

Section 3.5 Aesthetic/Visual Resources Night Lighting

Summary of Information contained in this Section (limited to night lighting)

This section of the SDEIS adds information on the following topics:

- 3.5.2.2.4 The turbine lighting plan for the project has been “developed in accordance with FAA guidelines and has been sent to the FAA for approval.” The proposed light fixture is L-864. A blink rate of approximately 5 seconds was assumed for the simulation.
- 3.5.2.2.5 “The panel’s review of the nighttime simulations from Viewpoints 70, 87 and 109 indicate that the FAA warning lights in the dark night skies that characterize much of the visual study area will be perceived negatively by area residents who view these lights from their homes and yards.”
- 3.5.2.2.6 The project sponsor “has committed to investigate the feasibility of a shading device for the FAA warning lights on the turbines.”

App F
Fig 15 The requested FAA lighting plan.

App D of
App F Nighttime visual simulations to show impact of flashing red lights.
Also, several files cannot be opened as they do not have file extensions that I recognize.

App F of
App F Information on Turbine Light Shade

- 3.13.3 A revised FAA request has been submitted reducing the number of lights from 39 to 32. See Figure 15. The two meteorological towers may “potentially” have warning lights as well (see 2.3.4).

Discussion of FAA Guidelines

The FAA has recognized the conflict between lighting for pilot safety and the aesthetic impact such lighting has on surrounding areas. This is especially important for turbine arrays as they typically cover large areas of land masses, are sited along high ridge lines and are spread out.

FAA guidelines are currently listed in Advisory Circular 70/460/1k Obstruction Marking and Lighting (April 15, 2000). However, this Advisory Circular is being updated by Advisory Circular 70/7460-11 as discussed below.

A recent study by James Patterson of the FAA titled Development of Obstruction Lighting Standards for Wind Turbine Farms was written November, 2005 (for the complete study, see FAA document DOT/FAA/AR-TN05/50) to review possible updates to this circular.

In summary, this study concluded that “The lighting concept for wind turbine farms includes the use of red, simultaneously flashing lights positioned on the outer perimeter of the wind turbine farm, each spaced no more than one-half statute mile from each other, and requires only one fixture per turbine. As long as the wind turbines are painted white in color, daytime illumination is not required.” This concept was tested at a site in Oklahoma and provides “ample warning” for pilots.

Lighting of turbines inside the perimeter is not required unless they stand higher than the perimeter turbines (by more than 100 feet in elevation). If elevation differs by more than 100 feet, “it may be appropriate to place a few lit turbines at strategic locations throughout the center of the cluster.”

The half mile recommendation and the requirement that all lights flash simultaneously are essential to preserving the sense of a single large ground object (the turbine farm).

Recommended light fixture is L-864 (red) with a minimum intensity of 2000 candelas. White lights (L-865) can be used as replacements for the red lights but no mixing of red and white is recommended.

Daytime lighting is not required so long as the turbines are painted bright white so they stand out for pilots.

“Studies have suggested that the use of red light emitting diode or rapid discharge style L-864 fixtures are effective in reducing impacts on neighboring communities, as the fixture’s exposure time is minimal, thus creating less of a nuisance.”

This study was issued about a year ago. The FAA has issued a new advisory circular, Advisory Circular 70/460/11. This most recent circular replaces the circular from 2000 and is the one that must now be used in setting warning lighting. We suspect that the project sponsor has used the out-of-date circular. This new circular is so recent that it is not yet available on the FAA web site. However, in an informal telephone discussion with an FAA official who reviews many wind turbine lighting plans throughout the country (Bill Marritt), we were given to understand that this new Advisory Circular recommends white painted towers with no daytime lighting and red lights flashing slowly in unison on some of the towers at night. Alternative paint colors with daytime lighting might be possible, but this was not discussed in detail over the phone. The spacing requirements are every 3,000 feet (1/2 nautical mile). He said typically about 1/4 of the towers will need lights. This would equate to about 15-16 lights, which is approximately half as many as proposed in the SDEIS. In any event, the new FAA advisory Circular needs to be addressed in the DEIS.

There are no guidelines about shielding. Again, in a telephone discussion with Mr. Marritt, he stated that the warning lights must be visible horizontally from the light and higher. This statement leads us to believe that the applicant might have a reasonable point in discussing shielding. But until a specific solution is proposed and cleared with the FAA it is not possible to evaluate it.

Review of Lighting Plan

The lighting plan presented at Figure 15 includes only 29 lights with 7 placed in the middle of the cluster. There are 3 lights missing from the figure. Some gaps exceed ½ mile while other spacings are needlessly less than ½ mile.

The SDEIS states that 32 turbines will be lighted. But it also states that the meteorological towers “potentially” may be lighted. If there are a total of 34 warning lights, then the SDEIS should be amended.

The SDEIS states that this array has been sent to the FAA for approval. No evidence of this transmission has been included in the SDEIS. Also, no application can be located in the FAA’s online archive of applications.

The SDEIS contains very limited information about light shields and only commits the sponsor to “investigate the feasibility” of such devices. Further investigation should be required as part of the SDEIS. The lighting shade being investigated is TowerShade by Towertex, Inc., a Canadian manufacturer of structural towers and related devices. The SDEIS contains a two page brochure in Appendix F of Appendix F but no further information. The Towertex information implies that their shade can be installed over FAA approved lights and that the lights will then meet or exceed FAA requirements with the shade. It also states that the shade will eliminate 97 % of light on the ground in the “target area”. There is no mention of how large this target area is. The DEIS should address the size of the area on the ground that the shades will protect from the tower lights. The manufacturer’s web site (www.towertex.com) describes its shade as a device to “control nuisance light from tower obstruction lighting.” The web site then goes further to state that “there is a ground swell of concern” about “light pollution created by FAA-mandated obstruction lighting.” Clearly, night lighting is an issue recognized even by this manufacturer of towers.

Review of Visual Simulations

The simulations are very suspect. From VP109 during the day, at least 20-30 turbines are clearly visible but at night only one red light??? VP70 at night shows no visible flashing red lights (despite the analysts’ rating sheets that indicate one flashing light at the left of the view). With 32 blinking lights (and maybe even 34 lights), this is hardly a believable simulation.

The night sky shows as a uniform total black. But this is rarely the natural condition. The hills are normally discernable with even a little moonlight. Perhaps the SDEIS should have taken night simulations during several evenings instead of just one. Or perhaps the photos have been altered to reduce the light bleed that happens with long exposure photos.

Only two night simulations were presented. Neither one helps us understand the true condition that will be present with the warning light pattern being proposed. This is especially important information for the more distant sites that will have clear night time views of the array of lights.

The simulations do not indicate whether shielding is assumed.

Recommendations for Changes

Resubmit night visual simulations that more accurately reflect what will be seen at night.

We have reviewed the plan and believe that the total number of lights can be reduced by up to half (15-16 lights). This presents an additional mitigation possibility. The sponsor should work with the FAA and present the results of such work as part of the SDEIS.

Reference in the SDEIS to the sponsor investigating light shields needs further clarification. The FAA Advisory Circulars make no mention of such shields. However, if allowable, they may be effective mitigation elements. This topic should be reviewed with the FAA and more information should be provided in the SDEIS including simulations with and without shields. If shielding is determined to mitigate the light nuisance the sponsor's application to the FAA should include the use of shields. Copies of the sponsor's application to the FAA should be included in the SDEIS.

White versus red: there is no discussion in the SDEIS or the DEIS as to which would have the lesser impact on the community. Red is selected, but why?

Further, there is no discussion of the FAA reference to light emitting diode, rapid discharge fixtures or slow flashing in unison, all of which reduce the actual time during which the lights are "on." This is another area of possible mitigation that should be investigated and included in the SDEIS.

The SDEIS ignores the requirement for daytime lighting. According to the FAA, such lighting is not required so long as the towers are painted bright white. The DEIS states that the towers will be painted white. However, the DEIS should address whether daytime lighting with appropriate shielding on towers painted to blend with the background is preferable to white painted towers with no lighting.

Prepared by Advocates for Springfield
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