Amendment

Final Environmental Impact Report

Montezuma Wind Plant Project (U-06-06)

January 2010
January 14, 2010

Dear Interested Agency:

Subject: Notice of Montezuma Wind Project Final Environmental Impact Report Amendment

The County of Solano Department of Resource Management published the Final Environmental Impact Report (FEIR) for the Montezuma Wind Project in February of 2007. An amendment to the FEIR has been prepared, dated January 2010, and is attached. The amendment describes and analyzes the potential impacts resulting from minor changes to the project description, environment and setting, and/or new information being received, generally described as follows:

- Modifications to wind turbine layout option #1 (Siemens).
- Elimination of PG&E reconductoring project from EIR (project near completion).
- Slight increased size (0.07 acre) of one of two substation options, and increased main transformer size from 40 MVA to 60 MVA.
- Increased project area from 1,458 to 1,466 acres.
- New and/or updated reports: blade throw, shadow flicker, low frequency/infrasound noise, and avian mortality.
- Update and resolution of Travis AFB radar issue related to the Project.
- Update to Air Quality section of EIR regarding greenhouse gases and global warming.
- Update to Biological Resources section of EIR regarding California Tiger Salamander and regulations for Bald and Golden Eagles.
- Other updates regarding County adoption of 2008 General Plan, plans underway for County adoption of updated development standards for wind turbine generators, and recently completed and planned wind energy projects in the vicinity of Montezuma Wind.

The amendment is limited to the above items only. The amendment does not add significant new information to the FEIR and does not further qualify for recirculation according to the California Environmental Quality Act. As such, the amendment is being provided to public agencies who previously commented on any of the issues relative to the above, at least 10 days prior to the scheduled certification of the FEIR by the Solano County Planning Commission.

The Planning Commission will hold a special public hearing to certify the FEIR as amended and approve the Use Permit (U-06-06) for the Montezuma Wind Project in the Board of Supervisors Chambers, First Floor, 675 Texas Street, Fairfield, at 7:00 p.m. on January 28, 2010. If you have any questions regarding this matter, please contact Mr. Ken Solomon at the address shown above or telephone (707) 784-3164. He may also be reached at kmsolomon@solanocounty.com.
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NOTICE OF PUBLIC HEARING
SPECIAL MEETING

FINAL ENVIRONMENTAL IMPACT REPORT
& USE PERMIT (U-06-06)

MONTEZUMA WIND PROJECT

NOTICE IS HEREBY GIVEN, pursuant to the California Environmental Quality Act, as amended, that the County of Solano has prepared an Amendment to the Final Environmental Impact Report (EIR) for the proposed development of a 37-megawatt (MW) wind power project comprised of 16 to 23 wind turbines and associated facilities and infrastructure, on approximately 1,466 acres of combined privately owned properties that are leased for wind power development. The Montezuma Wind Project, which is proposed by FPL Energy Montezuma Wind LLC, requires a Use Permit (U-06-06).

Review of this project had been suspended by the Planning Commission on October 4, 2007, at the request of the project applicant, due to radar interference issues at Travis Air Force Base, and has been reactivated at the request of the project applicant due to progress on resolving the radar issues.

The Project is located in the Montezuma Hills wind resource area in southeast Solano County, generally south of Highway 12, north of Montezuma Hills Road, extending east from Birds Landing Road and west of Currie and Anderson Roads, approximately 5 miles west of Rio Vista. Primary access to the project area is from Birds Landing Road.

The County of Solano is the Lead Agency in the preparation of the EIR, which examines all potentially significant environmental effects of the project. The EIR concludes that there could be significant adverse environmental effects in the areas of aesthetic/visual resources, agricultural resources, biological resources, cultural resources, geologic resources, hazardous materials, hydrology and water quality, air quality, land use, noise, public services and utilities, recreation, safety, and transportation and the EIR identifies alternatives and/or mitigation measures to reduce or avoid those significant impacts. Mitigation measures have been identified to reduce all impacts to a less-than-significant level, except for certain impacts under the topic areas of aesthetic/visual resources, air quality, biological resources, and cumulative impacts for these resources, where feasible and reasonable mitigation is not available and a Statement of Overriding Considerations is proposed for adoption.

The Draft EIR, dated October 2006, was published for a 45-day public review and comment period from November 3, 2006 to December 18, 2006 and circulated by the Governor’s Office of Planning and Research, State Clearinghouse Planning Unit (SCH#: 2006032129). The Final EIR dated April 2007
was prepared, describing and analyzing the potential impacts resulting from minor changes to the project description, and also contains an errata section showing changes and corrections to various sections of the EIR, additional documentation, comments and responses to comments on the DEIR, and an updated Mitigation Monitoring and Reporting Program (MMRP). The Final EIR was made available more than 10-days in advance of the initially scheduled certification date April 19, 2007 by the Solano County Planning Commission. Review of the project, including certification of the EIR, however, had been suspended by the Planning Commission on October 4, 2007, at the request of the project applicant, due to radar interference issues at Travis AFB, and has been reactivated at the request of the project applicant due to progress on resolving the radar issues.

An amendment to the Final EIR has been prepared, dated January 2010. The amendment describes and analyzes the potential impacts resulting from further minor modifications to the project description, new project information, and minor changes to the environment and/or project setting, foremost of which is an update on the resolution of the Travis AFB radar issue.

The amendment to the Final EIR does not add significant new information to the Final EIR and does not further qualify for recirculation according to the California Environmental Quality Act. As such, the amendment is being provided to public agencies who commented on the referenced radar issues including the air quality and biological resource sections of the EIR, at least 10 days prior to the re-scheduled certification of the FEIR by the Solano County Planning Commission.

The Planning Commission must certify the EIR as a complete, accurate, and objective analysis prior to taking action on the proposed Use Permit. Responsible and trustee agencies will use the EIR prepared by the County when considering approvals they may grant related to the Project during any subsequent regulatory permitting.

The Solano County Planning Commission will conduct a public hearing to review and consider certification of the Final EIR as amended, adoption of a Statement of Overriding Considerations and Mitigation Monitoring & Reporting Program, and approval of the requested Use Permit (U-06-06). The public is welcome to attend and comment on the project. The hearing will be held at 7:00 p.m. on THURSDAY January 28, 2010, at the Solano County Board of Supervisors Chambers, First Floor, Solano County Administration Center, 675 Texas Street, Fairfield, California.

If you decide to challenge the action of the County in court, you may be limited to raising only those issues you or someone else raised at or prior to the final public hearing on the Project.

Please submit any requests for a copy of the amendment to the Final EIR and your written comments to: Mr. Ken Solomon, Solano County Department of Resource Management, 675 Texas Street, Suite 5500, Fairfield, CA 94533. Please also provide the name, address and telephone number of a contact person with your response.

Copies of the EIR can be reviewed at the Department of Resource Management, 675 Texas Street, Suite 5500, Fairfield, CA 94533. Additional copies can be reviewed at the Fairfield Civic Center Library, 1150 Kentucky Street, Fairfield; Suisun City Library, 601 Pintail Drive, Suisun; and the Rio Vista Library, 44 South Second Street, Rio Vista; and, at the County’s internet website at www.solanocounty.com.
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<td>AB</td>
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<td>kV</td>
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<td>Leq</td>
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<td>MMT</td>
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OPR  Office of Planning and Research
OWG  Operations Working Group
Pd   probability of detection
PFCs  perfluorocarbons
PG&E  Pacific Gas and Electric
PM$_{10}$  particulate matter with an aerodynamic diameter of 10 microns or less
RWG  Radar Working Group
SB   Senate Bill
SF$_6$  sulfur hexafluoride
SMUD  Sacramento Municipal Utilities District
STARS  Standard Terminal Automation Replacement System
TCR  The Climate Registry
TRM  take resulting in mortality
USFWS  United States Fish and Wildlife Service
USTRANSCOM  United States Transportation Command
WRA  wind resource area
1.0 INTRODUCTION

The Draft Environmental Impact Report (Draft EIR, or DEIR) for the Montezuma Wind Project was circulated for public review in October 2006. Comments received on the DEIR, in addition to minor revisions, new information, and clarifications to the project, were incorporated into a Final Environmental Impact Report (Final EIR, or FEIR) that was released for agency and public review in April 2007. In October 2007, at the request of the project Applicant, the Planning Commission indefinitely suspended the EIR process for the Project as a result of the ongoing wind turbine-related radar issues at Travis Air Force Base (AFB). A brief introduction of the initial radar issue at the time of the FEIR in 2007 is presented in Section 5 (Comment Letters and Responses to Comments) of the FEIR.

As a result of progress on the radar issue and anticipating a full resolution in the near future, the Applicant requested in June 2009 that Solano County recommence with the Montezuma Wind EIR certification and use permit approval process. However, given that more than two years had passed since the FEIR was suspended, and aside from progress on the radar issue, other changes have occurred and new information has become available. In response to all of the changes and new information, Solano County, through its EIR contractor, Ecology and Environment, Inc. (E & E), has prepared this Amendment to the FEIR.

This Amendment to the FEIR presents an update to the previously described resolution of the Travis AFB radar issue in addition to a summary of the minor “Project Description” changes and changes in the environmental and regulatory settings that have occurred since the FEIR was released in April 2007. It also presents the results of new studies that have been performed and other new or updated information that has become available since the FEIR was released. The new project information and context are considered and evaluated to determine whether they would result in any new significant environmental impacts, a substantial change in the severity of a previously evaluated impact, and/or changes in the recommended mitigation measures. This FEIR Amendment concludes that no such impacts or changes would occur and thus that the information presented does not constitute “significant new information” that would otherwise require circulation under the California Environmental Quality Act (CEQA).

This Amendment is organized by presentation of the new project modifications and context, an explanation of the amendment process and CEQA rationale for this amendment, and a detailed discussion of the modifications to the sections of the FEIR requiring revisions. All other sections of the FEIR not modified by this Amendment remain valid.
2.0  NEW PROJECT MODIFICATIONS AND CONTEXT

Since completion of the Montezuma Wind Project FEIR, several minor modifications have been made to the project and the environment in which the project is set. These changes are summarized below and are divided as follows:

- Project Modifications
- New Project Information
- Changes in the Environmental and/or Regulatory Setting

2.1  PROJECT MODIFICATIONS

The following minor project modifications have occurred since the FEIR was released for agency and public review:

1. **Turbine Layout Modifications** – The Applicant is proposing modifications to the Option #1 turbine layout, changing the location of all 16 of the Siemens 2.3 megawatt (MW) turbines to accommodate updated wind turbine setback standards currently being drafted by the County and operational separation needs of the Siemens wind turbines. No change is proposed to turbine layout Options #2 (Vestas V-80) and #3 (GE 1.5sle).

2. **PG&E’s Reconductoring Project** – While the DEIR and FEIR analyzed potential impacts of both the Montezuma Wind Project and the separate but related PG&E Reconductoring Project, the Reconductoring Project was also evaluated in the Shiloh II Wind Plant Project EIR, which was certified by Solano County in March 2008. The Reconductoring Project has subsequently been built. As of the end of December 2009, the project was nearly complete and only a few final project details remain to be completed in 2010; therefore, this project no longer needs to be addressed as a component of the Montezuma Wind Project.

3. **Main Step-Up Transformer** – The main step-up transformer proposed within either of the two (A and B) proposed optional substation areas, as identified in the FEIR, would be increased in size from 40 megavolt-amperes (MVA) to 60 MVA. The minor increase in capacity is based on the commercial availability of the transformer and shipping and installation scheduling issues. While the locations for the two optional substation areas, Options A and B adjacent to the existing Pacific Gas and Electric (PG&E) Birds Landing switchyard, remain unchanged, the size of Option B would increase by 0.07 acre due to final engineering design modifications.

4. **Project Area** – The project area has slightly increased in size, from 1,458 to 1,466 acres, along the south boundary of the project area to accommodate wind turbine setback standards. No new project facilities are proposed within the added area.

5. **Parent Company of Project Applicant Renamed** – While the name of the project Applicant, FPL Energy Montezuma Wind LLC, remains unchanged, the name of the
Applicant’s parent company, FPL Energy LLC (FPLE), has changed to NextEra Energy Resources.

2.2 NEW PROJECT INFORMATION

1. Low-Frequency Noise/Infrasound Study – The Applicant has completed a Low-Frequency Noise/Infrasound Study (Epsilon 2009a), to evaluate the levels of low-frequency noise and infrasound specific to two of three optional wind turbines proposed.

2. Wind Turbine Blade Throw Analysis – The Applicant has completed a Wind Turbine Blade Throw Analysis (Epsilon 2009b), documenting the maximum blade throw range for the turbines compared to the location of the nearest residential uses.

3. Shadow Flicker Analysis – The Applicant has completed a Wind Turbine Shadow Flicker Analysis (Epsilon 2009c), that presents the hours per year of potential shadow flicker from the operation of proposed turbine Option #1 (Siemens), predicted in areas surrounding the project.

4. Availability of New Avian Mortality Data – New mortality data and assessment is available from the recently released (Final Report - October 2009) Shiloh I Post-Construction Avian Monitoring Study, which includes 3 years of data (April 2006 through April 2009).

5. Additional Record Information for California Tiger Salamander (CTS) – This FEIR Amendment includes discussion regarding two newly confirmed records of CTS near the proposed project area.

6. Travis Air Force Base Radar Issue – As indicated in Section 5 of the FEIR, Travis AFB reported that existing wind turbines in the Montezuma Hills were affecting the performance of the then-existing radar equipment at Travis AFB, and the concerns of these effects extended to the new radar equipment that was planned and to installation of any new wind turbines in the area, including the Montezuma Wind Project. A process to resolve the radar issues was included in the FEIR, but this was abandoned subsequent to the release of that document. As a result of the then ongoing concerns of Travis AFB, the EIR and use permit process were indefinitely suspended in October 2007. Since that time, a number of radar-related events and new wind project proposals relevant to the Montezuma Wind project have occurred. Several previously pending wind energy projects have also been built and new wind energy projects have been proposed, as previously identified and further discussed in this Amendment. In terms of radar events, the old ASR-8 radar at Travis AFB was replaced by a new DASR-11 radar, which was operational as of February 2009. The Air Force has evaluated and modified the performance capabilities of the new DASR 11 radar. In addition, a Cooperative Research and Development Agreement (CRADA) was developed and is currently being implemented between the U.S. Air Force and the Applicant, together with the developers of the proposed Shiloh III and SMUD-Solano Phase 3 wind projects, to allow the study via data collection and
modeling of the potential effects of all three wind projects on the radar at Travis AFB and airspace safety.

A more detailed discussion of the CRADA results and conclusions is presented in CHAPTER 4, Section 13.0.

2.3 CHANGES IN THE ENVIRONMENTAL AND/OR REGULATORY SETTING

1. **Greenhouse Gas and Climate Change Regulations** – Senate Bill 97, enacted in 2007, amends the CEQA statute to clearly establish that greenhouse gas (GHG) emissions and the effects of GHG emissions are appropriate subjects for CEQA analysis. Section 21097 of the CEQA Statute requires lead agencies to analyze the effects of GHG emissions. This requirement applies retroactively to EIRs, negative declarations, mitigated negative declarations, and other documents that have not become final. Further details are provided in this Amendment.

2. **Solano County General Plan** – Since the completion of the FEIR, Solano County has adopted the 2008 General Plan, which replaced the 1980 General Plan, including the 1987 Wind Turbine Siting Plan, which was referenced in the DEIR and FEIR. Commercial wind turbine generators are a permitted use within agriculturally zoned districts such as the Montezuma Wind parcels. Further details are provided in this Amendment.

With the adoption of the 2008 General Plan, the defined boundaries and designation of the areas formerly identified in the 1987 Wind Turbine Siting Plan as the Collinsville-Montezuma Hills Wind Resource Area (CMHWRA) and the Cordelia Hills Wind Resource Area (CHWRA) were eliminated. While the current General Plan still refers to the Collinsville-Montezuma Hills south of Highway 12 as the primary wind resource area for the County, it otherwise relies on the wind resource area maps available from the California Energy Commission to define the areas appropriate for commercial wind development. For purposes of this Amendment, all previous references in the DEIR and FEIR to the Collinsville-Montezuma Hills Wind Resource Area shall henceforth apply generally to the wind resource in the Montezuma Hills area and be termed “Wind Resource Area,” or the associated acronym “WRA.”

3. **Draft Standards for Commercial and Non-Commercial Wind Energy Facilities** – The Solano County Department of Resource Management is in the process of preparing a draft update to the existing General Plan and Zoning Regulation standards for commercial and noncommercial wind energy facilities.

4. **New Ruling for Bald and Golden Eagles** – On September 11, 2009, a Final Ruling was issued in the Federal Register concerning permit regulations under authority of the United States Fish and Wildlife Service (USFWS) pursuant to the Bald and Golden Eagle Protection Act (BGEPA), which would allow “take” (i.e., disturbing or killing) of bald and golden eagles pursuant to otherwise legal activities.
5. **California Tiger Salamander (CTS) Listing Under the California Endangered Species Act (CESA)** – In February 2009, the CTS was identified as a candidate for listing under the CESA.

6. **New Planned, Speculative, or Recently Completed Projects** – Other wind projects in the vicinity that have been built, proposed, or speculated include the following:

- The Shiloh II Project (75 Repower MM92 wind turbines, totaling 150 MWs), as referenced in the EIR, was completed in December 2008. The boundaries of this project have changed slightly because the project was reduced in size compared to that identified in the DEIR.

- The SMUD-Solano Phase 2B Project (21 Vestas V-90 wind turbines, totaling 63 MWs) was completed in December 2007.

- SMUD is proposing a Phase 3 expansion to their SMUD-Solano wind project, comprising 36 to 75 wind turbines, totaling up to 128 MWs. An early March 2010 EIR certification date and a build date in 2010 are currently planned.

- The Shiloh III Project, a new wind energy project comprising 60 to 80 wind turbines (up to 200 MW), is proposed in the vicinity of the Montezuma Wind Project. A use permit application submitted for this project was accepted as complete in August 2009, and the EIR process is underway. An early 2011 build date is planned by the applicant.

- Speculative only - The Applicant has discussed with County planning staff conceptual plans for a Montezuma Wind II Project, comprising 24 to 35 new wind turbines with a capacity of up to 60 MWs. This project would be located on approximately 1,800 acres adjacent to the south side of the subject Montezuma Wind Project. This new project would also involve the removal of approximately 350 of the existing, older enXco V wind turbines. At this time, no use permit application or formal plans have been submitted to the County for this project.

- Speculative only - Shiloh IV, comprising up to 79 new wind turbines, is being considered by a private wind developer. This project would be generally in and near a portion of the enXco V project area. This project would also involve the removal of approximately 100 of the existing, older enXco V wind turbines. This project has been reviewed by the Federal Aviation Administration (FAA) for potential obstructions to airspace navigation. The determinations of the FAA are viewable on the FAA Web site at https://oeaaa.faa.gov/oeaaa/external/portal.jsp. At this time, no use permit application or any plans have been submitted to the County for this project.
3.0 DETERMINATION AND RATIONALE FOR AMENDMENT TO FINAL EIR

3.1 AMENDMENT TO FEIR RATIONALE

Section 15088.5 of the State CEQA Guidelines requires that an EIR be recirculated for public review when “significant new information” is added to the EIR after public notice is given of the availability of the DEIR but before certification. According to that Guideline section, new information added to an EIR is “significant” if it discloses any of the following:

1. A new significant environmental impact from the project or from a new mitigation measure proposed to be implemented;

2. A substantial increase in the severity of an environmental impact unless mitigation measures are adopted that would reduce the impact to a level of insignificance; or

3. A feasible project alternative or mitigation measure considerably different from others previously analyzed clearly lessening the environmental impacts of the project, but the project’s proponents decline to adopt it.

Recirculation is not required where the new information merely clarifies or amplifies information already provided in the EIR, or makes insignificant modifications in an otherwise adequate EIR.

Based on a review of the project modifications, the new project information, and changes in the environmental and/or regulatory setting, it has been determined that this new information is not “significant” and can be adequately addressed in this Amendment to the FEIR. No new significant environmental impacts were identified, and there would be no substantial increase in the severity of any environmental impacts. Also, there are no new feasible project alternatives or mitigation measures that would be required. The purpose of this additional supplemental information is to clarify or amplify the analysis provided in the FEIR and does not affect the impact analysis of the FEIR. Therefore, per section 15088.5 of the CEQA Guidelines, these revisions and associated additional information are considered to be “not significant.”

4.0 MODIFICATIONS TO THE MONTEZUMA FEIR

E & E has reviewed the DEIR and FEIR to determine whether any of the proposed project modifications, new project information, or changes in the environmental or regulatory setting require changes to either document. There were no significant changes to the regulatory and environmental setting, impact assessment, proposed mitigation measures, or level-of-significance determinations for the following impact sections, and no further analysis is warranted: cultural resources, geologic resources, hazardous materials, hydrology and water quality, public services, recreational resources, and transportation. In addition, the discussion of the three alternatives in the
FEIR continues to be adequate as no significant changes have been proposed. Also, no changes have occurred in the conclusions of Short-Term/Long-Term Impacts, Growth-Inducing Impacts, or the Unavoidable Impacts level-of-significance determinations. Therefore, no new mitigation measures or text changes are suggested with regard to those sections.

While the majority of the original DEIR and FEIR text and content remain unchanged, since completion of the FEIR, several minor modifications have been made to the project and the environment in which the project is set. Specifically, this Amendment provides updates to the sections on project description, aesthetics, agricultural resources, air quality, biological resources, land use and population, noise, safety, and cumulative impacts. These changes to specific chapters are summarized below in accordance with how they were presented in the DEIR.

GLOBAL CHANGES

The above-mentioned project modifications, new project information, and changes in the environmental setting would apply to the entire DEIR and FEIR text. While the project site remains rural and undeveloped, the existing context of the project setting has changed from the rural, undeveloped agricultural land uses surrounding the project site to rural, agricultural land uses mixed with wind farm facility development in the surrounding area.

The project description has not changed substantially from the FEIR. The same three optional wind turbine options are still proposed, although the locations of all 16 of the Siemens 2.3 MW turbines (Option #1) have been slightly modified. In addition, approximately 8 acres have been added along the southern boundary of the project area to accommodate the County’s setback requirements. No new project facilities are proposed in this new area. The new setback area and the changes to the turbine locations are presented on Figure 1.

CHAPTER 3.0 PROJECT DESCRIPTION

The project description has not changed substantially from the project described in the FEIR. The project components; project objectives; and plant construction, operations, and maintenance assumptions remain intact for this Amendment. The regulatory setting has changed slightly with the adoption of the 2008 Solano County General Plan, which incorporates many of the standards of the 1987 Wind Turbine Siting Plan. Discussions regarding the project siting constraints and micro-siting are still relevant and are reflected in the current refined proposed Option #1 (Siemens) turbine locations. The project area has expanded slightly on the southeastern border by 8 acres to accommodate the setbacks for the new Siemens turbine locations. As discussed above, the existing surrounding land uses have changed as a result of new wind farm development projects being developed (SMUD-Solano Phase 2B and Shiloh II) and other new wind projects that have been proposed (Shiloh III and SMUD-Solano Phase 3).
Three optional turbine layout schemes were presented in the FEIR, one for each of three different turbine models. The Applicant proposes modifications to the turbine layout Option #1, comprising 16 Siemens turbines, to accommodate the updated wind turbine setback standards currently being drafted by the County and operational separation needs of the Siemens wind turbines. All proposed turbine relocations are contained within the same project footprint that was originally analyzed in the FEIR and continue to meet the setback requirements for biological resources, safety, noise, and aesthetics; therefore, no additional impacts associated with these location changes are anticipated. No changes are proposed to turbine layout Options #2 (Vestas) or #3 (GE).

As previously mentioned, the minor increase in capacity of the step-up transformer for the Project is based on commercial availability of the equipment and shipping and installation scheduling issues. The main step-up transformer would be increased in capacity from 40 MVA to 60 MVA. The transformer would be located within either of the two optional areas (A or B) already identified in the FEIR, which are adjacent to the existing PG&E Birds Landing switchyard. Because this increase in capacity does not result in additional impacts outside of disturbance perimeters and represents the same physical footprint size as described in the FEIR, no additional impacts are anticipated.

The DEIR and FEIR analyzed potential impacts of the Montezuma Wind Project and the separate but related PG&E Reconductoring Project. The PG&E Reconductoring Project has already received CEQA evaluation through the Shiloh II Wind Plant Project EIR, which was certified by Solano County on March 20, 2008. The Reconductoring Project, for purposes of the Montezuma EIR, has been under construction for some time and is nearly completed and, therefore, is no longer a required part of the Montezuma Wind Project.

CHAPTER 5.0 AESTHETIC/VISUAL RESOURCES

*Environmental Setting*

There have been changes in the environmental setting due to the completed construction of the neighboring Shiloh II wind energy project. When the FEIR for the Montezuma Wind Project was completed, the visual landscape throughout much of the area, when viewed in the foreground distance zone, consisted of relatively undeveloped rural farmland and scattered trees, with no artificial structures taller than a two-story farmhouse. Wind turbines from existing development were evident only in the far distance zone. In particular, views from view points along Highways 12 and 113 were largely free from development and wind turbines. Since that time, an adjacent wind farm, Shiloh II, has been developed and surrounds the project site. The regional visual landscape, while still consisting of rural farmland, is now dominated by wind turbines. Also since completion of the Montezuma Wind Project FEIR, the SMUD Solano Phase 2B wind farm has been developed, but this project does not affect the view points considered in the DEIR and FEIR, as it is far to the southeast of the project area and not visible from the public view corridors that were analyzed.
Figure 1
Montezuma Wind Proposed Layouts

- **Option 1**: Siemens 2.3 MW (May 28, 2009)
- **Option 1**: Siemens 2.3 MW (Jan 10, 2006)
- **Option 2**: Vestas 1.8 MW (Sept 06, 2006)
- **Option 3**: General Electric 1.5 MW (Sept 06, 2006)

**Project Area in FEIR (1,463.32ac)**

**Amended Project Area (1,466.11ac)**

**Parcel**

**County Road**

- **Regional Transmission Line**

**Residences**

**Land Cover Type**
- Bulrush / Cattail Wetland
- Pond
- Seasonal Wetland
- Vernal Pool

**Setbacks**
- Golden Eagle Nest Setback: 152.4m (500ft)
- Property Line Setback
- Residential Setback: 426m (1397.64ft)
- Roads Setback: 210m (688.98ft)
- Transmission Lines Setback: 210m (688.98ft)

**Water Features Setback**

- All setbacks assume a turbine height of 126.5m (415.02ft), a rotor diameter of 93m (305.12ft), and a rotor radius of 46.5m (152.56ft).

**Assumptions**
- Assumptions include County Required Safety and Biological Resource Setbacks and exclude any noise abatement setbacks that may be required.

- Option 1: Siemens 2.3MW turbine (93m (305.12ft) rotor diameter on an 80m (262.47ft) tall tower)

**Setbacks include County Required Safety and Biological Resource Setbacks and exclude any noise abatement setbacks that may be required.**

Map is for planning purposes only; it is not a construction document.
Regulatory Setting

Chapter 4 (Resources) of the 2008 General Plan essentially reaffirms the policies and standards set forth in the previous General Plan, including the former Wind Turbine Siting Plan, with regard to visual resources associated with commercial wind development.

Significance Criteria

The significance criteria from the FEIR still apply to the impact evaluation.

Impact Evaluation

The FEIR concluded that the Montezuma Wind Project may alter the anticipated views from Highways 12 and 113. In addition, the project could degrade the visual character of the landscape from public roads and for dispersed rural residential viewers. Alternatives that would avoid or reduce these and any other potentially significant environmental impacts of the project were selected. Alternatives also were selected on the basis of their feasibility. Factors also considered include engineering constraints, cost, access to existing infrastructure, and ease of installation. The FEIR analyzed the impacts on the visual landscape from the proposed project and found them to be significant and unavoidable. With the recent completion of the Shiloh II and SMUD-Solano Phase 2B project, which added 96 new wind turbines, total development has increased to 833 wind turbines in the Wind Resource Area. This additional development essentially embeds the proposed Montezuma Wind Project site within a regional viewscape already filled with wind turbines and provides additional change to the original visual baseline from open space and rolling agricultural pastures to an area visually dominated by wind turbines.

In October 2009, E & E took new baseline photos of the project site from the same viewpoints (1 through 6) as represented in the FEIR to document the current visual landscape. All the viewpoints were recaptured with the exception of viewpoint 1, which was not photographed due to site constraints. The photo to capture viewpoint #5 was taken approximately 1/8 mile east of the original photo. E & E superimposed the currently proposed locations of the 16 Option #1 (Siemens) turbines and the previously proposed GE (Option #2) and Vestas (Option #3) turbines onto this new visual setting and created visual simulations, as shown on Figures 2 through 6. As shown on Figures 2 through 6, the baseline visual conditions at the site have changed, and turbines are more present in the foreground and background of the site from various viewpoints.

Viewpoint #2 – Previously, no turbines were visible in the foreground or background. Currently, one turbine is prominently visible in the foreground, and many are visible in background.

Viewpoint #3 – Previously, no turbines were visible in the foreground or background. The current view is similar; however, several turbines are visible in the background.
Viewpoint #4 – Previously, no turbines were visible in the foreground or background. The current foreground view is similar; however, several turbines are visible in the background.

Viewpoint #5 – Previously, no turbines were visible in the foreground, and several were visible on the right side of the background viewscape. Currently, many turbines are visible in the foreground and throughout the background.

Viewpoint #6 – Previously, many turbines were visible on the right side of the background view corridor. Currently, many turbines are visible in the foreground and throughout the background.

When viewed against the current visual context, the turbine layout option containing the most wind turbines, Option #3 (GE) with 23 wind turbines, which would present the greatest potential visual impact, would not create a visual contrast or represent a noticeably new element in the new regional baseline visual environment. However, as shown in visual simulations of the three turbine layout options within the existing baseline visual environment (Figures 2, 3, 4, 5, and 6), the proposed addition of up to 23 turbines within the view corridors previously analyzed in the FEIR would continue to create significant, unavoidable visual impacts.

Impacts from wind turbine lighting and glare were found to be significant in the assessment of the original FEIR. The change in location of the 16 Siemens turbines in Option #1 and the change in the visual context would not change this determination.

**Level-of-Significance Determination and Mitigation Measures**

Although there have been changes in the regional visual setting as a result of completion of the Shiloh II Wind and SMUD-Solano Phase 2B Projects, visual impacts from the project would still be considered significant and unavoidable.

**CHAPTER 6.0 AGRICULTURAL RESOURCES**

**Environmental Setting**

There have been changes in the environmental setting due to the completed construction of the neighboring Shiloh II and SMUD Solano Phase 2B wind energy projects. As assessed in the FEIR, wind development was occurring in the vicinity of the Montezuma Wind site, but the immediately surrounding landscape was dominated solely by dryland farming and livestock grazing agriculture. The immediate surrounding environment is now a mix of dryland farming and wind farms. This represents a minor change in the environmental baseline from the predominantly agricultural baseline used in the assessment of the FEIR.
Figure 2
2009 View Point 2: View from Currie Road Looking West at Options 1, 2, and 3
Montezuma Wind Project
Solano County, California

Existing Condition

Simulated Condition, Option 1 (Siemens)

Simulated Condition, Option 2 (Vestas)

Simulated Condition, Option 3 (GE)
Figure 3

2009 View Point 3: View from Birds Landing Road Looking Northeast at Options 1, 2, and 3

Montezuma Wind Project
Solano County, California

Existing Condition

Simulated Condition, Option 1 (Siemens)

Simulated Condition, Option 2 (Vestas)

Simulated Condition, Option 3 (GE)
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2009 View Point 4: View from Birds Landing Road Looking East at Options 1, 2, and 3
Montezuma Wind Project
Solano County, California
Figure 5
2009 View Point 5: View from Highway 113 Looking Southeast at Options 1, 2, and 3
Montezuma Wind Project
Solano County, California
Montezuma Wind Project
Solano County, California

Figure 6
2009 View Point 6: View from Highway 113 and Olsen Road Looking Southeast at Options 1, 2, and 3
Regulatory Setting

All of the land in the Montezuma Wind Project Area is zoned A-160, Exclusive Agricultural. According to the Solano County Zoning Ordinance, construction and operation of commercial wind turbines, following approval of a Use Permit, is compatible with this zoning. Conditions for wind energy development are related to general land use, not specifically agricultural uses. Given the height and dispersed nature of the project facilities, existing agricultural uses are expected to continue in the Montezuma Wind Project Area in conjunction with wind energy generation.

The 2008 General Plan policies and goals relating to agriculture in the Montezuma Hills are consistent with the general goals of the previous (1980) General Plan of preserving agricultural lands by protecting them from urbanization and preventing conflicting land uses. The 2008 General Plan also combined the former Intensive Agriculture and Extensive Agriculture land use designations into one new land use designation, Agriculture. As such, the project area is now designated as Agriculture, compared to the Extensive Agriculture designation discussed in the FEIR. Commercial wind development remains a compatible use within this designation.

Chapter 3 (Agriculture) in the 2008 General Plan replaces the Agricultural section in the previous (1980) General Plan Land Use Element. While Policy AG.P-4 of the 2008 General Plan generally requires farmland conversion mitigation for development permits that change the use of land from production agriculture to nonagricultural use, as discussed in this section, this conversion mitigation requirement is not applicable to the Project.

Chapter 4 (Resources), Page RS-53, of the 2008 General Plan states, “...Agricultural lands within the county are particularly appropriate for wind harvesting as turbines generally do not interfere with daily agricultural operations and can provide additional revenue on these properties.”

In 2008, Solano County adopted new rules and regulations governing agricultural preserves and land conservation contracts, which, in part, clarified the compatibility of commercial wind development on lands under control of the Williamson Act. In particular, the new regulations identify commercial wind turbine generators as a compatible Communications and Infrastructure land use on prime and non-prime agricultural lands. The lands within the project area are non-prime agricultural lands.

Significance Criteria

The significance criteria from the FEIR still apply to the impact evaluation.

Impact Evaluation

The original assessment in the FEIR found that project development was compatible with the farmland preservation goals of the Williamson Act, and this conclusion remains the same under the current assessment.
Temporary and permanent conversion of farmland to other uses resulting from the development of the Montezuma Wind Project was not considered significant in the original FEIR assessment. The FEIR determined that the proposed project would impact only 2% of the agricultural land in the Montezuma Wind Project Area and 0.1% of the total farmland in Solano County. The FEIR analyzed the impacts from the proposed project and found them to be less than significant based on the very small percentage of permanently removed agricultural land and the fact that none of land was designated as Prime Farmland, Farmland of Statewide Importance, or Unique Farmland. Although the installation of Shiloh II and SMUD-Solano Phase 2B did remove agricultural land from production, this loss of acreage does not significantly change the environmental baseline for assessment of impacts on agricultural resources for the Montezuma Wind Project. In addition, there would be no changes in the estimates of temporary and permanent conversion of farmland as a result of the proposed project modifications.

In Chapter 4 (Resources) of the 2008 General Plan, wind harvesting is a compatible use on agricultural lands and can provide additional revenue to these properties. This is often supported by participating landowners who cite that wind leases provide an economic benefit that helps maintain and keep viable their agricultural operations on the property. Since dry farming and ranching activities will continue on the property, the project remains consistent with the new General Plan.

Given the minimal loss of agricultural land associated with wind development, as well as the preservation and facilitation of ongoing agricultural use of the land while commercial wind turbines are in operation, any issues associated with the loss of agricultural land, including requirements for mitigation in the General Plan, would not apply.

**Level-of-Significance Determination and Mitigations**

Impacts on soil erosion, soil loss, and soil productivity, as well as resumption of agricultural use, were considered less than significant with implementation of the mitigation measures presented in the FEIR, and these conclusions remain the same. Although there have been changes to the environmental and regulatory setting, there would be no new impacts or mitigations, and the conclusion that impacts would be less than significant is consistent with the FEIR.

**CHAPTER 7.0 AIR QUALITY**

**Environmental Setting**

There have been changes in the environmental setting due to recent concerns and understanding regarding global climate change and its contributing factors. Climate change refers to any significant change in measures of climate (temperature, precipitation, or wind) that lasts for an extended period (i.e., decades or longer). Climate change may be affected by a number of factors, including natural cycles (e.g., changes in the sun’s intensity or Earth’s orbit around the sun); natural processes within the climate system (e.g., changes in ocean circulation); and human activities that change
the atmosphere’s composition (e.g., burning of fossil fuels) or land surface (e.g., deforestation, reforestation, urbanization, and desertification).

California is a substantial contributor to global GHG emissions as it is the second largest contributor in the U.S. and the sixteenth largest in the world (CEC 2006). The main GHGs of concern include: carbon dioxide (CO$_2$), methane (CH$_4$), nitrous oxide (NO$_x$), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF$_6$).

According to the Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report, increased atmospheric levels of CO$_2$ are correlated with rising temperatures and concentrations of CO$_2$ have increased by 31% above pre-industrial levels since 1750 (Figure 7). Climate models show that temperatures will probably increase by 1.4 to 5.8°C between 1990 and 2100. Much of the uncertainty in this increase results from not knowing future CO$_2$ emissions, but there is also some uncertainty about the accuracy of the climate models. In a statement released on February 2, 2007, the IPCC concluded that “the widespread warming of the atmosphere and ocean, together with ice-mass loss, support the conclusion that it is extremely unlikely that global climate change of the past 50 years can be explained without external forcing, and very likely that it is not due to known natural causes alone” (IPCC 2007).

Global warming potential (GWP) is a measure of how much a given mass of greenhouse gas is estimated to contribute to global warming and is devised to enable comparison of the warming effects of different gases. It is a relative scale that compares the gas in question to that of the same mass of carbon dioxide. Carbon dioxide equivalence (CO$_2$e) is a measure used to compare the emissions from various GHGs based on their GWP, when measured over a specified timescale (generally 100 years). CO$_2$e is commonly expressed as million metric tons (MMT) of carbon dioxide equivalents (MMTCO$_2$e). The CO$_2$e for a gas is obtained by multiplying the mass and the GWP of the gas. For example, the GWP for methane over 100 years is 21. This
means that the emission of 1 MMT of methane is functionally equivalent to the emission of 21 MMT of CO₂.

In November 2004, the California Climate Action Team (CCAT) was formed, comprising 14 agencies and 11 subgroups to assist the California Air Resources Board (CARB) with the Climate Change Scoping Plan. According to the 2006 California CCAT Report (CCAT 2006), the following climate change effects, based on the IPCC trends, can be expected in California over the course of the next century:

- A diminishing Sierra snowpack, declining by 70 to 90%, threatening the state’s water supply;
- Temperature increases of 0.5 to 5.8°F under the higher emission scenarios, leading to a 25 to 35% increase in the number of days ozone pollution levels are exceeded in most urban areas;
- Increased vulnerability of forests due to pest infestation and increased temperatures; and
- Increased electricity demand, particularly in the hot summer months.

**Regulatory Setting**

The proposed project is located within the Yolo-Solano Air Quality Management District (AQMD). Emission thresholds and regulatory criteria for this region have not changed since the FEIR. However, on June 1, 2005, California Governor Arnold Schwarzenegger issued Executive Order S-3-05, establishing statewide GHG emission reduction targets of 2000 levels by 2010, 1990 levels by 2020, and 80% below 1990 levels by 2050. On September 27, 2006, Governor Schwarzenegger signed the Global Warming Solutions Act, Assembly Bill (AB) 32, which capped the state’s GHG emissions at 1990 levels by 2020. This is the first statewide program in the country to mandate an economy-wide emissions cap that includes enforceable penalties. Figure 8 shows a graphic representation of emissions reduction strategies to meet the goals of AB 32.

In 2007, the California Senate passed Senate Bill (SB) 97, requiring the Governor’s Office of Planning and Research (OPR) to prepare, develop, and transmit guidelines for the feasible mitigation of GHG emissions or their effects, including, but not limited to, effects associated with transportation and energy consumption.

On April 13, 2009, OPR submitted to the Secretary for the California Natural Resources Agency its proposed amendments to the state CEQA Guidelines for GHG emissions, as required by SB 97. These proposed CEQA Guideline amendments would provide guidance to public agencies regarding the analysis and mitigation of the effects of GHG emissions in CEQA documents. The Natural Resources Agency conducted formal rulemaking in 2009, prior to certifying and adopting the amendments, as required by SB 97 (OPR 2009). The amendments propose a number of revisions related to GHG impacts, including changes to questions in the CEQA Guidelines Appendix G Checklist.
Proposed changes and additions also address forest loss, energy conservation, and transportation effects.

![Graph showing CO2 emission reduction strategies](image)

**Figure 8 California’s CO2 Emission Reduction Strategies (CEC 2006)**

Based on its 1990–2004 inventory of GHG emissions in California, CARB staff recommended an amount of 427 MMTCO$_2$e as the total statewide GHG 1990 emissions level and 2020 emissions limit. CARB approved the 2020 limit on December 6, 2007. This limit is an aggregated statewide limit, and is not sector or facility specific. CARB estimated current (2007) emissions levels as approximately 480 MMTCO$_2$e. The 2020 reduction target is currently estimated to be 174 MMTCO$_2$e. CARB has recommended 44 CARB early actions that have the potential to reduce GHG emissions by approximately 42 MMT CO$_2$e by 2020 (about 25% of the estimated reductions needed by 2020). Due to expected growth in population and energy use, the emissions reduction target is approximately 30% below business as usual by the year 2020 (CEC 2006).

**Significance Criteria**

At this time, no mandatory GHG regulations or finalized agency thresholds of significance apply to this project.

**Impact Evaluation Methodology and Results**

The Montezuma Wind EIR analyzed the impacts from the proposed project and found the short-term impacts related to construction to be significant, requiring mitigation. The long-term impacts were found to cumulatively benefit air quality. Within the current
regulatory context, the impact assessment for the project has been expanded to include this evaluation of GHGs.

**GHG Analysis Methodology**

An analysis was performed to quantify emissions of GHGs that have GWP. The GWP compounds that will be emitted during the construction phase of the project are CO$_2$ and CH$_4$. GWP is the ratio of the radiative forcing (degree of warming of the atmosphere) that would result from the emission of one unit of a given GHG as compared to one unit of CO$_2$. It is expressed as a CO$_2$e—the quantity of a GHG multiplied by its GWP. For CH$_4$ it is 21 times the CH$_4$ emission rate, and for N$_2$O it is 310 times the N$_2$O emission rate. There are three sources of these emissions: vehicles of employees commuting to the work site, water trucks used to mitigate fugitive particulate emissions, and off-road vehicles such as bulldozers, graders, and backhoes. During the operations phase of the project, the emissions of these compounds would be negligible.

For water trucks and off-road equipment, the EFMAC 2007 (CARB Emissions Factor Model) emissions factors were used to determine GHG emissions based on the construction schedule and equipment list used in the 2007 FEIR. For worker commute emissions, the average emission factor of the Light Duty Truck category for gasoline was used.

**Project Construction**

Construction of the proposed project would result in on-site emissions of GHGs from the use of construction equipment and off-site emissions from worker and delivery truck trips, as shown in Table 1. The most common GHGs associated with fuel combustion include CO$_2$ and CH$_4$. Over the entire construction phase of the proposed project, approximately 908 MTCO$_2$e would be emitted.

**Table 1 GHG Emissions Estimates for Construction Activities**

<table>
<thead>
<tr>
<th>GHG</th>
<th>Total Pounds</th>
<th>Global Warming Potential</th>
<th>Lbs CO$_2$e</th>
<th>Metric tons CO$_2$e</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Construction</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CO$_2$</td>
<td>1,822,547</td>
<td>1</td>
<td>1,822,548</td>
<td>826.93</td>
</tr>
<tr>
<td>CH$_4$</td>
<td>176</td>
<td>21</td>
<td>3,712</td>
<td>1.68</td>
</tr>
<tr>
<td><strong>Worker Commute</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CO$_2$</td>
<td>173,852</td>
<td>1</td>
<td>173,853</td>
<td>78.88</td>
</tr>
<tr>
<td>CH$_4$</td>
<td>14</td>
<td>21</td>
<td>292</td>
<td>0.13</td>
</tr>
<tr>
<td><strong>TOTAL GHG metric tons CO$_2$e</strong></td>
<td></td>
<td></td>
<td></td>
<td>908</td>
</tr>
</tbody>
</table>

Although N$_2$O is also emitted during combustion of fossil fuels, the quantities are negligible compared to CO$_2$ and CH$_4$ (less than 0.1%); therefore, N$_2$O emissions were excluded from the emissions summary tables presented here (TCR 2008).
Project Operation

The project, once constructed, would not directly emit any GHGs other than those associated with periodic inspection and maintenance vehicles. Although the project will cause a small, temporary increase in regional emissions of GHGs during construction, the project will provide an emissions-free source of renewable electricity that will contribute toward reducing GHG emissions statewide.

According to the most recent CARB statewide GHG inventory, the electricity sector accounts for 22% of statewide emissions of GHGs (CARB 2009a). Over the course of a year, the project’s estimated theoretical maximum annual generation capacity of 37,000 megawatt hours (MWh) of electricity would avoid approximately 43,000 MTCO$_2$e by replacing grid average emissions associated with the generation of electricity in the region. While this is an over-simplified calculation (as the electricity generated will be added to the grid, rather than replacing any specific emissions sources), it illustrates the broad climate change benefits associated with the project. The Project will essentially displace the least efficient/highest-fuel-cost mode of electricity generation, which in most cases is also the higher polluting source.

Level-of-Significance Determination and Mitigations

In the absence of established State regulations addressing assessment of impacts related to GHG emissions under CEQA, the OPR has issued guidance encouraging agencies to develop a regional approach (OPR 2009). The project is located within the jurisdiction of the Yolo-Solano AQMD, which has not issued any finalized guidance on establishing thresholds for GHG impacts analysis under CEQA.

Although construction of the project would cause a short-term increase in GHG emissions, the amount of construction-related emissions (about 908 MTCO$_2$e) is negligible compared to any currently available threshold of significance$^2$. In addition, the project will be a long-term source of clean, renewable energy and as such will contribute towards statewide GHG reduction goals and renewable energy portfolio targets.

As with other individual small projects (e.g., projects that are not within the identified AB 32 mandatory GHG reporting sectors, or other stationary combustion sources that emit more than 25,000 MTCO$_2$e per year), the emissions increases that would result under this project would be temporary increases associated with construction of the project; individually, they would not be expected to have a significant impact on global climate change.

The impact of GHG emissions associated with the project will be less than significant based on the low level of operational emissions and the small short-term increase in GHG emissions associated with construction. The project will result in minimal GHG

$^2$ These include the CARB draft threshold of 7,000 tons per year, the SCAQMD interim threshold of 10,000 tons per year, and the CARB mandatory GHG reporting threshold of 25,000 tons per year.
emissions during operation (other than infrequent inspection and maintenance), and the overall project impacts on climate change are beneficial (by providing clean electricity) and in alignment with the policies and regulations adopted for meeting GHG emissions reductions targets in the State of California, as set forth in AB 32, and the Renewable Portfolio Standard and Executive Order S-21-09.

Although there have been changes to the air quality environmental and regulatory setting, there would be no new impacts or mitigations. Thus, the FEIR’s conclusions that the short-term air quality impacts related to construction would be significant without mitigation, and that the long-term impacts would cumulatively benefit air quality remain unchanged.

CHAPTER 8.0 BIOLOGICAL RESOURCES

Environmental Setting

No significant changes have occurred in the environmental setting due to the completed construction of the neighboring Shiloh II and SMUD-Solano Phase 2B wind energy projects or other known development in the project vicinity. The environmental setting assessed for the FEIR consisted of a landscape used predominantly for agriculture, including some roads and rural residences. Wind turbines were part of the mixed use of the project vicinity. Small drainages and a few ponds were present. Mixed use agricultural areas can constitute habitat for some species; however, no substantial native plant communities were present, and no portions of the landscape were undisturbed. Although more wind turbines occupy the WRA now than previously, base environmental conditions have not changed significantly for the current assessment.

The project site was and is still capable of supporting a number of special status species, including birds, mammals, amphibians, invertebrates, and plants. Agricultural practice and a scarcity of trees limits breeding habitat for many wildlife species. The site is largely used as foraging and resting habitat, with many species moving periodically through the site. Agricultural lands may provide foraging habitat for the golden eagle, western burrowing owl, Swainson’s hawk, white-tailed kite, and peregrine falcon, while grasslands provide nesting and foraging habitat for some raptors and migrating and overwintering birds. These species have all been documented by recent monitoring at adjacent wind farms. In the original assessment, the site was thought to potentially support breeding CTSs. An adult CTS was found dead (June 2007) beside Olsen Road, approximately 2.2 miles west of the Montezuma site (CNDDDB 2009). In addition, a larval CTS was also observed (May 2009) in a vernal pool located approximately 2 miles west of the Project boundary and immediately west of Olsen Road, approximately 1.5 miles north of the earlier CTS discovery. This pool is contained within a fenced area, excluded from livestock grazing. This record of larval CTS near the Project site now confirms the breeding of this species in the Project vicinity (CNDDDB 2009). Overall, there have been no significant changes to the type of biological resources within the Project area, although new information confirms the extent and presence of these aquatic-based species in the vicinity of the Project.
Regulatory Setting

There have been changes in the regulatory setting for biological resources based on new federal and state rulings. On September 11, 2009, a Final Ruling was issued in the Federal Register concerning permit regulations under authority of the USFWS pursuant to the BGEPA, which would allow "take" (i.e., disturbing or killing) of bald and golden eagles pursuant to otherwise legal activities. The ruling took effect on November 10, 2009. However, the majority of "take" permits that would be issued are expected to be for "disturbance" of eagles, as opposed to Take Resulting in Mortality (TRM). Few TRM permits will be issued, and the requirements to secure a TRM permit are expected to be extremely onerous, if such a permit can even be expected at all. In addition, in February 2009, the CTS was declared a candidate for listing under the CESA, giving the species an elevated level of state protection.

Significance Criteria

There are no changes to the significance criterion as a result of environmental, regulatory, or project changes.

Impact Evaluation Methodology and Results

The FEIR analyzed the impacts from the proposed project on biological resources and found several potentially significant impacts requiring mitigation. It was determined that all biological impacts, with the exception of impacts on avian species from project operation, could be mitigated to a less than significant level. In the original assessment for the FEIR, there would be impacts on agricultural and non-native grassland habitats and common terrestrial and avian species as a result of development of the Montezuma Wind Project. However, no sensitive natural communities, wildlife nursery sites, or significant migration corridors are known to occur within the project area. These conditions have not changed in the current assessment.

The FEIR concluded that the Montezuma Wind Project would result in potential mortality of protected avian species and, therefore, result in potentially significant impacts even with the incorporation of mitigation measures. Raptor species most likely to be affected by turbine operation are the American kestrel and red-tailed hawk. The golden eagle, a California species of special concern, could have an estimated mortality rate of about one individual every four years.

Potential impacts on wetlands and streams have also not changed under the current assessment. The majority of impacts would still be avoided, and the remaining potential impacts from drilling under wetlands would be minimized and mitigated in the same manner as described in the FEIR. In addition, no changes in potential impacts from sedimentation or release of contaminants have been identified in the current assessment.

Impacts on avian species, bats, nesting raptors, and sensitive species remain the same in this assessment as in the FEIR. For example, impacts on common avian species and
bats would still be incrementally greater with the construction of each additional wind turbine in the WRA; however, the very large and widely distributed populations of these common species are not significantly impacted by current development patterns and would not be significantly impacted by the proposed development patterns. Likewise, impacts on nesting raptors and other sensitive avian species in the WRA remain potentially significant and have not changed under the current assessment; however, the number of sensitive species that would be impacted would be reduced due to the removal of the Reconductoring Project from the assessment because fewer habitat zones and sensitive species would be disturbed.

Since the completion of the FEIR, additional information has become available due to studies of other wind projects and species in the project vicinity. New information is now available regarding impacts on avian species, particularly raptors, and the CTS. Details of these studies and records are described below.

**Avian Studies**

The FEIR acknowledged that a number of passerines (1,140 to 1,620) were likely to be impacted by the proposed Montezuma Wind project; however, the potential impacts were found to be less than significant. Numerous studies have shown that mortality impacts from wind farms to passerines alone, though great in number, are insignificant in terms of mortality from other causes such as collision with buildings and predation by domestic cats. These wind farm impacts alone have little effect on overall population stability for individual avian species (Erickson et al. 2001). Furthermore, the data and impacts analysis from recently completed avian mortality reports are consistent with this conclusion. Raptors, however, as an avian sub-group, are thought to be more vulnerable to high mortality at facilities with wind turbines. As such, they are typically discussed separately and are the focus of this potential impact discussion.

The FEIR cited avian mortality studies from adjacent projects, specifically the High Winds Power Project, Sacramento Municipal Utilities District (SMUD) facilities, and (indirectly) other built facilities in the western United States. The Phase 1 & 1A Avian Mortality Monitoring Report for 2004–2005 for the SMUD Solano Wind Project, a local study prepared by URS, compared raptor mortality data from three nearby sites—High Winds, SMUD, and Altamont Pass—and found mortality rates for all species of raptors to be lowest at the High Winds site (0.30 per MW per year), low at SMUD (0.53 per MW per year), and highest at the Altamont Pass (1.10 per MW per year) (URS 2005). This data illustrates the range of mortality rates between low to moderate (High Winds and SMUD) and higher impact facilities (Altamont Pass) (URS 2005).

The recently published Post-Construction Avian Monitoring Study for the Shiloh I Wind Power Project represents three years of new local avian mortality data. Results of the study recorded a total of 511 avian incidents—the vast majority of which were passerines, of which 47.5% consisted of five very common passerine species. None of the impacted avian species are federal or state endangered or threatened species, although three of the raptors are protected under other provisions. Raptors represented
only 54 cited fatalities (approximately 10.7% of total); 27 of these incidents were American kestrel and 15 were red-tailed hawk (Kerlinger et al. 2009).

In addition to recording mortality data, the Shiloh I study compares results and projections for Shiloh I to the High Winds baseline data in the aforementioned URS report. While Shiloh I recorded 2.53 birds killed per turbine per year, High Winds recorded 0.93 birds killed per turbine per year. This disparity in raw mortality rates can be partially explained by the substantial difference in search area and search frequency between the two sites (the Shiloh I study searched a larger area). When adjustments are made for these variables, the difference in result is reduced greatly. In addition, through the three years of study, the annual mortality rates showed a continual reduction trend as methods were revised (Kerlinger et al. 2009). Although the report does not provide an actual number for the ‘adjusted’ mortality rate, the authors claim that this rate is closer to the 0.93 mortality rate at High Winds than the unadjusted 2.53 mortality rate recorded at Shiloh I.

The Revised Avian and Bat Assessment for the Montezuma Wind Project (Jones & Stokes 2006) completed for and cited in the FEIR predicted avian mortality for the Montezuma Wind Project based on mortality results compiled at the High Winds site between 2003 and 2005 (2 years of data). This report predicted a total mortality of 2.38 individual birds per turbine per year with 0.69 of these being raptors. When comparing this projection to the unadjusted rate of 2.53 recorded at Shiloh I over three years, these rates are very similar. Factoring in the claim that an adjusted mortality rate would be much lower with slightly different methods, this study may have produced an avian mortality rate lower than that projected for the Montezuma Wind Project in the FEIR. Considering raw numbers for raptor mortality alone, the High Winds site reported 44 raptors killed in year one, with 71 in year two. For the Shiloh I project build-out, a total of 59 raptor fatalities were predicted per year (Solano County 2007). Actual results recorded over three years of study at Shiloh I found only 54 raptor incidents (approximately 18 per year), again with the vast majority being very common species like American kestrel and red-tailed hawk. These raptor mortality results are well below levels projected for the project but within the range of probability projected in the 2007 FEIR.

URS conducted additional surveys in support of the SMUD-Solano Phase 1 and 1A Wind Project EIR during the winter of 2006. No federal endangered species were observed during the surveys. During eight days of surveys between December 2006 and March 2007, there were 165 observations of 9 different species protected under state laws which were observed in the project area. Of these observations, 60% were of northern harrier, 32% were of white-tailed kite, and 2% were of golden eagles. Excluding an observation of a higher number of northern harriers, these findings do not conflict with or change any assessment of raptor usage within the WRA (URS 2009).

Recent third quarter surveys conducted at the SMUD-Solano Wind Project Phase I-1A by Burleson Consulting, Inc., documented the mortality of one American kestrel, one morning dove, one western red bat, and one golden eagle. According to the survey report, one injured golden eagle was found in December 2007 1 mile east of Shiloh.
Road, and 1.5 miles south of Little Honker Bay Road. It was taken to the UC Davis California Raptor Center, where it was determined to have severe injuries and was euthanized. Due to the location of this eagle near active wind farms, and the nature of the injuries, it was assumed it was struck and injured by turbines in the project vicinity (URS 2009). This indicates that protected golden eagles are indeed subject to injury and/or mortality from wind energy facility operations in the vicinity (URS 2009). This is consistent with the assumptions in the FEIR that there could be a potential mortality rate of 0.01 golden eagle per year per turbine for options #1 and #2, and a golden eagle death once every four years for Option #3.

It should be noted that comparison of data between different studies employing different methodologies in different locations can be misleading. Every variable that cannot be adequately controlled increases the likelihood of discrepancies and increases error probabilities in study findings, especially when making projections. The three year report for Shiloh I attempts to factor these issues into its reporting and conclusions. However, no results from the Shiloh I three year avian mortality study are so striking as to suggest that mortality at the proposed Montezuma Wind Project site will be statistically different from a dozen or more similar wind energy project sites in California.

In conclusion, the additional data and information derived from the assessment of the Post Construction Avian Monitoring Study for the Shiloh I Wind Power Project, and the Solano Wind Project Phase 1-1A as well as other avian mortality studies cited here would not alter the incident assumptions, potential impact conclusions or proposed mitigation measures for avian wildlife including raptors and golden eagles included in the FEIR.

California Tiger Salamander

In the FEIR, potential impacts to CTS were identified along with mitigation measures to minimize and avoid potential impacts to a less than significant level, such as avoiding all seasonal wetlands and vernal pools and conducting a preconstruction burrow survey to locate and remove aestivating (dormant) CTS in burrows. With implementation of the mitigation measures in the FEIR, it is anticipated that no incidental take permit under Section 10 of the Endangered Species Act would be needed and the preparation of a Habitat Conservation Plan was not and is still not being prepared for CTS.

The CTS is a federal threatened species which has recently become a candidate California threatened species under the CESA. In the initial studies for the Montezuma Wind Project, the CTS was noted as a species that may disperse, migrate, and aestivate in the project vicinity, but suitable breeding habitat was not known to occur within the project vicinity. Recent surveys have located breeding habitat and additional water features, including vernal pools, which may increase the likelihood of CTS occurrence within the project boundaries and vicinity. The most recent record was in May 2009 when an occurrence of a larval CTS was documented in a pond approximately 2.2 miles west of the project boundary along Olson Road. Another occurrence of a dead adult CTS was recorded in June 2007 approximately 1.5 miles southwest of the larval CTS occurrence, also along Olsen Road. Another older record of
CTS existence was documented in 1990 approximately 2 miles north of the proposed project area. All of these occurrences are registered in the California Natural Diversity Database (CNDDB) Rare-Find system managed by the California Department of Fish & Game (CNDDB 2009).

These records, combined with CTS species ecology and habitat information, affirm that the project area and vicinity constitutes suitable habitat for CTS. While CTS relies on seasonal or permanent pools for breeding, they disperse from wetlands to occupy upland rodent burrows in grassland habitats during the dry season. The species is nocturnal and movement to and from upland habitats occurs most frequently between November and May, generally on rainy nights (Trenham 2001; Natureserve 2009). The confirmed occurrence of both adult and larval CTS adjacent to Olsen Road suggest that this species is an active breeder and resident within at least a portion of the WRA and may be impacted by project activities associated with construction and operation of the Montezuma Wind Project.

In conclusion, the verification of the presence of CTS and breeding activity in the project vicinity increases the likelihood of project impacts to the species.

**Level-of-Significance Determination and Mitigations**

The FEIR identified potential impacts on biological resources and included mitigation measures to reduce the potential impact to a less than significant level to all species with the exception of raptors and golden eagles. Each of these mitigation measures would still apply to the project. The FEIR addressed CTS, which was federally listed at the time, and included mitigation measures to reduce the potential for impact to a less than significant level. Therefore, change in the status of the CTS and the increased likelihood of its occurrence in the project vicinity as a result of the two recent sightings does not change the analysis or conclusions in the EIR with regard to CTS.

The EIR also addressed avian and bat mortality and included mitigation measures to reduce the severity of impacts. The updated mortality information supports the conclusions of the FEIR, and the impacts to avian species continues to be significant even with mitigation.

No change to the mitigation measures established in the FEIR is necessary.

**CHAPTER 13.0 LAND USE AND POPULATION**

**Existing Setting**

The project exists within the area designated by the General Plan as the primary wind resource area in the County, the Collinsville-Montezuma Hills area, formerly referenced as the CMHWRA in the EIR. Establishment of this area as a WRA by the County in 1987 solidified the determination of wind resource development as a compatible use with the existing primary use of these lands for rural agriculture. At this time, 833 commercial wind turbines have been erected in the WRA of which 96 were most
recently constructed during the completion of the SMUD-Solano Phase 2B and Shiloh II
Wind Projects. Although the total number of turbines will change in the future as new
wind energy facilities are constructed and older technology at existing facilities is likely
replaced with fewer, larger turbines, the ultimate goal for Solano County and the WRA is
to enable renewable energy such as that generated by wind to reduce the reliance on
energy resources from outside the County.

Regulatory Setting

2008 Solano County General Plan

Since the completion of the FEIR, Solano County has adopted the 2008 General Plan,
which replaced the 1980 General Plan Land Use Element and the 1987 Wind Turbine
Siting Plan, both of which were referenced in the EIR. With the adoption of the new
General Plan, the land use designation for the project area, Agriculture, has replaced
the former designation, Extensive Agriculture, that was identified in the EIR. The 2008
General Plan includes essentially the same provisions for wind energy projects related
to aesthetics, noise, safety, and land use, as was contained in the former Wind Turbine
Siting Plan. According to the 2008 General Plan Resources Chapter (Chapter 4), wind
harvesting is a compatible use on agricultural lands and can provide additional revenue
which, according to participating landowners, helps maintain the viability of the
agricultural operation on their property. Also, the boundaries of the two wind resource
areas, Collinsville-Montezuma Hills and Cordelia Hills, as described in the 1987 Wind
Turbine Siting Plan and referenced in the EIR, are no longer defined. The 2008 General
Plan instead identifies the Collinsville-Montezuma Hills south of State Route 12 as the
primary wind resource area in the County, but does not further delineate the boundaries
of this area, and incorporates by reference the wind resource maps available by the
California Energy Commission to define the areas most appropriate for commercial wind
development.

In addition to complying with existing General Plan and Zoning Code regulations for
commercial wind energy development, the Project is designed to conform to a draft
update to these regulations, which is being prepared by the Department of Resource
Management.

Travis AFB Land Use Compatibility Plan

As described in Section 5 of the FEIR, the Airport Compatibility Subcommittee of the
Solano County Airport Land Use Commission (ALUC) reviewed the proposed project on
December 6, 2006, and found the project to be consistent with the Travis AFB Land Use
Compatibility Plan. The determination of the Subcommittee was contingent upon a
mitigation measure (TRA-5(b)) regarding FAA notification, pursuant to FAA CFR Part
77, Paragraph 77.13(a)(1), being added to the Project. As discussed in the FEIR, the
FAA issued a Determination of No Hazard to Air Navigation (“No Hazard
Determination”) in 2007 for wind turbine Option #3 (GE turbine). Subsequently, the FAA
has also issued a No Hazard Determination for the revised wind turbine layout Option
#1 (Siemens), as discussed in this Amendment. Given that the Applicant has already
completed the FAA notification for the Option #3 (GE) layout and for the revised Option 
#1 (Siemens), these two layout options for the project are in compliance with the 
conditional consistency determination issued by the ALUC Subcommittee.

The ALUC also requested that the FEIR address concerns relating to the potential 
turbine impacts on the new digital radar to be installed at Travis AFB, the potential 
turbine impacts on weather radar (on-plane) at low-level flights, and the potential 
daytime visual effects on pilots from turbine blade rotation. Further details are provided 
in Section 5 of the FEIR (pages 5-16 and 5-17).

Consistency with Travis AFB Radar Operations

Despite the first “No Hazard” FAA determination mentioned above, in March 2007, 
Travis AFB reported that existing wind turbines in the Montezuma Hills were affecting 
the performance of its then-existing radar equipment, and the concerns of these effects 
extended to the new planned radar and to the installation of any new wind turbines in 
the area, including the Montezuma Wind Project. Originally, concerns expressed by 
Travis AFB to Solano County and the Solano ALUC focused primarily on the impact of 
the three pending wind farm projects at the time (Shiloh II, Montezuma Wind, and 
SMUD-Solano Phase 3) on the new DASR-11 terminal surveillance radar.

Travis AFB’s concern was based primarily on feedback from its air traffic controllers. 
Therefore, Travis AFB recommended against the approval of any new wind projects 
within the WRA until this concern could be investigated, tested, and validated.

Subsequent to the preparation of the FEIR and spanning the past 2-plus years, the 
following generalized radar-related events relevant to the Montezuma Wind Project 
have occurred, presented in chronological order:

- Based on further review by the Air Force, the adjacent Shiloh II wind project was 
cleared of radar effects or concerns by Travis AFB and subsequently approved by 
the Solano County Planning Commission. This project was fully constructed and 
operating in the WRA by January 2009.

- Travis AFB replaced the old ASR-8 radar with the new DASR-11 radar. The new 
radar was deemed operational in February 2009, and the old radar was retired. The 
new DASR-11 radar is a fully digitized radar with state-of-the-art surveillance 
technology.

- A study conducted in January 2009 by the U.S. Air Force Flight Standards Agency 
(AFFSA) on the performance capabilities of the new DASR-11 radar found an 
increase in radar capability. As noted in the evaluation report by the AFFSA for the 
new DASR-11 radar system at Travis AFB, the new DASR-11 system “provides the 
required coverage” and “supports the mission requirements of Travis AFB.” A 
subsequent evaluation by AFFSA concluded that, with the installation of the new 
DASR-11 system, “Detection rates improved across the board,” and “False tracks 
significantly reduced” over the WRA. In this subsequent evaluation, AFFSA reported
that the probability of detection (Pd, the probability that a target within several various operating modes and conditions, approaching a radar is detected at least once by the time it reaches the radar’s range) over the WRA experienced a reduction of about 1.3% compared to the rest of Travis AFB’s airspace, and the DASR-11 radar system achieved a Pd of 89.01% over the WRA, which exceeds the FAA’s engineering acceptance standard for detection of 80%. The airspace immediately over Travis AFB has a probability of detection of 90.36%. The DASR-11 consists of a Primary Surveillance Radar, and a Secondary Surveillance Radar subsystem. When both the primary and secondary radar systems are employed, probability of detection increases to 99.81% over the WRA.

In December 2009, the Applicant, together with the developers of the proposed Shiloh III and SMUD-Solano Phase 3 wind projects, entered into a Cooperative Research and Development Agreement (CRADA) with representatives of the 60th Air Mobility Wing (AMW) at Travis AFB, the Air Mobility Command (AMC), the AFFSA, the Idaho National Laboratory, and the United States Transportation Command (USTRANSCOM) to assess the impact of the three currently pending wind projects on air traffic operations over the WRA. Specifically, the objectives of the CRADA were threefold:

- obtain reliable, objective data to assess current air traffic operational radar coverage in the Travis AFB area;
- run a simulation to assess the predicted air traffic operational impact potentially caused by proposed wind turbine development; and
- assess the operational impact upon the Travis AFB air traffic control areas of Shiloh III, Montezuma Wind, and Solano Phase 3 wind projects.

The CRADA essentially facilitated the formation of a joint working group between the participating federal agencies, private wind developers, and other interested entities to resolve the Travis AFB radar issues. Two working groups were designated under the CRADA to accomplish the three objectives stated above. The Radar Working Group (RWG), comprised of engineers from Westslope, the AFFSA, and the Idaho National Laboratory, was tasked with collecting aircraft track data from the DASR-11 radar at Travis AFB. The other working group, the Operations Working Group (OWG), comprised of representatives of the AFFSA, AMC, Travis AFB, Westslope and others, was tasked with taking the findings of the RWG and determining whether or not the projected loss of Pd would pose an impact on the safety and efficiency of air traffic operations over the WRA.

**Significance Criteria**

There were no changes to the significance criteria as a result of environmental, regulatory, or Project changes. However, an analysis of radar impacts, which was based on the CRADA methodology discussed below, determined that the overall probability of detection currently over the WRA as seen at the scope by air traffic
controllers is 80.3% below 4,000 feet and 84.2% below 10,000 feet. While the Air Force and FAA do not have an operational standard probability of detection (Pd), the OWG has agreed that ensuring the decrease in the probability of detection does not exceed 5% below the existing established baseline values (current performance) will conservatively ensure air safety for the subject air space. Therefore, the standard of significance that has been determined by the CRADA working groups is a 5% decline in Pd below the baseline established by the RWG.

**Impact Evaluation Methodology and Results**

**Consistency with Land Use Plans**

The FEIR analyzed impacts from the proposed project on land use and population and found that the project was consistent with the land use guidelines set forth in the Solano County 1980 General Plan Land Use Element, the Solano County Zoning Ordinance, and the Wind Turbine Siting Plan, the latter of which was part of the Energy Element of the General Plan. The FEIR determined that in order to ensure that the project would not inhibit future use of the area, mitigations to guarantee funds for decommissioning were proposed. The County's 2008 General Plan essentially reaffirms the regulations set forth in the previous General Plan and the Wind Turbine Siting Plan. The proposed project would be consistent with the noise standards, the scenic roadways element, the resources and energy element, and the health and safety element of the new General Plan. Temporary and permanent conversion of farmland to other uses resulting from the development of the proposed project were not considered significant in the FEIR. There would be no changes to this conclusion based on the changes presented in this Amendment.

According to Chapter 4 (Resources) of the General Plan, wind harvesting is a compatible use on agricultural lands and can provide additional revenue, which, according to participating landowners, helps maintain the viability of the agricultural operation on the property. Since agricultural operations will continue on the property, the proposed project would be consistent with General Plan, and issues related to loss of agricultural resources would not apply.

In terms of consistency with setback requirements, Figure 1 depicts all three currently proposed wind turbine layout options, in addition to the original Option #1 (Siemens) layout provided in the EIR, in relation to established setback features. The new proposed wind turbine layout Option #1 involves the installation of 16 Siemens 2.3 MW turbines, the largest turbine among the three options, and therefore represents the worst case with regard to setback distance. Solano County requires a minimum setback of 1,000 feet, or 3 times the maximum turbine height from the turbine to the property boundary. The maximum setback distances were calculated to be 1,396 feet based on use of the Siemens 2.3 MW turbine, which has a total height of 415 feet (when installed on the proposed 262-foot-tall tower) and a rotor radius of 152 feet. The maximum setback distance was used to locate most of the proposed turbines away from adjacent property boundaries (including the adjacent Shiloh II project properties), as well as public roads and residences. However, several of the new Siemens turbines, as well as
several of the GE and Vestas turbines, are located within the property setback requirements of Solano County. Per Mitigation Measure LU-1 in the FEIR, the Applicant will be required to obtain waivers for those turbines that are located within the setback distances. Additionally, the proposed turbine layouts were located to be consistent with the applicable biological resource setbacks as defined in the FEIR (i.e., setbacks from wetlands and ponds). The Applicant has sited all the turbine options according to the same setbacks as prescribed in the FEIR, as follows: 250 feet from ponds; 100 feet from wetlands, seasonal wetlands, vernal pools, and willow riparian scrub lands; 500 feet from golden eagle nests.

Radar-Related Issues

From September to December 2009, the two CRADA working groups obtained baseline radar coverage data in the Travis AFB airspace, ran simulations to predict the potential impacts of the wind energy projects on air traffic operations, and assessed the potential operational impacts of the three pending wind projects on the Travis AFB radar systems. The RWG was tasked with collecting aircraft track data from the DASR-11 radar at Travis AFB. This data collection took place in October of 2009 and became the “baseline,” or current state of coverage picture, for the radar. That data set was then filtered and uploaded into the Standard Terminal Automation Replacement System (STARS). The STARS system receives data and flight plan information and presents the information to air traffic controllers on color displays, allowing the controller to monitor and control air traffic. The calculated probability of detection (Pd) between the baseline data set and the filtered STARS data set represents the worst-case coverage. Both data sets were then recorded by the STARS software then independently analyzed to quantify probability of detection (Pd) over the WRA. The result of this analysis showed that the baseline coverage (as seen at the scope by air traffic controllers) is 80.3% Pd below 4,000 feet and 84.2% Pd below 10,000 feet. The worst case (with all three planned wind turbine projects constructed and operational) will be a reduction in Pd of 3.5% below 4,000 feet and 3.2% below 10,000 feet.

The OWG was tasked with taking the findings of the RWG and determining whether or not the projected loss of Pd would pose an impact on the safety and efficiency of air traffic operations over the WRA. In order to make this determination, it was first necessary to determine the minimum level of service and safety for air traffic operations in the airspace over the WRA. This assessment included a thorough review of federal aviation regulations as well as FAA and Air Force rules, orders, and instruction manuals. After conducting this review, the OWG concluded that the airspace over the WRA is classified as Class E airspace (controlled airspace but no communication with air traffic control required) and has no surveillance coverage requirement. Additionally, the RWG’s findings show that the number of non-transponder aircraft was significantly lower than anticipated. The OWG concluded that an average degradation of 5% Pd across the entire WRA (all three pending wind projects) would pose an insignificant operational impact and would not impact air traffic safety. Based on the RWG’s findings of 3.5% Pd degradation below 4,000 feet and 3.2% Pd degradation below 10,000 feet,
the cumulative impact of the three proposed wind projects falls within the margin specified by the OWG, resulting in an acceptable level of impact.

The results of the modeling conducted pursuant to the CRADA process to analyze the proposed Project and the proposed SMUD Solano Phase 3 and Shiloh III projects show that the impact on the radar Pd is 3.5% below 4,000 feet and 3.2% below 10,000 feet, which is well under the threshold of significance as defined by the OWG (CRADA 2010). This assessment further validates the previous FAA aeronautical study conducted for each of the three pending projects and represents a thorough review by the Air Force.

**Level-of-Significance Determination and Mitigations**

Although there are changes to the land use environmental and regulatory setting, there are no new impacts or mitigations. Therefore, the conclusion that the Project, with mitigations, would not have a significant impact on land use would be consistent with the FEIR.

Through the CRADA process, the OWG concluded that there should be no significant impacts on mission requirements of Travis AFB and the safety of the airspace above and adjacent to the wind resource area due to the construction and operation of the proposed Montezuma Wind Project and the proposed SMUD Solano Phase 3 and Shiloh III projects. All minor impacts are manageable and fall within the expected levels of safety and risk for the airspace being evaluated.

**CHAPTER 14.0 NOISE**

**Environmental Setting**

There would be no change in the environmental setting due to the completed construction of neighboring wind energy project Shiloh II and the more distant wind energy SMUD-Solano Phase 2B. However, since publication of the FEIR, there have been allegations elsewhere of “Wind Turbine Syndrome” occurring near wind farms, and a complaint was received by the Department of Resource Management from a Rio Vista resident regarding alleged low-level noise/vibration emanating from existing wind turbines in the Montezuma Hills. Therefore, an infrasound study was conducted for the project as described below.

**Regulatory Setting**

The 2008 Solano County General Plan is the guide for both land development and conservation in the unincorporated portions of the County. Chapter 5 of the 2008 General Plan, entitled “Public Health and Safety,” identifies a maximum community noise equivalent level (CNEL) of 60 dBA as the limit of acceptable exterior noise from all noise sources for new residential housing for land use compatibility. This was the same limit established in the earlier General Plan’s health and safety element. With respect to noise sources, however, Table HS-4 in the 2008 General Plan establishes new standards for non transportation noise. According to the General Plan, the daytime
average and maximum allowable $L_{eq}$ are 55 dBA and 70 dBA, respectively, in a residential outdoor area and 35 dBA and 55 dBA, respectively, in a residential interior for receiving land uses not affected by transportation noise.

**Significance Criteria**

There are no changes to the significance criteria as a result of environmental, regulatory, or project changes.

**Impact Evaluation Methodology and Results**

The FEIR analyzed impacts from the proposed project from noise and found them to be potentially significant, requiring mitigation. The FEIR analysis was based on noise standards outlined in the former Solano County Wind Turbine Siting Plan. The Siting Plan standards expressed limits on wind turbine noise in terms of the CNEL noise metric, a 24-hour weighted average noise level. The updated public health and safety element (Chapter 5) of the 2008 General Plan incorporates these noise level criteria but adds additional non-transportation standards. Since publication of the FEIR, the Siemens turbines (turbine layout Option #1) have been relocated, and their potential impacts on nearby residences have been reevaluated.

E & E performed noise calculations based on the expected Siemens 2.3 MW turbines maximum sound power level, the newly scaled distances of the Siemens turbines to residences, and the geometric spreading of sound energy. These calculations indicate that the wind turbine noise levels, when combined with typical background levels for the area, would not exceed 50 dBA outside the residences, which is below the 2008 Solano County General Plan daytime average outdoor $L_{eq}$ standard of 55 dBA for a residential area. Since the reduction of sound levels from the exterior of a home to the interior is at a minimum 15 dBA due to the house structure, the interior levels would be expected to be less than 35 dBA due to the operation of the wind turbines at these distances, which is within the average 35 dBA $L_{eq}$ residential interior standard for Solano County.

In response to an allegation of “Wind Turbine Syndrome” occurring elsewhere and a complaint from a Rio Vista resident alleging low-level noise/vibration emanating from existing wind turbines in the Montezuma Hills, both realized subsequent to completion of the FEIR, the Applicant commissioned an acoustic study of low-frequency noise and infrasound from wind turbines. The Study of Low Frequency Noise and Infrasound from Wind Turbines was conducted by Epsilon Associates, Inc. (Epsilon 2009a) for the GE 1.5sle (Option #3) and Siemens 2.3MW (Option #1) turbines. The study was conducted on these turbines only; at the request of the Applicant, the study did not include the Vestas turbines. Nonetheless, the GE and Siemens turbines have louder noise/infrasound footprints and represent the worst-case analytical scenarios. As part of the study, sound measurements were collected at operating wind turbines in November 2008 at the Horse Hollow Wind Farm in Taylor and Nolan counties, Texas, and the results were compared to existing guidelines and criteria for low-frequency sound and infrasound. The study included an extensive literature search of scientific papers and reports.
The acoustic studies conducted by Epsilon Associates, Inc., indicated that the Siemens 2.3 MW and GE 1.5sle wind turbines, at maximum noise levels at a distance of more than 1,000 feet from the nearest residence, do not pose a low-frequency or infrasound noise problem. The distance is relevant because all of the wind turbine location options for the proposed project would be in compliance with the minimum County required setback distance for a wind turbine, which is the greater of 1,000 feet or three times the maximum wind turbine height. As stated in the report, at this distance the wind farm operations would:

- meet American National Standards Institute (ANSI)/Acoustical Society of America (ASA) S12.2 indoor levels for low-frequency sound for bedrooms, classrooms, and hospitals;
- meet ANSI/ASA S12.2 indoor levels for moderately perceptible vibrations in lightweight walls and ceilings;
- meet ANSI S12.9 Part 4 thresholds for annoyance and beginning of rattles;
- meet United Kingdom Department for Environment, Food, and Rural Affairs disturbance-based guidelines;
- generate no infrasound audible to the most sensitive listeners;
- possibly have slightly audible low-frequency noise at frequencies of 50 Hz and above, depending on other sources of low-frequency noises in homes, such as refrigerators or external traffic or airplanes; and
- meet ANSI S2.71 recommendations for perceptible ground-borne vibrations in residences during nighttime hours.

The acoustical study conducted by Epsilon Associates, Inc. (Epsilon 2009a) included the manufacturer-supplied A-weighted 1/3-octave band sound power levels for the GE 1.5 sle and Siemens 2.3 MW wind turbines. Table 2 presents these values along with the sound power level provided by the manufacturer in the low frequencies for the Vestas V80 1.8 MW turbine, which was not included in the Epsilon study. In comparison, the Vestas V80 1.8 MW turbine generates higher sound power than the Siemens 2.3 MW turbine in the 25 to 63 Hz bands but lower sound power levels than the GE 1.5 sle and Siemens 2.3 MW turbines in the 80 to 200 Hz bands. When comparing the sound power levels for the Vestas V80 1.8 MW in the 25 to 200 Hz bands with the applicable guidelines and standards, the conclusions for the GE 1.5 sle and Siemens 2.3 MW turbines listed above are applicable to the Vestas V80 1.8 MW turbines with the exception of the last conclusion regarding ground-borne vibration. This conclusion is likely to be true for the Vestas V80 1.8 MW turbines due to similar operational characteristics as the other two turbines; however, vibration measurements were not available to verify this conclusion. Nonetheless, based on the review of these studies for the Siemens and GE turbines, and the similar operating level analysis for the Vestas turbines, it can be determined that the operation of any of the three proposed...
turbine options would not result in any exceedance of low-frequency vibration standards or guidelines.

**Table 2 Turbine Low-Frequency Sound Power Level Comparison**

<table>
<thead>
<tr>
<th>1/3-Octave Band Center Band Frequency Hz</th>
<th>GE 1.5 sle(^{1}) 80 m hub height 77 m rotor diameter</th>
<th>Siemens 2.3MW(^{1}) 80 m hub height 92.4 m rotor diameter</th>
<th>Vestas V80(^{2}) 105 m hub height 90 m rotor diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>ND</td>
<td>109</td>
<td>111.6</td>
</tr>
<tr>
<td>31.5</td>
<td>ND</td>
<td>105.7</td>
<td>109.4</td>
</tr>
<tr>
<td>40</td>
<td>ND</td>
<td>105.3</td>
<td>108.7</td>
</tr>
<tr>
<td>50</td>
<td>106.4</td>
<td>105.3</td>
<td>106.8</td>
</tr>
<tr>
<td>63</td>
<td>106.1</td>
<td>104.8</td>
<td>105.8</td>
</tr>
<tr>
<td>80</td>
<td>105.1</td>
<td>104.7</td>
<td>104.4</td>
</tr>
<tr>
<td>100</td>
<td>103.9</td>
<td>104.8</td>
<td>102.6</td>
</tr>
<tr>
<td>125</td>
<td>102.8</td>
<td>105.3</td>
<td>101.4</td>
</tr>
<tr>
<td>160</td>
<td>105.8</td>
<td>103.2</td>
<td>97.9</td>
</tr>
<tr>
<td>200</td>
<td>101.6</td>
<td>103.7</td>
<td>96.5</td>
</tr>
</tbody>
</table>

\(^{1}\) Epsilon 2009a.  

It has been alleged that living in proximity to wind farms may result in health effects due to low frequency noise and infrasound. Such health effects or symptoms have been collectively termed “Wind Turbine Syndrome” by Dr. Nina Pierpont. However, while these effects or symptoms are reported in anecdotal and case reports, they are not detected in peer-reviewed epidemiological studies. There is no evidence to indicate that low frequency sound or infrasound from current models of wind turbine generators should cause concern to anyone living close to a wind turbine generator or a wind farm (Bellhouse 2004; Colby et al. 2009).

**Level-of-Significance Determination and Mitigations**

The FEIR concluded that there would be potentially significant noise impacts as a result of the project but that they could be reduced to less than significant with implementation of mitigation measures. Additionally, comparisons between the noise modeling in the FEIR and the new non-transportation noise standards reveal that there would be no new exceedances of noise standards, and therefore, no new impacts or mitigation measures. Based upon noise studies and additional info for the Vestas (Option #2) wind turbine model, the operation of any of the proposed options would not result in any exceedance of low frequency vibration standards or guidelines. With the updated information, changes in the General Plan and the proposed changes in the locations of the Siemens (Option #1) turbines, there would be no new impacts or mitigation measures, and potential noise impacts to residence #3 would no longer occur. However, the GE 1.5 sle (Option #3) impacts to residence #3 remain as identified in the EIR with the corresponding mitigation measures reducing impacts to less than significant levels.
CHAPTER 17.0 SAFETY

Environmental Setting

There are no modifications to the environmental setting as a result of the new Wind Turbine Blade Throw Analysis and Wind Turbine Shadow Flicker Analysis being conducted.

Regulatory Setting

Since the completion of the FEIR, Solano County has adopted the 2008 General Plan, which replaced the former 1987 Wind Turbine Siting Plan that was referenced in the EIR. The 2008 General Plan includes the same safety-related provisions for wind energy projects that were included in the former Wind Turbine Siting Plan.

Significance Criteria

There is no change to the significance criterion as a result of the new blade throw analysis or the new shadow flicker analysis.

Impact Evaluation Methodology and Results

The FEIR analyzed the impacts from the proposed project on safety and found them to be less than significant with mitigation. Since the FEIR, the Applicant has conducted a blade throw analysis and a shadow flicker analysis in consideration of the updated wind turbine standards anticipated by the County.

Blade Throw

The FEIR relied upon the results of the Shiloh II Wind Project EIR hazard zone analysis. For the Shiloh II Wind Project, the hazard zone analysis determined that a blade throw would have the largest area of potential impact on the public and that other turbine failure hazards, including tower failure, rotor delamination, or a blade-tower strike, would not be as far reaching as a blade throw. Therefore, other potential tower failure hazards would occur within the setback established for a blade throw, and a complete hazard zone analysis was considered unnecessary.

Since the FEIR, the Applicant has completed a wind turbine blade throw analysis documenting the maximum blade throw range for the Siemens 2.3 turbines in wind turbine layout Option #1 compared to the location of the nearest residential uses. The blade throw analysis calculated the maximum range a blade could be thrown in the event of a failure at the hub attachment of the turbine. The analysis considered the Siemens wind turbines because these turbines are the largest of the three proposed wind turbine options and would represent the potential for the farthest blade throw. According to Epsilon’s analysis (2009b), the maximum blade throw was estimated to be 220 meters (723 feet) from wind turbine #16 based on the adjacent topography and under normal operating conditions (O’Neal 2009). This maximum setback was adopted
for each wind turbine location for all three layout options in order to represent the worst-case scenario. Given that the minimum distance of any of the turbines to any residence is approximately 525 meters (1722 feet), the report concluded that impacts to residences resulting from turbine rotor failure are unlikely. The results of this analysis suggest that impacts related to tower failure would not be significant because tower failure occurs well within the range of maximum blade throw distance, and residences near the project area are well out of reach of the maximum blade throw range for each of the towers. In addition, based on literature research, the most comprehensive study of wind turbine rotor failures places the risk of failure at approximately 1 in 1,000 turbines per year, and there have been no documented cases of injury due to blade throw worldwide (Rhode Island DEM 2009; Chatham-Kent Public Health Unit 2008; CanWEA 2008). However, consistent with the conclusions in the EIR, there is still the potential for injury to onsite maintenance personnel or other individuals that happen to be within striking distance of wind turbines in the event of rotor or tower failure.

**Shadow Flicker**

Since the FEIR, the Applicant has also conducted a shadow flicker analysis for the Option #1 layout (referred to as “Phase 1” in the analysis) (Epsilon 2009c).

Shadow flicker is defined as the on-and-off flickering effect of a shadow caused when the sun passes behind the moving rotor blade of a wind turbine (UK CLGD 2009). Shadow flicker may be noticed by an indoor observer as periodic changes in the brightness of a room or by an outdoor observer as shadows of the rotating blades on the ground or nearby structures. Shadow flicker has been documented to cause minor to moderate impacts to human receptors, related primarily to annoyance and stress, and flicker from a single turbine can distract drivers (Bittner-Mackin 2006; Voll 2006). Shadow flicker from wind turbines, however, in response to concerns from the Epilepsy Foundation, has been shown to be too slow to trigger epileptic seizures (AWEA 2009; Epilepsy Foundation 2009). Although no formal standards for the significance of shadow flicker impacts to human receptors have been adopted locally or on a State or federal level, one relative limit for allowable flicker that has been used in one case is a maximum of 30 hours per year based on predicted values (County of Essex 2007; MTC 2007). This value, based on a German best practice standard established in 2002 (and upheld in a later court decision), represents a moderate level of effect, and is based on a worst-case, maximum shadow scenario (i.e., a scenario in which the sun is shining continuously within a cloudless sky, sufficient wind exists to turn the rotor, and there are no obstacles such as vegetation or other external or internal screening).

A software suite designed for assessing the environmental impacts of wind turbines, WindPRO, was used by Epsilon to calculate shadow flicker impacts in the areas surrounding the wind turbines. The Option #1 (Siemens) layout was chosen for this analysis because it includes the preferred layout by the Applicant and the Siemens is the largest of the three proposed wind turbine options with the farthest shadow cast, and as such, this layout is likely to represent the greatest potential for impacts. Potential effects to eight residences in the project area, including two residences located outside of the project boundary immediately to the North of Route 12 were modeled. The results
of the analysis indicate that the two residences outside the project boundary would experience less than 10 hours of shadow flicker per year. Within the project boundary, three residences would experience fewer than 30 hours of shadow flicker per year. In addition, three residences within the project boundaries would be exposed to between 30 and 50 hours of shadow flicker per year, a level greater than the guideline maximum of 30 hours of shadow flicker per year described above. However, the owners of these residences have leased the land to the project Applicant and as such accepted shadow flicker to occur. It should be noted that modeling of individual residential receptors, taking into account such factors as the size and orientations of windows and vegetation, was not included in the analysis.

**Level-of-Significance Determination and Mitigations**

Although there is new information related to blade throw and shadow flicker, as well as updates to the regulatory setting, there are no new impacts or mitigation measures related to these issues or otherwise to Chapter 17.0 (Safety) of the EIR. The project would still have a significant impact on safety that could be mitigated to a less than significant level without any changes to the mitigation proposed in the FEIR. Up to three residences in the project area would be exposed to a moderate level of impact from shadow flicker.

**CHAPTER 20.0 CUMULATIVE IMPACTS**

**Environmental Setting**

The cumulative environmental baseline context has changed based on the potential build-out of the WRA. This reevaluation of cumulative impacts finds no changes to the environmental baseline for agricultural resources; cultural resources; land use and population; air quality; geology, soils, and mineral resources; hazardous materials; hydrology and water quality; noise; public services and utilities; recreation; safety; and traffic. The environmental setting has changed sufficiently with regard to aesthetic and biological resources to necessitate a comprehensive discussion of new cumulative impacts for these resources.

**Cumulative Development Scenarios**

Eight hundred and thirty-three wind turbines have been installed and are currently operating in the Montezuma Hills WRA. As additional projects are planned and built and existing facilities are repowered with newer turbine technology, the total number of wind turbines is expected to change. Based on two new speculative wind projects and other factors, the current projected near-future development scenario for the WRA south of Highway 12 has increased from the total of 513 wind turbines identified in the EIR to just under 700 wind turbines. This potential development places one wind turbine for every 58 acres of developable area in the WRA and, based on existing conditions, would impact approximately 1% to 2% of the total land area within the WRA. As individual wind energy projects are constructed, the existing environment changes from a region of rural agriculture open space with unobstructed vistas to a mixed-use environment.
increasingly occupied by wind turbines. At present, approximately 85% of the acreage within the WRA has been developed or is proposed for development, and full build-out of the WRA will likely be completed in the next decade. In this changing environment, cumulative impacts on resources (e.g., biological resources) in the WRA will continue to increase incrementally, while cumulative impacts on visual resources will become incrementally more significant with further development of individual projects within the WRA. Table 3 summarizes the current development status of individual existing, currently proposed, and speculative, wind energy projects within the WRA, compared to the status at the time of the FEIR. While this table represents the most recent estimate of wind turbines expected for build-out of the WRA, it should be noted that this number is expected to change as incremental wind energy projects are evaluated based on their impacts on environmental resources and safety issues of concern. Figure 9 shows the location of all existing and currently proposed wind energy projects in the WRA. The location details for speculative projects are not currently available.

In the FEIR the cumulative impact analysis was assessed against current and proposed development, but also primarily against the full build-out scenario planned for the entire WRA. The current 2010 analysis in this Amendment documents the status of additional proposed and speculative development, including the completion of two new wind energy projects (SMUD-Solano Phase 2B and Shiloh II, representing 96 added wind turbines) and the PG&E Reconductoring Project adjacent to the proposed Montezuma Wind Project. However, the predicted total acres impacted within the entire WRA remains the same as described in the FEIR.

The completion of additional projects adding more turbines to the landscape has changed the environmental baseline for assessment of cumulative impacts resulting from the Montezuma Wind Project.

Regulatory Setting

The cumulative regulatory baseline context has changed based on changes to local and federal laws regarding land use, air quality, noise, safety, and biological resources. The County has adopted a new General Plan containing new noise regulations and procedures for delineating appropriate wind resource areas. The County also is considering further amendments to the General Plan and the Zoning Code for wind energy facilities that will consider updated and clarified standards for noise, aesthetics, and safety. There also are new federal and state mandates regarding GHG emissions and climate change. In addition, the CTS was declared a candidate species for listing under the CESA. There have been no changes to the regulatory setting for aesthetics; agricultural resources; cultural resources; geology, soils, and mineral resources; hazardous materials; hydrology and water quality; public services and utilities; recreation; and traffic.
Table 3  Cumulative Development in the Montezuma Hills WRA

<table>
<thead>
<tr>
<th>Project Name</th>
<th>2007 Status</th>
<th>Turbine Number</th>
<th>2009 Status</th>
<th>Turbine Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Winds</td>
<td>Built</td>
<td>90</td>
<td>Built</td>
<td>90</td>
</tr>
<tr>
<td>enXco V</td>
<td>Built</td>
<td>516</td>
<td>Built</td>
<td>516</td>
</tr>
<tr>
<td>enXco V repowering*</td>
<td>Speculative</td>
<td>-476</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shiloh I</td>
<td>Built</td>
<td>100</td>
<td>Built</td>
<td>100</td>
</tr>
<tr>
<td>Shiloh I (Phase B – balance unbuilt)</td>
<td>Proposed</td>
<td>20</td>
<td>Speculative</td>
<td>20</td>
</tr>
<tr>
<td>Shiloh II</td>
<td>Proposed</td>
<td>88-112</td>
<td>Built</td>
<td>75</td>
</tr>
<tr>
<td>Shiloh III</td>
<td>Proposed</td>
<td>60-80</td>
<td>Speculative</td>
<td>-76 to -65</td>
</tr>
<tr>
<td>Shiloh IV**</td>
<td>Speculative</td>
<td>-</td>
<td>Speculative</td>
<td>-76 to -65</td>
</tr>
<tr>
<td>SMUD Solano County (phase 1 and 2A)</td>
<td>Built</td>
<td>31</td>
<td>Built</td>
<td>31</td>
</tr>
<tr>
<td>SMUD (phase 2B)</td>
<td>Proposed</td>
<td>21</td>
<td>Built</td>
<td>21</td>
</tr>
<tr>
<td>SMUD (phase 3)</td>
<td>Proposed</td>
<td>≤76</td>
<td>Proposed</td>
<td>36-75</td>
</tr>
<tr>
<td>PG&amp;E Transmission Reconductoring</td>
<td>Proposed</td>
<td>-</td>
<td>Built</td>
<td>-</td>
</tr>
<tr>
<td>Montezuma Wind</td>
<td>Proposed</td>
<td>16-23</td>
<td>Proposed</td>
<td>16-23</td>
</tr>
<tr>
<td>Montezuma Wind II***</td>
<td>Speculative</td>
<td>-271</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total WTGs</strong></td>
<td>Built</td>
<td>737</td>
<td>Built</td>
<td>833</td>
</tr>
<tr>
<td></td>
<td>Proposed Speculative</td>
<td>221-252 (-476)</td>
<td>Proposed Speculative</td>
<td>112-178 (-327) (-316)</td>
</tr>
<tr>
<td><strong>Total WTGs Projected</strong></td>
<td>Total</td>
<td>482-513</td>
<td>Total</td>
<td>618-695</td>
</tr>
</tbody>
</table>

*enXco V repowering represents removal of 510 existing enXco V wind turbines and installation of 34 new wind turbines, for a net decrease of 476 wind turbines in the WRA.

**Shiloh IV represents removal of approximately 100 existing enXco V wind turbines and installation of 24 to 35 new wind turbines, for a net decrease of 76 to 65 wind turbines in the WRA.

***Montezuma Wind II represents removal of approximately 350 existing enXco V wind turbines and installation of 79 new wind turbines, for a net decrease of 271 wind turbines in the WRA.

Impact Evaluation Methodology and Results

The FEIR discussion of impacts related to the proposed project identified specific resources where impacts from this project would not be cumulatively significant overall, either with or without mitigation. These resources include: agricultural resources; cultural resources; geology, soils, and mineral resources; hazardous materials; hydrology and water quality; land use; noise; public services and utilities; recreation; safety; and traffic. The assessment of impacts on these resources has not changed under the current project evaluation of cumulative impacts.

Agricultural Resources

The original assessment of cumulative impacts found no potential cumulative impacts on agricultural resources from the proposed Montezuma Wind Project. Wind resource development is consistent with agricultural operations, and impacts on local dry-land farming agriculture and agricultural resources remain less than significant.
Cultural Resources

The original assessment of cumulative impacts found no potential cumulative impacts on cultural resources from the proposed project. Impacts on cultural resources remain less than significant.

Geology, Soils, and Mineral Resources

The original assessment of cumulative impacts found no potential cumulative impacts on geology, soils, and mineral resources from the project with implementation of standard design modifications.

Hazardous Materials

The original assessment of cumulative impacts found no potential cumulative impacts on hazardous materials from the project with the implementation of standard best management practices.

Hydrology and Water Quality

The original assessment of cumulative impacts found no potential cumulative impacts on hydrology and water quality from the proposed project.

Land Use and Population

The original assessment of cumulative impacts found no potential cumulative impacts on land use and population from the proposed project. The project, as assessed in this amendment, would achieve the same no impact determination through mitigation measures that require, for instance, compliance with wind turbine setbacks and setback waivers, as appropriate and as prescribed in the FEIR.

Cumulative impacts on radar operations at Travis AFB were addressed through responses to comments by the Solano County ALUC in the FEIR. The responses to comments referenced the FAA’s Determination of No Hazard approval process and further consideration of impacts at the time of issuance of a use permit by the County. More wind turbines are now operating in the WRA than at the time of the publication of the FEIR, and the potential radar impacts have been more closely examined. The CRADA process examined the impacts of existing turbines on radar operations plus potential impacts from development of the proposed Project and the two other pending wind energy projects (SMUD Solano Phase 3 and Shiloh III). For these projects, the developers were able to provide sufficiently detailed site plans showing turbine locations such that the analysis of radar impacts could be accurately modeled. The CRADA analysis concluded that the combined cumulative impacts of these three projects in addition to the existing turbines would not result in a significant impact on radar operations. Therefore, the Montezuma Wind Project’s incremental effect on radar operations at Travis AFB is not considered to be cumulatively significant.
Figure 9

Wind Energy Projects
in the Montezuma Hills Wind Resource Area
Solano County, California
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Future wind turbine development beyond the three currently pending projects was not modeled during the CRADA study. However, future projects could undergo radar impact modeling using the modeling technology developed pursuant to CRADA. The CRADA process calls for verifying the current modeling results by studying the impacts of the three currently proposed projects after construction. If necessary, the model would then be refined to ensure accuracy before being applied to future projects.

Three technical solutions are available to minimize any significant impacts of potential future projects. First, gap filling (the use of additional radar feeds from other radar sensors) may improve the probability of detection by as much as 3%. Second, additional optimization of the DASR-11 radar is expected to occur that will improve the baseline coverage of the radar. Finally, the FAA and Air Force are currently adopting alternative surveillance technology (automatic dependent surveillance broadcast [ADS-B]), which will replace legacy radar-based surveillance systems. ADS-B, which is scheduled to be implemented by 2020, is not impacted by the Doppler shift (inconsistent radar readings) caused by rotating wind turbine blades. Nonetheless, future development will be assessed separately using the model developed pursuant to CRADA.

**Noise**

The original assessment of cumulative impacts found no potential cumulative impacts on noise from the proposed project.

**Public Services and Utilities**

The original assessment of cumulative impacts found no potential negative cumulative impacts on public services and utilities from the proposed project.

**Recreation**

The original assessment of cumulative impacts found no potential cumulative impacts on recreation from the proposed project.

**Safety**

The original assessment of cumulative impacts found no potential cumulative impacts on safety from the proposed project.

**Traffic**

The original assessment of cumulative impacts found no potential cumulative impacts on safety from the proposed project.

However, the cumulative impact assessment for aesthetics, air quality, and biological resources would change due to changes that have occurred since the publication of the FEIR for the Montezuma Wind Project. Although the assessment has changed for these
resources areas, the level-of-significance determinations remain the same as in the FEIR.

Aesthetics

The assessment in the FEIR found that both temporary and permanent cumulative impacts on aesthetic resources would be significant and unavoidable even with mitigation. The FEIR concluded that when considered along with other WRA projects, the Project could contribute to significant cumulative visual impacts on the community of Birds Landing and dispersed residential viewpoints in proximity to the project area. Impacts on visual resources, specifically along existing roads near the wind project and to residents in Birds Landing, would remain significant after mitigation and are unavoidable. However, the completion of additional development within the WRA changes the existing regional aesthetic environment baseline from which the 2007 assessment was made. When the FEIR for the Montezuma Wind Project was completed, the visual landscape throughout much of the area, when viewed in the foreground distance zone, consisted of relatively undeveloped rural farmland and scattered trees with no artificial structures taller than a two-story farmhouse. Relatively few turbines occupied the far distance zone. In particular, views from identified observation points along Highways 12 and 113 were largely free from development, including wind turbines. When viewed against this recent development, the maximum of 23 wind turbines proposed for the Montezuma Wind Project would not create a visual contrast or represent a noticeably new element in the new regional baseline aesthetic environment. However, as shown in visual simulations of the three options within the existing baseline visual environment (Figures 2, 3, 4, 5, and 6), the proposed addition of up to 23 wind turbines within the view corridors previously analyzed in the FEIR would continue to create significant unavoidable visual impacts.

Air Quality

The cumulative impact assessment for air quality presented in the FEIR identified temporarily significant impacts during construction but cumulatively beneficial overall impacts due to the reductions in pollution and GHG emissions. Impacts on air quality, specifically levels of NOx and PM10, remain significant after mitigation and are unavoidable. Cumulatively, operation of wind farms would reduce dependence on fossil fuels, reduce regional and statewide emissions, and have a long-term beneficial cumulative effect on regional air quality. This cumulative air quality assessment remains the same in the current analysis.

A scoping plan approved by the CARB Board December 12, 2008, provides the outline for actions to reduce California’s GHG emissions. The scoping plan now requires CARB and other state agencies to adopt regulations and other initiatives to reduce GHGs. At this time, there are no mandatory GHG regulations or finalized agency guidelines that would apply to this project. The cumulative contribution of GHGs associated with this project are net positive based on replacement of grid average electricity; and support overall efforts to increase renewable energy generation in the state of California.
Biological Resources

The original assessment found that significant potential cumulative impacts on biological resources could result from the Montezuma Wind Project. Avoidance and minimization measures were applied to potential impacts; however, these measures were unable to reduce potential impacts to a level of less than significant for all affected biological resources. Significant potential impacts on avian wildlife, particularly raptor species, remain unavoidable even after mitigation.

The assessment in the FEIR found that, with mitigation, both temporary and permanent cumulative impacts on sensitive plants and vegetation, wetlands and water, and non-avian wildlife would be less than significant. However, cumulative impacts on birds, especially raptor species and golden eagles, could be significant even after mitigation. In this assessment, this significance determination would not change. However, the baseline conditions for this project have changed due to the completion of additional wind energy development within the WRA. When the FEIR for the Montezuma Wind Project was completed, SMUD-Solano Phase 2B was incomplete and construction of the Shiloh II project had not begun. At the present time, both of these projects are complete, adding 96 additional wind turbine towers to the WRA and increasing the baseline for analysis of cumulative impacts. The proposed Montezuma Wind Project will add up to an additional 23 turbine towers and bring the total number of turbines within the WRA to approximately 856. The addition of 23 wind turbines to an environment containing existing wind energy facilities that is currently affecting avian species may result in a greater incremental impact than identified in the FEIR assessment. Therefore, the cumulative project impacts on birds presented in this analysis remain significant and may be incrementally greater than those identified in the FEIR.

5.0 Bibliography


ESRI. June 2009. Preliminary Turbine Locations Map, Shiloh III Wind Partners, LLC.


Amendment to Montezuma Wind Final EIR


