Illinois Department of
Natural Resources
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Pat Quinn, Governor
Marc Miller, Director

June 3, 2014

Mr. Will D'Andrea, Zoning Officer
Logan County
529 S. McLean St.
Lincoln, IL 62656

RE: Relight US Corp South Logan Wind Farm, Logan County
Endangered Species Consultation Program
EcoCAT Database Review #1411863

Dear Mr. D'Andrea:

The Department has received a submission from Relight US Corp for its proposed South Logan Wind Farm. The project was re-submitted for consultation in accordance with the *Illinois Endangered Species Protection Act* (IESPA) [520 ILCS 10/11], the *Illinois Natural Areas Preservation Act* (INAPA) [525 ILCS 30/17], and Title 17 *Illinois Administrative Code* Part 1075. This document is being submitted to you to become a part of any administrative record associated with a decision by the County to authorize the proposed wind farm facility.

This letter states the biological opinions of the Department of Natural Resources pertaining to Natural Areas and those endangered or threatened species protected by the statutes, identified above, which require the County's consultation with the Department, plus any opinions and recommendations pertaining to species covered by the *Fish and Aquatic Life Code* [515 ILCS 5] and the *Illinois Wildlife Code* [520 ILCS 5].

Coal Mining. Portions of the proposed project area lie near, but not above, areas within the approved mining plan of the Arch Coal Viper Mine, whose main portal is located just southeast of Elkhart. Mining may produce geological instability incompatible with wind turbine construction and operation. Currently, the proposed facility does not approach nearer than two kilometers to areas authorized for coal mining.

Recommendation #1. The wind energy project should not be expanded westward without investigating the mining status of newly-proposed areas.

Bats. The project area lies within the historic range of the federally-listed endangered **Indiana Bat**, *Myotis sodalis*, although the Department has no records or documentation for this species in Logan County. However, the Indiana Bat is present along the Lower Sangamon River in Cass County, and a specimen was collected in Springfield in 1971, suggesting its presence on the

Middle Sangamon. It is possible that undocumented summer colonies may be present along Salt Creek and its tributaries, which are part of the Sangamon River system.

The Indiana Bat is also migratory, known to fly up to 300 miles (though usually much less) between summer habitat and caves or mines in which it spends the winter. Little is known about the migratory movements of this species, so it is possible that migrating individuals may pass through the project area. However, on the basis of current information, the Department's opinion is that the proposed action is unlikely to adversely modify essential habitat of the Indiana Bat and is at low-risk of taking this species.

On October 3, 2013, the U.S. Fish & Wildlife Service gave 12-month notice of its intention to list as federally-endangered the **Northern Long-Eared Bat**, *Myotis septentrionalis*; listing is anticipated in October 2014. This species is present in Logan County and has a demonstrated vulnerability to wind turbine collision. It is not currently listed by the State of Illinois, but a federal listing will automatically place it on the Illinois List as endangered.

White-Nose Syndrome, the reason for the abrupt decline in populations of the Northern Long-Eared Bat, is now present in Illinois bat hibernation sites. While the fungus may not directly kill bats, mortality in infected caves can exceed 90% of the bats present. There is no known treatment for this disease.

In Illinois, up to 97% of the bats killed at wind farms consist of **Hoary Bats**, *Lasiurus cinereus*, **Eastern Red Bats**, *Lasiurus borealis*, and **Silver-Haired Bats**, *Lasionycteris noctivagens*. Collectively known as "tree bats" (since, unlike the species discussed above, they do not hibernate in caves or mines but migrate long distances and tend to roost singly in trees), these species suffer heavy collision mortality during their fall migration season, extending from mid-July to mid-November, with the heaviest losses from early September to mid-October. While most Illinois wind farms report an average of 2-4 bats killed per turbine (Logan County's Railsplitter Wind Farm is in this range), a wind farm in McLean County reported fatality rates of more than 15 bats per turbine (11.8 bats per MW capacity, another common measure).

While "tree bats" are considered very common, no good estimates of population sizes or "natural" mortality exist, and these species typically produce only one pup a year, limiting their ability to recoup abnormally-large losses. Consequently, potential losses of several thousand bats per year at just one wind farm give rise to concerns whether these species can sustain themselves in the face of wind energy development.

Recommendation #2. A program of pre-construction acoustic and mist-netting surveys should be performed to attempt to identify and quantify the bat species using the project area during both breeding and migration seasons as well as the locations of maternity colonies or collective roosts. After construction, mortality studies should be planned to identify and quantify the species adversely affected by turbine operations. The results of such studies should be provided to both Logan County and the Department of Natural Resources. The identification of any species listed as endangered or threatened should prompt application for appropriate permits from the Department of Natural Resources. If high rates of mortality of any bat species are identified, means of reducing or mitigating losses should be considered.

Recommendation #3. When wind speeds fall below power generation minimums (i.e., "cut-in speed"), turbine control systems should be programmed to "feather" turbine blades to prevent rotation. Recent studies have shown that between 30% and 50% of all bat losses occur at wind speeds below those at which turbines produce electricity. Feathering turbine blades at low wind speeds will conserve this wildlife resource.

Bald Eagle, *Haliaeetus leucocephalus*. Although de-listed from endangered species statutes, the Bald Eagle remains protected by the federal *Bald and Golden Eagle Protection Act*. No Eagle nesting sites or activity areas are known to occur in the vicinity of the proposed wind energy facility. The nearest documented Eagle nests are located over 12 miles northwest at the confluence of Sugar Creek with the Salt Fork, 17 miles southwest on the Sangamon River at Rt. 29, and 25 miles east-northeast at Clinton Lake. The activity radius from a nest is generally considered to be about ten miles, so the project lies outside the "activity area" associated with each of these nests.

However, Bald Eagles are migratory and often migrate directly overland. In addition, the project area is adjacent to the Salt Fork for several miles, and Bald Eagles may use this riparian corridor at various times. Nevertheless, it is the biological opinion of the Department the proposed action is unlikely to adversely modify the essential habitat of the Bald Eagle or pose the risk of prohibited taking of this animal.

Elkhart Hill INAI Site and Associated Preserves/Reserves. Portions of the project area lie within three miles of the **Elkhart Hill Illinois Natural Areas Inventory Site**, located on the large glacial kame which takes its name from the Village of Elkhart on its western flank. Within the INAI Site are located the **Elkhart Hill Grove Nature Preserve**, the **Elkhart Hill Grove Land & Water Reserve,** and the **North Elkhart Hill Grove Land & Water Reserve**.

The only potential impact on the Reserves/Preserve is that of visibility. The INAI is largely covered in deciduous forest, but its eastern verge provides an open vista of the landscape toward Mt. Pulaski, ten miles away on the far side of the proposed wind farm. Thus, in all seasons, the wind turbines of the project will be clearly visible to observers on the eastern edges of the Reserves and Preserve. In the winter, when the leaves have fallen, the wind turbines may be visible for some distance into the interiors of these sites. Whether the turbines will be obtrusive on the consciousness of Preserve visitors is likely to be a subjective determination for each visitor. The turbines are likely to at all times be less obtrusive than the nearby Arch Viper Coal Mine which is only one mile away. Even in the winter, visitors desirous of a "pre-settlement" visualization will be able to find locations within the Reserves/Preserve where wind turbines do not intrude.

It is the opinion of the Department the proposed action is unlikely to adversely modify the Elkhart Hill INAI Site or its constituent Land & Water Reserves and Nature Preserve.

Salt Creek INAI Site. Salt Creek has been designated an Illinois Natural Areas Inventory Site from the Clinton Dam tail-water to a point about 4.5 miles downstream of Interstate 55 due to its unusually high species diversity in mussels. As many as 18 species of mussels, including the State-listed threatened **Spike Mussel**, *Elliptio dilatata*, have been documented in Salt Creek.

Because all mussels are parasitic on one or more species of fish at one point during their life cycle, such diversity of mussels is also indicative of high fish diversity. The diversity of fishes and mussels is, in turn, dependent on favorable habitat conditions, which includes a favorable thermal regime in the stream.

For much of their lengths, Salt Creek and its tributaries, such as the Lake Fork which bounds the western side of the proposed wind farm, have been channelized to promote agricultural drainage. Although channelization is widely regarded as detrimental to in-stream habitat (and rightly so), the Department has found that many channelized streams and ditches support a rich diversity of fish and mussels. The principal reason for this is the influx of cool ground water from agricultural drain tiles, which tends to suppress in-stream water temperatures, despite the removal of natural shade from riparian forests.

However, during wind farm construction, drain tiles are often crushed or disrupted, interrupting flows and potentially causing significant temperature changes in receiving streams which are harmful to fish, mussels, and other aquatic organisms essential to a stable ecosystem. For example, the **Mudpuppy Salamander** (see below) is highly stressed at water temperatures above 72 degrees Fahrenheit, and temperatures above 77 degrees are fatal. Therefore it is important that drain tile systems be promptly repaired or replaced during the construction phase in order to minimize impacts to aquatic fauna.

Sedimentation and siltation are another major threat to aquatic habitats. The bed of Salt Creek, and that of most tributaries, consists mainly of gravel and cobble, with occasional sand bars. Siltation can bury this substrate and smother many plants and organisms which play important roles in the aquatic food chain.

Wind turbine construction requires extensive excavation of foundations, construction of new service roads, the installation of underground power lines, and the modification of many roads, including their drainage infrastructure, such as bridges and culverts. Many fields within the wind farm boundary possess field terraces to control erosion, and these are particularly vulnerable to careless modification. Adherence to a well-developed storm water management plan and careful attention to the modification of any surface features are essential to avoiding adverse in-stream impacts many miles downstream.

Several proposed turbine locations are near enough to Lake Fork Creek (less than 1.6 km) to cast "flicker" shadows on the channel for several hours on summer mornings. Such shadows may stress fish and other aquatic fauna while they last, but should not pose a significant barrier to migratory movements in the stream.

Recently, the Department has become concerned that extra-low frequency acoustic pulses (infrasound) emitted by wind turbines may adversely modify aquatic habitats, altering the behavior of fish and amphibians, as well as invertebrates. While some research is available demonstrating the successful use of low-frequency sound to exclude fish from hazardous areas, such as pipe intakes, its applicability to wind turbine acoustics has not been investigated. However, some potential may exist to alter habitats in the Salt Fork and its Lake Fork tributary.

Recommendation #4. All drain tile systems should be located and mapped prior to construction, and any drain tiles damaged or destroyed during construction should be promptly repaired or replaced. Service roads which traverse field terraces should be designed and constructed to provide appropriate drainage to preserve terrace functions. A well-developed soil erosion control plan should be enforced.

Migratory Aquatic Endangered/Threatened Species. The Sangamon River system supports several aquatic species with significant seasonal movements which may temporarily be present within or adjacent to the project area. Although not expected to directly affect these species, they may be adversely affected by indirect effects of wind turbine construction and operation, so it is appropriate to be aware of their potential presence.

Formerly distributed statewide, the nocturnal **Mudpuppy Salamander**, *Necturus maculosus*, is present in the Upper and Middle Sangamon River System, as well as the Mackinaw River System. Although not recently documented, it is likely present in the Lower Sangamon River and its tributaries, including Salt Creek. Unlike many other amphibians, the Mudpuppy does not hibernate and is most active in the winter, preferring waters around 40 degrees Fahrenheit. In late Fall and early Winter, it ascends tributaries in search of shallow gravel riffles in order to spawn. It gradually descends the stream system again, depositing eggs in February beneath logs, debris, and rocks in the stream bed. The Mudpuppy is the largest Illinois salamander, being up to one foot in length, and is also the only Illinois salamander unable to ever leave the water, remaining dependent on external gills for its entire life. Because the Mudpuppy has no swim bladder and does not float to the surface when stunned, it is rarely detected during modern standard fish surveys which employ electro-shocking equipment, and so is likely under-sampled. Important threats are water pollution, including thermal pollution, and routine removal of in-stream woody debris. The Mudpuppy is strongly dependent on lateral-line cells extremely sensitive to vibration and electro-magnetic fields which it uses to detect prey and avoid predators. Its sensitivity to the vibrations of operating wind turbines or to the electro-magnetic fields of buried power lines which cross beneath stream channels has not been determined.

The **Lake Sturgeon**, *Acipenser fulvescens*, is a primitive fish, which may travel hundreds of miles during a single year and may reach lengths of five or six feet during its hundred-year lifespan. Generally considered to occupy larger rivers, such as the Mississippi and Illinois, younger fish often ascend tributary streams, while spawning adults must find relatively shallow fast-flowing cobble riffles which are now rare in main-stem rivers modified for navigation. Lake Sturgeons more than three feet in length have been taken at the dam tail-water in Petersburg, above the Sangamon River confluence with Salt Creek. Lake Sturgeons have also been taken at the dam tail-water for Lake Bloomington, demonstrating their ability to ascend relatively minor tributaries. Consequently, it may be possible for this species to ascend Salt Creek all the way to the Clinton Lake tail-water, along with tributaries that enter below Clinton Lake. The Lake Sturgeon feeds primarily on invertebrates, including insects, snails, and small mussels. Primary threats include depauperate food resources, blockages of stream movement, the removal or adverse modification of spawning sites, and water pollution—particularly siltation and sedimentation.

The **Smooth Softshell Turtle**, *Apalone mutica*, is generally considered a larger river species, but is strongly represented in the Lower Sangamon River, of which Salt Creek is a tributary. Unlike its sympatric relative, the **Spiny Softshell**, *Apalone spinifera* (which is not listed), the Smooth Softshell is seldom found in non-flowing waters. It prefers soft substrates such as sand and mud, in which it may bury itself to ambush prey. It may lay its eggs as much as a hundred yards from the water, usually in sandy areas four feet or more above normal water levels to avoid inundation during the incubation period. While Salt Creek and the Lake Fork may be too shallow to provide preferred habitat, the prey-rich environment they offer may attract the Smooth Softshell from time to time. Primary threats include water pollution and modification or destruction of nesting areas, as well as confusion with the Spiny Softshell. Both species can be taken on a hook-and-line and both are edible.

Recommendation #5. If any in-stream work is necessary to improve or repair transportation infrastructure, either surveys should be performed to determine the presence of these species or measures should be taken to exclude them from the construction zone.

Consultation on the part of the Department is terminated, unless the County desires additional information or advice related to this proposal. In accordance with 17 Ill. Adm. Code 1075.40(h), Logan County must notify the Department of its decision regarding these recommendations, whether it will:

- Allow the action to proceed as originally proposed;
- Require the action to be modified per Department recommendations (please specify which measures if not all will be required); or
- Forgo the action.

This consultation is valid for two years unless new information becomes available which was not previously considered; or if the proposed action is modified; or if additional species, essential habitat, or Natural Areas are identified in the vicinity. If the project has not been implemented within two years of the date of this letter, or any of the above listed conditions develop, a new consultation is necessary.

The natural resource review reflects the information existing in the Illinois Natural Heritage Database at the time of the project submittal, and should not be regarded as a final statement on the site being considered, nor should it be a substitute for detailed site surveys or field surveys required for environmental assessments.

If additional protected resources are encountered during the project's implementation, the applicant must comply with the applicable statutes and regulations. Also, note that termination does not imply IDNR's authorization or endorsement of the proposed action. Please contact me if you have questions regarding this review.

Sincerely,

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cc: Valerie Njapa, Illinois Nature Preserves Commission
Michele Milani, Relight US Corp