



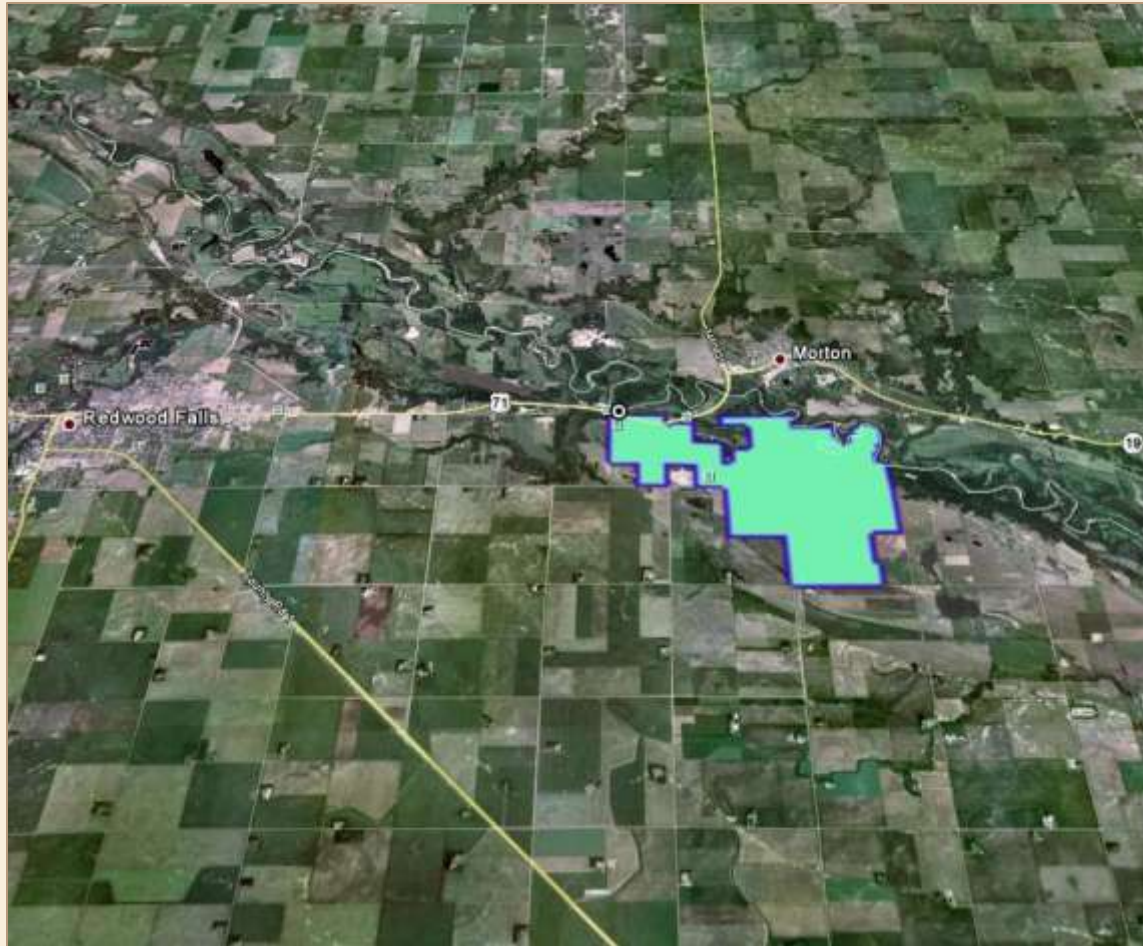
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Lower Sioux Indian Community Wind Energy Development

DOE Tribal Energy Program Review,
October 2010

Lower Sioux Community



Lower Sioux Energy Goals

- Provide clean and environmentally safe energy resources for tribal reservation by installing wind turbine in community
- Sell excess power to nearby power utility
- Lower cost of energy to local businesses and homeowners in the community
- Provide new employment opportunities



Facility-Scale Wind

- The Lower Sioux Community's original renewable energy goal was to build a single facility-scale turbine, followed by several more for a community-scale farm.
- After discussions with local utilities, we found that local distribution grids could not support a community-scale farm.
- Current plans include a 1.5MW wind turbine and an accompanying solar field.



Wind Feasibility Study

- Lower Sioux Community partnered with Westwood Professional Services to undertake a detailed Wind Feasibility Study and assist in project development.
- To date, Westwood has completed Phase I of the Study:
 - Land Usage, Constraint, and Permitting Matrix
 - Preliminary Site Selection and Layout
 - Preliminary Financial Analysis
 - Interconnection application and engineering studies



Land Usage, Constraint, and Permitting

- The foundation for evaluating the land which could potentially host wind turbines.
- A geographic information system (GIS) was created to overlay the Lower Sioux Community with digital data pertaining to:
 - Aerial photography
 - Wind resource
 - Land use
 - Physical infrastructure
 - Communications infrastructure
 - Environmental features
 - Known cultural resource features



GIS

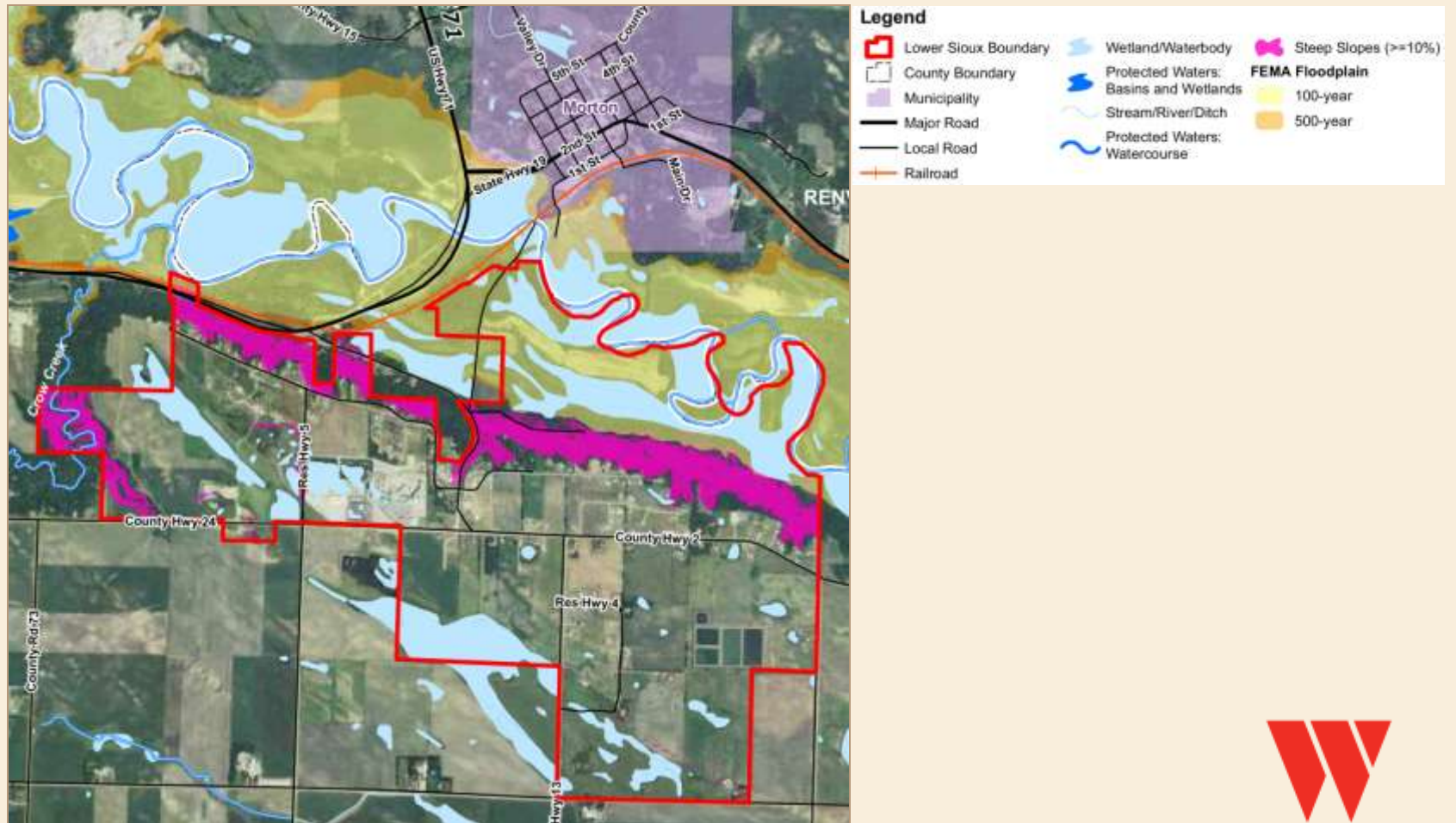
- The intent of this GIS is to:
 - Reveal encumbrances and physical constraints to project development
 - Highlight areas best suited for further evaluation
 - Create maps to better understand resources and constraints
 - Identify preliminary permitting requirements



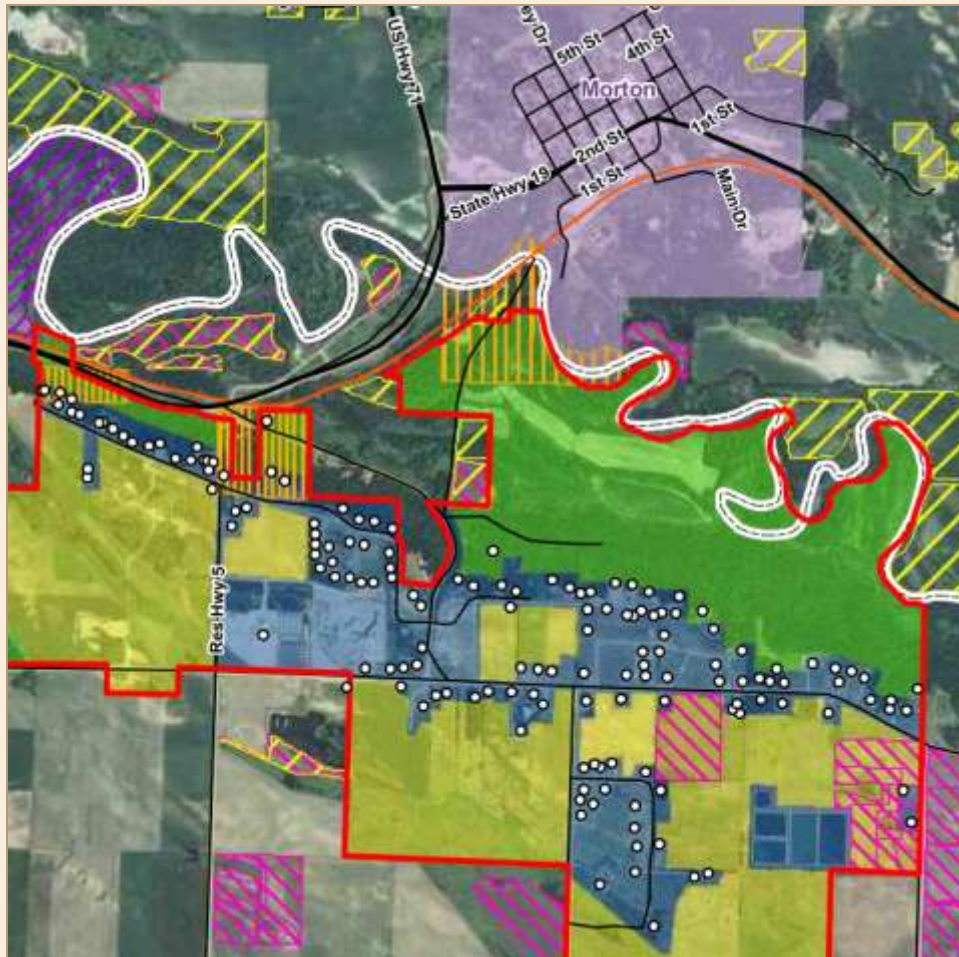
GIS - Infrastructure



GIS – Water Resources



GIS – Land Use



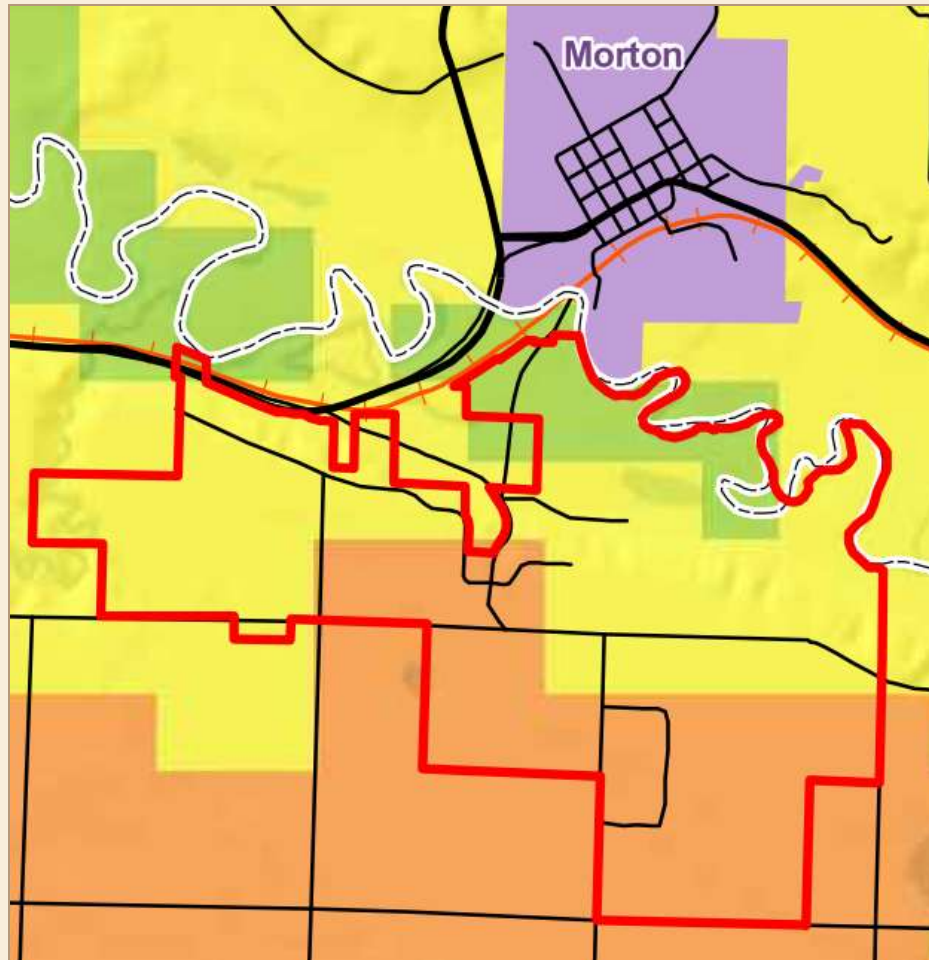
Legend

- | | |
|------------------------------|---|
| Lower Sioux Boundary | Local Road |
| County Boundary | Railroad |
| Municipality | State Funded Conservation Easement (e.g. WRP, RIM, CRP) |
| Major Road | |
| MnDNR Land | Land Use |
| Wildlife Management Area | Open Space |
| Conservation Reserve Program | Developed |
| Structure/Residence | Trees |



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GIS – Wind Resource



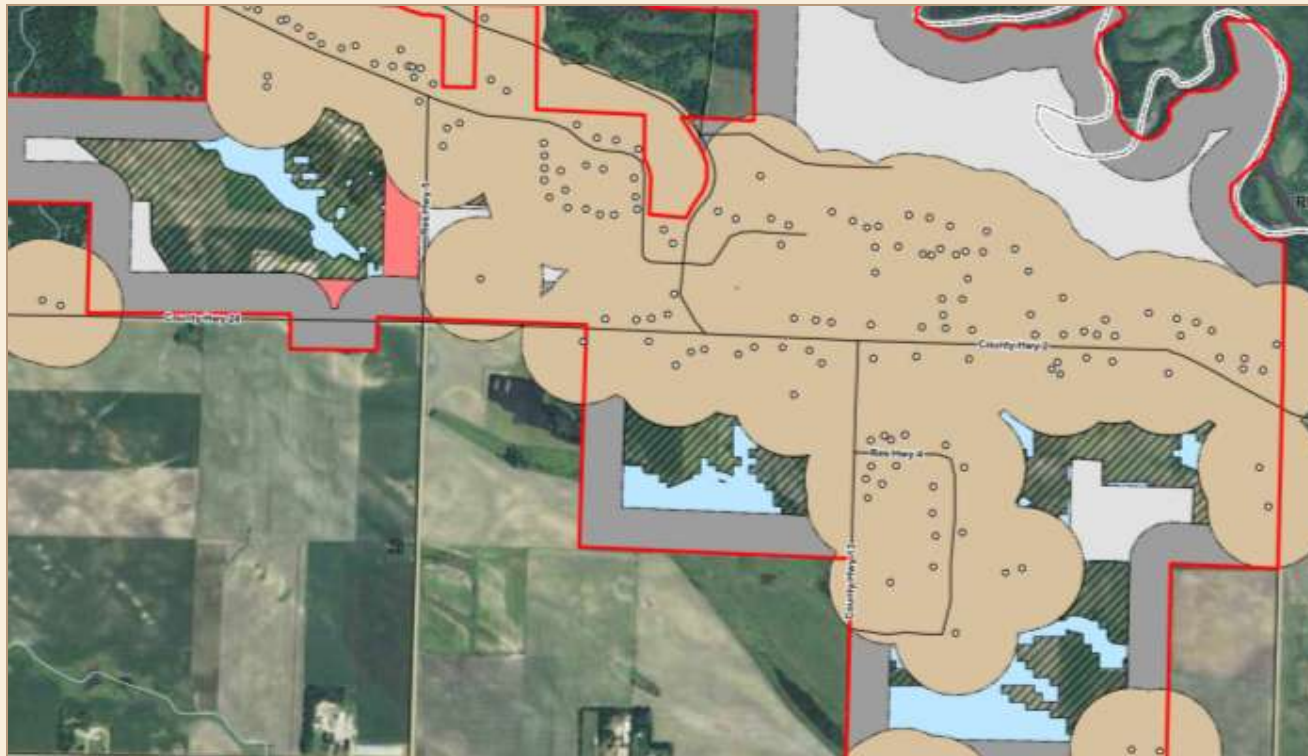
Legend

Lower Sioux Boundary	Wind Speeds (80m height in m/s)
County Boundary	6.0 - 6.5
Municipality	6.5 - 7.0
Major Road	7.0 - 7.5
Local Road	7.5 - 8.0
Railroad	8.0 - 8.5



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GIS – Preliminary Site Identification



Legend

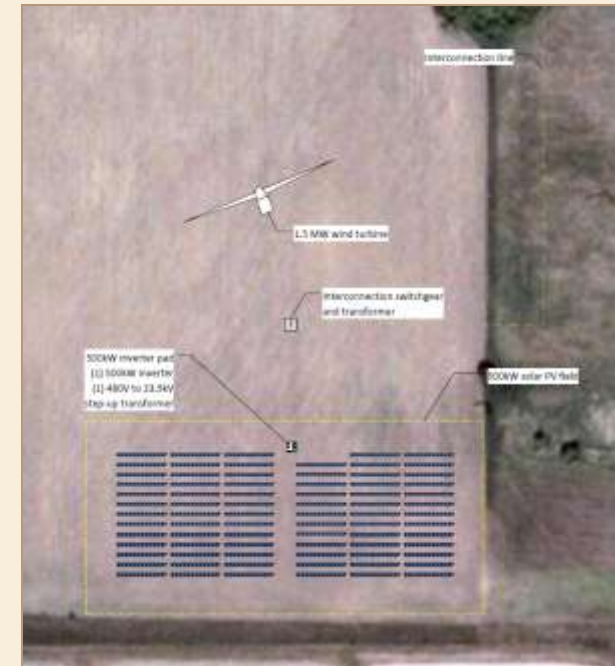
- | | | |
|----------------------|-----------------------------|--|
| Lower Sioux Boundary | Railroad | Approximate Road Setback = 500 Feet |
| County Boundary | Structure/Residence | Approximate Residence Setback = 750 Feet |
| Municipality | Wetland/Waterbody | Approximate Adjacent Property Setback = 500 Feet |
| Major Road | Stream/River/Ditch | Preliminary Developable Area (About 190 Acres) |
| Local Road | Land Use: Developed & Trees | |



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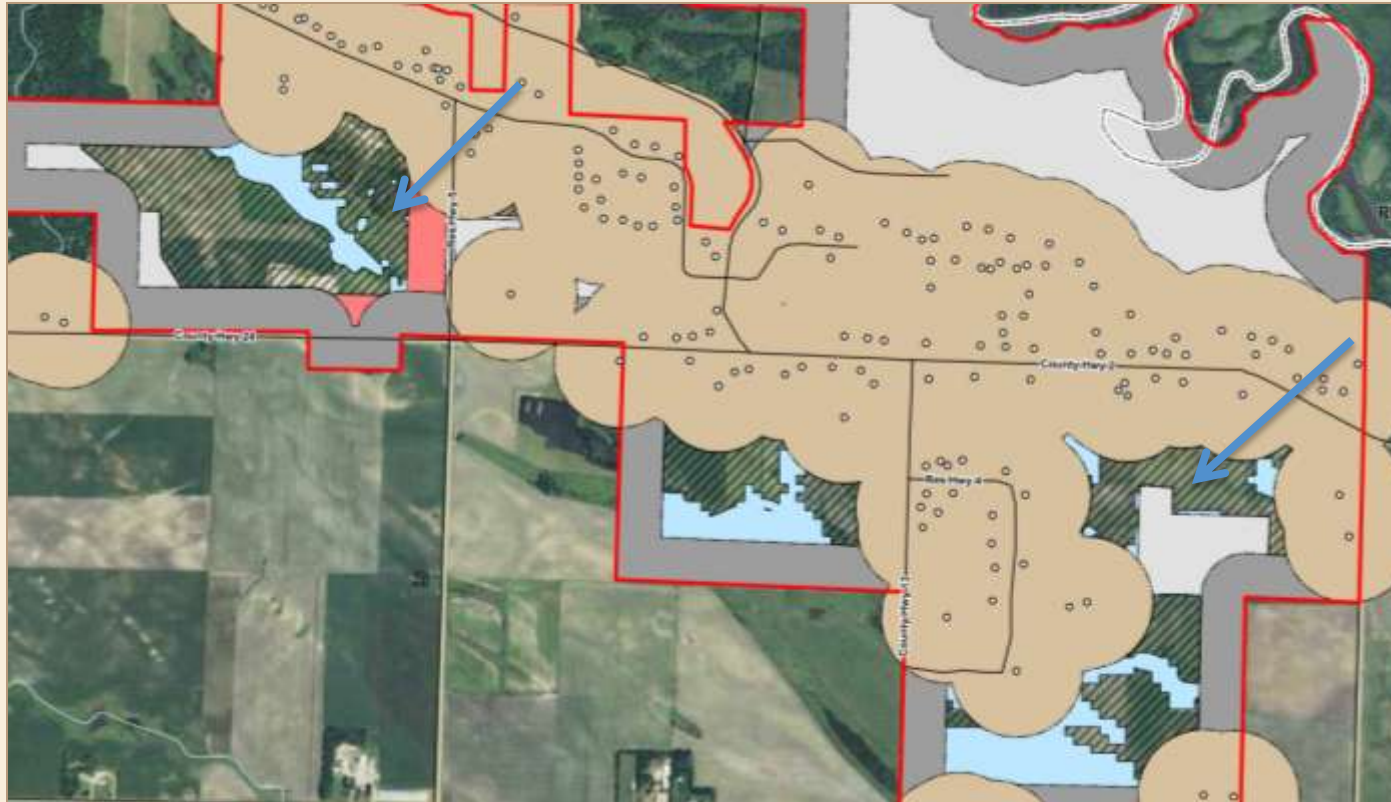
Site Selection

- Our preliminary focus is on two sites, one near the Jackpot Junction Casino, and one in the southeastern area of the community.



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Site Selection



Interconnection

- With preliminary sites chosen, we applied for interconnection to Xcel Energy's distribution grid.
- We applied for a 2MW hybrid system:
 - 1.5MW wind turbine
 - 500kW solar farm
- This application triggers Xcel's process of evaluating the system and engineering the interconnection.



Interconnection

- Xcel made a preliminary evaluation of the system for interconnection with their 23.9kV feeder that runs through the community.
- Xcel found that the size and type of system, along with the distance from the system to the substation, would have unfavorable effects on the local grid if connected directly.



Interconnection

- Because of Xcel's initial findings, we have decided instead to move forward with a “behind the meter” application.
- Instead of connecting to the grid, this will feed power and energy from the system directly into the Jackpot Junction network, where it will be used locally.



Interconnection



Phase II

- In Phase II we will evaluate the site in greater detail with the following tasks:
 - One year local wind resource study with meteorological towers at sites with best potential
 - Site survey and geotechnical report
 - Cultural resource review
 - Major equipment selection
 - Final utility interconnection study
 - Financial analysis and economic modeling



Conclusion

- This phase of the study will yield direct, detailed information about the site, and ultimately lead to the decision to move forward with the project at that location.
- This will allow us to further develop the project, with financial structuring and an RFP to potential contractors in later phases.



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