DESKTOP ANALYSIS AND ARCHAEOLOGICAL RECONNAISSANCE SURVEY FOR THE PROPOSED EXPANSION / MODIFICATION OF THE BEECH RIDGE WIND ENERGY FACILITY, GREENBRIER COUNTY, WEST VIRGINIA

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August 25, 2011

Lead Agency: U.S. Fish and Wildlife Service
WVSHPPO FR: 06-147-GB-35
Cultural Resource Analyst, Inc. conducted a desktop analysis and archaeological reconnaissance survey for the proposed expansion / modification of the Beech Ridge Wind Energy Facility in Greenbrier County, West Virginia (hereafter referred to as Project). Thirty-three turbines will be constructed as part of the Project but, for the purposes of this report, 47 turbine locations have been reviewed. This provides 14 alternate locations that could be utilized if one or more of the 33 turbine locations are not able to be constructed in their current proposed location. The study was completed under contract with Beech Ridge Energy II LLC.

Based on initial mapping data provided by Beech Ridge Energy II LLC, the Project area incorporates approximately 2,108.5 ha (5,210 acres) of rugged upland, with landforms typical for the larger region. It is within this area that the direct Area of Potential effects (APE), defined as the area of temporary and permanent ground disturbance, will be located. This area includes a large buffer around proposed turbine sites that will later be narrowed down to a more direct Area of Potential Effect.

Information from the desktop analysis indicates that that the majority of the Project consists of steeply sloped landforms. However, pedestrian survey of the Project failed to discover evidence of bedrock overhangs that could have been used as shelters. Less steeply sloped areas are primarily located on ridgetops. Soils developed in rocky residuum and colluvium; alluvial soils are not present.

The reconnaissance indicates that the vast majority of the Project has been timbered in the recent past, with associated ground disturbance having impacted large areas of the Project including the narrow ridgetops. Other disturbance is associated with former contour mines, which have impacted over 11 percent of the Project.

Four previously recorded sites are located within the Project. Three are reported as prehistoric low-density lithic scatters of unknown age and affiliation, and the fourth as a low-density artifact scatter containing prehistoric and historic / modern materials. Each of these sites has been determined not eligible for the National Register of Historic Places by the West Virginia State Historic Preservation Office.

Using information from the desktop analysis and reconnaissance survey, the overall probability of the Project to contain National Register eligible sites is considered low. This interpretation is based on the types of previously recorded sites located in the Project, and the extent of ground disturbance associated with recent clear-cutting. However, the presence of stone mounds, historic graves, and other site types cannot be totally discounted.

Based on these findings Cultural Resource Analysts makes the following recommendations: 1) Survey of steep slopes in excess 20 percent is not warranted; 2) further examination of previously recorded sites 46GB449, 450, 467 and 468, and survey of areas previously examined by Cultural Resource Analysts for the Beech Ridge Wind Energy project are not warranted; and 3) excluding man-made land and areas examined by the reconnaissance, survey of ridgetops and other landforms with slopes less than 20 percent should be completed, with specific attention given to the approximate 13.1 ha (32.9 acres) of Mandy channery silt loam, 3-15% slopes not examined during the prior surveys.
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I. INTRODUCTION

Beech Ridge Energy is considering expansion / modification (hereafter referred to as expansion) of its existing Beech Ridge Wind Energy Facility in Greenbrier and Nicholas Counties, West Virginia (Project) (Figure 1). The area of proposed expansion is located west of the extant facility in an area of rugged upland on the Nettie, Quinwood, Duo, and Richwood USGS 7.5-minute topographic quadrangles in Greenbrier County. As currently proposed the expansion would include construction of an additional 33 turbines and associated facilities. The locations of 47 turbines are under review, of which only 33 will be built; 14 are considered alternate turbine locations (Figure 2).

The current study is limited to archaeological sites and does not include the identification or evaluation of architectural resources. The direct Area of Potential Effects (APE), defined as the footprint of temporary and permanent ground disturbance, will be located within the Project as defined in Figure 2.

The cultural resources investigation for the Project is being completed to satisfy Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, with the U.S. Fish and Wildlife Service (UWFWS) being the lead agency. The authority of the USFWS is based on the issuance of an ESA section 10(a)(1)(B) incidental take permit. With the issuance of the permit the Project is considered a federal undertaking as defined in 36 CFR 800.16(y) of the NHPA. For federal undertakings, Section 106 of the NHPA requires federal agencies to take into account the effects of their undertakings on historic properties, and afford the Advisory Council on Historic Preservation a reasonable opportunity to comment.

In order to obtain information for the probability of the Project to contain significant archaeological sites, the USFWS requested that Beech Ridge Energy complete a desktop analysis. In response to this request, Beech Ridge Energy contracted Cultural Resource Analysts, Inc. (CRA) to complete the study, which included a desktop analysis and field reconnaissance. Results of this study will be used by the USFWS and West Virginia State Historic Preservation Office (WVSHPO) to determine the extent of further research, should it be required.

The study was completed by Christopher Nelson, Jamie Meece, Amber Hill, and C. Michael Anslinger, with Mr. Anslinger serving as principal investigator. Project coordination was with Erik Duncan of Beech Ridge Energy.

For the purpose of the Project, reconnaissance survey is defined as non-systematic field investigation designed to gather preliminary information for archaeological site probability. An archaeological site is defined as any belowground remains and/or aboveground ruins of a district, site, building, structure, or object 50 years of age or older. A historic property is defined as any archaeological site listed in, or determined eligible to, the National Register of Historic Places (NRHP). An effect is defined as any activity that alters a characteristic of a historic property qualifying it for inclusion in, or eligibility to, the NRHP.

II. ENVIRONMENTAL CONTEXT

Physiography and Geology

The western part of Greenbrier County is in the unglaciated Eastern Appalachian Plateau physiographic province, which is characterized by
a maturely dissected landscape and dendritic drainage pattern, with common landforms consisting of sinuous ridge systems with narrow ridgetops and steep sideslopes, and narrow, V-shaped stream valleys. The Beech Ridge Wind Energy Facility is located entirely within this physiographic province.

In portions of Greenbrier County, relative elevation between upland ridges and river/stream valleys exceeds 305 m (1,000 ft). The mountainous northern part of the county located within the Appalachian Plateau is primarily drained by tributaries of the Cherry River to the north, and Big Clear and Little Clear creeks to the south (Gorman et al. 1972).

Much of western Greenbrier County is underlain by Pennsylvanian and Mississippian age bedrock belonging to the Pottsville and Mauch Chunk series. The Pennsylvanian Pottsville series includes the Kanawha and New River formations, and the Pocahontas group. The Upper Mississippian Mauch Chunk series includes the Bluestone and Princeton, Hinton, and the Bluefield formations, as well as the Middle Mississippian Greenbrier group, and the Lower Mississippian Macrady formation and the Pocono group (Cardwell et al. 1986).

The portion of the Beech Ridge Wind Energy Facility in Greenbrier County is underlain by bedrock of the Pennsylvanian Pottsville series, the New River and the Pocahontas formations, and the Mississippian Mauch Chunk series, Bluestone and Princeton formations, and the Hinton and Bluefield formations.

The Pennsylvanian Pottsville series consists predominantly of sandstones, some of which are conglomeratic, with thin shales and coals. The New River formation is predominantly sandstone, with some shale, siltstone, and coal. This formation extends from the top of the Upper Nuttall Sandstone to the top of the Flattop Mountain Sandstone. The formation includes the Iaeger, Sewell, Welch, Raleigh, Beckley, Fire Creek, and Pocahontas Nos. 8 and 9 coals (Cardwell et al. 1986). The Pocahontas formation consists of approximately 50 percent sandstone, with some shale, siltstone, and coal, which extends from the top of the Flattop Mountain Sandstone to the top of the Mississippian age bedrock. The formation includes (from the bottom upward) Pocahontas coals Nos. 1 through 7 (Cardwell et al. 1986).

The Mississippian Mauch Chuck series consists of red, green, and medium-gray shale and sandstone, with a few thin limestone lenses (Cardwell et al. 1986). The Bluestone and Princeton formation consists of the Bluestone formation, which is mostly red, green, medium-gray shale and sandstone, with the Princeton Sandstone underneath (Cardwell et al. 1986). The Hinton formation is composed of red, green, and medium gray shale, sandstone, and thin beds of limestone (Cardwell et al. 1986). The Bluefield formation consists of red and green shale and sandstone, with a few limestone lenses such as the Reynolds (Cardwell et al. 1986).

**Toolstone Resources**

A number of raw materials used prehistorically as toolstone are located in the Ohio Valley and Appalachian region. Two of these consist of cherts that outcrop in southern West Virginia, and as such, would have been local or semi-local resources to groups living in Greenbrier County.

Reger (1931) indicates that nodules of Hillsdale chert occur in limestone of the Mississippian Greenbrier group in eastern West Virginia. The distribution of accessible exposures of Hillsdale chert is not adequately mapped. However, extant information indicates this raw material is generally available along a narrow, 125-km (77.7-mi) long band in Greenbrier and Pocahontas counties.

Although secondary sources of Hillsdale chert include fluvial and alluvial deposits along some streams throughout much of the Greenbrier drainage basin (Brashler and Lesser 1985, 1990), no such deposits are known to occur within the Beech Ridge Wind Energy Facility (Figure 3).
Figure 2. Modern topographic maps depicting Project location and setting.
A constituent of the Kanawha formation is Kanawha Black Flint (Kanawha chert), a raw material used locally throughout prehistory for the manufacture of chipped-stone tools. Kanawha chert is a bedded chert that occurs within the Lower/Middle Pennsylvania Upper Pottsville formation. This formation occurs in a basin that is approximately 42 km by 64 km in size in parts of Boone, Kanawha, Clay, Nicholas, Webster, and Fayette counties, West Virginia (Krebs and Teets 1914; Reger 1921:227; Reppert 1978:3). Olafson (1955) reported that it also extended northward into Braxton and Lewis counties. Kanawha chert is also available in cobble and gravel form from secondary deposits along the Kanawha and Teays River valleys (Yerkes and Pecora 1994). However, neither primary nor secondary deposits of raw Kanawha chert were identified within the Beech Ridge Wind Energy Facility (Figure 3).

**Hydrology**

The Project is drained by streams that enter the Meadow River. The Meadow River is fed by Big Clear Creek to the east and Price Fork to the west. Big Clear Creek is supported by several feeder streams: Sam Creek, Brown Creek, Elijah Branch, and several unnamed feeder streams into these streams. Price Fork is supported by several feeder streams: Peaser Branch, Hominy Creek, and several unnamed feeder streams.

**Modern Flora**

Greenbrier County is included in the Mixed Mesophytic Forest Region (Braun 1950). The forest associations found in this region are the oldest and most complex of the deciduous forests. Mixed Mesophytic refers to a climax community where dominance is shared by several species. As is true for most of the Appalachian Plateau, sugar maple-basswood-buckeye-tulip poplar segregates occurred mainly on north-facing slopes. Oak-chestnut and oak-hickory communities occupied upper slopes and ridgetops. Pine was dominant on ridgetops where rock outcrops occurred, and beech and white oak were located where shale was the underlying rock. Oak, oak-hickory, and oak-pine communities...
comprise the modern day forest (Niquette and Henderson 1984).

**Modern Fauna**

The types and composition of animal species that have inhabited Greenbrier County have changed in response to broader environmental changes and fluctuations over the last 12,000 years. Extinct Pleistocene species may have included giant beaver, stag, moose, mammoth, mastodon, horse, giant ground sloth, and dire wolf (Funkhouser 1925; Jillson 1968). With the retreat of the Wisconsin ice sheets and the onset of more moderate climatic conditions, these species were replaced by modern types such as turkey, passenger pigeon, Carolina parakeets, caribou, wolves, and buffalo (Barbour and Davis 1974). Today, the area is inhabited by a variety of animals; fauna common to the general area include white-tailed deer (Odocoileus virginianus), raccoon (Procyon lotor), opossum (Didelphis marsupialis), turkey (Meleagris gallopavo), muskrat (Ondatra zibethicus), beaver (Castor canadensis), eastern fox squirrel (Sciurus niger), eastern gray squirrel (Sciurus carolinensis), eastern gray fox (Urocyon cinereoargenteus), and black bear (Ursus americanus), along with numerous other small mammals, birds, reptiles, fish, and invertebrates.

**Late Pleistocene and Holocene Climate**

Climatic conditions during the terminal Pleistocene and Holocene ages represent a series of transitions in temperature, rainfall, and seasonal patterns (Anderson 2001; Niquette and Donham 1985; Shane et al. 2001). These transitions created a seemingly infinite range of ecological variation across time and space. This variation both limited and expanded survival strategies of human populations. Along these lines, some archaeologists see a link between certain climatic events and the development of prehistoric cultures in the Eastern Woodlands of North America (Anderson 2001). It must be recognized, however, that environmental determinism does not account for all culture change.

The Wisconsin glacial maximum occurred approximately 19,400 B.C. (Anderson 2001; Delcourt and Delcourt 1981). The landscape at that time was quite different from modern day conditions. Much of the mid-continent consisted of periglacial tundra, dominated by boreal conifer and jack-pine forests. In addition, sea levels were approximately 100 m (328 ft) below present levels. Because so much water was locked in the glaciers, the coastal plains were approximately twice the size seen today (Anderson 2001). Eastern North America was populated by a variety of faunal species at this time, including megafaunal taxa such as mastodon, mammoth, saber-toothed tiger, and horse, as well as modern taxa such as white-tailed deer, raccoon, and rabbit. A general warming trend and concomitant glacial retreat was underway by about 13,800 B.C. (Anderson 2001; Shane 1994). After 12,000 B.C., the boreal forest gave way to a mixed conifer-northern hardwoods forest regime. By 8000 B.C., much of the Ohio Valley was probably within the northern fringe of expanding deciduous forests (Delcourt and Delcourt 1981). Pollen records from the Gallipolis Lock and Dam on the Ohio River near Putnam County, West Virginia, reveal that all the important arboreal taxa of the mixed Mesophytic forest had arrived in the region by 7000-6500 B.C. (Fredlund 1989). Reidhead (1984) indicates that the general hardwood forests were well established in southeast Indiana and southwest Ohio by about 6200 B.C.

Prior to approximately 11,450 B.C., conditions were harsh but capable of supporting human populations. It now appears that people were in North America at this time. These populations were likely small and scattered (Anderson 2001). The Inter-Allerod Cold Period witnessed the spread of Clovis populations across the continent, circa 11,450-10,900 B.C. (Anderson 2001). This was followed by the rapid onset of the Younger Dryas cooling event. The period witnessed the extinction of megafauna species, rapid and broad scale changes in vegetation regimes, and
dramatic temperature fluctuations. The Younger Dryas corresponded with the end of the pan-North American Clovis culture and the appearance of subregional cultures across eastern North America. This rapid climatic change, perhaps as short as 10–40 years, may have been a factor in this settlement shift.

The beginning of the Holocene Age, dated circa 9000–8000 B.C., is associated with major and fairly rapid warming temperatures, decreases in cloud cover, and generalized landscape instability (Delcourt 1979; Webb and Bryson 1972). Estimated temperature increases during this period are three times greater than later Holocene fluctuations (Webb and Bryson 1972). During the early Holocene, rapid increases in boreal plant species occurred on the Allegheny Plateau in response to the retreat of the Laurentide ice sheet from the continental U.S. (Maxwell and Davis 1972; Whitehead 1973). At lower elevations, deciduous species were returning after having migrated to southern Mississippi Valley refugia during the Wisconsin advances (Delcourt and Delcourt 1997). The climate during the early Holocene was considerably cooler than the modern climate, and extant species in upper altitude zones of the Allegheny Plateau reflect conditions most similar to the Canadian boreal forest region (Klippel and Parmalee 1982; Maxwell and Davis 1972). Conditions at lower elevations were less severe and favored the transition from boreal to deciduous species. At Cheek Bend Cave in the Nashville Basin, an assemblage of small animals from the late Pleistocene has been reported (Klippel and Parmalee 1982). The faunal assemblage from this locality confirms the changes in environment that took place during the Pleistocene/Holocene transition and the resulting extinction of late Pleistocene megafauna and establishment of modern fauna in this area (Klippel and Parmalee 1982).

Traditionally, the Middle Holocene is dated from about 6000–3000 B.C. Climatic conditions during this period were consistently dryer and warmer than the present (Delcourt 1979; Klippel and Parmalee 1982; Wright 1968). In this model, the influx of westerly winds during this Hypsithermal climatic episode contributed to periods of severe moisture stress in the Prairie Peninsula and to an eastward advance of prairie vegetation (Wright 1968). Prairies expanded east into central Indiana between 6000–5000 B.C. (Webb et al. 1983). Pollen data from Hamilton and Marion counties in central Indiana indicate an oak-hickory dominance of the forest regime and warm, dry conditions sometime after about 6000 B.C. (Engelhardt 1960, 1965).

More recent research (Anderson 2001; Shane et al. 2001) suggests, however, that the middle Holocene was marked by considerable local climatic variability. Paleoclimatic data indicate it was a period of more pronounced seasonality, marked by warmer summers and cooler winters. This is supported by ice core data that show no appreciable decrease in continental ice volume, which would be expected with an increase in global temperature (Hu et al. 1999). However, a model put forth by Webb et al. (1983) of increased aridity during this period is still valid for much of the region. Delcourt (1979) identified middle Holocene moisture stress along the Cumberland Plateau in Tennessee, but indicates that upland barrens did not expand appreciably as did the Midwestern prairies. In fact, due to shifting tropical air masses, the southern and central Appalachians may have witnessed increased precipitation at this time (Delcourt and Delcourt 1997). At Gallipolis, no evidence of climatically driven vegetation change was documented to coincide with the period of prairie expansion (Fredlund 1989). This was probably due to the proximity of the site to the Ohio River. Fredlund (1989) reports that after 3700 B.C., the forest surrounding Gallipolis lost diversity and became dominated by xeric oak-hickory associations more typical of western mesophytic forests.

The Hypsithermal episode might have influenced hunter-gatherer adaptive strategies. Stafford (1994) and Stafford et al. (2000) argue that the changing vegetation resulted in heterogeneous upland resource availability in southern Indiana. In this model, the patchy
resource base was exploited through a logistical collector strategy, a change from the generalized foraging of the preceding period. In the southeast, the increased seasonal extremes, expansion of pine forests at the expense of oaks, and increasingly xeric conditions likely caused significant social stress on Middle Archaic populations. This stress may have been ameliorated by the consolidation of peoples into riparian settings where hardwood forests were maintained (Anderson 2001).

The earliest distinguishable late Holocene climatic episode began circa 3000 B.C. and ended around 1000 B.C. This episode is associated with the establishment of essentially modern deciduous forest communities in the southern highlands and increased precipitation across most of the midcontinental U.S. (Delcourt 1979; Maxwell and Davis 1972; Shane et al. 2001; Warren and O'Brien 1982). Changes in local and extra-local forests after about 2800 B.C. may have also been the result of anthropogenic influences. Fredlund (1989) reports that the Gallipolis pollen record documents evidence for increasing local disturbance of the vegetation beginning around 2800 B.C., which may have been associated with developmental and expanding horticulture activity. Based on a study of pollen and wood charcoal from Cliff Palace Pond in Jackson County, Kentucky, Delcourt and Delcourt (1997) recorded the replacement of a red cedar-dominated forest with a forest dominated by fire-tolerant taxa (oaks and chestnuts) around 1000 B.C. The change is associated with increased local wildfires (both natural and culturally augmented) and coincided with increases in cultural utilization of upland (mountain) forests.

Beginning around 800 B.C., generally warm conditions, probably similar to the twentieth century, prevailed until the onset of the Neo-Boreal episode, or Little Ice Age, around A.D. 1300. Despite this trend, there were brief climatic fluctuations during this period. Some of these fluctuations have been associated with adaptive shifts viewed as causal factors for subsistence and settlement changes in the Midwest. For example, the Middle Woodland Hopewellian florescence is temporally correlated with the relatively mild Sub-Atlantic climatic episode (Griffin 1961). Likewise, the culture's decline roughly corresponds to the Vandal Minimum at circa A.D. 400-800, a period of global temperature decline near the beginning of the Late Woodland period in West Virginia.

Fluctuations in the Neo-Boreal episode appear to have varied locally, with increased or decreased temperatures and precipitation (Baerreis et al. 1976; Warren and O'Brien 1982). Stuever and Vickery (1973) suggest a possible correlation between the onset of a cooler and moister period circa A.D. 400 and increased use of Polygonum by Late Woodland groups in the Midwest. During this same period (A.D. 400-A.D. 200), warmer temperatures have been inferred for the Great Plains and drier conditions for the Upper Great Lakes (Baerreis et al. 1976; Warren and O'Brien 1982). Other fluctuations during the late Holocene are similarly non-uniform across the midcontinental U.S.; however, the interfaces of all fluctuations are generally consistent. Given evidence of fluctuations elsewhere, it is most possible that changes occurred circa 350 B.C., A.D. 250, A.D. 650, and A.D. 1000.

Studies of historical weather patterns and tree ring data have indicated that climatological averages are "unusually mild" when compared with seventeenth through nineteenth century trends (Fritts et al. 1979:18). This study suggests that winters were generally colder, weather anomalies were more common, and unusually severe winters were more frequent between 1602 and 1899 than after 1900. These cooler, moister conditions are associated with the Neo-Boreal episode, which began around A.D. 1300 and coincided with minor glacial advances in the northwest and Europe (Denton and Karlen 1973; Warren and O'Brien 1982). Warren and O'Brien (1982) view this episode as a causal factor in vegetation pattern shifts in northeast Missouri.
The effects of the Neo-Boreal episode, which ended during the middle to late nineteenth century, have not been studied in detail for southern West Virginia. Despite this, it appears that the area experienced less radical temperature decreases during the late Neo-Boreal than did the upper Midwest and northern Plains (Fritts et al. 1979). Related changes in extant vegetation should therefore be more difficult to detect. It is probably safe to assume, however, that average temperatures were at least a few degrees cooler during the late Prehistoric and early Historic periods. The frequency of severe winters and average winter precipitation were probably greater as well. Several scholars (e.g. Anderson 2001; Griffin 1961; Grove 1988) have observed that the beginning of the Little Ice Age disrupted prehistoric cultures in the Eastern Woodlands. Anderson (2001:166) relates the agricultural difficulties brought on by the climatic downturn to “increased warfare and settlement nucleation, and decreased long distance exchange and monumental construction” (Anderson 2001:166), all of which are attributes that characterize the Late Woodland period in much of the greater Ohio Valley.

**Modern Climate**

The climate in southeastern West Virginia is continental in character and temperature and precipitation levels fluctuate widely. The area is influenced by a humid continental climate with continental polar and maritime tropical air masses (Guernsey and Doerr 1976). Prevailing winds are westerly, and therefore, most of the storms cross the state in a west to east pattern. Low-pressure storms that originate in the Gulf of Mexico and move in a northeasterly direction across West Virginia contribute the majority of precipitation received by the state. Warm, moist, tropical air masses from the Gulf predominate during the summer months when humidity levels also remain quite high. As storms move through the state, occasional hot and cold periods of short duration may be experienced. During the spring and fall, storm systems tend to be less severe and have a lower frequency, thus resulting in less radical extremes in temperature and rainfall.

Climate can vary drastically from one year to the next, but the trend is warm summers and mild to cold winters. According to Gorman et al. (1972), some of the highest ridges in the state are located in northwestern Greenbrier County, and these ridges have considerable effect on the climate. Because of prevailing westerly winds, considerable moisture falls on the windward side of the Allegheny Mountains, but the leeward side is relatively dry. In northwestern Greenbrier County, the average annual precipitation is about 51 inches and includes up to 80 inches of snowfall. In central and eastern parts of the county, annual precipitation is only 38 inches, which includes approximately 20 inches of snowfall (Gorman et al. 1972).

The annual average daily maximum temperature in the northwestern portion of Greenbrier County is 62.4°F, and the annual average daily minimum temperature is 37.6°F. The average freeze-free period is 132 days. The annual average daily maximum temperature in central and eastern portions of the county is 65.9°F, and the annual average daily minimum temperature is 39.7°F. The average freeze-free period in this portion of the county is 149 days (Gorman et al. 1972).

**III. CULTURAL OVERVIEW**

This section presents a brief overview for the prehistoric occupation of southern West Virginia, using information from published and non-published sources.

**Pre-Clovis**

No known pre-Clovis sites have been documented in West Virginia (Lepper 1999). However, elsewhere in the eastern U.S., including the upper Ohio River valley, cultural deposits located stratigraphically below Early Paleoindian have been reported (Adovasio et al. 1999; McAvoy and McAvoy 1997). Available uncorrected radiocarbon dates indicate these sites date to the late Pleistocene, at approximately 15,000 to 13,000 B.C. The presence of pre-Clovis sites in the region is not unexpected given the antiquity (circa 10,500 B.C.) accepted for the MV-II
occupation at the Monte Verde site in southern Chile (Dillehay 1997; Meltzer et al. 1997).

Associated artifacts consist of basally thinned trianguloid to lanceolate bifaces, prepared polyhedral cores, and prismatic blades. The core and blade industry has been described as having an Eurasian, Upper Paleolithic flavor (Adovasio et al. 1999). These early populations are characterized as generalized hunter-foragers, rather than specialized hunters.

Known Pre-Clovis sites have low artifact densities and low archaeological visibility. Extant regional data suggest the potential for sites dating to this period is low.

**The Paleoindian Period**

The earliest cultural period conclusively documented in the Ohio Valley is Paleoindian. Because of a general lack of dateable contexts, the chronology for the region has relied heavily on cross dating with sites located outside the region. Based on typological evidence and limited radiocarbon assays, there is consensus that early groups of specialized late Pleistocene hunters occupied the region by approximately 9500 to 9200 B.C. (Tankersley 1996).

Early Paleoindian sites are identified by the presence of highly distinctive Clovis fluted hafted bifaces. Gainey fluted and Cumberland fluted hafted bifaces are believed to date to the Middle Paleoindian period, and unfluted types of the Plano and Dalton clusters are diagnostic of Late Paleoindian (Tankersley 1996). Other lithic types commonly associated with regional Paleoindian sites include a variety of unifacial tools and bifaces.

Paleoindian sites, or sites having Paleoindian components, have been identified throughout Appalachia, although in the high, dissected plateau region of eastern Kentucky and southern West Virginia the sites are small, often consisting of isolated hafted bifaces (Lane and Anderson 2001). The majority of evidence for the Paleoindian period in West Virginia comes from surface finds located along the lower Kanawha River (Kanawha, Putnam, and Mason counties) and the Ohio River near Parkersburg (Wood County). Diagnostic hafted bifaces have also been recovered from the dissected uplands of southern West Virginia, with the most reported for Boone County. Although a small number of Paleoindian points are reported for Nicholas County, their occurrence is rare (McMichael 1965).

Given the paucity of Paleoindian sites in West Virginia, and that most of the artifacts/sites identified to date are located on alluvial landforms in the valleys of major drainages, the potential for their presence in the project area, which is characterized by open upland landforms, is low.

**The Archaic Period**

The Archaic period includes a long span of time during which important cultural and adaptive changes took place throughout the Eastern Woodlands. The period is customarily divided into three sub-periods: Early (8000-6000 B.C.), Middle (6000-3000 B.C.), and Late (3000-1000 B.C.).

**Early Archaic**

Except for the adoption of notched and stemmed hafted bifaces, Early Archaic toolkits in the Ohio Valley are similar to those associated with the late Paleoindian period. New hafted biface types include Kessell Side Notched, Charleston Corner Notched, Kirk Corner Notched, St. Albans Side Notched, LeCroy Bifurcated Base, and Kanawha Stemmed.

The paucity of tools associated with the preparation of plant foods and fishing suggests most subsistence remains were acquired by hunting (Dragoo 1976). In southern West Virginia, most Early Archaic sites are interpreted as temporary camps located on ridgetops or in upland rockshelters (McMichael 1968; Wilkins 1978). Larger floodplain sites, such as the well-known St. Albans (46Ka27) site and lesser-known Van Bibber Reynolds (46Ka223) site, are known from the Kanawha Valley.

Broyles (1971) suggested that the St. Albans site appeared to be a warm weather
base camp. This site, located on a natural levee of the Kanawha River, actually represents multiple spatially overlapping occupations, indicating it was a location repeatedly occupied throughout the period (Anslinger 1998a, 1998b). More recent work at the Van Bibber Reynolds site near Lower Belle, identified evidence of a buried Early Archaic occupation characterized by Kirk Corner Notched and various bifurcated base forms (Anslinger et al. 2004). Also present were large quantities of thermally altered rock. Spatial analysis suggests that the site functioned as a residential base that was reoccupied on occasion for a period of several thousand years.

According to data obtained from the Dixon and Rohr sites (Dragoo 1958; Mayer-Oakes 1955), Early Archaic peoples also utilized rockshelters as short-term camps. Durrett (1952) reported concentrations of Early Archaic materials at 46Cb10 near the confluence of the Guyandotte and Ohio rivers in Cabell County. Investigations by Ballweber and Michael (1990) documented an overwhelming occurrence of Early Archaic materials in association with mountaintop sites in Boone, Kanawha, Logan, and Wyoming counties in southern West Virginia. Wilkins (1977) documented similar evidence for Early Archaic occupation in Boone County.

Archaeological data derived from a wide variety of environmental contexts in West Virginia and the surrounding region indicate that Early Archaic hunter-gatherer populations were highly mobile and widely exploited both valley and upland settings. Sites tend to be small and contain a limited range of artifact functional types, and rarely are features other than shallow thermal facilities present. Based on extant data, including survey results presented by McMichael (1965) and MacDonald et al. (2006) for Nicholas County, the potential for Early Archaic sites in Nicholas and Greenbrier counties, including areas in and adjacent to the project area, is high.

Middle Archaic

During the Middle Archaic period, the environment was dryer and warmer than modern conditions. Increasing regionalization of artifact types and styles suggests decreased mobility and perhaps a shift from foraging to collecting subsistence strategies. In most areas of the Ohio Valley, sites are relatively small and not unlike those documented for the preceding Early Archaic period. However, by the end of the Middle Archaic, larger sites containing high densities of artifacts and cultural features and midden, occur with some regularity along the Ohio and many of its significant tributaries.

Hafted biface types common for the period include Stanly Stemmed, Big Sandy II, Amos Corner Notched, and Morrow Mountain. This period is also marked by the widespread introduction of ground stone artifacts, including grooved axes. The more regular presence of pitted stones and anvils, which are typically interpreted as implements used for processing plant foods, suggests greater emphasis on the utilization of plant food resources.

In southwestern West Virginia, Middle Archaic sites have been identified in both upland and floodplain settings in primary and secondary river valleys. Three sites in the Kanawha Valley contain Middle Archaic components. These include Hansford Ballfield (46Ka104) as reported by Wilkins (1985) and Youse (1992), Amos Power Plant (46Pu60) as reported by Youse (n.d.), and Glasgow (46Ka229) as reported by Niquette et al. (1991) and Redmond and Niquette (1991). These and other Middle Archaic sites in the region appear to have larger accumulations of cultural material than documented for Early Archaic sites, suggesting increasing group size and perhaps greater occupational stability.

The Middle Archaic component(s) at the Hansford Ballfield site is characterized by small notched points similar to Amos Corner Notched, and, perhaps, examples of Stanly Stemmed. Although the Middle Archaic occupation of the Amos Power Plant site is not well documented, it is best known for having a
component characterized by Amos Corner Notched points. Sites containing any quantities of this point type are rare, and to date, no single component Amos sites or components have been documented by professional archaeologists in West Virginia. Excavations at the Glasgow site documented a buried Stanly component, and more recently, some Stanly, Kirk Stemmed, and bifurcated base materials were recovered from a buried context at the Van Bibber Reynolds site (Anslinger et al. 2004).

**Late Archaic**

The Late Archaic was a time of increased cultural complexity, including the establishment of long distance trade systems in some areas. In West Virginia, Late Archaic sites are widely represented in both floodplain and upland settings. During this period in southwestern West Virginia, there was an increased use of rockshelters and bottomland open sites. Wilkins (1978) has documented many examples of upland rockshelters that were possibly occupied in the fall and winter. In addition, large bottomland base camps such as Buffalo (46Pu31) (Hanson 1975), Corey (46Pu100) (Hughes et al. 1991), HANS Ford Ballfield (46Pu104), and Burning Spring Branch (46Ka142) have been identified on the Kanawha River. Late Archaic settlement systems in some areas of the greater Ohio Valley appear to have been logistically organized (Stafford et al. 2000).

In southeastern Kentucky, archaeologists have documented a shift from the use of chert for the manufacture of hafted bifaces in the Early and Middle Archaic periods to a preference for materials such as quartzite, silicified shale, and ferruginous sandstones during the Late Archaic (Dunnell 1972). A similar pattern of raw material use appears to have occurred in southern West Virginia, where diagnostic specimens are often manufactured from quartzite and other non-chert materials. A good example of this pattern was documented by Broyles (1964) at the Mill Pond site (46Me2) in Mercer County.

The principal diagnostic hafted biface types for this period belong to the Brewerton, Late Archaic Stemmed (including Buffalo Stemmed), Lamoka, Merom, and Susquehanna clusters (Justice 1987). At sites dating late in the period, stone bowls made of steatite and sandstone have been documented (Anslinger 1999; Pullins et al. 2008; Youse 1992). Radiocarbon dates derived from organic residue collected from the interior surfaces of stone bowls at the Burning Spring Branch site (46Ka142) indicate a period of use from approximately 1100-1000 B.C. (Pullins et al. 2008).

Late Archaic sites are known to be widely distributed through West Virginia. The evidence indicates that Late Archaic hunter-gatherers, some of which may have been logistically organized, exploited nearly all portions of the environment, including valley floodplains and terraces, colluvial fans, upland ridgetops, and rockshelter settings. In his survey of Nicholas County, McMichael (1965) documented widespread evidence of Late Archaic cultures in Nicholas County, which, based on the morphology of hafted bifaces, were viewed as having ties to cultures in the Ohio Valley, Northeast, and Southeast.

Extant data indicate that the potential for Late Archaic sites to be present in and adjacent to the project area is high. Sites may occur in both open-air settings and rockshelters, and vary greatly in size and material content.

**The Woodland Period**

Traditionally, archaeologists distinguished the Woodland period from the preceding Archaic by the appearance of cordmarked or fabric-marked pottery, the construction of burial mounds and other earthworks, and the rudimentary practice of agriculture (Willey 1966). The Woodland period is customarily divided into Early (1000-400 B.C.), Middle (400 B.C. - A.D. 400), and Late (A.D. 400-1100).

**Early Woodland**

Early Woodland cultures in southern West Virginia appear to have developed in place out of local Late Archaic traditions. Evidence for
This period comes from burial mounds and small, dispersed habitation sites that occur in a wide variety of settings, including river terraces, colluvial slopes/benches, and upland rockshelters. More recent reviews of the archaeological data would place the end of this period at the beginning of mound construction (e.g., Clay 2005).

Tubular pipes, copper beads, bracelets, mica, and ground stone gorgets and celts have been recovered from Early Woodland sites in the region. Hafted bifaces typical of the period include Cresap Stemmed, Adena Stemmed, and Robins Stemmed (Justice 1987). Ceramics are thick and poorly produced, with various types of lithic material used as temper. Defined types include Fayette Thick (Griffin 1943a), Adena Plain (Haag 1940), and Montgomery Incised (Haag 1941).

The large, intensively occupied base camps common to the Late Archaic period have not been documented for the Early Woodland. Instead, the settlement system appears to have been diffuse, with small hamlets dotting the landscape. For the southern part of West Virginia and adjoining areas of eastern Kentucky, Early Woodland sites are located in upland areas of tributary valleys, while mortuary sites such as mounds occur on river terraces along main stem and secondary valleys (Fuerst 1988; Niquette 1992; Railey 1990).

In the West Virginia coal belt region, one significant Early Woodland site is the Dennison site (46Lg16). This multi-component site contained an Early Woodland component represented in part by Montgomery Incised ceramics. This marked only the second finding of this pottery type in West Virginia (Moxley 1982).

Mortuary sites include Gore Mound (46Bo26) in Boone County, which is located near the Little Coal River (Fowler et al. 1976; Wilkins 1977). The best documented Early Woodland burial mound in southern West Virginia is the Cotiga Mound (46Mo1) located in Mingo County. This National Register-listed site was located along the Tug Fork River, and was excavated for the construction of Appalachian Corridor G. The mound was constructed in several discrete episodes between 205 B.C. and A.D. 75. It was roughly contemporaneous with other Early and Middle Woodland mounds in West Virginia and eastern Kentucky. The Cotiga Mound contained between 7 and 18 human cremations and grave goods of bone, stone, and copper. The remains of two paired-post structures were identified beneath the mound (Frankenberg and Henning 1994; Wall 1994).

In Nicholas County, McMichael (1965) documented a number of sites that appeared to contain small quantities of Early Woodland artifacts, as evidenced primarily by several varieties of stemmed points. In West Virginia, including the counties associated with the current project, Early Woodland habitation sites occur at a low frequency and have low archaeological visibility, and as such, are difficult to discover. Based on extant data, the potential for Early Woodland sites to be present in or adjacent to the project is considered low to moderate.

**Middle Woodland**

The Middle Woodland period remains one of the most poorly documented and understood periods of West Virginia prehistory, although areas along major drainages such as the Ohio and Kanawha rivers have been more extensively studied by archaeologists. It is in the latter areas that the major concentrations of mound/earthwork complexes are/were located.

Subsistence was based on a mix of foraging and gardening. Ethnobotanical remains include hickory nut, black walnut, and acorns, along with domesticated species including sunflower, squash, gourd, and maygrass. Diagnostic hafted biface types include Manker, Snyder Corner Notched, and types in the Lowe Flared Base cluster (Justice 1987). Pottery was more refined than during the Early Woodland period, with plain and cordmarked grit-tempered wares most common in the area. The elaborate vessels and design motifs associated with Ohio Hopewell do not occur in this area. Similarly, local groups do not appear to have participated
widely in the Hopewellian Interaction Sphere, a geographically extensive trade network that facilitated the trade/exchange of exotic items including obsidian, copper, high quality flints, grizzly bear canines, and conch shells.

One example of a Middle Woodland site within the coal region is the multi-component Mount Carbon site (46Fa7), which appears to include the remains of a Middle Woodland hamlet (Fuerst 1988; McMichael 1962). Middle Woodland mound sites were located near habitations – this departs from the Early Woodland pattern in which habitation sites were not associated with mortuary sites (Fuerst 1988; Wilkins 1979).

A review of the extant record for Greenbrier and Nicholas counties (e.g., McMichael 1965; MacDonald et al. 2006), suggests the potential for Middle Woodland sites, whether mortuary facilities or habitations, to be present in or adjacent the project area is low.

**Late Woodland**

Increased dependency on farming and sedentism is characteristic of the Late Woodland period. Corn agriculture was important at floodplain villages along major rivers, while wild resources in upland settings were collected by foraging groups. However, Niquette (1992) states that permanent villages centered on agriculture are not apparent in the southwest region of the state. Evidence for foraging activity has been identified at both open-air and rockshelter settings in the uplands (Adovasio 1982; Baker and Fowler 1975; Niquette and Donham 1985).

Perhaps the most common hafted biface type for the early Late Woodland (circa A.D. 400-750) is Chesser Notched. This type is associated with the Childers phase and contemporary manifestations in the Ohio and Kanawha valleys. The settlement pattern for this period has been described as nucleated villages (Dancey 1988, 1992), although others (Clay and Creasman 1999) question the validity of this interpretation.

In the Kanawha Valley, the late Late Woodland is recognized by the Parkline phase (Niquette and Hughes 1990). Settlement during this period consisted of small hamlets dispersed primarily in valleys, although small extractive sites also have been reported for upland settings. Large villages have not been documented. Diagnostic hafted biface types include Raccoon Notched, Jack’s Reef Pentagonal, and Levanna. Seeman (1992) suggests the introduction of these small hafted biface types reflects the local introduction of the bow and arrow.

Rock-tempered ceramics are typically cordmarked and have thickened rims and some true collars and cordwrapped-stick decoration. Z-twist cordage is most common.

McMichael (1965) discovered substantial evidence for Late Woodland occupation in Nicholas County. In particular, rockshelter sites produced large quantities of ceramics and lithic artifacts attributed to the Buck Garden culture. The potential for Late Woodland sites to be present in or adjacent to the project area is considered moderate to high.

**The Late Prehistoric Period**

The predominant Late Prehistoric population in the middle Ohio and Kanawha valleys is known by archaeologists as Fort Ancient. Most archaeologists now agree that the Fort Ancient tradition probably encompassed several cultural or linguistic groups.

Fort Ancient settlements exhibited three important elements: (1) increased reliance on agriculture, (2) increased sedentism, and (3) a rise in sociopolitical complexity. However, unlike contemporaneous Mississippian groups in the Midwest and Southeast, no large ceremonial centers or earthworks have been found at Fort Ancient sites that would indicate a similar settlement hierarchy. To date, the only site types identified for Fort Ancient in West Virginia are villages and small extractive camps. Although still a topic of debate, most archaeologists view Fort Ancient as an in situ development from local Late Woodland populations rather than a manifestation resulting from the influx or migration of Mississippian peoples.
Fort Ancient subsistence was based on corn agriculture, as well as other crops such as beans, squash, and sunflower. Despite the increased importance of domestic crops, resources obtained by hunting continued to be important.

Material culture included a greater range of ceramic vessel types (mostly jars with handles), triangular arrow hafted bifaces, and bone and mussel shell tools (e.g., knives, scrapers, and hoes).

In West Virginia, Fort Ancient territory begins on the Ohio River Valley south of the Northern Panhandle and encompasses the Ohio Valley and the drainages of the Little Kanawha, Kanawha/New, and Guyandotte Rivers. Most Fort Ancient sites in West Virginia are located along one of the most heavily traveled Native American trail networks in eastern North America.

A number of chronologies have been developed over the years for Fort Ancient culture (Drooker 1997; Essenpreis 1978; Graybill 1988; Griffin 1943b; Mayer-Oakes 1955). However, Fort Ancient occupation in the Ohio Valley can generally be separated into several distinct periods based on changes in settlement patterns, the variability of design elements in ceramics, and the occurrence of time-sensitive artifacts that have been shown to be cultural or temporal markers.

Throughout the Ohio Valley, Fort Ancient has been divided into Early Fort Ancient A.D. 1000/50-1200/50), Middle Fort Ancient 700-500 B.P. (A.D. 1200/50-1400/50), and Late Fort Ancient 500-300 B.P. (A.D. 1400/50-1650/1750). Late Fort Ancient has further been divided between precontact and post contact, or protohistoric (Drooker and Cowan 2001).

Early Fort Ancient

Early Fort Ancient settlements were small (1.5 ac [0.62 ha]) (Graybill 1981), plentiful, and located primarily on high terraces along larger drainages (Maslowski 1984). Both circular and elliptical-shaped middens occur, with a central plaza encircled by a domestic/habitation area. When present, burial mounds are associated with plaza areas, and the vast majority of tools, pits, and general kitchen refuse is associated with a midden ring. Both surface (summer?) and semi-subterranean pit houses (winter?) have been identified.

Villages appear to be functionally and economically autonomous, unlike the highly integrated system noted for Mississippian societies to the west. Subsistence was based on maize agriculture, as well as resources acquired through gathering and hunting. Faunal remains from this period indicate that a variety of species of mammals, birds, fish, and mollusks were consumed, with elk and white-tailed deer dominating the assemblage (Graybill 1988).

In West Virginia, Early Fort Ancient includes as many as ten sites, of which three have been examined through excavation. These are Roseberry Farm in Mason County, Miller in Jackson County, and Bartlett-Bird in Wood County (Graybill 1988). Based on extant data, diagnostic material culture for this phase includes angular straps, semilunar lugs and other handles on ceramics, excurvate base triangular hafted bifaces, and semiplatform pipes. Ceramic vessels are limited primarily to jars with constricted necks. Bowls and other vessel types are rare. Temper is usually crushed shell, with plain or smoothed exterior surface treatment. Appendages include a variety of lugs or strap handles placed on opposite sides of the vessel below castellations. When present, decoration usually consists of linear arrangements of punctates or linear gashes.

Other artifacts manufactured from chert, sandstone, and igneous/metamorphic rocks, bone, antler, and shell include a wide variety of utilitarian and decorative/ceremonial items such as knives, scrapers, celts, biconcave discs, elbow pipes, pendants, hammerstones, anvils, awls, needles, tubular beads, beamers, and hairpins.
Middle Fort Ancient

Middle Fort Ancient sites appear to share historical continuity with the preceding phase, with differences between the two more a matter of degree than kind (Graybill 1988). Diagnostic artifacts such as semilunar lugs, semiplatform pipes, and excrurate triangular hafted bifaces are absent from Middle Fort Ancient phase assemblages. During this period, triangular hafted bifaces with straight bases predominate, and decorated pottery reached its peak.

Evidence for site types and settlement-subistence systems suggests drastic changes in life-style did not occur. However, villages appear to be larger (3.06 ac [1.24 ha]) and fewer in number, suggesting consolidation or grouping of peoples, possibly for defensive purposes (Graybill 1981). Pithouses continue to occur with surface structures as evidenced at Blennerhassett Village where six pithouses were encountered (Graybill 1988).

In addition, the preference for high terraces appears to have shifted to flat floodplains. Within sites, plaza and domestic/habitation “zones” persist, but midden stains are exclusively elliptical-shaped and average about 1.2 ha in size. Burial mounds have not been identified for this period and the placement of interments shifted to the domestic (midden) area. Although few sites have been examined by excavation, evidence is lacking for the presence of stockades or other fortifications (Graybill 1988).

The subsistence base for Middle Fort Ancient is similar to the previous period with intensive maize agriculture supplemented by hunting and gathering (Graybill 1988). Botanical remains from this period include maize kernels, beans, and walnut shell from Blennerhassett Village and maize, hickory nut, and wild plum from Lewis Farm. White-tailed deer continue to dominate the faunal assemblage (Graybill 1988).

Late Fort Ancient

The Late Fort Ancient period is further divided into precontact (A.D. 1450-1550) and protohistoric (A.D. 1550-1650). During the Late Fort Ancient period, significant differences are observed in the archaeological record relative to earlier Fort Ancient sites. Perhaps because of increased interaction between Fort Ancient peoples, the regional diversity previously apparent disappears. Villages are larger than before (4.67 ac [1.89 ha]) and are located in floodplain or T-0 settings (Graybill 1981, 1988). Pithouses are no longer found. Surface structures are larger than before and palisades begin to appear around villages (Graybill 1988).

Ceramics show great similarity over a large area in regard to vessel type, form, temper, and surface treatment, suggesting a high level of interaction and possible loss of village-level autonomy. The range of vessel types is expanded to include constricted neck jars, bowls, salt pans, and colanders. The type and amount of decoration and appendage use varies between vessel types, although cordmarked and plain exteriors predominate. Pestles, figurines, and pipes represent other types of ceramic artifacts common to this period (Graybill 1988).

The lithic inventory includes a variety of triangular hafted bifaces, as well as bifacial cutting tools, drills, and unifacial scrapers. In addition, disc pipes often manufactured from red catlinite, and effigy pipes are present. Items of bone and shell similar to those common on earlier Fort Ancient sites are found, although incised tubular bone beads and combs also occur. In addition, there is a marked increase in the use of marine shell to fashion ornaments. Conch or whelk columnella, marginella, and olivella shell beads occur, as do those of fresh water pearl.

Several precontact Late Fort Ancient sites are located on the upper Kanawha/New River drainage. These are Mount Carbon, Burning Spring Branch, Marmet Bluffs, and three Bluestone sites. At the Mount Carbon site, a mixture of Fort Ancient and Virginia-Siouan traits has been identified, although it is not clear whether two discrete components or a single Fort Ancient occupation with Siouan contact is represented (Graybill 1988).

Recent excavations for the Marmet Lock Replacement project on the Kanawha River at
Malden, West Virginia, revealed a previously unknown Late Prehistoric village across the river from the protohistoric Marmet Village (Pullins et al. 2008). Burning Spring Branch (46Ka142) is a Late Prehistoric palisaded village of approximately 25 houses with radiocarbon dates circa A.D. 1500. An abundance of shell-tempered pottery was found at the site, as well as bone and stone tools. The absence of European trade items corroborates the precontact date for the site.

Shortly after the arrival of the first significant European incursion into eastern North America by the entra da of Hernando de Soto in 1539, European trade goods of glass, iron, and brass/copper began to make their way inland along the established trade routes. Ornaments such as glass beads, metal tinklers, pendants, and animal effigy cutouts, as well as utilitarian items such as axes, knives, and chisels have been found on protohistoric sites in West Virginia (Graybill 1988).

Engraved marine shell gorgets with rattlesnake and weeping eye motifs have been identified at a number of Late Fort Ancient sites (Brasher and Moxley 1990; Graybill 1988; Hoffman 1997). Although these items were sometimes found before European contact, marine shell gorgets, especially the masks with the weeping eye design, are more frequent on protohistoric sites with European artifacts. Marine shell masks have been found in a widely dispersed pattern as far away as the Plains and Canada (Brain and Phillips 1996; Hoffman 1997). Some archaeologists think this might represent a movement of people out of the Southeast, where most of the marine shell ornaments were manufactured, following the cultural disruptions associated with European contact (Brain and Phillips 1996).

Important protohistoric Late Fort Ancient sites in West Virginia include Clover (46Cb40), Buffalo (46Pu31), Marmet Village (46Ka9), Logan (46Lg4), Neale’s Landing (46Wd39), Orchard (46Ms61), and Rolf Lee (46Ms51/123). Most of these sites are multi-component. Five of these sites, Clover, Rolf Lee, Buffalo, Marmet Village, and Logan, are located in the floodplain, while two other sites, Orchard and Neale’s Landing, are located on high terraces. It has been suggested that mortuary practices at sites such as Buffalo, where many individuals were buried in the floors of houses, are most similar to eastern Siouan-speaking peoples (Maslowski 1984).

The artifact assemblages and greater frequency of mortuary vessels from Orchard and Neale’s Landing are similar to Madisonville/Lower Shawneeetown and the Riker site in Ohio (Maslowski 1984). At the Orchard site, 30 percent of the individuals were buried with one or more ceramic vessels (Moxley 1988). The form and surface treatment of the vessels from Orchard and Neale’s Landing are very similar to those found at Madisonville and Riker in Ohio, indicating interaction between these sites and non-Fort Ancient Whittlesey sites in northeastern Ohio (Baker 1988; Hoffman 2001; Moxley 1988).

Animal and human figurines occurred at Clover, Buffalo, and Rolf Lee, but with less frequency at Orchard and Madisonville sites (Maslowski 1984). Twenty-one modeled clay objects were recovered from Neale’s Landing; however, they were much cruder than Clover specimens (Hemmings 1977). Common to all site types were triangular hafted bifaces with concave bases, as designated by Graybill (1981).

Pipes were also common throughout protohistoric sites. Fifty pipes exhibiting a range of shape and material were found at the Orchard site (Moxley 1988). The Buffalo site produced five pipes, of which two were bird effigies, two vasiform, and one disc platform (Hanson 1975). Vasiform pipes have been found at Clover, Orchard, and Madisonville (Maslowski 1984), and disc platform pipes have been reported at Buffalo (Hanson 1975), Rolf Lee (Maslowski 1984), and Madisonville (Hooton and Willoughby 1920). Narrow, triangular, and rectangular pipes have been found at Riker, Orchard, and Madisonville (Maslowski 1984).

No one knows exactly when or why protohistoric groups abandoned the Ohio Valley, or to where they migrated. Pressure from the Five Nations Iroquois to the north was
probably one factor, as well as the imminent arrival of European settlers. For whatever reason, by the end of the seventeenth century, the Upper Ohio Valley, including Fort Ancient territory in West Virginia, was depopulated.

McMichael (1965) discovered only minor evidence for Late Prehistoric occupation in Nicholas County. Evidence for this late period of prehistoric occupation was derived from shell-tempered ceramics and triangular points. Often these deposits were mixed with those of earlier occupations. The existing record indicates Late Prehistoric peoples made use of rockshelter and open-air settings in upland environments not unlike those that typify the project area. However, the main settlements or villages were located on alluvial landforms along significant waterways. The upland sites probably reflect short-term extractive camps that may have been occupied seasonally.

Concluding Remarks

Evidence from the published record (MacDonald et al. 2006; McMichael 1965) and a large number of unpublished reports completed primarily for Section 106 compliance projects, including many conducted by CRA, indicate clearly that central and southern West Virginia were occupied throughout all or most of local prehistory. Based on site frequency, the most intensive occupation of the region, including Greenbrier County, appears to have occurred during the Early Archaic, Late Archaic, and Late Woodland temporal periods. Middle Archaic and Late Prehistoric are also present, but at lower frequencies. Less evidence has been discovered for Paleoindian occupation, although the recovery of a small number of diagnostic points indicates some utilization of the area.

Because of the upland setting of the region, most sites are associated with stable or eroding landforms, which results in the accumulation of both mixed and disturbed cultural deposits. The best evidence for intact sites comes from rockshelters and open-air sites located along streams in alluvial settings.

Upland sites are often small and probably formed as the result of extractive activities and/or short-term encampments and stations. Because most uplands sites were not utilized intensively or for long periods, the archaeological record is characterized by artifact scatters confined to surface and shallow subsurface contexts, which in most instances are dominated by lithic waste material produced during tool maintenance or manufacture.

IV. HISTORIC OVERVIEW

A historic context for the region surrounding the Beech Ridge Wind Energy Facility has been previously developed by BHE Environmental, Inc. and Gray and Pape, Inc. (Sweeten and O’Bannon 2007), and will not be repeated here. Instead, this context was reviewed in conjunction with readily available historic-period maps to provide information for what types of historic activities may have occurred within the Project. Specifically, three categories of activities were isolated for further discussion: (1) farming; (2) industrial timbering and mining; and (3) events surrounding the American Civil War.

Farming

A review of the developed historic context and supplementary research on Greenbrier and Nicholas counties, suggests that agrarian or mountain farming played a significant role during the early settlement of both counties. Agrarian mountain farming evolved through time, as population and industrial pressures changed in West Virginia and many family farmsteads were abandoned during the early twentieth century. However, reviewed evidence suggests that farming, particularly in Greenbrier County, remains an important activity today.

During early settlement and throughout much of the nineteenth century, most upland landforms were not occupied due to their high elevation and channery soils, both of which hampered easy cultivation and habitation, especially during the winter months. Instead, upland ridges, like those found within the
Project, would have been primarily used for stock grazing. At this time occupation in upland areas was typically confined larger tracts of level land.

A review of an 1887 map of Greenbrier County and early twentieth-century USGS 15-minute quadrangles depict little development in the uplands near the Project (Figures 4–6).

**Industrial Timbering / Mining**

Historic contexts for the region suggest that during late nineteenth and twentieth centuries, upland portions of northern Greenbrier County were exploited heavily for their timber and coal resources. Much of the area in the vicinity of the Project is believed to have been under lease to several nearby timber/lumber companies during this period, and was probably clear-cut. Most of the project vicinity has remained under the ownership of Mead Westvaco, and its predecessors Westvaco and the West Virginia Pulp and Paper Company, which manages and continues to harvest upland timber resources. The abundance of surrounding mill and lumber communities also indicates that logging in this region of Greenbrier County was an important activity.

No established mill or lumber towns are known to have existed within the boundaries of the Project. The majority of these communities (e.g., Farmdale, Crawley, Williamsburg, Kieffer, Trout, Rupert, McClung, Alderson, Blue Sulphur Springs, Smoot, Dawson, Fort Spring, Meadow Bluff, Rainelle, Russellville, Richwood, and Fenwick) were historically located in valley settings where streams and railroads allowed for easy access to broader markets. However, it was common practice for temporary logging camps to be established near harvest areas. These communities were so temporary they were rarely depicted on standard maps, and therefore, their locations can be difficult to predict.

Coal mining was also identified as an important industry that influenced local development. As discussed by Sweeten and O’Bannon (2007), early commercial mining provided fuel to aid the timber industry. However, as the twentieth century progressed and standard gauge railroads expanded deep into remote areas, new opportunities arose and the mining industry expanded.

**Events Surrounding the American Civil War**

The historic context developed by Sweeten and O’Bannon (2007) and other accounts of the American Civil War suggest that Cold Knob Mountain, which runs to the east of the proposed turbine sites, contained a trace by the same name that was used during the war. The exact route of this trace is unknown, although, based on the reviewed accounts and an 1887 map (Figure 4), the road appears to have run along the spine of Cold Knob Mountain, located between Trout in Greenbrier County and Richwood in Nicholas County. Today, CR 10-1 (Richwood/Greenbrier Roads) follows a similar path. While not confirmed, accounts also suggest that a second route across northern Greenbrier County into southern Nicholas County past Job Knob on Beech Ridge was also utilized at least once during the war. Again, the exact route is in question, but it may have closely paralleled modern day CR 1-1 (Beech Ridge/Pole Roads). It is interesting to note that this second route is not charted on the 1887 map (Figure 4), suggesting that a formal road may not have existed along Beech Ridge during the nineteenth century.

Reviewed accounts of events during the American Civil War, including an online word search of the Official Records of the Civil War (Official Records) found no evidence that skirmishes, engagements, raids, or battles occurred within the vicinity of the Project.
Figure 4. Portion of 1887 Map of Greenbrier County depicting Project location.
Figure 5. Portion of 1921 USGS 15-minute Richwood, WV topographic quadrangle depicting Project location.
Figure 6. Portion of 1935 USGS 15-minute Richwood, WV topographic quadrangle depicting Project location.
V. DESKTOP ANALYSIS AND FIELD RECONNAISSANCE SURVEY

The desktop analysis has two primary goals. The first is to provide Beech Ridge Energy and review agencies with information regarding the presence of any previously recorded sites, including those listed on the NRHP, located within or adjacent to the Project. The second is to generate information for the physical character and settlement/use history of the Project to determine if locations or landforms with high probability to contain archaeological sites can be identified, and if possible, to provide some insight for the type of sites that might be present. The identification of such resources and locations in the planning stages of the project supports Beech Ridge Energy’s goal to avoid and/or minimize effects to significant archaeological sites. The resulting information also provides a basis for identifying survey strategies, which may be implemented for the completion of the Phase I identification survey should it be required.

To gather current information for the condition of the Project, a field reconnaissance survey was completed. The reconnaissance consisted of a non-systematic examination of the Project using pedestrian survey and limited shovel probing.

Desktop Analysis Goals and Methods

Specific goals of the desktop analysis are 1) to define physical characteristics of the Project for the purpose of determining the probability of archaeological sites, and 2) to identify previously recorded sites and surveyed areas located within and adjacent to the Project.

Information for the physical characteristics that define the landscape for the Project was obtained from a preliminary GIS analysis conducted with Project location data provided by Beech Ridge Energy. This included an analysis of slope and soils present within the Project. The slope analysis was based upon elevation models available through the Natural Resources Conservation Service (NRCS). The percentage of sloped vs. non-sloped topography was determined through analysis with ArcGIS. The types, frequencies, and characteristics of soil series likely to be encountered were determined by analysis of Soil Survey Geographic (SSURGO) data acquired from the NRCS.

Information for previously recorded sites and surveyed areas located within and adjacent to the Project was obtained from a record review completed at the WVSHPO, and from in-house files housed at CRA. Also examined were late nineteenth and early twentieth-century maps. These maps were georeferenced to overlay the Project shapefiles.

Reconnaissance Survey Goals and Methods

The primary goal of the reconnaissance survey was to gather preliminary information for the current condition of the Project, including information for access, type and extent of disturbance, presence of bedrock overhangs, and presence of archaeological sites.

Project Identification

For the reconnaissance CRA personnel used Garmin GPSMap 60CSx Chartplotting receivers (units) to verify locations in the field. Project boundaries provided to CRA by Beech Ridge Energy were first plotted onto the USGS 7.5-minute Nettie, Richwood, Duo, and Quinwood topographic quadrangles using the track function in Maptech Terrain Navigator software. Maps for use with the units were downloaded from the Garmin MapSource Eastern United States Topographic Maps CD-ROM. The datum used by both packages of software was projected into Universal Transverse Mercator (UTM) coordinates using North American Datum 1983 (NAD83). The geo-referenced tracks created in Maptech Terrain Navigator were loaded directly onto the units and appeared as overlays on the quadrangles. The units were then used in the field to verify the boundaries of the Project.

Pedestrian Survey

Access to the Project by truck and ATV is limited primarily to the area around and east of
Beech Knob. The central and southern parts of the Project are currently not accessible (or easily accessible) by motorized vehicle. Roads that might have provided access into the southern part of the Project are currently used by an active mining operation, and unauthorized access is prohibited. For these reasons the pedestrian survey was the primary method used to examine the Project. The Project was not examined systematically. Instead, the focus was to gather preliminary information for the condition / integrity of Project landforms / areas as an aid for evaluating the probability for the presence on intact archaeological sites.

Shovel Probing

This method was used to sample subsurface contexts. Shovel test probes (STPs) were excavated only when evidence of disturbance was not evident and/or landforms with slopes visually estimated to be less than 20 percent were present. STPs measured about 50 cm (19.7 in) in diameter and extended into culturally sterile deposits or until the presence of rocky deposits prevented further excavation. Excavated soil was not screened, as the goal was to document the integrity of the soil profile.

Field Documentation

Project area conditions and survey results were recorded using a combination of notes and high-resolution digital photography.

Results of Desktop Analysis

Topography

Based on current mapping, the Project incorporates approximately 2,108.5 ha (5,210 acres) of narrow upland ridge, steep sideslope, and narrow hollow bottoms, with elevations ranging from approximately 930.4 to 1,263.1 m (3,052.5 to 4,144.0 ft) above mean sea level (msl). Landforms are typical of the region. GIS analysis indicates that approximately 78 percent (1,644.6 ha, 4,063.8 acres) of the Project supports slopes in excess of 20 percent, with the remaining 463.9 ha (1,146.2 acres) having slopes less than 20 percent (Figure 7). Landforms with slopes less than 20 percent are primarily located along linear ridgetops and side spurs. Some of the landforms with slopes less than 20 percent are the result of former contour mining, and thus are not natural to the landscape (Figures 2 and 7).

Soils

Analysis of the SSURGO data acquired for the Project identified 17 NRCS soil-mapping units belonging to nine distinct series or complexes (Figure 8; Table 1). As the data in Table 1 indicate, all project soils developed in residuum, colluvium, or regolith. Soils developed in regolith are associated with areas of former coal mining, and represent man-made landforms, with those developed in residuum or colluvium associated with natural landforms. Given the nature of the parent materials for Project soils, the high percentages of rocky inclusions present is not unexpected. In many instances the inclusions of sandstone, shale, and other lesser materials are angular to subangular and up to 10-inches or more in length. Lacking from the Project are alluvial soils. Because land surfaces of the Project are eroding / deflating rather than aggrading, the potential for buried sites is low to non-existent in most areas.

The information presented in Table 2 indicates that the vast majority of Project soils are well drained; this is a common attribute for upland soils in the region with high percentage of rocky inclusions. Examined by slope, and excluding the Kaymine-rock outcrop complex unit which is man-made, a relatively small amount of the Project has slopes less than 15 percent, and the vast majority supports slopes in the range of 35-55 percent.
Figure 7. Map of Project depicting results of the slope analysis.
Figure 8. Map showing Project soils.
### Table 1. Project Soil Data.

<table>
<thead>
<tr>
<th>NRCS Soil Unit</th>
<th>Percent Slope</th>
<th>Drainage¹</th>
<th>Percent of Project</th>
<th>Parent Material</th>
<th>Percent Rocky Inclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Berks-Dekalb complex</td>
<td>3-15</td>
<td>WD - EWD</td>
<td>0.81</td>
<td>Residuum</td>
<td>Berks, 10-75 in solum, 35-90 in C horizon; Dekalb, 35-75 increases with depth</td>
</tr>
<tr>
<td>Berks-Dekalb complex</td>
<td>15-35</td>
<td>WD - EWD</td>
<td>0.79</td>
<td>Residuum</td>
<td>Berks, 10-75 in solum, 35-90 in C horizon; Dekalb, 35-75 increases with depth</td>
</tr>
<tr>
<td>Cookport loam</td>
<td>3-8</td>
<td>MWD</td>
<td>0.1</td>
<td>Residuum</td>
<td>0-30 in solum; 10-60 in C horizon</td>
</tr>
<tr>
<td>Ernest silt loam</td>
<td>3-15</td>
<td>MWD &amp; SPD</td>
<td>0.15</td>
<td>Residuum</td>
<td>0-50</td>
</tr>
<tr>
<td>Gilpin channery silt loam</td>
<td>1-15</td>
<td>WD</td>
<td>0.35</td>
<td>Residuum</td>
<td>5-40 in solum; 30-90 in C horizon</td>
</tr>
<tr>
<td>Gilpin channery silt loam</td>
<td>15-35</td>
<td>WD</td>
<td>0.44</td>
<td>Residuum</td>
<td>5-40 in solum; 30-90 in C horizon</td>
</tr>
<tr>
<td>Kaymine-rock outcrop complex</td>
<td>3-15</td>
<td>WD</td>
<td>11.5</td>
<td>Regolith from coal mining</td>
<td>15-80 throughout profile</td>
</tr>
<tr>
<td>Macove channery silt loam</td>
<td>15-35</td>
<td>WD</td>
<td>0.04</td>
<td>Colluvium</td>
<td>10-75, variable by horizon</td>
</tr>
<tr>
<td>Macove channery silt loam</td>
<td>3-15</td>
<td>WD</td>
<td>3.65</td>
<td>Colluvium</td>
<td>10-75, variable by horizon</td>
</tr>
<tr>
<td>Macove-Gilpin complex</td>
<td>35-55</td>
<td>WD</td>
<td>27.22</td>
<td>Colluvium</td>
<td>Macove, 10-75, variable by horizon; Gilpin, 5-40 in solum; 30-90 in C horizon</td>
</tr>
<tr>
<td>Mandy channery silt loam</td>
<td>1-15</td>
<td>WD</td>
<td>4.84</td>
<td>Residuum</td>
<td>10-70 in solum, 60-90 in C horizon</td>
</tr>
<tr>
<td>Mandy channery silt loam</td>
<td>15-35</td>
<td>WD</td>
<td>13.4</td>
<td>Residuum</td>
<td>10-70 in solum, 60-90 in C horizon</td>
</tr>
<tr>
<td>Mandy channery silt loam</td>
<td>35-55</td>
<td>WD</td>
<td>21.55</td>
<td>Residuum</td>
<td>10-70 in solum, 60-90 in C horizon</td>
</tr>
<tr>
<td>Snowdog silt loam</td>
<td>3-5</td>
<td>MWD</td>
<td>0.96</td>
<td>Colluvium</td>
<td>5-45 in solum, 20-75 in lower Bt and C horizon</td>
</tr>
<tr>
<td>Snowdog silt loam</td>
<td>15-35</td>
<td>MWD</td>
<td>3.49</td>
<td>Colluvium</td>
<td>5-45 in solum, 20-75 in lower Bt and C horizon</td>
</tr>
<tr>
<td>Snowdog silt loam</td>
<td>35-55</td>
<td>MWD</td>
<td>4.34</td>
<td>Colluvium</td>
<td>5-45 in solum, 20-75 in lower Bt and C horizon</td>
</tr>
<tr>
<td>Summers very channery sandy loam</td>
<td>0-15</td>
<td>WD</td>
<td>6.37</td>
<td>Residuum</td>
<td>20-60 in solum, 60-70 in C horizon</td>
</tr>
</tbody>
</table>

¹WD=well drained; EWD=excessively well drained; MWD=moderately well drained; SPD=somewhat poorly drained.

### Table 2. Project Soil Data Summary.

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Percent of Project</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Soil Drainage</strong></td>
<td></td>
</tr>
<tr>
<td>Well drained</td>
<td>89.36</td>
</tr>
<tr>
<td>Moderately well drained</td>
<td>8.89</td>
</tr>
<tr>
<td>Well drained-excessively well drained</td>
<td>1.60</td>
</tr>
<tr>
<td>Moderately well drained - somewhat poorly drained</td>
<td>0.15</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100.00</strong></td>
</tr>
<tr>
<td><strong>Percent Slope</strong></td>
<td></td>
</tr>
<tr>
<td>0-15</td>
<td>13.62</td>
</tr>
<tr>
<td>15-35</td>
<td>21.77</td>
</tr>
<tr>
<td>35-55</td>
<td>53.11</td>
</tr>
<tr>
<td>Kaymine-rock outcrop complex (man-made from mining)</td>
<td>11.50</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100.00</strong></td>
</tr>
</tbody>
</table>
Records Review

The search of archaeological records for this project was completed on August 4, 2011, at the WVSHPO in Charleston (Appendix A). Results indicate that eight previous professional surveys included tracts located 1.6 km (1.0 mi) of the Project, with four of these located within, or partially within, the Project. These investigations resulted in the recordation of four sites (46GB449, 46GB450, 46GB467, and 46GB468) located within the Project. Details of these surveys and previously identified sites are summarized below.

Previous Archaeological Investigations and Recorded Sites

Information obtained from the WVSHPO files document eight cultural resources surveys within 1.6 km (1 mi) of the Project (Table 3). Some of the previous work was completed for coal-prospecting / mining projects and others for the Beech Ridge Wind Energy Facility. These surveys resulted in the documentation of eight sites, four of which are located within the Project (Table 4).

In 1993 the WVSHPO cleared a project internally (93-1308-GB). No report is on file for this project and at this time no additional is available.

In 1995, Greenbrier Coal Company planned to construct a new deep mine face-up along Beech Ridge (FR# 95-277-GB). In conjunction with this was the plan to construct a new haul road connecting the proposed face-up with existing coal company facilities (FR# 95-276-GB). The face-up was to occupy 9.38 acres of land along a 20-40 degree slope. Field visits to both project areas by Lora Lamarre of the WVSHPO failed to discover evidence for sites. No additional archaeological investigations were recommended. In 2008, personnel from CRA conducted Phase I archaeological survey of approximately 69.9 ha (172.6 ac) for the proposed Beech Ridge Wind Energy Facility and associated Transmission Support Line in Greenbrier and Nicholas counties (Meece and Smith 2008). The survey resulted in the identification of six newly recorded archaeological sites (46GB445-46GB450) (Meece and Smith 2008). Site 46GB445 is a potential stone mound, 46GB446 a multicomponent artifact scatter containing prehistoric lithic debris and historic-period refuse, and 46GB447 and 46GB448 possible historic-period gravesites. Sites 46GB449 and 46GB450 are prehistoric lithic scatters of unknown cultural and temporal affiliation. Of these sites, 46GB449 and 46GB450 are located within the current Project (Figure 9).

In April 2009, CRA completed Phase I survey of an 8.9-ha (22.1-ac) tract selected for a proposed laydown and batch plant for the Beech Ridge Wind Energy Facility (Meece 2009). Systematic survey resulted in the identification of previously undocumented site 46GB467, defined as a prehistoric lithic scatter of unknown cultural and temporal affiliation. This site is located within the current Project (Figure 9).

In September 2009, CRA completed additional Phase I survey for the Beech Ridge Wind Energy Facility, with approximately 0.92 ha (2.26 ac) of ridgetop saddle for an Operations and Maintenance Facility examined (Baker 2009). The survey identified 46CB468, a previously unrecorded site reported as a multicomponent, low-density artifact scatter containing mixed deposits of prehistoric lithic materials and historic/modern domestic material within disturbed contexts. Evidence of cultural features and/or midden was not discovered. This site is located with the current Project (Figure 9).

In March 2010, CRA examined areas for seven turbine sites and associated access roads for the Beech Ridge Wind Energy Facility (Meece 2010). Approximately 1.5 ha (3.7 acres) of upland ridge were examined. No sites were identified.

The previous surveys completed by CRA for the Beech Ridge Wind Energy Facility examined approximately 23.8 ha (58.9 acres) of the current Project. The areas examined are located in the northeast part of the Project, at and east of Beech Knob (Figure 9). Surveyed areas included the locations of Potential Expansion Turbines 01-08 and Potential Alternate Expansion Turbines 01-03.
Figure 9. Topographic maps depicting Project and previously recorded sites and surveys.
Table 3. Previous Cultural Resources Surveys Located within 1.6 km (1 mi) of Project.

<table>
<thead>
<tr>
<th>WVSHPO</th>
<th>Report/Survey</th>
<th>Investigator</th>
<th>Date of Survey</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>93-1308-GB</td>
<td>Unknown</td>
<td>WVSHPO</td>
<td>1993</td>
<td>Cleared internally – no field investigation?</td>
</tr>
<tr>
<td>95-276-GB</td>
<td>Greenbrier Coal Company SMA 3030-94, Haul Road</td>
<td>WVSHPO</td>
<td>1995</td>
<td>No archaeological sites identified</td>
</tr>
<tr>
<td>95-277GB</td>
<td>Greenbrier Coal Company SMA 3030-94, Deep Mine</td>
<td>WVSHPO</td>
<td>1995</td>
<td>No archaeological sites identified</td>
</tr>
<tr>
<td>95-293-GB</td>
<td>Greenbrier Coal Company Permit No. P-3025-94</td>
<td>WVSHPO</td>
<td>1995</td>
<td>No archaeological sites identified</td>
</tr>
<tr>
<td>06-147-GB-27</td>
<td>Addendum II to the Phase I Archaeological Survey of the Beech Ridge Wind Energy Project &amp; Associated Transmission Support Line, Greenbrier and Nicholas Counties, West Virginia.</td>
<td>CRA</td>
<td>2009</td>
<td>46CB468 identified</td>
</tr>
<tr>
<td>06-147-GB-29</td>
<td>Addendum III to the Phase I Archaeological Survey of the Beech Ridge Wind Energy Project &amp; Associated Transmission Support Line, Greenbrier and Nicholas Counties, West Virginia</td>
<td>CRA</td>
<td>2010</td>
<td>No archaeological sites identified</td>
</tr>
</tbody>
</table>

Table 4. Previously Recorded Sites within 1.6 km (1.0 mile) of Project.

<table>
<thead>
<tr>
<th>WVSHPO</th>
<th>Site Description</th>
<th>Investigator</th>
<th>Inside Project</th>
<th>NRHP Recommendation</th>
<th>WVSHPO Concurrence with NRHP Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>06-147-GB-23</td>
<td>46GB449, unassigned prehistoric lithic scatter located in a wide bench. Recovered artifacts consist of 3 pieces of chert debitage recovered from 3 shovel probes. No diagnostic artifacts recovered. Site context disturbed.</td>
<td>CRA</td>
<td>Yes</td>
<td>Not eligible</td>
<td>Yes</td>
</tr>
<tr>
<td>06-147-GB-23</td>
<td>46GB450, unassigned prehistoric lithic scatter located on hillside bench. Recovered artifacts consist of 2 pieces of chert debitage recovered from 2 shovel probes. No diagnostic artifacts recovered.</td>
<td>CRA</td>
<td>Yes</td>
<td>Not eligible</td>
<td>Yes</td>
</tr>
<tr>
<td>06-147-GB-25</td>
<td>46GB467, unassigned prehistoric lithic scatter located on ridgetop. Recovered artifacts consist of 12 pieces of chert debitage recovered from 10 shovel probes. No diagnostic artifacts recovered.</td>
<td>CRA</td>
<td>Yes</td>
<td>Not eligible</td>
<td>Yes</td>
</tr>
<tr>
<td>06-147-GB-27</td>
<td>46GB468, multicomponent, low-density artifact scatter containing mixed deposits of prehistoric lithic materials and historic/modern domestic material within disturbed contexts. No diagnostic prehistoric artifacts recovered.</td>
<td>CRA</td>
<td>Yes</td>
<td>Not eligible</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Reconnaissance Results

The majority of the Project was examined by walkover survey during a two-day field session, with additional visual observations collected from numerous vantages used to gather information for other parts of the project area. The pedestrian survey was focused on ridgetops and other landforms believed to have the highest probability to contain archaeological sites, including the long, linear ridges that define the higher elevations of the Project.

Areas examined included the locations of 35 (74.5 percent) of the proposed 47 Expansion and Alternate Expansion turbines. This included the 11 sites for Expansion Turbines 01-08 and Potential Alternate Expansion Turbines 01-03 located in the northern part of the Project, north and east of Beech Knob (Figure 9). Review of records indicates this area of the Project was previously surveyed by CRA, with the 11 sites referenced as Turbine Sites I-1 thru I-7 and J-8 thru J-11 (Meece and Smith 2008). The location of these turbine sites with their 2008
and current designations is provided in Figure 9.

The reconnaissance also examined the locations of Potential Expansion Turbines 09–22, 28, 32, 33, and Potential Alternate Expansion Turbines 04-10 (Figure 9). The remaining turbine sites, which are situated on ridgetops in the southernmost part of the Project, were not directly examined during the reconnaissance due to lack of access. However, visual observations of these areas were made from various vantages.

Most of the Project has been impacted in recent years by clear-cut logging. As a result, the area is largely covered in thick vegetation consisting of brush, briars, and saplings. Only isolated patches of older growth forest remain. When the area was logged, skidder and haul roads were constructed, resulting in extensive impacts as indicated by bulldozed roads cut into subsoil and large numbers of push piles. Evidence for other impacts included those related to coal prospecting. For example, evidence for core drilling was documented at the location of Alternate Turbine 07.

As expected, the Project is defined by very rocky soils and rock outcrops. Although difficult to capture in photographic images due to the thickness of vegetation, large, angular pieces of rock cover a large percentage of the Project’s surface. While traversing slopes no evidence for developed bedrock overhangs of the type/size typically associated with human use or occupation was discovered. Representative conditions defining the Project are provided in Figures 10-20.

Figure 10. View of clear-cut slope on ridge locations of Expansion Turbines 09-17.
Figure 11. View of young saplings and evidence of timbering activities in area of Alternate Turbine 06.

Figure 12. Young growth forest in area of Alternate Turbine 05.
Figure 13. Overview of Alternate Turbines 15 and 16 depicting recent timbering.

Figure 14. Ground surface in area of Alternate Turbine 05 showing rocky conditions typical of many ridgetop areas.
Figure 15. Ground surface in area of Alternate Turbine 04 showing rocky conditions typical of ridgetops in southwest part of the Project.

Figure 16. Exposed bedrock at location of Expansion Turbine 33.
Figure 17. Push pile at location of Alternate Turbine 06, example of typical disturbance at most turbine locations.
Figure 18. Vegetation on older push pile in area of Expansion Turbine 12.

Figure 19. Core drilling pad located at Alternate Turbine 07.
VI. CONCLUSIONS AND RECOMMENDATIONS

Information obtained from the desktop analysis and reconnaissance survey provide important information for assessing the archaeological potential of the Project, and specifically as it relates to the probability of significant sites that would be eligible to the NRHP.

Important results of the desktop analysis are:

- The Project is defined by a rugged upland landscape typical for the larger region;
- Approximately 11.5 percent (242 ha / 599 acres) of the Project consists of man-made landforms associated with abandoned coal mines;
- Of the 1,866 ha (4,611 acres) of natural landforms in the Project, approximately 11.8 percent (221 ha / 547 acres) have slopes of 20 percent or less; the remaining 1,645 ha (4,064 acres) are steeply sloped, with most in the 35–55 percent range;
- Project soils developed in residuum and colluvium and contain large quantities of rocky material – alluvial soils are not represented;
- The probability for buried sites is low, and most landforms in the Project have no potential to contain buried sites;
- Previously recorded sites (N=4) located within and near the Project are located on ridgetops and other landforms with slopes less than 15–20 percent;
- Each of the previously recorded sites located within the Project is on a landform mapped as Mandy channery silt loam, 3 –15% slopes;
- No previously recorded sites located within 1.6 km (1.0 mi ) of the Project are located on steep mountain or ridge slopes;
- Previously recorded prehistoric sites are represented primarily by low-density lithic scatters of unknown age and cultural affiliation that have been determined not eligible to the NRHP;
- Review of historic maps found no evidence for historic residential development of the Project;
- The potential of the Project to contain significant sites associated with the Civil War is low; and
- The potential of the Project to contain significant industrial sites associated with the timbering or mining industries is low.

Important results of the reconnaissance survey are:

- The vast majority of the Project, including ridgetops, has been clear-cut in the recent past, resulting in widespread disturbance;
- Large areas of the Project have very rocky surfaces;
- Bedrock exposures do not include well developed overhangs; and
- Confirmation for the presence of disturbance associated with prior mining activities.

Based on the results discussed above it is apparent that the majority of the Project has low probability to contain archaeological sites, and especially sites that would qualify for inclusion in the NRHP under Criterion D, for their potential to yield information important in history or prehistory. The parts of the Project with the greatest probability to contain sites are ridgetops and other landforms with slopes less than 15-20 percent; including those supporting Mandy series soils where all previously recorded sites in the Project have
been identified. However, as documented by the reconnaissance survey, the integrity of surface and near surface contexts within the Project, and especially on the more level landforms, has been extensively compromised by recent timbering activities and some mining exploration. In these areas roads have been bulldozed and/or worn into subsoil, and any sites with aboveground remains would probably have been disturbed. For the latter, the thickness of vegetation presents a formidable obstacle to their identification.

**Recommendations**

Based on information resulting from this study CRA provides the following recommendations:

1. Survey of steep slopes in excess 20 percent is not warranted;

2. Further examination of previously recorded sites 46GB449, 450, 467 and 468, and survey of areas previously examined by CRA for the Beech Ridge Wind Energy project are not warranted;

3. Excluding man-made land and highly disturbed areas examined by the reconnaissance, a survey of ridgetops and other landforms with slopes less than 20 percent should be completed, with specific attention given to the approximate 13.1 ha (32.9 acres) of Mandy channery silt loam, 3-15% slopes not examined during the prior surveys.

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APPENDIX A:

WVSHPo USER REGISTRATION & RESEARCH RECORD FORM
West Virginia State Historic Preservation Office

Cultural Resources Files and Library
User Registration and Research Record Form

INSTRUCTIONS: Part I must be completed before you will be permitted access to the SHPO Cultural Resource Files and Library. Part II is a record of the site files, cultural resource reports, USGS topographic maps and other materials you utilize during your visit. Part III will be completed and signed by a SHPO staff member only when you have completed your research and have returned the materials to which you have been given access.

I. IDENTIFICATION

DATE: 8/4/11

Name(s): Amber Hill

Organization or Company: CRAL

Address: 3556 Tony's Valley Rd, Suite 3

Hurricane, WV Phone: 304-562-7238

FR Number (if known)

II MATERIALS UTILIZED

ARCHAEOLOGY:

USGS QUAD MAP NAMES:

Duo, WV
Quinwood, WV
Richwood, WV

ARCHAEOLOGY SITE FORM #s

46 GB 449
46 GB 467
46 GB 450
CRM Reports/Publications
06-147 GB
06-276 GB
06-277 GB
06-293 GB

SURVEY AND NATIONAL REGISTER:
County Survey Files

National Register Files

Other Materials
Civil War Maps
Coal Heritage Maps

III MATERIALS RETURNED IN GOOD ORDER

DATE: 8/4/11 # Photocopies $  

USER NAME: Amber Hill

SHPO STAFF SIGNATURE:  
(Signature assures that materials have been returned to file)