

## TECHNICAL MEMORANDUM

**To:** North Dakota Public Service Commission  
**From:** Avangrid Renewables, LLC  
**Date:** February 5, 2024  
**Re:** **Rugby Wind Farm Repower Project Environmental and Regulatory Compliance Review, Amendment**

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# 1. Introduction

## 1.1. Project Background

Rugby Wind, LLC (Rugby Wind), a subsidiary of Avangrid Renewables, LLC, operates the Rugby Wind Farm (Facility), located in Pierce County, North Dakota (Figure 1). The Facility is an electric energy conversion facility that began commercial operations in 2009 with a nameplate capacity of 149 megawatts (MW).

Pierce County granted a Conditional Use Permit (CUP, 2005-001 – Rugby Wind Farm) to Rugby Wind on July 12, 2005, and was updated on September 3, 2008, prior to construction. Rugby Wind received a Certificate of Site Compatibility (Certificate) from North Dakota Public Service Commission (ND PSC or Commission) on October 3, 2005, in Case No. PU-05-47. The Certificate was reissued on August 27, 2008, and the final layout was approved by the Commission on May 22, 2009. The existing Facility consists of 71 Suzlon S88 wind turbine generators with a capacity of 2.1 MW each, access roads, buried and overhead electrical collection lines, an electrical substation, an operations and maintenance building, and meteorological tower. As required by regulation, an aircraft detection lighting system was installed and became operational on March 18, 2022. Additionally, a 9.5-mile-long, 230-kilovolt (kV) transmission line runs from the Rugby Wind Farm Substation to the existing Rugby Substation.

As set forth in the Certificate, the Facility footprint is comprised of approximately 46,080 acres in Pierce County, North Dakota (Footprint) and includes the following:

Township 157 North, Range 71 West

Sections 5, 6, 7 and 8

Township 157 North, Range 72 West

Sections 1-12

Township 157 North, Range 73 West

Sections 1 and 12

Township 158 North, Range 71 West

Sections 5, 6, 7, 8, 17, 18, 19, 20, 29, 30, 31 and 32

Township 158 North, Range 72 West

Sections 1-36

Township 155 North, Range 73 West

Sections 1, 12, 13, 24, 25 and 36

This memorandum was compiled to support Rugby Wind's certification of compliance with North Dakota Century Code (N.D.C.C.) § 49-22-03(3)(a) as it relates to the proposed repowering activities at the Facility (Project). Rugby Wind analyzed the Project with respect to environmental and regulatory resources, with supporting documentation from SWCA Environmental Consultants (SWCA) and Jacobs Engineering Group, Inc. The following sections and referenced figures and appendices summarize the results of the analysis.

## 1.2. Project Repowering Description

Rugby Wind is proposing to retrofit Facility components for the purpose of improving the wind turbines generating efficiency, energy output and prolonging the operational life of the Facility. The repowering activities will include construction and temporary ground disturbance for the following activities:

- Replacing rotors (i.e., nose cone, hub, and blades), therefore increasing the turbine rotor diameter from 88 meters (m) up to 120 m.
- Replacing turbine nacelles and their interior elements (e.g., gearbox, oil cooler, drive shaft, and pitch drive).
- Adding an adapter section to the towers and increasing the hub height from 79 m up to approximately 85 m.
- Replacing the nameplate capacity from 2.1 MW up to 2.2 MW per turbine.
- Reinforcing turbine foundations with upgraded collars (as needed) and removing and replacing the existing pad-mounted transformers and pads within the existing turbine gravel pad.
- Installation of new 34.5-kilovolt (kV) collector line system (aboveground and buried) within existing easements, as needed.

There will be no changes to the Facility Footprint, existing leases, turbine locations, meteorological tower, collector substation, or associated 230kV transmission line. Figure 1 illustrates the existing Facility as-built layout. Table 1 summarizes the proposed turbine changes.

**Table 1: Rugby Wind Farm Existing and Proposed Turbine Dimensions**

Design Parameter	Existing	Proposed	Change
Hub Height	79 m	85 m	6 m
Rotor Diameter	88 m	120 m	32 m
Total Tip Height	124 m	145 m	21 m
Nameplate Capacity	149.1 MW	156.2 MW	7.1 MW

m – meters; MW – megawatt

The current capacity of each turbine is 2.1 MW. The new turbine equipment to be installed will have a capacity of up to 2.2 MW. The total nameplate capacity would increase from 149.1 MW up to 156.2 MW. The Facility currently has an Interconnection Agreement (IA) with Otter Tail Power which allows for generation up to 147 MW net at the point of interconnection. Rugby Wind will require an IA amendment to retrofit equipment but will continue to cap the output to 147 MW. Rugby Wind would maintain settings in the Facility’s Supervisory Control and Data Acquisition (SCADA) and windfarm management system to ensure the Facility does not exceed the net 147 MW limit at the point of interconnection. In the future, Rugby Wind may submit a surplus interconnection request with MISO to increase its net output at the Facility to accommodate the nameplate capacity pursuant to processes and standards established in the MISO Tariff.

Rugby Wind and equipment manufacturers have conducted evaluations of the existing wind turbines to determine suitability to continue to operate, within design parameters after the retrofit. Rugby Wind has also hired Barr Engineering to evaluate foundations and Westwood Professional Services to evaluate the electrical system. Based on preliminary results, turbine foundations may require further analysis. Additional investigations will be conducted to determine if any foundations will require structural upgrades, such as a foundation collar, prior to Project construction. While the reinforcement design is still under engineering review, it is anticipated that reinforcement would involve excavation below grade of all or a portion of the fill covering the existing reinforced concrete foundation, with placement of additional rebar and concrete to increase the structural capacity of the foundation. Excavated materials would be either spread on-site or disposed of at an appropriate off-site location; the excavated area would remain at-grade with the existing landscape.

The electrical system study determined that the collector system will require limited upgrades. This includes installing new 34.5 kV collector lines, where required, adjacent to the existing lines and within existing easements. Rugby Wind will decommission the original and new collector line systems once the Facility retires in accordance with landowner leases. Results of these preliminary engineering studies support the proposed retrofit and requested certification of compliance.

The replacement of the turbine nacelle and rotor will require a tower adapter section that allows for the appropriate taper angle and bolt alignment between a tower’s top flange and the proposed nacelle’s bottom flange. As a result of the change in nacelle hub and tower adapter, an approximately 6 m change in hub height has been incorporated into the current

design of the turbines and will result in an overall turbine tip height of approximately 145 meters (475 feet; see Table 1). For purposes of this amended Application, Rugby Wind is requesting a tip height up to approximately 146.3 m (480 feet) to allow for slight variations in total tip height as engineering continues to be refined between the time of this Application and the Project's implementation.

Rugby Wind will minimize temporary disturbance by utilizing previously disturbed construction areas such as turbine pads, electrical collector line easements, and permanent access roads. Turbine pads and permanent access roads will be widened to facilitate equipment removal and installation. Temporary crane paths may also be required. It is estimated that construction work areas at each turbine pad location would encompass an approximately 300-foot buffer that will be utilized to temporarily stage turbine blades, nose cone, and nacelle. Grading will not be required for the entire base area; however, this area will contain an engineered crane pad upon which the main crane will be placed. Proposed work will be completed within the Facility's Footprint.

In addition to the work areas at each turbine pad location, up to one, 10-acre temporary laydown area will be required for staging construction equipment and materials as well as to house construction trailers and provide parking for construction vehicles and construction employees' personal vehicles. An additional 5-acre temporary staging area may be required to store turbine components prior to delivery to the turbine sites. These areas will be located on leased land within the Facility Footprint and sited to avoid and minimize impacts to sensitive resources such as undisturbed habitat and water resources. Construction may occur at multiple turbine locations simultaneously to minimize Facility downtime. Rugby Wind estimates start of construction ground preparation work and equipment delivery as early as Q2 2025 with commercial operation as early as Q4 2025.

The turbine components that will be replaced, the rotor (nose cone, hub, and blades) and nacelle (including but not limited to gearbox, oil cooler, drive shaft, pitch drive), will be removed from the tower using a crane and placed in the turbine's adjoining construction work area. The new nacelle will then be lifted to the top of the tower and bolted in place. The rotor (nose cone, hub, and blades) will be assembled on the ground and then the whole rotor assembly will be hoisted and attached to the turbine assembly.

Removed turbine components (e.g., nacelle and its interior elements and rotor assembly) will be handled, processed, treated, stored, reused, disposed of, or recycled in accordance with pertinent federal, state, and local regulations. At this time, crane types for construction are unknown, but if track cranes are moved between turbine locations across agricultural fields, Rugby Wind will coordinate with landowners. Prior to construction, the presence of wetlands near crane paths will be evaluated and impacts to wetlands will be avoided to the extent possible or the requisite permits obtained if wetland impacts cannot be avoided completely. At the end of the repower construction activities, any graded areas will be de-compacted, recontoured (if necessary), and any disturbed soils will be restored to pre-disturbance conditions.

## 2. Environmental Analysis

### 2.1. Socioeconomics

The Project is anticipated to provide positive short-term and long-term impacts to the local economy by extending the life of the Facility. Impacts to social and economic resources from construction activities will be short-term and expected to increase local spending at commercial businesses, such as restaurants, grocery stores, hotels and gas stations. The Project will also have long-term impacts related continuing landowner payments, taxes, and employment of full-time personnel as facility managers, site managers and turbine technicians. As a result, the repower Project will revitalize the Facility to continue contributing to the local economy for an additional 20+ years.

### 2.2. Land Use

The Project will not change the layout of the Facility and all construction activities associated with the Project will occur entirely within the Footprint designated for the Project, utilizing access and other rights granted to Rugby Wind in existing easement and lease agreements. No additional landowner easements are required in connection with the construction of the Project. Rugby Wind will utilize previously disturbed construction areas such as turbine pads, electrical collection line easements, and permanent access roads. Temporarily impacted areas will be restored in compliance with applicable provisions of the Commission's Findings of Fact, Conclusions of Law and Order, dated October 3, 2005 (Case No. PU-05-47).

### 2.3. Public Services

Truck access to the Facility is served by US Highway 2 into Rugby, which is a four-lane divided highway connecting to I-29 in Grand Forks and US Highway 83 in Minot (another four-lane divided highway to I-94 in Bismarck). From Rugby, Highway 3 to Highway 17 will serve as the primary truck access into the Facility. Specific truck routes will be dictated by the location required for delivery. Existing access roads will be used to the extent practicable. In locations where crane paths or additional turning radii are necessary for equipment delivery and installation, these temporary upgrades will be designed and constructed to the appropriate standard necessary to accommodate their intended function (e.g., traffic volume and weight of vehicles) and minimize erosion. Following construction, temporary access roads will be decompacted, recontoured, and revegetated.

Given the increased road use during construction, Rugby Wind will coordinate with local road authorities to establish road use agreements that will be in place prior to construction to ensure the safe and efficient use of roads and to minimize and mitigate the overall impact. Additional permits will be issued by the State, County and/or township for over-sized truck movements.

### 2.4. Sound, Shadow Flicker, and Human Health and Safety

A sound level analysis was completed in support of the Project. The results of the sound analysis are provided as Attachment A. Based on the sound analysis, the Project will not result

in sound levels exceeding the 50 dBA noise standard adopted by the Pierce County Board of County Commissioners. The predicted sound level of 45 dBA may be exceeded within 100 feet of nine occupied residences. Rugby Wind anticipates obtaining waivers, maintaining existing Suzlon turbines, or operating turbines at a lower electrical and sound output mode in order to reduce the sound level to less than 45 dBA within 100 feet of occupied residences. Thus, the Facility will be in compliance with the noise standards adopted by the Commission.

There is no local, state, or federal zoning ordinance or permitting threshold regarding shadow flicker impact to residences from a wind energy project in Pierce County, North Dakota. Following the National Association of Regulatory Utility Commissioners' recommendations, previous North Dakota Public Service Commission wind farm approvals, and standardized energy siting guidance, a threshold of 30 hours of shadow flicker per year was used as a threshold for determining potential impacts at occupied residences. Rugby Wind has conducted shadow flicker assessments in connection with the Project. Results of the shadow flicker assessment are provided in Attachment B. With the exception of one residence, shadow flicker levels are not predicted to exceed 30 hours per year at any occupied residences. The total predicted annual shadow flicker at this residence is 53 hours, 36 minutes per year with the majority of the potential shadow flicker predicted to occur between November and January during mid-morning and early afternoon hours. The results of the flicker analysis are considered to be conservative because the sensitive receptors are assumed in direct view of incoming flicker from the wind turbines and does not account for vegetation, orientation of windows, or obstacles which may block the sun. Rugby Wind has obtained a waiver from the residence owner as of the date of this Application.

Rugby Wind has obtained Determinations of No Hazard's (DNH's) from the Federal Aviation Administration (FAA) for each turbine. A summary table has been included as Attachment C. Rugby Wind can provide copies of all DNH's to the Commission prior to start of repowering activities upon request.

Capitol Airspace Group completed a microwave path analysis for the Project. The results of the microwave path analysis are provided in Attachment D. The results of this analysis indicate that microwave path Fresnel zones do not overlie the Project. As a result, repowering wind turbines at any of the existing locations should not create a line-of-sight obstruction for any applied or licensed microwave links.

Rugby Wind will continue to comply with all safety-related and other conditions of the Commission's Order as it relates to security and hazardous materials and waste.

## 2.5. Cultural and Architectural Resources

A Class I cultural resources inventory, a Class III cultural resources survey, and consultation with the North Dakota State Historic Preservation Office (SHPO) was conducted for the original Certificate. Rugby Wind contracted SWCA to ascertain if any newly discovered resources or changes to the Project could potentially impact cultural resources. SWCA Environmental Consultants completed a Class I background research review, a Class II architecture history survey in October 2023, and a Class III archaeological survey in October and November 2023. Rugby Wind continues to progress in determining its construction limits and anticipates that development for the repower activities will take place in the previously

surveyed areas; however, should construction limits impact areas outside of previously surveyed areas, additional cultural resources survey and consultation with the North Dakota SHPO be completed prior to any ground disturbance. Rugby Wind initiated consultation with the North Dakota SHPO in September 2023.

Currently, no impacts are anticipated to known cultural or architectural resources in the Footprint. Rugby Wind is committed to minimize impacts to archaeological and architectural sites possibly eligible for listing in the National Register of Historic Places (NRHP) and will assess impacts and the need for mitigation for any additional NRHP-eligible or potentially eligible resources identified throughout the review process in coordination with the North Dakota SHPO. Rugby Wind will also develop an unanticipated discovery plan to be in place should previously unknown archaeological resources or human remains be inadvertently encountered during the construction period.

## 2.6. Recreational Resources

The Project will not impact recreational resources. The Project continues to maintain a setback of at least 0.25-mile from nearby waterfowl production areas (WPAs).

## 2.7. Land-Based Economics

The Project's repowering activities will be located on land currently associated with the Footprint and will utilize access and other rights granted to Rugby Wind in existing easement and lease agreements. As a result of construction, crop production or grazing may be temporarily impacted for areas within the proposed construction workspaces. Rugby Wind will compensate landowners for any temporary impacts to cropland in accordance with the terms of lease agreements, as applicable. Once the retrofits are completed, land surrounding the turbines can continue to be farmed or grazed. The Project will not result in any long-term land impacts to agricultural use or production.

## 2.8. Soils

Repowering activities and the movement of construction equipment within the construction workspace may result in temporary impacts to soil resources including soil erosion and soil compaction. It is anticipated that the construction activities associated with the Project will exceed one acre of ground disturbance. Rugby Wind will seek North Dakota Pollutant Discharge Elimination System (NPDES) Construction Stormwater Permit coverage from the North Dakota Department of Environmental Quality, including the development of a Stormwater Pollution Prevention Plan (SWPPP) that will describe methods to control erosion and runoff and specify best management practices (BMPs) to control erosion and sedimentation. The SWPPP will be implemented from the initiation of construction and used through site restoration efforts. Once construction has been completed, Rugby Wind will decompact soils and backfill graded and excavated areas with the stored native material and return surface conditions to preconstruction conditions. Rugby Wind will comply with the site restoration and reseeding conditions in the Commission's Order and all other applicable permitting requirements.

## 2.9. Geological and Groundwater Resources

The Project is not expected to disturb any geologic or groundwater resources.

## 2.10. Waterbodies, Wetlands, and Floodplains

The Project is located within the U.S. Fish and Wildlife (USFWS) J. Clark Salyer Wetland Management District (WMD). In June 2023, Rugby Wind confirmed with the USFWS WMD that no new grassland or wetland easements have been added to the Footprint since its construction. Rugby Wind will avoid all grassland conservation easements and plan to avoid the protected basins associated with the wetland easements.

SWCA completed an updated wetland delineation for the Project in Q2 of 2023 in accordance with the 1987 U.S. Army Corps of Engineers Wetland Delineation Manual and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains Region, Version 2.0. A second mobilization will be completed prior to construction to ensure the entirety of the construction works areas have been surveyed.

Wetlands and waterbodies will be avoided to the extent possible during construction of the Project. If wetland or waterbody impacts cannot be avoided, Rugby Wind will submit a permit application to the U.S. Army Corps of Engineers under Section 404 of the Clean Water Act. Wetlands and waterbodies will be flagged prior to construction to identify the limits of wetland boundaries in the vicinity of Project activities. BMPs will be designed and utilized to control sedimentation and erosion during construction as well. Temporary impacts to wetlands and waterbodies will be restored to pre-construction conditions, as needed.

A review of the FEMA Flood Map Service Center indicates that the unincorporated areas of Pierce County have not completed a study to determine flood hazard. The Facility is located within these unincorporated areas of Pierce County. Due to the limited construction work areas and general avoidance of wetlands and waterbodies, floodplain impacts are not anticipated as a result of the repowering.

## 2.11. Vegetation

The Project does not anticipate removing trees or shrubs; however, Rugby Wind will comply with the site restoration and reseeded conditions in the Commission's Order and all other applicable permitting requirements.

## 2.12. Wildlife

Rugby Wind conducted a preconstruction wildlife baseline studies in 2005 and 2006 including fixed-point avian use surveys (avian point count surveys), line transect breeding bird surveys (breeding bird surveys), bat acoustic surveys and sharp-tailed grouse lek surveys. The findings from the original review concluded that pre-construction surveys of the proposed Facility and related construction activities will avoid or not significantly impact wildlife resources in the Footprint. From March 2010 through March 2011, post-construction monitoring studies of bird and bat fatalities were conducted at the Facility.

Avangrid Renewables has implemented a Corporate Wildlife Plan (CWP) that supports processes and practices intended to avoid and minimize impacts to all wildlife (with emphasis on birds and bats) and their habitats. To implement the CWP, Avangrid Renewables developed a Wildlife Monitoring and Reporting System (WMRS) for internally reporting bird and bat fatalities discovered during operations. WMRS consists of voluntary operational monitoring for birds and bats to assess trends of a given wind plant. Avangrid Renewables uses the resulting information to implement adaptive management actions, as necessary, to minimize or avoid risk to birds or bats and identify mitigation measures.

In addition to implementation of the WMRS, Rugby Wind implements a voluntary strategy of feathering/pause-to-cut-in for turbines at wind speeds up to three meters/second (m/s), from one-half hour before sunset to three-quarters of an hour after sunrise, between May 15<sup>th</sup> and October 15<sup>th</sup>, when temperatures are over 50° Fahrenheit. No threatened and endangered species fatalities have been detected at the Facility to date.

To evaluate current conditions, SWCA conducted a biological resources assessment using a combination of existing information obtained from publicly available sources including reports, published literature, online agency databases, geographic information system data, and a site visit. A review of the 2015 *North Dakota State Wildlife Action Plan (SWAP)* and USFWS Information for Planning and Conservation (IPaC) online mapping tool identifies three federally listed species and one candidate species as having the potential to occur in the Facility area (Attachment E): Dakota skipper (*Hesperia dacotae*; federally threatened and a state SCP Level II species), piping plover (*Charadrius melodus*; federally threatened and a state SCP Level II species), red knot (*Calidris canutus*; federally threatened and a state SCP Level III species), Monarch butterfly (*Danaus plexippus*; candidate and a state SCP Level I species). No Designated Critical Habitat is present in or near the Footprint.

Based on the biological resources assessment review and proposed activities, the Project does not expect measurable impacts on wildlife or protected species in the region. The repower construction activity is associated with existing Facility components and previously disturbed work areas. The Project will not add new permanent structures or convert other current land uses. Tree or shrub removal is not anticipated at this time and impacts to vegetation are expected to be temporary and limited to the construction season. Operational impacts are expected to be similar to current operations and other operating wind projects in the region. Rugby Wind will engage USFWS and North Dakota Game and Fish Department in discussions regarding the Project. In addition, Rugby Wind will develop a Bird and Bat Conservation Strategy for the Facility, which will outline BMPs that are to be undertaken for the life of the Facility to minimize risks to birds, bats, and other wildlife from operation of the wind energy facility.

## 3. Compliance with Applicable Standards

### 3.1. Public Service Commission Exclusion Areas

Based on previous equipment upgrade dockets held before the Commission, Rugby Wind completed an analysis of the Commission’s current exclusion area and avoidance area criteria per North Dakota Administrative Code (N.D.A.C) §§ 69-06-08-01(1) - (4)..

Exclusion areas described in Table 2 below and are mapped for the Project in Attachment F. Avoidance areas are described in Table 3. For purposes of this analysis, the Project reviewed a conservative tip height of up to 480 feet to allow for slight variations in total tip height as engineering continues to be refined between the time of this Application and the Project’s implementation.

**Table 2: Summary of Exclusion Areas**

NDAC § 69-06-08-01	Exclusion Area Description	Rugby Wind Comments
NDAC § 69-06-08-01(1)(a)	Designated or registered national: parks; memorial parks; historic sites and landmarks; natural landmarks; historic districts; monuments; wilderness areas; wildlife areas; wild, scenic, or recreational rivers; wildlife refuges; and grasslands.	A USFWS WPA is located within the vicinity of the Facility. A minimum 0.25-mile setback was applied during the original Certification and continues to be maintained. All USFWS grassland easements have been avoided by the Project.
NDAC § 69-06-08-01(1)(b)	Designated or registered state: parks; forests; forest management lands; historic sites; monuments; historical markers; archaeological sites; grasslands; wild, scenic, or recreational rivers; game refuges; game management areas; management areas; and nature preserves.	Not applicable.
NDAC § 69-06-08-01(1)(c)	County parks and recreational areas; municipal parks; parks owned or administered by other governmental subdivisions; hardwood draws; and enrolled woodlands.	Not applicable.

<b>NDAC § 69-06-08-01</b>	<b>Exclusion Area Description</b>	<b>Rugby Wind Comments</b>
NDAC § 69-06-08-01(1)(d)	Areas critical to the life stages of threatened or endangered animal or plant species.	Not applicable.
NDAC § 69-06-08-01(1)(e)	Areas where animal or plant species that are unique or rare to this state would be irreversibly damaged.	Not applicable.
NDAC § 69-06-08-01(1)(f)	Areas within one thousand two hundred feet of the geographic center of an intercontinental ballistic missile (ICBM) launch or launch control facility.	Not applicable.
NDAC § 69-06-08-01(1)(g)	Areas within thirty feet [9.14 meters] on either side of a direct line between an intercontinental ballistic missile (ICBM) launch facility and a missile alert or launch control facilities to avoid microwave interference. This restriction only applies to aboveground structures, not to surface features, such as roads, or belowground infrastructure.	Not applicable.
NDAC § 69-06-08-01(2)(a)(1)	One and one-tenth times the height of the turbine from the nearest edge of an interstate or state roadway right of way;	No turbines will be located within this exclusion area.
NDAC § 69-06-08-01(2)(a)(2)	One and one-tenth times the height of the turbine plus seventy-five feet from the centerline of any county or maintained township roadway;	Turbines A8, Q4, J2 and J3 are located within the setbacks required by N.D.A.C. § 69-06-08-01(2)(a)(2). The Project meets all siting requirements of the original Order and Pierce County Conditional Use Permit (CUP, 2005-001 – Rugby Wind Farm). The county roadway exclusion area was established in 2013 (Administrative Rules Supplement 2013-348), four years following the Commission’s final approval of the

NDAC § 69-06-08-01	Exclusion Area Description	Rugby Wind Comments
		layout on May 22, 2009 (See PU-05-47, Docket 124). Additional details included in Table 4.
NDAC § 69-06-08-01(2)(a)(3)	One and one-tenth times the height of the turbine from the nearest edge of railroad right of way;	No turbines will be located within this exclusion area.
NDAC § 69-06-08-01(2)(a)(4)	One and one-tenth times the height of the turbine from the nearest edge of a one hundred fifteen kilovolt or higher transmission line right of way;	No turbines will be located within this exclusion area.
NDAC § 69-06-08-01(2)(a)(5)	One and one-tenth times the height of the turbine from the property line of a nonparticipating landowner and three times the height of the turbine from an inhabited rural residence of a nonparticipating landowner, unless a variance is granted. A variance may be granted if an authorized representative or agent of the permittee, the nonparticipating landowner, and affected parties with associated wind rights file a written agreement expressing all parties' support for a variance to reduce the setback requirement in this subsection. A nonparticipating landowner is a landowner that has not signed a wind option or an easement agreement with the permittee of the wind energy conversion facility as defined in North Dakota Century Code chapter 17-04.	Rugby Wind has identified one nonparticipating landowner that falls within this exclusion area. Rugby Wind has obtained a waiver from this nonparticipating landowner as of the time of this Application. Rugby Wind requests that the Commission grant a variance pursuant to N.D.A.C. § 69-06-08-01(2)(a)(5) with respect to this nonparticipating landowner.

**Table 3: Summary of Avoidance Areas**

NDAC § 69-06-08-01	Description	Rugby Wind Comments
NDAC § 69-06-08-01(3)(a)	Historical resources which are not designated as exclusion areas.	No impacts to historical resources are anticipated. Coordination with SHPO is ongoing to confirm historical resources on site. An Unanticipated Discoveries Plan will be prepared for the Project.
NDAC § 69-06-08-01(3)(b)	Areas within the city limits of a city or the boundaries of a military installation.	Not applicable.
NDAC § 69-06-08-01(3)(c)	Areas within known floodplains as defined by the geographical boundaries of the hundred-year flood.	Not applicable.
NDAC § 69-06-08-01(3)(d)	Areas that are geologically unstable.	Not applicable.
NDAC § 69-06-08-01(3)(e)	Woodlands and wetlands.	Woodlands and wetlands will be avoided to the extent possible during construction. If resource impacts cannot be avoided, Rugby Wind will work with the USFWS WMD and USACE to minimize impacts and restore areas, as needed. Rugby Wind will comply with the site restoration and reseeded conditions in the Commission's Order and all other applicable permitting requirements.
NDAC § 69-06-08-01(3)(f)	Areas of recreational significance which are not designated as exclusion areas.	Not applicable.
NDAC § 69-06-08-01(4)	A wind energy conversion facility site must not include a geographic area where, due to operation of the facility, the sound levels within one hundred	The Project will not result in sound levels exceeding the 50 dBA noise standard adopted by the Pierce County Board of County Commissioners. The

NDAC § 69-06- 08-01	Description	Rugby Wind Comments
	feet of an inhabited residence or a community building will exceed forty-five dBA. The sound level avoidance area criteria may be waived in writing by the owner of the occupied residence or the community building.	predicted sound level of 45 dBA is exceeded within 100 feet of nine occupied residences. Rugby Wind anticipates obtaining waivers, maintaining Suzlon turbines, or operating turbines at a lower electrical and sound output mode in order to reduce the sound level to less than 45 dBA within 100 feet of occupied residences.

### 3.2. Setbacks

In addition to compliance with the exclusion and avoidance areas described in section 3.1, the Project continues to comply with the setbacks from the original Pierce County Conditional Use Permit and ND PSC Certificate. Table 4 and Attachment F show the Project’s compliance with current and original permit setbacks.

**Table 4: Setback Compliance for Rugby Wind Farm**

Description	Calculated Setback Distance <sup>1</sup>	Status/Comments
<b>2005 Setback Compliance under PU-05-47 and Pierce County Conditional Use Permit</b>		
Setbacks of less than 200 feet are allowed if properties on both sides of the property line are leased by Rugby Wind, LLC.	61 m/200 ft	All repowered turbines are in compliance with this requirement.
No wind turbine would be placed within 1,000 feet of any occupied residence.	305 m/1,000 ft	All repowered turbines are in compliance with this requirement.
No wind turbine would be placed within 400 feet (or height of the turbine, whichever is greater) from any transmission line.	146 m/480 ft	All repowered turbines are in compliance with this requirement.
No wind turbine would be placed within 400 feet (or height of the turbine, whichever is	146 m/480 ft	All repowered turbines are in compliance with this requirement.

Description	Calculated Setback Distance <sup>1</sup>	Status/Comments
greater) from any developed road.		
No wind turbine would be placed within 400 feet (or height of the turbine, whichever is greater) from any adjacent non-participating property.	146 m/480 ft	All repowered turbines are in compliance with this requirement.
No wind turbine would be placed within 500 feet of any large (lacustrine) wetland complex (greater than 50 acres).	152 m/500 ft	All repowered turbines are in compliance with this requirement.
No wind turbine would be placed within 0.25 miles of any USFWS WPA.	0.25-mile	All repowered turbines are in compliance with this requirement.
No turbines would be placed on the one parcel of land (located in Section 24, Township 158 N, Range 72 W) within the project area covered by an irrigation permit.	Avoidance	All repowered turbines are in compliance with this requirement.
<b>Setback Compliance under NDAC § 69-06-08-01(2)(a)</b>		
1.1x the turbine height from the nearest edge of an interstate or state roadway right-of-way (ROW).	161 m/528 ft	All repowered turbines are in compliance.
1.1x the turbine height plus 75 feet from the centerline of any county or maintained township roadway.	184 m/603 ft	<p>Turbines A8, Q4, J2 and J3 are located within this setback; however, Rugby Wind's layout was approved by the Commission on May 22, 2009 (See PU-05-47, Docket 124).</p> <ul style="list-style-type: none"> <li>• A8 exceeds by less than 10 feet</li> <li>• Q4 exceeds by less than 10 feet</li> <li>• J2: adjacent to undeveloped county road</li> <li>• J3: adjacent to undeveloped county road, exceeds by approx. 10 feet</li> </ul>

Description	Calculated Setback Distance <sup>1</sup>	Status/Comments
1.1x the turbine height from the nearest edge of railroad ROW.	161 m/528 ft	All repowered turbines are in compliance.
1.1x the turbine height from the nearest edge of a 115 kV or higher transmission line ROW.	161 m/528 ft	All repowered turbines are in compliance.
1.1x the turbine height from the property line of a nonparticipating landowner.	161 m/528 ft	All repowered turbines are in compliance.
3x the height of the turbine from an inhabited rural residence of a nonparticipating landowner	439 m/1,440 ft	Variance requested for landowner affected by Turbine Q3 retrofit. .

1. Assumes a total tip height of approximately 146 meters (480 feet).  
m – meters; ft – feet

## 4. Conclusion

The Project will comply with the requirements of N.D.C.C. § 49-22-03(3)(a). The Project will continue to comply with all applicable siting laws, rules, and Commission orders, including the conditions specified in the Commission’s Order and Pierce County Conditional Use Permit. Table 5 summarizes the resources that will be impacted as a result of the Project and the appropriate mitigation.

Rugby Wind began engaging agencies throughout the early development process. Attachment G below provides a copy of agency correspondence.

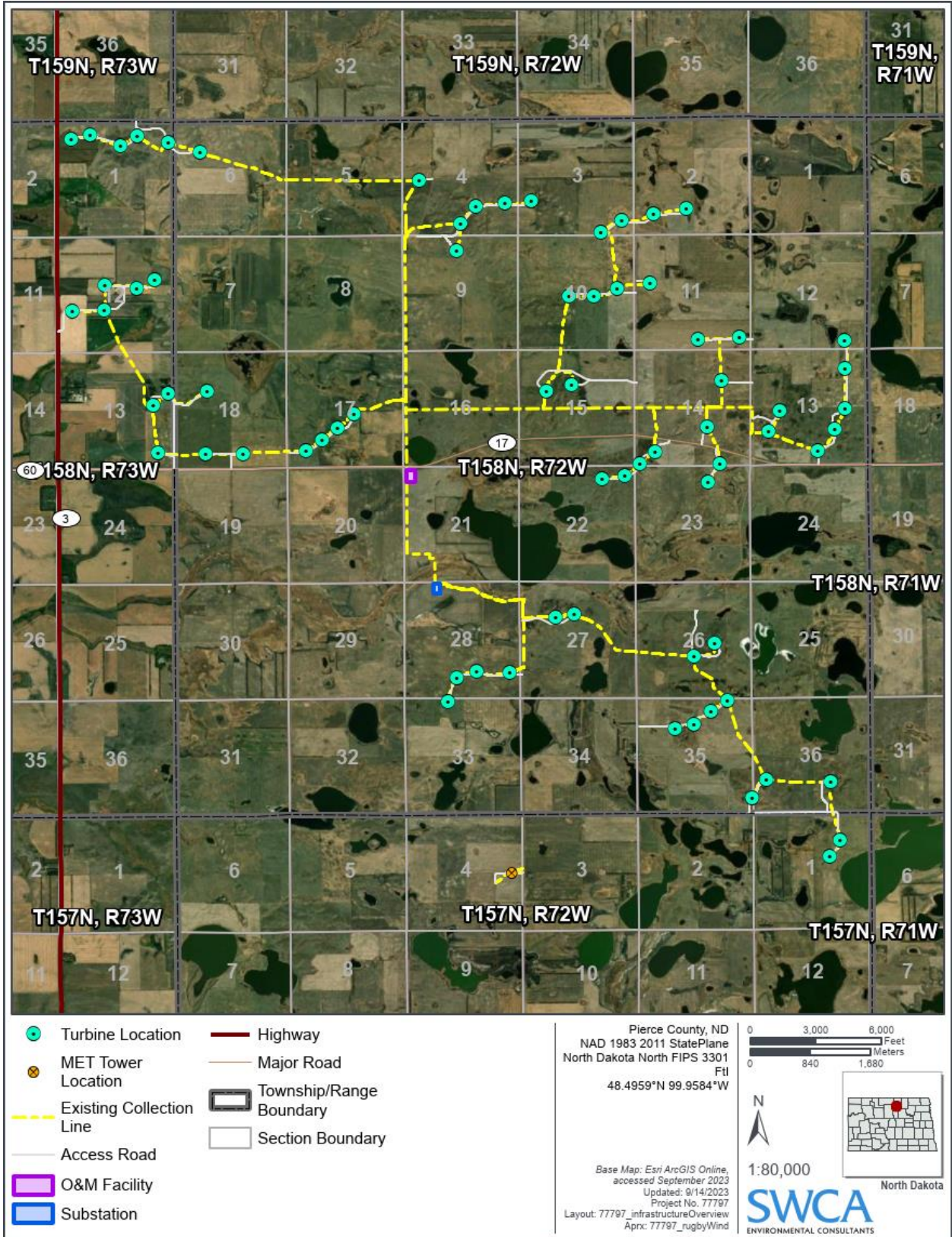
**Table 5: Summary of Environmental Resource Analysis**

Resource	Potential Project Effect	Mitigation and Avoidance Measures
Socioeconomics	The Project is anticipated to provide positive short-term and long-term impacts to the local economy.	None proposed at this time.
Land Use	The Project will not change the layout of the Facility and construction activities will utilize previously disturbed areas.	Temporarily impacted areas will be restored in compliance with applicable provisions in the Commission’s original Certificate.

Resource	Potential Project Effect	Mitigation and Avoidance Measures
Public Services	The Project will result in a temporary increase in traffic due to construction.	Rugby Wind will coordinate with local road authorities to establish road use agreements that will be in place prior to construction as well as obtain applicable permits for over-sized truck movements, as needed.
Sound	The Project will not result in sound levels exceeding the 50 dBA noise standard adopted by the Pierce County Board of County Commissioners. The predicted sound level of 45 dBA may be exceeded within 100 feet of nine occupied residences.	Rugby Wind anticipates obtaining waivers, maintaining Suzlon turbines, or operating turbines at a lower electrical and sound output mode in order to reduce the sound level to less than 45 dBA within 100 feet of occupied residences.
Human Health and Safety	<p>The Project has obtained updated DNHs for all 71 turbines at the site. No impacts to microwave beam paths are expected.</p> <p>All but one occupied residence will not exceed 30 hours of shadow flicker per year.</p>	<p>In the event that Rugby Wind receives complaints, impacts will be re-evaluated, and mitigation measures will be taken if necessary.</p> <p>Rugby Wind has obtained a waiver from the participating residence.</p>
Cultural and Architectural Resources	The Project will be utilizing previously disturbed work areas. As with its original construction, the Project does not anticipate impacting cultural or architectural resources.	Rugby Wind is committed to minimize impacts to archaeological and architectural sites possibly eligible for listing in the NRHP. Additional surveys will be conducted in coordination with the North Dakota SHPO, as needed. Rugby Wind will also develop an unanticipated discovery plan.
Recreational Resources	The Project will not impact recreational resources.	The Project will maintain the setback from USFWS WPAs.

Resource	Potential Project Effect	Mitigation and Avoidance Measures
Land-Based Economics	The Project will utilize existing Facilities and previously disturbed work areas. Crop production or grazing may be temporarily impacted for areas within the proposed construction areas. No long-term impacts are anticipated.	Rugby Wind will compensate landowners for temporary impacts to cropland in accordance with the terms of lease agreements. Once the retrofits are completed, land surrounding the Facility can continue to be farmed or grazed.
Soils	Project construction may result in temporary impacts to soil resources including soil erosion and soil compaction.	Rugby Wind will implement BMPs and the SWPPP throughout construction. Rugby Wind comply with the site restoration and reseeding conditions in the Commission's Order and all other applicable permitting requirements.
Geological and Groundwater Resources	The Project is not expected to disturb any geologic or groundwater resources.	None proposed at this time.
Waterbodies, Wetlands, and Floodplains	Temporary impacts to wetlands may result due to construction activities. There will be no impacts to floodplains.	If wetland or waterbody impacts cannot be avoided, Rugby Wind will submit for applicable permits. BMPs will be installed, and wetlands and waterbodies will be flagged prior to construction. Temporary impacts will be restored as required by applicable permits.
Vegetation	The Project will utilize previously disturbed work areas and does not anticipate removing trees or shrubs at this time.	Rugby Wind will comply with the site restoration and reseeding conditions in the Commission's Order and all other applicable permitting requirements.
Wildlife	The Project will utilize previously disturbed work areas and does not anticipate having long term impacts	Rugby Wind will continue its voluntary curtailment strategy at the site and

Resource	Potential Project Effect	Mitigation and Avoidance Measures
	<p>on wildlife or threatened and endangered species. Operational impacts are expected to be similar to current operations and other operating wind projects in the region.</p>	<p>develop a Bird and Bat Conservation Strategy to minimize risks to birds, bats, and other wildlife from operation of the wind energy facility.</p>



**Figure 1. Rugby Wind Farm existing facilities.**