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Witness:	Dr. Janet Haslerig
Sponsoring Party:	Missouri Department of Conservation
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MISSOURI PUBLIC SERVICE COMMISSION
FILE NO. EA-2019-0021

WRITTEN REBUTTAL TESTIMONY
OF
DR. JANET HASLERIG
ON
BEHALF OF
MISOURI DEPARTMENT OF CONSERVATION

DECEMBER 21, 2018

*****DENOTES HIGHLY CONFIDENTIAL INFORMATION*****

REBUTTAL TESTIMONY OF DR. JANET HASLERIG

MISSOURI DEPARTMENT OF CONSERVATION

CASE NO. EA-2019-0021

I. INTRODUCTION

Q. Please state your name, title and business address.

A. Janet Haslerig, Ph.D., Resource Scientist, Missouri Department of Conservation, P.O. Box 180, Jefferson City, Missouri 65102-0180.

Q. What are your qualifications and experience?

A. I have a Ph.D. in Wildlife Ecology and over 15 years of professional experience in wildlife conservation. I have served as the Bald Eagle Recovery leader for the Missouri Department of Conservation ("MDC") since October 2010 where I am responsible for the monitoring and recovery of bald eagle populations in the state.

Q. Have you testified previously before the Missouri Public Service Commission?

A. Yes. I have provided testimony in Case No. EA-2018-0202 before the Public Service Commission ("Commission"). In that case, Ameren Missouri ("Ameren") was seeking approval of Certificate of Convenience and Necessity for a wind farm in Schuyler and Adair Counties.

Q. Are you familiar with the application for Certificate of Convenience and Necessity ("CCN") filed by Ameren Missouri for the Brickyard Hills wind farm?

A. Yes. I am familiar with the project proposal to construct a wind farm in Atchison County, Missouri known as the Brickyard Wind Farm ("Project"). I have reviewed shapefiles provided by Ameren designating the Project boundary and have compared that information with

data contained in the MDC's Natural Heritage Database, which indicates current and past locations of threatened and endangered species as well as species designated by MDC as Species of Conservation Concern ("SOCC") as described below.

Q. What is the purpose of your rebuttal testimony?

A. The purpose of my testimony is to respond to the Application for a Certificate of Convenience and Necessity filed by Ameren. The purpose of this testimony is to express concern that the Project poses a risk to bald eagles and other raptors in and around the Project area and to explain why the Commission should impose conditions on the Project related to mitigation and monitoring to ensure that the construction and operation of the proposed wind turbines do not adversely impact the state's conservations interests.

Q. Are bald eagles currently protected by federal or state law?

A. Yes, both. While bald eagles were removed from the federal Endangered Species Act list in June 2007, they remain federally protected by the Bald and Golden Eagle Protection Act, 16 U.S.C. 668-668c, and the Migratory Bird Treaty Act, 16 U.S.C. 703-712. These acts generally prohibit anyone, without a permit, from taking or disturbing bald eagles, including their parts, nests, or eggs. The bald eagle has been also listed MDC as a Species of Conservation Concern ("SOCC"). This state designated status and rank indicate the level of concern about the species and/or natural community continued existence throughout its range in Missouri. The bald eagle is currently listed as "S3" within the state – which means that it is vulnerable in the state due to a restricted range, relatively few populations or occurrences, recent and widespread declines, or other factors making it vulnerable to extirpation. As an SOCC, the bald eagle in Missouri warrants routine monitoring to assess the population status and to document the continual recovery of the species as well as detect any eminent or pending threats to its survival.

Q. Can you generally describe the life history of the bald eagle species?

A. The bald eagle is a North American species with a historic range from Alaska and Canada to northern Mexico. As many as 300,000 – 500,000 bald eagles once made their home on the continent in the 1700s. By 1963, less than 500 nesting pairs remained in the lower 48 states. Habitat destruction and degradation, illegal shooting, and the contamination of its food source, largely because of dichlorodiphenyl-trichloroethane ("DDT"), decimated the eagle population. Consequently, the United States Fish and Wildlife Service ("USFWS" or "Service") listed the bald eagle as endangered in all 48 contiguous states under the Endangered Species Act in 1978. With the enforced federal protection, bald eagles have recovered dramatically with about 10,000 nesting pairs in the lower 48 states. In 2007, the USFWS announced the recovery of our nation's symbol and removal from the list of threatened and endangered species.

Q. Can you generally describe bald eagles' life expectancy, habitat and behavior?

A. Bald eagles may live 15 to 25 years in the wild, and longer in captivity. Eagles mate for life, choosing the tops of large trees to build nests, which they typically use and enlarge each year. They may also have one or more alternate nests within their breeding territory. Breeding bald eagles (beginning in fourth or fifth year) typically lay one to three eggs once a year, and they hatch after about 35 days. Hatchlings usually fly within three months and typically remain in the nest area for several months. The foraging area during the breeding season varies based on location and the abundance of food in the area. Until the fledgling learns how to hunt for food, they are dependent on the adults for food and will remain in the nest area for several weeks at which time they will follow the adults to foraging sites. In addition, it is well documented that fledged eagles typically return to the general vicinity (100-250 miles) of their

nest area to breed once they have reached sexual maturity between the ages of four to five. Disease, lack of food, human disturbance, lead poisoning, electrocution, collision with vehicles or power lines kill many fledglings.

Q. Describe MDC's efforts in restoring, managing and protecting bald eagles.

A. MDC has invested and will continue to invest considerable resources in the restoration, management and protection of bald eagles. From 1981 to 1990, MDC, in cooperation with USFWS and the Dickerson Park Zoo in Springfield, released 74 young bald eagles in Missouri to reestablish them as nesters. The eaglets were obtained from captive breeding facilities or healthy wild populations and released in good nesting habitat at Mingo National Wildlife Refuge and Schell-Osage Conservation Area. Since 1990, MDC has opportunistically monitored the population of nesting bald eagles in the state. After the USFWS delisted the bald eagles, we have systematically surveyed nesting bald eagles under the USFWS post-delisting monitoring plan. This plan calls for states nationwide to monitor the status of bald eagles for a 20-year period. In 2006 (prior to the official delisting of the bald eagle under the ESA), MDC participated in the pilot study to test the effectiveness of the post-delisting monitoring protocol. Since then, MDC conducted statewide aerial and ground surveys in 2011, 2016, 2017 and 2018. The yearly estimated monetary cost of conducting aerial surveys is approximately $10,189 (helicopter only), not including staff hours.

Initiated in the spring of 2018, the Missouri Eagle Watch Program allows volunteers to contribute to "real" science by collecting critical monitoring information necessary for the conservation and protection of bald eagles in the state. The Eagle Watch Program is a standardized and comprehensive eagle nest monitoring program using citizen scientists to

monitor bald eagle populations and their productive status. In just the first year, MDC had over 35 citizens participate in this program and MDC expects that number to grow rapidly.

Q. Are you concerned about the impact of the Project on bald eagles? Why or why not?

A. Yes, I am concerned about the impact of the Project on bald eagles. Based on shapefiles and reports provided by Ameren in response to MDC data requests, as well as a review of the MDC's Natural Heritage Database, there are no known eagle active or inactive eagle nests within the Project boundary. However, a 2016 Eagle and Raptor Nest Survey provided by Ameren in response to MDC data requests, indicates there were ***_____ _____ _____*** See Figure 1. ***_____ _____ _____*** See Figure 2.

Because the Project's 2016 and 2017 Eagle and Raptor Nest Surveys did not adhere to the same study design (i.e., project buffer areas) between years, I am concerned that the comparison of results are misleading and fail to accurately describe the full extent of nesting bald eagles in the Project vicinity (i.e., 10-mile buffer). ***_____ _____ _____ _____.***

According to MDC's Natural Heritage Database, there are an additional ***_____ _____*** not identified by the 2016 and

2017 Eagle and Raptor Nest Surveys. Additionally, the Project's Bird and Bat Conservation Strategy clearly demonstrates bald and golden eagle use of the Project area. See Figure 3.

Concern for eagles and other federally and state protected avian species is supported by the Project's Bird and Bat Conservation Strategy (September 2018), which states:

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According to the National Audubon Society, wind turbines and their associated infrastructure kill an estimated 140,000 to 328,000 birds each year in North America.[1] However, at best these are very rough estimates that are highly variable due in part to the lack of published and comparable studies or the general lack of rigorous monitoring and reporting of eagle mortalities.[2] It is my understanding that wind energy is among the fastest growing energy sectors in the world, and one of the most concerning threats to birds and bats in the United States.[3] At the end of 2016, there were more than 52,000 operating, commercial-scale wind turbines in the United States and many more currently under construction.[4]

[1] Bryce, E. 2016. Will Wind Turbines Ever Be Safe For Birds. National Audubon Society.

[2] American Wind Wildlife Institute (AWWI). 2018. Wind Turbine Interactions with Wildlife and Their Habitats: A Summary of Research Results and Priority Questions. Washington, DC.

[3] Pagel, Joel, K. Kritz, B. Millsap, R. Murphy, E. Kershner and S. Covington. 2013. Bald Eagle and Golden Eagle Mortalities at Wind Energy Facilities in the Contiguous United States. J. Raptor Res. 47(3):311-315.

[4] Colleen Martin, E. Arnett, and M. Wallace. 2013. Evaluating Bird and Bat Post-Construction Impacts at the Sheffield Wind Facility, Vermont. 2012 Annual Report.

Increasingly, estimates of raptor mortality at wind farms is the subject of intense effort and study.[5] Reportedly, diurnal raptors like bald eagles are relatively vulnerable to collision with wind turbines.[6] Because these groups are far less abundant than song birds, there is concern that the potential relatively high fatality rates are reflective of a high vulnerability to collision.[7] The high vulnerability of birds of prey is especially problematic as many species are slow to reproduce. Thus, a loss of breeding adults from fatal collisions has a greater effect on the population than on many other avian species.[8] Significant losses to raptors are exacerbated by wind energy projects located in or near major migratory routes, stopover sites, or key breeding or foraging areas.[9] Disturbance, displacement from suitable habitat, or demographic effects due to fragmentation of habitat from pre-construction, construction, or operation and maintenance activities might result in loss of productivity at nearby nests.[10] Serious disturbance or mortality effects could result in the permanent or long-term loss of a nesting territory and disturbances

[5] Hutchins, Michael. 2017. Wind Energy and Birds FAQ- Part 1: Understand the Threats Wind Energy Poses to Birds. American Bird Conservancy.

[6] Watson, R.T., P.S. Kolar, M. Ferrer, T. Nygard, N. Johnston, W.G. Hunt, H.A. Smit-Robinson, C.J. Farmer, M. Huso and T. E. Katzner. 2018. Raptor Interactions with Wind Energy: Case Studies From Around the World. J. Raptor Res. 52(1):1-18.

[7] American Wind Wildlife Institute (AWWI). 2018. Wind Turbine Interactions with Wildlife and Their Habitats: A Summary of Research Results and Priority Questions. Washington, DC.

[8] Mojica, E.K., B. Watts, and C. L. Turrin. 2016. Utilization Probability Map for Migrating Bald Eagles in Northeastern North America. A Tool for Sitting Wind Energy Facilities and Other Flight Hazards. PLoS ONE 11(6):e0157807.doi:10.1371/journal.pone.0157807.

[9] Pagel, *supra* n.2.

[10] Beston, Julie A., J. Diffendorfer, Scott R. Loss, and D.H. Johnson. 2016. Prioritizing Avian Species For Tier Risk of Population-Level Consequences from Wind Energy Development. PLoS One (3): e0150813.doi:10.1371/ journal.pone.0150813.

near important eagle use areas or migration concentration sites might stress eagles so much that they suffer reproductive failure or mortality elsewhere.

Q. Are you concerned about the impact of the Project proposed in this case upon raptors other than eagles? And if so, why?

A. Yes, I am concerned about the impact of the Project on non-eagle raptors. During the Project's 2016 Eagle Raptor Nest Survey, ***[redacted]*** See Figure 4. ***[redacted] *** See Figure 2.

Q. Do you have concerns about the impacts of this Project combining with the impacts from other wind projects in the area?

A. Yes. I am increasingly concerned about the potentially cumulative effects from industrial-scale wind projects (permitted and unpermitted) upon bald eagles in the area. There are a number of other wind farms operating in the area or are in the planning stages. I am continuing to review Ameren's responses to MDC data requests only recently received and may provide additional information on this issue in my surrebuttal testimony.

Q. It is my understanding that Ameren plans to develop an Eagle Conservation Plan in consultation with the USFWS, which will permit the incidental take of eagles under certain circumstances. Are you familiar with the ECP?

A. I am familiar with Eagle Conservation Plans ("ECP"), but I have not yet seen a draft copy of the plan described by Ameren. An ECP describes how the project developer or operator intends to comply with the regulatory requirements for programmatic permits under the Federal Endangered Species Act and the associated federal National Environmental Policy Act process by avoiding and minimizing the risk of taking eagles up-front, and formally evaluating possible alternatives in (ideally) siting, configuration, and operation of wind projects. Post-construction monitoring (i.e., disturbance and fatality monitoring) may be required by USFWS as a condition of an eagle programmatic take permit and will be required for wind-energy projects that may potentially take eagles.

Q. Does Ameren obtaining an ECP and an incidental take permit from the USFWS eliminate your concerns about eagles in Missouri?

A. No. At this point, we do not know if Ameren will apply for and obtain an ECP. Even if it does, MDC has and continues to invest substantial resources in the restoration, monitoring, and preservation of bald eagles, as well as other raptors. MDC has an interest in knowing how many eagles are killed by wind turbines, as well as how and where they are killed. MDC needs a greater understanding of how to protect eagles from threats such as wind turbines. This understanding can help MDC in the process described by MDC Witness Jennifer Campbell in working with project developers on any number of projects to ensure we are meeting the state's renewable energy standards but not ignoring conservation concerns in the process. The concern is that wind energy could nullify the significant investments by our state in conservation efforts.

Q. What does MDC recommend with respect to bald eagles and other raptors?

A. MDC is asking that the Commission ensure that Missouri citizens' investment in conservation of bald eagles is protected by requiring an ECP as a condition of the Certificate of Convenience and Necessity ("CCN). MDC further asks that the following conditions be imposed so that MDC can adequately protect, monitor and determine the impacts of the Project on the area's bald eagle and raptor population:

1. Require Ameren to provide reasonable advanced notice to MDC of all scheduled meetings and conference calls (related to the Project) with the USFWS.

2. Prohibit Ameren from clearing any known active or inactive eagle nest trees.

3. Require Ameren to conduct post-construction monitoring of eagle fatality and disturbances in accordance in USFWS Guidance. Fatality monitoring efforts involve searching for eagle carcasses beneath turbines and other facilities to estimate the number of fatalities. Disturbance monitoring will determine post-construction territory or roost occupancy rates, nest success rates and productivity.

4. Requires a minimum one-mile set-back from (or buffer around) known active and alternative (present and future) eagle nests within the Project area where turbines cannot be constructed or operated.

5. Report to MDC all eagle carcasses observed within 48 hours via email identifying the date, turbine location (UTMs), species, and sex.

6. Report to MDC observed mortalities for (a) all raptors and (b) bird species of conservation concern ("SOCC") observed annually by December 31, identifying the date, turbine location (UTMs), species, and sex.

7. Provide MDC a copy of all documents and/or reports related to the Project that it provides to the USFWS at the same time as they are provided to the USFWS.

8. Provide the Commission annual reports which include the information in Paragraph 3, 5, 6, and 7 above.

Q. Why should the Public Service Commission consider these issues when issuing a CCN?

A. The bald eagle is a symbol of national significance. In 1782, a committee of the Continental Congress selected the bald eagle as our nation's symbol. At that time, there were an estimated 100,000 nesting pairs in the United States. By 1890, bald eagles were nearly eliminated as nesters in Missouri, and by 1963, the bald eagle population was reduced to only 487 nesting pairs nationwide. Through increased protected, reintroductions and education spanning decades, the bald eagle population slowly increased. The bald eagle's recovery is one of the great conservation success stories in the United States. Although bald eagle numbers have increased from delisting in 2009, they are still well below historic numbers. Therefore, continued monitoring is critical to ensure a stable and increasing population. The public, through the MDC's Eagle Watch Program and "Eagle Days" events held throughout the state, are enthusiastically engaged in helping ensure that the bald eagle continues to thrive in the state. As an example, the 2018 Eagle Adventure Event at the Runge Conservation Center in Jefferson City hosted 1,500 visitors for the one-day event. The associated viewing at the nearby Marion Access hosted 436 visitors. This continues to be Runge Nature Center's largest one-day event, even though the program has been held statewide in some areas for 40 years.

Q. Does this conclude your rebuttal testimony?

A. Yes.

Figure 2. ***

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Figure 1. ***

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Figure 3. ***

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Figure 4. ***

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BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI

In the Matter of the Application of Union Electric Company d/b/a Ameren Missouri for Permission and Approval and a Certificate of Convenience and Necessity Authorizing it to Construct a Wind Generation Facility	)))))	File No. EA-2019-0021

AFFIDAVIT OF DR. JANET HASLERIG

STATE OF MISSOURI)
) ss
COUNTY OF COLE)

Dr. Janet Haslerig, being first duly sworn on her oath, states:

1. My name is Dr. Janet Haslerig. I work in Jefferson City, Missouri, and am employed at the Missouri Department of Conservation as a Resource Scientist.

2. Attached to this affidavit and made a part hereof for all purposes is my Written Rebuttal Testimony (testimony) on behalf of Missouri Department of Conservation. The testimony is 16 pages and has been prepared in the appropriate format to be introduced into evidence in the case above.

3. I hereby swear and affirm that my answers contained in the attached testimony to the questions promulgated therein are true and correct.

DR. JANET HASLERIG

Sworn to and subscribed before me this 21st day of December, 2018.

Notary Public

My commission expires: November 24, 2021

LAURA M. STICKANN
Notary Public - Notary Seal
State of Missouri
Commissioned for Cole County
My Commission Expires: November 24, 2021
Commission Number: 13551367