Black Rock
Wind Farm

Appendix Y

Archaeology
Phase I
Study

INTERIM PHASE I ARCHAEOLOGICAL INVESTIGATIONS FOR THE PROPOSED BLACK ROCK WIND FARM PROJECT, MINERAL AND GRANT COUNTIES, WEST VIRGINIA

WV SHPO FR No. Not Yet Assigned

8 January 2019

Prepared for:

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West Virginia Public Service Commission Docket No. Not Yet Assigned

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MANAGEMENT SUMMARY

Black Rock Wind Force, LLC (Black Rock), a subsidiary of Clearway Energy Group, LLC, proposes to construct a wind energy generating facility, known as Black Rock Wind Farm (BRWF or Black Rock), in Mineral and Grant Counties, West Virginia. Pursuant to West Virginia Code § 24-2-11(c), Black Rock is submitting a Siting Certificate to the West Virginia Public Service Commission for the construction and operation of the wind energy generating facility and associated interconnection and transmission facilities. This report documents the results of a Phase I Archaeological Investigation undertaken by Stantec Consulting Services Inc. (Stantec) to identify and assess the presence of known or potential archaeological sites within the proposed limits of disturbance (LOD) for the Black Rock Wind Farm (BRWF) project.

Stantec conducted an online review of the West Virginia archaeological site and project report files, prehistoric Native American contexts, Historic period contexts, and historical maps, and conducted pedestrian walkover and shovel test pit (STP) field survey of the LOD. The field investigations were conducted between November 5 and 16, 2018, and were designed to meet the standards of the Secretary of the Interior, as specified in the *Standards and Guidelines for Archeology and Historic Preservation* (Federal Register 1983), and the West Virginia Division of Culture and History's *Guidelines for Phase I, II, and III Archaeological Investigations and Technical Report Preparation* (Trader n.d.).

The BRWF will consist of up to 29 turbines and just under 10 miles (16 km) of access road and associated electrical collection system and transmission line corridors, as well as staging areas for use during construction, and an operation and maintenance facility. The wind turbines are located mostly on a ridge in the area north and south of the intersection of U.S. Route 50 and State Route 42 N. The BRWF will be situated in select portions of privately owned mountaintop land generally composed of uninhabited forested or timbered areas. In all the archaeological survey of the Area of Potential Effects (APE) for the turbine pads, staging areas, transmission line corridors, and access roads totals approximately 697.8 acres.

The archaeological site and project report file review indicated that a few archaeological survey projects had been conducted within approximately 1 mile (1.6 km) of the Black Rock LOD, but no archaeological sites have been identified as a result of those investigations. Our historic context and map research suggest that the Black Rock project area was a lightly populated rural landscape throughout recent history, with agriculture, logging, and mining being the main economic drivers in the region. Given the prehistoric Native American and Historic period contexts and the location of the LOD, Stantec archaeologists expected most Native American sites to consist of low-density artifact scatters while Historic period sites could include refuse dumps, agricultural outbuildings, and sites associated with logging or mining.

The survey consisted of both pedestrian walkover and screened STP excavations. Aside from those properties where access was not obtained (approximately 212.8 acres), archaeologists surveyed 697.8-acres of the LOD by pedestrian walkover on 15-m (49.2-ft) or narrower transects. Excluded from areas investigated by STPs were those portions of the LOD that had slopes greater than 20 percent, had no surface soil (e.g., consisted of exposed bedrock), or had been previously disturbed (mainly by mining activities). The remainder of the LOD was surveyed by excavating STPs at 15-m (49.2-ft) intervals, screening soil through ¼-inch (6.4-mm) mesh, recording the STP location

using a GPS unit, and documenting soil stratigraphy. For the 100-ft (30.5-m) wide road and transmission line corridors, two parallel transects of STPs, separated by 15 m (49.2 feet), were excavated. For the wind turbines, five transects separated by 15 m (49.2 feet) were excavated at each.

Field investigations included STP excavations and pedestrian reconnaissance. Shovel test excavations were conducted in six areas and included the excavation of 275 STPs. Pedestrian reconnaissance survey was conducted in the remaining areas where access was permitted. Slope, particularly leading up to the ridge lines, and/or no visible soil present (e.g., bedrock present on the surface) accounted for the majority of these areas. Additionally, several areas in the northern portion of the project area were disturbed by previous mining activities while the southern portion contained eroded livestock pastures, wetlands, and asphalt and gravel roadways. No archaeological resources were identified in the accessible project area. Based on the results of the Phase I archaeological survey conducted for the BRWF, Stantec recommends no additional archaeological investigations except for those areas where access was not initially provided, , and/or any other proposed LOD revisions or additions. The results of future surveys, if any, will be detailed as an addendum to this report.

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1.0 INTRODUCTION

Black Rock Wind Force, LLC (Black Rock) proposes to construct a wind energy generating facility, known as Black Rock Wind Farm (BRWF), in Mineral and Grant Counties, West Virginia (Figure 1). This report documents the results of a Phase I archaeological investigation of approximately 697.8 acres undertaken by Stantec Consulting Services Inc. (Stantec) to identify and assess the presence of known or potential archaeological sites for the proposed BRWF. The archaeological investigation was conducted on behalf of Black Rock for its submission of an application for a Siting Certificate to the West Virginia Public Service Commission. Field investigation was conducted between November 5 and 16, 2018. The investigations were designed to meet the standards of the Secretary of the Interior, as specified in the *Standards and Guidelines for Archeology and Historic Preservation* (Federal Register 1983), and the West Virginia Division of Culture and History's *Guidelines for Phase I, II, and III Archaeological Investigations and Technical Report Preparation* (Trader n.d.).

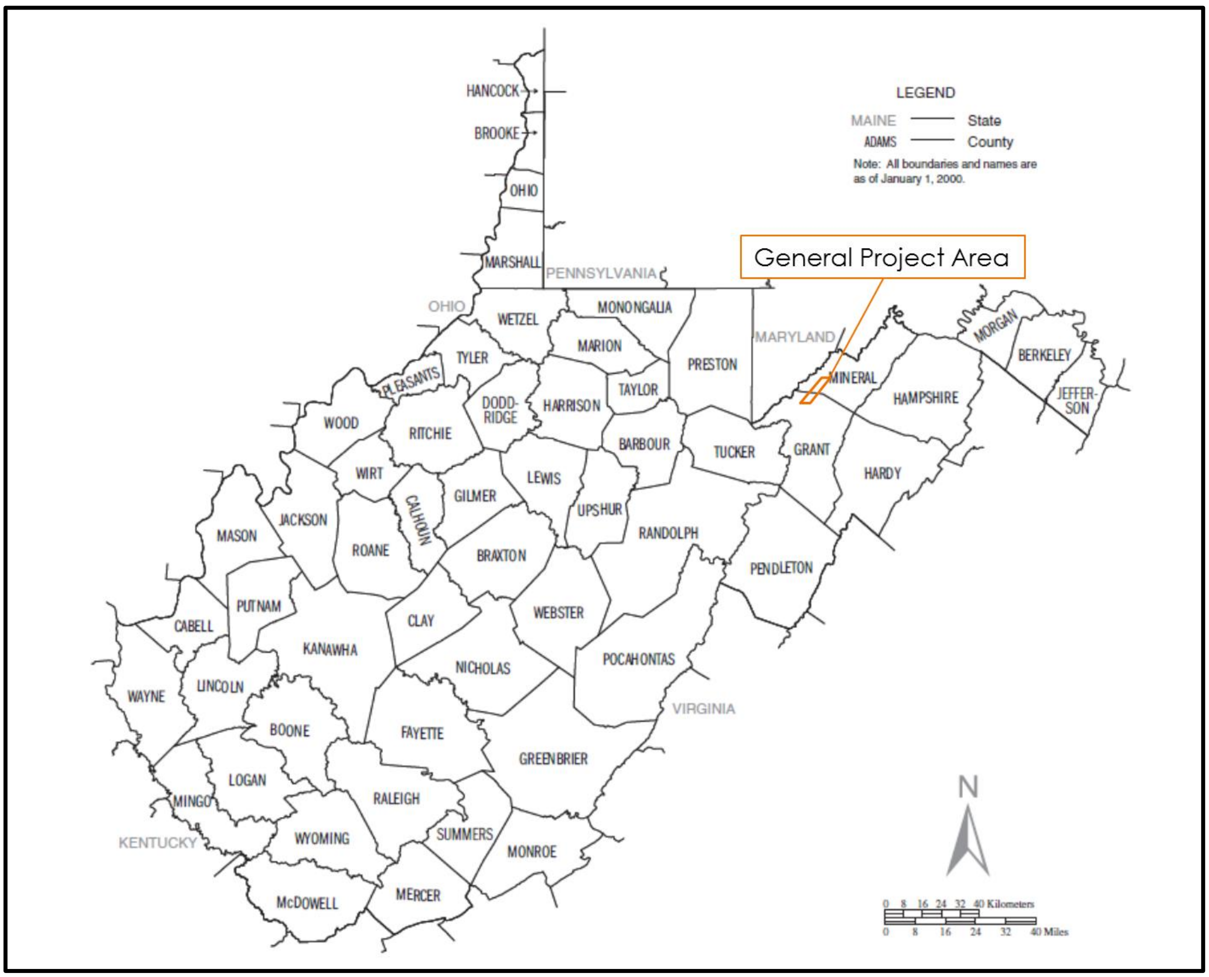

Figure 1. General location of the Black Rock Wind Farm project (base map from U.S. Census Bureau 2018).

1.1 PROPOSED UNDERTAKING

Pursuant to West Virginia Code § 24-2-11(c), Black Rock is submitting a Siting Certificate to the West Virginia Public Service Commission for the construction and operation of a wind energy generating facility and associated interconnection and transmission facilities in Mineral and Grant Counties, West Virginia (Figure 1).

Up to 68 potential turbine locations are currently being evaluated, although it is anticipated that not all locations will be selected for turbine construction. Black Rock proposes to construct up to 32 wind turbines and associated equipment along the Allegheny Front at Skyline, about 11.5 miles (18.5 km) southwest of Keyser in Mineral and Grant Counties, West Virginia. Turbine locations include sites along the Allegheny Front ridgeline, between the currently operating Mount Storm (Shell/Dominion) and Pinnacle (Clearway) wind farms, as well as along some lower, discontinuous ridges and hilltops west of the ridgeline. The project is projected to have a total operating capacity of up to approximately 110 MW. In addition to the wind turbines, their tubular supporting towers, and foundations, Black Rock proposes to construct access roads, an underground and/or overhead electric collection system, transmission line, a substation and an interconnection switchyard. Also included in the project limits of disturbance (LOD) are several construction staging areas. The wind turbine arrays and associated equipment and facilities are referred to collectively in this document as the BRWF.

The wind turbines are located mostly on the primary ridge, perpendicular to the prevailing wind, in the area north and south of the intersection of U.S. Route 50 and State Route 42 N. The BRWF will be situated in select portions of privately owned mountaintop land generally composed of uninhabited forested or timbered areas. The general project location is provided in Figure 2.

1.2 PROJECT LOCATION AND DESCRIPTION

The project area is composed of forested ridgelines and side slopes within the towns of Mount Storm and Skyline (Figure 2). The project area is within a rural setting with a mix of forested areas and pastures or meadows with a few residential dwellings and farms along U.S. Route 50, State Route 42, Pinnacle Road, and Mt. Pisgah Road. U.S. Route 50 bisects the project area from northeast to southwest. State Route 42 runs south into U.S. Route 50 in the northeast portion of the project area and splits from U.S. Route 50 to the southeast in the southwest portion, forming a Y-junction south of Mount Storm. Pinnacle Road extends northeast from State Route 42 to the proposed substation sites south of Bosley Road. Mt. Pisgah Road runs south from U.S. Route 50 nearly to the southernmost turbine location. Portions of the project area are being used as pasture for livestock (cattle and horses). Additionally, the project area includes active hunting grounds.

The area of potential effects (APE) for archaeology is the proposed LOD plus a 50-ft (15.2-m) buffer. This APE includes the projected footprints of the wind turbines and new substation, access roads, connector routes, and staging areas, including a proposed cement plant. Based on this definition of the APE, Stantec surveyed approximately 697.8 acres. In all, up to 32 wind turbines are currently planned, with the main line of wind turbines extending north-south for approximately 7.3 miles (11.7 km) along the spine of the Allegheny Front. Additional wind turbines are sited on isolated knolls west of the main ridge line. Connector routes and access roads

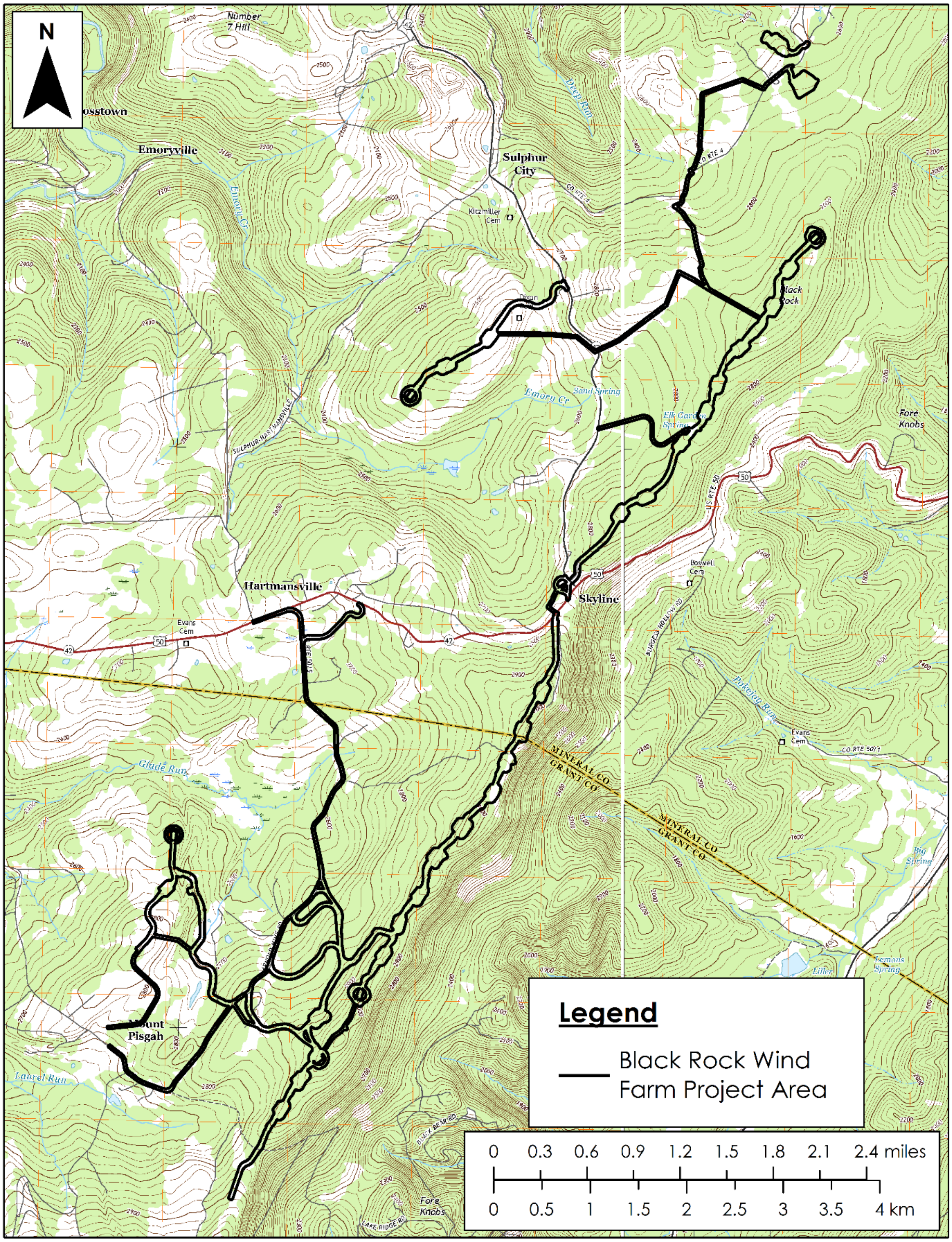

Figure 2. 2016 Mount Storm and Antioch 7.5-minute quadrangle maps showing the project area (U.S. Geological Survey 2018a).

follow the ridge line or existing roads where possible to minimize additional disturbance though construction of new access roads is expected.

Anticipated project impacts will include surface and sub-surface disturbances associated with timber and boulder clearing, grading, and filling related to the construction of the wind turbines, substation, new access roads, connector routes, underground and/or aboveground collection, interconnection switchyard, generation tie-line, operations and maintenance building, concrete batch plant, and construction staging areas.

1.3 ARCHAEOLOGICAL RESEARCH OBJECTIVES

The BRWF Phase I archeological investigation had a number of research objectives, including:

- To understand the environmental and cultural contexts (both Precontact and Historic periods) of the BRWF project area
- To identify archaeological resources within the BRWF LOD
- To determine from characteristics of artifacts or other objects the age and function of the identified archaeological resources
- To accurately determine the spatial (both horizontal and vertical) extent of the resources
- To determine the integrity of the resources
- To provide, if possible, either a preliminary recommendation on the significance of the resources by applying the National Register of Historic Places (NRHP) evaluation criteria, or if needed, to recommend the collection of additional information to provide such a recommendation

The project methods and results of investigations are described in greater detail in subsequent sections of this report. Included in Section 2 is a broad overview of the environmental parameters of the BWRF LOD including physiographic characteristics, soils, and vegetation patterns. Section 3 presents the historic context and modern land use as well as precontact Native American context and previous archaeological surveys conducted and sites found near the BRWF LOD. A detailed discussion of the research design and desktop, field, and laboratory methods is presented in Section 4, while the results of field investigations and laboratory analyses are in Section 5. Lastly, based on the results of the desktop, field, and laboratory research and investigations, conclusions on the impact of the proposed BRWF on archaeological resources and recommendations for additional follow-up field investigations are presented in Section 6.

Ultimately, the results of these investigations will inform the West Virginia Public Service Commission. Pursuant to West Virginia Code § 24-2-11(c), Black Rock is submitting a Siting Certificate to the West Virginia Public Service Commission for the construction and operation of the BRWF wind energy generating facility and associated interconnection and transmission facilities. This technical report will be submitted as one exhibit in support of the Siting Certificate application.

1.4 PROJECT PERSONNEL

Paul Kreisa (PhD, RPA) served as Principal Investigator for the project. Emily Swain (MA, RPA) supervised the field investigations. Additional field personnel included Ashley Bocan (BA), Max Becker (BA), Olivia McCarty (BS), and Patrick Mumma (BA). Emily Swain, Nancy LiPira (BA), and Jacqueline McDowell (MA) conducted the background and archival research and prepared the report graphics. Jacqueline McDowell assembled the report. Qualifications of key personnel are provided in Appendix A.

1.5 REPORT ORGANIZATION

The report begins with this introductory section, which describes the proposed undertaking and project location, archaeological research potential, and project personnel. Section 2 provides the general environmental setting, including physiography, soils, vegetation, and land use. Section 3 summarizes previous archaeological investigations and identified resources as well as the Native American and Historic period contexts for the general project area. Section 4 presents the research design that guided the investigations and the project methods. Section 5 details the results of investigations. Section 6 provides conclusions based on the results of the investigations and recommendations for additional work. References Cited complete the body of the report in Section 7. Appendix A presents the qualifications of key project personnel.

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2.0 ENVIRONMENTAL SETTING

The project area is in the westernmost portion of West Virginia's eastern panhandle, an area characterized by ancient mountainous terrain and mixed evergreen-deciduous forests dominated by red spruce. At present, the area is predominately wooded, with pasture for cattle and horses also present.

2.1 PHYSIOGRAPHIC SETTING

The project area is within the Appalachian Plateau physiographic province and, more specifically, within the Allegheny Mountain Section subprovince (Figure 3). The Allegheny Mountain Section combines characteristics of the folded mountains of the Valley and Ridge province to the east and those of the dissected Appalachian Plateau province to the west (West Virginia Geological and Economic Survey 2018a). The folded mountains of the Allegheny Mountain Section contain some of the oldest geologic formations in the state, with fold sequences dating from the late Ordovician through the Mississippian geologic periods. Within the project area the underlying geology consists of Paleozoic to Pennsylvanian (299 to 318 million years ago) cyclic sequences of sandstone, shale, clay, coal, and limestone (West Virginia Geological and Economic Survey 2018b). The project area encompasses rocky ridge lines with a dissected landscape on the western downslope. Flatter and gently sloping landforms are generally the result of mining activities. Occasional streams originating from springs are present, with named streams including Glade Run and Emory Creek. The BRWF LOD crosses Glade Run and a tributary of Emory Creek.

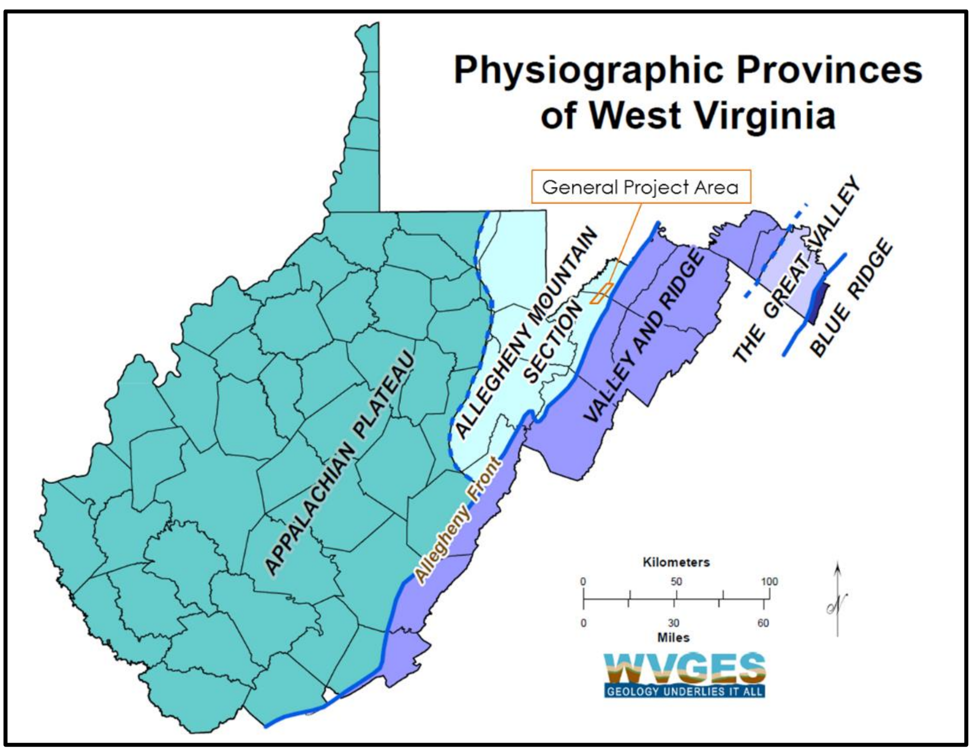

Figure 3. West Virginia physiographic provinces overlain with the Black Rock Wind Farm general project area (base map from West Virginia Geological and Economic Survey 2018a).

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2.2 SOILS

Soils in the project area are classified as belonging to the Gilpin-Wharton-Ernest and DeKalb-Lehew-Calvin associations in Mineral County and the Berks-Weikert, Shouns-Belmont-Calvin High Base Substratum, and Wharton-Gilpin-Cavode associations in Grant County (Curry 1978; Estepp 1989).

The Gilpin-Wharton-Ernest association is characterized by moderately deep and deep well-drained and moderately well-drained soils that formed in material weathered from shale, siltstone, and sandstone. These soils are found on uplands and footslopes of the Alleghany Plateau. This association includes Gilpin (56 percent), Wharton (9 percent), and minor (27 percent) soils including Pope, Philo, Atkins, Andover, Brinkerton, Laidig, Buchanan, and DeKalb as well as Strip mine. The DeKalb-Lehew-Calvin association consists of moderately deep, well-drained soils that formed in material weathered from shale, siltstone, and sandstone on uplands along the east slope of Alleghany Front Mountain. It includes DeKalb (32 percent), Lehew (24 percent), Calvin (17 percent), and minor (27 percent) soils including Laidig, Buchanan, and Ramsey as well as Typic Dystrochrepts, stony, and Rubble land (Curry 1978).

The Berks-Weikert association consists of gently sloping to very steep, well-drained, moderately deep and shallow soils on uplands. It includes Berks (50 percent), Weikert (25 percent), and minor (25 percent) soils including Ernest, Clarksburg, Potomac, Tioga, Basher, DeKalb, and Rushtown. The Shouns-Belmont-Calvin High Base Substratum association is characterized by moderately steep to very steep, well-drained, moderately deep and deep soils on uplands. It includes Shouns (44 percent), Belmont (20 percent), Calvin (15 percent), and minor (21 percent) soils including DeKalb, Laidig, and Buchanan. The Wharton-Gilpin-Cavode association consists of gently sloping to very steep, well-drained to somewhat poorly drained, moderately deep and deep soils on uplands. It includes Wharton (20 percent), Gilpin (20 percent), Cavode (12 percent) and minor (48 percent) soils including Clymer, DeKalb, Leetonia, Buchanan, and Buchanan variant as well as Rock outcrop and Rubble land (Estepp 1989).

2.3 VEGETATION

The project area includes a mixture of forested areas, grasslands, and pastures. Forested areas are generally confined to the ridge lines. Vanderhorst (2017) includes the project area within the Ridge and Valley Chestnut Oak/Mountain Laurel Forest. The area is characterized by mostly deciduous forests comprised of oaks (*Quercus* spp.) over shrubbery understories generally comprised of mountain laurel (*Kalmia latifolia*) (Figure 4). Dominant oak species included chestnut oak (*Quercus prinus*), northern red oak (*Quercus rubra*), black oak (*Quercus velutina*), and scarlet oak (*Quercus coccinea*). Additional trees often found in this forest type include American witch hazel (*Hamamelis virginiana*), black gum (*Nyssa sylvatica*), and red maple (*Acer rubrum*). Isolated stands of pines (*Pinus* spp.) and American chestnut (*Castanea dentata*) are also present in some areas. Mountain laurel thickets can be dense in some areas, particularly in rocky outcrops that cannot support large trees.

Figure 4. Typical vegetation along ridge line, facing east.

Grasslands were present throughout the project area and included patches of wild cotton. These areas appear to be mowed yearly to prevent the growth of trees but are not actively used for livestock grazing or farming (Figure 5). The edges of these areas often have scrub trees that act as a natural property or field barrier in addition to any fencing that was present. Pasture land consisted of short grass with the occasional stand of shade trees. Additionally, mowed lawn areas were present around structures adjacent to the project area.

2.4 LAND USE

See Section 1.2, Project Location and Description, for a summary of modern land use and Section 3.4, Historic Period Context, for a discussion of likely past land use in the project area.

Figure 5. Typical grasslands found through the project area.

3.0 PREVIOUS ARCHAEOLOGICAL INVESTIGATIONS AND BACKGROUND OVERVIEW

This section summarizes previous archaeological investigations conducted within and near the BRWF project area, previously documented archaeological resources, and Native American and Historic period contexts for the project area. These previous investigations and the contexts provide an interpretative framework for defining the types of archaeological sites and remains that could be present within the project area.

3.1 PREVIOUS ARCHAEOLOGICAL INVESTIGATIONS

Review of the West Virginia State Historic Preservation Office (WV SHPO) Map Viewer on 16 and 29 November 2018 indicates four surveys were previously conducted within one mile of the BRWF project area (Figure 6). These include three surveys in Grant County (91-505-GT, 02-836-GT, and 07-1030-GT) and one survey in Mineral County (97-1073-MI). No archaeological reports are available for Surveys 91-505-GT, 07-1030-GT, or 97-1073-MI.

In 2004, AMEC Earth & Environmental conducted a Phase I archaeological survey for NedPower Mount Storm Wind Energy, prior to the construction and operation of its up to 300 MW wind power facility in Grant County (Survey 02-836-GT; Simpson 2005). NedPower received a Certificate of Public Convenience and Necessity (certificate), from the West Virginia Public Service Commission in 2003. The NedPower site is approximately 10 miles (16.1 km) long and 0.5 to 2 miles (0.8 to 3.2 km) wide and oriented northeast to southwest. The cultural resources survey was conducted to satisfy the Public Service Commission requirements. The archaeological research focused on Segment One of the Mount Storm Wind project and utilized a sampling strategy to identify potentially significant archaeological sites. A total of 30.5 acres (12.3 ha) was investigated. The areas not tested were within areas previously disturbed by a now-abandoned strip mine. Visual walkover of the area determined that mining activity had made the area nonessential for archaeological assessment. Only one shovel test produced any cultural material, a chert flake. Due to the limited cultural material recovered, no additional testing was recommended. This survey overlapped in part with the southern portion of the BRWF project.

3.2 PREVIOUSLY IDENTIFIED ARCHAEOLOGICAL RESOURCES

No archaeological sites have been reported within the BRWF project area. Architectural resources are detailed in a separate report.

3.3 NATIVE AMERICAN CONTEXT

The following Native American context is based on review of various regional reports that provide a framework for the description and analysis of all known or expected archaeological resources and is the basis for evaluating the significance of those resources.

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3.1.1 Paleoindian Period (ca. 12,000 to 8000 BC)

The Paleoindian period reflects a pattern of cultural adaptation based on environmental conditions that marked the shift from the Late Pleistocene to the Early Holocene epoch. During this period of glacial retreat, the climate was probably three to eight degrees (Fahrenheit) colder than at present, and vegetation initially consisted of spruce, pine, fir, and alder (Brush 1986:149; LeeDecker and Holt 1991:72). By the end of this period, vegetation patterns comprised a mosaic of microhabitats, with mixed deciduous gallery forests near rivers, mixed coniferous forests and grasslands in foothill and valley floor settings, and coniferous forests on high ridges (Custer 1984; Kavanagh 1982; Petraglia et al. 1993).

Traditional characterizations often suggest that Paleoindian settlements consisted of small hunting camps associated with sources of high-quality lithic raw materials. Gardner (1983, 1989) identifies six different functional categories for Paleoindian sites in the Shenandoah Valley of Virginia: lithic quarries, reduction stations, quarry-related base camps, base-camp maintenance stations, hunting stations, and isolated point find spots. Custer (1984) suggests that these site types may be applicable to the wider Mid–Atlantic region.

In the archaeological record, early Paleoindian sites are usually characterized by the presence of large, fluted, lanceolate-shaped projectile points (e.g., Clovis), while later Paleoindian components are identified with projectile point types such as Dalton and Hardaway (Dent 1995:124; Justice 1987). Clovis points have been found throughout North America, from the Pacific to Atlantic coasts, and as far north as Nova Scotia. Preferred lithic materials for these projectile points were high-quality cryptocrystalline stones such as jasper and chert. Paleoindian hunter-gatherers probably traveled long distances to obtain food and the raw materials for tool production, as has been shown by studies of lithic-procurement systems centered on the Thunderbird site in Virginia and other Mid–Atlantic sites (Custer 1984; Gardner 1977). A study of fluted projectile points in northwestern Pennsylvania showed that most were made of cherts imported from 250 miles (402 km) away (Lantz 1985). At the Lamb site in western New York, one Clovis point was made of Knife River chert from North Dakota, more than 1,000 miles (1,609 km) away, and other Clovis points were made of chert from Indiana, 400 to 500 miles (644 to 805 km) away. Evidently, local Onondaga chert was not used (Gramly 1988). It is likely that many Paleoindian sites have not been discovered or documented because they are located on submerged portions of the continental shelf (Kraft and John 1978). In West Virginia, three Clovis points were recovered from upland settings in Upshur County (Broyles 1967:52–53). Several fluted points are also known from private collections, but their provenience is indeterminate (Wall et al. 2008:3-4).

3.1.2 Early Archaic Period (ca. 8000 to 6500 BC)

The Pre-Boreal/Boreal climatic episode, dating from 8500 to 6700 BC, for the most part corresponds to the Early Archaic period. Glacial recession continued and deciduous forests expanded, possibly leading to a greater proliferation of game species in this period. In many ways, this climatic period, and the cultural period as well, marks a transition from late Pleistocene to Holocene patterns. Summer temperatures became warmer while the winters continued to be wetter than at present. This resulted in an expansion of coniferous and deciduous trees at the expense of grasslands. Forests consisted of pine and hemlock on slopes, mixed coniferous-deciduous trees in valley floors, and hydrophytic gallery trees along rivers (Carbone 1976;

Kavanagh 1982:9). Kavanagh (1982:9) suggests that while little faunal evidence exists for this period, the environment most likely supported bear, deer, elk, and a variety of small game that were adapted to a northern climate. Evidence for this view comes from the Cactus Hill site (44SX202) in Virginia, which revealed a faunal assemblage containing species still common in the region today (Whyte 1995). After 7000 BC, the spread of deciduous woodlands into upland areas, previously dominated by spruce, hemlock, and pine forests, opened new habitats to be exploited by both animals and humans (Custer 1990).

The biggest difference in tool kits between the Paleoindian and Early Archaic periods seems to be in point types. Based on point types found at the Thunderbird and Fifty sites in the Shenandoah Valley, Gardner (1974) proposed a continuum for the Early Archaic period from corner-notched (Palmer, Kirk and Amos point types) to side-notched (Warren and Kessell point types) to stemmed points (Kirk Stemmed point type). Broyles (1966) documented similar changes at the St. Albans site on the Kanawha River. There was also a change in the techniques used to attach projectiles and knives to shafts that emphasize notched hafts. The use of different projectile point styles possibly appears to reflect a shift in hunting strategies to accommodate more varied game selection, such as bear, white-tailed deer, squirrel, otter, and fowl (DeSanto et al. 1982).

Foraging and hunting also expanded into more diverse ecological niches. In the Monocacy River valley of Maryland, most sites tend to be concentrated around the river, allowing exploitation of various food resources (Kavanagh 1983). Surveys on Lowes Island concluded that Early Archaic sites tended to be located on fans and marsh edges, indicating riverine resource exploitation (Larsen et al. 1980). Around 7000 BC, there was an increase in the use of upland settings in West Virginia (Roberts and Roberts 1997).

Both Gardner (1974) and Custer (1990) hypothesize that during the Early Archaic and Middle Archaic periods in portions of the Mid–Atlantic region, people banded together into macro-base camps, or groups of families in the spring and summer, and divided into smaller, micro-base camps in the fall and winter months. The larger base camps were in valley floodplains while the smaller autumn and winter encampments were in upland regions. Little information on this period is available from West Virginia.

3.1.3 Middle Archaic Period (ca. 6500 to 3000 BC)

The beginning of the Middle Archaic period coincides with the Atlantic climatic episode, a warm, humid period associated with a gradual rise in sea level that led to the development of inland swamps (Barse and Beauregard 1994:9). It was a time marked by increased summer droughts, sea level rise, grassland expansion into the Eastern Woodlands, and the appearance of new plant species (Carbone 1976:106; Hantman 1990:138). By 5000 BC, a cooling trend had begun. Gardner (1982) suggests that the climatic changes resulted in a zonally patterned floral and faunal species distribution across the region, leading to an increased emphasis on seasonal availability of resources.

The warming trend declined between 4000 and 3500 BC, and the archaeological record indicates a rise in population within the Mid–Atlantic region. Components dating to Paleoindian and Early Archaic periods are almost nonexistent at Middle Archaic sites, as according to Gardner (1989) "the local ecology of very few sites was able to transcend the changes between the Pleistocene and latter part of the Early Holocene." Tool types common to Paleoindian and Early Archaic lithic assemblages, such as unifacial tools and formal end scrapers, decreased substantially during the Middle Archaic (Egloff and McAvoy 1990). The bifurcate tradition of projectile points began at this time and is especially well-documented at the St. Albans site (Broyles 1971). Ground-stone tools also became widely utilized as Middle Archaic period subsistence and settlement patterns shifted. Some projectile point styles dating to this period include Stanly Stemmed/Neville, Morrow Mountain I and II, Guilford, and Halifax (Coe 1964; Ritchie 1971; Justice 1987; Reinhart and Hodges 1990). In West Virginia, the Hill site (46RD55) on a high alluvial terrace of the Tygart Valley River in Randolph County revealed Morrow Mountain II and Guilford projectile points (Lesser 1986:55; Wall et al. 2008:3-5).

3.1.4 Late Archaic Period (ca. 3000 to 1000 BC)

The Late Archaic environment included a warmer and drier climate, a continued rise in sea level, the expansion of oak-hickory forests onto valley floors and hillsides, and the reappearance of grasslands (Carbone 1976:189). As well, the distribution of faunal species characteristic of the early Historic period was established at the time. Seasonal hunting and foraging patterns continued, but exploitation of riverine resources rapidly became an important part of the subsistence base. The first large semisedentary base camps were established along rivers and streams.

Several Late Archaic complexes or cultures have been identified in portions of the Mid–Atlantic Region. These include the Halifax complex, the Savannah River complex, and the Susquehanna complex. The last two cultures are associated with the latter portion of the Late Archaic in what is sometimes called the Transition period. The Halifax complex is generally associated with Halifax points. Sites attributed to this culture are divided between riverine and non-riverine locales (Mouer 1991). Savannah River sites are generally found near waterways and are associated with Savannah River broadspear points (McLearen 1991; Mouer 1991). These points are generally quartzite and were probably multipurpose tools. Sandstone and soapstone bowls are also associated with this complex. Soapstone vessels and rhyolite broadspear points characterize the Susquehanna Complex.

Rhyolite and quartzite continued to be commonly used lithic materials, and rockshelter sites may be associated with rhyolite procurement (Kavanagh 1982). It was during the Late/Terminal Archaic and Early Woodland periods that rhyolite was transported the greatest distance from the sources to the Coastal Plain. However, the potential network that may have facilitated this trade is still largely unknown (Kavanagh 1982). This distribution implies a more sedentary settlement system.

3.1.5 Early Woodland Period (ca. 1000 to 500 BC)

The Early Woodland period, roughly dated between 1000 BC and 500 BC, generally coincides with the Sub-Boreal climatic episode, which approximated modern conditions although attenuated cycles of climatic change have been identified (Carbone 1976). Johnson and Peebles (1983) and Brush (1986) indicate that, by this period, forest composition was essentially similar to that of the modern period although differences in the frequency of species may have been present. Similarly, Eshelman and Grady (1986) suggest that the region contained a modern array of faunal species at the time.

The Early Woodland period is marked by the introduction of ceramics, increased sedentism and changes in tool kits. Broadspear points were quickly replaced by small lanceolate, notched, and stemmed forms. Common Early Woodland projectile point types in West Virginia include the Meadowood, Cresap, Adena, and Robbins types. To the west, the Early Woodland period is associated with the Adena culture of the Middle Ohio River valley.

The Adena culture is typically associated with the construction of burial mounds, and in West Virginia, these mounds have been found as far east as Berkeley County and as far south as the Big Sandy River (Griffin 1978: 22; Roberts and Roberts 1997). Adena mounds are often placed over circular structures with burials placed on the floor prior to construction. In some cases, log-lined tombs were constructed within the mound. Adena habitation sites are found primarily in floodplain or terrace settings. Site sizes suggest that these habitations can be considered villages and hamlets that were likely occupied for a portion of each year. Gardner (1982) has proposed that the settlement-subsistence system in portions of the Mid–Atlantic region during this period focused on a series of base camps where the populations aggregated to exploit seasonal resources.

A number of Early Woodland ceramic types have been identified in West Virginia (Roberts and Roberts 1997). These include the Marcey Creek, Selden Island, and Accokeek types more common to the east and the Fayette and Adena types more common to the west. The steatite or soapstone-tempered Marcey Creek and Selden Island varieties are some of the earliest ceramics in West Virginia. Marcey Creek vessels were probably copied from the stone bowls of the Late Archaic period. They possess flat bases, a protruding heel, and vertical walls, and they may be net- or fabric-impressed. Selden Island wares are often cord-impressed. Accokeek wares are tempered with sand or crushed quartz. These vessels are often marked with oblique cord impressions and are associated with fishtail and corner-notched point types.

3.1.6 Middle Woodland Period (ca. 500 BC to AD 900)

The Middle Woodland period is marked by changes in lithic production, an increased reliance on ceramics, and greater complexity of society as suggested by the construction of burial mounds (Stewart 1992). Bifaces were fashioned from flakes removed from cores rather than preforms or blanks. This technology required greater skill and implies that tools were being crafted by specialists. Projectile point types associated with Middle Woodland period in West Virginia include the Chesser, Lowe, Snyders, and Raccoon types. Small triangular points first seen in this period may indicate that the bow and arrow was being used by the Middle Woodland peoples. The presence of non-local lithic materials at a few sites suggests that localized exchange networks may have been in place (Barse and Beauregard 1994). Other characteristics of the Middle Woodland period include pit storage features and middens.

While the Middle Woodland period is often associated with the Hopewell culture to the west, evidence for Hopewell influence has generally only been found as far east as central West Virginia (Roberts and Roberts 1997:13), although little evidence of Hopewell culture is present in the uplands outside the river valleys. It appears that the local Middle Woodland population utilized a wide spectrum of wild, seasonal resources while the settlement system was focused on central base camps with storage facilities and widespread procurement sites. There is no substantial evidence of agriculture during this time, even though the shift to centralized base camps may have set the stage for the development of horticulture. Village settings, predominantly on floodplain and terrace formations of large rivers, appear favorable for the adoption of horticulture.

As in the Early Woodland period, Middle Woodland cultures are largely defined by the predominant ceramic type associated with sites (Roberts and Roberts 1997). Middle Woodland ceramics identified have been identified as of the Armstrong series, Lick Creek Plain, and various rock-tempered wares, including quartz-tempered ceramics recovered from 46MN122 in Morgan County.

3.1.7 Late Woodland Period (ca. AD 900 to 1200)

The single most important, and common, element across much of eastern North America in the Late Woodland period was the adoption of agriculturally based subsistence systems (Anderson and Mainfort 2002). Roberts and Roberts (1997) indicate that little is known about the early part of the Late Woodland period in the eastern half of West Virginia. However, in most areas, the Late Woodland is characterized by use of the bow and arrow, increased sedentism, the spread of dispersed hamlets, the growth of villages, rapid population growth, and movement of populations ultimately into less desirable locations (Walker and Miller 1992). There was a settlement shift from floodplains and terraces presumably for agricultural reasons. In the latter half of the period, a climatic shift reduced the growing season, placing stress on agricultural productivity. The establishment of stable agriculture during the Late Woodland period led to the development of sedentary floodplain village communities. Hunting, gathering, and fishing were still practiced, but to a lesser extent than earlier. Ceramic decoration, tempering materials and embellishment appear to be very important at the time. Triangular projectile points are also diagnostic of this period. Prior to approximately AD 1200, limestone-tempered ceramics consistent with the Page series have been identified in the Mineral and Grant Counties area (Roberts and Roberts 1997).

3.1.8 Late Prehistoric and Protohistoric Periods (ca. AD 1200 to 1750)

The local expression of Late Prehistoric culture is likely associated with intensive maize agriculture and villages along the larger rivers and a concomitant decrease in utilization of upland locales. Mineral and Grant Counties lie just southeast of the Monongahela region, with its circular to oval villages with central plaza (Johnson et al. 1989; Wall et al. 2008). Still, throughout West Virginia this period is characterized by a shift to permanent villages; an increase in population size with a concomitant decrease in the number of sites; and increased reliance on domesticated crops such as maize, beans, and squash (Bedard et al. 2016; Trader 2005; Trimmer 2011). Although maize was a major component of the diet, hunting and gathering continued to provide important food items such as deer, fish, and nuts. Evidence for the Protohistoric period in this area is lacking, but it is likely that the Susquehannock occupied the area and were followed by the Shawnee. The limited archaeological assemblages include triangular points, knives, scrapers, and perforators. European items include glass beads and broken pieces of iron items and possibly brass and copper (Wall et al. 2008).

3.4 HISTORIC PERIOD CONTEXT

The following historic context is based on various primary (e.g., county histories) and secondary sources (e.g., nearby archaeological reports). These resources provide a framework for the description and analysis of all known or expected archaeological resources and are the basis for evaluating the significance of those resources.

3.4.1 Contact and Colonial Periods (ca. 1660s to 1783)

Mineral and Grant Counties were part of a 1664 English land grant from King Charles II to Lord Culpepper, who in turn granted the lands to Lord Fairfax in 1691. Given the rugged terrain, remoteness of the area, and Native American hostilities, however, little exploration or settlement dates to the earliest days of the English colonies in this area (Brannon 1976; Child et al. 2009; Wall et al. 2008). The earliest documented exploration in Mineral County was in 1669, when Sir William Buckley sent John Lederer to the area (Wall et al. 2008). The earliest exploration for Grant County was in 1725, when John Van Meter accompanied a group of Delaware Indians that was on its way to attack the Catawba (Wall et al. 2008). In the 1730s, land companies marketed the area, especially to residents of Pennsylvania and New Jersey, and settlers of German, Scots–Irish, and Swiss descent began to arrive (Child et al. 2009). The 1744 Treaty of Lancaster (between the Six Nations and representatives of Virginia, Maryland, and Pennsylvania) transferred lands between the Ohio River and Alleghany Mountains to the English (Callahan 1913). In 1746, a survey party established the boundaries of these lands, which included modern Mineral and Grant Counties (Wall et al. 2008).

Following the close of the French and Indian War and recognizing the British government's inability to secure the region, a 1763 proclamation by King George III prohibited settlement west of the Alleghany Mountains. Despite the ban, people still made claims for lands in the Potomac Highlands, including the future Mineral and Grant Counties (Wall et al. 2008). Settlement remained sparse, however, even after the 1763 Treaty of Fort Stanwix opened the area between the Ohio River and Alleghany Mountains (Bedard et al. 2016; Wall et al. 2008). Those settlers who did establish claims were mainly small-scale farmers, growing and raising sufficient crops and livestock to feed their families and trade with small-scale businesses such as blacksmiths and millers. In 1774, the area became part of the District of West Augusta, which also included parts of Ohio and Pennsylvania (Bedard et al. 2016).

The project area's frontier location and sparse settlement left it far from the battles of the American Revolution. No major events took place in West Virginia, and the closest "action" was likely the 1777 attack on Fort Henry (near modern Wheeling) by Native Americans who had been armed by the British (Wall et al. 2008).

3.4.2 Early Federal Period to the Civil War (ca. 1784 to 1860)

The population in Mineral and Grant Counties grew slowly after the American Revolution. In 1802, Patrick McCarthy established "Paddy's Town" on land near modern Keyser that he acquired from Abram Inskeep. McCarthy set up a general store, mills, and an iron foundry (Wall et al. 2008). By 1838, the Northwestern Turnpike (later to become U.S. Route 50) had been completed, linking northwestern Virginia to Baltimore via Winchester (Sturm 2010). The Baltimore & Ohio Railroad, generally paralleling the Northwest Turnpike, reached Paddy's Town in 1852 and Wheeling the following year (Wall et al. 2008). Paddy's Town was renamed New Creek. With the railroad, trade with eastern cities could expand as well. Logging, mining, and tanning would soon become important parts of the regional economy after the disruptions caused by the Civil War.

3.4.3 The Civil War to Present (1861 to Present)

In contrast to their relative isolation during the American Revolution, the future Mineral and Grant Counties saw repeated military action during the Civil War. While support in the future West Virginia was mainly with the Union, Confederate sympathizers were still present, with many in what would become Mineral County. The future Grant County, however, mainly supported the Union, as evidenced in it being named for General Ulysses S. Grant (Wall et al. 2008). Keyser was a major supply point, and both sides fought repeatedly to control it and the railroad lines. The supply point reportedly changed possession 14 times between 1861 and 1864 (Wall et al. 2008). The 1864 Battle of New Creek took place approximately 8 miles (12.9 km) to the northeast of the project area. The State of West Virginia was established formally in 1863 during the Civil War, with its modern boundaries set in 1871. Although no known actions took place within the project area, both Union and Confederate troops likely passed through it on their way to other engagements.

With the war's end, industrialization expanded in West Virginia. Within Mineral and Grant Counties (both established in 1866), logging, coal mining, and tanning became major economic forces, bringing new roads, dams, and railroads to the area (Garber 2013). Small-scale farming continued as well, mainly based on livestock and poultry with limited crop production oriented toward livestock feed. Mirroring conditions across much of the country, these industries boomed during World Wars I and II but faced significant challenges during the intervening Great Depression. Farming and timbering continue to be important parts of the economy.

3.4.4 Historical Map Resources

Few historical maps exist for Mineral or Grant Counties in the period preceding the late 1800s. Early Federal period maps such as Wood's 1822 map of Hardy County focus on roads and trails and show few structures or landowners, reflecting the sparse population of the time (Wood 1822). Civil War-era maps are either broad in scope, covering individual or multiple states (e.g., Nicholson 1862), or battle-related (e.g., New Creek [Davis et al. 2003]), and thus outside the project area. Post-war atlases (e.g., White 1873) also provide limited information on cultural features other than roads, rail lines, or post office locations. It is not until the preparation of early government topographic maps in the late 1800s that more detailed cultural landscape features are noted for the project area.

The 1895 1:125000 scale Maryland–West Virginia Piedmont map shows no structures within the project area (Figure 7). Those structures that are depicted in the surrounding area are all clustered along roads in nearby small communities such as Hartmonsville, Sulphur City, Emory, and Laurel Dale. Only a few houses are shown between communities, and these are also situated adjacent to roads. No smaller farm or logging roads are noted in the project area. The 1920 1:48000 scale map (Figure 8) shows little change, although a few new structures are depicted along the roads. A few appear to be set off the larger roads, but most are still clustered around the small communities in this part of Mineral and Grant Counties. The 1972 edition of the 1967 Antioch, West Virginia, and 1949 Mount Storm, West Virginia 1:24000 maps reveals the continued rural nature of the project area as well as the presence of nearby strip mines, especially in Grant County (Figure 9). Only a few structures are shown near the project area, most along U.S. Route 50 near Hartmansville (also known as Hartmonsville on historical maps).

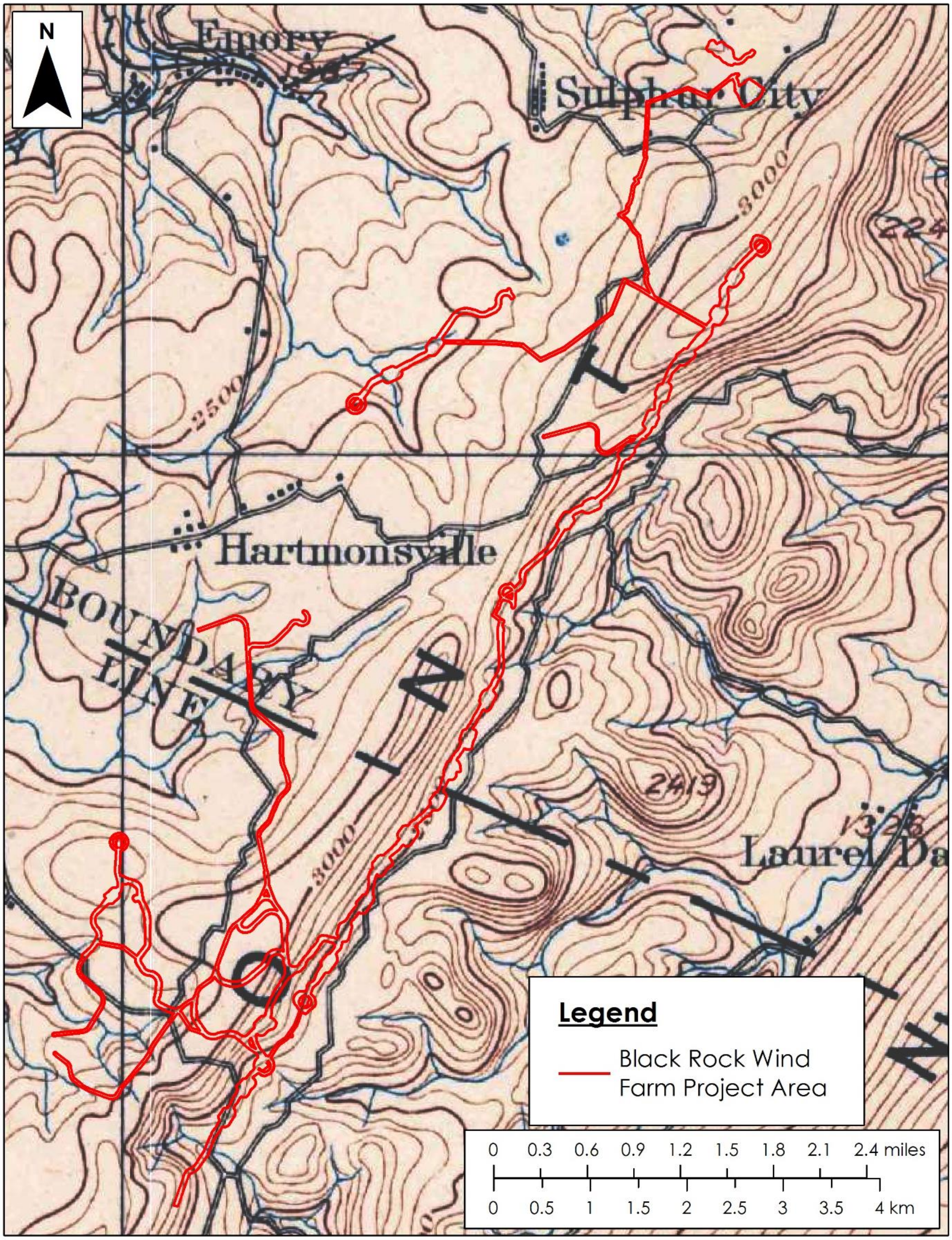

Figure 7. 1895 1:125000 scale Maryland–West Virginia Piedmont map overlain with the Black Rock Wind Farm project area (base map from U.S. Geological Survey 2018b).

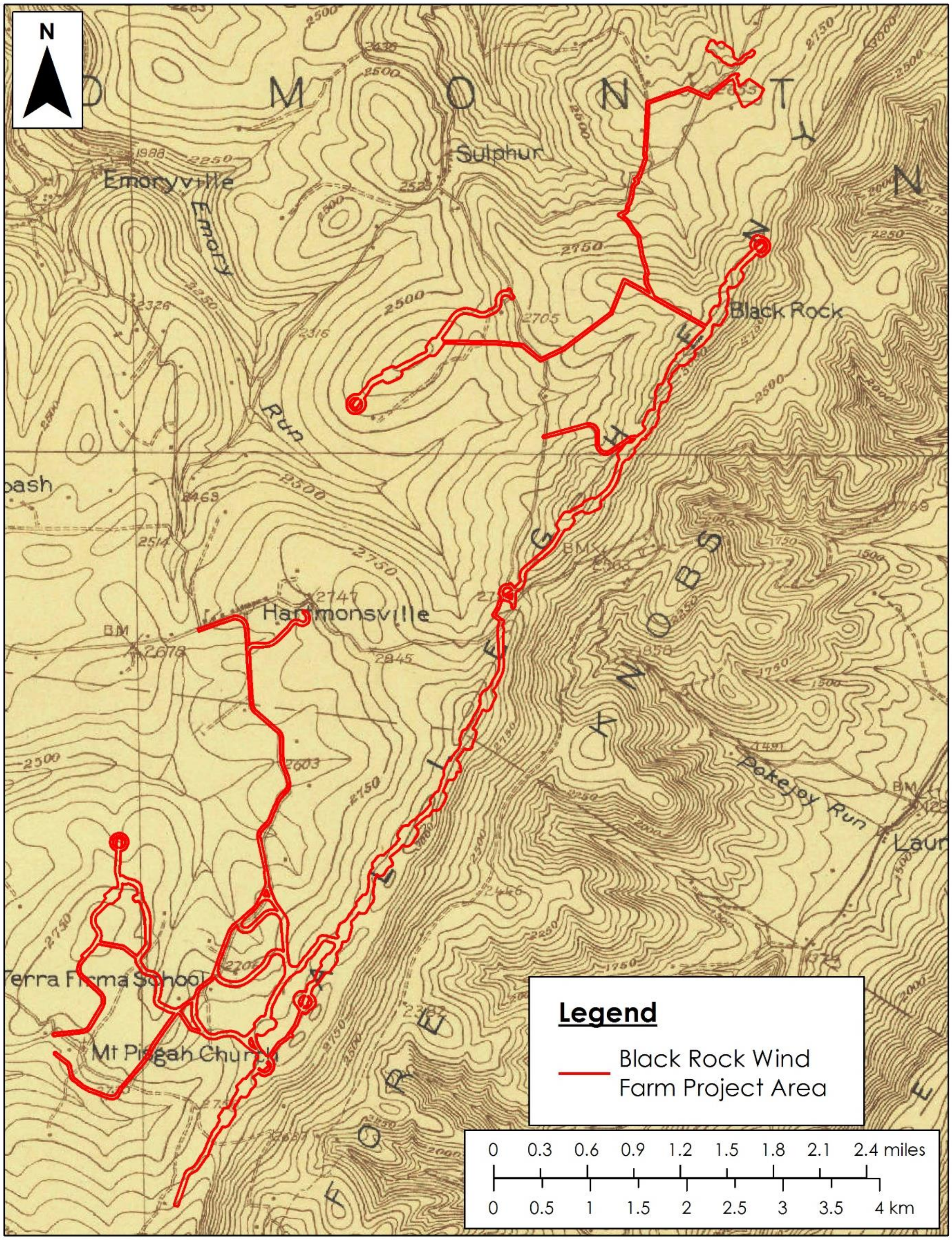

Figure 8. 1920 1:48000 scale Elk Garden, West Virginia, map overlain with the Black Rock Wind Farm project area (base map from U.S. Geological Survey 2018b).

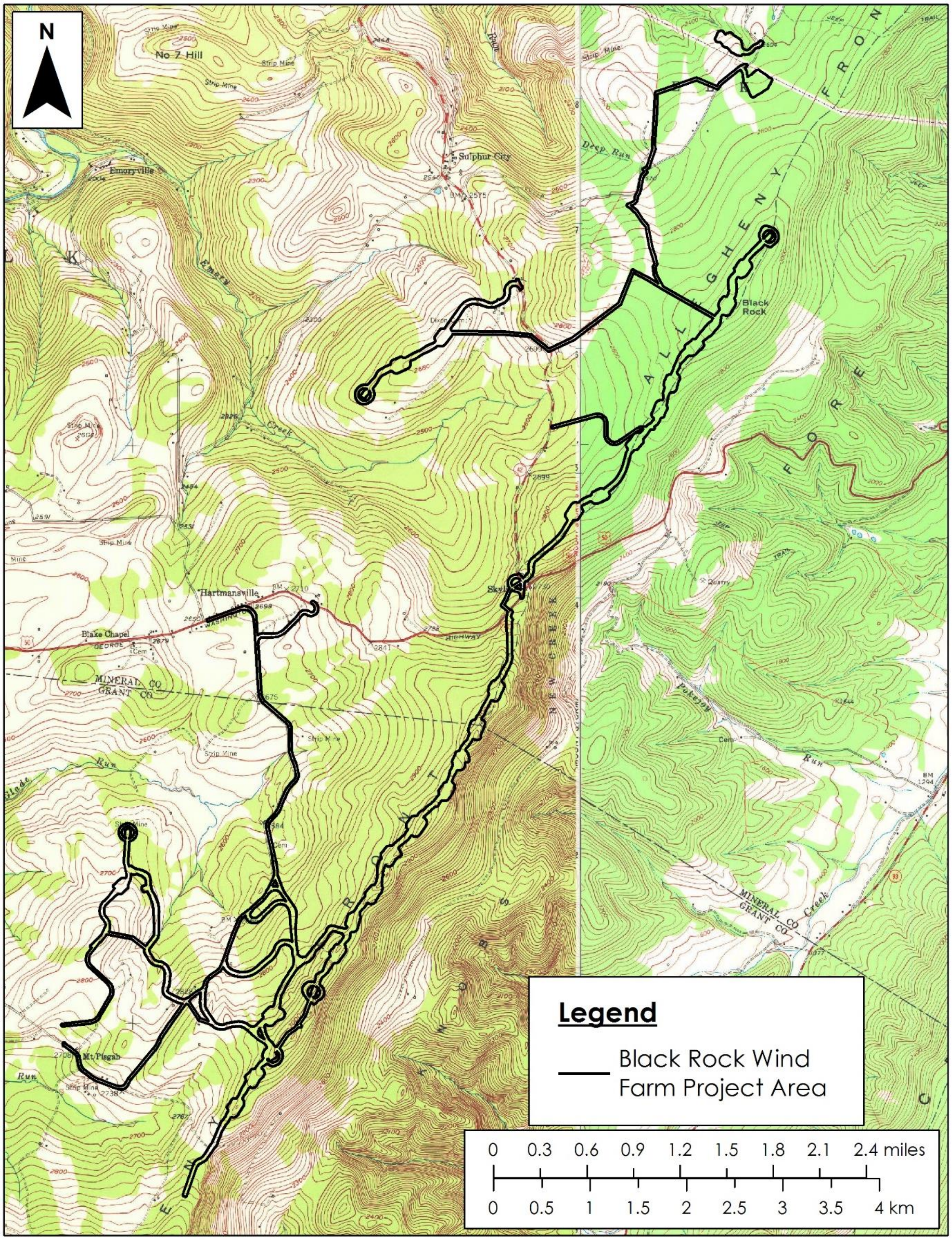

Figure 9. 1972 1:24000 scale Antioch and Mount Storm, West Virginia, maps overlain with the Black Rock Wind Farm project area (base map from U.S. Geological Survey 2018b).

4.0 RESEARCH DESIGN AND PROJECT METHODS

4.1 RESEARCH DESIGN

By completing the Phase I survey of the BRWF LOD and evaluating the significance of any identified archaeological resources using the precontact Native American and Historic period contexts, Stantec will assist Black Rock in its Siting Certificate application to the West Virginia Public Service Commission. The Phase I archeological investigations documented in this technical report were designed to identify archaeological resources within the BRWF LOD, determine (when possible) the age, function, and spatial extent of those resources, in part through analysis of artifacts or other objects and review of historical sources for resources dating to the Historic period, and, based on precontact Native American and Historic period contexts, provide a preliminary assessment of significance for each resource identified. The methods used by Stantec to implement this research design are detailed in this section, including discussions of the archaeological background and historical/archival research conducted, the field methods employed, and the artifact analysis and project curation protocols.

4.2 BACKGROUND AND ARCHIVAL RESEARCH

Documentary research was conducted utilizing the online resource records housed by the WVDCH and other appropriate sources in an attempt to locate more detailed information about the history and prehistory of the project area. Such research included the WV SHPO Map Viewer, previously submitted archaeological reports housed at WVDCH, and other available sources such as county histories and historical maps and plats.

4.3 FIELD INVESTIGATION

The BRWF LOD was surveyed by shovel test pit (STP) excavations and pedestrian reconnaissance to locate archaeological resources. The entire LOD was surveyed by pedestrian reconnaissance to identify archaeological resources visible on the ground surface, such as artifact scatters or structural remains.

STPs were then excavated within the LOD in all locations where surface soils were present, that have slopes less than 20 percent, and were the subsurface had not been disturbed, such as in a strip mining location. The STPs generally were excavated in a grid pattern at 15-m (49.2-ft) intervals. For access roads and transmission corridors, a 100-foot wide (30.4 m) LOD was investigated by the excavation of two parallel transects of STPs set 15 m (49.2 feet) apart, with individual pits spaced at 15-m (49.2-ft) intervals. For staging areas and turbine pads, multiple STP transects were excavated, with transects and individual pits set at 15-m (49.2-ft) intervals. Each STP minimally measured 35 cm (13.8 inches) in diameter. STPs were excavated below A-horizon soils and minimally 10 cm (3.9 inches) into B-horizon soils. Excavated soils were screened through ¼-inch (6.4-mm) hardware cloth to ensure uniform recovery of cultural materials, if present. All STPs were backfilled following documentation of findings on standardized recording forms. Each STP was located by GPS using an instrument with sub-meter accuracy, and the STP was illustrated on scaled and keyed project plan maps that include nearby structures.

No archaeological sites were identified in the 2018 investigation reported here. If archaeological sites are identified in later investigations, representative photographs will be taken and bracketing STPs at 5-m (16.4-ft) intervals excavated. The resource will be documented on a site recordation form and sketch map will be prepared, depicting positive and negative pit location, topography, and any natural or cultural features present. The site location will be recorded by a GPS unit with sub-meter accuracy.

4.4 ARTIFACT ANALYSIS

Since no archaeological materials were recovered from the project area, no artifact classification systems or analysis methods are detailed here.

4.5 CURATION

No artifacts were recovered during the project. Stantec has prepared all project documentation for curation at the Grave Creek Mound Archaeological Complex in Moundsville, West Virginia. Project documentation includes hard and electronic copies (pdf format) of the technical report and field notes. All GPS STP locations have been saved in a GIS shape file. The project documentation files will be submitted to the Grave Creek Mound Archaeological Complex upon acceptance of the project final report by the WVDCH.

5.0 RESULTS OF INVESTIGATIONS

The BRWF LOD was surveyed by STP excavations and pedestrian reconnaissance between 5 and 16 November 2018. The entire LOD was surveyed by pedestrian reconnaissance to identify archaeological and historical resources visible on or above the ground surface (e.g., artifact scatters or structural remains). If such resources were identified, the resource was documented on scaled and keyed project plan and site sketch maps, the location was recorded with a GPS unit with sub-meter accuracy, and the resource was photographed. If needed to determine if the resource retained a below surface component, STPs (described in the following paragraphs) were excavated. Pedestrian reconnaissance survey was the primary survey method in areas with no visible soil, excessive slope (greater than 20 percent), wetlands, livestock disturbance, or previous mining activity. Whether by pedestrian reconnaissance or systematic STP excavations, a total of 697.8 acres was surveyed for the BRWF LOD.

STPs were excavated within the LOD in locations with slopes less than 20 percent and no visible evidence of previous disturbance or wetlands. The STPs generally were excavated in a grid pattern at 15-m (49.2-ft) intervals. For those portions of the LOD less than 15.2 m (50 feet) wide, a single row of STPs was excavated, with individual pits spaced at 15-m (49.2-ft) intervals. Each STP minimally measured 35 cm (13.8 inches) in diameter. STPs were excavated below A-horizon soils and minimally 10 cm (3.9 inches) into B-horizon soils. Excavated soils were screened through ¼-inch (6.4-mm) hardware cloth to ensure uniform recovery of cultural materials, if present. All STPs were backfilled following documentation of findings on standardized recording forms. Each STP was located by GPS using an instrument with sub-meter accuracy, and the STP was illustrated on scaled and keyed project plan maps that include nearby structures.

For interpretative purposes, the project area was divided into nine smaller areas that correspond to proposed infrastructure or road boundaries (Figures 10 and 11). Area A includes the proposed location of substations at the northern extent of the project area. It was further subdivided into A-1 and A-2, representing the west and east proposed sites, respectively. Area B extends from the Area A-2 access road south to the intersection of the connector route with Pinnacle Road. Area C includes the connector routes between Pinnacle Road, State Route 42, and the ridge line. Area D includes turbine sites, access roads, and connector routes west of State Route 42. The turbine sites, access roads, and connector route along the ridge line north of U.S. Route 50 comprises Area E, while the same components along the ridge line south of U.S. Route 50 comprises Area F. Area G includes access roads from U.S. Route 50 following Pisgah Road and Arnold Mine Road. Area H comprises turbine sites, access roads, and connector routes west of Pisgah Road while Area I includes the same east of Mt. Pisgah Road to the ridge line. Due to access issues at the time of the survey, all of Area F and all but the southwest portion of Area I were not surveyed (Figure 12).

5.1 AREA A

Area A, totaling approximately 27.9 acres, encompassed the proposed locations of new substations. Area A-1, located on the west side of Pinnacle Road, was surveyed by STPs and pedestrian reconnaissance (Figure 13). Shovel testing was limited to the proposed location of the substation (Figure 14) and consisted of the excavation of 75 of 79 possible STPs within six transects. The four remaining STPs were not excavated due to the presence of an existing farm road. Stratigraphy generally consisted of two strata (Figure 15). Stratum I was comprised of dark

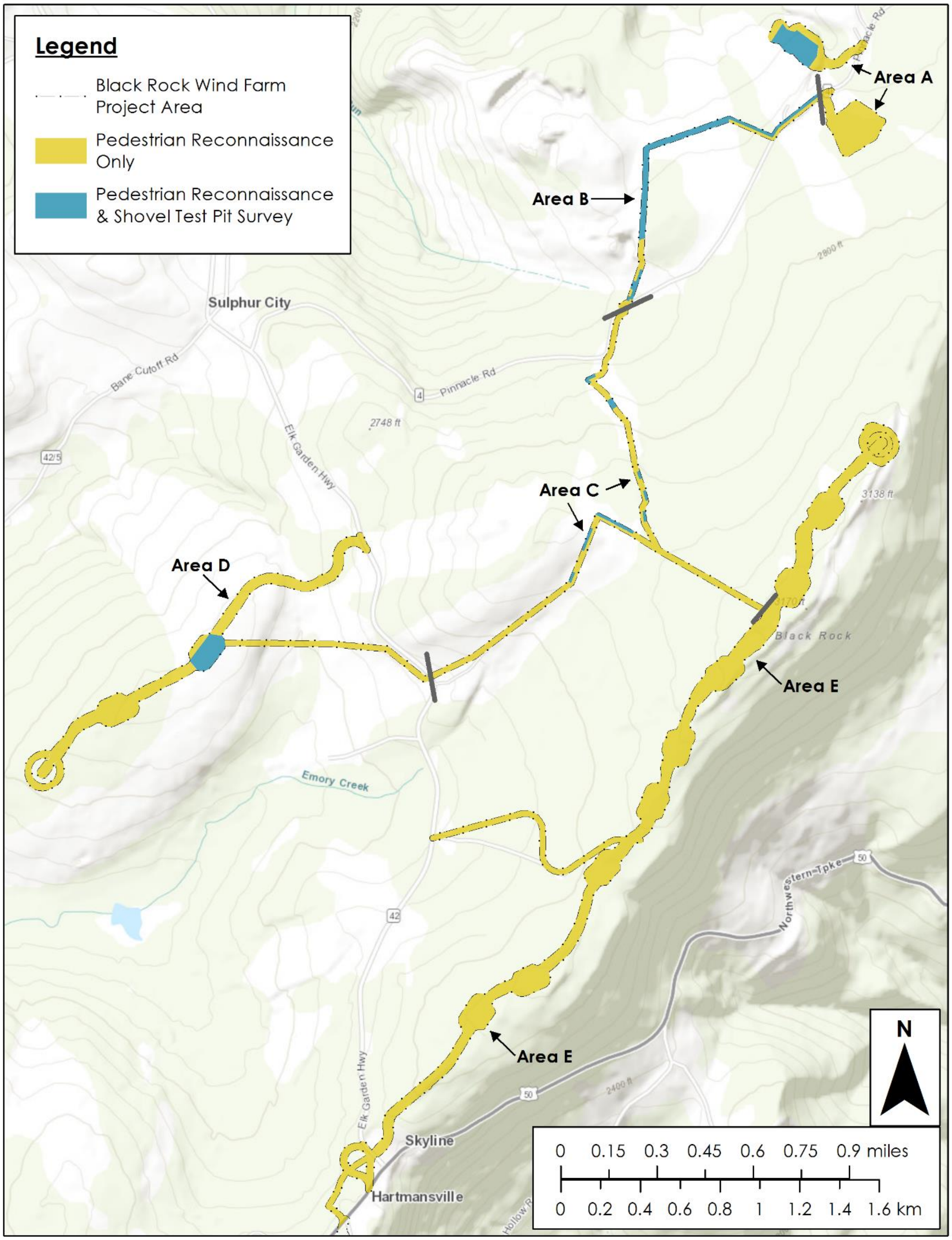

Figure 10. Location of Areas A–E and investigation methods (base map from ArcGIS 2018).

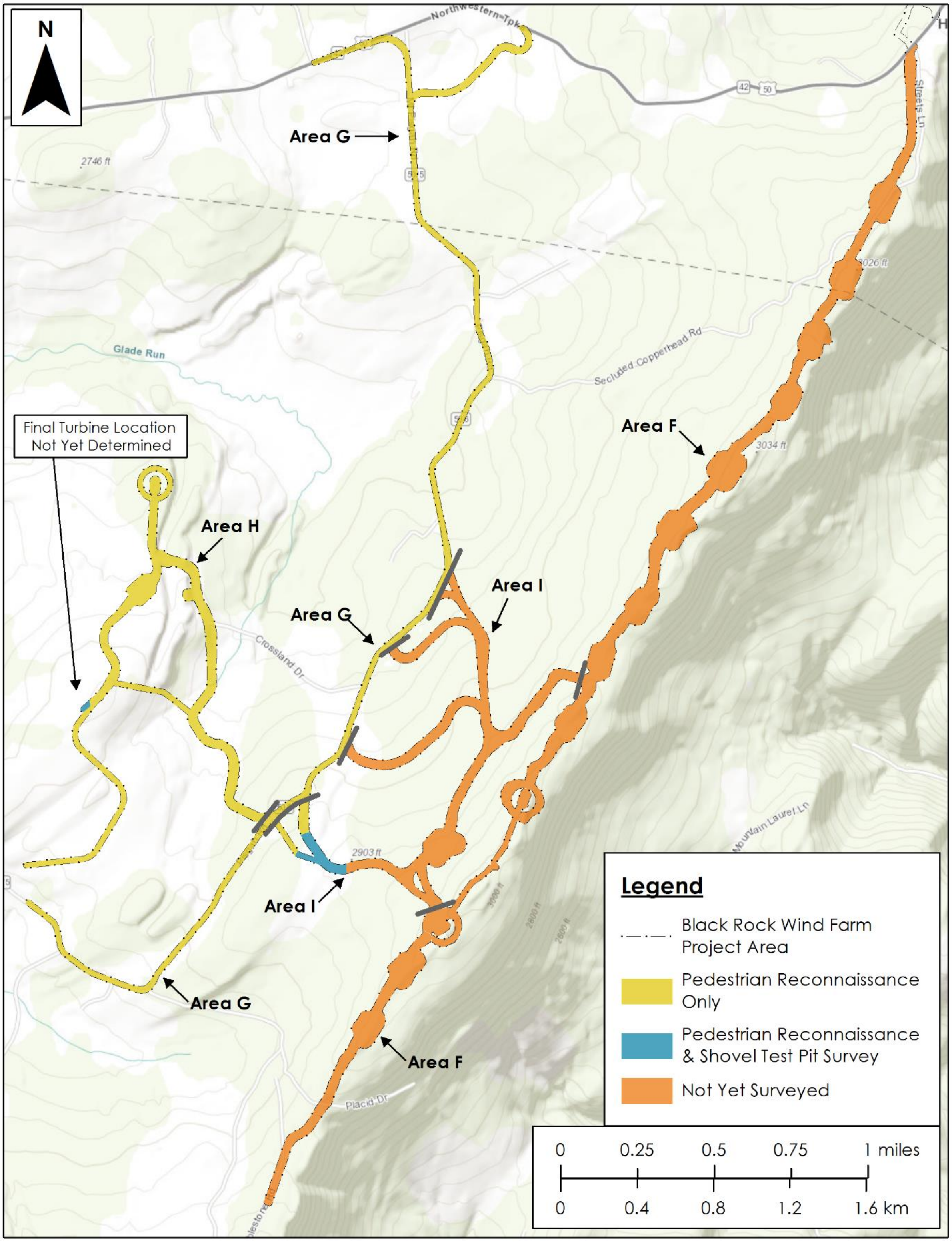

Figure 11. Location of Areas F–I and investigation methods (base map from ArcGIS 2018).

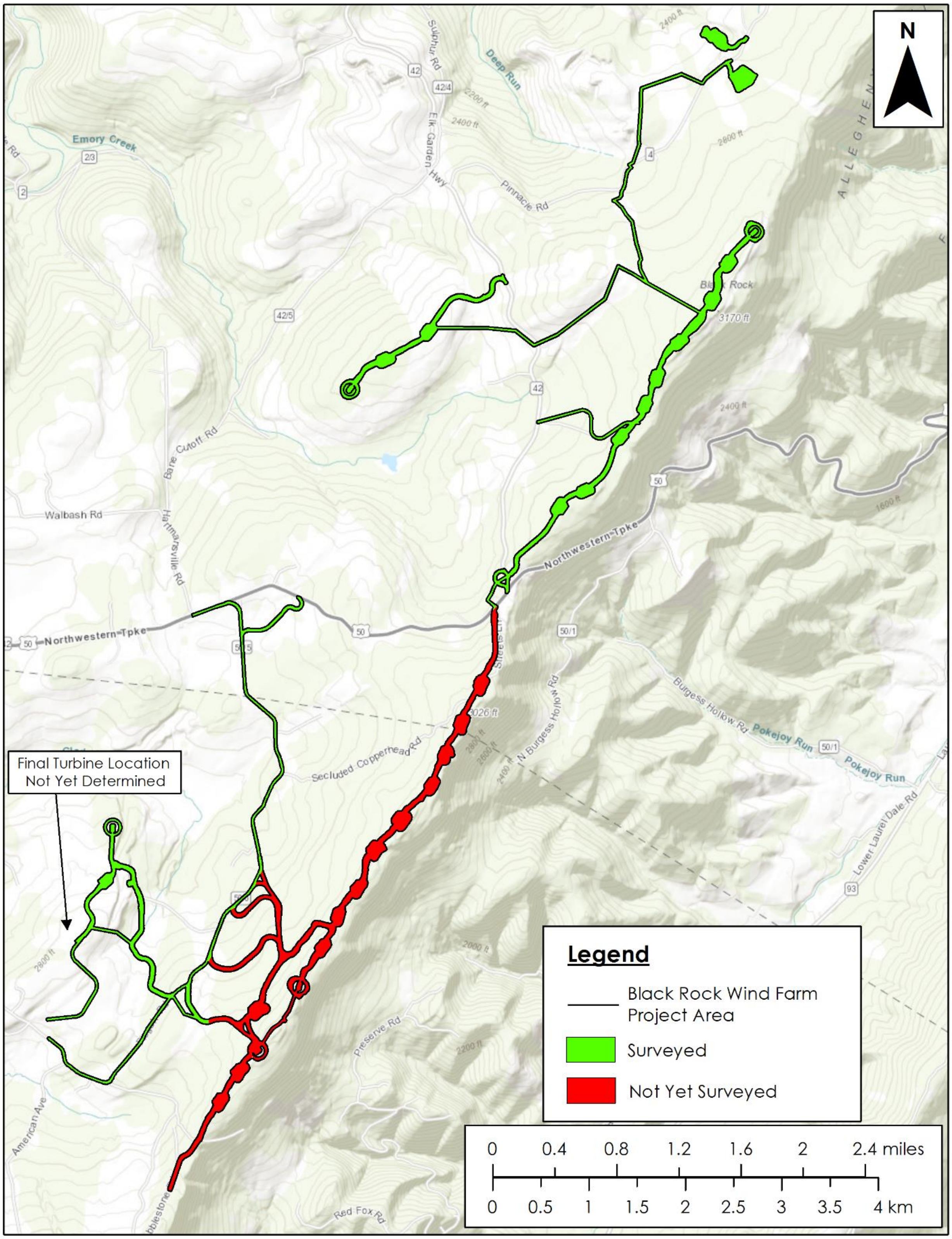

Figure 12. Current status of survey areas as of November 2018 (base map from ArcGIS 2018).

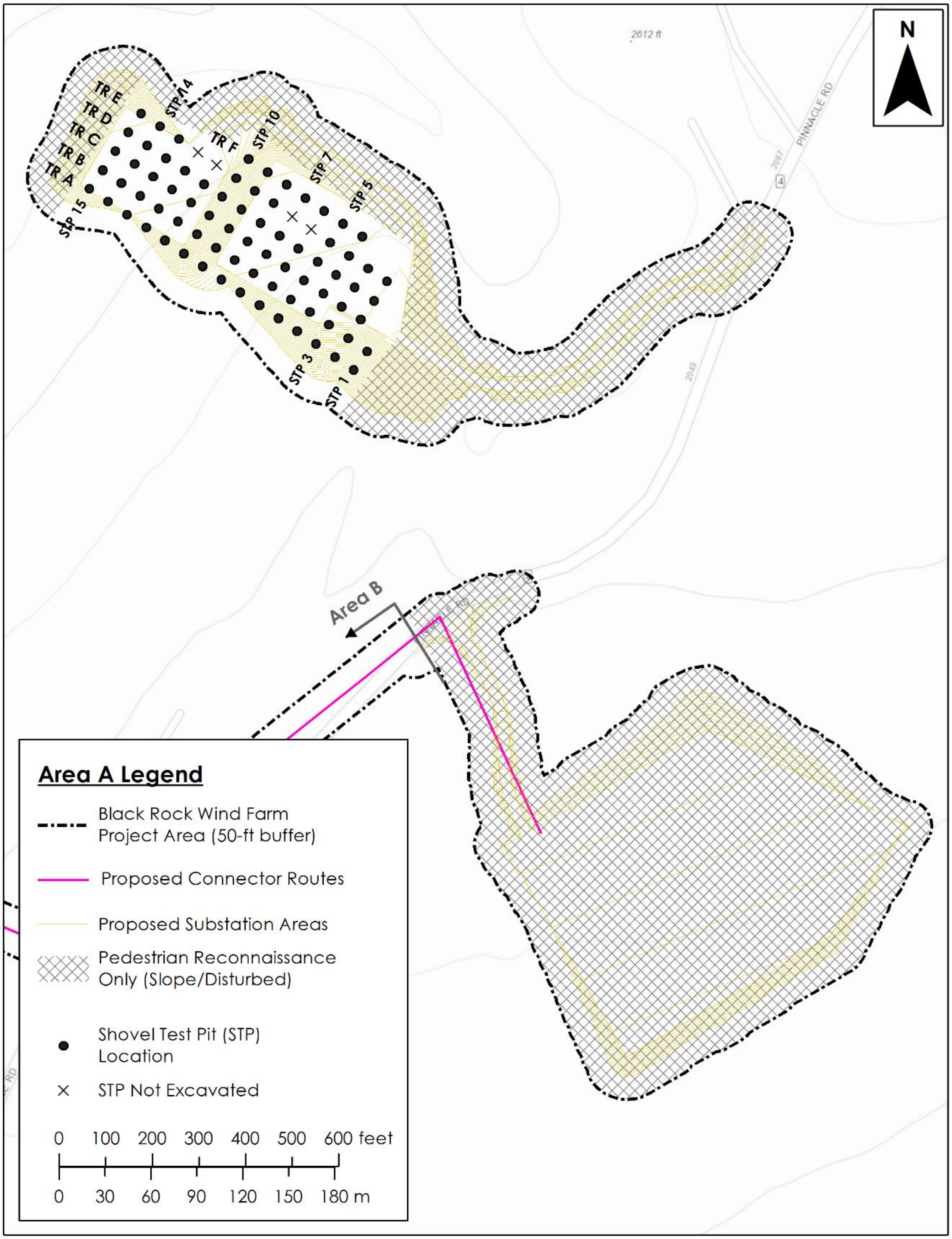

Figure 13. Detailed plan map of Area A. Area A-1 to the west and Area A-2 to the east (base map from ArcGIS 2018).

Figure 14. Area A-1 proposed substation footprint, looking north.

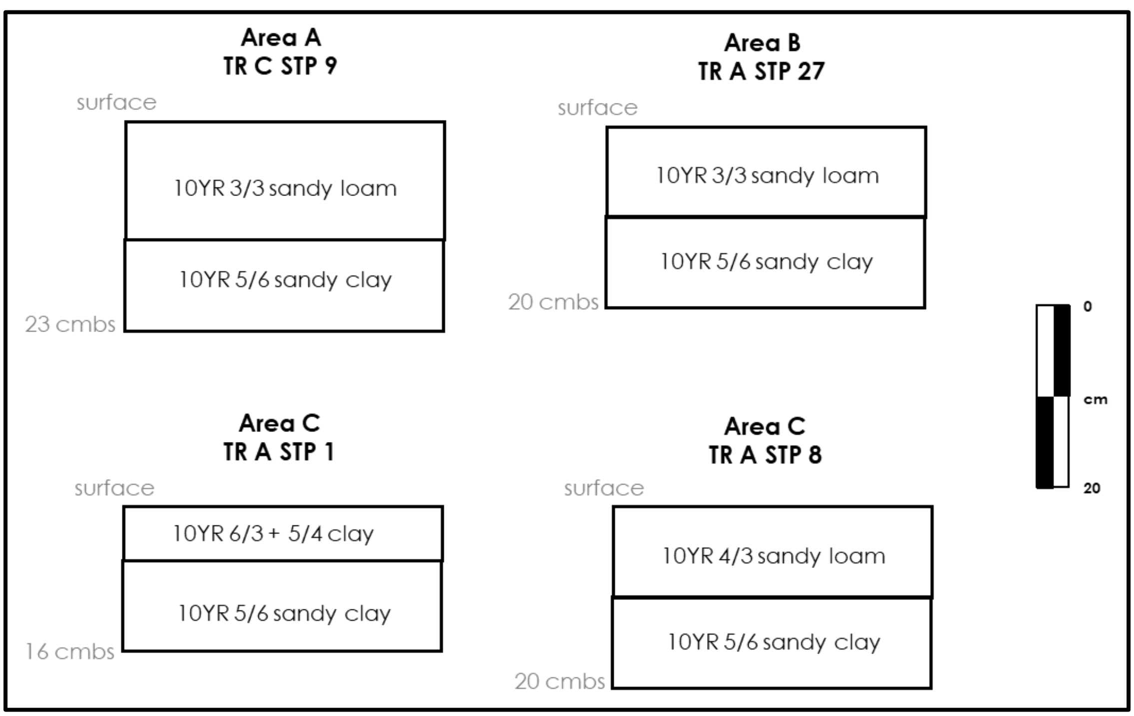

Figure 15. Representative STP profiles from Areas A, B, and C.

brown (10YR3/3) or dark yellowish brown (10YR4/4) sandy loam. This initial stratum had a thickness ranging from 5–20 cm (2.0–7.9 inches), with an average thickness of 13 cm (5.1 inches). Stratum II consisted of yellowish brown (10YR5/6 and 10YR5/8) sandy clay. Significant quantities of gravel and cobbles were present in both strata.

Area A-2, the second proposed substation location, was located on the east side of Pinnacle Road. The area consisted of large boulders interspersed with trees (Figures 13 and 16). As no soil was visible at the surface, the area was surveyed by pedestrian reconnaissance only. No visible archaeological resources were present.

Figure 16. Area A-2, looking west.

5.2 AREA B

The northernmost proposed connector route from Pinnacle Road to the proposed substations, traversing an approximate 1.86 km (1.16 miles) and encompassing 13.9 acres, was designated Area B (Figure 17). Due to the proximity of the proposed connector route to Pinnacle Road and an existing farm road, the northern 570 m (1,870 ft) of the connector route was surveyed by one transect consisting of 38 STPs. Of these STPs, 30 were excavated with the remaining 8 falling in areas of significant slope, dense brush, or asphalt. The next 885 m (2,904 ft) of the connector route, located in the middle of the connector route, was surveyed by two transects set 7.62 m (25 ft) from

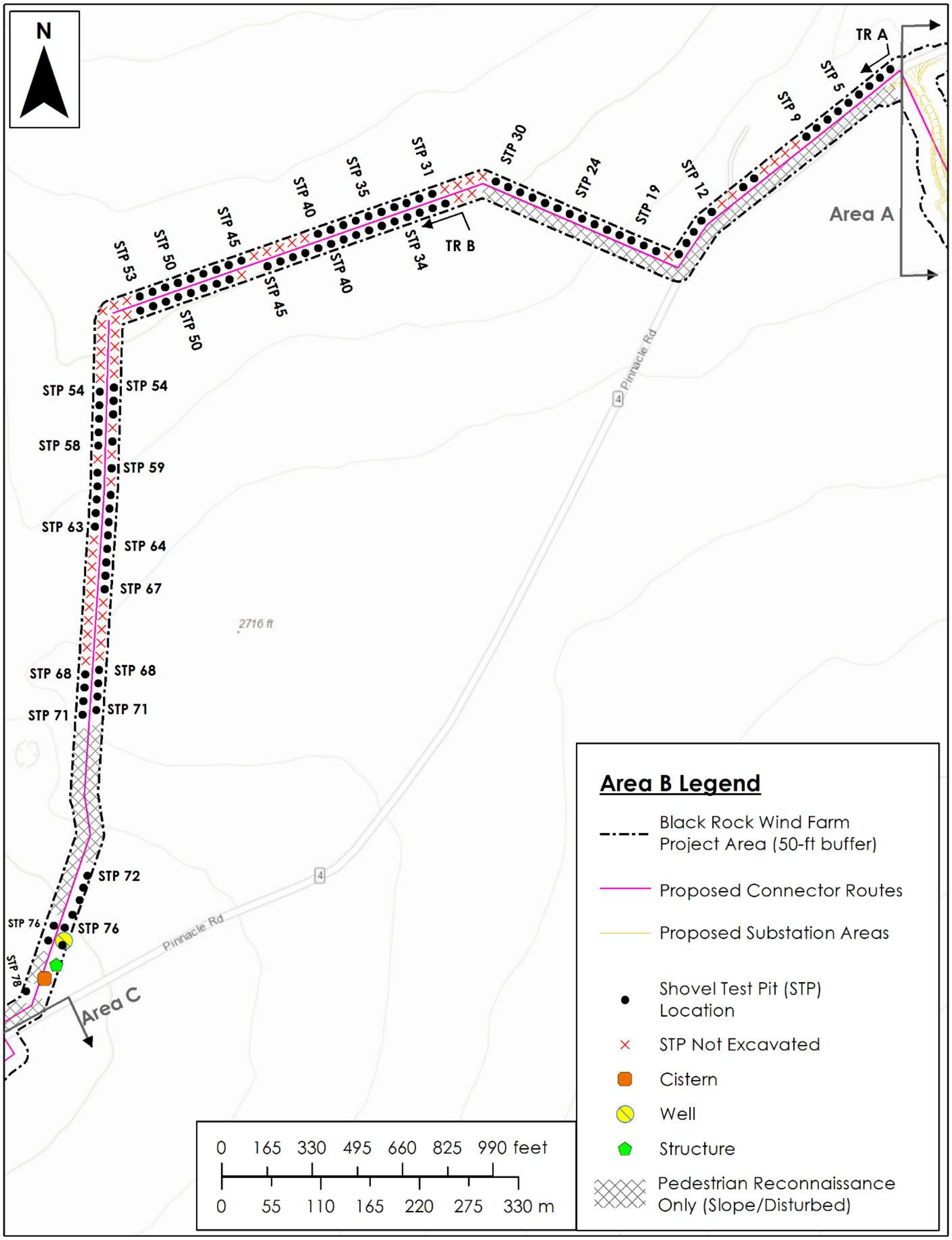

Figure 17. Detailed plan map of Area B (base map from ArcGIS 2018).

Figure 18. Area B, looking east from Transect B, STP 39.

the centerline (Figure 18). Of the 118 possible STP locations, 73 were excavated. Extensive slope, exposed rock, and dense brush prevented the excavation of the additional 45 STPs. The remaining 405 m (1,329 ft) within Area B consisted of a previously mined area, dense brush, and wetlands. Along these segments, a total of 8 STPs was excavated judgmentally around a standing barn (Figure 19, left) and adjacent to a capped well south of the barn (Figure 19, right). Additionally, a single STP was placed on high ground adjacent to wetlands. Connector route sections not surveyed by STP excavations, particularly within the southern portion of Area B, were investigated by pedestrian reconnaissance. Pedestrian survey identified a collapsed wooden spring house (Figure 20, top) and a metal cistern south of the barn (Figure 20, bottom). Because no artifacts were identified either on the surface or within the STP, the architectural features were not recorded as an archaeological site. They are discussed in the separate architectural report for this project.

Two strata were generally present within Area B regardless of location along the proposed connector route (Figure 15). The initial stratum consisted of dark brown (10YR3/3) or brown (10YR4/3) sandy loam. Thickness ranged from as little as 3 cm (1.2 inches) near the previously mined area to as much as 40 cm (15.7 inches) near the capped well. Thickness of Stratum I for the area was generally less than 15 cm (5.9 inches). Stratum II was comprised of yellowish brown (10YR5/6) sandy clay.

Figure 19. Area B facing north toward barn (left) and facing west toward capped well (right).

5.3 AREA C

Area C, totaling 26.6 acres, included a proposed connector route located between Pinnacle Road to the north, Elk Garden Highway (Route 42) to the south, and the ridgeline to the east (Figure 21). Survey methods were limited to pedestrian reconnaissance and judgmental STP excavations due to the significant slope present within the area (Figure 22, top) and the indication by a landowner that the area had previously been mined (personal communication, 12 November 2018). Additionally, approximately 980 m (3,215 feet) of the connector route leading up to the ridgeline was within a wooded area with no visible top soil (Figure 22, bottom) and the southern approximately 270 m (886 feet) contained wetlands. No archaeological resources were encountered in Area C.

Of the 15 judgmentally excavated STPs, two encountered old gravel deposits at 3 cm (1.2 inches) below surface and two additional STPs exhibited truncated deposits. The remaining 11 judgmentally placed STPs contained two strata (Figure 15). Stratum I was mixed pale brown (10YR6/3) and yellowish brown (10YR5/4) clay in the high flat area near a hunting cabin while brown (10YR4/3) sandy loam was found elsewhere. Mixed Stratum I deposits extended to 6 cm (2.4 inches) below surface, while thicknesses ranged from 5–26 cm (2.0–10.2 inches) below surface in the remaining STPs. Stratum II deposits were comprised of yellowish brown (10YR5/6) sandy clay.

Figure 20. Area B facing south toward collapsed spring house (top) and facing west toward metal cistern (bottom).

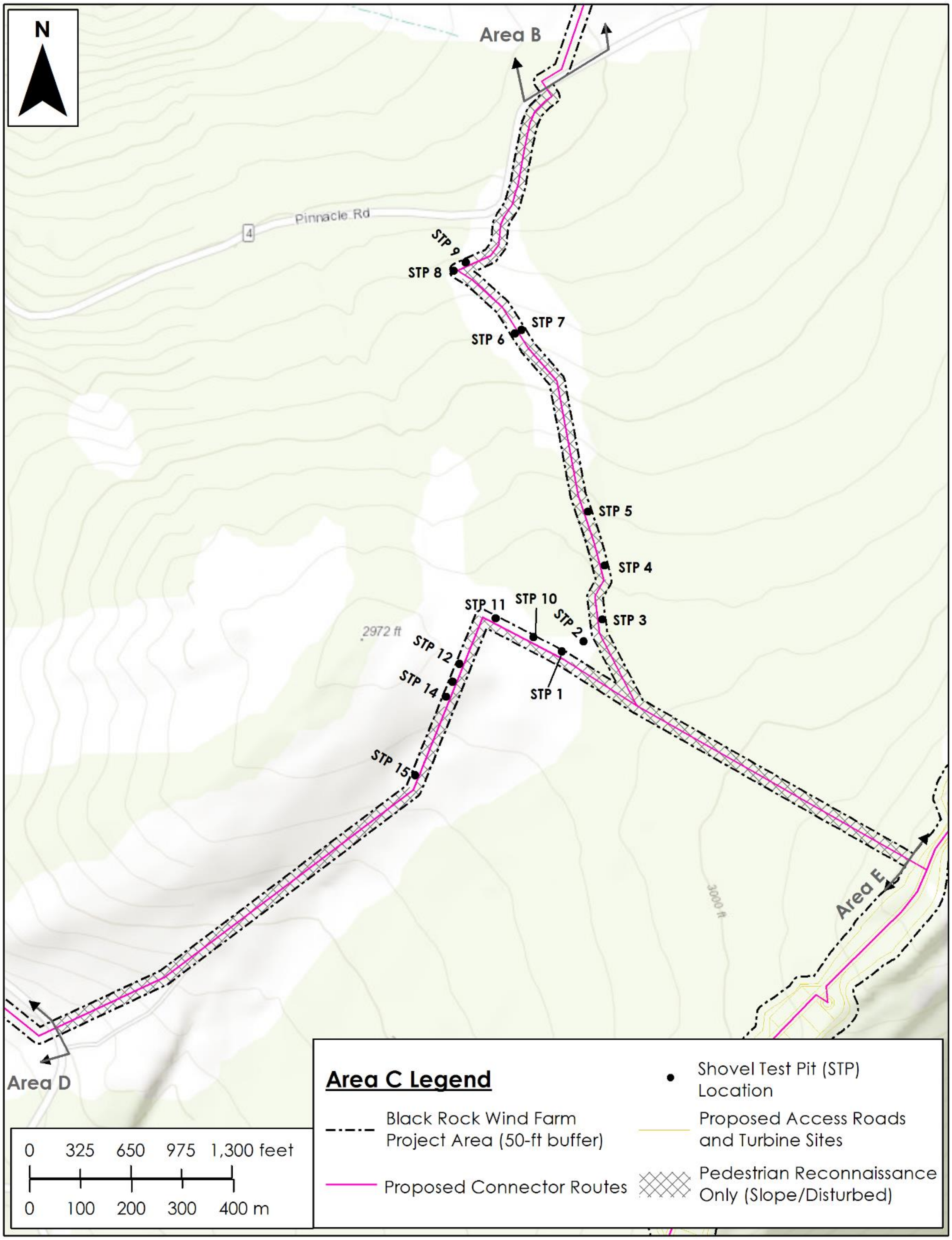

Figure 21. Detailed plan map of Area C (base map from ArcGIS 2018).

Figure 22. Area C, looking north from STP 15 (top) and looking southeast toward ridge line (bottom).

5.4 AREA D

Area D, approximately 49.9 acres in area, included a proposed connector route segment, access road, and three proposed turbine sites west of State Route 42 (Figure 23). The connector route was surveyed by pedestrian reconnaissance only as it partially followed State Route 42 before turning west to cross a steep ravine and an unnamed stream before connecting to the easternmost turbine site. Additionally, since no visible soil was present, pedestrian reconnaissance was conducted along the access road that followed an existing farm road and in the areas leading to and including the western two turbine sites. STPs were excavated only within the proposed footprint of the easternmost turbine site (Figure 24). Although the area was gridded out for 52 possible STPs, only 29 were excavated due to the high probability that the area was previously mined and the presence of a farm road running northeast-southwest through the proposed footprint. Two strata were present within Area D (Figure 25). Stratum I was comprised of yellowish brown (10YR5/4) sandy loam and generally extended from 0–24 cm (0–9.4 inches) below surface. Stratum II consisted of brownish yellow (10YR6/6) sandy clay. No archaeological resources were encountered in Area D.

5.5 AREA E

The main ridge line north of U.S. Route 50 and an associated access road were designated Area E (Figure 26). Nine turbine sites, an associated access road, and a connector route are proposed for this area, which totals 117 acres. As exposed bedrock and boulders were present throughout much of the area (Figure 27) and no visible soil was observed, Area E was surveyed by pedestrian reconnaissance only. No visible archaeological resources were encountered in Area E.

5.6 AREA F

The main ridge line south of U.S. Route 50 was designated Area F (Figure 11). Thirteen turbine sites, an associated access road, and a connector route are proposed for this area, which totals 147.8 acres. The area was not surveyed due to property access issues at the time of the initial survey. Once access has been obtained, the archaeological survey will be conducted along the entire ridge line, and the results will be provided in an addendum to this report.

5.7 AREA G

Area G includes an access road following Mt. Pisgah Road as well as portions of U.S. Route 50 and Arnold Mine Road, and has an LOD of 63 acres (Figure 28 and Figure 29, top). The northern section of Area G includes two proposed access routes from U.S. Route 50 that cross private property. The eastern access road partially followed an existing gravel drive before crossing wetlands adjacent to Mt. Pisgah Road (Figure 29, bottom). The western access road crosses a small corner of pasture at the intersection of U.S. Route 50 and Mt. Pisgah Road. Access was not granted to survey the property; however, a visual inspection from the roads showed little potential for archaeological resources due to the lack of soil deposition within the pasture. The entire area was surveyed via pedestrian reconnaissance. No archaeological resources were identified in Area G.

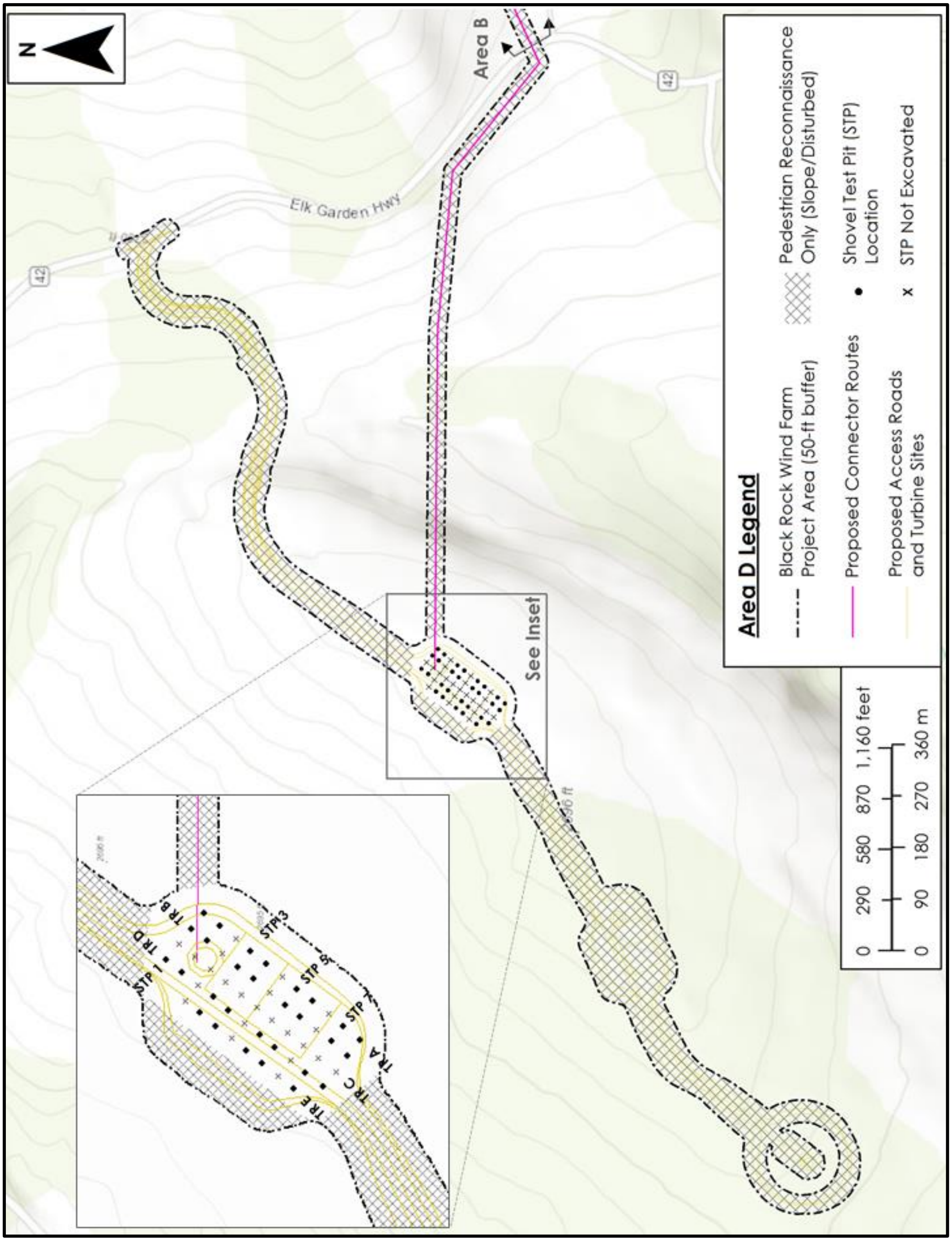

Figure 23. Detailed plan map of Area D (base map from ArcGIS 2018).

Figure 24. Area D from center of proposed turbine, looking north.

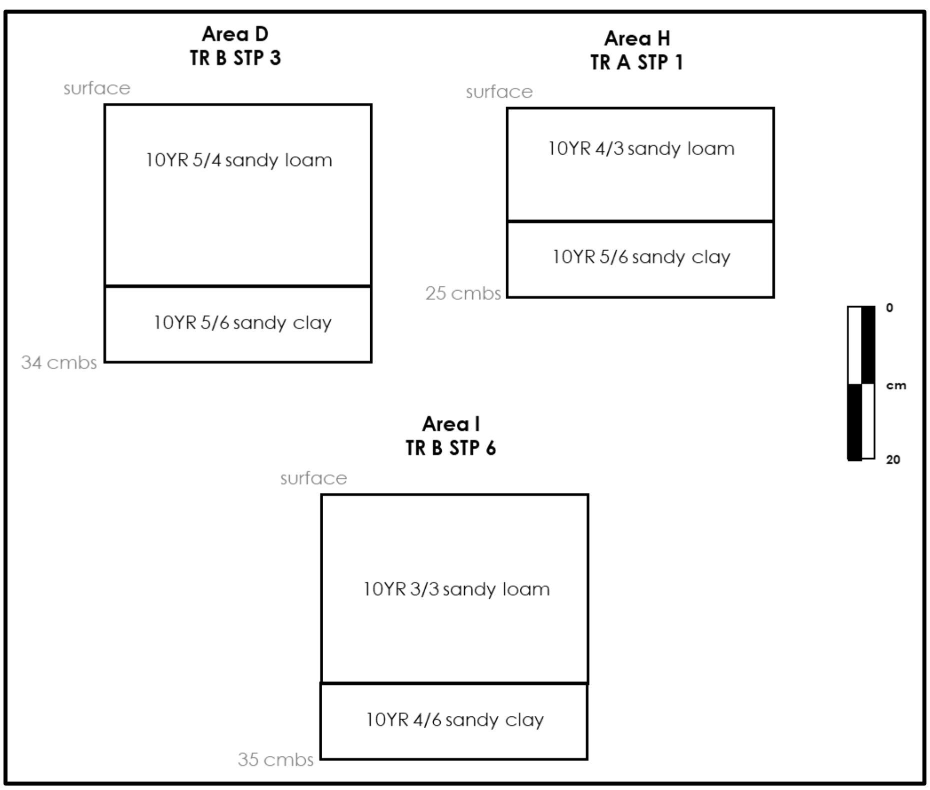

Figure 25. Representative STP profiles from Areas D, H, and I.

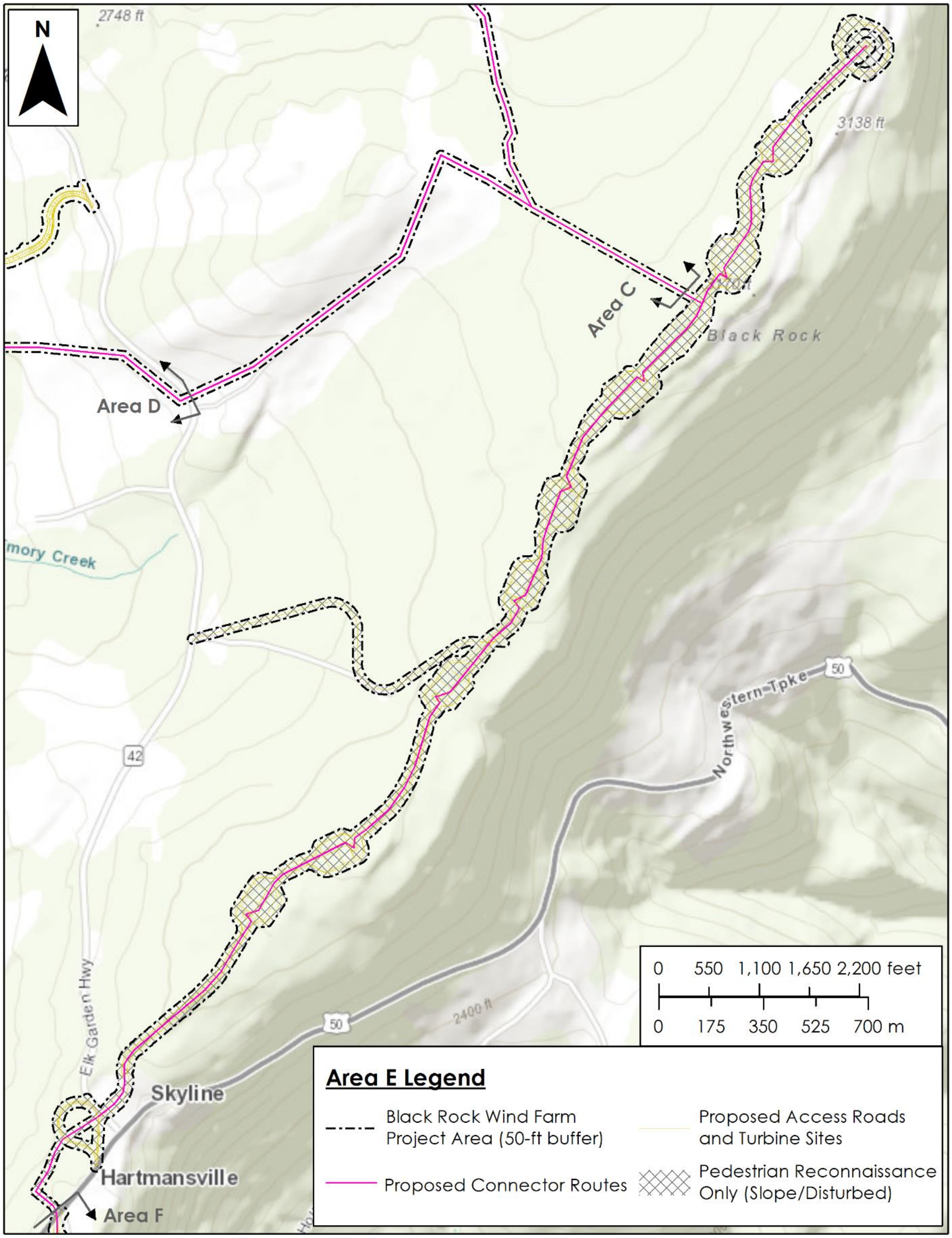

Figure 26. Detailed plan map of Area E (base map from ArcGIS 2018).

Figure 27. Typical view from proposed turbine site in Area E.

5.8 AREA H

Area H, which totals 59.6 acres, encompassed three proposed turbine sites and associated access road and connector routes west of Mt. Pisgah Road (Figure 30). The proposed access road followed an existing farm road which crossed Glade Run and associated wetlands (Figure 31, top). Proposed connector routes were in areas of slope greater than 20 percent and crossed wetlands and livestock pastures with little visible soil deposition. While the northern two proposed turbine sites were in wooded areas with no visible soil deposits, the southern proposed turbine site was in a viable area for shovel testing (Figure 31, bottom). Since the associated infrastructure footprint for the proposed turbine had not been determined at the time of the survey, four STPs were placed around the turbine base to test the area. These STPs contained two strata, including an initial stratum of brown (10YR4/3) sandy loam (Figure 25). Thicker deposits extending to 15 cm (5.9 inches) below surface were found in the western two STPs while the eastern two STPs contained initial deposits extending to 10 cm (3.9 inches) below surface. Stratum II was comprised of yellowish brown (10YR5/6) sandy clay. No archaeological resources were identified in Area H. Additional testing will be required in this area once the LOD for the proposed southern turbine site is defined.

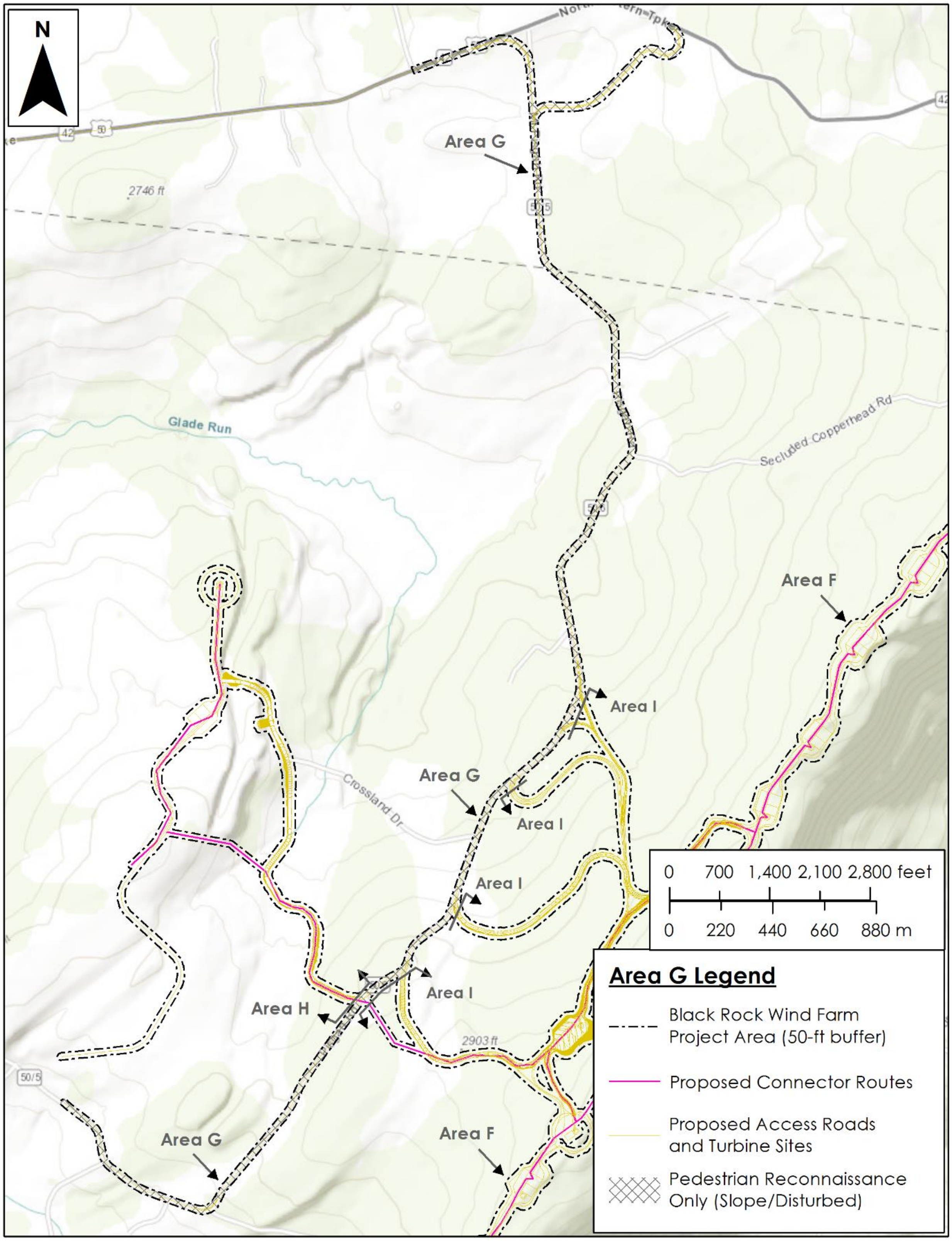

Figure 28. Detailed plan map of Area G (base map from ArcGIS 2018).

Figure 29. Area G, looking northeast along Mt. Pisgah Road (top) and looking east toward eastern access road (bottom).

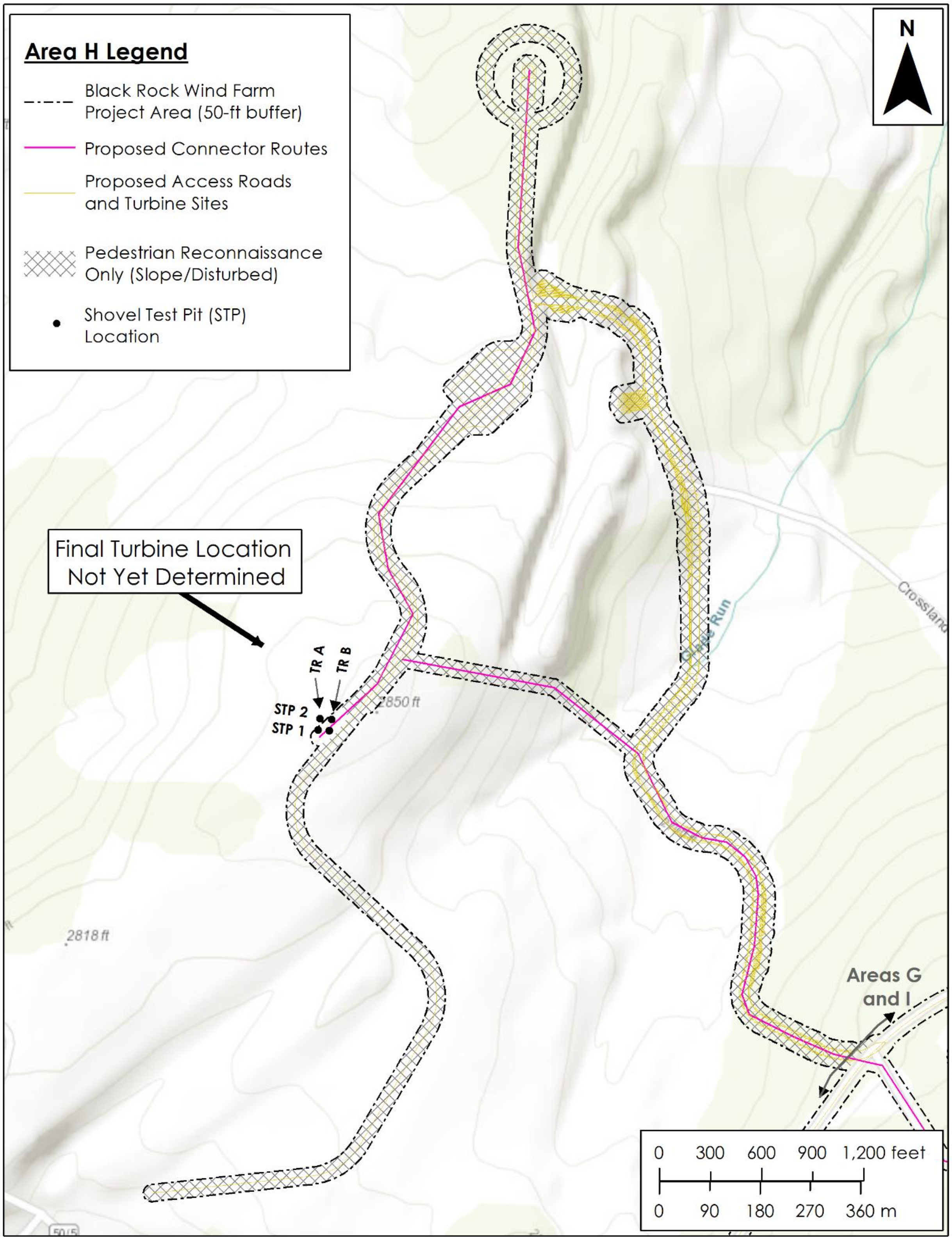

Figure 30. Detailed plan map of Area H (base map from ArcGIS 2018).

Figure 31. Looking south along access road near Glade Run (top) and looking north from southern proposed turbine site (bottom) in Area H.

5.9 AREA I

Proposed infrastructure in Area I includes a single turbine site, several access roads, and a connector route, all of which encompasses 73.4 acres. At the time of the survey, access to Area I, located east of Mt. Pisgah Road to the ridge line, was limited to non-forested areas (Figure 32). As such, only the southwestern portion of the area located in open fields was surveyed (Figure 33). Of 52 possible STPs, 40 were excavated within Area I. As the area had likely been previously mined, STPs at selected intervals were not excavated. Two strata were present within Area I (Figure 25). Stratum I consisted of dark brown (10YR3/3) sandy loam and extended to an average of 21 cm (8.3 inches) below surface. Stratum II was comprised of dark yellowish brown (10YR4/6) sandy clay. No archaeological resources have been identified in Area I; however, significant portions of the area have yet to be surveyed. Once access has been obtained, the archaeological survey will be completed, and the results will be provided in an addendum to this report.

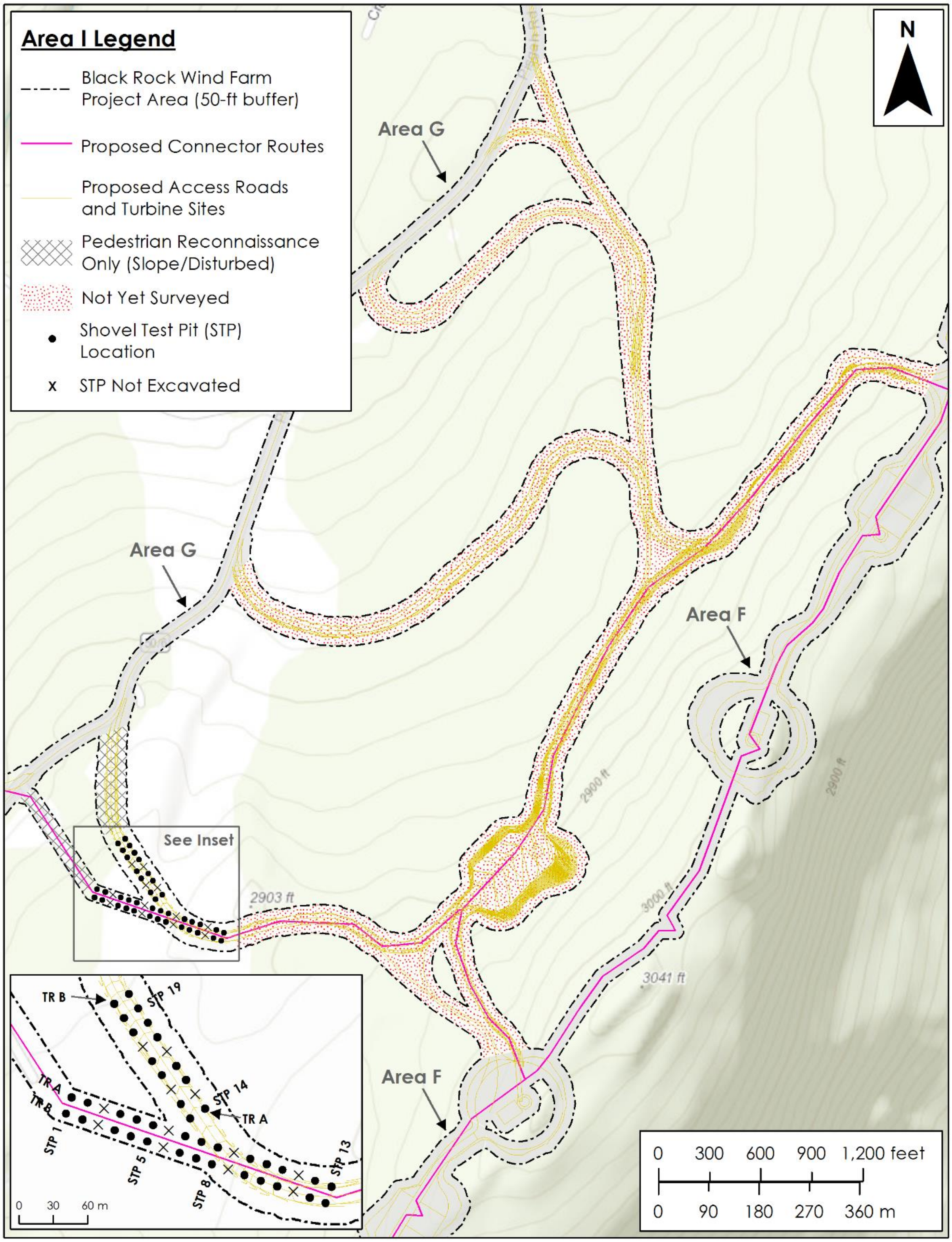

Figure 32. Detailed plan map of Area I (base map from ArcGIS 2018).

Figure 33. Area I shovel test area, looking east.

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6.0 CONCLUSIONS AND RECOMMENDATIONS

Black Rock proposes to construct a wind energy generating facility, known as Black Rock Wind Farm in Mineral and Grant Counties, West Virginia. The BRWF will consist of up to 32 turbines and just under 10 miles (16 km) of new access roads and associated underground and above-ground collection and generation tie-line corridors, an interconnection switchyard, an operations and maintenance building, as well as staging areas (including a concrete plant) for use during construction. The wind turbines are located mostly on a ridge in the area north and south of the intersection of U.S. Route 50 and State Route 42 N. The BRWF will be situated in select portions of privately owned mountaintop land generally composed of uninhabited forested or timbered areas. The archaeological APE identified for this undertaking, defined as the construction LOD plus buffer, totals approximately 697.8 acres. An additional 212.8 acres will be surveyed when landowner permission is obtained. Anticipated project impacts will include surface and sub-surface disturbances associated with timber and boulder clearing, grading, and filling related to the construction of the above mentioned facilities.

Pursuant to West Virginia Code § 24-2-11(c), Black Rock is submitting a Siting Certificate to the West Virginia Public Service Commission for the construction and operation of the wind energy generating facility and associated interconnection and transmission facilities. In support of the certificate application Stantec conducted a Phase I archaeological site survey to identify archaeological sites within the proposed BRWF project LOD. To accomplish this site survey, Stantec conducted a series of desktop reviews and subsequent field investigations. The desktop and field investigations were designed to meet the standards of the Secretary of the Interior, as specified in the *Standards and Guidelines for Archeology and Historic Preservation* (Federal Register 1983), and the West Virginia Division of Culture and History's *Guidelines for Phase I, II, and III Archaeological Investigations and Technical Report Preparation* (Trader n.d.). The results of these investigations are summarized here, followed by recommendations for completion of archaeological investigations associated with the BRWF Siting Certificate application.

6.1 DESKTOP REVIEW RESULTS

Stantec conducted an online review of the West Virginia archaeological site and project report files, prehistoric Native American contexts, Historic period contexts, and historical maps. The archaeological site and project report file review indicated that a few archaeological survey projects had been conducted within approximately 1 mile (1.6 km) of the Black Rock LOD, but no archaeological sites have been identified as a result of those investigations. Our historic context and map research suggest that the BRWF project area was a lightly populated rural landscape throughout recent history, with agriculture, logging, and mining being the main economic drivers in the region. Given the prehistoric Native American and Historic period contexts, the site file review, and the location of the LOD, Stantec expected few archaeological sites to be present within the project LOD. Any Native American sites were expected to likely consist of low-density artifact scatters. Historic period sites could include refuse dumps, remains of agricultural outbuildings, and sites or structural remains associated with logging or mining; once again, few such sites were expected based on the lack of structures depicted within the LOD on the historical maps reviewed for this project.

6.2 FIELD INVESTIGATION RESULTS

Stantec conducted pedestrian walkover and screened STP field survey of the LOD between November 5 and 16, 2018. Most landowners provided Stantec with access to their property to conduct the Phase I archaeological survey. Black Rock continues in negotiation for access to a few properties, most south of U.S. Route 50. Aside from those properties where access was not obtained, archaeologists surveyed the entire LOD by pedestrian walkover on 15-m (49.2-ft) or narrower transects (see Figures 11 and 12). Excluded from areas investigated by STPs were those portions of the LOD that had slopes greater than 20 percent, had no surface soil (e.g., consisted of exposed bedrock), had been previously disturbed (mainly by mining activities), or used existing roads. The remainder of the LOD was surveyed by excavating STPs at 15-m (49.2-ft) intervals, screening soil through ¼-inch (6.4-mm) mesh, recording the STP location using a GPS unit, and documenting soil stratigraphy. For the 100-ft (30.5-m) wide road and transmission line corridors, two parallel transects of STPs, separated by 15 m (49.2 feet), were excavated. For the wind turbines and staging areas, a variable number of transects separated by 15 m (49.2 feet) were excavated at each with the intent to cover the entire staging area LOD. Table 1 summarizes the results of the BRWF archaeological survey.

STP excavations were conducted in six areas and included the excavation of 275 STPs. Pedestrian reconnaissance survey was conducted in the remaining areas where access was permitted. Slope exceeding 20 percent, particularly leading up to the ridge lines, and/or no visible soil present (e.g., bedrock present on the surface) accounted for the majority of these areas. Additionally, several areas in the northern portion were disturbed by previous mining activities while the southern areas contained wetlands and asphalt and gravel roadways. These field investigations resulted in no archaeological resources being identified in that portion of the BRWF LOD for which landowner permission had been granted.

While fewer archaeological resources were identified within the accessible BRWF LOD than expected, the results are generally similar to other large wind farm projects conducted within the last 10 years in Grant and Mineral Counties. Only one cluster of structures (barn, spring house, and cistern) was located within the BRWF LOD. STPs excavated around these structures did not recover any artifacts. As such, this resource is documented in the built environment report for the BRWF project and is not considered an archaeological site. Historically, no structures were depicted as being located within the BRWF LOD, and as such, the lack of Historic period archaeological sites is not entirely unexpected. The wind farm projects conducted in the last 10 years in Grant and Mineral Counties likewise found few Historic period archaeological sites. As well, these projects identified no or few prehistoric Native American sites, with those found generally consisting of one to a few pieces of lithic debitage. Given this site profile, it is once again not unexpected that the current survey efforts did not identify any prehistoric Native American archaeological sites.

6.3 RECOMMENDATIONS

Black Rock continues in negotiation for access to a few properties, most south of U.S. Route 50. When access is obtained, Stantec will conduct the Phase I survey of those properties. Also, once the LOD for the Area H turbine has been determined, that area also will be surveyed. Stantec will then provide the results of these additional investigations as an addendum to this technical report

Table 1. BRWF summary of archaeological survey coverage.

Area	*Facilities*	*Total Acres*	*Acres Surveyed*	*Number STPs Excavated*	*Resources*
A	Substation, access	27.9	27.9	75	None Identified
B	Transmission connector route	13.9	13.9	112	Architectural
C	Transmission connector route	26.6	26.6	15	None Identified
D	Transmission connector route, access, and C line turbine pads	49.9	49.9	29	None Identified
E	Transmission connector route, access, and A line turbine pads 15 to 23	117.0	117.0	0	None Identified
F	Transmission connector route, access, and A line turbine pads 1 to 14	147.8	0	NA	To be surveyed
G	Transmission connector route and access	63.0	63.0	0	None Identified
H	Transmission connector route, access, and C line turbine pads	59.6	59.6	4	None Identified
I	Transmission connector route and access	73.4	8.4	40	To be surveyed

Similarly, if plans change or additional LOD is identified, Stantec will conduct the Phase I survey of those additions and provide the results as an addendum to this technical report.

Aside from properties where access was not obtained or LOD additions, and based on the results of the Phase I archaeological survey for the BRWF, Stantec recommends no additional archaeological investigations for those portions of the LOD where investigations have been conducted to date.

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APPENDIX A / QUALIFICATIONS

PAUL P. KREISA, PhD, RPA. Senior Archaeologist, Principal Investigator
PhD, Anthropology, University of Illinois at Urbana-Champaign, 1990
MA, Anthropology, Northern Illinois University, 1984
BA, Anthropology, University of Wisconsin, Oshkosh, 1981
Register of Professional Archaeologists (RPA)

Dr. Kreisa is a Senior Archaeologist and Principal Investigator for Stantec (formerly Greenhorne & O'Mara). Since joining the company in 2005, he has directed the investigations of several Colonial and Antebellum plantation sites; conducted numerous survey and evaluation projects for public and private sector clients in Maryland, Pennsylvania, Virginia, West Virginia, and Washington, DC; and created a Postbellum archaeological context for Prince George's County, Maryland, and an archaeological resources management plan for the redevelopment of St. Elizabeths Hospital in Washington, DC. With more than 30 years of experience at all levels of archaeological consulting, Dr. Kreisa has directed numerous Phase I survey, Phase II evaluation, and Phase III mitigation investigations at Historic and precontact Native American sites in the Mid–Atlantic, Mid–South, Southeast, Midwest, and Great Plains. Clients have included DoD facilities, US Army Corps of Engineers districts, GSA, NPS, state transportation agencies, local governments, and private developers. He has experience in completing Section 106 and NEPA documentation and complying with state and local regulations. Dr. Kreisa was previously a member of the Wisconsin SHPO staff and president of the Council for Maryland Archeology, the organization of professional archaeologists in Maryland, from 2011–2012.

EMILY L. SWAIN, MA, RPA. Archaeologist
MAA, Applied Anthropology, University of Maryland, 2010
BS, Anthropology/Archaeology, Mercyhurst University, 2007
Register of Professional Archaeologists (RPA)

Ms. Swain joined Stantec in 2015 and has more than 12 years of archaeological experience in Maryland, Pennsylvania, Texas, Virginia, and Washington, DC. She has performed and supervised fieldwork, artifact analysis, archival research, and report production for all phases of archaeological investigation. She also has experience in NEPA and Section 106 compliance.

JACQUELINE M. MCDOWELL, MA. Background and Archival Research
MA, Anthropology, Northern Illinois University, 1986
BS, Anthropology, Northern Illinois University, 1984

Ms. McDowell joined Stantec (formerly Greenhorne & O'Mara) as a planner in 2009. Since 2005, she has conducted research for cultural resources projects in Maryland, Pennsylvania, Virginia, West Virginia, and Washington, DC. She has more than 20 years of experience in conducting archival research with primary and secondary sources and incorporating the research into historic contexts and background research sections for reports. Ms. McDowell also has nearly 30 years of field and research experience in all phases of archaeological research and reporting in the Mid–Atlantic and Midwest, including both precontact Native American and Historic period sites. She has authored numerous reports for clients including DoD and GSA, state agencies, and private developers for Section 106, NEPA, and state- and county-level historic preservation legislation.

NANCY L. LIPIRA, BA. Archaeologist, Laboratory Director
MA, Historic Preservation, Goucher College, in progress
BA, Anthropology, Millersville University, 2006

Ms. Powell joined Stantec (formerly Greenhorne & O'Mara) in 2006 and has more than 12 years of archaeological experience in Maryland, Pennsylvania, Virginia, West Virginia, and Washington, DC. She has performed and supervised fieldwork, artifact analysis, archival research, and report production for all phases of archaeological investigation. Ms. Powell directs the archaeology workroom at Stantec's office in Laurel, Maryland. She also has experience in NEPA compliance, preparing documents such as Categorical Exclusion reports, Environmental Assessments, and Environmental Impact Statements.

Black Rock
Wind Farm

Appendix Z

Turbine Brochure

SG 4.5-145
New SGRE turbine with the best-in-class LCoE >4 MW

SIEMENS Gamesa
RENEWABLE ENERGY

First onshore launch of SGRE. Medium-wind design covering a broad range of sites

SG 4.5-145: low technological risk based on Siemens Gamesa's broad know-how of wind turbine technology

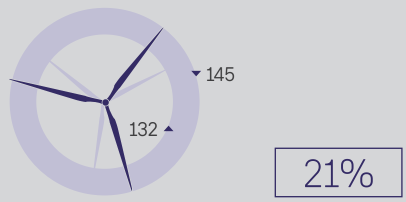
Siemens Gamesa, your trusted technology partner

One of the key aspects to Siemens Gamesa's success is the continuous development of new and advanced products adapted to the business case of every customer. We strive to provide the best technological solutions for each project, while driving down the LCoE.

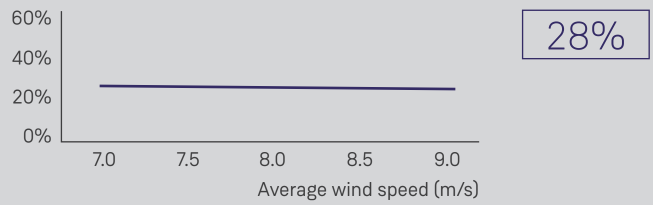
For this reason, we offer an optimized, streamlined catalog of proven solutions adapted to every type of site and condition, backed by:

- Our reputation as a trusted and stable partner (+87 GW installed worldwide).
- A proven track record spanning over 35 years that makes Siemens Gamesa a benchmark for wind projects.
- The recognition of the wind power sector.

Swept area increase



AEP increase SG 4.5-145 vs. SG 3.4-132 (preliminary)



New SG 4.5-145 wind turbine

The SG 4.5-145 is the first Siemens Gamesa onshore product launch and the first proposal of the Siemens Gamesa 4.X platform. Exemplar of a new generation of turbines, it is based on the operational experience accumulated by the company in the wind power market, and on the application of proven technological solutions. This new model fits into our catalog with a clear objective: to complement the product offer in the markets in which our clients require solutions with nominal powers greater than 4 MW, and with an excellent Cost of Energy. Given these premises and based on a design optimized for medium-wind speeds, its modularity and flexibility enable it to adapt to a wide range of sites.

Proven Siemens Gamesa technology

The knowledge acquired through our latest products, specifically in the optimization of design and industrialization processes, has been a key factor in the development of the SG 4.5-145 turbine. Siemens Gamesa has adopted proven technologies into this model, such as the combination of a three-stage gearbox (two planetary and one parallel) and a doubly-fed induction generator, greatly reducing technological risks. The inclusion of an optional premium converter also allows for compliance with the most demanding grid connection requirements.

It also has a new 71-meter blade made of fiberglass reinforced with epoxy resin, and integrates the aerodynamics and noise reduction know-how. This is how, thanks to the incorporation of DinoTails® Next Generation technology, the SG 4.5-145 turbine guarantees a high production of energy and reduced noise emission levels.

Greater efficiency and profitability

The SG 4.5-145 model includes control technology and strategies, which optimize the efficiency of the wind turbine depending on the site conditions. It offers a flexible power rating from 4.2 MW to 4.8 MW depending on the noise, temperature and electrical requirements of the project. With an increase of 21% of the swept area and 28% of AEP over the SG 3.4-132 wind turbine, this new model will become a reference in the market for its high levels of efficiency and profitability. The first SG 4.5-145 prototype installation is planned for the first quarter of 2019, and the Type Certificate is expected for the second quarter of 2019.

Technical specifications

General details	
Rated power	4.5 MW
Wind class	IEC IIB
Flexible power rating	4.2-4.8 MW
Control	Pitch and variable speed
Standard operating temperature	Range from -20ºC to 35ºC [1]

Rotor	
Diameter	145 m
Swept area	16,513 m²
Power density	254.35 W/m²

Blades	
Length	71 m
Airfoils	Siemens Gamesa
Material	Fiberglass reinforced with epoxy resin

Tower	
Type	Multiple technologies available
Height	90, 107.5, 127.5, 157.5 m and site-specific

Gearbox	
Type	3 stages

Generator	
Type	Doubly-fed induction machine
Voltage	690 V AC
Frequency	50 Hz/60 Hz
Protection class	IP 54
Power factor	0.9 CAP-0.9 IND throughout the power range [2]

[1] Different versions and optional kits are available to adapt machinery to high or low temperatures and saline or dusty environments.
[2] Power factor at generator output terminals, on low voltage side before transformer input terminals.

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10/2018