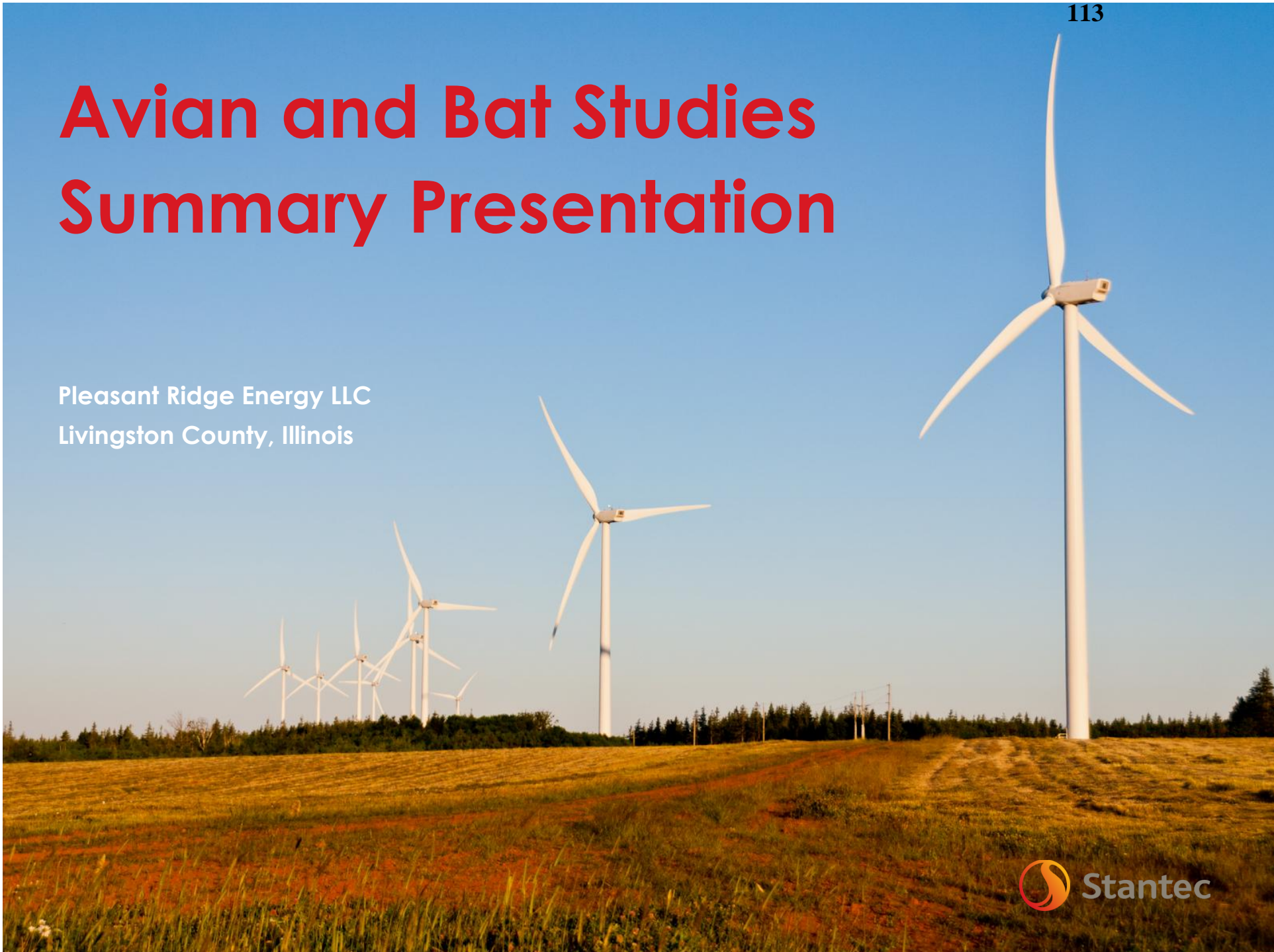


Avian and Bat Studies Summary Presentation

Pleasant Ridge Energy LLC
Livingston County, Illinois



Personal Qualifications

Terry VanDeWalle

- BS in Animal Ecology; MA in Biology
- Manage Stantec's Independence, IA office
- 8 years experience in the wind industry
- 25 years experience in Environmental Consulting
- Pre- and Post-Construction natural resource surveys and permitting at 57 wind farms in 15 states
- Avian and bat studies and permitting at 13 wind farms in Illinois

Pre-Construction Avian and Bat Studies Completed at Pleasant Ridge

- Site Characterization for Wildlife Issues (January 2009; Ritzert and Good 2009)
- Chiropteran Risk Assessment (February 2009; BHE 2009)
- Bat Acoustic Surveys (July 2009-October 2009; Good et al. 2010a)
- Habitat Mapping, Land Cover Analysis (April 2009 and May 2014)
- Bird Use Counts (March 2009-February 2010; Good et al. 2010b)
- American Golden-plover Surveys (April-May 2009; Good et al. 2010b)
- Smith's Longspur Surveys (April-May 2009; Good et al. 2010b)
- Raptor Nest Surveys (May 2009 [Good et al. 2010b] and April 2014 [Stantec 2014])
- Bat Mist-netting (Summer 2011; Murray et al. 2011)
- Summary of Natural Resources at the South Fork Vermilion River Crossing (July 2014; Shoener Environmental 2014)

Pre-construction Avian and Bat Studies

Summary of Findings – Land Cover

Habitat	Acres [Hectares]	% Composition
Cultivated Crops (e.g., corn, soybeans)	55,946[22,641]	92.6
Developed	3,432[1,389]	5.7
Deciduous Forest	451[183]	0.7
Hay/Pasture	347[140]	0.6
Open Water	122[49]	0.2
Woody Wetlands	111[45]	0.2
Barren Land	19[8]	0.0
Herbaceous	3[1]	0.0
Total	60,431[24,456]	100

Pre-construction Avian and Bat Studies

Summary of Findings – Avian Surveys

- Bird Use Surveys (2009-2010)
 - 67 species; mostly common species adapted to human disturbance
 - 5,325 bird observations; bird use and diversity relatively low
 - Northern Harrier (only sensitive species observed); none in rotor-swept zone
- Raptor Nest Surveys (2009 and 2014)
 - 2 active red-tailed hawk nests
 - No bald eagle nests
- American Golden-plover Surveys (2009)
 - 113 birds observed; none in rotor-swept zone
- Smith's Longspur Surveys (2009)
 - None observed

Pre-construction Avian and Bat Studies

Summary of Findings – Chiropteran (bat) Risk

Species	Federal status	Potential Seasonal Presence within 5 mi (8 km) of the Pleasant Ridge Project Area		
		Summer	Winter	Migration
Big brown bat	None	X	X	X
Silver-haired bat	None	X		X
Eastern red bat	None	X		X
Hoary bat	None	X		X
Little brown bat	Status review	X		X
Northern long-eared bat	Proposed Endangered	X		X
Indiana bat	Endangered	X		X
Evening bat	None	X		X
Tri-colored bat	None	X		X

Pre-construction Avian and Bat Studies

Summary of Findings – Bat Surveys

- Acoustic Surveys (2009)
 - Activity peaks late August
 - Mostly low-frequency species
 - 3.09 bat passes/detector night; low activity level
- Mist-netting (2011)
 - Big brown bats (67.5%)
 - Eastern red bats (30.5%)
 - Northern long-eared bats (6.0%)
 - Evening bats (2.4%)
 - Hoary bats (2.4%)
 - No Indiana bats

Bird and Bat Conservation Strategy (BBCS)

- Developed and submitted to USFWS
- Project siting (previously disturbed habitat)
 - 140 acres permanent disturbance
 - 511 acres temporary disturbance
- Indiana/northern long-eared bat conservation measures:
 - 1,000 feet avoidance buffer of all foraging habitat connected to the river
 - 6.9 m/s cut-in speed August 1 – October 7 (sunset to sunrise)
 - Feather blades below the cut-in speed
 - Tree-cutting (for transmission line only) will occur between November 1 and March 1

BBCS Monitoring and Adaptive Management Plan

- Post-construction mortality monitoring of all birds and bats
- American golden-plover monitoring
 - Migration monitoring to determine timing of use
 - Carcass monitoring
- Adaptive Management
 - Take of any ESA-listed species
 - Take of any bald or golden eagles
 - Identification of one or more variable(s) with a consistent and strong negative relationship to bat mortality

USFWS Technical Assistance Letter (TAL)

- USFWS reviewed BBCS, issued TAL on November 5, 2014
- Bald Eagles
 - Over 25 miles from nearest known nest
 - Pleasant Ridge will implement a carrion (road-kill) removal program
 - Risk of collision low, USFWS does not recommend applying for an eagle take permit
- Migratory Birds
 - Large flocks of migratory birds not present
 - American Golden Plover is present in project area
 - Pleasant Ridge will conduct 2 years of post-construction American Golden Plover monitoring
 - Post construction mortality monitoring of all birds

USFWS Technical Assistance Letter (TAL)

- Whooping Cranes
 - Experimental population migrates through Livingston County
 - USFWS encouraged Pleasant Ridge to coordinate with the International Crane Foundation
 - Pleasant Ridge sent a letter to Operation Migration USA on October 8, 2014 with project information
- Indiana Bat/Northern Long-eared Bat
 - Minimal summer habitat present, Fall migration risk
 - Turbines sited a minimum of 1,000 feet from suitable or occupied summer habitat – avoidance of summer take
 - Implement a 6.9 m/s cut-in speed August 1 – October 7 (sunset to sunrise) – avoidance of fall migratory take
 - Feather blades below the cut-in speed
 - Will implement 3-years of fall carcass monitoring and less intensive monitoring every 3 years during the life of the project

IDNR Consultation Letter (September 8, 2014)

Recommendation #1: *The County should consider a requirement for the applicant to conduct new mist-netting and acoustic monitoring studies to identify the bat species and bat activity areas within, and in the vicinity of, the proposed Pleasant Ridge facility. Particular attention should be paid to wooded areas along Indian Creek, the South Fork of the Vermilion River, and the North Fork of the Vermilion River.*

- Recommendation not necessary, habitat has not changed substantially, results of previous studies still valid, USFWS concurred
- Pleasant Ridge has assumed presence of listed bat species and designed/sited the project accordingly
- Implement a 6.9 m/s cut-in speed considered avoidance level by USFWS

IDNR Consultation Letter (September 8, 2014)

Recommendation #2: *The County should consider a requirement for the applicant to conduct at least one bat activity season (April-October) of post-construction bat mortality monitoring to establish a baseline for the scale of bat mortality due to normal wind farm operations, and to identify the species sustaining mortality.*

- Implies uncurtailed operation
- Pleasant Ridge does not believe that this is necessary and presents an unnecessary risk to bats
- Implement a 6.9 m/s cut-in speed to reduce overall bat mortality

IDNR Consultation Letter (September 8, 2014)

Recommendation #3: *The County should consider a requirement that wind turbine generators be set back at least 1,000 feet from wooded or forested areas which likely provide foraging habitat for bats or provide “commuting” corridors bats may follow between foraging areas.*

- Pleasant Ridge agrees, this has been incorporated into project design

IDNR Consultation Letter (September 8, 2014)

Recommendation #4: *The County should consider a requirement for the applicant to prevent “freewheeling” of turbine rotors at wind speeds below the manufacturer’s recommended “cut-in” wind speed between April 1 and October 31 each year.*

- Pleasant Ridge agrees, all turbines will be feathered below the cut-in speed

IDNR Consultation Letter (September 8, 2014)

Recommendation #5: *The County should consider a requirement for the applicant to implement mortality reduction measures during August, September, and October, the peak months for bat mortality. The Department recommends turbine cut-in speeds be raised (curtailed) to not less than 5.5 meters per second (12.3 mph) between sunset and sunrise whenever ambient air temperatures at nacelle height remain above 15°C (60°F) for a rolling average period of ten minutes.*

- USFWS has issued a TAL
- Pleasant Ridge will raise cut-in speeds to the more protective 6.9 m/s from August 1 – October 7

IDNR Consultation Letter (September 8, 2014)

Recommendation #6. *The County should consider a requirement for the applicant to conduct an additional activity season of mortality monitoring following the implementation of minimization and avoidance measures to evaluate their effectiveness.*

- Pleasant Ridge has committed to 3-years of fall carcass monitoring and less intensive monitoring every 3 years during the life of the project
- All monitoring will be conducted at turbines with minimization measures in place (feathering and increased cut-in speeds)

IDNR Consultation Letter (September 8, 2014)

Recommendation #7. *Based on the inferred presence of bachelor and maternity colonies derived from 2011 mist-netting for this project, the Department recommends the County should consider a requirement that the applicant make a good-faith effort to obtain an Incidental Take Authorization (ITA) from the IDNR for the Northern Long-Eared Bat, pursuant to Title 17 Part 1080 of the Department's Administrative Rules.*

- 6.9 m/s cut-in is considered avoidance level, and take of listed bat species is not expected to occur, USFWS concurred in the TAL
- USFWS confirmed an ESA Incidental Take Permit is not needed
- Pleasant Ridge believes a state Incidental Take Authorization is not needed

IDNR Consultation Letter (September 8, 2014)

Recommendation #8: *The Department recommends the County consider a requirement for the applicant to perform at least one full season of post-construction avian mortality monitoring of sufficient intensity to characterize the losses to be expected from this installation. A report of the results should be provided to both the County and the Department of Natural Resources.*

- USFWS has issued a TAL
- Spring and fall mortality monitoring will be conducted for 3-years, and then every 3 years for the life of the project
- Reports will be provided to USFWS

IDNR Consultation Letter (September 8, 2014)

Recommendation #9: *The County should consider requiring the prompt repair or replacement of disrupted agricultural field tiles to minimize disturbances to the flow and thermal regimes of receiving streams.*

Recommendation #10: *The County should consider requiring grading of disturbed areas to reflect as nearly as possible the original surface contours, to minimize alterations of watershed catchments.*

Recommendation 11: *The County should consider requiring the effective implementation and maintenance of erosion control measures to minimize pollution, siltation, and sedimentation in receiving streams to protect aquatic habitats.*

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- Pleasant Ridge agrees with these recommendations, and these issues are addressed by the proposed Agricultural Impact Mitigation Agreement (AIMA) that has been submitted to the County
 - Erosion control measures will also be addressed by the stormwater pollution prevention plan (SWPPP)

IDNR Consultation Letter (September 8, 2014)

Recommendation #12: *The County should consider requiring the applicant to perform acoustic/kinetic studies to determine the range, strength, and frequencies of aquatic noise generated by wind turbine operations.*

- Pleasant Ridge does not believe that this is necessary
- Pleasant Ridge is not aware of any commercially available scientific data that suggest that turbine noise and vibration will impact freshwater aquatic species

IDNR Consultation Letter (September 8, 2014)

Recommendation #13: *The County should consider requiring the applicant to perform biological surveys of each stream and channel within the project area and its near vicinity to characterize the invertebrate, mussel, fish, and amphibian communities which are present, with follow-up studies at intervals to monitor changes which may be attributable to wind turbine operation. Surveys in the winter and early summer may capture important seasonal movements.*

- Pleasant Ridge does not believe that this is necessary
- Pleasant Ridge is not aware of any commercially available scientific data that suggest wind turbine operation has an effect on invertebrate, mussel, fish, or amphibian community composition
- Not possible to show a causal link to wind turbine operation or conclude that observed changes are attributable to wind turbine operation given the many other factors that could affect community composition (e.g., water quality, disease, invasive species, climate change)

IDNR Consultation Letter (September 8, 2014)

Recommendation #14: *The Department recommends the County consider a requirement the applicant establish an instrumented monitoring station at the lower end of the Felky Slough - Saunemin Reach INAI Site to identify and monitor the frequency, duration, and amplitude of acoustic and kinetic vibrations in the INAI Site which may be emanating from project wind turbines. The Department recommends a second such station in the North Fork of the Vermilion River at the point nearest a project wind turbine for comparison.*

- Pleasant Ridge does not believe that this is necessary
- The Felky Slough - Saunemin Reach INAI Site is located approximately 4.5 miles from the nearest proposed turbine
- No records of threatened or endangered species
- Pleasant Ridge is not aware of any commercially available scientific data that suggest that turbine noise and vibration will impact freshwater mussel or fish species at a distance of 4.5 miles.

IDNR Consultation Letter (September 8, 2014)

Recommendation #15: *The Department recommends the County consider a requirement the applicant establish an instrumented monitoring station at the lower end of the Charlotte Reach INAI Site to identify and monitor the frequency, duration, and amplitude of acoustic and kinetic vibrations in the INAI Site which may be emanating from project wind turbines.*

- Pleasant Ridge does not believe that this is necessary
- The Kelly Creek - Charlotte Reach INAI Site is more than 3 miles
- No records of threatened or endangered species
- Pleasant Ridge is not aware of any commercially available scientific data that suggest that turbine noise and vibration will impact freshwater mussel species at a distance of greater than 3 miles

Effect of Wind Turbines on Livestock

- No scientifically defensible studies on cattle and hogs
- Domestic Geese (2013 study)
 - Compared the health effects of a wind turbine on the development of two groups of growing geese
 - Results suggest a negative effect in the immediate vicinity (50 m) of a wind turbine on stress parameters compared to birds raised 500m from the turbine
- Veterinarians working with herds in the vicinity of Illinois wind farms
 - No adverse effects have been reported or observed