SAND HILL WIND REPOWERING PROJECT ENVIRONMENTAL ANALYSIS

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Acronyms and Abbreviations

APE	area of potential effects
APLIC	Avian Power Line Interaction Committee
APWRA	Altamont Pass Wind Resource Area
BMPs	best management practices
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CNDDB	California Natural Diversity Database
County	Alameda County Community Development Agency
CRHR	California Register of Historic Resources
CUP	conditional use permit
CUPA	Certified Unified Program Agency
dBA	A-weighted decibel
EACCS	East Alameda County Conservation Strategy
ECAP	East County Area Plan
EIR	environmental impact report
FAA	Federal Aviation Administration
gen-tie	generation-tie
GHG	greenhouse gas
H&S	Health and Safety
HDD	horizontal directional drilling
HMBP	Hazardous Materials Business Plan
I-	Interstate
kV	kilovolt
MW	megawatt
NAHC	Native American Heritage Commission
NRHP	National Register of Historic Places
O&M	Operations & Maintenance
PG&E	Pacific Gas and Electric Company
PRD	Permit Registration Document
Project or proposed Project	Sand Hill Wind Repowering Project
QA/QC	quality assurance/quality control
RPS	Renewables Portfolio Standard
Sand Hill	Sand Hill Wind, LLC
SF_6	sulfur hexafluoride
SMARTS	Storm water Multiple Application and Report Tracking System
SPCC	Spill Prevention Control and Countermeasures
SWPPP	stormwater pollution prevention plan

Chapter 1
Introduction

In November 2014, the Alameda County Community Development Agency (County) certified the *Altamont Pass Wind Resource Area Repowering Final Program Environmental Impact Report* (PEIR). The PEIR includes a detailed account of the history and legal activities culminating in preparation of the PEIR, and provides a framework for consideration of subsequent projects, provided they are consistent with the PEIR and would be developed to be consistent with the County's goals, objectives, and conditions as set forth therein. This analysis has been prepared specifically to address the Sand Hill Wind Repowering Project (Project), in accordance with the purposes of the PEIR.

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1.1 Project Overview

Sand Hill Wind, LLC (Sand Hill) is proposing the Sand Hill Wind Repowering Project (Project or proposed Project) on 15 privately owned parcels in the Altamont Pass Wind Resource Area (APWRA) (Figure 1-1). The proposed Project would entail installation of up to 40 new wind turbines and is expected to utilize turbines with generating capacities between 2.3 and 4.0 megawatts (MW), all generally similar in size and appearance, to develop up to 144.5 MW. Three conceptual alternative layouts are proposed, each using up to 40 wind turbines. The layouts are substantially similar, mainly varying according to the location of 11 turbines in the center of the Project area, south and west of Bethany Reservoir and their relative distance from the primary access road for the Project. The final layout would be selected based on site constraints (e.g., avian siting considerations), data obtained from meteorological monitoring of the wind resources, and turbine availability. Each of these factors would be considered when micrositing turbines, with the final layout reflecting one or some combination of the alternative layouts. Existing roads would be used where possible, and temporary widening and some new roads would be necessary. The Project would also require three generation-tie (gen-tie) lines connecting the Project to two substations.

1.2 Relationship to the PEIR

The County has prepared this analysis and the associated checklist to validate the proposed Project's conformance with the analysis and mitigation presented in the PEIR, and to ensure that the Sand Hill Project is in compliance with requirements of the California Environmental Quality Act (CEQA). The

summary analysis in the checklist is intended to inform decision makers and the public of the Project's conformity with the analysis in the PEIR and to identify the specific impacts and mitigation measures relevant to the Project. This analysis and checklist support the decision not to prepare a subsequent EIR pursuant to Section 15168(c)(2) of the State CEQA Guidelines. The relationship of the checklist (supported by this analysis) to the PEIR is consistent with the intent of a program EIR as established in State CEQA Guidelines Section 15168(d), which calls for use of an initial study to determine whether a later, directly related (or tiered) project would have new or different environmental effects that were not disclosed in the PEIR or that would warrant a new EIR. The environmental checklist prepared for the proposed Project constitutes an initial study for the purpose of Section 15063, including its provision for use with a previously prepared EIR (Section 15063(b)(1)(B)). Moreover, any public notice required by County ordinance will state, as required by State CEQA Guidelines Section 15168(e), that the activities associated with the Sand Hill Project are within the scope of the PEIR and that the PEIR adequately described and assessed these activities.

As shown in Chapter 3, *Environmental Analysis*, despite the changes mentioned in the next section, the proposed Project would not result in any impacts not addressed in the PEIR, nor would it result in impacts of greater severity than those presented in the PEIR.

1.3 Changes Relevant to the PEIR Analysis

Since preparation of the PEIR, five factors relevant to the PEIR analysis have emerged. First, some of the turbines under consideration for the proposed Project, while mostly within the dimensional specifications of the turbines analyzed in the PEIR, exceed the individual nameplate capacity of the turbines analyzed in the PEIR by a small margin. The consequences of this change are two-fold: fewer turbines would be required to achieve the same Project-level generation capacity, and the larger turbines would have a larger rotor-swept area.

The second factor involves questions regarding the reliability of estimated avian mortality rates as presented in the PEIR. This issue is addressed briefly below and in detail in Section 3.4.2, *Environmental Impacts and Mitigation Measures*.

Third, the size of the proposed Project—144.5 MW—is larger than the originally proposed Sand Hill Project as considered in the PEIR. While the originally proposed Sand Hill Project was 34 MW, it occupied a smaller area than the current Project. The proposed Project now encompasses the original area as well as additional areas that were considered for development in the PEIR. Overall, the mix of foreseeable future wind projects has changed from that contemplated in the PEIR, but the overall level of anticipated wind development remains the same.

Fourth, while the PEIR did not include discussion of Operations and Maintenance (O&M) (Project-level analyses did include O&M buildings), Sand Hill proposes to install such a facility.

Finally, the County is aware that information regarding nighttime lighting during operation of the turbines, as well as FAA requirements, may in fact be different from the information in the PEIR. These five issues are described and evaluated in detail in the following subsections and in Chapter 3, *Environmental Analysis*, of this document.

1.3.1 Turbine Size

Sand Hill proposes two types of turbines: a 2.3 MW model and a 3.6 or 3.8 MW model. Because Sand Hill has not yet selected the specific turbine models, it retains the option of using turbines up to 4.0 MW, depending on product availability at time of construction. However, regardless of the turbine model selected, the Project would not exceed the proposed 144.5 MW capacity, and the overall dimensions of individual turbines would not exceed those currently proposed.

The PEIR analyzed projects with a range of turbine sizes. Table 1-1 shows the maximum dimensions of this range for comparison with the largest of three turbine types under consideration for the proposed Project.

Table 1-1. Turbine Specifications Contemplated in the PEIR and for Use with the Proposed Project

Turbine Model	PEIR Maximum—3.0 MW	General Electric 3.6 MW[a]
Rotor type	3-blade/horizontal axis	3-blade/horizontal axis
Blade length	62.5 m (205 ft)	67.2 m (220 ft)
Rotor diameter	125 m (410 ft)	137 m (449 ft)
Rotor-swept area	12,259 m^2 (131,955 ft^2)	14,741 m^2 (158,671 ft^2)
Tower type	Tubular	Tubular
Tower (hub) height	96 m (315 ft)	83.6 m (274 ft)
Total height (from ground to top of blade)	153 m (502 ft)	152 m (499 ft)
Blade height (from ground to bottom of blade)[b]	17.5 m (57 ft)	16.4 m (54 ft)

[a] A 3.8 MW turbine and an as-yet-undetermined turbine with a capacity up to 4.0 MW have also been considered; however, the 3.6 MW turbine is larger in all dimensions than the 3.8 MW and the 4.0 MW turbines, and is therefore presented here as the largest of the proposed turbine types.

[b] The PEIR evaluated hub heights ranging from 80 to 96 meters and blade lengths ranging from 41.25 to 62.5 meters. Measurements assuming the lowest distance from the ground surface to the bottom of the blade tip are presented here.

As shown in the table, the proposed Sand Hill turbines would be within the specifications established in the PEIR for rotor type, tower type, tower (hub) height, and total height. However, blade lengths would be up to 15 feet (approximately 7%) longer, rotor diameters up to 39 feet (approximately 9%) greater, and rotor-swept area up to 2,482 m^2 (approximately 17%) larger.

Because some of the proposed Project specifications exceed those described in the PEIR, additional review of potentially affected environmental resources is provided in this document. Larger turbines could affect three resources: aesthetics (Section 3.1), hazards (i.e., setbacks)(Section 3.8), and biological resources (i.e., birds and bats) (Section 3.4). At the same time, it should be borne in mind that while a 3 MW turbine was the largest considered in the PEIR, for purposes of the analysis of avian mortality, the turbine used as the basis for developing estimates of future or typical project impacts was the Vasco Winds 2.3 MW turbine. The consequence of the increased nameplate capacity to a 3.6, 3.8 or even 4.0 MW turbine, however, would be lower impacts per MW for certain environmental topic areas, because a 144.5 MW project would require 62 turbines of the capacity of the Vasco Winds turbines, whereas the same 144.5 MW capacity would be achieved with 40 of the turbines proposed for the Sand Hill Project. This decreased density of turbines would result in proportionally lesser impacts associated with air quality emissions, traffic, and ground disturbance.

1.3.2 Avian Mortality Estimates

Subsequent to certification of the PEIR, the first repowering project, Golden Hills, was completed as part of the overall APWRA repowering effort. In late 2017, H. T. Harvey & Associates prepared the *Golden Hills Wind Energy Center Postconstruction Fatality Monitoring Report: Year 1*, presenting the results of the first year's monitoring effort and analysis of those results. The monitoring effort indicated potentially higher mortality rates than those estimated in the PEIR (particularly for golden eagles and red-tailed hawks). However, as explained in detail in the discussion of Impact BIO-11 in Section 3.4.2, *Environmental Impacts and Mitigation Measures*, these results do not indicate new or more severe significant effects beyond those anticipated in the PEIR. The PEIR analyzed effects on avian and bat species using information on multiple repowered projects collected over multiple years, noting that "…fatality rates in the APWRA are highly variable (that is because they differ across years, turbine types, geographies, and topographies…"). Consequently, the new information on avian and bat fatalities from 1 year of monitoring a single project during an abnormally wet year within the larger APWRA—and suggesting more severe impacts on birds and bats—cannot be extrapolated to imply that the Sand Hill Project would result in new significant effects or a substantial increase in the severity of effects. A body of information spanning multiple projects and multiple years of monitoring are necessary to form conclusions regarding effects.

1.3.3 Megawatt Cap

The PEIR identified two alternatives for repowering the APWRA, analyzing both at an equal level of detail. Because the County adopted and certified the PEIR without identifying a preferred alternative, the County may authorize either alternative. Alternative 2 was the larger alternative, assuming a maximum capacity of 450 MW for the APWRA at full repowering. The PEIR also analyzed two projects, Golden Hills and Patterson Pass, and considered four other future projects (Table 1-2). While the PEIR did not contemplate the sequencing of projects considered in the future, County staff consider that the future projects identified in the PEIR should be considered first in allocating the total nameplate capacity. Subsequent projects would be reviewed on a first-come, first-served basis. As outlined in Table 1-2, the total capacity of approved, operational, or foreseeable future projects considered in the PEIR is 316.5 MW. The Sand Hill Project would increase that total to 425 MW. Because this is less than the 450 MW cap established by Alternative 2, the proposed Project would not conflict with the PEIR. However, the Rooney Ranch Project site (also known as the Santa Clara site) is also under consideration for repowering; this project would have a 25.1 MW nameplate capacity. If the Rooney Ranch Project were authorized under the PEIR, the total capacity of the program area would increase to 450.1 MW, a 0.02% exceedance of the 450 MW contemplated in Alternative 2 of the PEIR. For all resources, this minor difference cannot realistically be measured and is within the rounding already used in the PEIR; it would not result in new significant effects or a substantial increase in the severity of effects already described in the PEIR.

Table 1-2. Operational, Approved, or Foreseeable Projects in the APWRA[a]

Project	Owner/Operator	Status	Total MW
Patterson Pass[b]	EDF	Approved (PEIR)	19.8
Golden Hills[c]	NextEra	Operational (PEIR)	85.9
Golden Hills North	NextEra	Operational	40.8
Sand Hill[d]	Ogin (now sPower)	Foreseeable (PEIR)	36
Mulqueeny Ranch	Brookfield	Foreseeable (PEIR)	80
Summit Wind[e]	AWI (now Salka, LLC)	Approved	54
		Subtotal	316.5
Sand Hill (additional)[d]	sPower	CUP Application Submitted	108.5
Rooney Ranch[f]	sPower	Foreseeable	25.1
		Total	450.1

[a] County planning staff has received information from two additional companies, DunoAir-Altamont and NRG, indicating they are developing projects in the APWRA. Because the number of MWs to be developed under these projects is not yet known they are not listed in this table. Review of these projects under the PEIR, if ultimately proposed, would occur at a later date.

[b] County planning staff has indicated that the Patterson Pass Project is under new ownership and is no longer owned by EDF.

[c] Golden Hills was identified in the PEIR as up to 88.4 MW but 85.9 MW were ultimately constructed.

[d] The Sand Hill Project was identified in the PEIR as up to 34 MW. Under additional review, it was ultimately approved for up to 36 MW. sPower, the current project owner, has applied to expand the Project to a total of 144.5 MW (36 MW + 108.5 MW = 144.5MW).

[e] The Summit Wind Project was identified in the PEIR as up to 95 MW but was approved in 2016 for a total of 54 MW.

[f] The Rooney Ranch Project proposed by sPower would be subject to approval by the City of Santa Clara.

1.3.4 Operations and Maintenance Facility

The PEIR did not address O&M facilities at the program level; however, the two individual projects evaluated in that document both included O&M facilities, as would the Sand Hill Project. While the PEIR stated that no septic or other wastewater treatment systems would be part of repowering projects, Sand Hill proposes to install such a system in conjunction with its O&M facility. In accordance with local regulations, the installation of such a system would be subject to approval and permitting by Alameda County Department of Environmental Health. If preconstruction investigations indicate that the soils onsite are not suitable to support such a system, portable toilets, supplied and serviced by a commercial vendor, would be used instead.

1.3.5 Turbine Lighting

The County has noted that although the PEIR stated that lighting for repowered turbines would be similar to the lighting of previously existing turbines, in fact the new turbines have FAA-mandated lighting that differs observably from the lighting used on previously existing turbines. The FAA-mandated lighting is more noticeable to the public. The analysis evaluates and supports a determination, however, that this change is not cause for preparation of a Supplemental EIR to address the change. This change in observable effects is not the consequence of a feature of the

Project that is different from the anticipated features described in the PEIR, or in its circumstances; it is instead solely a change in information. In this case, CEQA prohibits a supplemental review of the issue because the correct information about the relative lighting impacts of new versus old turbines was readily available during preparation of the PEIR. For example, the Vasco Winds Project, which has nighttime lighting, could have been observed at the time the PEIR was prepared. Thus, CEQA prohibits the County from preparing a supplemental EIR under Public Resources Code Section 21166(c) and California Code of Regulations Title 14 Section 15162(a)(3) on the basis of the lighting issue because it constitutes information that could have been known with the exercise of reasonable diligence at the time the previous EIR was certified as complete.

As discussed in Section 3.1.2, Sand Hill has agreed to work with the County to the extent possible to implement light management techniques as part of the Project. Consequently, considering the analysis above and with Sand Hill's cooperation, this analysis confirms that the Project would not result in a new source of substantial light or glare beyond that described in the PEIR.

1.4 Organization of this Document

This analysis has been structured to parallel the PEIR; accordingly, all resource topics are addressed—even those that clearly would fall within the analysis and conclusions in the PEIR. Following this introductory chapter, the analysis comprises the chapters and appendices listed below.

Chapter 2, Project *Description*, describes the Project features, sequence of construction, and details of operations and maintenance.

Chapter 3, *Environmental Analysis*, provides the analysis of each resource topic considered in the PEIR, with a conclusion regarding any divergence from the conclusions presented in the PEIR.

Chapter 4, *List of Preparers*, identifies the persons involved in the preparation of this document.

Appendix A, *Air Quality Technical Memorandum*, provides the assumptions and modeling results used to support the air quality analysis for the proposed Project.

Appendix B, *Biological Resources Evaluation Report*, is the Project-specific report detailing biological conditions in the Project area.

Appendix C, *Cultural Resources Survey Report*, is the report prepared by ICF cultural resources staff for the proposed Project.

Appendix D, *Sound Technical Report*, is the report detailing the noise analysis prepared for the proposed Project.

1.5 References Cited

Alameda County Community Development Agency. 2014. *Altamont Pass Wind Resource Area Repowering Final Program Environmental Impact Report*. State Clearinghouse #2010082063. October. (ICF 00323.08.) Hayward, CA. With technical assistance from ICF International, Sacramento, CA.

H. T. Harvey & Associates. 2017. *Golden Hills Wind Energy Center Postconstruction Fatality Monitoring Report: Year 1*. December 15. Prepared for Golden Hills Wind, LLC, Livermore, CA.

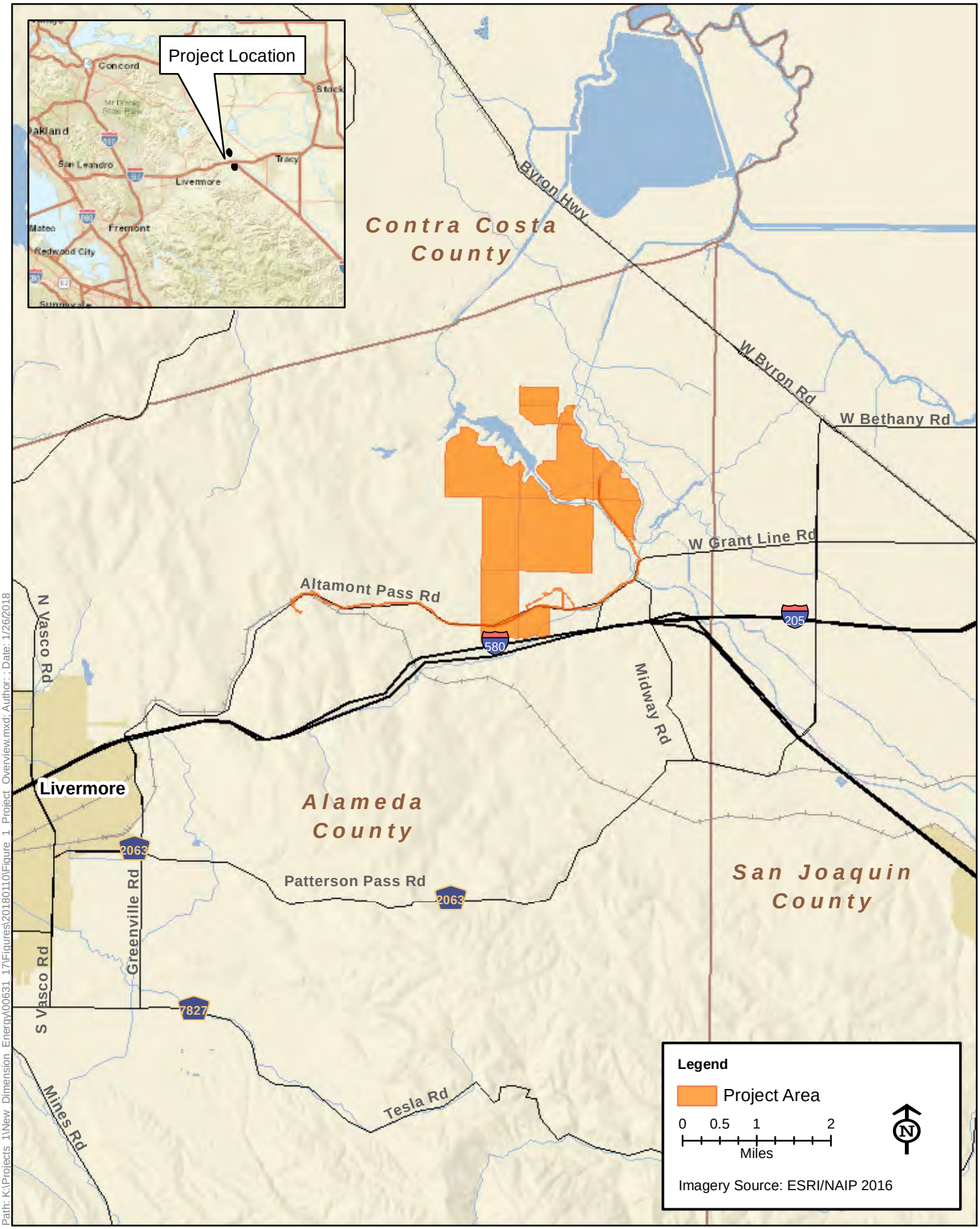

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Figure 1-1
Project Location

Chapter 2
Project Description

2.1 Project Location and Land Ownership

The Project area comprises 15 parcels (Table 2-1 and Figure 2-1), most of which were previously used for wind production. Land use in the Project area and the surrounding APWRA consists largely of cattle-grazed land supporting operating wind turbines and ancillary facilities.

Generally characterized by rolling foothills of annual grassland, the mostly treeless region is steeper on the west and gradually flatter to the east where it slopes toward the floor of the Central Valley. Elevations in the area range from approximately 600 to 1,200 feet above sea level.

Sand Hill has lease agreements with the landowners to install, operate, and maintain the repowered wind turbines while permitting ongoing agricultural activities to continue.

Table 2-1. Parcels and Proposed Uses[a]

Assessor's Parcel Number	Acreage	Proposed Use
99B-7750-6	101	Wind turbines and associated facilities
99B-6325-1-4	69	Access and setback
99B-6325-1-3	224	Wind turbines and associated facilities
99B-7375-1-7	314	Wind turbines and associated facilities
99B-7400-1-5	598	Wind turbines and associated facilities
99B-7300-1-5	443	Wind turbines and associated facilities
99B-7050-4-6	73	Wind turbines and associated facilities
99B-7050-1-9	82	Wind turbines and associated facilities
99B-7050-4-1	27	Access and setback
99B-7350-2-1	2	Access and setback
99B-7350-2-15	334	Wind turbines and associated facilities
99B-7350-2-5	57	Access and setback
99B-7500-3-2	53	Wind turbines and associated facilities
99B-7500-3-1	113	Wind turbines and associated facilities
99B-7600-1-1	105	Wind turbines and associated facilities
Total	2,595	

[a] The gen-tie lines and substations are not included in this list because they are existing facilities that would be upgraded as part of the proposed Project.

2.2 Project Need, Goals, and Objectives

The Project objective is to repower the existing wind Project on privately owned land to develop a 144.5 MW commercially viable wind energy facility that would deliver renewable energy to the electrical grid.

2.3 Existing Facilities

2.3.1 Wind Turbines and Foundations

The proposed Project may include the removal of old turbine foundations where they conflict with the location of repowered Project components (e.g., roadways and ground equipment).

2.3.2 Access Roads

Primary access to the Project area is through locked gates off Altamont Pass Road and Mountain House Road. Onsite roads are graveled and vary in width from 12 to 20 feet.

2.3.3 Meteorological Towers

Four 50-meter (164-foot) meteorological towers are present onsite. These towers monitor and record meteorological data such as wind speed, wind direction, and atmospheric pressure.

2.3.4 Power Collection System

Electricity generated by a portion of the previous project was collected from each wind turbine and transmitted to the AML and Dyer Road substations, where the voltage was increased for interconnection with the Pacific Gas and Electric Company's (PG&E's) transmission lines. The collection system comprises pad-mounted transformers, underground cables, overhead cables on wooden poles, assorted circuit breakers and switches, electrical metering/protection devices, and the substations.

2.3.4.1 Substations

The point of interconnection at the Dyer Road substation has been relocated to the Santa Clara substation. The existing AML substation encompasses 0.6 acre north of Altamont Pass Road; the existing Santa Clara substation encompasses 0.2 acre south of Altamont Pass Road.

2.3.4.2 Transmission Lines

Several PG&E transmission lines bisect the Project parcels.

2.3.5 Cattle Handling and Staging Areas

Several cattle handling and staging areas are located in the Project area.

2.4 Proposed Project Features

The proposed Project characteristics are listed below, illustrated in Figures 2-2a through 2-2c, and discussed in greater detail in the following subsections.

- A total nameplate generation capacity of up to 144.5 MW.
- Removal of old wind turbine foundations where they conflict with new Project components.
- Installation of up to 40 new wind turbine generators, towers, foundations, and pad-mounted transformers.
- Development of Project roads and installation of a power collection system.
- Use of existing roads to the extent possible.
- Use of existing substations (with upgrades to the equipment).
- Construction of an operations and maintenance (O&M) facility.
- Installation of three permanent meteorological towers.

2.4.1 Wind Turbines

Most of the turbines being repowered in the APWRA were installed in the 1980s and represent first- and second- generation utility-grade commercial wind turbine technology, now considered old technology. The terms *first-generation*, *second-generation*, *third-generation*, and *fourth-generation* are used to group wind turbine types with similar technologies currently installed or to be installed in the program area. In this context, first-generation wind turbines are those designed and installed during the 1980s. Second-generation turbines are those designed and installed in the 1990s. Third-generation turbines are those installed in previous repowering projects that use similar design to turbines proposed for the Project but that are of smaller size (i.e., up to 1 MW). Fourth-generation turbines—such as those proposed for installation, are large, 1.6–4 MW turbines.

The proposed repowering Project would entail installation of up to 40 fourth-generation turbines in the Project area. A range of turbines is being considered for the proposed Project. Turbines being considered range in nameplate capacity from 2.3 to 4.0 MW, a rotor diameter of 90–140 meters (295–459 feet), tower height of 80–110 meters (262–361 feet), and a maximum total turbine height of 152 meters (499 feet). The current Project layout assumes the use of turbines with the specifications presented in Table 2-2.

Table 2-2. Turbine Specifications[a]

	Turbine Model		
Turbine Characteristic	General Electric 2.3-116	General Electric 3.6-137	General Electric 3.8-130
Rotor type	3-blade/horizontal axis	3-blade/horizontal axis	3-blade/horizontal axis
Blade Length	56.9 m (187 ft)	67.2 m (220 ft)	63.7 m (209 ft)
Rotor diameter	116 m (381 ft)	137 m (449 ft)	130 m (427 ft)
Rotor-swept area	10,568 m^2 (113,753 ft^2)	14,741 m^2 (158,671 ft^2)	13,273 m^2 (142,869 ft^2)
Rotational speed	Variable: 5.0–14.9 rpm	Variable: 6.3–13.6 rpm	Variable: 6.95–12.1 rpm
Tower type	Tubular	Tubular	Tubular
Tower (hub) height	80 m (308 ft)	83.6 m (274 ft)	85 m (279 ft)
Rotor height (from ground to lowest tip of blade)	22 m (72.2 ft)	15.1 m (49.5 ft)	20 m (65.6 ft)
Total height (from ground to top of blade)	138 m (453 ft)	152 m (499 ft)	150 m (492 ft)

[a] Depending on availability at the time of construction, turbines of up to 4.0 MW may be used for the proposed Project. Turbine dimensions would not exceed those shown in the table and the Project capacity would not exceed 144.5 MW.

2.4.1.1 Siting Requirements

Sand Hill will adhere to the requirements of Alameda County to maintain consistency with regional planning that has been conducted to date. Setback requirements were originally developed for Alameda County windfarms in the 1980s and 1990s in consideration of a variety of factors, such as appropriate distance between upwind and downwind turbines for effective wind production, noise effects on sensitive land uses, visual impacts resulting from proximity to residences and possible shadow flicker, concerns with tower collapse, and blade throw hazard (where all or part of a rotor blade may break loose from the nacelle and strike an occupied area or infrastructure). Setbacks have historically been determined on a project-by-project basis in accordance with the standard conditions of approval for a conditional use permit (CUP). However, while the standard conditions applied in the 1980s and 1990s were appropriate for the older generation turbines, they may not suffice for the fourth-generation turbines proposed for repowering. Accordingly, the County has developed a set of updated standards to be used for proposed repowering projects. These are shown in Table 2-3.

Table 2-3. Updated Alameda County Turbine Setback Requirements

Affected Land Use or Corridor	General Setback	Setback Adjustment for Turbine Elevation Above or Below Affected Use[a]	Alternative Minimum[b]
Adjacent parcel with approved wind energy CUP[c]	1.1 times rotor length	1% TTH added or subtracted per 10 ft of turbine elevation, respectively, above or below affected parcel	50% of general setback

Affected Land Use or Corridor	General Setback	Setback Adjustment for Turbine Elevation Above or Below Affected Use[a]	Alternative Minimum[b]
Adjacent parcel without approved wind energy CUP	1.25 times TTH	1% TTH per 10 ft above or below affected parcel	1.1 times rotor length
Adjacent dwelling unit	3 times TTH	1% TTH per 10 ft above or below affected unit	50% of general or elevation differential setback
Public road (including I-580), trail, commercial or residential zoning	2.5 times TTH	1% TTH per 10 ft above or below affected right-of-way	50% of general setback with report by qualified professional, approved by Planning Director
Recreation area or property	1.25 times TTH	1% TTH per 10 ft above or below affected property	TTH
Transmission line[d]	2 times TTH	1% TTH per 10 ft above or below path of conductor line at ground level	50% of general setback with report by qualified professional, approved by Planning Director

Note: TTH = total turbine height: the height to the top of the rotor at 12:00 position. Setback distance to be measured horizontally from center of tower at ground level.

[a] The General Setback based on TTH will be increased or reduced, respectively, based on whole 10-ft increments in the ground elevation of the turbine above or below an affected parcel, dwelling unit, road right-of-way, or transmission corridor conductor line. Any portion of a 10-ft increment in ground elevation will be disregarded (or rounded down to the nearest 10-ft interval).

[b] *Alternative Minimum* refers to a reduced setback standard, including any adjustment for elevation, allowed with a notarized agreement or an easement on the affected property (if applicable), subject to approval of the Planning Director.

[c] CUP = conditional use permit. No setback from parcel lines is required within the same wind energy CUP boundary. Knowledge of proposed wind energy CUPs on adjacent parcels to be based on best available information at the time of the subject application.

[D] Measured from the center of the conductor line nearest the turbine.

2.4.1.2 Wind Turbine Installation

Foundations

The type of turbine foundation used depends on terrain, wind speeds, and wind turbine type. Two foundation types may be used in repowering APWRA wind projects: an inverted "T" slab foundation or a concrete cylinder foundation. An inverted T slab foundation is a type of spread footing foundation. A single concrete pad is placed at ground level, although part of the pad may be placed below ground level depending on the slope. At the center of the pad is a cylindrical concrete pedestal to which the wind turbine tower is bolted—hence the name, inverted T.

A concrete cylinder foundation is a large concrete cylinder with a concrete pedestal that is slightly larger than the tower base diameter. The size of the concrete cylinder and pad is determined by wind turbine size and site-specific conditions (e.g., expected maximum wind speeds, soil characteristics). Its weight must be sufficient to hold the wind turbine in place.

Either type of foundation is typically formed by placing concrete in an excavated footing with reinforced steel. The foundation would be installed immediately within the turbine work area adjacent to the crane pad. While the foundation type is determined by terrain, wind speeds, and turbine type, in general, the foundation is formed by placing concrete in an excavated footing with reinforced steel. A small graveled area would encircle each foundation to facilitate maintenance access. The total diameter of the final Project footprint for each turbine, including the graveled area, would be approximately 60 feet.

Construction

Repowered turbine construction entails placement of a foundation, new tower, rotor, nacelle, and transformer. Construction and installation of repowered turbines is regulated by County conditions of approval, building permit requirements, and grading permit requirements.

At each turbine site, a level turbine work area would be graded to support the construction of tower foundations and to support the use of large cranes to lift the turbine components into place. The extent and shape of grading at each turbine site would depend on local topography; however, each site would require approximately 2.9 acres of graded area to support the construction of foundations and installation of turbines. A crane pad would be leveled and graded within the turbine work area at each turbine site. The crane pad—a flat, level, and compacted area—would provide the base from which the crane would work to place the turbine. Most wind turbine construction activities would take place within the turbine work area. Following construction, the turbine work area would be reclaimed.

Construction and installation of turbines in this area is regulated by the County's conditions of approval, building permit requirements, and grading permit requirements. The turbine towers, nacelles, and blades are delivered to each turbine location in the order of assembly, once the concrete of the foundation has been poured and has cured sufficiently. Large cranes are brought to each site to lift and assemble the turbine components. First, the base section of the tower is secured to the foundation using large bolts. The remaining tower sections are then lifted with the crane and connected to the base section. After the nacelle and rotor are delivered to the turbine site, the turbine blades are bolted to the rotor hub, and the nacelle and rotor are lifted by a crane and connected to the main shaft.

Excess rock generated by foundation construction would be spread on existing roads and maintenance areas surrounding the turbines. Old foundations from the previous wind project onsite may be removed if they are within proposed construction areas, if removal is necessary for the installation of new turbines, or to comply with landowner agreements or County requirements; such removals would involve workers demolishing the foundations using jackhammers or similar tools. The material from old turbine foundations may be reused for road base or hauled offsite to the Altamont Landfill.

2.4.2 Site Preparation and Access Roads

Fourth-generation turbine towers and blades are significantly longer than older turbine components and require larger and longer trucks and cranes for transport and installation. These vehicles require wider roads with shallower turns and gradients than are currently present in the Project area. Consequently, the existing road infrastructure must be upgraded to accommodate construction of the turbines. Road infrastructure upgrades would include grading, widening, and re-graveling of

the existing roads. Existing road widths vary from 12 to 20 feet; future roads are expected to be approximately 20 feet wide. New roads may be needed in areas where existing roads do not provide access to proposed turbine locations.

Most roads in the portion of the Project area where new turbines would be installed would be temporarily widened to approximately 40 feet to accommodate larger towers as well as the larger equipment necessary to install them. It is likely that the locations where roads curve as they climb hills to the ridgetops would require more roadwork and would be widened to more than 40 feet in some spots to safely accommodate the larger equipment. In addition, access road entrances from main roads onto the Project site would need to be widened to provide sufficient space for the minimum turning radius of construction cranes and other flatbed delivery trucks. Lands subject to temporary road widening beyond a 20-foot permanent width would be reclaimed after construction.

Culverts are generally installed as part of the road drainage system on slopes, although some are installed at small stream crossings. Existing culverts may need to be replaced with larger culverts or reinforced to provide adequate size and strength for construction vehicles.

2.4.3 Staging Areas

Seven staging areas of various sizes, totaling up to 34 acres, would be established in the Project area. These areas would be used for the storage of turbine components, construction equipment, water tanks, office trailers, and other supplies needed for Project construction. The trailers would be used to support workforce needs and site security, and would also house a first aid station, emergency shelter, and hand tool storage area for the construction workforce. Parking areas would be located near the trailers. Vegetation would be cleared and the staging areas would be graded level. These areas would use native material, supplemented with gravel or soil stabilizer, if needed, and appropriate erosion control devices (e.g., earth berm, silt fences, straw bales) would be installed to manage water runoff. Diversion ditches would be installed, as necessary, to prevent stormwater from running onto the site from surrounding areas. Following completion of construction activities, the contractor would restore the temporary staging areas. The gravel surface would be removed, and the areas would be contour graded (if necessary and if environmentally beneficial) to conform with the natural topography. Stockpiled topsoil would be replaced, and the area would be stabilized and reseeded with an appropriate seed mixture.

2.4.4 Meteorological Towers

Three permanent meteorological towers would be installed in strategic locations onsite to monitor wind speeds and to calibrate turbines. The permanent meteorological towers would be a freestanding tower design without guy wires, approximately 80 meters tall. The permanent meteorological towers would each require a small concrete foundation and graveled area around the tower, as well as an access road to facilitate maintenance activities. The small foundation and graveled area would be approximately 30 feet in diameter.

2.4.5 Power Collection System

Each new wind turbine must be connected to the medium-voltage electrical collection system via a pad-mounted transformer. The collection system carries electricity generated by the turbines to a substation, where the voltage level of the collection system is stepped up to that of the power grid. From the substation, electricity is carried through an interconnection point to the transmission lines

that distribute electricity to the power grid. Transmission lines in the Project vicinity are maintained by PG&E. Each of the collection system components is discussed below.

2.4.5.1 Collection Lines

Medium-voltage collection lines would collect power from each turbine for conveyance to the substation. Medium-voltage lines are normally up to 35 kilovolts (kV). The new medium-voltage collection lines would be installed underground as close to Project roads as possible to minimize ground disturbance as well as to facilitate access for any necessary O&M activities on the lines.

Installation of underground medium-voltage lines is accomplished in most cases using a cut-and-cover construction method. A disturbance width of 20 feet is generally standard to allow for the trench excavation and equipment, but this width may vary depending on the topography and soil type. Typically, the topsoil is separated from the subsurface soil for later replacement. A 3-foot-wide trench is then plowed using a special bulldozer attachment that buries the line in the same pass in which it digs the trench. Once the collection lines are in place, the trench is partially backfilled with subsurface soil. Typically, communication lines are then placed in the trench. The trench is then backfilled with the remaining subsurface soil, compacted, and covered with the reserved topsoil.

To minimize surface disturbance within wetlands and streams, collection lines may be installed under wetlands and other waters using horizontal directional drilling (HDD) techniques, where feasible. HDD involves the use of a steered drilling head, which allows the bore machine to sit at ground level, bore down along on the collection line route, and to direct the bore back up to the surface at a distant point. The bore machine uses a drilling fluid in the process, typically a mixture of fine clay (such as bentonite) and fresh water. The clay and water mixture coats the wall of the borehole to help hold it open and to provide lubrication for the drill stem and conduit being installed. Excess drilling fluid is typically captured using a vacuum truck.

Collection lines would terminate near the edge of the property where power would be conveyed offsite to the substations through gen-tie lines. The gen-tie lines would be installed underground or overhead, making use of existing overhead power poles where possible. If gen-tie lines are carried on existing poles, these lines would need to be strung with new conducting wire (i.e., reconductored), requiring work areas (i.e., pull sites) to string the upgraded power line. Additionally, some power poles may need to be replaced. If new overhead collection or gen-tie line facilities are required, they would be completed in compliance with the latest recommendations of the Avian Power Line Interaction Committee (APLIC).

Three offsite gen-tie corridors would be used for the Project as listed below and shown in Figures Figure 2-2a through 2-2c.

- **Gen-tie 1**—Heading west from the Project area approximately 3.4 miles adjacent to Altamont Pass Road, 0.14 mile south along a private road, into the Santa Clara substation.
- **Gen-tie 2**—Heading east from the Project area approximately 1 mile adjacent to Altamont Pass Road, 0.5 mile north and west on private land, into the AML substation.
- **Gen-tie 3**—Heading south from the Project area approximately 0.4 mile adjacent to Mountain House Road, 0.8 mile southwest adjacent to Grant Line Road, 0.6 mile west adjacent to Altamont Pass Road, 0.5 mile north and west on private land, into the AML substation.

Gen-tie 3 may not be needed if collection lines from the northern and eastern parcels are routed directly across the California Aqueduct where it bisects the plan area as opposed to the alignments described above.

2.4.5.2 Transformers and Power Poles

Transformers boost the voltage of the electricity produced by the turbines to the voltage of the collection system. Each turbine would have its own transformer adjacent to or within the turbine, either mounted on a small pad adjacent to the turbine or within the tower.

The installation of overhead power lines and poles onsite would be limited to locations where underground lines are infeasible and locations immediately outside the substations where underground medium-voltage lines come aboveground to connect to the substations.

To install power poles, a laydown area is required. To mount the medium-voltage lines on a power pole, a pull site and a tension site are required. Pole sites, pull sites, tension sites, access roads, and laydown areas are cleared (i.e., mowed) if necessary. Pole holes and any necessary anchor holes are excavated. Where possible, a machine auger is used to install poles. The width and depth of the setting hole depends on the size of the pole, soil type, span, and wind loading.

Power poles are framed, devices installed, and any anchors and guy wires are installed before the pole is set. Anchors and guy wires installed during construction are left in place. After setting the pole, conductors are strung.

2.4.5.3 Substations

The main functions of a collector substation are to step up the voltage from the turbine collection lines to the transmission level and to provide fault protection. The basic elements of the substation facilities are a control house, a bank of one or two main transformers, outdoor breakers, capacitor banks, relaying equipment, high-voltage bus work, steel support structures, an underground grounding grid, and overhead lightning-suppression conductors. The main outdoor electrical equipment and control house are installed on a concrete foundation. The Project would connect to two existing substations as described below.

The AML substation served as the collector substation for a portion of the previous wind project. The AML substation consists of a graveled footprint area of approximately 0.6 acre, a 12-foot chain-link perimeter fence, and an outdoor lighting system. The AML substation would not be expanded; however, equipment within the existing fence may be upgraded for the repowering Project. Any new lights would be shielded or directed downward to reduce glare. The upgraded substation would remain fenced in keeping with the fencing around the existing substation (i.e., 12-foot chain link perimeter fencing).

The Santa Clara substation consists of a graveled footprint area of approximately 0.2 acre, a 12-foot chain-link perimeter fence, and an outdoor lighting system. The Santa Clara substation would not be expanded; however, equipment within the existing fence may be upgraded for the repowering Project.[1] Any new lights would be shielded or directed downward to reduce glare. The upgraded

[1] The Santa Clara substation is the connection point for the Rooney Ranch Wind Repowering Project, proposed by the same developer. If the Rooney Ranch Wind Repowering Project is constructed, it would include an expansion of the substation to a 0.3-acre footprint.

substation would be fenced in keeping with the fencing around the existing substation (i.e., 12-foot chain link perimeter fencing).

2.4.6 Operations and Maintenance Facility

An O&M building would be constructed onsite. Operations, storage, and repairs would take place at the facility. Upon completion of construction, the O&M facility would receive power from tapping into the existing PG&E powerlines. The line tap would be undergrounded along proposed access roads. Portable restrooms would be used during the construction phase, and the O&M building restroom facilities would be used during operation. An onsite wastewater treatment system would be required for the permanent restroom facilities and would be subject to permitting by the Alameda County Department of Environmental Health. If an onsite wastewater treatment system is determined to be infeasible, portable toilets, serviced by a contractor, would be used instead. The O&M building, parking, and equipment storage could occupy approximately 2 acres; the building or buildings would have floor space no greater than 10,000 square feet. Two locations are being considered for the O&M building (Figures 2-2a through 2-2c), referred to as O&M Option A and O&M Option B. The final location would be selected by Sand Hill based on site conditions and final lease agreements.

2.5 Project Construction

Turbines would be delivered to the site from the Port of Stockton or other nearby port or rail transfer locations. Tower assembly requires the use of one large track-mounted crane and two small cranes. The turbine towers, nacelles, and rotor blades would be delivered to each foundation site and unloaded by crane. A large track-mounted crane would be used to hoist the base tower section vertically then lower it over the threaded foundation bolts. The large crane would then raise each additional tower section to be bolted through the attached flanges to the tower section below. The crane then would raise the nacelle, rotor hub, and blades to be installed atop the tower. Two smaller wheeled cranes would be used to offload turbine components from trucks and to assist in the precise alignment of the tower sections. Estimated disturbance areas associated with Project construction and were calculated by estimating disturbance associated with each alternative layout, and using the scenario that would result in the most extensive impacts (Table 2-4).

Table 2-4. Estimated Disturbance Associated with Project Construction (acres)[a]

Project Component/Activity	Permanent Impacts	Temporary Impacts
Power collection system installation	0.0	31.5
Gen-tie installation	0.0	15.0
Staging areas installation	0.0	34.5
O&M facility installation	2.0	3.0
New access roads	10.6	7.6
Access road expansion[b]	7.9	24.3
Turbine foundation installation	2.6	107.0
Meteorological tower installation	0.2	0.6
Total	23.3	223.5

[a] Three alternative layouts are proposed; the estimated disturbance reflects the layout with the most extensive impacts.

[b] Existing access roads would be reused to the extent possible; however, some sections of new access road would be required.

2.5.1 Schedule

Project construction would proceed after all construction-related permits are issued. These activities are anticipated to proceed according to the sequence described below. Construction-related best management practices (BMPs) would be implemented during the November–April wet season. The final approved work hours would be specified in the proposed Project's CUP. If extended hours are necessary or desired, the appropriate approvals would be sought.

2.5.2 Construction Sequence

Typical construction steps are listed below.

- Demarcation of construction areas and any sensitive biological, cultural, or other resources needing protection.
- Construction of temporary staging areas.
- Road infrastructure upgrades.
- Erosion and sediment control.
- Wind turbine construction.
    - Final site preparation.
    - Crane pad construction.
    - Foundation excavation and construction.
    - Tower assembly.
    - Installation of nacelle and rotor.
- Power collection system and communication line installation.

- Gen-tie installation
- Upgrades to the substation.
- Permanent meteorological tower installation.
- Final cleanup and restoration.

Construction of the O&M building would not depend on the sequence of construction for the rest of the Project.

The construction contractors would prepare the Project area, deliver and install the Project facilities, oversee construction, and complete final cleanup and restoration of the construction sites. Sand Hill would implement BMPs consistent with standard practice and with the requirements of the PEIR as well as any state or federal permits to minimize soil erosion, sedimentation of drainages downslope of the Project area, and any other environmental impacts. Examples of likely erosion control measures are listed below.

- Use of straw wattles, silt fences/straw bale dikes, and straw bales to minimize erosion and collect sediment (to protect wildlife, no monofilament-covered sediment control measures would be used).
- Reseeding and restoration of the site.
- Maintenance of erosion control measures.
- Regular inspection and maintenance of erosion control measures.

The construction activities and the approximate duration of each are listed below.

- Staging areas: 2 weeks.
- Road construction: 8 weeks.
- Foundations/electrical: 8 weeks.
- Turbine delivery and installation: 12 weeks.
- Electrical trenching and substation upgrades: 12 weeks.
- Cleanup: 12 weeks.

2.5.3 Demarcation of Sensitive Resources

Sensitive resources in and adjacent to construction areas would be marked to ensure adequate avoidance. Sensitive areas identified through the environmental approval and permitting processes would be staked and flagged. Prior to construction, the construction contractor and any subcontractors would conduct a walk-through of areas to be affected, or potentially affected, by construction activities. The preconstruction walk-throughs would be conducted regularly to identify sensitive resources to be avoided, limits of clearing, location of drainage features, and the layout for sedimentation and erosion control measures. Following identification of these features, specific construction measures would be reviewed, and any modifications to construction methods or locations would be agreed upon before construction could begin.

2.5.4 Workforce

Based on data provided for typical wind energy projects of similar size, an average of 75 workers would be employed during construction, with a peak workforce of 150 workers. Craft workers would include millwrights, iron workers, electricians, equipment operators, carpenters, laborers, and truck drivers. Local construction contractors and suppliers would be used to the extent possible.

2.5.5 Construction Equipment

Equipment used for construction of repowering activities often includes the types listed below.

- Cranes
- Lowboys/trucks/trailers
- Flatbed trucks
- Service trucks (e.g., pickup trucks)
- Backhoes
- Bulldozers
- Excavators
- Graders
- Dump trucks
- Track-type dozers
- Rock crushers
- Water trucks
- Compactors
- Loaders
- Rollers
- Drill rigs
- Trenching cable-laying vehicles
- Cement trucks
- Concrete trucks and pumps
- Small hydraulic cranes
- Heavy and intermediate cranes
- Forklifts
- Generators

2.5.6 Hazardous Materials Storage

Hazardous materials (e.g, fuel, lubricants, other oils) would be stored at the staging area (use of extremely hazardous materials is not anticipated). To minimize the potential for harmful releases of

hazardous materials through spills or contaminated runoff, these substances would be stored within secondary containment areas in accordance with federal, state, and local requirements and permit conditions. Storage facilities for petroleum products would be constructed, operated, and maintained in accordance with the Spill Prevention Control and Countermeasures (SPCC) Plan that would be prepared and implemented for the proposed Project (Title 40 Code of Federal Regulations Part 112). The SPCC Plan would specify engineering standards (for example, secondary containment); administrative standards (for example, training with special emphasis on spill prevention, standard operating procedures, inspections); and BMPs.

A Hazardous Materials Business Plan (HMBP) would be developed for the proposed Project. The HMBP would contain specific information regarding the types and quantities of hazardous materials, as well as their production, use, storage, spill response, transport, and disposal.

2.5.7 Traffic and Parking

Construction traffic routing would be established in a Construction Traffic Plan, which would include a traffic safety and signing plan prepared by Sand Hill in coordination with the County and other relevant agencies. The plan would define hours, routes, and safety and management requirements.

This plan would incorporate measures such as informational signs, traffic cones, and flashing lights to identify any necessary changes in temporary roadway configuration. Flaggers with two-way radios would be used to control construction traffic and reduce the potential for accidents along roads. Speed limits would be set commensurate with road type, traffic volume, vehicle type, and site-specific conditions as necessary to ensure safe and efficient traffic flow. Onsite construction traffic would be restricted to the roads developed for the proposed Project. Use of existing unimproved roads would be restricted to emergency situations.

Vehicle trips to the site during construction would include oversized vehicles delivering wind turbine generator and substation materials, heavy equipment, and other construction-related materials. Construction of the proposed Project components (roads, turbines, substation, and electrical/communication lines) would take place concurrently, using individual vehicles for multiple tasks. There would also be daily round trips of vehicles transporting construction personnel to the site. The total number of trips would be estimated to support subsequent analysis by the County.

Construction-related parking would be directed to the construction staging areas. Carpooling would be used whenever possible.

After construction, O&M of the proposed Project would require fewer trips, consisting mostly of pickups or other light-duty trucks.

2.5.8 Water and Wastewater Needs

Water for construction activities would be provided through an agreement with municipal or private suppliers. Temporary onsite water tanks and water trucks would be made available for fire water support, dust suppression, and construction needs. Daily water use would vary, depending on the weather conditions and time of year, both of which affect the need for dust control. Hot, dry, windy conditions would necessitate greater amounts of water. Tanker trucks would apply water to construction areas where needed to aid in road compaction and reduce construction-generated

dust. A minimal amount of water would be required for construction worker needs (drinking water, sanitation facilities). This water would be trucked in or delivered as bottled drinking water. A local sanitation company would provide and maintain appropriate construction sanitation facilities. Portable toilets would be placed at each of the staging areas. When necessary, additional facilities would be placed at specific construction locations. Appropriate BMP training would be provided to truck operators to prevent runoff from dust suppression and control activities. Water used for cement mixing and truck washing would be managed in accordance with applicable permit conditions (and BMPs).

While the proposed Project would require only a minimal amount of water on a temporary basis during construction, and an even smaller amount of water during operations for the O&M building, Sand Hill has voluntarily prepared a water supply assessment (WSA) for the purpose of ensuring that sufficient water supply is available for the proposed Project. Water for construction (primarily for dust control) would be obtained from Zone 7 Water Agency, Byron-Bethany Irrigation District, the City of Livermore, or other approved water district or agency if available. Water for operations would be obtained from a groundwater source by installing an onsite well. The WSA concludes that there is an adequate water supply available to meet the needs of the proposed Project for both construction activities and operations.

2.5.9 Inspection and Startup Testing

Prior to operation, each completed turbine would be inspected and checked for mechanical, electrical, and control functions in accordance with the manufacturer's specifications before being released for startup testing. A series of startup procedures would then be performed by the manufacturer's technicians. Electrical tests on the transformers, underground power lines, and collector substations would be performed by qualified engineers, electricians, and test personnel to ensure that electrical equipment is operating within tolerances and that the equipment has been installed in accordance with design specifications. The aboveground power lines interconnecting to the PG&E system would be tested and inspected as required.

2.5.10 Restoration

Clearing and disposing of trash, debris, and scrub on those portions of the site where construction would occur would be performed at the end of each workday through all stages of construction. Existing vegetation would be cleared only where necessary. All excavations would be backfilled with compacted earth and aggregate as soon as cable infrastructure is tested. Disposal of cuttings and debris would be in an approved facility designed to handle the waste.

Before construction is complete, all remaining trash and debris would be removed from the site. Any debris would be properly disposed of offsite consistent with restoration requirements for nearby projects and described in a Reclamation Plan, which would be developed prior to construction as part of the construction planning and permitting process. Any material placed in the areas of the foundations or roads would be compacted as required for soil stability.

2.5.11 Safety and Environmental Compliance Programs

2.5.11.1 Quality Assurance and Quality Control

A quality assurance/quality control (QA/QC) program would be implemented to ensure that construction and startup of the facility are completed as specified. Sand Hill would be responsible for ensuring implementation of the QA/QC program prior to construction. The program would specify implementing and maintaining QA/QC procedures, environmental compliance programs and procedures, and health and safety compliance programs and procedures, and would integrate Sand Hill's activities with the contractors during Project construction. The engineering procurement and construction contractor and turbine supplier would be responsible for enforcing compliance with the construction procedures program for all of their subcontractors.

2.5.11.2 Environmental Compliance

Orientation of construction staff would include education on the potential environmental impacts of Project construction. The construction manager would establish procedures for staff to formally report any issues associated with the environmental impacts, to keep management informed, and to facilitate rapid response.

2.5.11.3 Stormwater Control

Because the Project would disturb more than 1 acre, it would require coverage under the state's General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Order 2010-0014-DWQ) (Construction General Permit). Permit coverage would be obtained by submitting permit registration documents (PRDs) to the State Water Resources Control Board through its Stormwater Multiple Application and Report Tracking System (SMARTS) website. The PRDs include a notice of intent, site maps, a stormwater pollution prevention plan (SWPPP), a risk level assessment, and other materials. The SWPPP would include the elements described in Section A of the Construction General Permit and maps that show the location and type of erosion control, sediment control, and non-stormwater BMPs, all of which are intended to prevent significant water quality impacts on receiving waters. The SWPPP would also describe site inspection, monitoring, and BMP maintenance procedures and schedules.

2.5.11.4 Safety Compliance

Sand Hill and its construction contractors and subcontractors would be responsible for construction health and safety issues. The contractor would provide a health and safety (H&S) coordinator, who would ensure that applicable laws, regulations, ordinances, and standards concerning health and safety are followed and that any identified deficiencies are corrected as quickly as possible. The H&S coordinator would conduct onsite orientation and safety training for contract and subcontract employees and would report back to the onsite construction manager. Upon identification of a health and safety issue, the H&S coordinator would work with the construction manager and responsible subcontractor or direct hire workers to correct the violation.

2.5.11.5 Emergency Situations

If severe storms result in a downed power line, standard O&M procedures would be applied. The turbines would be equipped with internal protective control mechanisms to safely shut them down

in the event of a high-voltage grid outage or a turbine failure related to fire or mechanical problems. A separate low-voltage distribution service feed might be connected to the low-voltage side of the collector substations as a backup system to provide auxiliary power to Project facilities in case of outages. For safety, the collector substations would be fenced, locked, and properly signed to prevent access to high-voltage equipment. Safety signage would be posted around turbines, transformers, and other high-voltage facilities and along roads, as required.

2.5.11.6 Public Access and Security

The Project would be located entirely on properties with restricted public access. Only authorized access to the Project site would be allowed. The site is fenced and the collector substations would be fenced with an additional 12-foot-high chain-link fence to prevent public and wildlife access to high-voltage equipment. Safety signs would be posted in conformance with applicable state and federal regulations around all turbines, transformers, and other high-voltage facilities and along access roads. Vegetation clearance would be maintained adjacent to Project ingress and egress points and around the collector substations, transformers, and interconnection riser poles.

2.5.11.7 Hazardous Materials Storage and Handling

The County's Hazardous Materials Program Division is the Certified Unified Program Agency (CUPA) for all areas of Alameda County. Management of hazardous materials would be conducted in accordance with a County-approved HMBP developed for the proposed Project pursuant to the requirements of the CUPA. Hazardous materials used during O&M activities would be stored within the proposed O&M building in aboveground containers with appropriate spill containment features as prescribed by the local fire code or the SPCC Plan for the O&M building as stipulated by the appropriate regulatory authority. Such materials would be similar in type and amount to those currently stored and used for O&M for the existing facility.

Lubricants used in the turbine gearbox are potentially hazardous. The gearbox would be sealed to prevent lubricant leakage. The gearbox lubricant would be sampled periodically and tested to confirm that it retains adequate lubricating properties. When the lubricants have degraded to the point where they are no longer adequate, the gearbox would be drained, new lubricant added, and the used lubricants disposed of at an appropriate facility in accordance with all applicable laws and regulations.

Transformers contain oil for heat dissipation. The transformers are sealed and contain no polychlorinated biphenyls or moving parts. The transformer oil would not be subject to periodic inspection and does not need replacement.

O&M vehicles would be properly maintained to minimize leaks of motor oil, hydraulic fluid, and fuel. During operation, O&M vehicles would be serviced and fueled at the proposed O&M building (using mobile fuel tanks) or at an offsite location. No storage tanks are located at the existing project, and none are proposed.

2.6 Operation and Maintenance Activities

Maintenance of turbines and associated infrastructure includes a wide variety of activities. Routine maintenance involves activities such as checking torque on tower bolts and anchors; checking for

cracks and other signs of stress on the turbine mainframe and other turbine components; inspecting for leakage of lubricants, hydraulic fluids, and other hazardous materials and replacing them as necessary; inspecting the grounding cables, wire ropes and clips, and surge arrestors; cleaning; and repainting. Most routine maintenance activities occur in and around the tower and the nacelle. Cleanup from routine maintenance activities would be conducted at the time maintenance is performed by the O&M personnel. While performing most routine maintenance activities, O&M staff would travel by pickup or other light-duty trucks. In addition, nonroutine maintenance such as repair or replacement of rotors or other major components could be necessary. Such maintenance would involve use of one or more cranes and equipment transport vehicles.

Monitoring of Project operations would be computer-based; computers in the base of each turbine tower would be connected to the O&M facility through fiber-optic or wireless telecommunication links.

The O&M workforce would consist of turbine technicians, operations personnel, administrative personnel, and management staff. O&M staff would monitor turbine and system operation, perform routine maintenance, shut down and restart turbines when necessary, and provide security. All O&M staff would be trained regularly to observe BMPs. Approximately four to six full-time staff would be required to conduct O&M activities.

2.7 Post-Project Decommissioning

The anticipated life of the windfarm is more than 30 years, as upgrading and replacing equipment could extend the operating life indefinitely with appropriate permit approvals. However, the life of the Project for CEQA purposes would be 35 years.

Decommissioning would involve removing the turbines, transformers, and related infrastructure in accordance with landowner agreements. Substations and met towers may be removed and the sites reclaimed; alternatively, the sites could be retained for continued use. A single large crane would be used to disassemble the turbines, and smaller cranes would lift the parts onto trucks to be hauled away. Generally, turbines, electrical components, and towers would either be refurbished and resold or recycled for scrap. All unsalvageable materials would be disposed of at authorized sites in accordance with federal, state, and local laws, regulations, ordinances, and adopted policies in effect at the time of final decommissioning. Existing service roads would be used. Road reclamation would be accomplished using scrapers and gravel trucks. Site reclamation after decommissioning would be subject to a locally approved reclamation plan. Based on site-specific requirements, the reclamation plan would include regrading, spot replacement of topsoil, and revegetation of disturbed areas with an approved seed mix.

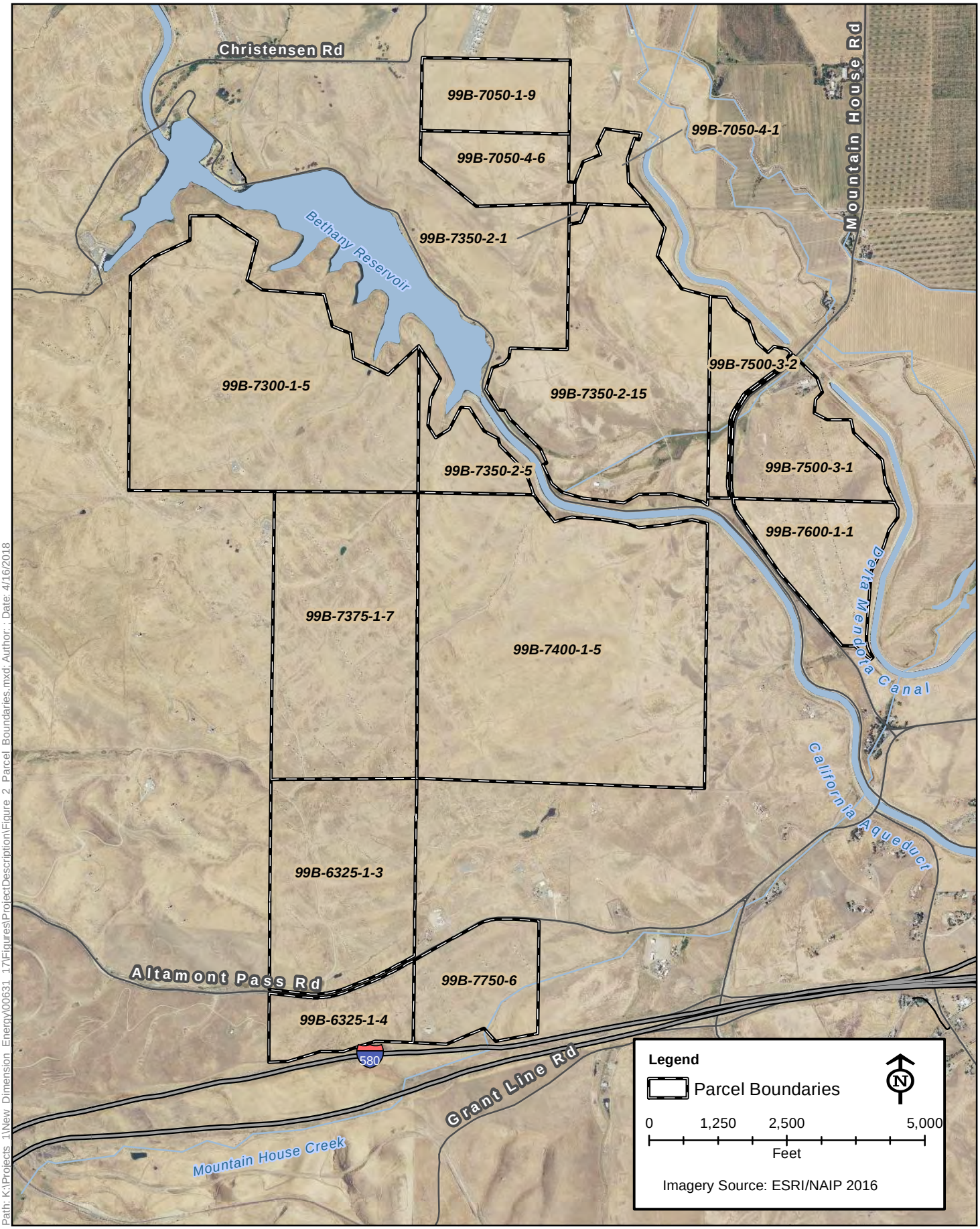

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Figure 2-1
Parcel Boundaries

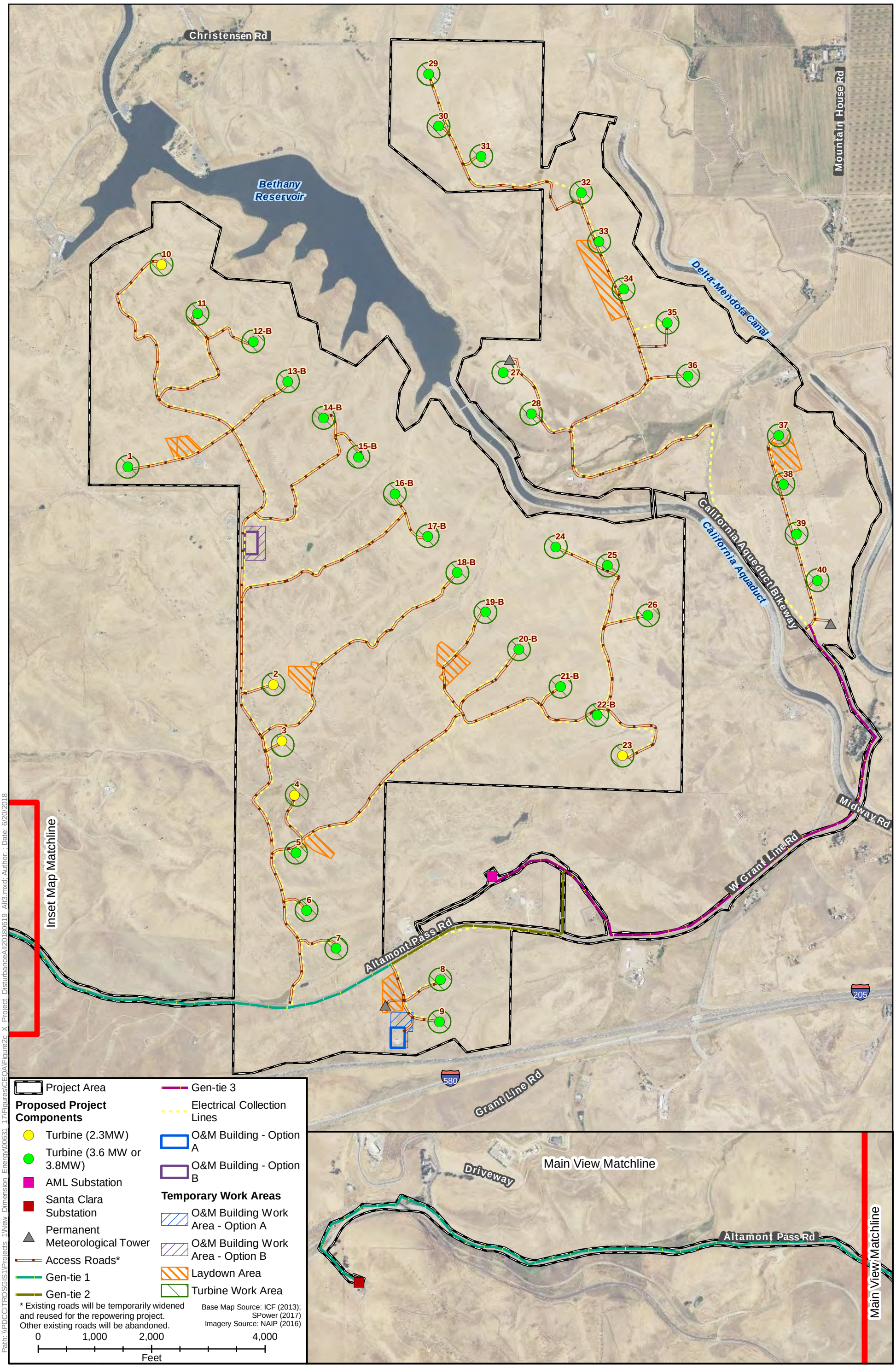

Figure 2-2c
Sand Hill Wind Repowering Project—Layout 3

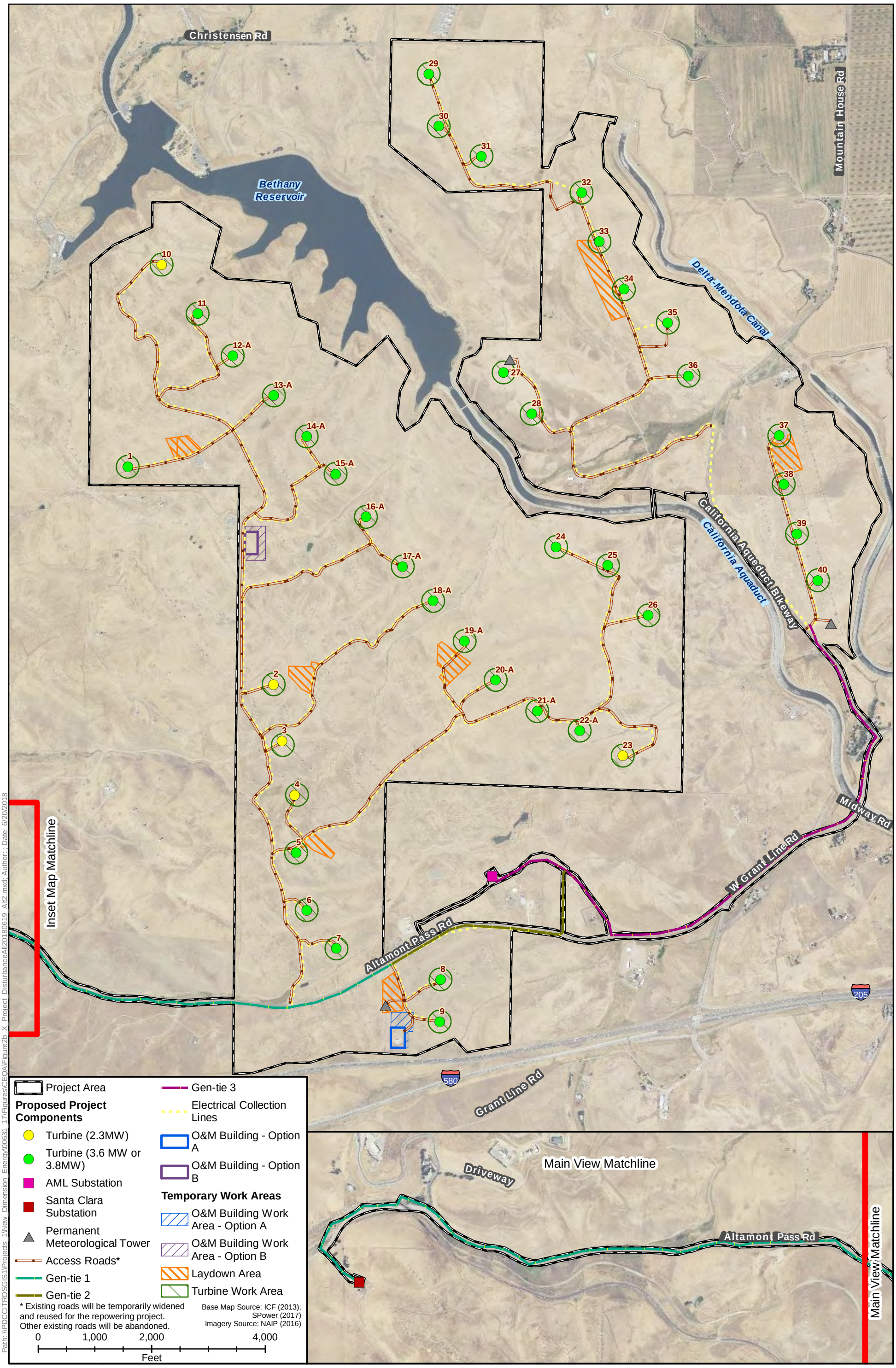

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Figure 2-2b
Sand Hill Wind Repowering Project—Layout 2

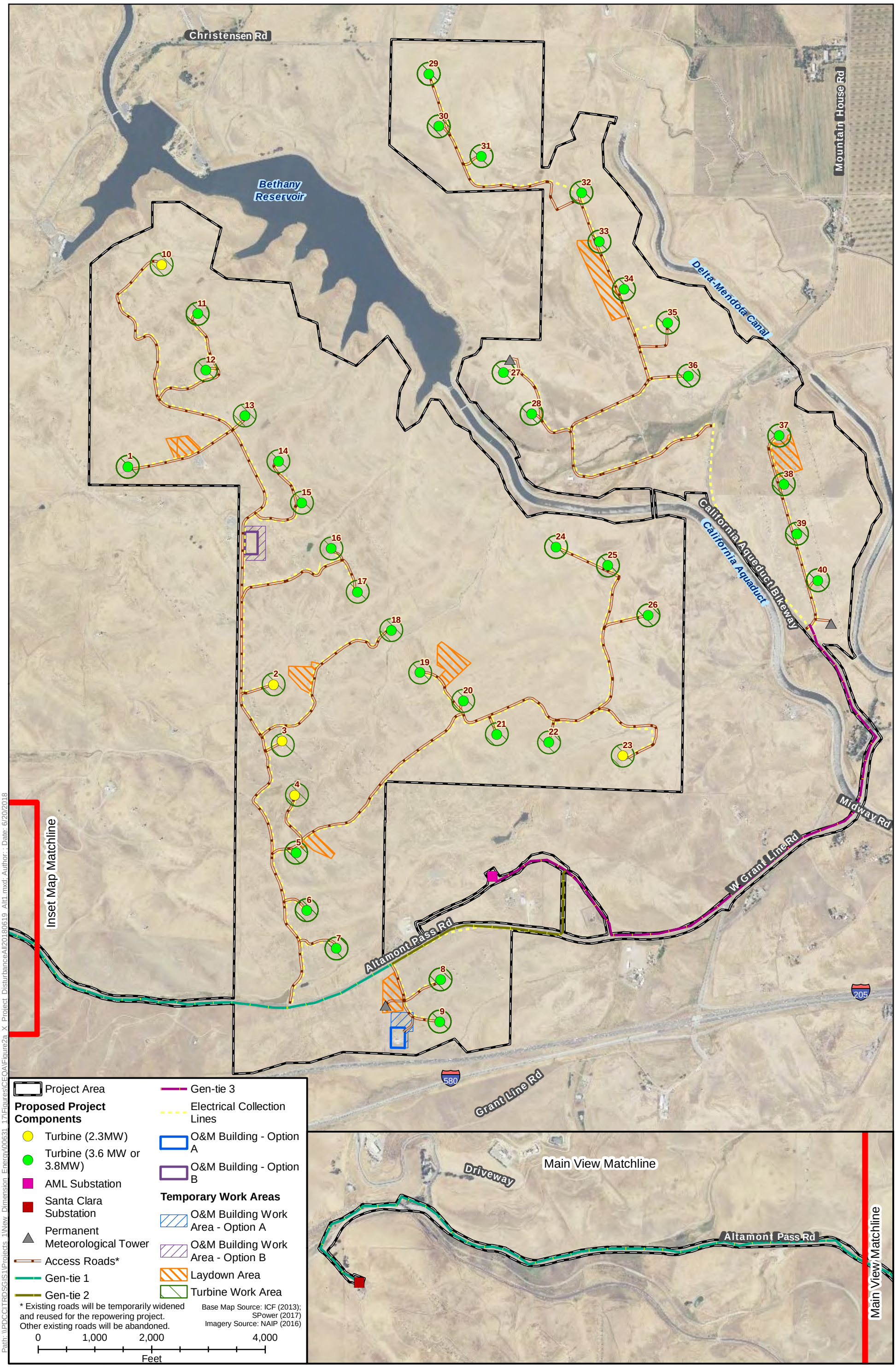


Figure 2-2a
Sand Hill Wind Repowering Project—Layout 1

Chapter 3
Environmental Analysis

As discussed in Chapter 1, *Introduction*, the analysis in this document parallels the organization of the PEIR. While some resource topics might have been summarily dismissed, it was deemed preferable to provide a brief argument supporting the decision to omit a more detailed analysis.

The resource discussions are organized as shown below. Where references are cited, they are provided at the end of each section.

- Section 3.1—Aesthetics and Visual Resources
- Section 3.2—Agricultural and Forestry Resources
- Section 3.3— Air Quality
- Section 3.4—Biological Resources
- Section 3.5—Cultural Resources
- Section 3.6—Geology, Soils, Mineral Resources, and Paleontological Resources
- Section 3.7—Greenhouse Gas Emissions
- Section 3.8—Hazards and Hazardous Materials
- Section 3.9—Hydrology and Water Quality
- Section 3.10—Land Use and Planning
- Section 3.11—Noise
- Section 3.12—Population and Housing
- Section 3.13—Public Services
- Section 3.14—Recreation
- Section 3.15—Transportation/Traffic
- Section 3.16—Utilities and Service Systems

3.1 Aesthetics and Visual Resources

The PEIR presented a broad and thorough analysis of the impacts on aesthetics and visual resources that would result from repowering the program area, selecting key viewpoints to develop photo simulations comparing the view under existing conditions with the same view under repowered conditions. To conduct the Project-level analysis, analysts selected eight Project-specific viewpoints to characterize visual changes that would result from Project implementation (Figure 3.1-1).

- Viewpoint 1—Looking southwest from the California Aqueduct Bikeway on the north shore of Bethany Reservoir.
- Viewpoint 2—Looking east along Christensen Road near the Bethany Reservoir entrance road.
- Viewpoint 3—Looking south along Bruns Road from 0.15 mile south of the Kelso Road intersection.
- Viewpoint 4—Looking southwest along Mountain House Road from 1.4 miles south of the Kelso Road intersection.
- Viewpoint 5—Looking north by northwest along Mountain House Road from just north of the Grant Line Road intersection.
- Viewpoint 6—Looking west by northwest from the California Aqueduct Bikeway at the Grant Line Road crossing of the California Aqueduct.
- Viewpoint 7—Looking west by northwest from westbound Interstate (I-) 580 at the West Grant Line Road onramp.
- Viewpoint 8—Looking northeast from Altamont Pass Road at an unnamed access road.

A review of each of the alternative layouts was conducted to determine if any particular layout was substantially different from a visual analysis perspective. The results of that review indicated that the layouts were not substantially different; Layout 2 was selected for the visual simulations (the layout with the "middle" group of turbines). As noted previously, the "middle" group of 11 turbines located south of Bethany Reservoir have different locations in each of the three layouts. Visual simulations were prepared for each viewpoint using the largest and tallest turbines considered to ensure that the most severe visual impacts would be considered.

3.1.1 Existing Conditions

As described in the PEIR, the Project vicinity, in the northeastern portion of the AWPRA, is mostly characterized by grass-covered, rolling hills, with road cuts to accommodate rural roads and I-580. Strings of turbines, power lines, transformers, access roads, and substations are the most visually distinct artificial features throughout most the vicinity. Rural residences dot the vicinity surrounding the Project area, but only a single residence is within it. The California Aqueduct, the California Aqueduct Bikeway, and Bethany Reservoir lie between the eastern and western portions of the Project area. The eastern terminus of the Brushy Peak Regional Preserve to Bethany Reservoir regional multiuse trail is immediately outside the northwestern boundary of the Project area.

Mountain House Road, a County-designated scenic roadway, passes through the eastern portion of the Project area (Figure 3.1-1). The area northwest of the road is currently undeveloped, although it

supported wind turbines in the past. Numerous older generation turbines are present on the southeast side of the road.

3.1.2 Environmental Impacts and Mitigation Measures

The Project-level analysis was based on review of the PEIR and on the visual photo simulations listed above. These photo simulations are presented in Figures 3.1-2 through 3.1-9.

The PEIR relied on a qualitative evaluation of the visual impacts of repowering the program area overall. In general, the PEIR characterized the new repowered turbines across the program area in comparison with the existing old-generation turbines. The Sand Hill Project's turbines would have a slightly longer blade length (i.e., 15 feet) and rotor-swept area than the turbines evaluated in the PEIR, but the Project would require fewer turbines because each would have a higher capacity than those contemplated in the PEIR. The longer blade length is not expected to be visually noticeable from nearby roads or residences because the proposed turbines are consistent with the overall dimensions of those evaluated in the PEIR; consequently, the analysis in the PEIR is relevant and appropriate for the Project. Accordingly, the applicant's proposal to use slightly larger turbines would not constitute a new significant effect or a substantial increase in the severity of effects on visual resources compared to those described in the PEIR. Additional analysis specific to the Project is provided below.

Impact AES-1: Temporary visual impacts caused by construction activities (less than significant with mitigation)

The PEIR concluded that construction activities could result in a significant impact, particularly for highly sensitive viewers such as residents and recreationists. The analysis specifically called out Bethany Reservoir, which is surrounded by the Sand Hill Project area, as well as scenic roadways and recreational trails. Accordingly, the potential visual impacts associated with construction as addressed in the PEIR would apply to the Project; as concluded in the PEIR, implementation of *Mitigation Measure AES-1, Limit construction to daylight hours*, would reduce these impacts to a less-than-significant level. This conclusion is consistent with the analysis presented in the PEIR, and the mitigation measures set forth in the PEIR would adequately address this impact.

Impact AES-2: Have a substantial adverse effect on a scenic vista (less than significant with mitigation)

The PEIR concluded that while the new, large turbines may be more visually evident than the older, smaller turbines, their wide spacing on the landscape would be less disruptive of the landscape features. The program-level analysis raised the greatest concern for areas without turbines; in the Project area, such conditions exist only on certain parcels east and south of Bethany Reservoir. *Mitigation Measure AES-2a*, *Require site development review*, specifically states:

> New turbines along ridgelines or hilltops that have not previously been developed with commercial-scale wind turbines will not be allowed, unless a separate Site Development Review is completed that determines that the visual effects will be substantially avoided by distance from public view points (e.g., more than 2,000 feet), intervening terrain, screening landscaping, or compensatory improvements to equivalent and nearby (radius of 1 mile) scenic features, as approved by the Planning Director.

Accordingly, while a portion of the repowering Project is being planned in an area that was previously developed with wind turbines, those turbines were removed prior to issuance of the

Notice of Preparation for the PEIR in 2010. The Project would introduce substantial changes to current views within and of the Project area along Mountain House Road by constructing new turbines where none have been since before 2010. For the purposes of full and conservative disclosure, and despite the fact that the area was developed with wind turbines in the past, the construction of turbines in this area could have a substantial adverse effect on a scenic vista; this impact is considered potentially significant. Implementation of *Mitigation Measure AES-2a, Require site development review*, would reduce this impact to a less-than-significant level. Visual impacts from other areas of the Project are also considered potentially significant for the reasons common to other wind repowering projects—specifically, the appearance of multiple pieces of construction equipment. Implementation of *Mitigation Measures AES-2b, Maintain site free of debris and restore abandoned roadways*, and *AES-2c, Screen surplus parts and materials*, would reduce this impact to a less-than-significant level. These conclusions are consistent with the analysis presented in the PEIR, and the mitigation measures set forth in the PEIR would adequately address these impacts.

Impact AES-3: Substantially damage scenic resources, including but not limited to trees, rock outcroppings, and historic buildings along a scenic highway (less than significant with mitigation)

As described above, Mountain House Road in the eastern portion of the Project area is a County-designated scenic roadway. As stated in the PEIR:

> There are also portions of I-580, Altamont Pass Road, Flynn Road, Mountain House Road, Patterson Pass Road, and the proposed Route 239 Freeway … where no turbines currently exist, but motorists on these roads are accustomed to seeing wind turbines along the route, so they would not be adversely affected.

Although the area northwest of Mountain House Road does not currently support turbine development, it has done so in the past. Moreover, the opposite side of the roadway is heavily developed with older generation turbines, which will be removed in 2018. Although these considerations serve to minimize the severity of this impact, the PEIR concluded that it was less than significant with mitigation. Accordingly, this analysis concludes that implementation of *Mitigation Measures AES-2a, AES-2b* and *AES-2c* would reduce this impact to a less-than-significant level. This conclusion is consistent with the analysis presented in the PEIR, and the mitigation measures set forth in the PEIR would adequately address this impact.

Impact AES-4: Substantially degrade the existing visual character or quality of the site and its surroundings (less than significant with mitigation)

The PEIR concluded that, in general, replacing numerous small turbines with fewer, much larger turbines would not degrade the existing visual character of the area but rather would improve the visual quality. The analysis raised concerns about areas where turbines do not currently exist, but as disclosed in the discussion of Impact AES-3, the area northwest of Mountain House Road was considered to have potentially significant impacts triggering site development review under *Mitigation Measure AES-2a*. While it might be argued that this impact as it pertains to the Sand Hill Project might be considered less than significant because the area was developed with wind turbines in the past (prior to development of the PEIR), for purposes of full and conservative disclosure, this impact is considered potentially significant. Implementation of *Mitigation Measures AES-2a, AES-2b and AES-2* would reduce this impact to a less-than-significant level. This conclusion is consistent with the analysis presented in the PEIR, and the mitigation measures set forth in the PEIR would adequately address this impact.

Impact AES-5: Create a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area (less than significant with mitigation)

The PEIR concluded that lighting required by the Federal Aviation Administration (FAA) in the Project area and vicinity and lighting associated with the substations would be shielded and directed downward to reduce glare, and that the color of new towers and rotors would be neutral and non-reflective. Since the preparation of the PEIR, the County has noted that lighting associated with the turbines may have effects beyond those described in the PEIR. However, as discussed in Section 1.3.5, *Turbine Lighting*, these effects could have been known when the PEIR was prepared. Consequently, this analysis confirms that the Project would not result in a new source of substantial light or glare beyond what is described in the PEIR.

However, the PEIR also concluded that shadow flicker—caused by blade rotation—could create a disruptive visual intrusion to residents who are exposed to the condition for extended periods: more than 30 minutes in a given day or 30 hours in a given year. In accordance with *Mitigation Measure AES-5*, *Analyze shadow flicker distance and mitigate effects or incorporate changes into project design to address shadow flicker*, Sand Hill will retain a qualified engineering firm to conduct a shadow flicker analysis. The terms of the mitigation measure require that Sand Hill implement measures to minimize the effect in consultation with the owner of the affected residence. Implementation of *Mitigation Measure AES-5* would reduce this impact to a less-than-significant level. This conclusion is consistent with the analysis presented in the PEIR, and the mitigation measures set forth in the PEIR would adequately address this impact.

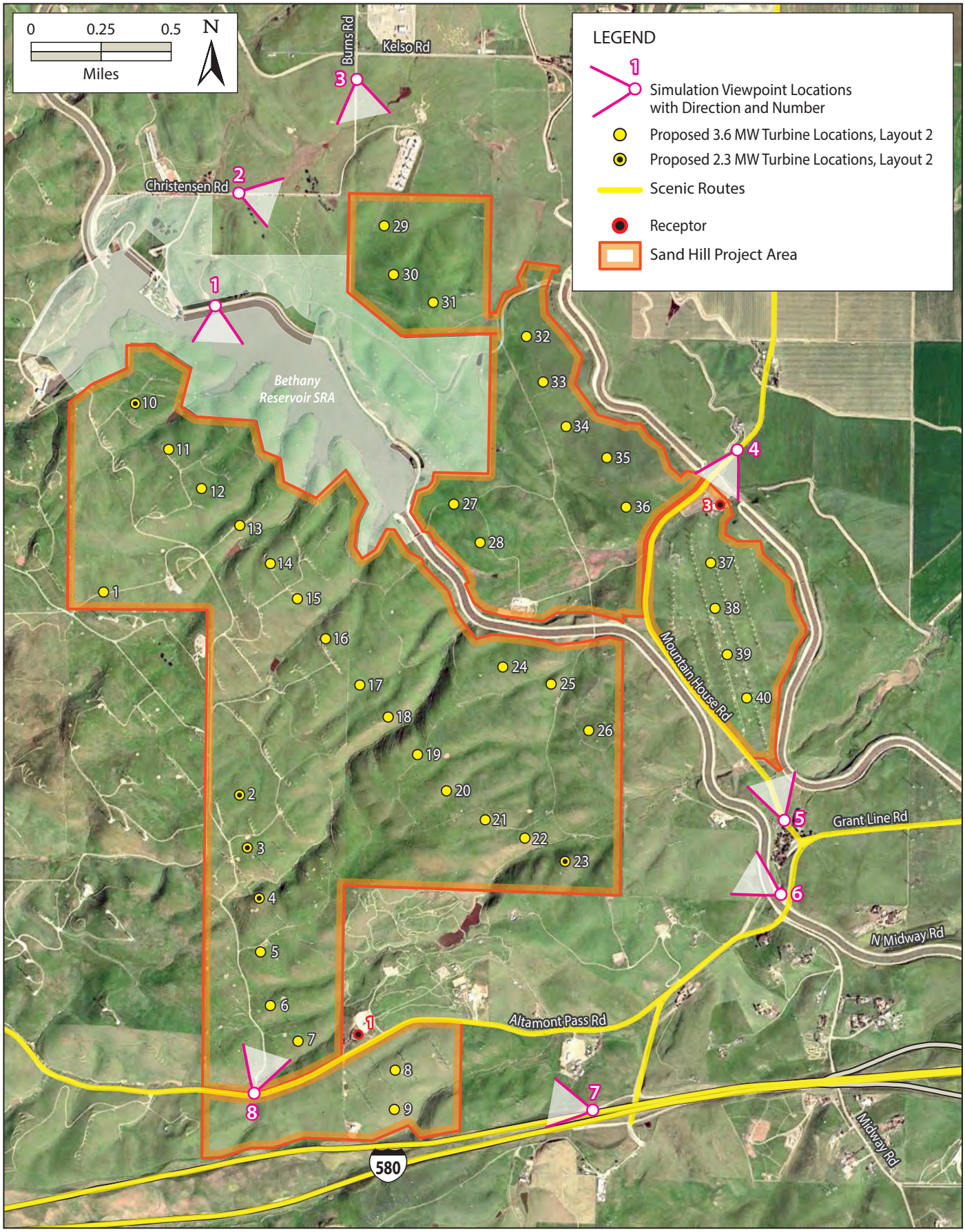
Impact AES-6: Consistency with state and local policies (less than significant with mitigation)

As disclosed in the PEIR, the County would be obligated to comply with measures set forth to protect visual resources along scenic roadways and open space areas identified for protection, as detailed in the Scenic Route and Open Space Elements of the Alameda County General Plan (Alameda County 1966). In addition, the County is obligated to comply with measures set forth in the East County Area Plan (ECAP) to protect visual resources such as sensitive viewsheds, streets and highways, scenic highways, and areas affected by windfarms (Alameda County 2000). The proposed Project is similarly subject to these requirements. Implementation of *Mitigation Measures AES-2b, AES-2c, AES-3*, and *AES-5* would reduce this impact to a less-than-significant level. This conclusion is consistent with the analysis presented in the PEIR, and the mitigation measures set forth in the PEIR would adequately address this impact.

3.1.3 References Cited

Alameda County. 1966. *Scenic Route Element of the General Plan*. May. Reprinted June 1974, Amended May 5, 1994.

———. 2000. *East County Area Plan*. Adopted May 1994. Modified by passage of Measure D, effective December 22, 2000. Oakland, CA.



ICF Graphics ... 00066.17 (5-1-2018) tm

Figure 3.1-1
Visual Simulation Viewpoint Locations

ICF Graphics ... 00631.17 (5-1-2018) tm

Figure 3.1-2
Viewpoint 1—Looking Southwest from California Aqueduct Bikeway at Bethany Reservoir

ICF Graphics ... 00631.17 (5-1-2018) tm

Figure 3.1-3
Viewpoint 2—Looking East along Christensen Road near Bethany Reservoir Entrance Road

ICF Graphics ... 00631.17 (5-1-2018) tm

Figure 3.1-4
Viewpoint 3—Looking South along Bruns Road from 0.15 mile South of Kelso Road

ICF Graphics ... 00631.17 (5-1-2018) tm

Figure 3.1-5
Viewpoint 4—Looking Southwest along Mountain House Road from 1.4 miles South of Kelso Road

ICF Graphics ... 00631.17 (5-1-2018) tm

Figure 3.1-6
Viewpoint 5—Looking North by Northwest along Mountain House Road from North of West Grant Line Road Intersection

ICF Graphics ... 00631.17 (5-1-2018) tm

Figure 3.1-7
Viewpoint 6—Looking West by Northwest from California Aqueduct Bikeway at Grant Line Road Crossing

ICF Graphics ... 00631.17 (5-1-2018) tm

Figure 3.1-8
Viewpoint 7—Looking West by Northwest from Westbound I-580 at the West Grant Line Road Onramp

ICF Graphics ... 00631.17 (5-1-2018) tm

Figure 3.1-9
Viewpoint 8—Looking Northeast from Altamont Pass Road at Unnamed Access Road

3.2 Agricultural and Forestry Resources

The PEIR identified approximately 24 acres of Prime Farmland in the extreme northeast corner of the program area and found that conversion of this agricultural land would constitute a significant impact, which could be mitigated to a less-than-significant level. However, because the Prime Farmland is outside the Sand Hill Project area, there would be no impact. Similarly, the PEIR found that because wind turbines are a conditionally permitted use on grazing land under Williamson Act contract, there would be no impact pertaining to conflicts with existing zoning. Finally, there is no forest land in the program area. Accordingly, agricultural and forestry resources are not discussed further in this analysis.

3.3 Air Quality

The PEIR evaluated impacts associated with development of up to 450 MW in combined nameplate capacity within the program area. Project-level criteria pollutant emissions and associated air quality impacts were assessed using many of the same methods and models as described in the PEIR. Specifically, analysts estimated combustion exhaust and fugitive dust based on Project-specific construction and operating data (e.g., schedule, equipment, truck volumes) provided by the Project engineer and a combination of emission factors and methodologies from CalEEMod, version 2016.3.2; California Air Resources Board's (ARB's) EMFAC2017 model; the U.S. Environmental Protection Agency's (EPA's) AP-42 Compilation of Air Pollutant Emission Factors, and several other industry-accepted tools. Appendix A provides additional modeling detail, including equipment and vehicle assumptions.

3.3.1 Existing Conditions

As described in the PEIR, the proposed Project is located in Alameda County, which is in the Bay Area Air Quality Management District (BAAQMD). Concentrations of ozone, carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), lead (Pb), and particulate matter (PM10 and PM2.5) are commonly used as indicators of ambient air quality conditions. These pollutants are known as *criteria pollutants* and are regulated by EPA and ARB through national and California ambient air quality standards (NAAQS and CAAQS), respectively. The NAAQS and CAAQS establish limits of criteria pollutant concentrations to protect human health and prevent environmental and property damage. Other pollutants of concern in the Project area are nitrogen oxides (NO_X) and reactive organic gases (ROG), which are precursors to ozone, and diesel particulate matter (DPM), which can cause cancer and other human health ailments. In general, the Project area is generally well ventilated by winds, resulting in relatively good ambient air quality conditions.

3.3.2 Environmental Impacts and Mitigation Measures

Construction emissions would primarily occur in the Project area in the BAAQMD. However, some equipment and materials would originate from the Port of Stockton and the city of Tracy, both of which are within the San Joaquin Valley Air Pollution Control District (SJVAPCD). Accordingly, heavy-duty truck trip exhaust emissions that would be generated in the SJVAPCD have been quantified and included in the construction analysis. Operational emissions would occur exclusively in the BAAQMD. Consistent with the PEIR, thresholds developed by the BAAQMD and SJVAPCD are used to evaluate the significance of the Project's emissions and associated air quality impacts (San Joaquin Valley Air Pollution Control District 2015; Bay Area Air Quality Management District 2017).

Impact AQ-1: Conflict with or obstruct implementation of the applicable air quality plan (less than significant)

The PEIR concluded that repowering projects under both alternatives would not conflict with the goals of BAAQMD's Clean Air Plan or SJVAPCD's air quality attainment plans. Accordingly, because the Sand Hill Project is consistent with the assumptions used in the PEIR, this impact would be less than significant, and no mitigation is required. This conclusion is consistent with the analysis presented in the PEIR.

Impact AQ-2: Violate any air quality standard or contribute substantially to an existing or projected air quality violation (significant and unavoidable)

The PEIR concluded that maximum daily unmitigated ROG and NO_X from construction of repowering projects would exceed BAAQMD's significance thresholds, resulting in a significant impact. Fugitive dust would also constitute a significant impact without application of BMPs. Implementation of Mitigation Measures AQ-2a, *Reduce construction-related air pollutant emissions by implementing applicable BAAQMD Basic Construction Mitigation Measures*, and AQ-2b, *Reduce construction-related air pollutant emissions by implementing measures based on BAAQMD's Additional Construction Mitigation Measures*, would ensure that impacts related to fugitive dust would be less than significant. However, implementation of these measures would not reduce ROG or NO_X emissions to a less-than-significant level. Accordingly, the impact of construction-related ROG and NO_X emissions would be significant and unavoidable in the BAAQMD. Neither long-term operation of the Project nor material hauling in SJVAPCD during construction would exceed any air district thresholds, and impacts would be less than significant. These conclusions are consistent with the analysis presented in the PEIR.

Impact AQ-3: Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is a nonattainment area for an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors) (significant and unavoidable for construction and less than significant for operation)

The PEIR concluded that construction of repowering projects would exceed BAAQMD's ROG and NO_X thresholds even after implementation of feasible mitigation. Accordingly, the PEIR determined that cumulative construction impacts in the BAAQMD would be significant and unavoidable. Long-term operation of the repowered projects was found to have a less-than-significant cumulative air quality impact.

As discussed under Impact AQ-2, neither long-term operation of the proposed Project nor material hauling in SJVAPCD during construction would exceed air district thresholds. Accordingly, cumulative impacts during construction in the SJVAPCD and during operation in the BAAQMD would be less than significant. Construction-related NO_x and PM emissions in the BAAQMD would exceed the air district's thresholds, resulting in a potentially significant impact. Implementation of Mitigation Measures AQ-2a and AQ-2b would ensure that impacts related to fugitive dust would be less than significant. However, NO_X emissions would remain significant and unavoidable and cumulatively considerable. This conclusion is consistent with the analysis presented in the PEIR.

Impact AQ-4: Expose sensitive receptors to substantial pollutant concentrations (less than significant with mitigation)

The PEIR concluded that receptor exposure to DPM from construction of the repowering projects would be less than significant with implementation of Mitigation Measures AQ-2a and AQ-2b, which would reduce both criteria pollutants and DPM emissions.

Long-term operation of the proposed Project would not result in a significant new source of emissions. Offsite truck trips during construction would be transitory, using multiple roads over a widespread area, thereby helping to disperse toxic pollutants and minimize exposure. Onsite construction activities would generate DPM, but these would occur over a relatively short period—approximately 1 year, far less than the exposure duration of 30 years that is typically associated

with chronic cancer risk (Office of Environmental Health Hazard Assessment 2015). Emissions would also be spatially dispersed throughout the Project area and at multiple turbine locations.

While exposure to DPM emissions would be of short duration, two receptors are within 1,000 feet of turbine work areas. These receptors may be exposed to increased health risks during construction at these individual locations. Accordingly, this impact is conservatively concluded to be potentially significant. Implementation of *Mitigation Measures AQ-2a* and *AQ-2b* would reduce DPM emissions and associated health risks to sensitive receptors. This impact would be less than significant with mitigation. This conclusion is consistent with the analysis presented in the PEIR.

Impact AQ-5: Create objectionable odors affecting a substantial number of people (less than significant)

The PEIR concluded that neither construction nor operation of the repowering projects would result in significant odor impacts. Odor emissions under the proposed Project would be similar to those evaluated at the program level; they would be primarily limited to the construction period. Sources of odors during construction would be diesel-powered trucks and vehicles. Potential odors from these sources would be temporary (1 year) and spatially dispersed over the Project area. Accordingly, the proposed Project is not anticipated to create objectionable odors that would violate air district nuisance rules. This impact would be less than significant, and no mitigation is required. This conclusion is consistent with the analysis presented in the PEIR.

3.3.3 References Cited

Bay Area Air Quality Management District. 2017. *Air Quality Guidelines*. May.

Office of Environmental Health Hazard Assessment. 2015. *Air Toxics Hot Spot Program Risk Assessment Guidelines Guidance Manual for Preparation of Health Risk Assessments*. February.

San Joaquin Valley Air Pollution Control District. 2015. *Guidance for Assessing and Mitigating Air Quality Impacts*. March.

3.4 Biological Resources

To evaluate the potential Project-specific impacts on biological resources, ICF prepared the *Biological Resources Evaluation for the Sand Hill Wind Repowering Project* (Appendix B). In addition to reviewing previous work conducted in support of the PEIR and the East Alameda Conservation Strategy (EACCS), as well as surveys conducted in portions of the Project area for an earlier wind project, ICF biologists searched the California Department of Fish and Wildlife's (CDFW's) California Natural Diversity Database (CNDDB) (California Department of Fish and Wildlife 2018) and the U.S. Fish and Wildlife Service IPaC Trust Resource Report species list for the Project area (U.S. Fish and Wildlife Service 2018).

In addition, ICF botanists/wetland ecologists conducted aquatic resource delineation surveys in October and November 2017 and January 2018. These were formal delineations undertaken with the purpose of characterizing potential waters of the United States, including wetlands, in the Project area.

Biologists conducted habitat surveys of the biological study area (i.e., the Project area plus a 1.24-mile buffer around it to account for the possible dispersal distance of California tiger salamanders from aquatic breeding habitat). ICF also conducted a site assessment for California tiger salamander and California red-legged frog.

3.4.1 Existing Conditions

3.4.1.1 Land Cover Types

Not all the land cover types described in the PEIR were found to be present in the Project area. The land cover types and the extent of each identified through the survey efforts are shown in Table 3.4-1.

Table 3.4-1. Approximate Acreage of Land Cover Types

Land Cover/Habitat Type	Acres
Nonnative annual grassland	2,604.7
Alkali wetland/drainage	20.1
Vernal pool	0.3
Perennial wetland drainage	9.7
Pond	6.3
Ephemeral drainage	3.7
Canal (aqueducts)	1.0
Developed/existing infrastructure	54.7
Total	2,700.5

3.4.1.2 Special-Status Plants

According to the Biological Resources Evaluation, the 10 special-status plant species listed below have been identified as having the potential to occur in the Project area. All these species were considered in the PEIR, although additional species that could occur in the program area were determined not to occur in the Project area due to microhabitat conditions or range constraints.

- Large-flowered fiddleneck (*Amsinckia grandiflora*)—state- and federally listed as endangered.
- San Joaquin spearscale (*Atriplex joaquiniana*)—CRPR 1B.2.[2]
- Big tarplant (*Blepharizonia plumosa*)—CRPR 1B.11.
- Round-leaved filaree (*California macrophylla*)—CRPR 1B.11.
- Lemmon's jewelflower (*Caulanthus lemmonii*)—CRPR 1B.21.
- Recurved larkspur (*Delphinium recurvatum*)—CRPR 1B.21.
- Diamond-petaled California poppy (*Eschscholzia rhombipetala*)—CRPR 1B.11.
- Shining navarretia (*Navarretia nigelliformis* ssp. *radians*)—CRPR 1B.21.
- Rayless ragwort (*Senecio aphanactis*)—CRPR 2.21.
- Caper-fruited tropidocarpum (*Tropidocarpum capparideum*)—CRPR 1B.11.

Four of these species—San Joaquin spearscale, caper-fruited tropidocarpum, round-leaved filaree, and diamond-petaled California poppy—have been previously documented within or adjacent to the study area.

3.4.1.3 Special-Status Wildlife

According to the Biological Resources Evaluation, the special-status wildlife species listed below have been identified as having the potential to occur in the Project area. All these species were considered in the PEIR, although additional species that could occur in the program area were determined not to occur in the Project area due to microhabitat conditions or range constraints.

- Vernal pool fairy shrimp (*Branchinecta lynchi*)—federally listed as threatened.
- Vernal pool tadpole shrimp (*Lepidurus packardi*)—federally listed as endangered.
- California tiger salamander (*Ambystoma californiense*)—state- and federally listed as threatened.
- California red-legged frog (*Rana draytonii*)—federally listed as threatened.
- Western spadefoot (*Spea hammondii*)—CDFW species of special concern.
- Western pond turtle (*Actinemys marmorata*)—CDFW species of special concern.
- San Joaquin coachwhip (*Masticophis flagellum ruddocki*)—CDFW species of special concern.

[2] CRPR = California Rare Plant Rank.
1B.1 = rare, threatened or endangered in California and elsewhere, seriously endangered in California.
1B.2 = rare, threatened or endangered in California and elsewhere, fairly endangered in California.
2.2 = rare, threatened or endangered in California, but more common elsewhere, fairly endangered in California.

- Blainville's horned lizard (*Phyrnosoma blainvillii*)— CDFW species of special concern.
- White-tailed kite (*Elanus leucurus*)—California fully protected.
- Northern harrier (*Circus cyaneus*)—CDFW species of special concern.
- Bald eagle (*Haliaeetus leucocephalus*)—federally de-listed; state-listed as endangered, fully protected.
- Golden eagle (*Aquila chrysaetos*)—California fully protected.
- Swainson's hawk (*Buteo swainsoni*)—state-listed as threatened.
- Western burrowing owl—CDFW species of special concern.
- Loggerhead shrike (*Lanius ludovicianus*)— CDFW species of special concern.
- Tricolored blackbird (*Agelaius tricolor*)—state-listed as threatened.
- American badger (*Taxidea taxus*)— CDFW species of special concern.
- San Joaquin kit fox (*Vulpes macrotis mutica*)—state-listed as threatened; federally listed as endangered.

California red-legged frog, burrowing owls, and foraging golden eagles were observed in the study area during the October 2017 surveys as well as during 2012 surveys previously conducted for another wind project (ICF International 2013).

3.4.2 Environmental Impacts and Mitigation Measures

Impact BIO-1: Potential for ground-disturbing activities to result in adverse effects on special-status plants or habitat occupied by special-status plants (less than significant with mitigation)

The PEIR concluded that ground-disturbing activities associated with Project construction could result in adverse impacts on special-status plants and their habitat. Because the activities associated with the Sand Hill Project and the special-status plant species with potential to occur in the Project area are unchanged from those contemplated in the PEIR, the impact would be comparable to that presented in the PEIR, and the same mitigation measures would apply. Implementation of Mitigation Measures BIO-1a, *Conduct surveys to determine the presence or absence of special-status plant species*; BIO-1b, *Implement best management practices to avoid and minimize impacts on special-status species*; BIO-1c, *Avoid and minimize impacts on special-status plant species by establishing activity exclusion zones*; BIO-1d, *Compensate for impacts on special-status plant* species; and BIO-1e, *Retain a biological monitor during ground-disturbing activities in environmentally sensitive areas*, would reduce this impact to a less-than significant level. This conclusion is consistent with the analysis presented in the PEIR, and the mitigation measures set forth in the PEIR would adequately address this impact.

Impact BIO-2: Adverse effects on special-status plants and natural communities resulting from the introduction and spread of invasive plant species (less than significant with mitigation)

The potential for the introduction and spread of invasive plant species in the Project area as a result of construction activities would be the same as described in the PEIR for repowering projects

overall. The introduction of invasive nonnative plant species would constitute a significant indirect impact. Implementation of *Mitigation Measures BIO-1b; BIO-2, Prevent introduction, spread, and establishment of invasive plant species*; *BIO-5c, Restore disturbed annual grasslands*; and *WQ-1, Comply with NPDES requirements*, would reduce this impact to a less-than-significant level. This conclusion is consistent with the analysis presented in the PEIR, and the mitigation measures set forth in the PEIR would adequately address this impact.

Impact BIO-3: Potential mortality of or loss of habitat for vernal pool branchiopods and curved-footed hygrotus diving beetle (less than significant with mitigation)

The PEIR concluded that repowering projects could result in habitat loss for and direct mortality of individual vernal pool branchiopod as well as curved-footed hygrotus diving beetles (*Hygrotus curvipes*). The Biological Resources Evaluation determined that no potential habitat for longhorn fairy shrimp (*Branchinecta longiantenna*) is present in the Project area. However, because potential habitat for vernal pool fairy shrimp, vernal pool tadpole shrimp, and curved-footed hygrotus diving beetle is present in and near the Project area, mortality and habitat loss are potentially significant impacts. The PEIR concluded that implementation of *Mitigation Measures BIO-1b; BIO-1e; BIO-3a, Conduct preconstruction surveys for habitat for special-status wildlife species*; and *BIO-3b, Implement measures to avoid, minimize, and mitigate impacts on vernal pool branchiopods and curved-footed hygrotus diving beetle*, would reduce this impact to a less-than-significant level. This conclusion is consistent with the analysis presented in the PEIR, and the mitigation measures set forth in the PEIR would adequately address this impact.

Impact BIO-4: Potential disturbance or mortality of and loss of suitable habitat for valley elderberry longhorn beetle (no impact)

Although the PEIR identified the potential for impacts on valley elderberry longhorn beetle (*Desmocerus californicus*) in portions of the program area, no elderberry shrubs (the species' host plant) have been identified in the Project area; accordingly, there would be no impact and no mitigation would be required.

Impact BIO-5: Potential disturbance or mortality of and loss of suitable habitat for California tiger salamander, western spadefoot, California red-legged frog, and foothill yellow-legged frog (less than significant with mitigation)

The PEIR concluded that construction as well as operation and maintenance activities could result in habitat loss for California tiger salamander, western spadefoot, California red-legged frog, and foothill yellow-legged frog, as well as mortality of individuals. Site assessments conducted for the Biological Resources Evaluation found no suitable habitat for foothill yellow-legged frog; however, because suitable habitat for the other three species is present in the Project area, the Project could result in significant impacts. The PEIR concluded that implementation of *Mitigation Measures BIO-1b; BIO-1e; BIO-3c; BIO-5a, Implement best management practices to avoid and minimize effects on special-status amphibians*; *BIO-5b, Compensate for loss of habitat for special-status amphibians*; and *BIO-5c* would reduce this impact to a less-than-significant level. This conclusion is consistent with the analysis presented in the PEIR, and the mitigation measures set forth in the PEIR would adequately address this impact.

Impact BIO-6: Potential disturbance or mortality of and loss of suitable habitat for western pond turtle (less than significant with mitigation)

The PEIR concluded that construction activities could result in direct effects on western pond turtles and their habitat. Because the Biological Resources Evaluation identified suitable habitat for this species in the Project area, such impacts could result from Project construction. Implementation of *Mitigation Measures BIO-1b; BIO-1e; BIO-3a;* and *BIO-6, Conduct preconstruction surveys for western pond turtle and monitor construction activities if turtles are observed*, would reduce this impact to a less-than-significant level. This conclusion is consistent with the analysis presented in the PEIR, and the mitigation measures set forth in the PEIR would adequately address this impact.

Impact BIO-7: Potential disturbance or mortality of and loss of suitable habitat for Blainville's horned lizard, Alameda whipsnake, and San Joaquin coachwhip (less than significant with mitigation)

The PEIR concluded that construction activities and, to a lesser extent, operation and maintenance activities could result in habitat loss for and individual fatalities of Blainville's horned lizard, Alameda whipsnake, and San Joaquin coachwhip. The Biological Resources Evaluation found that Alameda whipsnake had little to no likelihood to occur in the Project area; however, the potential remains for direct impacts on the other two species of special-status reptiles. Implementation of *Mitigation Measures BIO-1b; BIO-1e; BIO-3a; BIO-5c; BIO-7a, Implement best management practices to avoid and minimize effects on special-status reptiles*; and *BIO-7b, Compensate for loss of habitat for special-status reptiles*, would reduce this impact to a less-than-significant level. This conclusion is consistent with the analysis presented in the PEIR, and the mitigation measures set forth in the PEIR would adequately address this impact.

Impact BIO-8: Potential construction-related disturbance or mortality of special-status and non–special-status migratory birds (less than significant with mitigation)

The PEIR concluded that construction activities during the nesting season of white-tailed kite, bald eagle, northern harrier, Swainson's hawk, golden eagle, western burrowing owl, loggerhead shrike, and tricolored blackbird could result in direct effects on these species, as well as on non–special-status migratory birds, if they are nesting in the program area. Because of the scarcity of trees in the Project area, particularly near proposed turbine sites and roadways, there is limited potential for construction activities to affect nesting eagles or tree-nest species (e.g., Swainson's hawks, golden eagles, kites). However, shrub- and ground-nesting species (e.g., tricolored blackbird, western burrowing owl) could be affected by construction activities. Because construction activities described in the PEIR are the same as those anticipated for the Sand Hill Project, the impacts would be the same. Implementation of *Mitigation Measures BIO-1b; BIO-1e; BIO-3a; BIO-5c; BIO-8a, Implement measures to avoid and minimize potential impacts on special-status and non–special-status nesting birds*; and *BIO-8b, Implement measures to avoid and minimize potential impacts on western burrowing owl*, would reduce these impacts to a less-than-significant level. This conclusion is consistent with the analysis presented in the PEIR, and the mitigation measures set forth in the PEIR would adequately address this impact.

Impact BIO-9: Permanent and temporary loss of occupied habitat for western burrowing owl and foraging habitat for tricolored blackbird and other special-status and non–special-status birds (less than significant with mitigation)

The PEIR concluded that repowering projects would result in the temporary and permanent loss of grassland that is suitable foraging habitat for burrowing owls and other special-status and non–special-status migratory birds. However, the PEIR elected not to propose compensatory mitigation for loss of Swainson's hawk foraging habitat, because that species rarely uses grassland in the program area. Because grassland habitat in the Project area is consistent with that throughout the program area, the same impacts would apply. Implementation of *Mitigation Measures BIO-5b; BIO-5c;* and *BIO-9, Compensate for the permanent loss of occupied habitat for western burrowing owl*, would reduce this impact to a less-than-significant level. This conclusion is consistent with the analysis presented in the PEIR, and the mitigation measures set forth in the PEIR would adequately address this impact.

Impact BIO-10: Potential injury or mortality of and loss of habitat for San Joaquin kit fox and American badger (less than significant with mitigation)

The PEIR concluded that repowering projects could result in temporary and permanent loss of grassland habitat that could support San Joaquin kit foxes and American badgers, as well as in direct mortality of individuals. The Biological Resources Evaluation concluded that badgers have a high likelihood to occur in the Project area, while San Joaquin kit foxes are unlikely to use the area but have a slight likelihood of moving through it between other more suitable areas. Because of declines in both species, any impacts would be significant, especially if they result in fatalities. Because Project activities and Project area conditions are consistent with those contemplated in the PEIR, the impacts would be the same. Implementation of *Mitigation Measures BIO-1b; BIO-1e; BIO-3a; BIO-5c; BIO-10a, Implement measures to avoid and minimize potential impacts on San Joaquin kit fox and American badger*; and *BIO-10b, Compensate for loss of suitable habitat for San Joaquin kit fox and American badger*, would reduce this impact to a less-than-significant level. This conclusion is consistent with the analysis presented in the PEIR, and the mitigation measures set forth in the PEIR would adequately address this impact.

Impact BIO-11: Avian mortality resulting from interaction with wind energy facilities (significant and unavoidable)

The PEIR concluded that repowering would result in significant and unavoidable impacts associated with avian mortality, although it anticipated that mortality rates would decrease with the transition from old-generation to new-generation turbines. This expectation was based on combined estimates of avian mortality from three different repowering projects in the APWRA, given as a rate of x number of bird deaths per MW per year, in various combinations of species (all raptor species, each of eight individual raptor species, and all native non-raptor species). These estimates indicated reductions of 32–83% in raptor fatalities (e.g., 31–79% fewer American kestrel fatalities for buildout of 450 MW in the APWRA. The PEIR acknowledged, however, that the avian mortality estimates were uncertain, stating that (Alameda County Community Development Agency 2014:3.4-103):

> … while repowering is intended to reduce fatalities, enough uncertainty remains in light of project- and site-specific data to warrant a conservative approach in the impact analysis. Accordingly, the continued or increased loss of birds (including special-status species) *at a rate potentially greater than the existing baseline fatality rates* is considered a significant and unavoidable impact [emphasis added].[3]

[3] Similar statements are repeated throughout the PEIR; see page 3.4-121:

As noted in Section 1.3.2, *Avian Mortality Estimates*, of this analysis, early monitoring results from the Golden Hills repowering project that began operations in December 2015, numerous variables and inconsistencies in the methods of previous monitoring efforts in the APWRA raise questions regarding the accuracy of the avian mortality estimates presented in the PEIR.

The Golden Hills data reflect a single year of monitoring during northern California's wettest year on record, using search methods (i.e., search dogs and shorter, 7-day search intervals) that were not used for most of the baseline (and repower) mortality estimates presented in the PEIR. The short, 1-year duration during unusually high rainfall conditions and the use of different search methods make comparison with the PEIR's baseline data difficult (H. T. Harvey & Associates 2017:51–52). While the information in the report is relevant, it does not change the findings or conclusions of the PEIR with respect to avian and bat fatalities—namely, that impacts will be significant and unavoidable after mitigation—for the reasons discussed below.

The Golden Hills estimated mortality rate for all raptors combined (the primary criterion for APWRA avian impact measurement) was significantly lower than the pre-repowering average from the APWRA-wide avian monitoring study (which already reflected significant mortality reductions resulting from seasonal shutdown and the removal of high-risk turbines in accordance with the 2007 agreement) (H. T. Harvey & Associates 2017:51). APWRA-wide nonrepowered average mortality rates for all raptors combined was 2.43/MW/year. The all-raptors combined mortality rate for Golden Hills in its first year of operation was 1.56/MW/year, 36% less than the average APWRA-wide rate even though the latter included seasonal shutdowns and high-risk turbine removals.

The primary mortality model used in the H. T. Harvey report estimated higher golden eagle mortality rates than baseline, nonrepowered conditions (H. T. Harvey & Associates 2017:50). However, the authors explained that the model "inflate[d] the estimate by incorporating searcher efficiency and carcass persistence parameters that represent medium/large birds as a group rather than eagles specifically." Other models used in the H. T. Harvey report that did not incorporate these parameters yielded results that were "closer to reality." Those models estimated golden eagle mortality rates nearly matching (0.09/MW/year) or slightly below (0.07/MW/year) baseline conditions (0.08/MW/year) (H. T. Harvey & Associates 2017:50). All these rates are higher than the rates of the three repowered projects used to generate estimates in the PEIR. But the report observed that all of its golden eagle mortality rates may be overstated as a consequence of bias attributable to the presence of old turbines near the Golden Hills site that provided perching and nesting opportunities for raptors, including golden eagles, seen perching on them on several occasions (H. T. Harvey & Associates 2017:46, 50).

Red-tailed hawk mortality rates observed in the first-year study by H. T. Harvey also exceeded both the rates of the three repowering projects used to generate the PEIR's estimates for Golden Hills and

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As described above, for all avian focal species analyzed, a fully repowered program area would be expected to reduce estimated fatality rates. However, fatalities would still be expected to result from the operation of the repowered turbines, and uncertainty surrounding the accuracy of the estimated fatality rates and the types of species potentially affected remains. Considering this information, and despite the anticipated reductions in avian impacts compared to the baseline rates, the County has determined to use a conservative approach for the impact assessment, concluding that turbine related fatalities could constitute a substantial adverse effect on avian species because the rates for some or all of the species could be greater than the baseline rates. This impact would be significant. Implementation of Mitigation Measures BIO-11a through BIO-11i would reduce this impact, but not to a less-than-significant level; accordingly, this impact is considered significant and unavoidable.

the APWRA-wide estimates, but the H. T. Harvey report observed that additional years of study would be needed to determine whether this was an anomaly or a standard pattern (H. T. Harvey & Associates 2017:50). As stated in the report, red-tailed hawk results may also have been skewed by perching and nesting opportunities created by nearby old turbines, the removal of which would likely reduce fatality rates. The other raptor species analyzed in the H. T. Harvey report, American kestrel and burrowing owl, revealed significantly lower mortality rates than were estimated in the PEIR (H. T. Harvey & Associates 2017:50).

Bat fatalities (499.2 at 5.81/MW/year) were higher than estimated for Golden Hills in the PEIR (from 148 at 1.68/MW/year to 347 at 3.9/MW/year), but, as explained in the H. T. Harvey report, the PEIR's estimates were faulty because Vasco Wind's bat mortality rates in the first and second years were in fact 5.76/MW/year and 6.69/MW/year, not 1.68/MW/year; accordingly, Golden Hills' bat mortality rates for the first year were in line with the correct mortality rates at Vasco Winds (H. T. Harvey & Associates 2017:52).

The differences between the H. T. Harvey report and the mortality estimates of the PEIR do not indicate a new or more intense significant impact beyond the scope of the PEIR. The PEIR recognized the uncertainty of its avian mortality estimates and concluded that mortality rates under the 450 MW repowering program could exceed baseline, nonrepowered mortality rates (Alameda County Community Development Agency 2014). More specifically, while the PEIR used the "best available" data from three repowering projects to estimate a possible reduction of fatalities under the repowering program, the PEIR's impact conclusion for the 450 MW repowering program expressly acknowledged the uncertainty inherent in such data.

Thus, while the PEIR presented mortality estimates that looked promising, those estimates were uncertain and ultimately were not relied upon as the basis for its impact conclusion. Like the H. T. Harvey report, the PEIR concluded that more data were needed: "[p]ostconstruction monitoring, once the turbines are in operation, will provide data to quantify the actual extent of change in avian fatalities from repowering and the extent of avian fatality for projects in the program area …" (Alameda County Community Development Agency 2014:3.4-119). In light of this uncertainty, the PEIR requires adaptive management for any repowering project where "… fatality monitoring … results in an estimate that exceeds the preconstruction baseline fatality estimates (i.e., estimates at the nonrepowered turbines as described in this PEIR) … to ensure that the best available science is used to minimize impacts to below baseline" (Alameda County Community Development Agency 2014:3.4-116). The PEIR drew a similar conclusion and required a similar adaptive management program for impacts on bats (Alameda County Community Development Agency 2014:3.4-133, 3.4-136). Therefore, even though some of the first-year results from the Golden Hills project exceed the mortality estimates of the PEIR, those impacts are still within the scope of the PEIR's impact conclusions and associated mitigation measures.

While the PEIR set forth multiple measures to address avian mortality, it concluded that these measures would not reduce the impact to a less-than-significant level. This conclusion holds true for the Sand Hill Project, and although it remains difficult to estimate mortality rates with certainty, continued monitoring will contribute to the body of knowledge informing this effort. Implementation of the combined program of *Mitigation Measures, BIO-11a, Prepare a project-specific avian protection plan; BIO-11b, Site turbines to minimize potential mortality of birds; BIO-11c, Use turbine designs that reduce avian impacts; BIO-11d, Incorporate avian-safe practices into design of turbine-related infrastructure; BIO-11e, Retrofit existing infrastructure to minimize risk to raptors; BIO-11f, Discourage prey for raptors; BIO-11g, Implement postconstruction avian fatality monitoring*

for all repowering projects; BIO-11h, Compensate for the loss of raptors and other avian species, including golden eagles, by contributing to conservation efforts; and *BIO-11i, Implement an avian adaptive management program*, would reduce this impact but not to a less-than-significant level. This conclusion is consistent with the analysis presented in the PEIR, and the mitigation measures set forth in the PEIR would address this impact.

Impact BIO-12: Potential mortality or disturbance of bats from roost removal or disturbance (less than significant)

The PEIR identified two special-status bat species—pallid bat (*Antrozous pallidus*) and Townsend's big-eared bat (*Corynorhinus townsendii*)—as having the potential to roost in the program area. However, the Biological Resources Evaluation found that no suitable roosting habitat is present in the Project area. Accordingly, this impact would be less than significant, and no mitigation is required.

Impact BIO-13: Potential for construction activities to temporarily remove or alter bat foraging habitat (less than significant)

The PEIR concluded that while construction activities could degrade foraging habitat, the overall repowering effort, by decommissioning numerous old-generation turbines, would offset the loss of habitat associated with installation of new turbines and infrastructure. This impact would be less than significant, and no mitigation is required. This conclusion is consistent with the analysis presented in the PEIR.

Impact BIO-14: Turbine-related fatalities of special-status and other bats (significant and unavoidable)

The PEIR concluded that repowering would result in turbine-related fatalities of special-status and other bats. While the Biological Resources Evaluation found that the Project area did not support roosting habitat for special-status bats, special-status and other bats are assumed to migrate and forage in the Project area as they do throughout the program area.

Implementation of Mitigation Measures BIO-14a, Site and select turbines to minimize potential mortality of bats; BIO-14b, Implement postconstruction bat fatality monitoring program for all repowering projects; BIO-14c, Prepare and publish annual monitoring reports on the findings of bat use of the Project area and fatality monitoring results; BIO-14d, Develop and implement a bat adaptive management plan; and BIO-14e, Compensate for expenses incurred by rehabilitating injured bats, would reduce the severity of this impact, but not to a less-than-significant level. This conclusion is consistent with the analysis presented in the PEIR, and the mitigation measures set forth in the PEIR would address this impact.

Impact BIO-15: Potential for road infrastructure upgrades to result in adverse effects on alkali meadow (less than significant with mitigation)

The PEIR concluded that road infrastructure upgrades—especially those involving crossings—could result in adverse effects on alkali meadow. The aquatic resources delineation surveys conducted in support of the Project identified a total of 20.1 acres of alkali meadow in the study area; Project roads would cross some of these areas. Implementation of Mitigation Measure BIO-15, *Compensate for the loss of alkali meadow habitat*, would reduce this impact to a less-than-significant level. This

conclusion is consistent with the analysis presented in the PEIR, and the mitigation measures set forth in the PEIR would adequately address this impact.

Impact BIO-16: Potential for road infrastructure upgrades to result in adverse effects on riparian habitat (no impact)

While the PEIR identified several categories of riparian habitat in the program area, the surveys conducted in support of the Biological Resources Evaluation identified no riparian habitat in the Project area. There would be no impact, and no mitigation is required. This conclusion is consistent with the analysis presented in the PEIR.

Impact BIO-17: Potential for ground-disturbing activities to result in direct adverse effects on common habitats (less than significant)

The PEIR concluded that ground-disturbing activities would result in the permanent and temporary loss of common habitats—primarily annual grasslands. However, because of the extent of these habitats regionally available and the reclamation activities that are part of the Project, this impact would be less than significant, and no mitigation is required. This conclusion is consistent with the analysis presented in the PEIR.

Impact BIO-18: Potential for road infrastructure upgrades to result in adverse effects on wetlands (less than significant with mitigation)

The PEIR concluded that road infrastructure upgrades would result in placement of fill at crossings, as well as possible hydrologic alteration. This conclusion is true of the Sand Hill Project as well, particularly in association with the aquatic resources discussed in Impact BIO-15. This would be a significant impact. Implementation of *Mitigation Measure BIO-18, Compensate for the loss of wetlands*, would reduce this impact to a less-than-significant level. This conclusion is consistent with the analysis presented in the PEIR, and the mitigation measures set forth in the PEIR would adequately address this impact.

Impact BIO-19: Potential impact on the movement of any native resident or migratory wildlife species or established native resident or migratory wildlife corridors, and the use of native wildlife nursery sites (significant and unavoidable)

The PEIR concluded that construction activities could interfere with wildlife movement through introduction of barriers to passage; moreover, as discussed in Impacts BIO-11 and BIO-14, turbine operations could interfere with movement of birds and bats through turbine-related mortality. This would constitute a significant impact. Implementation of *Mitigation Measures BIO-1b, BIO-1e, BIO-3a, BIO-4a, BIO-5a, BIO-5c, BIO-7a, BIO-8a, BIO-8b, BIO-10a, BIO-11b, BIO-11c, BIO-11d, BIO-11e, BIO-11i, BIO-12a, BIO-12b, BIO-14a,* and *BIO-14d* would reduce this impact but not to a less-than-significant level. This conclusion is consistent with the analysis presented in the PEIR, and the mitigation measures set forth in the PEIR would adequately address this impact.

Impact BIO-20: Conflict with local plans or policies (less than significant with mitigation)

As described in the PEIR, the ECAP has several policies related to windfarms, including establishing a mitigation program to minimize the impacts of wind turbine operations on bird populations. Loss of special-status species and their habitat, loss of alkali meadow, loss of riparian habitat, and loss of existing wetlands as a result of implementing the program would be in conflict with these policies.

Because the conditions in the Project area and features and characteristics of the Sand Hill Project are consistent with those contemplated in the PEIR, the impact would be the same, except that riparian habitat is not present in the Project area. This impact would be significant; however, implementation of *Mitigation Measures BIO-1a* through *BIO-1e, BIO-3a, BIO-4a, BIO-4b, BIO 5a through 5c, BIO-7a, BIO-7b, BIO-8a, BIO-8b, BIO-9, BIO 10a, BIO-10b*, BIO-15, BIO-16, and *BIO-18* would reduce this impact to a less-than-significant level. This conclusion is consistent with the analysis presented in the PEIR, and the mitigation measures set forth in the PEIR would adequately address this impact.

Impact BIO-21: Conflict with provisions of an adopted HCP/NCCP or other approved local, regional, or state habitat conservation plan (no impact)

Because there are no adopted HCP/NCCPs for the program area and the program would not conflict with the EACCS, there would be no impact. The same is true for the Project area. This conclusion is consistent with the analysis presented in the PEIR.

3.4.3 References Cited

California Department of Fish and Wildlife. 2018. *California Natural Diversity Database*, RareFind 5, July 2018. Search of the Midway and Clifton Court Forebay USGS 7.5-minute Quadrangles and 10 surrounding quadrangles. Sacramento, CA.

ICF International. 2013. *Biological Resources Technical Report for the Sand Hill Project*. February. (ICF 00456.12.) Sacramento, CA. Prepared for FloDesign Wind Turbine Corporation, Waltham, MA.

U.S. Fish and Wildlife Service. 2018. *IPaC Trust Resource Report*. List of Federal Endangered and Threatened Species That Occur in or May Be Affected by the Project. Available: http://www.fws.gov/sacramento/es_species/Lists/es_species_lists.cfm. Accessed: January 2018.

3.5 Cultural Resources

The following analysis is based on cultural resources investigations conducted for the proposed Project (Appendix C). Impacts relative to cultural resources depend primarily on Project scope and area. The footprint of individual turbines would be the same as described in the PEIR.

3.5.1 Existing Conditions

As directed by Mitigation Measure CUL-2a, Conduct a preconstruction cultural field survey and cultural resources inventory and evaluation, in the PEIR, investigations were conducted for the proposed Project. These investigations identified three previously documented resources within the area of potential effects (APE).

- P-01-010613—A segment of Grant Line Road (P-01-010613) along the route of the original Lincoln Highway, the first paved transcontinental road, constructed around 1870.
- P-01-010947—The Pittsburg-Tesla 230kV transmission line constructed by PG&E in 1959–1960.
- P-01-011395—A 6-mile segment of the PG&E Tracy–Tesla 230kV transmission line built between 1949 and 1953.

Resources located within 0.25 mile of the APE include a historic-period ranch complex, a possible boundary marker/fence, and two sandstone milling stations.

A portion of the California Aqueduct main line intersects with the Project APE at two locations south of Bethany Reservoir. Segments of the California Aqueduct in other locations have been evaluated for eligibility for inclusion in the National Register of Historic Places (NRHP)/California Register of Historic Resources (CRHR), and the full extent of the aqueduct has been determined eligible for listing in the NRHP and CRHR.

Review of historic literature and maps reveals that, with the exception of construction of the California Aqueduct and wind turbines, limited development has occurred in the APE; rather, the vicinity has been used primarily as cattle rangeland. With the exception of the California Aqueduct—which would not be affected by the Project—the APE is not expected to contain historic built resources.

The Native American Heritage Commission (NAHC) was contacted three times in January and February 2018 to request a sacred lands file database search and to solicit any new information since the PEIR cultural resources investigations were conducted. To date, no response has been received.

3.5.2 Environmental Impacts and Mitigation Measures

Impact CUL-1: Cause a substantial adverse change in the significance of a historical resource (no impact)

The PEIR identified 19 historic architectural cultural resources in the program area, and concluded that repowering projects could result in an adverse change on such resources in the program area.

Three historic resources were identified within the Project area: P-01-010613 (Grant Line Road) and P-01-010947 and P-01-011395 (both historic transmission lines). These resources were not formally evaluated for eligibility in either the NRHP or the CRHR. However, Grant Line Road is an actively used roadway and the transmission lines consist of overhead power lines, none of which would be affected by Project activities. Similarly, while a segment of the California Aqueduct intersects with the APE, Project-related activities are not anticipated to disturb these resources. The Project would not change or modify the aqueduct. The Project would include a gen-tie line that would cross over the aqueduct using an overhead electrical line on poles or connecting conduit to an existing bridge, or it would cross under the aqueduct using directional boring. Directional boring would not affect the aqueduct. Attaching conduit to an existing bridge would not change the function or design of the bridge and therefore would not affect the integrity of the overall aqueduct. Because an overhead electrical line is already present, the gen-tie line would not change the existing conditions and would not change the integrity of the overall aqueduct. Accordingly, the Project would not cause a substantial adverse change in the significance of a historical resource. There would be no impact, and no mitigation is required. This conclusion is consistent with the analysis presented in the PEIR.

Impact CUL-2: Cause a substantial adverse change in the significance of an archaeological resource (less than significant with mitigation)

Of the four previously documented resources located near the APE, two—P-01-000163 (ranch complex) and P-01-011596 (milling station)—were documented as being located directly adjacent to the APE. Pedestrian survey relocated both resources outside the APE, and they would not be affected by the Project. No previously undocumented archaeological resources were identified within the APE during the pedestrian survey.

Although the APE and vicinity were used by prehistoric peoples, the nature of this land use would primarily have been resource collection. Consequently, the expected range of prehistoric artifact and feature types in the APE would include projectile points and lithic tools, lithic debitage, bedrock mortars, and grinding stones. Although the area could have been used for upland resource collection activities, the APE is located far from permanent water sources and is, therefore, expected to have moderate to low potential to contain prehistoric archaeological resources.

In the event that archaeological resources are inadvertently uncovered during Project construction, implementation of *Mitigation Measures CUL-2b, Develop a treatment plan for any identified significant cultural resources; CUL-2c, Conduct worker awareness training for archaeological resources prior to construction;* and *CUL-2d, Stop work if cultural resources are encountered during ground-disturbing activities*, would reduce this impact to a less-than-significant level. This conclusion is consistent with the analysis presented in the PEIR, and the mitigation measures set forth in the PEIR would adequately address this impact.

Impact CUL-3: Disturb any human remains, including those interred outside of formal cemeteries (less than significant with mitigation)

The PEIR concluded that although there is no indication that the program area has been used for human burials, because prehistoric sites are known to be present in the program area, the possibility cannot be discounted entirely. In the unanticipated event that human remains are encountered during Project construction, implementation of *Mitigation Measure CUL-3, Stop work if human remains are encountered during ground-disturbing activities*, would reduce this impact to a

less-than-significant level. This conclusion is consistent with the analysis presented in the PEIR, and the mitigation measures set forth in the PEIR would adequately address this impact.

3.6 Geology, Soils, Mineral Resources, and Paleontological Resources

As described in the PEIR, there are no known mineral resources in the program area and it was concluded that the program would not affect mineral resources. Accordingly, mineral resources are not further considered in this analysis.

3.6.1 Existing Conditions

As described in the PEIR, the program area, known for the frequent occurrence of earthquakes and potential ground shaking, contains two active faults, which are zoned under the Alquist-Priolo Act. The program area is in steep, hilly terrain known to be susceptible to earthquake-induced landsliding. Although the potential for liquefaction is likely low because of the depth to groundwater and the age of the geologic units in the program area, the risk of lateral spread and differential settlement is not known. Expansive soils occur in much of the program area, particularly in the Fontana-Diablo-Altamont soil association, which characterizes the Sand Hill Project area. Geologic units in the program area have the potential to contain paleontological resources; however, most of the Project area is not within the Neroly Formation, a geologic unit particularly sensitive for fossil material.

3.6.2 Environmental Impacts and Mitigation Measures

As disclosed in Section 1.3.4, *Operations and Maintenance Facility*, the PEIR did not address O&M facilities at the program level, and the two Project-level analyses assumed that no septic or other wastewater treatment system would be necessary. However, Sand Hill proposes to install such a system in conjunction with its O&M facility. In accordance with local regulations, the installation of such a system would be subject to approval and permitting by Alameda County Department of Environmental Health. If preconstruction investigations indicate that the soils onsite are not suitable to support such a system, portable toilets, supplied and serviced by a commercial vendor, would be used instead. Because this impact was dismissed in the PEIR, no new impact number has been introduced for this analysis; moreover, because a system would only be installed if it complies with local regulations, it would not present a new significant impact. In addition, the use of portable toilets would not constitute a significant impact in the context of soils because of their own regulatory requirements. Accordingly, this impact would be less than significant and would not entail a new significant impact or one of greater severity than was disclosed in the PEIR.

Impact GEO-1: Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death, as a result of rupture of a known earthquake fault (less than significant with mitigation)

The PEIR identified three active faults in the program area; however, only a small portion of the Midway fault, designated as potentially active, approaches the Project area. If a turbine were constructed on or near a fault, rupture of that fault could damage a turbine or cause harm to personnel on the site. The turbine could be damaged or collapse and possibly injure personnel or property in the immediate area. However, because the Project area is more removed from identified

faults than much of the program area, no impacts beyond those identified in the PEIR would result. Implementation of *Mitigation measure GEO-1, Conduct site-specific geotechnical investigation and implement design recommendations in subsequent geotechnical report*, would reduce this impact to a less-than-significant level. This conclusion is consistent with the analysis presented in the PEIR, and the mitigation measures set forth in the PEIR would adequately address this impact.

Impact GEO-2: Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death, as a result of strong seismic ground shaking (less than significant with mitigation)

As disclosed in the PEIR, construction of turbines or power collection systems in areas with the potential to experience strong ground shaking could expose people or structures to potential substantial adverse effects. The turbine could be damaged or collapse and possibly injure personnel or damage property in the immediate area. Implementation of *Mitigation Measure GEO-1* would reduce this impact to a less-than-significant level. This conclusion is consistent with the analysis presented in the PEIR, and the mitigation measures set forth in the PEIR would adequately address this impact.

Impact GEO-3: Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death, as a result of seismic-related ground failure, including landsliding and liquefaction (less than significant with mitigation)

As disclosed in the PEIR, if turbine foundations or power collection systems are not properly designed and sited for the earthquake-induced ground failure conditions present in the program area, they could fail and cause damage to or collapse of the turbine towers or collection system. This damage or collapse could cause harm to personnel or property in the immediate area. Although the potential for liquefaction is likely low because of the depth to groundwater and the age of the geologic units in the program area, the risk of lateral spread and differential settlement is unknown. The potential damage and harm that could result from landsliding, lateral spread, or differential settlement would be a significant impact. Implementation of *Mitigation Measure GEO-1* would reduce this impact to a less-than-significant level. This conclusion is consistent with the analysis presented in the PEIR, and the mitigation measures set forth in the PEIR would adequately address this impact.

Impact GEO-4: Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death, as a result of landsliding (less than significant with mitigation)

As disclosed in the PEIR, in addition to seismic-related ground failure discussed in preceding impacts, construction of turbines or power collection systems in areas with potential to experience non-seismic-related landsliding caused by heavy precipitation could also expose people or structures to potential substantial adverse effects. Damage or collapse resulting from landsliding could cause harm to personnel or property in the immediate area.

While the Project must comply with existing regulatory requirements (building safety requirements), these requirements may not address all ground failure issues. Implementation of *Mitigation Measure GEO-1* would reduce this impact to a less-than-significant level. This conclusion is consistent with the analysis presented in the PEIR, and the mitigation measures set forth in the PEIR would adequately address this impact.

Impact GEO-5: Result in substantial soil erosion or the loss of topsoil (less than significant)

As disclosed in the PEIR, decommissioning and Project construction could cause surface disturbance and vegetation removal resulting in soil erosion. However, compliance with federal and local erosion-related regulations (e.g., the SWPPP developed for the Project, requirements of the county's Stormwater Quality Management Plan) would ensure that ground-disturbing activities do not result in significant erosion. Moreover, the PEIR requires a reclamation plan with specific measures taken to ensure that repowering sites are regraded and seeded to pre-Project conditions. These requirements would ensure that potential impacts of soil erosion would be less than significant, and no mitigation is required. This conclusion is consistent with the analysis presented in the PEIR.

Impact GEO-6: Be located on expansive soil, creating substantial risks to life or property (less than significant with mitigation)

The PEIR disclosed that expansive soils occur in much of the program area, particularly in the Fontana-Diablo-Altamont soil association, which characterizes the Project area. Turbine foundations built on expansive soils would be subject to the shrink and swell of these soils, which could damage structures if the subsoil, drainage, and foundation are not properly engineered. However, soil sampling and treatment procedures are addressed by state and local building codes. Compliance with these codes and implementation of *Mitigation Measure GEO-1* would reduce this impact to a less-than-significant level. This conclusion is consistent with the analysis presented in the PEIR, and the mitigation measures set forth in the PEIR would adequately address this impact.

Impact GEO-7: Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature (less than significant with mitigation)

According to the PEIR, sedimentary rocks—geologic units with potential to contain paleontological resources—include most units in the program area. Because most of the program area is characterized by geologic units considered to be sensitive for paleontological resources, this analysis assumes the same to be true of the Project area. Substantial damage to or destruction of significant paleontological resources would be a significant impact. Implementation of Mitigation *Measures GEO-7a, Retain a qualified professional paleontologist to monitor significant ground-disturbing activities; GEO-7b, Mitigation Measure GEO-1g: Retain a qualified professional paleontologist to monitor significant ground-disturbing activities;* and *GEO-7c, Stop work if substantial fossil remains are encountered during construction*, would reduce this impact to a less-than-significant level. This conclusion is consistent with the analysis presented in the PEIR, and the mitigation measures set forth in the PEIR would adequately address this impact.

3.7 Greenhouse Gas Emissions

The proposed Project is a subset of the APWRA-wide repowering evaluated in the PEIR. Project-level greenhouse gas (GHG) emissions and associated impacts were assessed using the same methods as described above in Section 3.3, *Air Quality*. Refer to Appendix A for additional modeling detail, including equipment and vehicle assumptions.

3.7.1 Existing Conditions

Because GHG emissions result in global impacts, and because Project-specific activities are commensurate with those evaluated in the PEIR, the description of existing conditions presented in the PEIR is incorporated here by reference. Note that since publication of the PEIR, the state has adopted Senate Bill (SB) 32, which requires ARB to ensure that statewide GHG emissions are reduced to at least 40 percent below 1990 levels by 2030. The 2017 Climate Change Scoping Plan presents measures the state will implement to achieve this goal, including furthering the renewables portfolio standard (RPS) to require that 50% of retail electricity sales originate from renewable resources by 2030.

3.7.2 Environmental Impacts and Mitigation Measures

Impact GHG-1: Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment (less than significant)

The PEIR concluded that while repowering the APWRA (an aggregate of all the anticipated repowering projects proposed within the program area) would result in short-term emissions of GHGs, primarily associated with construction activities, and the potential operational emission of sulfur hexafluoride (SF_6), the repowering projects collectively would result in an annual net reduction of more than 100,000 tons of carbon dioxide equivalent emissions (CO_2e). This beneficial impact would be less than significant.

As detailed in Appendix A, the wind energy generated by the proposed Project would reduce GHG emissions by approximately 50,000 metric tons CO_2e per year. This would more than offset emissions generated by Project construction and O&M. This impact would be less than significant, and no mitigation is required. This conclusion is consistent with the analysis presented in the PEIR.

Impact GHG-2: Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases (less than significant with mitigation)

The PEIR evaluated the repowering of the program area for consistency with the following measures relevant to GHG emissions.

- Assembly Bill (AB) 32 Scoping Plan Measure T-7: Heavy-Duty Vehicle GHG Emission Reduction (Aerodynamic Efficiency)—Discrete Early Action.
- AB 32 Scoping Plan Measure E-3: Renewables Portfolio Standard (RPS)
- AB 32 Scoping Plan Measure H-6: High Global Warming Potential Gas Reductions from Stationary Sources – SF_6 Leak Reduction and Recycling in Electrical Applications.

- Alameda County Climate Action Plan (CAP) Measure E-10**:** Require new construction to use building materials containing recycled content.
- Alameda County CAP Measure WS-2: Strengthen the Construction and Demolition Debris Management Ordinance.

With the exception of Scoping Plan Measure E-3, the PEIR concluded that the repowering projects could potentially conflict with all these measures. However, implementation of *Mitigation Measures GHG-2a, Implement best available control technology for heavy-duty vehicles; GHG-2b, Install low SF_6 leak rate circuit breakers and monitoring; GHG-2c, Require new construction to use building materials containing recycled content*; and *GHG-2d, Comply with construction and demolition debris management ordinance*, would reduce this potential impact to a less-than-significant level.

In concept, the proposed Project is being pursued to promote sustainability and further alternative energy. Although the measures included in the AB 32 Scoping Plan, 2017 Climate Change Scoping Plan, and Alameda County CAP are necessarily broad, the proposed Project is generally consistent with the goals and desired outcomes of the plans. The additional wind energy generated by the Project will directly support the decarbonization of the electric power sector, helping California to meet its GHG goals in SB 32 and Executive Order S-3-05.[4] Nevertheless, emissions generated by the Project could potentially conflict with applicable measures in the AB 32 Scoping Plan, 2017 Climate Change Scoping Plan, and Alameda County CAP. This conclusion is consistent with the analysis presented in the PEIR, and the mitigation measures set forth in the PEIR would adequately address this impact.

[4] California EO S-03-05 seeks to reduce emissions to at least 80 percent below 1990 levels by 2050.

3.8 Hazards and Hazardous Materials

The PEIR evaluated the potential for impacts relating to hazards and hazardous materials. Because the characteristics of the Project area and the activities associated with Project construction and operation are the same as those contemplated in the PEIR, existing hazards and hazardous conditions in the Project area are generally the same as those analyzed in the PEIR. The use of hazardous materials during Project construction, operations, and maintenance activities would be similar. Issues related to the Project's proximity to schools and airports are covered under the PEIR as are wildland fire requirements. Due to the larger generation capacity of the Project's proposed turbines, fewer turbines would be required. However, they would be larger and would, like all repowering projects, be subject to County review.

3.8.1 Existing Conditions

The Project area is in the northeast portion of the program area north of I-580 near the Town of Byron. The conditions described in the PEIR also pertain to the Project area. The characteristics of the Project regarding the type of potential hazards in the area and the type and use of hazardous materials would not differ from those addressed in the PEIR. The potential for and type of blade throw, addressed in the discussion of Impact HAZ-9, would not differ from those hazards considered in the PEIR; however, discussion of the larger turbines is included for purposes of full disclosure.

3.8.2 Environmental Impacts and Mitigation Measures

Impact HAZ-1: Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials (less than significant)

The PEIR concluded that Project construction would involve small quantities of commonly used materials, such as fuels and oils, to operate construction equipment. The Project would implement standard construction BMPs, as required by the SWPPP, to reduce pollutant emissions during construction. This impact would be less than significant, and no mitigation is required. This conclusion is consistent with the analysis presented in the PEIR.

Impact HAZ-2: Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment (less than significant)

The Project would not involve activities or materials beyond those described in the PEIR. Further, the Project would not create a significant hazard to the public or the environment through reasonably foreseeable upset or accident conditions involving the release of hazardous materials into the environment. This impact would be less than significant, and no mitigation is required. This conclusion is consistent with the analysis presented in the PEIR.

Impact HAZ-3: Emit hazardous emissions or involve handling hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school (no impact)

There are no public or private K–12 schools within 0.25 mile of the Project area. The nearest school, Mountain House Elementary School, is approximately 0.54 mile east of the nearest Project facilities and it is unlikely that hazardous materials would be emitted or released within 0.25 mile of any schools. There would be no impact, and no mitigation is required. This conclusion is consistent with the analysis presented in the PEIR.

Impact HAZ-4: Location on a hazardous materials site, creating a significant hazard to the public or the environment (less than significant with mitigation)

The Project would involve soil disturbance and, as outlined in the PEIR, for all projects requiring a CUP, the County would require that a Phase I Environmental Site Assessment (and remediation, if necessary) be conducted prior to construction activities as a standard condition of approval for the CUP. Accordingly, implementation of *Mitigation Measure HAZ-4, Perform a Phase I Environmental Site Assessment prior to construction activities and remediate if necessary*, would reduce this impact to a less-than-significant level. This conclusion is consistent with the analysis presented in the PEIR, and the mitigation measures set forth in the PEIR would adequately address this impact.

Impact HAZ-5: Location within an airport land use plan area or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, resulting in a safety hazard for people residing or working in the project area (less than significant with mitigation)

The closest public airport to the Project area is the Byron Airport, approximately 2.7 miles north of the Project area. Livermore Municipal Airport is approximately 11.4 miles southwest of the Project area, and Tracy Municipal Airport is approximately 8 miles southeast of the Project area. Because the Project area is not within 2 miles of a public airport, implementation of the Project would not normally result in a safety hazard for people residing or working in the Project area. However, according to the PEIR, projects with facilities in the influence area zones of local airports are required to submit a Notice of Proposed Construction or Alteration form to the FAA for review and to implement all FAA requirements to reduce potential aviation impacts. A review of the Byron Airport influence area zone indicates that the Project is outside all influence area zones. Implementation of *Mitigation Measure HAZ-5, Coordinate with the Contra Costa ALUC [Airport Land Use Commission] prior to final design*, would reduce this impact to a less-than-significant level. This conclusion is consistent with the analysis presented in the PEIR, and the mitigation measures set forth in the PEIR would adequately address this impact.

Impact HAZ-6: Location within the vicinity of a private airstrip, resulting in a safety hazard for people residing or working in the project area (less than significant)

The closest private airport is Meadowlark Airfield, 6.25 miles southwest of the Project area. Because the Project area is not within 2 miles of a private airport, implementation of the Project would not result in a safety hazard for people residing or working in the Project area. Adherence to the requirements described in Impact HAZ-5 would reduce this impact to a less-than-significant level. This conclusion is consistent with the analysis presented in the PEIR, and the mitigation measures set forth in the PEIR would adequately address this impact.

Impact HAZ-7: Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan (less than significant with mitigation)

The PEIR concluded that impacts associated with emergency response plans would be temporary, occurring primarily during construction, with the potential to cause a substantial traffic increase on local county roads. Implementation of *Mitigation Measure TRA-1, Develop and implement a construction traffic control plan*, would reduce this impact to a less-than-significant level. This conclusion is consistent with the analysis presented in the PEIR, and the mitigation measures set forth in the PEIR would adequately address this impact.

Impact HAZ-8: Expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands (less than significant)

The PEIR concluded that while wind turbines can cause fire ignitions, sufficient fire response providers are already in place. Moreover, fewer turbines and the improved safety of newer models associated with repowered projects are anticipated to result in a reduction of potential fire ignitions. The PEIR concluded that the fire-related impact of individual repowering projects would be less than significant, and no mitigation is required. This conclusion is consistent with the analysis presented in the PEIR, and the mitigation measures set forth in the PEIR would adequately address this impact.

Impact HAZ-9: During normal operation, the effects of bending and stress on rotor blades over time could lead to blade failure and become a potential blade throw hazard (less than significant)

Blade throw impacts as assessed in the PEIR rely largely on the Updated Alameda County Turbine Setback Requirements (Table 2-3), which are calculated based on rotor (blade) length, total turbine height, or a percentage of the general setback, with some setbacks also adjusted for elevation. The proposed turbines would be within the PEIR specifications for rotor type, tower type, tower (hub) height, and total turbine height. However, blade lengths would be up to 15 feet longer than the blades contemplated in the PEIR. The general and alternative minimum setbacks that use rotor length to apply a setback standard would only apply to adjacent parcels (with or without approved wind energy CUPs). Since the blade lengths only differ by 15 feet, this change would add an additional setback distance of 16.5 feet (1.1 times blade length) when applying the setback requirements—a greater (i.e., more protective) setback than that based on the blade lengths envisioned in the PEIR. Prior to final Project design, the County would ensure that all setback requirements, whether general or alternative minimum, are met. Sand Hill would be required to either meet the County's general setbacks or meet the conditions required to implement alternative minimum setbacks. Adherence to County requirements would ensure that impacts related to blade throw are maintained at a less-than-significant level, and no mitigation is required. This conclusion is consistent with the analysis presented in the PEIR. Thus, the change to a larger turbine would have no change to the approach or findings regarding setbacks and hazards. There would be no new significant effects or substantial increase in the severity of effects for hazards.

3.9 Hydrology and Water Quality

The PEIR contemplated the impacts on hydrology and water quality that could result from construction and operation of wind repowering projects throughout the program area. The only change relevant to this resource topic from the projects considered in the PEIR is the larger capacity of the turbines proposed for use in the Sand Hill Project: 3.6–3.8 MW turbines contrasted with a maximum of 3 MW considered in the PEIR. The consequence of this change would be at least eight fewer turbines under the Sand Hill Project than would have been necessary to achieve the same nameplate capacity (i.e., 144.5 MW) under the turbine specifications considered in the PEIR. Despite the larger generative capacity of the Sand Hill turbines, their overall dimensions would be within the parameters established in the PEIR—most importantly (pertaining to the introduction of impervious surfaces), the footprint of individual turbines would be the same as described in the PEIR.

3.9.1 Existing Conditions

As disclosed in the PEIR, the Project area is southwest of the San Joaquin–Sacramento Delta in the Clifton Court Forebay watershed, and is in the Tracy groundwater subbasin. The conditions described in the PEIR pertain to the Project area.

3.9.2 Environmental Impacts and Mitigation Measures

Impact WQ-1: Violate any water quality standards or waste discharge requirements (less than significant with mitigation)

The Project would entail the same types of construction activities as disclosed in the PEIR, and these activities would potentially result in the same range of impacts. Trenching and site preparation create areas of bare soil that can increase sediment discharge to receiving waters. Implementation of *Mitigation Measure WQ-1, Comply with NPDES requirements*, (e.g., erosion control BMPs, implementation of a stormwater pollution prevention plan [SWPPP]), would reduce these impacts to a less-than-significant level. This conclusion is consistent with the analysis presented in the PEIR, and the mitigation measures set forth in the PEIR would adequately address this impact.

Impact WQ-2: Substantially deplete groundwater supplies or interfere substantially with groundwater recharge, resulting in a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted) (less than significant)

As disclosed in the PEIR, Project construction and operation would entail minimal use of water beyond standard BMPs such as road and worksite dust control measures. Accordingly, demand on groundwater supplies would be negligible. The PEIR also concluded that the relatively small footprints (approximately 2.6 acres for the 40 turbines of the Sand Hill Project) of the wind turbines would not interfere with groundwater infiltration. Moreover, while the PEIR assumed a maximum individual turbine capacity of 3 MW, the Sand Hill Project contemplates 3.8 MW turbines, requiring 40 turbines to achieve the Project's 144.5 MW capacity compared to the 48 turbines that would have

been required under the PEIR assumptions. The decrease of eight turbines would equate to approximately 0.5 acre less of impermeable surface than that considered in the PEIR. The impact would be less than significant, and no mitigation is required. This conclusion is consistent with the analysis presented in the PEIR.

Impact WQ-3: Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation onsite or offsite (less than significant with mitigation)

As disclosed in the PEIR, no turbines would be constructed within existing drainage areas, and Project facilities would be designed to avoid any downstream erosion during the rainy season. Implementation of *Mitigation Measure WQ-1* would ensure that program-related stormwater runoff would not result in substantial erosion or downstream siltation. This conclusion is consistent with the analysis presented in the PEIR, and the mitigation measures set forth in the PEIR would adequately address this impact.

Impact WQ-4: Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding onsite or offsite (less than significant with mitigation)

The analysis in the PEIR concluded that the most extensive increase in impervious surfaces would result from road improvements necessary to accommodate the new, larger turbines. However, as disclosed in the PEIR, the soils underlying the program area overall are high runoff soils, with a runoff potential comparable to that of compacted gravel roads. Because the roads themselves would not consequently entail introduction of new impervious surfaces, and because the NPDES stormwater Construction General Permit requires postconstruction runoff management measures be implemented if the SWPPP determines that the Project could cause an increase in peak runoff flows, implementation of *Mitigation Measure WQ-1* would reduce this impact to a less-than-significant level. This conclusion is consistent with the analysis presented in the PEIR, and the mitigation measures set forth in the PEIR would adequately address this impact.

Impact WQ-5: Create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff (less than significant with mitigation)

As established in the PEIR, the program area does not currently have existing or planned storm-water drainage facilities; accordingly, the Project would not exceed capacities of such facilities. Moreover, as previously discussed, implementation of *Mitigation Measure WQ-1* would ensure that there would be no increase in the rate of polluted runoff. This conclusion is consistent with the analysis presented in the PEIR, and the mitigation measures set forth in the PEIR would adequately address this impact.

Impact WQ-6: Otherwise substantially degrade water quality (less than significant with mitigation)

Because, as disclosed in the PEIR, the program area does not currently have any substantial water quality issues or drainages that could carry a substantial amount of polluted runoff to receiving waters, Project construction is not anticipated to substantially degrade water quality. Moreover, Project operation would not result in a substantial amount of additional runoff. Implementation of

Mitigation Measure WQ-1 would reduce the potential impacts of construction-related discharges to a less-than-significant level. This conclusion is consistent with the analysis presented in the PEIR, and the mitigation measures set forth in the PEIR would adequately address this impact.

Impact WQ-7: Place housing within a 100-year flood hazard area, as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map (no impact)

No portion of the Project area is within a 100-year flood hazard area.

Impact WQ-8: Place within a 100-year flood hazard area structures that would impede or redirect floodflows (no impact)

No portion of the Project area is within a 100-year flood hazard area.

Impact WQ-9: Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam (less than significant)

As disclosed in the PEIR, because the Project area is in rolling hills and there are no 100-year floodplains, the likelihood of a flood event in the area is considered minimal. In addition, because the Project would not involve construction of housing, if Bethany Reservoir Dam were to fail, the likelihood of significant risk or loss is considered minimal. This conclusion is consistent with the analysis presented in the PEIR.

Impact WQ-10: Contribute to inundation by seiche, tsunami, or mudflow (less than significant with mitigation)

As the PEIR concluded, the likelihood of seiche or tsunami is considered minimal. A mudflow is also highly unlikely, but such an event could be possible in rolling hills if proper BMPs are not used during the construction process. Implementation of *Mitigation Measure WQ-1* would ensure that Project-related stormwater runoff would be properly contained and would drain appropriately to preclude buildup or to cause rills and sedimentation that could result in the potential for a mudflow. This conclusion is consistent with the analysis presented in the PEIR, and the mitigation measures set forth in the PEIR would adequately address this impact.

3.10 Land Use and Planning

Because there are no established communities in the program area that would be bisected by any proposed repowering project, wind energy production is an established and permitted use throughout the APWRA, and the program area is not within an HCP or NCCP area, the PEIR concluded that there would be no impacts on land use and planning associated with repowering projects within the program area. Because the Project area is a subset of the program area, the analysis remains valid. Accordingly, this resource topic is not addressed further in this analysis.

3.11 Noise

ICF conducted short- and long-term noise monitoring near residential uses in support of a previous Project in portions of the Project area in January 2016 (ICF International 2016). The results of the analysis conducted for the current Sand Hill Project are presented in *Sound Technical Report for the Sand Hill Wind Repowering Project, Alameda County, California* (Sound Technical Report) (Appendix D).

3.11.1 Existing Conditions

The Project vicinity is primarily agricultural with some scattered rural residences. Sound sources in the Project area are primarily traffic on local and distant roadways and natural sources such as birds and wind blowing through tall grass. The older existing turbines in the Project area have either been removed or are nonoperational. New turbines that have been installed on adjacent properties are a source of sound but are not dominant in the sound environment of the Project area.

3.11.2 Environmental Impacts and Mitigation Measures

Impact NOI-1: Exposure of residences to noise from new wind turbines (less than significant with mitigation)

The Sound Technical Report identified two sensitive receptors that would be exposed to noise levels in exceedance of the 55 A-weighted decibel (dBA) threshold established by the County: one on Altamont Pass Road in the southern portion of the Project area, and one on Mountain House Road in the eastern portion. The PEIR concluded that such exceedances would be possible as projects are designed and constructed, and that such exceedances would constitute a significant impact. Accordingly, the findings of the Sound Technical Report are consistent with the conclusions of the PEIR. Implementation of *Mitigation Measure NOI-1, Perform project-specific noise studies and implement measures to comply with County noise standards*, would reduce this impact to a less-than-significant level. This conclusion is consistent with the analysis presented in the PEIR, and the mitigation measures set forth in the PEIR would adequately address this impact.

Impact NOI-2: Exposure of residences to noise during decommissioning and new turbine construction (less than significant with mitigation)

The PEIR concluded that some residences in the program area would be within distances of construction activities that could expose them to noise levels in exceedance of Alameda County noise ordinance standards. The receptor identified as R1 in the Sound Technical report is within 550 feet of a laydown area and within 1,000 feet of the nearest turbine; R3 is within 1,000 feet of the nearest turbine. The noise levels to which these receptors could be exposed during removal of some old turbine foundations and construction of Project facilities and infrastructure would constitute a significant impact. As disclosed in the PEIR, implementation of *Mitigation Measure NOI-2, Employ noise-reducing practices during decommissioning and new turbine construction*, would reduce this impact to a less-than-significant level. This conclusion is consistent with the analysis presented in the PEIR, and the mitigation measures set forth in the PEIR would adequately address this impact.

3.11.3 References Cited

ICF International. 2016. *Sound Technical Report for the Sand Hill Proposed Wind Project, Alameda County, California*. March. (ICF 00716.15.) Sacramento, CA. Prepared for Ogin, Inc., Waltham, MA.

3.12 Population and Housing

The PEIR anticipated continuing growth in Alameda County. However, it concluded that the repowering projects constituting the overall APWRA repowering effort would not induce population growth either directly or indirectly. Because the Project is a subset of this analysis, the analysis remains valid. The Project would not involve creation of any housing units, nor would it displace any existing housing units or people. There would be no impact and no mitigation is required; accordingly, this resource topic is not addressed further in this analysis.

3.13 Public Services

The PEIR concluded that there would be no impacts on public services. Because the reduction in the number of turbines and the improved safety of newer models would result in a reduction of potential fire ignitions, there would be no increase in the demand for fire protection services. Police protection facilities and infrastructure required to protect the program area are already in place to protect the existing wind energy facilities. No residences would be constructed, no schools are present in the Project area, and because the PEIR concluded that repowering the APWRA would not induce growth, there would be no increased demand on schools or recreational facilities. There would be no impact and no mitigation is required. This conclusion is consistent with the analysis presented in the PEIR. Because the Project area is a subset of the program area, the analysis remains valid. Accordingly, this resource topic is not addressed further in this analysis.

3.14 Recreation

Because there are no recreational facilities in the entire program area and because the repowering program overall would not lead to an increase in use of nearby facilities, the PEIR found that there would be no impact on recreational facilities and no mitigation is required. Because the Project area is a subset of the program area, the analysis remains valid. Accordingly, recreation is not further considered in this analysis.

3.15 Transportation/Traffic

The PEIR evaluated traffic impacts for a generic 80 MW project as well as for two specific projects in the program area. No Project-specific traffic analysis was necessary for the Sand Hill Project because the impacts identified as potentially significant in the PEIR (e.g., increased traffic congestion and traffic hazards) would also apply to the Project, and the mitigation measures set forth in the PEIR would adequately address those impacts.

3.15.1 Existing Conditions

The road network and other existing conditions pertaining to traffic and transportation was described in the PEIR for the entire program area, of which the Project area is a subset. Most of the Project area would be accessed using roads as described in the PEIR (e.g., I-580, Altamont Pass Road), but some of the turbines on the east side of Bethany Reservoir and the California Aqueduct would be accessed from Mountain House Road, which was not specifically addressed in the PEIR. However, the program-level analysis adequately discloses the potential impacts associated with the proposed Project.

3.15.2 Environmental Impacts and Mitigation Measures

Impact TRA-1: Conflict with an applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation, including mass transit and non-motorized travel and relevant components of the circulation system, including, but not limited to, intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit or conflict with an applicable congestion management program, including, but not limited to, level-of-service standards and travel demand measures or other standards established by the county congestion management agency for designated roads or highways (less than significant with mitigation)

The PEIR concluded that construction activities could cause a substantial traffic increase on local county roads that provide direct access to Project construction sites, because these roads generally have low traffic volumes. However, these increases, while they could degrade traffic operations, would be of temporary duration. Implementation of *Mitigation Measure TRA-1, Develop and implement a construction traffic control plan*, would reduce this impact to a less-than-significant level. This conclusion is consistent with the analysis presented in the PEIR, and the mitigation measures set forth in the PEIR would adequately address this impact.

Impact TRA-2: Conflict with an applicable congestion management program, including, but not limited to, level-of-service standards and travel demand measures or other standards established by the county congestion management agency for designated roads or highways (less than significant)

The PEIR concluded that Project-related traffic would not substantially degrade the level of service on a congestion management program–designated roadway (i.e., I-580) because it would contribute such a small percentage of total traffic. Accordingly, this impact would be less than significant, and no mitigation is required. This conclusion is consistent with the analysis presented in the PEIR.

Impact TRA-3: Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks (less than significant)

The PEIR concluded that repowering in the program area would not result in a change in air traffic patterns or any increase in related safety risks. Because the Project would be within the area analyzed, the Project-level impact would also be less than significant, and no mitigation is required. This conclusion is consistent with the analysis presented in the PEIR.

Impact TRA-4: Substantially increase hazards because of a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment) due to construction-generated traffic (less than significant with mitigation)

The PEIR concluded that the presence of large, slow-moving construction and delivery vehicles could increase traffic safety hazards. Additionally, some of these vehicles could exceed roadway load and size limits. Permits from California Department of Transportation District 4 and other relevant jurisdictions would be required for such vehicles. Compliance with permit requirements and implementation of *Mitigation Measure TRA-1* would reduce this impact to a less-than-significant level. This conclusion is consistent with the analysis presented in the PEIR, and the mitigation measures set forth in the PEIR would adequately address this impact.

Impact TRA-5: Result in inadequate emergency access due to construction-generated traffic (less than significant with mitigation)

Large, slow-moving construction and delivery vehicles and temporary road and lane closures could delay or obstruct the movement of emergency vehicles, as disclosed in the PEIR. Implementation of *Mitigation Measure TRA-1* would reduce this impact to a less-than-significant level. This conclusion is consistent with the analysis presented in the PEIR, and the mitigation measures set forth in the PEIR would adequately address this impact.

Impact TRA-6: Conflict with adopted policies, plans, or programs regarding public transit, bicycle or pedestrian facilities, or otherwise decrease the performance or safety of such facilities (less than significant with mitigation)

The PEIR concluded that no public transit services or pedestrian facilities are present on the Project access routes in the program area. However, oversized construction vehicles could potentially disrupt the movement of bicycles traveling on the shoulders of some local access roads (e.g., Altamont Pass Road, West Grant Line Road, Mountain House Road), and lane or road closures associated with material deliveries could temporarily disrupt bicycle access. Implementation of *Mitigation Measure TRA-1* would reduce this impact to a less-than-significant level. This conclusion is consistent with the analysis presented in the PEIR, and the mitigation measures set forth in the PEIR would adequately address this impact.

3.16 Utilities and Service Systems

The PEIR analyzed potential impacts on utilities and service systems and determined that there would be no impacts or that impacts would be less than significant. Similarly, as described in the PEIR wastewater generation and drainage for the Project would not affect capacity of a water or wastewater treatment facility. Because of the reduced number of turbines, water needs for the Project would be equal to or less than those analyzed for the PEIR. Water for construction activities would be provided through an agreement with municipal or private suppliers and would therefore not affect any water supply or require expanded entitlements. Solid waste would be generated primarily during Project construction and would not exceed the capacity of landfills. The Project would be required to comply with local, state, and federal solid waste regulations. There would be no impact and no mitigation is required. This conclusion is consistent with the analysis presented in the PEIR. Accordingly, this resource topic is not addressed further in this analysis.

Chapter 4
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Appendix A

Air Quality Technical Memorandum

Appendix B

Biological Resources Evaluation Report

Appendix C

Cultural Resources Survey Report

Appendix D

Sound Technical Report