

Geronimo Prairie Rose Wind Farm Project

*A Phase Ia Literature Search Report
In Rock County, Minnesota*

For

**Geronimo Wind Energy,
Edina, Minnesota**

By

**Stephen Sabatke, M.A.
HDR Engineering, Inc.
701 Xenia Avenue South
Suite 600
Minneapolis , MN 55416
(763) 591-5400**

SHPO Project No: 2009-3187

March 19, 2010

Table of Contents

1.0	Introduction	1
1.1	SHPO Correspondence	1
1.2	Definition of Study Area	2
1.3	Regulatory Frame Work	2
2.0	Brief Environmental and Historic Context.....	2
2.1	Physio-graphic Region	3
2.2	Rock Formations	3
2.3	Hydrology	3
2.4	Flora and Fauna	3
3.0	Paleo-Environment Context.....	4
4.0	Brief Historic context.....	5
4.1	Recorded Archaeological Sites	6
4.2	Recorded Historic Facilities	6
4.3	Previous Archaeological and Facility Investigations.....	7
4.4	Public Land Survey Maps/Andreas Maps/Trygg Maps/and Mounds and Burial Review	8
4.5	Implications for Archaeological and Facility resources.....	9
5.0	Conclusion.....	10
6.0	References	11

List of Tables

Table 1.	Prairie Rose Data Gathering Area	1
Table 2.	Archaeological Sites Not Evaluated	6
Table 3.	Previously Identified Historic Facilities	7
Table 4.	Previous Cultural Resource Reports Within the Data Gathering Area	8

1.0 Introduction

This report documents the archaeological and historic facilities resource data collection (Phase Ia Literature Search Report) for the proposed Prairie Rose Wind Farm Project (Project), in Rock and Pipestone Counties. In May 2009 HDR Engineering, Inc. (HDR) began assisting Geronimo Wind Energy (Geronimo) in preparing a Minnesota Large Wind Energy Conversion System (LWECS) permit application. In June 2009 and again in February of 2010 HDR reviewed information on file at the Minnesota State Historic Preservation Office (SHPO) located in St. Paul, Minnesota, to review relevant archaeological and historic facility properties documentation for the original, and later the revised data gathering area. This documentation will be used during project planning. Cultural resource data, housed at SHPO, consisted of cultural resource site files, cultural resource site leads, and previous professional cultural resource surveys and reports. In addition, HDR reviewed 19th Century Public Land Survey (PLS) maps to identify potential historic-period cultural features in the project area.

During the second week of June 2009, HDR archaeologist Stephen Sabatke and archaeological technician Melissa Lundberg performed a windshield survey of the original data gathering area (a subset of the current project area). This survey was conducted to review the existing environment and understand the landform types of the project vicinity. Initial documentation of the project area was taken at this time. A map of the current project area showing the existing resources and the land type characteristics is attached as Figure 1.

Data has been gathered in the following township, range, and sections (**Error! Reference source not found.**).

Table 1. Prairie Rose Data Gathering Area Legal Descriptions

County	Township	Range	Section
Pipestone	105	46	13, 14, 23-26, 34-36
Pipestone	105	45	16-22, 26-36
Rock	104	46	1-4, 9-16, 19-36
Rock	104	45	1-36
Rock	103	46	1-24
Rock	103	45	1-11, 17, 18

The project is located within the Minnesota Archaeological Resource Region known as the Southwestern Riverine.

1.1 SHPO Correspondence

In August 2009 Geronimo contacted the SHPO, Minnesota Department of Commerce (DOC), and the Minnesota Office of the State Archaeologist (OSA) to request a review of potential project-related impacts on known or suspected cultural resources within the proposed project area. SHPO responded with a letter (2009-3187) on September 9, 2009 recommending that Geronimo sponsor an archival records search within the data gathering area. SHPO also stated that there is a potential for unrecorded cultural properties to exist in the project area. Therefore, SHPO suggested that an archaeological field survey take place in the proposed project area.

In March 2010 Geronimo contacted the SHPO, DOC, and the OSA to request a review of potential project-related impacts on known or suspected cultural resources within the revised project area. SHPO sent a second letter dated April 12, 2010 which reiterated the comments from its original letter..

1.2 Definition of Study Area

In response to the September 9, 2009 letter from SHPO, Geronimo evaluated a data gathering area for the project defined as the project area plus a one mile buffer zone surrounding the project area. After the project area was expanded, the data gathering area was likewise redefined. Although usually only a one mile search area buffer is used to understand the context of the Project area, in this case a two mile search area buffer was used because the project boundary had not yet been completely defined, so the search area was expanded in order to capture possible additions to the project boundary. Geronimo anticipates SHPO will suggest an archaeological field survey take place in the newly defined Project boundary.

1.3 Regulatory Frame Work

As currently defined the project is not considered to be a federal undertaking as defined by Section 106 of the National Historic Preservation Act of 1966, as amended, and its implementing regulations (36CRF 800). If future information indicates the action is a federal undertaking this report may serve as a basis for additional study.

Through consultation with SHPO, OSA, and Geronimo it has been determined that this project is subject to regulations associated with:

- The Minnesota Wind Siting Act (Minnesota Statutes Chapter 216F)
- The Minnesota Administrative Rules Chapter 7836 Wind Siting
- The Minnesota Department of Commerce, Energy Facility, Permitting, Siting, and Routing Department's PUC LWECs Site permit
- Minnesota Statute Chapter 138.661-138.699 (Minnesota Historic Sites Act)
- and The Minnesota Pollution Control Agency's (PCA) National Pollutant Discharge Elimination System (NPDES) Permit No: Mn R100001 (Appendix A, Part G. Discharges Affecting Historic Places Or Archeological Sites)

2.0 Brief Environmental and Historic Context

The proposed Project area lies completely within the Southwest Riverine Archaeological Region (Anfinson 1990 also found as a part of the Minnesota Archaeological Predictive Model). This region also includes a large part of Pipestone County, a large part of Nobles County, a small part of Lincoln County, and a small part of Murray County. It then extends into northwest Iowa and southeastern South Dakota. Archaeological resource sites are small and in general widely scattered. However, it is suspected that archaeological site concentrations can be found near prominent land forms and near larger permanent water sources.

The topography of southwestern Minnesota is typically flat with minor swells from loess deposition. This landscape contains numerous small entrenched streams and few lakes. The lakes that are present are small and scattered. The majority of soils found in the region are fine silty loams.

2.1 Physio-graphic Region

The topographic feature notable in the area is the Coteau Des Prairies. The Coteau Des Prairies is broken up into an inner and outer part; only the inner part is described here. The inner part (Wright 1972:576) is located in the southwestern corner of Minnesota. This triangle of land is largely covered with loess. The loess thickens towards the southwest and probably originated as wind-blown silt from the Big Sioux River outwash plain. This area appears as a gently rolling plain and contains shallow drainage systems.

Glacial activity was the dominant force in shaping this landscape. The Wisconsin stage of glacial activity began about 75,000 years ago. During this period the Laurentide ice sheet fed the Des Moines lobe encouraging it to advance southeast across Minnesota eventually reaching central Iowa, around Des Moines, approximately 14,000 years ago. Around 13,000 years ago warmer weather initiated a general slow retreat of the glacial front. This retreat, and occasional advance, of the glacial front was the principal sculptor of the environment. Formations such as moraine systems, till plains, kames, and gravelly ridges emerged from beneath the Des Moines Lobe. The Des Moines lobe completely disappeared from the area around 11,300 years ago and left behind a fine, loamy soil.

2.2 Rock Formations

According to *Mn/Model: A Predictive Model of Precontact Archaeological Site Location for the State of Minnesota Final Report 2002* bedrock outcrops of high quality stone are rare in this region. In the western part of the region there are outcrops of Sioux Quartzite, while workable it is not considered of good quality. However, occasional deposits of Catlinite: a soft, clay rich stone used to make Native American pipes, plaques, and other goods, can be found in the region.

2.3 Hydrology

The major river basin in this area is the Rock River. In addition, numerous tributaries, small streams, and seasonal washes are scattered throughout this area. Few lakes are found in this region (*Mn/Model: A Predictive Model of Precontact Archaeological Site Location for the State of Minnesota Final Report 2002*).

It is important to note that some of the lakes and wetlands present in this area have been modified from their original characteristics. As a result of Euro-American expansion and settlement many of the lakes and wetlands were drained to allow for more arable land. Present landscape conditions may differ greatly from the pre-contact counter part.

2.4 Flora and Fauna

Mn/Model: A Predictive Model of Precontact Archaeological Site Location for the State of Minnesota Final Report 2002 states before settlement the entirety of the area was tall grass prairie. Trees were scarce because of numerous grass fires, but could be found in small amounts along rivers and drainages. However, prairie landscapes should not be thought of as one homogeneous biome. Factors such as soil, land formation, and moisture separate prairie vegetation regions into wet, mesic, and dry areas. Common

vegetation for this biome may have included, but is not limited to: big and little bluestem, Indian grass, prairie dropseed, porcupine grass, sidecoats grama, plains muhly, blue grama, hairy grama, sedges prairie cord-grass, switchgrass, mat muhly, blue-joint, and northern reed grass (referenced from Kay 1998:16-47).

The dominant pre Euro-American fauna in the region was bison and the occasional large elk herd. White tail deer has supplanted the bison and elk herds in the region as the dominant fauna. In addition, during pre Euro-American periods numerous small mammals, such as; gophers, white-tailed jackrabbits, badgers, red foxes, ground squirrels, coyotes, raccoons, skunks, weasels, voles, shrews, mice, and in wet areas, beavers, muskrat, and mink were found in the area (referenced from Kay 1998:16-47). Few fish and waterfowl are found in this region because of the lack of permanent water bodies. Other fauna includes native prairie birds such as: sharp-tailed grouse, prairie-chickens, sparrows, meadowlarks, red-winged blackbirds, yellow-headed blackbirds, owls, and hawks.

3.0 Paleo-Environment Context

Review of the information contained in Mn/Model: A Predictive Model of Precontact Archaeological Site Location for the State of Minnesota Final Report 2002 and the SHPO historic context outline entitled Outline of Historic Contexts for the Prehistoric Period (ca. 12,000 B.P. - A.D. 1700) were used to generate the following context.

Around 14,000 years ago gradual warming in the northern hemisphere forced the glacial advance to retreat. The retreat of the glacier set the stage for the present landscape of Minnesota. At 12,000 years ago sufficient warming had pushed the glacial front out of southern Minnesota and by about 11,000 years ago the glacial front was pushed out of northern Minnesota. Following the retreat of the glacial front the immediate environment would have been tundra-like plain followed closely by a spruce parkland-like environment where temperature had reached the appropriate level to support it. Immediately following the spruce parkland environment would have been a coniferous dominated forest. Fossil evidence gathered from southern Minnesota suggests that now-extent megafauna, such as large buffalo, mastodon, giant beaver, wolverine, moose, lynx, caribou, mountain line, white-tail deer, and a variety of other animals.

Around 11,500 years ago deciduous forests replaced the retreating spruce parkland/coniferous forest in southern Minnesota and by 10,500 years ago had pushed into central/northern Minnesota. Fossil evidence suggests that animal populations consisted of many birds, fish, amphibians, beaver, black bear, white-tailed deer, porcupine, weasels, moose, fisher, coyote, otter, bobcats, red fox, and timber wolf.

Around 10,000 years ago prairie vegetation, following the retreating deciduous forest front, moved into southern Minnesota. By 8,000 years ago Minnesota, excluding the north eastern arrow head region of Minnesota, was prairie lands. Numerous bison bone beds can be found in Minnesota dating to this time. Other animals associated with this time period are gophers, white-tailed jackrabbits, badgers, red foxes, ground squirrels, coyotes, raccoons, skunks, weasels, voles, shrews, mice, and in wet areas, beavers, muskrat, and mink. Along with numerous fish, waterfowl, and other prairie birds, such as prairie-chickens, sparrows, meadowlarks, red-winged blackbirds, yellow-headed blackbirds, owls, and hawks.

Around 6,000 years ago wetter conditions allowed the deciduous forest to reclaim land to the west and south. Starting at 3,000 years ago continued expansion of the deciduous forest west and south would set the boundary between prairie and forest as found at European contact. Animal and plant biomes at this time would have greatly resembled those described at European contact.

4.0 Brief Historic context

Review of the information contained in Mn/Model: A Predictive Model of Precontact Archaeological Site Location for the State of Minnesota Final Report 2002 and the SHPO historic context outline entitled The Contact Period Contexts (ca. 1630 A.D. – 1820 A.D.) were used to generate the following context.

Artifacts, such as fluted points and Plano points, associated with the Paleolithic period, about 12,000 years ago, have not been found in southwestern Minnesota. Archaeological evidence from North America suggests that Paleoindian people were small nomadic bands that followed the large herds of animals across the landscape. Artifact assemblages and deposits are shallow and do not suggest any long term habitations in a particular area. However, the general distribution of Paleo-artifacts across the landscape suggests that they were highly mobile and technologically savvy enough to push into areas of extreme climate conditions. To date no identified sites from this early prehistoric period have been professionally excavated in the region. If sites from this period are present in this region, they most likely occur rivers and may be deeply buried alluvium or loess.

Minimal numbers of sites dating to the Archaic period, about 8,000 years ago, have been identified in this region. Climate shifts during this time period produced a much dryer environment. If habitation locations are present in this region, they would have adjusted to stay near water sources. Probable subsistence would rely heavily on bison hunting and the draw to the area would have been the Pipestone Quarries (21PP2). Later, climatic shifts produced a wetter environment and dry areas would have become inundated or seasonal flooding may have deposited alluvium, submerging previously occupied sites and this may account for the minimal amount of sites found dating to this period in the region. It appears that Archaic sites within the region are widely distributed throughout the Rock River drainage system. The largest of these Archaic sites occur on terraces, bluffs, and particularly hilltops with panoramic views.

The Southwest Riverine Region is difficult to associate with the ceramic producing Woodland, Oneota, and Plains Village complexes. Artifacts from this region are composed mostly of lithic debitage. Woodland and Mississippian sites (most likely identified by the presence of Sioux Quartzite among the raw materials) can not be differentiated because of the lack of ceramics within their assemblages. Sites of this category are located on bluffs and terraces along permanent water courses, especially the Rock River.

Initial contact in the region occurred around 1700 by French explorers/fur traders. The Yankton, Yanktonai, Teton, and Santee Dakota were the indigenous tribe in the area at the time. These initial interactions between the French and the various Dakota Tribes were associated with fur trade posts located on the Upper Minnesota River. By the 1800's English and American fur traders would take over the area. Wahpeton and Sisseton Dakota would join the other Dakota tribes in fur trade activities with the English and Americans in the region around 1800. Soon after this time American

fur traders would establish trading posts in the interior of the region to interact with additional tribes.

The American Period in Minnesota history is generally considered to begin with the Purchase of the Louisianan Territory from France in 1803 by the United States. Soon after United States military expeditions would explore the state and reinforce with the tribes and remaining traders that this was now territory of the United States. The founding of Fort Snelling in 1819 at the confluence of the Minnesota and Mississippi Rivers increased Euro-American settlement in the area and treaties of 1825 and 1837 opened the lands north of Fort Snelling to logging and settlement. The opening of a commercial sawmill in the village of Marine on St. Croix in 1839 marked the beginning of the lumbering business in the state. These treaties opened the floodgates for industry and white settlement into the state. By 1849 Minnesota became a Territory and by 1858 the thirty-second state. As each subsequent event occurred it was accompanied by an ever increasing amount of European-American settlement. The increases in population lead to the establishment of ever more towns, larger cities, and other industries.

4.1 Recorded Archaeological Sites

No archaeological sites were identified within the Project boundary but seven archaeological sites (21PP003, 32PP0011, 21PP0012, 21PP0014, 21PP0015, 21PP0046, and 21RK0054) were identified within the two-mile search area. Six of the seven archaeological sites consisted of small lithic and artifact scatters on less than 5 acres of land. However, one site consisted of 44 flakes over 20 acres. Based on the documented surrounding sites, it is probable that any new sites found will be small, but there is a chance that a larger site could be located within the project boundary. During the background check, all site forms were available but not all of the archaeological sites have been evaluated for inclusion in the NRHP.

Table 2. Archaeological Sites Not Evaluated

County	Site Number	Site Name	Site Name	Location			Eligibility Determination
				T	R	S	
Pipestone	21PP0003	Lithic Scatter	Brockberg	105	45	26	Not Evaluated
Pipestone	21PP0011	Artifact Scatter	Faulkner	105	45	16	Not Evaluated
Pipestone	21PP0012	Lithic Scatter	Nece I	105	45	26	Not Evaluated
Pipestone	21PP0014	Artifact Scatter	Nece II	105	45	26	Not Evaluated
Pipestone	21PP0015	Lithic Scatter	N/A	105	45	26	Not Evaluated
Pipestone	21PP0046	Lithic Scatter	Pipestone #1	105	45	27	Not Evaluated
Rock	21RK0054	Lithic Scatter	Lois Raths	103	46	6	Not Evaluated

4.2 Recorded Historic Facilities

The records search at SHPO produced 12 historic facility resources (Table 3) within the data gathering area. Two historic facility resources (RK-DNT-001 and PP-ELM-001) were identified within the Project boundary and ten historic facility resources (PP-EDN-002, RK-HAC-001, RK-HAC-002, RK-HAC-003, RK-HAC-004, RK-RSD-001, RK-RSD-003, RK-RSD-004, RK-SPG-001, and RK-SPG-003) were identified within the two-mile search area.

During the SHPO background check, all site forms were available with the exception of PP-ELM-001 and RK-SPG-003. Neither of these sites have been evaluated for inclusion in the NRHP, and no additional information was available on these sites. The other 10 historic facility resources have not been evaluated for inclusion in the NRHP.

Table 3. Previously Identified Historic Facilities Within the Data Gathering Area

County	Site Number	Site Name	Location			Eligibility Determination
			T	R	S	
Pipestone	PP-EDN-002	Norwegian Lutheran Church	105	46	35	Not Evaluated
Pipestone	PP-ELM-001	Bridge No. 1448	105	45	33	Not Evaluated
Rock	RK-DNT-001	Bridge No. 4323	104	45	5	Not Evaluated
Rock	RK-HAC-001	Pool Hall	104	45	35	Not Evaluated
Rock	RK-HAC-002	Old Hardwick State Bank	104	45	35	Not Evaluated
Rock	RK-HAC-003	Recreational Hall	104	45	35	Not Evaluated
Rock	RK-HAC-004	New Hardwick State Bank	104	45	35	Not Evaluated
Rock	RK-RSD-001	School District No. 41	104	46	19	Not Evaluated
Rock	RK-RSD-003	Boettcher Farm, Split Farm	104	46	19	Not Evaluated
Rock	RK-RSD-004	Bridge No. L2299	104	46	30	Not Evaluated
Rock	RK-SPG-001	Bridge No. L2336	103	46	6	Not Evaluated
Rock	RK-SPG-003	Bridge No. L2292	103	46	7	Not Evaluated

4.3 Previous Archaeological and Facility Investigations

The records search at SHPO produced seven previous cultural resource reports (Table 4) in the data gathering area. Reports RK-78-1H, RK-94-1H, RK-94-3H, and PP-00-01 were unavailable at the SHPO at the time forms were collected.

Table 4. Previous Cultural Resource Reports Within the Data Gathering Area

Manuscript Number	Report Date	Manuscript Title	Author(s)/Association	Associated Sites	Comment
PP-79-1H	1979	Historic Resources of Pipestone County	Thomas Harvey/ Minnesota Historical Society	PP-EDN-002	This document represents a multiple resource area nomination
RK-78-1H	N/A	N/A	N/A	RK-HAC-001, RK-HAC-002, RK-HAC-003, RK-HAC-004, RK-RSD-001	N/A
RK-94-1H	N/A	N/A	N/A	RK-RSD-004	N/A
RK-94-3H	N/A	N/A	N/A	RK-SPG-001	N/A
SAS-80-01	1980	An Archaeological Survey of Nobles, Pipestone, and Rock Counties, Minnesota	Guy Gibbon/University of Minnesota	N/A	Investigation to reconstruct the prehistoric and early historic pattern of occupation in the area
PP-00-01	N/A	N/A	N/A	N/A	N/A
MULT-94-20	1994	Draft Phase I Cultural Resources Reconnaissance Survey Report Volume I: Technical Report	Kent Skaar, Jackie Sluss, Stacy Allan, Kent Bakken, Kelly Gragg/ Minnesota Historical Society	N/A	Cultural resources survey for reconstruction of Interstate 90 to Jasper

4.4 Public Land Survey Maps/Andreas Maps/Trygg Maps/and Mounds and Burial Review

19th Century Public Land Survey Maps (PLS) examined for the data gathering area has identified no archaeological or historic facilities resources within the data gathering area. However, in the southeast corner of the PLS map referencing T103N R46W, a dozen or so historic farmsteads are noted in sections 13, 24, 25, 34-36. While these cultural resources are not located within the project area, it does show that early American settlement had reached this vicinity by around 1860.

The Andreas illustrated hand book (*An Illustrated Historical Atlas of the State of Minnesota*) published in 1871 documents one property owner (C.F. Crosby) within the Project area. In addition two locations identified in Mound Township (just southwest of the Project area) are believed to be old Stone Quarries. The towns of Pipestone and Luverne are also documented on this map.

Trygg maps of the area show no more information than what is contained in the PLS maps.

Minnesota's Indian Mounds and Burial Sites: A Synthesis of Prehistoric and Early Historic Archaeological Data book states that about 20 mounds have been identified in Rock County. None of these mounds are identified near the project boundary.

4.5 Implications for Archaeological and Facility resources

Seven archaeological resources were identified in the data gathering area. These sites were representative of small lithic and artifact scatters, however one larger lithic scatter was distributed across 20 acres. Because of the similarity of the landscape; HDR believes any archaeological sites found within the data gathering area would ascribe to the pattern and be made up of small sites. However, because one larger site was found, it may be possible that a larger site could be located in the project boundary. In addition, after review of the landscape, HDR noticed what seemed like a small drained pothole lake inside the data gathering area. Shoreline around this old lake should be examined for the presence of archaeological resources.

HDR visually documented twelve possible locations that may be considered historic archaeology locations in the original survey. These locations are represented by abandoned farmsteads, historic farmstead scatters, and farmstead ruins. Further investigation of these locations may be needed to consider project effects on them.

Four possible historic facilities may have been identified in the data gathering area. These locations are represented by two graveyards, one farmstead, and an irrigation ditch. Further investigation of these locations may be needed to consider project effects on them. Since no windshield review of the revised project area has been completed at this time, it may be possible that additional resources are present within the current project boundary that will need consideration before project construction can begin.

Visual disturbance from the proposed wind farm is a possibility. Turbine structures are large and much different from the current buildings and structures located in the area. The current structures are represented by over head cabling and power line poles, over head cabling and telephone poles, transmission towers of various sorts, and farm structures such as silos, barns, granaries, etc.

After review of all the information gathered, HDR believes that the project area has potential to yield additional archaeological and historic facility resources. Specific locations needing further archaeological survey will be water crossings, high landforms, and areas of previous significant land use. In addition HDR feels the because of the close proximity of documented early historic settlement locations, that the data gathering area has an increased chance to contain resources of the same type and age.

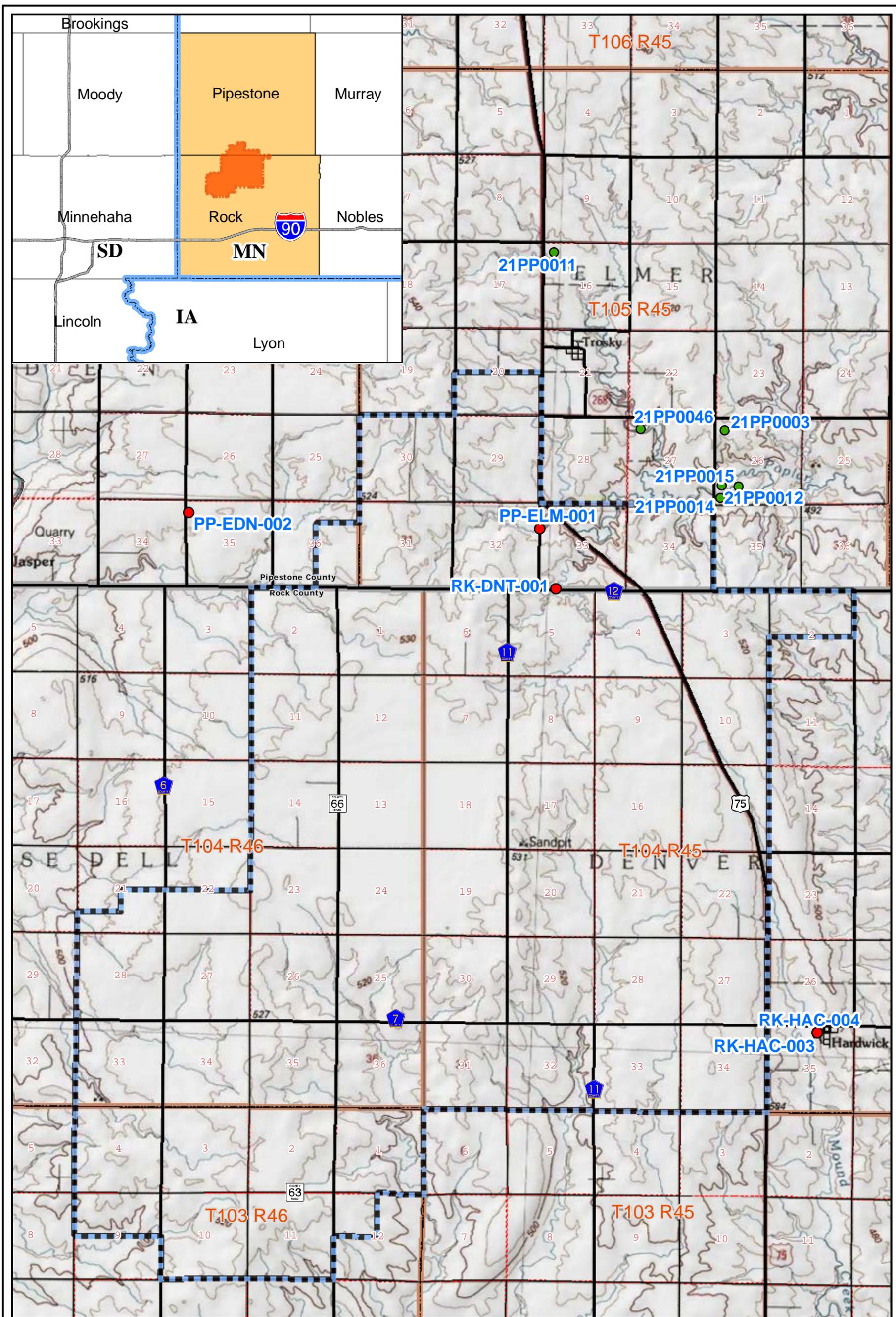
The construction of the wind farm will determine the potential impacts to cultural resources. Geronimo in coordination with HDR will consider impacts to identified resources to the extent practical. Constructing the wind farm, when possible, will avoid sensitive resources in the data gathering area.

5.0 Conclusion

HDR recommends a Phase I Archaeological Reconnaissance Survey for the project area. The survey should occur at a time when ground visibility is 25% or greater to minimize shovel testing. Surveyors should focus on a methodology that focuses on ground disturbance areas within the project area. The investigation must be conducted by a professional archaeologist permitted by the State of Minnesota per the Minnesota Field Archaeology Act of 1963 (138.31-138.41). Investigators should document the ground disturbing activities in the project area, the existing resources in the area, and offer recommendations for avoidance. If avoidance is not practical or can not be achieved additional investigation of the resource may be needed. This additional information would require the development of a new scope and budget.

6.0 References

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Map Document: (\\mspe-gis-file\GIS\proj\Geronimo\112145_Prairie_Rose\map_docs\mxd\CulturalResourcesMap.mxd) 3/19/2010 -- 3:59:17 PM



0 0.25 0.5 1 1.5 2 Miles

Legend

-  Project Boundary
-  Archaeology
-  Historic Structures
-  County Boundary

Figure 1. Cultural Resources Map
Prairie Rose Wind Project
Geronimo Wind Energy
Rock County, MN