

PHASE I ARCHAEOLOGICAL RECONNAISSANCE SURVEY RESERVOIR PROTECTION PROJECT

Town of Saugerties, Ulster County, New York



**THIS REPORT CONTAINS CONFIDENTIAL INFORMATION
NOT FOR PUBLIC DISTRIBUTION**

Prepared for:



Governor's Office of Storm Recovery
99 Washington Avenue, Suite 1224
Albany, New York 12260

Prepared by:



Louis Berger U.S., Inc.
A WSP Company
140 State Street, Suite 101
Albany, New York 12207

Draft
May 30, 2019

Management Summary

Involved Agencies	Town of Saugerties, Ulster County, New York New York State Governor's Office of Storm Recovery (GOSR)
Phase of Survey	Phase I Archaeological Survey
Location Information	Near the intersection of Van Vlierden Road and Brink Road
	<i>Town</i> Saugerties
	<i>County</i> Ulster
Survey Area	Approximately 228 square meters (2,454 square feet)
USGS 7.5-Minute Quadrangle Map	<i>Saugerties, NY</i> , 7.5-Minute Series Topographic Quadrangle, 2013

Archaeological Survey Overview

<i>Methods Used</i>	Pedestrian reconnaissance Subsurface shovel testing: 6 shovel tests excavated at 15-meter (50-foot) intervals, 4 shovel tests excavated at 3-meter (10-foot) intervals, 3 shovel tests excavated at 1-meter (3-foot) intervals).
<i>Artifacts Recovered/ Features Identified</i>	2 chert flakes

Results of Archaeological Survey

<i>No./Name(s) of Precontact Sites Identified</i>	Plattekill Oxbow Site (outside APE)
<i>No./Name(s) of Historic Sites Identified</i>	N/A
Recommendations	No archaeological sites identified within the APE. No further archaeological work recommended.
Report Author	Kevin E. Sheridan, PhD, RPA
Date of Report	May 30, 2019

Abstract

On behalf of the Governor's Office of Storm Recovery (GOSR), Louis Berger U.S., Inc., a WSP Company (WSP), Albany, New York, completed a Phase I Archaeological Reconnaissance Survey for the proposed Reservoir Protection Project in the Town of Saugerties, Ulster County, New York. This project involves the replacement of three culverts in the vicinity, as well as undertaking resiliency measures to protect the newly installed culvert infrastructure, including but not limited to riprap armoring surrounding the new culvert pipes and vegetative control measures to inhibit future erosion. In addition, the project calls for the construction of an earthen berm north of Plattekill Creek to restrict and contain contaminated stormwaters flowing from upland pastureland into Plattekill Creek and the Saugerties Reservoir (also referred to in GOSR documents as Blue Mountain Reservoir). The New York State Office of Parks, Recreation and Historic Preservation recommended a Phase I archaeological survey for the portion of the project including the earthen berm, which constitutes the project area or area of potential effect (APE). The goal of the Phase I survey was to identify archaeological resources in the APE. The survey included background research, pedestrian reconnaissance, and subsurface testing.

The APE is located approximately 60 meters (197 feet) west of the culvert on Van Vliet Road north of the intersection with Brink Road. The proposed earthen berm would be 76 meters (250 feet) long and 3 meters (10 feet) wide between the wetlands and the creek to restrain and control stormwater flow from entering Plattekill Creek. Berm construction would entail clearing, grubbing, and removing topsoil, then excavating a prism for a seepage barrier keyway, followed by erecting the berm itself, consisting of compacted structural fill with a seeded topsoil crown. The berm would be complemented by two sections of on-grade riprap; the first section would extend approximately 35 meters (115 feet) along a swale, and the second section would extend 21 meters (70 feet) along the outer curve of the Plattekill Creek oxbow. The APE, defined by the limits of disturbance for the proposed berm, covers approximately 228 square meters (2,454 square feet).

Background research indicated that one previously recorded archaeological site is located within 3.2 kilometers (2 mile) of the APE. The Saugerties Native American Burial Site (11115.000310) is located approximately 2.9 kilometers (1.8 miles) west of the APE. The site is represented by human remains recovered by the Saugerties Police Department. Several precontact sites are situated near Beaver Kill east of the APE: a total of 22 precontact sites, one historic site, and one multicomponent precontact/historic site are within 4.8 kilometers (3 miles) of the APE. Two of these sites contained diagnostic artifacts. The Wolven Cellar Hole Site included a Genesee Projectile point, indicating a Middle to Late Archaic date. The Woodstock: Site 3 (Area E) included a Fox Creek projectile point, indicating a Middle Woodland date. The sites consisted mainly of ephemeral lithic scatters, with some chert quarrying sites. It is likely that these sites represent short-term, single-use sites or resource procurement and processing sites created by mobile foraging groups utilizing the creeks and streams in the area to access upland resources above the Hudson Valley.

Six shovel tests were excavated at 15-meter (50-foot) intervals within all testable areas of the APE. Seven additional radials were excavated around Shovel Test A-1, which contained a single bifacial reduction flake. An additional flake was recovered from Shovel Test A-1/3mW. Both positive shovel tests were located just outside the APE. This assemblage was designated the Plattekill Oxbow Site. Given the limited amount of radial testing outside the APE, it is possible that the site is larger than currently recorded. The possible eligibility of the site could not be determined based on the current Phase I survey.

The archaeological survey did not identify any archaeological sites within the APE. It is the opinion of WSP that no further archaeological work is required the current project limits. Should project plans change and encompass a different area, further archaeological work may be required.

Table of Contents

	Page
Management Summary.....	i
Abstract	ii
List of Figures.....	iv
List of Tables	iv
List of Photographs.....	iv
I. Introduction	1
A. Project Location	1
B. Scope of Services	1
II. Background Research	4
A. Environmental Setting.....	4
1. Topography/Geology	4
2. Soils.....	4
3. Previous Impacts and Current Land Use	4
B. Precontact Context	4
1. Paleoindian Period (12,000 to 9500 BP)	4
2. Archaic Period (9500 to 3000 BP)	6
3. Woodland and Contact Periods (3000 to 300 BP).....	7
C. Historic Context	9
1. Town of Saugerties.....	9
2. Site File Research and Previous Surveys	9
D. Archaeological Sensitivity Assessment.....	9
III. Archaeological Survey.....	16
A. Archaeological Field Methods and Techniques	16
B. Results of Fieldwork	16
C. Archaeological Summary	20
IV. Conclusions and Recommendations	21
V. References Cited.....	22
Appendix A: Shovel Test Log	A-1
Appendix B: Methods of Artifact Cataloging and Analysis; Artifact Inventory	B-1

List of Figures

	<i>Page</i>
1 Location of Project Area (APE).....	2
2 Project Area Soils	5
3 Project Area in 1829	10
4 Project Area in 1853	11
5 Project Area in 1875	12
6 Project Area in 1903	13
7 Location of Shovel Tests	19

List of Tables

	<i>Page</i>
1 Project Area Soils	6
2 Archaeological Sites Mapped Within 4.8 Kilometers (3 Miles) of APE	14

List of Photographs

	<i>Page</i>
1 View of Eastern Periphery of APE, from East of Shovel Test A-1, Facing West	17
2 View East of the Tree Line, from Shovel Test A-3	17
3 View East of the Bank of Plattekill Creek, Showing Modifications	18
4 View of Western Periphery of APE, Facing East	18

I. Introduction

On behalf of the Governor's Office of Storm Recovery (GOSR), Louis Berger U.S., Inc., a WSP Company (WSP), Albany, New York, has completed a Phase I Archaeological Reconnaissance Survey for the proposed Reservoir Protection Project in the Town of Saugerties, Ulster County, New York (Figure 1).

This project involves the replacement of three culverts in the vicinity, as well as undertaking resiliency measures to protect the newly installed culvert infrastructure, including but not limited to riprap armoring surrounding the new culvert pipes and vegetative control measures to inhibit future erosion. In addition, the project calls for the construction of an earthen berm north of Plattekill Creek to restrict and contain contaminated stormwaters flowing from upland pastureland into Plattekill Creek and the Saugerties Reservoir (also referred to in GOSR documents as Blue Mountain Reservoir). The New York State Office of Parks, Recreation and Historic Preservation (OPRHP) recommended a Phase I archaeological survey for the portion of the project including the earthen berm, which constitutes the project area or area of potential effect (APE).

A. Project Location

The APE for this project is located approximately 60 meters (197 feet) west of the culvert on Van Vlieden Road north of the intersection with Brink Road. The right-of-way for the proposed earthen berm is situated between the creek oxbow to the south and a series of wetlands to the north. One third of the APE is situated within a woodlot on the APE's eastern periphery. The remaining portions of the APE are an open grass lot. Elevation in the project area is 128 meters (420 feet) above sea level.

The proposed earthen berm would be 76 meters (250 feet) long and 3 meters (10 feet) wide between the wetlands and the creek to restrain and control stormwater flow from entering Plattekill Creek. Berm construction would entail clearing, grubbing, and removing topsoil, then excavating a prism for a seepage barrier keyway, followed by erecting the berm itself, consisting of compacted structural fill with a seeded topsoil crown. The berm would be complemented by two sections of on-grade riprap; the first section would extend approximately 35 meters (115 feet) along a swale, and the second section would extend for 21 meters (70 feet) along the outer curve of the Plattekill Creek oxbow. The APE is defined by the limits of disturbance for the proposed berm and covers approximately 228 square meters (2,454 square feet).

B. Scope of Services

The Phase I archaeological survey included background research, pedestrian reconnaissance, and subsurface testing of the APE with the goal of identifying archaeological resources. Background research was conducted to (1) determine whether previously recorded precontact or historical archaeological sites or historic structures are located in the APE; (2) use archaeological, geological, and environmental information on the region to provide a basis for structuring field investigations; and (3) develop precontact and historic period contexts for the APE. The development of these contexts allowed refinement of the research issues and provided a basis for assessing the importance and significance of any cultural resources in the APE.

Appropriate soil survey and surficial/bedrock geology maps were examined to help assess the APE's archaeological sensitivity. Maps of the APE from the nineteenth and twentieth centuries were consulted to identify any potential former buildings in the APE. Regional histories were consulted to provide contextual background information about the area of the APE and the Town of Saugerties.

The Phase I archaeological survey was conducted in accordance with guidelines and recommendations established by the New York State OPRHP and the *Standards for Cultural Resource Investigations and the Curation of Archaeological Collections*, published by the New York Archaeological Council (2000). The technical report conforms to the New York Archaeological Council standards and the requirements set forth in 36 CFR 66, Methods, Standards, and Reporting Requirements for Data Recovery. The survey was performed in accordance with the National Historic Preservation Act of 1966, as amended; Procedures for the Protection of Historic and Cultural Properties (36 CFR 800); the Procedures for Determining Site Eligibility for the National Register of Historic Places (36 CFR 60 and 63); the New York State Environmental Quality Review Act (SEQRA); and the Secretary of the Interior's Standards for

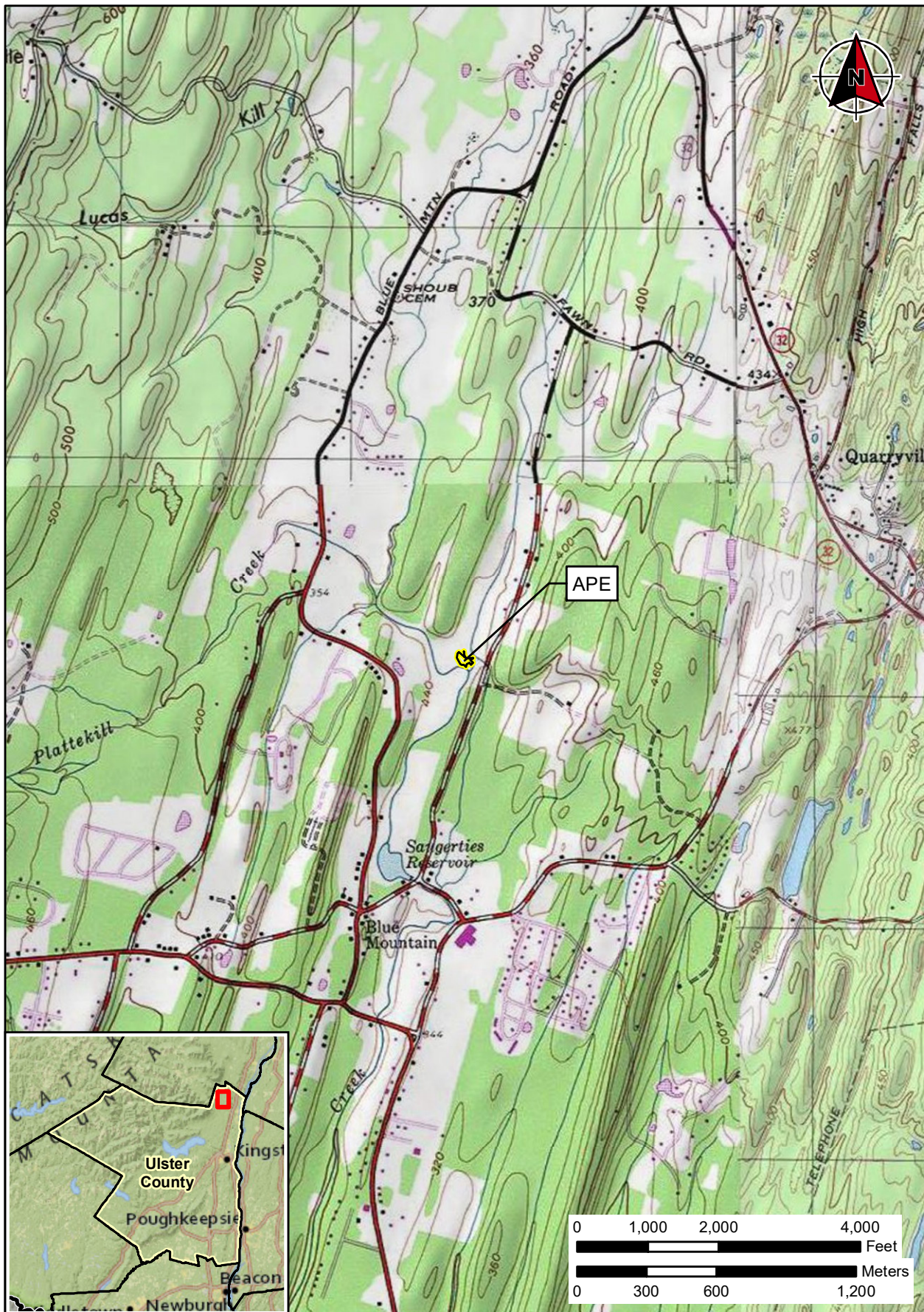


FIGURE 1: Location of Project Area (APE) (ESRI USA Topo 2019)

Archaeology and Historic Preservation. The Project Manager and Project Archaeologist meet or exceed the qualifications described in the Secretary of the Interior's Professional Qualifications Standards (*Federal Register* 48:190:44738–44739) (United States Department of the Interior 1983) and in 36 CFR 66.3(b)(2) and 36 CFR 61.

This report contains five chapters. After the introduction in Chapter I, Chapter II summarizes the background research and results of the archaeological sensitivity assessment. Chapter III presents the archaeological survey's methods and findings. A summary with recommendations is in Chapter IV. Chapter V contains a list of the references cited. Appendix A contains the shovel test log, which details the soil stratigraphy and soil conditions. Appendix B contains the artifact inventory and laboratory artifact analysis methods.

Lauren Hayden (Registered Professional Archaeologist [RPA] 16286) served as project manager for the Phase I Archaeological Reconnaissance Survey. Archaeologist Kevin Sheridan, PhD (RPA 33420836), completed the background research for this project. Dr. Sheridan conducted the archaeological survey and wrote the report. Principal Editor Anne Moiseev supervised the editing and production of the report, and Principal Draftsperson/GIS Analyst Jacqueline L. Horsford prepared the graphics.

II. Background Research

A. Environmental Setting

1. Topography/Geology

The project area is located in the Town of Saugerties, which is located in Ulster County in the Hudson Valley region of New York State. The town is bounded to the north by Greene County, to the south by the towns of Ulster and Kingston, to the east by Columbia and Dutchess counties, and to the west by the Town of Woodstock and Greene County. Elevations range from sea level at the Hudson River to 1,281 meters (4,204 feet) above sea level on Slide Mountain in the Catskills.

The nearest water source is Plattekill Creek, which flows adjacent to the southern boundary of the APE. Several confluences with other small streams surround the area. Beaver Kill is located approximately 1.1 kilometers (0.7 mile) southeast of the APE. The confluence of Plattekill and Esopus creeks lies approximately 6 kilometers (3.7 miles) south of the APE. Esopus Creek flows into the Hudson River approximately 5.6 kilometers (3.5 miles) east of the APE.

Surficial geology of the APE primarily consists of lacustrine silt and clay, consisting of generally laminated silt and clay deposited in proglacial lakes (Cadwell and Dineen 1987). Sedimentary bedrock in the area derives from the Plattekill Formation of the Hamilton Group, and consists of shale and sandstone.

2. Soils

Soils mapped in the project area consist of Alluvial land and Barbour loam, with Basher silt loam nearby (United States Department of Agriculture-Natural Resources Conservation Service [USDA-NRCS] (2018) (Figure 2; Table 1). These consist of well-drained to moderately well-drained soils formed from recent alluvial deposits on floodplains. The soils are viable for crops, pasture, or forest. The location of the APE on a floodplain suggests that deeply buried horizons may be present.

3. Previous Impacts and Current Land Use

Ulster County is primarily suburban and rural land. The City of Kingston is the largest municipality in the county. The nearest municipality is the Village of Saugerties, located east of the APE. The APE is located in an area of widely spaced rural homes. The section of the APE within the Town of Saugerties is zoned as Low Density Residential.

B. Precontact Context

Archaeologists have divided the vast expanse of New York culture history into five general periods: Paleoindian (12,000 to 9500 years before present [BP]), Archaic (9500 to 3000 BP), Woodland (3000 to 500 BP), Contact (500 to 300 BP), and Historic (300 BP to present). The first three subdivisions (Paleoindian, Archaic, and Woodland) are thought to represent Native American cultural adaptation to changing climatic conditions since the arrival of humans in the New York region around 12,000 years ago—from Pleistocene (Ice Age) to Holocene (modern) norms. The region's natural environment and geomorphology have greatly influenced the nature of Native American settlement, land use, and cultural development. One important factor in the interpretation of New York prehistory is the impact of glaciation on the topographic and hydrologic conditions in the area since the end of the Pleistocene.

1. Paleoindian Period (12,000 to 9500 BP)

Humans (the Paleoindians) first entered the region from the south between 12,000 and 9500 BP, following the retreat of the Wisconsin glaciers. At its maximum extent (18,000 and 16,000 BP), the Wisconsin glacier covered all of New York State and extended south into northern New Jersey and Pennsylvania. As the ice sheets receded, open spruce woodland developed in the Northeast, with pine replacing spruce as the dominant arboreal species by about 10,000 BP (Gaudreau 1988).

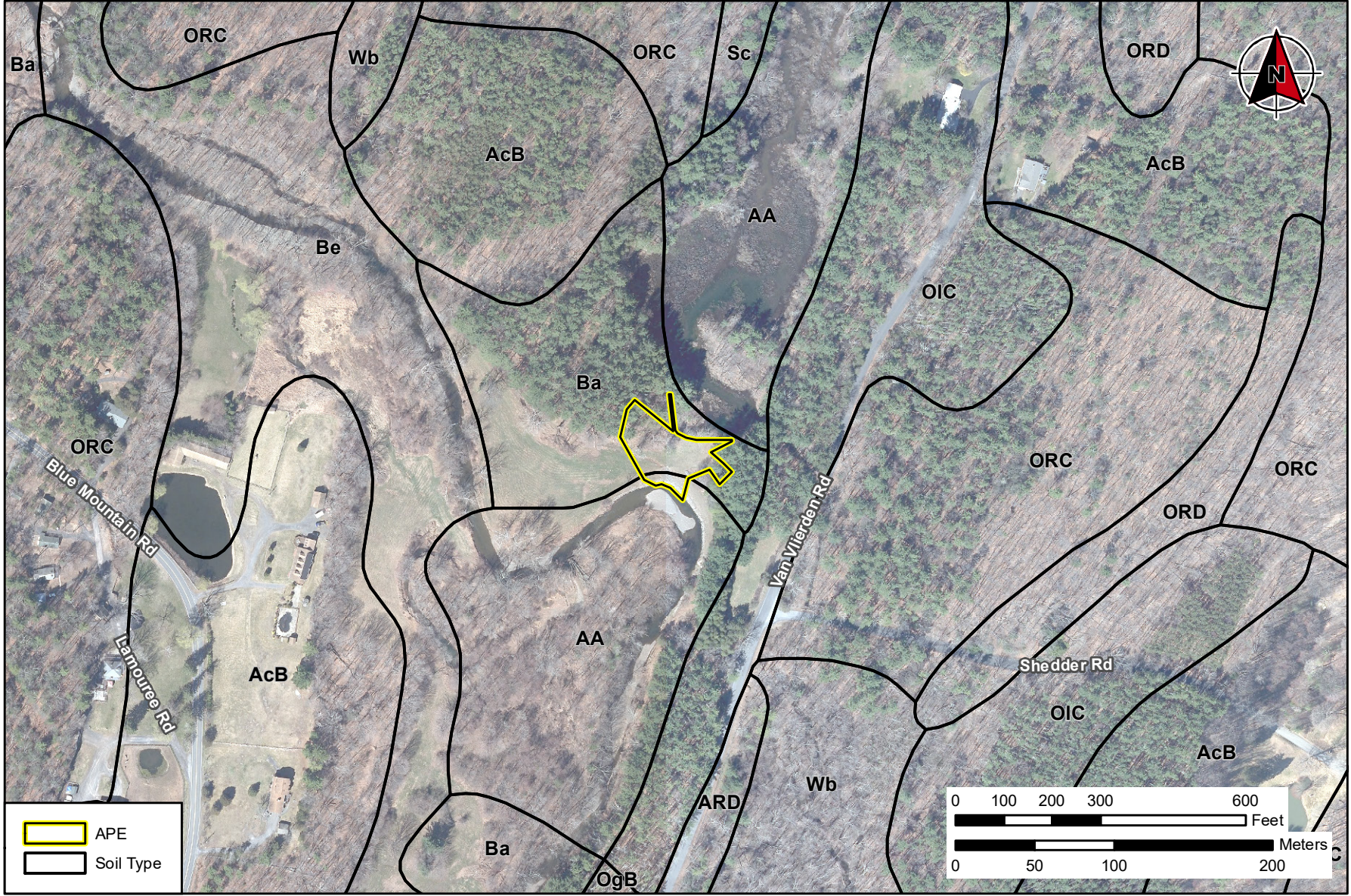


FIGURE 2: Project Area Soils (NYS GIS 2016; USDA-NRCS 2018)

TABLE 1: PROJECT AREA SOILS

SERIES NAME	SOIL HORIZON	DEPTH	COLOR	TEXTURE, INCLUSIONS	SLOPE	DRAINAGE	LANDFORM
Alluvial Land (AA)	A	0-10 cm (0-4 in)		Gravelly loam	0-5%	Moderately well drained	Floodplains
	B	10-178 cm (4-70 in)		Gravelly sandy loam			
Barbour Loam (Ba)	Ap	0-15 cm (0-6 in)	Dark reddish brown (5YR 3/2)	Loam	0-2%	Well drained	Floodplains
	Bw1	15-46 cm (6-18 in)	Reddish brown (5YR 4/3)	Silt loam			
	Bw2	46-66 cm (18-26 in)	Reddish brown (5YR 4/3)	Gravelly loam			
	2C	66-183 cm (26-72 in)	Reddish brown (5YR 4/4)	Very gravelly loamy sand			
Basher silt loam (Be)	Ap	0-23 cm (0-9 in)	Dark reddish brown (5YR 3/4)	Silt loam	0-2%	Moderately well drained	Floodplains
	Bw1	23-36 cm (9-14 in)	Dark reddish brown (5YR 3/4)	Silt loam			
	Bw2	36-51 cm (14-20 in)	Dark reddish brown (5YR 3/4)	Silt loam			
	BC	51-69 cm (20-27 in)	Yellowish brown (10YR 5/4)	Silt loam			
	C1	69-81 cm (27-32 in)	Grayish brown (10YR 5/2)	Loam			
	C2	81-107 cm (32-42 in)	Gray (10YR 5/1)	Loam			
	C3	107-183 cm (42-72 in)	Very dark gray (10YR 3/1)	Fine sandy loam			
USDA-NRCS 2018							

Few definite habitation sites from the Paleoindian period have been identified in the Northeast. It is more common to encounter isolated finds of artifacts that are diagnostic for the period. Such artifacts include Clovis-type fluted projectile points, assorted scrapers, graters, and drills. These lithic tools are usually made from cherts that originate in eastern New York and jaspers found in Pennsylvania and New Jersey. The Paleoindian sites that have been located in New York tend to be quarry-related activity areas, small base camps, and isolated kill sites.

Paleoindian period sites in the region appear to be located in three geographic settings: (1) lowlands adjacent to water and near coniferous swamps or larger rivers; (2) upland bluffs with deciduous trees as the predominant arboreal species; and (3) ridgetops with deciduous trees as the predominant arboreal species. The basic model for Paleoindian habitation in the Northeast assumes that Paleoindians coalesced in small, highly mobile bands that traveled and hunted through large territories, focusing on post-Pleistocene megafauna. It is also possible, however, that Paleoindian populations used a relatively wide range of plant and animal resources that were encountered in more restricted territorial ranges.

2. Archaic Period (9500 to 3000 BP)

The Archaic period is characterized by climatic amelioration that eventually resulted in greater biodiversity in the resource base, and changes in technology, site size, and site locations that reflect use of a broader spectrum of resources. Researchers usually divide the Archaic into three subperiods: Early (9500 to 7000 BP), Middle (7000 to 5500 BP), and Late (5500 to 3000 BP).

a. Early Archaic Period (9500 to 7000 BP)

The Early Archaic period was initially characterized by fluctuations in climate that eventually stabilized into a warming trend. The warmer conditions enhanced biological diversity in the plant and animal communities developing in the

region. The subsistence focus of aboriginal populations shifted from primarily hunting post-Pleistocene megafauna to hunting, fishing, and gathering a diverse range of animal and plant forms. Populations may have increased as a result of the greater stability of the resource base. Most of the evidence of human occupation during this period is based on isolated finds of artifacts diagnostic for the period, including bifurcate-base points, which are most often located along major drainages.

b. Middle Archaic Period (7000 to 5500 BP)

During the Middle Archaic the climatic warming trend continued, and new varieties of flora and fauna became established in the region. The subsistence and settlement pattern of the human occupants of the region continued to shift toward seasonal transhumance focused on use of specialized resources within limited ranges, which may have fostered a greater degree of territoriality (Dincauze and Mulholland 1977). Diagnostic artifacts include Neville and Stark projectile points. The reliance on diverse and specialized resources fostered expansion of the toolkit, which included adzes, axes, drills, mortars and pestles, netsinkers, and hammerstones.

c. Late Archaic Period (5500 to 3000 BP)

Climatic warming continued into the Late Archaic. The rich and diverse biotic resource base enabled increased habitation. Diagnostic artifacts for the subperiod include small stemmed projectile points, such as Lamoka, Taconic, Squibnocket, and Brewerton.

By the Terminal Archaic or Transitional period, people were grinding and polishing soapstone to make bowls and other cultural items. The Terminal Archaic is characterized by three cultural traditions: the Laurentian tradition (Vergennes phase and Vosberg complex); the small stemmed tradition; and the Susquehanna tradition (Snook Hill and Orient phases). Based on a reassessment of the distribution of Terminal Archaic points, Snow suggests that the Susquehanna tradition (Snook Hill, Perkiomen, and Susquehanna Broad points) was dominant in the first half of the Terminal Archaic and superseded by the Orient complex (Orient Fishtail points) in the second half of the period (Snow 1980:237). The exact nature of the cultural differences between these traditions has not been conclusively discerned. They may represent differences in settlement system and technology based on use of different resource niches, the migration of new people into the region, or the spread of distinctive technological ideas.

3. Woodland and Contact Periods (3000 to 300 BP)

The Woodland period is divided into three subperiods: Early Woodland (3000 to 1700 BP), Middle Woodland (1700 to 1200 BP), and Late Woodland (1200 to 500 BP).

a. Early Woodland Period (3000 to 1700 BP)

In general, Early Woodland occupations in the Eastern Woodlands are characterized by a continuation of Late Archaic lifeways. Throughout the eastern United States it appears that Early Woodland groups were sedentary or semisedentary, with residential sites located in riverine and upland contexts and logistical sites located in a variety of physiographic contexts.

Ritchie and Funk (1973:96) write that “as in the case of the Transitional [Archaic] stage, it [the Early Woodland] is marked by the appearance of certain new traits and by the characteristic expression of other, older traits,” but “there is no evidence for significant changes in subsistence or settlement patterns.” Substantial residential sites of the Late Archaic are often referred to as base camps, yet similar sites of the Early Woodland become “villages” with the presence of ceramics and possible storage pits at these sites.

Broadspire forms were phased out in the Early Woodland period, and small stemmed and notched forms, as well as lanceolate and teardrop forms, dominate hafted biface assemblages. Ground grooved axes, seen in the Late Archaic, continue into the Early Woodland but are refined, and the repertoire of such implements is expanded. Slate gorgets, pendants, and ground slate pieces have also been recovered from Early Woodland sites.

The mortuary complexity exhibited by some Late Archaic groups continued into the Early Woodland. Meadowood (3000 to 2560 BP) cremations, bundle burials, and flex burials include red ochre, cache blades (“up to 1,500 in one grave”), gorgets, tubular pipes, and copper objects, as well as utilitarian items such as hafted bifaces, other bifacial

tools, adzes, celts, bone tools, carbonized nets, and basketry (Ritchie and Funk 1973:96, 348). Early Woodland groups also created burial mounds for their dead, which represents one of the most dramatic manifestations of the social complexity inherent in Adena societies.

The Early Woodland period (Middlesex phase) is characterized by the introduction of ceramic vessels—in this region typed as Vinette 1 undecorated wares, some with steatite temper. Sites of the period are usually found on well-drained knolls next to fresh water (Ritchie 1980:21).

b. Middle Woodland Period (1700 to 1200 BP)

The Middle Woodland period is marked by changes in lithic and ceramic technology. During the Middle Woodland maize agriculture and other horticultural practices were gradually incorporated into the subsistence adaptations of the occupants of the region, promoting development of semipermanent village settlement. Subsistence practices during the Middle Woodland period were not very different from those of earlier periods, although intensified hunting, gathering, and small-scale agriculture increased use of resources. The climate during this cultural period remained similar to that of the Early Woodland period. Episodic fluctuations in temperature and precipitation did occur, which affected the distribution and composition of biotic communities. Site types identified include small camps (some temporary and some reoccupied over time), semipermanent large camps, cemeteries, burial mounds, and workshop activity areas (Ritchie and Funk 1973:349). The bow and arrow were introduced in this period. Diagnostic lithic artifacts include Jack's Reef Corner Notched and Pentagonal projectile points, and Fox Creek projectile points. The presence of increased amounts of exotic lithic materials suggests further development of interregional trade networks. Other items of material culture associated with the Middle Woodland include ornamental pendants and pins. Ceramic technology became more sophisticated as indicated by a decrease in the wall thickness of pots and a rounding of vessel shape. Ceramic decoration, including netmarking, and ornamentation of collars and bodies increased.

c. Late Woodland Period (1200 to 500 BP)

During the Late Woodland period aboriginal populations continued to grow and expand into riverine environmental zones. Agriculture continued to increase in importance as part of aboriginal subsistence systems. Maize became a major component of the precontact diet. By the time of the Late Woodland, the climate was very similar to that of today. A greater number of sites, larger sites, and sites with a higher density of cultural material are associated with this period in prehistory compared with earlier periods. Sites have been encountered along major drainages, in association with rockshelters, in coastal areas, and on islands. Small campsites are also located near swamps and streams. The settlement-subsistence system for this period appears to be characterized by an annual pattern of seasonal movement between riverine, coastal, and inland sites. The semipermanence of many of the occupations and resource areas may have fostered greater territoriality (Mulholland 1988:163). Diagnostic artifacts include Levanna projectile points and Owasco-related ceramics.

d. Early Historic Contact (500 to 300 BP)

Native American settlement and subsistence adaptations of the Late Woodland continued during the early Contact period, characterized by seasonal hunting and gathering and focusing on streams and major watercourses in the spring and fall for the seasonal fish runs. During this period Native Americans also accessed smaller sites in inland and upland areas for hunting and resource procurement. Larger semipermanent village sites, consisting of oval and round houses and large pits, were also located in the interior near planted fields. In the winter smaller bands of people occupied sites in inland and upland settings close to forest game (Cronon 1983:48).

Initial contact between Europeans and Native Americans was made when early explorers entered the area to engage in trade. The introduction of European material goods, the demands of trading relationships, rapid colonial expansion, and the spread of diseases brought by the Europeans had profound effects on the settlement and subsistence adaptations of the native populations. Native groups gradually became dependent on trade with the Europeans. Tribal and clan affiliations were affected, and much of the native population disappeared or was displaced (Brasser 1978). Some estimates suggest that between 60 and 90 percent of the native population was lost to European diseases in the seventeenth century in southern New England and New York (Snow 1980:34).

C. Historic Context

1. Town of Saugerties

The Town of Saugerties was incorporated on April 5, 1811, from land taken from the Town of Kingston. The area including the present-day town was part of a land grant of 442 acres to George Meals and Richard Hays in 1687. Euro-American settlement of this tract was gradual, with roads constructed by the late seventeenth/early eighteenth century. John Persen is noted as one of the earliest settlers and is associated with the construction of one of the first gristmills. A large Palatine community settled in the area in the winter of 1710-1711, most of whom were identified as Huguenots (Foote 1907). Records of the settlement note that a total of 185 families moved to the area. Andrew Brink, the town's first clerk, was also the captain of Robert Fulton's first steamboat, the *Clermont*, in 1807 (Foote 1907:364).

The proximity to the Hudson River and Esopus Creek enabled a number of industries in the town. In 1828 Henry Barclay established the Ulster Iron Works, and in 1830 he built a paper mill powered by Esopus Creek. A number of mills thrived into the twentieth century. Bluestone quarrying also became an important industry in the nineteenth century, and the first bluestone quarry in Ulster County opened near Saugerties in 1832. The bluestone was used for curbing, paving, and window sills, with a large portion of sales to New York City. Ice harvesting became an important industry in the town from 1880 to 1900. Icehouses were established in the hamlets of Glasco and Malden, and ice harvesting was conducted on the Upper Esopus.

2. Site File Research and Previous Surveys

Background research indicates that one previously recorded archaeological site is located within 3.2 kilometers (2 miles) of the APE. The Saugerties Native American Burial Site (11115.000310), approximately 2.9 kilometers (1.8 miles) west of the project area, is represented by human remains recovered by the Saugerties Police Department. Several precontact sites are situated near Beaver Kill east of the APE. Extending the search radius, a total of 22 precontact sites, one historic site, and one multicomponent site are within 4.8 kilometers (3 miles) of the APE. Two sites contained diagnostic artifacts. The Wolven Cellar Hole Site included a Genesee Projectile point, indicating a Middle-Late Archaic date. The Woodstock: Site 3 (Area E) included a Fox Creek projectile point, indicating a Middle Woodland date. The sites consisted mainly of ephemeral lithic scatters, with some chert quarrying sites.

One previous survey has been conducted within 3.2 kilometers (2 miles) of the project area. In 2002 Collamer & Associates conducted a Phase 1A survey for Shott Rock, Inc. in the Town of Saugerties approximately 2.9 kilometers (1.8 miles) south-southeast of the current APE. No report of the survey was available.

Most of the known archaeological sites within a 4.8-kilometer (3-mile) radius consist of unaffiliated lithic scatters (Table 2). These sites are located along creeks and streams feeding the Hudson River. The sites likely represent short-term, single-use occupations by mobile foragers utilizing the water system to access resources available in the uplands above the Hudson River Valley.

One NRHP Listed property, the Augusta Savage House and Studio at 189 Old NY 32, is located 3.05 kilometers (1.9 miles) east of the project area. Two NRHP-eligible properties are located within 3.2 kilometers (2 miles) of the APE. The nearest is the former Blue Mountain Schoolhouse (ca. 1895), 568 Blue Mountain Road (11115.000138), approximately 1.1 kilometers (0.7 mile) south of the project area. The Vedder House (ca. 1743), 100 Ralph Vedder Road (11115.000132), is located approximately 2.1 kilometers (1.3 miles) from the project area.

D. Archaeological Sensitivity Assessment

The APE contains soils mapped as intact (see Figure 2). The APE is located in an area containing a number of confluences of small creeks, including Plattekill Creek. These creeks connect to the Hudson River via Esopus Creek, and thus lie within the Hudson riverine system. In this context, small, seasonal camps, multi-task camps, and resource-processing stations are the most likely precontact sites to be found in the APE.

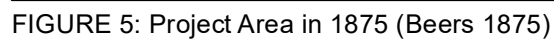
Analysis of the available historical maps, from 1829 to 1903, indicates that no map-documented structures are located in the APE (Figures 3–6). Historic archaeological sites are therefore not anticipated within the APE.



FIGURE 3: Project Area in 1829 (Burr 1829)



FIGURE 4: Project Area in 1853 (Tillson et al. 1853)



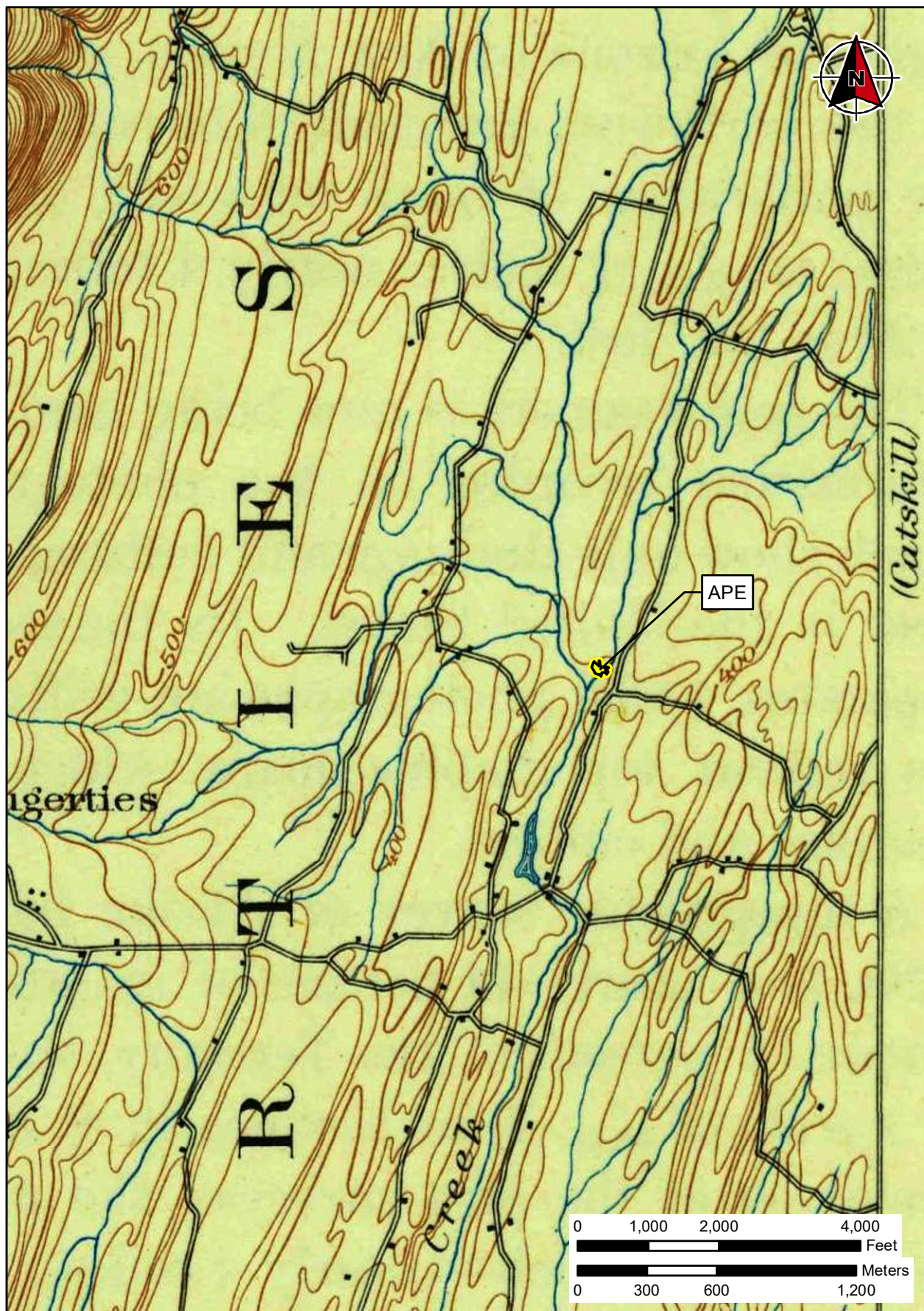


FIGURE 6: Project Area in 1903 (USGS Kaaterskill 1903)

TABLE 2: ARCHAEOLOGICAL SITES MAPPED WITHIN 4.8 KILOMETERS (3 MILES) OF APE

SITE NUMBER / SITE NAME	DISTANCE FROM APE	TIME PERIOD / SITE TYPE	ARTIFACTS / FEATURES	REPORTED BY
11115.000007 Possible Site	4.2 kilometers (2.6 miles)	Historic	Possible mill site	CRMS 1977
11115.000019 Wolven Cellar Hole	4.7 kilometer (2.9 miles)	Precontact Middle- Late Archaic/ Historic	18th-c. domestic scatter with house remains / precontact material – Genesee point	M.S. LaRusso
11115.000030 Reinhart Site V	4 kilometers (2.5 miles)	Precontact	End/side scraper, bifacially worked chert	Reinhart 1990
11115.000031 Reinhart Site D	4.8 kilometers (3 miles)	Precontact	Biface of western Onondaga Chert	Reinhart 1989
11115.000032 Reinhart Site G	4 kilometers (2.5 miles)	Precontact	Broken projectile point	Reinhart 1989
11115.000033 Reinhart Site F	3.9 kilometers (2.4 miles)	Precontact	Side-notched projectile point, 5-10 chert bifaces, 15-20 debitage, blocky chert	Reinhart 1989
11115.000034 Reinhart Site C	4.8 kilometers (3 miles)	Precontact	Normanskill chert debitage	Reinhart 1989
11115.000035 Reinhart Site B	4.3 kilometers (2.7 miles)	Precontact	Eastern Onondaga chert debitage	Reinhart 1989
11115.000036 Reinhart Site A	4.2 kilometers (2.6 miles)	Precontact	Chert flakes, hammerstone	Reinhart 1989
11115.000040 Reinhart Historic Site I	4 kilometers (2.5 miles)	Historic	Early 19th-c. rural cemetery	Reinhart 1989
11115.000041 Reinhart Site E	3.9 kilometers (2.4 miles)	Precontact	5 debitage, 1 spokeshave (Eastern Onondaga chert)	Reinhart 1989
11115.000057 Catskill Collection West Ridge Quarry Site	4.7 kilometers (2.9 miles)	Precontact	Chert quarry and initial reduction site	Mackey 1995
11115.000058 Catskill Collection East Ridge Quarry Site	4.3 kilometers (2.7 miles)	Precontact	Chert quarry and initial reduction site	
11115.000060 Woodstock 2: Site 1 (Areas A & B)	4.7 kilometers (2.9 miles)	Precontact	Flake, trim, shatter, core, quarry tools, biface	Moody 1997
11115.000061 Woodstock 2: Site 2 (Areas C & D)	4 kilometers (2.5 miles)	Precontact	Chert biface, quarry tools, debitage	Moody 1997
11115.000062 Woodstock 2: Site 3 (Area E)	3.9 kilometers (2.4 miles)	Precontact-Middle Woodland	Fox Creek projectile point, flake, trim, shatter, biface, hammerstone	Moody 1997
11115.000063 Woodstock 2: Site 4 (Area F)	3.9 kilometers (2.4 miles)	Precontact	Flake, trim, shatter, core, biface, hammerstone	Moody 1997
11115.000064 Woodstock 2: Site 5 (Area G)	4 kilometers (2.5 miles)	Precontact	Flake, trim, shatter core, biface, FCR	Moody 1997

TABLE 2 (continued)

SITE NUMBER / SITE NAME	DISTANCE FROM APE	TIME PERIOD / SITE TYPE	ARTIFACTS / FEATURES	REPORTED BY
11115.000065 Woodstock 2: Site 6 (Area H)	4.7 kilometers (2.9 miles)	Precontact	Flake, trim, shatter, core, quarry tools	Moody 1997
11115.000066 Saugerties Hotel 3	4.5 kilometers (2.8 miles)	Precontact	Flake, trim, shatter, core	Moody 1997
11115.000099 Snyder A Prehistoric Site	4.7 kilometers (2.9 miles)	Multicomponent Precontact	Projectile point and biface collection	Reinhart 1989
11115.000280 Saugerties Hotel 1	4.5 kilometers (2.8 miles)	Precontact	Flakes, block chert	Diamond 2015
11115.000281 Saugerties Hotel 2	4.5 kilometers (2.8 miles)	Precontact	Onondaga chert flakes	Diamond 2015
11115.000310 Saugerties Native American Burial Site	2.9 kilometers (1.8 miles)	Precontact	Precontact burials (human remains found by Saugerties Police Dept.)	Herter 2018
OPRHP 2019				

III. Archaeological Survey

A. Archaeological Field Methods and Techniques

The fieldwork, conducted on April 26, 2019, consisted of a thorough pedestrian reconnaissance of the project APE followed by systematic subsurface shovel testing. Transect A was placed along the limits of the proposed earthen berm. This strategy enabled sufficient coverage of all testable areas of the APE. Shovel tests were excavated at a standard 15-meter (50-foot) interval and measured approximately 40 centimeters (1.3 feet) in diameter. Positive shovel tests were bracketed by radial testing at 3-meter (9.8-foot) and 1-meter (3-foot) intervals in all cardinal directions.

All soils removed from the shovel tests were passed through 0.64-centimeter (0.25-inch) mesh hardware cloth to recover artifacts. As each natural or cultural stratum was excavated, that stratum was assigned an alphabetic designation (Stratum A, Stratum B, etc.) to indicate its stratigraphic relationship to the other levels in the shovel test. The letter designations were assigned beginning with the first excavated level of the shovel test and proceeded alphabetically through each subsequent level, until the termination of the shovel test. The shovel test data were recorded on standardized forms and included stratum depth, soil texture, soil color according to Munsell soil color charts, percentage of rock fragments, and other data, such as presence of disturbance or fill, as needed. Shovel tests were excavated 15 centimeters (0.49 foot) into sterile subsoil unless stopped by obstruction. Shovel test proveniences and project area conditions were recorded on a project plan map. Digital photographs were taken of the project area to give a general site overview and to complement the field notes. Appendix A provides detailed shovel test results.

B. Results of Fieldwork

Before conducting subsurface testing, the investigator walked over the entire APE to identify areas of potential disturbance. Photographs 1-4 illustrate the project APE. The area adjacent to the Plattekill Creek appears to have been modified and filled with riprap, possibly as a flood control measure (see Photograph 3). The western periphery of the APE had areas of standing water (see Photograph 4). Transect A (six shovel tests), in the area of the proposed berm, was staked into areas without apparent disturbance (Figure 7).

Shovel Tests A-1 and A-2 fell within the tree line at the eastern end of the APE (see Photographs 1 and 2); when the shovel tests were recorded via GPS, it was found that Shovel Test A-1 and its associated radials fell outside the APE. Soils encountered were generally consistent with mapped soils (USDA-NRCS 2018). Attempts were made to excavate each shovel test to 1 meter (3.3 feet) bgs; however, each shovel test encountered obstructions before that depth, including root mass, rocks, and the water table.

Shovel Test A-1 was positive for precontact cultural material, recovered from Stratum B between 23 and 60 centimeters (0.75 and 1.97 feet) below ground surface (bgs). An additional seven shovel tests were excavated at 3-meter and 1-meter intervals around the positive A-1. Of these, Shovel Test A-1/3mW was positive for precontact material, recovered from Stratum B between 23 and 49 centimeters (0.75 and 1.61 feet) bgs. No additional shovel test was excavated at a 1-meter interval to the west; the testing in this area represents the maximum amount possible because of dense tree roots.

Two strata were visible in Shovel Tests A-1 and A-2. Stratum A consisted of 7.5YR 3/4 dark brown silt loam, ranging to between 10 and 34 centimeters (0.33 and 1.12 feet) bgs. Stratum B consisted of 5YR 3/4 dark reddish-brown silt loam, terminating on dense roots at between 14 and 60 centimeters (0.46 and 1.97 feet) bgs.

Shovel Test A-3 displayed a Stratum A of 7.5YR 3/4 dark brown silt loam to 12 centimeters (0.39 foot) bgs. Stratum B consisted of 10YR 3/4 dark yellowish brown silt loam terminating on dense shale rock at 21 centimeters (0.69 foot) bgs.

Shovel Tests A-4–A-6 displayed a Stratum A of 7.5YR 3/4 dark brown silt loam, which extended to 13 to 30 centimeters (0.43 to 0.98 foot) bgs. Stratum B consisted of 5YR 3/3 dark reddish-brown silt loam, ranging to 30 to 52 centimeters (0.98 to 1.71 feet) bgs. These shovel tests terminated in water.



PHOTOGRAPH 1: View of Eastern Periphery of APE, from East of Shovel Test A-1, Facing West



PHOTOGRAPH 2: View East of the Tree Line, from Shovel Test A-3



PHOTOGRAPH 3: View East of the Bank of Plattekill Creek, Showing Modifications



PHOTOGRAPH 4: View of Western Periphery of APE, Facing East

CONFIDENTIAL INFORMATION - NOT FOR PUBLIC DISTRIBUTION



FIGURE 7: Location of Shovel Tests (NYS GIS 2016)

C. Archaeological Summary

One bifacial reduction flake was recovered from Shovel Test A-1, and one additional flake was recovered from Shovel Test A-1/3mW. Both flakes were recovered from Stratum B, at 23 to 60 centimeters (0.75 to 1.97 feet) and 23 to 49 centimeters (0.75 to 1.61 feet) bgs, respectively. Both shovel tests were located just outside the APE. This material was designated the Plattekill Oxbow Site. The site appears to represent a short-term, single-purpose site created by mobile foragers.

The Plattekill Oxbow Site represents a single-purpose, ephemeral precontact site with limited research potential. It reflects the general pattern of sites in the vicinity that are located along the creeks and streams in the area. Most of the previously recorded archaeological sites within a 4.8-kilometer (3 mile) radius consist of similar unaffiliated lithic scatters (see Table 2). The site lies outside the APE, adjacent to the APE's eastern terminus.

IV. Conclusions and Recommendations

On behalf of GOSR, WSP has completed a Phase I Archaeological Reconnaissance Survey for the proposed Reservoir Protection Project in the Town of Saugerties, Ulster County, New York. The New York State OPRHP recommended a Phase I archaeological survey for the portion of the project including a proposed earthen berm along Plattekill Creek, which constitutes the project area or APE, approximately 60 meters (197 feet) west of the culvert on Van Vlierden Road north of the intersection with Brink Road. The APE covered approximately 228 square meters (2,454 square feet). The goal of the Phase I survey was to identify archaeological resources in the APE. The survey included background research, pedestrian reconnaissance, and subsurface testing.

Background research indicated that one previously recorded archaeological site is located within 3.2 kilometers (2 mile) of the APE. The Saugerties Native American Burial Site (11115.000310) is located approximately 2.9 kilometers (1.8 miles) west of the APE. The site is represented by human remains recovered by the Saugerties Police Department. Several precontact sites are situated near Beaver Kill east of the APE: a total of 22 precontact sites, one historic site, and one multicomponent precontact/historic site are within 4.8 kilometers (3 miles) of the APE. Two of these sites contained diagnostic artifacts. The Wolven Cellar Hole Site included a Genesee Projectile point, indicating a Middle to Late Archaic date. The Woodstock: Site 3 (Area E) included a Fox Creek projectile point, indicating a Middle Woodland date. The sites consisted mainly of ephemeral lithic scatters, with some chert quarrying sites. It is likely that these sites represent short-term, single-use sites or resource procurement and processing sites created by mobile foraging groups utilizing the creeks and streams in the area to access upland resources above the Hudson Valley.

Six shovel tests were excavated at 15-meter (50 foot) intervals within all testable areas of the APE. Seven additional radials were excavated around Shovel Test A-1, which contained a single bifacial reduction flake. An additional flake was recovered from Shovel Test A-1/3mW. Both positive shovel tests were located just outside the APE. This assemblage was designated the Plattekill Oxbow Site. Given the limited amount of radial testing outside the APE, it is possible that the site is larger than currently recorded. The possible eligibility of the site could not be determined based on the current Phase I survey.

The archaeological survey did not identify any archaeological sites within the APE. It is the opinion of WSP that no further archaeological work is required within the current project limits. Should project plans change and encompass a different area, further archaeological work may be required.

V. References Cited

- Beers, F.W.
1875 *County Atlas of Ulster, New York*. Walker and Jewett, New York.
- Brasser, T.J.
1978 Mahican. In *Northeast*, edited by Bruce Trigger, pp. 198–212. Handbook of North American Indians, volume 15, William Sturtevant, general editor. Smithsonian Institution, Washington, D.C.
- Burr, David
1829 *Map of the County of Ulster*. Rawdon, Clark and Co., Albany and Rawdon, Wright and Co., New York.
- Cadwell, Donald H. and Robert J. Dineen
1987 *Surficial Geologic Map of New York; Hudson-Mohawk Sheet*. New York State Museum Chart and Map Series No. 40, Albany.
- Cronon, William
1983 *Changes in the Land: Indians, Colonists, and the Ecology of New England*. Hill and Wang, New York.
- Dincauze, Dena, and Michael Mulholland
1977 Early and Middle Archaic Site Distributions and Habitats in Southern New England. In *Amerinds and Their Paleo-environments in Northeastern North America*. Annals of New York Academy of Sciences 288:439–456.
- Environmental Systems Research Institute, Inc. [ESRI]
2019 *USA Topo Maps*. ArcGIS map server accessed May 2019 via ArcMap 10.6, http://services.arcgisonline.com/arcgis/rest/services/USA_Topo_Maps/MapServer.
- Foote, Charles E.
1907 The Town of Saugerties. In *The History of Ulster County, New York*, edited by Alphonso T. Clearwater, pp. 360–365. W.J. Van Deusen, Kingston, New York.
- Gaudreau, Denise C.
1988 The Distribution of Late Quaternary Forest Regions in the Northeast: Pollen Data, Physiography, and the Prehistoric Record. In *Holocene Human Ecology in Northeastern North America*, edited by George P. Nichols, pp. 215–256. Plenum Press, New York.
- Mulholland, Mitchell T.
1988 Territoriality and Horticulture: A Perspective for Prehistoric Southern New England. In *Holocene Human Ecology in Northeastern North America*, edited by George P. Nichols, pp. 137–166. Plenum Press, New York.
- New York Archaeological Council
2000 *Standards for Cultural Resource Investigations and the Curation of Archaeological Collections in New York State*. Available through the New York State Office of Parks, Recreation and Historic Preservation, Historic Preservation Field Services Bureau, Peebles Island, Waterford.
- New York State Geographic Information Systems [NYS GIS]
2016 Orthoimagery. New York State Geographic Information Systems (GIS) Clearinghouse, Albany, New York. Accessed online May 2019, <https://orthos.dhSES.ny.gov/>.
- New York State Office of Parks Recreation and Historic Preservation [OPRHP]
2019 Cultural Resource Information System (CRIS). Files accessed online February 2019, <https://cris.parks.ny.gov/Default.aspx>.

Ritchie, William A.

1980 *The Archaeology of New York State*. Revised edition. Harbor Hill Books, Harrison, New York.

Ritchie, William A., and Robert E. Funk

1973 *Aboriginal Settlement Patterns in the Northeast*. Memoir 20. New York State Museum and Science Service, Albany.

Snow, Dean R.

1980 *The Archaeology of New England*. Academic Press, New York

Tillson, Oliver J., Henry P. Brink, and Edward Herline

1853 *Map of Ulster County, New York*. P.B. Brink and O.J. Tillson, Saugerties, New York.

United States Department of Agriculture-National Resources Conservation Service [USDA-NRCS]

2018 *Ulster County, New York*. Web Soil Survey, Soil Survey Geographic (SSURGO) Database. U.S. Department of Agriculture, Natural Resources Conservation Service, Washington, D.C. Accessed online May 2019, <https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm>.

United States [U.S.] Department of the Interior

1983 Archaeology and Historic Preservation: Secretary of the Interior's Standards and Guidelines. *Federal Register*, Part IV, 48(2):44716-44742. Annotated version showing later technical and officially adopted revisions available from the National Park Service's preservation laws, regulations, and standards webpage, http://www.cr.nps.gov/local-law/arch_stnds_0.htm.

United States Geological Survey (USGS)

1903 *Kaaterskill, New York*. 15-Minute Topographic Quadrangle. Surveyed 1892, edition of Sept. 1903, reprinted 1943. United States Geological Survey, Washington, D.C., <https://ngmdb.usgs.gov/topo>.

2013 *Saugerties, New York*. 7.5-Minute Topographic Quadrangle. United States Geological Survey, Reston, Virginia.

Appendix A

Shovel Test Log

STP	Stratum	Depth to base of Stratum		Soil Color	Texture	Coarse Fraction	Artifact Cat. #	Comments
		cm	ft					
A1	A	23	0.75	7.5YR 3/4 Dark brown	Silt loam		NCM	
	B	60	1.97	5YR 3/4 Dark reddish brown	Silt loam		101	Root Impasse
A1/3mN	A	14	0.46	7.5YR 3/4 Dark brown	Silt loam		NCM	Root impasse
A1/1mN	A	30	0.98	7.5YR 3/4 Dark Brown	Silt loam		NCM	Root Impasse
A1/3mE	A	10	0.33	7.5YR 3/4 Dark brown	Silt loam		NCM	
	B	24	0.79	5YR 3/4 Dark reddish brown	Silt loam		NCM	Root Impasse
A1/1mE	A	12	0.39	7.5YR 3/4 Dark brown	Silt loam		NCM	
	B	30	0.98	5YR 3/4 Dark reddish brown	Silt loam		NCM	Root Impasse
A1/3mW	A	23	0.75	7.5YR 3/4 Dark brown	Silt loam		NCM	
	B	49	1.61	5YR 3/4 Dark reddish brown	Silt loam		102	Root impasse
A1/3mS	A	23	0.75	7.5YR Dark brown	Silt loam		NCM	
	B	30	0.98	5YR 3/4 Dark reddish brown	Silt loam		NCM	Root impasse
A1/1mS	A	14	0.46	7.5YR Dark brown	Silt loam		NCM	Root impasse
A2	A	34	1.12	7.5YR 3/4 Dark brown	Silt loam		NCM	Root impasse
A3	A	12	0.39	7.5YR 3/4 Dark brown	Silt loam		NCM	
	B	21	0.69	10YR 3/4 Dark yellowish brown	Silt loam		NCM	Rock impasse
A4	A	28	0.92	7.5YR 3/4 Dark brown	Silt loam		NCM	
	B	52	1.71	5YR 3/3 Dark brown	Silt loam		NCM	Water impasse
A5	A	13	0.43	7.5YR 3/4 Dark brown	Silt loam		NCM	
	B	30	0.98	5YR 3/3 Dark reddish brown	Silt loam		NCM	Water impasse
A6	A	30	0.98	7.5YR 3/4 Dark brown	Silt loam		NCM	
	B	52	1.71	5YR 3/3 Dark reddish brown	Silt loam		NCM	Water impasse

Appendix B

Methods of Artifact Cataloging and Analysis Artifact Inventory

METHODS OF ARTIFACT CATALOGING AND ANALYSIS METHODS

A. LABORATORY PROCESSING

All artifacts were transported from the field to the Louis Berger U.S., Inc., a WSP company (WSP), laboratory. In the field, artifacts were bagged in 4-mil, resealable polyethylene bags. Artifact cards bearing provenience information were included in the plastic bags. A Field Number was assigned to each unique provenience in the field. This number appears with all the provenience information and is used throughout processing and analysis to track artifacts.

Prehistoric lithics and most historic artifacts were washed in water with a soft toothbrush. Prehistoric ceramics, faunal material, and fragile artifacts were wet-brushed with a soft natural-bristle paint brush or were simply dry-brushed. Metal objects were cleaned using a dry toothbrush or stainless steel wire brush. All artifacts were laid out to air-dry in preparation for analysis.

During analysis, individual Specimen Numbers were assigned to artifacts. After analysis, the artifacts were re-bagged into clean, perforated 4-mil resealable polyethylene bags. Artifacts are organized sequentially first by Site Number, then Field Number and finally by Specimen Number. Before submitting for curation, catalog numbers were assigned in accordance with the curation facility guidelines. An acid-free artifact card listing full provenience information and analytical class was included in each bag.

Please note that all nails and some of the window glass in the collection were not labeled. No conservation treatment on the artifacts was needed nor performed.

B. ANALYTICAL METHODS

All artifact analyses were conducted by the Laboratory Supervisor and/or Material Specialist(s). WSP maintains an extensive comparative collection and laboratory research library to contribute to the completeness and accuracy of the analyses.

WSP has developed a flexible analytical database system that fully integrates all artifacts in one database for use in data manipulation and interpretation. The computerized data management system is written using Microsoft Access, a relational database development package that runs on a Windows® platform.

Each class of artifacts (historic ceramics, curved (vessel) glass, small finds/architectural, historic tobacco pipes, and faunal) has a series of attributes, sometimes unique to that class, that are recorded to describe each artifact under analysis. Artifact information (characteristics) was entered into the system during the process of analysis. The system was then used to enhance the artifact records with the addition of provenience information. WSP maintains a complete type and attribute coding system maintained in the database.

The Notes field allows for individual written comments applicable to a specific entry. In general, notes are used to describe particulars of decorative motifs or unusual characteristics, or to record bibliographic references used for identification or dating.

C. LITHIC ARTIFACT ANALYSIS.

The analytical approach to stone tool production and use that was used in this analysis can be described as technomorphological; that is, artifacts were grouped into general classes and then further divided into specific types based upon key morphological attributes, which are linked to or indicative of particular stone

tool production (reduction) strategies. Function was inferred from morphology as well as from use-wear. Data derived from experimental and ethnoarchaeological research were relied upon in the identification and interpretation of artifact types. The works of Callahan (1979), Clark (1986), Crabtree (1972), Flenniken (1981), Justice (1987), and Parry (1987) were drawn upon most heavily. All types were quantified by both count and weight (in grams).

a. *Debitage*

Debitage is the by-product of lithic reduction and includes all types of chipped-stone refuse that bear no obvious traces of having been utilized or intentionally modified. There are two basic forms ofdebitage: flakes and shatter. Observations on raw material and cortex were recorded and are discussed later. The following descriptions are for the Debitage types identified, but not the full range of types described in Taylor et al. (1996).

Decortication Flakes are intact or nearly intact flakes with 50 percent or more cortex covering their dorsal surface. These are the first series of flakes detached during lithic reduction.

Early Reduction Flakes are intact or nearly intact flakes with less than 50 percent dorsal cortex, fewer than four dorsal flake scars, on the average, and irregularly shaped platforms with minimal faceting and lipping. Platform grinding is not always present. These flakes could have been detached from early-stage bifaces or cores of the freehand and bipolar types.

Biface Reduction Flakes are intact or nearly intact flakes with multiple overlapping dorsal flake scars and small elliptically shaped platforms with multiple facets. Evidence of platform grinding is usually present. Platforms are distinctive because they represent tiny slivers of what once was the edge of a biface. Biface reduction flakes are generated during the middle and late stages of biface reduction and also during biface maintenance (resharpening).

Pressure Flakes are made using a flaker. Because the force is applied by pressing and not striking, there are some morphological differences as compared with hard and soft hammer flakes. First, the platform is not a flat surface, but a slightly crushed edge. The edge grinding appears as the result of the edge preparation procedure.

Bipolar Reduction Flakes are intact or nearly intact flakes that have been struck from a bipolar core. They typically exhibit sheared cones, diffuse bulbs, closely spaced ripples, and crushed and splintered platforms. Crushing can also occur on the termination of flakes (distal end).

Finishing Flake are small flakes, usually detached through pressure flaking and are used to create the final cutting edge of the blade.

Resharpening Flake are small, often rounded, flakes that are usually detached through pressure flaking and exhibit evidence of prior use on the dorsal surface. These flakes are the byproduct of resharpening the blade edge for further use.

Uniface Resharpening Flakes are small J-shaped flakes that have been removed from the margins of a uniface. Their platforms often bear traces of use damage or polish.

Flake Fragments are sections of flakes that are too fragmentary to be assigned to a particular flake type.

Block Shatter are angular or blocky fragments that do not possess platforms or bulbs. Generally the result of uncontrolled fracturing along inclusions or internal fracture planes, block shatter is most frequently

produced during the early reduction of cores and bifaces. Block shatter is also common in bipolar reduction, and it is equivalent to Binford and Quimby's (1963) "primary shatter." Thermal fracturing can also produce block shatter.

Flake Shatter are small, flat fragments or splinters that lack platforms, bulbs, and other obvious flake attributes. Flake shatter is generated throughout a reduction sequence but is most common in later stages. It is a common by-product of bipolar reduction, and it is equivalent to "secondary shatter" (Binford and Quimby 1963). Trampling of debitage on living surfaces also generates flake shatter, while thermal fracturing produces both flake and block shatter.

Other Flake Types These are flake types for which there is no Lithica (Taylor et al. 1996) designation. Their characteristics are described in the note field, as needed.

Indeterminate Flakes are flakes that cannot be assigned to a specific type because their surface has been damaged (e.g., pot lidding) or severely eroded (e.g. argillite debitage).

b. Cores

Cores are cobbles or blocks of raw material that have had one or more flakes detached and that have not been shaped into tools or used extensively for tasks other than as a nucleus from which flakes have been struck. The types of cores identified are listed below, but this does not represent the full range of types possible, as discussed in Taylor et al. (1996).

Freehand Cores are blocks or cobbles that have had flakes detached in multiple directions by holding the core in one hand and striking it with a hammerstone held in the other (Crabtree 1972). This procedure generates flakes that can be used as expedient tools or can be worked into formalized tools. Freehand percussion cores come in various shapes and sizes, depending upon the raw material form and degree of reduction.

Bipolar Cores are blocks or cobbles that have had flakes detached by direct hard-hammer percussion on an anvil: the core is placed on the anvil and struck vertically with a hammerstone (Crabtree 1972; Hayden 1980). Cores typically take on a tabular shape, exhibit heavy crushing and battering, and flake scars tend to run between areas of crushing and battering. Bipolar cores are normally smaller than freehand cores because bipolar reduction is a technique for maximizing available raw materials. Most flakes that are detached are only suitable for expedient flake tools.

Bifacial cores are specific types of freehand, amorphous cores flaked on both sides, i.e. reduced along one or more bifacially prepared edges for the purpose of flake production. Flaking occurs on both sides of a nodule to fully exploit the material.

Flake cores are made from tubular large flakes usually flaked on one side, often with a defined flaking pattern. Some large early reduction flakes could have been used as flake cores to produce flake-based scrapers or perhaps burins.

Tested Cobbles are unmodified cobbles, blocks, or nodules that have had a few flakes detached to examine raw-material quality.

Other Core Types are cores that do not easily fit into existing types as for example, formalized blade cores. The Notes field is used to record important attributes.

c. *Bifaces*

A biface is a flake or cobble that has had multiple flakes removed from the dorsal and ventral surfaces. Bilateral symmetry and a lenticular cross section are common attributes; however, these attributes vary with the stages of production, as do thickness and uniformity of edges (see Callahan 1979). Included in this artifact class are all hafted and unhafted bifaces that functioned as projectile points and/or knives, as well as bifacially worked drill bits and unfinished bifaces. Specific types of bifaces represented in the collection are described below.

Projectile Points are finished bifaces that were usually hafted and functioned primarily as projectiles. Projectile points are usually triangular in overall form, with various types of hafting elements.

Knives are finished bifaces that were usually hafted and functioned primarily as cutting implements. Knives are characterized by one or more elongate cutting edges.

Finished Bifaces are finished bifaces that were probably hafted, but are too fragmentary or ambiguous to assign to a functional category (i.e., projectile point or knife).

Late-Stage Bifaces are basically finished bifaces; they are well thinned, symmetrical in outline and cross section, and edges are centered. Small areas of cortex may still exist on one or both faces. These bifacial preforms are analogous to Callahan's Stage 4 bifaces (1979).

Middle-Stage Bifaces look more like bifaces; they have been initially thinned and shaped. A lenticular cross section is developing, but edges are sinuous, and patches of cortex may still remain on one or both faces. These bifaces are roughly equivalent to Callahan's Stage 3 bifaces (1979). Biface reduction is a continuum; therefore, middle-stage bifaces are often difficult to distinguish from early- and late-stage bifaces, depending upon the point at which their reduction was halted. Plus, rejected bifaces may have been used for other tasks (recycled).

Early-Stage Bifaces are cobbles, blocks, or large flakes that have had their edges bifacially trimmed and a few large reduction flakes detached. These bifacial blanks are equivalent to Callahan's Stage 2 bifaces (1979). Because of their crude condition, these bifaces can be confused with freehand percussion cores and choppers.

Choppers or cleavers are sizable bifaces that may have been employed in tasks that required heavy-duty cutting, chopping, or severing. These implements are often crudely formed and can be mistaken for cores or early-stage bifaces.

Drills are slender bifaces that could have been used to perforate or pierce various materials.

Adzes or gouges are bifaces that were hafted and used as heavy duty woodworking tools.

Other Bifaces are bifaces that do not easily fit into the above types. (The note field is used to record distinctive attributes).

Indeterminate Bifaces are sections of bifaces that are too badly damaged to be assigned to a specific type.

d. *Unifaces*

A uniface is a formalized tool fashioned from a flake by uniformly retouching its edges to create a specific working edge and a standardized shape. There are two basic types of formal unifaces - endscrapers and

sidescrapers. In the former, the working edge is transverse to the long axis of the tool; in the latter, the working edge (or edges) parallels the long axis of the tool.

Endscrapers are formalized uniface tools that have uniformly retouched edges, which creates a working edge and a standardized shape. The working edge is transverse to the long axis of the tool, and retouching often erases obvious indications that the tool is made on a flake.

Sidescrapers are formalized uniface tools that have uniformly retouched edges, which creates a working edge and a standardized shape. The working edge parallels the long axis of the tool, and retouching often erases obvious indications that the tool is made on a flake.

Other Uniface Types are uniface tools that do not fit easily into existing types. The note field is used to record distinctive attributes.

Indeterminate Uniface Fragments are uniface tools that are too fragmentary to be assigned to a specific type.

e. Flake Tools

Utilized and edge-retouched flakes are informal expedient tools. They are flakes that were struck from a core or a biface and used to perform one or more tasks, with little or no prior modification. In some cases, it is difficult to distinguish intentional retouch from use damage.

Utilized Flakes are expedient tools that exhibit traces of use damage and/or polish on one or more edges. These flakes could have been detached from cores or bifaces.

Retouched Flakes are expedient tools that have had one or more edges retouched, either to resharpen the working edge, to create a dulled edge for grasping, or to form a specific edge angle or shape. The flake itself could have been detached from a core or a biface.

Notched Flakes or spokeshaves are a special type of retouched flake. The retouching of one or more flake edges into a concavity distinguishes this morphological type.

Graver Flakes are a special type of retouched flake. The retouching of one or more edges into acute projections distinguishes this type.

Denticulated Flakes are a special type of retouched flake. They are distinctive because appropriately spaced flakes have been detached from one or more edges to form a toothed or serrated edge.

f. Cobble Tools

Alluvial cobbles or slabs of bedrock were used for various tasks, with little or no prior modification. These simple tools were used as hammers, anvils, grinding stones, abraders, or for a combination of functions. Battered, crushed, pitted, and/or smooth surfaces identify these stones as tools.

Netsinkers are notched cobbles. Direct hard hammer percussion was used to remove a few flakes from both ends of a cobble to facilitate the cobble's attachment to a net. Some specimens could have functioned as bolas stones.

Hammerstones are cobbles that show evidence of battering and crushing along their margins, indicating that they were intentionally used as percussors either for flaking siliceous materials or working other resistant materials.

Manos or grinding stones are hand-sized cobbles with one or more flat surfaces that were used to crush and grind various materials, as is evidenced by smoothed and polished surfaces.

Metates or grinding slabs are large cobbles or blocks of bedrock with one or two flat or concave surfaces, which exhibit evidence of grinding and crushing.

Pestles are linear (oblong) cobbles that exhibit crushing and smoothing on one or both ends or poles. Pestles can also be formalized tools that were shaped by pecking and grinding.

Mortars are large cobbles or blocks of bedrock with at least one deeply concave surface, which was used to hold various materials to be crushed and ground.

Pitted Cobbles or "nutting stones" are cobbles or blocks of bedrock with at least one smooth depression smaller than 4 cm in diameter. Unlike anvil depressions, these are smooth and tend to be circular or oval. These depressions may be the result of processing nuts, differing from anvil depressions created by bipolar lithic reduction.

Abraders are chunks of sandstone or related materials that were used to shape and sharpen tools made of various materials. Slotted abraders are believed to have been used in the manufacture and maintenance of bone and wood tools (e.g., needles, awls, shafts), and flat abraders are believed to have been used in the manufacture and maintenance of stone tools in addition to bone and wood tools.

Anvil Stones are cobbles or blocks of bedrock that were used as a base on which to rest materials while they were struck with a hammer. Anvil surfaces tend to possess shallow, coarse-textured depressions with amorphous outlines.

Other Cobble Tools are cobble tools that do not have pre-existing Lithica codes. A description of the specimen appears in the note field.

g. Groundstone Tool

Groundstone tools are formal stone tools and ornaments that were manufactured by pecking, grinding, and sometimes flaking. Typical artifact types are grooved axes, pipes, pendants, etc.

Stone Bowls are stone cooking vessels that were manufactured by carving, grinding, and polishing.

Grooved Axes are formal tools that were designed to be hafted, and their primary function was heavy duty woodworking.

Celts are ungrooved axes; they were hafted by a different method than grooved axes.

Adzes or gouges manufactured from granitic materials by pecking and grinding were hafted and functioned as heavy duty woodworking tools, much like their chipped stone tool counterparts.

Mauls are large, heavy duty, round implements with a blunt bit and are most commonly associated with quarrying activities. Mauls are usually grooved and have defined polls. Mauls are often made from granite, diorite, basalt, or other hard stone. Ungrooved mauls are generally defined as hammerstones.

Other Groundstone Tools are those tools and ornaments that are not covered by the above types, for example, bannerstones, pipes, and pendants.

Indeterminate Groundstone Fragments are sections of groundstone tools or ornaments that are too badly damaged to be assigned to a specific type.

h. Minerals

These are unmodified or minimally modified crystals or chunks of naturally occurring chemical elements, for example, galena (lead ore) and limonite and hematite (iron ores). These materials can be manufactured into tools and ornaments, but then, these artifacts would not be quantified as minerals. (The total number of items is recorded).

Other Minerals These are mineral types for which there is no Lithica designation. Their characteristics are described in the note field.

i. Fire-cracked Rock

Cracked rock includes all fragments of lithic debris that cannot be attributed to stone tool production. Generally, fire-cracked rock is recognized by surfaces that exhibit reddening and irregular breakages. Whether a broken cobble is actually fractured as a result of thermal stress is often difficult to discern. For this study, all fractured cobbles are considered fire-cracked rock, even if they exhibit no clear signs of being thermally altered.

j. Unmodified Cobbles and Pebbles

Unmodified Cobbles exhibit no evidence of cultural use or modification. However, these items are of potential importance because they may represent manuports and/or cached raw materials. A cobble is generally greater than 6 cm in maximum dimension.

Unmodified Pebbles exhibit no evidence of cultural use or modification, however, may allow for interpretation of environmental conditions. A pebble is generally smaller than 6 cm in maximum dimension.

REFERENCES CITED

Adams, Jenny

2002 *Ground Stone Analysis*. University of Utah Press, Salt Lake City.

Andrefsky., William Jr.

2001 *Lithic Debitage – Context, Form, Meaning*. University of Utah Press, Salt Lake City.

Callahan, Errett

1979 The Basics of Biface Knapping in the Eastern Fluted Point Tradition: A Manual for Flintknappers and Lithic Analysts. *Archaeology of Eastern North America* 7:1–180.

Clark, John E.

1986 Another Look at Small Debitage and Microdebitage. *Lithic Technology* 15:21–23.

Crabtree, Donald E.

1972 *An Introduction to Flintworking*. Occasional Papers No. 28. Idaho State Museum, Pocatello.

Custer, Jay F.

2001 *Classification Guide for Arrowheads and Spearpoints of Eastern Pennsylvania and the Central Middle Atlantic*. Commonwealth of Pennsylvania, Harrisburg.

Daniel, I. Randolph, Jr.

1998 *Early Archaic Settlement in the Southeast: Hardaway Revisited*. University of Alabama Press, Tuscaloosa.

Denker, Ellen, and Bert Denker

1985 *The Main Street Pocket Guide to North American Pottery and Porcelain*. The Main Street Press, Pittstown, New Jersey.

Flenniken, J. Jeffery

1981 *Replicative Systems Analysis: A Model Applied to the Vein Quartz Artifacts from the Hoko River Site*. Laboratory of Anthropology Reports of Investigation No. 59. Washington State University, Pullman.

Hatch, James W., and Patricia E. Miller

1985 Procurement, Tool Production, and Sourcing Research at the Vera Cruz Jasper Quarry in Pennsylvania. *Journal of Field Archaeology* 12:219-232.

Hranicky, Wm Jack

1991 *Projectile Point Typology and Nomenclature for Maryland, Virginia, West Virginia, and North/South Carolina*. Archaeological Society of Virginia, Richmond.

1994 *Middle Atlantic Projectile Point Typology and Nomenclature*. Archaeological Society of Virginia, Richmond.

Justice, Noel D.

1987 *Stone Age Spear and Arrow Points of the Midcontinental and Eastern United States*. Indiana University Press, Bloomington. 1995 paperback edition.

Louis Berger

2013 *Analytical Coding System for Historic and Prehistoric Artifacts*. Prepared by Camilla Deiber and the Archaeology Laboratory, Louis Berger, Kansas City, Missouri.

Perino, Gregory

1985 *Selected Preforms, Points, and Knives of the North American Indians, Volume 1*. Points and Barbs Press, Idabel, Oklahoma.

Ritchie, William A.

1961 *New York Projectile Points: A Typology and Nomenclature*. Revised 1971, reprinted 1997. New York State Museum and Science Service Bulletin 384. The University of New York, Albany.

Taylor, Randolph, and Brad Koldehoff, with contributions and revisions from Alex Ortiz, Robert Wall, and Ludomir Lozny

1996 *A Guide to Lithica: An R-Base Lithic Analysis System*. Prepared for Louis Berger & Associates, Inc., East Orange, New Jersey.

Whittaker, John C.

1994 *Flintknapping: Making and Understanding Stone Tools*. University of Texas Press, Austin.

Wray, Charles F.

1948 Varieties and Sources of Flint Found in New York State. *Pennsylvania Archaeologist* 18(1-2):25-45.

2004232.01.01.01_Phase I GOSR- Saugertiues Artifact Catalog

Area	STP	Stratum	Level	Field #	Spec #	Class	Artifact Description:	Count	Weight (g)	Begin Date - End Date	Comments
A	A1	B	3-60cr	101	1	Lithics	Biface Reduction Flake	1	2.2		Onondaga chert, bulb present; no heating, no cortex; reduction of dorsal surface
A	A1 3mW	B	3-40cr	102	1	Lithics	Debitage / General	1	0.1		Onondaga chert, no heating, no cortex

wsp