

**A Class II Architectural Inventory and Viewshed  
Analysis of the Ruso Wind Project in Ward, McHenry,  
and McLean Counties, North Dakota**

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**Abstract**

Ruso Wind Partners, LLC (the Proponent) has proposed the construction of the Ruso Wind Project, a wind farm, north of Benedict in Ward and McHenry Counties, North Dakota. The proposed Ruso Wind Project is under the jurisdiction of the Public Service Commission (PSC) and is subject to review by the North Dakota State Historic Preservation Office (SHPO). The Proponent is seeking a Certificate of Site Compatibility from the North Dakota PSC in accordance with the North Dakota Energy Conversion and Transmission Facility Siting Act as set forth in the North Dakota Century Code (NDCC) 49-22 as well as the North Dakota Administrative Code (NDAC) 69-06, the Energy Conversion and Transmission Facility Siting Act.

The Proponent has contracted Beaver Creek Archaeology, Inc. (BCA) to complete a cultural resource inventory including a Class I literature search, a Class III intensive cultural resource inventory and report, and a Class II architectural inventory and report. The Class III intensive cultural resource inventory as well as an addendum have already been completed along with the Class III cultural resource report and report addendum (see MS# 18230 & 18439). The reports received concurrence from the North Dakota SHPO on February 12, 2019 and July 9, 2019 respectively.

This report reflects the results and findings of the Class II architectural inventory of structures within a 2-mile radius of the proposed wind project in Ward, McHenry, and McLean Counties, North Dakota (see Table 1). In addition, this report includes a viewshed analysis, which was conducted to determine what kind of visual impact, if any, the proposed wind farm project would have from any one of the nine potentially eligible architectural sites within the 2-mile radius of the proposed wind farm.

**Table 1.** Legal Locations for the 2-mile Architectural Inventory.

County	Township	Range	Sections
McHenry	151N	80W	3, 4, 5, 8, 9, 10, 17, 30
	152N	80W	27, 28, 29, 30,31, 32, 33
Ward	151N	81W	3, 5, 6, 8, 10, 18, 19, 20, 21, 22, 25, 26, 27, 28, 29, 30, 32
	151N	82W	1, 2, 3, 4, 5, 8, 9, 10, 11, 13, 14, 15, 17, 20, 23, 24, 25, 26, 27, 29, 33, 35
	152N	81W	19, 20, 25, 26, 27, 29, 31, 32, 33
	152N	82W	32, 33, 34, 35
McLean	150N	81W	4, 5, 6, 7

The North Dakota SHPO requires an architectural assessment of buildings and structures within a 2-mile radius of any proposed wind farm. Any historic properties deemed potentially eligible to the National Register of Historic Places (NRHP) are required to have a site or site lead form submitted.

On June 14, and 18, 2019, Brittany Brooks (Field Director) conducted the Class II architectural inventory, with Emilie Arnold (Architectural Historian) assessing and reviewing the architectural locations. Wade Burns served as the Principal Investigator for this project.

During the Class II inventory, 174 architectural locations were investigated. Of these locations, 10 had no remaining standing structures, 50 are considered modern, 105 are being recommended by BCA as not eligible for the NRHP, and nine are being recommended by BCA as potentially eligible for the NRHP. During the archaeological survey, no architectural locations were located within the proposed project area.

Two existing wind farms are located near the proposed Ruso Wind Project. The New Frontier wind farm is located to the southeast and the Prairie Winds ND 1 is located to the northwest. Both of the existing wind farms are visible from the proposed project area. The visual impacts of the existing wind farms was also considered in determining what effect the proposed Ruso Wind Project would have on the potentially eligible architectural sites within the 2-mile radius. The viewshed analysis indicated the Ruso Wind Project will not significantly affect the viewshed of the nine potentially eligible architectural sites recorded during the Class II inventory, as they have already been affected by both existing wind farms.

## Table of Contents

Abstract .....	i
Table of Contents .....	iii
List of Tables .....	iv
List of Figures .....	iv
Acronyms, Abbreviations, & Definitions .....	vi
Introduction .....	1
Project Description/Objective .....	1
Environmental Setting .....	4
Souris River Study Unit .....	4
Garrison Study Unit .....	4
Historic Context .....	5
Euro-American Cultural Background .....	5
Dakota Territory (1858-1889) .....	5
North Dakota (1889-Present) .....	7
Architectural History of Benedict .....	8
Class I Literature Search .....	9
North Dakota SHPO Files .....	9
Class II Inventory .....	10
Inventory Methodology .....	10
Inventory Forms .....	10
Evaluation .....	10
Project Personnel .....	11
Survey Conditions .....	11
Limitations .....	11
Architectural Inventory Results .....	11
32MH474 (MH-007) .....	11
32MH472 (MH-019) .....	14
32MH473 (MH-021) .....	16
32WD2462 (WD-040) .....	17
32WD2463 (WD-054) .....	19
32WD1590 (WD-075a) .....	20
32WDx747 (WD-077) .....	22
32ML1362 (ML-115) .....	24
32ML949 (ML-130) .....	26
32ML1363 (ML-134) .....	27
32ML947 (ML-151) .....	29
32ML946 (ML-169) .....	31
Viewshed Analysis .....	33
Analysis Background .....	33
Digital Viewshed Methods .....	33
Results of Viewshed Analysis .....	33
Conclusion and Recommendation .....	38
References Cited .....	42
Appendix A: Maps	
Appendix B: Literature Search Results (REDACTED)	
Appendix C: Architectural Locations (REDACTED)	

## List of Tables

Table 1. Legal Locations for the 2-mile Architectural Inventory.....	i
Table 2. Architectural Project Area.....	1
Table 3. The Sinclair-Thomas Matrix applied to a 590.5' wind turbine (Sullivan et al 2012: Table 1).....	36
Table 4. Visibility rating form instructions used to rate visibility of wind facilities (Sullivan 2012: Table 2).....	37
Table 5. Architectural Property Inventory.....	39
Table 6. Architectural sites on file at the ND SHPO within a 2-mile radius of the direct APE (REDACTED).....	B-1
Table 7. Architectural site leads on file at the ND SHPO within a 2-mile radius of the direct APE (REDACTED).....	B-1
Table 8. Manuscripts on file at the ND SHPO from the section in which the direct APE is located (REDACTED).....	B-1

## List of Figures

Figure 1. Location of the Ruso Wind Project in Ward and McHenry Counties, North Dakota.....	3
Figure 2. Site 32MH474, June 14, 2019, from 35th St N facing southwest (crop of IMG_1829.jpg).....	13
Figure 3. Site 32MH474, June 14, 2019, from 35th St N facing southwest (IMG_1832.jpg), with focus on the gambrel roof dairy barn. The storehouse is in the foreground. ....	13
Figure 4. Site 32MH472 farmhouse, June 14, 2019, from 16th Ave N facing northwest (IMG_1889.jpg).....	15
Figure 5. Site 32MH472, June 14, 2019, from 16th Ave N facing west with focus on the possible wooden claim shack (IMG_1886.jpg).....	15
Figure 6. Site 32MH473 bank barn, June 14, 2019, facing east (IMG_1901.jpg).....	16
Figure 7. Site 32WD2462, June 14, 2019, looking south (crop of IMG_1993.jpg).....	18
Figure 8. Site 32WD2462 warehouse, June 14, 2019, looking north (IMG_1988.jpg).....	18
Figure 9. Site 32WD2463 barn, June 14, 2019, looking west-northwest (IMG_2045.jpg).....	19
Figure 10. Site 32WD1590 church, June 14, 2019, looking southwest (IMG_2169.jpg).....	21
Figure 11. Site 32WD1590 church, June 14, 2019, looking south (IMG_2171.jpg).....	21
Figure 12. Site lead 32WDx747 farmhouse, photographed in 2011, looking southwest (non-BCA image; Engel 2011).....	23
Figure 13. Site lead 32WDx747 gambrel barn, June 14, 2019, looking southeast (IMG_2178.jpg).....	23
Figure 14. Site 32ML1362 grain elevator, June 18, 2019, looking north (IMG_2416.jpg).....	25
Figure 15. Site 32ML1362 grain elevator, June 18, 2019, looking south (IMG_2390.jpg).....	25
Figure 16. Empty site of 32ML949, June 18, 2019, looking west (IMG_5002.jpg).....	26
Figure 17. Site 32ML1363 Boomtown/False Front commercial building, June 18, 2019, looking west-northwest (IMG_2508.jpg).....	28
Figure 18. Site 32ML1363 Boomtown/False Front commercial building, June 18, 2019, looking northwest (IMG_2458.jpg).....	28
Figure 19. Site 32ML947 ineligible residence, June 18, 2019, looking southeast (IMG_2533.jpg).....	30
Figure 20. Site 32ML947 ineligible residence, June 18, 2019, looking east (IMG_2525.jpg).....	30
Figure 21. Site 32ML946 ineligible church, June 18, 2019, looking northwest (IMG_2584.jpg).....	32

Figure 22. Site 32ML946 ineligible church, June 18, 2019, from rear, looking northeast  
(IMG\_2585.jpg)..... 32

Figure 23a & b. A wind farm silhouetted against the skyline at (a) a close distance at 2.04  
miles and at (b) a distance farther away at 16.35 miles, which illustrates the affect  
distance has on the size of a well facility. This is a wind farm located in South Dakota..... 35

Figure 24. The proposed impact distances for the planned Ruso Wind Project. The figure is  
modified from the Sullivan et al. study (2012:40). ..... 38

Figure 25. Architectural map..... A-1

Figure 26. Viewshed analysis of the proposed Ruso Wind Project..... A-2

Figure 27. Viewshed analysis of the existing New Frontier wind farm. .... A-3

Figure 28. Viewshed analysis of the existing Prairie Winds ND 1 wind farm. .... A-4

Figure 29. Visual impact of the proposed Ruso Wind Project. .... A-5

Figure 30. Visual impact of the existing New Frontier and Prairie Winds ND 1 wind farms..... A-6

## **Acronyms, Abbreviations, & Definitions**

**APE:** Area of Potential Effect  
**BCA:** Beaver Creek Archaeology, Inc.  
**BLM:** Bureau of Land Management  
**Ca.:** Circa  
**CCC:** Civilian Conservation Corps  
**DEM:** Digital Elevation Model  
**DSM:** Digital Surface Model  
**ESRI:** Environmental Systems Research Institute  
**FSA:** Farm Service Agency  
**FWP:** Federal Writers Program  
**GIS:** Geographic Information Systems  
**GSU:** Garrison Study Unit  
**LiDAR:** Light Detection and Ranging  
**LOS:** Line of Sight  
**MS#:** Manuscript  
**MW:** Megawatt  
**N:** North  
**NDAC:** North Dakota Administrative Code  
**NDCC:** North Dakota Century Code  
**NDCRS:** North Dakota Cultural Resource Survey  
**NDSU:** North Dakota State University  
**NRHP:** National Register of Historic Places  
**NW:** Northwest  
**Proponent:** Ruso Wind Partners, LLC  
**PSC:** Public Service Commission  
**Quad:** Quadrangle  
**R:** Range  
**S:** Section  
**SHPO:** State Historic Preservation Office  
**SHSND:** State Historical Society of North Dakota  
**SITS:** Smithsonian Institute Trinomial System  
**SOI:** Secretary of the Interior  
**SRSU:** Souris River Study Unit  
**SW:** Southwest  
**T/Twp:** Township  
**USGS:** United States Geological Survey  
**VR:** Visibility Rating  
**VRM:** Visual Resource Management  
**W:** West  
**WPA:** Works Progress Administration

**Direct APE** = the combined construction area of all project components; survey area

**Indirect APE** = the area surrounding the proposed project, but will not be physically impacted

## Introduction

Ruso Wind Partners, LLC (the Proponent) has proposed the construction of the Ruso Wind Project, a wind farm, north of Benedict in Ward and McHenry Counties, North Dakota (see Figure 1). The proposed Ruso Wind Project is under the jurisdiction of the Public Service Commission (PSC) and is subject to review by the North Dakota State Historic Preservation Office (SHPO).

The Proponent has contracted Beaver Creek Archaeology, Inc. (BCA) to complete a cultural resource inventory including a Class I literature search, a Class III intensive cultural resource inventory and report, and a Class II architectural inventory and report. The Class III intensive cultural resource inventory as well as an addendum have already been completed along with the Class III cultural resource report and report addendum (see MS# 18230 & 18439). The reports received concurrence from the North Dakota SHPO on February 12, 2019 and July 9, 2019 respectively.

This report is an addendum to the Ruso Wind Project (MS# 18230) and consists of a Class II architectural inventory of structures and buildings within a 2-mile radius of the proposed wind project. As a result, all inventoried architectural structures are located and recorded within the counties of Ward, McHenry, and McLean (see Appendix A: Maps). In addition, a viewshed analysis was conducted in order to determine any visual impacts of the proposed Ruso Wind Project on any potentially eligible architectural sites as well as on the surrounding landscape.

On June 14, and 18, 2019, Brittany Brooks (Field Director) conducted the Class II architectural inventory, with Emilie Arnold (Architectural Historian) assessing and reviewing the architectural locations. Wade Burns served as the Principal Investigator for this project.

The sections inventoried are presented in tabular format below (Table 2). The architectural locations are depicted on the project map in the Appendix, which utilizes the United States Geological Survey (USGS) 7.5' Blacktail Coulee, Robinson Coulee, Benedict, Benedict NW, and Benedict SW Quadrangle (Quad) maps.

**Table 2.** Architectural Project Area.

County	Township	Range	Sections	USGS Quad Maps
McHenry	151N	80W	3, 4, 5, 8, 9, 10, 17, 30	Blacktail Coulee
	152N	80W	27, 28, 29, 30, 31, 32, 33	Blacktail Coulee
Ward	151N	81W	3, 5, 6, 8, 10, 18, 19, 20, 21, 22, 25, 26, 27, 28, 29, 30, 32	Blacktail Coulee, Robinson Coulee, & Benedict
	151N	82W	1, 2, 3, 4, 5, 8, 9, 10, 11, 13, 14, 15, 17, 20, 23, 24, 25, 26, 27, 29, 33, 35	Robinson Coulee, Benedict NW, Benedict, & Benedict SW
	152N	81W	19, 20, 25, 26, 27, 29, 31, 32, 33	Blacktail Coulee & Robinson Coulee
	152N	82W	32, 33, 34, 35	Benedict NW
McLean	150N	81W	4, 5, 6, 7	Benedict
	150N	82W	1, 2	Benedict & Benedict SW

## Project Description/Objective

The Proponent is seeking a Certificate of Site Compatibility from the North Dakota PSC in accordance with the North Dakota Energy Conversion and Transmission Facility Siting Act as set forth in the North Dakota Century Code (NDCC) 49-22 as well as the North Dakota Administrative Code (NDAC) 69-06, the Energy Conversion and Transmission Facility Siting Act. The NDCC 49-

22-09 and NDAC 69-06-08 aid the commission in considering what effect the undertaking will have on historic properties.

The North Dakota SHPO requires an architectural assessment of buildings and structures within a 2-mile radius of any proposed wind farm. Any historic properties deemed potentially eligible to the National Register of Historic Places (NRHP) are required to have a site or site lead form submitted.

The three central objectives of this study are to assist the Proponent with their state compliance obligations, identify and assess project impacts to architectural resources located within the direct and indirect Area of Potential Effect (APE), and to provide NRHP recommendations for historic architectural properties encountered within the direct and indirect APE. Historic properties consist of any historic or prehistoric district, site, building, structure, or object (usually) over 50 years of age. Cultural resources include archaeological, historic, and architectural sites, as well as properties of traditional, cultural, or religious importance.

The direct APE or survey area is the combined construction area of all project components (see the definition below). Excerpt from the Class III Cultural Resource Inventory addendum for the Ruso Wind Project.

The [direct] Area of Potential Effect (APE) is defined as the combined construction area of all project components. As such, the APE includes the location of turbines, access roads, collector lines, crane paths, transmission line, and substation. ... The Ruso Wind Project, when completed, will generate up to 200 megawatts (MW) of electricity. The proposed layout consists of 47 wind turbine generators using either a Siemens SWT 2.415 108 m generator with a turbine height of 80 m and/or Siemens SG 4.2 145 m generator with a turbine height of 107.5 m. Eighteen alternate wind turbine locations were provided [Brooks 2019:1-2].

The indirect APE is the area surrounding the proposed project that will not be physically impacted, but where other impacts could arise due to visual changes to the landscape. The indirect APE for the architectural inventory is defined as a 2-mile radius around the direct APE.

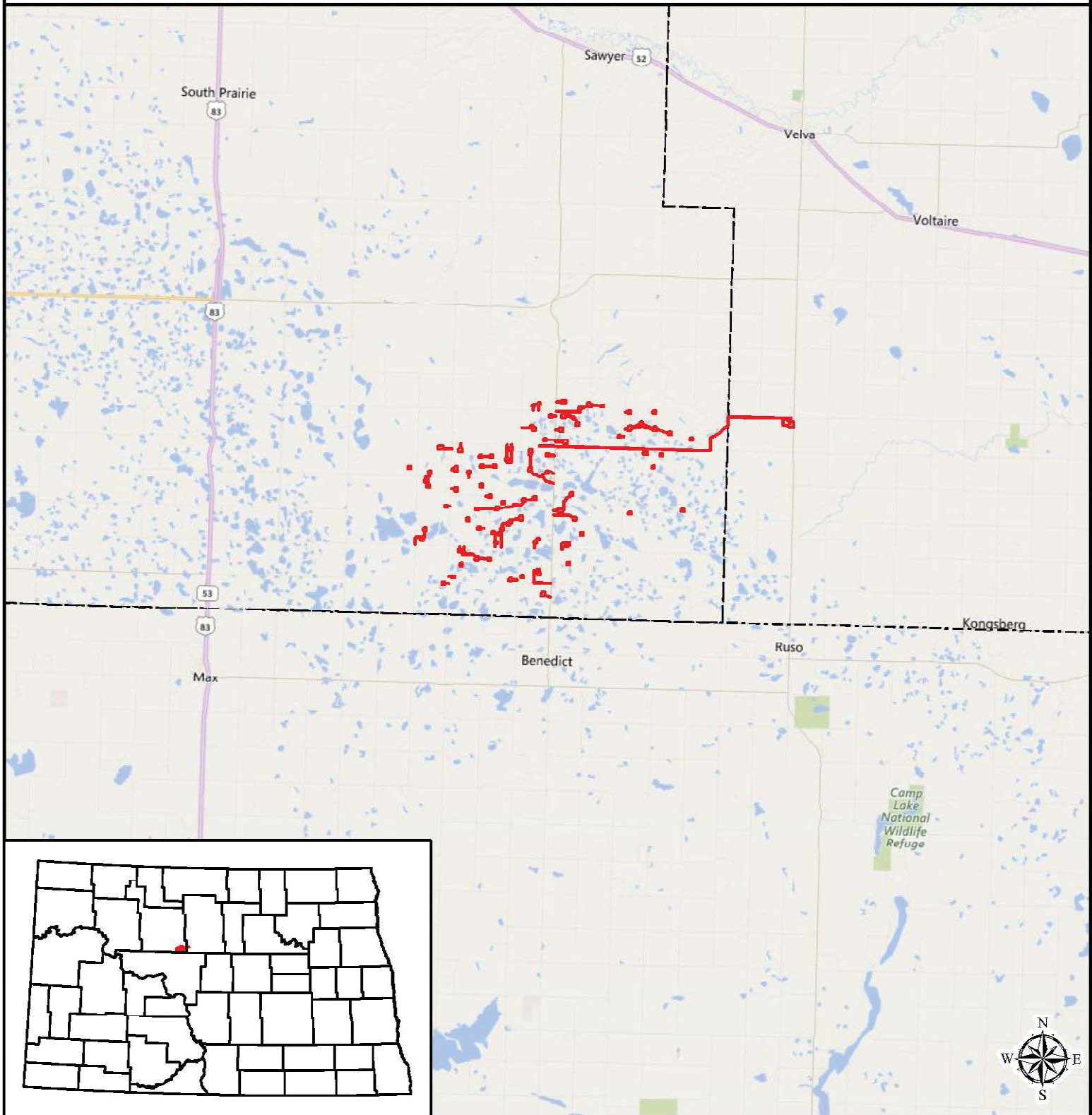

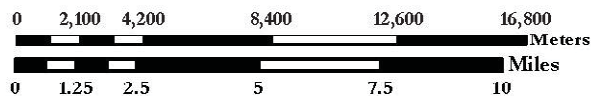


Figure 1. Location of the Ruso Wind Project in Ward and McHenry Counties, North Dakota.

### Legend

 Survey Area (860 acres)



Base Map: USGS 7.5'  
Scale: 1:250,000  
UTM NAD83 Zone 14

## Environmental Setting

North Dakota is divided into 13 Archeological Study Units based on areas with similar environment, history, and archaeological factors, and equate with different orders of hydrologic units (or drainage basins). These study units provide a broad archaeological overview, which can be utilized to understand and help predict the type and density of archaeological sites in the area. The borderlines of the study units generally follow township and range lines (but not section lines), as well as the state border. The empirical value of the 13 study units to North Dakota prehistory is unknown but remains a general starting point to determine the likelihood of archaeological sites within a region (State Historical Society of North Dakota [SHSND] 2016:B.1-4).

### *Souris River Study Unit*

The majority of the architectural project lies within the Souris River Study Unit (SRSU), which is located in north-central North Dakota. The SRSU is located across two physiographic provinces: Central Lowlands and Great Plains. The Drift Prairie and the Missouri Coteau represent the terrain types in each of these physiographic provinces. Drainage is split between those waterbodies that are to the southwest of the Missouri Coteau which end up in the Gulf of Mexico and those to the northeast of the Coteau which end up in the Hudson Bay. Prominent rivers in the SRSU are the Des Lacs and the Souris rivers, both of which originate in Canada. There are several smaller streams that are also located in the SRSU. These include Little Deep Creek, Cut Bank Creek, Willow Creek, Ox Creek, and Wintering River. Lake Darling and the Crosby Reservoir are notable water bodies in this study unit (SHSND 2016:11.1-11.6).

The climate in the SRSU is defined as northern continental. This type of climate is typified by extreme fluctuations in temperature with sporadic precipitation (SHSND 2016:11.6).

Landforms in this area consist of upland till plain, valley wall side slopes, valley wall foot slopes, alluvial fans, river terraces, and river floodplains. The SRSU is located within the Temperate North American Grassland ecological biome and supports northern floodplain forests, aspen parklands, and grasslands. The grasslands are comprised of needle grasses, slender wheat grass, needle and thread, grama grasses, and bluestem. Trees that are located in these different environs include the bur oak, aspen poplars, cottonwood, willow, elm, box elder, and green ash. Edible shrubs include the chokecherry, juneberry, buffaloberry, and the wild rose. The prairie and riparian environments are host to a variety of large and small animals. Animals that could have been hunted for meat, hides, feathers, teeth, bones, etc. in the past included white-tailed deer, pronghorn, elk, mule deer, grizzly bear, moose, caribou, bison, coyote, red fox, the long-tailed weasel, beaver, muskrat, mink, coot, ducks, geese, perch, and northern pike (SHSND 2016:11.10).

### *Garrison Study Unit*

A small portion of the architectural project lies within the Garrison Study Unit (GSU), which is located in the Missouri valley in northwestern North Dakota. The environmental setting of the GSU provided favorable conditions and ample natural resources for human habitation throughout the Holocene.

The study unit is situated within the Glaciated Missouri Plateau Subsection of the Great Plains Physiographic Province, with portions in the Missouri Trench District, but primarily in Missouri Coteau and Coteau Slope terrain. Knob-and-kettle glaciated terrain and other glacial features are common on the Coteau du Missouri, while the topography is gentler in the Coteau Slope, where rolling hills abound. Landforms in the GSU include glaciated uplands, breaks terrain, valley wall side slopes and foot slopes, draws, alluvial terraces, and floodplains. The Coteau Slope is filled with tributaries of the Missouri River, including a small part of the Big Muddy Creek basin. Named streams include the Big Muddy Creek, Painted Woods Creek, Douglas Creek, Shell Creek, and Deepwater Creek. Named rivers include Little Muddy River, Little Knife River, and White Earth

River. Water sources in the Missouri Coteau are predominantly sloughs and potholes, with named water bodies including White Lake and Powers Lake (SHSND 2016:6.1-6.6).

The GSU has a northern continental climate; temperatures vary immensely by season with warm summers and cold winters. Precipitation averages around 16 inches annually, most of which falls as rain during the spring and summer months. Prevailing winds throughout the year average around 16 mph from the west-northwest (SHSND 2016:6.6).

The GSU has a Northern Temperate Grasslands type biome that consists of mixed grass prairie dominated by western wheatgrass, blue grama, and needle-and-thread. This grassland provided good habitat for large game animals, such as bison and antelope. Gallery forests grew along the Missouri River and other tributaries, which provided a suitable environment for white-tailed deer and small mammals such as muskrat and porcupine. Hardwood draws of bur oak, green ash, and juniper are part of transition zones between the grasslands and floodplain forests. Food plants in the area include chokecherry, buffaloberry, and gooseberry. As a result of the variety of flora providing a range of habitats, the GSU is characterized by some of the greatest faunal diversity in the state. Animals native to the area that were utilized by hunters in the past include “bison, elk, pronghorns, white-tailed deer, mule deer, grizzly bears, mountain lions, bighorn sheep, wolves, coyotes, foxes, bobcats, otters, badgers, porcupines, prairie dogs, weasels, mink, cottontail rabbits, jackrabbits, ground squirrels, golden eagles, bald eagles, hawks, owls, pelicans, magpies, prairie chickens, grouse, and a variety of waterfowl, fish, turtles, and mussels” (SHSND 2016:6.8). This biotic diversity along with the availability of water makes this setting favorable for human settlement, both during prehistoric and historic time periods.

Today the area contains an agriculturally based economy with wheat, corn, and sunflowers being the most common crops. Ranching is also prevalent in the region, and grasslands are often used for grazing. Tree cover is limited to wind breaks surrounding farmsteads, floodplain forests and hardwood draws.

## **Historic Context**

The SRSU and GSU have their own historic contexts, which provides a description of the different types of prehistoric and historic districts, sites, buildings, structures, and objects that are known from various times in the past in different parts of the state. However, as this report is architectural, only the Euro-American Cultural Background will be discussed. This information provides the comparative base needed for the management of architectural resources.

### ***Euro-American Cultural Background***

The majority of historic sites within North Dakota are farmsteads/homesteads from the late 19th century and early 20th century.

### **Dakota Territory (1858-1889)**

The Dakota Territory consisted of the northernmost part of the land acquired from France in the 1803 Louisiana Purchase and in 1818, the United States acquired the northeastern portion of the Dakota Territory in a treaty with Great Britain. The Dakota Territory included North Dakota, South Dakota and much of present-day Montana and Wyoming. After becoming an incorporated territory in 1861, the population was slow to increase due to Indian attacks. Eventually, the population increased during the “Dakota Boom,” from 1870 to 1880, because of the railroad growth and the Homestead Act of 1862. Many of the settlers came from Germany and the Scandinavian countries of Norway and Sweden. The economic base was organized around agriculture, mining, and cattle ranching (Federal Writers Project [FWP] 1938).

*Fur Trade* – The earliest Europeans and European-Americans to venture into the region were looking for trade routes or to establish fur trading posts. Before and after the Lewis and Clark 1804-1806 expedition, notable explorers included Sieur de la Vérendrye, David Thompson, Charles Chaboillez, Alexander Henry, and Manuel Lisa. Some Europeans and European-Americans settled in the area, including “Spaniards from St. Louis, Frenchmen from Quebec, Scots and Britons from Hudson’s Bay and Montreal and Americans working either as free traders or engaged for a dozen fur companies” (FWP 1938; Lamar 1996:27).

*Forts* – The majority of the forts in the region were constructed in the 19th century. Their purpose included trading outposts, primarily fur trade and military posts for the protection of supply routes, trails, trade, and settlers. These forts, prior to the introduction of the railroad were along rivers such as the Missouri, Yellowstone, Heart, and Red rivers. Some of the more notable forts include Fort Mandan, Fort Lisa, Fort Henry, Fort Clark, Fort Union, Fort Abercrombie, Fort Berthold, Fort Buford, Fort Rice, Fort Totten, and Fort Abraham Lincoln (FWP 1938; SHSND 2008).

*Trails* – Two major trails, the River Trail and the Ridge Trail, branches of the network of Red River Trails in the Red River Valley, originally were Native American trails that were later used by Euro-American fur traders. The Red River Trails connected fur trading posts, where they hauled furs and goods by ox cart. Later, the trails also connected military posts, where military supplies and men were sent. These military posts (e.g., Fort Abercrombie, Fort Totten, and Fort Ransom) also protected the trails as well as the people traveling up and down the trails. Eventually the trails and ox carts were replaced by the railroad (Gilman et al. 1979).

A notable trail in the western part of the region is the Bismarck-Deadwood Stage Trail (1877-1880). This trail was a stagecoach and supply line that ran between Bismarck, the western terminus of the Northern Pacific Railroad and the Black Hills gold town of Deadwood in Dakota Territory. There was transportation and economic booms associated with this trail and these booms ended when the railroad reached Pierre and an alternate line opened (SHSND 2008).

*Riverboats* – The Missouri and Red rivers were important to the settlement and expansion of the Dakota Territory and were used the most for river transportation. Riverboats such as rafts, sailboats, rowboats, Mackinaws, keelboats, and steamboats brought explorers and fur traders into the Dakota Territory; however, the keelboat and steamboat were probably used more often due to their carrying capacity. “Keelboats were used primarily from 1800 to 1840, when they were replaced by steamboats” (Miller 2012). This type of boat floated high in the water allowing it to travel on shallow rivers and was able to carry 15 to 30 tons of cargo. River transportation became increasingly important for transporting goods to outposts and returning furs downstream.

Steamboats eventually replaced the keelboats and were used for cargo and passenger transportation. The riverboat industry became a popular mode of transportation, as it was much easier to deliver goods to remote areas by boat than overland routes. In addition, “settlers and visitors could also travel much more safely by taking steamboats” (Burns 2004:14). The demise of riverboat transportation occurred for several reasons: (1) less shipping of passengers and cargo, (2) scarcity of wood yards, (3) inconvenient climate, (4) labor unrest, and (5) the railroad. Shipping on the Red River continued until 1912 and until the 1930s on the Missouri River (Burns 2004).

*Railroad* - Major development of the railroad in the Dakota Territory occurred in the 1870s and 1880s with the Northern Pacific Railroad and the Great Northern Railroad facilitating population growth during this time. Federal land grants were given to the Northern Pacific Railroad, who in turn sold the land, while the Great Northern Railroad bought its lands from the federal government and promoted settlement along its lines (FWP 1938).

Agriculture – The Federal Homestead Act of 1862 offered free land to anyone over 21 years-old who would cultivate and improve his 160 acres of land and live on it for five years. An additional 160 acres could be obtained for a tree claim and a third tract of land could be acquired before or after the land was surveyed. Crops planted and harvested included spring wheat, durum, flaxseed, barley, oats, sugar beets, corn, hay, red clover, alfalfa, sweet clover, and seed potato. Ranching of cattle and sheep, poultry raising, and bee keeping was also done on farms (FWP 1938).

In eastern North Dakota, large tracts of land were often sold to just one family or one individual. These “Bonanza farms” were often large operations, often owned by companies in the east and run like factories with hundreds of men using the most advanced farming technologies of the time. Bonanza farming flourished in the Red River Valley during the last two decades of the 19th century, and the railroad companies appreciated the endeavor since it served as a great promotional tool for the land. However, land in the western part of North Dakota was more arid and posed more problems for farmers, especially those from other countries. Populations remained relatively small and early homesteading was often unsuccessful. The difficulty of farming the land, the isolation required to live on their claims while improving them, and the harsh and cold North Dakota landscape just proved to be too much for many of these first settlers (FWP 1938; Sherman 1986:12).

### **North Dakota (1889-Present)**

North Dakota became the 39th state to enter the Union on November 2, 1889. After statehood, industrial development increased. The railroad industry expanded and peaked in 1905 through competition between the Great Northern Railway and the Soo Line. Large lignite mines opened and local brickworks and flourmills flourished in the state. Entrepreneurs built stores, shops, and offices along Main Street and town squares. While rural areas still relied on small local general stores, city consumers had more choice with locally owned department retail stores. In 1919, the Bank of North Dakota at Bismarck opened and has become a large and powerful economic force. “The State Mill and Elevator at Grand Forks, completed in 1922, provided a market for grain and a source of feed and seed [and] the state hail insurance program benefitted many farmers until its elimination in the 1960s” (SHSND 2012).

Farm homes in the eastern part of the state were typically small, located close together, and made up of well-painted modernized buildings surrounded by neat lawns and tree groves. They had modern conveniences like electricity, telephones, radios, and cars. In the central part of the state, farms were not as modernized as eastern North Dakota but were well-kept. In western North Dakota, farm homes were often little more than shacks erected to establish residence under the Federal Homestead Act. Many such buildings were still in use in the early 20th century (FWP 1938).

The collapse of wartime prices for grain in the 1920s instigated an economic depression in North Dakota that lasted through the 1930s, concurrent with the Great Depression era. In 1921, more banks closed than in any other year, resulting in a wave of farm foreclosures. The Great Depression of the 1930s spurred change throughout the state. Rural populations decreased while city populations grew. Because of the price decline of farm produce, cooperatives enjoyed a renewed popularity as farmers banded together to market their produce and reduce the cost of farming. Farmers Unions built local elevators and organized oil cooperatives that served the needs of the rural community. Despite economic problems, crop failures, dust storms, and extreme weather, North Dakota visibly modernized during the 1930s, shifting to mechanized farming operations and motorized transportation. Federal relief programs improved highways, state parks, and city services throughout the state. State departments undertook public health and safety problems, and a movement for consolidated law enforcement was started with the formation of a State Highway Patrol in 1935. “Rural schools consolidated at an increasing rate. Public utilities extended their

reach through development or rural electric cooperatives; the first, Baker Electric of Cando, energized its lines in 1938” (SHSND 2012).

Immediately after Franklin Roosevelt took the oath of office, he began passing a series of laws aimed at putting people back to work, restoring faith in the banking system, and shoring up the economy (SHSND 2012). Among these efforts were the Works Progress Administration (WPA) and the Civilian Conservation Corps (CCC). In North Dakota between 1935 and 1942, the WPA built 20,373 miles of highways and streets, 821 new bridges and viaducts, 166 miles of sidewalks, 15,012 culverts, 503 new public buildings, 61 building additions, 680 outdoor recreation facilities, 809 water wells, two irrigation projects, 39 sewage treatment plants, and nine water treatment plants, as well as other reconstructions and repairs (Robinson 1966:408). In June of 1933, some 235,000 men were enrolled in the CCC to work on federal and state public improvement projects. They built national forest trails, campsites, and visitor centers in state and national parks as well as roads and dams (SHSND 2012).

From the 1940s to the 1960s, North Dakota continued to develop modern agriculture, industry and infrastructure. Starting in the 1940s, favorable weather and improved crop yields coincided with higher prices stimulated by America’s entry into World War II. By the end of the war, farm debt had dropped noticeably. After the war, the industrial economy continued to prosper. The rapid agricultural and industrial developments led to the construction of the Garrison Dam in 1946. Industrial developments included the beginning of the energy industry; in 1951, oil was discovered within the Bakken near Tioga. North Dakota also played a role in the military industry and two large Air Force Bases, one in Minot and the other in Grand Forks, had been built by the 1960s. Infrastructure developments included communication and interstate transportation systems, which were improved and expanded in the 1950s. As private auto transportation increased, the use of passenger rail service declined, and railroads increasingly became a means of hauling freight (SHSND 2012).

Large-scale energy development took off in the 1960s owing to high demand. Initially, coal strip mines and coal-fired power plants were the dominant form of energy in the state. An oil boom occurred in 1978 as international crude oil prices skyrocketed; oilfield towns such as Dickinson, Williston, and Watford City exploded along with the industry. This oil boom and subsequent population increase was short-lived, as worldwide oil prices declined in 1981 and oil workers moved away (SHSND 2012). Another oil boom started in 2008, resulting in enough oil and gas jobs to give North Dakota the lowest unemployment rate in the United States. In addition, the oil boom has supplied economic growth in other areas such as the service industry (Rocco 2013).

### **Architectural History of Benedict**

The proposed Ruso Wind Project is located north of the town of Benedict, which is situated within the 2-mile radius of the project. Benedict occupies 0.25 square miles east of the center of the northern border of McLean County with an estimated population of 73 people in 2018 (United States Census Bureau 2018). Its urban landscape is characterized by a mixed settlement of residences, commercial buildings, and a Lutheran church. Historically, Benedict served as a center of commerce and worship for the cattle and wheat farmers of the surrounding countryside, much as it exists today.

According to *Origins of North Dakota Place Names*, the name “Benedict” is derived from “the number of newly wed men (benedicts) who signed the petition for the establishment of a post office.” That post office went into operation on October 6, 1906 at Benedict’s original site three quarters of a mile northwest of its current location, described as a “squatter’s village” (Williams 1973:172).

In 1908, having built a side track (with an empty box car for a depot), Benedict boosters E.E. Simmons and Alex Lillaugen succeeded in persuading the railroad to consider Benedict for a station. The Soo Line Railway surveyed Benedict and added the town to its service. This forced settlers to relocate south of the tracks (Sundbakken 1976). The Main Street corridor south of the railroad tracks marks this historic area of commercial and civic development. Today, the post office, city hall, jail, and railyard are still found in this area.

In addition to establishing a new rail depot, the first construction at the new site of Benedict in 1908 included a combination grocery store/post office, the First State Bank, a new railroad depot, a meat market, restaurant/hotel, hardware store, barber shop, drug store, and co-op. The first church congregations organized between 1908 and 1912, holding services in private homes. By 1910, the jail was built. In 1912, Benedict established its school and first rural mail service. The *Benedict Banner*, a German-English newspaper, operated between 1908 and 1920.

The architectural character of Benedict at this time centered on Boomtown/False Front frame buildings that could be quickly built and pressed into service. Fire imperiled Benedict's early wooden townscape, and the small, inexpensively built frame buildings were frequently and easily moved from site to site. Few recognizable examples remain in Benedict today. One of these, 32ML1363 (described below), is a rare early case: formerly the First State Bank building, it was adapted with glass-front windows in the 1920s into a general store. Its relatively fancy pressed metal cornice harkens to its first years safeguarding the cash deposits of Benedict settlers.

The boomtown years gave way, and by the 1920s and 1930s, early businessmen began to sell their buildings to new owners, who adapted and modified them for new purposes. New construction also filled new needs, but Benedict's population peaked at 195 in 1920 and was on the decline by the 1940s. Between 1960 and 1970, Benedict's population dropped from 129 to 72 (North Dakota State University [NDSU] 2000:1). This exerted pressure for change: the old rail depot was torn down, children began to be sent to Max for schooling, and a volunteer fire department organized in 1965 before consolidating with the one in Max in 1976.

Today, Benedict retains its sleepy character as a quiet country outpost in the midst of McLean County farmland. Its architecture reflects a history of reuse, addition, adaptation, and occasional new construction. Though it has two examples of exceptional historic structures (32ML1362, the west grain elevator, and 32ML1363, the commercial building), as a whole, Benedict simply presents a coherent pattern of settlement and use dating back over 100 years without adhering to any particular architectural period or style.

## **Class I Literature Search**

The literature search is used to provide an indication of the types, distribution, and density of cultural resources near the proposed project area. This is done by checking individual files at the North Dakota SHPO in Bismarck, North Dakota. The proposed project is located north of Benedict, and the site distribution is light within a 2-mile radius of the direct APE (where the literature search was conducted).

### ***North Dakota SHPO Files***

On May 21, 2019, Greg Erickson of BCA conducted a literature search at the North Dakota SHPO. Records at the North Dakota SHPO were searched in order to identify architectural cultural resources and previous surveys within a 2-mile radius of the direct APE.

The results of the literature search indicate that 16 projects have been conducted within the sections where the survey area for the proposed project is located, of which nine were conducted within the last 10 years. This number included the report for the original Ruso Wind Project (MS#18230).

The manuscripts are included in tabular form in Appendix B. Since the literature search was conducted, BCA submitted an addendum to the Ruso Wind Project (MS# 18439).

The literature search also revealed five architectural sites and two architectural site leads within a 2-mile radius of the direct APE that were on file at the North Dakota SHPO at the time of the literature search. These results are included in tabular form in Appendix B. No site forms were updated for 32WD110, 32WD2159, and 32WDx769. No architectural structures were visible from the public road at site 32WD110; however, potentially eligible historic cultural material could be present and as such, 32WD110 remains recommended as unevaluated for the NRHP pending further investigation. Site 32WD2159 was previously recommended as not eligible for the NRHP as no change was noted. A windmill was noted at 32WDx769 and was deemed ineligible for the NRHP; however, potentially eligible historic cultural material could be present and as such, the site lead remains recommended as unevaluated for the NRHP pending further investigation.

## **Class II Inventory**

The architectural inventory encompassed the entire indirect APE of the project, which was defined as a 2-mile radius around the proposed Ruso Wind Project. The area was inventoried in order to comply with North Dakota SHPO cultural resource guidelines to locate any historic properties (45 years of age or older) deemed potentially eligible within or around the proposed project area, which may be affected by the construction of the Ruso Wind Project. This allows the Proponent to plan construction to minimize or eliminate impact to any NRHP eligible historic properties.

### ***Inventory Methodology***

The architectural inventory was performed by staying on public roads to take photographs and conduct a preliminary evaluation of each standing structure and to take photographs of each property. The architectural structures were photographed using a Canon EOS 50D with a 28-135 mm lens digital camera. Throughout the survey field notes were taken in a bound notebook. Copies of maps, field notes, and photographs are located at the BCA office in Bismarck, North Dakota.

### ***Inventory Forms***

A North Dakota Cultural Resource Survey (NDCRS) Architectural Site Form was completed for each identified property considered potentially eligible for the NRHP. The inventory forms were submitted to the North Dakota SHPO.

### ***Evaluation***

Upon completion of the Class II fieldwork, the potential eligibility of each resource was assessed for inclusion to the NRHP, based on their potential significance and integrity. To be eligible for inclusion on the NRHP, a site must usually be more than 50 years old, retain its integrity of location, design, setting, materials, workmanship, feeling, and association and it must meet one of the following criteria:

- (a) Associated with events that have made a significant contribution to the broad patterns of our history; or
- (b) Associated with the lives of persons significant in our past; or
- (c) Embody distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinctions; or
- (d) Have yielded, or may be likely to yield, information important in prehistory or history.

***Project Personnel***

The Secretary of the Interior (SOI) qualified archaeologist Wade Burns served as the Principal Investigator for this project. The architectural inventory was completed by Brittany Brooks (Field Director) on June 14 and 18, 2019. Emilie Arnold (Architectural Historian) reviewed the architectural locations, and prepared the site forms and report.

***Survey Conditions***

The architectural inventory was conducted in mid-June 2019. Weather conditions at the time included clear to overcast skies and the temperature ranged from 61-86°F.

***Limitations***

Several limitations restricted and hindered the architectural inventory. The project consisted of a Class II architectural inventory with access limited to public roads. As a result, some architectural sites were not visible and several structures were out of view due to vegetation and other standing structures blocking the view. Due to the immediate deadline for the project and the vast number of properties, detailed archival research of county records could not be completed for every single property, particularly those unlikely to be eligible. Public records, including historical aerials, Google Earth imagery, and county tax websites were consulted for construction dates; however, documentation of the exact construction date of the architectural structures was difficult. Any architectural building constructed or updated after 1991 was simple to determine through the use of Google Earth (2017). The build dates on some of the other structures were listed on county tax websites; however, with other structures, no information could be obtained. Any date listed in the report with ca. in front of the date is a professionally estimated date or time period for construction.

***Architectural Inventory Results***

The purpose of the architectural inventory was to photographically document architectural buildings located within a 2-mile radius of the proposed Ruso Wind Project to determine if there was any visual impact to potentially eligible or already listed architectural sites caused by the turbines.

There are 174 architectural locations situated within a 2-mile radius of the proposed Ruso Wind Project. Of these locations, 10 had no remaining standing structures; only one of the 10, formerly occupied by a historic church in Benedict, was recorded, while the remaining nine were not. Fifty architectural locations were determined to be modern and were not recorded. One hundred and three architectural sites were considered not eligible for the NRHP and were therefore not recorded.

Based on appearance of eligibility for the NRHP or prior listing in the NRHP, twelve architectural sites were selected for architectural history analysis and are detailed in this report. Of the 12, nine are recommended potentially eligible and three are recommended ineligible. Two of the architectural sites are located within the city limits of Benedict. During the architectural survey, no architectural locations were located within the proposed project area.

**32MH474 (MH-007)*****Description***

The property is located outside the direct APE and, as such, there was no access to this property (Figure 25). The following description is based on visible features from public roads and from information provided by the McHenry County Assessor Records.

The site is a farmyard (Figure 2) consisting of a wooden gambrel roof barn with shed addition (ca. 1915-1930), a Quonset warehouse (ca. 1945-1960), and three wooden storehouses or grain bins (ca. 1915-1930). Also on the site are a modern ranch/trailer farm house, a metal pole barn or equipment shed, a mobile home, and a garage. The gambrel barn, which has a one-story shed addition on its north side with fenestration suggesting a function as a dairy barn, shows no evidence

of alterations with non-historic materials, giving it the highest level of material integrity (Figure 3). The metal half-round Quonset, with a northern façade made of vertical wooden siding painted red, is more common in the North Dakota farming landscape, but it also has a high level of integrity. The three wooden storehouses/grain bins, two with gable roofs and one with a shed roof, are each in poor material condition, with damage to roofs and siding. All show evidence of adaptation with historically inappropriate roofing materials (asphalt shingles), and one (Feature 4) has been partially sided with sheet metal. Based on Farms Service Agency (FSA) aerial imagery (1957-1962), all of the historic buildings at site 32MH474 described above, with the exception of Feature 5 (the shed-roof grain bin), have been situated in their respective footprints continuously for at least 57 years.

#### *Significance and Evaluation*

Based on the pedestrian survey, 32MH474 is a relatively intact site that may be associated with North Dakota farming for evidence of barns, grain storage, and storage facilities that show continuous use between 1915 and the present (SHSND 2014:71). However, more research needs to be conducted to prove that this farmstead may have been significant in the history of farming in this locality. Therefore, until further research can be conducted, 32MH474 is considered provisionally ineligible for the NRHP under Criterion A as associated with a significant event in history.

The historic barn at site 32MH474 presents an excellent example of a North Dakota dairy barn, surrounded by historic outbuildings that support its historic setting by illustrating changing tastes, attitudes, and uses over time. Remnants of a historic shelterbelt tree line, also important to a farmstead's historic landscape, follow the contours of a dry coulee on the southeastern edge of the farmyard (SHSND 2014:34-35, 71). Therefore, the barn located on site 32MH474 appears eligible for the NRHP under Criterion C.

#### *Recommendation*

This property is thought to be potentially eligible for the NRHP, as the barn retains important architectural elements and presents a good example of a gambrel roof dairy barn, surrounded by less intact historic outbuildings that nevertheless support the integrity of the barn's historic setting, association, and feeling. Further research is needed to fully investigate this property and make a final determination of significance and eligibility to the NRHP under Criterion C.



**Figure 2.** Site 32MH474, June 14, 2019, from 35th St N facing southwest (crop of IMG\_1829.jpg).



**Figure 3.** Site 32MH474, June 14, 2019, from 35th St N facing southwest (IMG\_1832.jpg), with focus on the gambrel roof dairy barn. The storehouse is in the foreground.

**32MH472 (MH-019)***Description*

The property is located outside the direct APE and, as such, there was no access to this property (Figure 25). The following description is based on visible features from public roads and from information provided by the McHenry County Assessor Records.

The site is a farmstead consisting of an American four-square cube farmhouse (ca. 1915-1930), the remains of two wooden barns (ca. 1915-1930, collapsed within the last ten years and therefore unevaluated), post-World War II improvements with post-war materials (six grain bins, two Quonset huts, and a cattle shed constructed ca. 1945-1975), and a modified early wooden building possibly originally constructed as a claim shack (ca. 1900-1915, and further research may indicate an even earlier date). While the possible claim shack has seen extensive modifications, the modifications are appropriate in period materials, workmanship, and design and reflect adaptation in an active farmstead (Figure 5). Modifications to the main farmhouse, the American four-square, amount to modern vinyl siding, asphalt roof shingles, and some window replacements, though original window openings appear intact (Figure 4). With the exception of the two unevaluated, collapsed wooden barns, all other features at the site stand without apparent modification.

*Significance and Evaluation*

Based on the pedestrian survey, 32MH472 is a relatively intact site that may be associated with North Dakota farming for evidence of multiple dwellings, barns, corrals, grain storage, animal shelter, and storage facilities that show continuous use between 1915 and the present (SHSND 2014:71). However, more research needs to be conducted to prove that this farmstead may have been significant in the history of farming in this locality. Therefore, until further research can be conducted, 32MH472 is considered provisionally ineligible for the NRHP under Criterion A as associated with a significant event in history.

The historic features at site 32MH472 embody the distinctive nature of a North Dakota farmstead, presenting a picture of historic adaptation of the original property and illustrating changing tastes, attitudes, and uses over time. It is also surrounded by a shelterbelt, a feature important to a farmstead's historic landscape (SHSND 2014:34-35, 71). That all of these features retain good integrity and that all are historic (45 years or older) or, based on further research, near-historic in age shows an evolution of historic character through a century of use as a farm site. Sited together, several of these features present a significant and distinguishable entity whose components may lack individual distinction. It is rare that this many extant features illustrate this progression in a single site. Therefore, 32MH472 appears eligible for the NRHP under Criterion C.

*Recommendation*

Despite modern roofing and siding on the farmhouse and the state of the collapsed barns on the site, this property is thought to be potentially eligible for the NRHP, as it collectively presents the architectural evolution of an integral farm setting across a century of consistent farm use. Further research is needed to fully investigate this property and make a final determination of significance and eligibility to the NRHP under Criteria A and C. This research may also determine eligibility under Criterion B (association with the lives of significant persons in our past) at the regional or local level.



**Figure 4.** Site 32MH472 farmhouse, June 14, 2019, from 16th Ave N facing northwest (IMG\_1889.jpg).



**Figure 5.** Site 32MH472, June 14, 2019, from 16th Ave N facing west with focus on the possible wooden claim shack (IMG\_1886.jpg).

**32MH473 (MH-021)***Description*

The property is located outside the direct APE and, as such, there was no access to this property (Figure 25). The following description is based on visible features from public roads and from information provided by the McHenry County Assessor Records.

This farmstead is situated in rolling, hilly terrain at the foot of a long driveway. Based on aerial imagery from FSA (1957-1962), it has up to four historic buildings, but only one, a wooden and stone/concrete bank barn with gambrel roof (ca. 1915-1930 and, if researched, possibly earlier), was clearly visible (Figure 6). It is situated to the southeast of a modern farm building of unknown function. Modifications to the barn include asphalt roof shingles, with an underlying layer of historic wooden shingles apparent. Besides this, a lack of other apparent alterations gives it integrity of design and workmanship.

*Significance and Evaluation*

Based on the Class II survey, 32MH473 embodies the distinctive nature of a North Dakota bank barn, representing an excellent example of a barn type that descends from Pennsylvania and south German tradition. Therefore, due to its good integrity, 32MH473 appears eligible under Criterion C as a distinctive characteristic of a type, period, or method of construction.

*Recommendation*

Despite alterations to the roof, this property is thought to be potentially eligible for the NRHP, as the barn retains important architectural elements and presents a good example of a historic bank barn. Further research is needed to fully investigate this property and make a final determination of significance and eligibility to the NRHP under Criterion C.



**Figure 6.** Site 32MH473 bank barn, June 14, 2019, facing east (IMG\_1901.jpg).

**32WD2462 (WD-040)***Description*

The property is located outside the direct APE and, as such, there was no access to this property (Figure 25). The following description is based on visible features from public roads and from information provided by the Ward County Assessor Records.

The site is an outdoor storage area and warehouse yard with two historic warehouses (ca. 1930-1945) and a third non-historic gable roof warehouse likely built after the 1970s (Figure 7). It is situated northeast of the historic Truax-Traer Company Velva Mine (32WDx588), a lignite strip mine which was active beginning in 1927 and changed hands in 1962. The site is currently scattered with farm equipment. Due to its association with lignite strip mining, the surrounding terrain is distinctive, with ribs and ridges of clearly recognizable spoil piles and spotty tree growth, and it is especially striking on satellite imagery.

All historic buildings are metal framed with sheet metal sheathing and sheet metal roofs, and all retain original window openings, though many windows have been damaged or boarded. One vaulted-roof warehouse has a shed addition added after 1957-1962 (based on historic FSA aerial imagery) that is consistent in materials and design (Figure 8). The other is a twin vaulted-roof/gable-roof warehouse with halves that appear to have been constructed at roughly the same time; the gable-roof side presents evidence in its façade sheathing that its openings have been altered.

*Significance and Evaluation*

Based on their proximity to the historic Truax-Traer Company Velva Mine (32WDx588) and siting on a driveway that runs directly into the mine field, these warehouses may be former surface works associated with the mine. The Velva Mine was the third most productive contributor to North Dakota's fuel supply in the time period of study and extremely significant to North Dakota's coal mining history (Hess et al. 1992:53). Should further evaluation definitively make this connection, site 32WD2462 could be considered eligible to the NRHP under Criterion A as associated with a significant event in history.

The warehouses represent a significant and distinguishable entity whose components may lack individual distinction reflecting the character of early (ca. 1930-1945) metal utilitarian buildings furnishing a remote strip mine. Therefore, within the context of its setting and association in mining territory and due to their good integrity and characteristics, 32WD2462 is potentially eligible under Criterion C.

*Recommendation*

Despite the shed addition to one warehouse, this site is thought to be potentially eligible for the NRHP, as the collective site presents a utilitarian landscape of supporting surface works to the historically significant Truax-Traer Company Velva Mine (1927-1962). Further research is needed to fully investigate this property and make a final determination of significance and eligibility to the NRHP under Criteria A and C.



**Figure 7.** Site 32WD2462, June 14, 2019, looking south (crop of IMG\_1993.jpg).



**Figure 8.** Site 32WD2462 warehouse, June 14, 2019, looking north (IMG\_1988.jpg).

**32WD2463 (WD-054)***Description*

The property is located outside the direct APE and, as such, there was no access to this property (Figure 25). The following description is based on visible features from public roads and from information provided by the Ward County Assessor Records.

The site consists of one historic building, a raised-basement gambrel roof barn (ca. 1915-1930) with appropriate foundation, siding, and roof materials (whitewashed concrete, wood painted red, and metal). All visible windows appear to be original. It has exceptional integrity of materials, workmanship, and design (Figure 9). Modern outbuildings sit to the northeast of the barn, and a farmhouse of new construction is located north of those across the driveway. The yard also has modern grain bins.

*Significance and Evaluation*

Based on the pedestrian survey, 32WD2463 embodies the distinctive nature of a North Dakota raised-basement gambrel roof barn, presenting an excellent, unaltered example using period-appropriate materials. Therefore, due to its good integrity, 32WD2463 is recommended eligible under Criterion C.

*Recommendation*

This property is thought to be potentially eligible for the NRHP, as it is an intact, unmodified example of a barn with important architectural elements (raised basement, gambrel roof). Further research is needed to fully investigate this property and make a final determination of significance and eligibility to the NRHP under Criterion C as a distinctive characteristic of a type, period, or method of construction.



**Figure 9.** Site 32WD2463 barn, June 14, 2019, looking west-northwest (IMG\_2045.jpg).

**32WD1590 (WD-075a)***Description*

The property is located just outside of the indirect APE and, as such, there was no access to this property (Figure 25). The following description is based on visible features from public roads and from information provided by the Ward County Assessor Records.

The site consists of one historic building: Hope Lutheran Church, a rural vernacular Gothic Revival church (ca. 1900-1915). It is associated with the Hope Lutheran Cemetery (32WDx770), which is located in the indirect APE, situated 0.8 miles to the southeast. The church has a gable roof, bell tower with a bellcast pyramid roof, stone or brick foundation, and wood siding painted white. Its strongest Gothic Revival inflection can be seen in the fenestration on its side (north and south) façades: a total of ten three-pointed arch windows with simple intersecting tracery, adapted with rectangular sashes for ventilation (Figures 10 & 11). Historically inappropriate alterations to the building include half-glass, two-panel entry doors, the addition of modern gutters, and asphalt shingles on the tower steeple. The church is situated in a grass field with an unpaved driveway and parking area, surrounded in all directions by farmland.

*Significance and Evaluation*

Based on the pedestrian survey, 32WD1590 embodies the distinctive nature of a rural vernacular Gothic Revival church with superficial alterations to its historic fabric. Therefore, due to its good integrity, 32WD1590 is recommended eligible under Criterion C. Research into the history of the church and its importance to the rural community of Sawyer may also reveal significance to local history that supports eligibility for Criterion A as well.

*Recommendation*

This property is thought to be potentially eligible for the NRHP, as it is a good example of a vernacular Gothic Revival church. Further research is needed to fully investigate this property and make a final determination of significance and eligibility to the NRHP under Criterion A for significance to historical events and Criterion C as a distinctive characteristic of a type, period, or method of construction.



**Figure 10.** Site 32WD1590 church, June 14, 2019, looking southwest (IMG\_2169.jpg).



**Figure 11.** Site 32WD1590 church, June 14, 2019, looking south (IMG\_2171.jpg).

**32WDx747 (WD-077)***Description*

The property is located outside the direct APE and, as such, there was no access to this property (Figure 25). The following description is based on visible features from public roads and from information provided by the Ward County Assessor Records.

The site, a historic farmyard, contains three historic features: a cross-gambrel stone farmhouse and a gambrel roof barn (ca. 1910-1915), as well as a wooden grain bin (ca. 1930-1945). The farmhouse was inaccessible during the pedestrian survey, but photos of its east and north façades exist from a previous Class III survey done in 2011 (Figure 12). These images show that the farmhouse is made of cut and mortared stone and wooden siding painted white. A shed addition on its northwest corner, possibly a boarded-in porch, is the only apparent change in its plan, based on aerial imagery from FSA (1957-1962). Its visible fenestration also appears to be original.

The barn is a raised basement gambrel roof barn with a large shed addition (Figure 13). Its raised basement is made of a mixture of stacked stone, mortared cut stone, concrete block, and poured concrete with evidence of significant in-fill and repair. The siding, made of wood and painted red, is in poor condition with several slats missing. During the pedestrian survey, roof material and condition were not visible. Access doors are missing and/or boarded, and the condition of the building makes at least one window opening indistinguishable from missing siding.

Though it was mostly concealed by trees, metal grain bins, and a stationary bus during the pedestrian survey, the gable roof grain bin was found to be wood-framed, wooden-shingled, wood-sided, and painted red. A sliding wooden access door on a track was observed on its east side. It appears to have a shed roof addition on its west side. It is likely sited on wooden beams or concrete to allow circulation. While the siding showed evidence of weathering, the circumstances of the pedestrian survey meant that fully assessing the condition of the grain barn was not possible.

The farmhouse is situated in the midst of heavy and historic tree growth. Metal grain bins associated with the historic farmyard are also present in the vicinity of the wooden grain bin. The barn is located in the middle of an empty field strewn with farming equipment and other odds and ends.

*Significance and Evaluation*

Based on the pedestrian survey, these three features represent the distinctive characteristics of early architecture on North Dakota farmyards at the turn of the 20th century. The barn and grain bin, while not eligible individually, support the significant and distinguishable feeling and association of a historic farmyard as a component part of the whole. For these reasons, 32WDx747 is recommended eligible for the NRHP under Criterion C.

*Recommendation*

This property is thought to be potentially eligible for the NRHP, as an excellent example of a historic farmyard with a farmhouse and outbuildings including a barn and wooden grain bin. Further research is needed to fully investigate this property and make a final determination of significance and eligibility to the NRHP under Criterion C as a distinctive characteristic of a type, period, or method of construction.



**Figure 12.** Site lead 32WDx747 farmhouse, photographed in 2011, looking southwest (non-BCA image; Engel 2011).



**Figure 13.** Site lead 32WDx747 gambrel barn, June 14, 2019, looking southeast (IMG\_2178.jpg).

**32ML1362 (ML-115)***Description*

The property is located outside the direct APE and, as such, there was no access to this property (Figure 25). The following description is based on visible features from public roads and from information provided by the McLean County Assessor Records.

The property consists of a grain elevator, commercial silos, and grain bins (ca. 1930-1963 and, if researched, possibly older) located directly south of the rail corridor (Soo Line) at the intersection of 29th St SW and Main St in Benedict, ND. It is a defining feature of the Benedict skyline (Figures 14 & 15). The grain elevator tower, painted on at least two sides with the word “FARMER’S,” has a monitor roof; adjoining offices and storage areas have shed and gable roofs. All parts of the building are sheathed in steel: standing seam or corrugated metal roofs and steel sheet siding. Some corrosion is apparent in the steel sheathing of the storage building on the southwest side. A chimney connected to the office is made of brick and is in a state of partial collapse caused by deteriorated cement. Original window openings are intact but most windows are missing, damaged, or replaced. The silos are framed with metal and clad with steel sheet sheathing. The historic materials are intact, but heavily corroded. The grain bins are also metal framed and sheathed with steel sheeting. Each has a conical roof, one of which is also heavily corroded. To the east of the historic grain elevator complex is another grain elevator and silos of modern construction.

*Significance and Evaluation*

The appearance of the word “FARMER’S” painted on the grain elevator suggests an affiliation with the Farmers’ Grain and Shipping Company (1902-1943) and the broad patterns of North Dakota railroad history (Schmidt and Vermeer n.d.:24). However, 32ML1362 cannot be firmly associated with such an event without further study and evaluation. Therefore, it cannot currently be considered eligible under Criterion A for an association with an event that is significant to North Dakota railroad history.

The grain elevator embodies the distinctive character of the farm industry’s architectural impact on a rural North Dakota railroad corridor. Of the three visible in a photograph from the State Historical Society of North Dakota dated 1963, only this grain elevator complex remains standing. Historically, grain elevators rising above the railroad corridors have defined the skyline of North Dakota towns (Schmidt and Vermeer n.d.:92). This one is no exception, as a striking feature in the character of the city of Benedict. Therefore, due to its good integrity and distinctive characteristics, 32ML1362 is recommended eligible under Criterion C.

*Recommendation*

This property is thought to be potentially eligible for the NRHP, as it possesses research potential for connections to North Dakota farming and railroad history and also presents an intact example of a historic grain elevator complex. Further research is needed to fully investigate this property and make a final determination of significance and eligibility to the NRHP under Criteria A and C.



Figure 14. Site 32ML1362 grain elevator, June 18, 2019, looking north (IMG\_2416.jpg).



Figure 15. Site 32ML1362 grain elevator, June 18, 2019, looking south (IMG\_2390.jpg).

**32ML949 (ML-130)***Description*

The property is located outside the direct APE and, as such, there was no access to this property (Figure 25). The following description is based on visible features from public roads and from information provided by the McLean County Assessor Records.

The site was surveyed due to existing 1998-9 records suggesting the presence of a historic building, the Church of the Nazarene, at 307 Main St in Benedict, ND. Records stated that the church had closed ca. 1970 and had been unused since then. Further research indicates that the building had a construction date of 1927 and that the congregation bought a new church in 1960, at which point the old one was abandoned (Sundbakken 1976). During the pedestrian survey, the lot was found to be empty, with the former footprint grown over with grass (Figure 16).

*Significance and Evaluation*

Because the building has been removed or destroyed, 32ML949 is ineligible for listing on the NRHP under any criteria.

*Recommendation*

The information available at this time suggests that the property is ineligible for the NRHP.



**Figure 16.** Empty site of 32ML949, June 18, 2019, looking west (IMG\_5002.jpg).

**32ML1363 (ML-134)***Description*

The property is located outside the direct APE and, as such, there was no access to this property (Figure 25). The following description is based on visible features from public roads and from information provided by the McLean County Assessor Records.

The site is a small Boomtown/False Front commercial building (ca. 1900-1915 or earlier) located at the northwest corner of Main St and 3rd Ave in Benedict, ND. Research indicates that this building was formerly the First State Bank, built ca. 1908, which went out of business in 1922. Its new owner adapted the building with glass-front windows in the 1920s and turned it into a general store (Sundbakken 1976).

The building has a concrete foundation and is entirely clad in metal sheathing, with the false front painted white with turquoise details and the rest of the building painted forest green (Figure 18). The roof is made of standing seam metal. It consists of two main parts: a commercial front and a rear addition. The façade has a decorative cornice made of pressed metal, a recessed entry with door, and display windows (Figure 17). A historic transom has been boarded through with painted plywood, and windows in other intact historic window openings have also been replaced. There is a chimney made of stacked bricks mortared around a metal pipe on its southeastern corner. To the rear is an empty concrete foundation that currently serves as outdoor storage but may have been the site of another addition or separate building in the past. Other buildings on the block, and the buildings on the all surrounding blocks, are commercial in nature. It is the only commercial building with historic potential in this area. The terrain is open and flat.

*Significance and Evaluation*

Based on the pedestrian survey, 32ML1363 embodies the distinctive nature of a Boomtown/False Front commercial building. Alterations to the windows have not significantly changed the look and feel of its character, and it presents an excellent example of its type using period-appropriate materials. Therefore, due to its good integrity, 32ML1363 is recommended eligible under Criterion C for its distinctive characteristic of a type, period, or method of construction.

*Recommendation*

Despite the replacement of original windows with new windows or plywood, this commercial building is thought to be potentially eligible for the NRHP, as it retains important architectural elements from its original style and period. Further research is needed to fully investigate this property and make a final determination of significance and eligibility to the NRHP under Criterion C.



**Figure 17.** Site 32ML1363 Boomtown/False Front commercial building, June 18, 2019, looking west-northwest (IMG\_2508.jpg).



**Figure 18.** Site 32ML1363 Boomtown/False Front commercial building, June 18, 2019, looking northwest (IMG\_2458.jpg).

**32ML947 (ML-151)***Description*

The property is located outside the direct APE and, as such, there was no access to this property (Figure 25). The following description is based on visible features from public roads and from information provided by the McLean County Assessor Records.

The property consists of a Gable Front, wood-frame residence, recorded in 1998-9 as Benedict's "Old Methodist Church," since converted into a single-family dwelling (Figures 19 & 20). FSA aerial imagery from 1957-1962 shows that the building has been at this site, unaltered in plan, for at least 57 years. Constructed with two rooflines, it has a 1-story gable at the north (front) of the house and a 1.5-story gable at the back (south). The north gable has asphalt shingles, while the south gable has wooden shingles. The building's foundation is concrete block or cut stone. Framed with wood, it is sided with heavily weathered composition board. A photograph from 1998-9 show that the fenestration has been altered in at least two places, changing the original entry door to a window and a window on the northern (front) façade into the new entry. Most, if not all, original windows appear to have been replaced.

*Significance and Evaluation*

Although this building remains in its original setting, its integrity is poor: window openings have changed, original windows have been replaced, a new entry has been established, and most importantly, it bears no architectural clues to suggest its original function as a Methodist church. The conversion to a private residence has fundamentally interfered with its integrity of design, feeling, and association, and as a residence, it shows no historic merit as an architectural representative of a particular type or style. For these reasons, at this time, 32ML947 is recommended ineligible for the NRHP under any criteria, and further research would be needed to establish future eligibility.

*Recommendation*

The information available at this time suggests that the property is ineligible for the NRHP.



Figure 19. Site 32ML947 ineligible residence, June 18, 2019, looking southeast (IMG\_2533.jpg).



Figure 20. Site 32ML947 ineligible residence, June 18, 2019, looking east (IMG\_2525.jpg).

**32ML946 (ML-169)***Description*

The property is located outside the direct APE and, as such, there was no access to this property (Figure 25). The following description is based on visible features from public roads and from information provided by the McLean County Assessor Records.

The site is a vernacular Gothic Revival church. Research suggests its construction dates to 1954 (Sundbakken 1976). It is located at the northwest corner of Highway St and 4th Ave in Benedict, ND (Figure 21). The gable roof church has a bell tower with a pyramidal roof and a non-historic gable roof addition on its southwest side. The church foundation is in excellent condition, appearing to be concrete or stone with plaster/stucco applied and painted slate blue. Siding is white vinyl, and the roof is asphalt shingle, neither of which are historically appropriate. Modern gutters have been attached to the building. Its fenestration mainly consists of Gothic Revival arched windows filled in with glass blocks and a semicircular transom light on the non-historic addition. Three basement-level windows are visible in the foundation on the south façade with a fourth on the west (rear) façade (Figure 22). All appear to be 6/6 single-hung windows appropriate in appearance and style.

The church shares the east side of this block with new construction built to its north within the last ten years, and a tree line separates the two buildings. The church faces a residence and open farmland across Highway St to the east.

*Significance and Evaluation*

Based on the pedestrian survey, in spite of its historic setting and location, the integrity of the church has been significantly impacted by the use of modern materials and design. The gable roof rear side addition is of incompatible design and likely dates to the 1970s or 1980s. The glass block windows noted throughout the church, used in the Gothic Revival pointed arch windows as a substitute for stained glass, may date to its construction in the 1950s, but the popularity of this material in the latter half of the 20th century suggests it could date to the same era of the church addition. Modern siding and roofing also impact the integrity of workmanship. While the church embodies the distinctive nature of a vernacular Gothic Revival church likely dating from Benedict's founding, its material integrity is poor, and further investigation is needed to determine the nature of its updates. Therefore, site 32ML946 is recommended ineligible under Criterion C.

*Recommendation*

The information available at this time suggests that the property is ineligible for the NRHP.



**Figure 21.** Site 32ML946 ineligible church, June 18, 2019, looking northwest (IMG\_2584.jpg).



**Figure 22.** Site 32ML946 ineligible church, June 18, 2019, from rear, looking northeast (IMG\_2585.jpg).

## Viewshed Analysis

### *Analysis Background*

#### *Viewshed Analysis*

A viewshed analysis is a digital computer rendering of the visual effect that a specific location will have on the surrounding landscape. Using the parameters set within the computer program, the results depict areas deemed visible and not visible from a pre-determined location.

The analysis is generated on a computer using an ArcGIS mapping program (specifically the Spatial Analysis tool). The Geographic Information Systems (GIS) Analyst inputs three key pieces of information: (a) the height of the observer at the observer points, (b) the height of the target, and (c) terrain. The terrain is configured by using a 10-m Digital Elevation Model (DEM) which consists of terrain elevation values, split into cells with 10-m sides, void of any vegetation or man-made features and is often referred to as a “bare-earth” model (Miller 2011:16; USGS 2012). The Spatial Analysis tool uses the aforementioned information to create the digital rendering of the projected visual effect on the landscape.

If available, a digital surface model (DSM) derived from Light Detection and Ranging (LiDAR) data can be utilized in place of a DEM. LiDAR is a survey method that uses a laser to measure variable distances to the Earth’s surface, which generate precise and detailed terrain models (National Ocean Service 2015). “Since the accuracy of the data determines the quality of the model, the technique used to acquire the model’s data constitutes a significant factor in the model’s accuracy” (Miller 2011:16). However, data of this type was not available for this particular project.

In a viewshed analysis, the direct line of sight (LOP) and several variable factors can determine whether an object will be visible from a given location. The LOS variable factors include the terrain, the presence of features (e.g., vegetation or manmade structures), the observer’s visual acuity, the curvature of the earth, atmospheric refraction (i.e., horizon or skyline), air quality (e.g., haze from a fire), and time of day (e.g., shadows) (Environmental Systems Research Institute [ESRI] 2016). “It is important to take these factors into account with assessing visual impacts through a viewshed analysis” (ESRI 2016).

Viewshed analyses are used by individuals, companies, agencies, and others who are looking to understand the visual impact a particular object might have on its surrounding landscape. This helps companies plan each project component’s placement and adjust for any potential negative visual impacts. Visual impacts ranged in scale from negligible to dominant. Viewshed analyses can also be used by government agencies and consulting parties as an aid in determining whether or not to approve certain proposed projects.

### *Digital Viewshed Methods*

Utilizing ArcGIS 10.6.1, BCA placed observer points (i.e., potentially eligible architectural sites) into the Spatial Analyst tool. For the viewshed analysis, BCA ran an elevation raster based viewshed analysis utilizing 590.5’ (180 m) as the maximum target height for the proposed wind turbines which are planned for the Ruso Wind Project. These points were then analyzed in relation to the surrounding landscape and the locations of the architectural sites determined eligible for the NRHP.

### *Results of Viewshed Analysis*

Beaver Creek Archaeology, Inc. conducted a viewshed analysis for the proposed construction of the Ruso Wind Project. The proposed wind turbines were analyzed using the average (eye level) height of a person 6’ tall. Using the parameters set within the ArcGIS program, the results depict the area deemed to be visible (green) and not visible (red) from the predetermined location (see Figure 26).

The surrounding area is presently used for agricultural production, livestock grazing, wildlife habitat, housing, and commerce. Previous disturbances located within a 2-mile radius of the proposed Ruso Wind Project include agricultural fields, farmsteads, fence lines, overhead electric lines, gravel roads, paved roads, abandoned coal strip mines, a railroad, two wind farms (the New Frontier and the Prairie Winds ND 1), and the town of Benedict.

Figure 26 illustrates a general viewshed analysis from the proposed Ruso Wind Project using a 10-m DEM not taking into account environmental factors such as tree vegetation. Utilizing the height of a person 6' tall at the potentially eligible architectural sites, the map indicates that seven of the nine architectural sites deemed potentially eligible for the NRHP would have a view of the Ruso Wind turbines as indicated by each green diamond. One site (32MH474) and one site lead (32WDx747) would not have a view of the Ruso Wind Project as indicated by each red diamond. Figure 26 also illustrates that most of the area within 2-miles of the proposed Ruso Wind Project would be able to see the wind turbines, as indicated by the green areas. Low drainage areas and densely vegetated area, indicated by red areas, would not have a view of the wind turbines.

In addition to generating a viewshed analysis for the proposed Ruso Wind Project, viewshed analyses were also created for the two existing wind farms located on either side of the proposed project. The viewshed analysis results indicate that eight of the nine architectural sites of concern for this survey currently have a view of the existing New Frontier wind farm located to the southeast of the proposed Ruso Wind Project, while one site lead (32WDx747) has an obstructed view of the existing wind turbines (see Figure 27). Additionally, the results suggest that three of the nine architectural sites of concern for this survey have a view of the existing Prairie Winds ND 1 wind farm located to the northwest of the proposed Ruso Wind Project. Six sites (32WDx747, 32WD2463, 32ML1362, 32MH472, 32MZ473, and 32MH474) have an obstructed view of the existing wind turbines (see Figure 28). Based on these digital viewsheds, eight of the nine potentially eligible architectural sites have at least one view of the existing wind turbines. Site 32WDx747 is the exception, which does not appear to currently have a view of either wind farm.

Adding vegetation to the viewshed model would typically create a more accurate representational rendering of visible/not visible areas. However, the vast majority of vegetation that would obscure visibility in the analysis area consists of shelterbelts surrounding farmsteads, which are located close enough to the structures/buildings to block the view of the wind turbines. However, vegetation in drainages and on hill slopes and would not significantly alter the view from the proposed project area, as the wind turbines would be visible over the tree top vegetation. As such, adding vegetation to the viewshed model would not significantly alter the viewshed results, except around well sheltered farmsteads. Nevertheless, shelterbelt vegetation was included in the modeling around the nine architectural sites deemed potentially eligible for the NRHP.

It is important to note, one limiting factor in the virtual viewshed analysis is that it only shows the reviewer if a portion of the wind turbine is visible or not from an observation point, but does not indicate the extent to which each wind turbine is visible. In some cases, only the blade tips would be visible.

As mentioned in the Analysis Background, several factors besides direct LOS can determine whether an object will be visible from a given location in a viewshed analysis. For the Ruso Wind Project, these factors include the topography, tree vegetation, existing power lines and structures located between architectural sites deemed potentially eligible for the NRHP and the proposed project, the size and color of the wind turbines, the volume of traffic near the project, the observer's visual acuity, the curvature of the earth, atmospheric refraction, air quality, time of day, and time of year.

In fact, the farther an observer gets from an object, the smaller it appears, and the less an observer can see of the object. Utilizing photographs taken from an existing wind farm located in South Dakota at set distances, the figures below (Figure 23a & b) illustrate the impact distance has on the apparent size of a wind farm at a close distance (2.04 miles; Figure 23a) and at a distance farther away (16.35 miles; Figure 23b). Figure 28 indicates the results using this model for the visual impact of the Ruso Wind Project. Figure 29 illustrates the results of using this model for the visual impact of the existing wind farms.



**Figure 23a & b.** A wind farm silhouetted against the skyline at (a) a close distance at 2.04 miles and at (b) a distance farther away at 16.35 miles, which illustrates the effect distance has on the size of a wind facility. This is a wind farm located in South Dakota.

Looking to the Sinclair-Thomas Matrix model, and applying it to the Ruso Wind Project, in an ideal setting, under optimal viewing conditions (e.g., flat ground, clear skies, and little vegetation), the proposed wind farm would not be visible at distances greater than 47.17 miles (*negligible or no impact*). The proposed impact threshold distances suggest that the wind farm project would be visible to the unaided eye at a distance of approximately 35.24 miles (*suggested radius zone of visual impact analysis*). At approximately 31.83 miles, the wind farm project would have a *low visual impact*, becoming noticeable components in the overall landscape. At approximately 20.08 miles, the wind farm project would have a *moderate visual impact*, with components becoming more distinct. At approximately 8.90 miles, the wind farm project would have a *major impact due to the proximity*, capable of dominating the landscape. Finally, the wind farm project would have a *dominant impact* due to the large scale, movement, and proximity at distances up to approximately 4.74 miles.

Additional support to this model is supplied by the Sinclair-Thomas Matrix (see Table 3), which has been converted and applied to this project and illustrates similar results (see Figure 29).

**Table 3.** The Sinclair-Thomas Matrix applied to a 590.5' wind turbine (Sullivan et al 2012: Table 1).

Descriptors	Approximate Distance Range
Dominant impact due to large scale, movement, and proximity	0-4.74 mi
Major impact due to proximity; capable of dominating landscape	4.74-8.90 mi
Clearly visible with moderate impact; potentially intrusive	8.90-14.21 mi
Clearly visible with moderate impact; becoming less distinct	14.21-20.08 mi
Less distinct; size is reduced, but movement still is discernible	20.08-25.95 mi
Low impact, movement noticeable in good light; becoming noticeable components in the overall landscape	25.95-31.83 mi
Becoming indistinct with negligible impact on the wider landscape	31.83-41.11 mi
Noticeable in good light, but negligible impact	41.11-47.17 mi
Negligible or no impact	47.17 mi
<b>Suggested radius for zone of visual impact analysis</b>	<b>35.24 mi</b>

*Method of Conversion-* assuming the following items: (a) Maximum height of wind turbine is 311.7 Feet, (b) Maximum height of a wind turbine at the Ruso Wind Project is 590.5 Feet, and (c) one Mile equals 5,280 Feet; then using the maximum height of the wind turbine (in Feet) as the divisor and the maximum distance in question from the wind turbine (in Feet) as the dividend the quotient is obtained. The quotient of the known variables is then applied to the known divisor (the maximum height of the wind turbine) for which the equivalent maximum distance in question. In order to obtain the equivalency, the known divisor is multiplied by the solved for quotient, thus yielding the maximum distance trying to be solved. Finally, the result is converted into Miles by taking the maximum distance yielded (in Feet) as the divisor and 5,280 Feet as the dividend subsequently yielding the maximum distance in Miles.

Sullivan et al. (2012) conducted a visual impact study, sponsored by the Bureau of Land Management (BLM), at five wind facilities in the open landscapes of the western United States. The methodology for their study included a combination of field-based observations and geospatial analysis utilizing various distances under different lighting and atmospheric conditions (Sullivan et al. 2012:14). The average height of the wind turbines was approximately 328.1'. The study used a rating scale based on the visual contrast rating of the BLM's visual resource management (VRM) system, which "provides a means of systematically describing and evaluating potential impacts on the visual integrity and scenic qualities of affected landscapes" (Sullivan et al. 2012:7, 16). Table 4, below, provides the visibility rating (VR) form instructions utilized by the observers of the Sullivan et al. (2012) study.

**Table 4.** Visibility rating form instructions used to rate visibility of wind facilities (Sullivan 2012: Table 2).

Visibility Rating	Description
<b>VISIBILITY LEVEL 1:</b> <i>Visible only after extended, close viewing; otherwise invisible.</i>	An object/phenomenon that is near the extreme limit of visibility. It could not be seen by a person who was not aware of it in advance, and looking for it. Even under those circumstances, the object can only be seen after looking at it closely for an extended period of time.
<b>VISIBILITY LEVEL 2:</b> <i>Visible when scanning in general direction of study subject; otherwise likely to be missed by casual observer.</i>	An object/phenomenon that is very small and/or faint, but when the observer is scanning the horizon or looking more closely at an area, can be detected without extended viewing. It could sometimes be noticed by a casual observer; however, most people would not notice it without some active looking.
<b>VISIBILITY LEVEL 3:</b> <i>Visible after brief glance in general direction of study subject and unlikely to be missed by casual observer.</i>	An object/phenomenon that can be easily detected after a brief look and would be visible to most casual observers, but without sufficient size or contrast to compete with major landscape elements.
<b>VISIBILITY LEVEL 4:</b> <i>Plainly visible, could not be missed by casual observer, but does not strongly attract visual attention, or dominate view because of apparent size, for views in general direction of study subject.</i>	An object/phenomenon that is obvious and with sufficient size or contrast to compete with other landscape elements, but with insufficient visual contrast to strongly attract visual attention and insufficient size to occupy most of the observer's visual field.
<b>VISIBILITY LEVEL 5:</b> <i>Strongly attracts visual attention of views in general direction of study subject. Attention may be drawn by strong contrast in form, line, color, or texture, luminance, or motion.</i>	An object/phenomenon that is not of large size, but that contrasts with the surrounding landscape elements so strongly that it is a major focus of visual attention, drawing viewer attention immediately, and tending to hold viewer attention. In addition to strong contrasts in form, line, color, and texture, bright light sources (such as lighting and reflections), and moving objects associated with the study subject may contribute substantially to drawing viewer attention. The visual prominence of the study subject interferes noticeably with views of nearby landscape elements.
<b>VISIBILITY LEVEL 6:</b> <i>Dominates view because study subject fills most of visual field for views in its general direction. Strong contrasts in form, line, color, texture, luminance, or motion may contribute to view dominance.</i>	An object/phenomenon with strong visual contrasts that is of such large size that it occupies most of the visual field, and views of it cannot be avoided except by turning the head more than 45 degrees from a direct view of the object. The object/phenomenon is the major focus of visual attention, and its large apparent size is a major factor in its view dominance. In addition to size, contrasts in form, line, color, and texture, bright light sources, and moving objects associated with the study subject may contribute substantially to drawing viewer attention. The visual prominence of the study subject detracts noticeably from views of other landscape elements.

The results of visual impact thresholds provided by the visibility ratings and made available by the Sullivan et al. study, under optimal viewing conditions, have been converted and applied to this proposed project and illustrate similar results (Figure 24).

IMPACT RANGE	DESCRIPTOR, DISTANCE	AVERAGE VISIBILITY RATING
↑ Not Visible	<b>Limit of Visibility (64.8 mi)</b>	VR=1 <i>“Near the extreme limit of visibility”</i>
↓ No Impact		
↓ Minimal Impact	<b>Suggested Limit of Analysis (54 mi)</b>	VR=2 <i>“Visible when scanning”</i>
↓ Low Impact		
↓ Low Impact	<b>Limit of Casual Visibility (36 mi)</b>	VR=3 <i>“Unlikely to be missed by casual observer”</i>
↓ Moderate Impact		
↓ Moderate Impact	<b>Visual Impact in Most Settings (25.2 mi)</b>	VR=4 <i>“Moderate impacts for sensitive viewers”</i>
↓ High Impact		
↓ High Impact	<b>Limit of Visual Preeminence (18 mi)</b>	VR=5 <i>“A major focus of visual attention”</i>
↓ High Impact		
↓ High Impact	<b>Major Visual Impact (7.2 mi)</b>	VR=6 <i>“A major focus of visual attention that occupies much of the observer’s field of view”</i>

**Method of Conversion-** assuming the following items: (a) Maximum height of wind turbine is 328.1 Feet, (b) Maximum height of a wind turbine at the Ruso Wind Project is 590.5 Feet, and (c) one Mile equals 5,280 Feet; then using the maximum height of the wind turbine (in Feet) as the divisor and the maximum distance in question from the wind turbine (in Feet) as the dividend the quotient is obtained. The quotient of the known variables is then applied to the known divisor (the maximum height of the wind turbine) for which the equivalent maximum distance in question. In order to obtain the equivalency, the known divisor is multiplied by the solved for quotient, thus yielding the maximum distance trying to be solved. Finally, the result is converted into Miles by taking the maximum distance yielded (in Feet) as the divisor and 5,280 Feet as the dividend subsequently yielding the maximum distance in Miles.

**Figure 24.** The proposed impact distances for the planned Ruso Wind Project. The figure is modified from the Sullivan et al. study (2012:40).

The Sinclair-Thomas Matrix was created from observations of wind turbines located in Wales within the United Kingdom and the Sullivan et al. (2012) study was created from observations of wind turbines in the open landscapes of the western United States.

## Conclusion and Recommendation

The Proponent has proposed the construction of the Ruso Wind Project in Ward and McHenry Counties, North Dakota on private property. In order to accomplish this, the Proponent hired BCA to complete a cultural resource inventory including a Class I literature search, a Class III intensive cultural resource inventory and report, and a Class II architectural inventory and report for submittal to the PSC and North Dakota SHPO.

The Class III intensive cultural resource inventory as well as an addendum have already been completed along with the Class III cultural resource report and report addendum (see MS# 18230 & 18439). The reports received concurrence from the North Dakota SHPO on February 12, 2019 and July 9, 2019 respectively.

This report reflects the results and findings of the Class II architectural inventory of structures within a 2-mile radius of the proposed wind project in Ward, McHenry, and McLean Counties, North Dakota. The Class II inventory of the indirect APE was conducted on June 14 and June 18, 2019. The inventory consisted of a review of 174 locations including 10 locations with no remaining standing structures (one of which was previously recorded as a church), 50 modern locations, 103 locations deemed ineligible, and 12 locations which required architectural historical review (including the previously recorded church that has since been removed). Of these 12 sites, nine were ultimately recommended as potentially eligible for the NRHP, two of which are located within the city limits of Benedict. The 12 sites (totaling 29 structures) that were reviewed for architectural historical potential, as well as their individual recommended eligibility, are shown in Table 5 below.

**Table 5.** Architectural Property Inventory.

SITS Number	Feature	Historic Name	Date Range	Recommended
32MH474	1	Dairy barn	1915-1930	Eligible
	2	Quonset	1945-1960	Component
	3	Storehouse	1915-1930	Component
	4	Grain bin	1915-1930	Component
	5	Grain bin	1915-1930	Component
32MH472	1	Farmhouse	1915-1930	Eligible
	2	Cattle shed	1945-1960	Component
	3	Quonset	1960-1975	Component
	4	Claim shack	1900-1915	Eligible
	5	Quonset	1945-1960	Component
	6	Grain bin	1960-1975	Component
	7	Grain bin (2)	1945-1960	Component
	8	Grain bin (2)	1945-1960	Component
	9	Grain bin	1960-1975	Component
32MH473	1	Bank barn	1915-1930	Eligible
32WD2462	1	Warehouse	1930-1945	Component
	2	Warehouse	1930-1945	Component
32WD2463	1	Raised basement barn	1915-1930	Eligible
32WD1590	1	Church	1900-1915	Eligible
32WDx747	1	Farmhouse	1900-1915	Eligible
	2	Raised basement barn	1900-1915	Component
	3	Grain bin	1900-1915	Component
32ML1362	1	Grain elevator	1930-1945	Eligible
	2	Grain silo (3)	1945-1960	Component
	3	Grain bin (2)	1960-1975	Component
32ML949		Removed building		Not Eligible
32ML1363	1	False Front commercial	1900-1915	Eligible
32ML947	1	Residential house	1915-1930	Not Eligible
32ML946	1	Church	1945-1960	Not Eligible

A viewshed analysis was generated to determine what visual effects the proposed Ruso Wind Project would have on the nine potentially eligible architectural sites as well as to identify the existing visual effects from the New Frontier and Prairie Winds ND 1 wind farms. Through the use of a viewshed analysis, it was established that the proposed Ruso Wind project would be visible from the majority of the architectural sites deemed potentially eligible, with the exception of 32WDx747 (Figure 26). Based on the modeling for the existing wind farms, each of the architectural sites currently have a view of either one or both of the wind farms, with the exception of 32WDx747 (Figures 27 & 28). As such, site 32WDx747 (an abandoned farmstead) was determined to have no visual impacts from any windfarm, existing or proposed.

Conducting a visual impact analysis to the proposed Ruso Wind Project by utilizing the Sinclair-Thomas Matrix model indicates that the wind farm will visually dominate an area 4.74 miles from the wind turbines (Figure 29). A visual impact analysis was also applied to the existing New Frontier and Prairie Winds ND 1 wind farms, which indicated that both existing wind farms also have dominant or major impacts to the area (Figure 30).

Results of the viewshed analysis combined with the visual impact analysis indicate that the proposed Ruso Wind Project will not add significant visual impacts to the surrounding area or to the architectural sites deemed potentially eligible, as the any impacted view has already been affected by the existing wind farms.

Moreover, prior to the current three-bladed wind turbines used to generate electricity, many people in the area used windmills to generate power. Windmills are machines operated by the wind to create energy that is used to pump water, mill grain, and produce power among other tasks. American windmills were initially made of wood and later were built using metal. They are extensively located on farms and ranches across each county, North Dakota, and throughout the United States. Wind turbines constitute the progression of the windmill, though they are larger in scale both in terms of size and quantity in a given localized area. Wind turbines produce large amounts of power (i.e., electricity) for several properties/locations, unlike windmills which are employed for the sole purpose of a select property/location. Because windmills are commonly found within and around the proposed wind farm project area, the proposed wind turbines will not be a completely unusual site. Additional visual impacts to the area consist of overhead power lines, transmission line towers, and communication towers.

The utilization of the Sinclair-Thomas Matrix and the Sullivan et al. (2012) study in addition to calculating the visual impact distances for larger wind turbines provides an estimated visual impact assessment for the proposed project. Though the findings of this study can be useful in assessing a project's potential visual impacts, it is important to realize limitations of the virtual viewshed analysis. It is imperative to note that an analysis only can indicate whether one could see any portion of a project component from a given observation point, but does not indicate the extent to which each component is visible.

Moreover, the Sinclair-Thomas Matrix is based on data gathered from wind farms in Wales where there is more open space and less tree vegetation than North Dakota. Similarly, the Sullivan et al. study collected data from wind farms in Wyoming and Colorado where the landscape is open and also contains less tree vegetation than North Dakota. Because both studies were based in areas with open landscapes and minimal tall vegetation, the visual impact was likely determined to be greater and was determined to be visible at farther distances than what we should expect in North Dakota. Furthermore, the landscape around the proposed Ruso Wind Project contains hills, drainages, and some vegetation, which affect visual impacts. Accordingly, due to the terrain and tree vegetation observed within the project area, the visual impact and viewing distances would potentially be less significant than what the Sinclair-Thomas Matrix and Sullivan et al. (2012) studies would indicate.

The current inventory identified nine architectural sites that are recommended potentially eligible for the NRHP, provided a viewshed analysis of the proposed Ruso Wind Project as well as a viewshed analysis of the two existing wind farms, and provided a visual impact assessment of the project area. The eight potentially eligible architectural sites are already visually effected by the existing wind farms and as such, the addition of the Ruso Wind Project would not significantly add visual impacts to these sites. Site 32WDx747 is not currently impacted by the existing wind farms and will not be impacted by the proposed Ruso Wind Farm. Consequently, BCA recommends *No Adverse Effect to the Visual Setting*.

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**Appendix A: Maps**



**Ruso Wind Project Architectural Survey**

Ruso Wind Partners, LLC

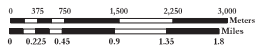
- Legend**
- Survey Area Limit (500 feet)
  - 2,000 Foot Buffer
  - Submerged Boundary
  - Rights/Unsubmerged
  - Rights
  - Unsubmerged (at least)

T151N R80W, T151N R81W,  
T151N R82W, & T152N R81W

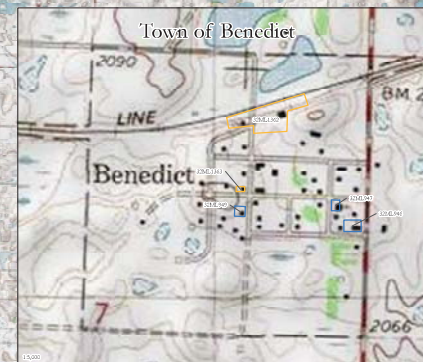
Benedict, Benedict SW,  
Benedict NW, Robinson Coulee,  
& Blacktail Coulee Quad. Maps

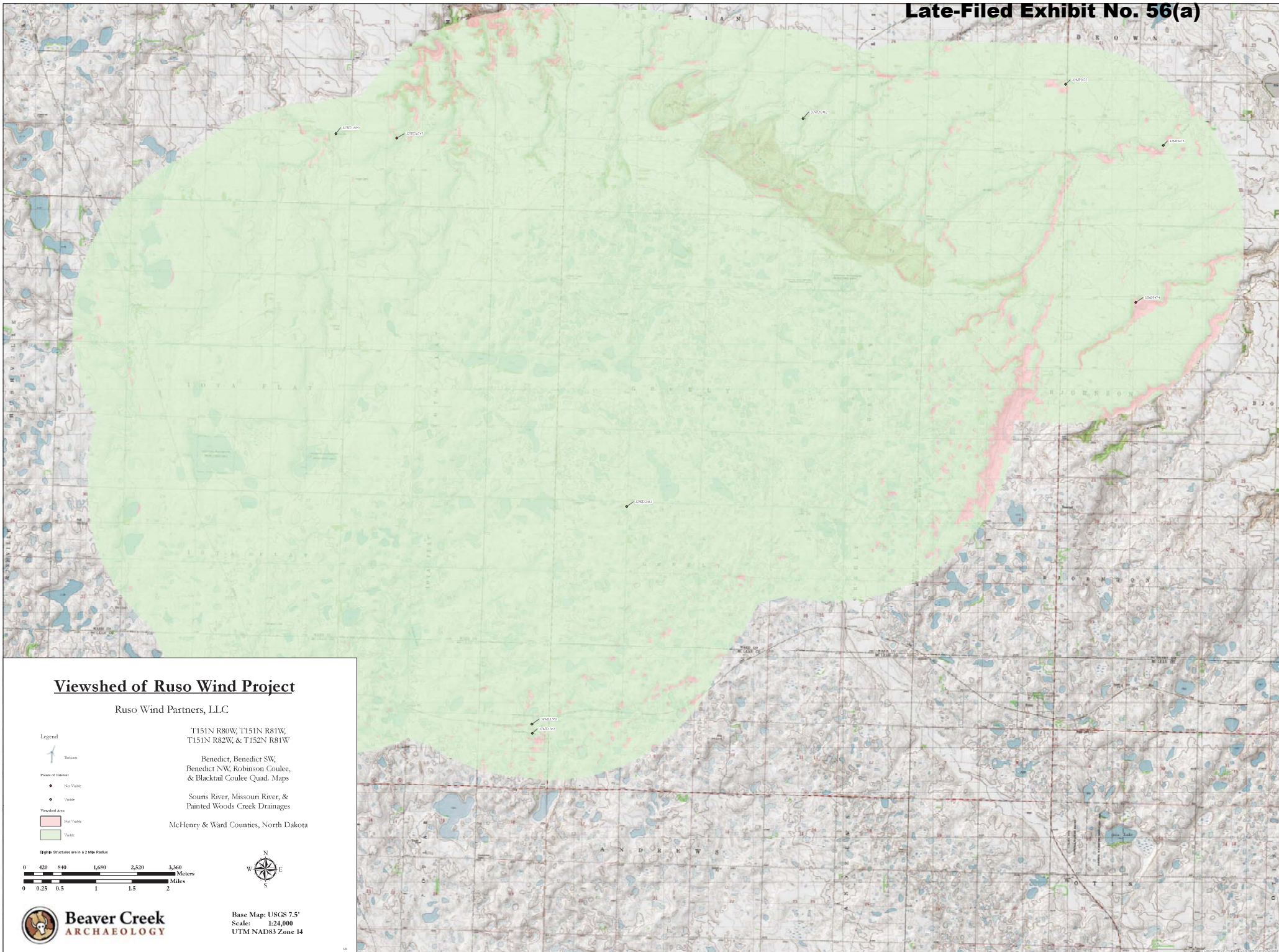
Souris River, Missouri River,  
& Painted Woods Creek Drainages

McHenry & Ward Counties, North Dakota



Base Map: USGS 7.5'  
Scale: 1:24,000  
UTM NAD83 Zone 14





### Viewshed of Ruso Wind Project

Ruso Wind Partners, LLC

T151N R80W, T151N R81W,  
T151N R82W, & T152N R81W

Benedict, Benedict SW,  
Benedict NW, Robinson Coulee,  
& Blacktail Coulee Quad. Maps

Souris River, Missouri River, &  
Painted Woods Creek Drainages

McHenry & Ward Counties, North Dakota

Legend



Turbine

Points of Interest



Hot/Visible



Visible

Viewshed Area

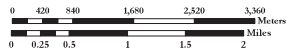


Not Visible

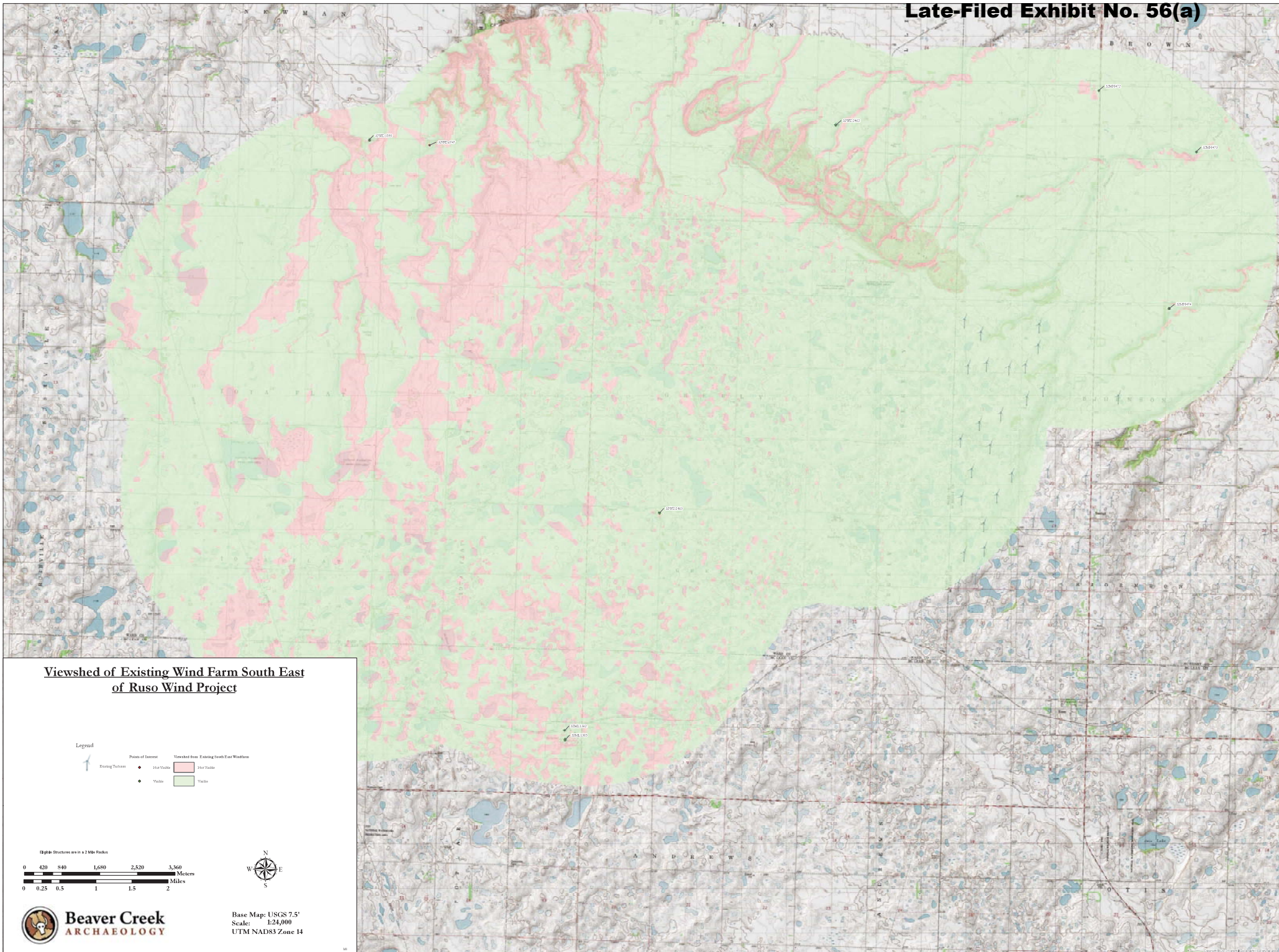


Visible







Height Structures are in a 2 Mile Radius

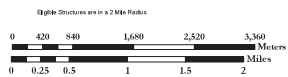


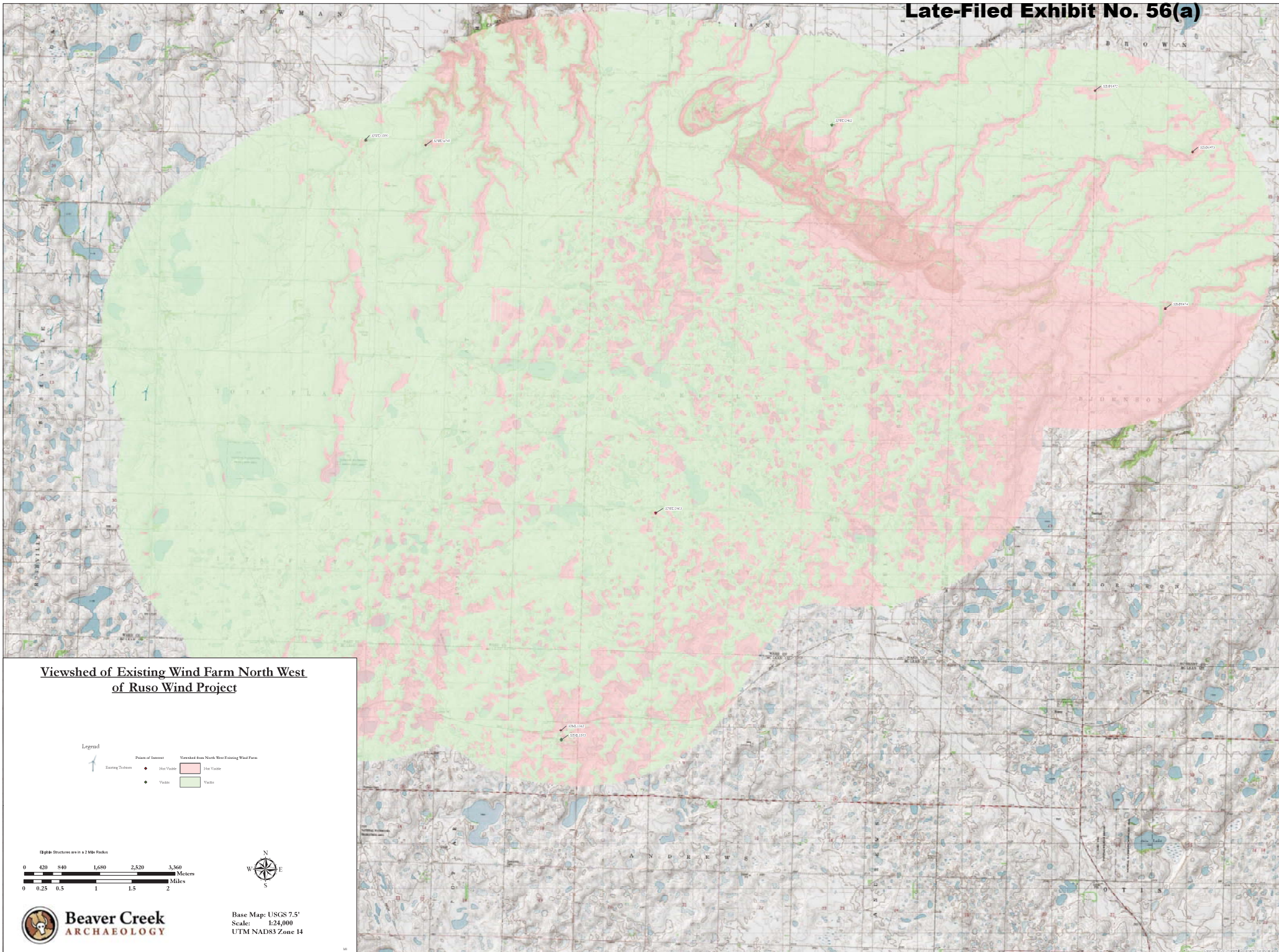
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Scale: 1:24,000  
UTM NAD83 Zone 14









**Viewshed of Existing Wind Farm South East  
of Ruso Wind Project**

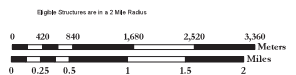
- Legend
- |   |  |  |
|---|--|--|
|  Existing Turbines |  Points of Interest |  Viewshed Area - Existing South-East Windfarm |
|  Star Valley       |  Yuba               |  Yuba   |

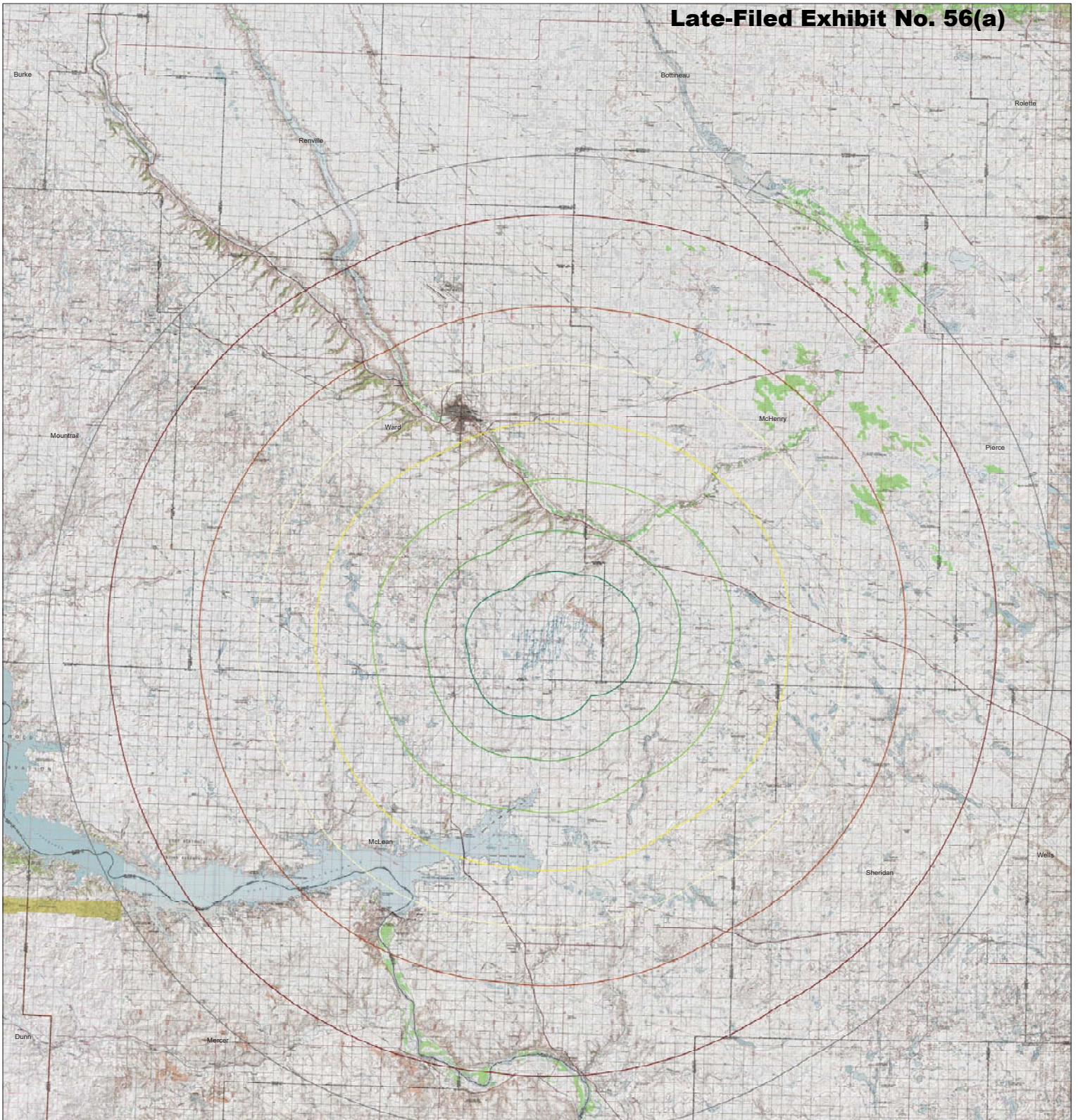




**Viewshed of Existing Wind Farm North West of Ruso Wind Project**

- Legend
- |  |  |   |
|--|--|---|
|  Existing Turbine |  Viewshed from Existing Wind Farm |  Viewshed from North West Existing Wind Farm |
|  Turbine          |  Viewshed                         |  Viewshed                                    |





### Ruso Wind Project Visual Impacts

Ruso Wind Partners, LLC

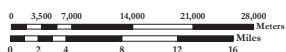
- Legend
- Visual Impact Zones
  - Zone 1 (0-10 Miles)
  - Zone 2 (10-15 Miles)
  - Zone 3 (15-20 Miles)
  - Zone 4 (20-25 Miles)
  - Zone 5 (25-30 Miles)
  - Project Area (1.5 Miles)

T151N R80W, T151N R81W,  
T151N R82W, & T152N R81W

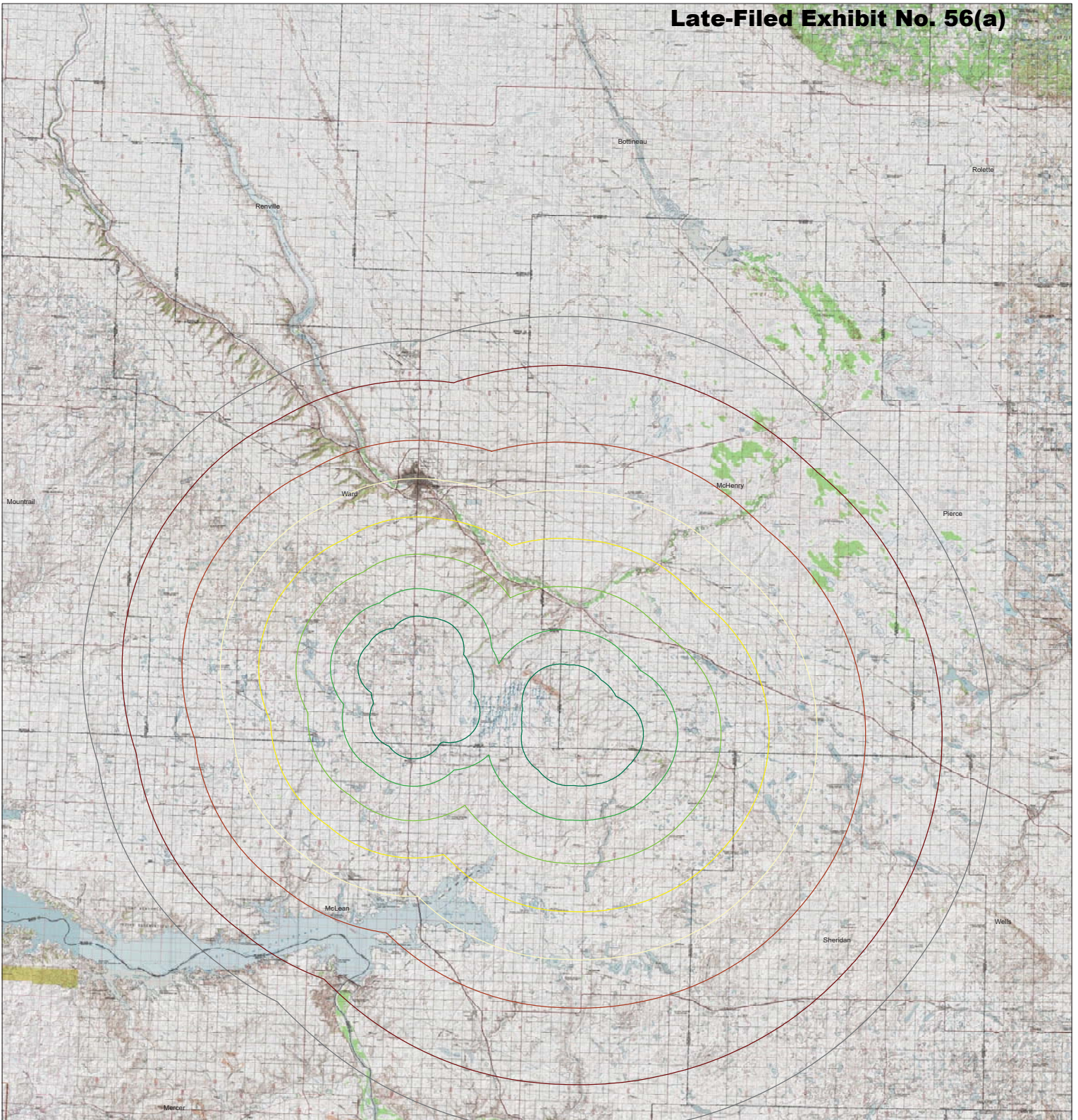
Benedict, Benedict SW,  
Benedict NW, Robinson Coulee,  
& Blacktail Coulee Quad. Maps

Sours River, Missouri River,  
& Painted Woods Creek Drainages

McHenry & Ward Counties, North Dakota



Base Map: USGS 7.5'  
Scale: 1:200,000  
UTM NAD83 Zone 14



### Existing Wind Farms Visual Impacts

Ruso Wind Partners, LLC

**Legend**

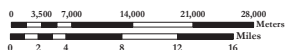
- Proposed River Tailwater
- Visual Impact Zones Existing Wind Farms**
- Disturbance Impact
- Minor Impact
- Periodically Intermittent
- Moderate Impact
- Large Disturbance
- Severe Impact
- Indistinct
- Negligible Impact

T151N R80W, T151N R81W,  
T151N R82W, & T152N R81W

Benedict, Benedict SW,  
Benedict NW, Robinson Coulee,  
& Blacktail Coulee Quad. Maps

Souris River, Missouri River, &  
Painted Woods Creek Drainages

McHenry & Ward Counties, North Dakota



Base Map: USGS 7.5'  
Scale: 1:200,000  
UTM NAD83 Zone 14



**Appendix B: Literature Search Results**

May 21, 2019

**REDACTED**

**Appendix C: Architectural Locations**

**REDACTED**