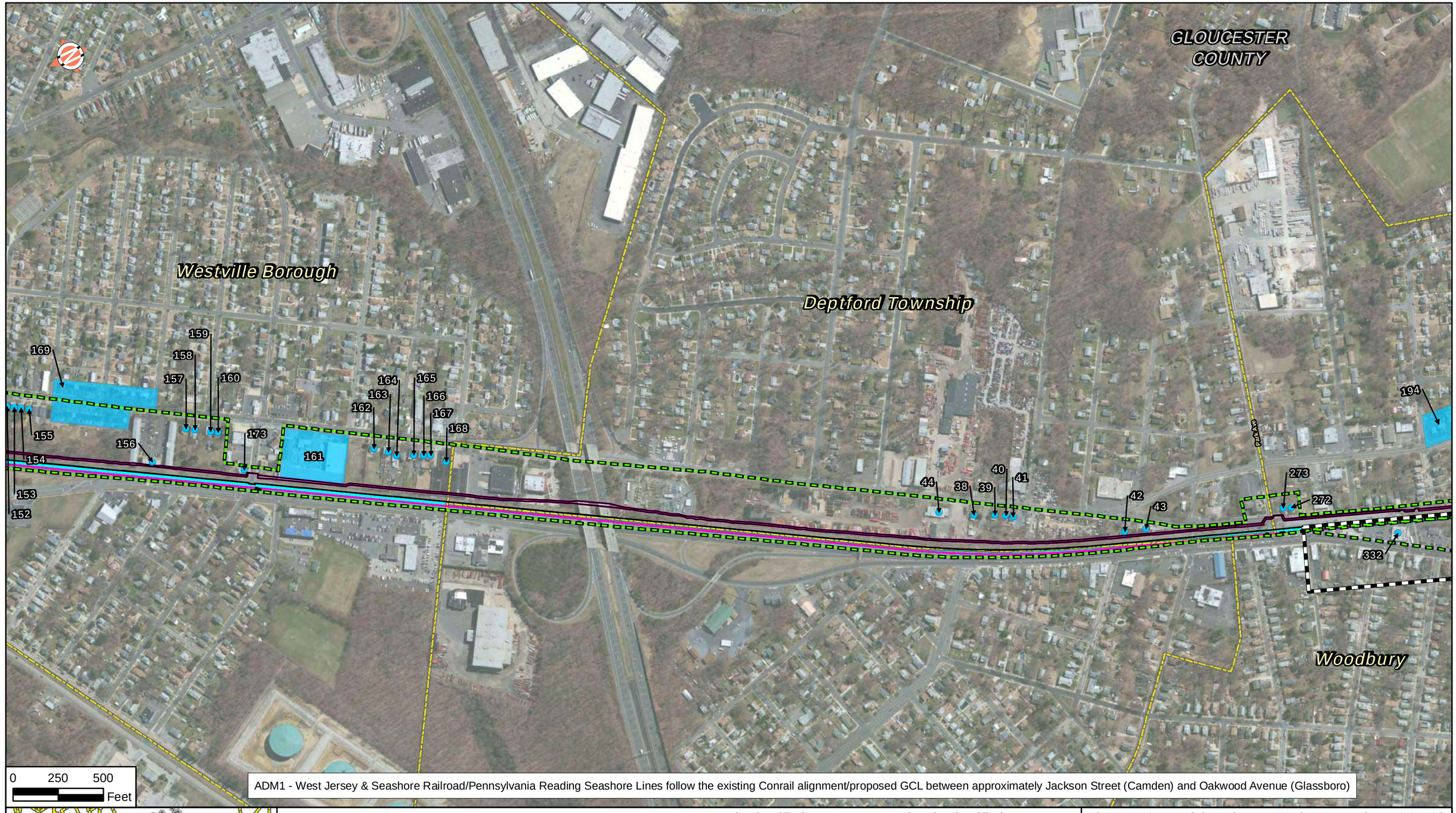

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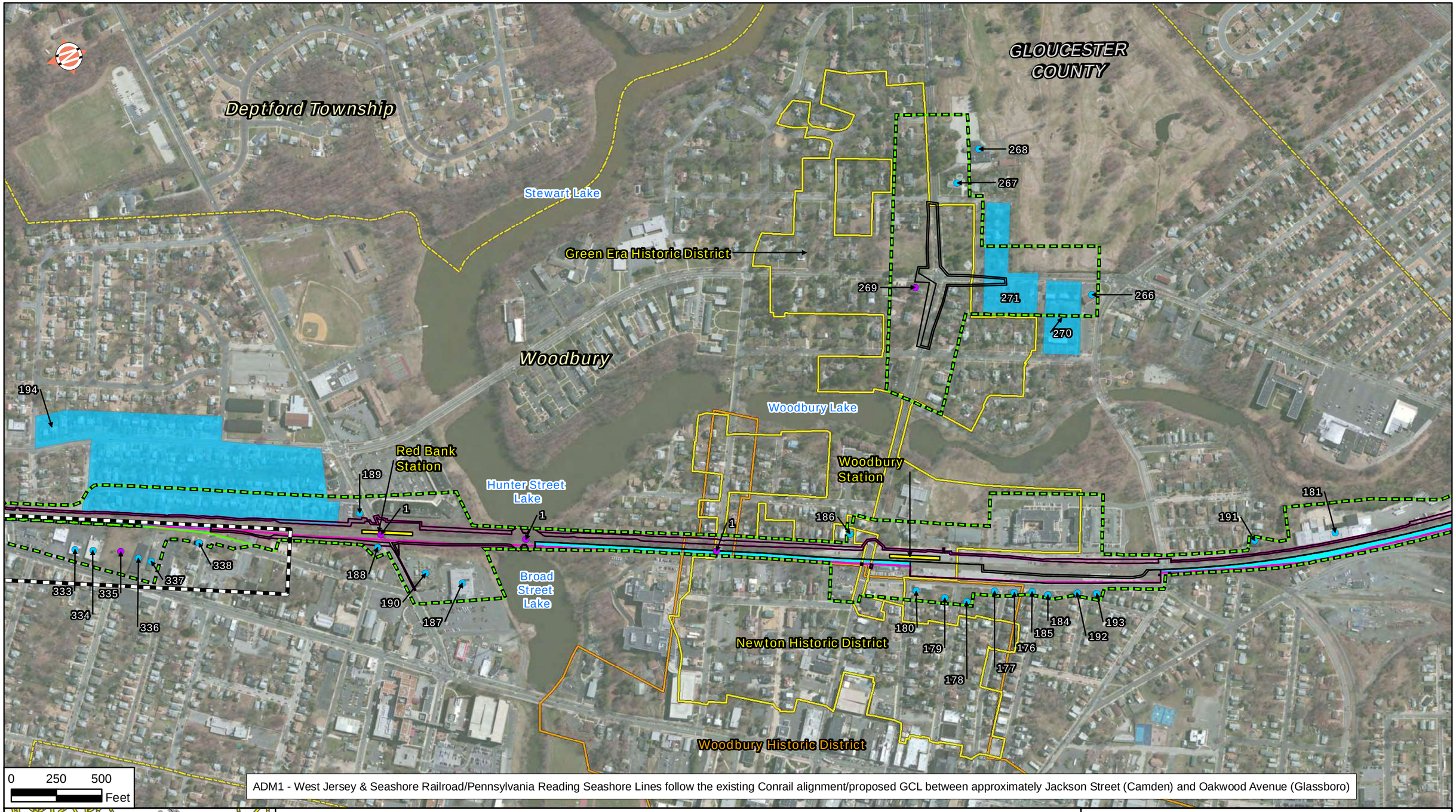

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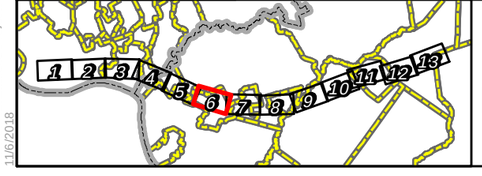

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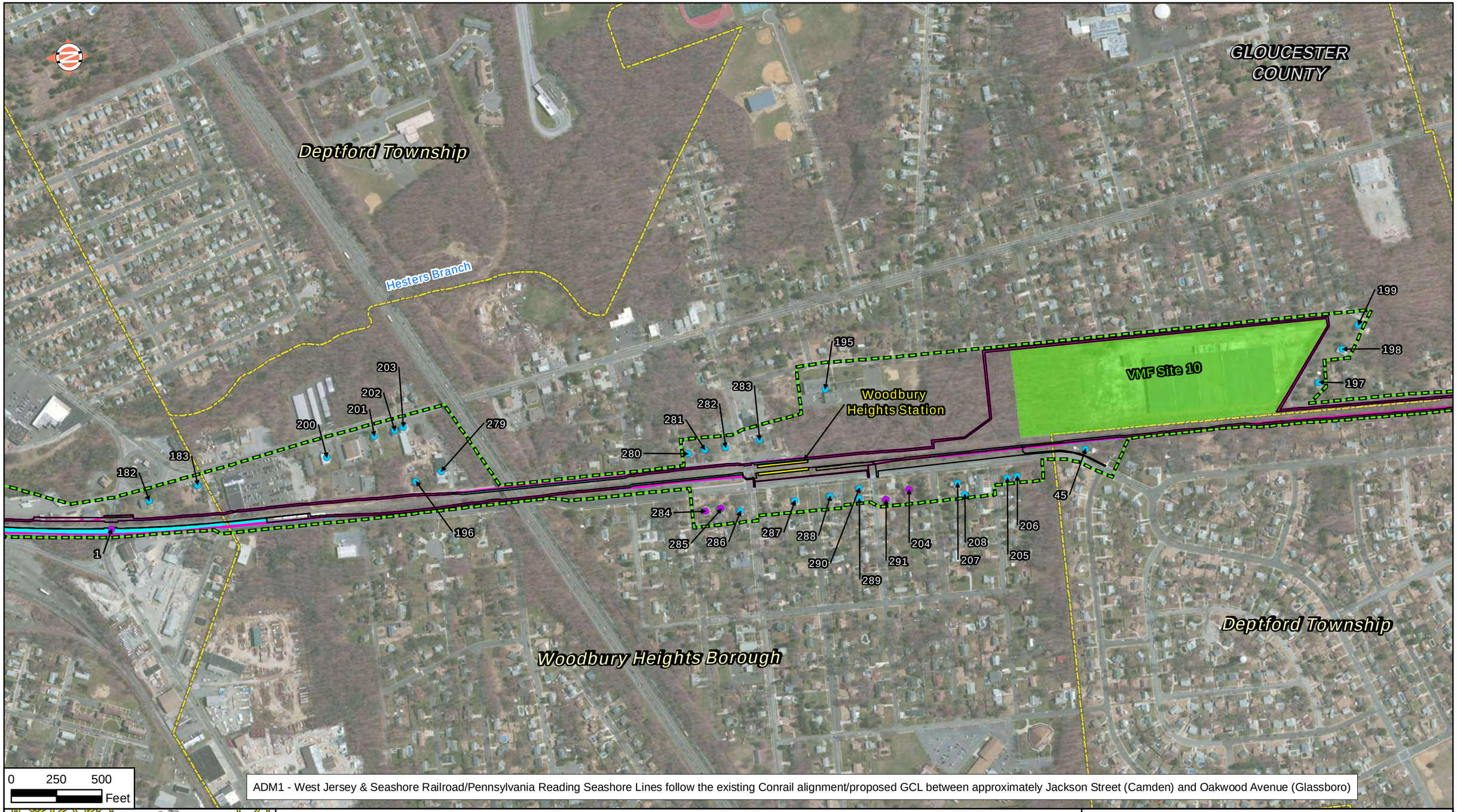

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GLOUCESTER COUNTY

Wenonah Historic District

Wenonah Train Station

1

135

Wenonah Station

Wenonah Borough

Deptford Township

Mantua Creek

0 250 500 Feet

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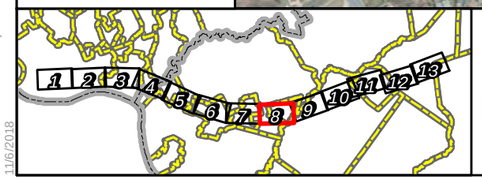

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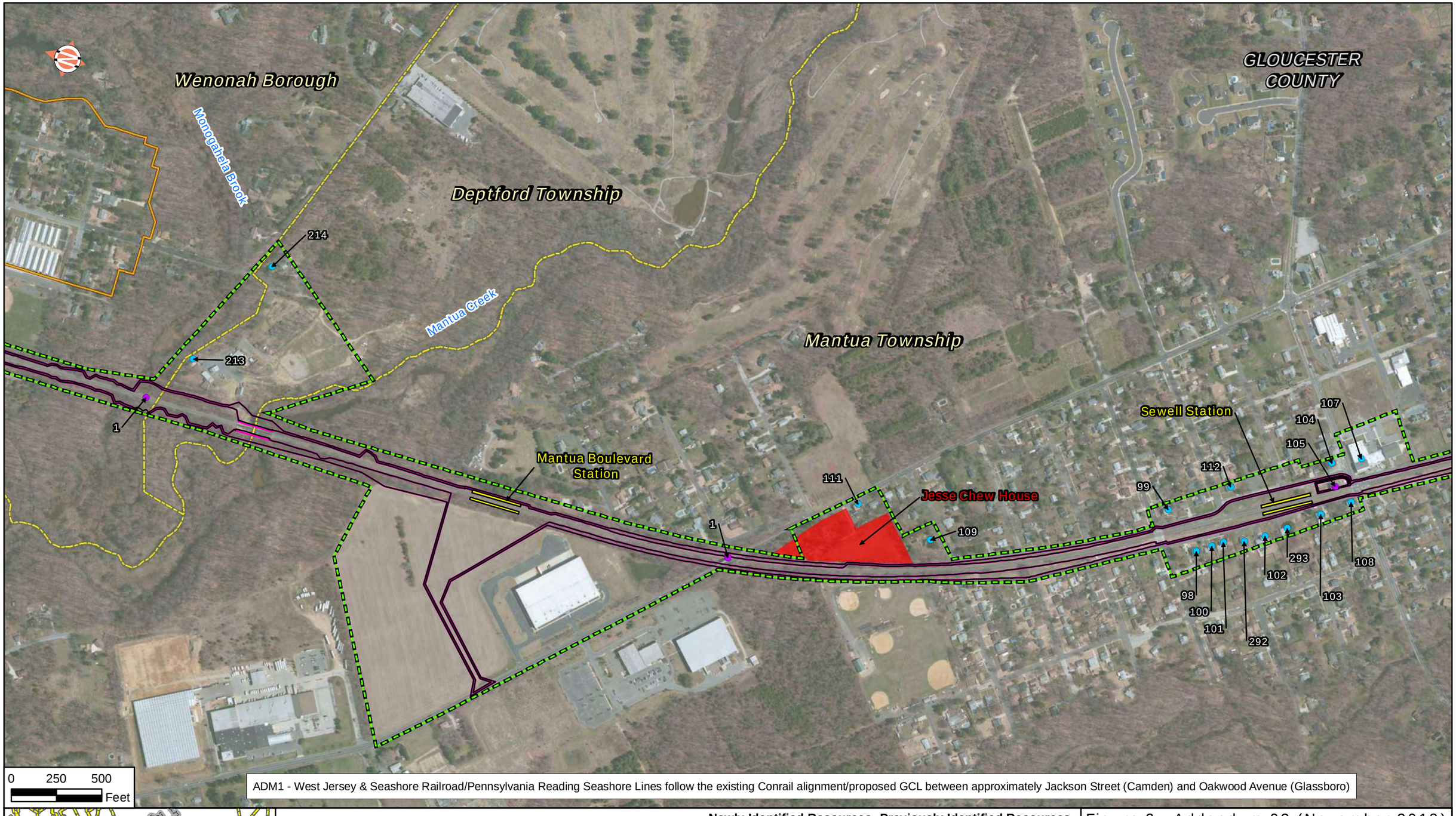

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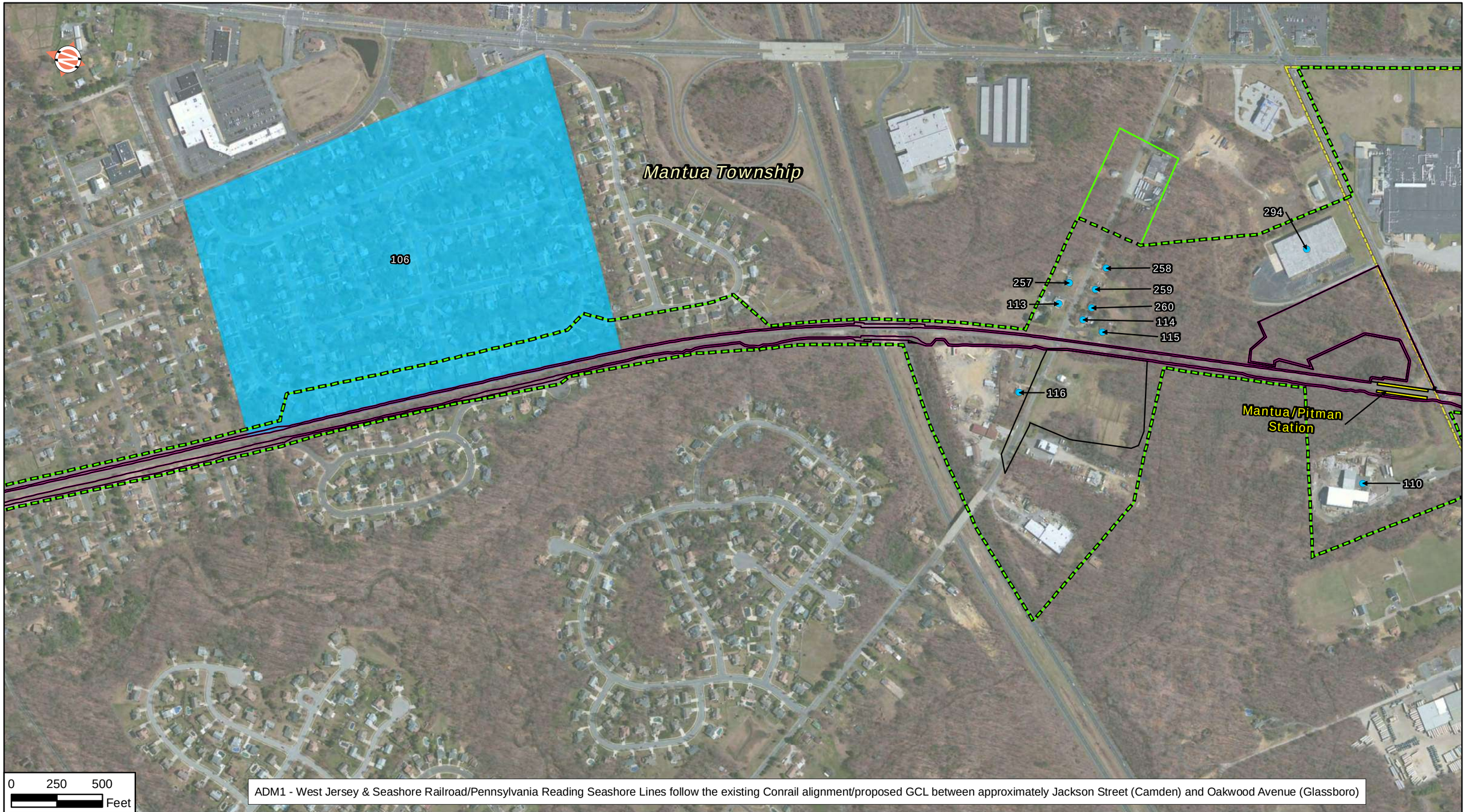

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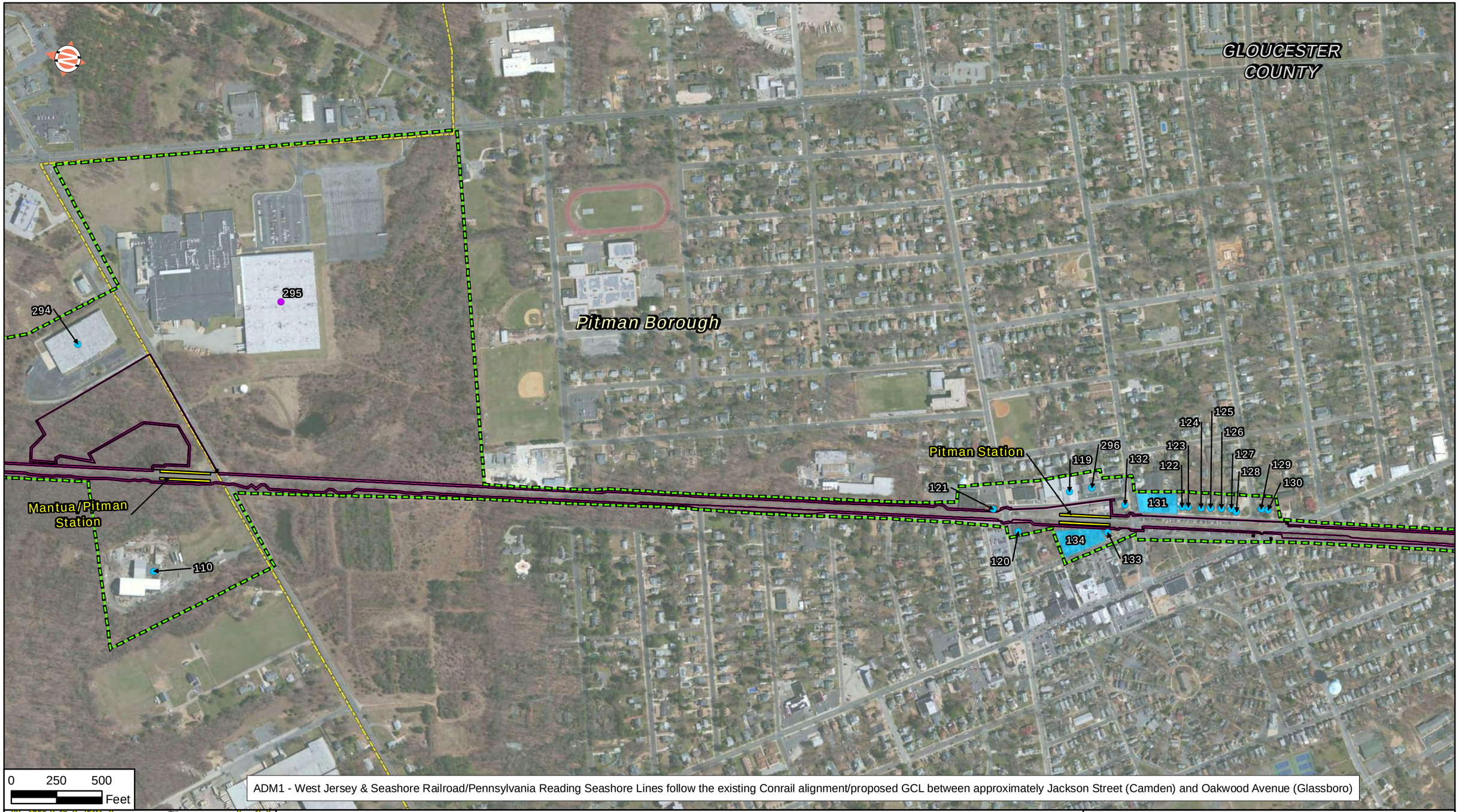

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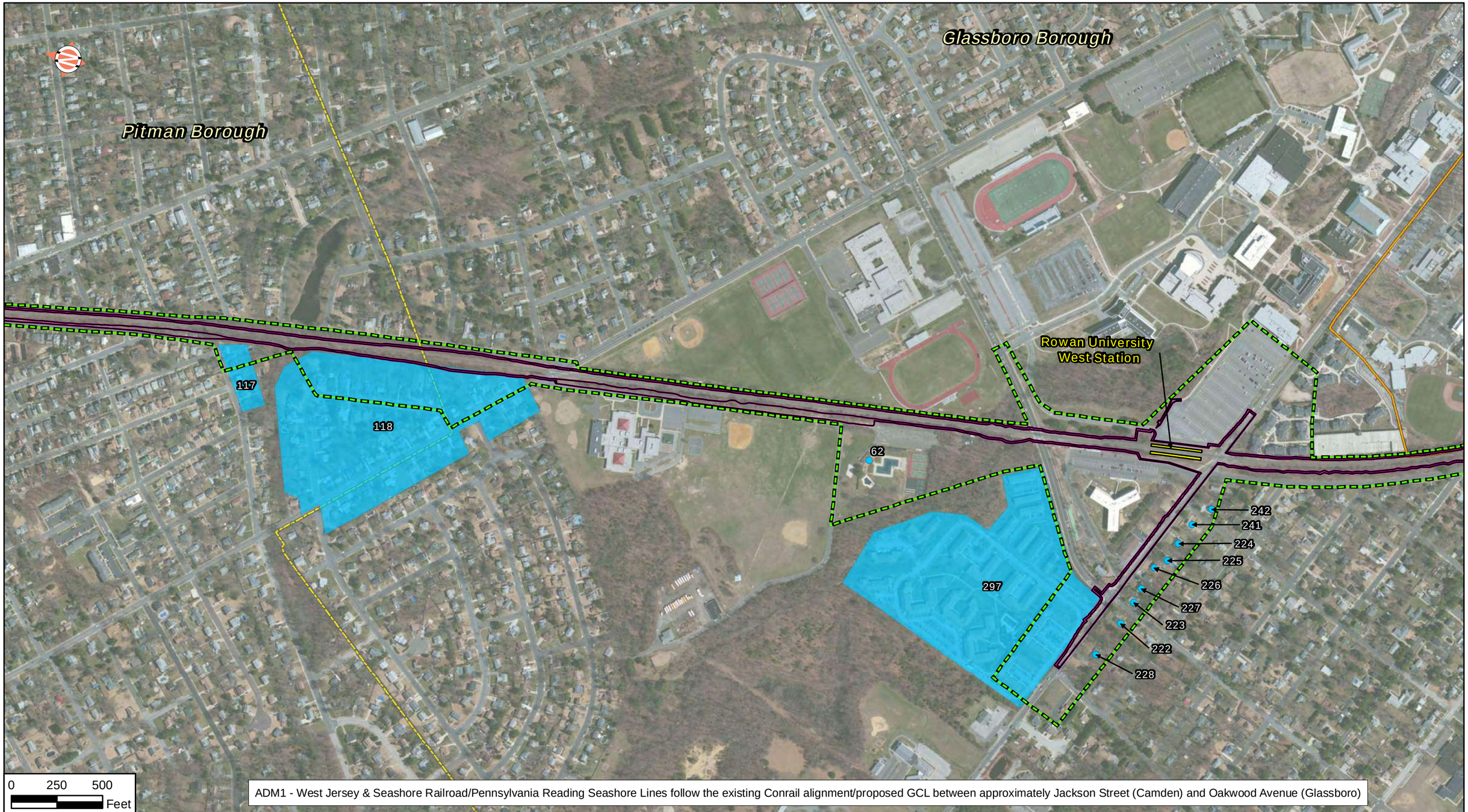

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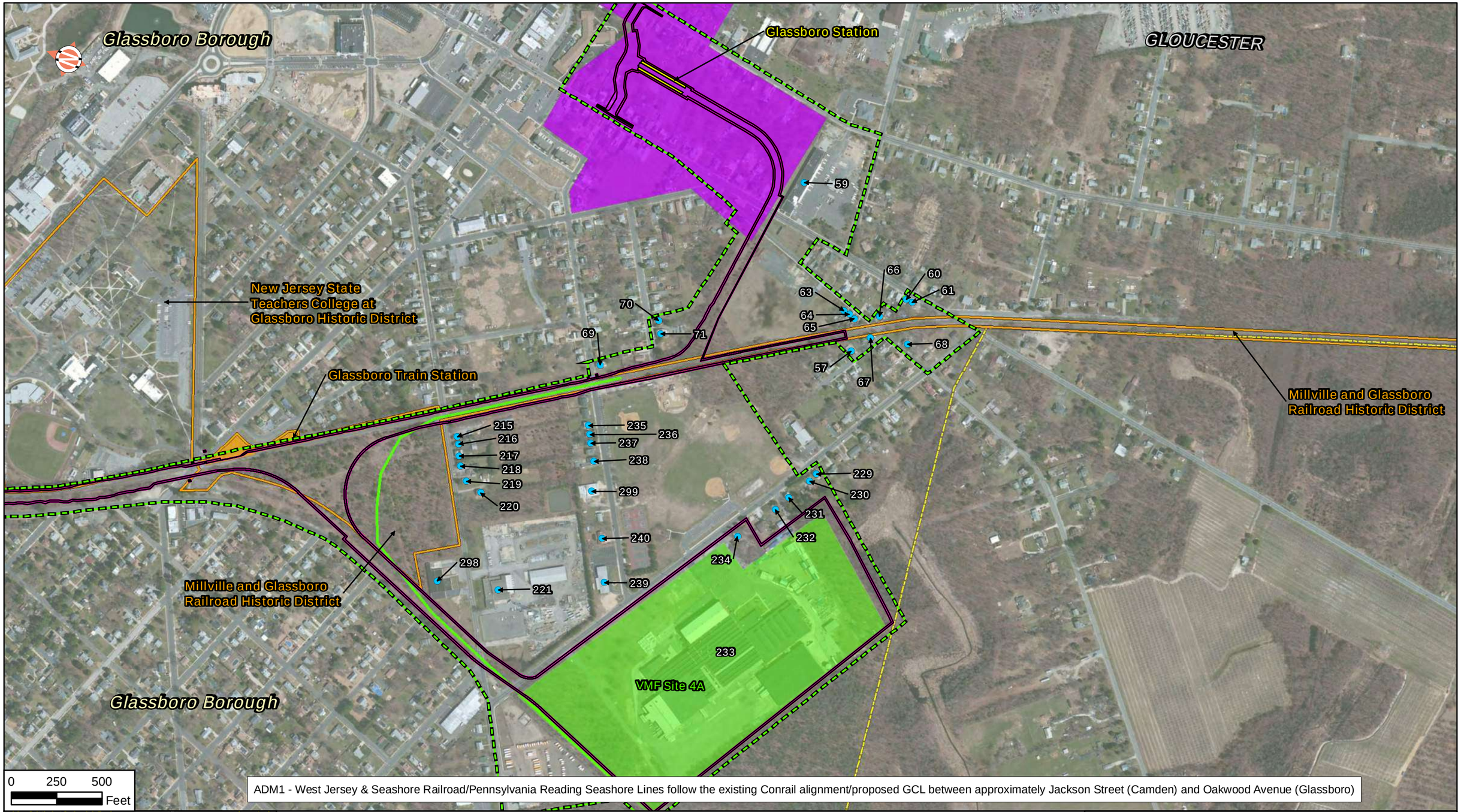

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Photograph 8: 509-511 Mercer Street, Gloucester City (October 2018).

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Photograph 12: 512-514 Middlesex Street, Gloucester City (October 2018).

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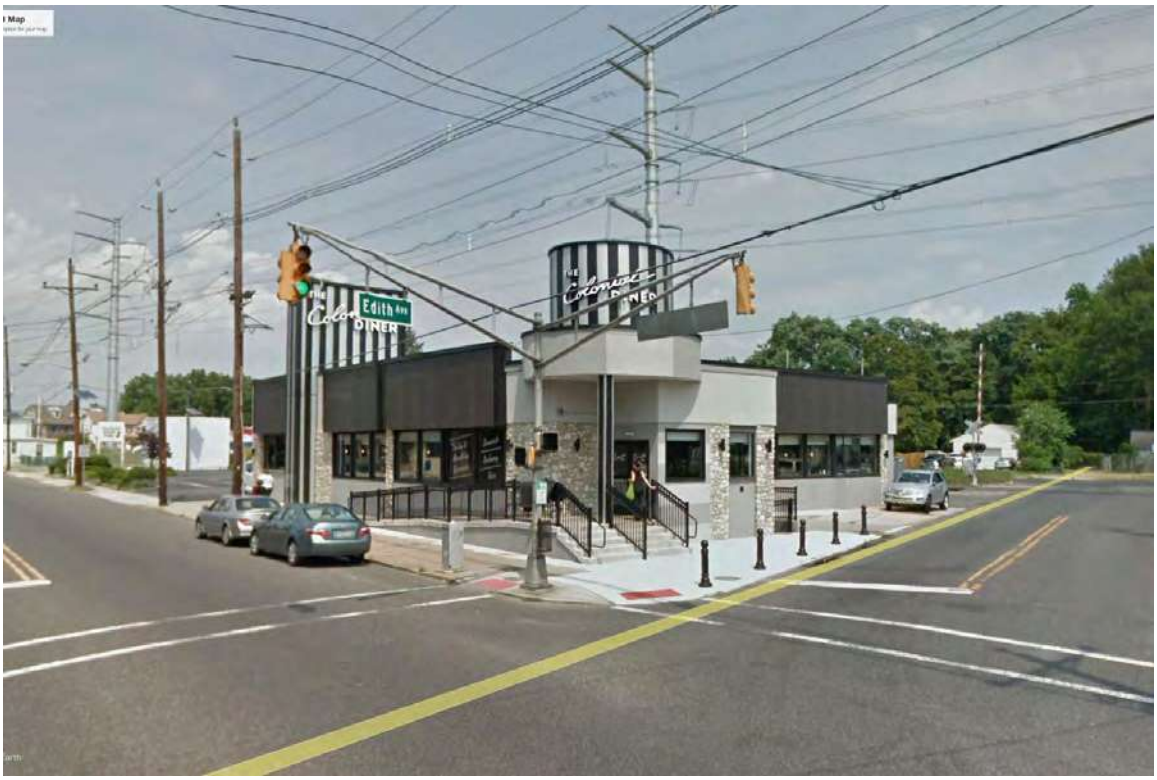
Photograph 33: 114 S. New Broadway, Brooklawn Borough (October 2018).



Photograph 34: 920-924 N. Broad Street, Woodbury City (October 2018).

Photograph 35: 818 N. Broad Street, Woodbury City (October 2018).

Photograph 36: 814 N. Broad Street, Woodbury City (October 2018).

Photograph 37: Presbyterian Church at Woodbury Cemetery, 800 N. Broad Street, Woodbury City (October 2018).

Photograph 38: 740 N. Broad Street, Woodbury City (October 2018).

Photograph 39: 736 N. Broad Street, Woodbury City (October 2018).

Photograph 40: 30 Dare Street, Woodbury City (October 2018).

Appendix 7-B: Phase IA Reports

Phase IA Archaeological Survey Report

Glassboro-Camden Line EIS

November 15, 2013

Prepared by:

A.D. MARBLE & COMPANY
Environmental, Cultural & Engineering Services

Prepared for:

STV 100 Years

Revision 00 – Final

PHASE IA ARCHAEOLOGICAL SURVEY REPORT

Glassboro-Camden Line

Camden and Gloucester Counties, New Jersey

Prepared for:

STV, Inc.
1818 Market Street, Suite 1410
Philadelphia, PA 19103-3616

Prepared by:

A.D. Marble & Company
375 East Elm Street, Suite 101
Conshohocken, Pennsylvania 19428

November 15, 2013

ABSTRACT

This report presents the results of the Phase IA archaeological assessment conducted by A.D. Marble & Company for the proposed Glassboro-Camden Line (GCL) under consideration for construction in Gloucester and Camden counties, New Jersey. A.D. Marble & Company performed the survey in the summer of 2013 on behalf of the Federal Transit Administration (lead federal agency), the Delaware River Port Authority, the Port Authority Transit Corporation, and the New Jersey TRANSIT (local joint lead agencies). An Environmental Impact Statement is being prepared in compliance with the National Environmental Policy Act of 1966. In addition, since the proposed project requires a United States Army Corps of Engineers permit and may involve federal funding, the undertaking must comply with Section 106 of the National Historic Preservation Act of 1966 (as amended) and the implementing regulations (36CFR800) of the Advisory Council on Historic Preservation. GCL would provide an 18-mile expansion of transit service between Camden and Glassboro. The proposed GCL project corridor generally follows the existing Conrail right-of-way from Glassboro northward to Camden, passing through the communities of Glassboro, Pitman, Sewell, Mantua Township, Deptford Township, Wenonah, Woodbury Heights, Woodbury, Westville, Brooklawn, Gloucester City and Camden. The project would provide 12 new walk-up stations and two park-and-ride facilities.

The Phase IA archaeological assessment was undertaken to identify archaeological resources in the Area of Potential Effects (APE) within the proposed project corridor, determine the range of historic and precontact activities that had occurred in the APE, and provide a preliminary assessment of archaeological integrity associated with those activities. Background research was undertaken in original historical sources and maps, secondary historical and archaeological studies, and recorded site files in the New Jersey Office of Historic Preservation in Trenton. Geographic variables such as distance to water, terrain slope, and soil types were considered. The evaluation of these variables was enhanced by a geomorphological study. The impact of human disturbance during the twentieth century was also considered.

Given the preliminary nature of planning at this point, it would appear that most of the project corridor would pass through areas with limited archaeological potential or would remain within the confines of the previously disturbed rail corridor. The rail corridor itself represents a resource of varying but at times considerable archaeological preservation and has been evaluated both as an important industrial resource and an agent of disturbance. The former location of the Glassboro station at Railroad Avenue appears to be well preserved and avoidance during this and subsequent projects is strongly recommended. A Phase IB archaeological survey is recommended for the proposed maintenance area in Woodbury Heights, the proposed Mantua Boulevard station parking, and the proposed maintenance area south of Glassboro. An alternative mitigation study is recommended for sections of Camden from Walter Rand Transportation Center to south of Atlantic Avenue due to the proposed use of elevated track support structures and the new South Camden station. Since current project plans call for the widening of the project APE from Camden south to Woodbury to provide for improved drainage, additional alternative mitigation or a Phase IB survey may be required. In particular, the impacts of the proposed widening in the area of the new Crown Point Road station in Westville, the crossing of Big Timber Creek in Westville (former rail power station), and the proposed rail line into the center of Glassboro should be evaluated.

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1.0 Introduction

1.0 INTRODUCTION

The following report details the results of a Phase IA archaeological evaluation conducted by A.D. Marble & Company of Conshohocken, Pennsylvania, for a proposed light commuter rail project in southern New Jersey extending south from the City of Camden in Camden County to Glassboro in Gloucester County (Appendix B, Figure 1). The Glassboro-Camden Line (GCL) Light Rail Project is a proposed expansion of transit service in southern New Jersey. The proposed line would restore passenger rail service along the existing Conrail right-of-way (ROW) using light rail vehicles similar to those in use on the NJ TRANSIT RiverLINE that extends into Camden from the north. Light rail along the GCL corridor was selected as the Recommended Alternative based on the two-year Alternatives Analysis (AA) study completed in 2009.

The Federal Transit Administration (FTA) is the lead federal agency for the project. The Delaware River Port Authority (DRPA) , Port Authority Transit Corporation (PATCO), and New Jersey TRANSIT serve as local joint lead agencies and are partnering with FTA to promote the project and seek federal funding. FTA, in coordination with the local joint lead agencies, has initiated preparation of an Environmental Impact Statement (EIS) as required by the National Environmental Policy Act of 1966 (NEPA). A Draft Scoping Document, Public Involvement Plan, and Agency Coordination Plan were completed in April 2010. Public and agency scoping meetings were held in May 2010. A Final Scoping Document was completed in June 2013.

The preparation of this Phase IA study was undertaken to fulfill requirements of Section 106 of the National Historic Preservation Act of 1966. This study was therefore both parallel to and separate from the NEPA process but ultimately contributed to fulfillment of agency responsibilities under NEPA. Potential Section 106 consulting parties would be (have been or were) identified in consultation with the New Jersey State Historic Preservation Office (NJSHPO), and Section 106 considerations would be addressed in future NEPA public meetings. STV, Inc., is the prime consultant to the DRPA for the various environmental studies, and A.D. Marble & Company is the sub-consultant for cultural resources investigations focusing on archaeological and historic architectural evaluations.

1.1 Background

The GCL corridor generally follows the existing Conrail ROW from Camden southward to Glassboro, passing through the communities of Glassboro, Pitman, Sewell, Mantua Township, Deptford Township, Wenonah, Woodbury Heights, Woodbury, Westville, Brooklawn, Gloucester City and Camden. Upon completion of the Alternatives Analysis by the DRPA in 2009 ("Southern New Jersey to Philadelphia Mass Transit Expansion Alternatives Analysis"), Light Rail was selected as the Recommended Alternative and was advanced as the Light Rail Alternative in the Draft EIS phase.

Three alternatives for transit service within the corridor are under study in the Draft EIS:

- No Action Alternative, or the future condition of the corridor if the GCL project is not undertaken. No Action includes the existing transit and transportation system plus planned improvements that may reasonably be expected to be implemented in the future.
- Transportation Systems Management (TSM) Alternative, or a series of lower-cost improvements to the existing or future transportation system such as operating changes and less costly improvement projects.
- Light Rail Alternative, or a new light rail service along the existing Conrail freight ROW from Glassboro to Camden that would connect with the PATCO Speedline and the NJ TRANSIT RiverLINE in Camden.

1.2 Project Description

The Light Rail Alternative or GCL is a proposed 18-mile expansion of transit service in southern New Jersey that would traverse eleven communities between Camden (Camden County) and Glassboro (Gloucester County). These communities are Camden, Gloucester City, Brooklawn, Westville, Woodbury, Woodbury Heights, Wenonah, Deptford Township, Mantua Township, Pitman and Glassboro. The proposed project would provide 14 new transit stations, including 12 walk-up stations and two park-and-ride facilities. Light rail along this corridor was selected as the Recommended Alternative based on the two-year AA study completed in 2009.

The proposed GCL would restore passenger rail service primarily along the existing Conrail freight corridor between Camden and Glassboro. The northern end of the corridor would share tracks with the existing New Jersey TRANSIT RiverLINE from the Camden waterfront through the Walter Rand Transportation Center (WRTC) in downtown Camden. The GCL would operate as its own service from

WRTC south to Glassboro. The proposed project would use diesel-powered light rail vehicles similar to the RiverLINE and would be designed to provide two tracks for light rail use, one for northbound and one for southbound service. In general, this service would operate at-grade, but some portions would be elevated to pass over existing roads and waterways. Gated-crossing would be used for at-grade crossings along the Conrail freight corridor. The GCL would operate within an urban environment along and within existing streets and roads at the northern-end of the proposed alignment.

The GCL service would leave the WRTC on the existing in-street RiverLINE alignment along a portion of Dr. Martin Luther King Boulevard before diverging onto its own elevated structure at approximately Haddon Avenue. The elevated structure would curve southward and continue adjacent to Interstate 676 (I-676), crossing Mickle Boulevard (a continuation of Martin Luther King Boulevard). The alignment would remain elevated on a combination of aerial structure and retained embankment, crossing Newton Avenue, Pine Street, Chestnut Street, Sycamore Street, Kaighns Avenue, Atlantic Avenue. The alignment would remain elevated south of Atlantic Avenue crossing the Conrail tracks, Carl Miller Boulevard/Van Hook Street, Ferry Avenue, Chelton Avenue, the Conrail Beesley's Point Secondary Spur track and Morgan Boulevard. The proposed alignment would then return to grade and shift to the Conrail right-of-way along the east side of the existing freight track between Morgan Boulevard and Newton Creek. The alignment would then continue east of, and parallel to, the existing freight track on two new light rail tracks at-grade to Woodbury City.

En route to Woodbury City, the proposed GCL alignment would cross over Newton Creek and pass beneath Interstate 76 (I-76)/Walt Whitman Bridge. The proposed alignment would traverse Gloucester City, cross Little Timber Creek, extend through Brooklawn Borough, cross Big Timber Creek, and enter into Westville Borough. The proposed GCL alignment would then cross beneath Interstate 295 (I-295) and cross over Red Bank Avenue and Woodbury Creek as it continues to Woodbury City. South of Woodbury City, the proposed GCL alignment would continue at-grade to Glassboro Borough on two tracks made up of the existing freight track and a new track, generally centered in the existing freight railroad right-of-way. En route to Glassboro Borough from Woodbury City, the proposed GCL alignment would cross beneath the New Jersey Turnpike through Woodbury Heights Borough, continue through Wenonah Borough and Mantua Township, then cross over New Jersey Route 55 and enter Pitman Borough. South of Pitman Borough, the proposed GCL alignment would enter Glassboro Borough and continue adjacent to Rowan University as it crosses US Route 322. The southern segment of the

proposed alignment in Glassboro Borough would follow a new right-of-way, diverge from the existing freight track at Zane Street, cross Union and Main Streets, continue northward within a former rail spur between and parallel to Main and Academy Streets, and terminate south of High Street in Downtown Glassboro.

Fourteen potential new stations have been identified, namely:

- two stations in Camden City (Cooper Hospital Station and South Camden Station);
- one station in Gloucester City (Gloucester City Station);
- one station in Westville Borough (Crown Point Road Station);
- two stations in Woodbury City (Red Bank Avenue Station and Woodbury Station);
- one station in Woodbury Heights Borough (Woodbury Heights Station);
- one station in Wenonah Borough (Wenonah Station);
- three stations in Mantua Township (Mantua Boulevard Station, Sewell Station, and Mantua Pitman Station);
- one station in Pitman Borough (Pitman Station); and,
- two stations in Glassboro Borough (Rowan University Station and Glassboro Station).

As noted, twelve of the fourteen stations would be walk-up stations, with the Mantua Boulevard Station and the Mantua/Pitman Station proposed to include park-and-ride facilities. With the exception of the Cooper Hospital Station, South Camden Station and Red Bank Station, stations would be located at existing ground level. Stations would be configured with center platforms, primarily from Woodbury City north, and side platforms, primarily south of Woodbury City. Platforms would be approximately 280 feet long to accommodate a two-car train consist. All stations would include facilities for bicyclists and pedestrians, including bike racks, sidewalks, and crosswalks. The proposed project would also include connections to the regional bus system. Ancillary facilities such as signal houses and crossing cases, as well as a maintenance and storage facility, would also be constructed. The maintenance and storage facility would be a full-service maintenance facility, capable of providing the GCL project's needs for regular preventative and unscheduled corrective vehicle maintenance and maintenance-of-way equipment. Two potential locations for the vehicle maintenance facility (VMF) are currently under evaluation. These locations are in Elk Township (Gloucester County), and Woodbury Heights (Gloucester County).

Since the proposed project requires a United States Army Corps of Engineers (USACE) permit, the project must comply with Section 106 of the National Historic Preservation Act 1966 (as amended), and the implementing regulations (36CFR800) of the Advisory Council on Historic Preservation. This Phase I survey was performed in compliance with the Secretary of the Interior's Standards and Guidelines; Section 106 of The National Historic Preservation Act of 1966, as amended; the Procedures for the Protection of Historic and Cultural Properties set forth in 36 CFR 800, as amended; 23 CFR 771, as amended; guidance published by the Advisory Council on Historic Preservation (ACHP); Sections 1(3) and 2(b) of Executive Order 11593; and the National Environmental Policy Act of 1969.

A.D. Marble & Company conducted the Phase IA archaeological assessment during the first half of 2013. Initial research was undertaken by Michael Lenert and Russell Stevenson; historical data was also derived from earlier research by Paul Schopp (Lawrence et al. 2008). Brooke Blades and Frank Dunsmore served as report coordinators and authors with considerable graphic assistance from Aaron Gove and editorial assistance from Stacy Silva.

A.D. Marble and Company wishes to extend its appreciation to the various archives and web sites from which historical maps were obtained and especially to Andrew and the other staff members in the Cartography Department of the National Archives in College Park, Maryland, for their assistance with the 1916 ICC valuation maps.

2.0 Environmental Setting

2.0 ENVIRONMENTAL SETTING

The GCL project area is located largely on the Inner Coastal Plain physiographic province of New Jersey although the southern portion of the corridor extends onto the Outer Coastal Plain. The province has relatively flat terrain and is underlain by sands and gravels of Cretaceous geologic origin. From an ecological standpoint, the province reflects affinities with both the Piedmont and the Outer Coastal Plain. Ecological communities include those associated with freshwater tidal marsh and emergent marsh and various forests: Southern mixed oak, beech-oak, red maple-sweet gum, upland pine, Virginia pine successional, and coastal white cedar swamp (EPA 2013).

The waters that flow across or drain the interior of the project area are ultimately tidal creeks that flow westward into the Delaware River or southward into the Delaware Bay. The town of Glassboro sits on the drainage divide between the Delaware River and Bay. The project corridor crosses near the tidal mouths of some of these creeks at the northern end: Newton, Little Timber, and Big Timber creeks. The middle and southern portions of the corridor cross or lie near the upper reaches and headwaters of others, such as Mantua Creek and Maurice River.

The soil associations in the northernmost portion, i.e., in Camden County, are either tidal marsh or have been largely remade by urban development. A gently sloping Downer-Woodston-Dragston association is found in southern Camden to Newton Creek with more grayish-brown sandy soils in Gloucester (USDA 1966). The crossing point over Newton Creek was low-lying tidal marsh; fill has been introduced during the twentieth century.

The area between Gloucester and Little Timber Creek was tidal marsh for the most part until the placement of fill. Much of the north-side of Big Timber Creek in Brooklawn was and remains tidal marsh. The latter creek, which represents the boundary with Gloucester County, is bordered by higher ground on the north side that is mapped as Downer loamy sand (USDA 1962).

The general soil associations in Gloucester County range from Downer-Woodston-Sassafras-Klej (sandy flats along the Delaware) from Big Timber Creek to Woodbury; Freehold-Colts Neck-Collington (gently to strongly sloping soils derived from greensand) to Mantua Creek; Westphalia-Nixonton-Barclay (nearly level to steep fine sandy soils) to Pitman; and Aura-Sassafras-Downer (generally gravelly soils on higher drainage divides) at Glassboro (USDA 1962).

As the project area moves slightly inland and away from the river, elevations increase to 50 feet above sea level in the vicinity of Woodbury. The proposed maintenance area in Woodbury Heights, at elevation 40 to 45 feet, is mapped as level to nearly level Woodstown and Dragston sandy loams and Fallsington loam. The planned parking lot at the proposed Mantua Boulevard station, at elevation 70 to 75 feet, lies in an agricultural field with soils mapped as Freehold loamy sand (USDA 1962). Geomorphological observations on the Mantua Boulevard location by Dr. Dan Wagner (see geomorphology appendix) confirmed the basic soil mapping.

The planned parking lot for the proposed Mantua/Pitman station is located along the south side of Tylers Mill Road at elevation 90 to 95 feet. Level to nearly level Westphalia soils—similar to Westphalia fine sandy loam—extend across the road from the north to south. Farther south along the rail line, Pasquotank fine sandy loam was mapped in an area that today is lower lying and on occasion wet (USDA 1962).

The southernmost portion of the corridor south of Glassboro is located in an area of hilltops at elevations of around 150 feet. These uplands lie between the headwaters of tributaries that flow southward into Maurice River and ultimately to Delaware Bay. The location of another proposed maintenance area contains wetlands and surrounding higher ground. The soil mapping consists of the following mapped types that reflect the coarser composition of the higher elevation drainage divides:

- North end: Woodstown and Dragston loamy sands, level to nearly level;
- Central band: Fallsington sandy loams; and
- Southern portion with various types, including Pocomoke loam and sandy loam, a band of Leon sand, and at the southern end of the area, Fallsington sandy loam (USDA 1962).

3.0 Culture History and Archaeological Site Context

3.0 CULTURE HISTORY AND ARCHAEOLOGICAL SITE CONTEXT

3.1 Paleoenvironmental Overview

The Pleistocene epoch witnessed a series of cold periods and associated "ice ages," the most recent of which terminated 14,000 to 10,000 years ago. One of the most dramatic effects of these ice ages was the lowering of ocean levels worldwide as sea water was frozen and trapped in glaciers and continental ice sheets. Estimates suggest that eustatic levels worldwide were 95 to 130 meters (310 to 225 feet) lower during the final Plesitocene glaciation (Milliman and Emery 1968). Belknap and Kraft (1977) questioned the maximum depth of sea-level drop but agreed with the overall timing of Pleistocene sea-level rises and falls. Along the Atlantic Coast, the sea front lay at the edge of the modern continental shelf, 50 to 60 kilometers (30 to 60 miles) east of the current New Jersey coastline during the final Pleistocene glaciation (Edwards and Merrill 1977; Kraft et al. 1983).

Climatic patterns have changed on regional and continental scales during the Holocene interglacial, which began at the end of the Pleistocene about 14,000 years before present (B.P.). Sea levels have continued to rise as a result of the release of water from melting ice sheets. As the sea level rose, it began to transgress, or cover, the land mass of the "Coastal Plain" (the modern submerged Atlantic continental shelf) to the west (Stuiver and Daddario 1963). The late Pleistocene-Holocene marine transgression, or sea level rise, began ca. 14,000 years ago and proceeded rapidly until ca. 7,000 years ago (Milliman and Emery 1968; Kraft et al. 1983).

The implications of such dynamic changes for a paleoenvironmental reconstruction of physical locations along the Delaware River are profound. Holocene climatic changes resulted in a succession of vegetational associations moving northward while the coastline and associated marine and eustatic environments were approaching from the east. As temperatures varied from cold to warm, and climate alternated between dry and moister periods during the Holocene, open grassy environments were replaced by closed boreal evergreen forests and eventually by deciduous forests. (It must be remembered, however, that such a general trend obscures a great deal of temporal and geographic variability.) As the coastline approached, portions of the local environment shifted from inland forest to salt tidal marsh and estuarine margin. Any paleoenvironmental reconstruction must, therefore, consider both the generally northward-moving vegetation patterns arising from regional climatic shifts and the westward-moving geographic settings associated with coastal environments.

3.2 Precontact Cultural Overview

The occupancy of precontact groups within these dynamic environments is an important focus of this study. The broad patterns of precontact systematics in the Middle Atlantic region are well known: a tripartite division into periods of Paleoindian (ca. 11,500 to 10,000 B.P.), Archaic (ca. 10,000 to 4,000 or 3,000 B.P.), and Woodland (ca. 4,000-3,000 B.P. to European contact) with a further subdivision of the latter two periods into early, middle, and late.

The Paleoindian is generally associated with mobile hunting groups although the extent and importance of small game procurement and plant gathering is increasingly being recognized. The Archaic is often regarded as a blend of highly mobile hunting and mobile, but increasingly localized, subsistence within closed forest conditions. Perspectives on the Archaic are conditioned by conflicting opinions as to the nature of middle Holocene climate, as will be discussed below.

Woodland groups, while continuing to hunt and gather in the deciduous forests, often occupied base camps that were larger in size than those occurring during the Archaic. Later Archaic and Woodland occupation of coastal settings generated large shell mound deposits. Some Woodland groups adopted and maintained cultivated crops. Woodland groups adopted ceramic technology to aid in the storage and preparation of foods; the flexible technology of pottery eventually provided a medium for the expression of linguistic, spatial, and possibly kinship divisions. Some Late Archaic and earlier Woodland societies in coastal New Jersey and elsewhere in the Middle Atlantic participated in regional manifestations of social complexity that ultimately did not give rise to ranked societies.

These periods and temporal phases within periods are often defined substantially or—in the absence of radiometric dates—exclusively on the presence of specific lithic projectile point shapes and/or ceramic types. Paleoindian occupations are indicated by fluted projectile points, among other lithic tools, while the Archaic is reflected in various side notched, corner notched, bifurcate-base, triangular, and narrow or wide points. Woodland phases generated points with, for example, biconical shapes (Rossville), concave bases (Fox Creek), and ultimately triangular shapes (Levanna and Madison). Variations in ceramic temper, design method, and design style provide means of temporal attribution for pottery.

However, it is important to recognize that these arbitrary period and phase divisions are themselves artifacts—in this instance of twentieth-century scholars—that often serve to obscure both behavioral continuity through time and regional geographic diversity during a particular time period. The following

sections will, therefore, focus on evidence and issues of relevance to understanding the nature of precontact occupation on the Coastal Plain of New Jersey.

3.3 Paleoindian and Earlier Archaic Occupations

A vegetation cover of oak with pine and hemlock and later hickory emerged relatively early in the Holocene on the Coastal Plain, but such vegetation was subject to variation, particularly during the fluctuating conditions between 10,000 and 9,000 B.P. (McWeeney and Kellogg 2001). The presence of favorable microenvironments arising due to topography, solar exposure, and surface water—ponds and rivers—exerted a considerable influence on precontact subsistence and adaptations. Mounier (Kraft and Mounier 1982a:74) has, for example, emphasized the relationship between relict thermokarst basins common in southern New Jersey and precontact hunting loci of probable Archaic age.

As should be clear from the previous discussion of transgressing sea levels, the region at the time of Paleoindian occupation was not a coastal one. The current project location was covered by an inland forest along the ancestral Delaware River. Thus, any evidence of earliest Holocene occupation in the vicinity would not relate directly to estuarine environments but to the exploitation of inland forest/riverine habitats with an increasingly estuarine focus. Paleoindian hunting and gathering groups would most likely have occupied coastal areas, but these paleogeographic locations currently lie on the continental shelf and are submerged.

Evidence of Paleoindian and earliest Archaic occupations on the Coastal Plain has generally been confined to “isolated” fluted projectile points (Marshall 1982) and loci such as Turkey Swamp (Cavallo 1981). Stanzeski has, more recently, published evidence from four Paleoindian and Early Archaic sites in southern New Jersey, including the Logan site loci around a periglacial depression between the branches of Rancocas Creek in Burlington County (Stanzeski 1998:43). The earliest occupants would have co-inhabited a region populated with a diverse fauna. The mammoth, oriented to more open habitats, disappeared from the area prior to the arrival of humans. A few forest mastodons may have been contemporaries of the earliest Paleoindians, but the image of early humans as hunters of megafauna requires substantial revision throughout the eastern United States (Meltzer 1993; Custer 1994:332-333). Deer and possibly caribou would have been common inhabitants of the early Holocene forests in addition to a smaller range of fauna.

Stream and riverine habitats would have supported aquatic resources, both animal and plant, in nature. Such a broad subsistence base including fish and nuts is suggested at the Shawnee-Minisink site on the upper Delaware River in Pennsylvania (Marshall 1982) dating around 10,900 B.P. (Carr and Adovasio 2002). The Steel site in Cape May County yielded carbonized acorn hulls dating 9530±60 B.P. (Beta 81355) found in association with latest Paleoindian/earliest Archaic artifacts (Stanzeski 1998:45). Such evidence emphasizes both the presence of deciduous oaks and the apparent exploitation of mast resources from the deciduous forest.

3.4 Paleoindian and Archaic Settlement Models

Models presuming movement within the Coastal Plain and particularly between the coast and the Piedmont are particularly relevant to this study. Custer et al. (1983) argued for "serial" movement between lithic raw material sources when such resources are comparatively abundant, as on the New Jersey Coastal Plain. Dent (1995:133-139), focusing on the Chesapeake region to the south, postulated Paleoindian seasonal movement between summer locations on the Outer Coastal Plain and winter occupations to exploit resources within the ecotone between the Inner Coastal Plain and Piedmont. The unfortunate lack of seasonality data due to the virtual absence of botanical remains makes testing of such models inferring seasonal movement impossible at present.

Pagoulatos (2003) cited New Jersey data that suggest a riverine distribution pattern for Early Archaic Kirk point component sites compared with later bifurcate-base point sites with a greater upland focus. He interpreted these different distributions as possible reflections of settlement pattern shifts and further argued for a relationship with changes from dry to wetter conditions during the fluctuating climates of the early Holocene. Pagoulatos followed the attribution of Mounier (Kraft and Mounier 1982a:76) that bifurcate points are associated with the Early Archaic.

An inland perspective was provided by Carr and Adovasio (2002:41-42) who noted that later Paleoindian and Early Archaic points are encountered less frequently than are bifurcate points, which they associate with the Middle Archaic. They suggest that the expanding boreal forest in northern Pennsylvania may have resulted in reduced carrying capacity, possibly encouraging human groups to migrate southward to more favorable deciduous forest settings. Increasing numbers of Middle Archaic bifurcate points were interpreted by Carr and Adovasio as a reflection of expanding population following the emergence of a deciduous forest environment after 9,000 B.P.

The Middle Archaic is generally correlated with the Atlantic climatic phase at about 8,000 B.P. Interpretations of environmental conditions during the Middle Archaic vary. Joyce (1988) contended that the traditional view of the Atlantic as a warm and wet climatic phase needed revision in response to paleoenvironmental data. More recent interpretations correlate the Atlantic phase with the dry Hypsithermal commencing about 8,500 B.P. (McWeeney and Kellogg 2001) or 7,500 B.P. (Anderson 2001) and ending at the Subboreal phase about 5,000 B.P. (Anderson 2001).

Stewart and Cavallo (1991:28-29) extended later Archaic settlement pattern models to evaluate Middle Archaic occupations at the Abbott Farm complex on the Inner Coastal Plain near Trenton. Base camps or staging areas were large group occupations in settings that would maximize proximity to a wide range of subsistence resources, such as floodplains, major stream terraces, and swamp-marsh-estuarine locations. These base camps and staging areas should have a wide range of artifacts resulting from diverse activities and possibly specialized procurements. Limited-activity transient loci would be generated by smaller groups and have lower artifact diversities than those at base camps. Individual stations would suggest intermittent visits from base camps or limited-activity loci.

Stewart and Cavallo (1991:31) argued that Area D at the Abbott Farm consisted of non-contemporaneous small clusters of lithics around hearths, perhaps created by individual families. Carr (1998:81) noted that Stewart and Cavallo defined a Middle Archaic base camp based on tool variation and feature presence but not necessarily large size.

3.5 Later Archaic and Woodland Settlement Models

Models that have been developed to identify later precontact settlement patterns on the Coastal Plain reflect a considerable degree of correspondence. Stewart (1987:Table 4) derived a model for Louis Berger and Associates (LBA) to define Late Archaic and Early Woodland occupation patterns at the Abbott Farm sites. The primary semi-permanent element was the macrosocial unit camp that was considered to reflect single or multiple band occupations. Such sites were often found on high terraces along streams or on floodplains with tidal stream associations. Artifacts and artifact distributions recovered reflected a wide range of activities such as food processing, storage, and consumption; tool manufacture and maintenance; and trash disposal. Such sites would generate a wide range of features, including hearths, pits, caches, burials, and structures.

The microsocial unit camp, interpreted as a semi-sedentary occupation for extended family groups, was derived from material remains very similar to those associated with the macrosocial unit. Microsocial unit camps were found on floodplain levees and high bluff terraces with tidal stream associations. Activities were considered to be the same as those occurring at macrosocial camps. Features arising from occupations were also very similar although burials may or may not be found and caches should not be generated at microsocial camps.

The third element in the Stewart LBA model was the transient camp created by a single family or task group. Favored settings included streams or Coastal Plain marshes, a consideration of particular relevance to the northern portion of the GCL area. Transient camps would have been occupied for several days at most and would have been loci for food processing, tool maintenance, and expedient tool manufacture. Features would be limited to hearths and lithic reduction areas. The fourth element, stations, would reflect hunting efforts by individuals or small groups of several hours duration. Such sites are expected in varied settings. The absence of features and presence of lithic debitage with rare broken or discarded tools reflects a suite of activities limited to tool maintenance and expedient tool manufacture. The final element, specialized camp, would facilitate the exploitation of a particular resource.

Pagoulatos (1992:61-63) argued for precontact site types defined in part by coefficient of variation (CV) indices derived from artifact quantities in four categories: ground stone tools, projectile points, other chipped stone tools, and tool production (cores, modified cobbles, and hammerstones). Base I sites would have a wide range of artifact types with a high density and would be deeply stratified if located in a setting that would allow for repeated deposition of soil layers. Base I sites would be generated by macrobands or large social units and would be located on major drainages and near ecotones. Feature diversity would mirror that of the Stewart LBA macrosocial unit.

Base II camps would be less dense and complex than Base I loci, reflecting limited seasonal reuse, with basic activities such as cooking, trash disposal, and activity areas. Evidence of households may be found, but burials and storage features would be rare. Base II camps would be generated by microbands of a few families, perhaps detached from the larger macroband camp.

Target I loci would reflect a specially organized task group or single family, and thus, would be similar to the Stewart LBA transient camp. Artifact density would be lower than within base camps; activities

would focus on specialized hunting and/or mast procurement with limited features for associated activities of cooking or resource processing. These sites should be located close to specific resource areas to facilitate processing prior to transport back to base camps.

Target II loci would have few artifact types and low density of artifacts. Features would be rare and if present would reflect exploitation of a specific subsistence or technological commodity. A social unit or a family, task group, or individual would generate these small sites, which are essentially the Stewart LBA stations and specialized camps.

Stewart (2003:15) noted that fishing and shell fishing from lowland camps had been an economic focus since the latest or Terminal Archaic. During the Middle Woodland, such sites become larger and were positioned to exploit ecotone settings, such as freshwater and saltwater interfaces where a range of habitats and resources were present. The Tuckerton Shell Mound in Ocean County (Cross 1941; Williams and Thomas 1982:125) is located on a coastal marsh behind a barrier island that was once on a tidal estuary along an inland bay. The occupancy of the location from the Archaic into much of the Woodland period does suggest, as pointed out by Williams and Thomas, long-term stability of shell fish resources near the coast throughout the later Holocene. Such shell fish exploitation also occurred along the margins of Delaware Bay.

3.6 Later Archaic and Woodland Cultural Complexity

The emergence of elements of cultural complexity during the latest Archaic, and particularly in the initial portion of the Woodland, is a regional phenomenon in which coastal populations in New Jersey and Delaware were participants. Material evidence in the form of various lithic artifacts apparently made on non-local materials was manifested in a mortuary context of 41 Late Archaic cremation burials at the Savich Farm site in Burlington County (Regensburg 1971; Kraft and Mounier 1982a:82).

The Middle Woodland in coastal New Jersey witnessed the emergence of socially complex manifestations referred to as Delmarva Adena and to the north as Adena-Middlesex. Stewart (2003:13) noted that while these elements of social complexity are regional phenomena, modern scholarly opinion does not see the elements as indicative of an intrusive culture or of group migration. Social complexity is manifested in a hierarchy of cemeteries based on site size and the extent of material wealth as reflected in traded items (Stewart 2003:13). Stewart suggests that some form of contact with the Ohio Valley

Adena is implied but argues more broadly for "some coincidence of world view that makes the cross-cultural use of symbols and ritual behavior viable" (Stewart 2003:13).

The influence of cultural ecology and systems theory on the interpretations of this social complexity is apparent. Custer (1989) has suggested these more complex Delmarva and southern New Jersey societies emerged from earlier occupations as population grew within rich but geographically circumscribed environments. This view draws upon observations in the late 1960s by Binford on the origins of agriculture, sedentism, and social complexity in the early Holocene and on Carneiro's emphasis on the influence of geographical restrictions on increasing social complexity. Stewart (2003:15) contended that the management of cooperative subsistence activities and consequent social inequality may be implied, but the lack of long-term "feedback" or benefit may have prevented the ultimate emergence of ranked societies. The importance of positive feedback as an element of social change was emphasized within the systems analysis approach promoted by Flannery in the 1970s. As Custer and Stewart have observed, the truncation of social complexity short of more rigidly defined ranked societies and the disappearance of these manifestations of complexity at the end of the Middle Woodland period are as interesting as the reasons for their initial appearance.

Mounier (Kraft and Mounier 1982b:159) observed that Late Woodland occupations reflected continuity with the earlier Woodland in southern New Jersey but also manifested changes. Larger sites with food storage features imply population increases, and local or subregional ceramic styles may reflect an increasing territoriality. Mounier suggests these changes may relate to the introduction or enhanced reliance upon maize cultivation. This reliance is evidently reflected in the charred maize cobs recovered from excavations along Mantua Creek (McEachern and Grossman-Bailey 2003).

3.7 Seventeenth-Century Native and European Occupations

The project area from Camden south to Glassboro lies within the area of earliest European settlement in the Delaware Valley during the first half of the seventeenth century. The English demonstrated early interest in the area, and soldiers and settlers from both Holland and Sweden sought to establish colonies along the lower Delaware River. Indeed, the Dutch labeled the location the "Suydt Rivier" (South River), in contrast to the Hudson as the North River. By the early 1620s, they had established a fortified trading post along the "Timmer Kil" (Timber Creek) that became known as Fort Nassau. The location was occupied with varying frequency until the early 1650s when it was abandoned (Acrelius 1759:62, 63). The 1639 Dutch map (Appendix B, Figure 2) reveals the origins of several geographic designations along

the river in southern New Jersey: “Timmer Kil”, “Roden hoeck” (Red Hook) and “Mantaes” (Mantua Creek). These locations also lie within or close to the current project area.

Accounts by early travelers provide important insights into the character of interactions between the local Native Americans and the Europeans during this period of contact. A Dutch expedition that included David Pietersz de Vries visited “the little fort named Fort Nassau, where formerly some families of the West India Company had dwelt” in early January 1633. The mid-seventeenth century Visscher map (Appendix B, Figure 3) copied earlier maps in depicting Fort Nassau along the south side of the Timmer kil. The local natives who began to assemble wished to trade beaver pelts for European goods, but the Dutch, having few goods remaining, wished to barter instead for “Turkish beans” or Indian corn. The natives encouraged them to anchor in the Timmer kil but they were warned by a Native American woman that nearby an English ship had been seized and the crew killed. The natives in the general vicinity were from Red Hook or Mantaes.

A few days later the Dutch returned to Fort Nassau where increasing numbers of Native Americans were gathering, perhaps in anticipation of the return of the Europeans. Nine leaders or “sachems from nine different places” came out in a “canoe—which is a boat hollowed out of a tree” and made peaceful statements to the Dutch, concluding with the presentation of ten beaver skins. De Vries wished to give each leader “an axe, adze, and pair of knives” but the natives indicated their gifts were made to symbolize peace, not to receive goods in return. The following day, the natives returned with “Indian corn of different colors, for which we [the Dutch] exchanged duffels, kettles, and axes. We also obtained some beaver-skins, all in good feeling….” (de Vries 1655:18-21).

In October 1643, de Vries visited the Delaware region and again stopped at Fort Nassau “in which the people of the West India Company were” for about one-half day. The bulk of his time, however, was spent slightly down river with the Swedish at Nya Göteborg or Tinnakongh (modern Tinicum Township in Delaware County, Pennsylvania) (de Vries 1655:28). The colony of New Sweden that emerged in the late 1630s and early 1640s extended from Salem County in southern New Jersey through Fort Christina (modern Wilmington, Delaware) and along the western side of the Delaware River to the mouth of the Schuylkill River and beyond (Appendix B, Figure 4). The Swedish colonial governor Johan Printz sought to divert Native American trade with the Dutch:

> Further, to prejudice the trade of the Hollanders, I have built a fine house (called Wasa) on the other side of Kärsholm, by the road of the Minquas, so strong that four or five men, well provided with guns, balls, and powder, will be able to defend themselves there against the savages; seven freemen, sturdy fellows, have settled in that place. Again, a quarter of a mile higher up, by the said Minquas road, I have built another strong house, five freemen living there….Now, when the great traders, the Minquas, travel to the Dutch trading-place or house, Nassau, they are obliged to pass by those two places, which (please God) hereafter shall be provided with cargoes. (Printz 1647:122-123)

This statement reveals that the trading location at Fort Nassau was still in operation on the eastern side of the river and suggests that the Dutch presence on the west side was non-existent. By contrast, Governor Printz was seeking to interdict trading routes through New Sweden to the Dutch outpost along the Timmer kil on the eastern side.

3.8 Enter the English

The Dutch ultimately gained control of the Swedish colony along the Delaware in the 1650s only to in turn be supplanted by the English in 1664. Many of the early accounts focus on the western side of the river where Philadelphia would emerge. The eastern side passed through several land divisions before emerging as the colony of West Jersey. An anonymous account of the colony did mention that "Their Houses are some Built of Brick, some of Timber, Plaister'd and Ceil'd, as in England…." (Colony of West Jersey 1681:192), which suggests the early emergence of English architectural traditions.

Some suggestions of settlement patterns may be inferred from contemporary accounts. A 1683 letter from Thomas Paschall described conditions on the western side of the river but may also have applied to the eastern side:

> The River is taken up all along, by the Sweads, and Finns and some Dutch, before the English came, near eight score miles, and the Englishmen some of them, buy their Plantations, and get roome by the great River-side, and the rest get into Creeks, and small rivers that run into it, and some go into the Woods seven or eight Miles….(Paschall 1683:251)

Later that same year, William Penn observed that "The Dutch inhabit mostly those parts of the Province, that lie upon or near to the Bay, and the Swedes the Freshes of the River Delaware" (Penn 1683:237). These sources therefore suggest geographic separation between the Dutch to the south near Delaware Bay and the Swedes further upriver closer to the current project area. The earliest English settlers, evidently, occupied properties along the river, or at least along the western side of the river, only when they could purchase them from Europeans who were already settled on the land. Some English therefore moved up the creeks and began or extended the occupancy of interior areas.

By the early eighteenth century, the northern end of the project area, i.e., between the confluence of "Coopers Creek" with the Delaware and the branches of Timber Creek, was indicated on the Thomas Sharp map of 1700 with land tracts allocated to owners with English surnames (Appendix B, Figure 5). These names include William and probably James Cooper at the confluence and along Coopers Creek; John Kaighn, John Dole, Archibald Mickle, Martin Par(?), Thomas Champion and Thomas Sharp from a small unnamed creek south to Newton Creek; lands of the Town of Gloucester between Newton and Timber Creeks; and Joseph or James Hugg between the two branches of Timber Creek. House symbols are indicated along the banks of the Delaware River on several tracts and along other waterways and roads, but in at least some instances these locations may simply indicate the tract was occupied. The Sharp map does indicate that West Jersey was an English colony from the earliest portion of the eighteenth century.

The riverfront emerged during the eighteenth century as a shipping point with the emergence of ferry locations that served, among other purposes, to transport produce across the river to the growing city of Philadelphia. A British military map of the lands south and west of Coopers Creek in 1778 (Appendix B, Figure 6), while not drawn to scale, does reveal the developed road network and rural character of the landscape. The Delaware River shore is owned by several members of the Cooper family. The road that extends eastward to Burlington from the wharf of Samuel Cooper probably became Market Street in the Camden town grid. The interior areas are depicted as wooded.

Military conflicts often generate extensive map coverage and such was the case with the American Revolution. A Hessian military map drawn in 1778 (Appendix B, Figure 7) depicted the lower Delaware River and South Jersey areas in considerable detail, including the road network from Coopers Creek opposite Philadelphia to beyond Woodbury. The towns of Gloucester and Woodbury—the latter the

seat of Gloucester County—are shown. Gloucester had occupied a position astride a roadway south from the ferry crossing points to the north. This road lay east (inland) from the later location of Broadway. The road crossed Newton Creek and extended southward across bridges over the Little and "Great" Timber Creeks, as the two branches of the Timmer kil came to be known in the British colony of New Jersey. Woodbury coalesced at the location of the Quaker Meeting House and at the crossing to north-south and east-west roads.

The Revolutionary War came to Gloucester County in the fall of 1777 following the Hessian attack on the fort at Red Bank in October and the Royal Navy subjugation of Fort Mifflin on Mud Island in November. A sketch map illustrating the marches and temporary encampments under the command of Lord Cornwallis in November (Appendix B, Figure 8) was probably drawn by the Hessian von Wangenheim. The map indicates successive camps at "Billinsport" on 18 November, "Woodberry" on 21 November, along the north-south road between the Big and Little Timber Creeks on 24 November, and finally at the road junction immediately east of Gloucester on 25 November. Therefore, limited British military encampments occurred in the general vicinity of the project area.

3.9 John Hills and the Early Nineteenth-Century Landscape

A sharp focus is provided on the northern portion of the project area by the detailed map surveyed by John Hills in the early nineteenth century and published in 1808 (Appendix B, Figure 9). The village/town of Camden had been laid out in 1773 (Bureau of Planning 1983) and is shown as a gridded plan between Cooper Street to the north and Plumb (modern Arch) Street to the south. Several named streets completed the original planned grid from west to east: King (modern Front), Queen (Second), Whitehall (Third), Cherry (Fourth), Cedar (Fifth), and Pine (Sixth).

The rural character of the area as indicated on the 1778 British military sketch (Appendix B, Figure 6) is indicated by the large land tracts surrounding the original street grid of Camden. The Cooper family remained established to the north with land tracts and a ship yard near Cooper's Point. The Cooper estate of "Pine Field" occupied 300 acres south of the grid while another member of the family held 95 acres along the Delaware River. Further south a member of the Kaighn family held "Boxville" of 210 acres, an estate that had been settled in 1696 and that appears on the Sharp map of 1700. The central portion of that original Kaighn/Dole tract was indicated by Hills as the apparently projected gridded plan of Canton, which later in the nineteenth century became South Camden. Another Kaighn tract—

"Prospect Lodge" of 220 acres—extended south from the projected grid to an unnamed creek later designated Little Newton Creek. (The mouth of the creek was noted as a "meadow" on the Sharp map a century earlier.) The L-shaped mark just east of the "e" in "Lodge" marks the location of a residence, presumably one occupied by the owner of the tract.

Two roads of relevance to the current project are indicated. Raigh Street, which survives today as Kaighn Street, extended eastward from the Kaighn Wharf Ferry. The "New Road" that extended south from the Camden grid and continued through Gloucester and across the branches of Timber Creek is modern Broadway. It was created to the west of the older road with the " 2 M" (miles) designation that was the eighteenth-century road to Gloucester shown on the Revolutionary War maps.

The New Road (Broadway) crossed "Newtown Creek" close to its mouth and east of the toll bridge that carried the eighteenth-century road across the creek. The older road, known today as King Street, extended into the center of Gloucester before emerging in a southeasterly orientation as modern-day Market Street. Several house symbols were indicated along Market Street. Two estates of the Brick family that were settled in 1690 were located east of Broadway and north of Little Timber Creek. A comparison of the Hills map and encampment map for the corps of Lord Cornwallis (Appendix B, Figure 8) would suggest the 25 November 1777 encampment occurred east of Broadway on the Brick estates and to the north on the Harrison tract of "Byillings Hill" that was settled in 1686. The encampment location would therefore most likely be close to but somewhat east of the current project area.

The eighteenth-century road crossed the Little Timber Creek at the location of "2 Tun Tav(ern)" to the east of Broadway and the current project area. Both this earlier road and Broadway crossed on to the Browning estate of "Pleasant Hill" north of properties settled in the 1680s: Hugg's "Meadow-house" and the Kays estate of "Spruce Plain." These properties extended down to the banks of the Great Timber Creek. The British encampment of 24 November 1777 would have flanked both sides of the eighteenth-century road generally east of the current project area although the northern portion of the corridor may pass through a portion of the encampment area.

The route of Broadway joined that of the earlier road at Great Timber Creek. The road crossed on to "Windmill Farm" that was evidently so named due to the presence of a wind mill on the south bank of the creek in Westville near the Delaware River. The project corridor extends southward across tributary

streams to the town of "Woodberry." The corridor passes east of the historic center of Woodbury, including the Quaker Meeting and the court house at the junction of modern Broad and Cooper Streets. The location of the town and the project corridor on high ground descending to the east is indicated on the Hills map. This same high ground is indicated on the British encampment map and was the location of the Cornwallis encampment of 21 November 1777.

3.10 Topography of the Northern Portion of the Corridor at Mid-Century

The earliest topographically-detailed maps of portions of the project area were created paradoxically to record depths and channels in bays and rivers. The United States Coast & Geodetic Survey (USC&GS) commenced surveys of coastal waters during the second quarter of the nineteenth century. The maps also recorded topographic details such as elevations, fields and field boundaries, woods, roads and railroads, houses and home lots at varying distances inland from the waterways. The portion of the project area from South Camden to Big Timber Creek and Westville is indicated on the 1848 USC&GS map of Delaware Bay and River (Appendix B, Figure 10). By this time the Woodbury and Camden Railroad extended south from the growing town. The rail line had been completed early in 1838 but had ceased operation in 1846. The line was revived during the next decade as the West Jersey Railroad and service had extended to Woodbury by 1857.

In addition to the rail line, many features that are still evident on the landscape were recorded on the 1848 USC&GS map. The angular Newton Avenue extended from the eastern convergence point of Camden streets southwestward across the railroad and Broadway to the road to Kaighn's Point (modern Kaighn Avenue) in South Camden. The street that became modern Fifth Street stopped at its junction with Newton Avenue. Numerous houses were present along the west side of Broadway and north side of Kaighn Avenue. One of the early alignment alternatives under consideration for the current project extends southward along Fifth Street across Newton and Kaighn prior to turning southeast to connect with the original rail line. This alignment would, therefore, pass through an area of settlement in South Camden that was established in the second quarter of the nineteenth century near a junction of roads dating from the early nineteenth century.

The Woodbury and Camden Railroad extended southward through farm fields with farm dwellings and possibly taverns standing near the railroad at roadway crossings. For the first time, these maps show clear distinctions between low-lying tidal marsh and meadows and higher ground that was generally

cultivated or partially covered with woods. The line crossed one such marshy area around a channelized stream before rising onto higher ground around the road that is modern Ferry Avenue. Numerous fields and very few houses were depicted on this higher ground that descended into marsh and wetlands north of "Newtown Creek."

A broad expanse of marsh and wetland extended south of the creek. A road extending southwest from Broadway survives today as King Street and led to the growing town at Gloucester Point. Dwellings stood on home lots along King Street and on the road (modern Market Street) that led southeast away from the point. The railroad continued to pass through agricultural fields before entering marshland both north and south of Little Timber Creek.

The railroad turned southwestward on the south side of Little Timber Creek and crossed to the west side of Broadway. The line entered a broad marsh north of Big Timber Creek; marsh was also indicated on the southeast side of this creek, but two structures are shown on the southwest side between the creek and road leading from Westville to the Delaware River (modern River Drive). Since the railroad extended inland and away from the river at Westville, it was no longer depicted on the 1848 map.

The topographic details provided on the map are interesting from the standpoint of speculation relating to the location of the early seventeenth-century Dutch occupation at Fort Nassau. Contemporary sources such as the 1656 Visscher Map (Appendix B, Figure 3) place the fort on the south bank of the "Timmer kil," and the account recorded by de Vries early in 1633 indicated it was necessary to "haul into" the Timmer kil to visit the settlement. Some later sources have argued that the fort—really a point of trade and contact with Native Americans—was located north of the creeks closer to Gloucester Point. The USC&GS survey map revealed the narrow channel into the Timber Creek, which passed in an S-shaped configuration around a thumb-shaped extension of tidal flat. The channel extended past an area of higher ground with a structure indicated at the mouth of Little Timber Creek; this structure may be reflected in the archaeological site 28-Ca-117 in modern Brooklawn that was recorded as yielding artifacts from Woodland and seventeenth- through nineteenth-century periods.

The higher ground in Brooklawn would, therefore, appear to be one potential location for the site of Fort Nassau although it does lie north of the main channel of Big Timber Creek. Another location with perhaps greater potential would be the higher ground northwest of Westville along River Drive south of

Big Timber Creek. The point of land at the end of River Drive would have afforded good views along the Delaware River although the Dutch may have considered access to the interior a more important consideration. If the latter was the case, the settlement may have been located further up Big Timber Creek, and thus, closer to the present project area.

3.11 The Development of the Southern Portion of the Corridor at Mid-Century

Most of the cartographic attention in this report has focused on the northern portion of the project area due to the high quality of the mapping during the first half of the nineteenth century. By the middle of the century, detailed maps for Gloucester County permit a more refined assessment of the landscape down to and south of Glassboro, which had emerged as an important glass manufacturing center during the second quarter of the nineteenth century. In addition, the existence of the West Jersey Railroad—the successor of the Woodbury and Camden Railroad—enables one to closely follow the route of the current proposed project.

The Lake and Beers Map of the Philadelphia vicinity, published by Gillette (Lake and Beers 1861) is one of several maps that serve to document the development along the project corridor by the middle of the nineteenth century. Since the northern portion in and around Camden has been discussed and will be examined again in maps dating to the later nineteenth century, the portion of the project corridor south of Newton Creek will be considered at this point.

The West Jersey Railroad crossed Newton Creek and extended past Gloucester. By 1861, a cluster of three houses was noted at a road crossing (modern Market Street) oriented southeast toward Mount Ephraim. The railroad crossed Little Timber Creek, turning to the southwest past the Downing houses, to cross Big Timber Creek and enter Westville Station at the junction of modern Broadway, Crown Point Road, and the Glassboro Turnpike.

The railroad tracks continued to run parallel to the Gloucester and Salem Turnpike (modern Broadway) towards Woodbury P.O. (Post Office), the county seat of Gloucester County. The tracks crossed Woodbury Creek entering the town on the south bank and passing along a bluff between the town to the west and Hesters Branch to the east below the bluff. The railroad passes through town—no branches are indicated on the 1861 map—and turned south, thereby, diverging from the turnpikes that extended to Salem and Mullica Hill.

The West Jersey Railroad passed various farms south of Woodbury to cross an east-west road at the Bilks property and grist mill, the future location of the town of Wenonah. The location lay east of the village of Carpenters Landing P. O., which by the late nineteenth century was known as Mantua. The course of the railroad was roughly parallel to and west of the Glassboro Turnpike.

The railroad extended across the main stem of Mantua Creek and turned southeastward to cross a road known today as Mantua Boulevard. The houses of T.L. Eldridge stood on the west side of the road with the proposed location of the Mantua Boulevard station and parking lot to the east between the road and railroad.

The West Jersey alignment continued southward between the Chestnut Branch of Mantua Creek to the west and a roadway (modern Mantua Boulevard) to the east. The alignment passed numerous Chew family farms; the general location was known in the 1860s as Chewsville. The Moore family farm estate of Cedar Grove stood at a crossroads that later became the location of the town of Sewell.

The density of occupation—or at least the number of farms—increased on the landscape, with associated saw mills, grist mills, schools, blacksmith shops and marl extraction pits. A saw mill on Chestnut Branch may be the origin of the name Tylers Mill Road. The farm dwellings of J.D. Turner were located on the north side of Tylers Mill Road near the railroad crossing; the proposed location of the Mantua/Pitman station and parking lot is located on south side of the road.

The railroad extended past two farm estates—Marl Bed and Excelsior—and several smaller farms to cross a road known today as Lambs Road. The rail lines continued south to a triangle formed by a road (modern Holly Avenue), the Glassboro and Barnsboro Road (modern Main Street or South Broadway) and the railroad. This triangular configuration became Pitman Grove, subsequently the town of Pitman, by the late nineteenth century.

The railroad extended south past farms of the Stanger, Iszard, and Whitney families and across the headwaters of Chestnut Branch to the rail depot west of Glassboro P.O. (The Stanger and Whitney families operated competing glass manufactories in Glassboro during the second quarter of the nineteenth century with the Whitney factories continuing later into the century.) The Glassboro depot

represented a dividing point in the rail line with a branch to the southwest toward Bridgeton and a spur eastward into town to the glass factories; the spur probably ran along the route of modern Railroad Avenue. The original line also continued southward across Main Street/Bridgeton Road.

Several houses—at least one owned by S.L. Strong—stood on the east side of the Bridgeton Road (modern Buck Road), between the road and the railroad and in the general area selected as site no. 2 for the proposed maintenance yard. The railroad crossed the road between Glassboro and Clayton

3.12 Development in the Later Nineteenth Century

By the third quarter of the nineteenth century, Camden had emerged as a densely populated center with a street grid expanding to the east and south. Two maps published by the Sanborn Insurance Company illustrated the extent of that development. The 1891 Sanborn map of Chestnut Street north to Cherry Street (Appendix B, Figure 12) shows tracks of the Camden and Amboy Railroad extending diagonally across 10th Street and Mt. Ephraim Avenue. Most of these structures were two-story dwellings with occasional corner saloons and shops and, somewhat unexpectedly, a rifle range east of 10th Street between Mt. Vernon and Walnut Streets. The presence of water mains buried beneath the streets reflected the extent to which the city was poised for continued expansion but also indicated that not all of the dwellings had at least potential access to the piped water.

The 1891 Sanborn map of the area from Jackson Street south to Ferry Avenue in South Camden (Appendix B, Figure 13) illustrated the continuation of the West Jersey Railroad along 7th Street. In this instance, however, these rail lines fall within the alignment for the current project, which connects with the former 7th Street line to the north near Atlantic Avenue. Limited development had occurred along the west side of 7th Street although some dwellings stand north and south of Van Hook Street. Industrial development was also indicated in the presence of a hosiery manufactory at the southeast corner of Van Hook Street.

The alignment of the West Jersey Railroad is clearly shown on the earliest United States Geological Survey quadrangle maps of the Philadelphia and southern New Jersey areas that were produced in the early 1890s (Appendix B, Figure 14). By that time the various towns between Woodbury and Glassboro—namely Wenonah, Sewell and Pitman Grove—had emerged. The coloration patterns of these early quadrangle maps are particularly useful for illustrating the contrasts between creek/stream

drainages and intervening interfluvial upland settings. One particularly interesting point emerges: the location of Glassboro rests on a drainage divide between headwaters of streams flowing northwestward to the Delaware River and those flowing southward to Delaware Bay. Such a placement may be one explanation for the apparent concentration of precontact occupation sites in the Glassboro vicinity.

3.13 The West Jersey & Seashore Railroad in 1916

The Pennsylvania Railroad had acquired the West Jersey Railroad in the early 1870s. By the early 1880s, the Pennsylvania and Reading Railroad extended its route from Williamstown to the east into Glassboro. By the early twentieth century, the original north-south line had been designated the West Jersey & Seashore Railroad and was an element of the Atlantic Division of the Pennsylvania Railroad (Appendix B, Figure 15).

The Interstate Commerce Commission (ICC) railroad valuation maps compiled during the first quarter of the twentieth century provide a highly detailed record of railways across the country (Appendix B, Figure 16). Happily for the current project, these maps include the West Jersey & Seashore Railroad and its branch lines. The maps were compiled as a result of the Valuation Act of 1913 that served to aid the ICC in evaluating railroad property as a basis for establishing rates to provide reasonable—presumably as opposed to excessive—profits. The valuation maps are found in Record Group 134 (bundle 1180) at the National Archives in College Park, Maryland (Pfeiffer 2004).

The maps that have been discussed up to this point—at least those from the 1840s onward—have shown the railroad route in limited detail. As such, the route was chiefly useful as an indicator of the proposed project location. The ICC maps provide such a level of detail that it is possible to define the precise location of features including railroad sidings, branches, and switches. Adjacent structures such as location towers, signal bridges, single signals, water tanks, and railroad buildings, such as stations, tool houses, freight houses and power houses are also shown. The construction materials and height of some of these structures are indicated. The maps were drawn to scale but in addition survey station data on the maps provide coordinates along the line to a resolution of one foot. For example, survey stations for the north end (256+99) and south end (258+34) of the bridge spanning Big Timber Creek indicate a length of 135 feet, since the distance between stations 250 and 260 was 1,000 feet.

A summary of the railroad features noted on the ICC valuation maps is presented in Table 1 (West Jersey & Seashore R.R. Structures, ICC Valuation Maps, 1916 (NA RG 134)) and portions of selected maps are

reproduced in Figure 16 in Appendix B. Since much of the railroad right-of-way has been completely abandoned in Camden and South Camden, the table summarizes portions of the maps from Newton Creek southward. The various selected maps are paired with modern aerial photographs to indicate current conditions.

Table 1. West Jersey & Seashore R.R. Structures, ICC Valuation Maps, 1916 (NA RG 134)

Sheet V	Survey	Location	Type	Comment
2.2-3	165+48	Newton Creek north side	Signal tower	West side of tracks
2.2-3	167+00	Newton Creek north side	P.S. (switch)	West side track junction
2.2-3	167+19	Newton Creek bridge north end	Bridge no. 3.10(2)	Pile trestle
2.3-1	129+19*	Newton Creek bridge south end	same	*new survey series 2.3
2.3-1	none	Newton Creek southeast side	“flat”	Maint. area no. 3
2.3-1	171+05	Gloucester south of Paul St	Siding junction	East side of tracks
2.3-1	172+47	Gloucester north of Bergen St	Structure	East side
2.3-1	172+72	Gloucester north of Bergen St	Structure	East side
2.3-1	175+15	Gloucester north of Monmouth St	Siding end	East side
2.3-1	175+60	Gloucester south of Monmouth St	Sidings end	West of station area
2.3-1	176+97	Gloucester south of Monmouth St	Station 1 sy brick frame	West side of tracks
2.3-1	176+97	Gloucester opposite station	Shelter 1 story frame	East side
2.3-1	178+20	Gloucester station area	Structure 1 story frame	West side
2.3-1	178+57	Gloucester station area	Structure 1 story frame	West side
2.3-1	205+74	S Gloucester north of Koehler Ave	Shelters 1 story frame	Both sides on platforms
2.3-1	210+85	S Gloucester south of Koehler Ave	Siding end	West side
2.3-1	212+64	S Gloucester south of Koehler Ave	Siding junction	West side
2.3-2	220+00	Little Timber Creek north side	Gloucester Branch jct	West side junction
2.3-2	221+14	Little Timber Ck bridge north end	no details	
2.3-2	221+65	Little Timber Ck bridge south end	same	
2.3-2	none	Little Timber Ck southeast side	P.R.R. property	East side
2.3-2	225+46	Little Timber Ck southeast side	Westville Cut-off jct	across PRR property
2.3-2	226+15	Little Timber Creek south side	Signal	opposite PRR property
2.3-2	226+17	Little Timber Creek south side	“WC” tower	on PRR property
2.3-2	226+98	Little Timber Creek south side	Siding junction	West side
2.3-2	227+30	South of “WC” tower	Wood box (culvert?)	1x1x26 feet under tracks
2.3-2	229+80	Old Broadway crossing of RR	Signal	West side
2.3-3	256+99	Big Timber Creek bridge north end	Bridge no. (565) 4	Pile trestle
2.3-3	258+34	Big Timber Creek bridge south end	same	
2.3-3	258+86	Big Timber Creek southwest side	End of sidings	Power house area
2.3-3	259+06	Big Timber Creek south side	Signal bridge	across tracks
2.3-3	259+43	Big Timber Creek southwest side	End of siding	Power house area
2.3-3	260+00	Big Timber Creek & River Drive	Power house	West side
2.3-3	262+46	Westville south of River Drive	Tool house	West side
2.3-3	263+01	Westville north of Highland Ave	Siding junction	West side
2.3-3	263+86	Westville north of Highland Ave	Siding junction	West side
2.3-3	264+67	Westville north of Highland Ave	Siding junction	West side
2.3-3	271+37	Westville at Crown Point Road	Station 1 sy brick frame	West side
2.3-3	271+37	Westville opposite station	Shelter 1 story frame	East side
2.3-3	272+64	Westville station area	Siding junction	East side

Sheet V	Survey	Location	Type	Comment
2.3-3	272+64	Westville station area	Siding end	West of freight house
2.3-3	273+31	Westville station area	freight house 1sy frame	West side
2.3-3	275+37	Westville station area	Siding end	East side
2.3-3	275+37	Westville station area	Siding junction	West side
2.3-5	365+39	N Woodbury at Broadway	Station 2 story frame	West side
2.3-5	365+39	N Woodbury end of Edith St	Shelter 1 story frame	East side
2.3-5	none	N Woodbury station area	Sidings end	West of freight house
2.3-5	366+44	N Woodbury station area	freight house 1 sy frame	West side
2.3-5	366+91	N Woodbury station area	Signal bridge	across tracks
2.3-5	369+72	N Woodbury south of station	Sidings merge	West side
2.3-5	370+90	N Woodbury south of station	Sidings junction	West side
2.3-5	372+01	N Woodbury south of station	Siding end	West side
2.3-6	392+28	Woodbury Creek bridge north end	Bridge no. 6 (8.10)	30’ concrete arch 57’
2.3-6	392+54	Woodbury Creek bridge south end	same	
2.3-6	395+43	Woodbury Creek south side	Signal bridge?	across tracks
2.3-6	409+95	Woodbury north of Cooper St	Tool house 1 sy frame	East side
2.3-6	412+51	Woodbury south of Cooper St	Station	West side
2.3-6	412+51	Woodbury opposite station	Shelter	East side
2.3-6	413+11	Woodbury station area	Double track end	West side at station
2.3-6	none	Woodbury station area	Structure	West side
2.3-6	415+70	Woodbury north of Centre St	Track end	West side
2.3-6	419+58	Woodbury north of Hopkins St	Freight house	West side
2.3-6	421+75	Woodbury north of Wallace St	Track end	West side
2.3-6	422+90	Woodbury opposite Wallace St	P.S. (switch)	East side
2.3-6	422+93	Woodbury north of Wallace St	Signal bridge	across tracks
2.3-6	422+94	Woodbury north of Wallace St	P.S. (switch)	East side
2.3-6	425+32	Woodbury south of Wallace St	P.S. (switch)	West sidings merge
2.3-6	425+35	Woodbury south of Wallace St	P.S. (switch)	East siding junction
2.3-6	425+45	Woodbury south of Wallace St	2 P.S. (switches)	East siding junction
2.3-6	426+43	Woodbury north of German St	Tool house	West side
2.3-6	426+79	Woodbury north of German St	P.S. (switch)	West side
2.3-6	427+03	Woodbury north of German St	Water tank	West side
2.3-6	427+35	Woodbury at German St	P.S. (switch)	East siding junction
2.3-6	427+44	Woodbury at German St	P.S. (switch)	East siding junction
2.3-6	427+51	Woodbury north of German St	“W” tower	East side
2.3-6	427+66	Woodbury at German St	P.S. (switch)	West sidings merge
2.3-6	none	Woodbury at German St	Structure unnamed	East side
2.3-6	428+11	Woodbury south of German St	P.S. (switch)	East siding/spur origin
2.3-6	429+31	Woodbury south of German St	P.S. (switch)	East siding/spur split
2.3-6	429+34	Woodbury south of German St	P.S. (switch)	West side junction
2.3-6	429+91	Woodbury south of German St	Salem Branch junction	
2.3-9	574+20	Wenonah south of Poplar St	Signal	West side
2.3-9	574+38	Wenonah south of Poplar St	Signal	East side
2.3-9	575+60	Wenonah south of Poplar St	Siding end	West side
2.3-9	576+66	Wenonah north of Mantua St	Station 2 story brick	East side
2.3-9	576+84	Wenonah opposite station	Shelter 1 story frame	West side
2.3-9	579+00	Wenonah south of Mantua St	Freight house	West side
2.3-10	609+71	Mantua Creek north side	Signal	West side

Sheet V	Survey	Location	Type	Comment
2.3-10	609+84	Mantua Creek north side	Signal	East side
2.3-10	601+00	Mantua Creek bridge north end	Bridge no. 12.22	20’ brick arch 96’
2.3-10	601+22	Mantua Creek bridge south end	same	
2.3-10	none	Mantua & Glassboro Rd (now Blvd)	O.G. Bridge no. 12.73	North of survey 640+00
2.3-11	661+72	Sewell north of Sussex St	Siding end	West side
2.3-11	662+04	Sewell north of Sussex St	Siding end	East side to station
2.3-11	665+36	Sewell at Sussex St	Siding end	East side
2.3-11	669+93	Sewell south of Essex St	Freight house	East side
2.3-11	670+10	Sewell south of Essex St	P.S. (switch)	West siding junction
2.3-11	671+52	Sewell north of Centre St	Station	East side
2.3-11	671+84	Sewell opposite station	Shelter	West side
2.3-11	674+80	Sewell south of Centre St	Track switch over	North-South track merge
2.3-12	734+86	Tylers Mill Road bridge crossing	RR in cut	
2.3-13	779+35	Pitman Grove north of Pitman Ave	Siding junction	East side
2.3-13	781+29	Pitman Grove north of Pitman Ave	Tool house	East side on siding
2.3-13	790+86	Pitman Grove north of Pitman Ave	2nd siding junction	East side
2.3-13	792+55	Pitman Grove north of Pitman Ave	Dwelling 1 story frame	East side
2.3-13	793+31	Pitman Grove north of Pitman Ave	Sidings split	East side
2.3-13	793+37	Pitman Grove north of Pitman Ave	Single siding junction	East side
2.3-13	740+60	Pitman Grove north of Pitman Ave	Signal	West side
2.3-13	740+72	Pitman Grove north of Pitman Ave	Signal	East side
2.3-13	798+06	Pitman Grove north of Pitman Ave	Single siding end	East side
2.3-13	804+49	Pitman Grove north of Pitman Ave	Track switch over	East side track
2.3-13	806+11	Pitman Grove north of Pitman Ave	Track switch over	West side track
2.3-13	808+95	Pitman Grove south of Pitman Ave	Station 2 story brick	West side
2.3-13	809+05	Pitman Grove opposite station	Shelter	East side
2.3-13	810+27	Pitman Grove station area	Section post	Track area
2.3-13	810+25	Pitman Grove station area	freight house 1 sy frame	West side
2.3-13	810+45	Pitman Grove station area	Siding end	East side at freight house
2.3-13	813+67	Pitman Grove at Glassboro Pike	Siding junction	West side
2.3-15	901+70	Glassboro north of Railroad Ave	Signal	West side
2.3-15	901+70	Glassboro north of Railroad Ave	Siding end	West side
2.3-15	901+71	Glassboro north of Railroad Ave	Signal	East side
2.3-15	902+23	Glassboro north of Railroad Ave	Track switch over	East side track
2.3-15	904+79	Glassboro north of Railroad Ave	Track switch over	West side track
2.3-15	905+08	Glassboro north of Railroad Ave	Bridgeton Branch	West side junction
2.3-15	906+29	Glassboro at Railroad Ave	P.S. (switch)	Bridgeton Branch
2.3-15	907+29	Glassboro at Railroad Ave	P.S. (switch)	Bridgeton Branch
2.3-15	908+37	Glassboro at Railroad Ave	Signal	East side
2.3-15	909+36	Glassboro south of Railroad Ave	Passenger subway	Passage under tracks
2.3-15	909+91	Glassboro south of Railroad Ave	Station 1 story frame	East side
2.3-15	910+43	Glassboro opposite station	Shelter	West side
2.3-15	910+43	Glassboro opposite station	Round, small structures	West behind shelter
2.3-15	911+04	Glassboro station area	“G” tower	East side
2.3-15	none	Glassboro-Bridgeton Branch	3 small structures	West side
2.3-15	912+15	Glassboro south of station	P.S. (switch)	East siding junction
2.3-15	913+13	Glassboro south of station	P.S. (switch)	East siding split
2.3-15	913+24	Glassboro south of station	Signal	West side

Sheet V	Survey	Location	Type	Comment
2.3-15	913+88	Glassboro south of station	P.S. (switch)	East track switch over
2.3-15	913+90	Glassboro south of station	P.S. (switch)	West track switch over
2.3-15	914+10	Glassboro south of station	P.S. (switch)	East siding split
2.3-15	916+01	Glassboro south of station	P.S. (switch)	Track switch junction
2.3-15	917+40	Glassboro south of station	Rectangular structure	West side near switch
2.3-15	917+40	Glassboro south of station	P.S. (switch)	N-S fork to Bridgeton
2.3-15	919+22	Glassboro south of station	Power house	East side
2.3-15	919+60	Glassboro at Power house	P.S. (switch)	Bridgeton fork junction
2.3-15	919+95	Glassboro south of Power house	P.S. (switch)	Bridgeton fork junction
2.3-16	929+95	Glassboro at Wilmer St	Signal (bridge?)	across tracks
2.3-16	930+00	Glassboro at Wilmer St	P.S. (switch)	East side track junction
2.3-16	930+88	Glassboro south of Wilmer St	Switch center track	Split to outer tracks
2.3-16	933+01	Glassboro north of Zane St	Switch	East junction from split
2.3-16	933+04	Glassboro north of Zane St	Switch	West junction from split
2.3-16	936+16	Glassboro south of Zane St	C.R.R. of N.J.	West side crossing
2.3-16	936+29	Glassboro south of Zane St	C.R.R. of N.J.	East side crossing
2.3-16	936+74.5	Glassboro south of C.R.R.	“GS” tower	East side
2.3-16	937+03	Glassboro south of “GS” Tower	Power house	East side
2.3-16	937+93	Glassboro south of Power house	Spur junction	East side
2.3-16	938+85	Glassboro south of Power house	Switch spur/siding split	East side to Main St
2.3-16	941+86	Glassboro north of Union St	Signal bridge	across tracks
2.3-16	948+21	South Glassboro south of Union St	Switch	East junction spur/siding
2.3-16	949+17	South Glassboro at Bridgeton Rd	Shelter and platform	West side south of Union
2.3-16	951+88	South Glassboro S. of Bridgeton Rd	Shelter and platform	East side
2.3-18	1041+96	South of Clayton & Glassboro Rd	Possible signal bridge	across tracks

The rail crossing of Newton Creek (Appendix B, Figure 16A) was supported by a pile trestle bridge; the current rail bridge across the creek was evidently constructed in the 1970s. A signal tower was located on the northern side at the junction of rail spur lines along the west side. The modern view reveals spur or siding tracks at or very near the same location. The Gloucester city station area (Appendix B, Figure 16B) consisted of a combined brick and frame station one story tall with smaller frame structures—unlabeled but probably tool and freight houses—to the south. Siding tracks had been laid between the station and Champion Street. The expanded station continues to stand within a densely developed urbanized landscape.

The crossing of Little Timber Creek (Appendix B, Figure 16C) occurred in an area that was relatively low-lying, particularly along the northern side. Spur rails for the Westville Cut-off (east side) and Gloucester Branch (west side) were indicated. The Westville Cut-off crossed the creek on the rail bridge before merging with the main tracks at the “WC” Tower on the south side. The Gloucester Branch merged with the main tracks on the north side. Both spur lines are visible in the modern view.

The rail crossing of Big Timber Creek (Appendix B, Figure 16D) was supported by a pile trestle bridge. As had been the case along Little Timber Creek, the north side of Big Timber Creek was low-lying wetlands. Higher ground was present along the south side but portions of this bank on the southwestern side were occupied by railroad power house and several rail sidings possibly for coal delivery to the power house. The rail corridor was not electrified, so presumably, the power was needed for junction switches and signals. The location of the power house between the creek and River Road is shown on the 1916 ICC map and is currently a vacant lot west of the rail corridor. The one story brick and frame station in Westville near Crown Point Road was also shown on the 1916 ICC map.

The North Woodbury station area (Appendix B, Figure 16E) was located between Edith Street east of the tracks and Broadway to the west. The station complex stood along the west side of the tracks and consisted of a two-story frame station, a one-story frame freight house, and associated wooden platforms and siding tracks. A signal bridge stood across the tracks south of the freight house. In addition, corrections to the maps (in yellow) noted a double-frame dwelling at 321 and 323 North Broadway, and another frame dwelling at 331 North Broadway. The modern aerial view reveals little evidence of this complex apart from the street grid.

The bridge across Woodbury Creek was described as a concrete arch; the town of Woodbury stood on the south bank of the creek. The Woodbury station was located along the west side of the tracks south of Cooper Street and is currently being operated as a restaurant. The southern portion of the station area (Appendix B, Figure 16F) consisted of numerous tracks and switches with a signal bridge and the junction of the Salem Branch line. Associated structures included a freight house, tool house, and a water tank on the west side of the tracks. The modern aerial view reveals that the station area remains open south to German Street, but the track sidings and structures have been removed.

The rail corridor bridge across Mantua Creek between Woodbury and Sewell was described in 1916 as a brick arch that may have been built when the rail line was initially extended south to Glassboro in the mid-nineteenth century. (This brick arch was apparently replaced relatively recently.) The area north of Mantua Boulevard (Mantua & Glassboro Road in 1916) and south of the Mantua Creek crossing is the proposed location of a new station and parking lot; no details of the location were provided on the 1916 ICC map. The proposed location of the Mantua/Pitman station and parking lot may similarly be found on the 1916 map, but no details were provided.

A plethora of railroad structures and features were indicated at the Glassboro station complex near Railroad Avenue (Appendix B, Figure 16G) or modern University Boulevard-Oakwood Avenue. By 1916, the spur tracks along Railroad Avenue still led into the center of Glassboro. The surviving one-story frame structure on the east side of the tracks is currently undergoing restoration. Tracks for the Bridgeton Branch to the southwest are still visible, as are the traces of junction tracks that connected the West Jersey & Seashore and the Bridgeton lines. A shelter and a subterranean passenger passage were located near the station, in addition to several unnamed structures that included a circular one that may have been a water tank. A tower marked "G" to identify Glassboro stood south of the station; a power house had been constructed on the west side near the junction connection with the Bridgeton Branch. Much of this area remains open and undeveloped at the present time although most of the structures are no longer standing.

A branch line crossed Union and Main streets in South Glassboro (Appendix B, Figure 16H) and provided access to the center of Glassboro. This line may have also provided a connection to the rail line from Williamstown that extended westward to Glassboro in the later nineteenth century. A location under consideration for GCL maintenance yards farther to the south along the rail corridor was not shown in any detail on the 1916 ICC maps.

3.14 The Corridor in the Twentieth Century

The extent of urbanization in Camden is clearly indicated on the Sanborn maps in the late nineteenth century and into the twentieth century on other maps (Appendix B, Figure 17). The importance of Camden as a rail center for the Pennsylvania Railroad and as a port is indicated. The presence of the New York Shipbuilding Corporation between the rail corridor and the Delaware River in South Camden reflects an aspect of the city's industrial heritage since the nineteenth century.

The rail line was designated the Pennsylvania-Reading Seashore Line in 1933 during a period when passenger service to communities along and beyond to Atlantic City was frequent and freight service to the industrial concerns in Camden and Glassboro was also extensive. The post-World War II growth of the communities along the corridor was mirrored by the economic decline of Camden and the termination of passenger rail service. Glassboro emerged as a community with the creation of Glassboro

State College (later Rowan University). The density of development along most segments of the corridor is clearly indicated in modern topographic maps (Appendix B, Figure 1).

3.15 Local Archaeological Site Context

Previous archaeological investigations have been undertaken near many portions of the proposed project corridor, as summarized in Table 2 (Previous Archaeological Studies in Vicinity of Project Area), and the archaeological sites identified are summarized in Table 3 (Recorded Archaeological Sites within 2000 Feet of GCL Corridor). These investigations varied in scale and scope from examinations of individual properties, or blocks, to longer corridors or areas. The studies collectively have evaluated known sites or identified newly-discovered sites, thereby, providing the data on which to base more refined statements on the nature of precontact and historic settlement near the project corridor.

Table 2. Previous Archaeological Studies in Vicinity of Project Area

Surveyor/Year	SHPO no.	ID	Location/Project	Results
Mounier 1976	CAM F6	3951	Camden, I-676 investigations	prehistoric site 28-Ca-22
McCormick Taylor 2003	MULT F680	4715	Camden, I-676 M.P. 2.3	no sites
Gimigliano et al. 1979	CAM J4 CAM J4a	4352 4353	Camden transportation terminal study	archaeological and architectural evaluation
Bureau of Planning 1982	CAM J4b	4354	Camden transportation study	historical evaluation
Hunter 1997	MULT Z50b	6392	Camden light rail corridor	archaeological evaluation
Ashton et al. 2003	CAM Z198	9263	Camden arts high school	archaeological evaluation
Heuser et al. 2005	CAM Z180	8884	Camden elementary school (location of Broadway Meth. Episcopal parsonage)	no pre-1860 archaeological contexts, parsonage evaluated as eligible for Nat. Register
Emory et al. 2005			Camden Johnson Park	prehistoric, 18th 19th c. artifacts
Berger 2/04 (28-Ca-103)			Camden Cooper and 4th sts	prehistoric, late 19th c. sites
URS 2011, 2012			Camden Cooper/Market sts	late 18th and 19th c. sites
Crist & McCarthy 1992	CAM R72		Camden Gloucester gas pipe	archaeological evaluation
Malcolm Pirnie 1998	CAM E242	3931	Camden contamination site	archaeological evaluation
ASNJ 1983			Gloucester City salvage	Woodland site 28-Ca-50
Thomas 1985			Gloucester City project	Woodland site 28-Ca-50
Berger 1994			Gloucester former CG station	Woodland 28-Ca-94, historic
Hunter 2002			Gloucester City waterfront	Woodland pit feature
Mounier 2001	CAM Y257	2044	Gloucester pump station	disturbed no sites
Grubb ca. 2007			Brooklawn Big Timber Creek	Woodland, historic 28-Ca-117
Coleman et al. 2011	CAM F882	9812	Brooklawn Route 130 circle	prehistoric poss. related to 28-Ca-44, 19-20c. site 28-Ca-125
Crist 1997	GLO Y170	1145	First Carpenter Street School Woodbury	1840 school of Bethel African Methodist Episcopal Church
Cooperman et al. 2006	GLO Y348		Woodbury justice center	archaeological evaluation
Affleck et al. 2006	GLO K162		Woodbury high school area	archaeological evaluation
Marston & Affleck 2006	GLO K162a		Woodbury high school area	no sites

Surveyor/Year	SHPO no.	ID	Location/Project	Results
Hueser et al. 2003	GLO F685		NJ Route 47 in Pitman, Glassboro, Washington Twp.	no sites, 1796 house Jessup-Lodge House not affected
Lawrence et al. 2008			Glassboro US Route 322	no sites, no effect/no adverse effect on historic properties
Grubb 2007-09			Glassboro cell tower location	prehistoric site 28-Gl-406

Table 3. Recorded Archaeological Sites within 2000 Feet of GCL Corridor

Site No.	Site Name or Setting	Location	Cultural Assoc.	Reference
28-Ca-103	Camden Courthouse	Cooper/4th streets	prehistoric, late 19c.	Berger form 2/04
28-Ca-124	Cooper300 Smith-Maskell	Cooper, Market 3rd, 4th streets	late 18 to 19c.	URS 2011, 2012
28-Ca-22	Morgan Village Preh.	near Newton Ck	prehistoric	Mounier form 1976
28-Ca-50	Gloucester City	on Delaware R	LW ossuary, pits, hearths; village	ASNJ 1983 Thomas 1985
28-Ca-94	Coast Guard	on Delaware R	Tr, E-LW (28-Ca-50), 18 & 19c.	Berger 1994
28-Ca-101	Proprietor's Park	on Delaware R	M-LW pit feature	Hunter 2002
28-Ca-117	Brooklawn Streambank	Big Timber Ck	Wd, 17? 18-19c.	Grubb ca. 2007
28-Ca-44	Brooklawn	Big Timber Ck	preh pits, artifacts	Cross 1941:239
28-Ca-125	Block 28, Lots 1/8	Big Timber Ck	preh near 28-Ca-44 19 to mid 20c.	Coleman et al. 2011
28-Gl-126		Big Timber Ck	unknown	5/73 form
28-Gl-184		nr Woodbury Ck	unknown	6/87 form
28-Gl-94	on sandy knoll 500 ft N	nr Woodbury Ck	prehistoric	Cross 1941:239
28-Gl-46		nr Woodbury Ck	unknown	Affleck et al. 2006
28-Gl-111	20 m E of Matthews Br	Matthews Branch	preh lithics ceramics	12/88 form
28-Gl-212	Loc 110	on Hester's Run	29 fks 1 biface, hist	3/89 form
28-Gl-211	Loc 109	on Hester's Run	2 fks 2 chunks, 20c.	3/89 form
28-Gl-150	Caesar #15	on Mantua Ck	2 straight stem pts, 1 bifurcate qtz pt	no form, note in files
28-Gl-406	Swim Club A	near creek	preh 54 artifacts	Grubb form 1/09
28-Gl-317	Rowan (University)	near creek	EA through LW	Gregg letter 10/01
28-Gl-313	Stranger Glassworks	in Glassboro	late 18-mid 19 c.	6/2000 form
28-Gl-240	Glassboro Proper Multi	Glassboro	prehistoric cluster	form no date

Alan Mounier conducted survey excavations along the proposed alignment of I-676 in Camden near Newton Creek in the 1970s (Mounier 1976). In addition to historic deposits, he defined intact precontact deposits in soils adjacent to Newton Creek leading to the definition of the Morgan Village Prehistoric site (28-Ca-22). The site was interpreted as having both Archaic and Woodland components. Subsequent work related to drainage improvements near a section of I-676 between Kaighn Street and Mt. Ephraim Avenue (McCormick Taylor 2003) encountered evidence of floor oil cloth and floor tile industrial concerns that, in this instance, were not considered likely to contribute archaeological information of significance to regional history.

A cultural resources overview related to the Camden Transportation Terminal was prepared by Historic Conservation and Interpretation, Inc. (Gimigliano et al. 1979). An overview of Camden history and development during the eighteenth and nineteenth centuries was provided by the Camden Bureau of Planning as background information for the Transportation Terminal (Bureau of Planning 1983).

The GCL, or Light Rail Alternative, is being considered in part due to the creation of the Southern New Jersey Light Rail TRANSIT System (SNJLRTS) that provides a connection between Camden and points northward to Trenton. An archaeological assessment and limited subsurface testing survey conducted in the late 1990s (Hunter 1997) documented precontact and historic resource potential across a segment of the Inner Coastal Plain north of Trenton. Areas considered to possibly hold precontact deposits included potential buried land surfaces along Rancocas Creek and Black's Creek. Crosswicks Creek apparently held the sunken remains of a possible Revolutionary War-era vessel. The proposed alignment passed near and through portions of the early nineteenth-century Delaware and Raritan Canal. Much of the proposed light rail corridor utilized the route formerly occupied by the Camden and Amboy Railroad in the 1830s. The study argued that evidence of early station architecture and other railroad-related features might be preserved along the corridor and was deemed worthy of evaluation. In all, 13 locations were identified as requiring archaeological evaluation to determine site integrity and National Register eligibility.

Several projects have taken place near the project corridor in Camden. A Phase I investigation of the area from Washington Street south to Royden Street and east of Broadway was undertaken by Richard Grubb & Associates, Inc. (Heuser et al. 2005). The proposed project involved the replacement of the Camden Landing Square Elementary School. Subsurface testing was conducted through the excavation of 13 shovel test pits; no pre-1860 artifacts or structural features were encountered, and no further investigations were recommended. The standing Broadway Methodist Episcopal Church Parsonage was considered to be eligible for the National Register under Criterion C. Recordation to Historic American Buildings Survey (HABS) standards was offered as a suggested form of impact mitigation prior to demolition. Survey and subsequent data recovery investigations were conducted by URS Corporation at the Smith-Maskell site (28-Ca-124) in the historic center of Camden at Cooper and Market streets (URS 2011, 2012).

Initial survey and more intensive Phase II excavations were undertaken by A.D. Marble & Company in deposits dating to the precontact period and the eighteenth and nineteenth centuries in Johnson Park (Emory et al. 2005). The proposed location of the Camden Creative and Performing Arts High School was enclosed by Cooper and Market streets (north and south) and Haddon Avenue and Broadway (east and west). As such, it was located just east of the initial lots within the original street grid of Camden as reflected in the 1808 Hills and 1848 USC&GS maps. A Phase I archaeological assessment of that proposed location, which lies approximately two blocks north of the Walter Rand Transportation Center (the northern terminus of the GCL), was prepared by Hunter Research (Ashton et al. 2003). A Phase IA study for a proposed gas pipeline and meter station was prepared by John Milner Associates (Crist and McCarthy 1992) for areas in Camden and Gloucester City immediately north and south of the rail crossing of Newton Creek.

A Phase IA evaluation of loci in South Camden and Gloucester City related to the Welsbach/General Gas Mantle site was undertaken as an element of a larger environmental assessment (Malcolm Pirnie 1998). The production of mantles for gas lamps resulted in a radiological hazard that required evaluation and remediation at several locations in South Camden and Gloucester City. A location along the southeast side of the Newton Creek crossing for the GCL project has been evaluated as possessing a radiological hazard.

A series of archaeological studies undertaken along the waterfront in Gloucester City have examined aspects on an important later precontact archaeological occupation. The Archaeological Society of New Jersey reported on salvage excavations at the Woodland site 28-Ca-50 (ASNJ 1983). Additional important investigations were undertaken by MAAR Associates at the same site (Thomas 1985). The Late Woodland site included an ossuary, pit features, and hearths and was interpreted as a village location. Louis Berger and Associates undertook excavations at the former Coast Guard station on the Delaware River front that identified site 28-Ca-94 with precontact (Transitional, Early through Late Woodland) and historic (eighteenth and nineteenth centuries) components (Berger 1994). Excavations in Proprietor's Park revealed a Middle to Late Woodland pit feature at site 28-Ca-101 (Hunter 2002). These projects collectively have defined the presence of a major Late Woodland occupation at Gloucester Point, one that may have been in existence as the European explorers and traders ventured into the Delaware River in the early seventeenth century.

The disturbed location on Essex Street in Gloucester City for a proposed pumping station was evaluated as having no site potential (Mounier 2001). A study related to improvements to the Route 130 traffic circle in Brooklawn identified a precontact site possibly affiliated with 28-Ca-44 (Cross 1941:239) near Big Timber Creek and an historic site 28-Ca-125 with components dating to the nineteenth and twentieth centuries (Coleman et al. 2011). An interesting historic site, 28-Ca-117, faced the mouth of Big Timber Creek in Brooklawn. The site was located on the higher ground above the tidal marsh north of the creek. Since the site yielded artifacts dating to the seventeenth, eighteenth and nineteenth centuries (Grubb ca. 2007), it may in fact be the structure shown north of Big Timber Creek on the 1848 USC&GS map (Appendix B, Figure 10). Further, the presence of seventeenth-century artifacts may be an indication of early European settlement along the Delaware.

Several studies have occurred within the Woodbury area. Investigations were undertaken by Kise Straw and Kolodner, Inc., at the First Carpenter Street School that had been erected in the second quarter of the nineteenth century by the Bethel African Methodist Episcopal Church and is considered to be the oldest surviving African-American schoolhouse in New Jersey (Crist 1997). Cultural Resource Consulting Group prepared a Phase I assessment of a proposed expansion for the Gloucester County Justice Center (Cooperman et al. 2006).

The precontact site, 28-Gl-94, was described by Dorothy Cross (1941:239) as located on a sandy knoll near the north side of Woodbury Creek. URS Corporation undertook assessment and survey investigations at the proposed replacement location of the Woodbury High School athletic stadium. The area between the stadium and Woodbury Creek was evaluated as having limited disturbance and survey excavations were recommended (Affleck et al. 2006). This study made reference to site 28-Gl-46 of unknown cultural affiliation near Woodbury Creek. Phase IB survey excavations were undertaken; no prehistoric artifacts or features were found, and the historic objects were recovered from fill deposits (Marston and Affleck 2006).

A precontact site, 28-Gl-111, that yielded lithics and ceramics—the latter implying Woodland occupation—was identified near Matthews Branch along a Conrail line west of the GCL corridor near the boundary between Woodbury and Woodbury Heights. A cluster of sites was identified adjacent to and southeast of the New Jersey Turnpike in Deptford Township somewhat beyond 2,000 feet from the rail corridor. Site 28-Gl-301 was evaluated as a foundation dating to occupancy by the third quarter of the

nineteenth century. Two sites—28-Gl-211 and 212—on Hester's Run yielded both precontact and historic artifacts. Another site—28-Gl-150—yielded Middle Archaic (bifurcate point) and Late Archaic (two straight stemmed points) artifacts and lay across Mantua Creek from the proposed location of a GCL station and parking area along Mantua Boulevard.

Archaeological and architectural evaluations were undertaken along NJ Route 47 in the Boroughs of Pitman and Glassboro and in Washington Township by Richard Grubb & Associates. No archaeological sites were identified, and the project was determined to have no impact on the Jessup-Lodge House dating to the late eighteenth century (Hueser et al. 2003).

Numerous sites have been identified in the immediate vicinity of Glassboro, perhaps due to its position on the interfluve or drainage divide between the Delaware River and Bay. The precontact site 28-Gl-406 was identified on a creek northwest of town near the rail corridor (Grubb 2007-09) and the Early Archaic through Late Woodland site 28-Gl-317 was isolated north of a Rowan University parking lot. Indeed, much of campus of Rowan University falls within a large archaeological locus 28-Gl-240 that is considered to be a cluster of precontact sites.

An historic site in Glassboro, 28-Gl-313, reflects the Stanger Glassworks. A.D. Marble & Company undertook an archaeological and architectural survey along NJ Route 322 just west of site 28-Gl-313. No sites were identified (Lawrence et al. 2008).

4.0 Research Design and Methods

4.0 RESEARCH DESIGN AND METHODS

The purpose of the Phase I archaeological resources identification survey was to identify archaeological resources in the APE of the proposed project corridor. The survey aimed to determine the range of historic and precontact-era activities that occurred in the APE and to preliminary assess the integrity of archaeological deposits that might be identified in the APE. A.D. Marble & Company performed the Phase I survey in a staged manner that included background research and fieldwork assessments.

4.1 Background Research

The investigation commenced with a review of archaeological literature. This review consisted of an examination of relevant archaeological site files and numerous cultural resource management reports at the New Jersey Office of Historic Preservation in Trenton. Research also included a review of current and past aerial photographs, historic sources and atlas maps, and an examination of environmental attributes (e.g., water, slope of terrain, soil types) that pertained to the geographic and ecological composition of the project area. The background information supplied investigators with an idea of the archaeological properties that might be encountered in the APE.

4.2 Geomorphology

Geomorphological investigations and evaluations were undertaken at selected locations along the GCL corridor. The investigations were conducted by Dr. Dan Wagner in early October and are presented in Appendix A. The tidal creek crossing at the northern end of the corridor—Newton, Little Timber and Big Timber creeks—were all evaluated as possessing little to no archaeological potential due to a mixture of historic disturbance, placement of fill soils and most importantly low-lying and frequently flooded tidal marsh that would not have been permitted occupation immediately adjacent to the creeks. The elevated land adjacent to Big Timber Creek would have been more attractive for precontact occupation but had been disturbed by subsequent historic-period occupation. A hand auger test at the proposed location of the Mantua Boulevard station parking area revealed shallow sandy soils with archaeological potential in the Ap-horizon or plow zone. The proposed parking lot area for the Mantua/Pitman station along Tylers Mill Road has been and is actively being disturbed by modern construction. In addition, portions of the area are low-lying and intermittently wet while an auger test revealed extensive fill at another location. The proposed location for a maintenance area south of Glassboro is located on an upland location but still contains extensive wetlands. A surface survey suggested that the northern

portion of the proposed location should be considered as having potential for precontact archaeological occupation evidence.

5.0 Phase IA Evaluation and Recommendations

5.0 PHASE IA EVALUATION AND RECOMMENDATIONS

The Glassboro-Camden Line project defines a proposed undertaking to provide light rail passenger service from Glassboro northward to Camden in southern New Jersey. The GCL would extend from the Walter Rand Transportation Center in Camden northward and westward on existing RiverLINE tracks. The GCL would extend southward and eastward from WRTC along former rail corridors and would roughly follow a course that lies parallel to Interstate 676. Project plans in the fall of 2013 indicate the rail lines through Camden would be supported by an elevated structure adjacent to I-676 that would descend to ground level either between Pine and Mt. Vernon streets or would remain elevated farther south to past Atlantic Avenue. The alignment would merge with the former West Jersey Railroad corridor along 7th Street in the vicinity of Atlantic Avenue. That corridor remains in current use by Conrail for a distance north of Newton Creek.

From the connection with the Conrail tracks north of Newton Creek to the end of the light rail corridor south of Glassboro, the GCL would run along existing Conrail tracks within the former West Jersey Railroad corridor. One possible exception is a proposed—in the fall of 2013—rail connection into the center of Glassboro along a former railroad right-of-way that is not currently active. Current plans call for the installation of two new light rail tracks adjacent to the existing single Conrail track. These new tracks would increase the width of the rail corridor but the extent of widening remains to be determined.

The various segments of the proposed GCL project would be assessed from the standpoint of potential project impact, archaeological potential, and any recommendations for additional study.

5.1 Camden to Woodbury (general)

Current project plans (as of late October 2013) call for a widening of the project ROW from Camden south to Woodbury to accommodate improved drainage facilities adjacent to the rail corridor. The widths and specific locations of these widened ROW segments is unclear at present, so comments relating to this northern portion of the corridor must be evaluated with the understanding that specific impacts should be evaluated and appropriate measures, such as targeted Phase IB survey or alternative mitigation studies, be undertaken.

5.2 South Camden to Newton Creek

Camden north of Walter Rand Transportation Center: The project would utilize existing tracks installed for the RiverLINE project and would have no impact on cultural deposits.

Camden south of Walter Rand Transportation Center to south of Atlantic Avenue: The proposed GCL corridor would be located on or close to former historic rail lines from the junction/split at Spruce Street and would skirt the western edge of I-676. It may also impact some dwelling sites dating from the later nineteenth century. For example, the proposed station at or near Ferry Avenue would be constructed in the block bordered by Van Hook Street (north), Ferry Avenue (south), and 6th Street (west), an area with dwellings facing eastward onto the railroad corridor in the 1890s (Appendix B, Figure 13). As mentioned previously, a portion of the GCL would be carried on an elevated structure but the extent of this structure and its consequent impacts on underlying deposits cannot be determined when the Phase IA assessment was prepared. It is, therefore, recommended that an alternative mitigation strategy framed within a memorandum of agreement (MOA) be considered for this section of the project.

Camden Ferry Avenue south to Newton Creek: The portion of the project area south to Newton Creek would be constructed within a former or existing rail corridor. No further survey activities are recommended.

5.3 Newton Creek and Gloucester to Little Timber Creek

Newton Creek into Gloucester: The crossing of Newton Creek occurs in an area that was tidal marsh into the late nineteenth century. The rail corridor was obviously elevated and carried across the creek on a low bridge. The land north and south of the creek is currently covered with fill. No archaeological deposits are indicated at this location, and no additional survey activities are recommended.

Gloucester station area: Extensive modern development is indicated at the location of the historic station; the station building has been adapted as a restaurant. The proposed development of the station would occur slightly north of Monmouth Street, while the historic location lay south of Monmouth Street. Since the proposed station would consist of a platform between the two light rail tracks—currently to be placed east of the existing freight line—no impact to surviving archaeological

deposits is anticipated as the rail corridor has remained in service since its creation in the second quarter of the nineteenth century. The continual use of the rail line has most likely eradicated evidence of railroad track features such as switches and signal towers that were documented on the 1916 ICC maps just as those early twentieth-century features had eliminated earlier ones.

Gloucester to Little Timber Creek: As was the case with Newton Creek, the land on both sides of Little Timber Creek was low-lying tidal marsh that is currently covered by fill. The archaeological potential in such areas is considered to be low to non-existent, and no further survey is recommended.

5.4 Brooklawn to Big Timber Creek and Westville

Brooklawn to Big Timber Creek: Much of the land on the north side of Big Timber Creek, particularly to the west between the railroad and the Delaware River, is low-lying tidal marsh. The rail line crossed the creek onto higher ground on the south side at Westville. The southeast corner was indicated as low-lying on the 1848 USC&GS map (Appendix B, Figure 10); it is currently covered with fill and occupied by an apparent salvage/storage yard and diner restaurant. The southwest corner was higher ground but was occupied in the early twentieth century by a railroad power house. No archaeological potential is considered to exist in the current or former low-lying marshes. Should project plans for the rail corridor or the Big Timber Creek rail bridge result in impacts to the site of the power house, some archaeological recordation—or alternative mitigation study—may be considered desirable.

Westville station area (new Crown Point Road station): The historic station at Westville was located south of the junction of Crown Point Road with the rail line. The new station would be constructed to the north of Crown Point Road in a highly urbanized area. Current plans propose a platform between the two light rail tracks with a bus/auto drop-off area and temporary parking spaces to the west of the rail line. The proposed location is close to the historic site of the Westville Flint Glass Works, but the development impact in such an urbanized zone is likely to be minimal. Nevertheless, project plans should be reviewed for the degree of impact or an alternative mitigation study may be appropriate.

5.5 Woodbury and Woodbury Heights

Former North Woodbury station (abandoned): The former North Woodbury station was located between Broadway on the west side and Edith Street on the east side of the tracks. The area is currently

covered with modern development, and no additional impacts from the project are anticipated as this location would not be utilized for a modern station. No further survey or study is, therefore, required.

Red Bank Avenue station in Woodbury: A new station is proposed south of Red Bank Avenue and north of the former position of Woodbury Creek, currently impounded in lakes. The station would be located between an existing strip mall (east) and commercial pharmacy building and electrical transformer (west). Although the location is currently extensively developed, the landform indicated on the 1891 USGS map (Appendix B, Figure 14) would have been an elevated south-facing point of land above wetlands on the north side of Woodbury Creek. Such a location would be considered a highly favorable one for precontact occupation. The proposed station developments along the tracks are minimal, consisting primarily of a platform between the tracks and some landscaping. No further investigations are recommended.

Woodbury station area: The historic rail station in Woodbury was located south of Cooper Street; the station building remains standing and is currently utilized as a restaurant. The proposed station would be located immediately to the south of the station building but within the confines of the historic station area (Appendix B, Figure 16F). The proposed station—consisting of a platform between the light rail tracks adjacent to the freight line and sidewalks—would straddle Center Street. The location in 1916 was occupied by six tracks: three through tracks and three sidings on the west side. No substantial impact to the station area is anticipated from the proposed development, and no additional survey or study is recommended.

Woodbury Heights station: A new station is proposed along West Jersey Avenue at Linden and Beech Avenues in the Borough of Woodbury Heights. The location is comparatively undeveloped but plans propose limited development, specifically a platform between the light rail tracks with some landscaping and limited parking along the west side. No additional study or survey is recommended at this location.

Woodbury Heights maintenance area (proposed): A railroad vehicle maintenance area was under consideration along the tracks within the township as the Phase IA assessment was being prepared. The area would include 18.2 acres, measuring between 1,400 and 1,750 feet in length north-south and roughly 525 feet in width. Much of the proposed area was impacted by the construction of a

rectangular warehouse (?) structure ca. 1960 that was recently demolished. The rail corridor within the township crosses a flat upland above and west of a north-flowing tributary of Woodbury Creek. Although no archaeological sites have been previously recorded in the vicinity, the wooded northern portion (roughly one-quarter) of the proposed maintenance area would require Phase IB archaeological testing.

5.6 Wenonah and Mantua Boulevard

Mantua Creek tributary crossing north of Wenonah: The rail line crosses an existing bridge or viaduct over the stream. The location is relatively open at present. The specific impact of the project (i.e., whether the bridge would be replaced or expanded) is unknown. Since the creek appears to be impounded and enlarged, it is unlikely that any archaeological deposits would be accessible, and therefore, no additional survey or study is recommended.

Wenonah station area: The historic station of Wenonah was located between Poplar and Mantua avenues; the station building remains standing and currently serves as the community center. The proposed redeveloped station would extend northward from the station building past East Poplar Street. Platforms would be constructed on the outside of light rail tracks. The new station area would be landscaped and would utilize existing parking areas. This construction would have limited impact on archaeological resources, and no further investigations are recommended.

Mantua Creek crossings south of Wenonah: The rail line crosses a branch of Mantua Creek and the main channel of the creek between Wenonah and Sewell. The 1891 USGS map (Appendix B, Figure 14) indicates that both crossings occur within deeply incised valleys. A recorded precontact site, 28-Gl-150, is located on an upland flat between the two creeks east of the rail corridor. The rail line formerly crossed the main creek over a brick arch bridge that was probably constructed in the mid-nineteenth century when the railroad was extended south from Woodbury to Glassboro. However, this brick arch bridge was apparently replaced within the recent past. No additional study or survey is recommended at this location.

Mantua Boulevard station area: A new station is proposed along the west side of the rail line immediately north of the junction with Mantua Boulevard. The proposed area is located in an agricultural field currently planted in soybeans behind a modern commercial building. The proposed

station includes a parking lot for approximately 250 cars between the commercial building and the rail line; the triangular parking lot measures roughly 375 by 450 by 375 feet.

A recorded precontact site, 28-Gl-150, was located on a similar landform on the opposite side of Mantua Creek, and an isolated precontact artifact was recorded in the early twentieth century to the north. Geomorphological investigations conducted by Dan Wagner revealed an Ap-horizon plow zone over a sandy E-horizon and underlying sandy Bt-horizon subsoil. The 1962 soils manual for Gloucester County mapped the portion of the field near the road and railroad as a former sand and gravel pit (USDA 1962). The archaeological potential would appear to be confined to the Ap-horizon. Phase IB survey testing is recommended at the proposed parking lot.

5.7 Sewell to Pitman

Sewell station area: The historic location of Sewell Station extends from Center Street past Essex Avenue to Sussex Avenue. The station building still stands near the tracks at the northwest corner of Center Street. The proposed new station platforms would extend along the light rail tracks from Essex to Sussex avenues, with landscaping from Center Street to north of Sussex Avenue. The limited proposed development would result in limited disturbance to potential railroad features if such features survive in the area at present. No additional survey or study is recommended.

Mantua/Pitman station along Tylers Mill Road: A new station is proposed along the west side of the tracks south of the crossing of Tylers Mill Road. The station would include platforms adjacent to the tracks and a parking lot for approximately 450 cars measuring roughly 675 by 825 feet extending west along the road. An early twentieth-century (?) house was demolished by the owner in the late summer or early fall of 2013, and a new metal barn was constructed on the location. The demolition and subsequent construction activities have impacted any potential archaeological resources on the site. The 1916 ICC map of the location indicated that the railroad was placed within a cut ravine that is still visible today. Some of the earth displaced by this cut may have been placed along Tylers Mill Road since a geomorphological boring exposed evidence of extensive fill deposition. By contrast, the land along the tracks to the south was comparatively wet and low-lying. The location does not appear to be one that possesses any archaeological potential, if indeed it ever had any, and no additional investigations are proposed.

Pitman station area: The historic station of Pitman or Pitman Grove was located on the west side of the tracks in the triangular area framed by Pitman Avenue to the north and Glassboro Pike, or modern South Broadway, to the west. The proposed new station would be built north of the historic location and north of Pitman Avenue between Commerce Avenue to the east and Simpson Avenue to the west. The platforms and landscaping proposed for the station would not impact archaeological resources, and no additional investigations are recommended.

5.8 Glassboro

Chestnut Branch tributary crossing at Heston Road in Glassboro: The railroad crossed a tributary stream that flowed northwestward as shown on the 1890 USGS Glassboro map (Appendix B, Figure 14). The recorded precontact site, 28-Gl-406, is located on the north side of the tributary west of the tracks. The impact of the project at this location is unclear, but it is unlikely that archaeological potential exists due to the existing railroad and the improvements to Heston Road. It is possible that archaeological sites may be buried by railroad embankment construction, but such sites would be inaccessible at present. No additional investigations are proposed at this location.

Rowan University station between Heston and Mullica Hill roads: A new station is proposed along the tracks immediately north of Mullica Hill Road (State Route 322). This location would utilize an existing parking lot to the east that is associated with Rowan University. The station would be built along an elevated portion of the tracks. The recorded precontact site, 28-Gl-317, is located north of the parking lot but would not be impacted by the station improvements. No additional survey or study is recommended at this location.

Glassboro station at former Railroad Avenue (abandoned): The former and historic station is located south of the crossing of University Boulevard-Oakwood Avenue (former Railroad Avenue) and the railroad. The station was a dividing point for the branch line to Bridgeton and the spur line into the center of Glassboro along Railroad Avenue. The main branch of the West Jersey Railroad continued southward (Appendix B, Figure 16G). The frame station survives on the east side, and tracks associated with the Bridgeton Branch and the traces of other tracks are still visible on the surface. Much of the location remains open wooded ground. The location is bounded by Ellis Street to the south and Girard Road to the west. This location is an important one for understanding and interpreting aspects of railroad development from the late nineteenth and early twentieth centuries in southern New Jersey. As

a consequence, the site should be preserved. Since the location is currently open, it may be considered as an equipment staging area or storage yard during the GCL or other projects. Such usage should be avoided.

Proposed rail line into center of Glassboro: An extension of GCL service into the center of Glassboro is under consideration. This extension would lie within a former rail corridor that was in existence by the early 1890s and is shown on the 1916 ICC valuation maps (Appendix B, Figures 14 and 16H). An earlier map of Glassboro (Everts and Stewart 1876) reveals that the northern portion of the spur line was not in existence in 1876 but does indicate the presence of numerous houses along Main Street to the west and Academy Street to the east (Appendix B, Figure 18). The proposed line would follow the spur line rail corridor from the main GCL tracks to the west and would extend northward to a point roughly adjacent to the junction of Wilmer and Main streets. In addition, a station to serve downtown Glassboro is proposed at the end of this extension line between Main and Academy streets. Since this station has the potential to impact archaeological deposits in the rear yards of the nineteenth-century houses in addition to railroad related features, Phase IB archaeological survey or an alternative mitigation study may be required.

Maintenance area south of Glassboro (proposed): A rail vehicle maintenance area has been proposed south of Glassboro in a largely wooded area between Buck Road—an extension of Main Street—to the west and the railroad to the east. The area crosses a power line right-of-way oriented east-west. The area is located near higher elevation hilltops south of Glassboro but contains extensive wetlands, particularly in the portion north of the power line corridor. The location is positioned above the headwaters of two tributaries of the Maurice River that flow southward toward Delaware Bay. The proposed maintenance area—at least those portions beyond the wetlands and not disturbed by the power line corridor—would require Phase IB archaeological survey.

5.9 Summary

The various portions of the project area discussed above may be placed in the following categories for ease of reference:

1. No further work required (*pending evaluation of corridor widening Camden to Glassboro)

- Camden north of Walter Rand Transportation Center*
- Camden Ferry Avenue south to Newton Creek*

- Newton Creek into Gloucester*
- Gloucester station area*
- Gloucester to Little Timber Creek*
- Former North Woodbury station (abandoned)*
- Red Bank Avenue station in Woodbury*
- Woodbury station area*
- Woodbury Heights station
- Mantua Creek tributary crossing north of Wenonah
- Wenonah station area
- Mantua Creek crossings south of Wenonah
- Sewell station area
- Mantua/Pitman station along Tylers Mill Road
- Pitman station area
- Chestnut Branch tributary crossing at Heston Road in Glassboro
- Rowan University station between Heston and Mullica Hill roads

2. Phase IB survey required

- Woodbury Heights maintenance area (proposed) (wooded northern end)
- Mantua Boulevard station area (parking lot)
- Maintenance area south of Glassboro (proposed)

3. Phase IB survey or alternative mitigation study required

- Camden to Woodbury (*pending evaluation of corridor widening)
- Camden south of Walter Rand Transportation Center to south of Atlantic Avenue (alternative mitigation)
- Westville station area (new Crown Point Road station) (review plans)
- Brooklawn to Big Timber Creek (archaeological recordation or alternative mitigation of former power station area if project impacts planned or seem likely)
- Proposed rail line into center of Glassboro (Phase IB or alternative mitigation study)

4. Avoid area and prevent development or use during project

- Glassboro station at former Railroad Avenue (abandoned).

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