Large Filing Separator Sheet

Case Number: 10-2865-EL-BGN

File Date: 3/10/11

Section: 8

Number of Pages: 148

Description of Document: Application

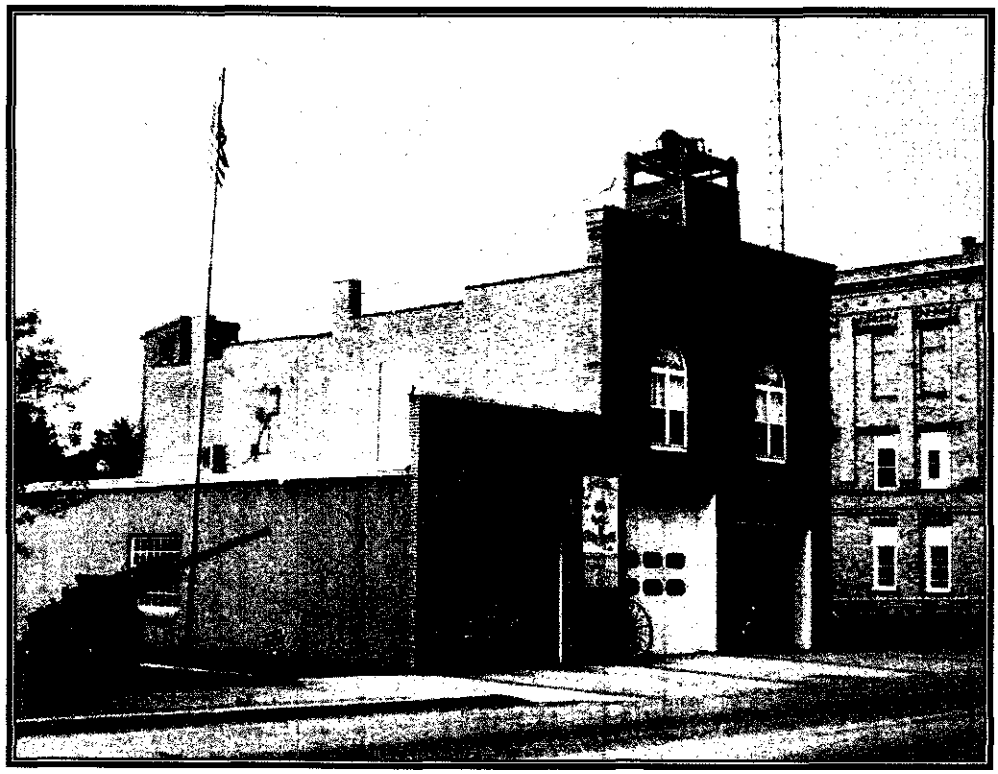

Figure 35. Fire Station, Shelby Center Historic District (82003638), East Main Street, Shelby, Ohio; view looking southwest.

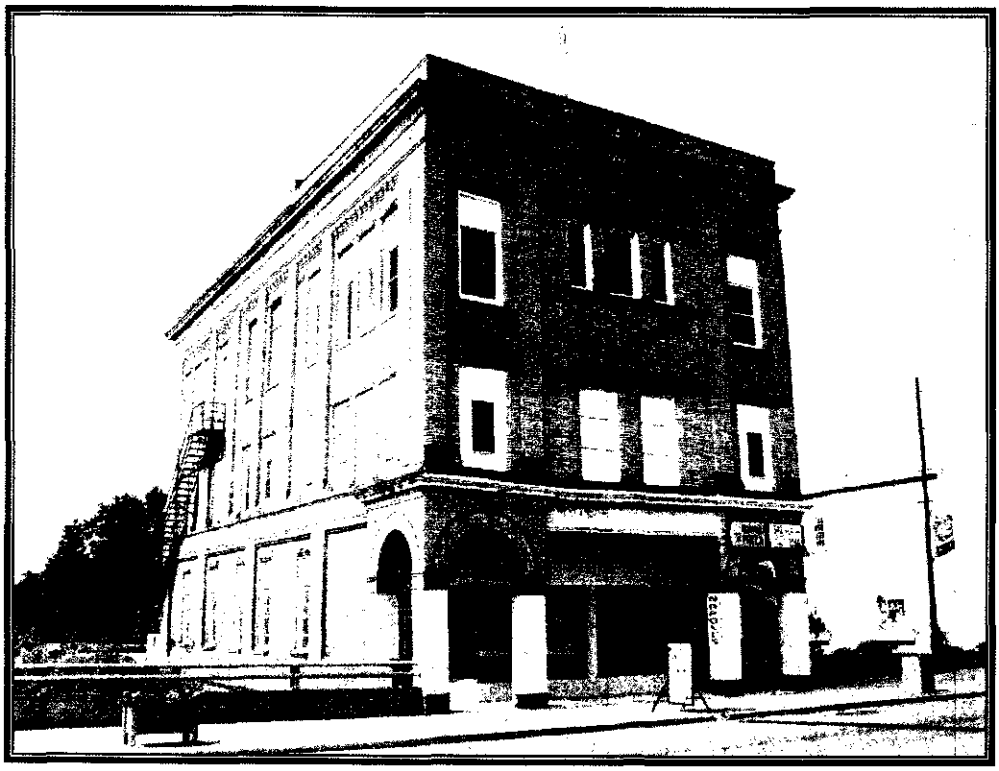

Figure 36. K of P Building/Commercial building, Shelby Center Historic District (82003638), 10-12 West Main Street, Shelby, Ohio; view looking southwest.

Figure 37. Commercial building, Shelby Center Historic District (82003638), southeastern corner of West Main Street and Central Avenue, Shelby, Ohio; view looking southwest.

Figure 38. Commercial building, Shelby Center Historic District (82003638), 22 West Main Street, southwest corner of West Main Street and Central Avenue, Shelby, Ohio; view looking toward southwest.

Figure 39. Commercial building, Shelby Center Historic District (82003638), 24-26 West Main Street, Shelby, Ohio; view looking south.

Figure 40. Commercial building, Shelby Center Historic District (82003638), 28 West Main Street, Shelby, Ohio; view looking south.

Figure 41. Commercial building, Shelby Center Historic District (82003638), 30-32 West Main Street, Shelby, Ohio; view looking southwest.

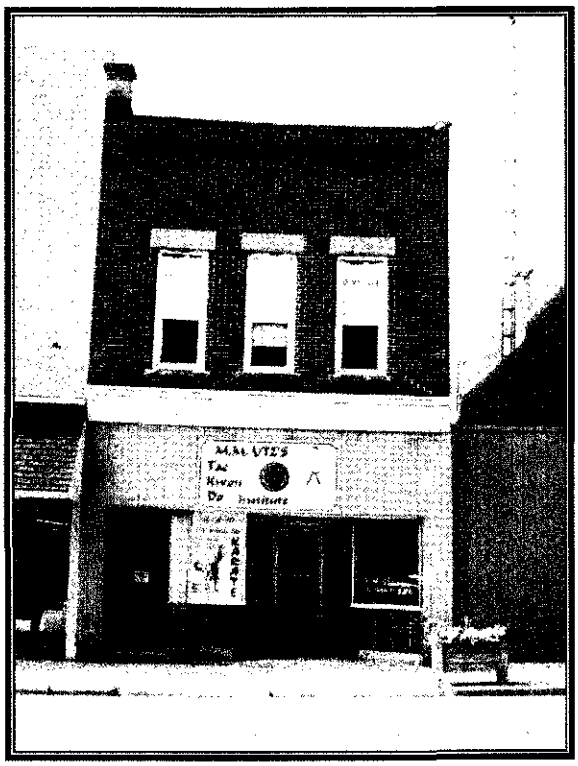

Figure 42. Commercial building, Shelby Center Historic District (82003638), 34 West Main Street, Shelby, Ohio; view looking southwest.

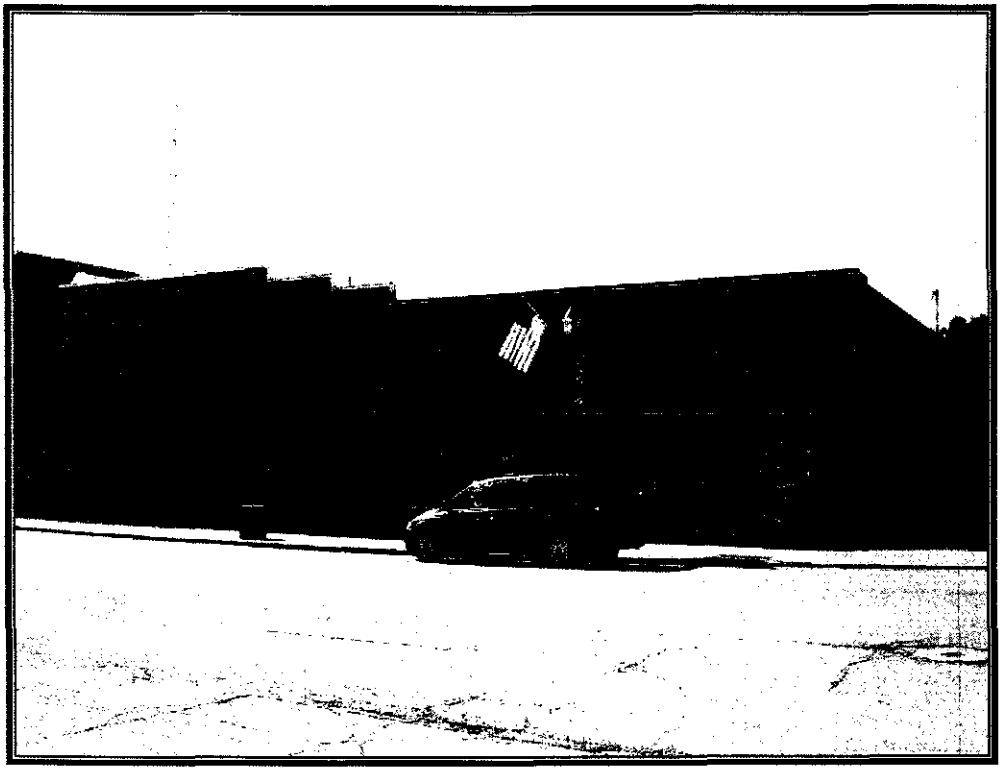

Figure 43. Commercial building, Shelby Center Historic District (82003638), West Main Street, Shelby, Ohio; view looking southeast.

Figure 44. Commercial building, Shelby Center Historic District (82003638), 48-50 West Main Street, Shelby, Ohio; view looking southwest.

Figure 45. "1879" Commercial building, Shelby Center Historic District (82003638), south side of West Main Street, Shelby, Ohio; view looking southwest.

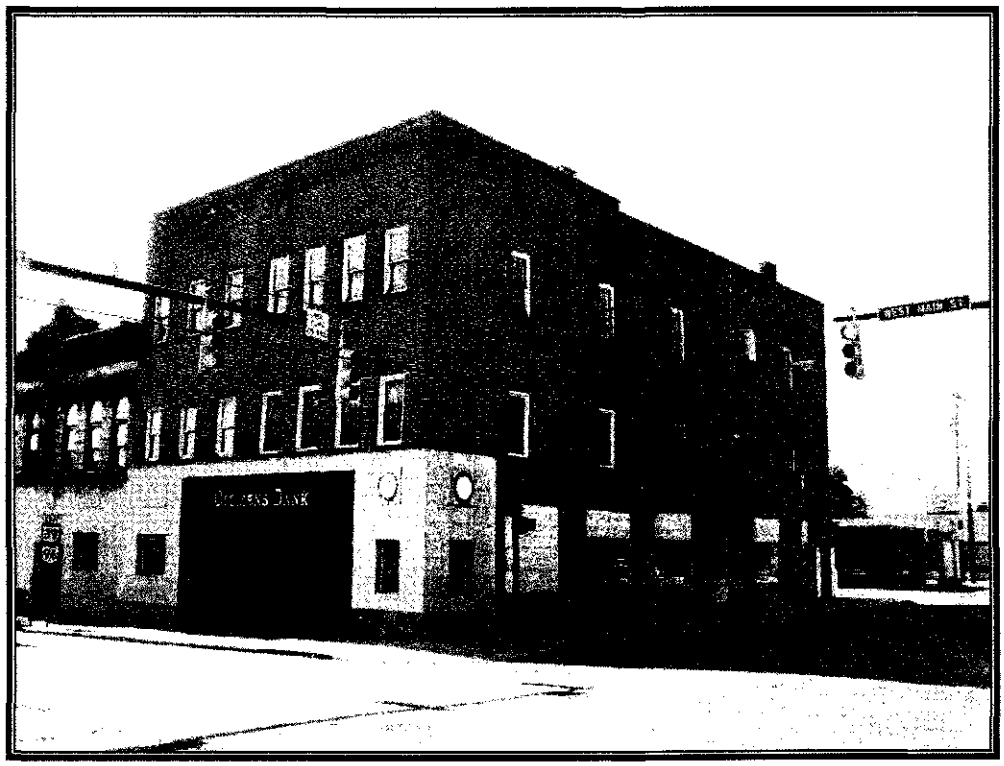

Figure 46. Commercial building, Shelby Center Historic District (82003638), located on southeast corner of West Main Street and South Gamble Street, Shelby, Ohio; view looking southeast.

Figure 47. Commercial building, Shelby Center Historic District (82003638), 62-64 West Main Street, Shelby, Ohio; view looking south.

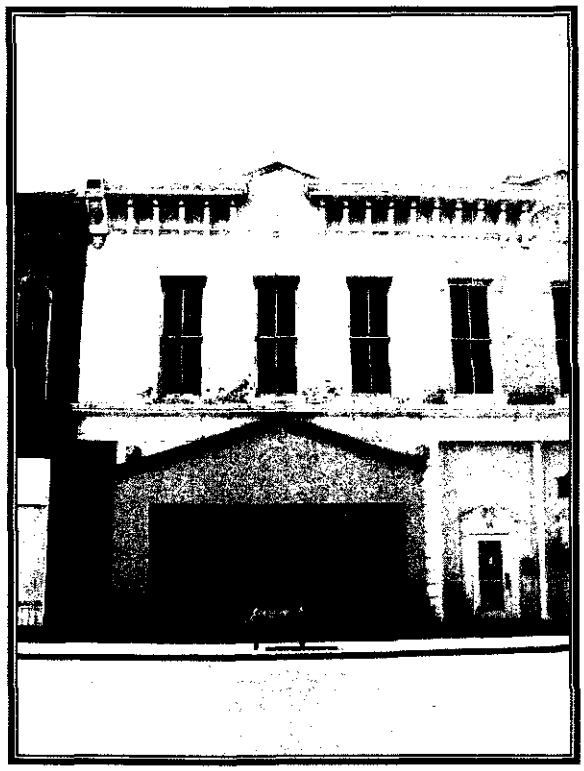

Figure 48. Commercial building, Shelby Center Historic District (82003638), 66 West Main Street, Shelby, Ohio; view looking south.

Figure 49. Commercial building, Shelby Center Historic District (82003638), 68 West Main Street, Shelby, Ohio; view looking south.

Figure 50. Commercial building, Shelby Center Historic District (82003638), 70-74 West Main Street, Shelby, Ohio; view looking south.

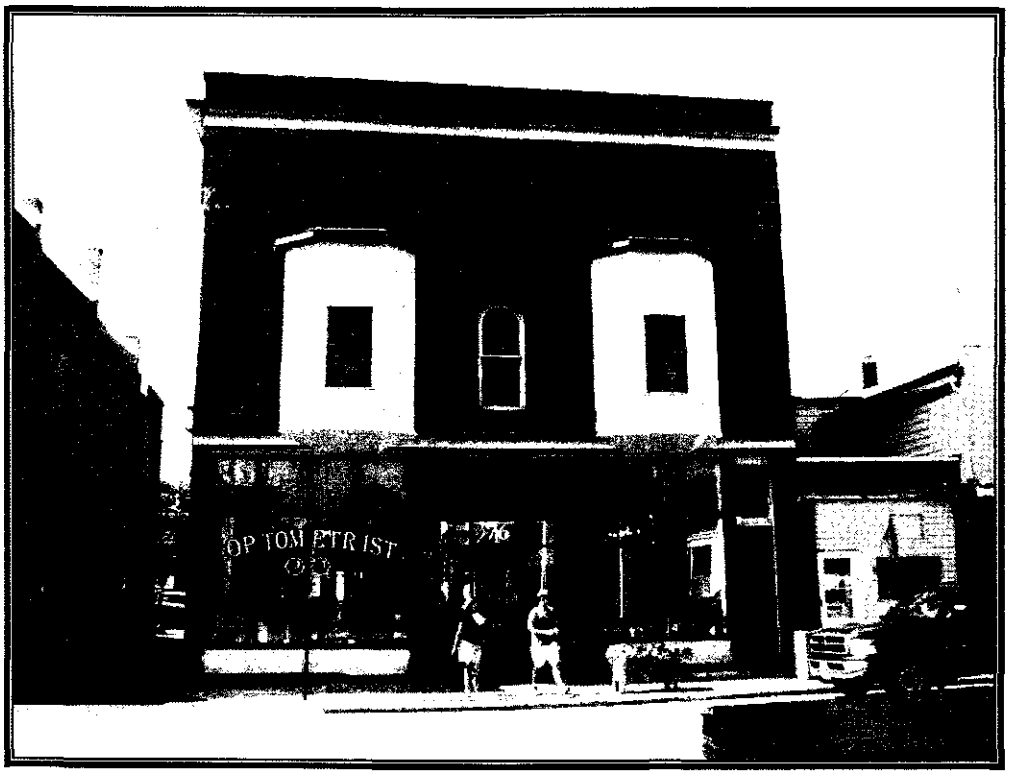

Figure 51. Commercial building, Shelby Center Historic District (82003638), 76 West Main Street, Shelby, Ohio; view looking south.

Figure 52. Commercial building, Shelby Center Historic District (82003638), 78-80 West Main Street, Shelby, Ohio; view looking southeast.

Figure 53. Commercial building, Shelby Center Historic District (82003638), 82 West Main Street, Shelby, Ohio; view looking south.

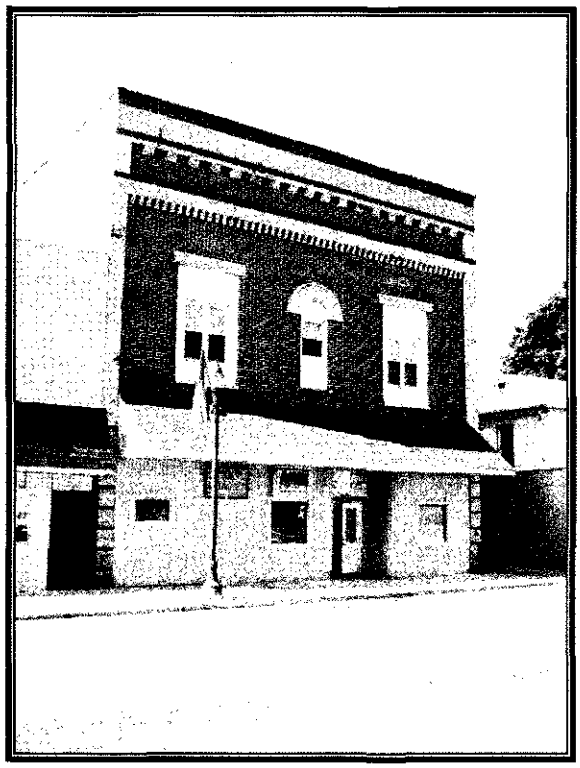

Figure 54. Commercial building, Shelby Center Historic District (82003638), 86 West Main Street, Shelby, Ohio; view looking south.

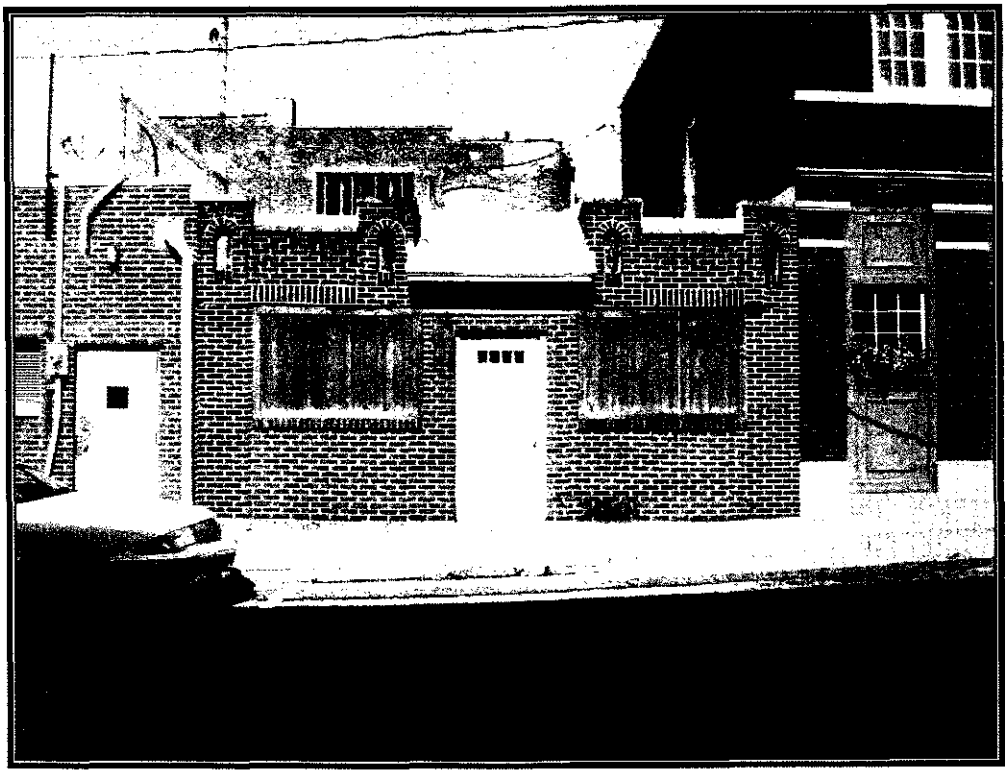

Figure 55. Commercial building, Shelby Center Historic District (82003638), Water Street, Shelby, Ohio; view looking toward the west.

Figure 56. Commercial building, Shelby Center Historic District (82003638), 6 Water Street, Shelby, Ohio; view looking southwest.

Figure 57. Commercial building, Shelby Center Historic District (82003638), 6 Mohican, Shelby, Ohio; view looking south.

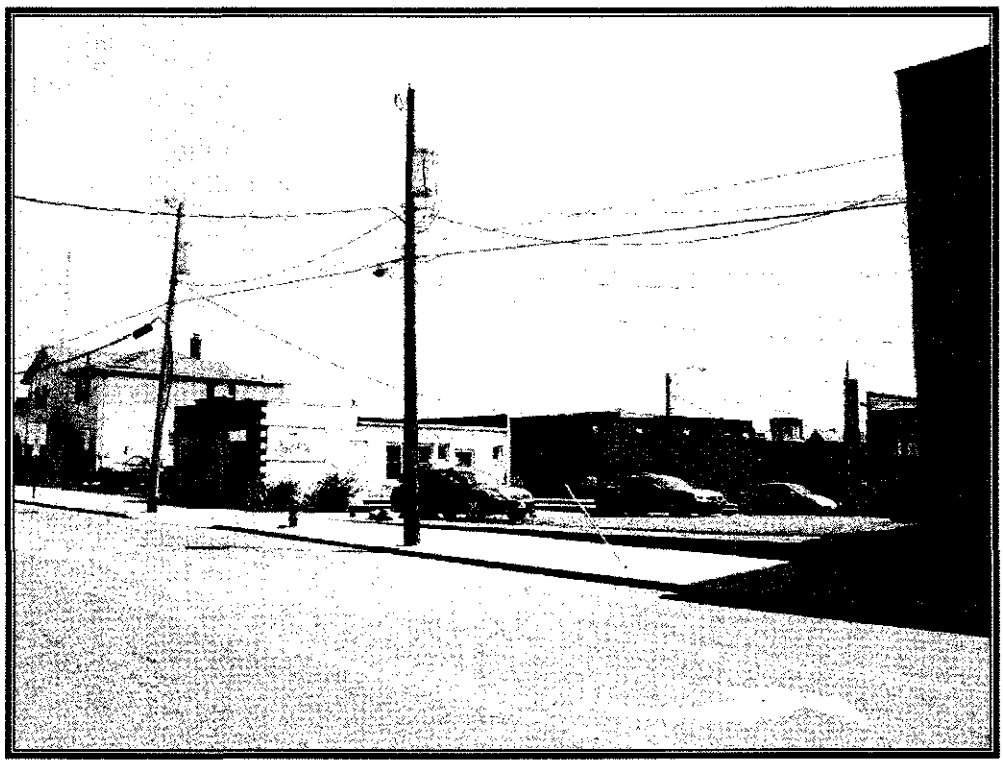

Figure 58. Former site of contributing property at 15 North Gamble St., Shelby Center Historic District (82003638), Shelby, Ohio; view looking northeast from North Gamble Street.

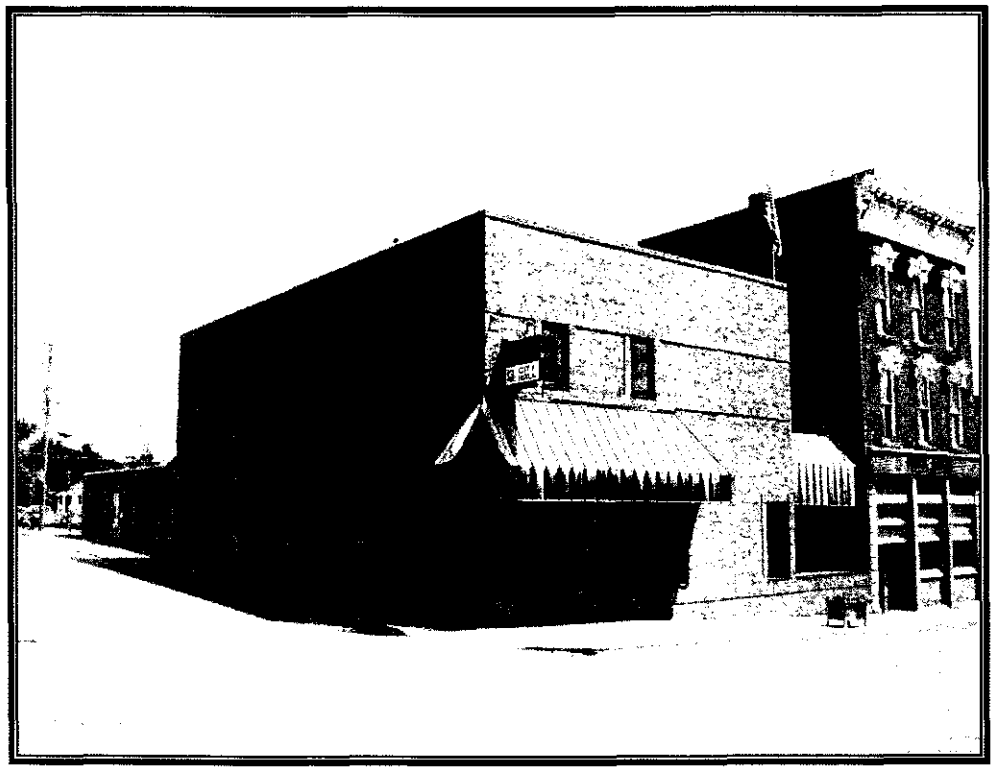

Figure 59. View of new City Hall building built on former commercial property site, Shelby Center Historic District (82003638), 39 West Main Street, Shelby, Ohio; view looking north.

Figure 60. Modern construction and city park on site of a former historic commercial building, Shelby Center Historic District (82003638), 13 West Main Street, Shelby, Ohio; view looking north.

Figure 61. Former site of contributing property at 10 South Gamble St., Shelby Center Historic District (82003638), Shelby, Ohio; view looking west from South Gamble Street.

Figure 62. Marvin Memorial Library (86003493), 34 North Gamble Street, Shelby, Ohio; view looking toward the west.

Figure 63. Marvin Memorial Library (86003493) 34 North Gamble Street, Shelby, Ohio. Addition on west façade; view looking northeast.

Figure 64. Most Pure Heart of Mary Catholic Church (78002179) West Street and Raymond Avenue, Shelby, Ohio; view looking east.

Figure 65. Silas Ferrell House (87002146) 25 East Main Street, Shiloh, Ohio; view looking east.

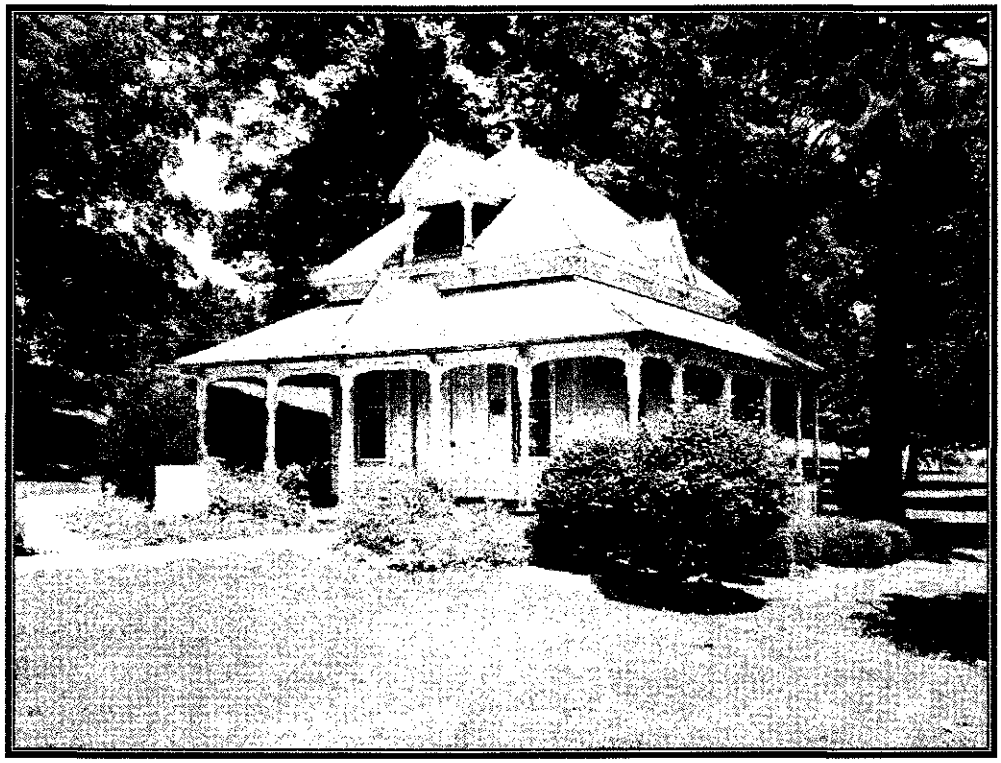

Figure 66. Plymouth Greenlawn Cemetery Chapel (96000116), Greenlawn Cemetery, Plymouth, Ohio; view looking north.

MAP 2

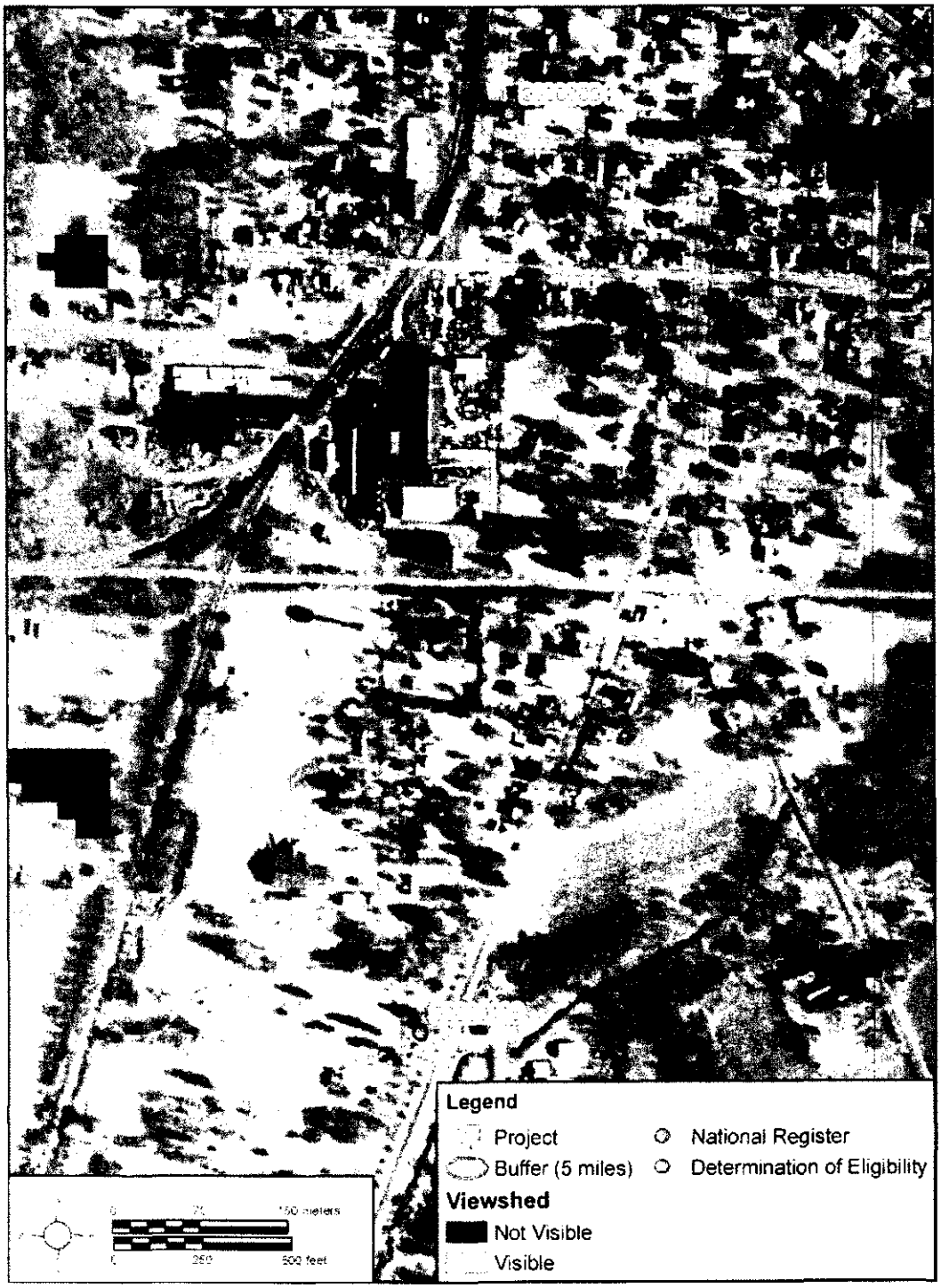

Figure 67. Aerial map showing Resources 99000094 shown in Figure 68 and 99000116 on Figure 68.

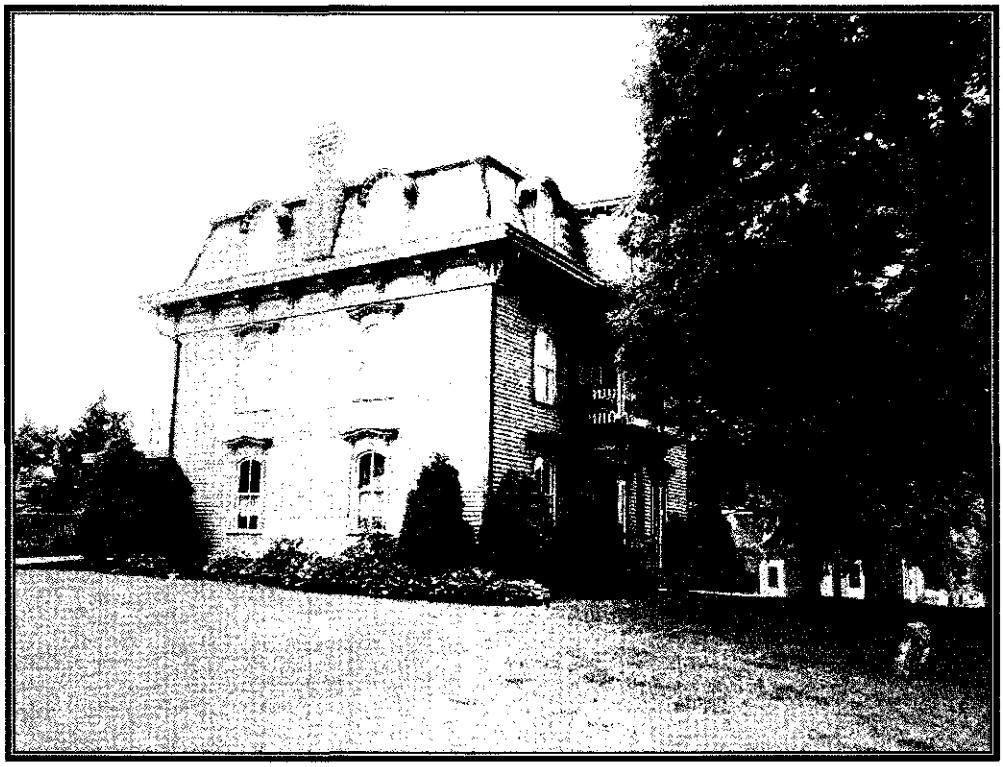

Figure 68. Searle House (Tubbs-Sourwine) (99000094), 49 Railroad Street, Plymouth, Ohio; view looking toward the east.

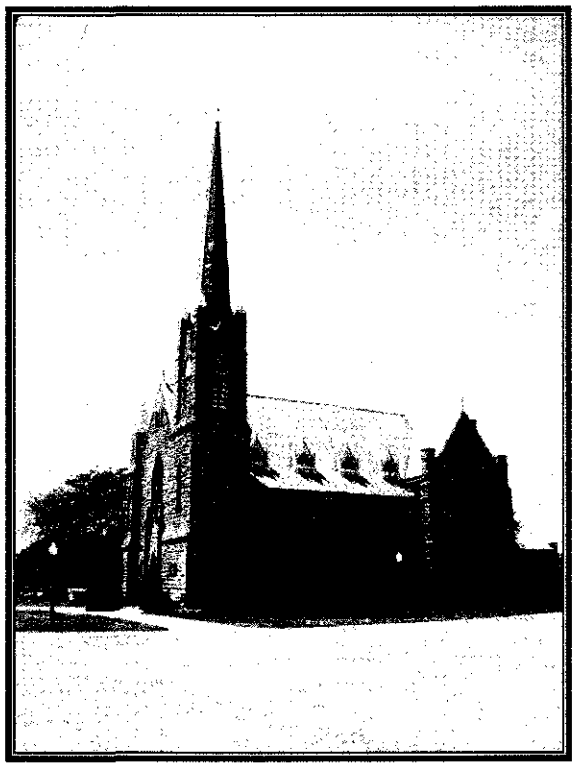

Figure 69. Sacred Heart of Jesus Churches (86000035) SR 61 in Bethlehem, Ohio; view looking north.

MAP 3

Figure 70. Aerial map showing Resource 86000035 shown in Figure 71.

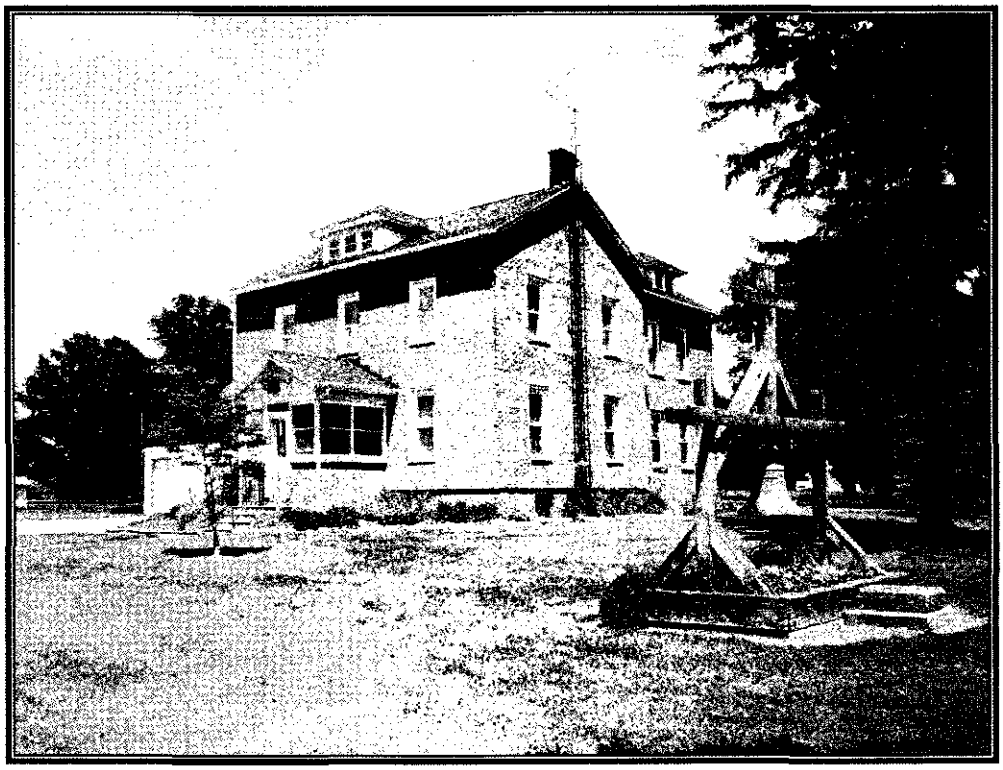

Figure 71. Sacred Heart of Jesus Churches (86000035) SR 61 in Bethlehem, Ohio, view of parsonage, cemetery to left, looking toward the east.

Figure 72. Heckler Farmhouse (76001385) north of Crestline, Ohio, off SR61 on Oldfield Road; view looking south.

MAP 4

Figure 73. Aerial map showing resources in Figures 74. 76-78, and 88-89.

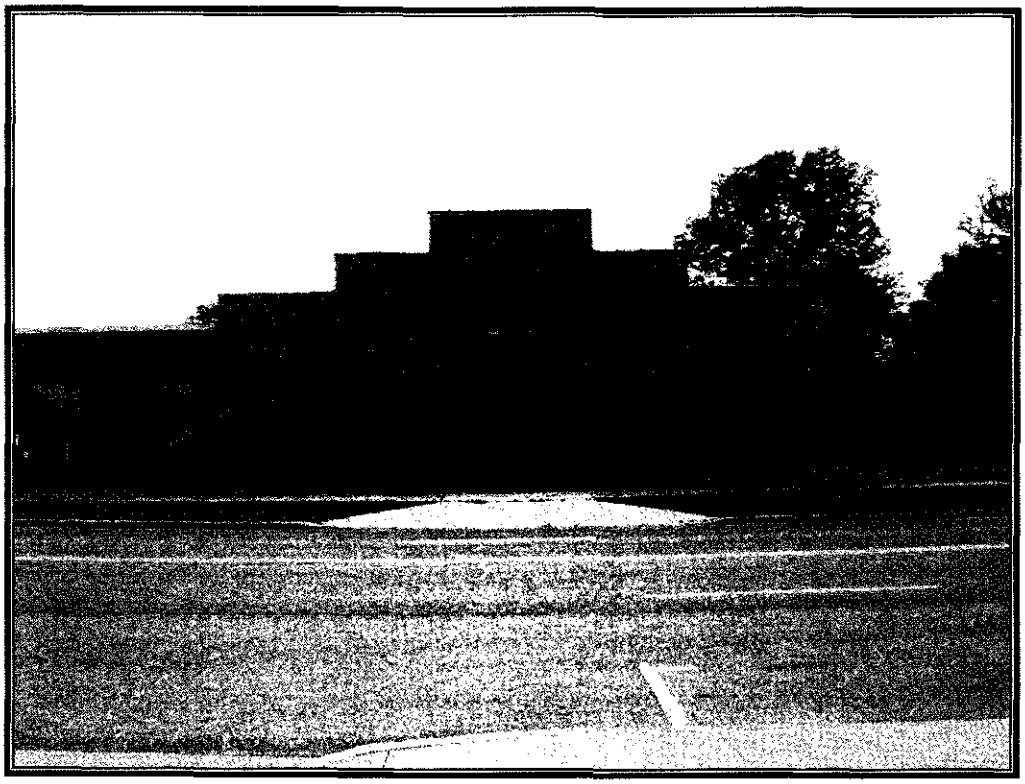

Figure 74. Former site of Crestline, Ohio, City Hall (74001427) showing new addition and recent reuse as a Senior Center; view looking east.

Figure 75. John Hoffman House/Shunk Museum (78002030) 211 Thoman Street, Crestline, Ohio; view looking east.

Figure 76. Methodist Episcopal Church (78002031) Intersection of Thoman and Union Streets, Crestline, Ohio; view looking west.

MAP 5

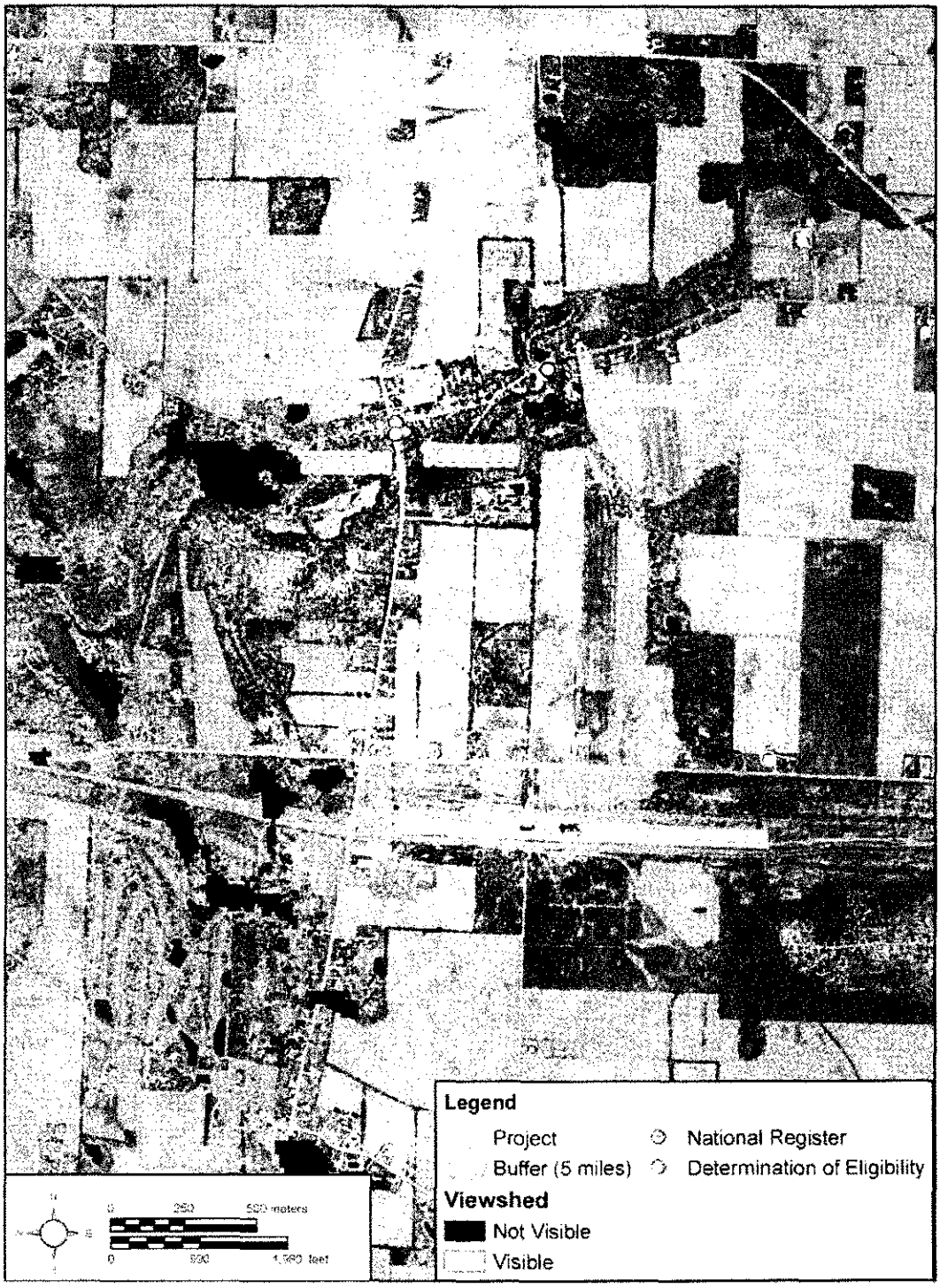

Figure 77. Aerial map showing locations of Resources 79002809, 79002810, 790028011, and 79002812 shown in Figures 80-83.

Figure 78. J&M Trading Post (79002811) Leesville Road (intersection of SR598 and CR 229), Leesville, Ohio; view looking south.

Figure 79. J&M Trading Post Annex (79002809) Leesville Road (intersection of SR598 and CR 229), Leesville, Ohio; view looking south.

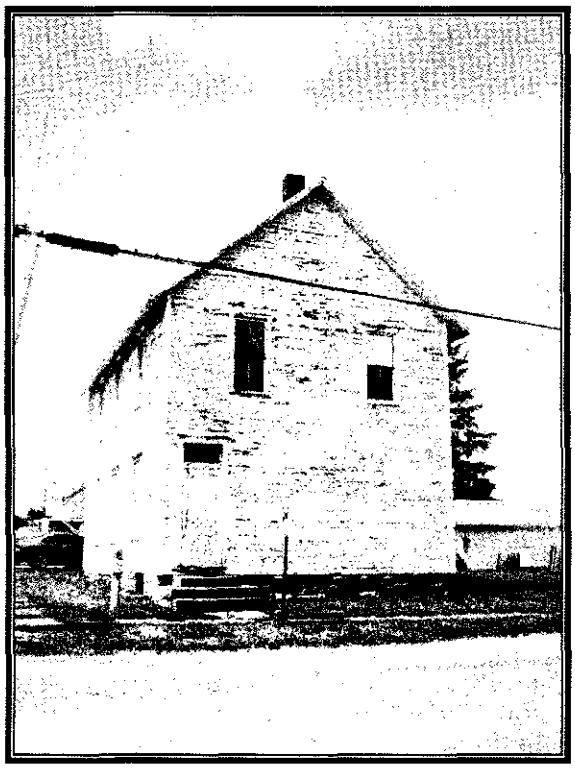

Figure 80. Leesville Town Hall (79002810) Leesville Road (intersection of SR598 and CR 229), Leesville, Ohio; view looking north.

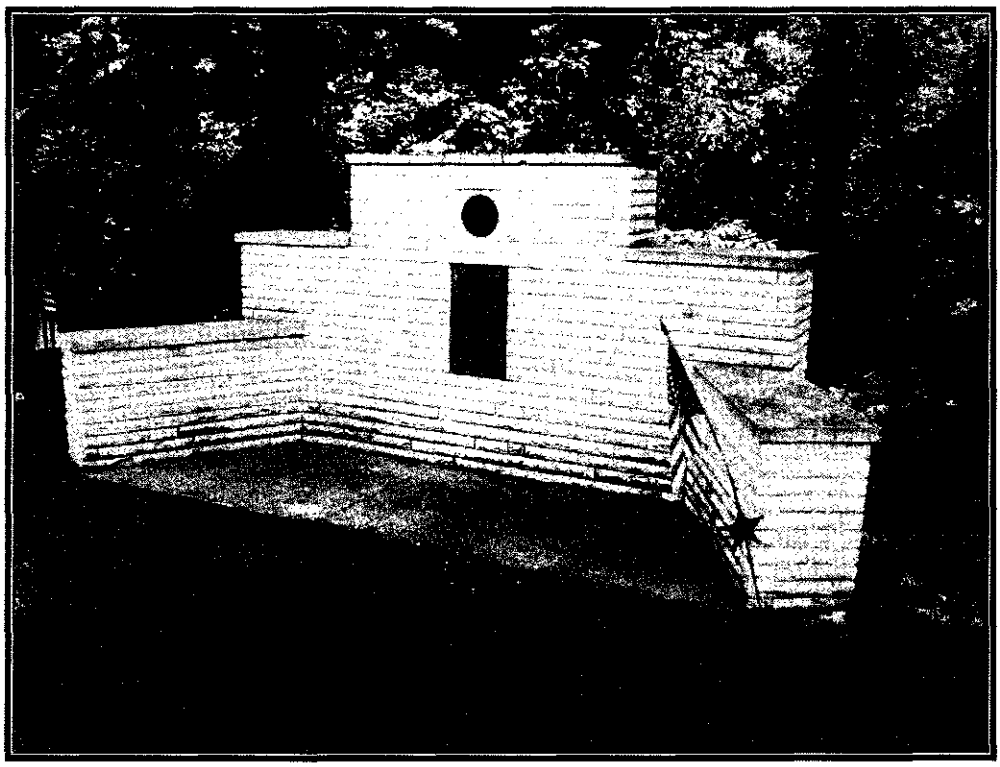

Figure 81. Col. Wm. Crawford Capture site (79002812) Leesville Road (0.5 mi east of intersection of SR598 and CR 229), Leesville, Ohio; view of monument looking toward the south.

MAP 6

Figure 82. Aerial map showing locations of Resources 3000325 (Figure 85) and 4000062 (Figure 86).

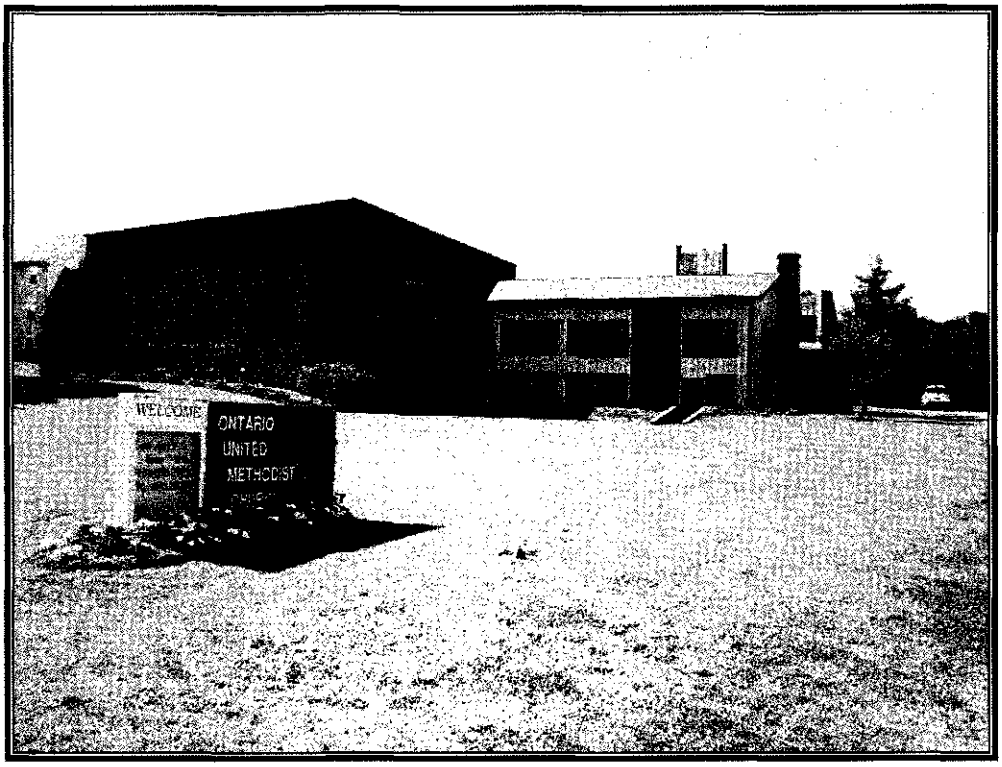

Figure 83. Former site of Springfield Township School House (3000325) east of Ontario, OH, showing new buildings; view looking north.

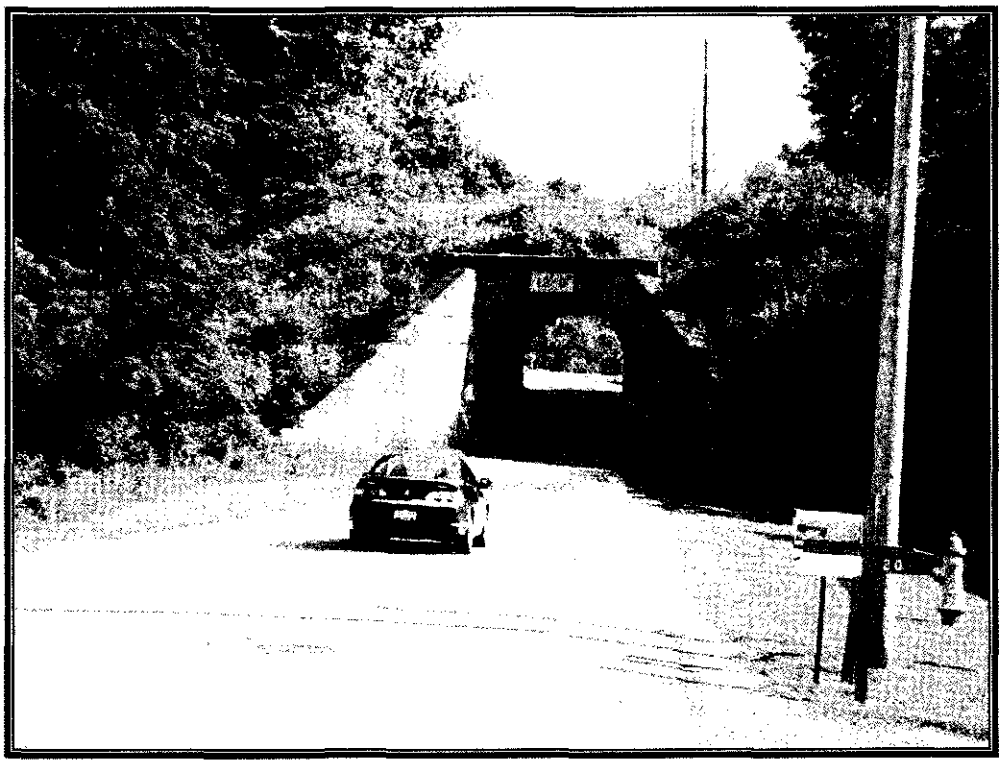

Figure 84. Former Erie Railroad Bridge over Rock Road (4000062), east of Ontario, Ohio; view looking toward the south.

Figure 85. Residence, 70 North Gamble Street, Shelby, Ohio; view looking west.

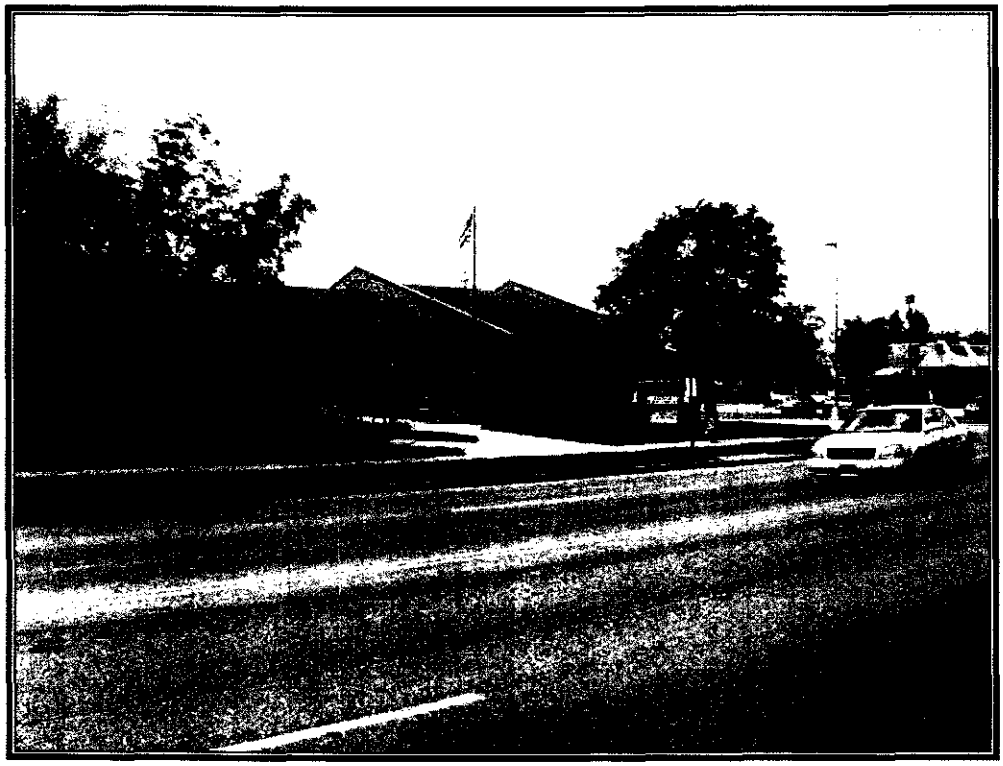

Figure 86. Site of former Baptist church (65004828), presently Crestline Public Library, corner of Thoman and John Streets, Crestline, Ohio; view looking west.

Figure 87. Former site of Fraternal Order of Eagles Hall (65004867), current parking lot area at right, 211 E. Bucyrus Street, Crestline, Ohio; view looking north.

MAP 7

Figure 88. Aerial map showing location of Resource CRA001013 shown in Figure 92.

MAP 8

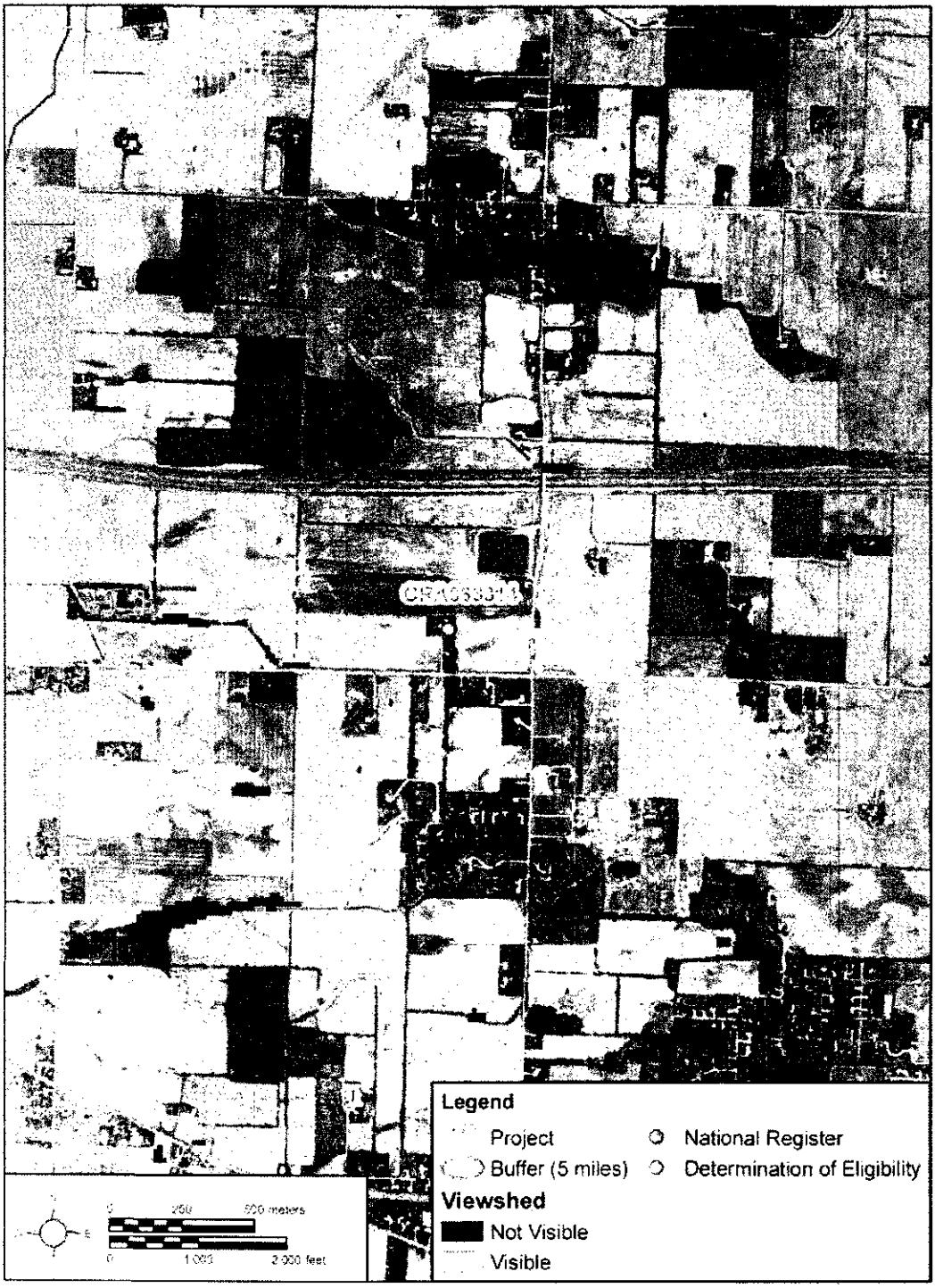

Figure 89. Aerial map showing location of Resource CRA063314 shown in Figure 93.

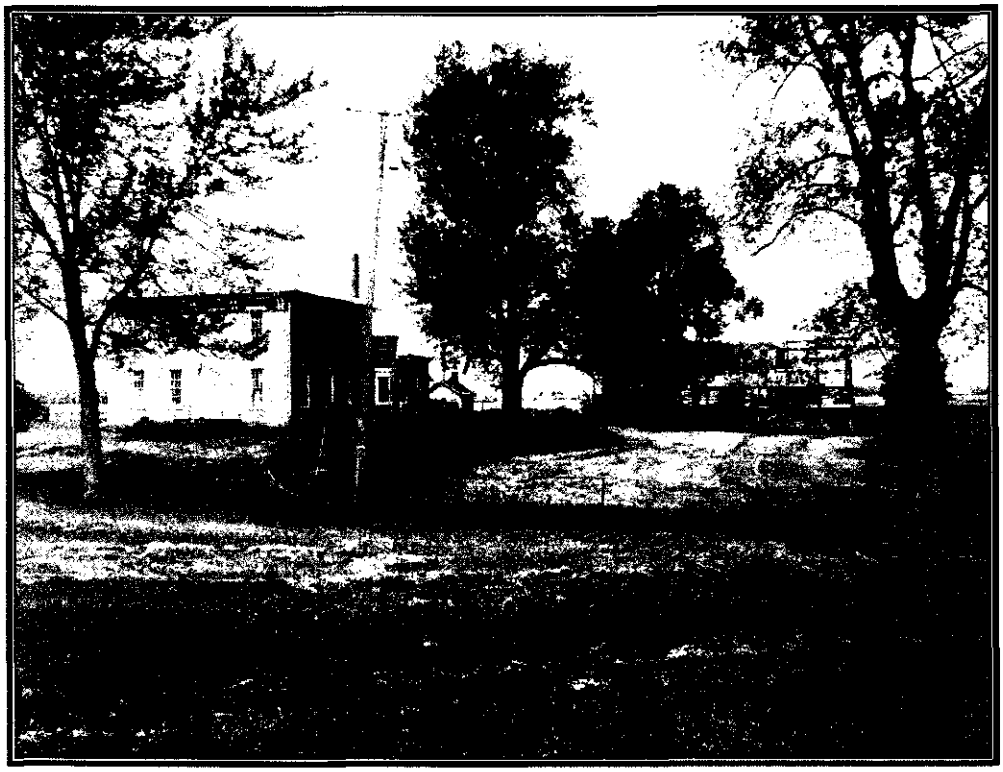

Figure 90. Summit Farm (CRA001013), 2133 Parcher Road, Crawford County, Ohio; view looking east.

Figure 91. Kocher House (CRA063314), 1624 Brandt Road, Crawford County, Ohio; view looking north.

MAP 9

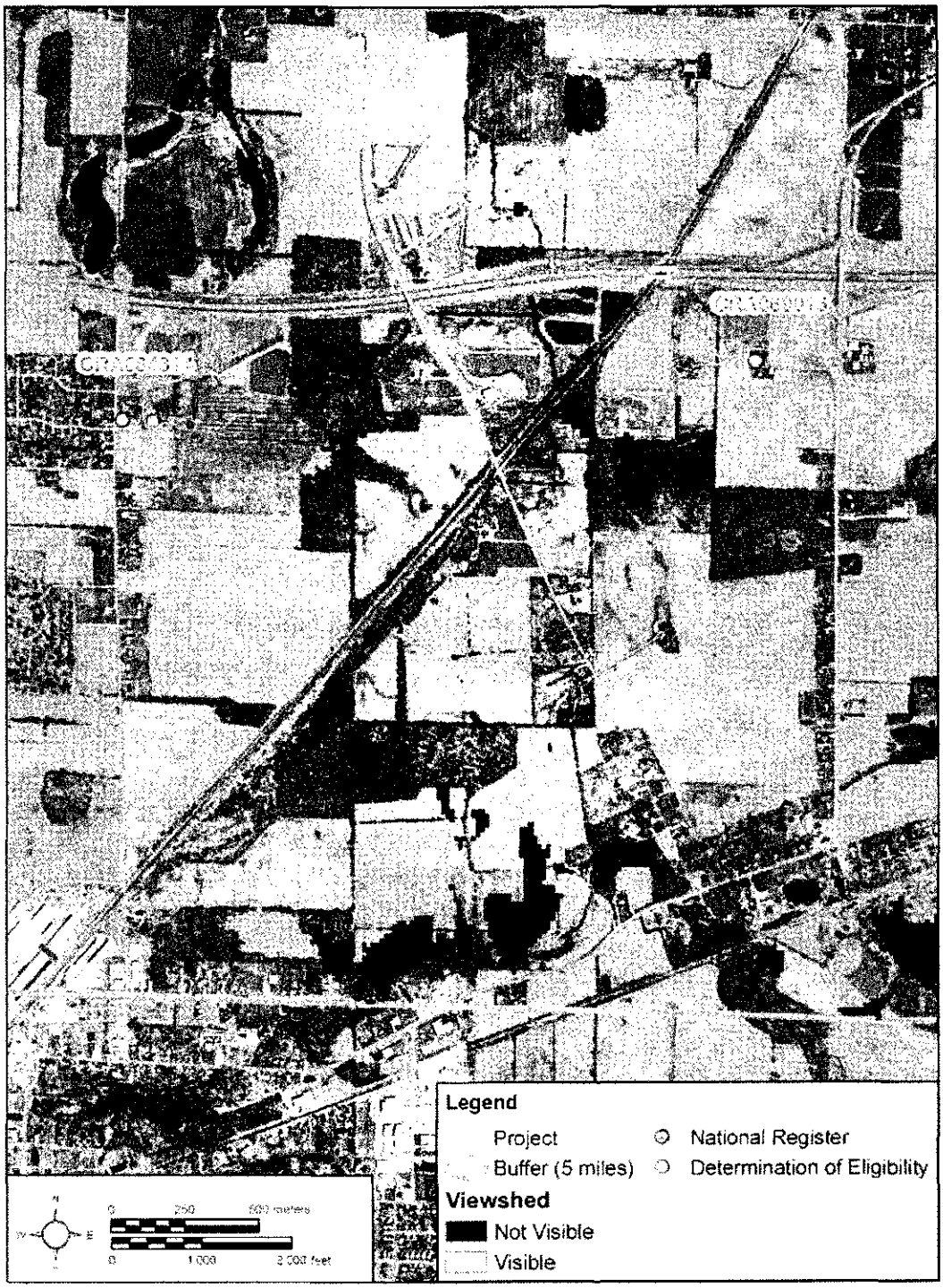

Figure 92. Aerial map showing locations of Resource CRA064314 shown in Figure 95 and Resource CRA069015 shown in Figure 96.

Figure 93. Gibson House (CRA064314), 1475 Knorr Road, Crawford Co., Ohio; view looking east.

Figure 94. Spoke House (CRA069015), 1506 SR61, Crawford Co., Ohio; view looking east.

APPENDIX C

PROJECT CORRESPONDENCE

cra
cultural resource analysts, inc.

December 21, 2010

Crestline Historical Society and Shunk Museum
211 N. Thoman Street
Crestline, OH 44827-1444

RE: Invitation to Participate as a Consulting Party to the Cultural Resource Review Process for the Black Fork Wind Farm in Crawford and Richland Counties, Ohio

Dear Sir or Madam:

Thank you for taking the time to review this letter regarding potential involvement by the Crestline Historical Society in the above-referenced project. Element Power US, LLC, proposes to construct a wind powered electric generating facility in Crawford and Richland Counties. The Black Fork Wind Farm Project will be regulated by the Ohio Power Siting Board (OPSB) under Chapter 1551 of the Ohio Revised Code and Chapters 4906-1 to 4906-17 of the Ohio Administrative Code. Chapter 4906-17-08 (D) Cultural Impact directs the identification of historic landmarks located within 5 miles of the proposed facility. We are soliciting comments and information from the public related to the existence of and effect to historic resources within the potential impact area.

Element Power has contracted with Cultural Resource Analysts, Inc. (CRA) to assist them with their cultural resource obligations. CRA is currently working closely with the Ohio Historic Preservation Office to identify historic properties within the 5 mile survey area and to evaluate the effects of the proposed project on these sites. If you would also like to be a participant in the process, please feel free to contact me at the number or address listed below. We look forward to hearing from you.

Sincerely,

Elizabeth Heavrin
Architectural Historian
151 Walton Avenue
Lexington, KY 40508
859.252.4737
egheavrin@crai-ky.com

Corporate Headquarters
151 Walton Avenue
Lexington, KY 40508
office 859.252.4737
fax 859.254.3747
www.crai-ky.com

Table 5. OGS Recorded Cemeteries 1803-2003 within the Survey Area.

County	OGS Reference #	Name
	2469	Crall-Liberty Chapel-United Methodist Church
	2472	Kruse
	2474	Roop/Rupp
	2471	Knappenburger
	2475	Saint Paul Lutheran-Shealy/Sheely
	2476	Union
	2477	Unnamed
	2465	Yeiter-Bittecover/Bittikofer-Hope
	2430	Brenner
	2440	Smith-Euliss-Mays Farm-Haynes Farm
	2445	Saint Bernard-Catholic
	2444	Saint Johns Lutheran-Lutheran-Saint Johns-German Lutheran-German Evangelical
	2447	Swabb/Schwabb
	2446	Union-New Washington
	2406	Baptist
	2407	North Auburn-Our Mother Of Sorrows-Saint Marys-Honey Creek
	2408	Swail-Cory-Hertzler-Miller
	2409	Goodwill-Methodist Episcopal Church
	2410	Handley
	2412	Oakland-Tiro
	2413	Tiro Mausoleum
	2448	Swale-Union Church
	2502	Sandusky
	2503	Tustian
	2514	Liberty
	2499	Biddle-Cole-Swisher-Evangelical United Brethren Church
	2500	Knisley-Loss Creek
	2511	Dapper-German Lutheran-Saint Pauls Lutheran
	2457	Crawford County Memory Garden
	2460	Leesville
	2513	Saint Pauls Reformed-German Reformed
	2459	Heller
	2461	Middletown-Miller
	2485	Catholic
	2491	Leveredge
	2494	Old City
	2496	Pletcher/Pfletcher
	2486	Cummings
	2490	Irish Catholic
	2492	Line
	2512	Dickson-Dekalb
	2411	Hanna-Auburn
Seneca	11167	Swamp-Union Pisgah

cra
cultural resource analysts, inc.

December 21, 2010

Craig Clinger, president
Galion Historical Society, Inc.
PO Box 125
Galion, OH 44833-0125

RE: Invitation to Participate as a Consulting Party to the Cultural Resource Review Process for the Black Fork Wind Farm in Crawford and Richland Counties, Ohio

Dear Sir:

Thank you for taking the time to review this letter regarding potential involvement by the Galion Historical Society in the above-referenced project. Element Power US, LLC, proposes to construct a wind powered electric generating facility in Crawford and Richland Counties. The Black Fork Wind Farm Project will be regulated by the Ohio Power Siting Board (OPSB) under Chapter 1551 of the Ohio Revised Code and Chapters 4906-1 to 4906-17 of the Ohio Administrative Code. Chapter 4906-17-08 (D) Cultural Impact directs the identification of historic landmarks located within 5 miles of the proposed facility. We are soliciting comments and information from the public related to the existence of and effect to historic resources within the potential impact area.

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Architectural Historian
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Lexington, KY 40508
859.252.4737
egheavrin@crai-ky.com

cra
cultural resource analysts, inc.

December 21, 2010

Bruce K. Shealy
New Washington Historical Society
PO Box 463
New Washington, OH 44854-0463

RE: Invitation to Participate as a Consulting Party to the Cultural Resource Review Process for the Black Fork Wind Farm in Crawford and Richland Counties, Ohio

Dear Sir:

Thank you for taking the time to review this letter regarding potential involvement by the New Washington Historical Society in the above-referenced project. Element Power US, LLC, proposes to construct a wind powered electric generating facility in Crawford and Richland Counties. The Black Fork Wind Farm Project will be regulated by the Ohio Power Siting Board (OPSB) under Chapter 1551 of the Ohio Revised Code and Chapters 4906-1 to 4906-17 of the Ohio Administrative Code. Chapter 4906-17-08 (D) Cultural Impact directs the identification of historic landmarks located within 5 miles of the proposed facility. We are soliciting comments and information from the public related to the existence of and effect to historic resources within the potential impact area.

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Sincerely,

Elizabeth Heavrin
Architectural Historian
151 Walton Avenue
Lexington, KY 40508
859.252.4737
egheavrin@crai-ky.com

cra
cultural resource analysts, inc.

December 21, 2010

Alan Wigton
Richland County Historical Society
310 Springmill Street
Mansfield, OH 44903

RE: Invitation to Participate as a Consulting Party to the Cultural Resource Review Process for the Black Fork Wind Farm in Crawford and Richland Counties, Ohio

Dear Sir:

Thank you for taking the time to review this letter regarding potential involvement by the Richland County Historical Society in the above-referenced project. Element Power US, LLC, proposes to construct a wind powered electric generating facility in Crawford and Richland Counties. The Black Fork Wind Farm Project will be regulated by the Ohio Power Siting Board (OPSB) under Chapter 1551 of the Ohio Revised Code and Chapters 4906-1 to 4906-17 of the Ohio Administrative Code. Chapter 4906-17-08 (D) Cultural Impact directs the identification of historic landmarks located within 5 miles of the proposed facility. We are soliciting comments and information from the public related to the existence of and effect to historic resources within the potential impact area.

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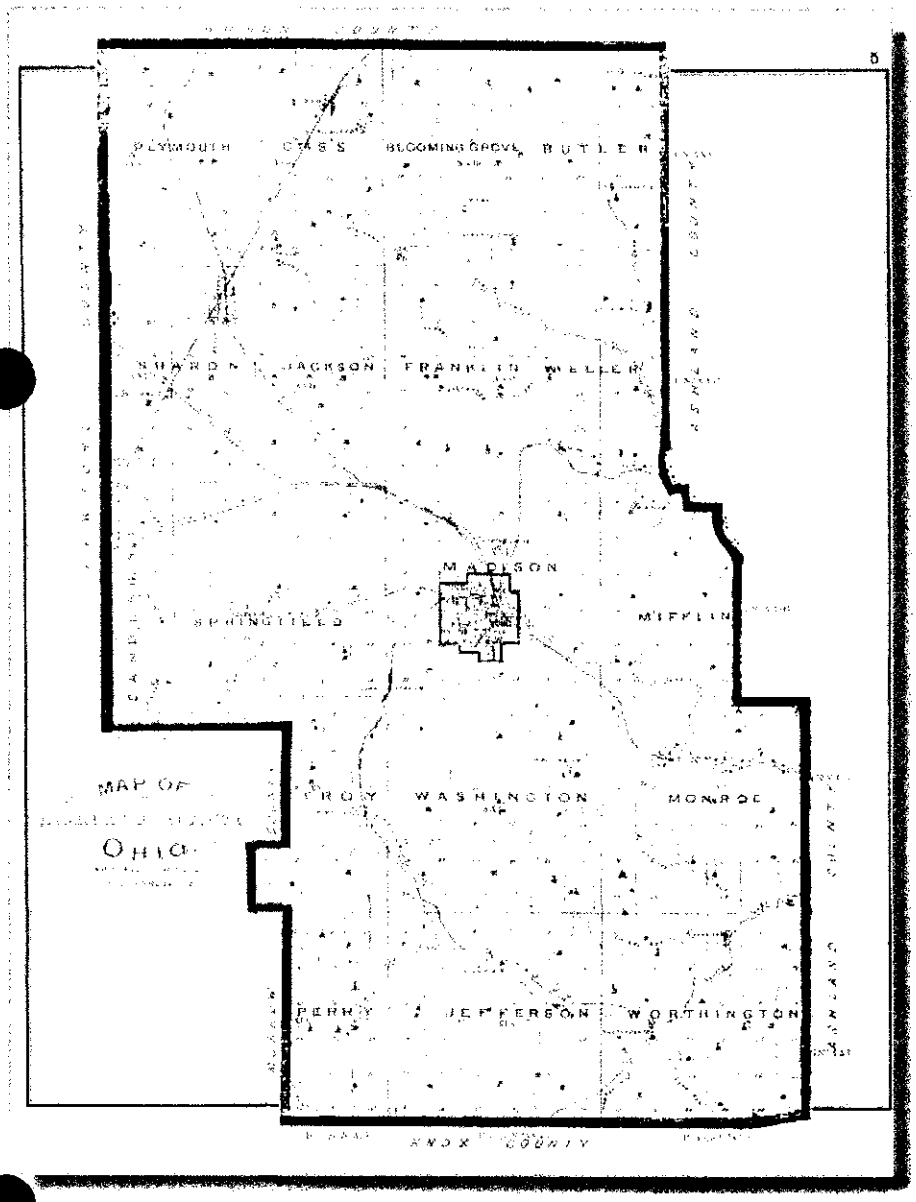
Contract Publication Series WV10-057

WORK PLAN FOR COMPLETING A PHASE I ARCHAEOLOGICAL SURVEY FOR THE PROPOSED BLACK FORK WIND FARM IN CRAWFORD AND RICHLAND COUNTIES, OHIO



by

Stevan C. Pullins, Flora Church, and James H. Kompanek

Prepared for

elementpower

Ohio Power Siting Board

Prepared by

cra
cultural resource analysts, inc

Lexington, KY | Hurricane, WV | Berlin Heights, OH
Evansville, IN | Longmont, CO
Mt. Vernon, IL | Sheridan, WY | Shreveport, LA

Contract Publication Series WV10-057

WORK PLAN FOR COMPLETING A PHASE I ARCHAEOLOGICAL SURVEY FOR THE PROPOSED BLACK FORK WIND FARM IN CRAWFORD AND RICHLAND COUNTIES, OHIO

By

Stevan C. Pullins, Flora Church, and James H. Kompanek

Prepared for

Scott Hawken
Senior Project Manager
ElementPower US, LLC
400 Preston Ave, Suite 200
Charlottesville, VA 22901
Scott.hawken@elpower.com
Phone: (434) 202-6708

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Lead Agency: Ohio Power Siting Board

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I. INTRODUCTION

Cultural Resource Analysts, Inc. (CRA) has developed the following work plan for the completion of a Phase I archaeological survey to satisfy Ohio Power Siting Board (OPSB) requirements for the construction of up to 91 turbines for the Black Fork Wind Farm (Project) in Crawford and Richland Counties, Ohio. The work plan establishes a survey methodology for the identification and evaluation of archaeological resources with potential to be impacted by the Project. This work plan may be adjusted based on the final layout of the Project as indicated in the final OPSB certificate.

Based on previous experience and guidance from the OPSB and the Ohio Historic Preservation Office (OHPO), the Phase I survey will focus on the systematic examination of the direct footprint of Project-related ground disturbance, whether permanent or temporary in nature. However, indirect effects for certain unique aboveground archaeological resources within the Study Area, including but not limited to potential mound sites, will be considered. The purpose of this survey is to gather extant information necessary for consideration of potential indirect effects on known aboveground archaeological resources, primarily mound sites that have already been recorded at the OHPO or reported by reliable informants such as the Ohio Archaeological Society (OAS). This survey will *not* seek to identify new aboveground archaeological resources outside of the direct footprint of the Project.

The work plan presented in this document was created by qualified archaeologists and conforms to professional standards to ensure that the survey is conducted and reported in an appropriate manner.

Project Location and Description

Black Fork Wind Energy, LLC (Applicant), a subsidiary of Element Power US, LLC, proposes to construct and operate the Project, a wind-powered electric generation facility to be located in Richland and Crawford Counties, Ohio (Figures 1 and 2). The Generation Facility will consist of up to 91 wind turbines and will have a maximum nameplate capacity of 200 megawatts (MW). In addition to the turbines, the Generation Facility will also include access roads, electrical collection lines, a concrete batch plant/temporary laydown area, a substation and switchyard, and an operation and maintenance (O&M) facility (Figure 3).

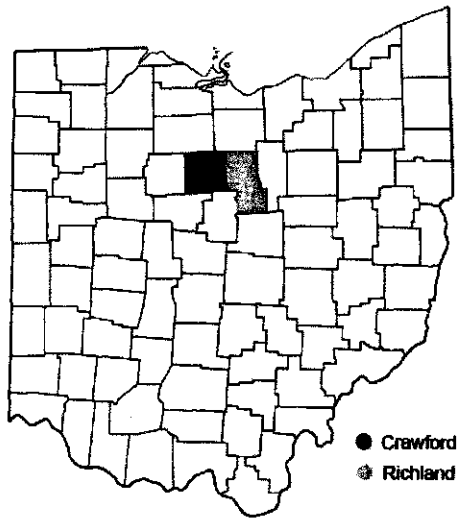

Figure 1. Project Area.

Currently, the Applicant assumes the use of Vestas V-100 (or comparable) turbines, each with a 1.8 MW nameplate capacity. The total generating capacity for these turbines is 163.8 MW. While the Vestas V-100 turbine is the preferred turbine model, the Applicant is also evaluating the use of other turbine models, ranging from 1.6 MW up to 2.3 MW turbine models. The Project layout will be the same regardless of the final turbine selection.

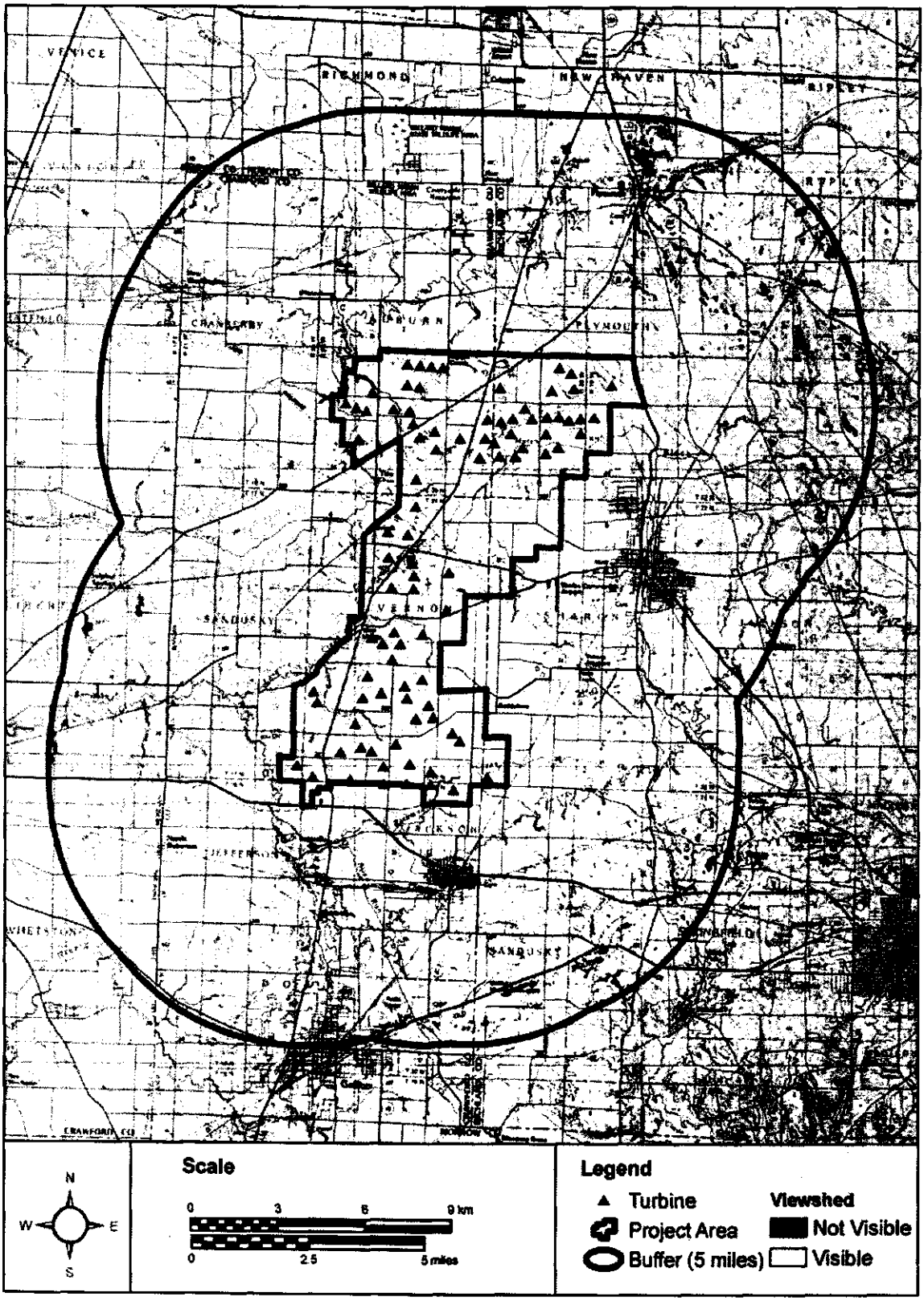

Figure 2. Location of the proposed Project and the Indirect Visual APE.

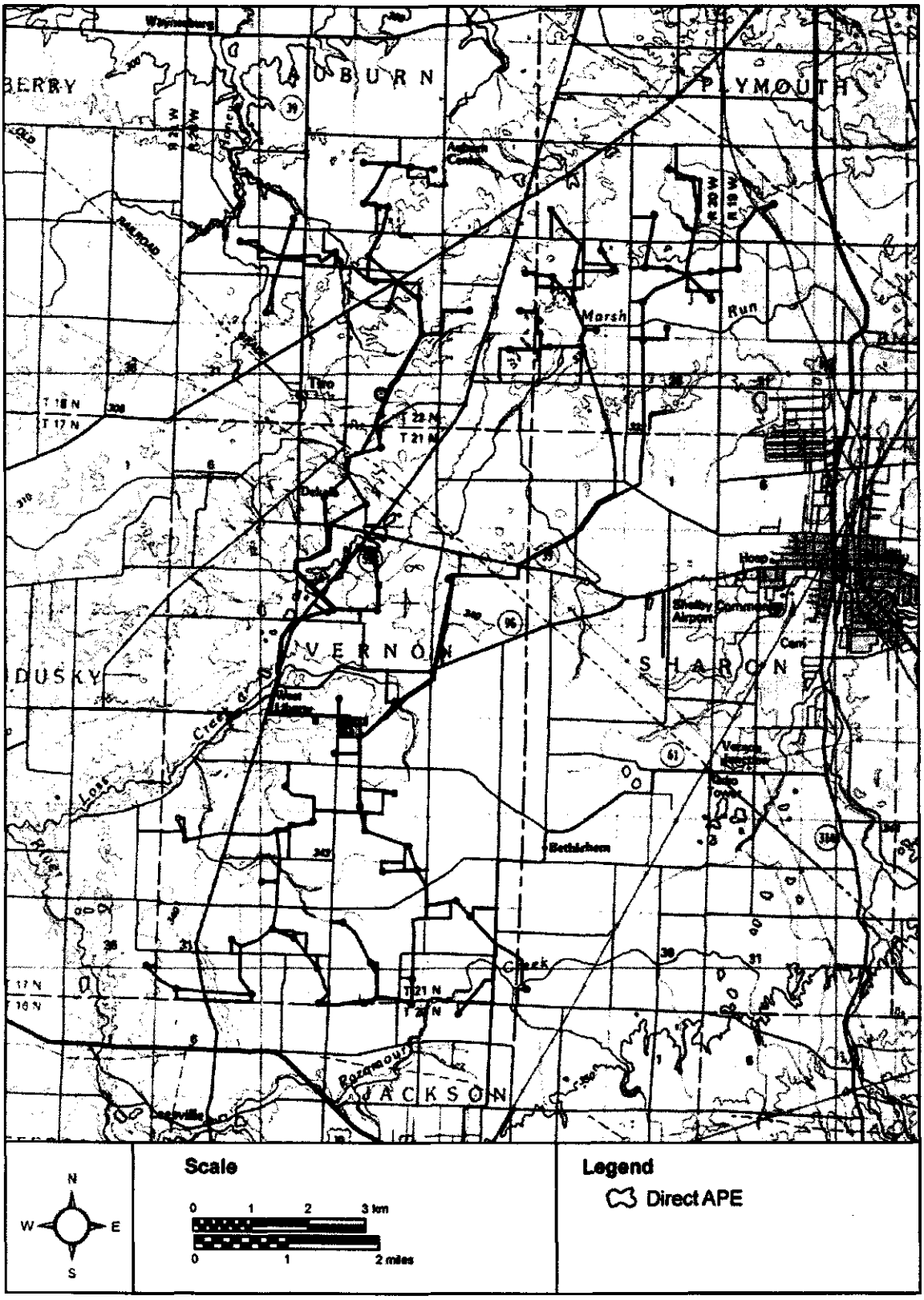

Figure 3. Direct APE on topographic map.

Each Vestas V-100 turbine will consist of an enclosed monopole support tower, a nacelle at the top of each tower containing the electrical generating equipment and transformer, and a three-bladed rotor 100 m (328 ft) in diameter and centered 80 to 95 m (262 to 312 ft) above ground. The maximum tip height of each turbine will be 130 to 145 m (427 to 476 ft) when the rotor blade is at the top of its rotation. If an alternative turbine is selected, the rotor diameter could be 101 m (331 ft) and the hub height could be up to 100 m (328 ft).

The expected construction and permanent land area requirements for the Project are detailed below. Table 1 presents the most current assumptions concerning temporary and permanent easements.

Table 1. Proposed Temporary and Permanent Easements.

	Easement Type	
Facility	*Temporary*	*Permanent*
Turbines	Treed: 350' radius	50'
	Non-treed: 150'	50'
Access Roads	Treed: 50'	16'
	Non-treed: 40'	16'
Collection Lines	Treed: 30'	0'
	Non-treed, open Trench construction: 20'	0'
	Non-treed, installation using trenching machine: 10' (~90% of installation will use this method)	0'
Concrete Batch Plant and Temporary Laydown Area	20 acres (square)	N/A
O&M Facility	3 acres	3 acres
Substation and Switchyard	3 acres each, adjacent	3 acres each, adjacent

The permanent impact of the Generation Facility is significantly less than the construction impact, as many components are temporary (e.g., laydown area) or require a smaller area during operation than construction (e.g., access roads).

There will be no permanent structure resulting from the concrete batch plant used only during construction.

Definitions

The Project Area is defined as a 38-square-mile area encompassing the direct Area of Potential Effects (APE) (Figure 2). The direct Area of Potential Effects (APE) is defined as the Project footprint or area of permanent *and* temporary ground disturbance (Figure 3). The indirect visual APE is defined as a five-mile radius around the Project Area (Figure 2). The Project Area together with the indirect visual APE are referred to as the Study Area.

Regulatory and Project Review Authority

The archaeological survey for the proposed Project may need to satisfy the requirements of two or more regulatory authorities – Ohio Administrative Code Chapter 4906-17-08 (D) for the Ohio Power Siting Board (OPSB), and possibly Section 106 of the NHPA for the U.S. Army Corps of Engineers (USACE) and/or other federal agencies. The overall goal under these authorities is to identify any significant, or potentially significant sites that might be affected by Project development and establish appropriate methods and procedures for their future treatment. To this end, it is the intent of E.ON to develop a single survey strategy that

satisfies the regulatory requirements of both the Federal authorities and the OPSB.

Federal Authority

The issuance of federal permit(s) (for example, a NWP Wetlands permit by the USACE) may be required for the Project. In such a case, the Project would be considered to be a Federal undertaking as defined in 36 CFR 800.16(y) of the NHPA, since a federal permit, license, or approval is necessary, and compliance with Section 106 of the NHPA is required by any federal undertaking. As part of compliance efforts associated with both Section 106 of the NHPA and the permit conditions of the OPSB, a systematic Phase I archaeological survey will be conducted for the entire direct APE in an effort to identify the presence or absence of archaeological sites within the Project footprint and, subsequently, to determine whether any of these sites are potentially eligible for listing on the NRHP.

State Authority

The Project will be regulated by the OPSB under Chapter 1551 of the Ohio Revised Code and Chapters 4906-1 to 4906-17 of the Ohio Administrative Code. Chapter 4906-17-08 (D) Cultural Impact directs the identification of historic landmarks located within five miles of the proposed facility.

Ohio Administrative Code 4906-17-08(d) requires the OPSB to take cultural resources into consideration as part of the application filing requirements for wind-powered electric generation facilities. Under the requirements of this code, a work plan for addressing cultural resource issues will be submitted to the OPSB. Based on CRA's experience, the OPSB will look to the OHPO for review and guidance.

Representatives of the Applicant and CRA met with Dave Snyder of the OHPO on September 22, 2010, to clarify the purpose, goals, and expectations for the survey as applicable under Ohio Administrative Code Chapter 4906-17-08 (D). Based upon this preliminary work, CRA has prepared the following work plan for conducting the archaeological survey, analyzing and reporting its results, and establishing appropriate mitigation efforts, if required.

II. RESEARCH DESIGN AND BACKGROUND RESEARCH

In accordance with the OPSB directive, and to satisfy possible Section 106 requirements, this work plan is designed to ensure that the archaeological survey for the proposed Project achieves the following goals:

1. Identify archaeological sites (historic and prehistoric) located within the direct APE, including those resources that are listed, determined eligible, or potentially eligible for inclusion in the National Register of Historic Places.
2. Make a determination of site importance as early as possible during the survey when turbine siting design is most flexible;
3. Avoid important sites wherever possible;
4. Assess the effect of the proposed Project on unavoidable important sites;
5. Make preliminary determinations of National Register eligibility for each identified site; and
6. Develop recommendations for mitigating any adverse effects to unavoidable important sites, including those that are listed, determined eligible, or potentially eligible for inclusion in the National Register of Historic Places.

To achieve these ends, established professional guidelines, such as *Guidelines for Local Surveys: A Basis for Preservation Planning: National Register Bulletin #24* (National Park Service 1985) and *Archaeology Guidelines* (OHPO 1994) provide the basis for all of the methods proposed in this work plan. Given the large area that must be considered when conducting archaeological surveys for wind farm projects, these guidelines have been interpreted and applied in a manner intended to be achievable in scope, comprehensive in

approach, and appropriate for addressing the particular goals of this project.

In addition, recognizing that a successful survey should acknowledge and address the concerns of the people who live in the survey area, the work plan also includes specific measures for involving the public. Based on our experience, this might include contacting the historical society of each county, local chapters of the OAS, and other knowledgeable individuals including some landowners. Potential consulting parties will include local governments and community organizations with a demonstrated legal, economic, or preservation interest in the Project. Ideally, the process of contacting these organizations and individuals will occur prior to the start of field survey, although it is expected some contacts will be made throughout the survey as new organizations and/or informants are identified.

CRA's methodology for engaging the public is discussed first, followed by a summary of the culture history for the Study Area. Subsequent sections explain CRA's approach to each phase of the archaeological survey work to be performed: Previous Background Research, Field Methods, Laboratory Methods, Impact Identification, and Determinations of Importance.

Public Involvement

Public involvement efforts will continue throughout the entire project. These efforts will include coordination with potential consulting parties and interviews with local informants.

Consulting Parties

Potential consulting parties will include local governments and community organizations with a demonstrated legal, economic, or preservation interest in the Project. In addition to the Richland County Historical Society in Mansfield, Ohio, and the Bucyrus Historical Society in Bucyrus, Ohio, (the Crawford County seat), Native American tribes will be contacted as potential consulting parties regarding the archaeological investigations. All organizations identified as potential consulting parties will be contacted by letter and by follow-up phone calls, emails, and personal meetings, as necessary, to provide them with information about the proposed Project and to seek input regarding the identification and evaluation of archaeological resources.

Local Informants

Local knowledge of archaeological resources and associated collections is often extensive. Local chapters of the OAS, including the Seccauim Archaeological Chapter in Bucyrus, as well as the Richland County Historical Society, and the Bucyrus Historical Society, will be contacted concerning local knowledge of archaeological and cultural sites, informal collections, and areas of concern. Local archaeological societies will also be able to offer a local perspective on the significance of archaeological sites. Initial contacts will be made with these organizations, with additional local informants identified as appropriate.

Previous Background Research

Prior background research associated with the original proposed Project was completed by CRA in 2009 (Church and Whetsell 2009). This original review will be updated by CRA personnel to make certain that archaeological decisions are made with the most current information available.

Previous Records Review

In June of 2009, personnel from CRA conducted a Phase Ia records review and field visit of National Register of Historic Places (NRHP)-listed and Determinations of Eligibility cultural resources for the proposed Project (Church and Whetsell 2009). While the details had not been finalized at that time, the Phase Ia survey was based on a Project Area encompassing portions of a 52-square mile area surrounding the direct APE and containing 132, 1.8-MW turbines with a 129-m (423 ft) maximum turbine height and an undetermined length of access roads and electrical collection lines. The initial Study Area used for this

original records review extended 5 miles in each direction from the Project Area boundary. This initial Study Area was larger than the subsequently revised Study Area used for this work plan.

The initial records search was completed on June 17 and 19, 2009, and identified 909 previously recorded prehistoric, historic, and multicomponent prehistoric/historic sites have been recorded previously within the Study Area. The majority of these sites were documented during large-scale transportation planning surveys associated with the relocation of U.S. Route 30 in the 1990s (see Gibbs, Frye, and Dobson-Brown 1996; Murphy 1989; Schweikart et al. 1996; Whitman et al. 1995; and Whitman et al. 1998), although the earliest survey associated with this Project was Baker (1978). New archaeological resources have been documented, and early archaeological sites field-checked and verified during the cultural resource surveys reviewed during this initial records search (Baker 1978; Biehl 1998; Burcham 2002; Cameron and Duddleston 2004; Clarke 1978; Gibbs, Frye, and Dobson-Brown 1996; Haywood 2005, 2006a-b; Jackson, Tuttle, and Harris 1992; Keener 2007; Morse 1979; Murphy 1989; Pacheco and Krumrine 1998a-b; Schweikartet al. 1996; Stathakis 2000; Weller 2007; Weller and Haines 2004; Whitman et al. 1995; Whitman et al. 1998).

Based on this 2009 review of the literature and the OAI forms, 674 archaeological sites (74 percent) had been determined not eligible for listing on the NRHP (Appendix A). An additional 235 sites (26 percent) have not been assessed for potential eligibility for listing on the NRHP (Appendix B). This list includes three sites in Huron County, 74 in Richland County, and 158 in Crawford County.

Update to Records Review

CRA has updated the 2009 records review. The Study Area employed for the updated records review is smaller than the Study Area used for the initial 2009 records review following the incorporation of changes in the Project Area, which has been reduced to approximately 38 square miles. The purpose of this update was to identify any archaeological sites or architectural properties added to the OAI or OHI since the 2009 study was completed. This was accomplished through the use of OHPO's online mapping system and the NRHP online database and a visit to the OHPO to review site files and reports that had not been logged on the online system.

This updated 2010 review of the literature and the OAI forms identified 872 recorded archaeological sites, including 638 archaeological sites (73 percent) that have been determined not eligible for listing on the NRHP (Appendix A). An additional 234 sites (27 percent) have not been assessed for potential eligibility for listing on the NRHP (Appendix B). These unevaluated sites include 3 sites in Huron County, 44 in Richland County, and 187 in Crawford County.

These previously identified archaeological sites will be briefly discussed within a culture-historical context after the following summary of the culture history of the Study Area.

Culture History

The primary purpose of this section is to provide the reader with an overview of some of the recent archaeological research completed in Ohio that appears relevant to identifying site types that might be present in the Study Area, as well as for identifying studies that might provide information useful in interpreting and evaluating identified sites.

Early Euro American and American travelers and settlers noted that the Study Area was almost completely forested, except for an area known as the Sandusky Plains in the eastern portion of what eventually would become Whetstone Township in Crawford County west to the Sandusky River (Hopley 1912:67). If images of the grasslands of the American Great Plains spring to mind, then the term 'plains' is something of a misnomer. These plains were flat swamplands with more swampy areas and cranberry bogs common in the northwestern portion of the county (Hopley 1912:68). While these swamps and bogs initially proved a deterrent to pioneer settlement, the gradual influx of settlers in the early decades of the 1800s eventually led to the

draining of the swamps and conversion instead to rich agricultural lands.

However, prior to historic settlement, early Euro American and American travelers recorded the presence of several Native American villages in Crawford County, especially along the Sandusky River and its tributaries (Hopley 1912:66). These villages attest to the continual use of the area for thousands of years before the arrival of the Euro Americans. The archaeological record reveals human occupation of the Study Area from the earliest recorded human cultures through the historic period. Unfortunately, the area has never been known for the spectacular prehistoric mound and earthwork complexes or villages documented elsewhere in Ohio; thus, there is a certain paucity of detail in our knowledge of the prehistory of the area.

We can generalize from our knowledge of prehistoric settlement patterns in the region to gain an understanding of how the Study Area was utilized during each prehistoric period. The sections below discuss our general understanding of broad prehistoric periods in the Eastern Woodlands region. An examination of archaeological sites specific to the Study Area is undertaken following this discussion.

Paleoindian Period

The Paleoindian period begins with the entry of humans into the New World during the early Holocene, following the retreat of the Wisconsin glaciers. The precise arrival of the earliest inhabitants of this continent is the subject of a great deal of contention, but it is generally agreed that humans occupied the whole of the North American continent by 13,500 B.P. and that the Paleoindian period ended roughly 10,000 B.P.

The Paleoindian period has been subdivided into three temporal divisions based on different diagnostic projectile points that presumably reflect changes in social organization and environmental conditions. The early Paleoindian period ranges from 13,500 B.P. to 10,500 B.P., and sites are identified by the presence of fluted projectile points and a unifacial chipped stone tool technology (Holsten and Cochran 1986), suggesting a subsistence practice based on hunting large animals (Dragoo 1976). The reliance on hunting may have been related to changing environmental conditions immediately following the glacial retreat, when northern vegetation communities gradually were being replaced by southern vegetation communities (Ford 1977). In the Muskingum drainage area, Lepper's research (1986) suggests that compressed vegetation zones paralleled the glacial fronts with the area south of the glacial front consisting of tundra, followed by middle latitude deciduous forests that progressed further south than their present distribution. As temperatures rose and glaciers retreated, the succession and reorganization of vegetation species into their present locations began.

With environmental instability limiting the abundance of animal and plant species, human groups would have been relatively small and highly mobile to exploit available resources. Mobility, coupled with large territory sizes, is suggested in the preferred use of high-quality cherts such as Wyandotte, Holland, and Upper Mercer for the production of fluted projectile points, because these cherts are limited in their natural occurrences (Holsten and Cochran 1986). Dorwin (1966) notes that most of the isolated occurrences of Paleoindian sites are associated with eroded outwash terraces along major river valleys, suggesting that early human groups were highly mobile and focused on the plants and herd animals using the valleys.

Archaeological excavation at Sheriden Cave, in Wyandot County in northwestern Ohio, has provided radiocarbon dates from cultural strata that indicate Paleoindians utilized the cave between 13,000-12,000 B.P. Artifacts recovered from cultural strata include debitage, charcoal and burned bone, a biface, a side scraper, an end scraper, a graver, two bone points, and a reworked fluted projectile point (Tankersley 2002; Tankersley and Redmond 1998). A large body of data regarding continuous use of rockshelters throughout the prehistoric period have been accumulated and are currently being synthesized by Nigel Brush, whose excavation team recovered a Paleoindian

hafted biface as recently as the fall of 2009 at a shelter in Coshocton County (e.g., Brush et al. 2009).

The late Paleoindian period (10,500-10,000 B.P.) is characterized by the absence of fluting in the production of points (Holsten and Cochran 1986; Swartz 1981). However, the general shapes of the projectile point types did not change dramatically from the fluted lanceolate forms of the earlier period. What did change was a growing reliance on locally available cherts for tool production and the less frequent occurrence of fluted points (Holsten and Cochran 1986). These observations have led to the conclusion that territory sizes were smaller, reflecting an increase in locally available plant and animal species.

The Plano period is a transitional period between 10,000-8,000 B.P. in which large lanceolate projectile point styles persist alongside shorter, more triangular-shaped forms (Swartz 1981). The changing size and haft characteristics of the projectile points have been seen as a shift in hunting practices toward the smaller game of deciduous forests, although large herd animals such as elk and deer were preferred (Holsten and Cochran 1986). The changes begun during this period continue in the subsequent Archaic period.

Archaic Period

In the Ohio Valley the concept of the Archaic has been used to define a roughly 7,000-year span of time that witnessed gradual developments and changes in the technological, adaptive, and sociocultural dimensions of indigenous hunter-gatherer cultures. Over the years, and especially following the use of modern recovery techniques, the definition of the Archaic for parts of the Eastern Woodlands has been modified to include many of the variables (e.g., agriculture, pottery, and mound construction) traditionally used to define the Woodland period beginning about 1000 B.C. In the region, the Archaic is traditionally divided into Early, Middle, and Late sub-periods, which to most archaeologists have both cultural and chronological significance. Temporal limits for sub-periods vary across space and continue to undergo revision within local/regional areas as additional data are obtained. However, there is general agreement that Early Archaic dates from 8000-6000 B.C., Middle Archaic from 6000 to 3000 B.C., and Late Archaic from 3000 to 1000 B.C. (Jefferies 1996).

Purtell's (2009) review of the Archaic period in Ohio revealed intensive occupation by Early Archaic groups of the Till Plains, a much less noticeable presence during the Middle Archaic, and a surge in utilization during the Late Archaic. This pattern is reflected in the frequency of Archaic sites documented within the Study Area, as noted in the discussion above. Early Archaic sites are most likely to be identified on the basis of lithic scatters, with some sites containing large numbers of hafted bifaces. Middle Archaic sites may show up as a component of predominately Early or Late Archaic sites, in which the Middle Archaic occupation is documented by the presence of distinctive hafted bifaces. Single component Middle Archaic sites with subsurface features are not usually found. Late Archaic populations in the Till Plains made widespread use of glacial features for siting base camps, procuring resources, and for mortuary purposes. By this time, distinct regional groups can be identified in the archaeological record on the basis of material traits, burial practices, and settlement types.

Early Archaic

Based primarily on transitional lithic forms and technologies, and the similarity of adaptive systems, it is evident that regional Early Archaic expressions developed in situ from Late Paleoindian manifestations (Funk 1978). Analysis of available radiocarbon determinations indicates the development of Early Archaic cultures took place during the early Holocene, from approximately 8000 to 6000 B.C.

By the beginning of the Early Archaic period, many of the harsh conditions associated with the terminal Pleistocene had been ameliorated, and the large megafauna species exploited by earlier Paleoindian populations had become extinct. Deciduous forests rich in nut producing taxa migrated northward, and rivers that previously served as sluiceways for

glacial meltwaters dwindled in size, exposing broad, braided valleys conducive to travel, exploitation, and settlement. As interpreted by Muller, "many of the features of the Early Archaic, though poorly understood, reflect the beginning of the long period of specialization to Eastern Woodland local environments" (Muller 1986:56).

The Early Archaic tool kit is strikingly similar to that used during the late or terminal Paleoindian period, with the primary difference being the replacement of lanceolate hafted bifaces with notched varieties. Morphological and technological changes in hafted bifaces have been documented at a number of deeply stratified open-air and rock shelter sites, including St. Albans in West Virginia (Broyles 1966, 1971), Longworth-Gick in Kentucky (Collins 1979), Modoc Rockshelter (Fowler 1959; Styles et al. 1983) and Koster (Brown and Vierra 1983) in Illinois, Rose Island and Ice House Bottom in Tennessee (Chapman 1975, 1976, 1977), Hardaway and Doerschuk in the Carolina Piedmont (Coe 1964), and James Farnsley in southern Indiana (Krapesh 2003). More recently, information for late Early to early Middle Archaic lithic technology was reported for the Van Bibber Reynolds site (Anslinger et al. 2004).

Archaeological data collected from surface surveys and excavations throughout the greater Ohio Valley indicate that the formation of most Early Archaic sites resulted from short-term occupations by small, mobile bands. Sites are characteristically small and produce a limited range of tool functional types. Piercing, cutting, and scraping tools associated with the procurement and processing of meat and hides are most common. Typically lacking are implements for the processing of plant foods. Evidence of pit features, structures, and human and dog burials is rarely reported in the Ohio Valley. When features are present, they tend to consist of surface hearths and possible smudge pits (Broyles 1971).

The largest Early Archaic sites are often located in close proximity to high quality exposures of raw tool stone. Associated artifact assemblages include large numbers of cores, flake debris, and aborted bifaces, reflecting the importance of lithic reduction activities. Often these sites appear to have been used repeatedly over long periods of time, with visits made for retooling, possibly as part of a scheduled settlement round.

Early Archaic hafted bifaces include types belonging to the Large Side Notched, Thebes, Kirk, Rice Lobed, and LeCroy clusters (Justice 1987). At the St. Albans site Broyles (1971) identified a deeply stratified sequence of Early Archaic deposits, which from earliest to most recent included Kirk Corner Notched, MacCorkle Stemmed, St. Albans Side-Notched, LeCroy Bifurcate Base, and Kanawha Stemmed components. The information obtained from this site played an important role in the development of the Early Archaic culture-historic sequence in the Eastern Woodlands.

Middle Archaic

The Middle Archaic spans the period from approximately 6000 to 3000 B.C. Based on trends in the geographic distribution of hafted biface styles, the period marks the first significant development of regionally distinct archaeological cultures in the Eastern Woodlands (Jefferies 1996). This development is generally viewed as a sociocultural and technological response of adapting to local environments. Regional studies indicate that during the Middle Archaic the overall diversity of the subsistence base increased and mobility decreased. These changes are interpreted as marking a shift in Archaic foraging to a largely logistic collector strategy (Brown and Vierra 1983; Stafford et al. 1998; Stafford et al. 2000). Unlike Early Archaic foragers that moved camp from resource to resource, at least some Middle Archaic groups in the region appear to have acquired resources more consistently through logistical forays initiated from base-camp(s). Residential sites associated with foragers generally have low densities of artifacts, simple hearths, and associated general activity areas (Stafford et al. 2000). Sites of logistically organized groups, on the other hand, show evidence of greater residential stability. In the archaeological record this stability is

recognized by the presence of rock-filled middens, large and functionally diverse pit features, and in some instances structures and human and dog burials (Brown and Vierra 1983; Jefferies 1996; Stafford 1994; Stafford et al. 2000). This fundamental shift is perhaps best documented in the deeply stratified records reported for the Koster (Brown and Vierra 1983) and Modoc Rockshelter (Styles et al. 1983) sites in southern Illinois. Sites dated to as early as 3000 B.C. and interpreted as multi-season base-camps are well documented in the southern Midwest and Mid-South. However, a similar record is not available for the central Ohio Valley.

Concomitant with these changes in settlement and subsistence, Middle Archaic tool assemblages reflect a broader range of functional types and styles that their Early Archaic counterparts. For the first time in the Ohio Valley, ground stone artifacts manufactured through a pecking-grinding-polishing technology occur with some regularity. Included are wood-working implements such as axes and adzes. Other formal and informal ground stone tools such as manos, mortars, pestles, and pitted anvils were used in the processing of nuts and other plant foods (and possibly the smashing of bone prior to boiling).

Regional hafted biface types include Stanly, Amos, Morrow Mountain, and Guilford. Toward the end of the period side-notched varieties including Big Sandy II and Brewerton appear to be common. Also present are newly introduced ground stone implements, including grooved axes, pitted anvils, and mortars and pestles. At midden sites where preservation is generally enhanced, tools and ornaments of bone and antler are often well represented.

Late Archaic

Based on the widespread occurrence of Brewerton hafted bifaces, most Late Archaic sites in the central Ohio River Valley have been linked to the Brewerton phase of the Laurentian tradition (Vickery 1980:47–53), circa 2980 B.C. to 1723 B.C. (Dragoo 1976). The hallmark of the tradition is the widespread occurrence of crudely fashioned, thick, small stemmed or notched hafted bifaces, such as Brewerton Side Notched, Corner Notched, and Eared forms (George 1971) or Vosburg, Otter Creek, Normanskill, and Genessee forms (Vickery 1980). Lamoka, Motley, and Big Sandy II hafted bifaces are minority types. In addition to these biface types, atlatl weights and hooks, adzes, and celts are included in the tool assemblage. Vickery (1980:51) suggests that the sites in the bottoms of upland stream valleys are base camps with hunting and gathering stations are located in the surrounding hills.

The most common description of Late Archaic site types comes from the work of Prufer and Long (1986), based on northern Ohio sites. Their original model of Late Archaic settlement divided sites into relatively large base camps on high ground along major tributaries and small encampments on knolls overlooking lakes, ponds, and swamps. Both kinds of sites produced similar artifact assemblages, but differed in the quantity of materials recovered (Prufer and Long 1986). Larger sites also produced more diverse assemblages that included ground stone and bone tools. A variation on this theme of large and small sites was described in the early 1990s with the excavation of a portion of site 33Fr945 in Franklin County, Ohio (Stevenson 1992). Consisting of discrete artifact clusters, this site was interpreted as a series of small encampments for hunting or collecting and the acquisition and reduction of lithic material (Stevenson 1992). Prufer (2001) subsequently revised his earlier model of Archaic settlement; the new model, based on old and new data, interprets the larger sites (previously described as base camps) as the result of repeated reoccupation throughout the Archaic period, not to a different site function from the smaller sites. This revised view is more consistent with the interpretation of site 33Fr945 than the earlier one.

Other models of the Late Archaic settlement system were based upon a generalized model of hunter-gatherer settlement for the Eastern Woodlands. Roper and Lepper (1991), based on their work in southwestern

Ohio, proposed four potential site types that would be generated by a Late Archaic hunter-gatherer adaptation, including semi-permanent base camps, satellite short-term seasonal camps for generalized resource procurement, special purpose extraction camps (e.g., quarries), and mortuary sites. In southeastern Ohio, Late Archaic sites have been interpreted as the result of a logistically organized settlement pattern (Church and McDaniel 1990) in which the use of lithic resources was embedded in the procurement of other resources (Stafford 1991).

Vickery (1976, 1980) defined three other Late Archaic complexes for sites of this age in southwestern Ohio: the Central Ohio Valley Archaic phase (2750–1750 B.C.), dominated by the McWhinney Heavy Stemmed hafted biface type, but including a few Brewerton, Vosburg, and Otter Creek hafted bifaces, atlatl weights and hooks, bell pestles, limestone roller pestles, grooved axes, Maple Creek knives, and a unique scraper-plane tool. These sites occurred as large base camps predominantly on the valley floor of major waterways and as smaller encampments and components of larger, multi-component sites in upland locations.

The Transitional Archaic, Vickery's second Late Archaic complex, was dated between 2000 and 1400 B.C. (Blank 1970) and was distinguished from the Central Ohio Valley Archaic by the presence of hafted biface types such as Ashtabula, Lehigh, Orient Fishtail, Perkiomen, Snook Kill, and Susquehanna Broad and may include soapstone bowls.

The third Late Archaic complex defined by Vickery was the Maple Creek phase, placed in the late Late Archaic between 1750 and 1000 B.C. (Vickery 1980:27). This phase was defined by the dominant presence of McWhinney Heavy Stemmed bifaces, which co-occur with Merom-Trimble hafted biface types (Vickery 1980:27–31). Co-occurrence of Merom-Trimble and McWhinney hafted bifaces has been documented at several other Late Archaic sites in the area. This may suggest a cultural affinity between the Riverton culture and the Maple Creek phase (Jefferies 1990). A chipped stone microtool industry is evident at Maple Creek phase sites, while smaller amounts of ground stone tools are present. Atlatl parts and bell pestles are scarce. The distribution of Maple Creek phase sites suggests that they closely follow the Ohio River and that sites of this phase are rare in the interior of Ohio (Vickery 1980:31–32).

However, Boisvert (1986), (Ledbetter and O'Steen 1991), and others later demonstrated that the McWhinney Heavy Stemmed type predates, and is replaced by, the Riverton types. The two types are only found together in great numbers in the heavily occupied Maple Creek and Logan sites. Rather than being associated, the McWhinney Heavy Stemmed hafted bifaces were probably from a previous Central Ohio Valley Archaic occupation.

The appearance of cultigens in Late Archaic contexts has been interpreted as evidence of early plant domestication and use of these plants as subsistence resources. Struever and Vickery (1973) defined two plant complexes domesticated at the close of the Archaic that continued to be used into the Woodland period.. The first was a group of native plants such as goosefoot, marsh elder, and sunflower, which Struever and Vickery (1973) suggested were cultivated first, followed by a second group of non-native plants such as gourd, squash, and corn, which were introduced later. Research in Missouri, Kentucky, and Tennessee, however, suggested that squash was under cultivation in the mid-south by the late third millennium B.C. (Adovasio and Johnson 1981:74). By the second half of the second millennium B.C., evidence from Illinois, Kentucky, and Tennessee demonstrates that squash, gourd, and sunflower already were established (Adovasio and Johnson 1981:74), contradicting Streuver and Vickery's scenario (Chomko and Crawford 1978).

Watson (1985) has outlined two different groups of cultigens, the East Mexican Agricultural complex and the Eastern United States Agricultural complex. The latter includes sunflower (Helianthus annus), sumpweed (Iva annua), goosefoot (Chenopodium sp.), maygrass (Phalaris sp.), and knotweed (Polygonum sp.), while the East Mexican Agricultural complex includes squash

(Curcurbita pepo), bottle gourd (Legenaria siceraria), and maize (Zea mays). Like Struever and Vickery, Watson (1985) suggested that corn, squash, and bottle gourd were domesticated in Mexico and imported into the eastern United States by way of the Gulf of Mexico, then up the Mississippi River and its tributaries. The native cultigens consisted of local species whose seeds recovered from archeological contexts are much larger than those that grow in a natural state; hence, cultivation is inferred.

Plant domestication was an important factor in Late Archaic cultural development as research documented at Cloudsplitter Rockshelter, where desiccated squash rind was found in a Late Archaic deposit associated with a radiocarbon date of 3728 ± 80 B.P. (Cowan et al. 1981:71). Seeds of the Eastern Agricultural complex (sunflower, sumpweed, maygrass, and erect knotweed) are sparse in the Late Archaic levels in the site. After circa 1000 B.C., all members of the Eastern Agricultural complex underwent a sudden and dramatic increase in the rate at which they were being deposited in the site. This was perhaps indicative of a wholesale introduction of the complex into the region at this time. The Late Archaic and Early Woodland inhabitants of Cloudsplitter seem to have followed a similar trajectory in cultivated plant usage which was experienced in several other river drainages in the eastern United States (Cowan et al. 1981:71).

Woodland Period

Traditionally, archaeologists distinguished the Woodland period from the preceding Archaic by the appearance of cordmarked or fabric-impressed pottery, burial mounds and other earthworks, and the rudimentary practice of agriculture (Willey 1966:267). However, over the years, and especially following the use of modern recovery techniques, pottery making and the rudimentary practice of agriculture haves been found to extend back into the Archaic temporal period in the Ohio Valley.

Woodland period archaeology in the Mid-Ohio Valley has focused on burial mounds rather than habitation sites. The apparent "lack" of habitation sites, particularly sites dating to the Early and Middle Woodland periods, confounded the understanding of subsistence and settlement systems and non-ritual lifestyles. It was difficult, at first, for early investigators to link the rather small, lackluster lithic and pottery scatters to the people who constructed the large ceremonial centers and earthen burial mounds and the often opulent burial accoutrements associated with them. Habitations were considered an element of the mound-building process and sub-mound structures were initially interpreted as dwellings (Webb 1941). A data gap developed between the period of mound construction and the equally visible and artifact and burial rich Fort Ancient sites. Prior to the use of extensive plow zone removal, it was often thought that the less distinguished sites were wholly disturbed and could provide little significant data. The last four decades of archaeological research has proven that significant finds can be made below the plow zone, and the number of Early, Middle, and Late Woodland habitations has increased dramatically.

The Woodland period, like the preceding Archaic period, is divided into three sub-periods: Early Woodland (1000 to 400 B.C.), Middle Woodland (400 B.C. to A.D. 400), and Late Woodland (A.D. 400 to A.D. 1100). In some areas of the Ohio Valley, Early Woodland is often viewed as synonymous with Adena, with Middle Woodland (400 B.C. to A.D. 400) as the period of Hopewell development and florescence. Late Woodland (A.D. 400 to A.D. 1100) is often defined by what it is not (i.e., high cultures like Hopewell and Mississippian) rather than what it is (Shott et al. 1993).

Overall, the Woodland period witnessed a continuation and elaboration of cultural practices that began during the Late Archaic. Woodland peoples became increasingly dependent on the cultivation of plant foods, which allowed for a more sedentary lifestyle. Except for the latter part of the Late Woodland, subsistence practices remained similar to the Archaic subsistence patterns - a combination of hunting, plant food production and gathering, and fishing in a seasonal round exploitation pattern. It is within the Woodland period that highly visible site types such as mounds and

enclosures were constructed in the Mid-Ohio Valley.

The evidence today suggests that Early Woodland habitations were not permanent structures, but temporary shelters for groups which likely moved on a seasonal basis within proscribed territories (Schweikart 2008). Such sites have been identified adjacent to wetlands and lithic outcrops. Associated with these territories were mortuary sites, such as the large mounds in the central Scioto river valley, but these are not present everywhere within the Till Plains, and variations are evident from drainage to drainage. The use of thick-walled ceramic vessels becomes common, with earlier steatite vessels gradually disappearing from use, and hafted bifaces become more limited in style.

Middle Woodland in the central Scioto Valley is often thought of as synonymous with Hopewell, which is spectacular—mound and earthwork groups have yielded exotic artifacts of mica and obsidian, stone effigy pipes, grizzly bear canines, etc., indicating a well-established trade network. In the last 25 years, in-roads have been made in our understanding of the habitation sites of this time period. Not surprisingly, such sites continue to follow a pattern established long before—small seasonal hamlets, perhaps, with seasonal resource extraction camps associated with them (Aument 1992; Yerkes 2006), although some researchers argue for the presence of sedentary communities during this time (Burks 2004; Burks and Dancey 1999; Dancey 1991, 1992; Kozarek 1996; Pacheco 1992, 1996). Distinctive blade and core technology, hafted bifaces, and ceramics mark the utilitarian material goods associated with Middle Woodland habitation sites (Genheimer 1992, 1996; Lemons and Church 1998; Yerkes 2006).

During the Late Woodland period, the region has produced evidence of two basic patterns of settlement: an early Late Woodland and a late Late Woodland pattern (e.g., Church 1987; Church and Nass 2002; Dancey 1988, 1992; Seeman and Dancey 2000). The earliest finds large sites situated on bluff edges or a similar location, especially in the central Scioto valley. These produce multiple patterns of houses and associated material culture and features (hearths, pits), sometimes behind a ditch. It is not clear if these communities represent simultaneous occupation by multiple households, which would be indicative of a nucleated settlement, or whether they represent sequential occupation over time by the same or different group (Clay 2002; Clay and Creasman 1999). Gone are the exotic artifacts and complex mound and earthworks associated with Ohio Hopewell; ceramics are simple in style and hafted bifaces show a widespread similarity of crude notched types of locally available cherts. Archaeobotanical evidence suggests that native seed plants are important components of the subsistence, continuing from earlier periods (Wymer 1992, 1996). During the late Late Woodland period, site types become more varied and more variably distributed (Church 1987; Maslowski 1985; Niquette 1989). Small groups are moving into the uplands and back to the valleys in well-established territories to obtain necessary resources. Nolan and Cook (2010) suggest that moisture stress played a crucial role in this diversified settlement-subsistence pattern, with this time period (approximately A.D. 800–900) experiencing one of the driest periods in the Middle Ohio Valley. Hafted bifaces change in form, and it is suggested that the bow and arrow is introduced into use during this part of the Late Woodland period (Seeman 1992; Yerkes and Pecora 1990). It is possible that separate burial sites—small mortuary sites—were being utilized.

Late Prehistoric

The Late Prehistoric period is marked by the presence of nucleated villages in the Central Scioto valley (Essenpreis 1982; Fuller 1982; Graybill 1981, 1986; Griffin 1943). Nolan and Cook (2010) offer an evolutionary explanation for the development of these communities out of the transitional period between the Late Woodland and Late Prehistoric, when moisture stress is alleviated and settlements increased in size and organizational complexity, with communities pooling and storing resources. Late Prehistoric sites (e.g., Baum and Gartner in the middle Scioto valley [Mills 1904, 1906]) are constructed on a basic ring pattern of

structures around an open central plaza. Behind the structures are located storage pits, reused for trash, sometimes with burials, and behind this, often an encircling palisade . Some villages, especially in the southern portion of the drainage, have associated burial mounds. The ubiquitous triangular hafted biface is the basic hafted biface, and cultigens like corn, beans, and squash (the three sisters) become the dietary staples, with white-tailed deer and wild turkey the most common faunal resources. Supplemental sites for specific resource extraction—in the uplands, for example—also are associated with this time period. Village sites are located along the major rivers and tributaries, and most are well-known.

The Glaciated Plateau physiographic section was not suited for growing crops, so large nucleated Late Prehistoric sites are not found in this area. As with the latter part of the preceding period, small groups—in this case from larger villages located elsewhere—most likely made use of the Glaciated Plateau region on a limited, seasonal basis, primarily for the extraction of specific resources—perhaps nuts and white-tailed deer.

Historic Period

Historically, the Crawford/Richland County area was opened to American settlers at the end of the Revolutionary War. Native Americans, having allied themselves with the British, found themselves on the losing end of that war and were forced to make major territorial concessions to the American government. Through the Treaty of Paris on September 3, 1783, the area of Crawford and Richland counties became part of the United States. Later, the treaties of January 27, 1785 and January 9, 1789, designated the entire north half of Ohio west of the Cuyahoga River as Indian territory, and on July 4, 1805, a third treaty moved the boundary west by fifty miles (Hopley 1912:65). On July 4, 1809, seven miles of land in the Crawford/Richland County area was purchased from the Native Americans and opened for settlement (Bayton and Bayton 1855:25); the eastern four miles were part of what was then Knox County and the rest was part of what was then Delaware County, Ohio. On January 13, 1813, Richland County was formed, with Crawford County created by an act of the Ohio legislature on February 12, 1820, although it would not be until another act passed on January 31, 1826, to allow for the election of county officers that Crawford County became a reality. Until then, the county was under the jurisdiction of first Delaware County, then later Marion County when that county was formed in 1823.

Although the area was politically opened for settlement at the end of the Revolutionary War, in actual fact, hostilities and uncertain relationships with Native Americans kept settlers out of the region until after the War of 1812. Troops passed through this area during the War of 1812, when two military roads (including Beall's Road) were cut through the forests and swamps. Traders, trappers, and settlers followed the military roads into the region after the War of 1812 ended and noted the presence of Indian villages in Crawford County as follows: one in northwestern Auburn Township, east of what would become North Auburn Station; a Delaware village a half mile northeast of Leesville; a Wyandot village on the bank of Whetstone Creek in Galion; a possible village four miles west of Bucyrus; one on the Sandusky River south of the Mount Zion church; and one on the Sandusky River one mile west of the Wyandot village (Hopley 1912:66).

Further treaties with the Wyandot tribe on September 20, 1817, and September 17, 1818, gave all of northwest Ohio to the Americans, except for a few tracts of land, the largest of which remained in what would become Crawford and Wyandot counties. This newly purchased land west of Range 21 became known as the 'New Purchase' in Crawford County, compared with the 'Old Purchase' land which had been surveyed as early as 1807 by Maxfield Ludlow (Bayton and Bayton 1855:28). In 1835, the county bought six miles of the eastern portion of the Wyandot Reservation, opening the land for settlement a few years later. The rest of the Wyandot Reservation was purchased on March 7, 1842, and in 1845, when Wyandot County was organized, the western 18-mile strip of what

was then part of Crawford County became part of Wyandot County (Bayton and Bayton 1855:25). At this same time, a four-mile strip of land from the western edge of Richland County became part of Crawford County and a two-mile-wide by 16-mile-long strip was added to Crawford from Marion County. Finally, in 1848, a one-mile by seven-mile strip of southern Crawford County was given to the newly created Morrow County. Since that time, the external boundaries of Crawford County have remained stable, although township boundaries were tweaked (Bayton and Bayton 1855:25).

A similar story of boundary changes played out in Richland County, which was initially surveyed in 1807 by James Hedges, Jonathan Cox, and Maxfield Ludlow (Figure 4). James Hedges not only surveyed the land, but bought three one-quarters of land where the city of Mansfield now stands, coming back to settle after the War of 1812; he served for a time as the Register of the Virginia Military Lands (Graham 1880:220). Richland County was initially part of Wayne County, the third 'county' in the Northwest Territory, which had been created on August 15, 1796, and included all of northwest Ohio, northwest Indiana, Michigan, northern Illinois, and Wisconsin. On December 9, 1800, Fairfield County was created from a portion of Wayne County, and included what would become Licking, Knox, and Richland counties by order of the General Assembly of the state of Ohio on January 16, 1808.

At first, Richland County was under the jurisdiction of Knox County, and on June 9, 1809, it consisted of a single township (Madison), a thirty-mile block of land north-south and east-west, although the southern boundary, which followed the Treaty of Greenville, was irregular. By January 7, 1812, Green Township was created from a portion of Madison Township, and on January 7, 1813, Richland County had sufficient population to warrant being under its own jurisdiction (Graham 1880:227). County boundaries diminished with the formation of Wyandot County, when land was taken from Richland and given to Crawford, which had lost its western townships to the newly formed Wyandot County. What was left of Richland's Auburn and Vernon Townships were put with Plymouth and Sharon Townships, respectively. Again in 1846, when Ashland County was created, Richland County lost Montgomery, most of Clear Fork, and part of Mifflin Township to the new county. Finally, in 1848, Richland County lost Congress and Bloomfield Townships and the western halves of Perry and Troy Townships when Morrow County was formed to the south (Graham 1880:231). The external county boundaries have remained unchanged since then, although internally, township boundaries changed when Jackson Township was created from Sharon Township in 1847, Weller was created from Franklin Township in 1849, and Cass was created from a portion of Plymouth Township at the end of 1849.

Settlement gained ground after the War of 1812 removed the threat of Native American hostilities and particularly after the New Purchase. However, the swampy area remained a deterrent. As Hopley (1912) records, Abraham Monett arrived in Crawford County in 1835 and counted 40 abandoned cabins on the Sandusky Plains; early settlers had observed in 1821 that weeds along the old military roads grew as high as a horse's head (Hopley 1912:68). Settlers moved into Crawford County through Richland County to the east, or came south through Huron County. Prior to 1815 and the close of the War of 1812, most of the early settlers were not true settlers, but were mostly hunters and trappers; these men usually did not own the land they squatted on, but like Jedediah Morehead on Honey Creek in Auburn Township, Crawford County, threw up a rough cabin while they trapped beaver and otter in the marshes (Hopley 1912:68). John Pettigon, a soldier in the War of 1812, owned his land in southern

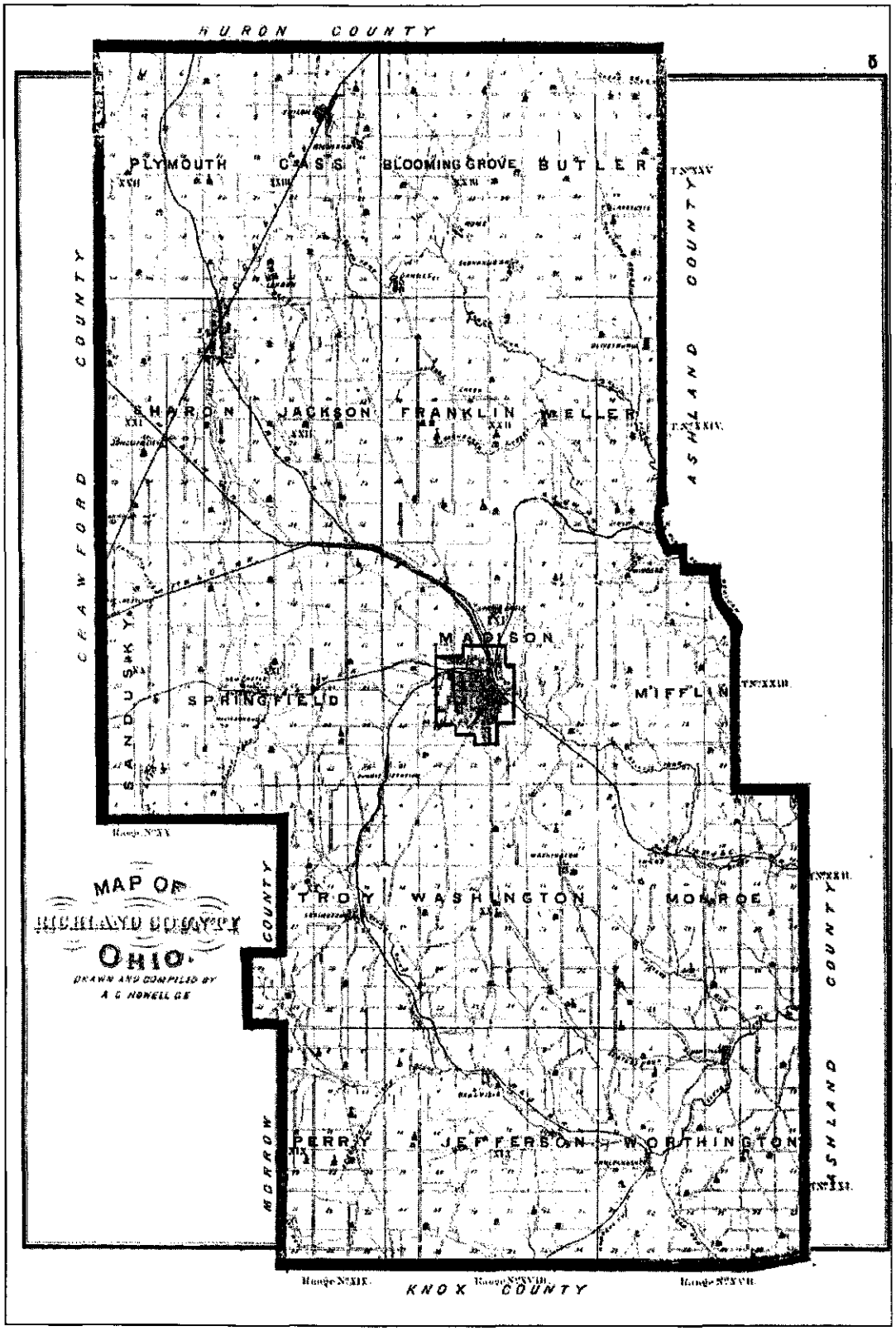

Figure 4. 1873 Atlas map of Richland County, Ohio (Andreas 1873).

Auburn Township in 1814; he was also a hunter and trapper (Hopley 1912:69). Pettigon and Morehead and others like them probably came through the area with the military along the road north during the War of 1812 and came back later to make a living here. None stayed long, moving on as the area began to fill up with homesteaders—men who came to stay and brought their families with them, platted crossroads villages and towns like Tiro, Leesville, Crestline, Galion, New Washington, West Liberty, Mechanicsburg, and Sulphur Springs, and cleared the forests, drained the swamps, built grist and sawmills and distilleries, set up taverns and trading stores, and eventually schools and churches. Early on, post offices were established, and by 1822, stages carried mail as well as passengers along Beall's Road. These early settlers came from Pennsylvania, New England, New York, and Virginia, and by 1820, sixty families lived in Crawford County (Hopley 1912:78).

Shelby, the largest city in the Study Area, was originally settled where two roads crossed in Sharon Township in 1818. Sharon Township contains the Black Fork and its tributaries, including a ridge between the headwaters of the Muskingum and Sandusky River drainages. The roads at Shelby were formed from trails—one going north towards Fremont. An Indian camp was reportedly located on a branch of Black Fork two miles west and south of Shelby; in 1828 the trail led from there to the village near Leesville in Crawford County (Graham 1880:566). Early settlers of Shelby were Eli Wilson, Henry Whitney, and Stephen Marvin, who all came together in the fall of 1818 from near Norwalk, Connecticut. Settlers also came from New England and from western Pennsylvania, with the city officially laid out in June 1834 by John Gamble, followed by Henry Whitney, who laid out the area north of Main Street and south of Mill Street. Eli Wilson—one of the original settlers noted above—laid out East Shelby in 1854, an area that was later incorporated into the city of Shelby. The post office, established in 1828 by John Gamble, was originally known as Gamble's Mill until 1840, when the name of it and the city became established as Shelby, after a Kentucky governor. Legally incorporated in 1853, Shelby boasted two newspapers, two jewelry stores, one wholesale liquor store, nine milliner and dressmaker shops, a foundry, a tannery, and two carriage factories (Graham 1880:572-581).

The Study Area remained firmly agricultural in terms of economy, largely self-sufficient, with commodities sold locally and regionally in Crawford County until 1853 when the first railroad reached Bucyrus from the north, reaching Galion by 1863. The railroads opened up markets to the north, into the Great Lakes region (Hopley 1912:164). The railroad reached Mansfield, in Richland County, by May 1846, providing the same opening of markets that would occur a few years later in Crawford County. Farmers shipped wheat and produce north, and later, when railroads connected to Columbus to the south, in that direction as well (Graham 1880:302). While Mansfield would have a great deal of industry in later decades, Crawford County and northern Richland County have remained largely agricultural.

Archaeological Record of the Study Area

A general survey of data available in the OAI for the updated Study Area reveals that the lack of detail in our knowledge of the area's prehistory is not due to a lack of prehistoric presence in the region. Within the Study Area, more than a thousand archaeological sites and components of sites have been inventoried (Table 2). The bulk of these sites were documented in the past two decades through cultural resource management studies done for Section 106 compliance, particularly for the Ohio Department of Transportation. This is particularly true along the southern boundary of the Study Area, where the massive US 30 project in the mid- to late-1990s recorded hundreds of archaeological sites.

Table 2. Temporal Distribution of Sites and Site Components from the Ohio Archaeological Inventory.

Temporal Period	n	Percent
Unknown Prehistoric	771	68.1
Paleoindian	9	0.8
Archaic	163	14.4
Woodland	81	7.2
Late Prehistoric	14	1.2
Protohistoric	0	0.0
Prehistoric/Historic	18	1.6
Historic	76	6.7
Totals	**1,132**	**100.0**

Note: totals indicate number of components, not number of sites.

An examination of the data in Table 2 reveals that more than two-thirds of all archaeological sites in the sample are of an unknown prehistoric origin. Put simply, this designates a site for which no temporally diagnostic artifacts were present. An additional 1.6 percent of sites were multicomponent prehistoric/historic sites with no prehistoric temporally diagnostic artifacts recorded. Historic sites represent 6.7 percent of the sample. (No specific dates are noted in the online OAI data for historic sites or components of historic sites). The table is revealing, however, in that all prehistoric periods of human occupation but one are recognized in the study area, from the Paleoindian period through the Late Prehistoric. No Protohistoric sites have been documented (i.e., that period of time immediately prior to historic occupation).

Summarizing the sample of sites in Table 2 in terms of general prehistoric periods, Table 3 reveals that less than one-quarter (23.6 percent) of all recorded prehistoric sites or site components can be assigned to specific temporal periods or subperiods. Few Paleoindian sites are known anywhere within the region; this sample includes five single component sites and four multicomponent sites, all identified as open sites, type unknown. Of the four multicomponent sites, two Paleoindian components occurred with Early Archaic components, one occurred with Late Woodland and Late Prehistoric components, and the last occurred as one component of a site with multiple Archaic and Woodland components. These are almost assuredly all lithic scatters, with temporal components identified on the basis of diagnostic hafted bifaces. The single component Paleoindian sites might be either small lithic scatters which contained at least one temporally diagnostic artifact, or else were single diagnostic hafted bifaces recovered in isolation from other cultural remains.

Table 3. Temporal Profile of Archaeological Sites and Site Components Inventoried in the Study Area.

Temporal Period	n	Percent
Paleoindian	9	3.4
Archaic	4	1.5
Early Archaic	75	28.1
Middle Archaic	6	2.2
Late Archaic	78	29.2
Woodland	5	2.0
Early Woodland	30	11.2
Middle Woodland	22	8.2
Late Woodland	24	9.0
Late Prehistoric	14	5.2
Protohistoric	0	0.0
Totals	**267**	**100.0**

Note: totals indicate number of components, not number of sites.

The study area appears to have been more heavily utilized during the Archaic period, with 163 (14.4 percent) sites or components of sites identified to this time period. Within the Archaic period, occupation seems to remain fairly consistent for both the Early and Late Archaic periods (Table 2), with very few sites recorded as Middle Archaic. It seems unlikely that the area would have been abandoned during the middle of the Archaic period, and is much more likely that the dearth of sites recorded to this period is a reflection of our lack of understanding of the archaeological record during this time. However, it seems clear that the Woodland period saw a sharp decrease in human occupation of the area, as measured by the number of archaeological sites or components of sites in our sample (Table 2). Slightly more Early Woodland sites have been identified, although the difference between Early, Middle, and Late Woodland periods is not great (Table 3). This pattern of decreasing human occupation continues into the Late Prehistoric period.

Further information regarding prehistoric sites in the Study Area was obtained from a review of Mills' *Archeological Atlas of Ohio* (2006 [1914]). Mills notes the presence of a square enclosure and two mounds at the periphery of the Project Area, and a "Burials" (Ordinary Interments) that may or may not be within the direct APE (Figure 5). Given the size of the symbols used in Mills' Atlas, we cannot know whether these sites are situated within the direct APE or not, but archaeological survey in the vicinity will be sensitive to their possible presence.

Our knowledge of the archaeological record of the area immediately pre-Euroamerican settlement, or during the Protohistoric period, is lacking. As indicated earlier, Hopley (1912:66) recorded a number of Native American villages in what became Crawford County. These villages were settled by different tribes, including the Delaware and the Wyandot, among others. The tribes were in flux by the time travelers and settlers reached into this part of Ohio, however, having been affected by more than 100 years' of Euroamerican settlement on the East Coast and north into Canada, by the wars fought between European powers to control the American continent, by the American Revolution, and by inter-tribal conflicts, so that the historic presence of Native American settlements in the study area is not a reflection of how the area may have been utilized prior to these effects.

Project Setting

Much of the western part of the state lies within the glaciated plains of the Central Lowland Province, a province subjected to periodic glacial activity over the last 500 million years. This region of the state lacks the topographic relief that characterizes the Appalachian Plateau. Here, the landscape is typified by level to gently rolling topography. Two distinct subregions are recognized within this province: the Till Plains formed by glacial deposition; and the Lake Plains formed by glacial meltwater (Figure 6). The Study Area for the Project is situated just west of the Allegheny Escarpment in the Till Plain physiographic province.

The Till Plains section, which was formed during the retreat of the glaciers, is composed of unconsolidated deposits of clay, sand, gravel, and other mixed materials. The majority of the landscape consists of nearly level ground moraine, but adding to the topographic diversity are end and lateral moraines, which appear as low, rolling hills and ridges. Also present are kettles, kames, and drumlins, as well as outwash plains along some larger streams. These outwash plains appear as high terrace formations. The outwash plains typically contain well-drained soils located above the 100-year floodplains of modern streams, and were favored settings for camps and settlements throughout much of local prehistory.

Soils and Drainage within the Direct APE

CRA has plotted the direct APE for the Project onto a GIS map of USDA NRCS soil classifications. Soils information was obtained by identifying these soil types based on USDA NRCS soil classifications and mapping them from the SSURGO database onto digital aerial photographs and direct APE GIS mapping provided by the Applicant (Figure 7). The direct APE is estimated at roughly 713.48 acres, and includes the physical footprint of the turbine sites, access roads, collection lines, concrete batch plant, temporary laydown area, O&M facility, substation, and switchyard.

Well-drained soils are uncommon within the direct APE, comprising only 17.88 acres (2.5 percent) (Table 4). These soils include Alexandria silt loam, Belmore loam, Berks channery silt loam, and Chili loam.

Moderately well-drained soils are somewhat more common in the direct APE (123.76 acres, 17.3 percent) (Table 4). These soil drainage types include Bogart loam, Cardington silt loam, Lykens silt loam, Tuscola fine sandy loam, Tuscola-Bennington complex, and Glenford silt loam.

Figure 5. Direct APE of the Project on the Mills Atlas (2006 [1914]).

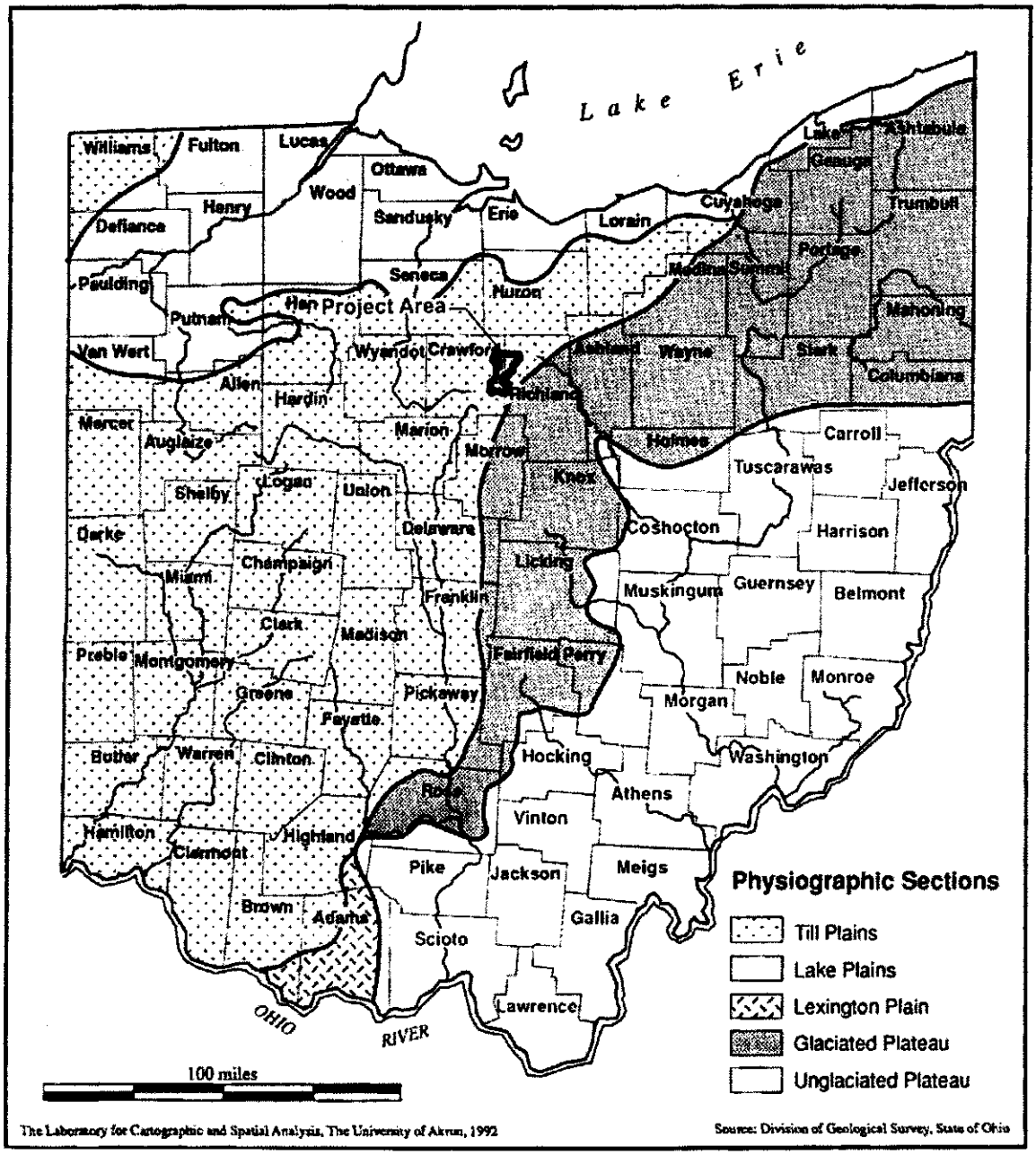

Figure 6. Ohio physiographic regions and Project location.

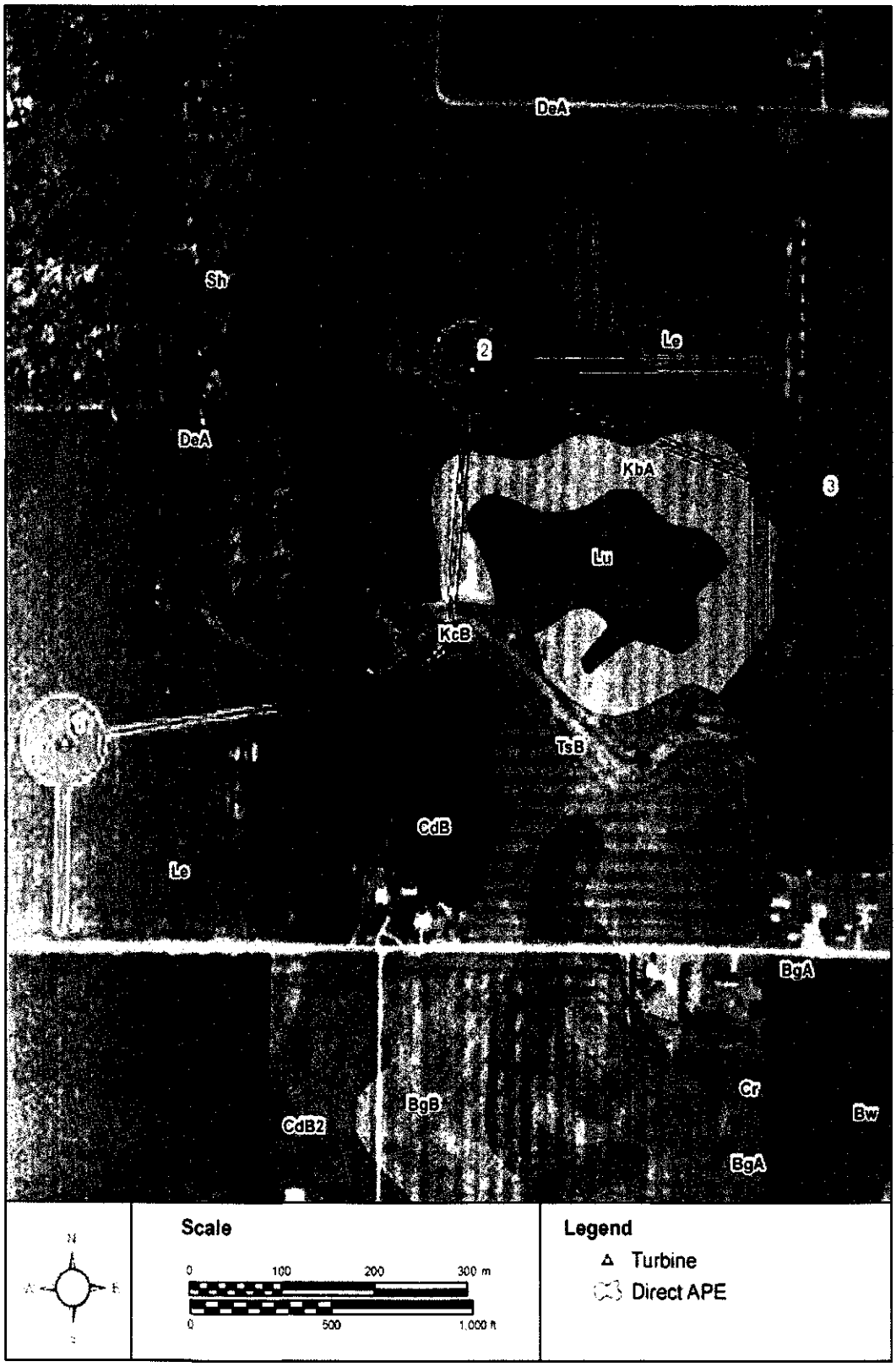

Figure 7. Example of Project Mapping and Soils Map Overlay.

Table 4. Soil drainage types within the direct APE.

Soil Type	WD	MWD	SPD	PD	VPD	Total Acres
Alexandria silt loam	14.21	-	-	-	-	14.21
Belmore loam	0.24	-	-	-	-	0.24
Berks channery silt loam	0.73	-	-	-	-	0.73
Chili loam	2.70	-	-	-	-	2.70
Bogart loam	-	4.39	-	-	-	4.39
Cardington silt loam	-	105.28	-	-	-	105.28
Glenford silt loam	-	9.87	-	-	-	9.87
Lykens silt loam	-	2.15	-	-	-	2.15
Tuscola fine sandy loam	-	1.78	-	-	-	1.78
Tuscola-Bennington complex	-	0.29	-	-	-	0.29
Bennington silt loam	-	-	145.24	-	-	145.24
Bennington-Fitchville silt loams	-	-	16.17	-	-	16.17
Del Rey silt loam	-	-	14.25	-	-	14.25
Fitchville silt loam	-	-	9.96	-	-	9.96
Fitchville-Bennington silt loams	-	-	24.63	-	-	24.63
Jimtown loam	-	-	3.10	-	-	3.10
Kibbie fine sandy loam	-	-	6.40	-	-	6.40
Kibbie-Bennington complex	-	-	3.22	-	-	3.22
Shoals silt loam	-	-	3.58	-	-	3.58
Tiro silt loam	-	-	95.41	-	-	95.41
Wilmer Variant silt loam	-	-	0.90	-	-	0.90
Lenawee silty clay loam	-	-	-	11.11	-	11.11
Sebring silt loam	-	-	-	11.23	-	11.23
Bono silty clay loam	-	-	-	-	1.77	1.77
Condit silt loam	-	-	-	-	6.49	6.49
Condit-Bennington silt loams	-	-	-	-	21.56	21.56
Luray silty clay loam	-	-	-	-	119.18	119.18
Marengo silty clay loam	-	-	-	-	8.85	8.85
Muskego muck	-	-	-	-	0.92	0.92
Olmsted silty clay loam	-	-	-	-	10.90	10.90
Pewamo silt loam	-	-	-	-	0.24	0.24
Pewamo silty clay loam	-	-	-	-	56.73	56.73
Total Acres	**17.88**	**123.76**	**322.86**	**22.34**	**226.64**	**713.48**

WD = Well-drained; MWD = moderately well-drained; SPD = somewhat poorly drained; PD = poorly drained; VPD = very poorly drained.

Somewhat poorly drained soils (322.86 acres) are the most common soil drainage type within the direct APE (Table 4), comprising 45.3 percent of the soils within the direct APE. Poorly drained and very poorly drained soils (248.98 acres, 34.9 percent) are also very common in the direct APE.

Soils and Archaeological Site Probability within the Study Area

CRA has also plotted the 872 known archaeological sites within the Study Area onto a GIS map of USDA NRCS soil classifications. Archaeological sites have been previously identified in association with 37 different soil types within this buffered area in Crawford, Richland, and Huron

counties (Table 5). The direct APE within the Study Area encounters 22 of these soil types, most commonly the moderately well-drained Cardington silt loam (14.76 percent of the direct APE), the somewhat poorly drained Bennington and Tiro silt loams (33.73 percent of the direct APE), and the very poorly drained Luray and Pewamo silty clay loams (24.65 percent of the direct APE). Together, these five soil types account for 73 percent of the direct APE. Within the buffered study area, these five soil types also account for 83 percent (n=728) of the previously identified archaeological sites (Table 5).

Many general models of archaeological site probability, especially for prehistoric sites, have often relied on the assumption that poorly or very poorly drained soils generally exhibit a low probability for the identification of archaeological sites. As illustrated in Tables 5 and 6, however, 18 percent of the archaeological sites within the Study Area have been identified on very poorly drained soils. Given the mosaic of soil types in the area, it may be that some of these sites are located on pockets of better-drained soils that were too small to be mapped at the resolution of the NRCS soils map. However, it is also possible that these poorly drained areas could represent an area that, while unsuitable for long-term habitation, may have contained abundant natural resources that were most efficiently exploited through temporary hunting camps or extraction sites. A state historical marker in Chatfield Ohio, only 13 miles northwest of Tiro (a small town within the Study Area), notes that:

> For centuries this area was used by Indian tribes as a hunting ground. Vast swamp forests of elm, ash, beech, pin oak, and maples lay on all sides. To the east [toward the Black Fork Wind study area], a large cranberry bog was covered by water most of the year. Indian hunting camps on the headwaters of Sycamore Creek were the scene of plentiful harvests of both game and cranberries. These wetlands produced abundant game after most sections of the country were settled and farmed. Today, extensive drainage has changed the area into productive farmland.

This characterization of the area as a procurement zone, rather than an area of heavy prehistoric settlement, is consistent with the prehistoric archaeological record of the study area. Most of the sites in the study area have been identified through the recovery of sparse concentrations of artifacts from the plow zone, and have typically been recommended as not eligible to the NRHP. To date, 674 archaeological sites (72 percent) of the 942 archaeological sites in the Study Area have been determined not eligible for listing on the NRHP (Appendix A), while none have been determined to be eligible or even potentially eligible for the NRHP. Such lightly used prehistoric sites are often typical of temporary hunting or resource extraction sites that seek to exploit the diverse plant and animal communities of these wetland areas.

The Bennington, Cardington, Tiro, Luray, and Pewamo series soils comprise much of the direct APE (73.14 percent). These soil types are common enough that 81 percent of the sites with historic components and 84 percent of the sites with prehistoric components are situated on these soils, regardless of whether the soils are moderately well drained (Cardington silt loam, accounting for 27 percent of all archaeological sites within the Study Area), somewhat poorly drained (Bennington and Tiro silt loams, accounting for 43 percent of all archaeological sites within the Study Area), or very poorly drained (Luray and Pewamo silty clay loams, accounting for 13 percent of all archaeological sites within the Study Area). It is considered especially important that the baseline survey of the direct APE is comprehensive and systematic in accordance with standard OHPO guidelines in these areas, regardless of the soil drainage.

Table 5. Soil Series and Associated Sites within the Study Area.

Soil Series	Drainage	Percent of Direct APE	Archaeological Sites within the Study Area			
			Historic	*Prehistoric*	*Historic and Prehistoric*	*Total*
Bennington silt loam	SPD	20.36	19	261	5	285
Cardington silt loam	MWD	14.76	13	217	9	239
Tiro silt loam	SPD	13.37	3	83	6	92
Luray silty clay loam	VPD	16.70	8	53	5	66
Pewamo silty clay loam	VPD	7.95	2	41	3	46
Bogart loam	MWD	0.62	1	15	-	16
Alexandria silt loam	WD	1.99	1	13	1	15
Chili loam	WD	0.38	1	12	2	15
Condit-Bennington silt loams	VPD	3.02	-	12	-	12
Holly silt loam	VPD	0.00	1	9	1	11
Shoals silt loam	SPD	0.50	-	9	-	9
Fitchville silt loam	SPD	1.40	-	6	1	7
Bono silty clay loam	VPD	0.25	-	6	-	6
Tuscola fine sandy loam	MWD	0.25	-	6	-	6
Pits, gravel	-	0.00	-	5	-	5
Lykens silt loam	MWD	0.30	-	2	2	4
Glenford silt loam	MWD	0.00	1	2	-	3
Wilmer Variant silt loam	SPD	0.13	1	2	-	3
Gallman silt loam	WD	0.00	-	3	-	3
Haney loam	MWD	0.00	-	3	-	3
Olmsted silty clay loam	VPD	1.53	-	3	-	3
Pewamo silt loam	VPD	0.03	1	2	-	3
Rittman silt loam	MWD	0.00	2	-	-	2
Elliott silt loam	SPD	0.00	1	1	-	2
Kibbie fine sandy loam	SPD	0.90	-	2	-	2
Marengo silty clay loam	VPD	1.24	-	2	-	2
Udorthents, loamy	-	0.00	-	2	-	2
Belmore loam	WD	0.03	-	1	-	1
Bennington-Urban land complex	SPD	0.00	-	1	-	1
Cardington-Urban land complex	MWD	0.00	-	1	-	1
Condit silt loam	VPD	0.91		1	-	1
Condit silty clay loam	VPD	0.00	-	1	-	1
Dumps	-	0.00	-	1	-	1
Jimtown loam	VPD	0.43	-	1	-	1
Pits	-	0.00	-	1	-	1
Sloan silt loam	VPD	0.00	-	1	-	1
Wheeling silt loam	WD	0.00		1	-	1
Total	-	-	**55**	**782**	**35**	**872**

WD = Well-drained; MWD = moderately well-drained; SPD = somewhat poorly drained; VPD = very poorly drained.

While it is suggestive that prehistoric sites are most often identified on these soil types, it is difficult to derive predictive models from such information without complete data regarding the location and intensity of the archaeological surveys (if any) that identified these sites. For example, we do not have sufficient information to derive site frequency data (e.g., one site per five acres, one site per 20 acres) for soil types within the study area, as extant information is not sufficiently detailed to determine what percentage of the total area surveyed is

represented by the individual soil units. Therefore, it is possible that some soil units having few associated recorded sites were poorly represented in surveys completed to date, as opposed to being well represented but containing few sites.

Table 6. Counts of Historic and Prehistoric Sites by Drainage Type within the Study Area.

Site	WD	MWD	SPD	VPD	N/A	Total
Historic	2	17	24	12	0	**55**
Prehistoric	30	246	365	132	9	**782**
Historic and Prehistoric	3	11	12	9	0	**35**
Total	**35**	**274**	**401**	**153**	**9**	**872**

WD = Well-drained; MWD = moderately well-drained; SPD = somewhat poorly drained; VPD = very poorly drained.

III. METHODOLOGY

Field Methods

A systematic Phase I archaeological survey will be conducted for the entire direct APE in an effort to identify the presence or absence of archaeological sites within the Project footprint and, subsequently, to determine whether any of these sites are potentially eligible for listing on the NRHP.

The Phase I archaeological field survey is designed to examine previously recorded sites and identify new sites. Phase I field tasks include the systematic survey of the direct APE using pedestrian walk-over and/or shovel testing as appropriate and in accordance with OHPO guidelines (1994). The collection of artifacts will employ sampling strategies that were also developed from OHPO guidelines.

Survey Data. Appliant provided data concerning the Project boundaries to CRA in the form of ESRI shapefiles. Data provided as points and line features were buffered to a distance to correspond to a "typical area of vegetation clearing", or 200–400 ft radius from the center point of each turbine, 40–50 ft temporary easement for access roads, and 10–30 ft temporary easement for buried electrical collection lines. This data was then merged with the provided polygon layers for staging areas and substations.

All aspects of the survey will be documented through the completion of notes, standard forms, digital photography, and GPS data collection for subsequent mapping. All GIS data concerning the Project boundaries have been and will continue to be downloaded to Garmin GPSMap 60CSx and Oregon 200 GPS receivers using the DNRGarmin utility developed by the Minnesota Department of Natural Resources. Topographic base maps for each GPS unit will be downloaded from the Garmin MapSource Eastern United States Topographic CD-ROM. The datum of each unit is set to NAD 1983 and projected in the UTM (Zone 17) coordinate system.

Survey in the Direct APE

Standard Survey Procedures. A thorough ground surface inspection of the entire direct APE, except areas of standing water, will be conducted to identify any archaeological resources such as lithic scatters, foundations, wells, mounds, or cemeteries, as well as natural formations such as rockshelters, rock ledges, and caves that may contain archaeological resources. This visual ground surface inspection will be conducted within the direct APE regardless of surface conditions, slope, or visibility.

Surface collection will be used in non-waterlogged areas of less than 15 percent slope whenever ground surface visibility is estimated at 50 percent or more. Ideal ground surface conditions for surface collection include freshly plowed fields, although fields with harvested crops may also be surface-collected if visibility is good. For the current Project, CRA and Applicant personnel will work to cultivate agricultural fields containing crop stubble having less than 50 percent visibility in advance of survey, using GPS data

and high quality aerial photographs to define Project boundaries. This process will be tested under various conditions to ensure visibility was increased to acceptable levels. Pedestrian survey transects will be spaced at 10-m intervals. Artifacts recovered will be associated with specific surface collection locations (SCL) spaced at 10-m intervals along each transect. Sufficient GPS points will be taken at each identified site and location to identify site location and boundaries within the direct APE.

Shovel testing is required in non-waterlogged areas of less than 15 percent slope whenever ground surface visibility is less than 50 percent, such as in pasture, residential lawns, woodlots, and agricultural fields with poor surface visibility. Shovel tests are 50 cm square, spaced at 15-m intervals, and extend below the plow zone into subsoil. As discussed below under *Modified Survey Procedures*, this approach may be judgmentally altered as conditions warrant. In any case, the excavated soil will be screened through ¼-inch mesh hardware cloth, and all shovel test probes backfilled. Whenever field strategies deviate from the standard practice, the rationale for such deviations will be set forth in the technical report.

Survey approaches will differ not only by the ground cover and visibility of individual survey areas, but also by the type of ground-disturbing activity planned for any given survey area. The direct APE includes 40 to 50 foot wide access roads. In areas where the proposed access roads cut across fields and do not follow existing farm roads, single transects will be surveyed down the middle of the proposed survey area. For example, where the proposed access roads follow existing farm roads, this approach will be subject to modification depending on field conditions. In either case, shovel test and pedestrian survey intervals will remain unchanged.

A similar approach will be taken for proposed buried collection lines. While most of these are contained within the same survey area as the proposed access roads, some subsurface collection lines will cross otherwise undisturbed agricultural fields. These proposed buried collection lines are 15 ft wide, and will be surveyed with a single transect.

The proposed wind turbine sites themselves have a ground-disturbing area comprised of a 200-foot radius around a central point, or about 2.9 acres. Where visibility at a turbine site is less than 50 percent, the turbine site area allows for approximately 49 shovel tests to be excavated on a 15-m grid. Where visibility is greater than 50 percent, the turbine site area allows for 11 pedestrian survey transects spaced at 10-m intervals, with about 101 SCL collection points. Specialized recording forms have been developed by CRA for turbine site areas, one for each type of survey. A similar approach will be taken for any proposed staging areas, substations, or O&M buildings.

Overhead collection lines may also be necessary under very limited circumstances (no more than 1 percent of all instances). As currently planned, these overhead collection lines, as well as the transmission line, will be placed on existing American Electric Power (AEP) poles. Since (1) there will be no placement of new poles, and (2) neither surface disturbance nor vegetational clearance will not be necessary, the transmission line and any possible overhead collection lines will not be subjected to Phase I archaeological survey.

Modified Survey Procedures. While the entire direct APE, excluding areas of standing water, will be surveyed systematically, a modified archaeological survey approach will be used to examine areas identified in the field as having a low site probability. In areas of modern disturbance and steep-sided drainages, for example, the testing interval may be increased to document the extent of the disturbance and soil/drainage conditions (e.g., gleyed soils, high water table). Shovel test survey intervals will be increased from 15 m to 30 m in such areas, and pedestrian transect survey intervals will be increased from 10 m to 20 m. Photographs, shovel test profiles and soils information will be recorded in all areas

subjected to this modified survey approach in support and documentation of the approach. By including a systematic survey that includes areas of lower site potential, the survey results will improve on previous modeling attempts and provide stronger baseline data in support of a more useful model.

Survey in the Indirect APE

Mound Sites. Prehistoric mound sites represent unique and important aboveground archaeological resources for which visual effects will be considered. For the purpose of consideration of indirect effects to prehistoric mounds, the indirect visual APE will be defined as the Project Area plus a 5-mile buffer surrounding the Project Area. This survey area should adequately factor any direct, indirect, and reasonably foreseeable future impacts of the proposed Project on prehistoric mound sites. The purpose of this survey is to gather information necessary for consideration of potential indirect effects on known aboveground archaeological resources, primarily mound sites that have already been recorded at the OHPO or reported by reliable informants such as the OAS. This survey will ***not*** seek to identify new mounds located outside of the direct APE.

The background review identified two previously recorded mound sites within the indirect visual APE, both in Crawford County. Both Shull #1 Mound (33CR211) and Burger Mound #1 (33CR214) are unevaluated Woodland-period mounds that have not been tested or excavated. While neither of these mounds lies within the direct APE of the Project, the evaluation of indirect effects will include such considerations as the distance to the nearest turbine, the visibility of the resource, the integrity of the surround area (e.g., do the mounds have direct line-of-site to other historic/modern developments), and the cultural importance and meaning of the resource to the consulting parties, especially any Native American tribes that may be included.

A visual field inspection of both mound sites will be conducted by CRA personnel. The person or persons involved will be responsible for visiting each of the mound site locations as recorded in OHPO records to visually confirm the existence of the mound. Any mound sites found to still exist will be photographed, including documentation of the surrounding natural and built environment, and sufficient data will be collected for the determination of potential visual effects on these mound sites.

Since all of these mound sites are outside of the direct APE and cannot be confirmed as man-made structures through field survey, determination of their importance as a cultural place and the relative indirect effects of the Project will rely upon previous archaeological documentation of the mound sites, the results of visual field inspection, and the traditions, concerns, and comments of the consulting parties. These actions will be taken to address the concerns of the OPSB and the OHPO that the effects of the proposed Project are given full and careful consideration regarding the potential for adverse effects from the siting of turbines in close proximity to these geographical features that would diminish the ability to appreciate and understand these places of importance.

Laboratory Methods

Prior to classification and analysis, the artifacts will be cleaned and sorted into gross categories (bone, glass, metal, ceramics, etc.) by provenience. Archaeological specimens recovered from the excavations will be analyzed using an Access-based data entry program, *Cultural Resource Analysts Material Management System*, developed by CRA. Once data for the artifacts are entered into the system, the analyst can then query the database to provide a wide range of information for specific types or classes of artifacts, or the assemblage as a whole. The query function allows for information on the quantities and percentages of artifact types by provenience or functional group to be quickly tabulated and presented to the analyst. These tabulations can then be exported to GIS formats for spatial analysis, as well as Excel,

Word, or Surfer programs to generate data tables or distribution maps for the assemblage.

Prehistoric Artifact Analysis. Prehistoric artifacts will be identified based on basic categories, flaked stone, ground stone, ceramic, etc., and entered into CRA's *Access*-based database. It has two main functions. The first is a data entry function whereby an individual record is created for each artifact. Each record includes fields for provenience, functional group, and artifact type and class. Other attributes including portion, size, weight, morphology, raw material, decorations, treatment, modifications, and technology are also recorded.

Historic Artifact Analysis. The analyst will assess the historic materials, creating a record for each item and grouping the individual items into a modified version of a scheme originally developed by Stanley South (1977). The classification scheme that was originally developed by South (1977) has subsequently been revised by numerous authors including Stewart-Abernathy (1986), Orser (1988), Wagner, and McCorvie (1992).

Curation. CRA's *Material Management System* creates a catalogue of recovered material using standardized lexicon in a manner consistent with guidelines for archaeology collections acquisitions procedures at the Ohio Historical Society (OHS).

Prior to the final preparation of artifacts for curation, Applicant will consult with landowners regarding the return of recovered archaeological materials to those owning property where archaeological sites are identified. If the landowners do not wish to have these materials returned to them, they will be asked to sign a formal donation form transferring ownership of the materials to the OHS.

In any case, the OHS will be provided a material inventory and all relevant information for review. All materials deemed worthy of curation by the OHS that the landowners have decided to donate will be placed in resealable polyethylene bags by context and site and stored in acid-free boxes until transfer can be made to the OHS. Both boxes and bags will be labeled with provenience information. Artifacts to be curated, along with a copy of completed catalogues, all generated forms and photographs, and a color copy of the final report will be provided to the OHS.

IV. IDENTIFYING IMPACTS AND DETERMINING IMPORTANCE

Project Development Regarding Direct Impacts to Archaeological Sites

The general strategy used by the Applicant for the physical development of this Project, including areas of both temporary and permanent ground disturbance, will be to avoid all important sites that may be considered to be potentially eligible for the NRHP. In the event survey identifies any previously undocumented sites within the direct APE that are considered eligible or potentially eligible to the NRHP, the first and preferred alternative will be avoidance.

Impact Identification

Archaeological Sites. Since most archaeological sites represent belowground resources, Project impacts will generally occur as part of ground-disturbing activities within the direct APE. These impacts are easily identifiable, and can be evaluated in the context of the type of impact. A range of direct impacts are expected, including such impacts as the clearing of vegetation for an access road, or the construction of large, deeply set concrete pads for turbine placement.

Mound Sites. No direct impacts to known mound sites are expected as part of this Project. The OHPO has indicated that indirect effects should be considered for potential mound sites, regardless of whether they have

been archaeologically demonstrated to be prehistoric mounds or whether they have been traditionally accepted as such. Indirect impacts will be considered for mound sites that are of exceptional significance to the Native American tribes, regardless of whether they meet the established NRHP registration requirements.

The assessment of indirect impacts to mound sites will utilize an approach similar to that employed for historic architectural properties. Observations from the field about current conditions, as described in the *Field Methods* section, will form an important component of this approach, as will prehistoric context and input from knowledgeable citizens. The proposed new turbines are expected to be visible in varying degrees within the survey area, and the indirect effects, if any, for each mound site will depend largely upon its surrounding vegetation and topography. Modern development in the vicinity of the mounds will also be considered; for example, a number of large elements are already present in the area as a result of technology, modern development, and agribusiness. Some of the existing features found throughout the Study Area include cellular communication towers, power lines, major transmission lines, grain elevators, large silos, water towers, radio towers, and older windmills. These features will help the archaeologists to gauge any indirect effects of the proposed wind turbines.

Information derived from the survey area mapping and computer-generated viewshed analysis developed for the architectural review will also be considered. These multiple lines of evidence will all be carefully considered to determine whether the proposed Project will threaten or compromise the continued preservation and meaningfulness of significant mound sites within the survey area.

Establishing Site Importance

At the survey level, it is necessary to be able to evaluate the importance of archaeological resources and identify individual effects in an efficient manner that allows for consideration of effects to sites that may be of importance as early as possible in the planning and design of the Project. Such a framework can be conceived as a series of site attributes or types of data that can be easily identified in the field. These attributes can facilitate the early identification of important sites prior to laboratory analysis.

Management Objectives

Making recommendations concerning the potential impacts of a project on archaeologically identified cultural resources hinges on 1) evaluating the importance of a given resource and 2) identifying the effects that the potential project impacts will have on the resource. To accomplish this in the field, a framework is needed that allows initial classification of sites into management categories. As Sebastian (2009:101) notes, the specific management categories employed depend on the management objectives and opportunities of a given project. For example, while several very specific categories of significance might be appropriate for a government agency managing a piece of property on a long-term basis, a wind farm survey has quite different management objectives that require a more limited range of categories, since long-term management of archaeological resources is not a management objective. For this Project, management objectives include:

- Identify important sites as early as possible when turbine siting design is most flexible;
- Avoid important sites wherever possible;
- Minimize effects to unavoidable important sites; and
- Avoid construction delays.

Categorization

In order to satisfy the management objectives, the field survey must be able to identify important sites that are likely to contain substantial information about the past as quickly and efficiently as possible. Using selected attributes of an example model

proposed by Sebastian (2009), we can establish two field-identified categories based on consideration of the individual effects of the Project on specific sites:

- **Category 1:** potentially important sites likely to yield substantial information about the past and contribute significantly to current research questions and theoretical issues.
- **Category 2:** unimportant sites whose research potential appears to have been exhausted by the act of recording their locations and characterizing their contents.

Category 1 sites are typically referred to as "potentially eligible for the NRHP" in many Phase I archaeological surveys, but the primary concern at this stage of the archaeological survey is the identification of potentially important sites as quickly as possible for purposes of avoidance or effect minimization.

Evaluating Relative Importance

There are several types of data that can be examined in the field and applied to the consideration of site importance and categorization in the field. These data types represent multiple lines of evidence that can be observed and applied in the field to sort archaeological sites into either Category 1 or Category 2 and allow us to proceed with the management objectives. However, none of these attributes can be considered separately, nor can they always be given equal or consistent weight, nor can they always be limited to these attributes alone.

Number of artifacts: The numbers of artifacts recovered represents one archaeological manifestation of the relative occupational intensity or frequency of usage for a site. Sites with large quantities of artifacts may represent either multiple occupations over a long period of time, or fewer, but more intense, occupations over a shorter period of time. In either case, the potential for the presence of important information, either through the sheer volume of artifacts or through preservation in features, is usually greater at sites with higher artifact densities.

Evidence for features and structures: Evidence for features and structures includes direct evidence, such as artifact-rich midden deposits, post/pit features in shovel test unit or probe profiles, or aboveground architectural remains. Indirect evidence suggesting the potential presence of features can include artifact clusters at the surface, the recovery of high quantities of daub, fire-cracked rock, or faunal materials, the identification of buried soil horizons containing archaeological material, or the recovery of multiple types of architectural remains, such as nails, window glass, or brick.

Evidence for buried materials: The identification of evidence for buried material is associated with the physical integrity of the site. Such sites are more likely to include contexts, data, and artifact associations that have retained important information. Evidence for buried materials may come from the soil profiles in shovel test units or probes, or from deep testing (hand-auger or backhoe excavation) in areas suspected to include alluvial or colluvial deposits.

Evidence for datable materials: The ability to place archaeological information in its appropriate temporal context is critical to a site's ability to contribute significantly to our understanding of history. At the survey level, datable materials are usually limited to artifacts diagnostic of specific historic or prehistoric time periods. Although less commonly identified, evidence for directly datable materials includes preserved plant remains in feature, midden contexts, or buried soil contexts.

Type of site: Certain site types, in both a functional and temporal sense, may be more or less important based on their relative ubiquity, rarity, or tendency to preserve important archaeological data. Prehistoric mound sites can speak to mortuary practices, ritual, and traditional cultural values. Centralized prehistoric village sites contain information concerning multiple overlapping aspects of

prehistoric society. Farmsteads dating from the time of early European exploration can provide rare insight into frontier life. The identification of Paleoindian or Early Archaic artifacts is considered to be of particular importance due to their relative rarity, especially from intact contexts. Dry rockshelters can preserve artifacts like wood, leather, and plant remains that are not found elsewhere. Such site types are uncommon for a variety of reasons, but their rarity can contribute greatly to the evaluation of their importance.

Determinations of Eligibility

After completing the field investigations and laboratory analysis, all survey data will be analyzed to determine which properties appear eligible for listing in the NRHP, and assess the impacts of the proposed Project on these resources.

Survey data and results will be evaluated in light of the historic and prehistoric contexts, as well as information gathered from public involvement, to assess the significance of recorded sites and make recommendations of eligibility for the NRHP. In general, in order for a site to be considered eligible for listing in the NRHP, it must possess both historic significance and integrity. Significance may be found in four aspects recognized by the National Register Criteria:

A. Association with historic events or activities;

B. Association with important persons;

C. Distinctive design or physical characteristics; or

D. Sites that have yielded, or may be likely to yield, information important in prehistory or history.

In general, archaeological sites are most often evaluated with particular regard to Criterion D. A property must meet at least one of the criteria for listing. Integrity must also be evident through historic qualities including location, design, setting, materials, workmanship, feeling, and association (Andrus 1997). A documentation table will be created that presents the individual determination of eligibility for every archaeological site recorded. Properties that appear eligible will be indicated as such on the documentation tables and GIS maps.

Site Avoidance and Minimizing Effects

During the design and siting stage of the Project, avoidance of Category 1 archaeological sites will be of prime consideration. The archaeological field supervisors will work closely with the Applicant to avoid Category 1 cultural resources through turbine site adjustment and the identification of alternate routes for access roads and buried lines. If an important site cannot be avoided, an effort will be made to identify alternatives that are free of data that contribute to the site's importance. The alternatives may extend through areas outside the site boundary, or through areas that have been eroded or impacted through historic and modern farming, and that can be defined and delineated by systematic shovel testing during the Phase I survey.

If a Category 1 archaeological site cannot be avoided, measures will be taken to minimize direct impacts to the site. These minimization efforts could include limiting clearing and grading within the direct APE, limiting heavy equipment operations during wet soil conditions, or placing temporary bedding material on a site. Where impacts to Category 1 sites can be minimized, even though the site can't be completely avoided, it may be possible to determine that the minimized impacts of the selected route on a given Category 1 site are not adverse. Such determinations will be made in consultation with OHPO and the Applicant.

Report of Results and Recommendations

The results and recommendations associated with this Phase I archaeological survey will be presented in a report prepared

in accordance with OHPO guidelines. The final report will be created in Microsoft Word and single-spaced on standard sized (8.5 x 11 inch) white paper. Page numbers will appear on all pages. Maps, photographs, and other graphics will be clearly presented. Maps will include the location of all recorded resources, and detailed GIS and AutoCAD maps.

Adjustments to the Direct APE Immediately Prior To Construction

It is possible that minor adjustments to turbine locations, access roads, collection lines, temporary laydown areas, or other portions of the direct APE may be necessary shortly before construction begins, but after the report of results and recommendations has been submitted and approved. If this situation occurs, then additional Phase I field survey will be completed for any previously unsurveyed areas within the adjusted direct APE. An expedited review process that includes both telephone and email consultation is outlined below in Chapter V (under *Project Completion*) for several scenarios, including the identification of no archaeological resources within the adjusted direct APE, the identification of Category 2 (not important) sites, and the identification of Category 1 (important) sites. This expedited approach to consultation is proposed to avoid construction delays while identifying and considering the effects of the proposed adjustments on any archaeological resources that may be affected by the adjustments.

V. PROJECT COORDINATION, COMMUNICATION, AND COMPLETION

Project Coordination and Communication

Black Fork Wind or CRA will make formal submittals to the OHPO. Submittals may be done by surface mail or emails. The submittal will include information on the content and purpose of the submittal, whether an OHPO formal response is required, and a time frame when the response is needed. Submittals will be directed to:

David M. Snyder

Archaeology Reviews Manager

Ohio Historic Preservation Office

The Ohio Historical Society:

1982 Velma Avenue

Columbus, OH 43211

Telephone: 614-297-2300

Toll-free: 800-686-6124

dsnyder@ohiohistory.org

OHPO responses to formal submittals will be directed to:

Scott Hawken

Senior Project Manager

ElementPower US, LLC

400 Preston Ave, Suite 200

Charlottesville, VA 22901

Phone: (434) 202-6708

Scott.hawken@elpower.com

The CRA project supervisors and the OHPO may from time to time consult directly on technical or general project issues via email

or telephone. It is also anticipated that a weekly email summarizing the work completed the previous week will be distributed each Monday morning. This summary is for information purposes only and will not require formal response from OHPO. Scott Hawken and the CRA project manager (Mike Anslinger) will be copied on all email exchanges. Telephone communications will be summarized in an email and distributed to the CRA project manager, Scott Hawken and OHPO. The following is contact information for Mr. Anslinger:

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Project Completion

The Project will be considered to be complete when the following commitments have been fulfilled:

- The Phase I field survey has been completed;
- Minimization measures for avoiding important sites within the direct APE have been agreed upon between the applicant and the OHPO through consultation;
- A set of unavoidable important sites within the direct APE requiring further work (if any) has been agreed upon between the applicant and the OHPO through consultation;
- A report of the Phase I survey results has been submitted to the OHPO and the OPSB;
- Comments from the OPSB and the OHPO concerning the Phase I survey report have been received and addressed in a final Phase I report submission; and
- OHPO and OPSB have notified Applicant of their concurrence with the recommendations provided in the report.

If any unavoidable important sites are identified, the following additional commitments must also be fulfilled for the Project to be considered complete:

- A work plan created to conduct evaluation/mitigation of the previously agreed-upon set of unavoidable important sites has been produced and approved through consultation;
- Evaluation/mitigation of the previously agreed-upon set of unavoidable important sites is conducted;
- A report (or reports) detailing the evaluation/mitigation results has been submitted to the OHPO and the OPSB;
- Comments the OPSB and the OHPO concerning the evaluation/mitigation report have been received and addressed in a final report submission; and
- OHPO and OPSB have notified Applicant of their concurrence.

Late Adjustments to the Direct APE

It is possible that minor adjustments to turbine locations, access roads, collection lines, temporary laydown areas, or other portions of the direct APE may be necessary shortly before construction begins, but after the Phase I archaeological survey report has been submitted and approved. For such cases, the following approach is proposed to avoid construction delays while identifying and considering the effects of the proposed adjustments on any archaeological resources that may be affected by the adjustments.

Additional Phase I field survey will be completed for any previously unsurveyed areas within the adjusted direct APE. If no archaeological resources are identified within the adjusted direct APE, then:

- Construction will be allowed to proceed. Following consultation with Applicant, a summary of the results of the additional survey will be submitted to the OHPO and the OPSB in letter report format as an amendment to the original Phase I report;
- Any comments from the OHPO and the OPSB concerning the amendment to the Phase I survey report will be addressed in a final Phase I letter report amendment submission; and
- OHPO and OPSB will notify Applicant concerning their concurrence with the recommendations provided in the report amendment.

If any Category 2 (not important) archaeological resources are identified within the adjusted direct APE, then:

- A short management summary in letter report format summarizing the results of the additional survey will be submitted to the OHPO and the OPSB for expedited review and consultation, primarily through telephone and email correspondence;
- Construction will be allowed to proceed after the recommendations of the management summary are agreed upon through the expedited review and consultation as described above;
- The formal draft results of the additional survey will be submitted to the OHPO and the OPSB in letter report format as an amendment to the original Phase I report;
- Any comments from the OHPO and the OPSB concerning the amendment to the Phase I survey report will be addressed in a final Phase I letter report amendment submission; and
- OHPO and OPSB will notify Applicant concerning their concurrence with the recommendations provided in the report amendment.

If Category 1 (important) archaeological resources are identified within the adjusted direct APE, then:

- Additional archaeological survey(s) will be conducted to identify additional adjustments to the direct APE that are necessary to avoid or minimize the effects of the Project on any newly identified important archaeological resource(s) within the adjusted direct APE;
- A short management summary in letter report format summarizing the results of the additional archaeological survey and the measures taken to avoid important sites within the adjusted direct APE will be submitted to the OHPO and the OPSB for expedited review and consultation, primarily through telephone and email correspondence;
- Construction will be allowed to proceed after the recommendations of the management summary are agreed upon through the expedited review and consultation as described above;
- The formal draft results of the additional survey will be submitted to the OHPO and the OPSB in letter report format as an amendment to the original Phase I report;
- Any comments from the OHPO and the OPSB concerning the amendment to the Phase I survey report will be addressed in a final Phase I letter report amendment submission; and
- OHPO and OPSB will notify Applicant concerning their concurrence with the recommendations provided in the report amendment.

REFERENCES CITED

Adovasio, J.M., and William C. Johnson
1981 The Appearance of Cultigens in the Upper Ohio Valley: A View from Meadowcroft Rockshelter. *Pennsylvania Archaeologist* 51(1-2):63-80.

Andreas, Alfred Theodore
1873 *Atlas Map of Richland County, Ohio.* Compiled, drawn, and published from personal graminations and surveys by A.T. Andreas. Chicago.

Andrus, P.W.
1997 *How to Apply the National Register Criteria for Evaluation*, edited by R.H. Shrimpton. Revised ed. National Register Bulletin No. 15. U.S. Department of the Interior, Washington, D.C.

Anslinger, C. Michael, Harold E. Smith, and Andrew P. Bradbury
2004 *Archaic and Woodland Period Archaeology at the Van Bibber Reynolds Site (46Ka223), Marmet Lock Replacement Project, Kanawha County, West Virginia.* Cultural Resource Analysts, Hurricane, West Virginia.

Aument, Bruce W.
1992 Variability in Two Middle Woodland Habitation Sites from the Central Ohio Uplands. Paper presented at the 57th Annual Meeting of the Society for American Archaeology in Pittsburgh, Pennsylvania.

Baker, Stanley W.
1978 *A Preliminary Cultural Resource Survey of the Proposed Relocation of U.S. Route 30 in Crawford and Richland Counties, Ohio (CRA/RIC-30-9.83/0.00).* Ohio Historical Society. Submitted to Ohio Department of Transportation, Columbus.

Bayton, M.N., and J.V.B. Watson Bayton
1855 *Atlas of Crawford County, Ohio.* Published by the authors.

Biehl, Steven B.
1998 *Phase I Cultural Resource Management Investigations for the Proposed 0.2 ha (0.5 a.) 360 Degree Communication Tower in Jefferson Township, Crawford County, Ohio.* Ms. On file, OHPO.

Blank, John E.
1970 The Ohio Archaic: A Study in Culture History. Unpublished Ph.D. dissertation, Department of Anthropology, UMass Amherst.

Boisvert, Richard A.
1986 Late Archaic Settlement Models in the Middle Ohio Valley: A Perspective from Big Bone Lick, Kentucky. Unpublished Ph.D. dissertation, Department of Anthropology, University of Kentucky, Lexington.

Brown, James A., and Robert K. Vierra
1983 What Happened to the Middle Archaic? Introduction to an Ecological Approach to Koster Site Archaeology. In *Archaic Hunters And Gatherers in the American Mid-West*, edited by James L. Phillips and James. A. Brown, pp. 165-196. Academic Press, New York.

Broyles, Bettye J.
1966 Preliminary Report: The St. Albans Site (46KA27), Kanawha County, West Virginia. *West Virginia Archeologist* 19:1-43.

1971 *Second Preliminary Report: the St. Albans Site, Kanawha County, West Virginia, 1964 1968.* Report of Archaeological Investigations 3. West Virginia Geological and Economic Survey, Morgantown.

Brush, Nigel, P. Nick Kardulias, and Scott Donaldson
2009 Facts and Fictions of Rockshelter Function. Paper presented at the 76th Eastern States Archaeological Federation annual meeting, November 6, 2009, Johnstown, Pennsylvania. Electronic document available at www.esaf-archeology.org; accessed 16 July 2010.

Burcham, James B.
2002 *Phase I Cultural Resources Management Investigations for the Proposed 482.5 m (1583 ft) Long, 60 m (100 ft) Wide Olentangy River Bank Stabilization in the City of Galion, Polk Township, Crawford County, Ohio.* Submitted to the City of Galion, Ohio. Ms. On file, OHPO.

Burks, Jarrod D.
2004 Identifying Household Cluster and Refuse Disposal Patterns at the Strait Site: A Third Century A.D. Nucleated Settlement in the Middle Ohio River Valley. Unpublished Ph.D. dissertation, Department of Anthropology, The Ohio State University, Columbus.

Burks, Jarrod, and William S. Dancey
1999 The Strait Site: A Middle to Late Woodland Settlement in Central Ohio. *Ohio Archaeological Council Newsletter* 11(2):6-11. <http://www.ohioarchaeology.org/> (Accessed: 2 March 2004).

Cameron, Erica L., and J. Ryan Duddleston
2004 *Phase I Archaeological Reconnaissance Survey of the Proposed Infrastructure Improvements for the City of Crestline, Jackson Township, Crawford County, Ohio.* Mannik & Smith. Submitted to the City of Crestline.

Chapman, Jefferson
1975 *The Rose Island Site and the Bifurcate Tradition.* Publications in Anthropology No. 8. Tennessee Valley Authority, Chattanooga. Report of Investigations No. 14. Department of Anthropology, University of Tennessee, Knoxville.

1976 The Archaic Period in the Lower Little Tennessee River Valley: The Radiocarbon Dates. *Tennessee Anthropologist* 1:1–12.

1977 *Archaic Period Research in the Lower Little Tennessee River Valley - 1975: Icehouse Bottom, Harrison Branch, Thirty Acre Island, Calloway Island.* Publications in Anthropology No. 13. Tennessee Valley Authority, Chattanooga. Report of Investigations No. 18. Department of Anthropology, University of Tennessee, Knoxville.

Chomko, Stephen A, and Gary W. Crawford
1978 Plant Husbandry in Prehistoric Eastern North America: New Evidence for its Development. *American Antiquity* 43: 405.

Church, Flora
1987 An Inquiry into the Transition from Late Woodland to Late Prehistoric Cultures in the Central Scioto Valley, Ohio, Circa A.D. 500 to A.D. 1250. Unpublished Ph.D. dissertation, Department of Anthropology, The Ohio State University, Columbus.

Church, Flora, and Gary McDaniel
1990 *The Stowers Sites: Two Early Archaic Camps along Raccoon Creek in Raccoon Township, Gallia County, Ohio.* (with contributions by David L. Cremeens and Annette Ericksen). Archaeological Services Consultants. Submitted to Ohio Department of Transportation, Bureau of Environmental Services, Columbus.

Church, Flora, and John P. Nass, Jr.
2002 Central Ohio Valley During the Late Prehistoric Period: Subsistence-Settlement Systems' Response to Risk. In *Northeast Subsistence-Settlement Change A.D. 700-1300*, edited by John P. Hart and Christine B. Rieth, pp. 11-42. New York State Museum Bulletin 496.

Church, Flora, and Robert E. Whetsell
2009 *Phase Ia Cultural Resources Records Review and Field Visit for the Proposed Black Fork Wind Farm, Crawford and Richland Counties, Ohio.* Contract Publication Series WV09-31, Cultural Resource Analysts, Inc. Submitted to Ecology and Environment, Inc., Chicago, Illinois.

Clarke, Wesley
1978 *An Archaeological Survey of the Proposed Sewer Expansion in the Vicinity of Galion, Crawford County, Ohio.* Submitted to Floyd G. Browne and Associates, Marion, Ohio.

Clay, R. Berle
2002 Deconstructing the Woodland Sequence from the Heartland. In *The Woodland Southeast*, edited by D. Anderson and Robert C. Mainfort, pp.162-184. University of Alabama Press, Birmingham.

Clay, R.Berle, and Steven D. Creasman
1999 Middle Ohio Valley Late Woodland Nucleated Settlements: Where's the Beef? *West Virginia Archeologist* 51(1 & 2):1-10.

Coe, Joffre L.
1964 *The Formative Cultures of the Carolina Piedmont.* New Series Vol. 54, Part 5. Transactions of the American Philosophical Society, Philadelphia.

Collins, Michael B. (editor)
1979 *Excavations at Four Archaic Sites in the Lower Ohio Valley, Jefferson County, Kentucky.* 2 vols. Occasional Papers in Anthropology No. 1. Department of Anthropology, University of Kentucky, Lexington.

Cowan, C. W., H. E. Jackson, K. Moore, A. Nickelhoff, and T. L. Smart
1981 The Cloudsplitter Rockshelter, Menifee County, Kentucky: A Preliminary Report. *Southeastern Archaeological Conference Bulletin* 24:60-76.

Dancey, William S.
1988 The Community Plan of an Early Late Woodland Village in the Middle Scioto River Valley. *Midcontinental Journal of Archaeology* 13(2):223-258.

1991 A Middle Woodland Settlement in Central Ohio: A Preliminary Report on the Murphy Site (33 Li 212). *Pennsylvania Archaeologist* 61(2):37-72.

1992 Village Origins in Central Ohio: The Results and Implications of Recent Middle and Late Woodland Research. In *Cultural Variability in Context: Woodland Settlements of the Mid-Ohio Valley*, edited by Mark F. Seeman, pp. 24-29. Special Papers 7, Midcontinental Journal of Archaeology, Kent State University Press, Kent, Ohio.

Dorwin, John T.
1966 *Fluted Points and Late Pleistocene Geochronology in Indiana.* Prehistory Research Series No. 4(3), edited by Charles H. Faulkner and Major Charles R. McCollough. Indiana Historical Society, Indianapolis.

Dragoo, Donald W.
1976 Some Aspects of Eastern North American Prehistory: A Review 1975. *American Antiquity* 41:3–27.

Essenpreis, Patricia S.
1982 *The Anderson Village Site: Redefining the Anderson Phase of the Fort Ancient Tradition of the Middle Ohio Valley.* Unpublished PhD dissertation, Department of Anthropology, Harvard.

Ford, Richard I.
1977 Evolutionary Ecology and the Evolution of Human Ecosystems: A Case Study from the Midwestern U.S.A. In *Explanation of Prehistoric Change* edited by J.N. Hill, pp. 153-184. University of New Mexico Press, Albuquerque.

Fowler, Marvin L.
1959 Summary *Report of Modoc Rockshelter*. Illinois State Museum Report of Investigations 8.

Fuller, John W.
1982 Developmental Change in Prehistoric Community Patterns: The Development of Nucleated Village Communities in Northern West Virginia. Unpublished PhD dissertation, Department of Anthropology, University of Washington, Seattle.

Funk, R. E.
1978 Post-Pleistocene Adaptations. In *Northeast,* edited by Bruce G. Trigger, pp. 16-27. Handbook of North American Indians, Vol. 15, William C. Sturtevant, general editor, Smithsonian Institution, Washington, D.C.

Genheimer, Robert A.
1992 Bladelets at the Stubbs Earthwork Cluster: An Examination of Middle Woodland Settlement in the Little Miami River Valley. Unpublished Master's thesis, Department of Anthropology, University of Cincinnati.

1996 Bladelets are Tools Too: The Predominance of Bladelets Among Formal Tools at Ohio Hopewell Sites. In *A View from the Core: A Synthesis of Ohio Hopewell Archaeology*, edited by Paul J. Pacheco, pp. 92-107. The Ohio Archaeological Council, Columbus.

George, Richard L.
1971 The Archaic of the Upper Ohio Valley: A View in 1970. *Pennsylvania Archaeologist* 41 (1-2):9-14.

Gibbs, Kevin, Lori Frye, and Deborah Dobson-Brown
1996 (with contributions by Mike Nickerson, Kevin Coleman, Mary Temple, Dawn Herr, Lori O'Donnell, and Gary McDaniel) *Literature Review and Reconnaissance Survey for the Proposed Relocation of US Route 30 through Crawford and Richland Counties, Ohio.* ASC Group, Inc. Submitted to McCoy & Associates, Akron, Ohio.

Graham, A.A. (compiler)
1880 *History of Richland County, Ohio, 1807–1880.* A.A. Graham & Publishers, Mansfield. Reprinted 1977 Unigraphic, Evansville, Indiana.

Graybill, Jeffrey R.
The Eastern Periphery of Fort Ancient (A.D. 1050-1650): A Diachronic Approach to Settlement Variability. Unpublished Ph.D. dissertation, Department of Anthropology, University of Washington, Seattle.

1986 Fort Ancient—East: Origins, Change, and External Correlations. Paper presented at the Midwestern Archaeological Conference, Columbus, Ohio.

Griffin, James B.
1943 *The Fort Ancient Aspect: Its Cultural and Chronological Position in Mississippi Valley Archaeology.* Museum of Anthropology, University of Michigan, Anthropological Papers 28.

Haywood, Norman A.
2005 *Phase I Cultural Resources Survey of Approximately 22 ac of Land for the Proposed Economic Development Project in the City of Crestline, Jackson Township, Crawford County, Ohio.* Haywood Archaeological Services. Submitted to the City of Crestline.

2006a *Phase I Cultural Resource Survey for the Proposed Commercial Development along Walker Lake Road in the City of Ontario, Springfield Township, Richland County, Ohio.* Haywood Archaeological Services. Submitted to C.J. Donley Corporation, Mansfield, Ohio.

2006b *Phase I Cultural Resource Survey for the Proposed Ethanol Plant near the City of Shelby in Plymouth and Cass Townships, Richland County, Ohio.* Haywood Archaeological Services. Ms. On file, OHPO.

Holsten, J.N., and Donald R. Cochran
1986 *Paleo-Indian and Early Archaic in the Upper Wabash Drainage.* Archaeological Resources Management Service, Reports of Investigation 19. Ball State University, Muncie, Indiana.

Hopley, John E.
1912 *History of Crawford County, Ohio and Representative Citizens.* Volumes I & II. Richmond-Arnold Publishing Company, Chicago.

Jackson, Kenneth, Elisabeth Tuttle, and E. Jeanne Harris
1992 *Phase I and II Archaeological Investigations of the Proposed Shelby Reservoir and Water Treatment Improvements, City of Shelby, Richland County, Ohio.* Submitted to Poggemeyer Design Group.

Jefferies, Richard W.
1990 Archaic Period. In *The Archaeology of Kentucky: Past Accomplishments and Future Directions,* edited by David Pollack. State Historic Preservation Comprehensive Plan Report No. 1. Kentucky Heritage Council, Frankfort.

1996 Hunters and Gatherers After the Ice Age. In *Kentucky Archaeology*, edited by R. Barry Lewis, pp. 39-77. Perspectives on Kentucky's Past: Architecture, Archaeology, and Landscape Series, Julie Riesenweber, general editor. University Press of Kentucky, Lexington.

Justice, Noel D.
1987 *Stone Age Spear and Arrow Points of the Midcontinental and Eastern United States.* Indiana University Press, Bloomington and Indianapolis.

Keener, Craig S.
2007 *Phase I Cultural Resource Survey of a Proposed 11.9 ha (29.53 a.) Development in Jackson Township, Crawford County, Ohio.* PAST. Ms. On file, OHPO.

Kozarek, Susan E.
1996 Determining Sedentism in the Archaeological Record. In *Ohio Hopewell Community Organization*, edited by William S. Dancey and Paul J. Pacheco, pp. 131-152. Kent State University Press, Kent, Ohio

Krapesh, Patti
2003 Digging the Past. *Indiana State University Magazine* 6(3):8-13.

Ledbetter, R. Jerald, and Lisa D. O'Steen
1991 *The Grayson Site, Phase III Investigations of (15CR73), Carter County, Kentucky.* Southeastern Archeological Services, Inc. Athens, Georgia.

Lemons, Reno, and Flora Church
1998 A Use Wear Analysis of Hopewell Bladelets from Paint Creek Lake Site #5, Ross County, Ohio. *North American Archeologist* 19(4):269-277.

1986 Early Paleo-Indian Land Use Patterns in the Central Muskingum River Basin, Coshocton County, Ohio. Unpublished Ph.D. dissertation, Department of Anthropology, The Ohio State University, Columbus.

1985 Woodland Settlement Patterns in the Mid and Upper Ohio Valley. *West Virginia Archeologist* 37(2):23-34.

Mills, William C.
1904 Explorations of the Gartner Mound and Village Site. *Ohio Archaeological and Historical Quarterly 13(2):129-189.*

1906 Explorations of the Baum Prehistoric Village Site. *Ohio Archaeological and Historical Quarterly 15:45-136.*

2006 [1914] *Archeological Atlas of Ohio. Ohio State Archeological and Historical Society.* Fred J. Heer, Columbus. Reprinted 2006 by Gustav's Library, Davenport, Iowa.

Morse, David R.
1979 *Mansfield Facilities Plan Archaeological and Historic Reconnaissance for Engineering Division, City of Mansfield.* Submitted to City of Mansfield.

Muller, Jon D.
1986 *Archeology of the Lower Ohio River Valley.* Academic Press, New York.

Murphy, Harry
1989 *An Archaeological Assessment of CRA-30-13.53 Bridge Replacement in Whetstone Township and CRA-30-16.62 Bridge Replacement in Jefferson Township, in Crawford County, Ohio (P.F. 1350).* Ohio Department of Transportation, Columbus.

National Park Service
1985 *Guidelines for Local Surveys: A Basis for Preservation Planning: National Register Bulletin #24.* National Park Service, Department of the Interior, Washington, D.C.

Niquette, Charles M.
1992 Woodland Settlement Patterns in the Kentucky-West Virginia Border Region. In *Cultural Variability in Context: Woodland Settlements of the Mid-Ohio Valley*, edited by Mark F. Seeman, pp. 15-18. MCJA Special Papers No.7. Kent State University Press, Kent, Ohio.

Nolan, Kevin C., and Robert A. Cook
2010 An Evolutionary Model of Social Change in the Middle Ohio Valley: Was Social Complexity Impossible during the Late Woodland but Mandatory during the Late Prehistoric? *Journal of Anthropological Archaeology* 29:62–79.

Ohio Historic Preservation Office (OHPO)
1994 *Archaeology Guidelines.* Ohio Historical Society, Columbus

Pacheco, Paul J.
1992 Ohio Middle Woodland Intracommunity Settlement Variability: A Case Study from the Licking Valley. Paper presented at the Society for American Archaeology meeting, Pittsburgh.

1996 Ohio Hopewell Regional Settlement Patterns. In: *A View from the Core, A Synthesis of Ohio Hopewell Archaeology,* edited by Paul J. Pacheco, pp. 16-35. The Ohio Archaeological Council, Columbus.

Pacheco, Paul J., and Krista J. Krumrine
1998a *Phase I Archaeological Survey for the Proposed Parking Lot and Access Road Construction at Lowe-Volk Park, Jefferson Township, Crawford County, Ohio.* P&K Archaeological Consultants. Submitted to Crawford Park District, Bucyrus, Ohio.

1998b *Phase I Archaeological Survey for the Proposed Wetland, Nature Center, and Facilities Development at Lowe-Volk Park, Jefferson Township, Crawford County, Ohio.* P&K Archaeological Consultants. Submitted to Crawford Park District, Bucyrus, Ohio.

Prufer, Olaf H.
2001 The Archaic of Northeastern Ohio. In *Archaic Transitions in Ohio and Kentucky Prehistory*, edited by Olaf H. Prufer, Susan E. Pedde, and R.S. Meindl, pp. 183-209. Kent State University Press, Kent, Ohio.

Prufer, Olaf H., and Dana A. Long
1986 *The Archaic of Northeastern Ohio.* Kent State University Research Papers in Archaeology No. 6, Kent, Ohio.

Purtill, Matthew P.
2009 The Ohio Archaic: A Review. In *Archaic Societies: Diversity and Complexity across the Midcontinent*, edited by Thomas E. Emerson, Dale L. McElrath, and Andrew C. Fortier, pp.565–600. SUNY Press, Albany.

Roper, Donna C., and Bradley T. Lepper
1991 *Archaeological Data Recovery from Four Sites at the William H. Zimmer Generating Station, Clermont County, Ohio.* Commonwealth Cultural Resources Group. Submitted to American Electric Power Service Corporation.

Schweikart, John F.
2005 The Swinehart Village: A Late Woodland Village in the Upper Hocking Valley. In *The Emergence of Moundbuilders: The Archaeology of Tribal Societies in Southeastern Ohio*, edited by Elliott M. Abrams and AnnCorinne Freter, pp. 115–125. Ohio University, Athens.

2008 Upland Settlement in the Adena Heartland: Preliminary Evidence and Interpretations from Two Nonmortuary Habitations in Perry County, Ohio. In *Transitions: Archaic and Early Woodland Research in the Ohio Country*, edited by Martha P. Otto, and Brian G. Redmond, pp. 232–270. Ohio University, Athens.

Schweikart, John, Dawn Herr, and Deborah Dobson-Brown
1996 *An Addendum to the Literature Review and Reconnaissance Survey for the Proposed Relocation of U.S. Route 30 (CRA/RIC-30-9.91/0.00) through Crawford and Richland Counties, Ohio.* ASC Group, Inc. Submitted to Balke Engineers.

Seeman, Mark F.
1992 The Bow and Arrow, the Intrusive Mound Complex, and the Late Woodland Jack's Reef Horizon in the Mid-Ohio Valley. In *Cultural Variability in Context: Woodland Settlements of the Mid-Ohio Valley*, edited by Mark F. Seeman, pp.41-51. MCJA Special Paper No. 7. Kent State University Press, Kent, Ohio.

Seeman, Mark F., and William S. Dancey
2000 The Late Woodland Period in Southern Ohio: Basic Issues and Prospects. In *Late Woodland Societies, Tradition and Transformation Across the Midcontinent*, edited by T.E. Emerson, D.L. McElrath, and A.C. Fortier, pp. 583–611. University of Nebraska Press, Lincoln.2000 The Late Woodland Period in Southern Ohio: Basic Issues and Prospects.

Shott, Michael J., Richard W. Jefferies, G. Oetelaar, Nancy O'Malley, M. L. Powell, and Dee Ann Wymer
1993 The Childers Site and Early Woodland Cultures of the Upper Ohio Valley. *West Virginia Archeologist* 45(1&2):1-30.

Stafford, C. Russell
Archaic Period Logistical Foraging Strategies in West-Central Illinois. *Midcontinental Journal of Archaeology* 16(2):212-246.

1994 Structural Changes in Archaic Landscape Use in the Dissected Uplands of Southwestern Indiana. *American Antiquity* 59:219-237.

Stafford, C. Russell, C.M. Anslinger, M. Cantin, and R.E. Pace
1988 *An Analysis of Data Center Surveys in Southwestern Indiana.* Indiana State University Anthropology Laboratory, Technical Report No. 3. Terre Haute.

Stafford, C. Russell, Ronald L. Richards, and C. Michael Anslinger
2000 The Bluegrass Fauna and Changes in Middle Holocene Hunger-Gatherer Foraging in the Southern Midwest. *American Antiquity* 65(2):317-336.

Stathakis, Steven A.
2000 *Phase I Cultural Resource Survey of the D-96 Line Replacement Project in Sandusky Township, Richland County, and Jackson Township, Crawford County, Ohio.* BBAR. Submitted to Columbia Gas Transmission Corporation, Morgantown, West Virginia.

Stevenson, Christopher M.
1992 *Phase III Assessment Survey of Prehistoric Archaeological Sites 33 Fr 944 and 33 Fr 945, Franklin County, Ohio.* Archaeological Services Consultants, Columbus. Report to Dodson-Lindblom Associates.

Struever, S., and K.D. Vickery
1973 The Beginnings of Cultivation in the Midwest Riverine Area of the United States. *American Anthropologist* 75:1197-1220.

Styles, Bonnie W., Stephen R. Ahler, and Melvin L. Fomler
1983 Modoc Rock Shelter Revisited. In *Archaic Hunters and Gatherers in the American Midwest*, edited by J. L. Phillips and J. A. Brown, pp. 261-297. Academic Press, New York.

Swartz, Barbara K.
1981 *Indiana's Prehistoric Past.* University Publications, Ball State University, Muncie, Indiana.

Tankersley, Kenneth B.
2002 *In Search of Ice Age Americans.* Gibbs, Smith, Salt Lake City.

Tankersley, Kenneth B., and Brian Redmond
1998 Description of a Paleoindian Bone Foreshaft from Sheriden Pit. Paper presented at the 43rd Midwest Archaeological Conference, Muncie, Indiana.

Vickery, Kent D.
1976 An Approach to Inferring Archaeological Site Variability. Unpublished Ph.D. dissertation, Department of Anthropology, Indiana University, Bloomington.

1980 *Preliminary Definition of Archaic Study Units in Southwestern Ohio.* Ms. on file, Ohio Historic Preservation Office, Ohio Historical Society, Columbus.

Watson, Patty Jo
1985 The Impact of Early Horticulture in the Upland Drainages of the Midwest and Midsouth. In *Prehistoric Food Production in North America*, edited by Richard Ford. Ann Arbor: University of Michigan Museum of Anthropology, Anthropological Papers No.

Webb, William S.
1941 *The Morgan Stone Mound, Site 15, Bath County, Kentucky.* University of Kentucky Reports in Anthropology and Archaeology 5(3). Lexington.

Weller, Ryan J.
2007 *Phase I Cultural Resources Management Survey for a 9.3 ha (23 ac) Faith Community Senior Housing Project in Jackson Township, Crawford County, Ohio.* Weller & Associates.

Weller, Ryan J., and Matthew C. Haines
2004 *A Phase I Cultural Resources Management Survey for an Approximately 17.7 km (9 mi.) Water System Improvements in Liberty, Sandusky, Whetstone, Jefferson, Cranberry, and Auburn Townships, Crawford County, Ohio.* Weller & Associates.

Whitman, Linda, David Blanton, Amanda Epperson, and Lori O'Donnell
1995 (with a contribution by Annette G. Ericksen). *Phase II Evaluation Studies of Nine Prehistoric Sites, Five Historic Archaeological Sites, and One Architectural Location to be Impacted by the Proposed Limited Access R-O-W of the U.S. Route 30 Relocation Project in Wyandotte and Crawford Counties, Ohio (WAY/CRA-030-14.86/0.00; PID#10289).* ASC Group, Inc. Submitted to Balke Engineers.

Whitman, Linda, Kevin Gibbs, Luella Beth Hillen, Amanda Epperson, and Dawn Grunwell
1998 *Phase II Evaluation Studies of Five Prehistoric Archaeological Sites and Two Historic Archaeological sites to be Impacted by the Proposed R-O-W of the U.S. Route 30 Relocation Project in Crawford and Richland Counties, Ohio (CRA/RIC-30-9.91/9.00; P.I.D. No.).* ASC Group, Inc. Submitted to Balke Engineers.

Willey, Gordon R.
1966 *An Introduction to American Archaeology.* Hall: Englewood Cliffs.

Wymer, Dee Anne
1992 Trends and Disparities: The Woodland Paleoethnobotanical Record of the Mid-Ohio Valley. In *Cultural Variability in Context: Woodland Settlements of the Mid-Ohio Valley*, edited by Mark F. Seeman, pp. 65-76. MCJA Special Papers No.7. Kent State University Press, Kent, Ohio.

1996 The Ohio Hopewell Econiche: Human-Land Interaction in the Core Area. In *A View from the Core: A Synthesis of the Ohio Hopewell Archaeology*, edited by Paul J. Pacheco, pp. 36-53. The Ohio Archaeological Council, Columbus.

Yerkes, Richard W.
2006 Middle Woodland Settlements in the Central Ohio Valley: Were the Hopewell Really Farmers? In *Recreating Hopewell,* edited by Douglas K. Charles, and Jane E. Buikstra, pp. 50–61. University Press of Florida, Gainesville.

Yerkes, Richard W., and Albert M. Pecora
1990 The Introduction of the Bow and Arrow. In *Late Woodland Archaeology at the Parkline Site (46 Pu 99) Putnam County, West Virginia*, edited by Charles M. Niquette and Myra A. Hughes, pp. 95-109, Cultural Resources Analysts, Contract Publication Series 90-93.

APPENDIX A: ARCHAEOLOGICAL RESOURCES WITHIN THE PROJECT AND APE: NOT ELIGIBLE.

OAI#	CULTURAL AFFILIATION	USGS 7.5' TOPOGRAPHIC QUAD	UTM		
			ZONE	EASTING	NORTHING
CR0003	Prehistoric	North Robinson	17	349851	4513682
CR0004	Prehistoric	North Robinson	17	349930	4513430
CR0005	Prehistoric	North Robinson	17	349520	4513810
CR0009	Prehistoric	North Robinson	17	351689	4513583
CR0012	Historic	North Robinson	17	341830	4513760
CR0014	Prehistoric and Historic	Galion	17	349969	4511912
CR0015	Prehistoric	Galion	17	347920	4511940
CR0016	Prehistoric	North Robinson	17	349820	4513880
CR0017	Prehistoric	North Robinson	17	349538	4513641
CR0018	Prehistoric	North Robinson	17	349645	4513575
CR0019	Prehistoric	North Robinson	17	349770	4513540
CR0020	Prehistoric	North Robinson	17	349670	4513340
CR0021	Prehistoric	North Robinson	17	349917	4513319
CR0022	Prehistoric	North Robinson	17	349410	4513750
CR0024	Prehistoric	North Robinson	17	350462	4514692
CR0025	Prehistoric	North Robinson	17	350060	4514280
CR0027	Prehistoric	North Robinson	17	350770	4513876
CR0028	Prehistoric	North Robinson	17	348960	4513760
CR0029	Prehistoric	North Robinson	17	348760	4513740
CR0030	Prehistoric	North Robinson	17	348625	4513951
CR0031	Prehistoric	North Robinson	17	347940	4513560
CR0033	Prehistoric	Galion	17	349802	4511593
CR0049	Prehistoric	North Robinson	17	349440	4515480
CR0050	Prehistoric	North Robinson	17	349760	4515290
CR0051	Prehistoric	North Robinson	17	349920	4515010
CR0052	Prehistoric	North Robinson	17	350190	4514870
CR0055	Prehistoric	North Robinson	17	349140	4513770
CR0061	Prehistoric	North Robinson	17	348720	4513920
CR0062	Prehistoric	Crestline	17	352581	4514144
CR0063	Prehistoric	Crestline	17	352713	4513676
CR0064	Prehistoric	Crestline	17	352700	4513380
CR0081	Prehistoric	North Robinson	17	350836	4514542
CR0082	Prehistoric	North Robinson	17	349720	4514680
CR0083	Prehistoric and Historic	North Robinson	17	349650	4514320
CR0084	Prehistoric and Historic	North Robinson	17	351560	4514150
CR0088	Prehistoric	North Robinson	17	346179	4513593
CR0089	Prehistoric	North Robinson	17	346002	4513818
CR0090	Prehistoric	North Robinson	17	348300	4513220
CR0091	Prehistoric	North Robinson	17	348004	4513326
CR0092	Prehistoric	North Robinson	17	348780	4513320
CR0094	Prehistoric	North Robinson	17	347836	4514440
CR0095	Prehistoric	North Robinson	17	347847	4514283
CR0096	Prehistoric	North Robinson	17	347600	4514240
CR0097	Prehistoric	North Robinson	17	347400	4513940
CR0098	Prehistoric	North Robinson	17	347355	4513708
CR0100	Prehistoric	North Robinson	17	347434	4513222

OAI#	CULTURAL AFFILIATION	USGS 7.5' TOPOGRAPHIC QUAD	UTM		
			ZONE	EASTING	NORTHING
CR0103	Prehistoric	North Robinson	17	350139	4513371
CR0105	Prehistoric	North Robinson	17	347280	4514340
CR0108	Prehistoric	North Robinson	17	350231	4514686
CR0114	Prehistoric	North Robinson	17	350310	4513490
CR0118	Prehistoric	North Robinson	17	351170	4514290
CR0119	Prehistoric	North Robinson	17	351179	4514706
CR0120	Prehistoric	North Robinson	17	349042	4515174
CR0121	Prehistoric	North Robinson	17	348906	4515327
CR0122	Prehistoric	North Robinson	17	350989	4513764
CR0129	Prehistoric	North Robinson	17	348516	4515043
CR0131	Prehistoric	North Robinson	17	344880	4514200
CR0132	Prehistoric	North Robinson	17	344586	4513953
CR0133	Prehistoric	North Robinson	17	344319	4514670
CR0134	Prehistoric	North Robinson	17	344305	4514431
CR0140	Prehistoric	North Robinson	17	349137	4513325
CR0144	Prehistoric	Crestline	17	352820	4513260
CR0145	Prehistoric	Crestline	17	353142	4513944
CR0148	Prehistoric	North Robinson	17	349207	4515338
CR0149	Prehistoric	North Robinson	17	350402	4514294
CR0150	Prehistoric	North Robinson	17	351515	4513241
CR0157	Prehistoric	Bucyrus	17	340580	4518260
CR0158	Prehistoric	Galion	17	350140	4514420
CR0159	Prehistoric	North Robinson	17	350000	4514460
CR0161	Prehistoric	North Robinson	17	351330	4514000
CR0162	Prehistoric	North Robinson	17	350590	4514320
CR0163	Prehistoric	North Robinson	17	350544	4513808
CR0228	Prehistoric	North Robinson	17	350480	4513340
CR0229	Prehistoric	North Robinson	17	350480	4513492
CR0230	Prehistoric	North Robinson	17	350561	4513613
CR0477	Prehistoric	North Robinson	17	349800	4515160
CR0478	Prehistoric	North Robinson	17	349960	4515170
CR0479	Prehistoric	North Robinson	17	349790	4515080
CR0480	Prehistoric	North Robinson	17	349670	4515080
CR0481	Prehistoric	North Robinson	17	349720	4515020
CR0482	Prehistoric	North Robinson	17	349710	4514930
CR0483	Prehistoric	North Robinson	17	349830	4514940
CR0484	Prehistoric	North Robinson	17	349850	4514970
CR0485	Prehistoric	North Robinson	17	349870	4514920
CR0486	Prehistoric	North Robinson	17	350160	4514850
CR0487	Prehistoric	North Robinson	17	350090	4514850
CR0488	Prehistoric	North Robinson	17	350080	4515090
CR0489	Prehistoric	North Robinson	17	350210	4515080
CR0490	Prehistoric	North Robinson	17	350220	4515190
CR0491	Prehistoric	North Robinson	17	350210	4514960
CR0492	Prehistoric	North Robinson	17	350270	4514840
CR0493	Prehistoric	North Robinson	17	350370	4515000

OAI#	CULTURAL AFFILIATION	USGS 7.5' TOPOGRAPHIC QUAD	UTM		
			ZONE	EASTING	NORTHING
CR0494	Prehistoric	North Robinson	17	350410	4515060
CR0495	Historic	North Robinson	17	350480	4515120
CR0496	Prehistoric	North Robinson	17	350470	4514550
CR0497	Prehistoric	North Robinson	17	350510	4514580
CR0498	Prehistoric	North Robinson	17	350550	4514870
CR0499	Prehistoric	North Robinson	17	350580	4515050
CR0500	Prehistoric	North Robinson	17	349940	4514840
CR0501	Prehistoric and Historic	North Robinson	17	350990	4514000
CR0502	Prehistoric	North Robinson	17	350300	4513760
CR0503	Prehistoric	North Robinson	17	351450	4514540
CR0504	Prehistoric	North Robinson	17	351510	4514590
CR0505	Prehistoric	North Robinson	17	351430	4514640
CR0506	Prehistoric	North Robinson	17	351540	4514770
CR0507	Prehistoric	North Robinson	17	351520	4514930
CR0508	Prehistoric	North Robinson	17	351440	4515010
CR0509	Prehistoric	North Robinson	17	351610	4514800
CR0510	Prehistoric	North Robinson	17	351630	4514730
CR0511	Prehistoric	North Robinson	17	351630	4514510
CR0515	Prehistoric	North Robinson	17	343830	4515460
CR0516	Prehistoric	North Robinson	17	343370	4515460
CR0517	Historic	North Robinson	17	344410	4515280
CR0518	Prehistoric	North Robinson	17	343880	4515220
CR0519	Prehistoric	North Robinson	17	343560	4515070
CR0520	Prehistoric	North Robinson	17	344800	4515450
CR0521	Prehistoric	North Robinson	17	344770	4514890
CR0522	Prehistoric	North Robinson	17	344490	4515170
CR0523	Prehistoric	North Robinson	17	344460	4514990
CR0524	Prehistoric and Historic	North Robinson	17	344470	4514870
CR0525	Prehistoric	North Robinson	17	344350	4514890
CR0526	Prehistoric	North Robinson	17	341650	4515030
CR0527	Prehistoric	North Robinson	17	350540	4514660
CR0528	Prehistoric	North Robinson	17	346670	4514970
CR0529	Prehistoric	North Robinson	17	346660	4514940
CR0531	Prehistoric	North Robinson	17	346790	4515060
CR0532	Prehistoric	North Robinson	17	346760	4515180
CR0533	Prehistoric	North Robinson	17	346630	4515380
CR0534	Prehistoric	North Robinson	17	346820	4515100
CR0535	Prehistoric	North Robinson	17	346790	4514890
CR0536	Prehistoric	North Robinson	17	347170	4514880
CR0537	Prehistoric	North Robinson	17	347410	4515000
CR0538	Prehistoric	North Robinson	17	347170	4515360
CR0539	Prehistoric	North Robinson	17	347310	4515280
CR0540	Prehistoric	North Robinson	17	347480	4514890
CR0541	Prehistoric	North Robinson	17	347520	4515040
CR0542	Prehistoric	North Robinson	17	347610	4514890
CR0543	Prehistoric	North Robinson	17	347720	4514970

OAI#	CULTURAL AFFILIATION	USGS 7.5' TOPOGRAPHIC QUAD	UTM		
			ZONE	EASTING	NORTHING
CR0544	Prehistoric	North Robinson	17	347710	4515120
CR0545	Prehistoric	North Robinson	17	347690	4514800
CR0546	Prehistoric	North Robinson	17	347730	4514720
CR0547	Prehistoric	North Robinson	17	347700	4514860
CR0548	Prehistoric	North Robinson	17	347710	4514760
CR0549	Historic	North Robinson	17	346520	4514860
CR0550	Historic	North Robinson	17	347360	4514890
CR0551	Historic	North Robinson	17	347650	4514860
CR0552	Prehistoric	Crestline	17	353890	4514130
CR0555	Prehistoric	North Robinson	17	344620	4514880
CR0556	Prehistoric	North Robinson	17	345340	4515120
CR0557	Prehistoric	North Robinson	17	344630	4515040
CR0558	Prehistoric	North Robinson	17	344620	4515100
CR0559	Prehistoric	North Robinson	17	350910	4515010
CR0560	Prehistoric	North Robinson	17	350880	4514920
CR0562	Prehistoric	North Robinson	17	351020	4514420
CR0563	Historic	North Robinson	17	351070	4513700
CR0564	Prehistoric	North Robinson	17	350740	4514690
CR0565	Prehistoric	North Robinson	17	350740	4514870
CR0566	Prehistoric	North Robinson	17	350690	4515020
CR0567	Prehistoric and Historic	North Robinson	17	350650	4514830
CR0568	Prehistoric	North Robinson	17	350640	4514620
CR0569	Prehistoric	North Robinson	17	349430	4515040
CR0570	Prehistoric	North Robinson	17	349460	4515130
CR0571	Prehistoric	North Robinson	17	349890	4513500
CR0572	Prehistoric	North Robinson	17	349900	4513600
CR0575	Historic	Bucyrus	17	340220	4515940
CR0577	Prehistoric	Crestline	17	353000	4513160
CR0578	Prehistoric	Crestline	17	352930	4513120
CR0579	Prehistoric	Crestline	17	353660	4513110
CR0580	Prehistoric	North Robinson	17	343310	4514100
CR0581	Prehistoric	North Robinson	17	344050	4513830
CR0582	Prehistoric	North Robinson	17	343790	4514270
CR0583	Prehistoric	North Robinson	17	343960	4514130
CR0584	Prehistoric	North Robinson	17	343890	4514000
CR0585	Prehistoric	North Robinson	17	343350	4513660
CR0587	Prehistoric	North Robinson	17	343530	4513770
CR0588	Prehistoric	North Robinson	17	343630	4513730
CR0609	Prehistoric	Bucyrus	17	341020	4516520
CR0610	Prehistoric	Bucyrus	17	341050	4516580
CR0611	Prehistoric	Bucyrus	17	341110	4516330
CR0612	Prehistoric	Bucyrus	17	341190	4516450
CR0614	Prehistoric	Crestline	17	353950	4514410
CR0615	Prehistoric and Historic	North Robinson	17	351750	4514140
CR0616	Prehistoric	North Robinson	17	351980	4514440
CR0617	Prehistoric	North Robinson	17	351980	4514370

OAI#	CULTURAL AFFILIATION	USGS 7.5' TOPOGRAPHIC QUAD	UTM		
			ZONE	EASTING	NORTHING
CR0618	Prehistoric	North Robinson	17	352130	4514240
CR0619	Prehistoric	North Robinson	17	352140	4514200
CR0620	Prehistoric	North Robinson	17	352240	4514300
CR0622	Prehistoric	North Robinson	17	349690	4513440
CR0623	Prehistoric	North Robinson	17	349680	4513450
CR0624	Prehistoric	North Robinson	17	351940	4514360
CR0625	Prehistoric	North Robinson	17	344300	4515320
CR0626	Prehistoric	North Robinson	17	344620	4515430
CR0627	Prehistoric	North Robinson	17	345040	4513670
CR0628	Historic	North Robinson	17	344950	4513460
CR0629	Historic	North Robinson	17	344790	4513850
CR0630	Prehistoric	North Robinson	17	345390	4513680
CR0631	Prehistoric	North Robinson	17	345310	4513710
CR0632	Prehistoric	North Robinson	17	345270	4513640
CR0633	Historic	North Robinson	17	345530	4513600
CR0634	Prehistoric	North Robinson	17	345480	4513530
CR0635	Prehistoric	North Robinson	17	345420	4513590
CR0636	Prehistoric	North Robinson	17	345370	4513530
CR0637	Prehistoric	Bucyrus	17	340600	4515580
CR0638	Prehistoric	Bucyrus	17	340660	4515670
CR0639	Prehistoric	Bucyrus	17	340510	4515740
CR0640	Prehistoric	Bucyrus	17	340460	4515510
CR0641	Prehistoric	Bucyrus	17	340700	4515480
CR0642	Prehistoric	Bucyrus	17	340670	4515290
CR0647	Prehistoric	North Robinson	17	345260	4513490
CR0648	Prehistoric	North Robinson	17	345530	4513470
CR0649	Prehistoric	North Robinson	17	345280	4513390
CR0650	Prehistoric	North Robinson	17	345110	4513380
CR0651	Historic	North Robinson	17	345420	4513330
CR0668	Prehistoric	Bucyrus	17	339960	4517910
CR0669	Prehistoric	Bucyrus	17	340640	4517800
CR0670	Prehistoric	Bucyrus	17	340630	4517700
CR0672	Prehistoric	Bucyrus	17	340090	4517760
CR0673	Prehistoric	Bucyrus	17	340240	4517730
CR0674	Prehistoric	Bucyrus	17	340360	4517680
CR0675	Prehistoric	Bucyrus	17	340700	4517640
CR0676	Prehistoric	Bucyrus	17	340600	4517630
CR0677	Prehistoric	Bucyrus	17	340180	4517640
CR0683	Prehistoric	North Robinson	17	349570	4514650
CR0684	Prehistoric	North Robinson	17	349610	4514780
CR0685	Prehistoric	North Robinson	17	349780	4514620
CR0686	Prehistoric	North Robinson	17	349820	4514690
CR0687	Prehistoric	North Robinson	17	349850	4514670
CR0688	Prehistoric	North Robinson	17	351350	4514850
CR0689	Prehistoric	North Robinson	17	351300	4514800
CR0690	Prehistoric	North Robinson	17	351640	4514570

OAI#	CULTURAL AFFILIATION	USGS 7.5' TOPOGRAPHIC QUAD	UTM		
			ZONE	EASTING	NORTHING
CR0691	Prehistoric	North Robinson	17	351860	4514630
CR0692	Prehistoric	North Robinson	17	352070	4513960
CR0693	Prehistoric	North Robinson	17	351930	4514010
CR0694	Prehistoric	North Robinson	17	351390	4513560
CR0695	Prehistoric	North Robinson	17	351540	4513500
CR0696	Prehistoric	North Robinson	17	351380	4513640
CR0697	Prehistoric	North Robinson	17	351290	4513720
CR0698	Prehistoric	North Robinson	17	351300	4513790
CR0699	Prehistoric	North Robinson	17	351290	4513820
CR0700	Prehistoric	North Robinson	17	343180	4513820
CR0701	Prehistoric	North Robinson	17	342780	4513930
CR0702	Prehistoric	North Robinson	17	343090	4513970
CR0703	Prehistoric and Historic	North Robinson	17	343190	4513980
CR0704	Prehistoric	North Robinson	17	342990	4514000
CR0705	Prehistoric	North Robinson	17	343170	4514110
CR0706	Prehistoric	North Robinson	17	342940	4514150
CR0707	Prehistoric	North Robinson	17	343140	4514160
CR0708	Prehistoric	North Robinson	17	342710	4514280
CR0709	Prehistoric	North Robinson	17	342540	4514420
CR0711	Prehistoric	North Robinson	17	342320	4514220
CR0712	Prehistoric	North Robinson	17	342360	4514520
CR0713	Prehistoric	North Robinson	17	342700	4514960
CR0714	Prehistoric	North Robinson	17	342770	4514880
CR0715	Prehistoric	North Robinson	17	342940	4514950
CR0716	Prehistoric and Historic	North Robinson	17	342760	4514730
CR0717	Prehistoric	North Robinson	17	342960	4514730
CR0718	Prehistoric	Bucyrus	17	341710	4515060
CR0719	Prehistoric	Bucyrus	17	341720	4515170
CR0720	Prehistoric	Bucyrus	17	341520	4515190
CR0721	Prehistoric	Bucyrus	17	341340	4515230
CR0722	Prehistoric	Bucyrus	17	341270	4515340
CR0723	Prehistoric	Bucyrus	17	341400	4515400
CR0724	Prehistoric	Bucyrus	17	341660	4515290
CR0725	Prehistoric	Bucyrus	17	341700	4515360
CR0726	Prehistoric	Bucyrus	17	340760	4515360
CR0728	Prehistoric	Bucyrus	17	340700	4515300
CR0729	Prehistoric	Bucyrus	17	340750	4515260
CR0731	Prehistoric	Bucyrus	17	341270	4515130
CR0732	Prehistoric	Bucyrus	17	340800	4514990
CR0733	Prehistoric	North Robinson	17	341910	4515100
CR0734	Prehistoric	North Robinson	17	341850	4515170
CR0735	Prehistoric	North Robinson	17	341810	4515020
CR0736	Prehistoric	North Robinson	17	341840	4515360
CR0737	Prehistoric	North Robinson	17	341870	4515220
CR0738	Prehistoric	North Robinson	17	342040	4515310
CR0739	Prehistoric	North Robinson	17	342920	4515230

OAI#	CULTURAL AFFILIATION	USGS 7.5' TOPOGRAPHIC QUAD	UTM		
			ZONE	EASTING	NORTHING
CR0740	Prehistoric	North Robinson	17	343230	4515280
CR0741	Prehistoric	North Robinson	17	342980	4515340
CR0742	Prehistoric	North Robinson	17	342680	4515330
CR0743	Prehistoric	North Robinson	17	342400	4515420
CR0744	Prehistoric	North Robinson	17	343080	4515420
CR0745	Prehistoric	North Robinson	17	342550	4515180
CR0746	Prehistoric	North Robinson	17	342370	4515260
CR0747	Prehistoric	North Robinson	17	341800	4514540
CR0748	Prehistoric	North Robinson	17	343170	4515680
CR0749	Prehistoric	North Robinson	17	343120	4515480
CR0750	Prehistoric	North Robinson	17	344320	4513760
CR0751	Prehistoric	North Robinson	17	344500	4513450
CR0752	Prehistoric	North Robinson	17	344750	4513330
CR0753	Prehistoric and Historic	North Robinson	17	345080	4514880
CR0754	Prehistoric	North Robinson	17	345070	4515100
CR0755	Prehistoric	North Robinson	17	345040	4515040
CR0756	Prehistoric	North Robinson	17	345070	4515080
CR0757	Prehistoric	North Robinson	17	345160	4514970
CR0758	Prehistoric	North Robinson	17	345270	4514850
CR0759	Prehistoric	North Robinson	17	345440	4514910
CR0760	Prehistoric	North Robinson	17	345470	4515020
CR0775	Prehistoric	North Robinson	17	345930	4513460
CR0776	Prehistoric	North Robinson	17	345810	4513410
CR0777	Prehistoric	North Robinson	17	345650	4513560
CR0778	Prehistoric	North Robinson	17	345970	4513560
CR0779	Prehistoric	North Robinson	17	346320	4513300
CR0780	Historic	North Robinson	17	346060	4513360
CR0781	Prehistoric	North Robinson	17	345980	4513330
CR0782	Prehistoric	North Robinson	17	345590	4513390
CR0783	Prehistoric	North Robinson	17	345780	4513350
CR0784	Prehistoric	North Robinson	17	346350	4513620
CR0785	Prehistoric	North Robinson	17	345900	4513650
CR0786	Prehistoric	North Robinson	17	345700	4513650
CR0788	Prehistoric and Historic	North Robinson	17	346180	4513740
CR0794	Prehistoric	North Robinson	17	345740	4515000
CR0795	Prehistoric	North Robinson	17	345810	4514890
CR0796	Prehistoric	North Robinson	17	345780	4514830
CR0797	Prehistoric	North Robinson	17	345840	4515040
CR0798	Prehistoric	North Robinson	17	345830	4514830
CR0799	Prehistoric	North Robinson	17	345990	4514830
CR0800	Prehistoric	North Robinson	17	345980	4515040
CR0801	Prehistoric	North Robinson	17	346020	4515090
CR0802	Prehistoric	North Robinson	17	346010	4515400
CR0803	Prehistoric	North Robinson	17	346230	4515220
CR0804	Prehistoric	North Robinson	17	346050	4515150
CR0805	Prehistoric	North Robinson	17	346060	4515120

OAI#	CULTURAL AFFILIATION	USGS 7.5' TOPOGRAPHIC QUAD	UTM		
			ZONE	EASTING	NORTHING
CR0806	Prehistoric	North Robinson	17	346300	4515130
CR0807	Prehistoric	North Robinson	17	346350	4515120
CR0808	Prehistoric	North Robinson	17	346690	4513610
CR0809	Prehistoric	North Robinson	17	346780	4513670
CR0810	Prehistoric	North Robinson	17	346770	4513810
CR0811	Prehistoric	North Robinson	17	346610	4513840
CR0812	Prehistoric	North Robinson	17	346510	4513820
CR0813	Prehistoric	North Robinson	17	346770	4513880
CR0814	Prehistoric	North Robinson	17	346250	4515340
CR0815	Prehistoric	North Robinson	17	346120	4515380
CR0816	Prehistoric	North Robinson	17	346910	4513600
CR0817	Prehistoric	North Robinson	17	346010	4513820
CR0818	Prehistoric	North Robinson	17	347180	4513790
CR0819	Prehistoric	North Robinson	17	348550	4514000
CR0820	Prehistoric	North Robinson	17	348570	4513950
CR0821	Prehistoric	North Robinson	17	348120	4513810
CR0823	Prehistoric	North Robinson	17	347550	4513660
CR0824	Prehistoric	North Robinson	17	347360	4513530
CR0825	Prehistoric	North Robinson	17	348380	4513330
CR0826	Prehistoric	North Robinson	17	348320	4513370
CR0827	Prehistoric	North Robinson	17	348500	4513570
CR0828	Prehistoric	North Robinson	17	348390	4513490
CR0829	Prehistoric	North Robinson	17	347630	4513530
CR0830	Prehistoric	North Robinson	17	347630	4513530
CR0831	Prehistoric	North Robinson	17	347370	4513380
CR0832	Prehistoric	North Robinson	17	347400	4513400
CR0835	Prehistoric and Historic	Bucyrus	17	339540	4518180
CR0842	Prehistoric	Bucyrus	17	340330	4518220
CR0843	Prehistoric	Bucyrus	17	340150	4518250
CR0844	Prehistoric	Bucyrus	17	339820	4518420
CR0845	Prehistoric	Crestline	17	354190	4514380
CR0846	Prehistoric	Crestline	17	354080	4513960
CR0847	Prehistoric	Crestline	17	354070	4513850
CR0848	Prehistoric and Historic	Crestline	17	353970	4513260
CR0849	Prehistoric	Crestline	17	354000	4513130
CR0850	Prehistoric	Crestline	17	353930	4513540
CR0851	Prehistoric	Crestline	17	354060	4513540
CR0852	Prehistoric	North Robinson	17	348760	4513620
CR0853	Prehistoric	North Robinson	17	348660	4513720
CR0856	Prehistoric	Bucyrus	17	340730	4517470
CR0857	Prehistoric	Bucyrus	17	340570	4517470
CR0858	Prehistoric	Bucyrus	17	340630	4517270
CR0863	Prehistoric	Crestline	17	352460	4513840
CR0865	Prehistoric	Crestline	17	352320	4513340
CR0866	Prehistoric	Crestline	17	352610	4513340
CR0867	Prehistoric	North Robinson	17	352220	4513240

OAI#	CULTURAL AFFILIATION	USGS 7.5' TOPOGRAPHIC QUAD	UTM		
			ZONE	EASTING	NORTHING
CR0868	Prehistoric	Crestline	17	352520	4513170
CR0869	Prehistoric	Crestline	17	352520	4513040
CR0870	Historic	Bucyrus	17	340770	4516220
CR0871	Prehistoric	Bucyrus	17	340660	4516240
CR0872	Prehistoric	Bucyrus	17	341170	4516190
CR0873	Prehistoric	North Robinson	17	351290	4514360
CR0874	Prehistoric	Bucyrus	17	341530	4515970
CR0878	Prehistoric and Historic	Bucyrus	17	341410	4516000
CR0879	Prehistoric	Bucyrus	17	341220	4516010
CR0880	Prehistoric	Bucyrus	17	341080	4516040
CR0881	Prehistoric	Bucyrus	17	341190	4516100
CR0882	Historic	Bucyrus	17	341010	4516050
CR0883	Prehistoric	North Robinson	17	352090	4514100
CR0885	Prehistoric	North Robinson	17	349220	4514810
CR0886	Prehistoric	North Robinson	17	349180	4515010
CR0887	Prehistoric	North Robinson	17	349030	4514990
CR0888	Prehistoric	North Robinson	17	349080	4514910
CR0889	Prehistoric	North Robinson	17	351870	4514260
CR0890	Prehistoric	North Robinson	17	349000	4513800
CR0891	Prehistoric	North Robinson	17	349190	4513740
CR0892	Prehistoric	North Robinson	17	349270	4513670
CR0893	Prehistoric	Crestline	17	354260	4514670
CR0894	Prehistoric	Crestline	17	353940	4514350
CR0895	Prehistoric	North Robinson	17	346870	4515350
CR0896	Prehistoric	North Robinson	17	347820	4514930
CR0897	Prehistoric	North Robinson	17	347920	4515290
CR0898	Prehistoric	North Robinson	17	348160	4515250
CR0899	Prehistoric	North Robinson	17	348180	4514840
CR0900	Prehistoric	North Robinson	17	348340	4514770
CR0901	Prehistoric	North Robinson	17	348620	4514410
CR0902	Prehistoric	North Robinson	17	348630	4514550
CR0903	Prehistoric	North Robinson	17	348520	4515170
CR0904	Prehistoric	North Robinson	17	349390	4514770
CR0905	Prehistoric	North Robinson	17	349110	4514750
CR0906	Prehistoric	North Robinson	17	349030	4514710
CR0907	Prehistoric and Historic	North Robinson	17	350630	4513570
CR0908	Prehistoric	North Robinson	17	348520	4515170
CR0909	Prehistoric	Bucyrus	17	341160	4515050
CR0910	Prehistoric	Bucyrus	17	341260	4515060
CR0911	Prehistoric	Bucyrus	17	341500	4515070
CR0912	Prehistoric	Bucyrus	17	341450	4514970
CR0913	Prehistoric	Bucyrus	17	341300	4514960
CR0914	Prehistoric	Bucyrus	17	341250	4514940
CR0915	Prehistoric	Bucyrus	17	341230	4514870
CR0916	Prehistoric	Bucyrus	17	341500	4514760
CR0917	Prehistoric	Bucyrus	17	341440	4514800

OAI#	CULTURAL AFFILIATION	USGS 7.5' TOPOGRAPHIC QUAD	UTM		
			ZONE	EASTING	NORTHING
CR0918	Prehistoric	Bucyrus	17	341530	4514820
CR0919	Prehistoric	North Robinson	17	351290	4514380
CR0920	Prehistoric	North Robinson	17	349910	4514590
CR0921	Prehistoric	North Robinson	17	349890	4514630
CR0922	Prehistoric	North Robinson	17	349900	4514710
CR0923	Prehistoric	North Robinson	17	350520	4513470
CR0924	Prehistoric	Bucyrus	17	340580	4516940
CR0925	Prehistoric	Bucyrus	17	340480	4517020
CR0926	Prehistoric	Bucyrus	17	340440	4516930
CR0927	Prehistoric	Bucyrus	17	340520	4516890
CR0938	Prehistoric	Bucyrus	17	341770	4514530
CR0939	Prehistoric	Bucyrus	17	341440	4514540
CR0940	Historic	Bucyrus	17	341390	4514570
CR0941	Prehistoric	Bucyrus	17	340800	4515580
CR0942	Historic	Bucyrus	17	340870	4515610
CR0943	Historic	Crestline	17	352710	4513770
CR0944	Historic	Bucyrus	17	341310	4516080
CR0945	Historic	Bucyrus	17	340290	4517500
CR0946	Prehistoric	North Robinson	17	350620	4514080
CR0947	Historic	North Robinson	17	350650	4514030
CR0949	Prehistoric and Historic	North Robinson	17	349050	4514550
CR0950	Prehistoric	North Robinson	17	349200	4514520
CR0951	Prehistoric	North Robinson	17	349400	4514510
CR0952	Historic	North Robinson	17	349460	4514470
CR0953	Prehistoric	North Robinson	17	349500	4514480
CR0954	Prehistoric	North Robinson	17	349300	4514430
CR0955	Prehistoric and Historic	North Robinson	17	349220	4514410
CR0956	Historic	North Robinson	17	349180	4514360
CR0957	Prehistoric and Historic	North Robinson	17	349360	4514300
CR0958	Prehistoric	North Robinson	17	349190	4513980
CR0959	Historic	North Robinson	17	349320	4514120
CR0960	Prehistoric	North Robinson	17	350020	4514150
CR0961	Prehistoric and Historic	North Robinson	17	350970	4514080
CR0962	Prehistoric	North Robinson	17	351270	4514120
CR0963	Prehistoric	North Robinson	17	349750	4514280
CR0964	Prehistoric and Historic	North Robinson	17	349180	4517080
CR0966	Prehistoric	North Robinson	17	349390	4517148
CR0967	Historic	Crestline	17	353610	4518090
CR0968	Prehistoric	Crestline	17	353765	4517885
CR0969	Prehistoric	Crestline	17	354020	4517880
CR0970	Historic	Crestline	17	354280	4517760
CR0973	Prehistoric	North Robinson	17	350007	4515894
CR0974	Prehistoric	North Robinson	17	350061	4515799
CR0975	Prehistoric	North Robinson	17	350110	4515680
CR0982	Historic	Crestline	17	354280	4515320
CR0983	Prehistoric	Crestline	17	354110	4515300

OAI#	CULTURAL AFFILIATION	USGS 7.5' TOPOGRAPHIC QUAD	UTM		
			ZONE	EASTING	NORTHING
CR0984	Prehistoric and Historic	Crestline	17	354025	4515230
RI0012	Prehistoric	Crestline	17	356530	4513470
RI0031	Prehistoric	Crestline	17	358410	4515000
RI0032	Prehistoric		17	358291	4514709
RI0033	Historic		17	358301	4514497
RI0034	Prehistoric		17	357943	4514448
RI0091	Prehistoric	Crestline	17	356900	4513930
RI0092	Prehistoric	Crestline	17	357273	4513970
RI0097	Prehistoric	Crestline	17	355594	4514537
RI0098	Prehistoric		17	355482	4514671
RI0099	Prehistoric	Crestline	17	355920	4514560
RI0101	Prehistoric	Crestline	17	354555	4513705
RI0103	Prehistoric	Crestline	17	359997	4515271
RI0104	Prehistoric	Crestline	17	359812	4515215
RI0195	Prehistoric	Shelby	17	360615	4530575
RI0233	Prehistoric	Shelby	17	360730	4529880
RI0280	Prehistoric	Crestline	17	357740	4514960
RI0281	Historic	Crestline	17	357751	4514642
RI0282	Prehistoric	Crestline	17	357670	4514470
RI0283	Prehistoric	Crestline	17	357550	4514938
RI0284	Prehistoric	Crestline	17	358580	4514400
RI0285	Prehistoric	Crestline	17	354620	4514690
RI0286	Prehistoric	Crestline	17	354670	4514000
RI0287	Prehistoric	Crestline	17	354680	4514100
RI0288	Prehistoric	Crestline	17	354890	4514350
RI0289	Prehistoric	Crestline	17	354414	4514811
RI0290	Prehistoric	Crestline	17	354972	4514793
RI0291	Prehistoric	Crestline	17	354999	4514854
RI0292	Prehistoric	Crestline	17	355010	4514918
RI0293	Prehistoric	Crestline	17	354980	4514890
RI0294	Prehistoric and Historic	Crestline	17	354860	4514853
RI0295	Prehistoric	Crestline	17	356650	4514400
RI0297	Prehistoric	Crestline	17	356550	4513590
RI0298	Prehistoric	Crestline	17	356750	4514580
RI0299	Prehistoric	Crestline	17	356910	4514490
RI0300	Prehistoric	Crestline	17	356590	4513530
RI0301	Prehistoric	Crestline	17	356350	4513570
RI0302	Historic	Crestline	17	356300	4513660
RI0303	Prehistoric	Crestline	17	356140	4513349
RI0304	Prehistoric	Crestline	17	355910	4513320
RI0305	Prehistoric	Crestline	17	356647	4514821
RI0306	Prehistoric	Crestline	17	356540	4514850
RI0307	Prehistoric	Crestline	17	356300	4514760
RI0308	Prehistoric	Crestline	17	356600	4514890
RI0309	Prehistoric	Crestline	17	356893	4514986
RI0310	Prehistoric	Crestline	17	356690	4513520

OAI#	CULTURAL AFFILIATION	USGS 7.5' TOPOGRAPHIC QUAD	UTM		
			ZONE	EASTING	NORTHING
RI0311	Prehistoric	Crestline	17	356690	4513470
RI0312	Prehistoric	Crestline	17	357380	4513750
RI0313	Prehistoric	Crestline	17	354380	4514150
RI0314	Prehistoric	Crestline	17	354280	4514010
RI0315	Prehistoric	Crestline	17	354400	4513940
RI0316	Prehistoric	Crestline	17	354920	4513320
RI0317	Prehistoric	Crestline	17	354832	4513303
RI0319	Prehistoric	Crestline	17	355950	4514889
RI0320	Prehistoric	Crestline	17	356030	4514423
RI0321	Historic	Crestline	17	355090	4513180
RI0322	Prehistoric	Crestline	17	355280	4513230
RI0323	Prehistoric	Crestline	17	355790	4514520
RI0325	Prehistoric	Crestline	17	356190	4515010
RI0326	Prehistoric	Crestline	17	356065	4514989
RI0327	Prehistoric	Crestline	17	356350	4514430
RI0328	Prehistoric	Crestline	17	356520	4514660
RI0329	Prehistoric	Crestline	17	356650	4514610
RI0330	Prehistoric	Crestline	17	356550	4514520
RI0331	Prehistoric	Crestline	17	354510	4513210
RI0332	Prehistoric	Crestline	17	354320	4513150
RI0333	Prehistoric and Historic	Crestline	17	354457	4513613
RI0334	Historic	Crestline	17	354319	4513621
RI0335	Prehistoric	Crestline	17	354882	4513627
RI0336	Prehistoric	Crestline	17	355250	4513600
RI0337	Prehistoric	Crestline	17	355356	4513658
RI0338	Prehistoric	Crestline	17	355410	4513440
RI0339	Prehistoric	Crestline	17	355420	4513260
RI0340	Prehistoric	Crestline	17	355431	4513161
RI0341	Historic	Crestline	17	355609	4513501
RI0342	Prehistoric	Crestline	17	355698	4513161
RI0343	Prehistoric	Crestline	17	357800	4513890
RI0344	Prehistoric	Crestline	17	357641	4514179
RI0345	Prehistoric	Crestline	17	357360	4513800
RI0346	Prehistoric	Crestline	17	359063	4514832
RI0347	Prehistoric	Crestline	17	359160	4514790
RI0348	Prehistoric	Crestline	17	357010	4513450
RI0349	Prehistoric	Crestline	17	356990	4513510
RI0350	Prehistoric	Crestline	17	356930	4513440
RI0351	Prehistoric	Crestline	17	356900	4513470
RI0352	Prehistoric	Crestline	17	358224	4514376
RI0353	Prehistoric	Crestline	17	358034	4514548
RI0354	Prehistoric	Crestline	17	358089	4514619
RI0356	Prehistoric	Crestline	17	359490	4514880
RI0357	Prehistoric	Crestline	17	359480	4514980
RI0358	Prehistoric	Crestline	17	359510	4514800
RI0359	Prehistoric	Crestline	17	359519	4514931

OAI#	CULTURAL AFFILIATION	USGS 7.5' TOPOGRAPHIC QUAD	UTM		
			ZONE	EASTING	NORTHING
RI0360	Prehistoric	Crestline	17	359850	4515050
RI0361	Prehistoric	Crestline	17	359880	4515040
RI0362	Prehistoric	Crestline	17	357400	4514310
RI0363	Prehistoric	Crestline	17	357448	4514256
RI0364	Prehistoric	Crestline	17	357321	4514213
RI0365	Prehistoric	Crestline	17	357340	4514170
RI0366	Prehistoric	Crestline	17	357160	4514110
RI0367	Prehistoric	Crestline	17	357128	4514007
RI0368	Prehistoric	Crestline	17	357458	4514153
RI0369	Prehistoric	Crestline	17	357321	4514033
RI0370	Prehistoric	Crestline	17	357150	4513930
RI0371	Prehistoric	Crestline	17	356772	4514773
RI0372	Prehistoric	Crestline	17	356900	4514820
RI0373	Prehistoric	Crestline	17	357065	4514738
RI0374	Prehistoric	Crestline	17	357044	4514786
RI0375	Prehistoric	Crestline	17	357150	4514730
RI0376	Prehistoric	Crestline	17	357260	4514810
RI0377	Prehistoric	Crestline	17	357183	4514858
RI0378	Prehistoric	Crestline	17	357100	4514870
RI0379	Prehistoric	Crestline	17	357027	4514911
RI0380	Prehistoric	Crestline	17	356820	4514862
RI0381	Prehistoric	Crestline	17	356755	4514880
RI0382	Prehistoric	Crestline	17	356730	4514870
RI0383	Prehistoric	Crestline	17	356710	4514880
RI0384	Prehistoric	Crestline	17	356820	4514910
RI0385	Prehistoric	Crestline	17	357050	4514930
RI0386	Prehistoric	Crestline	17	356990	4514990
RI0387	Prehistoric	Crestline	17	356985	4515046
RI0388	Prehistoric	Crestline	17	356952	4514979
RI0389	Prehistoric	Crestline	17	357330	4514420
RI0390	Prehistoric	Crestline	17	357354	4514353
RI0391	Prehistoric	Crestline	17	357310	4514470
RI0392	Prehistoric	Crestline	17	357428	4514424
RI0393	Prehistoric	Crestline	17	357370	4514480
RI0394	Prehistoric	Crestline	17	357430	4514480
RI0395	Prehistoric	Crestline	17	357320	4514600
RI0396	Prehistoric	Crestline	17	357450	4514624
RI0397	Prehistoric	Crestline	17	357470	4514630
RI0398	Prehistoric	Crestline	17	357400	4514630
RI0399	Prehistoric	Crestline	17	357360	4514660
RI0400	Prehistoric	Crestline	17	357300	4514720
RI0402	Prehistoric	Crestline	17	355126	4514945
RI0403	Prehistoric	Crestline	17	355180	4514550
RI0404	Prehistoric	Crestline	17	355171	4514383
RI0405	Prehistoric	Crestline	17	355130	4514730
RI0406	Prehistoric	Crestline	17	355060	4514480

OAI#	CULTURAL AFFILIATION	USGS 7.5' TOPOGRAPHIC QUAD	UTM		
			ZONE	EASTING	NORTHING
RI0407	Prehistoric	Crestline	17	355060	4514400
RI0408	Prehistoric	Crestline	17	355200	4514900
RI0409	Prehistoric	Crestline	17	355585	4514999
RI0410	Prehistoric	Crestline	17	355849	4514990
RI0411	Prehistoric	Crestline	17	355590	4514890
RI0412	Prehistoric	Crestline	17	355679	4514849
RI0413	Prehistoric	Crestline	17	355320	4514390
RI0415	Historic	Crestline	17	356580	4515000
RI0416	Prehistoric	Crestline	17	357330	4515020
RI0418	Historic	Crestline	17	357362	4514924
RI0419	Historic	Crestline	17	356460	4514970
RI0420	Prehistoric	Crestline	17	355804	4513740
RI0421	Prehistoric	Crestline	17	357614	4514118
RI0422	Prehistoric	Crestline	17	357053	4513678
RI0423	Prehistoric	Crestline	17	359520	4515120
RI0424	Prehistoric	Crestline	17	359600	4515110
RI0425	Historic	Crestline	17	360522	4515387
RI0426	Historic	Crestline	17	360462	4515635
RI0427	Prehistoric	Crestline	17	359841	4515722
RI0428	Prehistoric	Crestline	17	359822	4515680
RI0429	Prehistoric	Crestline	17	359290	4515230
RI0430	Prehistoric	Crestline	17	359240	4515210
RI0431	Prehistoric	Crestline	17	359730	4515100
RI0432	Prehistoric	Crestline	17	359900	4515120
RI0433	Prehistoric	Crestline	17	359930	4515170
RI0434	Prehistoric	Crestline	17	358580	4514090
RI0436	Prehistoric and Historic	Crestline	17	360103	4515880
RI0437	Prehistoric	Crestline	17	358550	4515050
RI0438	Prehistoric	Crestline	17	359640	4515500
RI0440	Historic	Crestline	17	359420	4514750
RI0467	Historic	Crestline	17	354580	4517660
RI0468	Historic	Crestline	17	356595	4517585
RI0469	Prehistoric	Crestline	17	356800	4517575
RI0470	Historic	Crestline	17	357045	4517560
RI0471	Historic	Crestline	17	358020	4517515
RI0472	Historic	Crestline	17	357600	4517550
RI0473	Prehistoric	Crestline	17	358550	4517480
RI0474	Prehistoric	Crestline	17	359000	4517420
RI0475	Prehistoric	Crestline	17	359240	4517360
RI0476	Prehistoric	Crestline	17	360190	4517250

APPENDIX B: ARCHAEOLOGICAL RESOURCES WITHIN THE PROJECT AND APE: ELIGIBILITY NOT ASSESSED.

OAI#	CULTURAL AFFILIATION	USGS 7.5' TOPOGRAPHIC QUAD	UTM		
			ZONE	EASTING	NORTHING
CR0002	Prehistoric	Galion	17	349540	4511850
CR0023	Prehistoric	Galion	17	350130	4511600
CR0026	Prehistoric	North Robinson	17	350462	4511692
CR0032	Prehistoric	Galion	17	349880	4511690
CR0034	Prehistoric	Galion	17	350130	4511580
CR0035	Prehistoric	Galion	17	351148	4511499
CR0036	Prehistoric	Galion	17	351306	4511568
CR0037	Prehistoric	Galion	17	351410	4511590
CR0038	Prehistoric	Galion	17	351417	4511731
CR0039	Prehistoric	Galion	17	351520	4511940
CR0040	Prehistoric	Galion	17	350883	4511768
CR0041	Prehistoric	Galion	17	350949	4511557
CR0042	Prehistoric	Galion	17	350590	4511590
CR0043	Prehistoric	Galion	17	350295	4511434
CR0044	Prehistoric	Galion	17	350418	4511873
CR0045	Prehistoric	Galion	17	350500	4512210
CR0046	Prehistoric	North Robinson	17	350559	4512388
CR0047	Prehistoric	Galion	17	350339	4512279
CR0048	Prehistoric	North Robinson	17	350330	4512710
CR0053	Prehistoric	North Robinson	17	350380	4514860
CR0054	Prehistoric	North Robinson	17	349200	4515730
CR0056	Prehistoric	North Robinson	17	349889	4512735
CR0057	Prehistoric	North Robinson	17	350112	4512478
CR0058	Prehistoric	North Robinson	17	350121	4512318
CR0059	Prehistoric	North Robinson	17	349072	4513078
CR0060	Prehistoric	North Robinson	17	351180	4513188
CR0066	Prehistoric	Crestline	17	352830	4512680
CR0067	Prehistoric	Crestline	17	353099	4512742
CR0068	Prehistoric	Crestline	17	352774	4512404
CR0069	Prehistoric	Blooming Grove	17	352699	4512132
CR0070	Prehistoric	North Robinson	17	349270	4512605
CR0071	Prehistoric	North Robinson	17	351910	4512700
CR0072	Prehistoric	North Robinson	17	351098	4512786
CR0073	Prehistoric	North Robinson	17	346889	4513069
CR0074	Prehistoric	Crestline	17	353739	4522011
CR0075	Prehistoric	North Robinson	17	342425	4518140
CR0076	Prehistoric	North Robinson	17	342534	4518226
CR0077	Prehistoric	North Robinson	17	342811	4518191
CR0078	Prehistoric	North Robinson	17	343100	4518220
CR0079	Prehistoric	Crestline	17	353620	4522300
CR0080	Prehistoric	Crestline	17	353440	4522239
CR0085	Prehistoric	North Robinson	17	347672	4518252
CR0086	Prehistoric	North Robinson	17	347128	4518652
CR0087	Prehistoric	North Robinson	17	346668	4518398
CR0093	Prehistoric	North Robinson	17	348934	4517687
CR0099	Prehistoric	North Robinson	17	346600	4513140

OAI#	CULTURAL AFFILIATION	USGS 7.5' TOPOGRAPHIC QUAD	UTM		
			ZONE	EASTING	NORTHING
CR0101	Prehistoric	North Robinson	17	348080	4513100
CR0102	Prehistoric	North Robinson	17	350809	4512965
CR0104	Prehistoric	North Robinson	17	350440	4512780
CR0106	Prehistoric	North Robinson	17	346910	4516100
CR0107	Prehistoric	North Robinson	17	347988	4515863
CR0110	Prehistoric	Galion	17	346840	4511940
CR0111	Prehistoric	Galion	17	346680	4512260
CR0116	Prehistoric	Blooming Grove	17	352744	4511856
CR0117	Prehistoric	North Robinson	17	347320	4516490
CR0127	Prehistoric	North Robinson	17	348920	4512600
CR0128	Prehistoric	North Robinson	17	350120	4512900
CR0130	Prehistoric	North Robinson	17	343038	4517962
CR0135	Prehistoric	North Robinson	17	348191	4517614
CR0136	Prehistoric	North Robinson	17	348296	4517593
CR0137	Prehistoric	North Robinson	17	348420	4517524
CR0138	Prehistoric	North Robinson	17	348448	4517611
CR0139	Prehistoric	North Robinson	17	349100	4516120
CR0141	Prehistoric	North Robinson	17	346446	4520554
CR0142	Prehistoric	North Robinson	17	346544	4520424
CR0143	Prehistoric	North Robinson	17	349260	4517820
CR0146	Prehistoric	Crestline	17	353200	4514120
CR0147	Prehistoric	Crestline	17	353343	4514196
CR0151	Prehistoric	Crestline	17	353911	4514598
CR0154	Prehistoric	North Robinson	17	343276	4518244
CR0155	Prehistoric	North Robinson	17	341860	4517578
CR0156	Prehistoric	North Robinson	17	341828	4517757
CR0165	Prehistoric	North Robinson	17	348817	4520344
CR0170	Prehistoric	North Robinson	17	345751	4520858
CR0171	Prehistoric	North Robinson	17	345514	4520810
CR0172	Prehistoric	North Robinson	17	345237	4520816
CR0173	Prehistoric	North Robinson	17	346790	4519560
CR0174	Prehistoric	North Robinson	17	344207	4520062
CR0175	Prehistoric	North Robinson	17	344360	4520000
CR0176	Prehistoric	North Robinson	17	344571	4519973
CR0177	Prehistoric	North Robinson	17	344790	4520028
CR0178	Prehistoric	North Robinson	17	344840	4520240
CR0179	Prehistoric	North Robinson	17	344410	4520210
CR0180	Prehistoric	North Robinson	17	344280	4520140
CR0181	Prehistoric	North Robinson	17	344680	4520400
CR0182	Prehistoric	North Robinson	17	344665	4520682
CR0183	Prehistoric	North Robinson	17	344902	4520624
CR0184	Prehistoric	North Robinson	17	344925	4520382
CR0185	Prehistoric	North Robinson	17	347120	4519150
CR0186	Prehistoric	North Robinson	17	347020	4519460
CR0187	Prehistoric	North Robinson	17	346870	4518850
CR0188	Prehistoric	North Robinson	17	346880	4519120

OAI#	CULTURAL AFFILIATION	USGS 7.5' TOPOGRAPHIC QUAD	UTM		
			ZONE	EASTING	NORTHING
CR0189	Prehistoric	North Robinson	17	347180	4518780
CR0190	Prehistoric	North Robinson	17	345080	4520541
CR0191	Prehistoric	North Robinson	17	345350	4520650
CR0192	Prehistoric	North Robinson	17	348020	4521340
CR0193	Prehistoric	North Robinson	17	347998	4521508
CR0194	Prehistoric	North Robinson	17	348114	4521976
CR0195	Prehistoric	North Robinson	17	348440	4521970
CR0196	Prehistoric	North Robinson	17	348520	4522120
CR0197	Prehistoric	North Robinson	17	348650	4522150
CR0198	Prehistoric	North Robinson	17	346123	4522164
CR0199	Prehistoric	North Robinson	17	345905	4522290
CR0200	Prehistoric	North Robinson	17	346360	4522260
CR0201	Prehistoric	North Robinson	17	344580	4519850
CR0202	Prehistoric	North Robinson	17	344800	4519780
CR0203	Prehistoric	North Robinson	17	345388	4519872
CR0204	Prehistoric	North Robinson	17	345702	4519846
CR0205	Prehistoric	North Robinson	17	345461	4520118
CR0206	Prehistoric	North Robinson	17	348885	4519335
CR0211	Prehistoric	New Washington	17	349771	4533921
CR0212	Prehistoric	New Washington	17	349930	4533935
CR0213	Prehistoric	New Washington	17	349747	4533997
CR0214	Prehistoric	New Washington	17	350878	4532625
CR0215	Prehistoric	New Washington	17	350940	4532695
CR0216	Prehistoric	North Robinson	17	347630	4525011
CR0217	Prehistoric	North Robinson	17	347751	4525030
CR0218	Prehistoric	North Robinson	17	347942	4524875
CR0219	Prehistoric	North Robinson	17	348060	4524940
CR0220	Prehistoric	North Robinson	17	348153	4524865
CR0221	Prehistoric	North Robinson	17	348300	4524940
CR0222	Prehistoric	North Robinson	17	348005	4525068
CR0223	Prehistoric	North Robinson	17	347866	4525078
CR0224	Prehistoric	North Robinson	17	346475	4525855
CR0225	Prehistoric	North Robinson	17	346078	4525821
CR0226	Prehistoric	North Robinson	17	346058	4526022
CR0233	Prehistoric	North Robinson	17	346719	4520717
CR0234	Prehistoric	North Robinson	17	347749	4522729
CR0235	Prehistoric	North Robinson	17	344282	4526130
CR0236	Prehistoric	North Robinson	17	344126	4526062
CR0237	Prehistoric	North Robinson	17	343970	4526161
CR0238	Prehistoric	North Robinson	17	343850	4526036
CR0246	Prehistoric	Crestline	17	352760	4518910
CR0247	Prehistoric	North Robinson	17	346430	4520700
CR0248	Prehistoric	North Robinson	17	345590	4520960
CR0251	Prehistoric	North Robinson	17	351440	4517740
CR0252	Prehistoric	North Robinson	17	352100	4518300
CR0253	Prehistoric	North Robinson	17	351600	4518120

OAI#	CULTURAL AFFILIATION	USGS 7.5' TOPOGRAPHIC QUAD	UTM		
			ZONE	EASTING	NORTHING
CR0270	Prehistoric	Shelby	17	354000	4529700
CR0530	Prehistoric and Historic	North Robinson	17	346690	4515150
CR0553	Prehistoric and Historic	Crestline	17	353310	4513450
CR0554	Prehistoric	Crestline	17	353300	4513300
CR0561	Prehistoric and Historic	North Robinson	17	351610	4514390
CR0573	Prehistoric and Historic	North Robinson	17	349730	4513920
CR0586	Prehistoric and Historic	North Robinson	17	343330	4513600
CR0608	Historic	North Robinson	17	344220	4514060
CR0621	Prehistoric	North Robinson	17	349830	4513330
CR0671	Prehistoric	Bucyrus	17	340520	4517650
CR0710	Historic	North Robinson	17	342420	4514450
CR0727	Prehistoric	Bucyrus	17	340940	4515290
CR0730	Prehistoric and Historic	Bucyrus	17	341670	4515120
CR0773	Prehistoric	North Robinson	17	346250	4513420
CR0774	Prehistoric	North Robinson	17	346060	4513410
CR0789	Prehistoric and Historic	North Robinson	17	346190	4513820
CR0822	Prehistoric	North Robinson	17	347860	4513730
CR0841	Historic	Bucyrus	17	340350	4517990
CR0854	Historic	North Robinson	17	348800	4513780
CR0855	Prehistoric and Historic	Bucyrus	17	340260	4517350
CR0864	Prehistoric	Crestline	17	352280	4513650
CR0875	Prehistoric	Bucyrus	17	341300	4515950
CR0876	Prehistoric	Bucyrus	17	340990	4515910
CR0877	Prehistoric	Bucyrus	17	341030	4515970
CR0884	Prehistoric and Historic	North Robinson	17	349290	4514860
CR0965	Prehistoric	North Robinson	17	347200	4515940
CR0976	Historic	North Robinson	17	343520	4522170
CR0977	Historic	New Washington	17	342950	4526730
CR0978	Prehistoric	New Washington	17	343115	4526880
CR0979	Prehistoric	New Washington	17	342950	4526730
CR0980	Historic	New Washington	17	345230	4528190
CR0981	Historic	New Washington	17	346120	4528580
CR0987	Prehistoric	North Robinson	17	349295	4517160
CR1003	Prehistoric	New Washington	17	350580	4535880
CR1004	Prehistoric	New Washington	17	350560	4535960
CR1005	Prehistoric	New Washington	17	350715	4535685
CR1006	Prehistoric and Historic	New Washington	17	350420	4535685
CR1007	Prehistoric	New Washington	17	350290	4535690
CR1008	Prehistoric	New Washington	17	350205	4535955
CR1009	Prehistoric	New Washington	17	350575	4535355
CR1010	Prehistoric	New Washington	17	350835	4535580
CR1011	Prehistoric	New Washington	17	350740	4535125
CR1012	Prehistoric and Historic	New Washington	17	350470	4535665
CR1013	Prehistoric	Crestline	17	352310	4514700
CR1014	Prehistoric	Crestline	17	352410	4514890
CR1015	Prehistoric	North Robinson	17	352260	4517690

OAI#	CULTURAL AFFILIATION	USGS 7.5' TOPOGRAPHIC QUAD	UTM		
			ZONE	EASTING	NORTHING
CR1016	Prehistoric	North Robinson	17	352290	4517600
CR1017	Prehistoric	North Robinson	17	352210	4517670
CR1018	Prehistoric	North Robinson	17	352210	4517600
HU0009*	Prehistoric	Willard	17	357305	4540275
HU0162	Prehistoric	Centerton	17	348960	4541780
HU0163	Prehistoric	Centerton	17	348990	4541100
RI0013	Prehistoric	Shelby	17	361134	4533776
RI0088	Prehistoric		17	356801	4513350
RI0089	Prehistoric		17	356737	4515201
RI0090	Prehistoric		17	356770	4515416
RI0093	Prehistoric	Crestline	17	356476	4517413
RI0094	Prehistoric		17	355402	4513874
RI0095	Prehistoric		17	355368	4514031
RI0096	Prehistoric		17	355365	4514164
RI0100	Prehistoric		17	354590	4513860
RI0102	Prehistoric		17	354817	4513470
RI0113	Prehistoric		17	359848	4514634
RI0114	Prehistoric		17	359709	4514504
RI0115	Prehistoric		17	359823	4514344
RI0116	Prehistoric		17	359591	4514324
RI0117	Prehistoric		17	359783	4514845
RI0123	Prehistoric		17	356781	4516331
RI0124	Prehistoric		17	357000	4516340
RI0125	Prehistoric		17	355100	4516120
RI0126	Prehistoric		17	355106	4515609
RI0151	Prehistoric	Shelby	17	360152	4529803
RI0196	Prehistoric	Shelby	17	362700	4528090
RI0232	Prehistoric	Shelby	17	360090	4526430
RI0234	Prehistoric	Shelby	17	359890	4537590
RI0235	Prehistoric	Shiloh	17	363504	4530790
RI0257	Prehistoric	Crestline	17	354660	4522140
RI0296	Historic	Crestline	17	358271	4515041
RI0318	Prehistoric	Crestline	17	355945	4514738
RI0324	Prehistoric	Crestline	17	356157	4514672
RI0355	Historic	Crestline	17	359342	4514884
RI0401	Prehistoric	Crestline	17	355086	4514826
RI0414	Prehistoric	Crestline	17	358230	4514880
RI0417	Prehistoric	Crestline	17	357282	4514974
RI0435	Prehistoric	Crestline	17	358340	4514950
RI0439	Historic	Crestline	17	359540	4515510
RI0441	Historic	Crestline	17	356260	4514490
RI0442	Prehistoric	Shiloh	17	365451	4528726
RI0443	Prehistoric	Lucas	17	358060	4536850
RI0444	Prehistoric	Shelby	17	360860	4536600
RI0482	Prehistoric	Crestline	17	361360	4521520
RI0490	Prehistoric	Mansfield North	17	362911	4522180

OAI#	CULTURAL AFFILIATION	USGS 7.5' TOPOGRAPHIC QUAD	UTM		
			ZONE	EASTING	NORTHING
RI0504	Historic		17	360680	4529560
RI0505	Prehistoric		17	361260	4529635
RI0506	Prehistoric		17	360670	4529155
RI0507	Prehistoric		17	360910	4529180
*Site reported destroyed on OAI form.					

APPENDIX C: RESUMES OF KEY PERSONNEL

C. Michael Anslinger

Flora J. Church

Stevan C. Pullins

C. Michael Anslinger, MA, RPA	Senior Vice President, Business Development and Marketing - East Region; Principal Investigator

Availability: Immediate **Email:** manslinger@crai-ky.com	**Specific Duties:** • CEO WV Office • Project Manager • Principal Investigator • Report writing/editing	**Education and Training:** • M.A. anthropology, Washington State University, Pullman, Washington • B.S. anthropology, Indiana State University, Terre Haute, Indiana

Experience Summary Information

Principal Investigator	Project Supervisor	Field Supervisor
Cultural Resource Analysts, Inc. 1993 – present	Anthropology Laboratory, Indiana State University 1983 – 1993	Anthropology Laboratory, Indiana State University 1977 – 1979

Experience and Skills:

- Prehistoric archaeology
- Geoarchaeology
- Hunter-gatherer studies
- Lithic analysis
- Project level management of multidisciplinary teams

Representative Projects:

- Project Manager & Principal Investigator – Marmet Archaeological Project, Kanawha County, West Virginia. This large, multi-year project being conducted for the Huntington District Corps of Engineers included the survey, National Register assessments, and data recovery excavations for a series of important archaeological sites dating to the prehistoric and historic periods, including Archaic camps, Woodland hamlets, a Late Prehistoric Village, and nineteenth century residential, industrial and cemetery sites.
- Project Manager – Phase Ia Cultural Resources Study for the Proposed Shady Spring Interchange to the West Virginia Turnpike, Raleigh County, West Virginia. Duties for this project included overseeing the development of cultural contexts for the prehistoric and historic periods and for the development of predictive statements regarding site potential along project corridors. Historic structures were also identified and preliminarily documented and assessed for the National Register. Completed for HNTB, Inc., Scott Depot, West Virginia.
- Project Manager – Urban Archaeological Investigations for the Proposed First Bank of Charleston, Kanawha County, West Virginia. This project included extensive historical and archival research and subsurface testing in Charleston. Completed for First Bank of Charleston.
- Project Manager – Cultural Resources Study for the Proposed I-77 Widening Project near Beckley, Raleigh County, West Virginia. This project included archival research to assess potential impacts to National Register listed or eligible resources. Completed for HNTB, Inc., Scott Depot, West Virginia.
- Project Manager – Phase I Archaeological Survey and Architectural Assessment, WV 2 Parkersburg to St. Marys Road Widening and Realignment Project, Wood County, West Virginia. This project included a records review, background research, and archaeological and architectural field survey. Completed for HDR Engineering, Inc., Weirton, West Virginia.
- Project Manager – Phase Ia Cultural resources Survey, Spring Valley I-64 Connector Project, Wayne and Cabell Counties, West Virginia. Completed for Benatec, Inc., Scott Depot, West Virginia.

- Project Manager – Phase Ia Cultural Resources Reconnaissance, North Bridgeport Bypass Project, Harrison County, West Virginia. Completed for Potesta & Associates, Inc., Charleston, West Virginia.
- Project Manager – Phase Ia & Ib Cultural Resources Investigations, Flowing Spring Road Improvement Project, Jefferson County, West Virginia. Completed for Terradon Corporation, Nitro, West Virginia.
- Project Manager – Phase I Archaeological Survey, Tablers Station Connector and Industrial Park Access Road Project, Berkeley County, West Virginia. Completed for Terradon Corporation, Nitro, West Virginia.
- In addition to the above, Mr. Anslinger has served as Project Manager and/or Principal Investigator for several hundred Section 106 projects located in Raleigh County and other portions of southern West Virginia. The majority of these projects were completed for the coal and wireless telecommunications industries, and to a lesser extent the Huntington District Corps of Engineers and the National Park Service.

Professional Organizations:

- Registered Professional Archaeologist, Register of Professional Archaeologists (1999 - present)
- Society for American Archaeology
- Eastern States Archaeological Federation
- Midwest Archaeological Conference
- BOD member Council for West Virginia Archaeology
- President and BOD member West Virginia Archeological Society

Most Recent Major Publication:

Stafford, C. R., R. L. Richards, and C. M. Anslinger (2000) The Bluegrass Fauna and Changes in Middle Holocene Hunter-Gatherer Foraging in the Southern Midwest. *American Antiquity* 65:317-336.

FLORA CHURCH, PHD, RPA	Director of Operations – Ohio, Principal Investigator, Lithic Specialist, Zooarchaeology Specialist	
Availability: Immediate **Email:** fjchurch@crai-ky.com	**Specific Duties:** • Project archaeologist • Principal investigator • Lithics analysis specialist • Zooarchaeology specialist	**Education and Training:** • Ph.D., Ohio State University • M.A. anthropology, Ohio State University • B.A. anthropology (cum laude), Ohio State University • A.A. Liberal Arts (with honors), Bowling Green State University
Experience Summary Information		
Principal Investigator Cultural Resource Analysts, Inc. 2005 – present	**Adjunct Faculty/ Archaeology** Hocking College 2001 – 2006	**Principal Investigator** ASC Group 1990 – 1998

Experience and Specialties:

- Eastern Woodlands
- Prehistoric archaeology
- Late prehistoric cultures
- Zooarchaeology
- Lithic analysis
- High-powered microwear analysis specialist

CRM Reports (sample):

(2007) Archaeological Phase III Data Recovery for the Baker's Bluff Site (33Li1094/1096/1182), St. Albans Township, Licking County, Ohio, for Project FRA/LIC 161/37-23.15 (PID 12139). Co-authored with William D. Updike, with contributions by C. Michael Anslinger, R. Berle Clay, and Annette G. Ericksen. Cultural Resource Analysts, Inc. Contract Publication Series WV07-49. Submitted to the Ohio Department of Transportation, Columbus.

(2006) Historic Properties Management Plan for Paint Creek Lake, Ross County, Ohio. Cultural Resource Analysts, Inc. Contract Publication WV06-20. Submitted to the U.S. Army Corps of Engineers, Huntington District.

(2005) Archaeological Phase III Data Recovery for the ROS-207-0.00 State Route 207.U.S. 23 Connector (PID 18492) McCafferty Run Site (33Ro919), Union Township, Ross County, Ohio. Cultural Resource Analysts, Inc. Contract Publication Series 05-23. Co-authored with Jonathan P. Kerr. Submitted to MS Consultants, Inc., Canton, Ohio.

(2004) Historic Properties Management Plan for Eighteen Counties within the Muskingum River Watershed in Ohio. Cultural Resource Analysts, Inc. Contraction Publication Series WV04-67. Submitted to the U.S. Army Corps of Engineers, Huntington District.

(2004) Historic Properties Management Plan for Dillon Lake in the Muskingum River Watershed in Ohio. Cultural Resource Analysts, Inc. Contraction Publication Series WV04-66. Submitted to the U.S. Army Corps of Engineers, Huntington District.

(1997) The Results of Data Recovery at 33 Pe 361 and 33 Pe 362 for the Proposed Gas Pipeline through Portions of Fairfield, Perry, Muskingum, and Noble Counties, Ohio. ASC Group, Inc. Co-authored with John Schweikart, M.A., and Annette Ericksen, Ph.D. Submitted to Texas Eastern Gas Pipeline Company, Houston, Texas.

(1996) Assessment Survey of an Archaeological Resource (33 DI 27) to be Impacted by the Proposed Maxtown Road Extension, Orange Township, Delaware County, Ohio. ASC Group, Inc. Submitted to R.D. Zande and Associates, Inc., Columbus, Ohio.

(1995) The Results of Data Recovery at Site 33 Pk 153 for the PIK-SR.32-13.55 Project, Seal Township, Pike County, Ohio. Archaeological Services Consultants, Inc. Submitted to Burgess & Niple, Limited, Columbus, Ohio.

Publications:

(2002) (with John P. Nass, Jr.) Central Ohio Late Prehistoric Subsistence and Settlement: Responses to Risk. In *Subsistence and Settlement Patterns between A.D. 800-A.D.1400*, edited by John P. Hart and Christina Reith, New York State Museum, Albany, New York.

(2001) The Bosman Site: Seasonality and Diversity of the Faunal Assemblage from a Protohistoric Village in Muskingum County, Ohio. *North American Archaeologist.*

(1998) (with Reno Lemons) Use Wear Analysis of Hopewell Bladelets from Paint Creek Lake Site #5, Ross County, Ohio. *North American Archaeologist* 19 (4).

(1998) Upland, Lowland, Citizen, Chief: Patterns of Use Wear from Five Easter Island Sites. *Proceedings of the 1997 South Seas Symposium, Albuquerque, New Mexico, Rapa Nui Journal.*

(1997) (with Annette G. Ericksen). Beyond the Scioto Valley: Middle Woodland Occupation in the Salt Creek Valley. In *Ohio Hopewell Community Organization*, edited by William S. Dancey and Paul J. Pacheco, pp. 331- 360. Kent State University Press, Kent, Ohio.

(1996) (with J. Grace Ellis). A Use-Wear Analysis of Obsidian Tools from an Ana Kionga. *Rapa Nui Journal* 10(4):81-92.

(1996) Madeira Brown Site (33 Pk 153), Seal Township, Pike County, Ohio. *Ohio Archaeologist* 46(1):12-15.

(1995) An Analysis of Faunal Bone Fragments from the Mt. Vernon Site (12 Po 885), Posey County, Indiana. In *The Mount Vernon Site (12-Po-885): A Hopewell Burial Mound in Southwestern Indiana*, edited by Thomas Beard.

(1995) A High Power Microwear Analysis of Stone Tools from the Mt. Vernon Site (12 Po 885), Posey County, Indiana. In The Mount Vernon Site (12-Po-885): A Hopewell Burial Mound in Southwestern Indiana, edited by Thomas Beard.

(1995) Monongahela Subsistence and Settlement in the Northern West Virginia Panhandle: the Saddle Site (46 Mr 95). *Archaeology of Eastern North America* 23:57-72.

(1995) (with Paul W. Sciulli) Biology of the Saddle Site (46 Mr 95) Skeletal Sample. *Archaeology of Eastern North America* 23:73-80.

Professional Organizations:

- Register of Professional Archaeologists
- Sigma Xi

STEVAN C. PULLINS, MA, RPA		Director of Operations – West Virginia
Availability: Immediate **Email:** spullins@crai-ky.com	**Specific Duties:** • Proposals and budgets • Supervise fieldwork • Material and data analysis • Report writing and oversight • Operations management	**Education and Training:** • M.A. anthropology, Pennsylvania State University, University Park, Pennsylvania • B.A. anthropology, Indiana University, Bloomington, Indiana

Director of Operations, West Virginia	**Principal Investigator**	**Project Archaeologist**
Cultural Resource Analysts, Inc., 2007–present	Cultural Resource Analysts, Inc. 2002–present	Center for Archaeological Research-College of William and Mary, 1995–2002

Experience and Expertise:

- Appalachian archaeology
- Bioarchaeology
- Prehistoric archaeology
- Historic archaeology
- Photography

Representative Cultural Resource Management Reports:

Pullins, Stevan C. (2010) *Phase III Archaeological Data Recovery at Site 11Pk1791/1792 for the Rockies Express Pipeline-East (REX East) Project, Pike County, Illinois.* Contract Publication Series WV08-81, Cultural Resource Analysts, Hurricane, West Virginia.

Pullins, Stevan C., C. Michael Anslinger, Andrew Bradbury, Alexandra Bybee, Flora Church, Linda Scott Cummings, Lisa Dugas, Annette Ericksen, Kim Kral, Kristie R. martin, Kent Mead, Harold B. Rollins, Darla Spencer, William D. Updike, and Simone Kompanek (2008) *Late Prehistoric, Late Woodland, and Late Archaic/Early Woodland Transitional Occupations at the Burning Spring Branch Site on the Kanawha River, West Virginia.* Contract Publication Series WV08-22, Cultural Resource Analysts, Hurricane, West Virginia.

Pullins, S. C. (2006) *Update to the Historic Properties Management Plan for Bluestone Lake in West Virginia.* Prepared for the U.S. Army Corps of Engineers, Huntington District. Contract Publication Series WV05-72. Cultural Resource Analysts, Inc., Hurricane, West Virginia.

Pullins, S. C., and W. D. Updike (2005) *Phase II Archaeological Evaluation of the Big Creek High School Site (46Md61), McDowell County, West Virginia.* Contract Publication Series WV05-13, Cultural Resource Analysts, Inc., Hurricane, West Virginia.

Pullins, S. C., A. G. Ericksen, W. D. Updike, A. O. Smith, C. M. Anslinger, and J. Allgood (2005) *Prehistoric Archaeology at the Jenkins House Site (46Cg41), Green Bottom Wildlife Management Center, Cabell County, West Virginia.* Contract Publication Series WV04-49, Cultural Resource Analysts, Inc., Hurricane, West Virginia.

Pullins, S. C., L. O'Connor, J. Allgood, and A. G. Eriksen (2005) *A Phase III Excavation at the Duckworth Farm Site (15Bh212) in Bath County, Kentucky (Item No. 9-121.20).* Contract Publication Series WV04-31, Cultural Resource Analysts, Inc., Hurricane, West Virginia.

Professional Organizations:

- Society for American Archaeology
- Register of Professional Archaeologists
- West Virginia Archeological Society
- Midwest Archaeological Conference

Articles:

Blanton, D. B., S. C. Pullins, and H. Lapham (2000) Late Woodland Features at Site 44SK40, Hillpoint Farm, Suffolk, Virginia. Quarterly Bulletin of the Archaeological Society of Virginia 55(2).

Milner, G. R., S. C. Pullins, and R. Paine (2002) Human Skeletal Remains from the Range Site. In *The Range Site 3: Mississippian and Oneota Occupations in the American Bottom (11S47).* American Bottom archaeology, Illinois Dept. of Transportation FAI-270 site reports, v. 29, edited by Ned H. Hanenberger and Mark Mehrer. University of Illinois Press, Urbanna.

Pullins, S. C. (2001) Late Woodland Settlement Organization in Southwest Virginia's Appalachian Plateau: A Small Site Perspective. West Virginia Archeologist 53(1 & 2):36-51.

Pullins, S. C. and D. B. Blanton (2000) Prehistoric Settlement on Jamestown Island: Archaeological Data Recovery at Site 44JC895 on Black Point, Jamestown Island, James City County, Virginia. To be published by the National Park Service.

Pullins, S. C., and D. B. Blanton (1999) Results of Excavation. In *The Potomac Creek Site (44ST2) Revisited*, by Dennis B. Blanton, Stevan C. Pullins, and Veronica L. Deitrick, pp.21-46. Research Report Series No. 10, Virginia Department of Historic Resources, Richmond, Virginia.

Symposia:

Blanton, D. B., and S. C. Pullins (2000) Building a Case for Sandy Site Integrity: Studies from North Carolina and Virginia. Invited paper for the symposium entitled *Landscape Perspectives on the Prehistory of the Sandhills, North Carolina.* Fifty-Seventh Annual Meeting of the Southeastern Archaeological Conference, Macon, Georgia.

Pullins, Stevan C. (2010) Ceramics, Chronology, and Cultural Affiliation at a Late Woodland Site in the Southern Sny Bottom, Illinois. Invited paper for the symposium entitled *Archaeology of the Rockies Express Pipeline Project Missouri and Illinois.* The Seventy-fifth Anniversary Meeting of the Society for American Archaeology, St. Louis, Missouri.

Pullins, S. C. (2004) Ceramics and Intra-Village Organization: A Theoretical Framework for the Analysis of Ceramic Artifacts at a Fort Ancient Village in West Virginia. Invited paper for the symposium entitled *Recent Contributions to the Application of Ceramic Theory and Method in the Archaeology of the Midwestern and Southeastern United States.* The 2004 Joint Meeting of the Midwest Archaeological Conference and the Southeastern Archaeological Conference, St. Louis, Missouri..

Pullins, S. C. and Maureen Meyers, co-organizers (2000) The Question of Cultural Crossroads in Prehistoric Southwestern Virginia. Symposium organized for the Fifty-Seventh Annual Meeting of the Southeastern Archaeological Conference, Macon, Georgia.

Pullins, S. C. (1998) Ceramic Technology and Early Woodland Settlement in the Virginia Coastal Plain. Invited paper for the symposium entitled *The Early Woodland Before Adena: Recent Research in the Eastern Woodlands.* Sixty-Third Annual Meeting of the Society for American Archaeology, Seattle, Washington.

Presented Papers:

Pullins, Stevan C. (2009) Ceramics, Chronology, and Cultural Affiliation at a Late Woodland Site in the Southern Sny Bottom, Illinois. Annual Meeting fo the Midwest Archaeological Conference, Iowa City, Iowa.

Pullins, Stevan C. (2007) Late Prehistoric Ceramics at the Burning Spring Branch Site (46Ka142). Annual Meeting of the West Virginia Archaeological Society, Charleston, West Virginia.

Pullins, S. C. (2006) Late Prehistoric Structures at the Burning Spring Branch Site (46Ka142). Annual Meeting of the West Virginia Archeological Society. Charleston, West Virginia.

Pullins, S. C. (2005) Ongoing Analytical Work at the Burning Spring Branch Site (46Ka142): Early Trends Associated with the Late Prehistoric Component. Annual meeting of the West Virginia Archeological Society, South Charleston, West Virginia.

Pullins, S. C. (2004) The Domestic Landscape of Slavery: Results of Excavations at the Duckworth Farm,

Bath County, Kentucky. Paper presented at the 21st Annual Kentucky Heritage Council Archaeology Conference. Cumberland Falls State Park, Kentucky.

Pullins, S. C., and Joe B. Jones (2004) Southall's Quarter: Results of Excavations at a Slave Quarter Near Williamsburg, Virginia. Paper presented at the 37th Annual Conference on Historical and Underwater Archaeology, St. Louis, Missouri.

Pullins, S. C. (2001) Data Recovery and Geoarchaeology at a Stratified Site in the Virginia Piedmont. Poster presented at the Fifty-Eighth Annual Meeting of the Southeastern Archaeological Conference, Chattanooga, Georgia.

Pullins, S. C. (2000) The Middle Woodland Period in Southwestern Virginia: Regional Influences and the Concept of Cultural Crossroads. Paper presented at the Fifty-Seventh Annual Meeting of the Southeastern Archaeological Conference, Macon, Georgia.

Pullins, S. C. (1999) The Status of Prehistory in Virginia's Clinch River Valley. Presented at the Fifty-Sixth Annual Meeting of the Southeastern Archaeological Conference, Pensacola, Florida.

Pullins, S. C. (1998) Nationalism, Life History, and Ceramic Dumps in Early Nineteenth Century Virginia. Presented at the September meeting of the Franklin Rotary Club, Franklin, Virginia.

Pullins, S. C. (1998) Recent Archaeological Investigations Associated with the Route 58 Project in the Powell Valley, Lee and Wise Counties, Virginia. Presented at the March Meeting, Wolf Hills Chapter of the Archaeological Society of Virginia.

Pullins, S. C. (1997) The Moore Hoff Farm Site: Excavations at a Late Eighteenth/Early Nineteenth Century Farmstead in Prince William County, Virginia. Presented at the 1997 Annual Meetings of the Archaeological Society of Virginia, Roanoke, Virginia.

Pullins, S. C. (1996) Ceramic Technology and Early Woodland Settlement in the Virginia Coastal Plain. Presented at the Fifty-Third Annual Meeting of the Southeastern Archaeological Conference, Birmingham, Alabama.

Pullins, S. C. (1996) Watsons, Willses, and Dedakers: The Evolution of a Nineteenth-Century Farmstead in Piedmont Virginia. Presented at the 74th Annual Meeting of the Virginia Academy of Science, Virginia Commonwealth University, Richmond, Virginia.

Pullins, S. C. (1995) Prehistoric Settlement Patterns in Southwestern Virginia: Non-deterministic Integration of Soil Survey Data and Archaeological Testing. Presented at the 1995 Annual Meetings of the Archaeological Society of Virginia, Abingdon, Virginia.

cra
cultural resource analysts, inc

March 3, 2011

Scott Hawken
Senior Project Manager
ElementPower US, LLC
400 Preston Ave, Suite 200
Charlottesville, VA 22901
Scott.hawken@elpower.com
Phone: (434) 202-6708

RE: Black Fork Wind Farm
Crawford and Richland Counties, Ohio
OAC Rule 4906-17-08(D), paragraph (D)(2)

Dear Mr. Hawken:

In an effort to meet the OPSB's required filing rules, CRA presents the following discussion of the estimated impact of the proposed facility on known landmarks within five miles of the proposed Project Area (an area referred to hereafter as the Study Area).

(D) Cultural Impact

(2) Impact to Landmarks

Above-ground and Architectural Landmarks. As described in the Work Plan for Completing an Architectural Survey for the Proposed Black Fork Wind Farm in Crawford and Richland Counties, Ohio (Heavrin 2011) which is included with the OPSB application, a review of the files available at the Ohio Historic Preservation Office (OHPO) determined that one historic district (the Shelby Center Historic District) consisting of 47 contributing resources, and 15 individual resources located in the Study Area are listed in the National Register of Historic Places (NRHP). Eleven additional resources have been determined eligible for listing in the NRHP. In addition to the properties previously listed or determined eligible, the records review identified 88 previously identified cemeteries and 326 resources for which Ohio Historic Inventory (OHI) forms were completed. These resources were either determined ineligible for listing in the NRHP or their eligibility has not been assessed.

Since none of the listed or eligible properties are located in the Project Area, the undertaking should have no direct effect on these resources. Since some of the listed and eligible properties are located in the Study Area and within the viewshed for the proposed project, indirect effects (visual, audible, cumulative, etc.) to the preservation and continued meaningfulness of these properties should also be considered. While some of the previously identified properties that have not been evaluated for NRHP eligibility are scattered in the Project Area and others are located in the rural parts of the Study Area, the majority are concentrated in the Study Area's numerous towns and villages including Shelby, Crestline, New Washington, and Plymouth. There is also a concentration located along the US 30 corridor in the southern part of the Study Area. Due to established setback requirements for turbine locations, direct effects to above-

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ground resources located in the Project Area are not anticipated. Given the nature of the proposed project, the most common effects will likely be indirect visual effects, as the introduction of dozens of large wind turbines to the area may alter people's perceptions of the traditional rural character of the landscape and alter the settings of character-defining historic resources.

Viewshed analysis utilizing ArcView GIS software indicates that the turbines will be visible throughout most of the Study Area. There are some small areas in the northeastern, southeastern, and western parts of the Study Area where no turbines will be visible due to topography. This analysis did not consider the shielding effect of vegetation and other buildings. In the portions of the Study Area where the turbines are visible, the perception of the turbines will vary depending on a property's distance from them and the characteristics of the surrounding landscape. For the properties located closest to the facility, the turbines may become a part of their immediate setting, perhaps impacting people's perceptions of individual properties and the landscape as a whole. For properties located farther from the project area, the turbines will become a part of their surrounding viewshed, in some cases appearing only as distant features on the horizon. In addition, it is anticipated that the visual impact will be less for those resources located in urban areas because their site lines and defining characteristics are typically oriented toward, or associated with, the interior of the city rather than the surrounding rural landscape. Thus, based on the locations of the known NRHP listed and eligible properties, there is low potential for indirect effects to the majority of these properties.

One property, the Sacred Heart of Jesus Church, is located in the rural community of Bethlehem to the east of the Project Area. The church, a striking feature on the rural landscape, is located approximately one mile from the nearest proposed turbine, so there is moderate potential for visual impacts to this property. Formal evaluation of indirect effects will occur during the survey work proposed in the work plan. If it is determined that the project will indirectly adversely affect the continued meaningfulness of the Study Area's historic landscape, a creative mitigation plan will be developed in coordination with local consulting parties

Below-ground and Archaeological Landmarks. As described in the Work Plan for Completing a Phase I Archaeological Survey for the Proposed Black Fork Wind Farm in Crawford And Richland Counties, Ohio (Pullins et al. 2011) which is included with the OPSB application, the review of the relevant literature and Ohio Archaeological Inventory (OAI) forms identified 872 previously recorded archaeological sites within the Study Area. These sites include 638 archaeological sites (73 percent) that have been determined not eligible for listing on the NRHP, and an additional 234 sites (27 percent) that have not been assessed for potential eligibility for listing on the NRHP (Appendix B). None of the known archaeological resources within the Study Area have, to date, been identified as important sites requiring additional archaeological evaluation to determine eligibility for listing on the NRHP.

All of the facilities associated with the proposed Black Fork Wind Farm have been situated to avoid direct permanent and temporary impacts to previously identified archaeological resources. Based on the results of the records review, the proposed facilities will not have direct impacts on known cultural resources within the Study Area.

Mitigating Adverse Impacts. Since there are no NRHP listed or eligible properties located in the Project Area, the proposed facility will have no direct impacts on landmarks that must be considered for the purposes of paragraphs (D)(1) and (D)(2) of OAC Rule 4906-17-08(D). Since there are listed or eligible properties located in the surrounding Study Area, indirect impacts to the preservation and continued meaningfulness of these properties should be considered. Based on the locations of the listed or eligible properties, it is estimated that there is low to moderate potential for the proposed facility to have an adverse indirect effect on these properties. An historic architecture survey will be conducted to assess the potential effects of the proposed project on these known landmarks as well as previously undocumented cultural historic resources located within the Study Area. If the historic architecture survey identifies any cultural resources that will be adversely impacted by the proposed project, a creative mitigation plan will be developed as described in the work plan.

A Phase I archaeological reconnaissance survey will also be conducted to identify important but previously unknown cultural resources within the areas of direct temporary and permanent impact within the Project Area. If any important archaeological sites are identified, an effort will first be made to identify alternatives that are free of data that contribute to the site's importance. If an important site cannot be avoided, measures will be proposed to minimize direct impacts to the site. These minimization efforts could include limiting clearing and grading, limiting heavy equipment operations during wet soil conditions, or placing temporary bedding material on a site. Where impacts to important sites cannot be minimized or avoided, a work plan will be created to conduct evaluation/mitigation of a set of unavoidable important sites that has been approved through consultation with the OPSB and the OHPO.

Sincerely,

Stevan C. Pullins, RPA
Director of Operations – West Virginia

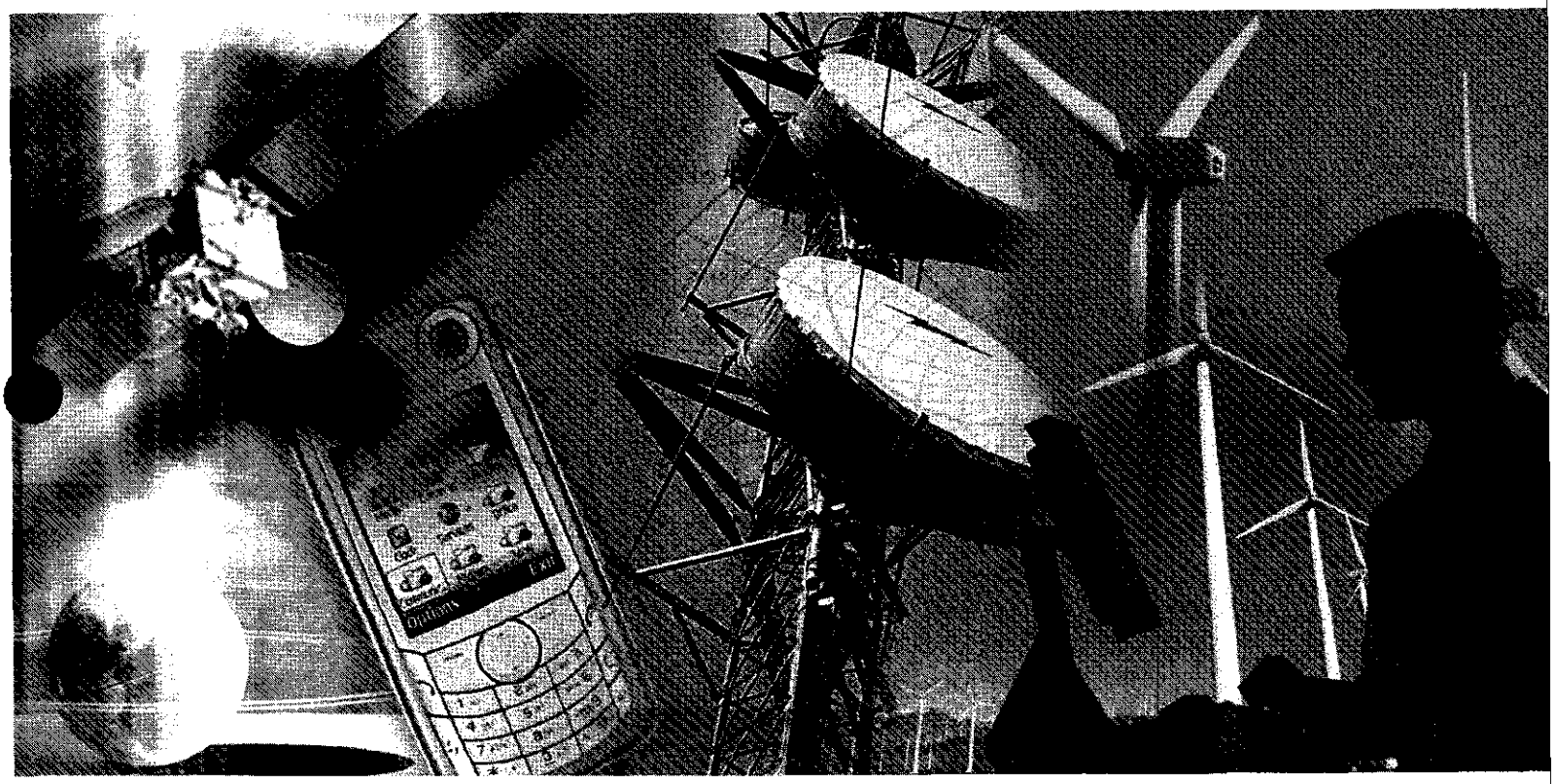
P

Comsearch Report for Microwaves

Wind Power GeoPlanner™

Licensed Microwave Report

Black Fork



Prepared on Behalf of
Black Fork, LLC

January 25, 2011

COMSEARCH
A CommScope Company

Table of Contents

1. Introduction

The use of wind energy, one of the oldest forms of harnessing a natural energy source, is now one of the world's fastest growing alternative energy sources. The United States is committed to the use of wind energy, and over the next several years billions of dollars will be spent on wind power projects. However, as new wind turbine generators are installed around the country, it is important to note that they may pose an interference threat to existing microwave systems and broadcast stations licensed to operate in the United States.

Wind turbines can interfere with microwave paths by physically blocking the line-of-sight between two microwave transmitters. Additionally, wind turbines have the potential to cause blockage and reflections ("ghosting") to television reception. Blockage is caused by the physical presence of the turbines between the television station and the reception points. Ghosting is caused by multipath interference that occurs when a broadcast signal reflects off of a large reflective object—in this case a wind turbine—and arrives at a television receiver delayed in time from the signal that arrives via direct path.

Many states and other jurisdictions recognize the need for regulations addressing interference to radio signal transmissions from the wind turbine installations. Specifically, local planning authorities typically require project developers to ensure wind turbines will not cause interference. In some cases they require developers to notify the telecommunication operators in the area of the proposed wind turbine installation. Other factors prompting developers to undertake proactive investigation into potential interference include the need to prevent legal and regulatory problems and the desire to promote goodwill within the community—a good neighbor approach.

Comsearch has developed and maintains comprehensive technical databases containing information on licensed microwave networks throughout the United States. Microwave bands that may be affected by the installation of wind turbine facilities operate over a wide frequency range (900 MHz – 23 GHz). These systems are the telecommunication backbone of the country, providing long-distance and local telephone service, backhaul for cellular and personal communication service, data interconnects for mainframe computers and the Internet, network controls for utilities and railroads, and various video services.

This report focuses on the potential impact of wind turbines on licensed non-federal government microwave systems. Comsearch provides additional wind energy services, a description of which is available upon request.

2. Summary of Results

An overall summary of results appears below.

Project Information

Name: Black Fork

County: Crawford and Richland

State: Ohio

Total Microwave Paths	Paths with Obstructions	Total Turbines	Turbine Obstructions
10	0	91	0

Methodology

Our obstruction analysis was performed using Comsearch's proprietary microwave database, which contains all non-government licensed paths from 0.9 - 23 GHz[1]. First, we determined all microwave paths that intersect the area of interest[2]. The area of interest was defined by the client and encompasses the planned turbine locations. Next, for each microwave path that intersected the project area, we calculated a Worst Case Fresnel Zone (WCFZ). The mid-point of a full microwave path is the location where the widest (or worst case) Fresnel zone occurs. Fresnel zones were calculated for each path using the following formula.

$$Rn \cong 17.3\sqrt{\frac{n}{F_{GHz}}\left(\frac{d_1 d_2}{d_1 + d_2}\right)}$$

Where,

R_n = Fresnel Zone radius at a specific point in the microwave path, meters
n = Fresnel Zone number, 1
F_{GHz} = Frequency of microwave system, GHz
d_1 = Distance from antenna 1 to a specific point in the microwave path, kilometers
d_2 = Distance from antenna 2 to a specific point in the microwave path, kilometers

For worst case Fresnel zone calculations, $d_1 = d_2$

[1] Please note that this analysis does not include unlicensed microwave paths or federal government paths that are not registered with the FCC.

[2] We use FCC-licensed coordinates to determine which paths intersect the area of interest. It is possible that as-built coordinates may differ slightly from those on the FCC license.

The calculated WCFZ radius, giving the linear path an area or swath, buffers each microwave path in the project area. See the Tables and Figures section for a summary of paths and WCFZ distances. In general, this is the two-dimensional area where the planned wind turbines should be avoided, if possible. A depiction of the WCFZ overlaid on topographic basemaps can be found in the Tables and Figures section, and is also included on the enclosed spreadsheet and shapefiles[3,4].

Discussion of Potential Obstructions

For this project, 91 turbines were considered in the analysis, with a max blade diameter of 101 meters and turbine hub height ranging from 80 to 100 meters.

None of the turbines were found to have a potential conflict with the incumbent microwave paths.

[3] The ESRI® shapefiles enclosed are in NAD 83 UTM Zone 17 projected coordinate system.

[4] Comsearch makes no warranty as to the accuracy of the data included in this report beyond the date of the report.

3. Tables and Figures

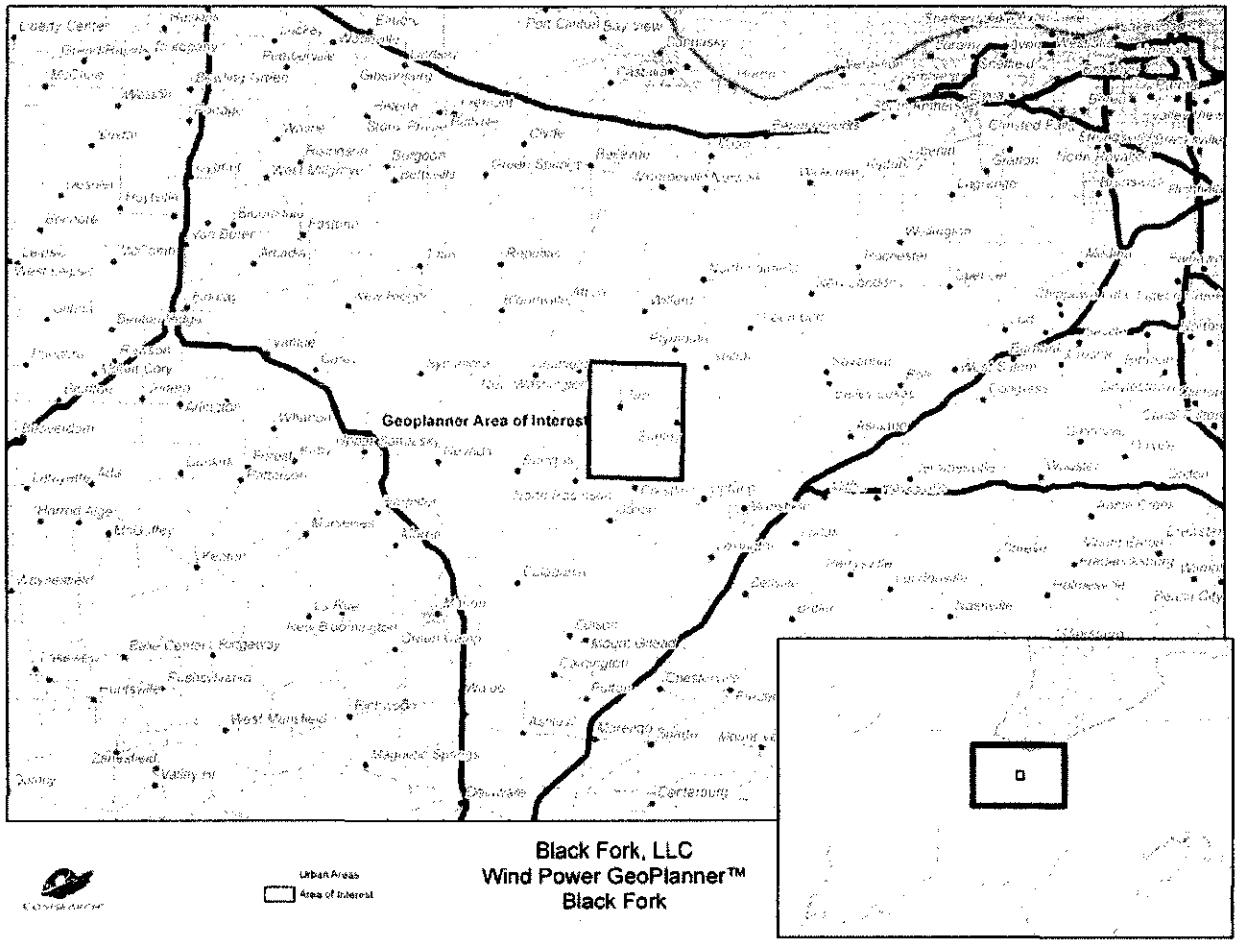


Figure 1: Area of Interest

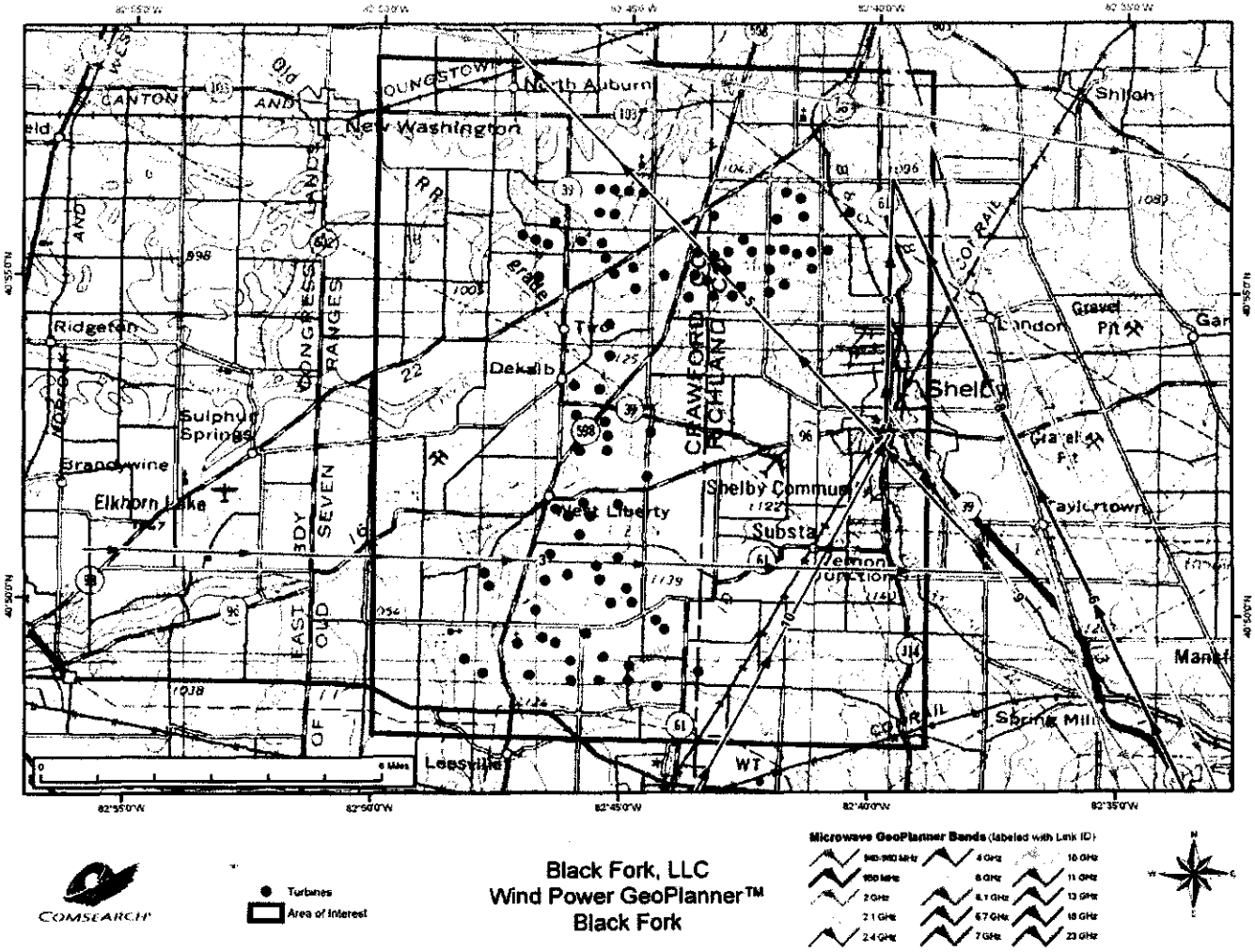


Figure 2: Microwave Paths that Intersect the Area of Interest

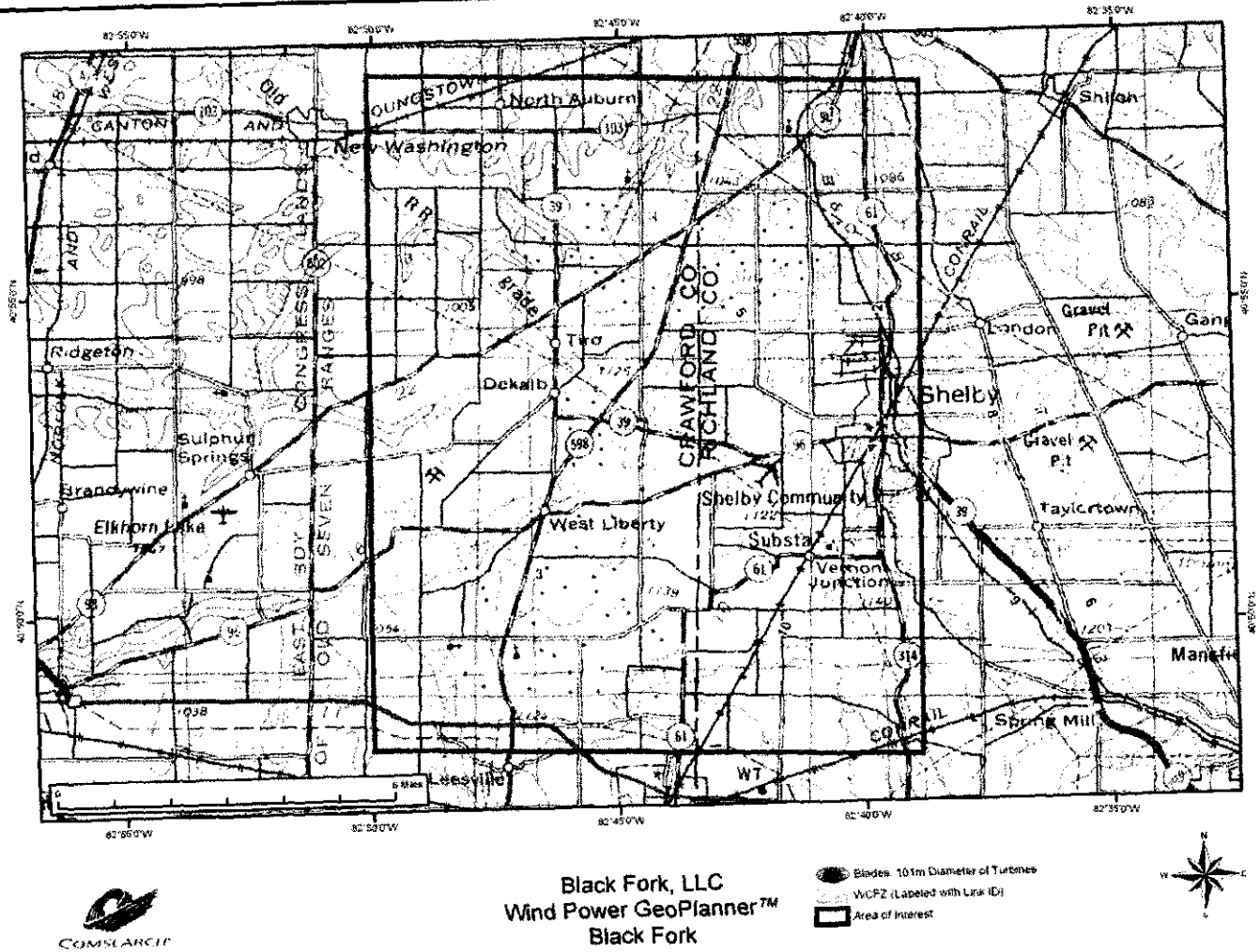


Figure 3: Microwave Paths with WCFZ Buffers

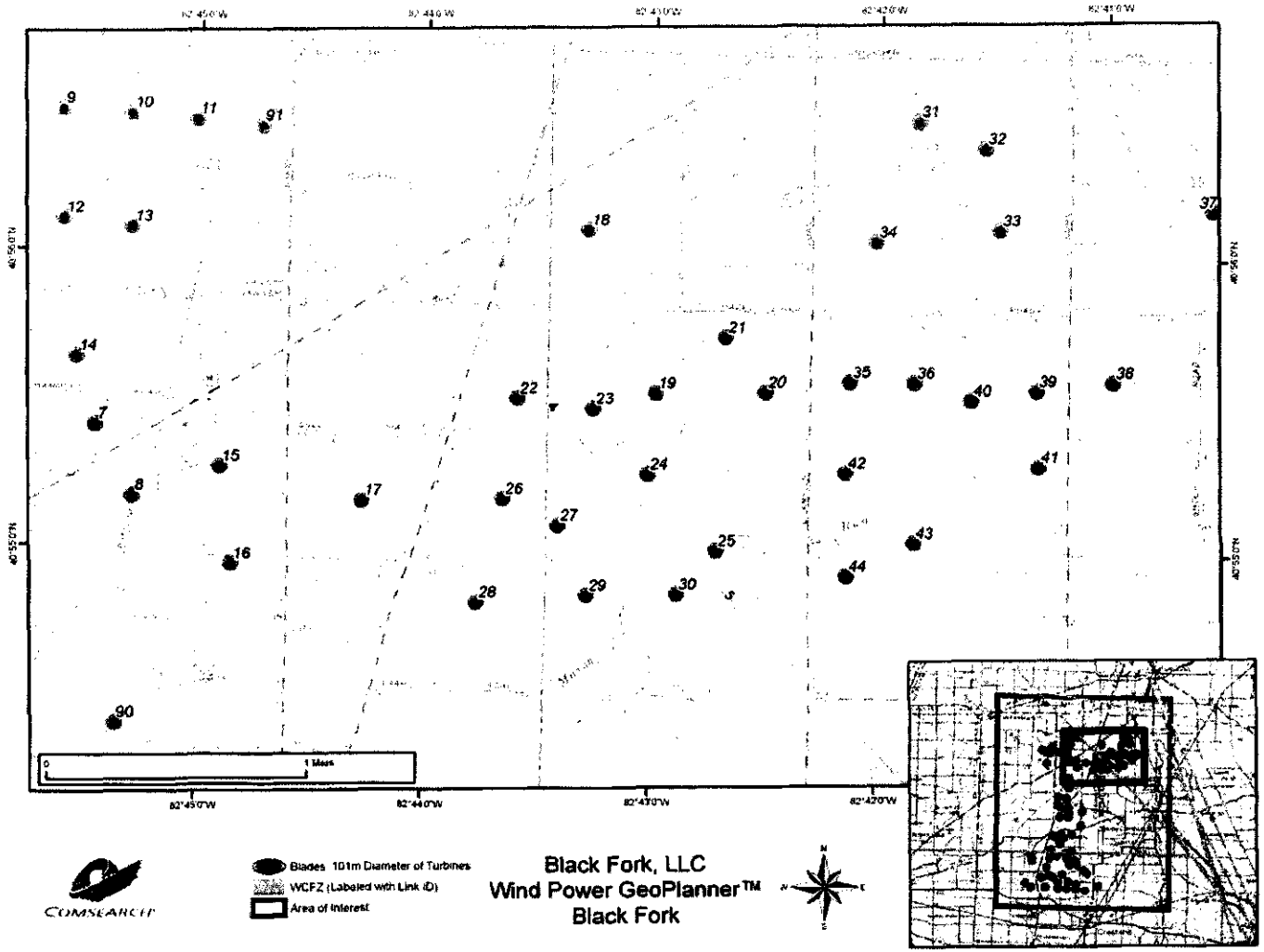


Figure 4: Microwave Paths with WCFZ Buffers (paths 4 and 5)

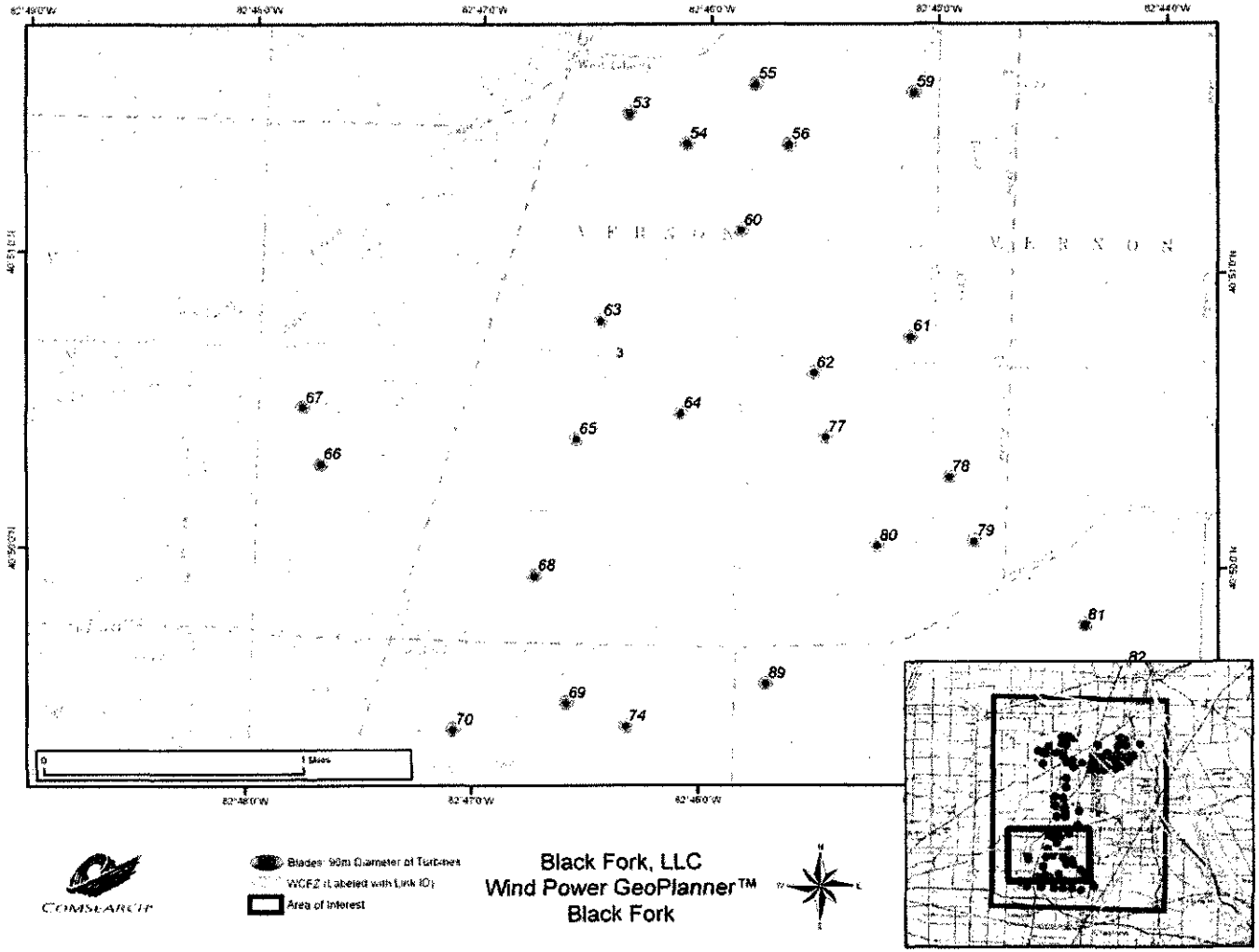


Figure 5: Microwave Paths with WCFZ Buffers (path 3)

ID	Site Name 1	Site Name 2	Callsign 1	Callsign 2	Band	Licensee	WCFZ (m)
1	BLOOMVILLE	ADARIO	KLZ74	KLZ73	Lower 6 GHz	AMERICAN ELECTRIC POWER SERVICE CORP.	23.92
2	E MAIN ST	SHELBY	WHB304	RXONLY	950 MHz	CAPSTAR TX LIMITED PARTNERSHIP	23.38
3	BUCYRUS	SHELBY	WMN888	WLW433	Lower 6 GHz	Ohio RSA 5 Limited Partnership	17.77
4	SHELBY	ATTICA	WPNJ825	WPNJ823	Lower 6 GHz	Ohio RSA 2 Limited Partnership	20.76
5	SHELBY	ATTICA	WPNJ825	WPNJ823	Upper 6 GHz	Ohio RSA 2 Limited Partnership	19.93
6	RADIO LANE	SHELBY	WPNM418	RXONLY	950 MHz	CAPSTAR TX LIMITED PARTNERSHIP	41.67
7	PLYMOUTH WT	SCENIC DR TW	WQEV846	RXONLY	940-960 MHz	RICHLAND COUNTY OF OH	51.18
8	PLYMOUTH WT	STRAUB RD WT	WQEX884	RXONLY	940-960 MHz	RICHLAND COUNTY OF OH	50.76
9	SHELBY PD TW	SCENIC DR TW	WQHK768	RXONLY	940-960 MHz	RICHLAND COUNTY OF OH	42.38
10	OH0101	OH0082	WQML230	OH0082	11 GHz	Open Range Communications	8.93

Table 1: Microwave Paths that Intersect the Area of Interest

(See enclosed mw_geopl.xls for more information and
GP_dict_matrix_description.xls for detailed field descriptions)

4. Contact Us

For questions or information regarding the Licensed Microwave Report, contact:

Contact person:	Denise Finney
Title:	Account Manager
Company:	Comsearch
Address:	19700 Janelia Farm Blvd., Ashburn, VA 20147
Telephone:	703-726-5650
Fax:	703-726-5595
Email:	dfinney@comsearch.com
Web site:	www.comsearch.com

Q Aviation Study

AVIATION SYSTEMS INC.
Aviation Consultants

October 11, 2010

Mr. Scott Hawken
Element Power
400 Preston Ave., Suite 200
Charlottesville, VA 22901

Re: Black Fork Project, 10-N-0633.VA.001

Dear Mr. Hawken:

Pursuant to your request, Aviation Systems, Inc. (ASI), has performed an evaluation of the feasibility of the Black Fork Project. The purpose of the study, from an aviation and airspace point of view, is to determine the feasibility of erecting wind turbines with a tip height of up to 499 feet above ground level (AGL). We have reviewed the above referenced project against aviation and airspace criteria set forth in Federal Aviation Regulation (FAR) Part 77 (14 CFR 77) *Objects Affecting Navigable Airspace*; FAA Order 8260.3B, the *United States Standard for Terminal Instrument Procedures* (TERPs) and; FAA Order *JO 7400.2G, Procedures for Handling Airspace Matters*. The criteria in these documents comprise the factors the Federal Aviation Administration (FAA) will use in evaluating the aeronautical compatibility of the project when it is submitted for their official regulatory review. Our findings include the following:

- The project consists of wind turbines to be located within an area 6.24 x 7.87 nautical miles (NM) in the State of Ohio.

- Ground elevations within the area range from 1000 feet above mean sea level (AMSL) to 1165 feet AMSL. With a proposed turbine height of 499 feet AGL the highest point of the project could be up to 1664 feet AMSL. See attached maps depicting the project and surrounding area. A 100 foot buffer was added for terrain variations and to establish a "Target Height" of 1764 feet AMSL.

- The nearest public airport is Shelby Community (12G) Airport, located 1.76 NM, east of the project centerpoint. The project would impact the airport's operations (Sectors A, B, C, and D), and impact Bucyrus (17G) and Galion (GQQ) Airports' operations described below. Cole Airfield, a private airport located within the project area is not protected by FAA Obstruction Regulations.

- The project would not impact Minimum Vectoring Altitudes (MVA).

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Tel: 310.530.3188 • Fax: 310.530.3850 • Email: asi@aviationsystems.com • www.aviationsystems.com

- The Mansfield VOR is 3.6 NM east of the project area boundary. FAA may object to course guidance interference caused by the wind turbines. If this occurs, further study may be necessary.

- The project would penetrate the Minimum Obstacle Clearance Altitude (MOCA) of V416-542 above 1500 feet AMSL. The FAA may initially issue Notices of Presumed Hazard. However, Obstruction Standards are not considered ultimate Operational Limitations and the FAA should issue Determinations of No Hazard after conducting an extended study.

- The Indianapolis (London) Long Range Radar Site is within 71.06 NM of the search area centerpoint. Impact to Air Defense and Homeland Security radars is likely (Yellow Zone on Federal Radar and Military Airspace Preliminary Screening Tool). Further radar impact study may be advisable.

- Minimal to no impact to Weather Surveillance Radar – 1988 Doppler (WSR-88D) weather radar operations. Further radar impact study is not necessary.

- The following list of Black Fork Sectors indicates the vertical limits of each listed procedure. Sectors 1 through 4 pertain to aviation constraints to the project without consideration of Shelby Airport operations (Map 1). Sectors A through D provide additional aviation constraints posed by Shelby Airport operations (Map 2):

    - Sector 1: 1476' AMSL – GQQ VOR or GPS Runway 22 Approach Primary Area
    - Sector 2: 1476' to 1600' AMSL – GQQ VOR or GPS Runway 22 Approach Secondary Area
    - Sector 3: 1600' AMSL – 17G VOR or GPS Runway 22 Approach Transition Route
    - Sector 4: 1764' AMSL – Target Height
    - Sector A: 12G – 1295' AMSL - VOR-A Approach Circling Area
    - Sector B: 12G – 1295' to 1470' AMSL – Departure Climb Area
    - Sector C: 12G – 1470' AMSL – Category C VFR Traffic Pattern
    - Sector D: 12G – 1470' to 1600' AMSL – Departure Climb Area

- Within Sectors A, B, C and 1, 499 foot AGL turbines would not be feasible. Below (total AMSL) height limits in the remaining Sectors, 499 foot AGL turbines should be feasible.

Additionally, any structure over 200 feet AGL, in this case the turbines, requires notice to the FAA and also would require lighting in accordance with FAA Advisory Circular (AC) 70/7460-1K, Change 2. After suitable locations are selected and at your request, ASI can handle the FAA filing process pursuant to the notice requirements of FAR Part 77 and follow-up until the No Hazard Determinations are issued by the FAA. We will be able to negotiate selective lighting so that not all of the turbines would require the extra expense of installing and maintaining lights.

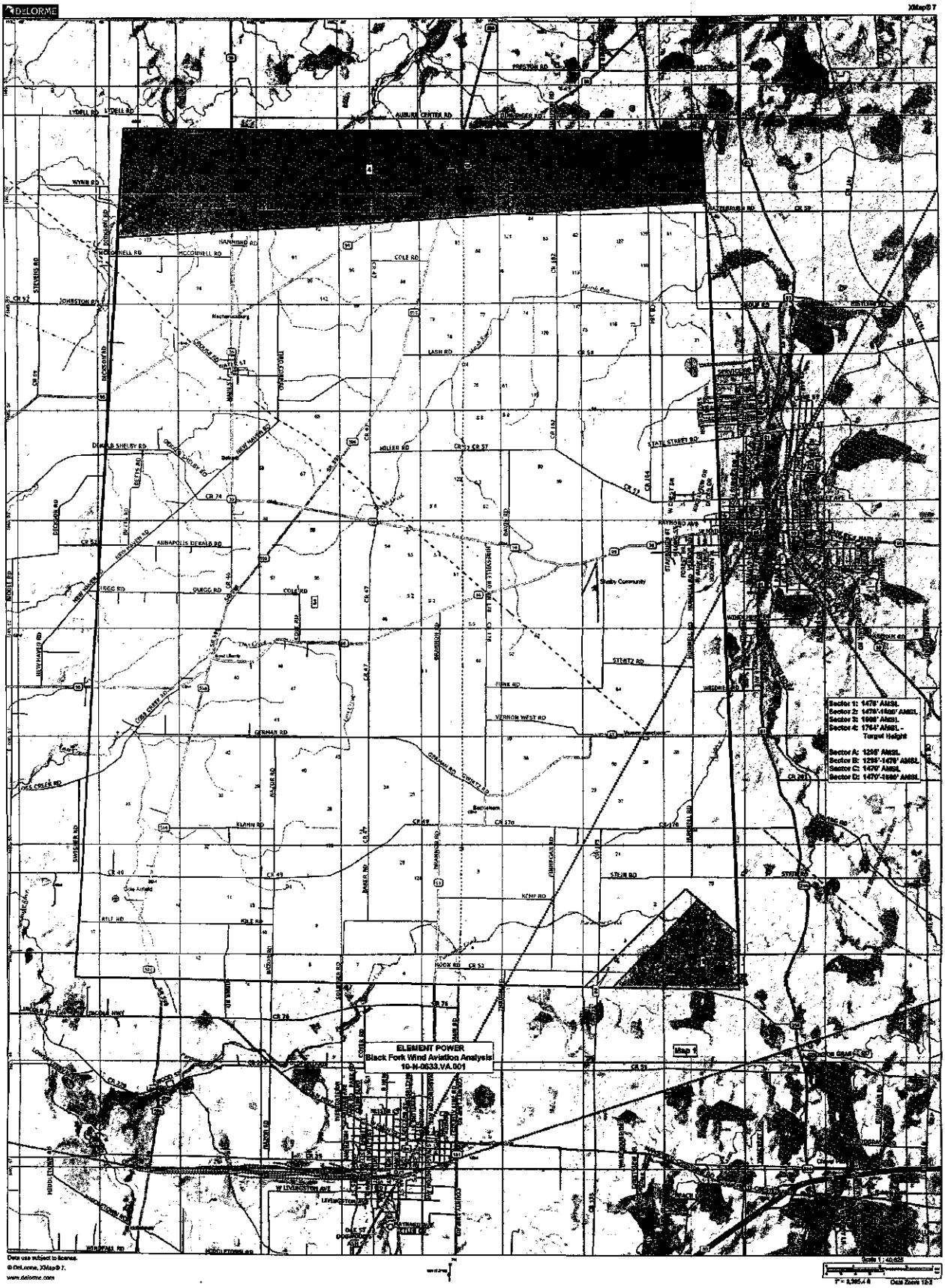
FAA makes changes to the National Aviation System everyday. New approaches are published, departure procedures are changed, new runways are planned, MVAs are modified, etc. Therefore, it is possible for the study findings to become obsolete in a relatively short time period. We recommend that prior to filing specific sites within the study area, the study findings be reviewed for currency. Studies greater than 12 months old should automatically be re-visited and their findings confirmed.

Our findings are intended as a planning tool, in conjunction with the resolution of other pertinent issues. Actual construction activities are not advisable until the FAA Determinations of No Hazard are issued.

Sincerely,

Gary M. Allen, Esq., Ph.D.
President

Attachments


DELORME
XMap® 7
Sector 1: 1478' AMSL
Sector 2: 1478'-1585' AMSL
Sector 3: 1585' AMSL
Sector 4: 1764' AMSL - Target Height
Sector A: 1358' AMSL
Sector B: 1358'-1478' AMSL
Sector C: 1478' AMSL
Sector D: 1478'-1585' AMSL
ELEMENT POWER
Black Fork Wind Aviation Analysis
10-N-0033,VA.001
Map 4
Data use subject to license.
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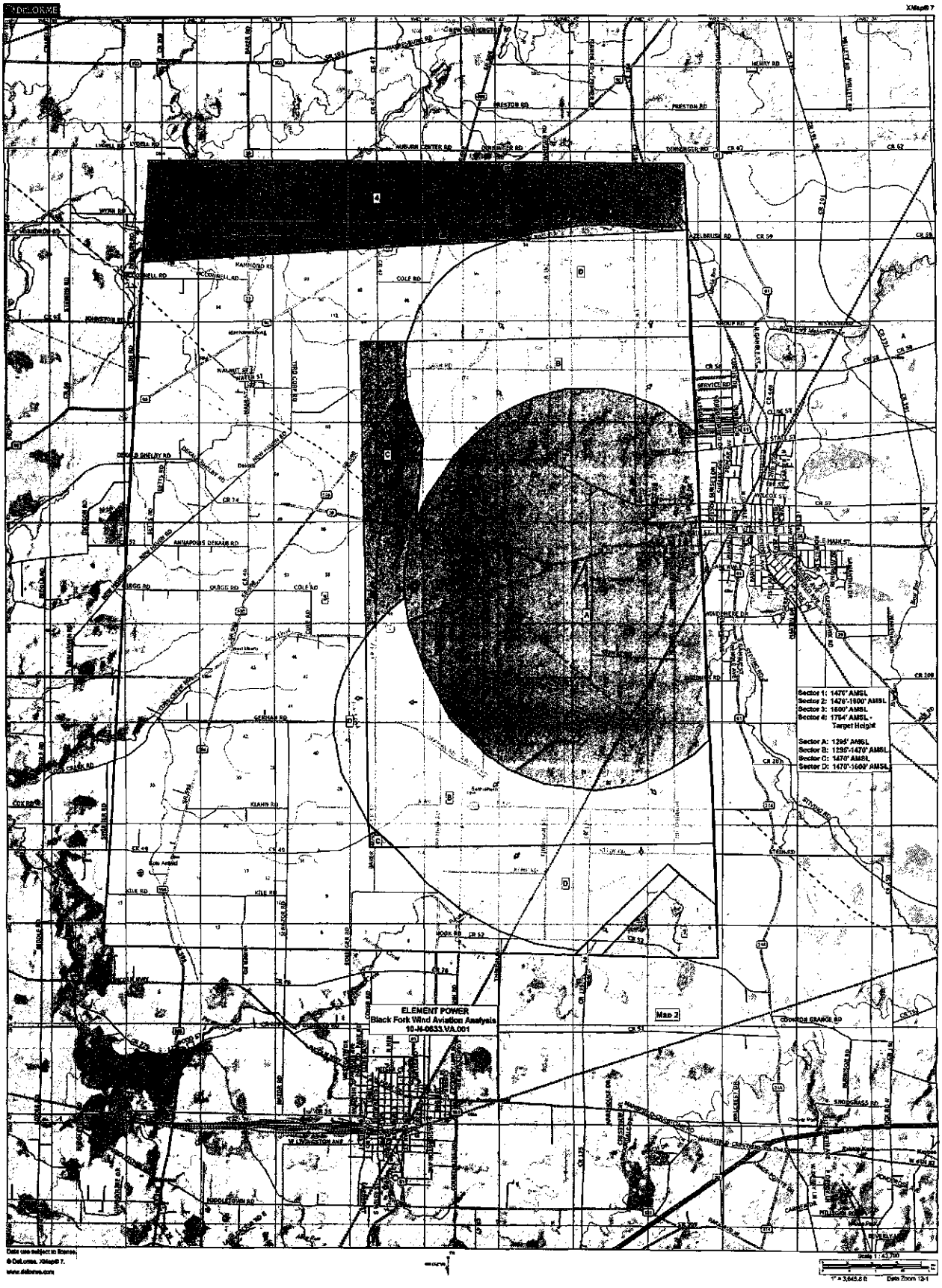
Scale 1: 40,625
Data Zone 16 S


Sector 1: 1476' AMSL
Sector 2: 1476'-1800' AMSL
Sector 3: 1800' AMSL
Sector 4: 1754' AMSL - Target Height
Sector A: 1295' AMSL
Sector B: 1295'-1470' AMSL
Sector C: 1470' AMSL
Sector D: 1470'-1600' AMSL
ELEMENT POWER
Black Fork Wind Aviation Analysis
10-JI-0633.VA.001
Map 2

elementpower

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400 Preston Avenue, Suite 200
Charlottesville, VA 22903
434.202.6704 – Main
434.202.2950 – Fax
www.elpower.com

February 28, 2011

Mr. Edward Davidson
U.S Department of Commerce/NTIA
Room 4099A, HCHB
1401 Constitution Ave. NW
Washington, DC 20230

RE: **Notification of Black Fork Wind Project in Richland County Ohio and Crawford County Ohio.**

Dear Mr. Davidson:

This letter and its attachments will serve as notification that Black Fork Wind Energy, LLC a subsidiary of Element Power US, LLC is currently developing the Black Fork Wind Energy Facility in Richland and Crawford Counties, Ohio.

Enclosed are maps and tables that describe the location of the project.

- Table 1 is a list of the general coordinates of the projects extent.
- Figure 2 is a small scale map of the project in relation to the State of Ohio.
- Figure 3 is a large scale topographic map of the projects extent.

The project will consist of a combination of 150m and 130m turbines due to airport flight procedures in the vicinity of the project. In an effort to be consistent though, please assume 150m for all turbines for this analysis. The approximate dimensions of the wind turbines to be installed at this facility are:

- Turbine Hub Height AGL: 100m
- Turbine Blade Diameter: 100m
- Blade Tip Height AGL: 150m

If you have any questions or need additional information please contact me at (434)202-6708 or via email at scott.hawken@elpower.com.

Sincerely,

Scott Hawken
Senior Project Manager
Element Power

Table 1 – Corner Coordinates for Black Fork Wind Project in NAD 83

	Latitude	Longitude
NW Corner	40.945338	-82.813955
NE Corner	40.947652	-82.660409
SE Corner	40.806291	-82.656880
SW Corner	40.803988	-82.810100

Figure 1. General Area of Black Fork Wind Project

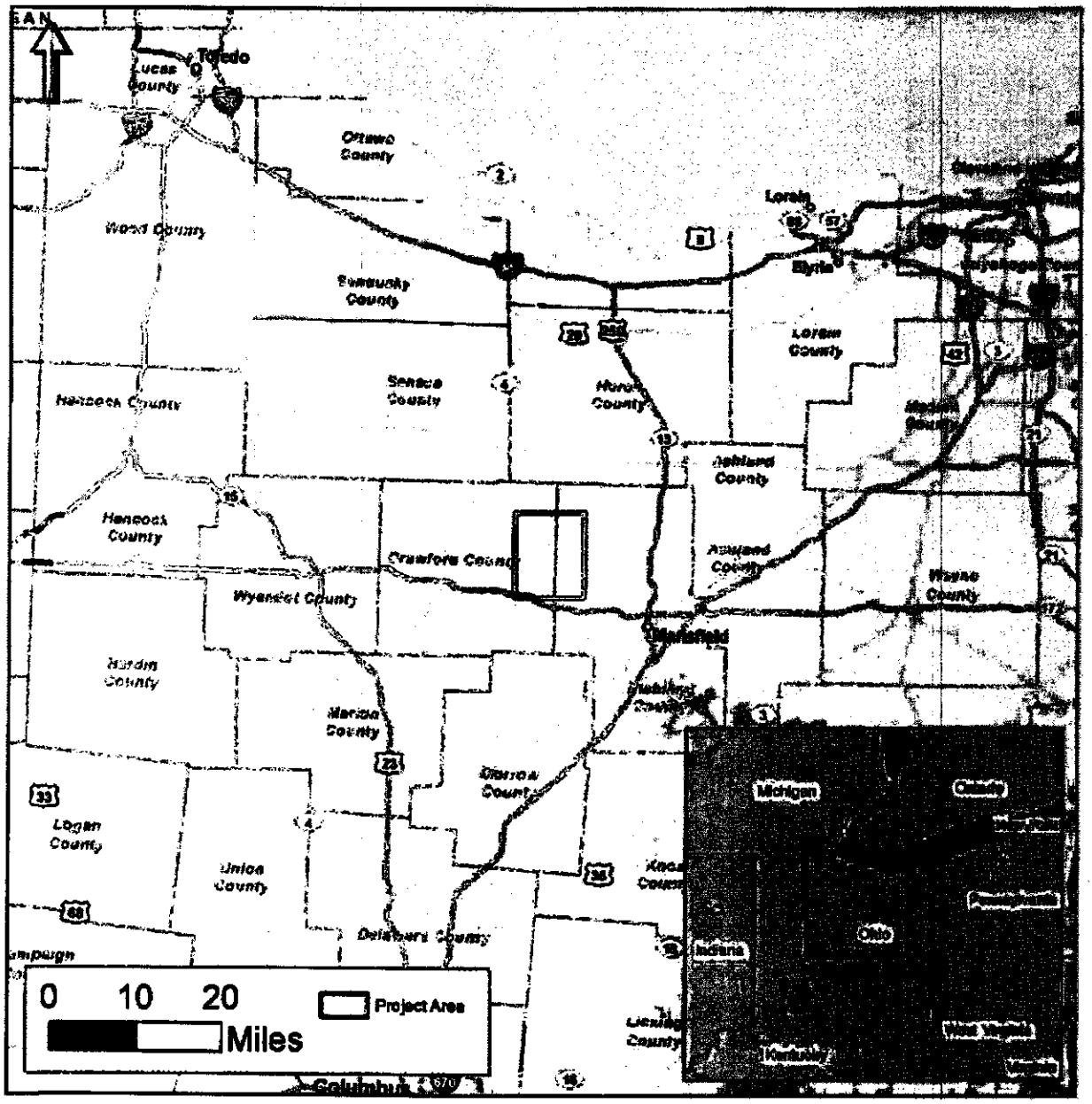

Figure 2. Local Area of Black Fork Wind Project