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Memo

To:	Patrick O'Neill, HDR
From:	Pamela Cecere, Lori Arena, and Mario Osorio, HDR
Project:	Tule Wind Project
Date:	March 3, 2011

RE: Tule Wind Project – Visual Resources Analysis

The information in this memorandum supports the following changes to the Tule-VIS-4 and Tule-VIS-5 impact determinations for the Draft East County Substation/Tule Wind/Energia Sierra Juarez U.S. Generator-Tie Environmental Impact Report/Environmental Impact Statement (DEIR/DEIS) pertaining to the Tule Wind Project (Project).

Impact Tule-VIS-4:

Under Impact Tule-VIS-4, an adverse significant impact would occur only if "the project would create a substantial new source of light or glare that would adversely affect day or nighttime views in the area." The DEIR/DEIS analysis erroneously states that the Project would adversely affect nighttime views in the area due to the required FAA obstruction lighting and flashing red or white lights which would be visible to residents, recreationists, and motorists on Interstate 8 (I-8). The Operations and Maintenance (O&M) building lighting would not impact dark skies, but would be visible to residences in the general area due to the general lack of existing nighttime lighting in the area. This memorandum presents information to support the change in impact classification for Tule-VIS-4 from a Class I (significant and unmitigable) impact to a Class III (less than significant) impact.

Impact Tule-VIS-5:

Under Impact Tule-VIS-5, an adverse significant impact would occur only if "the construction of the Tule Wind Project or the presence of project components would result in an inconsistency with federal, state, or local regulations, plans, and standards applicable to the protection of visual resources" thus negating a specific jurisdictional agency's attempt to reduce or avoid unnecessary visual impacts. The DEIR/DEIS incorrectly concludes that: 1) the Project is not consistent with County regulations and policies (Draft and Existing) that are provided to protect the environment by minimizing light pollution for the protection of community character or rural areas, ecosystems, and astronomical research; 2) the Project is not consistent with the County of San Diego Existing General Plan Mountain Empire Subregional Plan (Scenic Highway Goal) due to visual impacts to I-8 as a third priority rated roadway; and 3) operation of the Obstacle Collision Avoidance System (OCAS) would result in light trespass that could likely extend beyond the spill light thresholds identified by the County that would cause an inconsistency with Section 6324 of the County of San Diego Zoning Ordinance. This memorandum presents information to support the change in impact classification for Tule-VIS-5 from a Class I (significant and unmitigable) impact to a Class III (less than significant) impact.

The visual resource analysis, as described in the DEIR/DEIS for the Project, addresses all existing Federal, state, and local light pollution, dark sky, and scenic highway policies and regulations, in addition to draft policies and regulations as described within the County of San Diego Draft General Plan. A brief description of the dark sky policies, FAA regulations, and scenic highway policies included in this analysis of the Project are provided below. An analysis of the Project's compliance and project design features proposed as part of the Project's

implementation is also provided to support the change in impact classification for Tule-VIS-4 and Tule-VIS-5.

Policies Pertaining to Dark Sky Conditions

Federal

- BLM Eastern San Diego County Resource Management Plan. As part of the BLM's Eastern San Diego Resource Management Plan (RMP), public lands are typically designated according to VRM Classes, ranging from Class I to Class IV. The BLM plan and policies for public lands in the project area are contained in the Eastern San Diego County RMP. The majority of the project area is located within BLM land and has a visual resource management class rating of Class IV. This class rating allows for "the level of change to the characteristic landscape can be high". This classification permits greater visual change due to energy projects.
- FAA Advisory Circular 70/7460-1K (FAA 2007) requires that all airspace obstructions over 200 feet in height or in close proximity to an airfield have obstruction lighting.

  Chapter 13 of FAA Advisory Circular 70/7460-1K (FAA 2007) is dedicated to marking and lighting wind turbine farms (wind turbine farms are defined as wind turbine developments containing three or more turbines of heights over 200 feet aboveground level). As listed in Chapter 13, general standards established for wind turbine farm lighting include:

  - Not all wind turbine units within an installation or farm need to be lighted.
  - Obstruction lights within a group of wind turbines should have unlighted separations or gaps of not more than ½ statute mile of the integrity of the group appearance is to be maintained. This is especially critical if the arrangement of objects is essentially linear.
  - Nighttime wind turbine obstruction lighting should consist of the preferred FAA L-864 aviation red-colored flashing lights (20–40 flashes per minute is the standard flashing range for this lighting type).
  - Daytime lighting of wind turbine farms is not required as long as the turbine structures are painted in a bright white color or light off-white color most often found on wind turbines.
  - Light fixtures should be placed as high as possible on the turbine nacelle, so as to be visible from 360 degrees.
  - For wind turbine farms in a linear turbine configuration, place a light on each turbine positioned at each end of the line or string of turbines. In the event that the last segment is significantly short, push the lit turbine back toward the starting point to present a well-balanced string of lights. High concentrations of lights should be avoided.

County

- San Diego County Light Pollution Code (Title 5, Div. 9, Sections 59.101-59.113 of the County Code of Regulatory Ordinances) as added by Ordinance No. 6900, effective January 18, 1995 and amended July 17, 1986 by Ordinance No. 7155 and April 20, 2005 by Ordinance No. 9716.

  - The Light Pollution Code (LPC), also known as the Dark Sky Ordinance, was adopted to "minimize light pollution for the enjoyment and use of property and the

night environment by the citizens of San Diego County and to protect the Palomar and Mount Laguna observatories from the effects of light pollution that have a detrimental effect on astronomical research by restricting the permitted use of outdoor light fixtures on private property" (Sec. 59.101).

- San Diego County General Plan, Conservation Element (Part X), Chapter 7 Astronomical Dark Sky, discusses the importance of maintaining dark skies in the County. This chapter makes several findings pertaining to suitable observatory site criteria. Chapter 7 also sets out several policy and action programs designed to limit light pollution and ensure the protection of dark skies in the County, including minimizing development impacts on the useful life of the observatories, assisting in the regulation of dark sky conservation, amending ordinances to control potentially significant adverse effects to Palomar and Mount Laguna observatories, and designing future roadways and development in a way suitable for the protection of dark skies near the observatories.
- County of San Diego Zoning Ordinance (Section 6320, 6322, 6324) (County of San Diego 2010d). Sections 6320, 6322, and 6324 of the Zoning Ordinance contains performance standards for glare caused by all commercial and industrial uses in residential, commercial, and identified industrial zones.
- County of San Diego Draft Mountain Empire Subregional Plan Policy LU 3.1.1 and 3.1.2 encourages development to preserve dark skies with reduced lighting and increased shielding requirements and encourages increased resources or methods for enforcement of preservation of dark skies, respectively.
    - The Draft General Plan and the Mountain Empire Subregional Plan are currently in draft form and have not been formally adopted by the County of San Diego. Therefore, the Project would not be subject to these policies.
- County of San Diego Draft General Plan Update – Conservation and Open Space Element (Policies COS-11.1 and COS-11.2) (County of San Diego 2010)
    - The Draft General Plan is currently in draft form and has not been formally adopted by the County of San Diego. Therefore, the Project would not be subject to these policies.
- Mountain Empire Subregional Plan, Chapter 6 Conservation, Environmental Resource Goal (Adopted 1979, Amended 1995), Policy 6, " the dark night sky is a significant resource for the Subregion and appropriate steps shall be taken to preserve it."

Policies Pertaining to Scenic Highways

State

- *California Department of Transportation: Scenic Highway Program:* The California Scenic Highway Program was created in 1963 to preserve and protect scenic highway corridors from change that would diminish the aesthetic value of lands adjacent to California highways. The State Scenic Highway system includes both "designated" scenic highways and "eligible" scenic highways. An "eligible" state highway becomes "designated" after a local jurisdiction adopts a scenic corridor protection program, applies to the California Department of Transportation (Caltrans) for scenic highway approval, and receives the designation. Within the project area, there are no designated state scenic highways. Both I-8 and SR-94 are eligible state scenic highways.
- *California State Historic Routes:* Old Highway 80 is a designated California State Historic Route. In 2006, the state legislature granted this designation in recognition of the highway's "outstanding natural, cultural, historic, and scenic qualities. This designation

does not influence the "future planning or development of adjacent public and private properties" (Assembly Concurrent Resolution (ACR) 123 (State of California Legislature 2006)).

County

- *San Diego County General Plan Scenic Highway Element:* The County of San Diego General Plan does not contain a separate element for visual or aesthetic resources; however, the General Plan does address visual quality under the Scenic Highways Element (1986). The purpose of the San Diego County General Plan Scenic Highway Element is to protect and enhance the County's scenic, historic, and recreational resources within a network of scenic highway corridors. The Scenic Highways Element identifies scenic highways and contains a list of priorities for future designation and protection measures. The list identifies the route's priority for scenic corridor planning and implementation. Within the project area, I-8 from SR-79 east to the Imperial County line, and SR-94 from SR-125 to I-8, are both listed as third priority San Diego County scenic routes.
- *Mountain Empire Subregional Plan:* The protection of scenic and visual resources in the Mountain Empire Subregion is acknowledged under the Scenic Highway Goal contained within the Mountain Empire Subregional Plan which states "Establish a network of scenic highway corridors within which scenic, historical and recreational resources are protected and enhanced".

Tule Wind Project – Dark Sky Compliance

The Tule Wind Project Plan of Development and DEIR/DEIS describe the proper use of lighting to meet FAA lighting requirements as well as local policies for preservation of dark skies through various applicant proposed measures (APMs) and design features incorporated into the Project's design:

- To minimize visual impacts, all of the turbine components will be finished using low-reflectivity neutral white colors in compliance with FAA regulations. In addition, approximately one-third to one-half of the turbine structures will be lit with synchronized red flashing lights per FAA regulations. Red flashing lights are proposed to be used because they are both more evident from aircrafts and less diminishing to dark sky conditions.

  FAA has prepared guidance (USDOT FAA *Advisory Circular Obstruction Marking and Lighting*) for lighting wind farms with structures over 200-feet in height. The tallest structure proposed on site (wind turbines measured from base to blade tip) would be approximately 492 feet high; and therefore, on-site turbines would require obstruction lighting. FAA prefers the use of L-864 red-colored flashing lights as these lights are the most conspicuous to aircraft. The red-colored flashing light is also the least intrusive lighting with regard to preserving dark sky conditions because the red lighting preserves the natural night vision as the human eye is less sensitive to red lighting than white or other colored lighting.

  The use of red strobe lighting, as opposed to white strobe lighting, allows observers to "dark adapt" in areas within sight of the turbines. Red strobe lighting remains the least obtrusive type of lighting according to the International Dark Sky Association (IDA) http://www.darksky.org/mc/page.do;jsessionid=FC0FBB24FBB 299EBEC39174BC11AA3A4.mc0?sitePageId=119791. As described in the DEIR/DEIS, exterior lighting installed on turbines would be restricted to the minimum required

number of lights and would only include the minimum intensity of FAA aviation warning lights to meet FAA standards.

Furthermore, it should be noted that the DEIR/DEIS proposes mitigation (see MM VIS-4b) to incorporate Obstacle Collision Avoidance System (OCAS) onto the Project's wind turbines. Mitigation Measure VIS-4b states "The project applicant shall install the OCAS lighting system on all proposed wind turbines in order to minimize nighttime lighting impacts attributed to the operation of FAA-required obstruction lighting. As the OCAS and other Audio Visual Warning Systems (AVWS) have been approved by the FAA and are considered to be suitable alternatives to the marking and lighting requirements as recommended in FAA Advisory Circular (AC) 70/7460-1K, installation of this system would be compatible with FAA requirement."

Correspondence from the FAA states that approval for the use of AVWS is not extended to wind turbines or wind farms, and "FAA is unable to approve requests for AVWS to light wind turbines or wind farms". Compliance with FAA regulations will be met through utilizing red-colored flashing lights on wind turbines as mentioned above.

Given the applicable dark sky and light pollution policies, the Project visual resource evaluation and project design features account for the preservation and protection of dark sky conditions in accordance with the County of San Diego regulations.

- The County of San Diego Light Pollution Code applies to the Project and is intended to restrict the permitted use of outdoor light fixtures emitting undesirable light into the night sky that have a detrimental effect on astronomical research. The Operations and Maintenance (O&M) facility is the only permanent building that will require outdoor lighting. Project design feature APM AES-7 will establish compliance with the County standard to use Class II lamp source and shielding requirements to illuminate walkways, roadways, equipment yards, parking lots and outdoor security. Other security lighting for construction purposes will be limited to construction storage areas for security and will be removed upon completion of construction. The Project will adhere to the San Diego County Light Pollution Code to minimize light pollution to the night environment and would therefore be incompliance with the San Diego County Light Pollution Code.
- The O&M facility is the only permanent building that will require outdoor lighting. The Project will adhere to the San Diego County Light Pollution Code to minimize light pollution to the night environment and would not have an adverse effect to Palomar and Mount Laguna observatories. Fully shielded low pressure sodium lighting will be used on outdoor fixtures to reduce or eliminate detrimental lighting impacts to the nearby Palomar observatory which is more than 8 miles from the project site. The use of low pressure sodium lighting with shielding is the most effective way of reducing light pollution and is used for lighting surrounding astronomical observatories to best preserve dark sky conditions.

  The Project will include exterior lighting on turbines as aviation warning lights as described in APM TULE-AES-4. Red-colored strobe lighting will be used as this color preserves the dark sky conditions and is less sensitive to the human eye. This lighting type is considered less obtrusive by the International Dark Sky Association (IDA). Given the compliance with the County Light Pollution Code relative to mandatory FAA lighting, the Project will be incompliance with the San Diego County General Plan, Conservation Element (Part X) Chapter 7 Astronomical Dark Sky.
- The Project would not significantly produce a light source that would impact night skies; therefore, the Project would comply with the Mountain Empire Subregional Plan, Chapter

6 Conservation, Environmental Resource Goal, Policy 6 that states that appropriate steps should be taken to preserve dark night sky.

- The Draft General Plan and the Mountain Empire Subregional Plan are currently in draft form and have not been formally adopted by the County of San Diego. Therefore, the Project would not be subject to these policies.

Tule Wind Project –Scenic Highway Compliance

- There are only two official scenic highways located in San Diego County, with neither located adjacent to the Project. Interstate 8 is currently not listed as a state scenic highway or scenic corridor by the California Department of Transportation (CALTRANS) Scenic Highway Program, although it is listed as eligible. The San Diego County Scenic Highway Element, Policy 1 supports the ongoing County scenic highway system, of which roadways are rated in three categories (first, second, and third priority). Currently the County has six first priority routes, 16 second priority routes, and 35 third-priority routes listed, of which I-8 is identified as a third-priority. The Mountain Empire Subregional Plan also lists I-8 to be listed as a scenic highway from SR-79 east to the Imperial County Line in the Scenic Highways Goal. Considering the low status rating of I-8 as a scenic highway and the current CALTRANS scenic highway status, it is unlikely that I-8 will be designated as scenic highway in the near future; therefore, the Project would be consistent with the State scenic highway program and the Scenic Highway Goal Mountain Empire Subregional Plan.
- Old Highway 80 is designated as a California State Historic Route. This designation does not influence future planning or development of adjacent public and private properties" (Assembly Concurrent Resolution (ACR) 123 (State of California Legislature 2006); therefore, the development of the Project would not have a visual impact to Old Highway 80.

Conclusion

Implementation of the FAA lighting and security lighting is not anticipated to contribute a significant additional light source that would impact night skies to the Boulevard area. As previously described, the Project will adhere to the San Diego County Light Pollution Code to minimize light pollution to the night environment. Operation of the AVWS remains unapproved by the FAA and therefore will not be utilized for the Project. However, the Project will utilize red colored FAA lighting for the turbines and Class II lamp source and shielding requirements for the O&M building as required by the County of San Diego. This information presented supports a change in impact determination for Tule VIS-4 from an adverse, significant and unmitigable impact (Class I) to a less than significant impact (Class III) in the DEIR/DEIS.

Construction of the Project would not impact scenic or historic highways. I-8 is considered to be a third priority roadway and is currently not listed as a scenic highway by CALTRANS Scenic Highway Program. Considering the low status rating of I-8 as a scenic highway and the current CALTRANS scenic highway status, it is unlikely that I-8 will be designated as scenic highway in the near future; therefore, the Project would be consistent with the State scenic highway program and the County plans and policies. In addition, Old Highway 80 is considered a "historic highway", not a scenic highway and would not be subject to visual impacts due to the Project.

San Diego County plans and policies that are currently in draft form are not applicable to the Project; therefore, the Project need not comply with such regulations. No additional new sources of light or glare have been identified; therefore, the Project would be consistent with all other

plans and polices relative to protection of visual resources. This information supports a change in impact determination for Tule-VIS-5 from an adverse, significant and unmitigable impact (Class I) to a less than significant impact (Class III) in the DEIR/DEIS.