Project Report

Texas Tech University CWC Team

Produced for: DOE CWC 2021
Date: Spring 2021

- Due 5/23
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- Emphasis on selection process for each area applicable (this is where we did bad last year)
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- “Team members must be prepared to explain their process to judges at the competition.”

“Other items the team may wish to balance include triple bottom-line opportunities (social, environmental, financial), restoring the site at the end of the project life, and asset disposal/recycling.”

“more long-term summaries be included to communicate the attractiveness of the project for investment.”

If an economically viable project is not feasible at this time, discuss economic developments (e.g., incentives, novel financing mechanisms, market changes, power purchase agreement pricing) and/or technology developments that would be required to make the project viable.

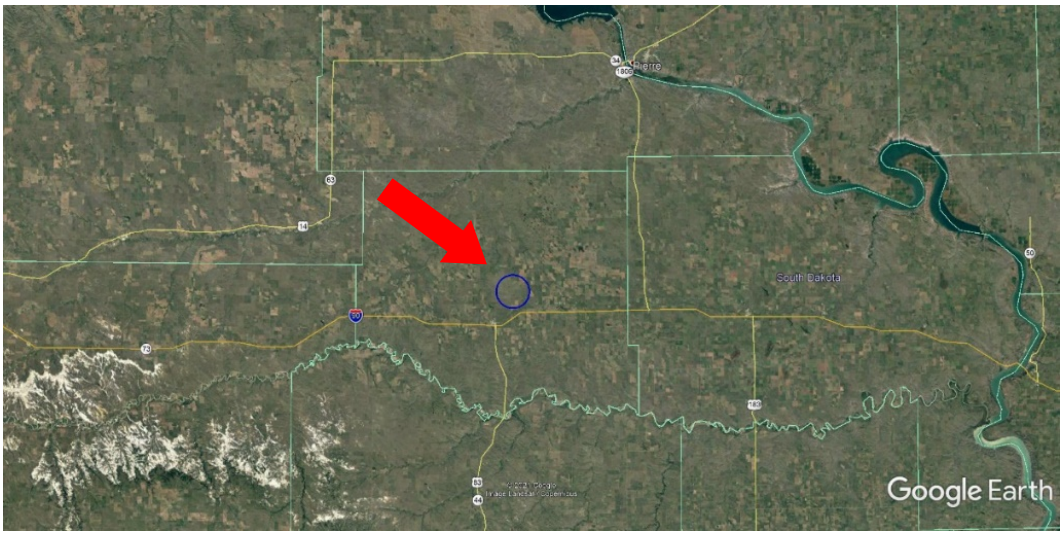
Project Development Team

Team Lead/Financial Analyst:
Community Impact Analyst:
Mitigation Plan Analyst:
Site Development:
Decommissioning:
Permitting:
Professional References:
Team member Contact Information

Site description and energy estimation

Our team chose to propose our project in the central region of South Dakota, in Jones county, West of the Missouri river.

We chose this site based on a set of factors and characteristics found throughout our research, and thus determined the greatest overall wind energy potential available at this development site, in comparison to the other locations we considered. The development site is about forty-seven kilometers southwest of Pierre and the Missouri river, and five miles north of Interstate Highway 90. The elevation of our proposed wind project ranges between 2100 and 2360 feet. The area is rural, and the nearest city is Murdo, South Dakota southwest of the site. The climate is [...]. The terrain consists of hills



County: Jones County

Position compared to points of interest:

- KSUO Rosebud Sioux Tribal Airport
- KANW - Ainsworth Regional Airport
- KICR - Winner Regional Airport
- KRBE - Rock County Airport
- KTIF - Thomas County Airport
- KVTN Miller Field Airport Valentine, Nebraska, USA

Elevation:

Windographer info:

- Mean wind speed:
- Strategic turbine placement:

  After analyzing wind data, we calculated the estimated wind resource for this site, using windographer, wasp, and related applications. We assessed five locations in western SD and found a resource to request data from to use during our search. We contacted South Dakota Mesonet Research Climatologist Dr. Ruben Behnke, from a South Dakota State University directory/website. Dr. Behnke shared the data with us

Project permitting

- Building permits
- Conditional use permits
- Right of way/transportation permits
- Road crossing permits
- FAA L-810 red light required
- Material transportation permits

Biological analysis

Endangered species:

- Black-Footed Ferret, Dakota Skipper, Gray Wolf, Least Tern, Northern Long- Eared Bat, Pallid Sturgeon, Piping Plover, Poweshiek Skipperling, Rufa Red Knot , Rusty Patched Bumble Bee, Western Prairie Fringed Orchid (endangered), (we might want to move this one to Vegetation), and Whooping Crane.

Threats to wildlife:

Migrating species

(It is different for each bird like the Canadian Gesses they are by the water for the most time, so we need to look to see if there are ponds or others river, and creeks.) GF.nd.gov

Vegetation information

Soil information

Climate information

Operation curtailment

for any of these reasons and how we will get it back up and running

Compensatory mitigation

Societal impacts

Etc., ...]

- Public Opinion
- Willingness from the local government
- Local economic benefits
- Temporary jobs/permanent jobs
- addition to local economy: Creating a more diverse job market and expanding population in rural areas. Jones county is the least populated county in SD. This is an advantage for wind resource because less people mean lowered risk of human impact.

- Upgrade of any infrastructures necessary
- Break it down between construction and operation years

operating years

Project costs

- Break down in graph of each general expense

Annual operating expenses

- O&M
- Planned/unplanned
  - Balance of plant

        - ?
    - Property taxes
        - Look this up
    - Project insurance
        -
    - Reserve fund
        - How much will we have incase of emergency
    - Land leasing/royalties
        - How much during each period
        - Fixed cost/percentage
        -

Project financing

    - Market conditions
- Debt payoff/cash flow
- Loan setups

Triple bottom line opportunities

    - Restoration of site at end of life
    - Decommissioning fund

Asset disposal

    - Recycle blades.
    - Repower?