

## C. ALTERNATIVES

This section is organized as follows: Section C.1 is an overview of the alternatives development and screening process, Section C.2 describes the methodology used for the alternatives evaluation, Section C.3 summarizes which alternatives have been selected for full Environmental Impact Report/Environmental Impact Statement (EIR/EIS) analysis and which have been eliminated based on California Environmental Quality Act (CEQA)/National Environmental Policy Act (NEPA) criteria, Section C.4 describes the alternatives that have been retained for full EIR/EIS analysis in Section D of this EIR/EIS, Section C.5 describes the alternatives eliminated from full EIR/EIS analysis and rationale for elimination, and Section C.6 provides a description of the No Project/No Action Alternatives. Section E of this EIR/EIS, Comparison of Alternatives, compares the environmental advantages and disadvantages of the East County (ECO) Substation Project, the Tule Wind Project, and the Energia Sierra Juarez U.S. Generator-Tie Project (ESJ Gen-Tie Project), collectively referred to as the Proposed PROJECT, and the alternatives carried forward for further evaluation.

### C.1 Alternatives Development and Screening Process

**NEPA Requirements.** Under NEPA, the range of alternatives required to be evaluated by an EIS is governed by the rule of reason, which requires an EIS to set forth only those alternatives necessary to permit a reasoned choice. An EIS must consider a reasonable range of alternatives as defined by the specific facts and circumstances of the proposed action. In addition to the “No Action” alternative, which maintains existing conditions on a project site, the evaluated alternatives must fulfill the basic requirements of a project's statement of purpose and need. NEPA also requires that alternatives be feasibly carried out in the context of technical, economic, environmental, and other factors. If alternatives have been eliminated from detailed study, the EIS must briefly discuss the reasons for their elimination. Under NEPA, feasible alternatives must be addressed at the same level of detail as a proposed project. In addition, under NEPA, the alternatives analysis should present the environmental impacts of the proposed project and the alternatives in comparative form, thereby defining the issues and providing a clear basis for choice among options by the decision maker and the public.

**CEQA Requirements.** The range of alternatives under CEQA is also governed by the rule of reason. The CEQA Guidelines indicate that an EIR must describe a range of reasonable alternatives to the project or its location, which would feasibly attain most of the project objectives while avoiding or substantially reducing the significant effects of a proposed project, and evaluate the comparative merits of each alternative. An EIR must consider a reasonable range of alternatives that will foster informed decision making and public participation. The EIR also should identify any alternatives that were considered but rejected as infeasible and briefly

explain the reasons underlying the lead agency's determination. Among the factors that may be used to eliminate alternatives from further detailed consideration in an EIR are (a) failure to meet most of the basic project objectives, (b) infeasibility, or (c) inability to avoid significant environmental impacts. CEQA also makes clear that an EIR must include sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the proposed project.

An EIR also must include a "No Project" alternative, similar to the "No Action" alternative required under NEPA. The description of each alternative must be sufficient to allow meaningful evaluation and comparison with a proposed project. The lead agency must also identify the environmentally superior alternative.

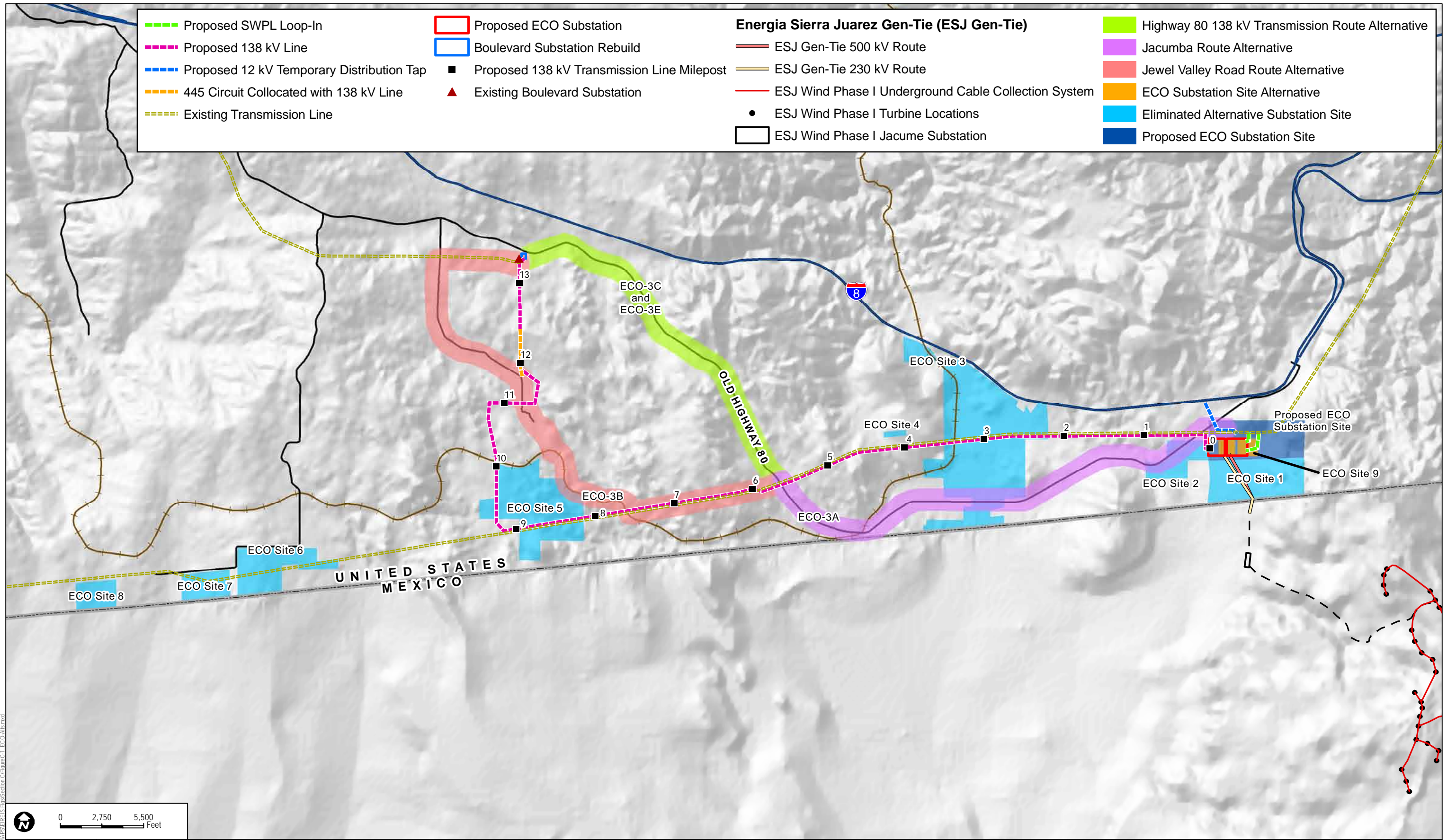
It should be noted that since the Campo, Manzanita, and Jordan wind energy projects are not defined at a project level (due to insufficient detail at this time) and are instead addressed at a program level in this EIR/EIS, these projects are not included in the environmentally superior alternative and will be considered in detail in future environmental analysis conducted for these projects.

Alternatives considered in this EIR/EIS include those identified by the applicants, the California Public Utilities Commission (CPUC), and the Bureau of Land Management (BLM), as well as those identified by the general public and other agencies during the public scoping period, which was from December 28, 2009, through February 15, 2010. Over 40 potential alternatives to the Proposed PROJECT were identified for consideration in the following categories:

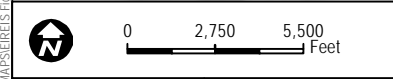
**Alternatives to the ECO Substation Project:** Twenty-one alternatives to the ECO Substation Project were evaluated, including nine alternative locations for the ECO substation; one alternative location for the Boulevard Substation; five 138-kilovolt (kV) transmission design, routing, and undergrounding alternatives (Figure C-1); and six system alternatives.

**Alternatives to the Tule Wind Project:** Twelve alternatives to the Tule Wind Project were evaluated, including seven alternative location/configurations and five design alternatives (as shown in Figure C-2).

**Alternatives to the ESJ Gen-Tie Project:** Five alternatives to the ESJ Gen-Tie Project were evaluated, including undergrounding of the 230 kV gen-tie, undergrounding of the 500 kV gen-tie (both at the same location as the proposed aboveground options shown in Figure B-32 and Figure C-1), overhead alternative alignment routes for the 230 and 500 kV gen-ties toward the east (as shown in Figure C-3), and an undergrounding alternative alignment route for the 230 kV gen-tie toward the east, as well as the ECO System Alternative 6.

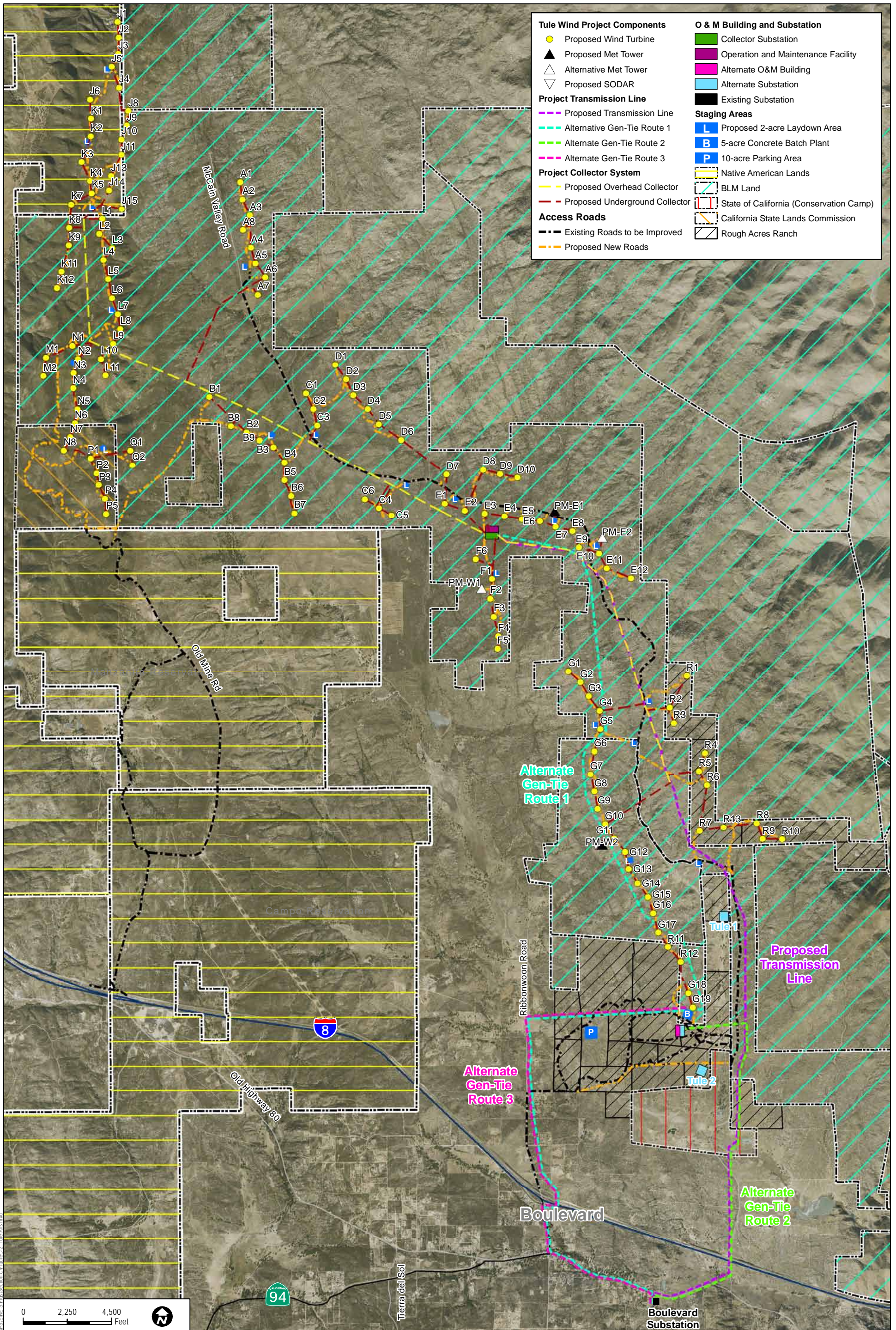


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|---|---|---|--|
| <ul style="list-style-type: none"> <li><span style="color: green;">---</span> Proposed SWPL Loop-In</li> <li><span style="color: magenta;">---</span> Proposed 138 kV Line</li> <li><span style="color: blue;">---</span> Proposed 12 kV Temporary Distribution Tap</li> <li><span style="color: orange;">---</span> 445 Circuit Collocated with 138 kV Line</li> <li><span style="color: yellow;">---</span> Existing Transmission Line</li> </ul> | <ul style="list-style-type: none"> <li><span style="border: 1px solid red; display: inline-block; width: 15px; height: 10px;"></span> Proposed ECO Substation</li> <li><span style="border: 1px solid blue; display: inline-block; width: 15px; height: 10px;"></span> Boulevard Substation Rebuild</li> <li><span style="display: inline-block; width: 10px; height: 10px; background-color: black;"></span> Proposed 138 kV Transmission Line Milepost</li> <li><span style="color: red;">▲</span> Existing Boulevard Substation</li> </ul> | <p><b>Energia Sierra Juarez Gen-Tie (ESJ Gen-Tie)</b></p> <ul style="list-style-type: none"> <li><span style="color: red;">---</span> ESJ Gen-Tie 500 kV Route</li> <li><span style="color: brown;">---</span> ESJ Gen-Tie 230 kV Route</li> <li><span style="color: red;">---</span> ESJ Wind Phase I Underground Cable Collection System</li> <li><span style="color: red;">●</span> ESJ Wind Phase I Turbine Locations</li> <li><span style="border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> ESJ Wind Phase I Jacume Substation</li> </ul> | <ul style="list-style-type: none"> <li><span style="color: green;">---</span> Highway 80 138 kV Transmission Route Alternative</li> <li><span style="color: purple;">---</span> Jacumba Route Alternative</li> <li><span style="color: orange;">---</span> Jewel Valley Road Route Alternative</li> <li><span style="color: blue;">---</span> ECO Substation Site Alternative</li> <li><span style="color: cyan;">---</span> Eliminated Alternative Substation Site</li> <li><span style="color: darkblue;">---</span> Proposed ECO Substation Site</li> </ul> |
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**DUDEK**

SOURCE: HDR 2010

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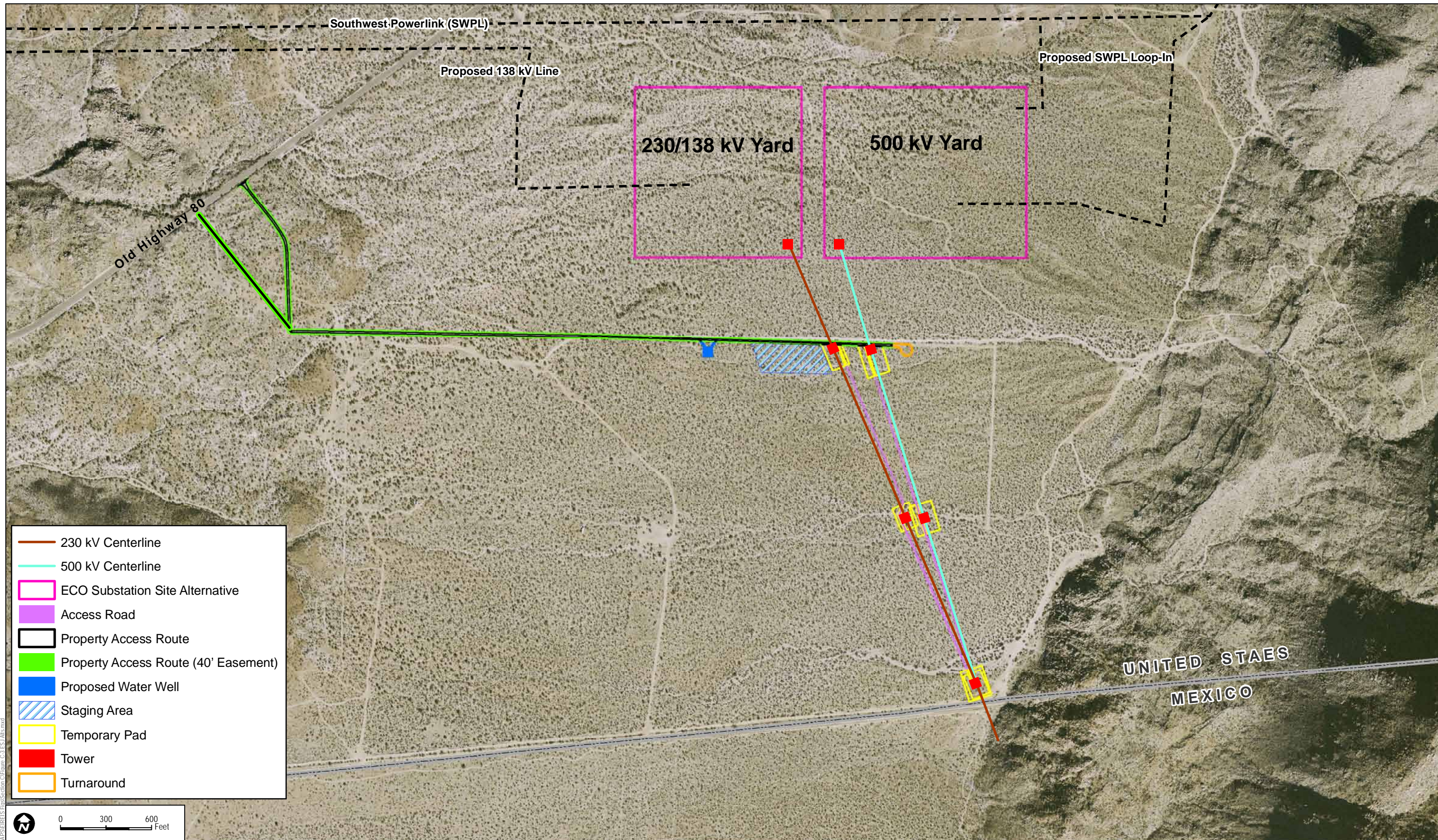
East County Substation/Tule Wind/Energia Sierra Juarez Gen-Tie Projects - EIR/EIS

**FIGURE C-2**  
**Tule Wind Project Alternatives Map**



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- 230 kV Centerline
- 500 kV Centerline
- ECO Substation Site Alternative
- Access Road
- Property Access Route
- Property Access Route (40' Easement)
- Proposed Water Well
- Staging Area
- Temporary Pad
- Tower
- Turnaround



**DUDEK**

SOURCE: Aecom 2010; SanGIS 2008; SANDAG 2007

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East County Substation/Tule Wind/Energia Sierra Juarez Gen-Tie Projects - EIR/EIS

**FIGURE C-3**  
**ESJ Gen-Tie Overhead Alternative Alignment Routes**



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**Other Energy Alternatives:** Other energy alternatives, including energy efficiency and distributed generation such as rooftop solar panels and alternative fuels, were evaluated.

**No Project/No Action Alternatives:** Four No Project/No Action Alternatives were evaluated.

The Campo, Manzanita, and Jordan wind energy projects are evaluated under the other energy alternative and the No Project/No Action Alternative. Project-specific information has not been developed for these projects; therefore, providing a full evaluation of these wind energy projects and any alternatives developed in respect to these projects would be speculative. Once sufficient project-specific information has been developed, alternatives will be discussed in detail in further environmental review of these projects.

## **C.2 Alternatives Screening Methodology**

The development of alternatives to the Proposed PROJECT considered in this EIR/EIS was completed using a screening process that consisted of three steps:

- Step 1:** Clarify the description of each alternative to allow comparative evaluation.
- Step 2:** Evaluate each alternative using CEQA and NEPA criteria (defined below).
- Step 3:** Determine the suitability of each alternative for full analysis in the EIR/EIS.

The following criteria were used to evaluate the alternatives:

- Does the alternative meet most of the Proposed PROJECT's basic objectives and fulfill the BLM's project purpose and need as provided in Section A of this EIR/EIS?
- Is the alternative feasible (i.e., legal, regulatory, technical, practical)?
- Is the alternative environmentally acceptable? Does the alternative avoid or substantially lessen environmental effects of the Proposed PROJECT?

Alternatives that met all of the criteria previously listed (i.e., were determined to best meet the basic project objectives and purpose and need as set forth in Section A) and are feasible and environmentally acceptable were carried forward as reasonable alternatives for detailed analysis and are detailed in Section C.3.1. Those that did not meet the criteria were determined not to be reasonable alternatives and were eliminated from further analysis; they are described in Section C.3.2, along with the reasons for elimination.



### **C.2.1 Consistency with Project Objectives**

Section 15126(a) of the CEQA Guidelines (14 CCR 15000 et seq.) requires that project objectives be set forth in an EIR in order to help define alternatives to the Proposed PROJECT that meet most of the basic project objectives. Moreover, a project may not limit the objectives of a project in such a way as to effectively confine the range of feasible alternatives that are available. Having taken into consideration the project objectives set forth by San Diego Gas and Electric (SDG&E) for the ECO Substation Project, Pacific Wind Development for the Tule Wind Project, and Energia Sierra Juarez U.S. Transmission, LLC, for the ESJ Gen-Tie Project (Section A of this EIR/EIS), the CPUC has identified the following basic project objectives used to screen alternatives:

- C-1 Accommodate delivery of renewable energy to meet state and federal renewable energy goals from wind and solar sources in San Diego County
- C-2 Meet California's renewable portfolio standard (RPS) program requiring utilities to purchase 20% of energy from renewable sources by 2010
- C-3 Meet the Governor's Executive Order S-14-08 that increased the RPS goal to 33% by 2020
- C-4 Improve the reliability of the delivery of power to the communities of Boulevard, Jacumba, and surrounding communities.

The Council on Environmental Quality (CEQ) Regulations at 40 CFR 1502.13 require that the statement shall briefly specify the underlying purpose and need to which the agency is responding in proposing the alternatives, including the proposed project. The purpose and need for the Proposed PROJECT under NEPA is provided in Section A of this EIR/EIS.

### **C.2.2 Feasibility**

Section 15364 of the CEQA Guidelines (14 CCR 15000 et seq.) defines feasibility as "capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors."

In addition, Section 15126.6(f) of the CEQA Guidelines (14 CCR 15000 et seq.) requires that the lead agency consider site suitability, economic viability, availability of infrastructure, general plan consistency, other regulatory limitations, jurisdictional boundaries, and the proponent's control over alternative sites in determining the range of alternatives to be evaluated to provide a clear basis for choice among options by the decision makers and the public. Similarly, NEPA



guidelines require the consideration of a reasonable range of alternatives, defined as alternatives that are practical or feasible from a technical and economic standpoint (40 CFR 1502.14).

Feasibility can include several components:

- **Technical Feasibility:** Is the alternative feasible from a technological perspective, considering the construction, operation, and maintenance?
- **Legal and Regulatory Feasibility:** Does the alternative involve lands that have legal protections or regulatory restrictions that may prohibit or substantially limit the feasibility of permitting a new natural gas storage reservoir and associated facilities?

For the screening analysis, the legal, regulatory, and technical feasibility of potential alternatives was assessed. The assessment was directed toward reverse reason; that is, a determination was made as to whether there was anything about the alternative that would be infeasible on technical, legal, or regulatory grounds.

The screening analysis did not focus on relative economic factors or costs of the alternatives since Section 15126.6(b) of the CEQA Guidelines requires consideration of alternatives capable of eliminating or reducing significant environmental effects even though they may “impede to some degree the attainment of project objectives or would be more costly” (14 CCR 15000 et seq.).

### **C.2.3 Potential to Eliminate Environmental Effects**

CEQA requires that to be fully considered in an EIR/EIS, an alternative must have the potential to avoid or substantially lessen any of the significant effects of the project. If an alternative was identified that clearly does not provide potential overall environmental advantage as compared with the Proposed PROJECT, it was eliminated from further consideration. At the screening stage, it is not possible to evaluate all of the impacts of the alternatives in comparison with the Proposed PROJECT with absolute certainty, nor is it possible to quantify impacts. However, it is possible to identify elements of an alternative that are likely to be the sources of impact and to relate them, to the extent possible, to general conditions in the subject area.

## **C.3 Summary of Screening Results**

Of the more than 40 alternatives considered, 12 project alternatives and 4 no project alternatives are carried forward for full analysis in this EIR/EIS. Table C-1 provides a composite list of the alternatives considered and the results of the screening analysis with respect to the criteria findings for consistency with project objectives, feasibility, and environmental effectiveness. Alternatives carried forward for full EIR/EIS analysis are listed in Section C.3.1. Alternatives eliminated from further consideration follow in Section C.3.2.



**Table C-1**  
**ECO Substation, Tule Wind, and ESJ Gen-Tie Projects**  
**Summary of Alternatives Screening Analysis**

Alternative	Project Objectives Criteria	Feasibility Criteria	Environmental Criteria	Conclusion: Included in EIR/EIS for Further Analysis
<b>Alternatives to ECO Substation Project</b>				
<b>ECO-1 Alternative Site Locations for ECO Substation</b>				
ECO Substation Alternative Site 1 (south of the Proposed ECO Substation Site)	Meets project objectives criteria.	Meets feasibility criteria.	Does not meet environmental criteria. Impacts from ESJ Gen-Tie Project would be less due to reduced distance; however, reduction in impacts would be offset by increased distance from Southwest Powerlink (SWPL). Impacts could potentially be greater due to increased access requirements and hydrology impacts.	No. Does not meet environmental screening criteria.
ECO Substation Alternative Site 2 (west of the Proposed ECO Substation Site)	Meets project objectives criteria.	Does not meet feasibility criteria due to geologic conditions.	Does not meet environmental criteria. Impacts to physical environment greater due to substantial increase in grading and fill requirements. Impacts from ESJ Gen-Tie Project slightly greater due to increased distance.	No. Does not meet feasibility or environmental screening criteria.
ECO Substation Alternative Site 3 (Ketchum Ranch Site)	Meets project objectives criteria.	Meets feasibility criteria.	Does not meet environmental criteria. Has potential to conflict with prime agricultural resources and existing and planned land uses. Reduction in impacts by reducing the distance of the 138 kV transmission line would be offset by increased impacts from increasing the length of the ESJ Gen-Tie Project.	No. Does not meet environmental screening criteria.
ECO Substation Alternative Site 4 (Jacumba Site)	Meets project objectives criteria.	Meets feasibility criteria.	Does not meet environmental criteria. Has potential to create greater impacts to critical habitat for quino checkerspot butterfly (QCB) and existing and planned land uses. Reduction in impacts from reducing the length of the 138 kV transmission line would be offset by increased impacts from increasing the length of ESJ Gen-Tie Project.	No. Does not meet environmental screening criteria.

**East County Substation/Tule Wind/Energia Sierra Juarez Gen-Tie Projects**  
**C. ALTERNATIVES**

**Table C-1 (Continued)**

Alternative	Project Objectives Criteria	Feasibility Criteria	Environmental Criteria	Conclusion: Included in EIR/EIS for Further Analysis
ECO Substation Alternative Site 5 (south of Boulevard Site)	Meets project objectives criteria.	Meets feasibility criteria.	Does not meet environmental criteria. Would transfer project impacts to alternate site, which is farther from existing access. Has potential to create greater impacts due to increased access requirements. Reduction in impacts from reducing the length of the 138 kV transmission line would be offset by increased impacts from increasing the length of the ESJ Gen-Tie Project.	No. Does not meet environmental screening criteria.
ECO Substation Alternative Site 6 (west of Boulevard Site)	Meets project objectives criteria.	Meets feasibility criteria.	Does not meet environmental criteria. Would transfer project impacts to alternate site, which is closer to residences and within area designated as agricultural preserve by the County of San Diego. Reduction in impacts from reducing the length of the 138 kV transmission line by approximately 6 miles would be offset by increased impacts from increasing the length of the ESJ Gen-Tie Project.	No. Does not meet environmental screening criteria.
ECO Substation Alternative Site 7 (east of Campo Site)	Meets project objectives criteria.	Meets feasibility criteria.	Does not meet environmental criteria. Would transfer project impacts to alternate site, which is closer to residences. Reduction in impacts from reducing the length of the 138 kV transmission line would be offset by increased impacts from increasing the length of the ESJ Gen-Tie Project.	No. Does not meet environmental screening criteria.
ECO Substation Alternative Site 8 (Campo Site)	Meets project objectives criteria.	Meets feasibility criteria.	Does not meet environmental criteria. Would transfer project impacts to alternate site. Reduction in impacts from reducing the length of the 138 kV transmission line would be offset by increased impacts from increasing the length of the ESJ Gen-Tie Project.	No. Does not meet environmental screening criteria.



**Table C-1 (Continued)**

Alternative	Project Objectives Criteria	Feasibility Criteria	Environmental Criteria	Conclusion: Included in EIR/EIS for Further Analysis
ECO Substation Alternative Site 9 (700 feet east of proposed site)	Meets project objectives criteria.	Meets feasibility criteria.	Meets environmental criteria. Would reduce impacts without increasing impacts to other resources.	Yes. Would meet project objectives, is feasible, and would reduce environmental impacts.
<b>ECO-2 Alternative Site Locations to Boulevard Substation</b>				
ECO Alternative Boulevard Substation Site	Would meet project objectives assuming rebuild of Boulevard would be done to meet reliability criteria or Alternative Boulevard site would include proposed upgrades to meet local reliability needs.	Meets feasibility criteria; however, would require additional transmission line construction due to rearrangement of existing distribution system and/or upgrade of existing Boulevard Substation and connection to the 138 kV system.	Does not meet environmental criteria. Would transfer project impacts to alternate site on public/BLM lands as opposed to the proposed ECO Substation Project, which would expand an existing use on private lands. Reduction in impacts from reducing the length of the Tule 138 kV transmission line would be offset by increasing the length of the ECO Substation Project 138 kV transmission line component. May also require rearrangement of existing distribution system and or upgrade of existing Boulevard Substation resulting in additional impacts compared with proposed rebuild of existing substation. May conflict with management and conservation of natural resources as managed by BLM.	No. Does not meet environmental screening criteria.
<b>ECO-3 138 kV Transmission Design, Routing, and Underground Alternatives</b>				
ECO Jacumba 138 kV Transmission Route Alternative. This segment overbuilds existing distribution line for approximately 6.2 miles from proposed ECO Substation to intersection of Highway 80 and SWPL and then joins proposed route to Boulevard Substation. Total length 13.7 miles compared with proposed, which is 13.3 miles.	Meets project objectives criteria.	Meets feasibility criteria.	Does not meet environmental criteria. Would transfer project impacts to alternate route that is closer to sensitive land uses (residences, school, airport) and not within a BLM-designated transmission corridor.	No. Does not meet environmental screening criteria.

**Table C-1 (Continued)**

Alternative	Project Objectives Criteria	Feasibility Criteria	Environmental Criteria	Conclusion: Included in EIR/EIS for Further Analysis
ECO Jewel Valley Road 138 kV Transmission Route Alternative. This segment requires new right-of-way (ROW) for approximately 7.6 miles that would run from the proposed route at the Highway 80/SWPL intersection west along existing rail line and then Jewel Valley Road to the Boulevard Substation. Total length 15.1 miles compared with proposed, which is 13.3 miles.	Meets project objectives criteria.	Meets feasibility criteria.	Does not meet environmental criteria. Would transfer project impacts to alternate route that is farther from existing access. Has potential to create greater impacts due to increased access requirements.	No. Does not meet environmental screening criteria.
ECO Highway 80 138 kV Transmission Route Alternative. This segment would overbuild an existing distribution line for approximately 4.8 miles along Highway 80 from Highway 80/SWPL intersection to Boulevard Substation. Total length 10.6 miles compared with proposed, which is 13.3 miles.	Meets project objectives criteria.	Meets feasibility criteria. However, would cause multiple outages on existing distribution circuit.	Expected to meet environmental criteria. Has potential to reduce project impacts by using existing utility ROW by overbuilding an existing line when compared with establishing a whole new 138 kV ROW. Environmental issues include visual and biological, including 2.5 miles of critical habitat for QCB.	Yes. Would meet project objectives, feasibility, and environmental criteria.
ECO Partial Underground 138 kV Transmission Route Alternative. This segment would underground the proposed 138 kV transmission line from approximately milepost (MP) 9 to the Boulevard Substation.	Meets project objectives criteria.	Meets feasibility criteria.	Expected to meet environmental criteria. Has potential to reduce long-term visual and land use impacts. Environmental issues include increased short-term construction impacts.	Yes. Would meet project objectives, feasibility, and environmental criteria.
ECO Highway 80 Underground 138 kV Transmission Route	Meets project objectives criteria.	Meets feasibility criteria. However, would cause	Expected to meet environmental criteria. Undergrounding the proposed and existing line	Yes. Would meet project objectives, feasibility, and



**East County Substation/Tule Wind/Energia Sierra Juarez Gen-Tie Projects**  
**C. ALTERNATIVES**

**Table C-1 (Continued)**

Alternative	Project Objectives Criteria	Feasibility Criteria	Environmental Criteria	Conclusion: Included in EIR/EIS for Further Analysis
Alternative. Same as described for the ECO Highway 80 138 kV Transmission Route Alternative except transmission line would be undergrounded.		multiple outages on existing distribution circuit.	when compared with establishing a whole new 138 kV ROW. Has potential to reduce long-term visual and land use impacts. Environmental issues include increased short-term construction impacts.	environmental criteria.
<b>ECO-4 System Alternatives</b>				
ECO System Alternative 1— Eliminate 138 kV Transmission Line component	Does not meet project objectives criteria. Tule Wind Project and other potential interconnections of renewable energy into the Boulevard Substation would be limited, and the reliability and flexibility of electric service in the area would remain unchanged.	Meets feasibility criteria.	Meets environmental criteria because it would eliminate the 138 kV transmission line from ECO to Boulevard Substation and resulting short-term construction impacts and long-term operation impacts.	No. Does not meet project objectives screening criteria.
ECO System Alternative 2— Elimination of 138 kV Transmission Line and Rebuild TL6931 (Boulevard to Crestwood Substation) and TL629E (Crestwood Substation to Cameron Tap)	Does not meet project objectives criteria. Tule Wind Project and other potential interconnections of renewable energy into the Boulevard Substation would be limited, and while the alternative would increase the reliability and flexibility of electric service in the area, it would still be vulnerable to common structure outages.	Meets feasibility criteria.	Potentially meets environmental criteria because it would eliminate the 138 kV transmission line from ECO to Boulevard Substation and resulting short-term construction impacts and long-term operation impacts. However, elimination of these impacts would be partially offset by the need to rebuild/reconductor 13 miles of existing transmission from the Boulevard to Crestwood substation and from Crestwood to Cameron Tap.	No. Does not meet project objectives screening criteria.
ECO System Alternative 3— Build a new 230 kV switchyard	Does not meet project objectives criteria. Would	Meets feasibility criteria.	Does not meet environmental criteria. Reduction in impacts from reducing the proposed ECO	No. Does not meet project objectives or environmental

**East County Substation/Tule Wind/Energia Sierra Juarez Gen-Tie Projects**  
**C. ALTERNATIVES**

**Table C-1 (Continued)**

Alternative	Project Objectives Criteria	Feasibility Criteria	Environmental Criteria	Conclusion: Included in EIR/EIS for Further Analysis
and extend a 230 kV line from the Imperial Valley Substation	severely limit the amount of generation that could interconnect, and the reliability and flexibility of electric service in the area would remain unchanged.		substation to a switching yard and elimination of the proposed 138 kV transmission line from the ECO substation to the Boulevard Substation would be offset by increased impacts from developing a 30-mile 230 kV transmission line from the ECO switching station to the Imperial Valley Substation as well as need for developing a 230 kV interconnect transmission line from the Tule Wind Project to the switching station as compared with the 138 kV transmission line as proposed.	screening criteria.
ECO System Alternative 4— Connect to the Sunrise Powerlink	Meets project objectives criteria.	Meets feasibility criteria.	Does not meet environmental screening criteria. This alternative would not reduce project impacts and may increase impacts if the Sunrise Powerlink were looped in instead of SWPL, which would cause additional impacts with upgrading the outlet capacity at the Sycamore substation as compared with no upgrades required at the Miguel substation outlet as proposed.	No. Does not meet environmental screening criteria.
ECO System Alternative 5— Eliminate 230 kV yard at the ECO Substation	Does not meet project objectives criteria. Would meet most common project objectives. However, would not provide flexibility compared with the proposed project and may limit number of interconnect points.	Does not meet feasibility criteria. Creates system concerns for mid- to large-scale wind energy projects. Also, creates equipment concerns in the event of an emergency due to lack of availability of 500/138 kV transformers. 500/230 kV transformers are standard.	Does not meet environmental criteria. Reduction in impacts from reducing the proposed ECO substation by eliminating the 230 kV substation yard would be offset by increased impacts from 500 kV gen-tie lines, which would require additional ROW as compared with 230 kV lines.	No. Does not meet project objectives, feasibility, or environmental screening criteria.



**Table C-1 (Continued)**

Alternative	Project Objectives Criteria	Feasibility Criteria	Environmental Criteria	Conclusion: Included in EIR/EIS for Further Analysis
<p>ECO System Alternative 6—Use existing Comisión Federal de Electricidad (CFE) 230 kV line located in northern Mexico and Path 45 to transmit ESJ Energy, and upgrade East County 69 kV substations combined with upgrading existing East County 69 kV substation(s) and lines to accommodate local wind development combined with microgrid reinforcement of local transmission infrastructure to meet load requirements from rooftop solar or other local, small-scale resources.</p> <p>Alternative would eliminate need for ESJ Gen-Tie and ECO Substation projects.</p>	<p>Would not meet project objectives criteria. Would not be able to interconnect all of the ESJ Wind Project or all the region’s planned renewable generation and, therefore, would only marginally meet common project objectives. Would not meet reliability objectives when local renewable resources are unavailable.</p>	<p>Does not meet feasibility criteria. Import capacity of CFE into the United States is limited to 800 megawatts (MW) (California Independent System Operator (CAISO)) and, therefore, would not be able to accommodate planned generation of 1,200 MW from the ESJ Wind Project.</p> <p>Required upgrades would be at the sole discretion of the CFE and would require international contract agreements. As such, upgrades to the CFE system may pose substantial regulatory and legal constraints to achieving delivery of renewable energy produced by the ESJ Project within the 2010–2020 time frame.</p> <p>At best, upgrades would have capacity to accommodate 150 MW out of over 500 MW planned to be interconnected in the Boulevard area.</p> <p>Alternative would not be able to accommodate any wind energy planned to be</p>	<p>May not reduce environmental impacts because up to 100 miles of reconductoring or rebuilding projects would be required to integrate planned renewable generation in the Boulevard area.</p>	<p>No. Does not meet project objectives and feasibility screening criteria and may not meet environmental screening criteria.</p>

**Table C-1 (Continued)**

Alternative	Project Objectives Criteria	Feasibility Criteria	Environmental Criteria	Conclusion: Included in EIR/EIS for Further Analysis
		interconnected at the ECO Substation. Ignores the issue of reliability and continuity of service during times when resources to power local rooftop photovoltaic (PV) systems are unavailable.		
<b>Alternatives to Tule Wind Project</b>				
<b>TULE-1 Alternative Site Location/Configuration</b>				
Tule Alternative Site Closer to Demand Areas Near Existing Transmission Facilities.	Would not meet project objectives criteria. Would not meet common project objectives criteria to develop and accommodate planned renewable wind generation in San Diego County and Mexico where good wind resource has been identified.	Would not meet feasibility criteria. Alternative locations for utility-scale wind development closer to demand areas are not viable due to lack of resource (Figure A-1, NREL Wind Resource Map). Wind velocity is the single most significant variable affecting feasibility, and the wind velocity at the proposed site is among the highest in the San Diego region when compared with more urban areas to the west, which are considered to have poor wind resource (NREL 2009; CEC 2006).	May not meet environmental criteria. While this alternative would reduce impacts to the rural character of the project area, it would transfer project impacts to alternate site.	No. Does not meet project objectives and feasibility screening criteria and may not meet environmental screening criteria.
Tule Alternative Gen-Tie Route 1 from proposed collector station to Boulevard Substation (route runs	Meets project objectives criteria.	Meets feasibility criteria.	Does not meet environmental criteria. Would transfer project impacts to alternate route, which is 1.3 miles longer when compared with the proposed	No. Does not meet environmental screening criteria.

**Table C-1 (Continued)**

Alternative	Project Objectives Criteria	Feasibility Criteria	Environmental Criteria	Conclusion: Included in EIR/EIS for Further Analysis
west of proposed route and partially uses Ribbonwood Road). Route runs west of proposed route and partially utilizes Ribbonwood Road. Total length 10.9 miles.			route. Has potential to create greater impacts due to increased access requirements. Has potential to create greater impacts to biological resources and drainages.	
Tule Alternative Project Configuration 2. Alternative 138 kV transmission line Route 2 and Collector Substation and Operations and Maintenance (O&M) facility. Moves O&M and substation to Rough Acres Ranch. The 138 kV transmission line would run from the alternate substation site to Boulevard Substation, partially using McCain Valley Road. Total length is 4 miles.	Meets project objectives criteria.	Meets feasibility criteria.	Meets environmental criteria. Has potential to reduce impacts due to siting and reduced 138 kV ROW. Alternative site for O&M and substation facilities in more of a disturbed state as compared with proposed sites and would reduce access requirements. The 138 kV route is 5.6 miles shorter when compared with the proposed route.	Yes. Would meet project objectives, feasibility, and environmental criteria.
Tule Alternative Project Configuration 3. Alternative 138 kV transmission line Route 3 and Collector Substation and O&M Facility. Moves O&M and substation to Rough Acres Ranch. The 138 kV transmission line would run from the alternative substation site to the Boulevard Substation, partially using Ribbonwood Road. Total length is 5.4 miles.	Meets project objectives criteria.	Meets feasibility criteria.	Meets environmental criteria. Has potential to reduce impacts due to siting and reduced 138 kV ROW. Alternative site for O&M and substation facilities in more of a disturbed state as compared with proposed sites and would reduce access requirements. The 138 kV route is 4.2 miles shorter when compared with the proposed route.	Yes. Would meet project objectives, feasibility, and environmental criteria.



**Table C-1 (Continued)**

Alternative	Project Objectives Criteria	Feasibility Criteria	Environmental Criteria	Conclusion: Included in EIR/EIS for Further Analysis
Tule Alternative O&M Facility Location 1—Private property west of McCain Valley Road. Moves O&M Facility to private property west of McCain Valley Road.	Meets project objectives criteria.	Meets feasibility criteria.	Does not meet environmental screening criteria. This alternative would not reduce project impacts and may increase impacts by not consolidating the proposed substation and O&M Facility as proposed.	No. Does not meet environmental screening criteria.
Tule Alternative O&M Facility Location 2—Rough Acres Ranch west of McCain Valley Road. Moves O&M Facility to Rough Acres Ranch west of McCain Valley Road.	Meets project objectives criteria.	Meets feasibility criteria.	Does not meet environmental screening criteria. This alternative would not reduce project impacts and may increase impacts by not consolidating the proposed substation and O&M Facility as proposed.	No. Does not meet environmental screening criteria.
Tule Alternative Collector Substation and O&M Facility Location 3)	Meets project objectives criteria.	Meets feasibility criteria.	Does not meet environmental criteria. Has potential to increase environmental impacts as compared to proposed project.	No. Would not meet environmental criteria.
<b>TULE-2 Design and Undergrounding Alternatives</b>				
Tule Reduction in 62 Turbines.	A reduction in the number of turbines proposed would meet project objectives criteria.	Meets feasibility criteria.	Meets environmental criteria. Has potential to reduce impacts to Areas of Critical Concern (ACEC) and golden eagles by increasing setbacks of project facilities area as compared with proposed Tule Wind Project.	Yes. Would meet project objectives, feasibility, and environmental criteria.
Tule Alternative Turbine Design (vertical axis wind turbine (VAWT)).	Does not meet project objectives criteria. Energy producing capacity is less efficient.	Does not meet feasibility criteria. Not in wide-scale commercial use. VAWT cannot take advantage of higher wind speed available at higher elevated locations.	May meet environmental screening criteria by reducing project impacts to biological resources.	No. Does not meet project objectives or feasibility screening criteria.
Tule Alternative Undergrounding the Proposed 138 kV transmission line.	Meets project objectives criteria.	Meets feasibility criteria.	Does not meet environmental screening criteria. Would only partially avoid some of the significant visual impacts of the proposed project; however,	No. Does not meet environmental screening criteria.

**Table C-1 (Continued)**

Alternative	Project Objectives Criteria	Feasibility Criteria	Environmental Criteria	Conclusion: Included in EIR/EIS for Further Analysis
			the rugged terrain between the proposed substation and Rough Acres Ranch would create other significant impacts due to substantially more construction impacts required.	
Tule Alternative Project Configuration 2—Alternative 138 kV transmission line Route 2 Underground and Collector Substation and O&M Facility. Moves O&M and substation to Rough Acres Ranch. The 138 kV transmission line would run underground from the alternate substation site to Boulevard Substation, partially using McCain Valley Road. Total length is 4 miles.	Meets project objectives criteria.	Meets feasibility criteria.	Meets environmental criteria. Has potential to reduce impacts due to siting and reduced 138 kV ROW. Alternative site for O&M and substation facilities in more of a disturbed state as compared with proposed sites and would reduce access requirements. The 138 kV route is 5.6 miles shorter when compared with proposed route. Undergrounding of 138 kV from alternative substation site to Boulevard Substation would reduce project visual impacts without substantially increasing impacts as terrain is not rugged.	Yes. Would meet project objectives, feasibility, and environmental criteria.
Tule Alternative Project Configuration 3—Alternative 138 kV transmission line Route 3 Underground and Collector Substation and O&M Facility. Moves O&M and substation to Rough Acres Ranch. The 138 kV transmission line would run underground from the alternative substation site to the Boulevard Substation, partially using Ribbonwood Road. Total length is 5.4 miles.	Meets project objectives criteria.	Meets feasibility criteria.	Meets environmental criteria. Has potential to reduce impacts due to siting and reduced 138 kV ROW. Alternative site for O&M and substation facilities in more of a disturbed state as compared with proposed site and would reduce access requirements. The 138 kV route is 4.3 miles shorter when compared with proposed route. Undergrounding of 138 kV from alternative substation site to Boulevard Substation would reduce project visual impacts without substantially increasing impacts because terrain is not rugged.	Yes. Would meet project objectives, feasibility, and environmental criteria.

**East County Substation/Tule Wind/Energia Sierra Juarez Gen-Tie Projects**  
**C. ALTERNATIVES**

**Table C-1 (Continued)**

Alternative	Project Objectives Criteria	Feasibility Criteria	Environmental Criteria	Conclusion: Included in EIR/EIS for Further Analysis
<b>Alternatives to ESJ Gen-Tie Project</b>				
Undergrounding 230 kV Gen-Tie.	Meets project objectives criteria.	Meets feasibility criteria.	Meets environmental criteria. Has potential to reduce long-term visual and land use impacts. Environmental issues include increased short-term construction impacts.	Yes. Would meet project objectives, feasibility, and environmental criteria.
Undergrounding 500 kV Gen-Tie.	Meets project objectives criteria.	Does not meet feasibility criteria. Undergrounding 500 kV transmission lines is not a commercially viable option using current technology.	Meets environmental criteria. Has potential to reduce long-term visual and land use impacts. Environmental issues include increased short-term construction impacts.	No. Does not meet feasibility screening criteria.
Overhead Alternative Alignment (similar to proposed 230 and 500 kV gen-tie options; however, shifted 700 feet east to connect with ECO Substation Alternative Site 9).	Both the 230 and 500 kV gen-ties meet project objectives criteria.	Meets feasibility criteria.	Meets environmental criteria. Recommend comparing environmental effects of both alignments for best option.	Yes. Would meet project objectives, feasibility, and environmental criteria.
Underground Alternative Alignment (undergrounding of the 230 kV gen-tie to connect with the ECO Substation Alternative Site 9).	Meets project objectives criteria.	Meets feasibility criteria.	Meets environmental criteria. Has potential to reduce long-term visual and land use impacts. Environmental issues include increased short-term construction impacts.	Yes. Would meet project objectives, feasibility, and environmental criteria.
ECO System Alternative 6.	Does not meet project objectives criteria.	Does not meet feasibility criteria.	Would meet environmental screening criteria because it would eliminate both the ECO Substation and ESJ Gen-Tie projects.	No. Does not meet project objective or feasibility screening criteria.
<b>Other Energy Alternatives</b>				
Energy Efficiency.	Will not replace the demand for enough energy to substantially reduce the need to develop renewable energy and, therefore,	Not considered feasible at the scale of the proposed ESJ Gen-Tie, ECO Substation, and Tule Wind projects.	Would reduce project impacts and, therefore, would meet environmental screening criteria.	No. Does not meet project objectives or feasibility screening criteria.



**East County Substation/Tule Wind/Energia Sierra Juarez Gen-Tie Projects**  
**C. ALTERNATIVES**

**Table C-1 (Continued)**

Alternative	Project Objectives Criteria	Feasibility Criteria	Environmental Criteria	Conclusion: Included in EIR/EIS for Further Analysis
	would not meet project objectives.			
Distributed Generation <ul style="list-style-type: none"> <li>• Rooftop Solar</li> <li>• Alternative Fuel Supply, Biofuels, Hydrogen Fuel Cells, Bloom Box, etc.</li> </ul>	Does not meet basic project objectives. Will not meet renewable energy goals within the 2010–2020 time horizon. Only partially solves reliability issues to Boulevard and Jacumba communities.	Does not meet feasibility criteria. The sheer number of required residential and commercial rooftop solar systems required render this alternative infeasible from a technical and commercial standpoint within the 2010–2020 time horizon.	The rooftop solar and fuel alternatives would result in a significant reduction in project impacts as compared with the proposed ECO Substation, Tule Wind, and ESJ Gen-Tie projects and, therefore, would meet environmental screening criteria.	No. Although this alternative meets environmental screening criteria, it fails to meet the project objectives and feasibility screening criteria due to the uncertainty surrounding the actual implementation of this alternative within the 2010–2020 time horizon.
Nuclear Energy Alternative.	Would not contribute to meeting renewable energy resource goals within the San Diego region and, therefore, would not meet project objectives criteria.	May not meet feasibility criteria. Constraints to development of this alternative may render this alternative infeasible from a technical and commercial standpoint within the 2010–2020 time horizon.	Depending on the alternative fuel supply, may or may not reduce project impacts.	No. This alternative fails to meet project objectives.
<b>No Project/No Action Alternatives</b>				
No Project Alternative 1—No ECO Substation, Tule Wind, ESJ Gen-Tie, or Campo, Manzanita, and Jordan Wind Energy projects.	Does not meet project objectives criteria.	Meets feasibility criteria.	Would eliminate impacts resulting from ECO Substation, Tule Wind, and ESJ Gen-Tie projects because existing conditions would remain at these sites.	Yes. Required by CEQA and NEPA.
No Project Alternative 2—No ECO Substation Project.	Does not meet project objectives criteria.	Meets feasibility criteria.	May not reduce environmental impacts because additional substation and transmission lines would be required to support planned renewable generation in the project area.	Yes. Required by CEQA and NEPA.

**Table C-1 (Continued)**

Alternative	Project Objectives Criteria	Feasibility Criteria	Environmental Criteria	Conclusion: Included in EIR/EIS for Further Analysis
No Project Alternative 3—No Tule Wind Project.	Does not meet project objectives criteria.	Meets feasibility criteria.	Would eliminate impacts resulting from Tule Wind Project.	Yes. Required by CEQA and NEPA.
No Project Alternative 4—No ESJ Gen-Tie Project.	Does not meet project objectives criteria.	Meets feasibility criteria.	May not reduce environmental impacts because proposed wind energy development in Mexico would require transmission to be built connecting into U.S. market.	Yes. Required by CEQA and NEPA.

### **C.3.1 Alternatives Analyzed in the EIR/EIS**

The alternatives listed as follows are those selected through the alternative screening process for detailed EIR/EIS analysis. Each of these alternatives meets most or all of the basic project objectives as identified by the CPUC, fulfills the purpose and need as identified by the BLM, is feasible, and potentially avoids or reduces environmental effects of the Proposed PROJECT. These alternatives are described in Table C-1 and Section C.3.

**ECO Substation Project Alternatives**—Of the 21 alternatives considered, the following alternative to the ECO Substation Site, as well as 3 transmission design, routing, and undergrounding alternatives, have been selected for detailed analysis in this EIR/EIS:

- ECO Substation Alternative Site
- ECO Partial Underground 138 kV Transmission Route Alternative
- ECO Highway 80 138 kV Transmission Route Alternative
- ECO Highway 80 Underground 138 kV Transmission Route Alternative.

**Tule Wind Project Alternatives**—Of the 12 alternatives considered, the following 5 configuration and design alternatives have been selected for detailed analysis in the EIR/EIS:

- Tule Wind Alternative 1, Gen-Tie Route 2 with Collector Substation/Operations and Maintenance (O&M) Facility on Rough Acres Ranch
- Tule Wind Alternative 2, Gen-Tie Route 2 Underground with Collector Substation/O&M Facility on Rough Acres Ranch
- Tule Wind Alternative 3, Gen-Tie Route 3 with Collector Substation/O&M Facility on Rough Acres Ranch
- Tule Wind Alternative 4, Gen-Tie Route 3 Underground with Collector Substation/O&M Facility on Rough Acres Ranch
- Tule Wind Alternative 5, Reduction in Turbines.

**Alternatives to the ESJ Gen-Tie Project**—Of the five alternatives considered, the following three alternatives have been selected for detailed analysis in the EIR/EIS:

- ESJ 230 kV Gen-Tie Underground Alternative
- ESJ Gen-Tie Overhead Alternative Alignment (approximately 700 feet east of proposed 230 and 500 kV option to connect with the ECO Substation Alternative Site)



- ESJ Gen-Tie Underground Alternative Alignment (undergrounding of the 230 kV line to tie in with the ECO Substation Alternative Site proposed 700 feet east of proposed site).

**No Project/No Action Alternatives**—The following four No Project/No Action alternatives are analyzed in this EIR/EIS as required by CEQA and NEPA:

- No Project Alternative 1—No ECO Substation, Tule Wind, ESJ Gen-Tie, Campo, Manzanita, and Jordan wind energy projects
- No Project Alternative 2—No ECO Substation Project
- No Project Alternative 3—No Tule Wind Project
- No Project Alternative 4—No ESJ Gen-Tie Project.

### **C.3.2 Alternatives Eliminated from EIR/EIS Consideration**

The alternatives that have been eliminated through the alternative screening process described in Section C.2 are listed in the following paragraphs. The rationale for elimination of each alternative is summarized in Table C-1 and explained in Section C.5.

**ECO Substation Project Alternatives.** Of the 21 alternatives considered, the following 17 substation location, transmission design and routing, and system alternatives were eliminated from further consideration in this EIR/EIS:

- ECO Substation Alternative Site 1—South of the Proposed ECO Substation Site
- ECO Substation Alternative Site 2—West of the Proposed ECO Substation Site
- ECO Substation Alternative Site 3—Ketchum Ranch Site
- ECO Substation Alternative Site 4—Jacumba Site
- ECO Substation Alternative Site 5—South of Boulevard Site
- ECO Substation Alternative Site 6—West of Boulevard Site
- ECO Substation Alternative Site 7—East of Campo Site
- ECO Substation Alternative Site 8—Campo Site
- ECO Alternative Boulevard Substation Site
- ECO Jacumba 138 kV Transmission Route Alternative
- ECO Jewel Valley Road 138 kV Transmission Route Alternative
- ECO System Alternative 1—Elimination of 138 kV Transmission Line

- ECO System Alternative 2—Elimination of 138 kV Transmission Line and Rebuild TL6931 (Boulevard to Crestwood Substation) and TL629E (Crestwood Substation to Cameron Tap)
- ECO System Alternative 3—Build a new 23 kV switchyard and extend a 230 kV line from the Imperial Valley Substation
- ECO System Alternative 4—Connect to the Sunrise Powerlink
- ECO System Alternative 5—Eliminate 230 kV yard at the ECO Substation
- ECO System Alternative 6—Use existing Comisión Federal de Electricidad (CFE) 230 kV line located in northern Mexico and Path 45 to transmit ESJ Energy, and upgrade East County 69 kV substations and lines to accommodate local wind development and microgrid reinforcement of local transmission infrastructure to meet load requirements from solar or other local small-scale resources (alternative would eliminate the need for ESJ Gen-Tie and ECO Substation projects).

**Tule Wind Project Alternatives.** Of the 12 alternatives considered, the following 7 configuration and design alternatives were eliminated from further consideration in this EIR/EIS:

- Tule Alternative Site Closer to Demand Areas Near Existing Transmission Facilities
- Tule Alternative Gen-Tie Route 1 from proposed substation to Boulevard Substation (route runs west of proposed route and partially utilizes Ribbonwood Road)
- Tule Alternative O&M Facility Location 1—Private property west of McCain Valley Road
- Tule Alternative O&M Facility Location 2—Rough Acres Ranch west of McCain Valley Road
- Tule Alternative Collector Substation and O&M Facility 3
- Tule Alternate Turbine Design
- Tule Undergrounding the Proposed 138 kV Transmission Line.

**Alternatives to the ESJ Gen-Tie Project.** Of the five alternatives considered, the following two alternatives were eliminated from further consideration in this EIR/EIS:

- ESJ Gen-Tie Alternative Undergrounding the 500 kV Gen-Tie Transmission Line
- ECO System Alternative 6 as previously described.

**Other Energy Alternatives.** The following three other energy alternatives were eliminated from further consideration in this EIR/EIS:

- Energy efficiency
- Distributed generation—Rooftop solar panels and other alternative fuel supplies (e.g., biofuels, hydrogen fuel cells, bloom box)
- Nuclear energy.

## **C.4 Alternatives Evaluated in this EIR/EIS**

As discussed in Section C.2, alternatives were assessed for their technical, legal, and regulatory feasibility; their ability to reasonably achieve the project objectives and fulfill the purpose and need; and their potential for reducing the significant environmental impacts of the Proposed PROJECT. Based on these screening criteria, the following alternatives were selected for detailed analysis within this EIR/EIS.

### **C.4.1 ECO Substation Project Alternatives**

Table C-2 provides a comparison of project components for the proposed ECO Substation Project and alternatives for this project evaluated in this EIR/EIS.

**Table C-2**  
**Comparison of Project Components Proposed ECO Substation Project and Alternatives**

<b>Project Components</b>	<b>Proposed ECO Substation Project</b>	<b>ECO Substation Alternative Site</b>	<b>ECO Partial Underground 138 kV Transmission Route Alternative</b>	<b>ECO Highway 80 138 kV Transmission Route Alternative</b>	<b>ECO Highway 80 Underground 138 kV Transmission Route Alternative</b>
ECO Substation 500/230/138 kV	26.15 acres temporary impacts/85.9 acres permanent impacts	26.5 acres temporary impacts/85.2 acres permanent impacts	Same as proposed	Same as proposed	Same as proposed
SWPL Loop-In	0 acres temporary impacts/1.74 acres permanent impacts (includes the placement of four transmission structures)	2.4 acres temporary impacts/approx. 2.6 acres permanent impacts (includes the placement of six transmission structures)	Same as proposed	Same as proposed	Same as proposed

**Table C-2 (Continued)**

Project Components	Proposed ECO Substation Project	ECO Substation Alternative Site	ECO Partial Underground 138 kV Transmission Route Alternative	ECO Highway 80 138 kV Transmission Route Alternative	ECO Highway 80 Underground 138 kV Transmission Route Alternative
138 kV Transmission Line	13.3-mile-long overhead transmission line (22.54 acres temporary impacts/11.06 acres permanent impacts)	13.4 -mile long overhead transmission line (approx. 22.31 acres temporary impacts/approx. 11.15 acres permanent impacts)	13.3-mile-long overhead/partial underground transmission line (approx. 46.37 acres temporary impacts/ 7.48 acres permanent impacts)	10.6-mile-long overhead transmission line (approx. 17.80 acres temporary acres/approx. 8.73 acres permanent impacts)	10.6-mile-long overhead/partial underground transmission line (44.59 acres temporary acres/approx. 4.239 acres permanent impacts)
Boulevard Rebuild	0 acres temporary impacts/3.2 acres permanent impacts	Same as proposed	Same as proposed	Same as proposed	Same as proposed

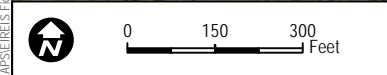
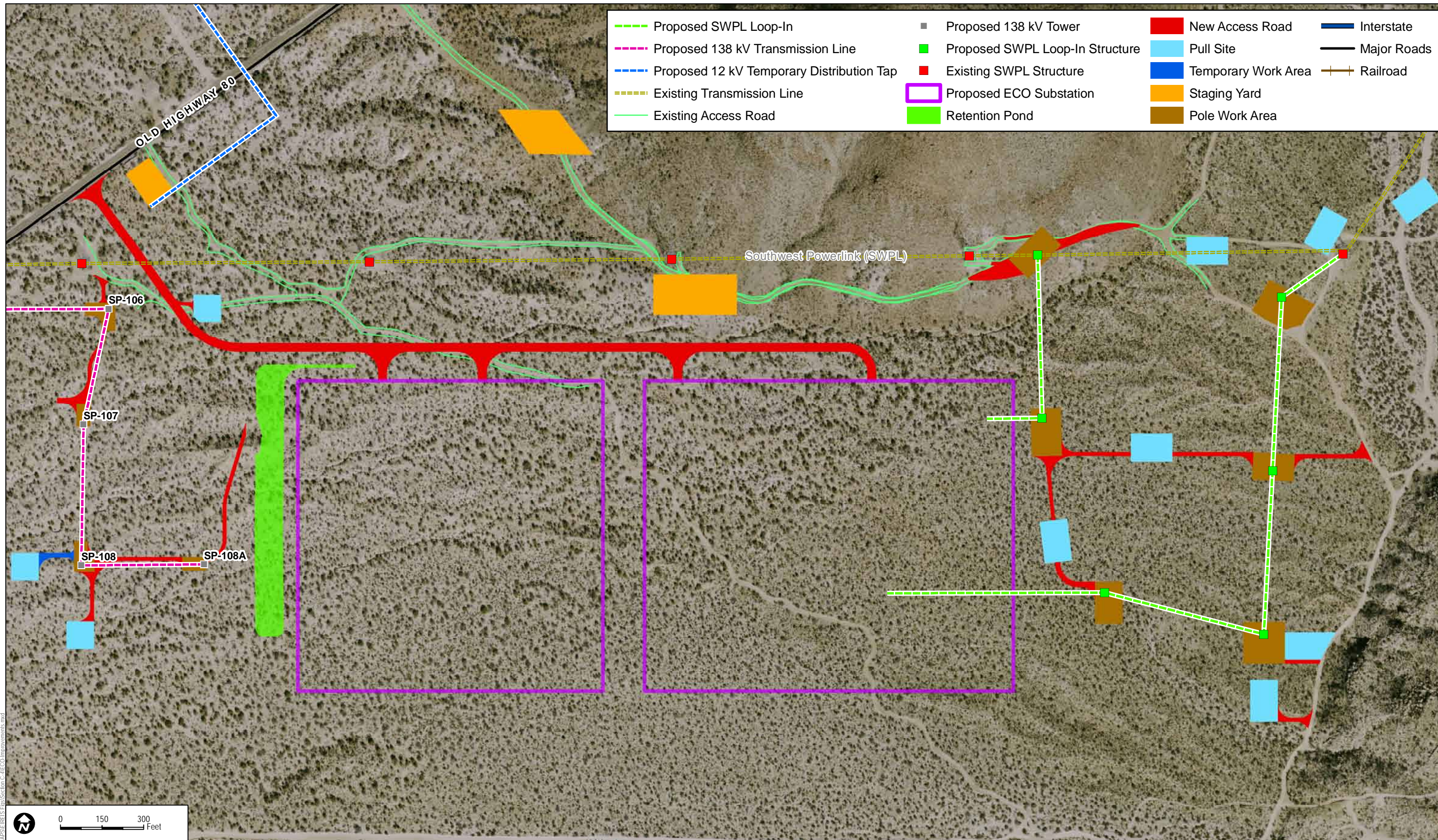
**C.4.1.1 ECO Substation Alternative Site**

**Description**

Under this alternative, the proposed ECO Substation would be located 700 feet east of the proposed ECO Substation site (Figure C-1). This alternative would also change the configuration of the Southwest Powerlink (SWPL) Loop-In (two additional structures required), as well as extend the 138 kV (one additional pole (108a)—total length 13.4 miles) and 12 kV distribution transmission lines. Figure C-4 depicts the ECO Substation Alternative Site improvements as proposed. This alternative includes the following additional changes from the Proposed PROJECT:

- One additional staging area (100 x 150 feet) for the 12 kV tap
- Three additional pull sites (pull sites would be located to the east of the ECO Substation footprint)
- The addition of 0.13 acres (new access roads) and 0.09 acres (permanent maintenance pads)
- The two retention basins in the Proposed PROJECT joined to form one (2.41 acres).





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SOURCE: SDGE 2010

6168-01

East County Substation/Tule Wind/Energia Sierra Juarez Gen-Tie Projects - EIR/EIS

**FIGURE C-4**  
**ECO Substation Alternative Site**



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All other elements of the proposed ECO Substation Project would remain as described in Section B of this EIR/EIS. Undeveloped open space surrounds this alternative substation site to the west and the north. This alternative substation site is generally level, and no residences lie within 0.5 mile of the site. The site is approximately 1 mile from the Jacumba National Cooperative Land and Management Area, an area protected by the California Desert Protection Act. It is approximately 3 miles from Anza-Borrego Desert Park. The site is also approximately 0.3 mile from Whip Peak, 0.5 mile from Nopal Peak, and less than 1 mile from Blue Angels Peak. The site is approximately 0.3 mile from Old Highway 80 and within 1 mile of Interstate 8 (I-8). It is in close proximity to the location of anticipated wind generation, which is north and east of the site. Conditions at this alternative site are similar to the proposed site. A site visit and review of existing documentation indicate that sensitive plant and animal species similar to those that occur on the proposed ECO Substation site also occur on or in the vicinity of the site and that cultural resources, such as sites of prehistoric scatter, may occur on the site. At this alternative site, there is also a blue line drainage that runs east–west that would be impacted during construction of the proposed substation (SDG&E 2009).

### **Rationale for Full Analysis**

The ECO Substation Alternative Site location would meet project objective criteria and is considered feasible. Under this alternative, impacts would potentially be less when compared with the proposed ECO Substation Project due to avoidance of known sensitive environmental resources. Therefore, because the ECO Substation Alternative Site meets the environmental criteria, is feasible, and would meet project objectives criteria and purpose and need as set forth in Section A, it is considered a reasonable alternative and was selected for detailed analysis in this EIR/EIS.

#### ***C.4.1.2 ECO Partial Underground 138 kV Transmission Route Alternative***

##### **Description**

For this alternative, the proposed ECO Substation Project would be the same as described in Section B of this EIR/EIS, with the exception that the approximately 4-mile-long portion of the proposed 138 kV transmission line between the SWPL and Boulevard Substation (from milepost (MP) 9 to Boulevard Substation; Figure C-1) would be installed underground rather than overhead on transmission line poles. Between MP 9 and the Boulevard Substation Rebuild site, undergrounding of the 138 kV transmission line would require the acquisition of less right-of-way (ROW) compared with the overhead 138 kV transmission line associated with the proposed ECO Substation Project as described in Section B, Project Description. In addition, based on existing topography and a preliminary slope analysis of the route, the route does not contain grades that exceed the maximum allowable slope (12%) for undergrounding transmission lines.

Where this alternative crosses surface water drainages, additional ROW and horizontal directional drilling would be implemented to avoid direct impacts to surface water.

### **Rationale for Full Analysis**

This alternative meets project objectives criteria and purpose and need as set forth in Section A, and is considered feasible. While this alternative would increase short-term construction impacts, it has the potential to reduce long-term visual and land use impacts and, therefore, is also expected to meet environmental criteria and has been selected for detailed analysis in this EIR/EIS.

#### ***C.4.1.3 ECO Highway 80 138 kV Transmission Route Alternative***

##### **Description**

For this alternative, the proposed ECO Substation Project would be the same as described in Section B of this EIR/EIS, with the exception that this alternative replaces the proposed 138 kV transmission line route from approximately MP 5.8 to MP 13.3 and instead would install the proposed 138 kV transmission line generally along Old Highway 80 where it would follow and overbuild an existing electrical distribution line (Figure C-1). In addition to SDG&E utilities, non-SDG&E utilities are co-located on 20% of the poles supporting the existing distribution line along the proposed alternative route. The proposed Old Highway 80 segment would connect the 138 kV transmission line from near the intersection of Old Highway 80 and the SWPL ROW to the Boulevard Substation. The proposed Old Highway 80 segment of the 138 kV transmission line would run northwest of SWPL for approximately 4.8 miles generally parallel to Old Highway 80, through the unincorporated communities of Bankhead Springs and Boulevard. Overbuilding along the distribution line would require the removal and replacement of wooden poles with taller, steel poles. The new poles would support the existing distribution lines and non-SDG&E utilities (those co-located on poles supporting the existing distribution line) on the lower arms of the structures, with the 138 kV transmission line on the upper arms. Also, additional ROW (beyond the existing distribution line ROW) would be required along the entire proposed alternative route to provide a suitable ROW for a 138 kV overhead line. Total length of the proposed 138 kV transmission line would be 10.6 miles, compared with the proposed 13.3-mile-long 138 kV transmission line.

##### **Rationale for Full Analysis**

The proposed Old Highway 80 Alternative location for the 138 kV transmission line meets project objectives criteria and purpose and need as set forth in Section A, and is considered feasible. This project alternative is also expected to meet environmental criteria because it has the potential to reduce project impacts by expanding and using an existing ROW for the



transmission line rather than establishing an entirely new ROW for the 138 kV transmission line and would reduce the total length of the 138 kV transmission line to 10.6 miles from the proposed project's 13.3 miles of transmission line. Therefore, it has been selected for detailed analysis in this EIR/EIS.

#### **C.4.1.4 ECO Highway 80 Underground 138 kV Transmission Route Alternative**

##### **Description**

This alternative would essentially be the same as described for the ECO Highway 80 138 kV Transmission Route Alternative with the exception that the portion of the proposed 138 kV transmission line to be installed along Old Highway 80 would be installed underground along the same alignment as the existing ROW along Old Highway 80 (Figure C-1). Undergrounding the 138 kV transmission line would require the acquisition of additional ROW (beyond the existing distribution line ROW) along the entire proposed alternative route. Installation of the new 138 kV transmission line underground along the existing ROW alignment would include the transfer of existing lines to underground conduit. Since non-SDG&E utilities are currently co-located on 20% of the poles supporting the existing distribution line, existing wood poles supporting non-SDG&E utilities would either be relocated or left in place.

In addition, based on existing topography and a preliminary slope analysis of the route, the route contains grades that exceed the maximum allowable slope (12%) for undergrounding transmission lines. At these locations, additional ROW, horizontal directional drilling, or overhead components would be implemented to avoid slope issues.

##### **Rationale for Full Analysis**

This alternative meets project objectives criteria and purpose and need as set forth in Section A, and is considered feasible. This project alternative is also expected to meet environmental criteria because it has the potential to reduce project impacts by expanding and utilizing an existing ROW for the transmission line rather than establishing an entirely new ROW for the 138 kV transmission line. This project alternative would reduce the total length of the 138 kV transmission line to 10.6 miles from the proposed project's 13.3 miles of transmission line. While this alternative would increase short-term construction impacts, it has the potential to reduce long-term visual and land use impacts and, therefore, is expected to meet environmental criteria and has been selected for detailed analysis in this EIR/EIS.

#### **C.4.2 Tule Wind Project Alternatives**

Table C-3 provides a comparison of project components for the proposed Tule Wind Project and alternatives for this project analyzed in this EIR/EIS.

**Table C-3  
Comparison of Project Components Proposed Tule Wind Project and Alternatives**

Project Components	Proposed Tule Wind Project	Tule Wind Alternative 1, Gen-Tie Route 2 with Collector Substation/O&M Facility on Rough Acres Ranch	Tule Wind Alternative 2, Gen-Tie Route 2 Underground with Collector Substation/O&M Facility on Rough Acres Ranch	Tule Wind Alternative 3, Gen-Tie Route 3 with Collector Substation/O&M Facility on Rough Acres Ranch	Tule Wind Alternative 4, Gen-Tie Route 3 Underground with Collector Substation/O&M Facility on Rough Acres Ranch	Tule Wind Alternative 5, Reduction in Turbines
Wind Turbines	0 acres temporary impacts/386.5 acres permanent impacts	Same as proposed	Same as proposed	Same as proposed	Same as proposed	0 acres temporary impacts/approx 207.7 acres permanent impacts
Overhead and Underground 34.5 kV Cable Collection System	108.2 acres temporary impacts/0.02 acre permanent impacts	132.39 acres temporary impacts/0.03 acre permanent impacts	132.39 acres temporary impacts/0.03 acre permanent impacts	132.39 acres temporary impacts/0.03 acre permanent impacts	132.39 acres temporary impacts/0.03 acre permanent impacts	Approx. 98.12 acres temporary impacts/ Approx. 0.01 acre permanent impacts
Collector Substation	0 acres temporary impacts/5 acres permanent impacts	Same as proposed	Same as proposed	Same as proposed	Same as proposed	Same as proposed
O&M Facility	0 acres temporary impacts/5 acres permanent impacts	Same as proposed	Same as proposed	Same as proposed	Same as proposed	Same as proposed
Meteorological Towers	0.048 acre temporary impacts 0.062 acre permanent impacts	Same as proposed	Same as proposed	Same as proposed	Same as proposed	Same as proposed
138 kV Transmission Line	44.6 acres temporary impacts/0.12 acre permanent impacts	18.42 acres temporary impacts/0.05 acre permanent impacts	11.08 acres temporary impacts/0 acres permanent impacts	25.67 acres temporary impacts/0.07 acre permanent impacts	15.63 acres temporary impacts/0 acres permanent impacts	Same as proposed
Access Roads	84.2 acres temporary impacts/166.1 acres permanent impacts	83.43 acres temporary impacts/165.1 acres permanent impacts	83.43 acres temporary impacts/165.1 acres permanent impacts	83.43 acres temporary impacts/165.1 acres permanent impacts	83.43 acres temporary impacts/165.1 acres permanent impacts	Approx. 73.2 acres temporary impacts/ approx. 114.5 acres permanent impacts

**C.4.2.1 Tule Wind Alternative 1, Gen-Tie Route 2 with Collector Substation/O&M Facility on Rough Acres Ranch**

**Description**

Under this alternative, the proposed Tule Wind Project would be the same as described in Section B of this EIR/EIS with the exception that the proposed O&M and collector substation facilities would be co-located on Rough Acres Ranch (T17S R7E Sec9), approximately 5 miles south of the originally proposed site (Figure C-2). Moving the O&M and collector substation facilities to this alternative location would result in an increase in the length of the 34.5 kV overhead collector lines to connect the wind turbines to the substation, from 9.4 miles (proposed) to 17 miles and would increase the amount of collector line poles from 250 to 452 poles. However, the underground collector lines would decrease in distance from 29.3 miles (proposed) to 28.9 miles, and the 138 kV transmission line would decrease in distance as a result of this alternative from 9.7 miles (proposed) to 3.8 miles and would decrease the amount of transmission line poles from 116 poles (proposed) to 44 poles. Under this alternative, the 138 kV transmission line would run from the alternate collector substation approximately 1 mile east, south along McCain Valley Road, and then west along Old Highway 80 until connecting to the proposed Boulevard Substation Rebuild component of the ECO Substation Project. This alternative would increase the total land disturbance by 9.3 acres, from 765.3 acres (proposed) to 774.6 acres.

**Rationale for Full Analysis**

This alternative meets project objectives criteria, is considered feasible, and is consistent with the purpose and need set forth in Section A, and therefore is considered a reasonable alternative in this EIR/EIS. This project alternative is also expected to meet environmental criteria. It has the potential to reduce permanent impacts because the alternate site for the O&M and collector substation facilities on Rough Acres Ranch is in more of a disturbed state than the proposed site, would have reduced access requirements, and has the potential to reduce impacts due to reduced 138 kV transmission line requirements (including an overall reduced ROW requirement). Therefore, it has been selected for detailed analysis in this EIR/EIS.

**C.4.2.2 Tule Wind Alternative 2, Gen-Tie Route 2 Underground with Collector Substation/O&M Facility on Rough Acres Ranch**

**Description**

This alternative would essentially be the same as that described in Section C.4.2.1 for the Alternative Gen-Tie Route 2 with Collector Substation/O&M Facility on Rough Acres Ranch with the exception that the proposed 138 kV transmission line would run underground from the

alternate collector substation approximately 1 mile east, south underground along McCain Valley Road, and then west underground along Old Highway 80 until reaching the Boulevard Substation Rebuild component of the ECO Substation Project.

Based on existing topography and a preliminary slope analysis of the route, Alternative Gen-Tie Route 2 contains grades that exceed the maximum allowable slope (12%) for undergrounding transmission lines. At these locations (two short segments of the alignment), additional ROW, horizontal directional drilling, and other construction considerations could be implemented to avoid slope issues.

### **Rationale for Full Analysis**

This alternative meets project objectives criteria, is considered feasible, and is consistent with the purpose and need set forth in Section A, and therefore is considered a reasonable alternative in this EIR/EIS. This project alternative is also expected to meet environmental criteria; it has the potential to reduce permanent impacts because the alternate site for the O&M and collocated substation facilities on Rough Acres Ranch is in more of a disturbed state than the proposed site, would have reduced access requirements, and has the potential to reduce impacts due to reduced 138 kV transmission line requirements (including an overall reduced ROW requirement). While this alternative would increase short-term construction impacts, it also has the potential to reduce long-term visual and land use impacts and, therefore, has been selected for detailed analysis in this EIR/EIS.

#### ***C.4.2.3 Tule Wind Alternative 3, Gen-Tie Route 3 with Collector Substation/O&M Facility on Rough Acres Ranch***

### **Description**

This alternative would essentially be the same as that described in Section C.4.2.1 for the Alternative Gen-Tie Route 2 with Collector Substation/O&M Facility on Rough Acres Ranch with the exception that the proposed 138 kV transmission line would, as shown in Figure C-2, run from the alternate collector substation approximately 3 miles west to Ribbonwood Road, continue south along Ribbonwood Road, and then east along Old Highway 80 until connecting to the proposed Boulevard Substation Rebuild component of the ECO Substation Project. As a result of this alternative, the 138 kV transmission line would decrease in distance from 9.7 miles (proposed) to 5.4 miles. Additionally, under this alternative, transmission line poles would decrease from 116 poles (proposed) to 60 poles.

This alternative would increase the total land disturbance by 14.7 acres, from 765.3 acres (proposed) to 780.0 acres.



### **Rationale for Full Analysis**

This alternative meets project objectives criteria, is considered feasible, and is consistent with the purpose and need set forth in Section A, and therefore is considered a reasonable alternative in this EIR/EIS. This project alternative is also expected to meet environmental criteria; it has the potential to reduce permanent impacts because the alternate site for the O&M and collector substation facilities on Rough Acres Ranch is in more of a disturbed state than the proposed site, would have reduced access requirements, and has the potential to reduce impacts due to reduced 138 kV transmission line requirements (including an overall reduced ROW requirement). Therefore, it has been selected for detailed analysis in this EIR/EIS.

#### ***C.4.2.4 Tule Wind Alternative 4, Gen-Tie Route 3 Underground with Collector Substation/O&M Facility on Rough Acres Ranch***

### **Description**

This alternative would essentially be the same as that described in Section C.4.2.4 for the Alternative Gen-Tie Route 3 with Collector Substation/O&M Facility on Rough Acres Ranch with the exception that the proposed 138 kV transmission line would run underground from the alternate collector substation approximately 3 miles west to Ribbonwood Road, continue south along Ribbonwood Road, and then east underground along Old Highway 80 until reaching the Boulevard Substation.

Based on existing topography and a preliminary slope analysis of the route, Alternative Gen-Tie Route 3 contains grades that exceed the maximum allowable slope (12%) for undergrounding transmission lines. At these locations (three short segments of the alignment), additional ROW, horizontal directional drilling, and other construction considerations could be implemented to avoid slope issues.

### **Rationale for Full Analysis**

This alternative meets project objectives criteria, is considered feasible, and is consistent with the purpose and need set forth in Section A, and therefore is considered a reasonable alternative in this EIR/EIS. This project alternative is also expected to meet environmental criteria; it has the potential to reduce permanent impacts because the alternate site for the O&M and collocated substation facilities on Rough Acres Ranch is in more of a disturbed state than the proposed site, would have reduced access requirements, and has the potential to reduce impacts due to reduced 138 kV transmission line requirements (including an overall reduced ROW requirement). While this alternative would increase short-term construction impacts, it has the potential to reduce long-term visual and land use impacts and, therefore, has been selected for detailed analysis in this EIR/EIS.

**C.4.2.5 Tule Wind Alternative 5, Reduction in Turbines**

Under this alternative, the proposed Tule Wind Project would be the same as that described in Section B of this EIR/EIS with the exception that this alternative would remove specific turbine locations. The proposed action would erect 11 turbines adjacent to the BLM In-Ko-Pah Mountains Area of Critical Concern (ACEC) (R1 through R10 and R13) and 51 turbines adjacent to wilderness areas on the western side of the project site (Figure C-2). Under this alternative, 62 turbines would be removed including J1 through J15; K1 through K12; L1 through L11; M1 and M2; N1 through N8; P1 through P5; Q1 and Q2; R1 through R10, and R13. Note that there are no turbines labeled J7, J12, K6, or K10.

**Rationale for Full Analysis**

A reduction in turbines as proposed would meet project objectives criteria, is considered feasible, and is consistent with the purpose and need as set forth in Section A; therefore, this alternative is considered a reasonable alternative in this EIR/EIS. This project alternative is also expected to meet environmental screening criteria because it has the potential to reduce impacts to the BLM ACEC and golden eagles as compared with the proposed Tule Wind Project. For these reasons, this alternative has been selected for detailed analysis in this EIR/EIS.

**C.4.3 ESJ Gen-Tie Project Alternatives**

Table C-4 provides a comparison of project components for the proposed ESJ Gen-Tie Project and alternatives evaluated in this EIR/EIS.

**Table C-4**  
**Comparison of Project Components for Proposed ESJ Gen-Tie Project and Alternatives**

Project Components	Proposed ESJ Gen-Tie Project		ESJ 230 kV Gen-Tie Underground Alternative	ESJ Gen-Tie Overhead Alternative Alignment	ESJ Gen-Tie Underground Alternative Alignment
	500 kV option	230 kV option			
Steel Lattice Towers/Monopoles and 30-foot fire clearing	0 acres temporary/ 3.45 acres permanent impacts	0 acres temporary/ 2.2 acres permanent impacts	Approximately 7.27 acres temporary impacts/0 acres permanent impacts	0 acres temporary/2.02 acres permanent impacts for 500 kV option 0 acres temporary/1.32 acres permanent for 230 kV option	Same as ESJ Gen-Tie 230 kV Underground Alternative
Gen-Tie Tower Access Road	0 acres temporary/ 0.8 acre permanent impacts	0 acres temporary/ 0.9 acre permanent impacts	N/A	0 acres temporary impacts/ 0.65 acre permanent impacts for 500 kV option/0.68 acre permanent acres for 230 kV option	Same as ESJ Gen-Tie 230 kV Underground Alternative

**Table C-4 (Continued)**

Project Components	Proposed ESJ Gen-Tie Project		ESJ 230 kV Gen-Tie Underground Alternative	ESJ Gen-Tie Overhead Alternative Alignment	ESJ Gen-Tie Underground Alternative Alignment
	500 kV option	230 kV option			
28-foot Property Legal Access Road and Turnaround	0 acres temporary/ 4.5 acres permanent impacts	0 acres temporary/ 4.5 acres permanent impacts	0 acres temporary/4.5 acres permanent impacts	Same as proposed	Same as ESJ Gen-Tie 230 kV Underground Alternative
Construction Laydown/Parking/Stringing Area	0 acres temporary/ 1.9 acres permanent impacts	0 acres temporary/ 2.0 acres permanent impacts	0 acres temporary/2.0 acres permanent impacts (stringing area not needed)	Same as proposed	Same as ESJ Gen-Tie 230 kV Underground Alternative

**C.4.3.1 ESJ 230 kV Gen-Tie Underground Alternative**

**Description**

Under this alternative, the 230 kV gen-tie line would be placed underground rather than aboveground. It would follow the same proposed path as described in the proposed project. Based on existing topography and a preliminary slope analysis of the gen-tie route, the route does not contain grades that exceed the maximum allowable slope (12%) for undergrounding transmission lines.

**Rationale for Full Analysis**

Construction of the 230 kV gen-tie transmission line underground would meet project objectives criteria and is considered feasible. Compared with the overhead gen-tie, undergrounding the gen-tie line would result in a reduced permanent ROW requirement. While this alternative would increase short-term construction impacts, it has the potential to reduce long-term visual and land use impacts and, therefore, has the potential to meet environmental criteria.

**C.4.3.2 ESJ Gen-Tie Overhead Alternative Alignments (230 kV or 500 kV options shifted 700 feet east)**

**Description**

This alternative would provide a connection of either the 230 or 500 kV gen-tie options with the ECO Substation Alternative Site that is proposed 700 feet east of the existing location (Figure C-3). Similar to the Proposed ESJ Gen-Tie Project described in Section B of this EIR/EIS, this alternative would consist of either a single circuit 500 kV double-circuit or a 230 kV line option. Under this alternative, these gen-tie options would be supported on either three to five

150-foot steel lattice towers or three to five 170-foot steel monopoles. The 500 kV line would interconnect with the 500 kV yard, and the 230 kV line would interconnect with the 230/138 kV yard of the ECO Substation alternative site location. The northernmost support structures would be located within the fenced portion of the proposed ECO Substation. Approximately 1 mile of the gen-tie lines would be constructed in the United States by ESJ U.S. Transmission, LLC, on private land

### **Rationale for Full Analysis**

Construction of the 230 or 500 kV gen-tie transmission line meets project objective criteria and is feasible. Environmental impacts of the 230 kV line as compared with the 500 kV line are not known, but they are expected to be similar in scope because the proposed gen-tie line routes are adjacent and separated by a maximum of about 250 feet at their potential terminus points where they would connect to their respective substation. Therefore, the 230 or 500 kV gen-tie alignments have been selected for detailed analysis in the EIR/EIS.

#### ***C.4.3.3 ESJ Gen-Tie Underground Alternative Alignment (230 kV Only to Connect with ECO Substation Alternative Site)***

### **Description**

Under this alternative, the 230 kV gen-tie line would be placed underground rather than aboveground to connect with the ECO Substation alternative site. Based on existing topography and a preliminary slope analysis of the gen-tie route, the route does not contain grades that exceed the maximum allowable slope (12%) for undergrounding transmission lines.

### **Rational for Full Analysis**

Construction of the 230 kV gen-tie transmission line underground would meet project objectives criteria and is considered feasible. Compared with the overhead gen-tie, undergrounding the gen-tie line would result in a reduced permanent ROW requirement. While this alternative would increase short-term construction impacts, it has the potential to reduce long-term visual and land use impacts and, therefore, has the potential to meet environmental criteria.



## **C.5 Alternatives Eliminated from Full EIR/EIS Evaluation**

### **C.5.1 ECO Substation Project Alternatives**

#### **C.5.1.1 ECO Substation Alternative Site 1—South of the Proposed ECO Substation Site**

##### **Description**

Under this alternative, the proposed ECO Substation would be located in the southeastern corner of San Diego County, directly adjacent to the U.S.–Mexico international border to the south and the Imperial County border to the east (Figure C-1). This alternative would also include extending the SWPL Loop-In and 138 and 12 kV distribution transmission lines to reach the alternatively located substation. All other elements of the proposed ECO Substation Project would remain as described in Section B of this EIR/EIS. Undeveloped open space surrounds this alternative substation site to the west and the north. This alternative substation site is generally level, and no residences lie within 0.5 mile of the site. The site is approximately 1 mile from the Jacumba National Cooperative Land and Management Area, an area protected by the California Desert Protection Act. It is approximately 3 miles from Anza-Borrego Desert Park. The site is also approximately 0.3 mile from Whip Peak, 0.5 mile from Nopal Peak, and less than 1 mile from Blue Angels Peak. The site is approximately 0.3 mile from Old Highway 80 and within 1 mile of I-8. It is in close proximity to the location of anticipated wind generation, which is north and east of the site. Conditions at this alternative site are similar to the proposed site. A site visit and review of existing documentation indicate that the potential for environmental resources to occur on this site are similar to those that occur on the proposed ECO Substation site. At this alternative site there is also a blue line drainage that runs east–west that would be impacted during construction of the proposed substation (SDG&E 2009). Due to the site’s close proximity to the U.S.–Mexico international border, a heightened security risk is associated with this site.

##### **Rationale for Elimination**

ECO Substation Alternative Site 1 would meet project objective criteria and is considered feasible. Under this alternative, impacts from ESJ Gen-Tie Project would be less due to reduced distance; however, this reduction in impacts would be offset by increased distance from the SWPL. Under this alternative, impacts in general would be similar when compared with the Proposed PROJECT, with the exception that it would increase impacts to hydrologic resources. Therefore, the ECO Alternative Substation Site 1 was determined not to meet the alternatives screening criteria described in Section C.2 and was eliminated from further consideration as a reasonable alternative in this EIR/EIS.

### **C.5.1.2 ECO Substation Alternative Site 2—West of the Proposed ECO Substation Site**

#### **Description**

Under this alternative, the proposed ECO Substation would be located in the southeastern corner of San Diego County, directly west of the location proposed in the project description (Figure C-1). This alternative would also include extending the ESJ Gen-Tie Project to reach the alternate substation location and a reduction in the length of the 138 kV transmission line. All other elements of the ECO Substation Project would remain as described in Section B of this EIR/EIS. This alternative substation site has steep slopes and would require significant grading. A minor geologic fault also traverses the property.

#### **Rationale for Elimination**

ECO Alternative Substation Site 2 would meet project objectives criteria. This alternative does not meet feasibility criteria due to the site's steep slopes and because a minor geological fault traverses the property, making it undesirable to construct the substation on the site. Furthermore, this alternative does not meet the environmental criteria due to substantial grading and fill requirements on the site. Therefore, it was determined that the ECO Substation Alternative Site 2 would not meet the alternatives screening criteria described in Section C.2, and it was eliminated from further consideration as a reasonable alternative in this EIR/EIS.

### **C.5.1.3 ECO Substation Alternative Location 3—Ketchum Ranch Site**

#### **Description**

ECO Substation Alternative Site 3 would locate the ECO Substation on the Ketchum Ranch site, which is approximately 3 miles west of the proposed site (Figure C-1). This alternative would result in a reduction in the 138 kV transmission line by approximately 2 miles and an extension of the ESJ Gen-Tie Project of approximately 2 miles. All other elements of the ECO Substation Project would remain as described in Section B of this EIR/EIS. A portion of the site is designated as prime agricultural land. In addition, a residential housing project has been proposed for the site.

#### **Rationale for Elimination**

ECO Substation Alternative Site 3 would meet project objectives criteria and is considered feasible. This alternative site for the ECO Substation is in active agricultural production and in close proximity to the town of Jacumba, I-8, and Old Highway 80. Building the ECO Substation on Ketchum Ranch would result in potential land use impacts due to the site being designated as prime agricultural lands, and it would conflict with the residential community proposed for the

site. A reduction in impacts from decreasing the distance of the 138kV line would be offset by increasing the length of the ESJ Gen-Tie Project. Consequently, due to potential land use conflicts, the ECO Substation Alternative Site 3 was determined not to meet the alternatives screening criteria described in Section C.2 and was eliminated from further consideration as a reasonable alternative in this EIR/EIS.

#### ***C.5.1.4 ECO Substation Alternative Location 4—Jacumba Site***

##### **Description**

ECO Substation Alternative Site 4 would be built north of the unincorporated community of Jacumba, which is north of the existing SWPL transmission ROW and approximately 3.5 miles east of the proposed ECO Substation site (Figure C-1). Under this alternative, the length of the 138 kV transmission line would decrease from approximately 8 to 5.5 miles, and the length of the ESJ Gen-Tie Project would need to be increased from less than 1 mile to approximately 3 miles. All other elements of the ECO Substation Project would remain as described in Section B of this EIR/EIS. The ECO Substation Alternative Site 4 is within critical habitat for the quino checkerspot butterfly (QCB) and near a U.S. Fish and Wildlife Service (USFWS) reference population of the species.

##### **Rationale for Elimination**

ECO Substation Alternative Site 4 would meet project objectives criteria and is considered feasible. However, the entire site is located within critical habitat for the QCB and near a USFWS reference population of the species. Construction of the substation at this location would cause a substantial impact to this federally listed species and its critical habitat. In addition, the Jacumba site is situated significantly farther away from the wind generation planned in Mexico, which would require construction of approximately 3 additional miles of 500 or 230 kV transmission lines to connect the generation to the proposed substation. Therefore, ECO Substation Alternative Site 4 was determined not to meet the alternatives screening criteria described in Section C.2 and was eliminated from further consideration as a reasonable alternative in this EIR/EIS.

#### ***C.5.1.5 ECO Substation Alternative Location 5—South of Boulevard Site***

##### **Description**

ECO Substation Alternative Site 5 is located south of the unincorporated community of Boulevard, approximately 500 feet north of the U.S.–Mexico international border, approximately 100 feet south of a railway, and predominantly surrounded by undeveloped land to the west and east (Figure C-1). Under this alternative, the length of the 138 kV transmission line would decrease from approximately 8 to 2.5 miles, and the length of the ESJ Gen-Tie Project would

need to be expanded from less than 1 mile to approximately 5 miles. All other elements of the ECO Substation Project would remain as described in Section B of this EIR/EIS. ECO Substation Alternative Site 5 has relatively varied topography and includes Lake Domingo, a portion of Jewel Valley, and a large portion of Boundary Peak—a distinctive cinder-cone landform. Portions of the site have riparian tree cover associated with Jewel Valley and Lake Domingo. The site is within 0.5 mile of approximately four residences. It is adjacent to land managed by the BLM to the north and southeast and is approximately 1 mile from Rattlesnake Mountain. The site is approximately 3 miles from I-8 and Highway 94 and approximately 2.25 miles from Old Highway 80. A site visit and review of existing documentation indicate that the potential for sensitive environmental resources to occur on this alternative site are similar to those that occur on the proposed site. The site also contains five wetlands, as depicted on National Wetland Inventory (NWI) wetland maps (SDG&E 2009).

### **Rationale for Elimination**

ECO Substation Alternative Site 5 would meet project objectives criteria and is considered feasible. However, this alternative is a greater distance from existing access and would, therefore, increase impacts due to greater access length requirements. A reduction in the 138 kV transmission line would be offset by an increased length of the ESJ Gen-Tie Project. Additionally, this alternative site for the ECO Substation contains five wetlands. Therefore, due to increased impacts to wetlands, the ECO Substation Alternative Site 5 was determined not to meet the alternative screening criteria described in Section C.2 and was eliminated from further consideration as a reasonable alternative in this EIR/EIS.

#### **C.5.1.6 ECO Substation Alternative Site 6—West of Boulevard Site**

##### **Description**

ECO Substation Alternative Site 6 is located approximately 7 miles west of the proposed ECO Substation site (Figure C-1). Under this alternative, the length of the 138 kV transmission line would decrease from approximately 8 to 4.5 miles, and the length of the ESJ Gen-Tie Project would need to be increased from less than 1 mile to approximately 7.5 miles. All other elements of the ECO Substation and ESJ Gen-Tie projects would remain as described in Section B of this EIR/EIS. ECO Substation Alternative Site 6 is bordered by Tierra Del Sol Road to the north, the U.S.–Mexico international border to the south, and predominantly undeveloped land to the west and east. This alternative site is generally level and located in the most populated area, as compared with the other alternatives. The site is within 1,000 feet of approximately 28 residences on both sides of the U.S.–Mexico border and within 0.5 mile of approximately 50 residences. On the U.S. side, the residences are generally distributed along the Tierra del Sol Valley. The site is also located approximately 1 mile from Rattlesnake Mountain, which lies on

land managed by the BLM. Additionally, a portion of the site is currently designated as an agricultural preserve by the County of San Diego. Conditions at this alternative site are similar to the proposed site. A site visit and review of existing documentation indicate that the potential for sensitive environmental resources to occur on or in the vicinity of the site have a moderate to high potential to occur on the site (SDG&E 2009). Due to the site's close proximity to the U.S.–Mexico international border, a heightened security risk is associated with this site. In addition, this site is a significant distance (approximately 11 miles) from proposed wind-generating facilities and more than 8 miles from any major roadways (SDG&E 2009).

### **Rationale for Elimination**

ECO Substation Alternative Site 6 would meet project objectives criteria and is considered feasible. While this alternative would reduce the 138 kV transmission line component, the decrease would be offset by an increased length of ESJ Gen-Tie Project. This alternative would transfer project impacts to a location that is closer to residences and in an area designated as agricultural preserve by San Diego County. Therefore, due to increased impacts to residences and areas designated as agricultural preserve, this alternative was determined not to meet the alternatives screening criteria described in Section C.2 and was eliminated from further consideration as a reasonable alternative in this EIR/EIS.

#### ***C.5.1.7 ECO Substation Alternative Site 7—East of Campo Site***

### **Description**

ECO Substation Alternative Site 7 is located between the unincorporated communities of Campo and Boulevard and is bordered by Tierra del Sol Road to the north, the U.S.–Mexico international border to the south, and predominantly undeveloped land to the west and east (Figure C-1). Under this alternative, the length of the 138 kV transmission line would decrease from approximately 8 to 5.5 miles, and the length of the ESJ Gen-Tie Project would need to be increased from less than 1 mile to approximately 8.5 miles. All other elements of the ECO Substation Project would remain as described in Section B of this EIR/EIS. This alternative site is relatively level and is not near any notable topographic features. It is located within a low-density rural residential area and within 1,000 feet of approximately 12 residences. Additionally, approximately 20 residences are located within 0.5 mile of this site, some of which are located across the border in Mexico. The site is not located in close proximity to any scenic routes, public open spaces, or recreational trails. Conditions at this alternative site are similar to the proposed site. A site visit and review of existing documentation indicate that the potential for sensitive environmental resources to occur on or in the vicinity of the site is similar to those that occur on the proposed site. Due to the site's close proximity to the U.S.–Mexico international



border, a heightened security risk is associated with this site. In addition, this site is more than 8 miles from any major roadways.

### **Rationale for Elimination**

ECO Substation Alternative Site 7 would meet project objective criteria and is considered feasible. Under this alternative, the proposed project would transfer project impacts to an alternate site that is closer to residences. A reduction in the 138 kV transmission line would be offset by an increased length of the ESJ Gen-Tie Project. Therefore, due to increased impacts to residences, ECO Substation Alternative Site 7 was determined not to meet the alternative screening criteria described in Section C.2 and was eliminated from further consideration as a reasonable alternative in this EIR/EIS.

#### ***C.5.1.8 ECO Substation Alternative Site 8—Campo Site***

### **Description**

ECO Substation Alternative Site 8 is south-southeast of the unincorporated community of Campo (Figure C-1). Under this alternative, the length of the 138 kV transmission line would decrease from approximately 8 to 5 miles, and the length of the ESJ Gen-Tie Project would need to be expanded from less than 1 mile to approximately 8 miles. All other elements of the ECO Substation Project would remain as described in Section B of this EIR/EIS. This alternative site is bordered by Tierra Estrella Road to the north, the U.S.–Mexico international border to the south, and predominantly undeveloped land to the west and east. This alternative site is generally level and is not near any notable topographic features. There is one residence located within this alternative site and approximately six rural residences within 1,000 feet of the site; two additional residents are located within 0.5 mile. The site is approximately 6 miles from the southern terminus of the Pacific Crest National Scenic Trail and is adjacent to the Campo Indian Reservation (Kumeyaay Nation) and located on tribal land. Conditions at this alternative site are similar to the proposed site. A site visit and review of existing documentation indicate that the potential for sensitive environmental resources to occur on or in the vicinity of the site is similar to those that occur on the Proposed PROJECT site. Additionally, no major rivers, streams, lakes, or ponds are within or adjacent to the site. Due to the site's close proximity to the U.S.–Mexico international border, a heightened security risk is associated with this site. In addition, this site is more than 10 miles from any major roadway (SDG&E 2009).

### **Rationale for Elimination**

ECO Substation Alternative Site 8 meets project objectives criteria and is considered feasible. This alternative would transfer project impacts associated with the proposed ECO Substation closer to residences. This project alternative would also increase impacts associated with access

to the ECO Substation site. Therefore, due to increased impacts to residences, ECO Substation Alternative Site 8 was determined not to meet the alternatives screening criteria described in Section C.2 and was eliminated from further consideration as a reasonable alternative in this EIR/EIS.

#### **C.5.1.9 ECO Alternative Boulevard Substation Site**

##### **Description**

The Boulevard Substation Alternative would relocate some of the 138 kV facilities planned for the Boulevard Substation Rebuild component of the ECO Substation Project to an alternative site on BLM property north of I-8 within the Tule Wind Project site to facilitate interconnection of the Tule Wind Project (Figure C-2). The existing Boulevard Substation would be rebuilt to meet local reliability criteria. All other elements of the ECO Substation Project would remain as described in Section B of this EIR/EIS.

##### **Rationale for Elimination**

This alternative would transfer project impacts to the alternate site on public/BLM lands north of I-8 as opposed to the proposed project, which would expand an existing use on private lands. Reduction in impacts from reducing the length of the Tule 138 kV transmission line would be offset by increasing the length of the ECO Substation Project 138 kV transmission line component. This alternative may also require rearrangement of existing distribution system and/or upgrade of the existing Boulevard Substation to meet the local reliability criteria, which could result in additional impacts compared with the proposed rebuild of the existing Boulevard Substation. In addition, this alternative may conflict with management and conservation of natural resources as managed by BLM. Therefore, due to the potential need to rearrange portions of the existing distribution system and potential conflicts with the management and conservation of natural resources, the ECO Boulevard Substation Alternative was determined not to meet the alternatives screening criteria described in Section C.2 and was eliminated from further consideration as a reasonable alternative in this EIR/EIS.

#### **C.5.1.10 ECO Jacumba 138 kV Route Segment Alternative**

##### **Description**

This alternative replaces the proposed 138 kV transmission line route from approximately MP 0.1 to MP 5.8 and instead would follow and overbuild an existing electrical distribution line west, approximately 6 miles from the proposed ECO Substation, through the unincorporated community of Jacumba, along Old Highway 80 to the intersection of Old Highway 80 and the SWPL (Figure C-1). The line would be located within 100 feet of an elementary school and 500 feet from the Jacumba Airport, commonly used by U.S. Border Patrol aircraft.

Overbuilding along the distribution line would require the removal and replacement of wooden poles with taller, steel poles. The new poles would support the existing distribution lines on the lower arms of the structures, with the 138 kV transmission line on the upper arms. The total length of this segment would be approximately 6.2 miles. All other elements of the ECO Substation Project would remain as described in Section B of this EIR/EIS. This route is considered to have high potential for sensitive resources, including approximately 1.4 miles of critical habitat for the QCB.

### **Rationale for Elimination**

This alternative would meet project objectives criteria and is considered feasible. However, this alternative would result in increased environmental impacts to sensitive environmental resources including critical habitat for QCB. Therefore, due to increased impacts to sensitive resources including critical habitat for the QCB, this alternative was determined not to meet the alternative screening criteria described in Section C.2 and was eliminated from further consideration as a reasonable alternative in this EIR/EIS.

#### ***C.5.1.11 ECO Jewel Valley Road 138 kV Route Alternative***

### **Description**

This alternative replaces the proposed 138 kV transmission line route from approximately MP 5.8 to MP 13.3 and instead would follow Jewel Valley Road from the intersection of the SWPL and Old Highway 80 to the Boulevard Substation (Figure C-1). The Jewel Valley Road segment would run west along the SWPL approximately 1.9 miles before heading northwest along an existing railroad line for approximately 1.4 miles. After paralleling the railroad line, the route would continue northwest near Jewel Valley Road for approximately 3.1 miles before intersecting with an existing SDG&E 69 kV transmission line approximately 1 mile west of the Boulevard Substation. The line would then parallel the existing line east to the Boulevard Substation. This transmission line segment would require the construction of new transmission poles for approximately 7.6 miles to accommodate the new line. All other elements of the ECO Substation Project would remain as described in Section B of this EIR/EIS. The potential for sensitive resources along this segment is considered to be high. This alternative transverses approximately 1.4 miles of QCB sensitive habitat.

### **Rationale for Elimination**

This alternative would meet project objectives criteria and is considered feasible. However, this alternative would result in increased impacts due to a longer route that would require additional access. Therefore, due to increased length of new transmission required (7.6 miles) within an area of high sensitivity, including QCB habitat, this alternative was determined not to meet the

alternatives screening criteria as described in Section C.2 and was eliminated from further consideration as a reasonable alternative in this EIR/EIS.

#### ***C.5.1.12 ECO System Alternative 1—Elimination of 138 kV Transmission Line***

##### **Description**

Under ECO System Alternative 1, the proposed substation project would be built without the 138 kV transmission line. Without the 138 kV transmission line, the proposed project would not provide for an alternative transmission system in the Boulevard, Jacumba, and surrounding communities. All other elements of the ECO Substation Project would remain as described in Section B of this EIR/EIS.

##### **Rationale for Elimination**

ECO System Alternative 1 is considered feasible and would reduce short-term construction-related impacts and long-term environmental operational impacts associated with installation of the 138 kV transmission line component of the ECO Substation Project. This alternative would therefore meet environmental criteria. However, this alternative would not improve the reliability of power delivery to the communities of Boulevard, Jacumba, and surrounding communities and would not accommodate the interconnections of renewable energy into the Boulevard Substation, such as the proposed Tule Wind Project; therefore, it would not meet project objectives criteria. Consequently, because this alternative would not meet most project objectives and is not consistent with the purpose and need set forth in Section A, this alternative was eliminated from further consideration as a reasonable alternative in this EIR/EIS.

#### ***C.5.1.13 ECO System Alternative 2—Elimination of 138 kV Transmission Line and Rebuild TL6931 (Boulevard to Crestwood Substation) and TL629E (Crestwood Substation to Cameron Tap)***

##### **Description**

Under ECO System Alternative 2, the project would not include the 138 kV transmission line and instead would include the rebuilding of two other existing transmission line segments: (1) the TL6931 Boulevard to Crestwood Substation transmission line and (2) the TL629E Crestwood Substation to Cameron Tap. All other elements of the ECO Substation Project would remain as described in Section B of this EIR/EIS.

##### **Rationale for Elimination**

ECO System Alternative 2 is considered feasible. However, this alternative does not meet project objectives criteria and may not meet environmental criteria. Under this alternative, the Tule

Wind Project and other potential interconnections of renewable energy into the Boulevard Substation would be limited without large-scale upgrades to the East County 69 kV system. While this alternative would increase reliability and flexibility of electric service in the service area, it would still be vulnerable to common structure outages and, therefore, would not meet project objectives criteria. While this alternative would eliminate the 138 kV transmission line component from the ECO Substation to the Boulevard Substation and associated impacts, elimination of these impacts would be partially offset by the need to rebuild/reconductor 13 miles of existing transmission from the Boulevard to Crestwood Substation and from the Crestwood to Cameron Tap.

Therefore, since ECO System Alternative 2 does not meet most project objectives criteria and would require the need to rebuild/reconductor 13 miles of existing transmission, it was determined not to meet the alternatives screening criteria described in Section C.2 and was eliminated from further consideration as a reasonable alternative in this EIR/EIS.

***C.5.1.14 ECO System Alternative 3—Build a New 230 kV Switchyard and Extend a 230 kV Line from the Imperial Valley Substation***

**Description**

This alternative completely replaces the ECO Substation Project. In its place, a 230 kV switchyard would be built, and a 230 kV transmission line would be extended from the Imperial Valley Substation west approximately 30 miles to the new switchyard that would be developed on the proposed ECO Substation site.

**Rationale for Elimination**

While ECO System Alternative 3 is considered feasible, it does not meet project objectives criteria because it would severely limit the amount of generation that could interconnect, and the reliability and flexibility of electric service in the area would remain unchanged. This alternative also does not meet environmental criteria. Reduction in impacts from changing the proposed ECO Substation to a switching yard and elimination of the proposed 138 kV transmission line from the ECO Substation to the Boulevard Substation would be offset by increased impacts from developing a 30-mile 230 kV transmission line from the ECO switching station to the Imperial Valley Substation, as well as the need for developing a 230 kV interconnect transmission line from the Tule Wind Project to the switching station, as compared with the 138 kV transmission line as proposed. Therefore, since ECO System Alternative 3 would not meet most project objectives, is not consistent with the purpose and need set forth in Section A, and would require the construction of a 30-mile 230 kV transmission line, it was determined not to meet the alternatives screening criteria described in Section C.2 and was eliminated from further consideration as a reasonable alternative in this EIR/EIS.



### ***C.5.1.15 ECO System Alternative 4—Connect to the Sunrise Powerlink***

#### **Description**

Under ECO System Alternative 4, the ECO Substation Project would connect to the Sunrise Powerlink instead of SWPL. All other elements of the ECO Substation Project would remain as described in Section B of this EIR/EIS.

#### **Rationale for Elimination**

ECO System Alternative 4 would meet the project objectives criteria and is considered feasible. However, this alternative would not reduce project impacts and may increase impacts if the Sunrise Powerlink were looped into the ECO Substation in place of SWPL, which would cause additional impacts because it would require upgrading the outlet capacity at the Sycamore Substation as compared with no upgrades required at the proposed Miguel Substation outlet. Therefore, because ECO System Alternative 4 would require additional system upgrades and resulting impacts when compared to the proposed project, it was determined not to meet alternatives screening criteria described in Section C.2 and was eliminated from further consideration as a reasonable alternative in this EIR/EIS.

### ***C.5.1.16 ECO System Alternative 5—Eliminate 230 kV Yard at the ECO Substation***

#### **Description**

Under ECO System Alternative 5, the 230 kV yard at the ECO Substation would not be built. All other elements of the ECO Substation Project, including the 138 kV yard and 500 kV yard, as shown in Figure B-3, would remain as described in Section B of this EIR/EIS.

#### **Rationale for Elimination**

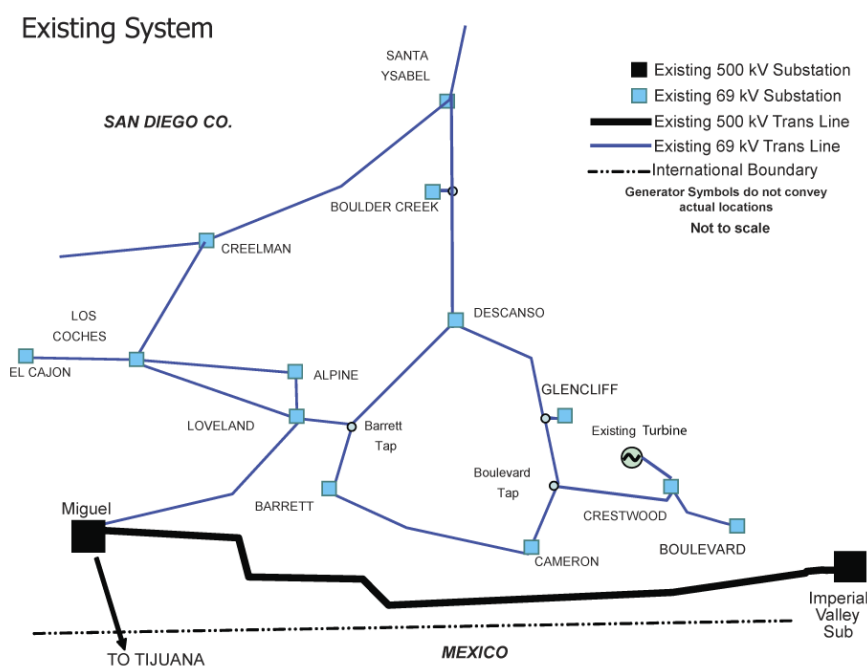
ECO System Alternative 5 may not meet project objectives criteria and would not meet feasibility or environmental criteria. This alternative may not meet project objectives criteria because it would not provide flexibility and may limit the number of interconnect points when compared with the proposed project. ECO System Alternative 5 does not meet feasibility criteria because it creates system concerns for mid- to large-scale wind energy projects, and it creates equipment concerns in the event of an emergency due to lack of a readily available 500/138 kV transformers (500/230 kV transformers are standard equipment for SDG&E as well as other neighboring utilities). This alternative also does not meet environmental criteria because a reduction in impacts from reducing the proposed ECO Substation by eliminating the 230 kV substation yard could be offset by increased impacts from 500 kV gen-tie lines that would be required for large-scale renewable projects as opposed to providing an option to use 230 and 500

kV lines under the proposed project, which would require additional ROW as compared with 230 kV lines. Therefore, since ECO System Alternative 5 would not meet most project objectives, would create systems concerns, and would take away the option to use 230 kV gen-tie lines instead of 500 kV gen-tie lines, it was determined not to meet alternatives screening criteria described in Section C.2 and was eliminated from further consideration as a reasonable alternative in this EIR/EIS.

**C.5.1.17 ECO System Alternative 6—Use Existing CFE 230 kV Line Located in Northern Mexico and Path 45 to Transmit ESJ Energy, Upgrade East County 69 kV Distribution System and Microgrid Enforcement**

**Description**

Under ECO System Alternative 6, the ECO Substation and the ESJ Gen-Tie projects would be eliminated. Instead, two existing CFE 230 kV transmission lines located in northern Mexico and Path 45 would be used to connect the ESJ Project to the San Diego County power grid. These two lines are interconnected to the Western Energy Coordinating Council Path 45 and join the SDG&E system at two points: Imperial Valley and Tijuana (see inset map depicting existing and potential transmission lines in the border region). Additionally, East County 69 kV substations and transmission lines would be upgraded to accommodate local wind power development (see inset graphic that depicts the existing SDG&E 69 kV grid. Finally, to improve the reliability of power delivery to the communities of Boulevard and Jacumba and surrounding areas, this alternative would include development of rooftop solar and other local, small-scale energy sources as well as reinforcement and upgrading of the local energy delivery system.



### **Rationale for Elimination**

ECO System Alternative 6 would not meet project objectives criteria or feasibility criteria. This alternative would not be able to interconnect all of the ESJ Gen-Tie Project or all the region's planned renewable generation and, therefore, would only marginally meet project objectives. This alternative would not meet reliability objectives when local renewable resources are unavailable. Import capacity of CFE into the United States is limited to 800 megawatts (MW) (California Independent System Operator (CAISO)) and, therefore, would not be able to accommodate planned generation of 1,200 MW from the ESJ Gen-Tie Wind Project without significant upgrading. The alternative would also require upgrades to the CFE portion of the system; it would be at the sole discretion of the CFE and would require international contract agreements. The environmental impacts of such upgrades, the cost of the upgrades, and the operational impacts of the upgrades on the CFE system are not quantifiable without detailed study of the CFE system. Such study would have to be conducted by CFE and the operational parameters established by CFE. Based on discussions between Sempra and CFE over the course of various years, beginning generally during the development of the Termoeléctrica de Mexicali combined-cycle project and most recently with respect to the ESJ Gen-Tie Wind Project, CFE has indicated to Sempra Generation that CFE's La Rosita (ROA) to Tijuana (TJ) 230 kV system is at capacity. Any flows from generation connected directly to CFE's 230 kV lines will exacerbate existing overload conditions. Additionally, CFE has indicated that the CFE transmission system cannot be used to solve U.S.-related transmission deficiencies. This includes increasing dependence on Special Protection Schemes (SPS) that open one of the two lines connecting CFE to CAISO as a means of protecting CFE's system from overloads. CFE recently proposed transmission tariffs for renewable energy projects. Sempra Generation has not reviewed the proposed renewable energy tariffs, but current transmission service charges for the CFE system are very high. These charges would be passed on to the utilities that would purchase the energy, thus increasing the cost of renewable energy to rate payers at the very least, and at worst, rendering the project economically infeasible. This cost assumes that no system upgrades are required. As such, upgrades to the CFE system may pose substantial regulatory and legal constraints to achieving delivery of renewable energy produced by the ESJ Project within the 2010–2020 time frame.

At best, upgrades throughout the entire East County 69 kV system would provide capacity to accommodate approximately 150 MW out of over 500 MW planned to be interconnected in the Boulevard area, and this alternative would not be able to accommodate any wind energy planned to be interconnected at the ECO Substation. This alternative ignores the issue of reliability and continuity of service during times when resources to power local rooftop photovoltaic (PV) systems are unavailable. Furthermore, this alternative may not meet environmental criteria because up to 100 miles of reconductoring or rebuilding projects would be required to integrate

planned renewable generation in the Boulevard area. Therefore, ECO System Alternative 6 was determined not to meet alternatives screening criteria described in Section C.2 and was eliminated from further consideration as a reasonable alternative in this EIR/EIS.

## **C.5.2 Tule Wind Project Alternatives**

### ***C.5.2.1 Tule Alternative Site Closer to Demand Areas, Near Existing Transmission Facilities***

#### **Description**

Under this alternative, the proposed Tule Wind Project would be built nearer to urban areas and demand centers for energy to the west of the proposed Tule Wind Project, in the vicinity of existing transmission grid connecting points.

#### **Rationale for Elimination**

This alternative would not meet feasibility criteria. Alternative locations for utility-scale wind development closer to demand areas are not viable due to lack of wind resource. Wind velocity is the single most significant variable affecting feasibility, and the wind velocity at the proposed site is among the highest in the San Diego region when compared with more urban areas to the west, which are considered to have poor wind resource (NREL, CEC 2006). As shown in Figure A-1, the areas with consistent high wind speeds in San Diego County are the areas where the Tule Wind Project proposes to construct wind turbines. This alternative would not meet project objectives criteria because it would not develop and accommodate planned, renewable wind generation in San Diego County and Mexico where good wind resource has been identified. Also, this alternative may not meet environmental criteria. While it would reduce impacts to the rural character of the project area, it would transfer project impacts to an alternate site. Since this alternative does not meet most project objectives or feasibility criteria and is not consistent with the purpose and need set forth in Section A, it was determined not to meet the alternatives screening criteria described in Section C.2 and was eliminated from further consideration as a reasonable alternative in this EIR/EIS.

### ***C.5.2.2 Tule Alternative Gen-Tie Route 1 from Proposed Collector Station to Boulevard Substation (Route Runs West of Proposed Route and Partially Uses Ribbonwood Road)***

#### **Description**

Under this alternative, the proposed Tule Wind Project would be the same as described in Section B of this EIR/EIS with the exception that the 138 kV transmission line that would connect into the Boulevard Substation Rebuild component of the ECO Substation Project would

be located farther west (Figure C-2). As shown in Figure C-2, under this alternative, the proposed 138 kV transmission line would run from the proposed collector substation approximately 5.5 miles south to the Rough Acres Ranch (south of turbine G18). From Rough Acres Ranch, the line would continue west to Ribbonwood Road (approximately 3 miles). The line would continue south on Ribbonwood Road to Old Highway 80 and east along Old Highway 80 to the Boulevard Substation.

This alternative would increase the land disturbance by 13 acres, from 712 acres (proposed) to 725 acres. The 138 kV transmission line would increase in distance from 9 miles (proposed) to 11 miles and would increase the amount of transmission line poles from 126 poles (proposed) to 156 poles.

### **Rationale for Elimination**

While this alternative would meet project objective criteria and is considered feasible, it would transfer the impacts associated with the 138 kV line to a 1.3-mile longer route that would have greater access requirements. Therefore, due to increased length of new 138 kV transmission line required and associated impacts, which would be substantially similar to those associated with the proposed project, this alternative was determined not to meet the alternatives screening criteria, as described in Section C.2 and was eliminated from further consideration as a reasonable alternative in this EIR/EIS.

### **C.5.2.3 Tule Alternative O&M Facility Location 1—Private Property West of McCain Valley Road**

#### **Description**

Under this alternative, the proposed Tule Wind Project would be the same as described in Section B of this EIR/EIS with the exception that the O&M Facility would be located on private property, Rough Acres Ranch (T17S R7E Sec4), west of McCain Valley Road, as shown in Figure C-2. This alternative would consist of separating the 5-acre O&M building from the collector substation.

#### **Rationale for Elimination**

While this alternative would meet the project objectives criteria and feasibility criteria, it would have substantially similar impacts when compared to the proposed project and may increase impacts by not co-locating the proposed O&M Facility with the collector substation as proposed, possibly creating the need for additional disturbance and access areas. Therefore, due to the possibility of creating additional disturbance and impacts when compared to the proposed project, this alternative was determined not to meet the alternatives screening criteria described



in Section C.2 and was eliminated from further consideration as a reasonable alternative in this EIR/EIS.

#### **C.5.2.4 Tule Alternative O&M Facility Location 2—Rough Acres Ranch West of McCain Valley Road**

##### **Description**

Under this alternative, the proposed Tule Wind Project would be the same as that described in Section B of this EIR/EIS with the exception that the O&M Facility would be located on private property, Rough Acres Ranch (T17S R7E Sec 16), located west of McCain Valley Road, as illustrated in Figure C-2. This alternative would locate the O&M Facility further south than as proposed under the Tule Alternative O&M Facility Location 1.

##### **Rationale for Elimination**

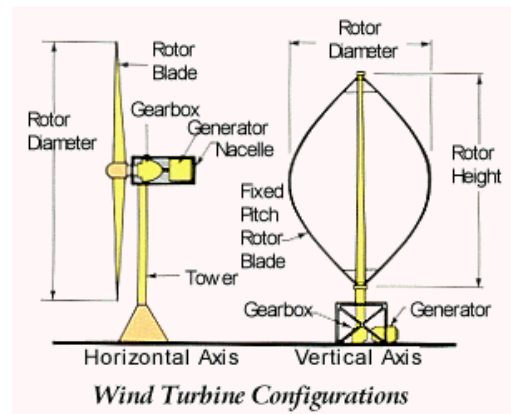
While this alternative would meet the project objectives criteria and feasibility criteria, it would have substantially similar impacts when compared to the proposed project and may increase impacts by not co-locating the proposed O&M Facility with the collector substation as proposed, possibly creating the need for additional disturbance and access areas. Therefore, due to the possibility of creating additional disturbance and impacts when compared to the proposed project, this alternative was determined not to meet the alternatives screening criteria described in Section C.2 and was eliminated from further consideration as a reasonable alternative in this EIR/EIS.

#### **C.5.2.5 Tule Alternative Turbine Design**

##### **Description**

###### *Alternative Turbine Design*

Early wind turbines had various designs, including vertical axis, two-bladed, and downwind turbines. The industry converged on the upwind, horizontal axis, three-bladed turbine as the design of choice. Recent research and development has focused on incremental changes to this basic design as opposed to redesign. Innovations include variable speed, pitch control, and tubular rather than lattice towers. One of the primary environmental drawbacks of the horizontal axis, three-bladed wind turbines is their impact on birds. The tips of the blades spin much faster than the wind speed,



chopping through the air. The birds generally just do not see them coming. The vertical-axis wind turbine (VAWT) provides an alternative to the horizontal-axis design.

The VAWT is a type of wind turbine in which the axis of rotation is perpendicular to the wind stream and the ground. VAWTs work somewhat like a classical water wheel in which water arrives at a right angle (perpendicular) to the rotational axis (shaft) of the water wheel. Vertical-axis wind turbines fall into two major categories: Darrieus turbines and Savonius turbines. Neither type is in wide use today, and the energy-producing capacity is less efficient than those produced by horizontal-axis wind turbines. Because there is no tower structure required, they cannot take full advantage of the higher wind speeds that are available on higher, elevated locations. They also require energy to start the turning the blades due to their low starting torque.

### **Rationale for Elimination**

While an alternative turbine design for the Tule Wind Project may meet environmental screening criteria, it would not meet project objectives or feasibility criteria and is not consistent with the purpose and need set forth in Section A. Because VAWTs are not in wide-scale commercial use at the scale of the proposed Tule Wind Project, their availability and use as an alternative to horizontal-axis wind turbines as proposed would not be commercially viable. Therefore, this alternative was determined not to meet the alternatives screening criteria described in Section C.2 and was eliminated from further consideration as a reasonable alternative in this EIR/EIS.

### ***C.5.2.6 Tule Undergrounding the Proposed 138 kV Tie-Line Alternative***

#### **Description**

Under this alternative, the proposed 138 kV transmission line would be installed underground along the same transmission route as in the proposed project. All other elements of the project would remain as described in Section B of this EIR/EIS.

#### **Rationale for Elimination**

This alternative would meet project objectives criteria, but it would not meet feasibility or environmental criteria. While this alternative would partially avoid some of the significant visual impacts of the proposed project, based on existing topography and preliminary slope analysis, portions of the route exceed the maximum allowable slope of 12% for underground transmission lines. Additionally, this alternative would cause significant construction-related impacts due to the rugged terrain between the proposed substation and Rough Acres Ranch. Therefore, due to the rugged terrain along this route, it was determined that this alternative would not meet alternatives screening criteria described in Section C.2, and it was eliminated from further consideration as a reasonable alternative in this EIR/EIS.

### **C.5.3 ESJ Gen-Tie Project Alternatives**

#### **C.5.3.1 *ESJ Gen-Tie Alternative Undergrounding the 500 kV Gen-Tie Transmission Line***

##### **Description**

Under this alternative, the proposed 500 kV gen-tie transmission line would be installed underground along the same transmission route as in the proposed project. All other elements of the project would remain as described in Section B of this EIR/EIS.

##### **Rationale for Elimination**

This alternative does not represent a commercially proven technology. Therefore, this alternative was determined not to meet alternatives screening criteria described in Section C.2 and was eliminated from further consideration as a reasonable alternative in this EIR/EIS.

#### **C.5.3.2 *Use Existing CFE 230 kV Line Located in Northern Mexico and Path 45 to Transmit ESJ Energy***

For a description of this alternative and rationale for elimination, see Section C.5.1.17 as ECO System Alternative 6.

### **C.5.4 Other Energy Alternatives**

#### **C.5.4.1 *Distributed Generation—Rooftop Solar Panels and Other Alternative Fuel Supplies Description***

Under this alternative, the ECO Substation, Tule Wind, and ESJ Gen-Tie projects would not be built. Instead, distributed generation including but not limited to residential and commercial rooftop solar panels, biofuels, hydrogen fuel cells, and other renewable distributed energy sources would be installed in place of the Proposed PROJECT.

##### **Rationale for Elimination**

While this alternative, including rooftop solar, would result in a significant net reduction in project impacts as compared with the Proposed PROJECT and would contribute directly to meeting state and federal renewable energy resource goals, this alternative fails to meet several of the basic project objectives and would not meet feasibility criteria.

California's RPS requires retail sellers of electricity to increase their procurement of eligible renewable resources by at least 1% per year so that 20% of their retail sales are procured from eligible renewable energy resources by 2010. Executive Order S-3-05 (June 2005) identified

greenhouse gas emission reduction targets for the state, providing the impetus for a potential expansion of the RPS program to include a goal of 33% renewable energy by 2020.

The Renewable Resources Development Report prepared by the California Energy Commission (CEC) identifies renewable resources that are available to the SDG&E territory. These resources include wind and solar as the principal resources.

The County of San Diego uses approximately 2,500 MW with peak usage topping 4,500 MW. In 2009, SDG&E furnished 10.2 % of its electricity from renewable resources (SDG&E 2010).

There are several reasons that this alternative does not meet feasibility criteria.

*1) Regulatory Feasibility*

As stated above, one of the primary drivers for the development of renewable energy within California is the RPS (PROJECT Objective C-2). At present, most rooftop solar is ineligible to contribute towards the RPS, and current trading mechanisms by which distributed generation facilities could contribute to the RPS target are either impractical for small-scale systems or ineligible for utility participation. While a CPUC decision was issued authorizing the use of tradable renewable energy credits (RECs) (CPUC Decision 10-03-021), the decision was stayed, so the market has yet to be defined and is not yet active. As a consequence, the lack of a market for tradable RECs means that no agreed mechanism currently exists to allow developers to purchase or trade small-scale distributed generation that could displace the development of utility-scale wind, which contributes to the RPS goals. While tradable RECs may be available as early as 2011, legislation is currently under development, with no known timescale of completion or enactment. Therefore any market and consequently any distributed generation solution as an alternative to the Proposed PROJECT would be speculative.

*2) Technical Feasibility—Distributed Solar Photo Voltaic (PV)*

Solar PV is less efficient than the stated capacity factor for the Proposed PROJECT, 20% capacity factor versus 30% capacity factor, respectively. Consequently, for any given nameplate capacity, 50% more solar will have to be installed to deliver equivalent energy. As a rough approximation, 100 square feet of solar PV delivers 1 kilowatt (kW) capacity, and the average size of a domestic system in San Diego is about 4.5 kW (San Diego Regional Renewable Energy Study Group 2005). Therefore, to deliver the equivalent capacity of 326 MW of the Proposed PROJECT (200 MW for Tule Wind plus 126 MW for ESJ Phase I Wind Development), the proponents will need between 100,000 and 163,000 domestic systems to secure the equivalent capacity and energy proposed by the Proposed PROJECT.

In 2009, San Diego County had a total of 4,873 installed residential and commercial and pending PV units, totaling approximately 38 MW capacity (Soto 2010). Given recent averages for rooftop solar installations and recognizing that approximately 2,000 residential rooftop solar installations would generate approximately 1 MW, the sheer number of new installations required to meet basic project objectives render this alternative highly speculative and therefore infeasible from a technical and commercial perspective. There also exist as yet undefined technical hurdles associated with high levels of PV development that create imbalances in the grid system. The intermittent performance characteristics of PV result in rapid localized voltage drops. As a consequence, extensive upgrading to substations may be required to cope with such variation. Such upgrading may involve environmental impacts that cannot be clearly defined.

Additionally, distributed generation only partially solves the issue of reliability in the Boulevard and Jacumba communities; therefore, this alternative would not address the southeastern energy transmission system servicing the Boulevard, Jacumba, and other surrounding communities, which under this alternative would remain unstable.

### 3) *Technical Feasibility—Other Distributed Generation Technologies*

Other distributed generation technologies are still as yet unproven or have limited potential growth. For example, fuel cell technologies, including the Bloom Box, have only been installed in a few pilot projects and/or have a limited development potential. Such technology only qualifies as a renewable energy resource if run on biogas. Biogas capacity in California is both limited and expensive; of the 704 MW potentially available (Rickerson et al. 2008), 35% has already been developed, leaving no more than 451 MW for future development. Replacing the proposed 326 MW of wind generation with biogas would not be feasible for several reasons: (a) the technology is not within the control of the proponent, and it is therefore too speculative to assume that implementation of sufficient biogas facilities is achievable; (b) Approximately 75% of the known available capacity would be needed to offset the wind capacity proposed by the project; and it would not be possible to replace the 1,200 MW of potential capacity that may, in future, connect into the ECO Substation; and (c) such a system would be infeasible for improving reliability in the Jacumba area as it would likely require extension of the gas network, which would in turn add to environmental costs.

Therefore, the distributed generation alternative was eliminated from further consideration as a viable alternative to the Proposed PROJECT because it would require substantial installations and would be prohibitively expensive. These installations would render this alternative's ability to meet most of the project objectives infeasible from a technical and commercial perspective within the 2010–2020 time frame. Secondly, this alternative would not improve the reliability of power delivery to the communities of Boulevard, Jacumba, and surrounding communities.



#### **C.5.4.2 Energy Efficiency**

##### **Description**

Energy Conservation and Demand-Side Management programs are designed to reduce customer energy consumption. Regulatory requirements dictate that supply-side and demand-side resource options should be considered on an equal basis in a utility's plan to acquire the lowest cost resources. These programs are designed to either reduce the overall use of energy or to shift the consumption of energy to off-peak times.

Under the direction of the CPUC, SDG&E offers a number of energy conservation programs for customers, including financial incentives for installing specific energy-efficient appliances or taking other measures to conserve energy. SDG&E also provides programs, such as inline energy profiling and in-home energy audits, to make customers more aware of their energy usage and of ways to conserve, as well as a variety of free brochures on improving energy efficiency.

Under this alternative, the need for the Proposed PROJECT would be met through increased conservation and load-management activities similar to those previously noted.

##### **Rationale for Elimination**

The energy efficiency alternative would result in significant reduction in project impacts as compared with the Proposed PROJECT and would, therefore, meet the environmental screening criteria. However, while energy efficiency would reduce demand, it would not reduce demand sufficiently to meet most of the project objectives and the need to develop renewable energy sources. Additionally, this alternative would not improve the reliability of power delivery to the communities of Boulevard, Jacumba, and the surrounding communities. Therefore, because this alternative would not meet most project objectives and is not consistent with the purpose and need set forth in Section A, it was determined not to meet the alternatives screening criteria described in Section C.2 and was eliminated from further consideration as a reasonable alternative in this EIR/EIS.

#### **C.5.4.3 Nuclear Energy**

##### **Description**

Under this alternative, the ECO Substation, Tule Wind, and ESJ Gen-Tie projects would be eliminated and replaced with new nuclear energy production.

##### **Rationale for Elimination**

The nuclear energy alternative would not contribute to meeting renewable energy resource goals established by the State of California or the federal government and, therefore, would not meet

project objectives or purpose and need as set forth in Section A. Additionally, the nuclear energy alternative does not meet feasibility criteria as permitting of new nuclear facilities in California is not currently allowable by law. Therefore, it was determined that this alternative does not meet the alternatives screening criteria described in Section C.2, and it was eliminated from further consideration as a reasonable alternative in this EIR/EIS.

## **C.6 No Project/No Action Alternatives**

CEQA and NEPA require an evaluation of the No Project/No Action Alternative so that decision makers can compare the impacts of approving the project with the impacts of not approving the project. According to CEQA Guidelines, Section 15126.6(e) (14 CCR 15000 et seq.), the No Project Alternative must include the assumption that conditions at the time of the Notice of Preparation (NOP) (i.e., baseline environmental conditions) would not be changed since the Proposed PROJECT would not be installed. The No Project Alternative must also describe the events or actions that would be reasonably expected to occur in the foreseeable future if the project were not approved. The first condition is described in the EIR/EIS for each environmental discipline as the “environmental baseline,” since no impacts of the Proposed PROJECT would be created. This section defines the second condition of reasonably foreseeable actions or events broken down into four scenarios: No combined ECO Substation, Tule Wind, and ESJ Gen-Tie Project; No ECO Substation Project; No Tule Wind Project; and No ESJ Gen-Tie Project. The impacts of these actions are discussed briefly here and are evaluated in each issue area’s analysis in Section D of this EIR/EIS.

### **C.6.1 No Project Alternative 1—No ECO, Tule, ESJ Gen-Tie, Campo, Manzanita, or Jordan Wind Energy Projects**

Under the No Project Alternative 1, the ECO Substation, Tule Wind, and ESJ Gen-Tie projects, as well as the Campo, Manzanita, and Jordan wind energy projects, would not be built, and the existing conditions at these sites would remain. The southeastern energy transmission system servicing the Boulevard, Jacumba, and other surrounding communities would remain unstable.

### **C.6.2 No Project Alternative 2—No ECO Substation Project**

Under the No Project Alternative 2, the ECO Substation Project would not be built, and the conditions in the existing energy grid and local environment would remain. Without the ECO Substation Project, there would not be an interconnection hub that would enable renewable generation such as the ESJ Gen-Tie or Tule Wind projects to connect to the grid. Additionally, energy transmission would remain unreliable in the Boulevard, Jacumba, and surrounding communities. Planned generation facilities in the project area would require additional miles of transmission line to reach an interconnection point and possibly multiple connection points on

SDG&E's existing transmission system. In addition, new substations to be constructed by each generator might be required to connect the generation facilities to the grid.

### **C.6.3 No Project Alternative 3—No Tule Wind Project**

Under the No Project Alternative 3, the ROW would not be granted by BLM and the Tule Wind Project would not be built. The existing conditions on the project site would remain. Without the Tule Wind Project, approximately 200 MW of proposed renewable energy production would not be developed on federal (BLM) lands in the southeastern portion of San Diego County.

### **C.6.4 No Project Alternative 4—No ESJ Gen-Tie Project**

Under the No Project Alternative 4, the ESJ Gen-Tie Project would not be built and the existing conditions on the project site would remain. There would be no transmission line to carry energy from the ESJ Project in northern Mexico to the San Diego grid.

## **C.7 References**

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