APPENDIX A

Notice of Preparation and Comment Letters

State of California – The Resources Agency

DEPARTMENT OF PARKS AND RECREATION

NOTICE OF PREPARATION

PROJECT TITLE: Gonzaga Ridge Wind Repowering Project

The California Department of Parks and Recreation (CDPR) is the Lead Agency under the California Environmental Quality Act (CEQA) for the Gonzaga Ridge Wind Repowering Project (Project) and is preparing a focused environmental impact report (EIR) to evaluate the potential effects of implementing the project. CDPR would like to know the views of your agency or organization concerning the scope and content of the EIR that is germane to the statutory responsibilities of your agency or organization, in connection with the proposed project including potential project alternatives. If you do not belong to an agency or organization, this notice has been sent to provide you with an opportunity to comment on the scope of the review and to identify important issues you believe should be evaluated in the EIR. A written response to this Notice of Preparation will provide you with the opportunity to identify and discuss these issues. The EIR will evaluate the project-specific and cumulative impacts, identify feasible mitigation measures to reduce or avoid significant project impacts, and identify a reasonable range of potentially feasible alternatives to the proposed project and describe their comparative environmental effects.

PROJECT LOCATION:

The proposed project area is located within Pacheco State Park (Park) in unincorporated Merced County, as shown on Figure 1, Vicinity Map and Figure 2, Project Location. The Park consists of 6,900 acres of former ranchland along State Route (SR) 152 known as Pacheco Pass, at the edge of the Diablo Range. The western portion of State Route (SR 152) provides access to Interstate Highway 5 (I-5), which is approximately 1 mile east of the project area. State Route 33 (SR 33), and the unincorporated community of Santa Nella is 2 miles northeast of the San Luis Reservoir. Other nearby cities are Los Banos, approximately 6 miles east, and Gilroy, 38 miles to the west. The Park is generally equidistant between the cities of Gilroy and

Los Banos and is an approximate two hour drive from San Francisco. The land between the Park and the San Luis Reservoir State Recreation Area is managed by CDPR.

PROJECT BACKGROUND:

The proposed project is a wind energy repowering project that will replace the 30-year-old wind farm currently within the Park. Gonzaga Ridge Wind Farm (Gonzaga– project applicant) is a renewable energy development company that has been selected by the State to decommission the existing wind farm and install new, modern wind turbines. Scout was awarded the new long-term lease (maximum 35 years) and as part of the project will decommission (remove) all existing wind turbines and transmission facilities and will install substantially fewer new turbines, reducing the number by at least 100. The replacement turbines are more efficient and use state-of-the art technology as compared to the existing turbines.

The existing wind farm has operated since 1984 and is one of the oldest wind energy facilities in the U.S. The wind energy project generates income that includes funds specifically earmarked for the Park, as stipulated by the last member of the Pacheco family who donated the wind farm and Park to the State.

PROJECT DESCRIPTION:

The project would replace the existing 16.5 megawatt (MW) wind energy facility, comprised of 166 wind turbines, with approximately 40 new wind turbines and associated, modern infrastructure (i.e., collector substation and switching station, meteorological (MET) towers, access roads, operations and maintenance facility, overhead and underground electrical collector system, and temporary equipment laydown areas) with a generating capacity of up to approximately 100 MW. The project would also use privately-owned property, as well as land owned by the Bureau of Reclamation (BOR), for wind turbine and transmission line siting.

POSSIBLE ENVIRONMENTAL EFFECTS AND SCOPE OF THE EIR:

Pursuant to CEQA and California Code of Regulations (CCR) section 15064, the discussion of potential effects on the environment in the EIR shall be focused on those impacts that CDPR has determined may be potentially significant. CDPR has preliminarily determined that the project has the potential to cause significant effects on:

- Biological Resources (primarily avian species)
- Aesthetics (public views of the Park)

CEQA allows a lead agency to limit the detail of discussion of the environmental effects that are not considered potentially significant. (Pub. Resources Code, § 21100; CCR §§ 15126.2(a), 15128.) CEQA requires that the discussion of any significant effect on the environment be limited to substantial, or potentially substantial, adverse changes in physical conditions that exist within the affected area, as defined in Public Resources Code section 21060.5. Environmental issue areas outside the scope of the focused EIR will include an explanation, based on an Initial Study, of why these issue areas would not result in significant environmental effects and further evaluation is not required. Environmental issue areas that CDPR has preliminarily determined to be outside the scope of the focused EIR include:

- Agricultural/Forestry Resources
- Air Quality
- Geology and Soils
- Cultural Resources
- Greenhouse Gas Emissions
- Hazards and Hazardous Emissions
- Hydrology and Water Quality
- Public Services
- Recreation
- Land Use, Planning and Population
- Noise
- Energy
- Mineral Resources
- Population and Housing
- Transportation/Traffic
- Tribal Cultural Resources
- Utilities and Service Systems

ENVIRONMENTAL REVIEW PROCESS:

Comments as to the appropriate scope of analysis in the EIR are invited from all interested parties. Written comments or questions concerning the EIR for the proposed project should be directed to the contact listed below by no later than Monday, November 19, 2018.

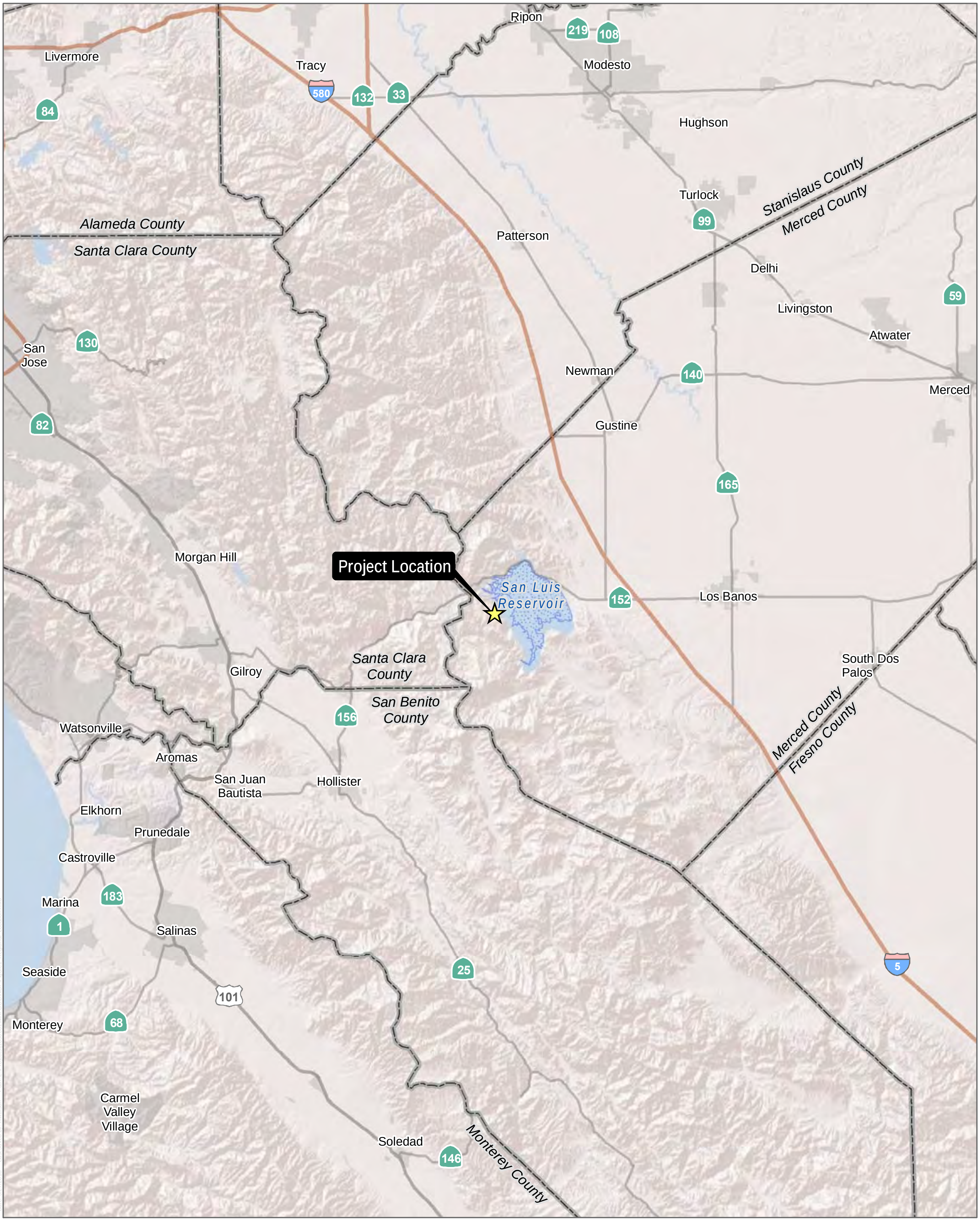
Once completed, the Draft EIR will be made available for a 45-day public review and comment period in accordance with CEQA. Responses will be prepared for all significant environmental comments received and revisions made to the Draft EIR, if any, will be included in the Final EIR to be presented to the California State Parks and Recreation Commission Hearing for review and approval.

Notices associated with the project's CEQA review are available at: https://www.parks.ca.gov/?page_id=982.

Your comments must be sent to the address below not later than thirty (30) days after the receipt of this notice or by Monday, November 19, 2018. Please include the contact person's full name and address.

DEPARTMENT OF PARKS AND RECREATION CONTACT PERSON:

Danielle Gerhart
District Services
Central Valley District - California State Parks
22708 Broadway
Columbia, CA 95310-9400
Danielle.Gerhart@parks.ca.gov
(209) 536-2912



SOURCE: ESRI 2018

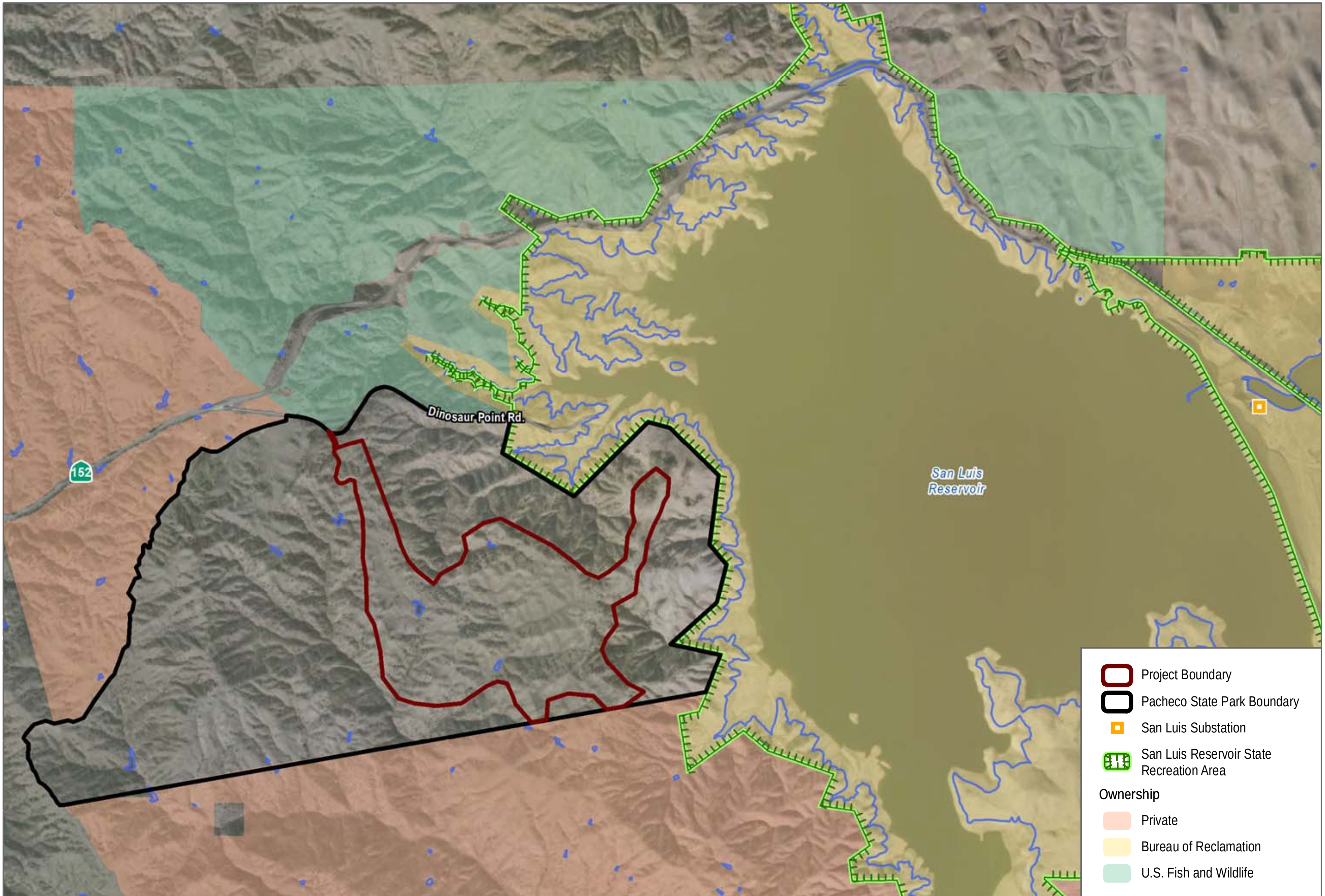
DUDEK

0 5 10 Miles

FIGURE 1

Regional Location

Gonzaga Ridge Wind Repowering Project



SOURCE: Merced County 2018, Bing Maps 2018

DUDEK

FIGURE 2

Project Location

Gonzaga Ridge Wind Repowering Project

From: Prasad, Rodney@DWR <Rodney.Prasad@water.ca.gov>
Sent: Monday, October 29, 2018 2:55 PM
To: Gerhart, Danielle@Parks <Danielle.Gerhart@parks.ca.gov>
Subject: RE: Gonzaga Ridge Wind Project

Thank you for the information.

From: Gerhart, Danielle@Parks [mailto:Danielle.Gerhart@parks.ca.gov]
Sent: Monday, October 29, 2018 2:53 PM
To: Prasad, Rodney@DWR <Rodney.Prasad@water.ca.gov>
Subject: RE: Gonzaga Ridge Wind Project

Good afternoon Rodney,
The POI is the Los Banos substation, east of the San Luis Reservoir.

Please let me know if you have any further questions.

Danielle Gerhart
District Services – Planning, Marketing
Central Valley District
California State Parks
(209) 536-2912

From: Prasad, Rodney@DWR <Rodney.Prasad@water.ca.gov>
Sent: Monday, October 29, 2018 8:50 AM
To: Gerhart, Danielle@Parks <Danielle.Gerhart@parks.ca.gov>
Subject: Gonzaga Ridge Wind Project

Hi Danielle,

I am reviewing the EIR for the Gonzaga Ridge Wind Project and I would like to know what is it's Point of Interconnection (POI). I will appreciate if you could provide me with this information. Also, I have left you a voicemail asking you about the same information.

Sincerely,
Rodney Prasad
Senior HEP Utility Engineer
Transmission Interconnections Section
SWP Power and Risk Office
Phone: (916) 574-1983
Email: Rodney.Prasad@water.ca.gov

STATE OF CALIFORNIA Edmund G. Brown Jr., Governor

NATIVE AMERICAN HERITAGE COMMISSION
Cultural and Environmental Department
1550 Harbor Blvd., Suite 100
West Sacramento, CA 95691
Phone (916) 373-3710
Email: nahc@nahc.ca.gov
Website: http://www.nahc.ca.gov
Twitter: @CA_NAHC

November 6, 2018

Danielle Gerhart
California Department of Parks and Recreation
22708 Broadway Street
Colombia, CA 95310-9400

RE: SCH# 22018101047 Gonzaga Ridge Wind Repowering Project, Merced County

Dear Ms. Gerhart:

The Native American Heritage Commission (NAHC) has received the Notice of Preparation (NOP), Draft Environmental Impact Report (DEIR) or Early Consultation for the project referenced above. The California Environmental Quality Act (CEQA) (Pub. Resources Code §21000 et seq.), specifically Public Resources Code §21084.1, states that a project that may cause a substantial adverse change in the significance of a historical resource, is a project that may have a significant effect on the environment. (Pub. Resources Code § 21084.1; Cal. Code Regs., tit.14, §15064.5 (b) (CEQA Guidelines §15064.5 (b)). If there is substantial evidence, in light of the whole record before a lead agency, that a project may have a significant effect on the environment, an Environmental Impact Report (EIR) shall be prepared. (Pub. Resources Code §21080 (d); Cal. Code Regs., tit. 14, § 5064 subd.(a)(1) (CEQA Guidelines §15064 (a)(1)). In order to determine whether a project will cause a substantial adverse change in the significance of a historical resource, a lead agency will need to determine whether there are historical resources within the area of potential effect (APE).

CEQA was amended significantly in 2014. Assembly Bill 52 (Gatto, Chapter 532, Statutes of 2014) (AB 52) amended CEQA to create a separate category of cultural resources, "tribal cultural resources" (Pub. Resources Code §21074) and provides that a project with an effect that may cause a substantial adverse change in the significance of a tribal cultural resource is a project that may have a significant effect on the environment. (Pub. Resources Code §21084.2). Public agencies shall, when feasible, avoid damaging effects to any tribal cultural resource. (Pub. Resources Code §21084.3 (a)). **AB 52 applies to any project for which a notice of preparation, a notice of negative declaration, or a mitigated negative declaration is filed on or after July 1, 2015.** If your project involves the adoption of or amendment to a general plan or a specific plan, or the designation or proposed designation of open space, on or after March 1, 2005, it may also be subject to Senate Bill 18 (Burton, Chapter 905, Statutes of 2004) (SB 18). **Both SB 18 and AB 52 have tribal consultation requirements**. If your project is also subject to the federal National Environmental Policy Act (42 U.S.C. § 4321 et seq.) (NEPA), the tribal consultation requirements of Section 106 of the National Historic Preservation Act of 1966 (154 U.S.C. 300101, 36 C.F.R. §800 et seq.) may also apply.

The NAHC recommends consultation with California Native American tribes that are traditionally and culturally affiliated with the geographic area of your proposed project as early as possible in order to avoid inadvertent discoveries of Native American human remains and best protect tribal cultural resources. Below is a brief summary of portions of AB 52 and SB 18 as well as the NAHC's recommendations for conducting cultural resources assessments.

Consult your legal counsel about compliance with AB 52 and SB 18 as well as compliance with any other applicable laws.

AB 52

AB 52 has added to CEQA the additional requirements listed below, along with many other requirements:

1. Fourteen Day Period to Provide Notice of Completion of an Application/Decision to Undertake a Project: Within fourteen (14) days of determining that an application for a project is complete or of a decision by a public agency to undertake a project, a lead agency shall provide formal notification to a designated contact of, or tribal representative of, traditionally and culturally affiliated California Native American tribes that have requested notice, to be accomplished by at least one written notice that includes:
   a. A brief description of the project.
   b. The lead agency contact information.
   c. Notification that the California Native American tribe has 30 days to request consultation. (Pub. Resources Code §21080.3.1 (d)).
   d. A "California Native American tribe" is defined as a Native American tribe located in California that is on the contact list maintained by the NAHC for the purposes of Chapter 905 of Statutes of 2004 (SB 18). (Pub. Resources Code §21073).

2. Begin Consultation Within 30 Days of Receiving a Tribe's Request for Consultation and Before Releasing a Negative Declaration, Mitigated Negative Declaration, or Environmental Impact Report: A lead agency shall begin the consultation process within 30 days of receiving a request for consultation from a California Native American tribe that is traditionally and culturally affiliated with the geographic area of the proposed project. (Pub. Resources Code §21080.3.1, subds. (d) and (e)) and prior to the release of a negative declaration, mitigated negative declaration or Environmental Impact Report. (Pub. Resources Code §21080.3.1(b)).
   a. For purposes of AB 52, "consultation shall have the same meaning as provided in Gov. Code §65352.4 (SB 18). (Pub. Resources Code §21080.3.1 (b)).

3. Mandatory Topics of Consultation If Requested by a Tribe: The following topics of consultation, if a tribe requests to discuss them, are mandatory topics of consultation:
   a. Alternatives to the project.
   b. Recommended mitigation measures.
   c. Significant effects. (Pub. Resources Code §21080.3.2 (a)).

4. Discretionary Topics of Consultation: The following topics are discretionary topics of consultation:
   a. Type of environmental review necessary.
   b. Significance of the tribal cultural resources.
   c. Significance of the project's impacts on tribal cultural resources.
   d. If necessary, project alternatives or appropriate measures for preservation or mitigation that the tribe may recommend to the lead agency. (Pub. Resources Code §21080.3.2 (a)).

5. Confidentiality of Information Submitted by a Tribe During the Environmental Review Process: With some exceptions, any information, including but not limited to, the location, description, and use of tribal cultural resources submitted by a California Native American tribe during the environmental review process shall not be included in the environmental document or otherwise disclosed by the lead agency or any other public agency to the public, consistent with Government Code §6254 (r) and §6254.10. Any information submitted by a California Native American tribe during the consultation or environmental review process shall be published in a confidential appendix to the environmental document unless the tribe that provided the information consents, in writing, to the disclosure of some or all of the information to the public. (Pub. Resources Code §21082.3 (c)(1)).

6. Discussion of Impacts to Tribal Cultural Resources in the Environmental Document: If a project may have a significant impact on a tribal cultural resource, the lead agency's environmental document shall discuss both of the following:
   a. Whether the proposed project has a significant impact on an identified tribal cultural resource.
   b. Whether feasible alternatives or mitigation measures, including those measures that may be agreed to pursuant to Public Resources Code §21082.3, subdivision (a), avoid or substantially lessen the impact on the identified tribal cultural resource. (Pub. Resources Code §21082.3 (b)).

7. Conclusion of Consultation: Consultation with a tribe shall be considered concluded when either of the following occurs:
   a. The parties agree to measures to mitigate or avoid a significant effect, if a significant effect exists, on a tribal cultural resource; or
   b. A party, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached. (Pub. Resources Code §21080.3.2 (b)).

8. Recommending Mitigation Measures Agreed Upon in Consultation in the Environmental Document: Any mitigation measures agreed upon in the consultation conducted pursuant to Public Resources Code §21080.3.2 shall be recommended for inclusion in the environmental document and in an adopted mitigation monitoring and reporting program, if determined to avoid or lessen the impact pursuant to Public Resources Code §21082.3, subdivision (b), paragraph 2, and shall be fully enforceable. (Pub. Resources Code §21082.3 (a)).

9. Required Consideration of Feasible Mitigation: If mitigation measures recommended by the staff of the lead agency as a result of the consultation process are not included in the environmental document or if there are no agreed upon mitigation measures at the conclusion of consultation, or if consultation does not occur, and if substantial evidence demonstrates that a project will cause a significant effect to a tribal cultural resource, the lead agency shall consider feasible mitigation pursuant to Public Resources Code §21084.3 (b). (Pub. Resources Code §21082.3 (e)).

10. Examples of Mitigation Measures That, If Feasible, May Be Considered to Avoid or Minimize Significant Adverse Impacts to Tribal Cultural Resources:
    a. Avoidance and preservation of the resources in place, including, but not limited to:
       i. Planning and construction to avoid the resources and protect the cultural and natural context.
       ii. Planning greenspace, parks, or other open space, to incorporate the resources with culturally appropriate protection and management criteria.
    b. Treating the resource with culturally appropriate dignity, taking into account the tribal cultural values and meaning of the resource, including, but not limited to, the following:
       i. Protecting the cultural character and integrity of the resource.
       ii. Protecting the traditional use of the resource.
       iii. Protecting the confidentiality of the resource.
    c. Permanent conservation easements or other interests in real property, with culturally appropriate management criteria for the purposes of preserving or utilizing the resources or places.
    d. Protecting the resource. (Pub. Resource Code §21084.3 (b)).
    e. Please note that a federally recognized California Native American tribe or a non-federally recognized California Native American tribe that is on the contact list maintained by the NAHC to protect a California prehistoric, archaeological, cultural, spiritual, or ceremonial place may acquire and hold conservation easements if the conservation easement is voluntarily conveyed. (Civ. Code §815.3 (c)).
    f. Please note that it is the policy of the state that Native American remains and associated grave artifacts shall be repatriated. (Pub. Resources Code §5097.991).

11. Prerequisites for Certifying an Environmental Impact Report or Adopting a Mitigated Negative Declaration or Negative Declaration with a Significant Impact on an Identified Tribal Cultural Resource: An Environmental Impact Report may not be certified, nor may a mitigated negative declaration or a negative declaration be adopted unless one of the following occurs:
    a. The consultation process between the tribes and the lead agency has occurred as provided in Public Resources Code §21080.3.1 and §21080.3.2 and concluded pursuant to Public Resources Code §21080.3.2.
    b. The tribe that requested consultation failed to provide comments to the lead agency or otherwise failed to engage in the consultation process.
    c. The lead agency provided notice of the project to the tribe in compliance with Public Resources Code §21080.3.1 (d) and the tribe failed to request consultation within 30 days. (Pub. Resources Code §21082.3 (d)).

The NAHC's PowerPoint presentation titled, "Tribal Consultation Under AB 52: Requirements and Best Practices" may be found online at: http://nahc.ca.gov/wp-content/uploads/2015/10/AB52TribalConsultation_CalEPAPDF.pdf

SB 18

SB 18 applies to local governments and requires local governments to contact, provide notice to, refer plans to, and consult with tribes prior to the adoption or amendment of a general plan or a specific plan, or the designation of open space. (Gov. Code §65352.3). Local governments should consult the Governor's Office of Planning and Research's "Tribal Consultation Guidelines," which can be found online at: https://www.opr.ca.gov/docs/09_14_05_Updated_Guidelines_922.pdf

Some of SB 18's provisions include:

1. Tribal Consultation: If a local government considers a proposal to adopt or amend a general plan or a specific plan, or to designate open space it is required to contact the appropriate tribes identified by the NAHC by requesting a "Tribal Consultation List." If a tribe, once contacted, requests consultation the local government must consult with the tribe on the plan proposal. **A tribe has 90 days from the date of receipt of notification to request consultation unless a shorter timeframe has been agreed to by the tribe.** (Gov. Code §65352.3 (a)(2)).
2. No Statutory Time Limit on SB 18 Tribal Consultation. There is no statutory time limit on SB 18 tribal consultation.
3. Confidentiality: Consistent with the guidelines developed and adopted by the Office of Planning and Research pursuant to Gov. Code §65040.2, the city or county shall protect the confidentiality of the information concerning the specific identity, location, character, and use of places, features and objects described in Public Resources Code §5097.9 and §5097.993 that are within the city's or county's jurisdiction. (Gov. Code §65352.3 (b)).
4. Conclusion of SB 18 Tribal Consultation: Consultation should be concluded at the point in which:
    a. The parties to the consultation come to a mutual agreement concerning the appropriate measures for preservation or mitigation; or
    b. Either the local government or the tribe, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached concerning the appropriate measures of preservation or mitigation. (Tribal Consultation Guidelines, Governor's Office of Planning and Research (2005) at p. 18).

Agencies should be aware that neither AB 52 nor SB 18 precludes agencies from initiating tribal consultation with tribes that are traditionally and culturally affiliated with their jurisdictions before the timeframes provided in AB 52 and SB 18. For that reason, we urge you to continue to request Native American Tribal Contact Lists and "Sacred Lands File" searches from the NAHC. The request forms can be found online at: http://nahc.ca.gov/resources/forms/

NAHC Recommendations for Cultural Resources Assessments

To adequately assess the existence and significance of tribal cultural resources and plan for avoidance, preservation in place, or barring both, mitigation of project-related impacts to tribal cultural resources, the NAHC recommends the following actions:

1. Contact the appropriate regional California Historical Research Information System (CHRIS) Center (http://ohp.parks.ca.gov/?page_id=1068) for an archaeological records search. The records search will determine:
    a. If part or all of the APE has been previously surveyed for cultural resources.
    b. If any known cultural resources have already been recorded on or adjacent to the APE.
    c. If the probability is low, moderate, or high that cultural resources are located in the APE.
    d. If a survey is required to determine whether previously unrecorded cultural resources are present.

2. If an archaeological inventory survey is required, the final stage is the preparation of a professional report detailing the findings and recommendations of the records search and field survey.
    a. The final report containing site forms, site significance, and mitigation measures should be submitted immediately to the planning department. All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum and not be made available for public disclosure.
    b. The final written report should be submitted within 3 months after work has been completed to the appropriate regional CHRIS center.

3. Contact the NAHC for:
   a. A Sacred Lands File search. Remember that tribes do not always record their sacred sites in the Sacred Lands File, nor are they required to do so. A Sacred Lands File search is not a substitute for consultation with tribes that are traditionally and culturally affiliated with the geographic area of the project's APE.
   b. A Native American Tribal Consultation List of appropriate tribes for consultation concerning the project site and to assist in planning for avoidance, preservation in place, or, failing both, mitigation measures.

4. Remember that the lack of surface evidence of archaeological resources (including tribal cultural resources) does not preclude their subsurface existence.
   a. Lead agencies should include in their mitigation and monitoring reporting program plan provisions for the identification and evaluation of inadvertently discovered archaeological resources per Cal. Code Regs., tit. 14, §15064.5(f) (CEQA Guidelines §15064.5(f)). In areas of identified archaeological sensitivity, a certified archaeologist and a culturally affiliated Native American with knowledge of cultural resources should monitor all ground-disturbing activities.
   b. Lead agencies should include in their mitigation and monitoring reporting program plans provisions for the disposition of recovered cultural items that are not burial associated in consultation with culturally affiliated Native Americans.
   c. Lead agencies should include in their mitigation and monitoring reporting program plans provisions for the treatment and disposition of inadvertently discovered Native American human remains. Health and Safety Code §7050.5, Public Resources Code §5097.98, and Cal. Code Regs., tit. 14, §15064.5, subdivisions (d) and (e) (CEQA Guidelines §15064.5, subds. (d) and (e)) address the processes to be followed in the event of an inadvertent discovery of any Native American human remains and associated grave goods in a location other than a dedicated cemetery.

If you have any questions or need additional information, please contact me at my email address: Sharaya.Souza@nahc.ca.gov.

Sincerely,

for Nancy Gonzalez

Sharaya Souza
Staff Services Analyst

cc: State Clearinghouse

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
2800 Cottage Way, Suite W-2605
Sacramento, California 95825-1846

In Reply Refer to:
08ESMF00-
2019-TA-0305

NOV 21 2018

Danielle Gerhart
District Services
Central Valley District-California State Parks
22708 Broadway
Columbia, California 95310-9400

Subject: Gonzanga Wind Repowering Project, Pacheco State Park, California

Dear Ms. Gerhart:

This letter is in response to an October 29, 2018, request for comments submitted by California Department of State Parks to the U.S. Fish and Wildlife Service (Service), regarding a notice of preparation of an environmental impact report (EIR) to update an existing wind farm facility (proposed project). The proposed project would include the replacement of an existing 16.5 megawatt (MW) wind energy facility, comprised of 166 wind turbines, with approximately 40 new wind turbines with a generating capacity of 100 MW and associated infrastructure. This would include a collector substation and switching station, meteorological towers, access roads, operations and maintenance facilities, overhead and underground electrical collector systems, and staging areas. Land owned by the Bureau of Reclamation and privately owned property would be used for wind turbine and transmission line siting. The proposed project is located in Pacheco State Park on the west side of the San Luis Reservoir in Merced County. Your request was received by the Service on October 29, 2018.

This response is pursuant to the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*), (Act). Section 9 of the Act prohibits the take of endangered and threatened species, respectively, without special exemption. "Take" is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. "Harass" is defined by regulations at 50 CFR 17.3 as an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering. "Harm" is defined by the same regulations as an act which actually kills or injures wildlife. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavior patterns, including breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity.

A review of available aerial imagery shows that the proposed project site and surrounding areas are comprised of rangeland and lakes located within the range of the San Joaquin kit fox (*Vulpes macrotis mutica*, kit fox, federally endangered), California tiger salamander (*Ambystoma californiense,* salamander, federally threatened), and California red-legged frog (*Rana draytonii*, frog, federally threatened). According to the California Natural Diversity Database, presumed extant records of kit fox and a recorded natal den occur within 5 miles of the proposed project. Salamanders have been recorded within 4 miles of the proposed site. In addition, the proposed project site occurs within designated critical habitat for the frog, and three lakes near or within the proposed project boundary have records of frog occurrences and breeding activity (Wolf Lake, Mammoth Lake, and Dinosaur Lake). Upland habitats, such as fallow fields found on and around the proposed project site, may be used for dispersal. As such, there is the potential for take to occur if the species uses the proposed project site during construction, operation, and maintenance activities.

The Service recommends that the scope of the EIR consider effects to kit fox, salamander, frog, and frog critical habitat, as well as any other federally protected species that may occur on or near the proposed project site during construction, operations, or maintenance activities. The Service recommends a search of the Service's Information Planning and Consultation system at http://ecos.fws.gov/ipac to obtain a full list of federally-listed species that may occur on the proposed project site. Any take that would occur as a result of the proposed project would require prior consultation with the Service under Section 7 or Section 10 of the Act in order to avoid violation of the Act.

Thank you for the opportunity to review this proposed project. If you have questions regarding this response, please contact Sarah Yates (sarah_d_yates@fws.gov) at (916) 414-6625 or me (patricia_cole@fws.gov) at the letterhead address or (916) 414-6544.

Sincerely,

Patricia Cole

Patricia Cole
Chief, San Joaquin Valley Division

cc:
Jim Vang, California Department of Fish and Wildlife, Fresno, CA

From: Forrest, Kim <kim_forrest@fws.gov>
Sent: Friday, November 16, 2018 8:53 AM
To: Gerhart, Danielle@Parks <Danielle.Gerhart@parks.ca.gov>
Cc: patricia_cole@fws.gov; Thomas Leeman <Thomas_Leeman@fws.gov>; Bob Parris <bob_parris@fws.gov>; Stacy Armitage <stacy_armitage@fws.gov>; Karl Stromayer <karl_stromayer@fws.gov>
Subject: Re: [EXTERNAL] RE: NoP - Gonzaga Ridge Wind Repowering Project

Excellent -- thank you!

-- Kim

Kim Forrest, Refuge Manager
San Luis NWR Complex
U.S. Fish & Wildlife Service
P.O. Box 2176
7376 S. Wolfsen Road
Los Banos, CA 93635
209/826-3508 ext. 116 (phone)
209/826-1445 (fax)
https://www.facebook.com/SanLuisNWRC/

On Fri, Nov 16, 2018 at 8:51 AM Gerhart, Danielle@Parks <Danielle.Gerhart@parks.ca.gov> wrote:

Hi Kim,

I apologize for my delay in getting back to you. Our team was asked to help with the southern California fires, so I am just getting back to responding to my emails.

See answers below and please let me know if I can clarify anything else.

Danielle Gerhart
Marketing/District Services
Central Valley District
California State Parks
(209) 536-2912

From: Forrest, Kim <kim_forrest@fws.gov>
Sent: Monday, November 5, 2018 9:09 AM
To: Gerhart, Danielle@Parks <Danielle.Gerhart@parks.ca.gov>
Cc: Patricia Cole <patricia_cole@fws.gov>; Thomas Leeman <Thomas_Leeman@fws.gov>; Bob Parris <bob_parris@fws.gov>; Stacy Armitage <stacy_armitage@fws.gov>; Karl Stromayer <karl_stromayer@fws.gov>
Subject: Re: [EXTERNAL] RE: NoP - Gonzaga Ridge Wind Repowering Project

Hi Danielle --

Sorry, but...that really didn't answer my questions...

- Are these turbines larger that the existing ones? If so, how much larger? Yes, they will be larger, but the final model has not yet been determined. The current turbines are a variety of sizes so it is difficult to say how much larger the new ones will be at this point. This will be defined in the EIR next spring.
- Is the "Project Boundary" within the existing infrastructure footprint (other than transmission lines)? Yes, it is within the existing footprint, however, it is now much smaller. For reference, the prior lease included 3,819 acres and the new lease only includes 1,630 acres, an approximate 58% reduction in the amount of land the lessee will be using.
- I assume my question about increased/decreased bird/bat safety will be addressed in the EIS. Yes.

-- Kim

Kim Forrest, Refuge Manager
San Luis NWR Complex
U.S. Fish & Wildlife Service
P.O. Box 2176
7376 S. Wolfsen Road
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209/826-3508 ext. 116 (phone)
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On Mon, Nov 5, 2018 at 8:58 AM, Gerhart, Danielle@Parks <Danielle.Gerhart@parks.ca.gov> wrote:

Good morning Kim,

Thank you for commenting on the project. A few responses to your questions below:

- The height of the new turbines will be approximately 494 feet at the top of the blade.

- With the exception of the transmission line, all of the infrastructure will be within the project boundary (1,630 acres).

- The EIR will address wildlife concerns; biological surveys are still in process.

The EIR will be coming out early spring 2019 and we look forward to comments from USFWS. Let me know if you have any other questions between now and then.

Danielle Gerhart

Marketing/District Services/Planning
Central Valley District
California State Parks
(209) 536-2912

From: Forrest, Kim <kim_forrest@fws.gov>
Sent: Monday, October 29, 2018 1:34 PM
To: Gerhart, Danielle@Parks <Danielle.Gerhart@parks.ca.gov>
Cc: Patricia Cole <patricia_cole@fws.gov>; Thomas Leeman <Thomas_Leeman@fws.gov>; Bob Parris <bob_parris@fws.gov>; Stacy Armitage <stacy_armitage@fws.gov>; Karl Stromayer <karl_stromayer@fws.gov>
Subject: NoP - Gonzaga Ridge Wind Repowering Project

Danielle --

I received this NoP here at San Luis National Wildlife Refuge Complex -- we manage the refuges in the Grasslands area and along the San Joaquin River. I am cc'ing San Joaquin Valley Division Chief Patricia Cole of the USFWS Endangered Species Division and Deputy Chief Thomas Leeman of the USFWS Migratory Birds Division; to assure that those offices receive this NoP, because they are most responsible for responding with USFWS comments.

I do see one error, on your Figure 2 Project Location map. The land marked "U.S. Fish and Wildlife" is actually land managed by the California Department of Fish & Wildlife.

I have two questions:

- Though the proposal would reduce the number of wind turbines from 166 to about 40, with the much greater megawatt production I would presume that these are the larger wind turbines. Is that correct?
    - If so, are these new turbines safer for birds and bats?
- Though there are many fewer wind turbines, this NoP indicates that considerable infrastructure will be built. Does the "Project Boundary" shown on the Project Location map indicate both the existing and the planned project boundaries, or will there be an expanded footprint?

Thank you for providing this information.

-- Kim
Kim Forrest, Refuge Manager
San Luis NWR Complex
U.S. Fish & Wildlife Service

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APPENDIX B

Initial Study

INITIAL STUDY
Gonzaga Ridge Wind Repowering Project

Prepared for the California Department of Parks and Recreation Four Rivers District

SCH# 2018101047

OCTOBER 2019

Printed on 30% post-consumer recycled material.

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ACRONYMS AND ABBREVIATIONS

Acronym/Abbreviation	Definition
AB	Assembly Bill
amsl	above mean sea level
BMP	best management practice
BOR	Bureau of Reclamation
CAISO	California Independent System Operator
CalEEMod	California Emissions Estimator Model
CalRecycle	California Department of Resources Recycling and Recovery
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CBC	California Building Code
CCIC	Central California Information Center
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CH_4	methane
CHRIS	California Historical Resources Information System
CIMIS	California Irrigation Management Information System
CNEL	Community Noise Equivalent Level
CNPS	California Native Plant Society
CO	carbon monoxide
CO_2	carbon dioxide
CTMP	Construction Traffic Management Plan
CVP	Central Valley Project
dB	decibel
DPM	diesel particulate matter
DTSC	Department of Toxic Substances Control
DWR	Department of Water Resources
EIR	environmental impact report
EPA	Environmental Protection Agency
ESA	environmental site assessment
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FIRM	Flood Insurance Rate Map
FMMP	Farmland Mapping and Monitoring Program
FPP	Fire Protection Plan
GHG	greenhouse gas
GRWF	Gonzaga Ridge Wind Farm, LLC
HA	hydrologic area
HCP	Habitat Conservation Plan
HFC	hydrofluorocarbon

Acronym/Abbreviation	Definition
HU	hydrologic unit
I-5	Interstate 5
IPCC	Intergovernmental Panel on Climate Change
kV	kilovolt
L_{eq}	Energy Equivalent Level
LID	low impact design
Lmax	maximum sound level recorded during the measurement interval
LOS	level of service
MCAG	Merced County Association of Governments
MCC	Merced County Municipal Code
MET	meteorological evaluation tower
MT CO_2e	metric tons of carbon dioxide equivalent
MW	megawatt
N_2O	nitrous oxide
NAHC	Native American Heritage Commission
NAHC	Native American Heritage Commission
NF_3	nitrogen trifluoride
NO_2	nitrogen dioxide
NOI	Notice of Intent
NO_x	oxides of nitrogen
NPDES	National Pollutant Discharge Elimination System
O&M	operations and maintenance
O_3	ozone
Park	Pacheco State Park
Pb	lead
PCB	polychlorinated biphenyl
PCE	Passenger car equivalent
PFC	perfluorocarbon
PG&E	Pacific Gas and Electric Company
PGA	peak ground acceleration
PM_{10}	particulate matter with an aerodynamic diameter less than or equal to 10 microns
$PM_{2.5}$	particulate matter with an aerodynamic diameter less than or equal to 2.5 microns
POI	point of interconnect
PPV	peak particle velocity
PRC	Public Resources Code
proposed Project	Gonzaga Ridge Wind Repowering project
PSHA	probabilistic seismic hazard assessment
PUC	Public Utilities Commission
REC	recognized environmental condition
RMS	Root Mean Square
ROG	reactive organic gas
RTP	Regional Transportation Plan

Acronym/Abbreviation	Definition
RWQCB	Regional Water Quality Control Board
SCS	Sustainable Communities Strategy
SF_6	sulfur hexafluoride
SJVAB	San Joaquin Valley Air Basin
SJVAPCD	San Joaquin Valley Air Pollution Control District
SO_2	sulfur dioxide
SO_x	sulfur oxides
SR	State Route
SRA	State Recreation Area
State Parks	California Department of Parks and Recreation
SWP	State Water Project
SWPPP	stormwater pollution prevention plan
SWRCB	State Water Resources Control Board
TAC	toxic air contaminant
TCR	tribal cultural resource
TESC	Temporary Erosion and Sediment Control
TIA	Traffic Impact Assessment
US 101	U.S. Highway 101
USFWS	U.S. Fish and Wildlife Service
USMP	University of California, Berkeley Museum of Paleontology
VOC	volatile organic compound

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CHAPTER 1 INTRODUCTION

1.0 INTRODUCTION AND REGULATORY GUIDANCE

This Initial Study has been prepared by the California Department of Parks and Recreation (CDPR) as a preliminary evaluation of the potential environmental effects of construction and operation of a wind energy repowering project located in Pacheco State Park (Park) in central California. In 1984, the prior landowner entered into a 25-year lease with a private entity to construct and operate approximately 200 wind turbines on the site. In 1992, 6,900-acres of land (which included the Project site) was conveyed to CDPR by the prior landowner and Pacheco State Park was created. The initial wind energy lease has expired and CDPR has signed a new lease with Gonzaga Ridge Wind Farm, LLC (GRWF) to decommission the existing wind farm and to install new, state-of-the art wind turbines along with ancillary facilities.

The California Environmental Quality Act (CEQA; Public Resources Code § 21000 et seq.) and the CEQA Guidelines (14 CCR §15000 et seq.) establish CDPR as the lead agency. The lead agency is defined in CEQA Guidelines Section 15367 as "the public agency which has the principal responsibility for carrying out or approving a project." The lead agency decides whether an Environmental Impact Report (EIR) or Negative Declaration is required for the project and is responsible for preparing the appropriate environmental review document.

Pursuant to Section 15070, and in light of the information provided in the scoping process and in this Initial Study, CDPR has determined a focused EIR is the appropriate environmental review document for the proposed Gonzaga Ridge Wind Repowering Project (proposed Project).

1.1 LEAD AGENCY CONTACT INFORMATION

The lead agency for the proposed Project is CDPR. The contact person for the lead agency is:

Danielle Gerhart, District Services
Central Valley District - California State Parks
22708 Broadway
Columbia, California 95310-9400
Danielle.Gerhart@parks.ca.gov
209.536.2912

1.2 DOCUMENT PURPOSE AND ORGANIZATION

The purpose of this document is to provide a preliminary evaluation of the potential environmental effects of construction and operation of a wind repowering project located within Pacheco State Park as a basis for determining the appropriate scope of a focused EIR for the proposed Project. This document is organized as follows:

- Chapter 1 – Introduction. This chapter provides an introduction to the Project and describes the purpose and organization of this document.
- Chapter 2 – Project Description. This chapter describes the Project location, area, site, objectives, and characteristics. See Chapter 2 in the Draft EIR for a more comprehensive description of the Project.
- Chapter 3 – Environmental Checklist and Responses. This chapter contains the Environmental Checklist, which identifies the significance of potential environmental impacts (by environmental issue). It includes a brief discussion of each impact resulting from implementation of the proposed Project and the information sources used in the analysis. This chapter also contains the Mandatory Findings of Significance.
- Chapter 4 – Report Preparation. This chapter provides a list of those contributors involved in the preparation of this document.

CHAPTER 2 PROJECT DESCRIPTION

2.0 INTRODUCTION

The proposed Gonzaga Ridge Wind Repowering Project (proposed Project) is a renewable wind energy generation development to be constructed and operated in Pacheco State Park (Park) in Merced County, California, by Gonzaga Ridge Wind Farm, LLC (GRWF). GRWF was awarded a 35-year lease by the State of California to install a new, state-of-the-art wind farm. The Project would replace the existing 18.4 megawatt (MW) wind energy facility that was constructed starting in 1988 and has been operating since that time. The Project would consist of wind turbines and associated infrastructure, with a nameplate generating capacity[1] of up to approximately 100 MW on the approximately 1,766-acre Project site. The Project would use land owned by the Bureau of Reclamation (BOR), Merced County property, and privately owned property for a new transmission line to the Los Banos Substation, located south of the O'Neill Forebay (New Transmission Line). The Project would also use the existing transmission line that runs north to the Dinosaur Point Tap switchyard(existing switchyard) to transmit electricity.

The Park consists of 6,900 acres of former ranchland along State Route (SR) 152 known as Pacheco Pass, at the edge of the Diablo Range. The Park is located adjacent to SR-152, that connects two major north-south arteries—Interstate 5 (I-5), which is 16 miles to the east, and U.S. Highway 101 (US 101), which is approximately 30 miles to the west. The Park is generally equidistant between the cities of Gilroy and Los Banos and is an approximate two-hour drive from San Francisco. The Park lies adjacent to the San Luis Reservoir State Recreation Area (SRA), which is under BOR ownership and managed by the CDPR.

The property was bequeathed by the former owner, Paula Fatjo, to CDPR. The Project honors the wishes of Ms. Fatjo as described in her will to fund resource protection, quality visitor experience, and education in the form of various types of recreation.[2] The existing wind project is located within the Park's Leased Zone, which the Park's General Plan states is to maintain windmills and associated power production and operation infrastructure.

The Project would consist of up to 40 modern wind turbines, and ancillary facilities such as construction laydown areas, a possible temporary batch plant, access roads, underground and overhead communications system , underground and overhead collector lines and associated

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1 The nameplate generating capacity for a wind energy generation project is the sum of the total capacity rating of the turbines and should be considered a project's total potential generation output. A project's capacity factor refers to the percentage of the nameplate capacity actually generated over time.

2 Pacheco State Park General Plan and Environmental Impact Report SCH No. 2003121089. May 2006. Sacramento, California.

equipment, an operations and maintenance (O&M) facility, meteorological or MET tower(s), upgrades to the existing switchyard, relocation of a communications tower, a new 70 kV transmission line (New Transmission Line), relocation of existing transmission line poles, an electrical substation and associated substation components, battery storage facility, and storage sheds. In addition, the Project includes upgrades to the Los Banos Substation.

A number of environmental studies are currently in progress to collect additional site condition information. Information gained from these studies, as well as wind resource studies and turbine performance tests, would be used to further refine the Project layout and turbine size.

2.1 PROJECT OBJECTIVES

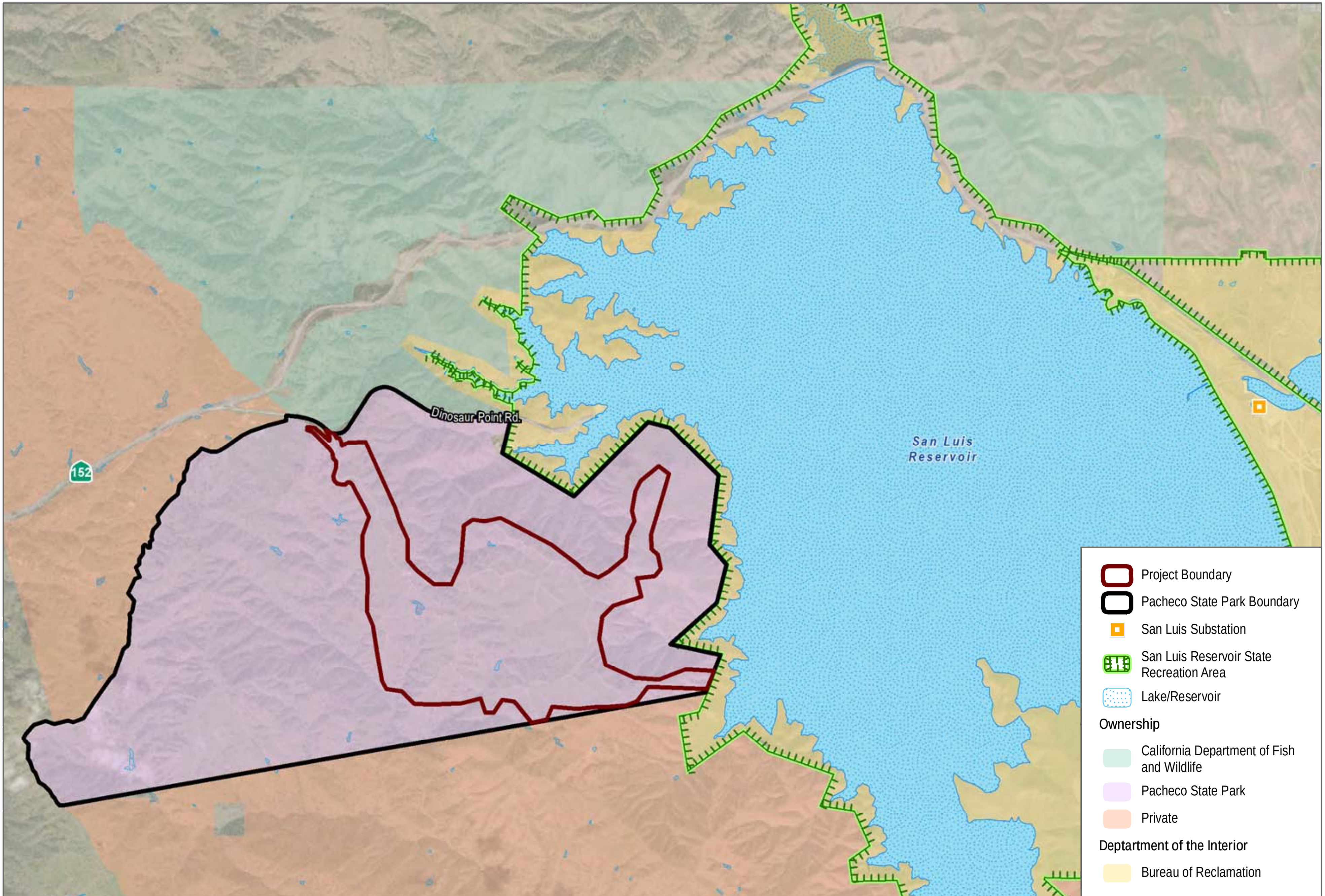
The following Project objectives have been identified:

- Assist California in meeting its target of 100 percent carbon-free electricity by 2045 (Senate Bill 100) and reducing greenhouse gas emissions to 1990 levels by 2020 (California Global Warming Solutions Act of 2006/Assembly Bill 32).
- Continue production of wind energy within Pacheco State Park to generate income to advance the goals of CDPR for resource protection, quality visitor experience, and education in the form of various types of recreation.
- Replace outdated wind turbine infrastructure and reduce the total number of turbines and overall Project footprint on CDPR lands with state-of-the art facilities to achieve increased performance, lower cost, higher reliability, longer service life, and reduction in risk to avian species, especially raptors.
- Optimize the use of previously disturbed land within Pacheco State Park by replacing the existing wind turbines.

2.2 PROJECT DESCRIPTION

Description of Project Location and Existing Site Conditions

GRWF has a long-term (maximum 35-year) lease on approximately 1,766 acres with the State of California for development, construction and operation of the Project. The Project would include up to 40 wind turbines and construction of a New Transmission Line. The Project site is defined as the 1,766-acre lease area within the Park boundaries. The Project site includes the proposed wind turbines and associated infrastructure, including a portion of the existing transmission line, existing switchyard, and the New Transmission Line within the Park boundaries. Elements of the Project outside of the Project site are included within the larger Project Area, which includes the New Transmission Line and associated infrastructure (including temporary roads for construction and permanent roads for maintenance access), as shown on Figure 2-1.



SOURCE: Merced County 2018, Bing Maps 2018

DUDEK

FIGURE 2-1
Project Location
Gonzaga Ridge Wind Repowering Project

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The portion of the Park comprising the Project site makes up roughly the eastern two-thirds of the Park, and is currently home to 162 wind turbines. This area has remained undeveloped for public access since the Park's inclusion into the State Park system. The existing turbines range from Micon 108s and other similarly sized machines installed in 1988 to a NegMicon installed in 2002. In addition, a small substation, transmission line, switchyard and a trailer are on-site that provide office space for the on-site maintenance staff and five temporary meteorological evaluation towers (MET) installed in 2017 to gather information on meteorological and wind conditions on the site. Currently, there are sixteen microwave paths that bisect the Project site according to a report prepared by ComSearch (Wind Power GeoPlanner Microwave Study, September 2018). The microwave paths are associated with the following licencee's: AT&T/New Cingular Wireless, T-Mobile, and the Santa Clara Valley Water District. An existing 70 kV transmission line is also located on the north side of the Project site connecting to the Dinosaur Point substation. A small portion of Dinosaur Lake trail is also located within the Project site which would require relocating depending on the final location of the wind turbines

The New Transmission Line would tie into the existing Los Banos electrical substation located approximately 16 miles to the east of the Project site. This New Transmission Line would have up to approximately 120-foot tall power poles. The specific number and location of the poles has not yet been determined. To accommodate the Project the substation would require minor upgrades to tie the 70 kV New Transmission Line to the existing PG&E substation. The Project would also utilize the existing 70 kV transmission line and existing switchyard.

2.3 PROJECT OVERVIEW

This section provides an overview of each of the Project facilities and their related activities. These include:

- Decommissioning, removal and recycling of the existing turbines and associated infrastructure, with the exception of the existing 70 kV transmission line that links the existing wind farm to the existing switchyard and the existing switchyard. The existing O&M building and existing substation may also be used for Phase I and decommissioned in Phase II;
- Up to 40 turbines erected on tubular steel towers set on concrete foundations, with associated turbine pads, laydown areas, and pad mounted transformers;
- A 34.5-kilovolt (kV) overhead and underground electrical collector system linking each turbine to the next and to the on-site collector substation;
- An overhead and underground communication system (fiber optic cabling);

- One on-site collector substation that may contain two parts. One part would be focused on sending electricity on the existing transmission line and the other part would be focused on sending electricity on the New Transmission Line;
- A new overhead approximately 16-mile 70 kV transmission line (including portions located outside of Park boundaries) for connecting the Project site to the Los Banos Substation (New Transmission Line);
- Access roads, consisting of utilizing and upgrading existing roads and installing new roads;
- Relocation of the Dinosaur Lake Trail;
- A temporary, approximately 15-acre construction and equipment laydown area, construction trailer area, and associated parking area;
- A temporary, approximately 15 acre construction and equipment laydown and staging area for the New Transmission Line;
- An O&M facility including an operations building and outdoor storage area;
- Permanent and temporary MET towers and wind measurement equipment;
- Upgrades to the Los Banos Substation and existing switchyard;
- Battery storage facility;
- Storage sheds; and,
- A temporary staging area for deliveries.

The proposed Project would consist of the decommissioning and removal of the existing wind turbines and overhead energy collection system and the installation of up to 40 modern wind turbines in two phases. Phase I includes construction of up to nine turbines and associated infrastructure along with the decommissioning and removal of approximately 47 existing turbines, while Phase II would construct the remaining up to 31 turbines and other various Project components. The decommissioning and removal of the remaining 115 turbines would occur after construction of Phase I is complete and prior to commencing construction of Phase II.

When the facility is decommissioned, the turbine components would be removed from the site, below grade infrastructure (e.g., cables, pipes, conduit or equipment) buried within two feet of the surface would be removed; infrastructure greater than two feet below grade would remain on-site, the concrete foundations would be demolished down at least one foot below grade, and the remaining materials would be reused or recycled, to the extent practical. The remaining materials that are not recyclable would be removed from the site to be disposed of at an approved facility.

Wind Turbines

GRWF is currently considering a variety of turbine models from leading manufacturers, ranging in generating capacity and dimensions, to meet the desired approximately 100 MW nameplate generating capacity of the Project. The final turbine model and specific number of turbines would be selected based on availability at time of construction, conformance with power grid requirements, on-site wind resources, and other project-specific factors.

The turbines would be three-bladed, horizontal-axis models. Turbine towers would be mounted on a permanent concrete foundation. Turbine models being considered range in height; however, none would exceed a maximum height at the top of the blade of 650 feet above ground level.

Obstruction lighting consisting of red flashing, or strobe lights would be located at the top of the turbine nacelle, in accordance with Federal Aviation Administration (FAA) requirements. An FAA approved Lighting Plan would be developed for the Project. This Lighting Plan would specify the installation of lights on designated turbines and MET towers (if required).

Electrical Collector System and Communications System

Power generated by the turbines would be collected by an above ground and underground 34.5 kV electrical collector system. This system would feed into an on-site collector substation, which would step up the voltage and transmit the power to the points of interconnect (POIs) with PG&E and the California Independent System Operator (CAISO). The majority of the collector system would be located underground. Where necessary, portions of the collector system would be above ground to transmit power that would otherwise require multiple underground cables, respond to construction challenges or to avoid environmental impacts.

Power generated by the turbines would be transmitted via the existing transmission line for up to approximately 18.4 MW and the New Transmission Line would transmit up to approximately 80 MWs.

On-site Collector Substation

The existing on-site substation would be decommissioned and removed and a new on-site 34.5 kV collector substation would be constructed to collect power generated by the turbines into the collector substation that would convert the voltage to 70 kV for transmission. Approximately 5 acres would be needed for construction of the substation. The final permanent footprint of the substation site would be approximately 3 acres and consist of a graveled area, fence, and parking area for maintenance vehicles. This new collector substation would be constructed as part of Phase II.

Access Roads

Access to the Project site is from SR-152 onto Dinosaur Point Road at an existing uncontrolled intersection. Internal Project access is primarily from Windmill Road, an existing Park road closed to the public that intersects with Dinosaur Point Road. Project access would prioritize utilization of the existing internal network of roads created for the existing wind farm although some new roads would need to be constructed, in addition to improving and widening others to meet construction and maintenance activity requirements including Windmill Road. Road modifications made for construction purposes would be restored at the completion of project construction, per terms of the lease and with a CDPR approved Restoration Plan. The Restoration Plan would be developed prior to commercial operations.

Temporary Construction and Equipment Area, Construction Trailer Area, Associated Parking Area, and O&M Facility

The temporary construction and equipment area, construction trailer area, and associated parking area would consist of an approximately 15-acre compacted gravel pad on a cleared and graded footprint. During construction, this area would be used to store large equipment and materials, to refuel equipment, and to collect and temporarily store construction waste. It would also serve to provide temporary parking, construction office space, and temporary (portable) sanitary facilities.

The O&M facility and its associated storage yard and parking area would consist of a permanent 3- acre area. During Project operation, large equipment required for maintenance could be staged in the O&M storage yard.

Water for the O&M facility would initially be trucked to the site and stored in an on-site water storage tank installed at the building. In the future, any efforts to install a domestic well would be conducted in accordance with the rules and regulations of the State Water Resources Control Board. Wastewater from the O&M facility would be processed using an on-site septic system. This system would conform to all County design standards and specifications to avoid impacts on ground- or surface waters.

At this time, GRWF is anticipating concrete would be trucked to the site to construct the turbine foundations and an on-site batch plant would not be required.

Meteorological Towers

Up to two permanent and three temporary MET towers would be constructed in the Project site. These towers support instruments that measure and record weather data to assess performance of turbines and guide Project operation. The MET towers would be up to 400 feet tall and would include lights, if required, in accordance with FAA requirements.

Storm Water Management and Erosion Control Measures

The Project would implement low impact design (LID) measures and best management practices (BMPs) in order to preserve the existing hydrology of the Project site, preclude discharge of pollutants into downstream waters, and reduce the potential for developing erosion features and increasing sediment loading to the San Luis Reservoir. Grading associated with the proposed turbines, the O&M facilities (and accompanying storage yard), and the access roads would be planned, designed, and constructed in a manner that minimizes changes in runoff patterns and water quality impacts associated with erosion and/or poor drainage. Prior to construction, a qualified professional (e.g., Professional Geologist, Professional Engineer, or Engineering Geologist) shall review and/or modify plans as necessary to ensure that the Project minimizes changes in natural hydrology. The Project shall incorporate appropriate and effective erosion control BMPs, and integrate requirements of the Project's SWPPP per the Construction General Permit (SWRCB Order No. 2009-0009-DWQ, as amended).

Off-site Improvements - Upgrades to the Los Banos Substation and Relocation of Dinosaur Lake Trail

The New Transmission Line would travel from the substation located on the Project site to the point of change of ownership pole (PCO Pole), near the Los Banos Substation. At the PCO Pole, PG&E assumes installation, operation and maintenance responsibility for the remainder of transmission line and corresponding pole structures that tie the line into the Los Banos Substation (PG&E transmission line). The PCO Pole would be a steel or wood pole structure with a total structure height of up to 120 feet above ground.

The Point of Interconnection (POI) is where the PG&E transmission line connects to the Los Banos Substation 70 kV Main Bus. Inside the walled portion of the substation, a new control building may be needed to support the installation of the new bay and 70 kV circuit breaker.

The portion of Dinosaur Lake Trail adjacent to the western boundary of the Project site would require relocating to accommodate the wind turbines. This trail is a narrow, single-track, unimproved dirt trail used by hikers to the Park. The trail is not designed to be ADA accessible and CDPR is proposing to relocate the trail just to the west of the Project site. At this time CDPR has not designed the trail, but it is anticipated it would be designed and constructed similar to the existing trail and would avoid tree removal and impacting any protected plant species or wetlands.

2.4 CONSTRUCTION ACTIVITIES

Grading

The Project contractor would prepare a Health and Safety Plan (HSP) prior to commencing any ground-disturbing activities as part of Phase I. The HSP would include best practices to ensure safety for all construction personnel would be maintained during construction activities. Ground-disturbing activities including clearing and grubbing, topsoil stripping, grading, compaction, utility trenching, and placement of aggregate surfacing would occur during construction of the Project. Grading activities would consist of the removal, storage, and/or disposal of earth, gravel, vegetation, organic matter, loose rock, and debris. The cut and fill required for the Project would be balanced to the extent possible, to minimize the amount of materials that would need to be brought onto or removed from the site. Estimates of cut and fill cannot be determined until engineering for construction has been undertaken. Per terms of the lease, CDPR would approve the Final Construction Plan, Final Plan of Development and Specifications, and Restoration Plan.

A site-specific SWPPPwould be prepared for the Project. The SWPPP would identify BMPsthat would be used to minimize or eliminate the potential for sediments and pollutants to reach surface waters through stormwater runoff. The BMPs would comply with CDPR requirements that all BMPs are wildlife friendly and do not include any monofilaments. The construction contractor would prepare a Health and Safety Plan to address safety of construction personnel that would be working within the Project Area.

In rocky areas, blasting may be necessary to loosen rock before excavation. If blasting is necessary, a Blasting Plan would be prepared to identify the locations that are anticipated to require blasting would be shared with CDPR for their review. All applicable federal, state, and local regulations for blasting procedures would be identified in the Blasting Plan and would be followed. Explosives would only be used within specified times and at specified distances when the work is located within or nearby sensitive habitat areas.

Transportation of Turbine and New Transmission Line Components

Turbine components would be transported to the Project site by transport vehicles via the local highways and assembled on site. Each turbine would require multiple deliveries for various components. The specifics of these deliveries would depend upon the final turbine model selected, but transport on oversized trucks would be required. As such, site access may require modifications to the SR-152/Dinosaur Point Road intersection and possibly other roads that may require a California Department of Transportation (Caltrans) encroachment permit. Coordination with Caltrans to address the transportation and delivery requirements of the Project would be included as part of the Transportation Permit, required by Caltrans for oversized vehicles.

Delivery of the New Transmission Line components would be via semi-trucks and trailers to the temporary staging area or laydown area(s). Delivery trucks would not be as large as what is required for the turbine components and may not require either a Transportation or Encroachment Permit from Caltrans.

Construction Schedule and Workforce

The Project would be constructed in two phases starting with Phase 1, consisting of the installation of up to nine turbines, road widening and improvements, temporary staging and laydown areas, relocation of existing transmission line poles and upgrades to the existing switchyard, if required, and the decommissioning and removal of approximately 47 existing turbines and associated infrastructure. Construction of Phase I is expected to last approximately 9 months. Construction of Phase II includes installing the remaining up to 31 turbines along with other various Project components that consist of overhead and underground communication system (fiber optic cabling); on-site collector substation; new overhead 70 kV transmission line (New Transmission Line) including upgrades to the Los Banos Substation and switchyard; O&M facility; MET towers; battery storage facility and storage sheds; and temporary construction laydown and staging areas. Construction of Phase II is anticipated to take up to 12 months and would take place sometime between 2021 and 2023.

Construction would typically be completed during daylight hours, from 6 a.m. to 6 p.m. but may be earlier or later depending on available daylight. Night construction may be necessary if certain conditions exist (e.g., high daytime winds that prevent turbine erection) or if Caltrans requires nighttime deliveries to avoid traffic. The construction workforce is estimated to include up to 200 construction workers at any given time.

2.5 OPERATIONS AND MAINTENANCE ACTIVITIES

GRWF anticipates employing up to approximately eight full-time workers upon commencing commercial operation of the Project. Approximately two full-time employees would be retained once Phase I is operational with the up to six remaining employees hired once Phase II is complete. Technician staffing is commensurate with site needs, which are primarily driven by turbine type. Operation and maintenance activities would generally occur during normal workday hours (i.e., 8:00 a.m. to 5:00 p.m.) from Monday to Friday with emergency call outs 7 days a week after normal business hours. A control center would monitor and control the turbines through the SCADA monitoring system 24 hours a day, seven days a week. The system would perform self-diagnostic tests and allow a remote operator to set new operating parameters, perform system checks, and ensure turbines are operating at peak performance. Turbines would automatically shut down if sustained winds or gusts exceed predetermined maximum operating parameters.

In conjunction with existing resource protection plan documents, the Project would develop and implement a Fire Protection Plan (FPP) prior to construction and operation. The FPP would include emergency response and evacuation procedures that would include immediate reporting notification of local fire agencies. Employees would be equipped with fire suppression equipment, radio and cellular access, and pertinent telephone numbers for reporting a fire.

The anticipated operational life of the Project is 35 years. After that time, GRWF and CDPR would evaluate whether to continue operation of the Project or to decommission it in accordance with the Decommissioning Plan. A Decommissioning Plan shall be developed prior to commercial operations.

2.6 REQUIRED APPROVALS AND PERMITS

The local, state, and federal permits that may be required for the Project are listed in Table 2-3 below.

Table 2-3
Approval and Permits Potentially Required for the Proposed Project.

Jurisdiction	Permit or Approval
Local	Merced County Department of Public Health, Division of Environmental Health— Septic system permit
	San Joaquin Valley Air Pollution Control District - Authority to Construct and Permit to Operate for proposed concrete batch plant
	Merced County – Encroachment permit for improvements to any County roads and New Transmission Line
	Merced County – Road Use Agreement or equivalent
	Santa Clara County – Road Use Agreement or equivalent
State	California Department of Transportation Division of Aeronautics—Permit required per Public Utilities Commission (PUC) Section 21656
	California Department of Transportation – Transportation permit for oversized vehicles and, as applicable, encroachment permit for possible lane closures for turbine delivery vehicles
	California Department of Fish and Wildlife (CDFW) - Notification of Lake or Streambed Alteration under Fish and Game Code Section 1602 CDFW Lake or Streambed Alteration Agreement under Fish and Game Code Section 1603
	California Regional Water Quality Control Board— National Pollutant Discharge Elimination System (NPDES) General Construction Permit, Clean Water Act Section 401 Water Quality Certification
Federal	Federal Energy Regulatory Commission—Approval to be an Electric Wholesale Generator and to sell electricity at market-based rates
	Federal Aeronautics Administration —Notice of proposed construction
	Bureau of Reclamation – Approval of all or portions of the New Transmission Line

CHAPTER 3 ENVIRONMENTAL CHECKLIST AND RESPONSES

PROJECT INFORMATION

1.	**Project Title:**	Gonzaga Ridge Wind Repowering Project
2.	**Lead Agency Name and Address:**	Central Valley District - California State Parks 22708 Broadway Columbia, California 95310-9400
3.	**Contact Person and Phone Number:**	Danielle Gerhart 209.536.2912
4.	**Project Location:**	Pacheco State Park, Merced County
5.	**Project Sponsor's Name and Address:**	Gonzaga Ridge Wind Farm, LLC 4865 Sterling Drive, Suite 200 Boulder, Colorado 80301 Contact: Bob Karsted

6. **General Plan Designation:** The Project site is within a California state park owned by the California state government. The Project site is within the Park's General Plan designated Leased Zone (LE). A majority of the New Transmission Line is located on federal land with some county and private land. Local general plan designations do not apply to state or federal lands.

7. **Zoning:** The wind lease portion is within a California state park owned by the California state government. A majority of the New Transmission Line is located on federal land with some county and private land. Local zoning designations do not apply to state or federal lands.

8. **Description of the Project:** Wind repowering project located in Pacheco State Park with the construction of a New Transmission Line located on federal,.county and private lands and continued utilization of some existing facilities.

9. **Surrounding Land Uses and Setting:** Ranch/grazing land; San Luis Reservoir SRA, which includes recreation areas, campgrounds, trails and San Luis Reservoir; Pacheco State Park trails

10. **Have California Native American tribes traditionally and culturally affiliated with the project area requested consultation pursuant to Public Resources Code section 21080.3.1? If so, has consultation begun?** Consultation pursuant to Assembly Bill (AB) 52 has been initiated by CDPR.

11. **Other Public Agencies Whose Approval is Required:** See section 2.6 in Chapter 2, Project Description for a complete list of anticipated permits and approvals.

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact," as indicated by the checklist on the following pages requiring further evaluation in an EIR. Potentially significant impacts to aesthetics, biological resources and transportation will be further evaluated in the EIR. Impacts to cultural and tribal cultural resources and hazards and hazardous materials can be mitigated to less than significant.

☒ Aesthetics	☐ Agriculture and Forestry Resources	☐ Air Quality
☒ Biological Resources	☐ Cultural Resources	☐ Geology and Soils
☐ Greenhouse Gas Emissions	☐ Hazards and Hazardous Materials	☐ Hydrology and Water Quality
☐ Land Use and Planning	☐ Mineral Resources	☐ Noise
☐ Population and Housing	☐ Public Services	☐ Recreation
☒ Transportation	☐ Tribal Cultural Resources	☐ Utilities and Service Systems
☐ Mandatory Findings of Significance	☐ Energy	☐ Wildfire

DETERMINATION: (To be completed by the Lead Agency)

On the basis of this initial evaluation:

☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☐ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

☒ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect (1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and (2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier ENVIRONMENTAL IMPACT REPORT or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier ENVIRONMENTAL IMPACT REPORT or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

______________________________________ ____________________

Signature Date

EVALUATION OF ENVIRONMENTAL IMPACTS:

As described in the description of the Project, construction is proposed to occur in two phases. The first phase, Phase I, includes improvements to Dinosaur Point Road and Windmill Road to provide access to the site to deliver turbines and other materials, and construction of new roads to access the turbine locations within the Project site. Phase I also includes the decommissioning and removal of approximately 47 existing turbines and associated infrastructure and the construction of up to nine new turbines. Once Phase I is complete the remaining 115 turbines would be decommissioned and removed prior to commencing construction of Phase II. Phase II includes the construction of up to 31 turbines (for a maximum of total 40 turbines), on-site collector substation, new overhead 70 kV transmission line (New Transmission Line) including upgrades to the Los Banos Substation and switchyard, a new O&M facility, as well as new on-site roads to access the Phase II turbine locations. The Initial Study analyzes the full buildout of the proposed Project (the "whole of the project" as required by CEQA) and the site disturbance associated with construction and operation of the Project.

3.1 AESTHETICS

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
I. AESTHETICS – Would the project:				
a) Have a substantial adverse effect on a scenic vista?	☒	☐	☐	☐
b) Substantially damage scenic resources including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☒	☐	☐	☐
c) In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?	☒	☐	☐	☐
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☒	☐	☐	☐

3.1.1 Environmental Setting

Scenic Vistas

The Project site encompasses elevated ridgelines, hillsides, and high valley terrain to the northeast and east of Spikes Peak (elevation 1,927 feet above mean sea level (amsl)) and within the eastern half of Pacheco State Park (Park). Topography within the Project site primarily consists of steeply sloped grass-covered and moderate to dense, clusters of oak trees on hillsides. As such, the Project site is located in an area where the topography ensures the proliferation of scenic vistas. While not located atop ridgelines or other prominent terrain, the Romero Visitor Center provides an overlook from which scenic views to the characteristic vegetation and terrain of the local landscape are available. Lastly, segments of SR-152 within the project viewshed occasionally offer broad and scenic views of the Diablo Range and San Joaquin Valley to westbound and eastbound motorists.

Many of the vistas available in the Project Area; however, can be characterized as views of large public works projects superimposed on the natural environment. For example, easterly views from Spikes Peak encompass the Project site which is developed with 162 ridgeline wind turbines. This area has remained undeveloped for public access since the Park's inclusion into the State Park system and this project does not propose an expansion of the closed area. From the Romero Visitor

Center, man-made San Luis Reservoir is a prominent foreground feature in views and existing wind turbines on the project site are visible. These features are also visible from SR-152 where tall and mounded road cuts do not substantially block and limit the available views.

Scenic Highways

SR-152 is an officially designated state scenic highway from the Merced/Santa Clara County boundary east to the I-5 junction (approximately 13.8 miles long), which includes the portion of the highway that traverses Pacheco Pass, near the Project site. Interstate 5 (I-5) from State Route 33 north to the Merced/Stanislaus County boundary (approximately 14.9 miles long) is also a designated state scenic highway (Caltrans 2018). The portion SR-152 farther to the west in Santa Clara County is considered an eligible State scenic highway. At its closest location, SR-152 is located approximately one mile north of the Project boundary within Pacheco State Park. The Project boundary within the Park is located 9.7 miles west of the designated scenic segment of I-5 (the existing Los Banos substation is located approximately 2.5 miles west of I-5).

Visual Character and Quality

The Project site encompasses elevated ridgelines, hillsides, and high valley terrain that is primarily covered with grasslands, savanna, and tall and spreading, oak woodland vegetation. In addition to low riparian and mesic herbaceous communities that occur within and along drainages on the Project site, non-native and weedy plant communities are present near existing areas of disturbance (i.e., roads, an electrical substation and the onsite turbine research facility). The eastern portion of the Park that includes the Project site features over 162 wind turbines primarily installed between 1988 and 2002. The existing wind turbines are installed atop ridgelines in linear strings or groupings that are accessible via a network of dirt roads that branch off from a primary access road (i.e., Windmill Road). The turbines are primarily supported by slightly conical steel tube towers that are approximately 80 feet high at the hub/nacelle however, several turbines are supported by unpainted lattice steel towers. In addition, tall and thin, steel lattice MET towers are temporarily installed in the Project site and are used to gather information on meteorological and wind conditions on the site.

The New Transmission Line is proposed to the south and east of the Park on lands primarily managed by the BOR. The BOR lands in this area currently contain significant electrical infrastructure, including a pump storage electric generating facility and multiple transmission lines.

Light and Glare

There are no buildings within the Project site with the exception of a trailer that provides office space for employees and a small adjoining equipment shed. A small substation is also located onsite. Sources of lighting within the Project site consist of FAA-required obstruction lights on only one existing wind turbine, and exterior lighting on the trailer and at the substation site. Lighting at residential properties along Dinosaur Point Road and at facilities along the SR-152 corridor to the east of the Romero Visitor Center also contribute nighttime lighting to the area. Lights are also provided at the Los Banos substation. With the exception of the previously identified lighting sources that may generate potential glare, there are no sources of substantial glare currently within the Project site or the larger Project Area.

Despite the presence of existing wind turbines and FAA-required obstruction lights, the Pacheco State Park General Plan states that the Park is an ideal location for viewing dark skies and stars (California State Parks 2006; p. 2-32). Further, the General Plan states that Dinosaur Point and the San Luis SRA Visitors Center are known locations where astronomers set up their telescopes.

3.1.2 Discussion

Would the proposed project:

a. Have a substantial adverse effect on a scenic vista?

The hilly terrain and numerous trails in the Park provide opportunities for scenic views of the Park lands and surrounding area including from the Spikes Peak Trail. While somewhat limited in length by the hilly terrain within the Park and prominent mountain terrain of the Diablo Range, the Dinosaur Lake Trail in the Park offers scenic view opportunities. In addition, the Romero Visitor Center in the San Luis Reservoir SRA provides an overlook from which scenic views across the reservoir are available.

As proposed, implementation of the Project would entail the removal of the existing 162 existing wind turbines (between approximately 100 and 325 feet high) distributed across the Project site. In addition, the Project would install a maximum of up to 40 new wind turbines that would be up to approximately 650 feet high as measured from base to extended blade tip. Due to the proximity of new wind turbines to Park trails and the height and distribution of wind turbines as viewed from SR-152 and the Romero Visitors Center, view impacts from these locations would be considered potentially significant. Therefore, potential effects to scenic vistas or views from Spikes Peak and the Spikes Peak Trail, Dinosaur Lake Trail, and the Romero Visitor Center overlook will be further evaluated in the EIR. Potential impacts to views from SR-152 are addressed under item (b) below.

The New Transmission Line would be detectable in the views of visitors at the San Luis Reservoir (e.g., from boats and along the shoreline) and other locations within the SRA including the visitor's center, Basalt Campground, and recreational trails. However, the New Transmission Line would be located in an area currently containing significant electrical infrastructure including transmission lines of comparable scale and much larger transmission lines. In addition, support poles of the New Transmission Line would not substantially block or interrupt existing views or scenic features. Therefore, impacts to scenic vistas due to the New Transmission Line would be less than significant.

b. Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

Within the Project site there are no historic buildings or rock outcroppings. However, as previously stated, oak woodland vegetation is a characteristic vegetation community on State Park lands and mature oak trees regularly occur on the Project site and in the region.

SR-152, a state scenic highway, provides access to Pacheco State Park and provides westbound motorists views to existing wind turbines on the Project site. The removal of 162 existing wind turbines and the installation of 40 new wind turbines would be noticeable to westbound motorists and may result in substantial damage to existing scenic resources and more specifically, existing scenic quality as experienced from SR-152. Therefore, potential effects to scenic resources as experienced from SR-152 are considered potentially significant and will be further evaluated in the EIR.

The Project site is located 9.7 miles west of the officially designated state scenic segment of I-5. In addition, the New Transmission Line would be located approximately 2.5 miles west of I-5. Due to distance, new wind turbines on the Project site would be generally indiscernible to passing motorists on I-5. Similarly, the interconnection of the New Transmission Line would not damage scenic resources or views because new support poles (approximately 120-foot tall each) would be setback over 2.5 miles from the interstate and would not command the attention of interstate motorists. Further, new poles and transmission lines would be indistinct from the numerous existing transmission lines and associated infrastructure installed near the existing Los Banos substation. Impacts associated with damage to scenic resources within I-5 would be less than significant; however, this issue will be further evaluated in the EIR.

c. In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point).

The proposed Project includes removing 162 existing wind turbines, MET towers and related infrastructure on the site and replacing them with up to 40 larger wind turbines and up to three MET towers and related infrastructure. The existing visual character of the Project site includes views of existing wind turbines; however, the installation of new, larger turbines along with other ancillary facilities (transmission line power poles) would alter the existing visual quality of the site and surrounding area. Further, alteration of existing visual character and quality would be visible from on and offsite public locations including the Park, SR-152 and at the nearby San Luis Reservoir SRA. Due to the scale and massing of new wind turbines, implementation of the proposed Project may substantially degrade the existing visual character or quality of public views of the site which would be considered a potentially significant aesthetics impact. Therefore, potential effects to the existing character and quality of public views of the site and its surroundings will be further evaluated in the EIR.

The New Transmission Line would be detectable in the views of visitors to the San Luis Reservoir (e.g., from boats and along the shoreline) and other locations within the SRA including the Visitor Center, Basalt Campground, and recreational trails. However, the New Transmission Line would be located in an area currently containing significant electrical infrastructure including transmission lines of comparable scale and much larger transmission lines. In addition, the New Transmission Line would generally be viewed against mountainous or hilly terrain of the area and would not be visually prominent. Further, the New Transmission Line would be experienced in the context of visually prominent landscape alterations including the San Luis Reservoir, wind turbines on the Project site, and a variety of transmission lines that interconnect to the Los Banos substation. Therefore, the New Transmission Line would not substantially degrade the existing character and quality of the site and surrounding area and impacts would be less than significant.

d. Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

Construction of the Project is anticipated to last approximately 12 months. Construction activities would primarily occur during daylight hours but may involve extended hours, as needed, to complete certain activities and/or during emergencies. Also, during emergencies, tasks requiring extended hours and during late fall and winter months, the lack of adequate natural lighting may dictate that portable lighting sources be used at specific construction sites.

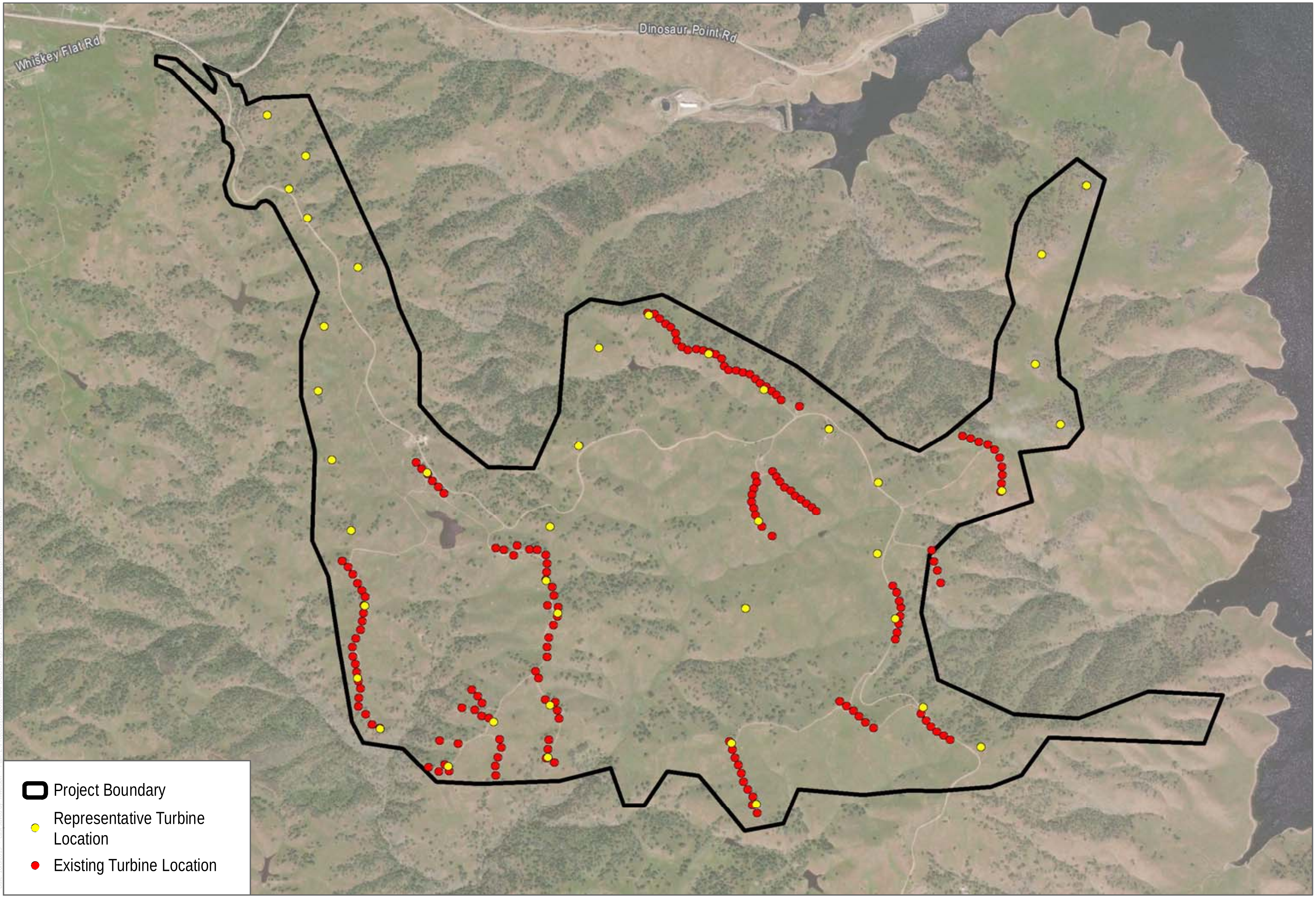
Because the Project may entail periodic operation of nighttime lighting sources during construction and would result in the addition of wind turbine related obstruction lights and MET tower lighting, the quality of existing nighttime views could be affected and impacts could be significant. As such, sources of nighttime lighting associated with the Project will be further evaluated in the EIR.

Consistent with FAA rules established in Advisory Circular 70/7460-1L: Obstruction Marking and Lighting, all turbine components (including towers, nacelles, and rotors) would be painted or finished using low-reflectivity, neutral white colors. Facilities including the Project substation and O&M facility would be screened from view of motorists along SR-152 and other local receptors by intervening terrain and oak woodland vegetation. Regarding the New Transmission Line, the materials under consideration for support poles are consistent with that displayed by existing electrical infrastructure in the landscape and are not typically considered highly reflective. Project components and operational facility lighting would not produce substantial glare that would adversely affect day or nighttime views in the area. Therefore, impacts associated with glare would be less than significant.

Given the distance between the new wind turbines and the nearest residences, and the location of wind turbines in relation to the nearest residences, it is anticipated the Project would result in minimal (if any) annoyance associated with shadow flicker. Shadow flicker results from the blades of a wind turbine rotating between the sun and an observer, creating a moving shadow. While potential impacts to daytime views are anticipated to be less than significant, shadow flicker will be further addressed in the EIR.

Sources

Dudek. Visual Resources Report for the Gonzaga Ridge Wind Repowering Project, Dudek. November 2018.



SOURCE: Scout Energy 2018, Bing Maps 2018

DUDEK

0 1,000 2,000 Feet

FIGURE 3.1-1

Existing and Proposed (Representative) Turbines

Gonzaga Ridge Wind Repowering Project

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3.2 AGRICULTURAL AND FORESTRY RESOURCES

		Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
II.	AGRICULTURE AND FORESTRY RESOURCES – In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project:				
a)	Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☒
b)	Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒
c)	Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	☐	☐	☐	☒
d)	Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☒	☐
e)	Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☐	☒

3.2.1 Environmental Setting

The U.S. Department of Agriculture, Natural Resources Conservation Service, has identified important farmlands as follows (USDA 1994):

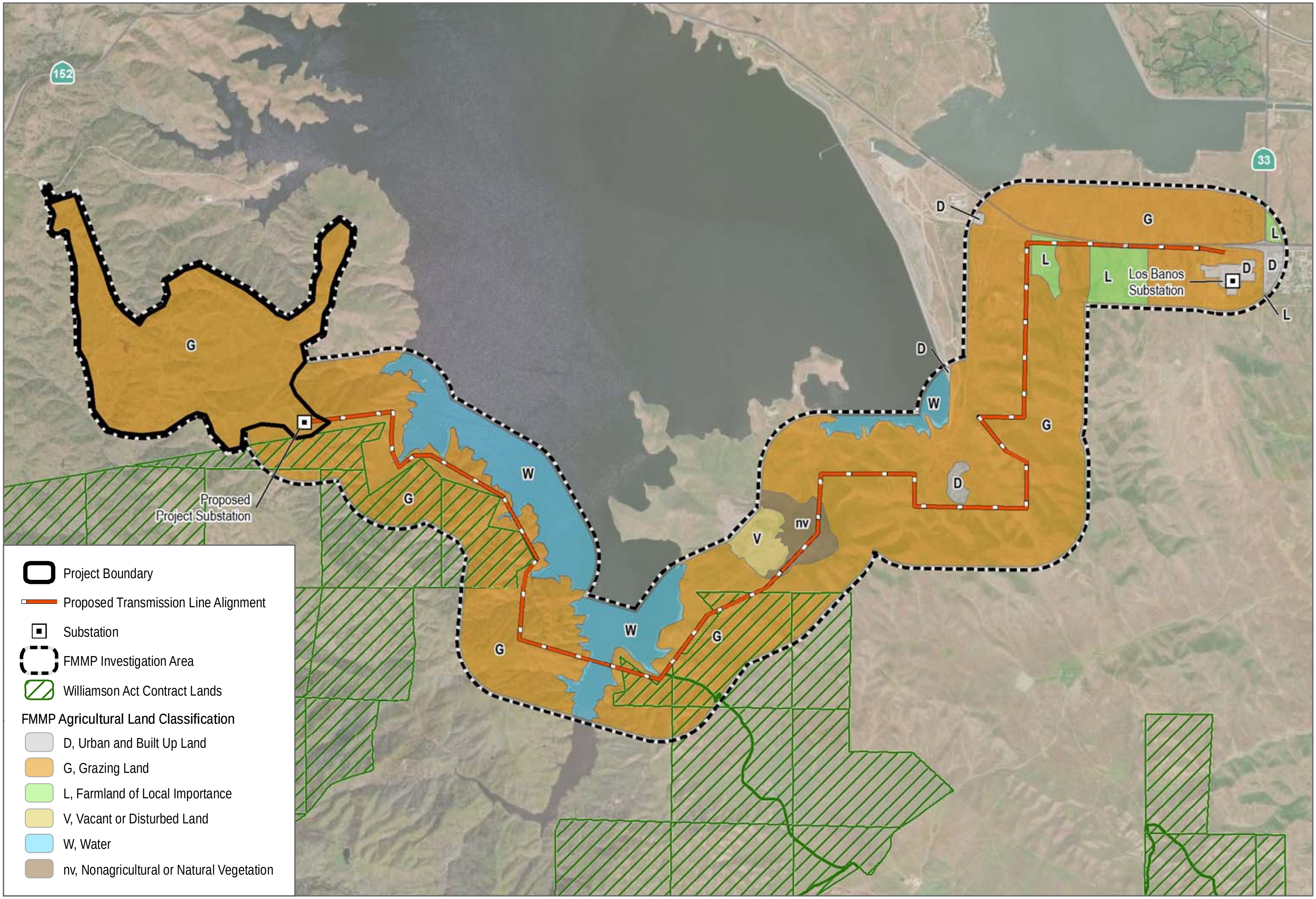
- **Prime Farmland:** Prime farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops, and is also available for these uses (the land could be cropland, pastureland, rangeland, forest land, or other land, but it is not urban or built-up land or water areas).

- **Unique Farmland:** Unique farmland is land other than prime farmland that is used for the production of specific high-value food and fiber crops. It has the special combination of soil quality, location, growing season, and moisture supply needed to economically produce sustained high quality and/or high yields of a specific crop when treated and managed according to acceptable farming methods.
- **Additional Farmland of Statewide Importance:** This is land, in addition to prime and unique farmlands, that is of statewide importance for the production of food, feed, fiber, forage, and oilseed crops.
- **Additional Farmland of Local Importance:** In some local areas, there is concern for certain additional farmlands for the production of food, feed, fiber, forage, and oilseed crops, even though these lands are not identified as having national or statewide importance.

The California Land Conservation Act of 1965 (Williamson Act) covers parcels of land where agricultural lands are preserved and local guidance, such as general plans, further plans for the preservation and use of designated agricultural lands. The Project would be constructed within the boundaries of Pacheco State Park, located within Merced County, California and on lands between the Park and the Los Banos Substation, which is primarily owned by the BOR.. The majority of the Project site is not located on land that is designated as Prime Farmland, Farmland of Statewide Importance, Unique Farmland, or Farmland of Local Importance. However, there are portions of the New Transmission Line located on lands currently under a Williamson Act contract.

The Project site was historically used as a cattle ranch until it was bequeathed by the former owner Paula Fatjo to CDPR. The site has operated as a wind farm with 166 wind turbines since 1988 (currently there are 162 turbines on the site). The land is not irrigated and has not been used for active agriculture. Although State property is not subject to local general plans and zoning, land underlying the Project site is zoned Exclusive Agriculture (A-2) under Merced County Zoning. The majority of the Project site is designated as Grazing Land by the Department of Conservation Farmland Mapping and Monitoring Program (FMMP), and portions of the Project site are designated as Urban and Built-Up Land and Farmland of Local Importance. Areas designated as Farmland of Local Importance are located near the Los Banos substation (DOC 2018). Figure 3.2-1 depicts the Farmland types and Williamson Act lands on and near Project site.

The predominant vegetation community on the Project site is California annual grassland, with large areas of the Project site lacking trees. The Project site also contains areas of Blue Oak woodland and Blue Oak savannah, with smaller areas of California Buckeye grove, California Sycamore woodland, and Coast Live Oak woodland, as well as additional vegetation community types (see Section 3.4, Biological Resources). Merced County has not zoned the Project site for forest land, timberland, or timberland production.



SOURCE: Bing Maps 2018, Scout Energy 2018, CA Dept. of Conservation 2016, Merced County 2010

DUDEK

FIGURE 3.2-1

Project Site FMMP Designations

Gonzaga Ridge Wind Repowering Project

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3.2.2 Discussion

Would the proposed project:

a. Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?

The Project site is not under active crop cultivation or used for livestock grazing. As described in Section 3.2.1, the majority of the Project site is designated as Grazing Land by the FMMP (DOC 2018). Although Grazing Land is considered agricultural land under Public Resources Code (PRC) Section 21060, it is not considered Prime, Unique, or Farmland of Statewide Importance. Furthermore, livestock grazing is generally considered incompatible with Park purposes; however, the Park's General Plan allows this use in the Backcountry Zone of the Park. Portions of the Project site are also designated as Farmland of Local Importance and Urban and Built-Up Land (DOC 2018). Areas that are considered Farmland of Local Importance would not be impacted by the proposed Project, as these areas would contain above-ground transmission lines that would not preclude existing or future agricultural uses. Therefore, the Project is not expected to result in conversion of Farmland to non-agricultural uses and no impact would occur.

b. Conflict with existing zoning for agricultural use, or a Williamson Act contract?

The Project site is zoned Exclusive Agriculture under Merced County Zoning. However, as described in Section 3.2.1, state-owned lands are not subject to local general plans and zoning. Portions of the proposed New Transmission Line corridor would cross lands under Williamson Act contracts, as shown on Figure 3.2-1. However, the New Transmission Line would be constructed above-ground and would not interfere with agricultural uses. As a result, no conflicts with existing zoning for an agricultural use or conflicts with a Williamson Act contract would result with Project implementation, and no impact would occur.

c. Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?

"Forest land" is defined in California PRC Section 12220(g) as land that can support 10% native tree cover of any species, including hardwoods, under natural conditions and that allows for management of one or more forest resources, including timber, aesthetics, fish and wildlife, biodiversity, water quality, recreation, and other public benefits. The Project site has historically included more open grassland areas, oak savannah, and oak woodlands rather than forest land. Wooded areas are primarily concentrated on hillsides and are located in areas where the New Transmission Line is proposed. There are no forest land or timberland areas zoned in either Merced County or Santa Clara County in the vicinity of the Project site. Therefore, there is no potential for conflict with California PRC, Section 12220(g) or Section 51104(g), and no impacts would result from Project construction, operation, and maintenance.

d. Result in the loss of forest land or conversion of forest land to non-forest use?

As described above in Section 3.2.2(c), the proposed New Transmission Line would be constructed within wooded areas; however, the turbines are primarily located on top of the ridgelines where trees presently do not exist. The Project site is characterized as rolling hillsides with areas of California Buckeye, California Sycamore, and Coast Live Oak woodland. Trees would be removed to accommodate construction of roads in this area and also to construct some of the turbines; however, the removal of trees throughout the site would not be considered converting forest land to non-forest uses because these trees are not considered forest land, as defined in Public Resources Code section 12220(g). Construction of the New Transmission Line would also require removal of a number of trees. The loss of oak woodlands and the habitat provided is addressed in more detail in the Biological Resources section of the EIR. For the purposes of evaluating whether or not the Project would convert forest land to non-forest uses due to the lack of forest resources (as discussed above) within the Project Area impacts would be considered less than significant.

e. Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?

As discussed above, the proposed Project is not located on land used for agricultural purposes and agricultural production is not typically permitted on lands within the State Park system, except under very limited circumstances. In addition, the Project is not located on existing agricultural land, and where it is located adjacent to agricultural land or forested land, construction, operation, and maintenance activities would avoid impacts and would not convert agricultural or forest land. Thus, the proposed Project would not result in a loss or conversion of agricultural land to non-agricultural use or forest land into non-forest use during construction or operation and maintenance phases, and no impact would occur.

Sources

USDA (U.S. Department of Agriculture). 1994. U.S. Department of Agriculture, Natural Resources

Conservation Service, Prime and Other Farmlands Definitions. Accessed October 2018. https://www.nrcs.usda.gov/wps/PA_NRCSConsumption/download?cid=stelprdb1042433&ext=pdf.

DOC (California Department of Conservation). 2018. California Important Farmland Finder. Accessed October 2018. https://maps.conservation.ca.gov/DLRP/CIFF/.

3.3 AIR QUALITY

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
III. AIR QUALITY – Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☒	☐
b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?	☐	☐	☒	☐
c) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☒	☐
d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people??	☐	☐	☒	☐

3.3.1 Environmental and Regulatory Setting

To evaluate air emissions associated with construction and operation of the Project, an Air Quality and Greenhouse Gas Emissions Analysis Technical report was prepared for the Project. A copy of this report is included in Appendix A. Please refer to this report for more detailed information, including modeling output data. This section is based on information contained in that report.

Environmental Setting

Criteria air pollutants are defined as pollutants for which the federal and state governments have established ambient air quality standards, or criteria, for outdoor concentrations to protect public health. Criteria air pollutants include ozone (O_3), nitrogen dioxide (NO_2), carbon monoxide (CO), sulfur dioxide (SO_2), particulate matter with an aerodynamic diameter less than or equal to 10 microns (PM_{10}), particulate matter with an aerodynamic diameter less than or equal to 2.5 microns ($PM_{2.5}$), and lead (Pb). Pollutants that are evaluated herein include reactive organic gasses (ROGs) (i.e., volatile organic compounds (VOCs) and reactive organic compounds), oxides of nitrogen (NO_x), CO, sulfur oxides (SO_x), PM_{10}, $PM_{2.5}$. ROGs and NO_x are important because they are precursors to O_3.

The Project site is located within the San Joaquin Valley Air Basin (SJVAB) and is under the jurisdiction of the San Joaquin Valley Air Pollution Control District (SJVAPCD). Access to the Project site is from SR-152 via Dinosaur Point Road. The Environmental Protection Agency (EPA) has designated the SJVAB as a nonattainment area for the federal 8-hour O_3 standard, and the California Air Resources Board (CARB) has designated the SJVAB as a nonattainment area for the state 1-hour and 8-hour O_3 standards. The SJVAB has been designated as a nonattainment area for the state 24-hour and annual PM_{10} standards, nonattainment area for the federal 24-hour and annual $PM_{2.5}$ standards, and nonattainment area for the state annual $PM_{2.5}$ standard. The SJVAB is designated as unclassified or attainment for the other criteria air pollutants.

The closest residences that would be considered "sensitive receptors" are rural residential land uses, with the nearest located approximately 0.30-mile (1,604 feet) south of the Project site.

To evaluate potential impacts associated with construction activities, criteria air pollutant and GHG emissions were estimated using the California Emissions Estimator Model (CalEEMod) Version 2016.3.2, consistent with SJVAPCD guidance. For purposes of estimating Project-generated emissions, it is assumed that construction of the Project would include several sub-phases including decommissioning of the existing wind turbines, development of access roads, installation of up to 40 wind turbines, construction of the New Transmission Line, and construction of an O&M building, substation, and off-site batch plant. Notably, there will be some overlap in construction activities for several of the sub-phases. The Project may also require minimal rock blasting during installation of the wind turbines which was also estimated. Operational activities would generate only miniscule amounts of air emissions associated with employee vehicle trips; therefore, these activities are not further evaluated. The Project would be required to comply with SJVAPCD Regulation VIII (Fugitive PM_{10} Prohibition) by law, which specifies standard construction practices to reduce fugitive dust emissions. Pursuant to Regulation VIII, Rule 8021, Section 6.3, the Project would be required to develop, prepare, submit, obtain approval of, and implement a dust control plan, which would reduce fugitive dust impacts to less than significant for Project construction. Contractors retained by GRWF would also be required to use construction equipment that meets a Tier 3 (or higher) engine rating. This requirement would be included in the contract language with all contractors' retained to do work on the Project.

Please see Appendix A for more detailed information.

3.3.2 Discussion

Would the proposed project:

a. Conflict with or obstruct implementation of the applicable air quality plan?

Implementation of the Project would not exceed the demographic growth forecasts in the *San Joaquin Valley Demographic Forecasts 2010 to 2050* (Fresno County Association of Governments 2014) and would also be consistent with the SJVAPCD Attainment Plans for

CO, PM_{10}, $PM_{2.5}$, and O_3. In addition, the Project would not result in an increase in the frequency or severity of existing air quality violations or cause or contribute to new violations. Based on these considerations, impacts related to the Project's potential to conflict with or obstruct implementation of the applicable air quality plan would be less than significant.

b. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?

The potential for the Project to result in a cumulatively considerable impact, per the SJVAPCD guidance and thresholds, is based on the Project's impact compared to the SJVAPCD significance criteria. The modeling shows that the maximum annual construction and operational emissions would not exceed the SJVAPCD significance thresholds for ROG, NO_x, CO, SO_x, PM_{10}, or $PM_{2.5}$ (see Appendix A). Furthermore, the Project would not conflict with the SJVAPCD Ozone Attainment Plans, or the PM_{10} or $PM_{2.5}$ Attainment Plan, which address the cumulative emissions in the SJVAB and account for emissions associated with construction activity in the SJVAB.

Therefore, the Project would not result in a cumulatively considerable increase in criteria air pollutants and the impact is less than significant.

c. Expose sensitive receptors to substantial pollutant concentrations?

Construction activities would not result in substantial pollutant concentrations that would affect sensitive receptors. In addition, diesel equipment would also be subject to the CARB air toxic control measures for in-use off-road diesel fleets, which would minimize diesel particulate matter (DPM) emissions.

No residual toxic air contaminant (TAC) emissions and corresponding cancer risk are anticipated after construction, and no long-term sources of TAC emissions are anticipated during operation of the Project. Therefore, the exposure of Project-related TAC emission impacts to sensitive receptors would be less than significant. The Project would not negatively affect the level of service (LOS) of intersections near the project site and would not significantly contribute to a CO hotspot. As such, impacts to sensitive receptors would be less than significant.

d. Result in other emissions (such as those leading to odors) affecting a substantial number of people?

Potential odors produced during construction would be attributable to concentrations of unburned hydrocarbons from tailpipes of construction equipment, which would disperse rapidly from the Project site and generally occur at magnitudes that would not affect substantial numbers of people. Impacts associated with odors during construction would be less than significant. The Project would not generate any new odors during operation; therefore, there would be no impact during Project construction or operation.

Sources

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3.4 BIOLOGICAL RESOURCES

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
IV. BIOLOGICAL RESOURCES – Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☒	☐	☐	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☒	☐	☐	☐
c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☒	☐	☐	☐
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☐	☒
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	☒
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒

3.4.1 Environmental Setting

Located on the crest and eastern slope of the Diablo Range, the natural vegetation on the Project site is generally dominated by open grasslands, oak savannah, and oak woodlands on gently to steeply-sloped terrain. Smaller areas of chaparral and sage scrub, California sycamore woodland, native grasslands, as well as several small ponds and seeps, occur intermittently across the landscape. Riparian vegetation is found along the few drainages and small canyons that occur on the site. All vegetation communities occurring on the Project site were characterized and mapped in 2018. The Park, including the Project site was historically used as a cattle ranch, but the portion of the Park where the turbines are located is no longer used for any grazing activities.

The New Transmission Line alignment generally follows the southern and eastern boundaries of the San Luis Reservoir in areas generally characterized by oak savannah, patches of scrub vegetation, and grassland in gentle to moderately sloped topography. The area between the Reservoir and the substation in which the New Transmission Line would occur is generally flat and dominated by open grassland and pasture land. Near the terminus of the New Transmission Line at the Los Banos Substation, the alignment runs parallel to SR-152 along undeveloped lands adjacent to the highway.

These vegetation communities, in turn, provide habitat for a variety of common wildlife species. Several plant and animal species considered of special-status by state and federal resource agencies are also known to occur, or potentially occur, on the site. These species, and the potential impacts on them as a result of the proposed Project, are discussed in more detail below.

3.4.2 Discussion

Would the proposed project:

a. Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?

Special-status species are those plants and wildlife species that are legally protected or otherwise recognized as vulnerable to habitat loss or population decline by federal, state, or local resource conservation agencies and organizations. For the purposes of this analysis, special-status species include:

- Species that are state and/or federally listed or proposed for listing as Threatened or Endangered
- Species considered as candidates for listing as Threatened or Endangered
- CDFW Species of Special Concern
- Fully Protected species per California Fish and Game Code
- Plants considered by the California Native Plant Society (CNPS 2018) to be rare, threatened, or endangered

Based on an analysis of the quality, extent, and overall habitat characteristics of onsite vegetation communities; on a review of previous assessments of biological resources within Pacheco State Park; on a review of the California Natural Diversity Data Base (CDFW 2018) for historical observations of special-status species in the vicinity of the Project site; and on the known range and habitat requirements of special-status species known to occur in the region, a number of special-status species were identified as occurring, or potentially occurring, on the Project site, which is an existing wind farm. This includes three species state- or federally-listed as Threatened or Endangered. The bald eagle (State Endangered) is known to nest along San Luis Reservoir to the east of the Project site and individuals have been observed foraging in the eastern portion of the Project site during the non-breeding season. The California red-legged frog (Federally Threatened) has been historically observed within several ponds on the Project site, and the California tiger salamander (State/Federally Threatened) is known to occur in close proximity to the site and is assumed to be present within these same ponds. While not state or federally listed as Threatened or Endangered, the golden eagle is state Fully Protected and has been observed on the Project site several times and could potentially nest in portions of the site, although no nests have been observed on-site.

Additionally, at least one special-status plant species, Hall's bush mallow (California Native Plant Society (CNPS) special-status), has been historically documented and known to occur within the Project site and four other CNPS special-status plant species have some potential to occur on the site. Impacts to special-status plant and wildlife species would be considered potentially significant and will be further evaluated in the EIR.

b. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?

The Natural Communities List (CDFG 2010b) is considered the authority by the state for ranking the conservation status of vegetation communities in California. Vegetation communities considered sensitive pursuant to the above threshold are those with an "S" ranking of 1, 2, or 3 (CDFG 2010b) and those that are potentially regulated pursuant to Section 1600 of the California Fish and Game Code. Of the thirteen total vegetation communities and land cover types on the Project site, four are considered sensitive pursuant to the above threshold: native grassland, riparian woodland, California sycamore woodland, and California buckeye grove.

Depending on the final placement of the new turbines as well as any access roads, the proposed Project could adversely affect sensitive natural communities. However, the Project has committed to avoid all riparian and aquatic habitats. Because of the relatively small footprint of each turbine, and because the Project has flexibility in the final placement of turbines and access roads such that the small areas of native grassland, riparian woodland, California sycamore woodland, and California buckeye groves on the site can likely be avoided, any impacts to these communities are not expected to be considered substantial in terms of CEQA. However, this will be further evaluated in the EIR.

c. ***Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?***

Although the Project site contains lacustrine water features (ponds, lakes), seasonal wetlands, and seeps that could be considered jurisdictional under Section 404 of the Clean Water Act, the Project has committed to locating all ground disturbance areas outside of these areas such that no direct or indirect impacts to these resources would occur. Therefore, it is anticipated there would be no impacts to federally protected wetlands. However, more analysis is required to confirm the Project would not result in direct or indirect impacts to these resources. This issue will be further evaluated in the EIR.

d. ***Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?***

The Project involves removing 162 existing wind turbines and installing up to 40 new wind turbines resulting in a substantial reduction in the total number of turbines on the site. It is anticipated resident wildlife species would continue to use the site for local as well as larger-scale movement and any established wildlife corridors would continue to function in their current state. The Project does not include installing new fences, other than surrounding the new substation, or other impediments to wildlife movement. Project implementation would not result in any changes to the existing wildlife species corridor usage; therefore, there would be no impact to the movement of any native resident or migratory wildlife species or established wildlife corridors. In addition, based on the fieldwork conducted on the site, there are no known wildlife nursery sites present. Therefore, the Project would result in no impact to wildlife corridors or nursery sites.

e. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

The state is not required to comply with local regulations. Therefore, the Project would not conflict with any local ordinance or policy and there is no impact. However, the EIR will evaluate the loss of any native trees associated with construction of the turbines as well as the New Transmission Line. This issue will be further evaluated in the EIR.

f. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?

There are no adopted Habitat Conservation Plans or Natural Community Conservation Plans with coverage for any area or activity in Merced County; therefore, the Project would pose no conflict with any such plan and there is no impact.

Sources

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3.5 CULTURAL RESOURCES

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
V. CULTURAL RESOURCES – Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5?	☐	☐	☒	☐
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☐	☒	☐	☐
c) Disturb any human remains, including those interred outside of dedicated cemeteries?	☐	☐	☒	☐

3.5.1 Environmental Setting

Information presented in this section was gathered from the Cultural Resources Inventory Report (see Appendix B) prepared for the Project. Please refer to Appendix B for more information. Subsequent to preparation of this section, additional design refinements have been provided that include additional Project components that have yet to be subject to an archaeological survey. These areas would be surveyed in the near future, and the analysis updated to reflect the results of those additional efforts.

Existing Site

The Project site, which is an existing wind farm, located to the south of SR-152 within the eastern portion of Pacheco State Park, is approximately 2 miles southwest of Santa Nella and approximately 8 miles west of Los Banos. The Project site is located in the oak woodland savanna habitats of foothills of the Diablo Range and bordered on the west by the hilly terrain that separates the range from the San Joaquin Valley. Adjacent ranches include a small number of both permanent residences and periodically used dwellings. The Project site is undeveloped with the exception of 162 remaining wind turbines installed between 1988 and 2002, temporary MET towers, and a trailer and maintenance building in the northwestern portion of the site near the existing on-site substation. The Project site was historically used as a cattle ranch before its conversion to a wind farm in 1988.

The New Transmission Line traverses undeveloped land for a majority of the alignment until it reaches SR-152. The New Transmission Line alignment generally follows the southern and eastern boundaries of the San Luis Reservoir in areas generally characterized by oak savannah, patches of scrub vegetation, and grassland in gentle to moderately sloped topography. Near the terminus of the New Transmission Line at the Los Banos Substation, the alignment runs parallel to SR-152 along generally undeveloped lands adjacent to the highway.

Records Search

The Cultural Resources Inventory Report (Appendix B) prepared for the Project included a California Historical Resources Information System (CHRIS) records search for the Project site within Pacheco State Park and 0.5-mile radius, which were conducted at the Central California Information Center (CCIC) on November 17, 2017 and April 24, 2018, and a records search for the New Transmission Line corridor and 0.5-mile radius, which was conducted by CCIC staff on November 15, 2018 and January 28, 2019.

The CCIC records indicate that forty-eight previous cultural resource investigations have been conducted within the 0.5-mile search radius of the Project site, of which three studies include portions of the Project site (see Appendix B).

According to the CCIC records, there are 10 previously recorded cultural resources located within, or immediately adjacent to, the Project site. The 10 cultural resources have been identified within, or immediately adjacent to, the Project site include the following:

- P-24-000142 – prehistoric bedrock milling and habitation site;
- P-24-001820 - prehistoric bedrock milling site containing a single boulder with two mortars;
- P-24-001821 - stone cairn atop a single boulder likely used as a marker or survey monument and may be prehistoric or historic-era in nature;
- P-24-001822 - segment of the historic-era Pacheco Pass Highway;
- P-24-001823 - fence serving as the southern boundary of a state lands parcel which contains historic-era elements;
- P-24-001824 - remnants of a historic-era windmill;
- P-24-001856 – historic-era San Luis Gonzaga Rancho-Paula (Pacheco) Fatjo Ranch;
- P-24-001988 – historic-era road;
- P-24-002143- historic-era PG&E steel lattice transmission tower;
- P-24-002164 – historic-era road.

Furthermore, there are 43 previously recorded resources within 0.5 miles of the Project site (Appendix B).

Pedestrian Survey

Intensive pedestrian surveys of the Project site were conducted by Dudek archaeologists between September 4 through April 5, 2019. Nine of the previously recorded cultural resources were relocated and found to be in the same general condition as previously recorded. One cultural resource, P-24-000142, was not re-identified. As this resource was recorded in 1966 to a location mapped within San Luis Reservoir (constructed circa 1967), it is likely that the site was either mismapped and is located elsewhere outside of the APE or that it is now underwater. In addition, four newly discovered isolated cultural resource (GZ-I-02, GZT-I-01, GZT-I-02, and GZT-I-03) were identified during the survey (Appendix B).

3.5.2 Discussion

Would the proposed project:

a. Cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5?

The Project as currently designed has the potential to impact two historic-era resources (P-24-001822 and P-24-001856) that fall within the boundaries of the Project site. All resource components associated with these sites consist of historic-era dirt roads in varying present states of improvement that fall within the larger San Luis Gonzaga Rancho-Paula (Pacheco) Fatjo Ranch District (P-24-001856). A DPR form prepared by Linda D. Bissonnette in 2006 indicates that dirt roads are considered contributing resources to the District. The roads, while used during historical ranching activities associated with the Fatjo/Pacheco family have no documented connection to particular events, people, or architectural resources. As such, while these road segments do lend to the broader integrity of location, setting, feeling and association of the larger San Luis Gonzaga Rancho-Paula (Pacheco) Fatjo Ranch District, this contribution remains appropriately conveyed through ongoing use as access roads. Any data potential associated with historic-era roads intersecting the Project has been exhausted through recordation. As such, roads falling within the Project site that are associated with P-24-001856 are not eligible for listing and impact/improvements related to use for Project access would not be significant.

One additional historic-era road, crosses the New Transmission Line alignment. This road was likely constructed to connect the San Luis Reservoir to the basalt quarry. The road segment intersecting the 200 foot-wide survey corridor is a typical dirt road of approximately 52 years old, with evidence of improvements over time. It does not appear to convey the characteristics associated with significant events, is not associated directly with a known significant person, does not embody distinctive characteristics of construction, and has no additional data potential to provide beyond the existing level of documentation. This segment of P-24-001988 is not eligible for listing and impact/improvements related to use for Project use would not be significant.

No other historic-era resources were identified during the cultural resource evaluation conducted for the Project. However, because there is always the potential for unknown subsurface historic-era resources to be uncovered during construction activities this is considered a potentially significant impact. Compliance with Mitigation Measures CUL-1 and CUL-2 would ensure if any resources are uncovered the proper steps would be taken to ensure the resources are protected reducing the impact to less than significant.

b. Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?

Prior cultural resource evaluations, that included the Project site identified two prehistoric-era archeological resources; P-24-001820-prehistoric bedrock milling site containing a single boulder with two mortars; and P-24-001821 - stone cairn atop a single boulder likely used as a marker or survey monument and may be prehistoric or historic in nature. One cultural resource, P-24-000142, was not re-identified, although it is recorded to a location along the New Transmission Line where it crosses a bay of San Luis Reservoir. The site is presumed to have been incorrectly mapped, having been documented on highly generalized maps prior to GPS technology, or is now underwater. Regardless, the site would not be impacted. In addition, the survey conducted as part of the Project discovered four new prehistoric isolates. This included GZ-I-02, consisting of a single white cryptocrystalline interior flake; GZT-I-01, a hand stone fragment; GZT-I-02, a hand stone fragment; and GZT-I-03, a quartzite interior flake. All isolates were discovered on the ground surface. No associated cultural constituents were observed, however less than one-half of the ground surface was visible through tall grasses. There is little evidence for subsurface deposits in these areas. These isolates were left on site, and likely could be avoided by the Project as currently designed. Isolates are not eligible for listing and, as such, impacts would not represent a significant effect if these isolates could not be avoided. However, such finds do demonstrate that there exists the potential that during construction activities additional prehistoric archaeological resources or deposits could be uncovered. These resources are indicated by the presence of discolored or dark soil, fire-affected material, the presence of imported shell, burned or complete bone, non-local lithic materials, or other characteristics observed to be atypical of the surrounding area. Common prehistoric artifacts may include modified or battered lithic materials; lithic or bone tools that appeared to have been used for chopping, drilling, or grinding; projectile points; fired clay ceramics or non-functional items; and other items. Historic-age deposits are often indicated by the presence of glass bottles and shards, ceramic material, building or domestic refuse, ferrous metal, or old features such as concrete foundations or privies. Because the Project site may contain unknown, subsurface or otherwise prehistoric-era resources this is considered a potentially significant impact. Compliance with Mitigation Measures CUL-1 and CUL-2 would ensure impacts would be reduced to less than significant.

Mitigation Measure

CUL-1 At the construction site orientation, construction workers shall be alerted to the potential to encounter sensitive historic-era or prehistoric archaeological material. Information detailing what these resources could look like shall be provided as part of an environmental sensitivity training. This information can be provided as a handout or in person. In the event that archaeological resources (sites, features, or artifacts) are exposed during construction activities for the Project, all construction work occurring within 100 feet of the find shall immediately stop until a qualified archaeologist, meeting the Secretary of the Interior's Professional Qualification Standards, can evaluate the significance of the find and determine whether additional study is warranted. This work exclusion buffer may be adjusted by the qualified archaeologist in consultation with the lead agency. Depending upon the significance of the find under CEQA (14 CCR 15064.5(f); PRC Section 21082), the archaeologist may simply record the find and allow work to continue. Prior to any disturbing investigative techniques, the feasibility of resource avoidance shall be considered. If the discovery proves significant, additional work, such as preparation of an archaeological treatment plan, testing, or data recovery may be warranted.

CUL-2 During ground disturbing activities associated with construction of the turbines, Operations & Maintenance building, substation, New Transmission Line, and any underground utilities within 300 feet of any waterways, caves, springs or known archaeological sites, the Project contractor shall coordinate with CDPR staff to contact the Amah Mutsun Tribal Band to provide on-site monitors during these activities. The Project contractor shall retain an archaeological consultant to provided Archaeological monitoring in these areas. Archaeological and Native American monitoring shall occur in these areas.

c. ***Disturb any human remains, including those interred outside of formal cemeteries?***

Based on a review of the historical records it does not appear that the Project site included a known cemetery or burial ground. However, there is always the potential to unearth unknown human remains when excavating for installation of the new turbines and other earth moving activities. GRWF would create an Unanticipated Discovery Plan to address the potential for discovering a site during construction. In the event bone or any human remains are unearthed during construction, pursuant to Section 7050.5 of the California Health and Safety Code, the county coroner shall be immediately notified of the discovery. No further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent remains shall occur until the county coroner has determined, within 2 working days of notification of the discovery, the appropriate treatment and disposition of the human remains. If the county coroner determines that the remains are, or are believed to be, Native American, he or she shall notify the Native American Heritage Commission (NAHC) in Sacramento within 24 hours. In accordance with California Public Resources Code, Section 5097.98, the NAHC must immediately notify those persons it believes to be the most likely descendant from the deceased Native American. The most likely descendant shall complete his/her inspection within 48 hours of being granted access to the site. The designated Native American representative would then determine, in consultation with the property owner, the disposition of the human remains. This would ensure impacts would be reduced to less than significant.

Sources

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3.6 ENERGY

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
VI. Energy – Would the project:				
a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	☐	☐	☒	☐
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	☐	☐	☐	☒

3.6.1 Environmental Setting

Electricity

Pacific Gas & Electric Company (PG&E) is the utility provider for Merced County. PG&E provides electric services to 5.4 million customers, including 106,681 circuit miles of electric distribution lines and 18,466 circuit miles of interconnected transmission lines over a 70,000-square-mile service area that includes Northern California and central California (PG&E 2016). According to PG&E, customers consumed 82,224 million kilowatt-hours (kWh) of electricity in 2017 (CEC 2017a).

PG&E receives electric power from a variety of sources. According to California Public Utilities Commission's (CPUC's) *2018 Renewable Portfolio Standard (RPS) Annual Report to the Legislature*, 33% of PG&E's power came from eligible renewable energy sources in 2017, including biomass/waste, geothermal, small hydroelectric, solar, and wind sources (CPUC 2018).

Based on recent energy supply and demand projections in California, statewide annual peak electricity demand is projected to grow an average of 890 megawatts per year for the next decade, or 1.4% annually, and consumption per capita is expected to remain relatively constant at 7,200–7,800 kWh per person (CEC 2015).

Petroleum

There are more than 35 million registered vehicles in California, and those vehicles consume an estimated 18 billion gallons of fuel each year (CEC 2017b; DMV 2018). Petroleum currently accounts for approximately 92% of California's transportation energy consumption (CEC 2017b). However, technological advances, market trends, consumer behavior, and government policies could result in significant changes in fuel consumption by type and in total. At the federal and state levels, various policies, rules, and regulations have been enacted to improve vehicle fuel efficiency, promote the development and use of alternative fuels, reduce transportation-source air pollutants and greenhouse gas (GHG) emissions, and reduce vehicle miles traveled. Market forces have driven the price of petroleum products steadily upward over time, and technological advances have made use of other energy resources or alternative transportation modes increasingly feasible.

Largely as a result of and in response to these multiple factors, gasoline consumption within the state has declined in recent years, and availability of other alternative fuels/energy sources has increased. The quantity, availability, and reliability of transportation energy resources have increased in recent years, and this trend may likely continue and accelerate (CEC 2017b). Increasingly available and diversified transportation energy resources act to promote continuing reliable and affordable means to support vehicular transportation within the state.

3.6.2 Discussion

Would the proposed project:

d. Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?

The proposed Project would involve replacing the existing 18.4 MW wind energy facility that was constructed on the Project site beginning in 1988 with a wind energy facility capable of generating up to approximately 100 MW. The Project would generate up to four times more renewable energy than currently is being produced at the Project site. Furthermore, the Project would result in the installation of more energy efficient turbines by installing up to 40 wind turbines that generate up to 100 MW compared to the existing 162 wind turbines that generate 16.5 MW of electricity. Power generated by the turbines would be transmitted via the existing transmission line for up to approximately 18.4 MW and the New Transmission Line would transmit up to the remaining approximately 80 MWs.

Construction and operation of the proposed Project would require use of energy associated with motor vehicle trips to and from the Project site, operation of construction and maintenance equipment, generation of electricity consumed by the Project, and from the emergency generator. However, energy used by the Project during construction would be minimal and would be completely offset by renewable energy produced by the Project. Therefore, the Project would not result in wasteful, inefficient, or unnecessary consumption of energy resources during Project construction or operation, and impacts would be less than significant.

e. ***Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?***

As described in above in response (a), the Project would convert the existing up to 18.4 MW wind energy facility on the Project site to a wind energy facility capable of generating up to approximately 100 MW. The Project would therefore produce up to 81.6 MW of renewable energy more than is currently being produced. This would assist the state's goal of achieving carbon neutrality by 2045, as stated in the state's Scoping Plan and as required by Senate Bill 100. Therefore, the Project would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency, and no impact would occur.

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3.7 GEOLOGY AND SOILS

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
VII. GEOLOGY AND SOILS – Would the project:				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☒	☐
ii) Strong seismic ground shaking?	☐	☐	☒	☐
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☒	☐
iv) Landslides?	☐	☐	☒	☐
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☒	☐
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☒	☐
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	☐	☐	☒	☐
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	☐	☐	☐	☒
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☒	☐

3.7.1 Environmental Setting

The Project Area is located in the northcentral portion of the Coast Ranges Geomorphic Province. The Coast Ranges span from northern to southern California along the state's coastline, subparallel to the active San Andreas Fault. Low mountain ranges and associated valleys characterize the Coast Ranges, and elevations typically range between 2,000 and 4,000 feet above sea level. The Coast Ranges primarily consist of thick late Mesozoic and Cenozoic sedimentary rocks. In some areas, the topography of the Coast Ranges is subject to the irregular, knobby outcrops of the landslide-prone rocks of the Franciscan Complex (CGS 2002).Geologic formations within Merced County consist of the Basement Complex, Ione Formation, Valley Springs Formation, Mehrten Formation, Tulare Formation, and recent alluvium (Merced County 2013).

The topography of the Project site is characterized by an overall slope to the south-southeast with scattered mountains. Elevation varies throughout the property, but is listed as 1,197 feet above mean sea level in the ERIS report completed for the Phase I Environmental Site Assessment (Phase 1 ESA, Appendix C). The San Luis Reservoir SRA is located immediately to the east of the Project site adjacent to the Park and to the north of the proposed New Transmission Line. Several smaller streams, lakes, and springs are also located throughout the Project site. There are no existing on-site water or sewer lines within the Park.

According to the U.S. Department of Agriculture Natural Resources Conservation Service Soil Survey of Merced County, California, Western Part, the Project site includes the following Geologic Units: Franciscan Complex (KJf), Upper Cretaceous marine rocks (Ku), Quaternary alluvium and marine deposits (Q), Plio-Pleistocene and Pliocene loosely consolidated deposits (QPc), Tertiary volcanic flow rocks (Tv), and water (USDA 2018).

The majority of the soils that compose these geologic units have runoff potential that ranges from moderately high to high (Appendix C). In general, soil characteristics are strongly governed by slope, relief, climate, vegetation, and the geologic unit upon which they form. Soil types are important in describing engineering constraints such as erosion and runoff potential, corrosion risks, and various behaviors that affect structures, such as expansion and settlement.

Expansive soils increase in volume when they absorb water and shrink when they dry out. Expansion often occurs in soils that have clay minerals, primarily montmorillonite and illite (a non-expanding clay mineral). Damage from expansive soils can impact roadways, pavements, and other flat construction. The majority of the Project site has low shrink-swell potential, with areas of high shrink-swell potential occurring near the Los Banos substation and in the northeastern area of the wind turbine portion of the Project site (USDA 2018).

Table 3.7-1 lists the soil units mapped on the Project site, and their key physical characteristics and Figure 3.7-1 shows the location of the various soil types.

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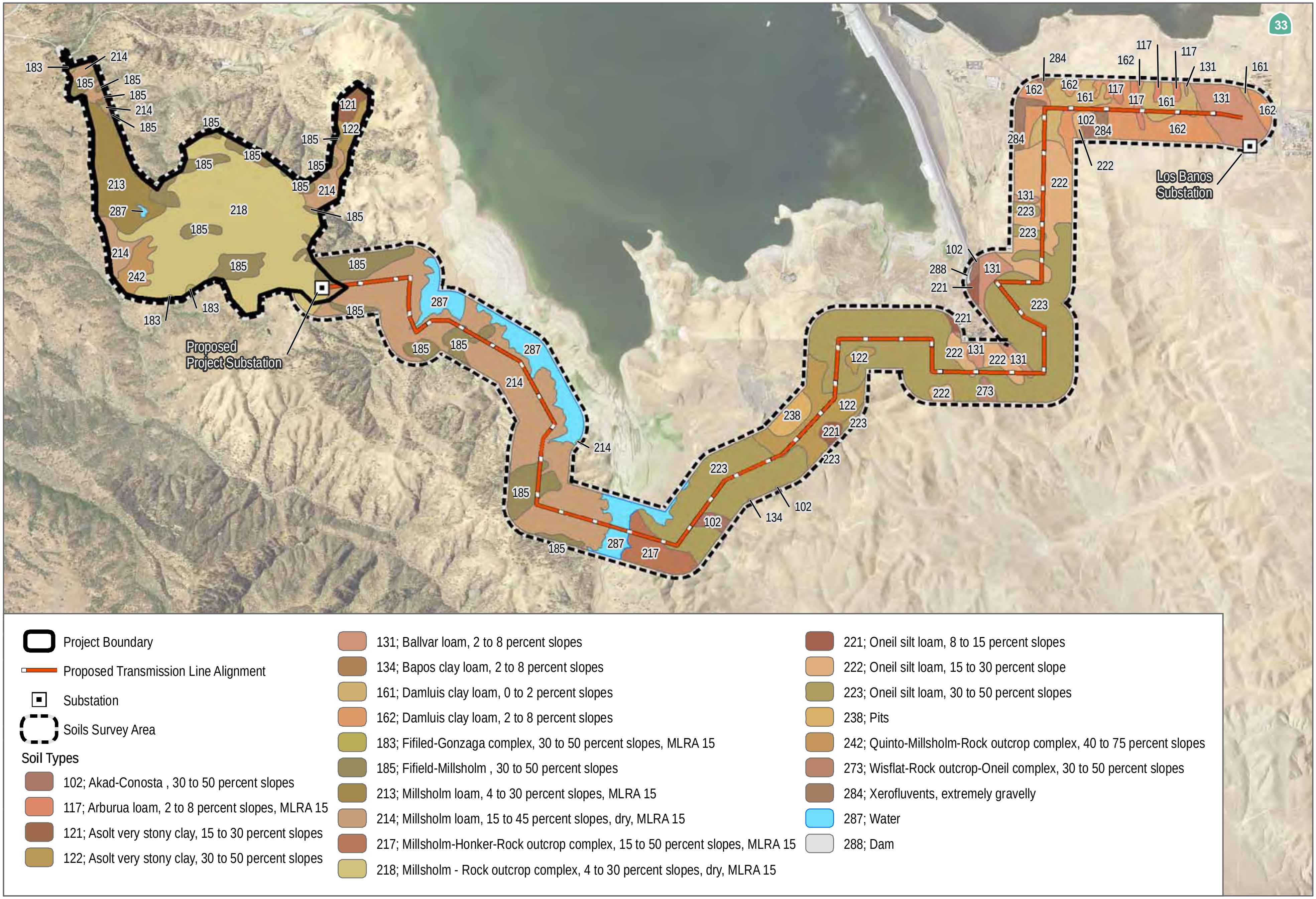

SOURCE: Scout Energy 2018, USDA 2018

DUDEK

0 0.5 1 Miles

FIGURE 3.7-1

Soil Types

Gonzaga Ridge Wind Repowering Project

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Table 3.7-1
Soil Types Underlying the Project Site

Soil Type	Acres	Drainage	Runoff Potential	Hydro Group
Project Site				
Asolt very stony clay, 15 to 30 percent slopes	30.6	Well drained	Moderately high	C - Soils in this group have moderately high runoff potential when thoroughly wet. Water transmission through the soil is somewhat restricted.
Asolt very stony clay, 30 to 50 percent slopes	43.3	Well drained	Moderately high	C - Soils in this group have moderately high runoff potential when thoroughly wet. Water transmission through the soil is somewhat restricted.
Fifiled-Gonzaga complex, 30 to 50 percent slopes, MLRA 15	8.0	Well drained	Moderately high	C - Soils in this group have moderately high runoff potential when thoroughly wet. Water transmission through the soil is somewhat restricted.
Fifield-Millsholm , 30 to 50 percent slopes	220.7	Well drained	Moderately high	C - Soils in this group have moderately high runoff potential when thoroughly wet. Water transmission through the soil is somewhat restricted.
Millsholm loam, 4 to 30 percent slopes, MLRA 15	226.7	Well drained	Moderately high	D - Soils in this group have high runoff potential when thoroughly wet. Water movement through the soil is restricted or very restricted.
Millsholm loam, 15 to 45 percent slopes, dry, MLRA 15	140.9	Well drained	High	D - Soils in this group have high runoff potential when thoroughly wet. Water movement through the soil is restricted or very restricted.
Millsholm - Rock outcrop complex, 4 to 30 percent slopes, dry, MLRA 15	898.8	Well drained	High	D - Soils in this group have high runoff potential when thoroughly wet. Water movement through the soil is restricted or very restricted.
Quinto-Millsholm-Rock outcrop complex, 40 to 75 percent slopes	58.4	Somewhat excessively drained	High	D - Soils in this group have high runoff potential when thoroughly wet. Water movement through the soil is restricted or very restricted.
Water	3.3			
Transmission-line Corridor and Surrounding 0.25 Mile				
Akad-Conosta , 30 to 50 percent slopes	39.9	Somewhat excessively drained	Moderately High	C - Soils in this group have moderately high runoff potential when thoroughly wet. Water transmission through the soil is somewhat restricted.
Arburua loam, 2 to 8 percent slopes, MLRA 15	38.7	Well drained	Moderately High	C - Soils in this group have moderately high runoff potential when thoroughly wet. Water transmission through the soil is somewhat restricted.

Table 3.7-1
Soil Types Underlying the Project Site

Soil Type	Acres	Drainage	Runoff Potential	Hydro Group
Asolt very stony clay, 30 to 50 percent slopes	196.5	Well drained	Moderately High	C - Soils in this group have moderately high runoff potential when thoroughly wet. Water transmission through the soil is somewhat restricted.
Ballvar loam, 2 to 8 percent slopes	228.4	Well drained	Moderately High	C - Soils in this group have moderately high runoff potential when thoroughly wet. Water transmission through the soil is somewhat restricted.
Bapos clay loam, 2 to 8 percent slopes	0.4	Well drained	High	D - Soils in this group have high runoff potential when thoroughly wet. Water movement through the soil is restricted or very restricted.
Damluis clay loam, 0 to 2 percent slopes	173.9	Well drained	High	C - Soils in this group have moderately high runoff potential when thoroughly wet. Water transmission through the soil is somewhat restricted.
Damluis clay loam, 2 to 8 percent slopes	272.5	Well drained	Moderately High	C - Soils in this group have moderately high runoff potential when thoroughly wet. Water transmission through the soil is somewhat restricted.
Fifield-Millsholm , 30 to 50 percent slopes	268.9	Well drained	Moderately High	C - Soils in this group have moderately high runoff potential when thoroughly wet. Water transmission through the soil is somewhat restricted.
Millsholm loam, 15 to 45 percent slopes, dry, MLRA 15	857.0	Well drained	High	D - Soils in this group have high runoff potential when thoroughly wet. Water movement through the soil is restricted or very restricted.
Millsholm-Honker-Rock outcrop complex, 15 to 50 percent slopes, MLRA 15	104.8	Well drained	High	D - Soils in this group have high runoff potential when thoroughly wet. Water movement through the soil is restricted or very restricted.
Millsholm - Rock outcrop complex, 4 to 30 percent slopes, dry, MLRA 15	56.1	Well drained	High	D - Soils in this group have high runoff potential when thoroughly wet. Water movement through the soil is restricted or very restricted.
Oneil silt loam, 8 to 15 percent slopes	33.2	Well drained	Moderately High	C - Soils in this group have moderately high runoff potential when thoroughly wet. Water transmission through the soil is somewhat restricted.
Oneil silt loam, 15 to 30 percent slope	367.0	Well drained	Moderately High	C - Soils in this group have moderately high runoff potential when thoroughly wet. Water transmission through the soil is somewhat restricted.

Table 3.7-1
Soil Types Underlying the Project Site

Soil Type	Acres	Drainage	Runoff Potential	Hydro Group
Oneil silt loam, 30 to 50 percent slopes	1,388.6	Well drained	Moderately High	C - Soils in this group have moderately high runoff potential when thoroughly wet. Water transmission through the soil is somewhat restricted.
Pits	47.9			
Wisflat-Rock outcrop-Oneil complex, 30 to 50 percent slopes	15.5	Well drained	High	D - Soils in this group have high runoff potential when thoroughly wet. Water movement through the soil is restricted or very restricted.
Xerofluvents, extremely gravelly	49.2	Poorly drained	Moderately Low	B/D - These soils have moderately low runoff potential when drained and high runoff potential when undrained.
Water	279.7			
Dam	2.4			

Source: Appendix C (Phase I ESA), USDA 2018.

Faults and Seismicity

Significant faults within the vicinity of Merced County include the San Andreas Fault to the west, the Hayward, Greenville, and Calaveras Faults to the northwest, and the Bear Mountain Fault Zone to the east, which have ruptured during historic times. The closest faults to the Project site include the Great Valley Fault, located approximately 6 miles east of the Los Banos Substation, and the Ortigalita Fault, located less than one-mile southwest of the Project site (Merced County 2013).

Fault Rupture

The Alquist Priolo (AP) Earthquake Fault Zoning Act was passed in 1972 to mitigate the hazard of surface faulting to structures for human occupancy. In accordance with this act, the state geologist established regulatory zones, called "earthquake fault zones," around the surface traces of active faults and published maps showing these zones. Each earthquake fault zone extends approximately 200 to 500 feet on either side of the mapped fault trace, because many active faults are complex and consist of more than one branch. A review of the AP Earthquake Fault maps shows that the Project site is not located within an AP fault zone (DOC 1986). The closest edge of an AP fault zone is a strand of the Ortigalita Fault Zone, located approximately 0.8 of a mile to the southwest of the Project site (Merced County 2013). The Ortigalita Fault has not been active within historic times (1,800 years ago to present). Surface rupture has occurred within the Holocene period (11,000 years before present). Other AP Earthquake Fault Zones near Merced County include the Calaveras Fault, Greenville Fault, and the San Andreas Fault (Merced County 2013).

Seismic Ground Shaking

The primary tool that seismologists use to evaluate ground shaking hazard and characterize statewide earthquake risks is a probabilistic seismic hazard assessment (PSHA). The PSHA for the State of California takes into consideration the range of possible earthquake sources and estimates their characteristic magnitudes to generate a probability map for ground shaking. The PSHA maps depict values of peak ground acceleration (PGA) that have a 10 percent probability of being exceeded in 50 years (or a 1 in 475 chance). This probability level allows engineers to design structures for ground motions that have a 90 percent chance of not occurring in the next 50 years, making structures safer than if they were simply designed for the most likely events. Although the Project proposes no habitable structures, the PGA still provides a useful estimate of ground shaking that can be reasonably expected to occur on the Project site. Based on the California Geological Survey's Probabilistic Seismic Hazards Mapping Ground Motion Page, there is a 10 percent probability of earthquake ground motion exceeding 0.44 g at the Project site over a 50-year period (DOC 2008). This level of ground motion can cause significant damage to buildings and occupied structures. However, it is not considered hazardous to structures such as wind turbines.

Landslides and Subsidence

The Background Report prepared for the Merced County General Plan states that slope instability is most likely to occur within the western part of the County, due to the steep topography of the Coast Range and proximity of faulting in the area. Earthquake-induced landslides can occur due to ground deformation and secondary ground cracks after seismic activity. Seismic lurching occurs when soil or a rock mass moves toward features such as a sea cliff, road cut, or steep natural hillside, and can result in landslides. Heavy rainfall, human activities, or earthquakes can trigger or intensify landslides.

Subsidence is the result of land settling due to over saturation or extensive withdrawal of groundwater, oil, or natural gas. Two areas located near the unincorporated communities of Los Banos and El Nido have been deemed susceptible to subsidence in Merced County. These areas are located approximately 3 miles east of the Los Banos Substation in the easternmost portion of the County (Merced County 2013).

Liquefaction

Liquefaction is a soil condition in which earthquake-induced ground motion causes an increase in soil water pressure in saturated, loose, sandy soils, resulting in loss of soil shear strength. Liquefaction can lead to near-surface ground failure, which may result in loss of foundation support and/or differential ground settlement.

The Background Report for the Merced County General Plan specifies that although there are no designated liquefaction hazard areas within the County, there is potential for liquefaction due to the high water table and unconsolidated sediments throughout the San Joaquin Valley. Liquefaction hazards are likely to occur near the County's wetland areas adjacent to the San Joaquin River (Merced County 2013).

Dam and Levee Failure

Several dams and levees are located within Merced County that pose a significant hazard to the region in the event of failure during an earthquake or excessive rainfall event. The nearest dam to the Project site is the San Luis Reservoir dam, located approximately 4.6 miles east of the Project site. This dam was constructed to withstand a magnitude 8.3 earthquake. The Department of Water Resources inspects this dam annually to evaluate its safety (Merced County 2013). The proposed wind farm is west of the dam and highly unlikely to be affected.

Paleontological Records Search

Within the Project site, surface-mapped geological units include unnamed Quaternary (Holocene; less than approximately 11,650 years old) landslide material, late Miocene age (approximately 11.63 to 2.58 million years old [Ma]) Quien Saba Volcanics, and Jurassic (201 to 145 Ma) or Cretaceous (145 to 66 Ma) age Franciscan Assemblage (Dibblee and Minch, 2007).

A search of the University of California, Berkeley Museum of Paleontology (UCMP) online database did not uncover any recorded fossil collecting localities in this area.

3.7.2 Discussion

Would the proposed project:

a. Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:

i. Rupture of a known earthquake fault, as delineated on the most recent AlquistPriolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault?

As discussed in Section 3.7.1, Environmental Setting, the closest known active fault traces are those of the Ortigalita Fault, located approximately 0.8 of a mile southwest of the Project site (Merced County 2013). Because the Project site is not located on the trace of an Alquist-Priolo Fault Zone or any other potentially active fault, fault-line surface rupture would not be a hazard within the Project Area. Furthermore, the wind turbines, O&M building and other infrastructure would be designed and constructed to meet the California Building Code (CBC) seismic standards and recommendations of a site-specific geotechnical report in order to reduce potential damage due to fault rupture. Adherence to the CBC and recommendations of the geotechnical report would ensure maximum practicable protection. With compliance with these requirements and recommendations, impacts would be less than significant.

ii. Strong seismic ground shaking?

The intensity of ground shaking depends on the distance from the earthquake epicenter to the site, the magnitude of the earthquake, site soil conditions, and the characteristics of the source. As described previously, the Project would be located in a seismically active area, with the Ortigalita Fault and Great Valley Fault located in the vicinity of the Project site (Merced County 2013). In the event of a major earthquake, ground shaking is a main cause of structural damage. The Project is required by state law to comply with the CBC. In addition, preparation of a site-specific geotechnical report and compliance with recommendations of this report would ensure that all Project features (i.e., wind turbine foundations) are designed and built to current standards to minimize impacts associated with ground shaking. In addition, the Project does not include any permanent housing and no more than approximately eight employees (an increase of six employees compared to the existing wind farm) would be required to maintain the facility. Therefore, impacts due to seismic ground shaking would be less than significant.

iii. Seismic-related ground failure, including liquefaction?

Soil liquefaction most commonly occurs when ground shaking from an earthquake causes a sediment layer saturated with groundwater to lose strength and take on the characteristics of a fluid, thus becoming similar to quicksand. Factors determining the liquefaction potential are the level and duration of seismic ground motions, the type and consistency of soils, and the depth to groundwater. Loose sands and peat deposits; uncompacted fill and other Holocene materials deposited by sedimentation in rivers and lakes (fluvial or alluvial deposits); and debris or eroded material (colluvial deposits) are the most susceptible to liquefaction. As noted above, the Background Report prepared for the Merced County General Plan specifies that although there are no designated liquefaction hazard areas within the County, there is potential for liquefaction due to the high water table and unconsolidated sediments throughout the San Joaquin Valley. However, liquefaction hazards are likely to occur near wetland areas adjacent to the San Joaquin River. The Project site is not located near the San Joaquin River or any other major river in the area and the potential for liquefaction to occur is low. In addition, the CBC provides design criteria and calculation methods to assist in the design process and reduce the likelihood of ground failure. The proposed Project would comply with the CBC and recommendations of a site-specific geotechnical report. With compliance with these requirements and recommendations, impacts due to seismic-related ground failure would be less than significant.

iv. Landslides?

Areas at risk from landslides include locations on or close to steep hills and steep road cuts or excavations, or areas where existing landslides have previously occurred. Proposed turbines and new roads would be located along hillsides and on ridgelines that could be susceptible to landslides. A site-specific geotechnical investigation would be performed and appropriate design criteria and measures to address potentially unstable soil conditions within this area would be implemented. Further, the Project is required to comply with the CBC, which outlines specific design, engineering, and development standards for structures proposed in areas with unstable soils. Compliance with current regulations would ensure that all structures are designed and built to current standards to minimize impacts associated with seismic-related ground failure, including landslides. Therefore, impacts would be less than significant.

b. Result in substantial soil erosion or the loss of topsoil?

c. Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?

b,c) Ground-disturbing activities associated with Project construction would include site clearing around each turbine location and grubbing, topsoil stripping, and grading for the switching station and O&M facility as well as for the temporary batch plant. In addition, soil compaction, utility trenching, and placement of aggregate surfacing would also be required Project activities. Grading activities would consist of the removal, storage, and/or disposal of earth, gravel, vegetation, organic matter, loose rock, and debris. This would result in exposure of subsurface soils and potential soil erosion. A site-specific Stormwater Pollution Prevention Plan (SWPPP) would be implemented during Project construction to control potential erosion of temporarily disturbed areas. This would include implementation of erosion control best management practices (BMPs) such as perimeter controls (e.g., straw wattles, hay bales, or silt fences), containment measures (i.e., covering stockpiles), and other BMPs to reduce the risk of erosion. Due to the limited and temporary nature of ground disturbances in any one place, and the implementation of standard erosion control best management practices, the proposed Project would not result in substantial soil erosion or loss of topsoil. Furthermore, a site-specific geotechnical investigation would be performed and appropriate design criteria and measures to address potentially unstable soil conditions within this area would be implemented. In addition, the Project is required to comply with the CBC, which outlines specific design, engineering, and development standards for structures proposed in areas with unstable soils. Compliance with current regulations would ensure that all structures are designed and built to current standards to minimize impacts associated with unstable geologic units or soils. Therefore, impacts would be less than significant.

d. Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?

Although some soils on the Project site have the potential to be expansive, the majority of the project-site has low shrink-swell potential, with the exception of areas near the Los Banos substation and the northeastern area of the wind turbine portion of the Project site (USDA 2018). Due to the deep foundations required for wind turbine towers, expansive soils are unlikely to be a hazard. However, preparation of a site-specific geotechnical investigation and compliance with associated design measures and recommendations, and adherence to the CBC, would reduce any potential impacts related to expansive soils. Therefore, impacts would be less than significant.

e. Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?

There are no on-site sewer connections that service the Park. During project construction activities on-site portable toilets would be provided for construction workers. The Project would include installation of a septic system to service the O&M building during project operation and would be designed in accordance with, and under a permit from Merced County. The permitting process would ensure that soils would support the use of a septic system or the County would not issue a permit; therefore, impacts would be less than significant.

f. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

The records search conducted at the University of California, Berkeley Museum of Paleontology online database did not uncover any recorded fossils in this area. In addition, no unique geologic features have been identified on the Project site.

Based on a review the site, any landslide material would have low paleontological resource sensitivity due to the mixed nature and youthful age of the deposits. The basalts of the Quien Sabe Volcanics have no paleontological resource sensitivity due to their igneous origin. The Franciscan Assemblage rocks are considered to have low potential to yield scientifically significant paleontological resources. The Franciscan Assemblage is a mix of sedimentary and minor mafic igneous rocks. In this area, the assemblage consists of a greywacke sandstone, and considered to be part of Yolla Bolly Terrain of Wentworth (1999). If the Franciscan rocks do contain portions correlative with the Yolla Bolly Terrain, it has been known to produce siliceous microfossils (e.g., radiolarian tests). Due to the metamorphism associated with this unit and poor preservation of such fossils, it has low potential to yield scientifically significant (and non-redundant) paleontological resources. Impacts to paleontological resources would be less than significant.

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3.8 GREENHOUSE GAS EMISSIONS

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
VIII. GREENHOUSE GAS EMISSIONS – Would the project:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☒	☐
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☒	☐

3.8.1 Environmental Setting

To evaluate greenhouse gas (GHG) emissions associated with construction and operation of the Project, an Air Quality and Greenhouse Gas Emissions Analysis Technical report was prepared for the Project by Dudek. A copy of this report is included in Appendix A. Please refer to this report for more detailed information, including modeling output data. This section is based on information contained in this report.

Climate change refers to any significant change in measures of climate, such as temperature, precipitation, or wind patterns, lasting for an extended period of time (decades or longer). The Earth's temperature depends on the balance between energy entering and leaving the planet's system, and many factors (natural and human) can cause changes in Earth's energy balance. The greenhouse effect is the trapping and build-up of heat in the atmosphere (troposphere) near the Earth's surface. The greenhouse effect is a natural process that contributes to regulating the Earth's temperature, and it creates a livable environment on Earth. Human activities that emit additional GHGs to the atmosphere increase the amount of infrared radiation that gets absorbed before escaping into space, thus enhancing the greenhouse effect and causing the Earth's surface temperature to rise.

Global climate change is a cumulative impact; a project contributes to this impact through its incremental contribution combined with the cumulative increase of all other sources of GHGs. Thus, GHG impacts are recognized exclusively as cumulative impacts (CAPCOA 2008).

A GHG is any gas that absorbs infrared radiation in the atmosphere; in other words, GHGs trap heat in the atmosphere. As defined in California Health and Safety Code Section 38505(g) for purposes of administering many of the state's primary GHG emissions reduction programs, GHGs include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF_6), and nitrogen trifluoride (NF_3) (see also 14 CCR 15364.5). The three GHGs evaluated herein are CO_2, CH_4, and N_2O.

Gases in the atmosphere can contribute to climate change both directly and indirectly.[3] The Intergovernmental Panel on Climate Change (IPCC) developed the global warming potential concept to compare the ability of each GHG to trap heat in the atmosphere relative to another gas. The reference gas used is CO2; therefore, global warming potential-weighted emissions are measured in metric tons of CO_2 equivalent (MT CO_2e). Consistent with CalEEMod Version 2016.3.2 (CAPCOA 2016), this GHG emissions analysis assumed the global warming potential for CH_4 is 25 (emissions of 1 MT of CH_4 are equivalent to emissions of 25 MT of CO_2), and the global warming potential for N_2O is 298, based on the IPCC Fourth Assessment Report (IPCC 2007).

In California, climate change impacts have the potential to affect sea-level rise, agriculture, snowpack and water supply, forestry, wildfire risk, public health, and electricity demand and supply (CCCC 2006). The primary effect of global climate change has been a 0.2°C rise in average global tropospheric temperature per decade, determined from meteorological measurements worldwide between 1990 and 2005. Scientific modeling predicts that continued emissions of GHGs at or above current rates would induce more extreme climate changes during the twenty-first century than were observed during the twentieth century. A warming of about 0.2°C (0.36°F) per decade is projected, and there are identifiable signs that global warming could be taking place.

Although climate change is driven by global atmospheric conditions, climate change impacts are felt locally. A scientific consensus confirms that climate change is already affecting California. The average temperatures in California have increased, leading to more extreme hot days and fewer cold nights. Shifts in the water cycle have been observed, with less winter precipitation falling as snow, and both snowmelt and rainwater running off earlier in the year. Sea levels have risen, and wildland fires are becoming more frequent and intense due to dry seasons that start earlier and end later (CAT 2010).

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3 Direct effects occur when the gas itself absorbs radiation. Indirect radiative forcing occurs when chemical transformations of the substance produce other GHGs, when a gas influences the atmospheric lifetimes of other gases, and/or when a gas affects atmospheric processes that alter the radiative balance of the Earth (e.g., affect cloud formation or albedo) (EPA 2017).

3.8.2 Discussion

Would the proposed project:

a. ***Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?***

Construction of the Project would result in GHG emissions, which are primarily associated with use of off-road construction equipment, on-road vendor trucks, and worker vehicles.

GHG emissions during construction would generate approximately 453 MT CO_2e in 2019 and 1,043 MT CO_2e in 2020 (see Appendix A). Merced County recommends a significance threshold of 1,100 MT CO_2e per year. In the absence of any state significance threshold, the Project was evaluated using the County's threshold. The Project would not exceed the County's threshold for either year of construction. Therefore, the Project's construction-related GHG contribution would be not cumulatively considerable and is less than significant.

Operation of the Project would generate GHG emissions through motor vehicle trips to and from the Project site for routine inspection and maintenance, water truck deliveries, energy use (generation of electricity consumed by the Project), solid waste generation, and from the emergency generator. Estimated annual project-generated GHG emissions would be approximately 60 MT CO_2e per year as a result of Project operation. As shown, the total annual emissions would not exceed the County's recommended GHG significance threshold of 1,100 MT CO_2e per year. As such, the Project's operational GHG emissions would be considered less than significant.

Furthermore, in keeping with the renewable energy target under the Scoping Plan, and as required by Senate Bill 100, the Project would provide a source of renewable energy to help the state reach carbon neutrality by 2045. Renewable energy generated by the Project would in turn, potentially offset GHG emissions generated by fossil-fuel power plants.

b. ***Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?***

The Merced County Association of Governments' (MCAG's) Regional Transportation Plan (RTP) / Sustainable Communities Strategy (SCS) is an applicable plan adopted for the purpose of reducing GHGs from the land use and transportation sectors in Merced County. The RTP/SCS was adopted in 2018. CARB has not approved the 2018 RTP/SCS, an assessment of the Project's consistency with the 2018 RTP/SCS has been provided. Although the state is not required to comply with local plans or policies the RTP/SCS is based on state law and other state policies to reduce state-wide GHG emissions in order to meet state reduction requirements. Accordingly, the Project was analyzed for consistency with the RTP/SCS and found to comply with the plan. The Project would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs, and no mitigation is required. This impact would be less than significant.

Sources

CAPCOA (California Air Pollution Control Officers Association). 2016. *California Emissions Estimator Model (CalEEMod) User's Guide Version 2016.3.2* Prepared by Trinity Consultants and the California Air Districts. September 2016. http://www.aqmd.gov/docs/default-source/caleemod/upgrades/2016.3/01_user-39-s-guide2016-3-1.pdf?sfvrsn=2.

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3.9 HAZARDS AND HAZARDOUS MATERIALS

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
IX. HAZARDS AND HAZARDOUS MATERIALS – Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☒	☐
b) 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?	☐	☐	☒	☐
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☒
d) Be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☒	☐	☐
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☒	☐
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?	☐	☐	☒	☐

3.9.1 Environmental Setting

Current activities to address weed suppression within the Project site, include contracting with a licensed applicator to spray herbicides around all structures on an annual basis. The herbicide, Round Up ProMax is used exclusively for weed suppression. The portion of the Project site located within the Park includes 162 wind turbines and 41 electrical transformers. To evaluate the presence of any areas of potential contamination in the Project site, Dudek prepared a Phase 1 Environmental Site Assessment (ESA) in March 2018, included as Appendix C.

Existing Conditions

The Phase 1 ESA notes an electrical substation appears in the northeastern corner of the Project site and a wind farm is also currently in operation. One active groundwater well was observed and one abandoned well and accompanying water tank were observed on the Project site. There is no sewer connection or septic system on the Project site. A network of high-voltage (70 kV-500 kV) transmission lines crisscrosses the region connecting to the Los Banos substation to the east.

Evidence of recognized environmental conditions (RECs) was observed on the Project site including one of the 41 transformers located throughout the operations area was observed to be leaking and minor soil staining was observed. Minor soil staining was also observed at four additional transformers, although no active leaks were observed at these four transformers. Minor soil stains were typically 1 to 2 feet in diameter. Additional petroleum-related soil staining was observed in two of the four inspected wind turbines. These impacted soils were also small in area, typically 1 to 2 feet in diameter, and appeared to be contained within the walls of the turbine generator. However, these are also considered a REC.

The on-site substation, located on the northeast corner of the Project site, has had two reported oil releases. The first release consisted of one gallon of polychlorinated biphenyl (PCB)-containing mineral oil in 1996. The leak was secured, and cleanup completed in 1996. The second release consisted of 200 gallons of non-PCB oil released to soil with no reported groundwater impacts. Cleanup began in 2014, but completion of cleanup was not reported. Because cleanup was not reported as complete, this is considered a REC.

Dudek followed up with an analysis of the RECs on the site in April 2018, and conducted soil sampling to determine if TPH-diesel or motor oil was present and at what levels (see Appendix C). Based on the findings, Dudek recommended the petroleum-stained soil be removed from the site. In summer 2018, the stained soils were removed from the Project site by the prior wind farm owner and all RECs have been successfully remediated.

Hazardous Waste Regulations

Hazardous materials and hazardous wastes are heavily regulated by federal, state and local agencies including the California Environmental Protection Agency (EPA) and the California Department of Toxic Substances Control (DTSC). In California, the handling and storage of hazardous materials is regulated by Chapter 6.95 of the California Health and Safety Code. Under Sections 25500–25543.3, facilities handling hazardous materials are required to prepare a Hazardous Materials Business Plan. The plan provides information to the local emergency response agency regarding the types and quantities of hazardous materials stored at a facility and provides detailed emergency planning and response procedures in the event of a hazardous materials release. In the event that a facility stores quantities of specific acutely hazardous materials above the thresholds set forth by the California code, facilities are also required to prepare a Risk Management Plan and California Accidental Release Plan, which provides information on the potential impact zone of a worst-case release, and requires plans and programs designed to minimize the probability of a release and mitigate potential impacts.

The transportation of hazardous waste is regulated under Chapter 6.5 of the California Health and Safety Code. Under Section 21560, hazardous waste generators must complete a manifest for the waste before it is transported or offered for transportation. The enforcement agencies for the transportation of hazardous materials regulations are the California Highway Patrol and Caltrans.

Due to the historical uses of the Project site for grazing and as a wind farm, chemicals such as herbicides, as well as equipment fuel have been used on the Project site. The proposed Project would be expected to generate limited amounts of hazardous waste associated with maintenance equipment and use of herbicides for weed management and suppression.

According to the Fire Hazard Severity Zones in State Responsibility Areas (SRA) Map prepared by CalFire for Merced County, the Project site is designated as having a High fire risk (CalFire 2007).

The closest school to the Project site is Romero Elementary School located at 13500 Luis Avenue in Gustine, approximately 3 miles north of the Los Banos Substation and 9.5 miles east of the Project site. The closest airport to the Project site is the Los Banos Municipal airport located at 800 Airport Road in Los Banos. The airport is located approximately 8.5 miles east of the Los Banos Substation and 16.5 miles east of the Project site.

3.9.2 Discussion

Would the proposed project:

a. ***Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?***

   Project construction would include the use of gasoline, diesel fuel, lubricating oil, grease, and other solvents. Varying amounts of these materials would be stored and used on site at any one time. In addition, materials handled would not pose a significant risk to construction workers because the Contractor would be required to ensure these materials would be used and stored in accordance with existing laws and regulations. GRWF would prepare an oil spill prevention plan, or a SPCC Plan designed to prevent a discharge of oil into navigable waters or adjoining shorelines. The U.S. EPA requires preparation of a SPCC Plan it there is an aggregate aboveground oil storage capacity greater than 1,320 gallons or a completely buried storage capacity greater than 42,000 gallons and there is a reasonable expectation of an oil discharge into or upon navigable waters of the U.S. Besides proper handling per label instructions, compliance with hazardous materials laws and regulations, and preparation of a SPCC plan, use of hazardous materials associated with Project construction would also be governed under the Construction General Permit, and handled according to a site-specific Stormwater Pollution Prevention Plan (SWPPP), prepared as part of the Project. All SWPPPs must have a spill response and implementation element which requires, among other things, that appropriate spill response personnel are assigned and trained, and that equipment and materials for cleanup of spills (i.e., spill kits) shall be available on site. In addition, implementation of best management practices (BMPs) would help avoid and minimize impacts from the use of hazardous materials and may include requirements that all construction staging activities would occur within a designated staging area. The staging area(s) would be identified in the field and on the construction plans. All refueling and maintenance activities would occur within the staging area(s) and any hazardous materials spill would be cleaned up immediately, in accordance with all federal, state, and local regulations. Given implementation of existing laws and regulations, the impact associated with leaks and/or spills of construction site materials that could create a hazards to the public or the environment would be less than significant.

Operation of the Project would require the storage of herbicides for weed abatement and other types of lubricating oil, grease, and other solvents required for the maintenance and operation of the wind turbines. The use, storage and disposal of these chemicals would be conducted in accordance with existing CDPR requirements for use of herbicides for weed suppression, and any other applicable state and federal laws and would not create a significant hazard to the public or the environment through the routine transport, use or disposal. Currently, weed suppression on the Project site is conducted on an annual basis by a licensed contractor starting in late December through late January, depending on the weather. The total square footage of treated areas is approximately 85,600 square feet (pers com Justin Mattila). The herbicide Roundup is used for weed suppression and is consistent with what CDPR uses on other areas within the Park. Reliance on herbicides for weed abatement would be kept at a minimum and applied by a licensed contractor according to current CDPR practices for weed abatement within the Park and applicable state and federal requirements. The application of any herbicides would be target-specific to areas around the existing structures, consistent with CDPR current best management practices, and applied to present the least hazard to the environment, consistent with current CDPR requirements. Starting in late spring and continuing through the fall weed abatement continues using weed cutters and hand tools around all the structures on the site. This is considered a less-than-significant impact.

b. ***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?***

Implementation of the proposed Project would not involve permanent storage of fuel, oil, or other potentially hazardous materials. Construction equipment typically uses only a minor amount of hazardous materials, primarily motor vehicle fuels and oils, with the construction period lasting up to approximately 12 months. During this timeframe, there is a possibility that these materials may be released in accidental spills; however, compliance with both the SWPPP and SPCC Plan would minimize risks associated with a hazardous material spills. If any spills did occur, implementation BMPs would ensure that any spills were addressed quickly and remediated adequately, thereby reducing any impacts to the on-site employees or environment to less than significant.

c. ***Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or hazardous waste within one-quarter mile of an existing or proposed school?***

The closest school to the Project site is Romero Elementary School located approximately 3 miles north of the Los Banos Substation (termination of the New Transmission Line) and 9.5 miles east of the Project site. The Project does not include any uses that would emit hazardous materials or substances or generate hazardous waste within one-quarter mile of an existing school. There would be no impact.

d. ***Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?***

A search of federal, state, and local databases regarding hazardous material releases and site cleanup lists was conducted for the Project site as part of the Phase 1 ESA (see Appendix C). This search determined that the Project site is not included on a regulatory agency database related to hazardous materials/wastes. Nearby sites are listed on regulatory agency databases related to hazardous materials/wastes. Given that these sites have been remediated and the closed status of these nearby cases and/or current environmental conditions, it is unlikely these nearby sites have impacted the Project Site. As the Project site is not included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5, and surrounding sites are cleaned up, the project would not create a significant hazard to the public or the environment. Therefore, impacts to the public or environment due to hazardous conditions onsite would be less than significant.

An initial visual assessment of the New Transmission Line corridor was conducted and did not reveal evidence of any hazardous materials or waste. However, hazardous materials or waste could be present subsurface or in areas that were not evident when the area was surveyed. Compliance with Mitigation Measure HAZ-1 would ensure potential impacts to construction workers in the event any hazardous materials are encountered during installation of the New Transmission Line would be reduced to less than significant.

Mitigation Measures

HAZ-1 The Health and Safety Plan (HSP) prepared by the Project (construction contractor) shall include procedures for identification and management of hazardous materials/wastes. The HSP shall include information on how to detect and identify potentially contaminated soils and groundwater (e.g., visual and olfactory) and health and safety measures that shall be implemented should contaminated materials be present and proper management and reporting procedures. Contaminated materials shall be managed and disposed of in accordance with federal, state and local regulations.

e. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?

The closest public airport to the Project site is the Los Banos Municipal airport. This airport is located approximately 8.5 miles east of the Los Banos Substation and 16.5 miles from the Project site. Because the Project includes the installation of wind turbines, GRWF is required to coordinate with the Federal Aviation Administration (FAA) to ensure the wind turbines include lights and are visible to aircraft. FAA has already provided Determinations of No Hazard for representative wind turbine locations across the Project site. Due to the rural nature of this portion of Merced County the area is sparsely populated and the closest resident is to the southern boundary of the Project site and is located approximately 0.3 of a mile from the Project boundary. The Project would not result in a safety hazard for people living or working in the Project Area and the impact is less than significant.

f. ***Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?***

The proposed Project site is not within any local or regional emergency response or evacuation routes (Merced County 2013). Construction would generate an increase in delivery trucks and construction worker vehicle trips; however, it would not impair implementation of an emergency evacuation route. Project operation would generate negligible increases in traffic and therefore would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan. In addition, the Project does not include any uses that would house a new population or provide employment opportunities, with the exception of the eight employees that would be employed to oversee operation and maintenance of the wind turbines. Due to the type of project it would not develop uses that could impair implementation of an adopted emergency response plan or emergency evacuation plan. No impact would occur.

g. ***Expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires?***

The Project site is located in a rural area of the County with very limited development. According to the Fire Hazard Severity Zones in State Responsibility Areas (SRA) prepared by CalFire for Merced County, the Project site is designated as having a High fire risk (CalFire 2007). There have been small brush fires over the years both on the Project site and in the project vicinity. However, the Project does not include any uses that would house a new population or employ a large number of people that could be subjected to injury or death involving wildland fires. Because the Project would not expose people or structures to loss, injury or death involving wildfires this is considered a less-than-significant impact.

Sources

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Dudek. Phase 1 Environmental Site Assessment for the Gonzaga Ridge Wind Farm Project, Merced County, California. March 2018.

Merced County. Merced County 2030 General Plan, Chapter 11, Safety. December 2013.

Personal communication. E-mail from Justin Mattila, Harvest Energy Services, January 17, 2019.

3.10 HYDROLOGY AND WATER QUALITY

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
X. HYDROLOGY AND WATER QUALITY – Would the project:				
a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?	☐	☐	☒	☐
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	☐	☐	☒	☐
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:	☐	☐	☒	☐
i) result in substantial erosion or siltation on or off site;	☐	☐	☒	☐
ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on or off site;	☐	☐	☒	☐
iii) create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or	☐	☐	☒	☐
iv) impede or redirect flood flows?	☐	☐	☒	☐
d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	☐	☐	☐	☒
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☐	☐	☒	☐

3.10.1 Environmental Setting

A Hydrology and Water Quality Technical Report was prepared for the Project and is included in Appendix D. The information provided in this section is based on that report.

Regional Hydrology/Watershed

The Project site is located within the jurisdiction of the Central Valley Regional Water Quality Control Board (RWQCB), which administers a water quality control plan (Basin Plan) and other water quality programs for the Central Valley region. The Central Valley RWQCB covers approximately 60,000 square miles and stretches from the Oregon border to the northern boundary of Los Angeles County. The Sacramento River and the San Joaquin River drain the Central Valley region (CVRWQCB 2010).

Site Topography and Drainage

The Project site is located on a ridge south of Pacheco Pass in the eastern foothills of the Diablo Range. The Project site is mountainous with ephemeral drainages that feed into the San Luis Reservoir. The topography of the subject property is characterized by an overall slope to the south-southeast with scattered mountains. Elevation varies throughout the Project site, but is listed as 1,197 feet above mean sea level in the ERIS report completed for the Phase I Environmental Site Assessment (Appendix C). The San Luis Reservoir SRA is located immediately to the east of the Project site, immediately adjacent to the Park and to the north of the New Transmission Line route.

Surface Water

Based on regional watersheds defined by the Central Valley RWQCB, the Project site falls within the Grasslands Subarea, part of the Lower San Joaquin River watershed. This subarea is bounded to the west by the Coastal Range and to the east by the Lower San Joaquin River between the Mendota Dam and the confluence of the Merced River. Watershed boundaries are further subdivided into hydrologic units (HUs), which are partitioned into hydrologic areas (HAs). The Project site is located within the Pacheco Pass HA.

Surface flows in the Project site are primarily ephemeral, present only in direct response to precipitation. There are a number of stock watering ponds throughout the site, two of which are perennial throughout the year (Mammoth Lake and Wolf Lake). The average annual rainfall totals for the weather stations located approximately 16 miles (California Irrigation Management Information System (CIMIS) Station No. 126) west and 42 miles (City of Merced National Weather Service Station) east of the Project site are 11.3 and 10.9 inches, respectively. At both stations, over 9 inches of rain falls between the months of October and March, typical for this region that is dependent on a winter precipitation regime. The remaining 6 months (April through September) receive on average less than 2 inches of rainfall, with the months between June and August being the driest.

The Project site is located approximately ½ mile west of the San Luis Reservoir and drains into the Reservoir in one of two ways. One way drains directly from the ephemeral channels on the northern and eastern edges of the wind turbine portion of the site. The other way is by the ephemeral creeks through the center of the wind turbine portion of the site to the intermittent Salt Creek south of the site. Salt Creek flows into San Luis Creek and then to San Luis Reservoir. San

Luis Reservoir is supplied by water primarily from the San Joaquin Delta via the California Aqueduct and Delta-Mendota Canals. It is pumped into the reservoir from the O'Neill Forebay during the winter and spring. San Luis Reservoir discharges into the O'Neill Forebay, as well. Most of the water is utilized for the Central Valley Project (CVP) and California State Water Project (SWP); however, the San Luis Wasteway and the Pacheco Pumping Station receive some of the water as well. The San Luis Wasteway discharges to Los Banos Creek, which discharges to Mud Slough and then the San Joaquin River.

The Pacheco Pumping station is located on the western end of San Luis Reservoir and delivers water to the Pacheco Conduit. The Pacheco Conduit carries the water west of the ridgeline to a bifurcation that splits that water between the Hollister Conduit and the Santa Clara Conduit. The Hollister Conduit extends to the Hollister Pumping Plant and then a second reach of the Hollister Conduit which then terminates at the San Justo Reservoir. The San Justo Reservoir is for off-stream water storage. The Santa Clara Conduit extends to the Santa Clara Pumping Plant, which pumps water through the Santa Clara Tunnel to the second reach of Santa Clara Conduit. From there it is delivered to Coyote Pumping Plant at the base of Anderson Dam and Reservoir. The water from the plant is then discharged to Coyote Creek for recharge or sent to water treatment plants. Coyote Creek discharges to San Francisco Bay.

Groundwater

A groundwater basin is defined by the California Department of Water Resources (DWR) as a hydrogeologic unit containing one large aquifer, or a series of stacked aquifers, with definitive lateral and horizontal boundaries. A portion of the eastern development area of the Project site is located at the western end of the San Joaquin Valley – Delta–Mendota Sub-Basin (DWR Basin No. 5-22.07). As defined by DWR, this sub-basin covers an estimated 747,000 acres, and is bounded to the west by the Tertiary and older marine sediments of the Coast Ranges and on the north by the Stanislaus/San Joaquin County line. The sub-basin is bounded to the east by the San Joaquin River and the eastern boundary of Columbia Canal Company, the Chowchilla Bypass, and the eastern border of Farmer's Water District on the southern end. This sub-basin is bounded to the south by the northern end of the Westside Groundwater Basin, which corresponds with the Westlands Water District, as shown in Figure 3.9-1. The general groundwater flow direction in this basin is north and east toward the San Joaquin River.

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SOURCE: Scout Energy 2018, DWR 2018, USDA 2018

DUDEK

0 0.5 1 Miles

FIGURE 3.10-1

San Joaquin Valley-Delta-Mendota Sub-Basin

Gonzaga Ridge Wind Repowering Project

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The Project site itself sits above the Central Valley floor and has minimal connection to the San Joaquin Valley – Delta-Mendota Sub-Basin (which primarily consists of percolation from the San Luis Reservoir). Groundwater within the Project site has been identified within the fractured bedrock which feeds two springs (one ~850 feet south of Mammoth Lake, and one identified as the Windmill Spring on the USGS 7.5 Minute Quadrangle), and one active well that currently supports O&M activities for the existing wind energy operations. One active well is located in the northwestern part of the Project site; however, there is no data from the well. One inactive well is also present at the northern point of the site. What groundwater recharge may take place on the site would most likely occur where surface water makes contact with fractured bedrock or through channel transmission during periods of flow in the ephemeral channels.

Flood Hazards

The entire Project site falls within Zone D of the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) panel 06047C0775G (FEMA 2008). Zone D is used to identify regions that have not been mapped. A separate floodplain analysis conducted by the U.S. Army Corps of Engineers for the Central Valley Region (ACOE 2002) also does not have the Project site mapped. The absence of mapping in this region does not preclude the possibility for flooding in the Project site, but the positioning of Project infrastructure along the ridges does.

3.10.2 Discussion

Would the proposed project:

a. Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?

For stormwater discharges associated with construction activity in the State of California, the State Water Resources Control Board (SWRCB) has adopted the General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Construction General Permit) to avoid and minimize water quality impacts attributable to such activities. Construction General Permits regulate stormwater flows from construction activities that disturb one acre or more of land and construction on smaller sites that are part of a larger project. The permit requires preparation of and implementation of a SWPPP, which includes Best Management Practices (BMPs) designed to reduce potential impacts to surface water quality through construction and operation of the Project. The Construction General Permit requires routine inspection of all BMPs to monitor effectiveness of the SWPPP. GRWF must submit a Notice of Intent (NOI) to the SWRCB to be covered by a NPDES permit and prepare the SWPPP prior to the beginning of construction. Since the Project would disturb more than one acre of land, the Project requires coverage under the Construction General Permit. Based on the characterization of water quality impairments, potential Project-related pollutant sources, comparison of existing versus post-project runoff rates, and the implementation of stormwater BMPs and the SWPPP, the Project's impact on water quality standards and waste discharge requirements would be less than significant.

b. Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?

The Project proposes importing all water required for construction and operation. Use of the existing well within the Project site may be considered for future uses, but would only be done in coordination with CDPR. To the extent any groundwater use by the Project is within a groundwater basin subject to the Sustainable Groundwater Management Act, the use would only be done in coordination with the applicable groundwater sustainability agency. Site infiltration characteristics would not change as a result of the Project, whatever exchange between surface water and groundwater within the Project site would be maintained. Therefore, impacts to groundwater resources and recharge as a result of the Project are less than significant.

c. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:

i) result in substantial erosion or siltation on or off site;

Through proper implementation of road design and maintenance, the Project's impacts to the existing drainage pattern (resulting in increased erosion or siltation) would be less than significant. The site design would incorporate the existing access roads to the maximum extent practicable, and any proposed repair or installation of culverts would be designed to convey the peak flow rate from the 25-year 24-hour rainfall event. Where new access roads are required, they would be designed/graded to preserve the natural drainage patterns, and would implement design measures that promote sheetflow and minimize the potential for concentrating flows and contributing sediment to downstream water bodies. Routine road maintenance protocol and scheduling would be incorporated into the long-term operation of the facility to ensure potential issues are dealt with promptly and effectively. Thus, impacts to altering the existing drainage pattern resulting in substantial erosion or siltation would be less than significant.

ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on or off site;

The Project would not alter the course of a stream or river, nor would it impact the peak discharge volumes for the 2-, 5-, and 25-year 24-hour storm event (see Appendix D). Therefore, the Project would not substantially increase the rate or amount of surface runoff in a manner that would result in increased flooding on or off site and the impact is less than significant.

iii) create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or

As discussed in the Hydrology and Water Quality Technical Report prepared for the Project (see Appendix D), the Project would maintain the existing peak discharge rates for the 2-, 5-, and 25-year storm events, and would not produce substantial additional sources of pollutants in surface flows. Therefore, the impact is less than significant.

iv) impede or redirect flood flows?

The entire Project site falls within Zone D of the FEMA Flood Insurance Rate Map (FEMA 2008). Zone D is used to identify regions that have not been mapped. A separate floodplain analysis conducted by the U.S. Army Corps of Engineers for the Central Valley Region (ACOE 2002) also does not have the Project site mapped. However, the only potential structures that could be within a 100-foot flood hazard area would be road crossings requiring culverts or bridges. The other Project buildings or facilities (i.e., wind turbines) would be located on higher areas within the Project site and are expected to be out of a flood hazard area. Should these crossings be required, and should a significant flood occur and result in their damage, it is not anticipated that flood flows would be impeded or redirected. Therefore, the impact of the Project with respect to impedance or redirection of flood flows would be less than significant.

d. In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?

The Project site is not located in a flood zone prone to seiches or tsunamis. There would be no impact associated with seiche or tsunami events.

e. ***Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?***

Project construction/operation activities would maintain regional water quality standards and discharge requirements, as defined in the Central Valley Regional Water Quality Control Board Basin Plan (Central Valley RWQCB 2018) and the Construction General Permit (SWRCB Order No. 2009-0009-DWQ, as amended), and would import the majority, if not all, water for construction and operation, ensuring the Project meets Pacheco State Park Resource Management Goals WQ1 through WQ3 (California State Parks 2006). The potential use of existing groundwater resources beneath the Project site would be coordinated with CDPR to verify sustainable use and compliance with the Park's Resource Management Goals, and to the extent any groundwater used by the Project comes from a groundwater basin subject to the Sustainable Groundwater Management Act, the use would only be done in coordination with the applicable groundwater sustainability agency. The Project's potential conflict or obstruction of local/regional water quality control plans or sustainable groundwater management plans is considered less than significant.

Sources

Dudek. Hydrology and Water Quality Technical Report for the Gonzaga Ridge Wind Repowering Project, Merced County, California. Dudek. October 2018.

CVRWQCB (Central Valley Regional Water Quality Control Board). 2010. Central Valley

Pacheco State Park General Plan and Environmental Impact Report. May 2006. Sacramento, California.

Regional Water Quality Control Board Region 5.

3.11 LAND USE AND PLANNING

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
XI. LAND USE AND PLANNING – Would the project:				
a) Physically divide an established community?	☐	☐	☐	☒
b) Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☒

3.11.1 Environmental Setting

The proposed Project site is located in Pacheco State Park, which straddles the Merced and Santa Clara County lines in California. The Project site would be located within the eastern portion of the Park in Merced County, California. The Park is located on SR-152, that connects two major north-south arteries—Interstate 5 (I-5), which is 16 miles to the east, and U.S. Highway 101 (US 101), which is approximately 30 miles to the west. The New Transmission Line would be located on land owned by the BOR, Merced County and on private land between the Park and the Los Banos substation in Merced County. Adjacent ranches include a small number of both permanent residences and periodically used dwellings. The portion of the Park within the Project site is currently home to 162 remaining wind turbines.

3.11.2 Discussion

Would the proposed project:

a. Physically divide an established community?

The Project site is located within an existing state park that does not include an established community. Therefore, no impact would occur.

b. Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?

As explained in Section 3.11.1, Environmental Setting, no local agencies have jurisdiction over the Project because it is located on land owned by the state, with the exception of the New Transmission Line. Further, there are no federal or state plans, regulations, or land use policies with which the Project could conflict. The Project is consistent with the goals and policies contained in the Pacheco State Park General Plan. Installation of the New Transmission Line would occur primarily within BOR's right-of-way with only a small portion on county and private lands and would be entirely overhead. GRWF would obtain all the necessary permits for portions of the New Transmission Line within land under Merced County's jurisdiction. As the proposed Project would occur primarily within land owned by either the state or the federal government, and GRWF would obtain any required permits for areas on private lands, the Project would not conflict with local land use plans or policies and no impact would occur.

Sources

PG&E (Pacific Gas & Electric Company). 2006. Final PG&E San Joaquin Valley Operation and Maintenance Habitat Conservation Plan. December 2006.

Pacheco State Park General Plan and Environmental Impact Report. May 2006. Sacramento, California.

3.12 MINERAL RESOURCES

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
XII. MINERAL RESOURCES – Would the project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?	☐	☐	☐	☒

3.12.1 Environmental Setting

The Project site where the wind turbines would be located is within the boundaries of Pacheco State Park. The New Transmission Line corridor would be located on lands owned by the BOR, county and private landowners. The Project Area is located within the boundaries of Merced County; however, the state and the federal government are not subject to local planning ordinances or requirements. Within the County mineral resources are limited to primarily sand and gravel mining operations. Typically, sand and gravel aggregate mines are located near major rivers and creeks. The Project Area is not located near any major rivers or creeks and is not identified on the County's aggregate resources map as having a high likelihood of providing sand and gravel resources. This area is not identified as including any known locally-important mineral resources.

3.12.2 Discussion

Would the proposed project:

a. Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?

b. Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?

a,b) Based on a review of Merced County's mineral resource data the Project Area is not identified as having a high likelihood of known mineral resources (Merced County 2013). Replacement of the existing wind turbines with fewer turbines and ancillary facilities would not, in and of itself, result in the loss of availability of a known mineral resource or result in the loss of a locally-important mineral resource recovery site as identified in a local planning document. Because there are no known mineral resources either on or in the vicinity of the Project Area, there would be no impact associated with Project implementation.

Sources

Merced County. 2030 Merced County General Plan Background Report. December 2013.

3.13 NOISE

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
XIII. NOISE – Would the project result in:				
a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☒	☐
b) Generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☒	☐
c) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒

3.13.1 Environmental Setting

A Noise Impact Study (Noise Study) was prepared for the Project and is included in Appendix E. Information to prepare this section is based on the Noise Study.

Fundamentals of Noise

A brief background on the fundamentals of environmental acoustics is helpful in understanding how humans perceive sound levels. Decibels (dB) are a common unit to measure sound calculated on a logarithmic scale; thus, a 10 dB increase represents a 10-fold increase in acoustic energy, while a 20 dB increase represents a 100-fold increase. The A-weighted decibel system (with units of dBA) is a convenient sound measurement metric that adjusts frequencies based on the human ear's responsiveness. Noise is defined as sound that is loud, unpleasant, unexpected, or undesired.

It is generally accepted that the average healthy ear can barely perceive a noise level change of 3 dB. A change of 5 dB is usually readily perceptible, and a change of 10 dB is perceived as twice or half as loud. A doubling of sound energy results in a 3 dB increase in sound, which means that a doubling of sound energy (e.g., doubling the average daily number of traffic trips on a road) would result in a barely perceptible change in sound level.

Ambient environmental noise levels can be characterized by several different descriptors. Energy Equivalent Level (L_{eq}) describes the average or mean noise level over a specified period of time. L_{eq} provides a useful measure of the impact of fluctuating noise levels on sensitive receptors and is the most common noise metric. Other descriptors of longer-term noise incorporate a weighting system that accounts for human's susceptibility to noise irritations at night. Community Noise Equivalent Level (CNEL) is a measure of cumulative noise exposure over a 24-hour period, with a 5 dB penalty added to evening hours (7:00 p.m. to 10:00 p.m.) and a 10 dB penalty added to night hours (10:00 p.m. to 7:00 a.m.). Since CNEL is a 24-hour average noise level, an area could have sporadic loud noise levels above 65 dB(A) which average lower over the 24-hour period. The L_{dn} or Day-Night Level is a similar metric addressing long term noise over a 24-hour period with the same 10 dB penalty during nighttime, but without the penalty during the evening hours.

Groundborne Vibration Fundamentals

Groundborne vibration is a small, rapidly fluctuating motion transmitted through the ground. The strength of groundborne vibration attenuates rapidly over distance. Some soil types transmit vibration quite efficiently; other types (primarily sandy soils) do not. Several basic measurement units are commonly used to describe the intensity of ground vibration. The descriptors used by the Federal Transit Administration (FTA 2006) are peak particle velocity (PPV), in units of inches per second, and velocity decibel (VdB). The average person can just barely perceive vibration velocity levels below 70 VdB (typically in the vertical direction). Typical background vibration levels are between 50 and 60 VdB, and the level for minor cosmetic damage to fragile buildings or blasting generally begins at 100 VdB.

Existing Noise Guidelines

No federal or state laws, regulations, or policies for construction-related noise and vibration apply to the Project. Guidance regarding the determination of a substantial permanent increase in ambient noise levels in the Project vicinity above existing levels is provided by the Federal Highway Administration (FHWA) and California Department of Transportation (Caltrans). In California, Caltrans defines a substantial noise increase as 12 dBA or more (Caltrans 2011). Because the Project is located in California, the threshold of 12 dBA or more is used to define a substantial increase.

Guidance from Caltrans was used in this analysis for permanent substantial noise increase thresholds. Similarly, for temporary noise from construction, the Caltrans Standard Specification Section 14-8.02 (Noise Control) was used. Section 14-8.02 (Noise Control) requires that construction activity not exceed 86 dBA maximum sound level recorded during the measurement interval (L_{max}) at 50 feet from job site activities from 9:00 p.m. to 6:00 a.m. and that internal combustion engines be equipped with manufacturer-recommended mufflers (Caltrans 2011).

Also, groundborne vibration information related to construction activities has been collected by Caltrans (2013) and indicates that transient vibrations (such as construction activity) with a peak particle velocity (PPV) of approximately 0.035 inches per second may be characterized as barely perceptible, and vibration levels of 0.24 inches per second may be characterized as distinctly perceptible. The threshold of 0.24 inches per second (distinctly perceptible) is used for this Project as the significance threshold for the exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels.

Existing Noise Conditions

Dudek visited the Project site on September 26 and September 28, 2018, to measure ambient sound levels in the Project vicinity. None of the existing wind turbines were operating during the sound measurements. Tables 2 and 3 in Appendix E provide the short-term and long-term noise levels. Based on the ambient noise levels measured at the site, the existing noise levels range from an average of 54 to 56 L_{dn} over a 24-hour period.

Table 4 in Appendix E provides the hourly modeled noise levels including the existing wind turbines at various receivers. The noise levels range from approximately 33 dB(A) at the boat launch area to 43 dB(A) L_{eq} at a structure along Dinosaur Point Road (no a residence). Traffic noise from SR-152 was also included in the noise model.

3.13.2 Discussion

Would the proposed project:

a. Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Construction

Project work includes decommissioning and removing the existing wind turbines and infrastructure on the site. Phase I includes the decommissioning and removal of approximately 47 existing turbines, while the decommissioning and removal of the remaining 115 turbines would occur after construction of Phase I is complete and prior to commencing construction of Phase II. Construction noise (including demolition of the existing infrastructure) is a temporary phenomenon and it is assumed that construction activities beginning with the decommissioning activities would occur over a period of approximately 12 months. The activities associated with decommissioning of the existing turbines would be similar to construction of the new turbines in terms of the equipment used and activities conducted; thus, potential decommission noise impacts are addressed here along with possible construction noise impacts.

The Project site is located in a largely rural and undeveloped area with the closest sensitive receptor (residence) located approximately 1,604 feet south of the site boundary.

Construction noise levels would vary from hour to hour and day to day, depending on the equipment in use, the operations being performed, and the distance between the source and receptor. Construction equipment with substantially higher noise-generation characteristics (such as rock drills) and/or excavators with hydraulic hammers may be necessary during existing turbine decommissioning.

Construction noise is difficult to quantify because of the many variables involved, including the specific equipment types, size of equipment used, percentage of time in use, condition of each piece of equipment, and number of pieces of equipment that will actually operate on site. The construction vehicle assemblage would include standard equipment such as cranes, excavators, man lifts, graders, rollers, dozers, trackers, and miscellaneous trucks.

The typical operating cycles for construction equipment involve one or two minutes of full power operation followed by 3 or 4 minutes at lower power settings. Noise from construction equipment generally exhibits point source acoustical characteristics. A point source sound is attenuated (is reduced) at a rate of 6 dB per doubling of distance from the source for “hard site” conditions and at 7.5 dB per doubling of distance for “soft site” conditions. A hard site is characterized by ground surface covered by pavement, or hard compacted soils; a soft site is characterized by ground covered with vegetation, or loose soil with a rough surface (such as tilled land). These rules apply to the propagation of sound waves with no obstacles between source and receivers, such as topography (ridges or berms) or structures.

The noise modeling conducted for the Project shows that turbine construction and decommissioning activities would take place relatively close to the nearest residence or “sensitive receiver” (approximately 1,604 feet away), and modeled noise levels would range from approximately 44 to 61 dBA L_{eq} (see Appendix E). Typical turbine decommissioning and construction-related noise levels are anticipated to range from approximately 40 to 57 dBA L_{eq} at other residential properties located over 2,300 feet from the northwest boundary of the Project site.

Periodically throughout the construction workday, it is assumed temporary noise from turbine construction would be above the ambient existing noise level in the Project vicinity. However, noise from construction activities would typically be below the ambient noise levels in the area. It is assumed construction activities would occur during the daylight hours of 6:00 a.m. to 6:00 p.m., for approximately 12 hours over the weekdays and Saturdays (Monday through Saturday), with some possible work on Sundays, if needed due to the construction schedule. While construction activities would temporarily increase daytime noise levels, the expected increases would only be temporary and intermittent. As a point of reference, the Merced County Code allows for noise levels to be "temporarily elevated" during construction. The County Code addresses construction in or adjacent to urban areas, by limiting construction hours to the daytime hours between 7 a.m. and 6 p.m. The state is not required to comply with local requirements. With the allowance for temporarily elevated noise levels, the construction noise from the Project is considered less than significant.

In addition to the on-site construction noise, there would be intermittent truck deliveries occurring throughout the workday on offsite access roads (Dinosaur Point Road), delivering turbine components and other materials. This temporary off-site noise would not constitute a significant noise impact, though it may be intermittently audible at the nearest residences, located approximately 150 feet or more from Dinosaur Point Road.

If blasting to construct turbine bases is required, noise would be of a short duration and occur infrequently. While blasting noise may be audible at vicinity residences, the short duration of the event(s) fall within the allowed "temporarily elevated noise" that is mentioned in the County Code. Although the state is not required to comply with local requirements as a point of reference noise from temporary construction is typically exempt. Thus, noise impacts from potential blasting operations are considered less than significant.

Decommissioning and construction noise are the only temporary noise impacts associated with the Project. Noise from Project construction and decommissioning would range from less than the measured ambient noise level in the Project Area to about 61 dBA at the nearest residences during the construction phase with the highest expected noise levels. Construction noise could at times be clearly perceptible at the nearest noise-sensitive receivers, particularly during the relatively brief periods in which intense construction work takes place. However, given the variable levels of noise during construction and because construction would occur only during daytime hours, the increase in noise during the construction period is not considered to be "substantial." Therefore, short-term construction impacts associated with a substantial temporary or periodic increase in ambient noise levels in the Project vicinity would be less than significant.

Operation

Noise associated with the wind turbines was also modeled during operation. Noise sources associated with power transmission include occasional breaker operation in the switchyard, and corona noise, which is a very low hum from the conductors.

Existing turbine noise levels as modeled are compared with the proposed turbine noise levels as modeled, as well as with the most stringent regulation. Although the State is not required to comply with local regulations a review of the County's noise regulations was conducted in the absence of any state noise guidelines. Predicted noise levels produced by the proposed wind turbines would range from 52 dBA L_{dn} at receiver M7 (residence to the south) to approximately 37 dBA L_{dn} at receiver M5 (residence to the west). The Merced County Code 65 dB L_{dn} standard for residential property would not be exceeded at any of the modeled receiver locations during Project operation. In addition, noise sources associated with the New Transmission Line include occasional breaker operation in the switchyard, and corona noise and very low magnetostriction[4] hum from the conductors. Breaker noise is considered impulsive in nature, lasting a very short duration and may occur only a very few times per year. Corona noise is characterized as a buzz or hum and is usually worse when the conductors are wet, such as in rain or fog.

Noise produced by a conductor decreases at a rate of three decibels per doubling of distance from the source. The EPRI Transmission Line Reference Book indicates that the audible noise from a typical 230 kV line with two conductors per phase would likely be less than 40 dBA at a distance of 40 feet from the outside conductor at ground level. The sound levels produced from the New Transmission Line would be lower than a 230 kV transmission line (less than 40 dBA at a distance of 40 feet). Due to the distance to the closest sensitive receptors, long-term operational impacts associated with the exposure of persons to or generation of noise levels in excess of local standards would be less than significant.

b. Generation of excessive groundborne vibration or groundborne noise levels?

The Project is not anticipated to include equipment or activities capable of producing substantial long-term groundborne vibration or groundborne noise levels. The only ground vibration potential would be associated with the short-term decommissioning and construction phases of the Project.

4 Transformer noise is caused by a phenomenon which causes a piece of magnetic sheet steel to extend itself when magnetized. When the magnetization is taken away, it goes back to its original condition. This phenomenon is scientifically referred to as magnetostriction.

Groundborne vibration from construction (and by extension, decommissioning) activities is typically attenuated over short distances. Blasting (if required) has the potential to produce high levels of groundborne vibration, but details of blasting locations are not available at this time. As described in the Project description, a Blasting Plan would be prepared if the need for blasting arises. The Blasting Plan should include consideration and analysis of potential groundborne vibration based on the specific details in the plan.

Blasting for construction projects typically results in a Root Mean Square Amplitude (RMS) vibration velocity of about 100 VdB at 50 feet from the source (DOT 2005). As discussed above in issue (a) above, the shortest distance between an existing residence and where the blasting activity was assumed to occur within 1,604 feet from the nearest existing residence. Given attenuation of vibration velocities with distance, the vibration level at the nearest existing residence would be about 46 VdB. This vibration level from blasting is less than typical background vibration levels and less than typical perceptible levels for people. Based on the expected blasting vibration level at the nearest residential receiver, the blasting impact is expected to be less than significant.

The heavier pieces of construction equipment used on site could include cranes, excavators, bulldozers, graders, loaded trucks, and rollers. Based on published vibration data, the anticipated construction equipment would generate a vibration level of approximately 94 VdB (reference of 1 micro-inch per second) at a distance of 25 feet from the source (DOT 2006). The closest existing residences are approximately 1,604 feet from the Project boundary. At this distance and with the anticipated construction equipment, the RMS vibration levels would be less than 40 VdB. For access road improvements work, heavy equipment such as graders would be used, which would generate a maximum RMS vibration level of approximately 87 VdB (reference of 1 micro-inch per second) at a distance of 25 feet from the source (DOT 2006). These levels would be far less than the recommended threshold of 70 VdB for human response within residential structures (DOT 2006). Thus, vibration from construction equipment would be less than significant at noise-sensitive land uses.

c. For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

The Project site is not located within an airport land use plan and the closest public airport or private airstrip to the Project site is the Los Banos Municipal airport; located approximately 8.5 miles east of the Los Banos Substation and 16.5 miles from the State Park. The Project would not expose people residing or working in the area to excessive airport noise levels. Therefore, impacts associated with public airport noise would be less than significant.

The Project site is not within the vicinity of a private airstrip (Airnav.com 2018; Google Earth 2018). Therefore, no impacts associated with private airstrip noise would occur.

Sources

Caltrans. 2013. Technical Noise Supplement to the Traffic Noise Analysis Protocol: A Guide for Measuring, Modeling, and Abating Highway Operation and Construction Noise Impacts. September 2013. Accessed October 2018. http://www.dot.ca.gov/hq/env/noise/pub/TeNS_Sept_2013B.pdf.

Caltrans (California Department of Transportation). 2011. Traffic Noise Analysis Protocol for New Highway Construction, Reconstruction, and Retrofit Barrier Projects. May 2011. Accessed October 2018.

Dudek. 2018. Noise Impact Study for the Gonzaga Wind Energy Repowering Project. November 2018.

FHWA. 2010. 23 CFR Part 772: Procedures for Abatement of Highway Traffic Noise and Construction Noise – Final Rule. Federal Register, Vol. 75, Number 133. July 13, 2010.

3.14 POPULATION AND HOUSING

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
XIV. POPULATION AND HOUSING – Would the project:				
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☒	☐	☐	☐
b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

3.14.1 Environmental Setting

There are no housing or residences located within the boundaries of the Project site or Project Area.

3.14.2 Discussion

Would the proposed project:

a. Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?

The Project includes replacing existing outdated wind turbines with new, larger turbines that would have the capability of producing up to 100 MW of electricity along with ancillary infrastructure. Project construction would require up to 200 temporary construction workers during the approximately 12-month construction period. It is anticipated these construction workers would either live nearby or temporarily relocate to areas near the Project site. It is not anticipated that the construction workers would induce substantial population growth due to the transient nature of many of these specialized construction workers. Because at this time it is not known where the electricity generated by the Project would be used, any link between the Project and supporting unplanned growth throughout the state would be speculative. It is anticipated the Project would help facilitate planned growth, but would not induce unplanned growth throughout the state.

b. Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?

Construction of the Project would not displace any existing housing units or people because there are no housing units or residents that live on the site. The twelve-month construction period would employ up to approximately 200 workers, and future onsite operation and maintenance activities would employ up to approximately eight people. The Project would not displace existing housing or residences requiring the construction of replacement housing elsewhere in the county. Thus, no impacts to existing housing or population would occur.

3.15 PUBLIC SERVICES

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
XV. PUBLIC SERVICES				
a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services:				
Fire protection?	☐	☐	☐	☒
Police protection?	☐	☐	☐	☒
Schools?	☐	☐	☐	☒
Parks?	☐	☐	☐	☒
Other public facilities?	☐	☐	☐	☒

3.15.1 Environmental Setting

There are no permanent residences or employment uses located within this area of the Park that require public services. Water to service an existing trailer that provides office space for maintenance employees is provided via an on-site well. Wastewater is currently provided by a portable restroom. No water or sewer infrastructure, including a septic system is currently provided on the site.

3.15.2 Discussion

Would the proposed project:

a. Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:

i. Fire protection?

ii. Police protection?

iii. Schools?

iv. Parks?

v. Other public facilities?

The proposed Project would not increase the need for public services, including law enforcement, fire protection, school capacity, parks, or other public facilities (i.e., libraries), because it does not generate an increase in population resulting in an increase in demand for public services or new commercial/employment uses which may also result in an increase in demand for police and fire protection services. The Project includes replacing 162 remaining wind turbines located on land in Pacheco State Park with up to 40 new turbines and associated ancillary facilities. Once completed the Project would require up to approximately eight employees to operate and manage the wind farm, but the new employees would not be considered a significant increase in permanent jobs or population requiring public services from the County. Therefore, impacts to public services which could result in physical impacts would not occur and there would be no impact.

3.16 RECREATION

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
XVI. RECREATION				
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☒
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	☒	☐

3.16.1 Environmental Setting

The majority of the Project site, located within the eastern portion of the 6,890-acre Pacheco State Park, is not open to the public. Only the 2,600 acres in the western portion of the Park are open to the public. Within this area there are 28 miles of trails for hiking and mountain biking, although the Park does not provide facilities for camping and there is no potable water available. There is a small area in the western portion of the Project site where the Project boundary overlaps with Dinosaur Lake Trail. This is the only public access trail in the immediate vicinity of the Project site.

The San Luis Reservoir SRA is located just to the east of the Park. The San Luis Reservoir SRA includes hiking and equestrian trails, mountain biking, fishing and boating, swimming, camping, restrooms and a visitor center. There are four developed campgrounds that provide RV hookups and tent camping and are open year round.

3.16.2 Discussion

Would the proposed project:

a. Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?

b. Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?

a,b) The proposed Project would not significantly increase the use of recreational facilities because it would not result in an increase in a permanent population (see Section 3.16, Population and Housing) or a significant number of new jobs. The majority of the Project Site is located within a restricted area of Pacheco State Park on land currently developed with a wind farm. The Project proposes to remove the existing wind turbines and install up to 40 new wind turbines and associated ancillary facilities and does not propose any uses that would increase the demand for recreational facilities and directly result in the construction or expansion of such facilities. The Project does not include a new residential population that could increase the demand for neighborhood or regional parks and the addition of up to 8 employees would not contribute to a substantial physical deterioration of existing recreational facilities. Thus, there would be no impact.

New wind turbines are currently proposed on a ridgeline where Dinosaur Lake Trail is currently located. Because the wind turbines would impact the trail the GRWF is proposing to work with CDPR to relocate the portion of the trail adjacent to the western boundary of the Project site further west. The trail would be designed consistent with the existing trail which is a narrow, single track, dirt trail that is not ADA accessible. CDPR has not designed the new trail yet, but it is anticipated the new trail would be constructed using small equipment and hand tools due to the terrain and to minimize potential impacts (i.e., tree removal). It is anticipated construction-related impacts would be minimal and less than significant and would not result in adverse physical effects on the environment.

3.17 TRANSPORTATION

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
XVII. TRANSPORTATION/TRAFFIC – Would the project:				
a) Conflict with a program, plan, ordinance or policy addressing the circulation system, including roadway, pedestrian, and bicycle facilities?	☒	☐	☐	☐
b) Conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?	☐	☐	☒	☐
c) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☒	☐	☐	☐
d) Result in inadequate emergency access?	☐	☐	☒	☐

3.17.1 Environmental Setting

A Traffic Impact Assessment (TIA) was prepared for the Project and is included in Appendix F. The analysis evaluated the existing conditions of the study area, and analyzed temporary construction impacts associated with the Project. Once in operation the Project would generate only nominal traffic related to occasional on-site maintenance and trips associated with up to approximately eight employees. Therefore, the analysis focuses primarily on construction-related traffic and activities. Information provided is based on the TIA prepared for the Project.

Study Area

The study area for the TIA is comprised of the following two intersections that would be potentially impacted by construction-related traffic generated from the proposed Project:

1. SR-152/Dinosaur Point Road – Fifield Road
2. SR-152/Old Pacheco Pass Road

The following streets are located within the study area. Brief descriptions of each street are provided below.

State Route 152 is a generally a four-lane, divided freeway that runs east-west within the study area, connecting to I-5 and the communities of Merced County in the east, to the communities of Santa Clara County in the west. While the freeway is divided with a landscape median, a turn pocket along Dinosaur Point Road – Fifield Road allows for left-turning movements and U-turns.

Dinosaur Point Road – Fifield Road is a two-lane, undivided road that runs north-south, and east-wind within the study area. Dinosaur Point Road connects to the interior of Pacheco State Park and provides a public parking lot and boating area for the San Luis Reservoir, while Fifield Road connects to the Upper Cottonwood Creek Wildlife Area.

Old Pacheco Pass Road is a two-lane, undivided road that runs east-west within the study area. Old Pacheco Pass Road is unpaved and serves as a connection to Dinosaur Point Road. The road provides a wide shoulder for SR-152.

Traffic Volumes

Existing peak hour counts at the study intersections were conducted in September 2018 during a typical non-holiday week. Due to the large amount of truck traffic existing along SR-152, existing volumes were adjusted to include a "heavy vehicle percentage" factor within the traffic model, Synchro. Use of the heavy vehicle percentage factor within Synchro more accurately estimates the operation of an intersection. There are a total of 38,000 daily vehicle trips on the portion of SR-152 near the Project site (see Figure 2 in Appendix F).

Intersection Operations

All of the study area intersections are currently operating at LOS C or better under existing conditions during both peak hours, with the exception of the intersection of SR-152/Dinosaur Point Road – Fifield Road which operates at LOS E (35.1 seconds) in the AM peak hour. The northbound left consisting of 4 vehicles is the resulting delay. All other movements are LOS C or better.

Trip Generation

Trip generation estimates for the construction phase of the Project were calculated based on the peak phase of construction and delivery of wind turbine equipment. Construction traffic includes the number of workers, and the amount of delivery and on-site truck traffic that would be generated to and from the Project site during a 24-hour period (daily), and the AM and PM peak commute hours. It is assumed construction activities would occur during the daylight hours of 6:00 a.m. to 6:00 p.m., for approximately 12 hours over the weekdays and Saturdays (Monday through Saturday), with some possible work on Sundays, if needed due to the construction schedule. The peak construction phase would occur in late spring, and since construction is contingent upon daylight hours, shifts would be shortened for other phases occurring during winter.

For the purposes of this analysis, approximately 200 workers and 8 vendor trucks would access the site during the AM and PM peak hours. The length of the wind turbine components necessitates oversized haul trucks that are longer than average and contain more axles, and as a result, would require coordination with Caltrans for encroachment permits (for oversized vehicles traveling on State highways). Coordination with the California Highway Patrol (CHP) may also be necessary to ensure oversized haul trucks have safe access to/from the site. Due to the irregular size and safety requirements associated with hauling these materials, it is assumed the specialized oversized haul trucks would not deliver equipment during the AM or PM peak hours.

Trip generation for project operation includes 8 full-time employees that would work between the hours of 8:00 a.m. to 5:00 p.m., for approximately 9 hours over the weekdays (Monday through Friday). Approximately eight employees would arrive to the site during the AM and PM peak hours.

3.17.2 Discussion

Would the proposed project:

a. Conflict with a program, plan, ordinance or policy addressing the circulation system, including roadway, pedestrian, and bicycle facilities?

Construction

During the peak construction phase of the Project, the TIA estimated a total of 456 daily trips would be generated, 22 AM peak hour trips (21 inbound and 1 outbound), and 22 PM peak hour trips (1 inbound and 21 outbound). It should also be noted that due to the irregular size and safety requirements associated with hauling these materials, the specialized oversized haul trucks would not deliver equipment during the AM or PM peak hours.

It is assumed all construction-related Project truck traffic would originate from I-5 to the east due to close proximity of services and housing for construction workers, and enter the Project site via SR-152 westbound, and exit via SR-152 eastbound. Trucks would use I-5 as a major regional connector. Construction workers are assumed to be drawn from areas to the east (Central Valley) and west (Bay Area). Impacts of large delivery trucks accessing SR-152 and other local roadways are considered potentially significant and will be further addressed in the EIR.

Operation

Project operation would generate daily trips for the employees of the Project that would access the site at the intersection of SR-152/Dinosaur Point Road – Fifield Road. This intersection currently operates at LOS E (35.8) in the AM peak hour, and degrades from LOS C (24.4) to operate at LOS F (>300) in the PM peak hour.

Since LOS E is maintained there is no significant impact in the AM peak hour. However, during the PM peak hour degrades from LOS C to LOS F. This movement constitutes a small proportion of the total intersection volume (less than 0.2%), would not meet the Caltrans signal warrant criteria (due to minor approaches being substantially less than the 100 required), and is an assumption based upon an equal distribution between east and west residing employees. However, due to the HCM 2010 methodology requirements for two-way stop control analysis, this must be evaluated as the worst movement. This is considered a potentially significant impact that will be further addressed in the EIR.

b. Conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?

This section of the CEQA Guidelines was added in late 2018 to address the change from evaluating traffic impacts using level of service (LOS) to vehicle miles traveled (VMT). Because jurisdictions have until July 1, 2020 to adopt VMT thresholds compliance with this checklist item is still evolving. The Project's VMT is very low because only eight employees would be required to run and manage the facility. Although this impact would be less than significant, the Project's VMT is further addressed in the EIR.

c. Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

The Project site is located within Pacheco State Park in a rural area of Merced County. The Project includes improving and in some cases, constructing, new roads on-site to provide access to both remove the existing wind turbine infrastructure and to install the new wind turbine facilities and infrastructure. The delivery trucks required to transport the turbine components are oversized and may present hazards to vehicles on SR-152 and local roads. This is considered a potentially significant impact and will be further addressed in the EIR.

d. Result in inadequate emergency access?

The Project site is accessible via an unimproved road that provides access to the wind turbines and ancillary facilities. During Project operation there would be a total of up to approximately eight employees working on the site. In the event of an emergency access would be available for anyone on the site to safely exit via the existing unimproved road. The Project would not result in inadequate emergency access and the impact is less than significant.

Sources:

Dudek. Technical Memorandum prepared for the Gonzaga Ridge Wind Repowering Project - Construction Traffic Assessment. Dudek. October 29, 2018.

3.18 TRIBAL CULTURAL RESOURCES

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
XVIII. TRIBAL CULTURAL RESOURCES				
Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:				
a) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or	☐	☒	☐	☐
b) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe?	☐	☒	☐	☐

3.18.1 Environmental Setting

Information presented in this section was gathered, in part, from the Cultural Resources Inventory Report (see Appendix B) prepared for the Project.

The Project site is located near the latitudinal center of California, within Merced County, and is bordered by SR-152 to the north. The Project site primarily consists of undeveloped California annual grasslands and was historically used as a cattle ranch before its conversion to a wind farm in 1988. Nearby uses include private ranches that include a small number of both permanent residences and periodically used dwellings. The topography of the site is characterized by an overall slope to the south-southeast with hilly terrain and mountains. The Project site is undeveloped with the exception of 162 remaining wind turbines installed between 1988 and 2002, temporary meteorological towers and a trailer and maintenance building in the northwestern portion of the site near the existing on-site substation. The New Transmission Line is primarily located on lands owned by the BOR within areas characterized by oak savannah, patches of scrub vegetation, and grassland in gentle to moderately sloped topography.

Records Search

A Cultural Resources Inventory Report for the Gonzaga Ridge Wind Repowering Project was prepared for the proposed Project by Dudek in November 2017 (see Appendix B). The Cultural Resources Report included a California Historical Resources Information System (CHRIS) records search for the Project site, which was conducted at the Central California Information Center (CCIC) on November 17, 2017, to determine if any recorded cultural resources have been identified on the Project site and surrounding 0.5-mile radius. Additional records searches for the New Transmission Line corridor extending from the Project site eastward on Bureau of Reclamation Lands, was completed by CCIC on April 24, 2018, November 15, 2018 and January 28, 2019. The records search involved a review of previously recorded cultural resources, previous cultural resources investigations and their limits within the Project Area, historic aerial photographs and maps, and official records and maps of previously recorded archaeological sites and surveys within Merced County. The CCIC records indicate that 10 cultural resources have been previously identified within the Project site. In addition, 43 cultural resources have been identified within 0.5-mile the Project site (see Appendix B).

Sacred Lands File Search

On November 17, 2017, an initial sacred lands file search request was sent to the Native American Heritage Commission (NAHC) along with a request for the Native American contact list for the Project site. This search request covered the area of the Project site within Pacheco State Park. On November 27, 2017, the NAHC responded to the initial sacred lands file search request with negative results. On April 23, 2018, a sacred lands file search request and request for the Native American contact list was made for the New Transmission Line portion of the Project Area. The NAHC responded that sacred sites were identified within the New Transmission Line area and recommended that the Table Mountain Rancheria of California be contacted directly for additional information about potential sacred sites and tribal cultural resources within the Project Area. Follow up coordination with NAHC-listed Native American tribes was completed by the lead agency through formal government-to-government consultation.

Assembly Bill 52 Consultation

AB 52 amended California Public Resources Code, Section 5097.94, and added California Public Resources Code, Sections 21073, 21074, 21080.3.1, 21080.3.2, 21082.3, 21083.09, 21084.2, and 21084.3. AB 52 established that tribal cultural resources (TCRs) must be considered under CEQA, and provided for additional Native American consultation requirements for the lead agency. Section 21074 describes a TCR as a site, feature, place, cultural landscape, sacred place, or object that is considered of cultural value to a California Native American Tribe. A TCR is either of the following:

- On the California Register of Historical Resources or a local historic register or eligible for the California Register of Historical Resources or a local historic register; or
- A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Section 5024.1.

AB 52 formalizes the lead agency–tribal consultation process, requiring the lead agency to initiate consultation with California Native American groups that are traditionally and culturally affiliated with a project, including tribes that may not be federally recognized. The proposed Project is subject to compliance with AB 52 (PRC 21074), which calls for consideration of impacts to TCRs as part of the CEQA process, and requires the lead agency to notify any NAHC-listed groups or representatives who previously requested notification of proposed projects within their traditional or culturally affiliated geographic area. Pursuant to Public Resources Code section 21080.3.1 subdivision (d), CDPR is required to consult with tribes that are traditionally and cultural affiliated with the geographic area of proposed projects. As CDPR is the lead CEQA agency, CDPR staff is undertaking tribal consultation. Associate State Archaeologist, Chris Kimsey, from the Northern Service Center in Sacramento is conducting tribal consultation at the request of the Central Valley District.

Tribal Consultation

On November 7, 2017, CDPR sent letters via certified mail to four Native American tribes that the NAHC identified as having traditional lands or cultural places that included the Project Area. Signed recipes were received from two individuals: Katherine Perez, Chairperson of the North Valley Yokuts Tribe, and Valentine Lobez, Chairperson of the Amah Mutsun Tribal Band. A receipt from the letter to Robert Ledger, Chairperson of the Dumna Wo-Wah Tribal Government, was received saying it was still in transit as of November 20, 2018. The letter sent to Bill Leonard, Chairperson of the Southern Sierra Miwuk Nation, was returned undelivered. CDPR followed up with phone calls to all four tribes on November 28, 2018. The Amah Mutsun Tribal Band was the only tribe that responded and requested Amah Mutsun tribal monitors be present for any ground disturbing activities within 300 feet of any waterways, caves, springs, or known archeological sites.

3.18.2 Discussion:

Would the proposed project:

a. ***Cause a substantial adverse change in the significance of a tribal cultural resources, defined in Public Resources Code section 21074 as either a site, feature, place cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is?***

i. ***Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k)?***

ii. ***A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1? In applying the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American Tribe.***

Based on a search of the NAHC Sacred Lands File no sacred sites were identified in or near the Project site (see Appendix B). To determine if the local tribes have any TCRs in the Project site, CDPR reached out to the four tribes identified by the NAHC as having traditional lands or cultural places within the area. None of the tribes indicated the presence of any known TCRs, as defined in Public Resources Code Section 21074, on the Project site or in its immediate vicinity. The CHRIS records search conducted for the Project site did not identify any previously recorded tribal cultural resources on the Project site.

Dudek contacted the NAHC to request a review of the SLF on November 17, 2017 for the Project site. The NAHC responded to Dudek's request on November 27, 2017, stating that the SLF search was conducted with "negative results." On April 23, 2018, a SLF search request and request for the Native American contact list was made for the New Transmission Line portion of the Project Area. The NAHC responded that sacred sites were identified within the New Transmission Line area and recommended that the Table Mountain Rancheria of California be contacted directly for additional information about potential sacred sites and tribal cultural resources within the Project Area.

On November 28, 2018, one tribe responded to the tribal consultation request letter sent by State Parks, the Amah Mutsun Tribal Band. Although the tribe did not identify any known TCRs that may be affected by the Project, the Amah Mutsun Tribal Band requested that Amah Mutsun tribal monitors be present for any ground disturbing activities within 300 feet of any waterways, caves, springs, or known archeological sites.

No other tribes have responded with a request for consultation or with information regarding TCRs affiliated with the Project site. However, there is the potential for subsurface unknown TCRs to be encountered during ground-disturbing activities still exists. As no known TCRs occur at the Project site or would be affected by the Project, there is the potential unknown resources could be unearthed, specifically in areas near water sources. Therefore, this is considered a potentially significant impact. Compliance with Mitigation Measure TCR-1 would ensure impacts would be reduced to less than significant.

Mitigation Measures

TCR-1 Implement and comply with Mitigation Measures CUL-1 and CUL-2.

Sources

Cultural Resources Inventory Report for the Gonzaga Ridge Wind Repowering Project. Dudek in November 2018.

3.19 UTILITIES AND SERVICE SYSTEMS

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
XIX. UTILITIES AND SERVICE SYSTEMS – Would the project:				
a) Require or result in the relocation or construction of new or expanded water, wastewater treatment, or stormwater drainage, electric power, natural gas, or telecommunications facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒
b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry, and multiple dry years?	☐	☐	☐	☒
c) Result in a determination by the wastewater treatment provider, which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	☒
d) Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	☐	☐	☐	☒
e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	☐	☐	☐	☒

3.19.1 Environmental Setting

Pacheco State Park currently provides very limited facilities for visitors. The Project site does not have water, wastewater or storm drain infrastructure and development is limited to trails and the existing wind farm. No potable water or restroom facilities are available. Within the Project site an existing trailer that provides office space for operations and maintenance receives water trucked into the site and a portable restroom provides waste water service.

Assembly Bill 75 passed in 1999, and the State Agency Model Integrated Waste Management Act, which took effect on January 1, 2000, mandated that state agencies develop and implement an integrated waste management plan. The act also mandated that community service districts providing solid waste services report disposal and diversion (i.e., recycling/reuse) information to the city, county, or regional agency in which the community service district is located. Provisions of the act require that all state agencies and large state facilities divert at least 50% of solid waste from landfills after 2004 and that each state agency and large facility submit an annual report to the California Department of Resources Recycling and Recovery (CalRecycle) summarizing its yearly progress in implementing waste diversion programs.

3.19.2 Discussion

Would the proposed project:

a. Require or result in the relocation or construction of new or expanded water, wastewater treatment, or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?

c. Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?

a,c) The Project includes decommissioning the existing wind farm and installing new, state-of-the-art wind turbines along with ancillary infrastructure. The Project is located in rural Merced County within Pacheco State Park that does not include public infrastructure including water, wastewater or storm drain infrastructure. In addition, the Project does not include new housing or commercial uses that require wastewater and storm drainage facilities.

During Project construction portable restrooms and access to water would be provided to serve up to 200 construction workers. Once the Project is completed, there would be up to approximately eight full time employees to maintain and operate the facilities. The Operations and Maintenance (O&M) facility would provide restrooms serviced by an on-site septic system and potable water would be trucked to the site and stored in a water storage tank. No public utility infrastructure exists in the area and the Project would not require construction enabling connection to existing water, wastewater or storm drain facilities. Thus, the Project would result in no impact to wastewater treatment, storm water drainage, electricity, natural gas or telecommunications or capacity for wastewater treatment.

b. Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry, and multiple dry years?

Water would be required for Project construction activities and also during Project operation. During Project construction portable restrooms and access to an on-site water tank would be provided to serve up to 200 construction workers. The Project would require concrete for construction of the turbine foundations which would be provided by an off-site batch plant. According to a similar project that required construction of turbine foundations for up to 50 wind turbines, the batch plant was estimated to require 5,400 gallons of water per day and up to 500 cubic yards of concrete (ICF 2014). Since the proposed Project requires up to 40 turbine foundations it is estimated the water demand would be approximately 4,500 gallons per day, including water required to wash the trucks and other equipment. Construction and decommissioning would occur over two phases: Phase I, anticipated to last approximately 9 months, includes construction of up to nine turbines and associated infrastructure along with the decommissioning and removal of approximately 47 existing turbines, while Phase II would construct the remaining up to 31 turbines and other various Project components over approximately 12 months. The decommissioning and removal of the remaining 115 turbines would occur after construction of Phase I is complete and prior to commencing construction of Phase II.

d. Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?

e. Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?

d,e) The Project includes decommissioning 162 wind turbines that exist on the Project site. The decommissioning process includes draining all fluids from the nacelles[5] and removing the towers. The turbine components would be removed from the Project site, below grade infrastructure (e.g., cables, pipes, conduit or equipment) buried within two feet of the surface would be removed; infrastructure greater than two feet below grade would remain abandoned on-site, the concrete foundations would be demolished down at least one foot below grade and the remaining materials would be reused, recycled, sold for scrap, or disposed of at a landfill that accepts these types of materials (i.e., Billy Wright Landfill located in Los Banos). Installation of the turbines and other ancillary facilities would also generate construction debris, but given the type of project the amount of construction-related debris would be less than a typical development project. All forms of refuse and waste produced during construction would be collected and disposed of in an appropriately licensed facility or hauled to a commercial soil recycling facility. State regulations (i.e., Integrated Waste Management Act) require diversion of at least 50% of construction and demolition debris. This construction and demolition requirement would substantially reduce solid waste associated with the Project's decommissioning activities. The remaining construction material would be disposed of at a solid waste facility with available capacity.

[5] A nacelle is a cover housing that houses all of the generating components in a wind turbine, including the generator, gearbox, drive train, and brake assembly.

There would not be an issue with landfill capacity to accommodate construction and demolition debris from construction. The Billy Wright Landfill is located approximately 3.0 miles southeast of the Los Banos Substation at 17173 Billy Wright Road in Los Banos. The landfill has a maximum permitted throughput of 1,500 tons per day and a maximum permitted capacity of 14,800,000 cubic yards (CalRecycle 2018). Numerous attempts were made to contact the landfill to get updated capacity information, but were unsuccessful. It is anticipated there is adequate landfill capacity to accommodate disposal needs for the Project. If not, the waste hauler would take the materials to another landfill with remaining capacity.

All solid waste generated by the proposed project during and following construction would be handled in accordance with federal, state, and local statutes and regulations and hauled to an approved solid waste facility with permitted capacity to accept the waste materials. Implementation of the proposed Project would have no impact related to solid waste disposal.

Sources

CalRecycle (California Department of Resources Recycling and Recovery). 2018. “SWIS

ICF. Altamont Pass Wind Resource Area Repowering Draft Program Environmental Impact Report. State Clearinghouse number 2010082063. June 2014.

Facility Detail: Billy Wright Disposal Site.” Accessed October 2018. https://www2.calrecycle.ca.gov/swfacilities/Directory/24-AA-0002/.

We-energies. Developing and Constructing Wind Energy. No date.

3.20 WILDFIRE

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
XX. WILDFIRE – If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:				
a) Substantially impair an adopted emergency response plan or emergency evacuation plan?	☐	☐	☒	☐
b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	☐	☐	☒	☐
c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines, or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	☐	☐	☒	☐
d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	☐	☐	☒	☐

3.20.1 Environmental Setting

The Project site is characterized by elevated ridgelines, hillsides and high valley terrain to the northeast and east of Spikes Peak and within the eastern half of Pacheco State Park. Annual grassland dominates the majority of the Project site, with savanna, oak woodland, and riparian plant communities also occurring. Topography within the Project site primarily consists of steeply sloped grass-covered and moderate to dense clusters of oak trees on hillsides. The Project site is not irrigated. The New Transmission Line includes an approximately 16 mile alignment connecting to the Project site to the Los Banos Substation traversing along the south side of the San Luis Reservoir. The vegetation in this area includes oak savannah, patches of scrub vegetation, and grassland in gentle to moderately sloped topography.

According to the Fire Hazard Severity Zones in State Responsibility Areas (SRA) Map prepared by CalFire for Merced County, the Project site is designated as having a high fire risk within a designated SRA (CalFire 2007).

3.20.2 Discussion

Would the proposed project:

a. Substantially impair an adopted emergency response plan or emergency evacuation plan?

The Project site is located within a State Park with limited facilities, including an adopted emergency response plan or emergency evacuation plan. During Project operation there would be a total of up to approximately eight employees working on the site. In the event of an emergency access would be available for anyone on the site to safely exit via Windmill Road, Dinosaur Point Road to SR-152. The Project would not result in inadequate emergency access and the impact is less than significant.

b. Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?

The Project site includes slopes associated with elevated ridgelines, hillsides and high valley terrain. There have been small brush fires over the years both on the Project site and in the Project vicinity. However, the Project is not proposing any uses or activities that would contribute to the potential for wildfires to occur. There are no permanent residences or employment uses located within this area of the Park and the Project does not include any uses that would house a new population or employ a large number of people that could be subjected to substantial pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire. During Project operation up to eight employees would be employed by the Project, Monday through Friday. Because the Project does not include permanent residents it would not expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire, this is considered a less-than-significant impact.

c. Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines, or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?

The Project would install up to 40 modern wind turbines and ancillary facilities, such as access roads, overhead transmission lines and poles, underground and overhead collector lines and associated equipment, an O&M facility, meteorological or MET tower(s), relocation of a communications tower, New Transmission Line, relocation of existing transmission line poles, upgrades to the existing switchyard, upgrades to the Los Banos Substation, storage sheds, battery storage facility, and an electrical substation and associated substation components. Project construction and operation would comply with applicable federal and state requirements as it pertains to the use, transport and storage of any household hazardous materials to reduce any fire risks. In addition, GRWF would prepare and implement a components would not exacerbate fire risks in the area. The Project would include routine maintenance activities to ensure that Project components are operating properly and do not pose a hazard, including overhead transmission lines. Furthermore, the Project would develop and implement a Fire Protection Plan (FPP) prior to construction and operation. The FPP would include emergency response and evacuation procedures that would include immediate reporting notification to local fire agencies. Employees would also be equipped with fire suppression equipment, radio and cellular access, and pertinent telephone numbers for reporting a fire. The Project does not include installation or maintenance of infrastructure that could be considered uses that could exacerbate fire risk in the Project site or larger Project Area, and impacts would be less than significant.

d. Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?

The Project site is located in a rural area of Merced County with limited development. According to the Fire Hazard Severity Zones in State Responsibility Areas prepared by CalFire for Merced County, the Project site is designated as having a high fire risk (CalFire 2007). There have been small brush fires over the years both on the Project site and in the project vicinity. However, the Project does not include any uses that would house a new population or employ a large number of people that could be subjected to risks involving wildland fires and associated hazards including downslope or downstream flooding and landslides as a result of fire. Because the Project would not expose people or structures to significant risks involving wildfires this is considered a less-than-significant impact.

Sources

CalFire. Fire Hazard Severity Zones in State Responsibility Area (SRA). Adopted by CalFire November 7, 2007.

3.21 MANDATORY FINDINGS OF SIGNIFICANCE

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
XIX. MANDATORY FINDINGS OF SIGNIFICANCE				
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☒	☐	☐	☐
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	☒	☐	☐	☐
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☐	☒

3.21.1 Discussion

Would the proposed project:

a. ***Have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?***

As discussed in section 3.4, Biological Resources, the Project has the potential to impact protected biological resources which could substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, and substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important. These issues are considered potentially significant and will be further evaluated in the EIR.

To ensure the Project would not eliminate important examples of major periods of California history or prehistory mitigation has been provided to ensure the protection of any unknown subsurface prehistoric or historic resources unearthed during construction activities, as discussed in section 3.5, Cultural Resources. Impacts to cultural resources are considered less than significant.

b. Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means the incremental effects of a project are considerable when viewed in connection with the efforts of past projects, the effects of other current projects, and the effects of probable future projects)?

The Project's cumulative impacts have been evaluated in this Initial Study checklist and based on the analysis there would be no potential cumulative impacts with the exception of Biological Resources. The Project's potential to result in impacts to protected species or their habitat that could be cumulatively considerable is considered a potentially significant impact that will be further evaluated in the EIR.

c. Have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?

As discussed in Chapter 2, Project Description, the Project includes replacing an existing wind farm with fewer wind turbines and other ancillary infrastructure. None of these uses or activities would affect individuals, in part because this area of Pacheco State Park is closed to the public. The Project would have no impact and/or adverse effects on human beings.

CHAPTER 4 REPORT PREPARATION

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APPENDIX A

Air Quality and GHG Report

Air Quality and Greenhouse Gas Emissions Analysis Technical Report for the Gonzaga Ridge Wind Repowering Project Merced County, California

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ACRONYMS AND ABBREVIATIONS

Acronym/Abbreviation	Definition
°C	degrees Celsius
°F	degrees Fahrenheit
μg	micrograms
AB	Assembly Bill
AAQA	Ambient Air Quality Analysis
ANFO	ammonium nitrate/fuel oil
Applicant	Gonzaga Ridge Wind Farm, LLC
ATCM	airborne toxic control measure
BAU	business as usual
BPS	best performance standard
CAAQS	California Ambient Air Quality Standards
CalEEMod	California Emissions Estimator Model
CALGreen	California Green Building Standards Code
CalRecycle	California Department of Resources Recycling and Recovery
CAPCOA	California Air Pollution Control Officers Association
CARB	California Air Resources Board
CCAP	Climate Change Action Plan
CEC	California Energy Commission
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CH_4	methane
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
County	County of Merced
CPUC	California Public Utilities Commission
DC	direct current
DPM	diesel particulate matter
EIR	environmental impact report
EO	Executive Order
EPA	U.S. Environmental Protection Agency
First Update	First Update to the Climate Change Scoping Plan: Building on the Framework
GHG	greenhouse gas
GWP	global warming potential
HAP	hazardous air pollutant
HCFC	hydrochlorofluorocarbon
HFC	hydrofluorocarbon
IPCC	Intergovernmental Panel on Climate Change
ISR	Indirect Source Review

Acronym/Abbreviation	Definition
kV	kilovolt
LCFS	Low Carbon Fuel Standard
lbs	pounds
LOS	level of service
m^3	cubic meter
MCAG	Merced County Association of Governments
MOU	Memorandum of Understanding
MPO	metropolitan planning organization
MT CO_2e	metric tons of carbon dioxide equivalent
MW	megawatt
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NF_3	nitrogen trifluoride
NHTSA	National Highway Traffic Safety Administration
NO_2	nitrogen dioxide
NO_x	oxides of nitrogen
O&M	operations and maintenance
O_3	ozone
Pb	lead
PFC	perfluorocarbon
PG&E	Pacific Gas and Electric
PM_{10}	particulate matter with an aerodynamic diameter less than or equal to 10 microns
$PM_{2.5}$	particulate matter with an aerodynamic diameter less than or equal to 2.5 microns
PPA	Power Purchase Agreement
ppb	parts per billion
ppm	parts per million
project	Gonzaga Ridge Wind Repowering Project
PSD	prevention of significant deterioration
RACT	Reasonably Available Control Technology
ROG	reactive organic gases
RPS	Renewable Portfolio Standard
RTP	Regional Transportation Plan
SB	Senate Bill
SCADA	Supervisory Control and Data Acquisition
Scoping Plan	Climate Change Scoping Plan: A Framework for Change
SCS	Sustainable Communities Strategy
SF_6	sulfur hexafluoride
SIP	State Implementation Plan
SJVAB	San Joaquin Valley Air Basin
SJVAPCD	San Joaquin Valley Air Pollution Control District
SLCP Strategy	Proposed Short-Lived Climate Pollution Reduction Strategy
SO_2	sulfur dioxide

Acronym/Abbreviation	Definition
SO_x	sulfur oxides
SR-	State Route
TAC	toxic air contaminant
US 101	U.S. Highway 101
VOC	volatile organic compound
WTG	wind turbine generator
ZEV	zero-emissions vehicle

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EXECUTIVE SUMMARY

The purpose of this technical report is to assess the potential air quality and greenhouse gas (GHG) emissions impacts associated with implementation of the proposed Gonzaga Ridge Wind Repowering Project (Project) located in Pacheco State Park in Merced County, California (County). This assessment uses the significance thresholds in Appendix G of the California Environmental Quality Act (CEQA) Guidelines (14 CCR 15000 et seq.).

Project Overview

The Project would replace the existing 16.5 megawatt (MW) wind energy facility with a new facility capable of producing up to approximately 100 megawatts of wind energy. As proposed by the Project Applicant, Gonzaga Ridge Wind Farm, LLC, the repowering component of the Project would consist of up to forty new wind turbines, each having a generating capacity of up to 2.5 MW in nameplate capacity per turbine or Gonzaga may purchase larger turbines with a generating capacity of up to 3.8MW which would result in reducing the number of turbines to 26, and ancillary infrastructure. Moreover, the existing 166 wind turbines would be decommissioned and removed.

The wind turbines are capable of operating 24 hours per day, depending on wind and meteorological conditions.

The Project site is located within the San Joaquin Valley Air Basin (SJVAB) and is under the jurisdiction of the San Joaquin Valley Air Pollution Control District (SJVAPCD). Construction criteria air pollutant and GHG emissions were estimated using the California Emissions Estimator Model (CalEEMod) Version 2016.3.2, consistent with SJVAPCD guidance. Although the state is not required to comply with local regulations, the analysis presented herein relies on local and regional plans which have been developed to reduce criteria air pollutants and GHG emissions within the region.

Air Quality

The air quality impact analysis evaluated the potential for adverse impacts to ambient air quality due to construction and operational emissions resulting from the project. Impacts were evaluated for their significance based on the SJVAPCD environmental thresholds of significance (SJVAPCD 2015b).

Criteria air pollutants are defined as pollutants for which the federal and state governments have established ambient air quality standards, or criteria, for outdoor concentrations to protect public health. Criteria air pollutants include ozone (O_3), nitrogen dioxide (NO_2), carbon monoxide (CO), sulfur dioxide (SO_2), particulate matter with an aerodynamic diameter less than or equal to 10 microns (PM_{10}), particulate matter with an aerodynamic diameter less than

or equal to 2.5 microns ($PM_{2.5}$), and lead (Pb). Pollutants that are evaluated herein include reactive organic gasses (ROGs) (i.e., volatile organic compounds (VOCs) and reactive organic compounds), oxides of nitrogen (NO_x), CO, sulfur oxides (SO_x), PM_{10}, $PM_{2.5}$. ROGs and NO_x are important because they are precursors to O_3.

The Environmental Protection Agency (EPA) has designated the SJVAB as a nonattainment area for the federal 8-hour O_3 standard, and CARB has designated the SJVAB as a nonattainment area for the state 1-hour and 8-hour O_3 standards. The SJVAB has been designated as a nonattainment area for the state 24-hour and annual PM_{10} standards, nonattainment area for the federal 24-hour and annual $PM_{2.5}$ standards, and nonattainment area for the state annual $PM_{2.5}$ standard. The SJVAB is designated as unclassified or attainment for the other criteria air pollutants.

Air Quality Plan Consistency

Implementation of the Project would not exceed the demographic growth forecasts in the *San Joaquin Valley Demographic Forecasts 2010 to 2050* (Fresno County Association of Governments 2014) and would also be consistent with the SJVAPCD Attainment Plans for CO, PM_{10}, $PM_{2.5}$, and O_3. Although State property is not subject to local general plans and zoning, State Park land underlying the Project site is zoned Exclusive Agriculture (A-2) under Merced County Zoning and would not change as a result of the Project. In addition, the Project would not result in an increase in the frequency or severity of existing air quality violations or cause or contribute to new violations. Based on these considerations, impacts related to the Project's potential to conflict with or obstruct implementation of the applicable air quality plan would be less than significant.

Construction Criteria Air Pollutant Emissions

Construction of the Project would result in the temporary addition of pollutants to the local airshed caused by on-site sources (i.e., off-road construction equipment and soil disturbance) and off-site sources (i.e., on-road haul trucks, vendor trucks, and worker vehicle trips). Maximum annual unmitigated construction emissions would not exceed the SJVAPCD significance thresholds for ROG, NO_x, CO, SO_x, PM_{10}, or $PM_{2.5}$. In addition, the Applicant has committed to using at minimum Tier 3 or equivalent off-road equipment during the construction per PDF-AQ-1, which would ensure that maximum daily on-site emissions would not exceed 100 lbs/day for any criteria air pollutant; thus, an ambient air quality analysis (AAQA) was determined to not be required. Overall, construction criteria air pollutant emissions would result in less than significant impacts.

Operational Criteria Air Pollutant Emissions

Operational activities would be limited to maintenance and repair. Maximum annual operational emissions would not exceed the SJVAPCD operational annual significance thresholds for ROG, NO_x. CO, SO_x, PM_{10}, or $PM_{2.5}$. Operational impacts would be less than significant.

Valley Fever

Coccidioidomycosis, more commonly known as "valley fever," is an infection caused by inhalation of the spores of the *Coccidioides immitis* fungus, which grows in the soils of the southwestern United States. The Project would be required to comply with SJVAPCD Rule 8021, Section 6.3, which would require the Project to develop, prepare, submit, obtain approval of, and implement a dust control plan. Compliance with the required dust control plan would reduce fugitive dust impacts to less than significant for Project construction, which would also minimize the release of the *Coccidioides immitis* fungus from construction activities.

Exposure of Sensitive Receptors

Construction activities would not result in substantial pollutant concentrations that would affect sensitive receptors. In addition, diesel equipment would also be subject to the California Air Resources Board (CARB) air toxic control measures for in-use off-road diesel fleets, which would minimize diesel particulate matter (DPM) emissions. Sensitive receptors are scattered rural residential land uses, with the nearest sensitive receptor located approximately 0.30-mile (1,604 feet) south of the project site.

No residual toxic air contaminant (TAC) emissions and corresponding cancer risk are anticipated after construction, and no long-term sources of TAC emissions are anticipated during operation of the Project. Therefore, the exposure of project-related TAC emission impacts to sensitive receptors would be less than significant. The Project would not negatively affect the level of service (LOS) of intersections on the project site and would not significantly contribute to a CO hotspot. As such, impacts to sensitive receptors would be less than significant.

Odors

Potential odors produced during construction would be attributable to concentrations of unburned hydrocarbons from tailpipes of construction equipment, which would disperse rapidly from the Project site and generally occur at magnitudes that would not affect substantial numbers of people. Impacts associated with odors during construction would be less than significant. The Project would not generate any new odors during operation; therefore, impacts during operation would be less than significant.

Cumulative Impacts

The potential for the Project to result in a cumulatively considerable impact, per the SJVAPCD guidance and thresholds, is based on the Project's impact compared to the SJVAPCD significance criteria. As discussed previously, maximum annual construction and operational emissions would not exceed the SJVAPCD significance thresholds for ROG, NO_x, CO, SO_x, PM_{10}, or $PM_{2.5}$. Therefore, the Project would not result in a cumulatively considerable increase in criteria air pollutants.

Greenhouse Gas Emissions

Global climate change is primarily considered a cumulative impact but must also be evaluated on a proposed project-level under CEQA. A proposed project participates in this potential impact through its incremental contribution combined with the cumulative increase of all other sources of GHG emissions. GHGs are gases that absorb infrared radiation in the atmosphere. Principal GHGs regulated under state and federal law and regulations include carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). GHG emissions are measured in metric tons of CO_2 equivalent (MT CO_2e), which account for weighted global warming potential (GWP) factors for CH_4 and N_2O.

Project-Generated Construction and Operational Greenhouse Gas Emissions

The SJVAPCD guidance does not limit the lead agency from establishing its own methodology in determining the significance of project-related greenhouse gas emissions. The threshold applied to assess the potential for the Project to generate GHG emissions either directly or indirectly that may have a significant impact on the environment was the bright line threshold of 1,100 MT CO_2e per year. Construction-generated GHG emissions were amortized based on an estimated 30-year project life and included in annual operational GHG emissions estimates.

Construction of the Project would result in GHG emissions primarily associated with use of off-road construction equipment, on-road hauling and vendor (material delivery) trucks, and worker vehicles. The estimated GHG emissions during construction would be approximately 505 MT CO_2e in 2019 and 1,325 MT CO_2e in 2020. Amortized construction emissions would be approximately 61 MT CO_2e. Operation of the Project would generate GHG emissions through motor vehicle trips to and from the Project site for routine inspection and maintenance, water truck deliveries, energy use (generation of electricity consumed by the Project), solid waste generation, and from the emergency generator. Estimated Project-generated operational and amortized construction emissions would be approximately 301 MT CO_2e per year, which is less than GHG threshold of 1,100 MT CO_2e.

Consistency with Applicable Greenhouse Gas Reduction Plans

The Merced County Association of Governments' (MCAG's) Regional Transportation Plan (RTP) / Sustainable Communities Strategy (SCS) is an applicable plan adopted for the purpose of reducing GHGs from the land use and transportation sectors in Merced County. As previously stated, although the state is not required to comply with local plans or policies, the RTP/SCS is based on state law and other state policies to reduce state-wide GHG emissions in order to meet state reduction requirements. The RTP/SCS was adopted in 2018. The Project could result in a significant impact due to a conflict with an applicable plan, policy, or regulation if it would be inconsistent with the adopted MCAG RTP/SCS. As such, the Project would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs, and no mitigation is required. This impact would be less than significant.

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1 INTRODUCTION

1.1 Report Purpose and Scope

The purpose of this technical report is to assess the potential air quality and greenhouse gas (GHG) emissions impacts associated with implementation of the proposed Gonzaga Ridge Wind Repowering Project (Project) located in Merced County (County). This assessment uses the significance thresholds in Appendix G of the California Environmental Quality Act (CEQA) Guidelines (14 CCR 15000 et seq.) and is based on the emissions-based significance thresholds recommended by the San Joaquin Valley Air Pollution Control District (SJVAPCD) and other applicable thresholds of significance.

This introductory section provides a description of the Project and the Project location. Section 2, Air Quality, describes the air quality-related environmental setting, regulatory setting, existing air quality conditions, thresholds of significance, and analysis methodology and presents an air quality impact analysis per Appendix G of the CEQA Guidelines. Section 3, Greenhouse Gas Emissions, follows the same format as Section 2 and similarly describes the GHG emissions-related environmental setting, regulatory setting, existing climate changes conditions, thresholds of significance, and analysis methodology and presents a GHG emissions impact analysis per Appendix G of the CEQA Guidelines. Section 4, References Cited, includes a list of the references cited. Section 5, List of Preparers, includes a list of those who prepared this technical report.

The analysis in this technical report incorporates Project data provided by the Project Applicant and the California Emission Estimator Model (CalEEMod) default values where appropriate.

1.2 Regional and Local Setting

The Project site is located in Pacheco State Park in Merced County, California. Pacheco State Park (Park) consists of 6,900 acres of former ranchland along State Route (SR) 152 known as Pacheco Pass, at the edge of the Diablo Range. Currently, less than 3,000 acres of the Park are open to the public. The Park is located on SR-152, that connects two major north-south arteries—Interstate 5 (I-5), which is 16 miles to the east, and U.S. Highway 101 (US 101), which is approximately 30 miles to the west (as shown on Figure 1). The Park is generally equidistant between the cities of Gilroy and Los Banos and is an approximate two-hour drive from San Francisco. The land between Pacheco State Park and the San Luis Reservoir State Recreation Area that belongs to Bureau of Reclamation is managed by the California Department of Parks and Recreation (State Parks).

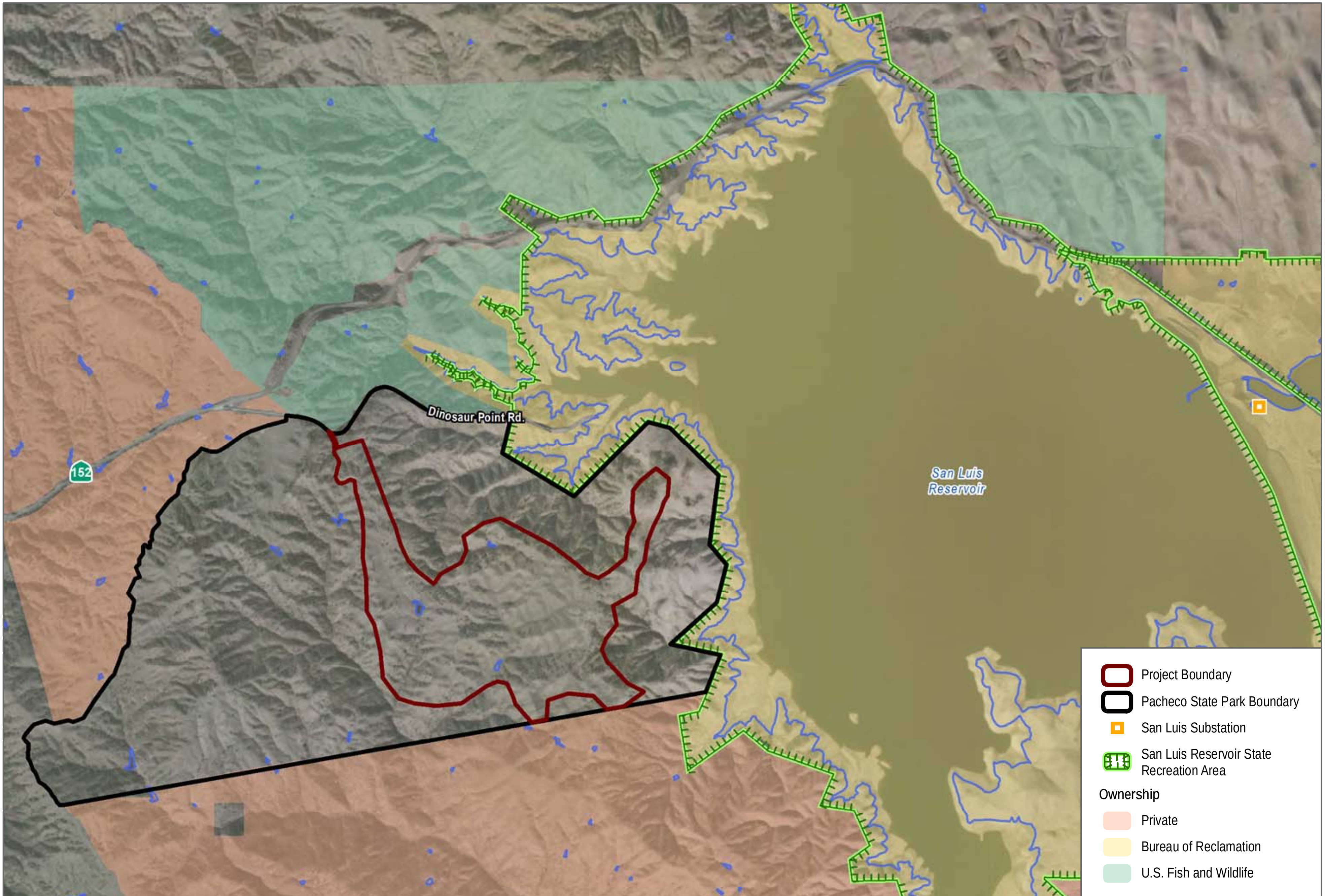
1.3 Project Description

The Project would consist of up to 40 turbines, each having a generating capacity of up to 3.8 MW. Turbines would consist of tubular steel towers and a total height (turbine base to top of turbine blade in the twelve o'clock position) of up to 650 feet. All turbines would be three-bladed, upwind, horizontal-axis wind turbines. Each wind turbine would be mounted on a concrete pedestal supported by a permanent concrete foundation. All wind turbines would have a turbine rotor and nacelle mounted on top of its tubular stee1 tower. The wind turbines would be grouped in a several rows and connected by an underground or overhead electrical cable system. Turbines would be arranged in the row in accordance with applicable industry siting recommendations for optimum energy production and minimal land disturbance. The Project would also include ancillary facilities such as construction laydown areas; temporary batch plant(s), if needed; access roads; overhead transmission lines; underground and overhead collector lines and associated equipment; an operations and maintenance (O&M) facility; meteorological tower(s); transmission; switchyard; storage sheds; and an electrical substation and associated substation components. Additional, information regarding Project components is discussed in Section 2 of the environmental impact report (EIR).

Supervisory Control and Data Acquisition System

Each wind turbine would be connected to an off-site Supervisory Control and Data Acquisition (SCADA) system. The SCADA system would allow for controlling and monitoring individual wind turbines, as well as the Project as a whole, from a central operations center. If problems occur, the SCADA system could send signals to a cell phone, tablet, computer, or other personal communication device to alert operations staff. The SCADA system would also be connected to the California Independent System Operator and Southern California Edison.

The Project would use wind turbines designed with several levels of built-in safety measures to comply with Occupational Safety and Health Administration and American National Standards Institute requirements. Personnel located at an off-site operations and maintenance facility would monitor the wind turbines with the SCADA system.



SOURCE: Merced County 2018, Bing Maps 2018

DUDEK

FIGURE 2

Project Location

Gonzaga Ridge Wind Repowering Project

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Access Roads

Where feasible, the existing network of permanent access roads would be retained and reused for the new wind turbines. In addition to the existing roads, 10 miles of permanent access and maintenance roads would be constructed to provide access and circulation within the Project. These access roads will consist of an approximately 20-foot-wide permanent roads to provide access to each wind turbine and ancillary equipment. These same permanent access roads would be used during construction, although the width of these roads may be temporarily increased to up to an approximately 40 feet wide to accommodate cranes and larger construction equipment.

Access roads will consist of compacted native material but may also require aggregate and/or geosynthetic material to provide the soil strength needed for construction. The disturbed areas outside the final roadway width would be graded and compacted for use during construction and then de-compacted and stabilized at the conclusion of construction. A new permanent access road layout will incorporate applicable federal and local standards regarding internal road design and circulation, particularly those provisions related to emergency vehicle access.

Temporary Laydown and Parking

Turbine laydown areas would be cleared including an area of approximately 5 acres (depending on the terrain) at each turbine for the crane pad, construction laydown area, and rotor assembly area. Within the graded turbine laydown area, a gravel pad would be established for supporting a crane to be used to erect the towers and turbines. Prior to construction of the turbine foundations, soil samples would be collected during the pre-construction and construction geotechnical investigation to assist in determine site-specific turbine foundations to be utilized during final engineering.

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2 AIR QUALITY

2.1 Environmental Setting

2.1.1 Climate and Topography

As discussed in Section 1, the project is located within the SJVAB,[1] which consists of eight counties and is spread across 25,000 square miles of Central California. The SJVAB is bordered on the east by the Sierra Nevada (8,000–14,491 feet in elevation), on the west by the Coast Ranges (averaging 3,000 feet in elevation), and to the south by the Tehachapi Mountains (6,000–7,981 feet in elevation). The San Joaquin Valley comprises the southern half of California's Central Valley, is approximately 250 miles long, and averages 35 miles wide with a slight downward elevation gradient from Bakersfield in the southeast end (elevation 408 feet) to sea level at the northwest end where the San Joaquin Valley opens to the San Francisco Bay at the Carquinez Strait. Its northern end in the Sacramento Valley comprises the northern half of California's Central Valley. The region's topographic features restrict air movement through and out of the SJVAB. As a result, the SJVAB is highly susceptible to pollutant accumulation over time.

The San Joaquin Valley is in a Mediterranean Climate Zone, influenced by a subtropical high-pressure cell most of the year and characterized by warm, dry summers and cooler winters. Mediterranean climates are characterized by sparse rainfall, which occurs mainly in winter. Summertime maximum temperatures in the San Joaquin Valley often exceed 100 degrees Fahrenheit (°F). The San Joaquin Valley Air Basin (SJVAB) averages 10.6 inches of precipitation per year (WRCC 2017).

The vertical dispersion of air pollutants in the San Joaquin Valley can be limited by the presence of persistent temperature inversions. Air temperatures usually decrease with an increase in altitude. A reversal of this atmospheric state, where the air temperatures increases with height, is termed an inversion. A temperature inversion can act like a lid, restricting vertical mixing of air above and below an inversion because of differences in air density and thereby trapping air pollutants below the inversion. The subtropical high-pressure cell is strongest during spring, summer, and fall and produces subsiding air, which can result in air temperature inversions. Most of the surrounding mountains are above the normal height of summer inversions (1,500–3,000 feet). Wintertime high-pressure events can often last many weeks with surface temperatures lowering into 30°F–40°F. During these events, fog can be present and inversions are extremely strong. These wintertime inversions can inhibit vertical mixing of pollutant to a few hundred feet.

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1 Descriptions of climate and topography are based on the SJVAPCD's *Guidance for Assessing and Mitigating Air Quality Impacts* (SJVAPCD 2015c).

Wind speed and direction play an important role in dispersion and transport of air pollutants. Winds in the San Joaquin Valley most frequently blow from the northwesterly direction, especially in the summer. The region's topographic features restrict air movement and channel the air mass towards the southeastern end of the San Joaquin Valley. Marine air can flow into the SJVAB from the Sacramento–San Joaquin River Delta and over Altamont Pass and Pacheco Pass. From there, it can flow through the San Joaquin Valley, over the Tehachapi Pass, and into the Mojave Desert Air Basin. The Coastal Range and the Sierra Nevada are barriers to air movement to the west and east, respectively. A secondary but significant summer wind pattern is from the southeasterly direction and can be associated with nighttime drainage winds, prefrontal conditions, and summer monsoons. During winter, winds can be very weak, which minimizes the transport of pollutants and results in stagnation events.

Two significant diurnal wind cycles that occur frequently in the San Joaquin Valley are the sea breeze and mountain-valley upslope and drainage flows. The sea breeze can accentuate the northwest wind flow, especially on summer afternoons. Nighttime drainage flows can accentuate the southeast movement of air down the San Joaquin Valley. In the mountains during periods of weak synoptic scale winds, winds tend to be upslope during the day and downslope at night. Nighttime and drainage flows are pronounced during the winter when flow from the easterly direction is enhanced by nighttime cooling in the Sierra Nevada. Eddies can form in the valley wind flow and can recirculate a polluted air mass for an extended period.

Solar radiation and temperature are particularly important in the chemistry of O_3 formation. The SJVAB averages over 260 sunny days per year. Photochemical air pollution (primarily O_3) results from the atmospheric ROGs and NO_2 under the influence of sunlight. O_3 concentrations are very dependent on the amount of solar radiation, especially during late spring, summer and early fall. O_3 levels typically peak in the afternoon. After the sun goes down, the chemical reaction between N_2O and O_3 begins to dominate. This reaction tends to reduce O_3 concentrations in the metropolitan areas through the early morning hours. At sunrise, NO_x tend to peak, partly due to low levels of O_3 at this time and also due to the morning commuter vehicle emissions of NO_x.

Reaction rates generally increase with temperature, which results in greater O_3 production at higher temperatures. However, extremely hot temperatures can "lift" or "break" the inversion layer. Typically, if the inversion layer remains intact, O_3 levels peak in the late afternoon. If the inversion layer breaks and the resultant afternoon winds occur, O_3 levels peak in the early afternoon and decrease in the late afternoon as the contaminants are dispersed or transported out of the SJVAB. O_3 levels are low during winter periods when there is much less sunlight to drive the photochemical reaction.

2.1.2 Pollutants and Effects

2.1.2.1 Criteria Air Pollutants

Criteria air pollutants are defined as pollutants for which the federal and state governments have established ambient air quality standards, or criteria, for outdoor concentrations to protect public health. The federal and state standards have been set, with an adequate margin of safety, at levels above which concentrations could be harmful to human health and welfare. These standards are designed to protect the most sensitive persons from illness or discomfort. Pollutants of concern include O_3, nitrogen dioxide (NO_2), carbon monoxide (CO), sulfur dioxide (SO_2), PM_{10}, $PM_{2.5}$, and lead. These pollutants, as well as toxic air contaminants (TACs), are discussed in the following paragraphs.[2] In California, sulfates, vinyl chloride, hydrogen sulfide, and visibility-reducing particles are also regulated as criteria air pollutants.

Ozone. O_3 is a strong-smelling, pale blue, reactive, toxic chemical gas consisting of three oxygen atoms. It is a secondary pollutant formed in the atmosphere by a photochemical process involving the Sun's energy and O_3 precursors. These precursors are mainly NO_x and volatile organic compounds (VOCs). The maximum effects of precursor emissions on O_3 concentrations usually occur several hours after they are emitted and many miles from the source. Meteorology and terrain play major roles in O_3 formation, and ideal conditions occur during summer and early autumn on days with low wind speeds or stagnant air, warm temperatures, and cloudless skies. O_3 exists in the upper atmosphere O_3 layer (stratospheric ozone) and at the Earth's surface in the troposphere (ozone).[3] The O_3 that the U.S. Environmental Protection Agency (EPA) and the California Air Resources Board (CARB) regulate as a criteria air pollutant is produced close to the ground level, where people live, exercise, and breathe. Ground-level O_3 is a harmful air pollutant that causes numerous adverse health effects and is thus considered "bad" O_3. Stratospheric, or "good," O_3 occurs naturally in the upper atmosphere, where it reduces the amount of ultraviolet light (i.e., solar radiation) entering the Earth's atmosphere. Without the protection of the beneficial stratospheric O_3 layer, plant and animal life would be seriously harmed.

O_3 in the troposphere causes numerous adverse health effects; short-term exposures (lasting for a few hours) to O_3 at levels typically observed in Southern California can result in breathing pattern changes, reduction of breathing capacity, increased susceptibility to infections, inflammation of the

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[2] The descriptions of each of the criteria air pollutants and associated health effects are based on the EPA's Criteria Air Pollutants (EPA 2016a) and the CARB Glossary of Air Pollution Terms (CARB 2017a).

[3] The troposphere is the layer of the Earth's atmosphere nearest to the surface of the Earth. The troposphere extends outward about 5 miles at the poles and about 10 miles at the equator.

lung tissue, and some immunological changes (EPA 2013). These health problems are particularly acute in sensitive receptors such as the sick, the elderly, and young children.

Nitrogen Dioxide. NO_2 is a brownish, highly reactive gas that is present in all urban atmospheres. The major mechanism for the formation of NO_2 in the atmosphere is the oxidation of the primary air pollutant nitric oxide, which is a colorless, odorless gas. NO_x plays a major role, together with VOCs, in the atmospheric reactions that produce O_3. NO_x is formed from fuel combustion under high temperature or pressure. In addition, NO_x is an important precursor to acid rain and may affect both terrestrial and aquatic ecosystems. The two major emissions sources are transportation and stationary fuel combustion sources such as electric utility and industrial boilers.

NO_2 can irritate the lungs, cause bronchitis and pneumonia, and lower resistance to respiratory infections (EPA 2016b).

Carbon Monoxide. CO is a colorless, odorless gas formed by the incomplete combustion of hydrocarbon, or fossil fuels. CO is emitted almost exclusively from motor vehicles, power plants, refineries, industrial boilers, ships, aircraft, and trains. In urban areas, such as the Project location, automobile exhaust accounts for the majority of CO emissions. CO is a nonreactive air pollutant that dissipates relatively quickly; therefore, ambient CO concentrations generally follow the spatial and temporal distributions of vehicular traffic. CO concentrations are influenced by local meteorological conditions—primarily wind speed, topography, and atmospheric stability. CO from motor vehicle exhaust can become locally concentrated when surface-based temperature inversions are combined with calm atmospheric conditions, which is a typical situation at dusk in urban areas from November to February. The highest levels of CO typically occur during the colder months of the year, when inversion conditions are more frequent.

In terms of adverse health effects, CO competes with oxygen, often replacing it in the blood, reducing the blood's ability to transport oxygen to vital organs. The results of excess CO exposure can include dizziness, fatigue, and impairment of central nervous system functions.

Sulfur Dioxide. SO_2 is a colorless, pungent gas formed primarily from incomplete combustion of sulfur-containing fossil fuels. The main sources of SO_2 are coal and oil used in power plants and industries; as such, the highest levels of SO_2 are generally found near large industrial complexes. In recent years, SO_2 concentrations have been reduced by the increasingly stringent controls placed on stationary source emissions of SO_2 and limits on the sulfur content of fuels.

SO_2 is an irritant gas that attacks the throat and lungs and can cause acute respiratory symptoms and diminished ventilator function in children. When combined with particulate matter, SO_2 can injure lung tissue and reduce visibility and the level of sunlight. SO_2 can also yellow plant leaves and erode iron and steel.

Particulate Matter. Particulate matter pollution consists of very small liquid and solid particles floating in the air, which can include smoke, soot, dust, salts, acids, and metals. Particulate matter can form when gases emitted from industries and motor vehicles undergo chemical reactions in the atmosphere. $PM_{2.5}$ and PM_{10} represent fractions of particulate matter. Coarse particulate matter (PM_{10}) consists of particulate matter that is 10 microns or less in diameter and is about 1/7 the thickness of a human hair. Major sources of PM_{10} include crushing or grinding operations; dust stirred up by vehicles traveling on roads; wood-burning stoves and fireplaces; dust from construction, landfills, and agriculture; wildfires and brush/waste burning; industrial sources; windblown dust from open lands; and atmospheric chemical and photochemical reactions. Fine particulate matter ($PM_{2.5}$) consists of particulate matter that is 2.5 microns or less in diameter and is roughly 1/28 the diameter of a human hair. $PM_{2.5}$ results from fuel combustion (e.g., from motor vehicles and power generation and industrial facilities), residential fireplaces, and woodstoves. In addition, $PM_{2.5}$ can be formed in the atmosphere from gases such as sulfur oxides (SO_x), NO_x, and VOCs.

$PM_{2.5}$ and PM_{10} pose a greater health risk than larger-size particles. When inhaled, these tiny particles can penetrate the human respiratory system's natural defenses and damage the respiratory tract. $PM_{2.5}$ and PM_{10} can increase the number and severity of asthma attacks, cause or aggravate bronchitis and other lung diseases, and reduce the body's ability to fight infections. Very small particles of substances such as lead, sulfates, and nitrates can cause lung damage directly or be absorbed into the blood stream, causing damage elsewhere in the body. Additionally, these substances can transport adsorbed gases such as chlorides or ammonium into the lungs, also causing injury. PM_{10} tends to collect in the upper portion of the respiratory system, whereas $PM_{2.5}$ is so tiny that it can penetrate deeper into the lungs and damage lung tissue. Suspended particulates also damage and discolor surfaces on which they settle and produce haze and reduce regional visibility.

People with influenza, people with chronic respiratory and cardiovascular diseases, and the elderly may suffer worsening illness and premature death as a result of breathing particulate matter. People with bronchitis can expect aggravated symptoms from breathing in particulate matter. Children may experience a decline in lung function due to breathing in PM_{10} and $PM_{2.5}$ (EPA 2009).

Lead. Lead in the atmosphere occurs as particulate matter. Sources of lead include leaded gasoline; the manufacturing of batteries, paints, ink, ceramics, and ammunition; and secondary lead smelters. Prior to 1978, mobile emissions were the primary source of atmospheric lead. Between 1978 and 1987, the phaseout of leaded gasoline reduced the overall inventory of airborne lead by nearly 95%.

With the phaseout of leaded gasoline, secondary lead smelters, battery recycling, and manufacturing facilities are becoming lead-emissions sources of greater concern.

Prolonged exposure to atmospheric lead poses a serious threat to human health. Health effects associated with exposure to lead include gastrointestinal disturbances, anemia, kidney disease, and in severe cases, neuromuscular and neurological dysfunction. Of particular concern are low-level lead exposures during infancy and childhood. Such exposures are associated with decrements in neurobehavioral performance, including intelligence quotient performance, psychomotor performance, reaction time, and growth. Children are highly susceptible to the effects of lead.

Volatile Organic Compounds. Hydrocarbons are organic gases that are formed from hydrogen and carbon and sometimes other elements. Hydrocarbons that contribute to formation of O_3 are referred to and regulated as VOCs (also referred to as reactive organic gases). Combustion engine exhaust, oil refineries, and fossil-fueled power plants are the sources of hydrocarbons. Other sources of hydrocarbons include evaporation from petroleum fuels, solvents, dry cleaning solutions, and paint.

The primary health effects of VOCs result from the formation of O_3 and its related health effects. High levels of VOCs in the atmosphere can interfere with oxygen intake by reducing the amount of available oxygen through displacement. Carcinogenic forms of hydrocarbons, such as benzene, are considered TACs. There are no separate health standards for VOCs as a group.

Reactive Organic Gases. Hydrocarbons are organic gases that are formed from hydrogen and carbon and sometimes other elements. Hydrocarbons that contribute to formation of O_3 are referred to and regulated as ROGs. Combustion engine exhaust, oil refineries, and fossil-fueled power plants are sources of hydrocarbons. Other sources of hydrocarbons include evaporation from petroleum fuels, solvents, dry cleaning solutions, and paint.

The primary health effects of ROGs result from the formation of O_3 and its related health effects. High levels of ROGs in the atmosphere can interfere with oxygen intake by reducing the amount of available oxygen through displacement. Carcinogenic forms of hydrocarbons, such as benzene, are considered TACs. There are no separate health standards for ROGs as a group.

Sulfates. Sulfates are the fully oxidized form of sulfur, which typically occur in combination with metals or hydrogen ions. Sulfates are produced from reactions of SO_2 in the atmosphere. Sulfates can result in respiratory impairment, as well as reduced visibility.

Vinyl Chloride. Vinyl chloride is a colorless gas with a mild, sweet odor, which has been detected near landfills, sewage plants, and hazardous waste sites, due to the microbial breakdown of chlorinated solvents. Short-term exposure to high levels of vinyl chloride in air can cause nervous system effects, such as dizziness, drowsiness, and headaches. Long-term exposure through inhalation can cause liver damage, including liver cancer.

Hydrogen Sulfide. Hydrogen sulfide is a colorless and flammable gas that has a characteristic odor of rotten eggs. Sources of hydrogen sulfide include geothermal power plants, petroleum refineries, sewers, and sewage treatment plants. Exposure to hydrogen sulfide can result in nuisance odors, as well as headaches and breathing difficulties at higher concentrations.

Visibility-Reducing Particles. Visibility-reducing particles are any particles in the air that obstruct the range of visibility. Effects of reduced visibility can include obscuring the view-shed of natural scenery, reducing airport safety, and discouraging tourism. Sources of visibility-reducing particles are the same as for $PM_{2.5}$ described above.

2.1.2.2 Non-Criteria Air Pollutants

Toxic Air Contaminants. A substance is considered toxic if it has the potential to cause adverse health effects in humans, including increasing the risk of cancer upon exposure or acute and/or chronic non-cancer health effects. A toxic substance released into the air is considered a TAC. TACs are identified by federal and state agencies based on a review of available scientific evidence. In California, TACs are identified through a two-step process that was established in 1983 under the Toxic Air Contaminant Identification and Control Act. This two-step process of risk identification and risk management and reduction was designed to protect residents from the health effects of toxic substances in the air. In addition, the California Air Toxics “Hot Spots” Information and Assessment Act, Assembly Bill (AB) 2588, was enacted by the legislature in 1987 to address public concern over the release of TACs into the atmosphere. The law requires facilities emitting toxic substances to provide local air pollution control districts with information that will allow an assessment of the air toxics problem, identification of air toxics emissions sources, location of resulting hotspots, notification to the public exposed to significant risk, and development of effective strategies to reduce potential risks to the public over 5 years.

Examples include certain aromatic and chlorinated hydrocarbons, certain metals, and asbestos. TACs are generated by a number of sources, including stationary sources such as dry cleaners, gas stations, combustion sources, and laboratories; mobile sources such as automobiles; and area sources such as landfills. Adverse health effects associated with exposure to TACs may include carcinogenic (i.e., cancer-causing) and non-carcinogenic effects. Non-carcinogenic effects typically affect one or more target organ systems and may be experienced on either short-term (acute) or long-term (chronic) exposure to a given TAC.

Diesel Particulate Matter. Diesel particulate matter (DPM) is part of a complex mixture that makes up diesel exhaust. Diesel exhaust is composed of two phases, gas and particle, both of which contribute to health risks. More than 90% of DPM is less than 1 micrometer in diameter (about 1/70th the diameter of a human hair) and, thus, is a subset of $PM_{2.5}$ (CARB 2016b). DPM is typically composed of carbon particles ("soot," also called black carbon, or BC) and numerous organic compounds, including over 40 known cancer-causing organic substances. Examples of these chemicals include polycyclic aromatic hydrocarbons, benzene, formaldehyde, acetaldehyde, acrolein, and 1,3-butadiene (CARB 2016b). The CARB classified "particulate emissions from diesel-fueled engines" (i.e., DPM; 17 CCR 93000) as a TAC in August 1998. DPM is emitted from a broad range of diesel engines: on-road diesel engines of trucks, buses, and cars and off-road diesel engines, including locomotives, marine vessels, and heavy-duty construction equipment, among others. Approximately 70% of all airborne cancer risk in California is associated with DPM (CARB 2000). To reduce the cancer risk associated with DPM, CARB adopted a diesel risk reduction plan in 2000 (CARB 2000). Because it is part of $PM_{2.5}$, DPM also contributes to the same non-cancer health effects as $PM_{2.5}$ exposure. These effects include premature death; hospitalizations and emergency department visits for exacerbated chronic heart and lung disease, including asthma; increased respiratory symptoms; and decreased lung function in children. Several studies suggest that exposure to DPM may also facilitate development of new allergies (CARB 2016b). Those most vulnerable to non-cancer health effects are children whose lungs are still developing and the elderly who often have chronic health problems.

Odorous Compounds. Odors are generally regarded as an annoyance rather than a health hazard. Manifestations of a person's reaction to odors can range from psychological (e.g., irritation, anger, or anxiety) to physiological (e.g., circulatory and respiratory effects, nausea, vomiting, and headache). The ability to detect odors varies considerably among the population and overall is quite subjective. People may have different reactions to the same odor. An odor that is offensive to one person may be perfectly acceptable to another (e.g., coffee roaster). An unfamiliar odor is more easily detected and is more likely to cause complaints than a familiar one. Known as odor fatigue, a person can become desensitized to almost any odor, and recognition may only occur with an alteration in the intensity. The occurrence and severity of odor impacts depend on the nature, frequency, and intensity of the source; wind speed and direction; and the sensitivity of receptors.

Valley Fever. Coccidioidomycosis, more commonly known as "valley fever," is an infection caused by inhalation of the spores of the *Coccidioides immitis* fungus, which grows in the soils of the southwestern United States. The fungus is very prevalent in the soils of California's San Joaquin Valley. The ecologic factors that appear to be most conducive to survival and replication of the spores are high summer temperatures, mild winters, sparse rainfall, and alkaline, sandy soils. New residents to the San Joaquin Valley have usually never been exposed to Valley Fever, and as a result, are particularly susceptible to the infection. Many longtime residents of the area have at some time been exposed to the fungus, become infected, and have recovered, and are thus immune.

2.1.3 Sensitive Receptors

Some land uses are considered more sensitive to changes in air quality than others, depending on the population groups and the activities involved. People most likely to be affected by air pollution include children, the elderly, athletes, and people with cardiovascular and chronic respiratory diseases. Facilities and structures where these air pollution-sensitive people live or spend considerable amounts of time are known as sensitive receptors. Land uses where air pollution-sensitive individuals are most likely to spend time include schools and schoolyards, parks and playgrounds, daycare centers, nursing homes, hospitals, and residential communities (sensitive sites or sensitive land uses) (CARB 2005). The SJVAPCD considers hospitals, schools, parks, playgrounds, daycare centers, nursing homes, convalescent facilities, and residential areas as sensitive receptor land uses (SJVAPCD 2015c).

The greatest potential for exposure of sensitive receptors to air contaminants would occur during the temporary construction phase, when soil would be disturbed and equipment would be used for site grading, materials delivery, and turbine installation. However, the Project is located within the Pacheco State Park, which consists of 6,900 acres of former ranchland along State Route (SR) 152 known as Pacheco Pass, at the edge of the Diablo Range. The nearest sensitive receptor is located approximately 0.30-mile (1,604 feet) south of the project site.

2.2 Regulatory Setting

2.2.1 Federal Regulations

2.2.1.1 Criteria Air Pollutants

The federal Clean Air Act, passed in 1970 and last amended in 1990, forms the basis for the national air pollution control effort. The EPA is responsible for implementing most aspects of the Clean Air Act, including setting National Ambient Air Quality Standards (NAAQS) for major air pollutants; setting hazardous air pollutant (HAP) standards; approving state attainment plans; setting motor vehicle emission standards; issuing stationary source emission standards and permits; and establishing acid rain control measures, stratospheric O_3 protection measures, and enforcement provisions. Under the Clean Air Act, NAAQS are established for the following criteria pollutants: O_3, CO, NO_2, SO_2, PM_{10}, $PM_{2.5}$, and lead.

The NAAQS describe acceptable air quality conditions designed to protect the health and welfare of the citizens of the nation. The NAAQS (other than for O_3, NO_2, SO_2, PM_{10}, $PM_{2.5}$, and those based on annual averages or arithmetic mean) are not to be exceeded more than once per year. NAAQS for O_3, NO_2, SO_2, PM_{10}, and $PM_{2.5}$ are based on statistical calculations over 1- to 3-year periods, depending on the pollutant. The Clean Air Act requires the EPA to reassess the NAAQS at least every 5 years to determine whether adopted standards are adequate to protect public health based on current scientific evidence. States with areas that exceed the NAAQS must prepare a state implementation plan that demonstrates how those areas will attain the standards within mandated time frames.

2.2.1.2 Hazardous Air Pollutants

The 1977 federal Clean Air Act amendments required the EPA to identify National Emission Standards for HAPs to protect public health and welfare. HAPs include certain volatile organic chemicals, pesticides, herbicides, and radionuclides that present a tangible hazard, based on scientific studies of exposure to humans and other mammals. Under the 1990 federal Clean Air Act Amendments, which expanded the control program for HAPs, 189 substances and chemical families were identified as HAPs.

2.2.2 State Regulations

2.2.2.1 Criteria Air Pollutants

The federal Clean Air Act delegates the regulation of air pollution control and the enforcement of the NAAQS to the states. In California, the task of air quality management and regulation has been legislatively granted to CARB, with subsidiary responsibilities assigned to air quality management districts and air pollution control districts at the regional and county levels. CARB, which became part of the California EPA in 1991, is responsible for ensuring implementation of the California Clean Air Act of 1988, responding to the federal Clean Air Act, and regulating emissions from motor vehicles and consumer products.

CARB has established California Ambient Air Quality Standards (CAAQS), which are generally more restrictive than the NAAQS. The CAAQS describe adverse conditions; that is, pollution levels must be below these standards before a basin can attain the standard. Air quality is considered "in attainment" if pollutant levels are continuously below the CAAQS and violate the standards no more than once each year. The CAAQS for O_3, CO, SO_2 (1 hour and 24 hours), NO_2, PM_{10}, and $PM_{2.5}$ and visibility-reducing particles are values that are not to be exceeded. All others are not to be equaled or exceeded. The NAAQS and CAAQS are presented in Table 1.

Table 1
Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards[a]	National Standards[b]	
		Concentration[c]	*Primary*[c,d]	*Secondary*[c,e]
O_3	1 hour	0.09 ppm (180 μg/m^3)	—	Same as Primary Standard[f]
	8 hours	0.070 ppm (137 μg/m^3)	0.070 ppm (137 μg/m^3)[f]	
NO_2[g]	1 hour	0.18 ppm (339 μg/m^3)	0.100 ppm (188 μg/m^3)	Same as Primary Standard
	Annual Arithmetic Mean	0.030 ppm (57 μg/m^3)	0.053 ppm (100 μg/m^3)	
CO	1 hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)	None
	8 hours	9.0 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)	
SO_2[h]	1 hour	0.25 ppm (655 μg/m^3)	0.075 ppm (196 μg/m^3)	—
	3 hours	—	—	0.5 ppm (1,300 μg/m^3)
	24 hours	0.04 ppm (105 μg/m^3)	0.14 ppm (for certain areas)[g]	—
	Annual	—	0.030 ppm (for certain areas)[g]	—
PM_{10}[i]	24 hours	50 μg/m^3	150 μg/m^3	Same as Primary Standard
	Annual Arithmetic Mean	20 μg/m^3	—	
$PM_{2.5}$[i]	24 hours	—	35 μg/m^3	Same as Primary Standard
	Annual Arithmetic Mean	12 μg/m^3	12.0 μg/m^3	15.0 μg/m^3
Lead[j,k]	30-Day Average	1.5 μg/m^3	—	—
	Calendar Quarter	—	1.5 μg/m^3 (for certain areas)[k]	Same as Primary Standard
	Rolling 3-Month Average	—	0.15 μg/m^3	
Hydrogen sulfide	1 hour	0.03 ppm (42 μg/m^3)	—	—
Vinyl chloride[j]	24 hours	0.01 ppm (26 μg/m^3)	—	—
Sulfates	24 hours	25 μg/m^3	—	—
Visibility reducing particles	8 hour (10:00 a.m. to 6:00 p.m. PST)	Insufficient amount to produce an extinction coefficient of 0.23 per kilometer due to the number of particles when the relative humidity is less than 70%	—	—

Source: CARB 2016b.

Notes: μg/m^3 = micrograms per cubic meter; mg/m^3= milligrams per cubic meter; ppm = parts per million by volume; O_3 = ozone; NO_2 = nitrogen dioxide; CO = carbon monoxide; SO_2 = sulfur dioxide; PM_{10} = particulate matter with an aerodynamic diameter less than or equal to 10 microns; $PM_{2.5}$ = particulate matter with an aerodynamic diameter less than or equal to 2.5 microns.

a California standards for O_3, CO, SO_2 (1 hour and 24 hours), NO_2, suspended particulate matter (PM_{10}, $PM_{2.5}$), and visibility-reducing particles are values that are not to be exceeded. All others are not to be equaled or exceeded. CAAQS are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

b National standards (other than O_3, NO_2, SO_2, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once per year. The O_3 standard is attained when the fourth highest 8-hour concentration measured at each site in a year, averaged over 3 years, is equal to or less than the standard. For PM_{10}, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 μg/m³ is equal to or less than 1. For $PM_{2.5}$, the 24-hour standard is attained when 98% of the daily concentrations, averaged over 3 years, are equal to or less than the standard.

[c] Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based on a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

[d] National Primary Standards: The levels of air quality necessary, with an adequate margin of safety, to protect the public health.

[e] National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

[f] On October 1, 2015, the national 8-hour O_3 primary and secondary standards were lowered from 0.075 to 0.070 ppm.

[g] To attain the national 1-hour standard, the 3-year average of the annual 98th percentile of the 1-hour daily maximum concentrations at each site must not exceed 100 parts per billion (ppb). Note that the national 1-hour standard is in units of ppb. California standards are in units of ppm. To directly compare the national 1-hour standard to the California standards, the units can be converted from ppb to ppm. In this case, the national standard of 100 ppb is identical to 0.100 ppm.

[h] On June 2, 2010, a new 1-hour SO_2 standard was established, and the existing 24-hour and annual primary standards were revoked. To attain the national 1-hour standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The 1971 SO_2 national standards (24 hours and annual) remain in effect until 1 year after an area is designated for the 2010 standard, except that in areas designated nonattainment of the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved.

[i] On December 14, 2012, the national annual $PM_{2.5}$ primary standard was lowered from 15 μg/m³ to 12.0 μg/m³. The existing national 24-hour $PM_{2.5}$ standards (primary and secondary) were retained at 35 μg/m³, as was the annual secondary standard of 15 μg/m³. The existing 24-hour PM_{10} standards (primary and secondary) of 150 μg/m³ were also retained. The form of the annual primary and secondary standards is the annual mean averaged over 3 years.

[j] CARB has identified lead and vinyl chloride as TACs with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

[k] The national standard for lead was revised on October 15, 2008, to a rolling 3-month average. The 1978 lead standard (1.5 μg/m³ as a quarterly average) remains in effect until 1 year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.

2.2.2.2 Toxic Air Contaminants

The state Air Toxics Program was established in 1983 under AB 1807 (Tanner). The California TAC list identifies more than 700 pollutants, of which carcinogenic and non-carcinogenic toxicity criteria have been established for a subset of these pollutants pursuant to the California Health and Safety Code. In accordance with AB 2728, the state list includes the (federal) HAPs. In 1987, the legislature enacted the Air Toxics "Hot Spots" Information and Assessment Act of 1987 (AB 2588) to address public concern over the release of TACs into the atmosphere. AB 2588 law requires facilities emitting toxic substances to provide local air pollution control districts with information that will allow an assessment of the air toxics problem, identification of air toxics emissions sources, location of resulting hotspots, notification to the public exposed to significant risk, and development of effective strategies to reduce potential risks to the public over 5 years. TAC emissions from individual facilities are quantified and prioritized. "High-priority" facilities are required to perform a health risk assessment, and if specific thresholds are exceeded, the facility operator is required to communicate the results to the public in the form of notices and public meetings.

In 2000, CARB approved a comprehensive Diesel Risk Reduction Plan to reduce diesel emissions from both new and existing diesel-fueled vehicles and engines (CARB 2000). The regulation is anticipated to result in an 80% decrease in statewide diesel health risk in 2020 compared with the diesel risk in 2000. Additional regulations apply to new trucks and diesel fuel, including the On-Road Heavy Duty Diesel Vehicle (In-Use) Regulation, the On-Road Heavy Duty (New) Vehicle Program, the In-Use Off-Road Diesel Vehicle Regulation, and the New Off-Road Compression-Ignition (Diesel) Engines and Equipment program. These regulations and programs have timetables by which manufacturers must comply and existing operators must upgrade their diesel-powered equipment. There are several Airborne Toxic Control Measures that reduce diesel emissions, including In-Use Off-Road Diesel-Fueled Fleets (13 CCR 2449 et seq.) and In-Use On-Road Diesel-Fueled Vehicles (13 CCR 2025).

California Health and Safety Code, Section 41700

This section of the California Health and Safety Code states that a person shall not discharge, from any source whatsoever, quantities of air contaminants or other material that cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public; or that endanger the comfort, repose, health, or safety of any of those persons or the public; or that cause, or have a natural tendency to cause, injury or damage to business or property. This section also applies to sources of objectionable odors.

2.2.3 Local Regulations

The following local/regional regulations pertaining to air quality would apply to the Project.

2.2.3.1 San Joaquin Valley Air Pollution Control District

The SJVAPCD is the regional agency responsible for the regulation and enforcement of federal, state, and local air pollution control regulations in the SJVAB. The SJVAPCD jurisdiction includes all of Merced, San Joaquin, Stanislaus, Madera, Fresno, Kings, and Tulare Counties, and the San Joaquin Valley portion of Kern County.

The SJVAPCD has prepared several air quality attainment plans to achieve the ozone and particulate matter standards, the most recent of which include the *2016 Plan for the 2008 8-Hour Ozone Standard* (SJVAPCD 2016a), *2014 Reasonably Available Control Technology Demonstration for the 8-Hour Ozone State Implementation Plan* (SJVAPCD 2014), *2013 Plan for the Revoked 1-Hour Ozone Standard* (SJVAPCD 2013), *2007 PM_{10} Maintenance Plan and Request for Redesignation* (SJVAPCD 2007a), *2012 $PM_{2.5}$ Plan* (SJVAPCD 2012), *2015 Plan for the 1997 $PM_{2.5}$ Standard* (SJVAPCD 2015b), and the *2016 Moderate Area Plan for the 2012 $PM_{2.5}$ Standard* (SJVAPCD 2016b). The following sections summarize key elements of these and other recent air quality attainment plans.

2.2.3.2 Extreme 1-Hour Ozone Attainment Demonstration Plan

The *Extreme 1-Hour Ozone Attainment Demonstration Plan*, adopted by the SJVAPCD Governing Board October 8, 2004, sets forth measures and emission-reduction strategies designed to attain the federal 1-hour ozone standard by November 15, 2010, as well as an emissions inventory, outreach, and rate of progress demonstration (SJVAPCD 2004). This plan was approved by the EPA on March 8, 2010; however, the EPA's approval was subsequently withdrawn effective November 26, 2012, in response to a decision issued by the U.S. Court of Appeals for the Ninth Circuit (*Sierra Club v. EPA*, 671 F.3d 955) remanding EPA's approval of these SIP revisions. Concurrent with the EPA's final rule, CARB withdrew the 2004 plan. The SJVAPCD developed a new plan for the 1-hour ozone standard, the *2013 Plan for the Revoked 1-Hour Ozone Standard*, which it adopted in September 2013.

2.2.3.3 2007 8-Hour Ozone Plan

The *2007 8-Hour Ozone Plan*, adopted by the Governing Board on April 30, 2007, sets forth measures and a "dual path" strategy to attain the federal 1997 8-hour ozone standard by 2023 for the SJVAB by reducing emissions of ozone and particulate matter precursors (SJVAPCD 2007b). The plan also includes provisions for improved pollution control technologies for mobile and stationary sources, as well as an increase in state and federal funding for incentive-based measures to reduce emissions. All local measures would be adopted by the SJVAPCD before 2012. This plan was approved by the EPA on April 30, 2012. On November 26, 2012, however, the EPA withdrew its determination that the plan satisfied the federal Clean Air Act requirements regarding emissions growth caused by growth in vehicle miles traveled. All other determinations in the EPA's March 1, 2012, rule approving the plan remain unchanged and in effect. The SJVAPCD is currently in the process of developing an ozone plan to address EPA's 2008 8-hour ozone standard, with attainment required by 2032.

2.2.3.4 2009 RACT SIP

On April 16, 2009, the Governing Board adopted the *Reasonably Available Control Technology Demonstration for Ozone State Implementation Plans* (2009 RACT SIP) (SJVAPCD 2009a). In part, the 2009 RACT SIP satisfied the commitment by the SJVAPCD for a new RACT analysis for the 1-hour ozone plan (see discussion of the EPA withdrawal of approval in the *Extreme 1-Hour Ozone Attainment Demonstration Plan* summary above) and was intended to prevent all sanctions that could be imposed by EPA for failure to submit a required SIP revision for the 1-hour ozone standard. With respect to the 8-hour standard, the plan also assesses the SJVAPCD's rules based on the adjusted major source definition of 10 tons per year (due to the SJVAB's designation as an extreme ozone nonattainment area), evaluates SJVAPCD rules against new

Control Techniques Guidelines promulgated since August 2006, and reviews additional rules and rule amendments that had been adopted by the Governing Board since August 17, 2006, for RACT consistency.

2.2.3.5 2013 Plan for the Revoked 1-Hour Ozone Standard

The SJVAPCD developed a plan for EPA's revoked 1-hour ozone standard after the EPA withdrew its approval of the 2004 *Extreme 1-Hour Ozone Attainment Demonstration Plan* as a result of litigation. As a result of the litigation, the EPA reinstated previously revoked requirements for 1-hour ozone attainment plans. The 2013 plan addresses those requirements, including a demonstration of implementation of Reasonably Available Control Measures and a demonstration of a rate of progress averaging 3% annual reductions of ROG or NO_x emissions every 3 years. The *2013 Plan for the Revoked 1-Hour Ozone Standard* was approved by the Governing Board on September 19, 2013 (SJVAPCD 2013). Based on implementation of the ongoing control measures, preliminary modeling indicates that the SJVAB will attain the 1-hour ozone standard by 2017, before the final attainment year of 2022 and without relying on long-term measures under the federal Clean Air Act, Section 182(e)(5) ("black box reductions").

2.2.3.6 2014 RACT SIP

On June 19, 2014, the Governing Board adopted the *2014 Reasonably Available Control Technology Demonstration for the 8-Hour Ozone State Implementation Plan* (2014 RACT SIP) (SJVAPCD 2014). This RACT SIP includes a demonstration that the SJVAPCD rules implement RACT. The plan reviews each of the NO_x reduction rules and concludes that they satisfy requirements for stringency, applicability, and enforceability, and meet or exceed RACT. The plan's analysis of further ROG reductions through modeling and technical analyses demonstrates that added ROG reductions will not advance SJVAB's ozone attainment. Each ROG (i.e., VOC) rule evaluated in the 2009 RACT SIP, however, has been subsequently approved by the EPA as meeting RACT within the last 2 years. The ozone attainment strategy, therefore, focuses on further NO_x reductions.

2.2.3.7 2016 Plan for the 2008 8-Hour Ozone Standard

On June 16, 2016, the Governing Board adopted the *2016 Plan for the 2008 8-Hour Ozone Standard* (SJVAPCD 2016a). The comprehensive stationary and mobile source control strategy included in this plan will reduce NO_x emissions by 60% between 2012 and 2031 and will bring the San Joaquin Valley into attainment of the EPA's 2008 8-hour O_3 standard as expeditiously as possible, no later than December 31, 2031. To ensure that the plan is approvable with the necessary federal Clean Air Act contingencies, the plan includes "black box" provisions under the federal Clean Air Act, Section 182(e)(5).

2.2.3.8 2007 PM_{10} Maintenance Plan and Request for Redesignation

On September 20, 2007, the Governing Board approved the *2007 PM_{10} Maintenance Plan and Request for Redesignation* (SJVAPCD 2007a). After achieving compliance with the annual and 24-hour NAAQS for PM_{10} during the period from 2003 to 2006,[4] the SJVAPCD prepared the *2007 PM_{10} Maintenance Plan and Request for Redesignation*. The plan includes future emission estimates through 2020, and based on modeling, projects that SJVAB will continue to attain the PM_{10} NAAQS through 2020. The plan does not call for adoption of new control measures. Measures called for in the *2007 8-Hour Ozone Plan* and *2008 $PM_{2.5}$ Plan* (discussed below) will also produce PM_{10} benefits; however, the plan does include a contingency plan if future PM_{10} levels were to exceed the NAAQS. It also includes a request that the EPA redesignate the SJVAB to attainment status for the PM_{10} NAAQS. On October 25, 2007, CARB approved the SJVAPCD's plan with modifications to the transportation conformity budgets. On September 25, 2008, the EPA redesignated the SJVAB to attainment for the PM_{10} NAAQS and approved the PM_{10} maintenance plan.

2.2.3.9 2008 $PM_{2.5}$ Plan

The SJVAPCD Governing Board adopted the *2008 $PM_{2.5}$ Plan* on April 30, 2008 (SJVAPCD 2008). This plan is designed to assist the SJVAB in attaining all $PM_{2.5}$ standards, including the 1997 federal standards, the 2006 federal standards, and the state standard, as soon as possible. On July 13, 2011, the EPA issued a proposed rule partially approving and disapproving the *2008 $PM_{2.5}$ Plan*. Subsequently, on November 9, 2011, the EPA issued a final rule approving most of the plan with an effective date of January 9, 2012. However, the EPA disapproved the plan's contingency measures because they would not provide sufficient emission reductions.

2.2.3.10 2012 $PM_{2.5}$ Plan

Approved by the Governing Board on December 20, 2012, the *2012 $PM_{2.5}$ Plan* addresses attainment of EPA's 24-hour $PM_{2.5}$ standard of 35 micrograms per cubic meter ($\mu g/m^3$) established in 2006. In addition to reducing direct emissions of $PM_{2.5}$, this plan focuses on reducing emissions of NO_x, which is a predominant pollutant in the formation of $PM_{2.5}$ in the SJVAB. The plan relies on a multilevel approach to reducing emissions through SJVAPCD efforts (industry, the general public, employers, and small businesses) and state/federal efforts (passenger vehicles, heavy-duty trucks, and off-road sources), as well as SJVAPCD and state/federal incentive programs to accelerate replacement of on- and off-road vehicles and equipment. Through compliance with this attainment plan, the SJVAB would achieve attainment of the federal $PM_{2.5}$ standard by the attainment deadline of 2019, with the majority of the SJVAB actually experiencing attainment

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4 Attainment is achieved if the 3-year annual average PM_{10} concentration is less than or equal to 50 $\mu g/m^3$ and the expected 24-hour exceedance days is less than or equal to 1.0.

well before the deadline. The EPA lowered the $PM_{2.5}$ standard again in 2012 and is in the process of completing attainment designations.

2.2.3.11 2015 Plan for the 1997 $PM_{2.5}$ Standard

The Governing Board adopted the *2015 Plan for the 1997 $PM_{2.5}$ Standard* on April 16, 2015 (SJVAPCD 2015b). This plan addresses the EPA's annual $PM_{2.5}$ standard of 15 micrograms per cubic meter ($\mu g/m^3$) and 24-hour $PM_{2.5}$ standard of 65 $\mu g/m^3$ established in 1997. While nearly achieving the 1997 standards, the SJVAB experienced higher $PM_{2.5}$ levels in winter 2013–2014 due to the extreme drought, stagnation, strong inversions, and historically dry conditions; thus, the SJVAPCD was unable to meet the attainment date of December 31, 2015. Accordingly, this plan also contains a request for a one-time extension of the attainment deadline for the 24-hour standard to 2018 and the annual standard to 2020. The plan builds on past development and implementation of effective control strategies. Consistent with EPA regulations for $PM_{2.5}$ plans to achieve the 1997 standards, the plan contains Most Stringent Measures, Best Available Control Measures, additional enforceable commitments for further reductions in emissions, and ensures expeditious attainment of the 1997 standard.

2.2.3.12 2016 Moderate Area Plan for the 2012 $PM_{2.5}$ Standard

On September 15, 2016, the Governing Board adopted the *2016 Moderate Area Plan for the 2012 $PM_{2.5}$ Standard* (SJVAPCD 2016b). This plan addresses the federal mandates for areas classified as "moderate nonattainment" for the 2012 $PM_{2.5}$ NAAQS of 12 $\mu g/m^3$. Consistent with EPA's $PM_{2.5}$ Implementation Rule, the plan satisfies the mandate to submit a moderate nonattainment plan to EPA by October 2016, demonstrates impracticability of attaining the 2012 $PM_{2.5}$ standard by the moderate nonattainment deadline of 2021, includes a request to reclassify the San Joaquin Valley to a "serious nonattainment" area for the 2012 $PM_{2.5}$ standard, satisfies all federal Clean Air Act requirements for moderate nonattainment areas, and demonstrates that emissions are continuing to be reduced in the San Joaquin Valley.

2.2.3.13 2018 Particulate Matter Plans

The SJVAPCD has drafted an attainment strategy to address the 1997, 2006, and 2012 $PM_{2.5}$ standards and a plan to demonstrate maintenance of the 1987 PM_{10} standard, as required under the federal Clean Air Act (SJVAPCD 2018). The plan builds upon the District's 1-hour ozone, 8-hour ozone and particulate matter strategies. Air quality modeling for this plan demonstrates that the Valley will attain the standard by 2025, but only if the most stringent feasible control measures are implemented. The plan goes beyond the requirements for a Serious area attainment plan to include the most stringent measures feasible for implementation in the San Joaquin Valley. The Governing Board will consider the plan for adoption on November 15, 2018.

Applicable Rules

The SJVAPCD's primary means of implementing air quality plans is by adopting and enforcing rules and regulations. Stationary sources within the jurisdiction are regulated by the SJVAPCD's permit authority over such sources and through its review and planning activities. Unlike stationary source projects, which encompass very specific types of equipment, process parameters, throughputs, and controls, air emissions sources from land use development projects are mainly mobile sources (traffic) and area sources (small dispersed stationary and other non-mobile sources), including exempt (i.e., no permit required) sources such as consumer products, landscaping equipment, furnaces, and water heaters. Mixed-use land development projects may include nonexempt sources including devices such as small to large boilers, stationary internal combustion engines, gas stations, or asphalt batch plants.

Notwithstanding nonexempt stationary sources, which would be permitted on a case-by-case basis, SJVAPCD Regulations VIII and IX generally apply to land use development projects and are described below:

2.2.3.15 Regulation VIII – Fugitive PM_{10} Prohibition

- Rule 8021: Construction, Demolition, Excavation, Extraction, and Other Earthmoving Activities
- Rule 8031: Bulk Materials
- Rule 8041: Carryout and Trackout
- Rule 8051: Open Areas
- Rule 8061: Paved And Unpaved Roads
- Rule 8071: Unpaved Vehicle/Equipment Traffic Areas

Pursuant to Rule 8021, Section 6.3, the Project would be required to develop, prepare, submit, obtain approval of, and implement a dust control plan, which would reduce fugitive dust impacts to less than significant during Project construction.

2.2.3.16 Regulation IX – Mobile and Indirect Sources

- Rule 9110: General Conformity
- Rule 9120: Transportation Conformity

- Rule 9410: Employer Based Trip Reduction
- Rule 9510: Indirect Source Review (ISR)
- Rule 9610: State Implementation Plan Credit for Emission Reductions Generated through Incentive Programs

2.2.3.17 Rule 9510: Indirect Source Review

The ISR rule, which was adopted December 15, 2005, and went into effect March 1, 2006, requires developers of new residential, commercial, and some industrial projects to reduce NO_x and PM_{10} emissions generated by their projects. Pursuant to Rule 9510, the purpose of the ISR program is to reduce emissions of NO_x and PM_{10} from new land development projects. In general, development contributes to air pollution in the SJVAB increasing the number of vehicles and vehicle miles traveled. ISR applies to development projects that require discretionary approval from the lead agency. The ISR rule also applies to transportation and transit projects whose construction exhaust emissions would equal or exceed 2 tons per year of NO_x or PM_{10}. The ISR rule requires submittal of an air impact assessment application no later than the date on which application is made for a final discretionary approval from the public agency. The air impact assessment contains the information necessary to calculate both construction and operational emissions of a development project.

Section 6.0 of the ISR rule outlines general mitigation requirements for developments that include reduction in construction emissions of 20% of the total construction NO_x emissions, and 45% of the total construction PM_{10} exhaust emissions. The rule also requires the Project to reduce operational NO_x emissions by 33.3% and operational PM_{10} emissions by 50% compared to the unmitigated baseline. Section 7.0 of the ISR rule includes fee schedules for construction or operational excess emissions of NO_x or PM_{10}—those emissions above the goals identified in Section 6.0 of the rule. Monies collected from this fee are used by the SJVAPCD to fund emission reduction projects in the SJVAB on behalf of the Project.

2.2.3.18 Rule 9610: State Implementation Plan Credit for Emission Reductions Generated through Incentive Programs

Rule 9610 provides an administrative mechanism for the SJVAPCD to receive credit towards SIP requirements for emission reductions achieved in the SJVAB through incentive programs administered by the SJVAPCD, United States Department of Agriculture Natural Resources Conservation Service, or CARB. On April 9, 2015, EPA finalized a limited approval and limited disapproval (for a minor administrative error) of Rule 9610 as a revision to the California SIP. Additional documentation regarding the effectiveness of the SJVAPCD's incentive programs can be found in *2015 Annual Demonstration Report SIP Credit for Emission Reductions Generated Through Incentive Programs* (SJVAPCD 2015c).

2.2.3.19 Merced County Association of Governments

The MCAG is the regional planning agency for the County and serves as a forum for regional issues relating to transportation, solid waste, and air quality. MCAG was formed through a Joint Powers Authority igned by member jurisdictions in November, 1967. As a regional collaborative agency, MCAG serves in a number of transportation planning roles in Merced County based on local, state and federal designations. These designations offer increased funding for MCAG activities, primarily in transportation planning for the unincorporated areas of Merced County. With respect to air quality planning and other regional issues, MCAG has prepared the 2018 RTP/SCS for the region which is an update of the 2014 RTP/SCS (MCAG 2018). The 2018 RTP/SCS provides a foundation for transportation and land use decisions to accommodate growth and development in Merced County through 2042. Additional areas of emphasis and policy initiatives in the 2018 RTP/SCS include references to Environmental Justice, and Goods Movement Planning. In addition, the 2018 RTP/SCS includes updated project lists and updated performance measures.

Within each element of the 2018 RTP/SCS, assumptions are made that guide the goals, policies and actions. Those assumptions include: demographic projections, land use forecasts, air quality models, performance indicators, capital and operations costs, cost of alternatives, timeframe (short-and long-term), environmental resources and methodology (MCAG 2018).

2.3 Regional and Local Air Quality Conditions

2.3.1 San Joaquin Valley Air Basin Attainment Status

Pursuant to the 1990 federal Clean Air Act amendments, the EPA classifies air basins (or portions thereof) as “attainment” or “nonattainment” for each criteria air pollutant, based on whether the NAAQS have been achieved. Generally, if the recorded concentrations of a pollutant are lower than the standard, the area is classified as “attainment” for that pollutant. If an area exceeds the standard, the area is classified as “nonattainment” for that pollutant. If there is not enough data available to determine whether the standard is exceeded in an area, the area is designated as “unclassified” or “unclassifiable.” The designation of “unclassifiable/attainment” means that the area meets the standard or is expected to be meet the standard despite a lack of monitoring data. Areas that achieve the standards after a nonattainment designation are re-designated as maintenance areas and must have approved Maintenance Plans to ensure continued attainment of the standards. The California Clean Air Act, like its federal counterpart, called for the designation of areas as “attainment” or "nonattainment," but based on CAAQS rather than the NAAQS. Table 2 depicts the current attainment status of the Project site with respect to the NAAQS and CAAQS. Table 2 depicts the current attainment status of the Project site with respect to the NAAQS and CAAQS. The attainment classifications for the criteria pollutants are outlined in Table 2.

Table 2
San Joaquin Valley Air Basin Attainment Status (Merced County)

Pollutant	Designation/Classification	
	Federal Standards	*State Standards*
Ozone (O_3) – 1 hour	No federal standard[1]	**Nonattainment/severe**
O_3 – 8 hours	**Nonattainment/extreme[2]**	**Nonattainment**
Nitrogen dioxide (NO_2)	Unclassifiable/attainment	Attainment
Carbon monoxide (CO)	Unclassifiable/attainment	Attainment
Sulfur dioxide (SO_2)	Not Designated[3]	Attainment
Coarse particulate matter (PM_{10})	Attainment[4]	**Nonattainment**
Fine particulate matter ($PM_{2.5}$)	**Nonattainment[5]**	**Nonattainment**
Lead	Unclassifiable/attainment	Attainment
Hydrogen sulfide	No federal standard	Unclassified
Sulfates	No federal standard	Attainment
Visibility-reducing particles	No federal standard	Unclassified
Vinyl chloride	No federal standard	No designation

Sources: SJVAPCD 2015a; CARB 2016b; EPA 2016a; EPA 2017b.
Notes: Attainment = meets the standards; Attainment (maintenance) = achieve the standards after a nonattainment designation; Nonattainment = does not meet the standards; Unclassified or unclassifiable = insufficient data to classify; Unclassifiable/attainment = meets the standard or is expected to be meet the standard despite a lack of monitoring data.

1 Effective June 15, 2005, the EPA revoked the federal 1-hour ozone standard, including associated designations and classifications. EPA had previously classified the SJVAB as extreme nonattainment for this standard. EPA approved the 2004 Extreme Ozone Attainment Demonstration Plan (SJVAPCD 2004) on March 8, 2010 (effective April 7, 2010). Many applicable requirements for extreme 1-hour ozone nonattainment areas continue to apply to the SJVAB.

2 Though the San Joaquin Valley was initially classified as serious nonattainment for the 1997 8-hour ozone standard, EPA approved San Joaquin Valley reclassification to extreme nonattainment in the Federal Register on May 5, 2010 (effective June 4, 2010).

3 Federal designations for SO_2 are on hold by EPA; EPA expects to make the designations by December 2017 (EPA 2016a).

4 On September 25, 2008, EPA re-designated the San Joaquin Valley to attainment for the PM_{10} NAAQS and approved the PM_{10} Maintenance Plan.

5 The San Joaquin Valley is designated nonattainment for the 1997 $PM_{2.5}$ NAAQS. EPA designated the San Joaquin Valley as nonattainment for the 2006 $PM_{2.5}$ NAAQS on November 13, 2009 (effective December 14, 2009).

6 CARB has identified lead and vinyl chloride as TACs with no threshold level of exposure for adverse health effects determined.

In summary, the EPA has designated the SJVAB as a nonattainment area for the federal 8-hour O_3 standard, and CARB has designated the SJVAB as a nonattainment area for the state 1-hour and 8-hour O_3 standards. The SJVAB has been designated as a nonattainment area for the state 24-hour and annual PM_{10} standards, nonattainment area for the federal 24-hour and annual $PM_{2.5}$ standards, and nonattainment area for the state annual $PM_{2.5}$ standard. The SJVAB is designated as unclassified or attainment for the other criteria air pollutants.

2.3.2 Local Ambient Air Quality

Under authority and oversight from the EPA pursuant to 40 Code of Federal Regulations (CFR) Part 58, the SJVAPCD and CARB maintain ambient air quality monitoring stations throughout the SJVAB, and the SJVAPCD currently operates six monitoring sites[5]. In addition, the SJVAPCD gathers air quality data from a variety of monitoring sites from other contracted agencies (e.g., United States Marine Corps). Air quality monitoring stations usually measure pollutant concentrations 10 feet above ground level; therefore, air quality is often referred to in terms of ground-level concentrations. Not all air pollutants are monitored at each station; thus, data are summarized from the closest representative station that monitors a specific pollutant.

The closest ambient air quality monitoring station to the Project site that monitors PM_{10} and $PM_{2.5}$ is the M Street station, located at 2334 M Street, Merced, California 95340, approximately 42 miles to the northeast of the Project. The data collected at this station are considered representative of the air quality experienced in the Project vicinity. The closest monitoring station for O_3 and NO_2 would be the Coffee Street monitoring station in Merced, approximately 43 miles to the northeast. The most recent background ambient air quality data from 2015 to 2017 and the number of days exceeding the ambient air quality standards are presented in Table 3.

Table 3
Local Ambient Air Quality Data

Monitoring Station	Unit	Averaging Time	Agency/ Method	Ambient Air Quality Standard	Measured Concentration by Year			Exceedances by Year		
					2015	*2016*	*2017*	*2015*	*2016*	*2017*
Ozone (O_3)										
Coffee Street	ppm	Maximum 1-hour concentration	State	0.09	0.102	0.097	0.093	2	2	0
	ppm	Maximum 8-hour concentration	State	0.070	0.090	0.087	0.085	34	29	17
			Federal	0.070	0.089	0.086	0.084	29	28	16
Nitrogen Dioxide (NO_2)										
Coffee Street	ppm	Maximum 1-hour concentration	State	0.18	0.0035	0.0035	0.0038	0	0	0
			Federal	0.100	0.0035	0.00354	0.00389	0	0	0
	ppm	Annual concentration	State	0.030	—	—	0.007	0	0	0
			Federal	0.053	0.0007	0.0007	0.0007	0	0	0

5 Tranquility, Fresno-Sierra Skypark #2, Fresno-Garland, Clovis, Fresno-Drummond, and Parlier.

Table 3
Local Ambient Air Quality Data

Monitoring Station	Unit	Averaging Time	Agency/ Method	Ambient Air Quality Standard	Measured Concentration by Year			Exceedances by Year		
					2015	*2016*	*2017*	*2015*	*2016*	*2017*
Coarse Particulate Matter (PM_{10})[a]										
M Street	μg/m³	Maximum 24-hour concentration	State	50	94.0	64.5	144.0	*31.8* (5)	*38.9* (6)	*76.6* (12)
			Federal	150	97.2	64.3	146.6	0.0 (0)	0.0 (0)	0.0 (0)
	μg/m³	Annual concentration	State	20	30.6	29.3	35.4	—	—	—
Fine Particulate Matter ($PM_{2.5}$)[a]										
M Street	μg/m³	Maximum 24-hour concentration	Federal	35	60.8	42.8	66.7	15.2 (5)	6.3 (0)	20.4 (6)
	μg/m³	Annual concentration	State	12	—	—	—	—	—	—
			Federal	12.0	12.6	11.1	12.6	—	—	—

Sources: CARB 2017b.
Notes: — = not available; μg/m3 = micrograms per cubic meter; ND = insufficient data available to determine the value; ppm = parts per million
Data taken from CARB iADAM (http://www.arb.ca.gov/adam) and EPA AirData (http://www.epa.gov/airdata/) represent the highest concentrations experienced over a given year.
Exceedances of federal and state standards are only shown for O_3 and particulate matter. Daily exceedances for particulate matter are estimated days because PM_{10} and $PM_{2.5}$ are not monitored daily. All other criteria pollutants did not exceed federal or state standards during the years shown. There is no federal standard for 1-hour ozone, annual PM_{10}, or 24-hour SO_2, nor is there a state 24-hour standard for $PM_{2.5}$.
[a] Measurements of PM_{10} and $PM_{2.5}$ are usually collected every 6 days and every 1 to 3 days, respectively. Number of days exceeding the standards is a mathematical estimate of the number of days concentrations would have been greater than the level of the standard had each day been monitored. The numbers in parentheses are the measured number of samples that exceeded the standard.

2.4 Significance Criteria and Methodology

2.4.1 Thresholds of Significance

Appendix G of the CEQA guidelines (14 CCR 15000 et seq.) provides guidance for evaluating whether a development project may result in significant impacts. Based on Appendix G of the CEQA Guidelines, the Project would have a significant impact on air quality if the Project would:

1. Conflict with or obstruct implementation of the applicable air quality plan.
2. Violate any air quality standard or contribute substantially to an existing or projected air quality violation.
3. Result in a cumulatively considerable net increase of any criteria pollutant for which the proposed project region is non-attainment under an applicable federal or state

ambient air quality standard (including releasing emissions which exceed quantitative thresholds for O_3 precursors).

4. Expose sensitive receptors to substantial pollutant concentrations.
5. Create objectionable odors affecting a substantial number of people.

Appendix G of the CEQA Guidelines (14 CCR 15000 et seq.) indicates that, where available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to determine whether the Project would have a significant impact on air quality. The SJVAPCD *Guidance for Assessing and Mitigating Air Quality Impacts* has established emissions-based thresholds of significance for criteria pollutants (SJVAPCD 2015b), which are depicted in Table 4. As shown in Table 4, the SJVAPCD has established significance thresholds for construction emissions and operational permitted and non-permitted equipment and activities, and it recommends evaluating impact significance for these categories separately. These thresholds of significance are based on a calendar-year basis, although construction emissions are assessed on a rolling 12-month period.

Table 4
San Joaquin Valley Air Pollution Control District California Environmental Quality Act Significance Thresholds for Criteria Pollutants

Pollutant	Construction Emissions and Operational Emissions (tons per year)
ROG	10
NO_x	10
CO	100
SO_x	27
PM_{10}	15
$PM_{2.5}$	15

Source: SJVAPCD 2015b

In addition to the annual emissions mass thresholds described in Table 4, the SJVAPCD has also established screening criteria to determine whether a project would result in a CO hotspot at affected roadway intersections (SJVAPCD 2015b). If neither of the following criteria are met at any of the intersections affected by the project, the project would result in no potential to create a violation of the CO standard:

- A traffic study for the project indicates that the LOS on one or more streets or at one or more intersections in the project vicinity will be reduced to LOS E or F.
- A traffic study indicates that the project will substantially worsen an already existing LOS F on one or more streets or at more or more intersections in the project vicinity.

Toxic Air Contaminants

The SJVAPCD has established thresholds of significance for combined TAC emissions from the operations of both permitted and non-permitted sources (SJVAPCD 2015b). Projects that have the potential to expose the public to TACs in excess of the following thresholds would be considered to have a significant air quality impact:

- Probability of contracting cancer for the maximally exposed individual equals or exceeds 20 in 1 million people.[6]
- Hazard Index[7] for acute and chronic noncarcinogenic TACs equals or exceeds 1 for the maximally exposed individual.

Odors

As described in the *Guidance for Assessing and Mitigating Air Quality Impacts*, due to the subjective nature of odor impacts, there are no quantitative thresholds to determine if potential odors would have a significant impact (SJVAPCD 2015b). Projects must be assessed for odor impacts on a case-by-case basis for the following two situations:

- **Generators:** Projects that would potentially generate odorous emissions proposed to locate near existing sensitive receptors or other land uses where people may congregate.
- **Receivers:** Residential or other sensitive receptor projects or other projects built for the intent of attracting people locating near existing odor sources.

The SJVAPCD has identified some common types of facilities that have been known to produce substantial odors, as well as screening distances between these odor sources and receptors. These are depicted in Table 5.

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6 The cancer risk threshold was increased from 10 to 20 in 1 million with approval of APR 1906 (Framework for Performing Health Risk Assessments) on June 30, 2015.

7 Non-cancer adverse health impact, both for acute (short-term) and chronic (long-term) health effects, is measured against a hazard index, which is defined as the ratio of the predicted incremental exposure concentration from the project to a published reference exposure level that could cause adverse health effects as established by the Office of Environmental Health Hazard Assessment. The ratio (referred to as the hazard quotient) of each noncarcinogenic substance that affects a certain organ system is added together to produce an overall hazard index for that organ system.

Table 5
Screening Levels for Potential Odor Sources

Type of Facility	Screening Distance (miles)
Wastewater treatment facility	2
Sanitary landfill	1
Transfer station	1
Composting facility	1
Petroleum facility	2
Asphalt batch plant	1
Chemical manufacturing	1
Fiberglass manufacturing	1
Painting/coating (i.e., auto body shop)	1
Food processing facility	1
Feed lot / dairy	1
Rendering plant	1

Source: SJVAPCD 2015b

If the project would result in an odor source and sensitive receptors being located within these screening distances, additional analysis would be required. For projects involving new receptors locating near an existing odor source where there is currently no nearby development and for new odor sources locating near existing receptors, the SJVAPCD recommends the analysis be based on a review of odor complaints for similar facilities, with consideration also given to local meteorological conditions, particularly the intensity and direction of prevailing winds. Regarding the complaint record of the odor source facility (or similar facility), the facility would be considered to result in significant odors if there has been:

- More than one confirmed complaint per year averaged over a 3-year period, or
- Three unconfirmed complaints[8] per year averaged over a 3-year period.

2.4.2 Approach and Methodology

2.4.2.1 Construction

Emissions from the construction phase of the Project were estimated using CalEEMod Version 2016.3.2 (CAPCOA 2017). Construction scenario assumptions, including phasing, equipment mix, and vehicle trips, were based on information provided by the Project Applicant and CalEEMod default values when Project specifics were not known.

8 An unconfirmed complaint means that either the odor/air contaminant release could not be detected or the source/facility cannot be determined (SJVAPCD 2015b).

For purposes of estimating Project emissions, and based on information provided by the Project Applicant, it is assumed that construction activities beginning with the decommissioning of the existing wind turbines would commence in October 2019 and would last approximately one year, ending in October 2020. The analysis and modeling prepared herein, assumes the Project-related construction activities would commence in October 2019 and completion in July 2020. This was the estimated commencement and completion dates when the Project construction schedule was originally prepared in November 2018. The estimated commencement date for Project construction is now going to occur at a date further into the future. However, for the purposes of construction modeling, the models do not need to use the exact commencement and completion dates to accurately represent the project construction emissions. This is because state and local regulations, restrictions, and increased market penetration of cleaner construction equipment are anticipated to continue to reduce emissions in the future. In other words, because California's construction related emission sources are regulated and will foreseeably continue to be more strictly regulated in the future, project emissions are reasonably expected to continue to decline. Thus, by utilizing an earlier start date of October 2019, this analyses' estimated emissions likely overstate actual emission levels. Therefore, the analysis and modeling included herein continue to provide an accurate and conservative assessment of the Project's construction-related air pollutant emissions.

- Turbine Decommissioning: 4 months (October 2019–January 2020)
- Access Roads: 4 months (October 2019–January 2020)
- Substation: 5 months (November 2019–March 2020)
- Foundations: 3 months (January 2020–March 2020)
- Collection: 3 months (February 2020–April 2020)
- Turbine Installation: 2 months (March 2020–April 2020)
- Transmission Line: 5 months (March 2020–July 2020)
- O&M Building: 5 months (March 2020–July 2020)
- Reclamation: 2 months (July 2020–August 2020)
- Turbine Precommissioning/Commissioning: 3 months (June 2020–August 2020)
- Final Testing/Close Out: 2 months (August 2020–October 2020)

Construction worker estimates, vendor truck trips, and number of haul truck trips by construction phase were provided by the Project Applicant. CalEEMod default trip length values for vendor and haul trucks were updated to conservatively assume an approximate 40-mile trip distance to the San Francisco Bay Area. The closest batch plant to the Project site is located approximately 28 miles to the east which was assumed for the aggregate material deliveries during foundation work. Other vendor truck deliveries were assumed to have an average trip length of 25 miles. In addition, turbines would require 1–2 deliveries for motor and freight parts. The demolition of the existing turbines was assumed to require approximately 6 haul trucks per day.

The construction equipment mix and vehicle trips used for estimating the Project-generated construction emissions are shown in Table 6.

Table 6
Construction Workers, Vendor Trips, and Equipment Use per Day

	One-Way Vehicle Trips			Equipment		
Construction Phase	*Average Daily Worker Trips*	*Average Daily Vendor Truck Trips*	*Total Haul Truck Trips*	*Equipment Type*	*Quantity*	*Usage Hours*
Turbine Decommissioning	80	0	1,068	Excavators	4	8
				Forklifts	2	8
				Skid Steer Loaders	2	4
				Tractors/Loaders/Backhoes	2	4
Access Roads	46	36	2,412	Graders	3	4
				Rollers	3	4
				Rubber Tired Dozers	5	4
				Tractors/Loaders/Backhoes	3	4
Substation	36	2	0	Excavators	1	4
				Forklifts	2	8
Foundations	90	176	294	Cranes	2	8
				Excavators	2	4
				Forklifts	2	8
				Other Construction Equipment	1	4
				Rollers	2	4
				Rubber Tired Dozers	2	4
Collection	36	2	0	Trencher	1	4
				Forklifts	10	8
				Bore/Drill Rig	1	6
				Rubber Tired Dozers	1	4
Turbine Installation	100	40	0	Cranes	7	8
				Forklifts	8	8
Transmission Line	24	12	0	Cranes	2	8
				Other Construction Equipment	2	4

Table 6
Construction Workers, Vendor Trips, and Equipment Use per Day

	One-Way Vehicle Trips			Equipment		
Construction Phase	*Average Daily Worker Trips*	*Average Daily Vendor Truck Trips*	*Total Haul Truck Trips*	*Equipment Type*	*Quantity*	*Usage Hours*
O&M Building	30	2	0	Excavators	1	4
				Forklifts	1	8
				Rubber Tired Dozers	1	4
O&M Building – Architectural Coatings	10	0	0	Air Compressor	1	6
Reclamation	20	0	0	Rubber Tired Dozers	4	4
				Other Construction Equipment	1	4
Turbine Precommissioning/Commissioning	10	0	0	N/A	N/A	N/A
Final Testing/Close Out	10	0	0	N/A	N/A	N/A

Notes: See Appendix A for details.
N/A = not applicable (no off-road construction equipment associated with the proposed activity phase)

The decommissioning stage of the Project consists of dismantling and removing the existing wind turbine generators (WTG) and removing the existing overhead collection line and poles, if elected not to re-use them.

The decommissioning process for the Project is expected to follow these steps:

- The contractor will mobilize staff and equipment to perform the work, including setting up a field office, hiring personnel, and arranging for utilities, along other general decommissioning requirements.
- Construction permits would be obtained, and a stormwater pollution prevention plan, a spill prevention control and countermeasure plan, and other documents as required by the County would be submitted prior to the start of decommissioning field operations. These documents include a Project health and safety plan, revegetation plan, site reclamation and monitoring plan, construction notification plan, noxious weed and invasive species control plan, dust control plan, and traffic control plan for the decommissioning phase of the Project.
- Cranes and other construction equipment sufficient to dismantle and remove the existing WTGs would be mobilized to the site.

- Gearboxes, transformers, and hydraulic systems would be drained of fluids, which would be put into appropriate containers and would be transported and disposed of in accordance with all state and federal environmental regulations.
- The contractor would dismantle and remove the rotor, nacelle, towers, and transformers, and transport the entire WTG off site. It is anticipated that the towers and nacelle would be reduced to manageable-sized pieces on-site to facilitate movement off-site to recycling facilities. Blades would be cut up into manageable- and appropriately sized pieces to be hauled to an appropriate recycling facility or to an approved disposal site. If the resale market for used wind turbines and components is viable, some of the turbines and components, such as blades, may be transported off site intact for resale.
- All underground cables would be de-energized and abandoned in place.
- Crane paths would be de-compacted, regraded, and restored to as close as reasonably possible to pre-construction condition.
- The use of temporary staging areas during decommissioning would be kept to a minimum. If temporary staging areas are required, they will also likely be used for the construction phase of the Project, after which they would be restored and re-vegetated after use.
- The Project site would be cleaned, and any remaining debris would be removed and disposed of off-site.

The existing network of permanent access roads would be retained and reused for the new wind turbines. In addition to the existing roads, permanent access and maintenance roads would be constructed to provide access and circulation within the Project. These access roads will consist of 20-foot-wide permanent roads with an approximate 6-foot shoulder on either side for storm drainage, to provide access to each wind turbine and ancillary equipment. These same permanent access roads would be used during construction, although the width of these roads may be temporarily increased to up to 40 feet wide to accommodate cranes and larger construction equipment.

While an existing, on-site laydown area may be temporarily expanded and used to provide construction parking and stage wind turbine components, construction equipment, and construction materials, it is more likely that an existing, off-site laydown area would be used to stage these materials and provide construction parking. Steel construction containers would be used to securely store specialized equipment inside the perimeter of the laydown area. If on-site, the temporary laydown and parking area would be placed strategically within the Project to optimize construction activities while also minimizing off-site visual impacts to the extent feasible. After construction, all temporary disturbances and construction containers associated with the staging/storage areas would be removed, and these areas would be restored.

An approximately 5-acre temporary work area for each wind turbine site would be used for the crane pad, equipment laydown, and other construction-related needs. Within this temporary work area, a crane pad is required for supporting the large tower erection crane. The crane pad will consist of a compacted native soil or compacted aggregate base gravel area. The topsoil from the crane pads, if any, would be used at adjacent locations during restoration activities. Upon completion of construction, a permanent 30-foot by 50-foot gravel driveway would be placed around the base of the foundation. The gravel would provide a stable surface area for maintenance vehicles.

To support the construction crane for turbine erection, a compacted-soil crane pad with a slope of 2% or less would be required. The construction crane pad will not have an asphalt surface, and underlying soils would be compacted to provide a soil bearing capacity designed to provide a stable foundation for the crane. In locations where this is not feasible, a different type of crane mat would be used to stabilize the crane.

The Project's complete electrical collector system would consist of a network of circuits that would collect and deliver electricity from each of the wind turbine generators to the existing Pacific Gas and Electric (PG&E) owned Los Banos substation located south of the O'Neill Forebay, east of the project site. The collector system typically includes three-phase conductor wires, fiber-optic cable, and a copper ground-conductor wire.

The Project would install an entirely new overhead or underground collector system (or combination, thereof) for connecting to the Los Banos substation. An approximately 100-foot-wide temporary disturbance would be required along the installation path for portions of the new overhead collector system and a 50-foot-wide disturbance would be required for the underground collector system component. This system would follow new and existing Project access roads to the extent possible in order to minimize the temporarily disturbed areas associated with the installation. The underground system would be placed within an approximately within a 46-inch-deep and approximately 12-inch-wide cable trench generally located along the length of the turbine access roads. Any topsoil would be stripped and set aside as trenching occurred, and then it would be replaced as the uppermost layer during backfill.

For portions of a new collector system that may be installed overhead and requiring new poles, above ground portions of the electrical collector system would have a maximum pole height of 90 feet and wire heights ranging from 20 to 30 feet above the ground unless special circumstances warrant different clearances.

Blasting

Blasting operations may be required for turbine installation. Rock blasting is the controlled use of explosives to excavate, break down, or remove rock. The result of rock blasting is often known as a rock cut. The most commonly used explosives today are ammonium nitrate/fuel oil (ANFO)–based blends due to their lower cost compared to dynamite. The chemistry of ANFO detonation is the reaction of ammonium nitrate with a long-chain alkane to form NO_x, carbon dioxide, and water. When detonation conditions are optimal, these gases are the only products. In practical use, such conditions are impossible to attain, and blasts produce moderate amounts of other gases. The EPA's Compilation of Air Pollutant Emission Factors (AP-42), Section 13.3 – Explosives Detonation (EPA 1980), provided the emissions factors for CO, NO_x, and SO_x used in this assessment. According to AP 42, "Unburned hydrocarbons also result from explosions, but in most instances, methane is the only species that has been reported" (EPA 1980); methane is not a VOC, and a methane emission factor has not been determined for ANFO.

AP-42 states that CO is the pollutant produced in greatest quantity from explosives detonation. All explosives produce measurable amounts of CO. Particulates are produced as well, but such large quantities of particulate are generated during shattering of the rock and earth by the explosive that the quantity of particulates from the explosive charge cannot be distinguished. Accordingly, AP-42, Section 11.9 – Western Surface Coal Mining (EPA 1998), provided the basis for the PM_{10} and $PM_{2.5}$ emissions factors. The emissions factors are based on the horizontal area disturbed during blasting.

It was assumed that blasting operations would occur during the grading for each wind turbine which would occur in 2020. No more than one blast per day would occur during construction activities. Based off experience with other similar types of projects, it was assumed that an average of 0.06 tons of ANFO would be applied per blast. All blasting activity would comply with local and state regulations including Section 9.24.055 of the County of Merced Fire Code.

2.4.2.2 Operation

Emissions from the operational phase of the Project were estimated using CalEEMod Version 2016.3.2. Operational year 2021 was assumed upon construction completion.

Area Sources

CalEEMod was used to estimate operational emissions from area sources, including emissions from consumer product use and architectural coatings for the O&M building. Consumer products are chemically formulated products used by household and institutional consumers, including detergents; cleaning compounds; polishes; floor finishes; cosmetics; personal care products; home, lawn, and garden products; disinfectants; sanitizers; aerosol paints; and automotive specialty products. Other paint products, furniture coatings, or architectural coatings are not considered consumer products (CAPCOA 2017). Consumer product VOC emissions are estimated in CalEEMod based on the floor area of the buildings and on the default factor of pounds of VOC per building square foot per day.

VOC off-gassing emissions result from evaporation of solvents contained in surface coatings such as in paints and primers using during building maintenance. CalEEMod calculates the VOC evaporative emissions from application of surface coatings based on the VOC emission factor, the building square footage, the assumed fraction of surface area, and the reapplication rate. The VOC emission factor is based on the VOC content of the surface coatings, and SJVAPCD's Rule 4601 (Architectural Coatings) governs the VOC content for interior and exterior coatings. The model default reapplication rate of 10% of area per year is assumed. Consistent with CalEEMod defaults, it is assumed that the surface area for painting equals 2.7 times the floor square footage, with 75% assumed for interior coating and 25% assumed for exterior surface coating.

Energy Sources

As represented in CalEEMod, energy sources include emissions associated with building electricity and natural gas usage (non-hearth). Electricity use would contribute indirectly to criteria air pollutant emissions; however, the emissions from electricity use are only quantified for GHGs in CalEEMod, since criteria pollutant emissions occur at the site of the power plant, which is typically off site. There would be no natural gas service to the site. Therefore, no energy-related criteria air pollutant emissions were quantified for the Project.

Mobile Sources

Mobile sources for the Project would primarily be motor vehicles (automobiles and light-duty trucks) traveling to and from the Project site. Motor vehicles may be fueled with gasoline, diesel, or alternative fuels. Based on data provided by the Applicant, the proposed Project is anticipated to generate 16 round-trips per day by worker vehicles traveling to and from the operations and maintenance building. CalEEMod default data, including trip characteristics, variable start information, and emissions factors were conservatively used for the model inputs to estimate daily emissions from proposed vehicular sources. Workers were conservatively assumed to travel from Los Banos. Project-related traffic was assumed to include a mixture of vehicles in accordance with the model outputs for traffic. CalEEMod default emissions factors and vehicle fleet mix were conservatively used for the model inputs to estimate daily emissions from proposed vehicular sources.[9] Emission factors representing the vehicle mix and emissions for 2021 were used to estimate emissions associated with full build-out of the Project.

Stationary Sources

The Project would include a 100-kilowatt (kW) emergency generator at the O&M Building. The generator was assumed to run for testing and maintenance approximately 1 hour per day, or approximately 100 hours per year in accordance with the CARB airborne toxic control measure (ATCM) for stationary sources (CARB 2011). The generator was assumed to be a 440 horsepower Tier 4 Final diesel engine and emission factors were taken from Appendix D of the CalEEMod User's Guide (CAPCOA 2017). Emissions were estimated based on a 33% average engine load.

Applicable Project Design Features

To reduce project-generated construction emissions, the Project would implement the following project design feature:

PDF-AQ-1 **Construction Equipment.** For off-road equipment with engines rated at 50 horsepower or greater, no construction equipment will be used that is less than Tier 3. An exemption from these requirements may be granted by the California Department of Parks and Recreation in the event that the Applicant documents that (1) equipment with the required tier is not reasonably available (e.g., reasonability factors to be considered include those available within California Department of Parks and Recreation within the scheduled construction period), and (2) corresponding reductions in criteria pollutant emissions are achieved from other construction equipment.

2.5 Impact Analysis

2.5.1 Would the Proposed Project Conflict with or Obstruct Implementation of the Applicable Air Quality Plan?

A project is non-conforming with an air quality plan if it conflicts with or delays implementation of any applicable attainment or maintenance plan. The SJVAPCD has prepared plans to attain federal and state O_3 and particulate matter ambient air quality standards as required under the federal and California Clean Air Act, as detailed in Section 2.2.3, Local Regulations. The SJVAPCD has established thresholds of significance for criteria pollutant emissions, which are based on SJVAPCD

9 Motor vehicles may be fueled with gasoline, diesel, or alternative fuels. The default vehicle mix (vehicle class distribution including automobiles, trucks, buses, motorcycles) provided in CalEEMod 2016.3.2, which is based on CARB's Mobile Source Emissions Inventory model, EMFAC Version 2014, was applied.

New Source Review offset requirements for stationary sources. Stationary sources in the SJVAPCD jurisdiction are subject to some of the toughest regulatory requirements in the nation. Emission reductions achieved through implementation of SJVAPCD offset requirements are a major component of the SJVAPCD's air quality plans. Thus, projects with emissions below the thresholds of significance for criteria pollutants would be determined to not conflict or obstruct implementation of the SJVAPCD's air quality plan (SJVAPCD 2015a). As discussed in Section 2.5.2, the Project would not exceed SJVAPCD thresholds for criteria air pollutants during construction or operations. Therefore, the Project would not conflict with or delay the implementation of the SJVAPCD attainment plans and would result in a less-than-significant impact.

2.5.2 Would the Proposed Project Violate Any Air Quality Standard or Contribute Substantially to an Existing or Projected Air Quality Violation?

Construction Emissions

Construction of Project components would temporarily generate ROG, NO_x, CO, SO_x, PM_{10}, and $PM_{2.5}$ emissions that would result in short-term impacts on ambient air quality in the area. Emissions would originate from mobile and stationary construction equipment exhaust, on-road vehicle (workers and trucks) exhaust, dust from clearing the land, and exposed soil eroded by wind. Construction-related emissions would vary substantially depending on the level of activity, length of the construction period, specific construction operations, types of equipment, number of personnel, wind and precipitation conditions, and soil moisture content. On-site sources of criteria air pollutant emissions would include off-road equipment and fugitive dust, and off-site sources would include hauling and vendor trucks and worker vehicles. Entrained dust results from the exposure of earth surfaces to wind from the direct disturbance and movement of soil, resulting in PM_{10} and $PM_{2.5}$ emissions. The Project would be required to comply with SJVAPCD Regulation VIII (Fugitive PM_{10} Prohibition) by law, which specifies standard construction practices to reduce fugitive dust emissions. Pursuant to Regulation VIII, Rule 8021, Section 6.3, the Project would be required to develop, prepare, submit, obtain approval of, and implement a dust control plan, which would reduce fugitive dust impacts to less than significant for Project construction. Furthermore, the Applicant has committed to using Tier 3 or equivalent off-road equipment during the construction of this project per PDF-AQ-1, which is assumed in the project-generated construction emissions calculations.

As discussed in Section 2.4.2, criteria air pollutant emissions associated with temporary construction activity were quantified using CalEEMod. Construction schedule assumptions, including phase type, duration, and sequencing, were based on information provided by the Applicant and is intended to represent a reasonable scenario based on the best information available. Default values provided in CalEEMod were used where detailed Project information was not available.

Table 7 presents the estimated annual construction emissions generated during construction of the Project including blasting emissions. Details of the emission calculations are provided in Appendix A.

Table 7
Estimated Annual Construction Criteria Air Pollutant Emissions

Year	ROG	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Tons per Year					
2019	0.12	2.03	1.88	0.01	1.75	0.34
2020	0.34	5.13	4.79	0.01	4.53	0.80
SJVACPD Threshold	*10*	*10*	*100*	*27*	*15*	*15*
Threshold Exceeded?	**No**	**No**	**No**	**No**	**No**	**No**

Notes: CO = carbon monoxide; NO_x = oxides of nitrogen; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; SJVAPCD = San Joaquin Valley Air Pollution Control District; SO_x = sulfur oxides; ROG = reactive organic gases
See Appendix A for complete results.
These emissions reflect implementation of PDF-AQ-1, which requires that all construction equipment with a horsepower greater than 50 would have certified Tier 3 interim engines and compliance with SJVAPCD Rule 8021.

As shown in Table 7, annual construction emissions would not exceed the SJVAPCD annual significance thresholds for ROG, NO_x, CO, SO_x, PM_{10} or $PM_{2.5}$ during construction.

The Project would comply with SJVAPCD Rule 8021 to control fugitive dust emissions generated during grading activities, which would be required as a condition of approval. Standard construction practices that would be employed to reduce fugitive dust emissions include:

- Develop a dust control plan to outline how the Project will comply with Rule 8021 and minimize fugitive dust during construction,
- Minimize and cleanup trackout onto paved roads,
- Cover haul trucks,
- Rapid cleanup of Project-related trackout or spills on paved roads,
- Minimize grading and soil movement when winds exceed 30 miles per hour, and
- Implement a speed limit of 15 miles per hour during all construction phases for vehicles travelling on un-paved roads.

The SJVAPCD recommends that an AAQA be performed when emissions of any criteria pollutant would equal or exceed any applicable threshold of significance for criteria pollutants or 100 pounds per day of any criteria pollutant (SJVAPCD 2015a). As presented Table 8, the Project would not exceed 100 lbs/day on-site for any criteria air pollutant during construction in 2019 and 2020; therefore, an AAQA is not required.

Table 8
Estimated Daily Construction Criteria Air Pollutant Emissions

Year	ROG	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Pounds per Day					
2019	1.83	37.01	49.28	0.07	8.93	5.63
2020	17.57	75.47	97.05	0.26	14.15	8.75

Notes: CO = carbon monoxide; NO_x = oxides of nitrogen; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; SJVAPCD = San Joaquin Valley Air Pollution Control District; SO_x = sulfur oxides; ROG = reactive organic gases
See Appendix A for complete results.
The values shown are the maximum summer or winter daily emissions results from CalEEMod.
These emissions reflect implementation of PDF-AQ-1, which requires that all construction equipment with a horsepower greater than 50 would have certified Tier 3 interim engines and compliance with SJVAPCD Rule 8021.

Operational Emissions

The Project involves development of 40 wind turbines and associated infrastructure. Operation of the Project would generate ROG, NO_x, CO, SO_x, PM_{10}, and $PM_{2.5}$ emissions from mobile sources, including vehicle trips from maintenance vehicles. As discussed in Section 2.4.2.2, Operation, pollutant emissions associated with long-term operations were quantified using CalEEMod. Project-generated mobile source emissions were estimated based on Project-specific trip rates.

Table 9 presents the annual emissions associated with the first full year of Project operations (year 2021). Details of the emission calculations are provided in Appendix A.

Table 9
Estimated Annual Operational Criteria Air Pollutant Emissions

Year	ROG	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Tons per Year					
Area	0.02	<0.01	<0.01	<0.01	<0.01	<0.01
Energy	<0.01	<0.01	0.01	<0.01	<0.01	<0.01
Mobile	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Stationary	<0.01	0.01	0.07	<0.01	<0.01	<0.01
Total Annual Emissions	**0.03**	**0.01**	**0.08**	**<0.01**	**<0.01**	**<0.01**
SJVAPCD Threshold	*10*	*10*	*100*	*27*	*15*	*15*
Threshold Exceeded?	No	No	No	No	No	No

Notes: CO = carbon monoxide; NO_x = oxides of nitrogen; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; SJVAPCD = San Joaquin Valley Air Pollution Control District; SO_x = sulfur oxides; ROG = reactive organic gases.
See Appendix A for complete results.

2.5.3 Would the Proposed Project Result in a Cumulatively Considerable Net Increase of Any Criteria Pollutant for Which the Proposed Project Region Is Non-Attainment Under an Applicable Federal or State Ambient Air Quality Standard (Including Releasing Emissions Which Exceed Quantitative Thresholds For Ozone Precursors)?

For purposes of this air quality analysis and consistent with SJVAPCD guidance documents, actions that exceed criteria pollutant NAAQS (i.e., primary standards designed to safeguard the health of people considered to be sensitive receptors while outdoors and secondary standards designed to safeguard human welfare) or the EPA's Prevention of Significant Deterioration (PSD) Significant Impact Levels would result in significant impacts. Additionally, actions that violate CAAQS developed by CARB are considered significant.

Determination of whether project emissions would violate any ambient air quality standard is largely a function of air quality dispersion modeling. The SJVAPCD recommends that an ambient air quality analysis be performed when emissions of any criteria pollutant would equal or exceed any applicable threshold of significance for criteria pollutants or 100 lbs/day of any criteria pollutant. If the impacts resulting from a project's emissions would not exceed the CAAQS and NAAQS at the project's property boundaries, the project would not violate any air quality standard or contribute substantially to an existing or projected air quality violation (SJVAPCD 2015b). The CAAQS and NAAQS are shown in Table 1 of Section 2.2, Regulatory Framework. As shown in Table 10, maximum daily on-site emissions with mitigation would not exceed 100 lbs/day for any criteria air pollutant; therefore an ambient air quality standards analysis was not required and no State or Federal ambient air quality standards would be exceeded.

Air pollution is largely a cumulative impact. The nonattainment status of regional pollutants is a result of past and present development, and the SJVAPCD develops and implements plans for future attainment of ambient air quality standards. Based on these considerations, project-level thresholds of significance for criteria pollutants are relevant in the determination of whether a project's individual emissions would have a cumulatively significant impact on air quality. As described in Section 2.5.2, the Project would have a potentially significant impact for construction and a less-than-significant impact for operations.

The SJVAB is a nonattainment area for O_3, PM_{10}, and $PM_{2.5}$ under the NAAQS and/or CAAQS. The poor air quality in the SJVAB is the result of cumulative emissions from motor vehicles, off-road equipment, commercial and industrial facilities, and other emission sources. Projects that emit these pollutants or their precursors (i.e., ROG and NO_x for O_3) potentially contribute to poor air quality. Table 7 demonstrates that the annual construction emissions associated with the Project would not exceed the SJVAPCD significance thresholds for criteria pollutants. Accordingly, the Project would result in a less than significant increase in emissions of nonattainment pollutants. The Project would not generate a long-term increase in operational emissions, as shown in Table 9. Furthermore, the Project would not conflict with the SJVAPCD Ozone Attainment Plans, or the PM_{10} or $PM_{2.5}$ Attainment Plan, which address the cumulative emissions in the SJVAB and account for emissions associated with construction activity in the SJVAB.

As shown in Section 2.5.2, the Project would not exceed any State or Federal ambient air quality standards during the construction of the Project. Operation of the Project would include very minimal emission generating activity. Based on these considerations, the Project would not result in a cumulatively considerable increase in emissions of nonattainment pollutants. Impacts would be less than significant.

2.5.4 Would the Proposed Project Expose Sensitive Receptors to Substantial Pollutant Concentrations?

The SJVAPCD considers hospitals, schools, parks, playgrounds, daycare centers, nursing homes, convalescent facilities, and residential areas as sensitive receptor land uses (SJVAPCD 2015a). Land uses surrounding the proposed work areas consists primarily of agricultural land. As discussed in Section 2.1.3, the Project is located within Pacheco State Park, proximate sensitive receptors are scattered rural residential land uses, with the nearest sensitive receptor located approximately 0.30-mile (1,604 feet) south of the project site.

The greatest potential for exposure of sensitive receptors to air contaminants would occur during the temporary construction phase, when soil would be disturbed and equipment would be used for site grading, materials delivery, and turbine installation. Potential exposure to emissions would vary substantially from day to day, depending on the amount of work being conducted, weather conditions, location of receptors, and exposure time. The construction-phase emissions in this analysis are estimated conservatively based on worst-case conditions, with maximum levels of construction activity occurring simultaneously within a short period of time.

Criteria Air Pollutant Exposure

As discussed in Section 2.5.2, the Project would not result in localized criteria air pollutant emissions concentrations that would exceed the applicable SJVAPCD thresholds during construction. Additionally, operations would consist of routine inspection and maintenance and would not expose sensitive receptors to substantial criteria air pollutant concentrations.

Valley Fever Exposure

There are no specific thresholds for the evaluation of potential Valley Fever exposure. The valley fever fungal spores, *Coccidioides immitis,* live in the top 2 to 12 inches of soil in many parts of the state, including parts of the County. When fungal spores are present, any work activity that disturbs the soil, such as digging, grading, or other earth-moving operations, or vehicle operation on dirt roads, can cause the spores to become airborne, thereby increasing the risk of valley fever exposure (California Department of Industrial Relations 2013). All workers on sites where the fungus is present, and who are exposed to dusty conditions and wind-blown dusts, are at increased risk of becoming infected.

The fungal spores are too small to be seen by the naked eye, and there is no reliable way to test the soil for spores before working in a particular place. Accordingly, the valley fever analysis assumes the potential presence of the fungal spores within the Project site. The potential for valley fever exposure as a result of the Project is evaluated based on the anticipated earth-moving activities, and considers compliance with Rule 8021 which requires development and implementation of a dust control plan to help control the release of the *Coccidioides immitis* fungus during construction activities.

Health Impacts of Carbon Monoxide

Mobile source impacts occur on two scales of motion. Regionally, Project-related travel would add to regional trip generation and increase the vehicle miles traveled within the local airshed and the SJVAB. Locally, Project-generated traffic would be added to the County's roadway system near the Project site during construction. If such traffic occurs during periods of poor atmospheric ventilation, is composed of a large number of vehicles "cold-started" and operating at pollution-inefficient speeds and is operating on roadways already crowded with non-Project traffic, there is a potential for the formation of microscale CO hotspots in the area immediately around points of congested traffic. Because of continued improvement in vehicular emissions at a rate faster than the rate of vehicle growth and/or congestion, the potential for CO hotspots in the SJVAB is steadily decreasing.

The Project would have trip generation associated with construction worker vehicles and vendor trucks. The California Code of Regulations, 40 CFR 93.123(c)(5), Procedures for Determining Localized CO, PM_{10}, and PM_2 Concentrations (hot-spot analysis), states that "CO, PM_{10}, and $PM_{2.5}$ hot-spot analyses are not required to consider construction-related activities, which cause temporary increases in emissions. Each site which is affected by construction-related activities shall be considered separately, using established 'Guideline' methods. Temporary increases are defined as those which occur only during the construction phase and last five years or less at any individual site" (40 CFR 93.123). While Project construction would involve on-road vehicle trips from trucks and workers during construction, construction activities would last approximately one year and would not require a Project-level construction hotspot analysis.

In regards to operational activities, the Project would employing up to eight full-time employees. Accordingly, proposed activities would not generate traffic that would contribute to potential adverse traffic impacts that may result in the formation of CO hotspots. An operational CO hotspot evaluation is also not required. As such, potential Project-generated impacts associated with CO hotspots would be less than significant.

2.5.5 Would the Proposed Project Create Objectionable Odors Affecting a Substantial Number of People?

Odors are a form of air pollution that is most obvious to the general public and can present problems for both the source and surrounding community. Although offensive odors seldom cause physical harm, they can be annoying and cause concern. Odors would be potentially generated from vehicles and equipment exhaust emissions during construction of the Project. Odors produced during construction would be attributable to concentrations of unburned hydrocarbons from tailpipes of construction equipment. Such odors are temporary and generally occur at low levels that would not result in nuisance. In regards to long-term operations, the Project entails development of 40 wind turbine including ancillary facilities and would not result in the creation of a land use that is associated with odors. Therefore, Project construction and operations would result in an odor impact that is less than significant. Therefore, impacts associated with odors would be considered less than significant.

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3 GREENHOUSE GAS EMISSIONS

3.1 Environmental Setting

3.1.1 Climate Change Overview

Climate change refers to any significant change in measures of climate, such as temperature, precipitation, or wind patterns, lasting for an extended period of time (decades or longer). Earth's temperature depends on the balance between energy entering and leaving the planet's system. Many factors, both natural and human, can cause changes in Earth's energy balance, including variations in the Sun's energy reaching Earth, changes in the reflectivity of Earth's atmosphere and surface, and changes in the greenhouse effect, which affects the amount of heat retained by Earth's atmosphere (EPA 2017a).

The greenhouse effect is the trapping and build-up of heat in the atmosphere (troposphere) near Earth's surface. The greenhouse effect traps heat in the troposphere through the following threefold process: Short-wave radiation emitted by the Sun is absorbed by Earth, Earth emits a portion of this energy in the form of long-wave radiation, and GHGs in the upper atmosphere absorb this long-wave radiation and emit it into space and toward Earth. The greenhouse effect is a natural process that contributes to regulating Earth's temperature and creates a pleasant, livable environment on Earth. Human activities that emit additional GHGs to the atmosphere increase the amount of infrared radiation that gets absorbed before escaping into space, enhancing the greenhouse effect and causing Earth's surface temperature to rise.

The scientific record of Earth's climate shows that the climate system varies naturally over a wide range of time scales, and that, in general, climate changes prior to the Industrial Revolution in the 1700s can be explained by natural causes such as changes in solar energy, volcanic eruptions, and natural changes in GHG concentrations. Recent climate changes, in particular the warming observed over the past century, however, cannot be explained by natural causes alone. Rather, it is extremely likely that human activities have been the dominant cause of that warming since the mid-twentieth century and is the most significant driver of observed climate change (IPCC 2013; EPA 2017a). Human influence on the climate system is evident from the increasing GHG concentrations in the atmosphere, positive radiative forcing, observed warming, and improved understanding of the climate system (IPCC 2013). The atmospheric concentrations of GHGs have increased to levels unprecedented in the last 800,000 years, primarily from fossil fuel emissions and secondarily from emissions associated with land use changes (IPCC 2013). Continued emissions of GHGs will cause further warming and changes in all components of the climate system, which is discussed further in Section 3.3.2, Potential Effects of Climate Change.

3.1.2 Greenhouse Gases

A GHG is any gas that absorbs infrared radiation in the atmosphere; in other words, GHGs trap heat in the atmosphere. As defined in California Health and Safety Code, Section 38505(g), for purposes of administering many of the state's primary GHG emissions reduction programs, GHGs include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF_6), and nitrogen trifluoride (NF_3). (See also CEQA Guidelines Section 15364.5.)[10] Some GHGs such as CO_2, CH_4, and N_2O occur naturally and are emitted into the atmosphere through natural processes and human activities. Of these gases, CO_2 and CH_4 are emitted in the greatest quantities from human activities. Manufactured GHGs, which have a much greater heat-absorption potential than CO_2, include fluorinated gases such as HFCs, PFCs, and SF_6, which are associated with certain industrial products and processes. The following paragraphs provide a summary of the most common GHGs and their sources.[11]

Carbon Dioxide. CO_2 is a naturally occurring gas and a by-product of human activities and is the principal anthropogenic GHG that affects Earth's radiative balance. Natural sources of CO_2 include respiration of bacteria, plants, animals, and fungus; evaporation from oceans; volcanic out-gassing; and decomposition of dead organic matter. Human activities that generate CO_2 are from the combustion of fuels such as coal, oil, natural gas, and wood and changes in land use.

Methane. CH_4 is produced through both natural and human activities. CH_4 is a flammable gas and is the main component of natural gas. Methane is produced through anaerobic (without oxygen) decomposition of waste in landfills, flooded rice fields, animal digestion, decomposition of animal wastes, production and distribution of natural gas and petroleum, coal production, and incomplete fossil fuel combustion.

Nitrous Oxide. N_2O is produced through natural and human activities, mainly through agricultural activities and natural biological processes, although fuel burning and other processes also create N_2O. Sources of N_2O include soil cultivation practices (microbial processes in soil and water), especially the use of commercial and organic fertilizers, manure management, industrial processes (e.g., in nitric acid production, nylon production, and fossil-fuel-fired power plants), vehicle emissions, and the use of N_2O as a propellant (e.g., in rockets, racecars, and aerosol sprays).

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10 Climate forcing substances include GHGs and other substances such as black carbon and aerosols. This discussion focuses on the seven GHGs identified in the California Health and Safety Code, Section 38505, as impacts associated with other climate forcing substances are not evaluated herein.

11 The descriptions of GHGs are summarized from the Intergovernmental Panel on Climate Change (IPCC) Second Assessment Report (IPCC 1995), IPCC Fourth Assessment Report (2007), CARB's "Glossary of Terms Used in GHG Inventories" (CARB 2017c), and EPA's "Glossary of Climate Change Terms" (EPA 2016d).

Fluorinated Gases. Fluorinated gases (also referred to as F-gases) are synthetic, powerful GHGs emitted from many industrial processes. Fluorinated gases are commonly used as substitutes for stratospheric O_3-depleting substances (e.g., chlorofluorocarbons, hydrochlorofluorocarbon, and halons). The most prevalent fluorinated gases include the following:

- **Hydrofluorocarbons:** HFCs are compounds containing only hydrogen, fluorine, and carbon atoms. HFCs are synthetic chemicals used as alternatives to O_3-depleting substances in serving many industrial, commercial, and personal needs. HFCs are emitted as by-products of industrial processes and are used in manufacturing.
- **Perfluorocarbons:** PFCs are a group of human-made chemicals composed of carbon and fluorine only. These chemicals were introduced as alternatives, with HFCs, to the O_3-depleting substances. The two main sources of PFCs are primary aluminum production and semiconductor manufacturing. Since PFCs have stable molecular structures and do not break down through the chemical processes in the lower atmosphere, these chemicals have long lifetimes, ranging between 10,000 and 50,000 years.
- **Sulfur Hexafluoride:** SF_6 is a colorless gas soluble in alcohol and ether and slightly soluble in water. SF_6 is used for insulation in electric power transmission and distribution equipment, semiconductor manufacturing, the magnesium industry, and as a tracer gas for leak detection.
- **Nitrogen Trifluoride:** NF_3 is used in the manufacture of a variety of electronics, including semiconductors and flat panel displays.

3.1.3 Global Warming Potential

Gases in the atmosphere can contribute to climate change both directly and indirectly. Direct effects occur when the gas itself absorbs radiation. Indirect radiative forcing occurs when chemical transformations of the substance produce other GHGs, when a gas influences the atmospheric lifetimes of other gases, and/or when a gas affects atmospheric processes that alter the radiative balance of the Earth (e.g., affect cloud formation or albedo) (EPA 2016d). The Intergovernmental Panel on Climate Change (IPCC) developed the global warming potential (GWP) concept to compare the ability of each GHG to trap heat in the atmosphere relative to another gas. The GWP of a GHG is defined as the ratio of the time-integrated radiative forcing from the instantaneous release of 1 kilogram of a trace substance relative to that of 1 kilogram of a reference gas (IPCC 2014). The reference gas used is CO_2; therefore, GWP-weighted emissions are measured in metric tons of CO_2 equivalent (MT CO_2e).

The current version of CalEEMod (version 2016.3.2) assumes that the GWP for CH_4 is 25 (so emissions of 1 MT of CH_4 are equivalent to emissions of 25 MT of CO_2), and the GWP for N_2O is 298, based on the IPCC Fourth Assessment Report (IPCC 2007). The GWP values identified in CalEEMod were applied to the Project.

3.2 Regulatory Setting

3.2.1 Federal Regulations

Massachusetts vs. EPA. On April 2, 2007, in *Massachusetts v. EPA*, the Supreme Court directed the EPA Administrator to determine whether GHG emissions from new motor vehicles cause or contribute to air pollution that may reasonably be anticipated to endanger public health or welfare, or whether the science is too uncertain to make a reasoned decision. In making these decisions, the EPA Administrator is required to follow the language of Section 202(a) of the federal Clean Air Act. On December 7, 2009, the Administrator signed a final rule with two distinct findings regarding GHGs under Section 202(a) of the Clean Air Act:

- The Administrator found that elevated concentrations of GHGs—CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6—in the atmosphere threaten the public health and welfare of current and future generations. This is referred to as the "endangerment finding."
- The Administrator further found the combined emissions of GHGs—CO_2, CH_4, N_2O, and HFCs—from new motor vehicles and new motor vehicle engines contribute to the GHG air pollution that endangers public health and welfare. This is referred to as the "cause or contribute finding."

These two findings were necessary to establish the foundation for regulation of GHGs from new motor vehicles as air pollutants under the Clean Air Act.

Energy Independence and Security Act. On December 19, 2007, President George W. Bush signed the Energy Independence and Security Act of 2007. Among other key measures, the act would do the following, which would aid in the reduction of national GHG emissions:

1. Increase the supply of alternative fuel sources by setting a mandatory Renewable Fuel Standard requiring fuel producers to use at least 36 billion gallons of biofuel in 2022.
2. Set a target of 35 miles per gallon for the combined fleet of cars and light trucks by model year 2020 and direct the National Highway Traffic Safety Administration (NHTSA) to establish a fuel economy program for medium- and heavy-duty trucks and create a separate fuel economy standard for work trucks.
3. Prescribe or revise standards affecting regional efficiency for heating and cooling products and procedures for new or amended standards, energy conservation, energy efficiency labeling for consumer electronic products, residential boiler efficiency, electric motor efficiency, and home appliances.

Federal Vehicle Standards. In response to the previously discussed U.S. Supreme Court ruling, the Bush Administration issued Executive Order (EO) 13432 in 2007 directing EPA, the Department of Transportation, and the Department of Energy to establish regulations that reduce GHG emissions from motor vehicles, non-road vehicles, and non-road engines by 2008. In 2009, NHTSA issued a final rule regulating fuel efficiency and GHG emissions from cars and light-duty trucks for model year 2011; and, in 2010, EPA and NHTSA issued a final rule regulating cars and light-duty trucks for model years 2012–2016 (EPA and NHTSA 2016).

In 2010, President Barack Obama issued a memorandum directing the Department of Transportation, Department of Energy, EPA, and NHTSA to establish additional standards regarding fuel efficiency and GHG reduction, clean fuels, and advanced vehicle infrastructure. In response to this directive, EPA and NHTSA proposed stringent, coordinated federal GHG and fuel economy standards for model years 2017–2025 light-duty vehicles. The proposed standards are projected to achieve 163 grams per mile of CO_2 in model year 2025, on an average industry-fleet-wide basis, which is equivalent to 54.5 miles per gallon if this level were achieved solely through fuel efficiency. The final rule was adopted in 2012 for model years 2017–2021. On January 12, 2017, the EPA finalized its decision to maintain the current GHG emissions standards for model years 2022–2025 cars and light trucks (EPA 2017b).

In addition to the regulations applicable to cars and light-duty trucks previously described, in 2011, EPA and NHTSA announced fuel economy and GHG standards for medium- and heavy-duty trucks for model years 2014–2018. The standards for CO_2 emissions and fuel consumption are tailored to three main vehicle categories: combination tractors, heavy-duty pickup trucks and vans, and vocational vehicles. According to EPA, this regulatory program will reduce GHG emissions and fuel consumption for the affected vehicles by 6%–23% over the 2010 baselines.

In August 2016, EPA and NHTSA announced the adoption of the phase two program related to the fuel economy and GHG standards for medium- and heavy-duty trucks. The phase two program will apply to vehicles with model year 2018–2027 for certain trailers, and model years 2021–2027 for semi-trucks, large pickup trucks, vans, and all types and sizes of buses and work trucks. The final standards are expected to lower CO_2 emissions by approximately 1.1 billion MT and reduce oil consumption by up to 2 billion barrels over the lifetime of the vehicles sold under the program (EPA and NHTSA 2016).

Clean Power Plan and New Source Performance Standards for Electric Generating Units. On October 23, 2015, EPA published a final rule (effective December 22, 2015) establishing the Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units (80 FR 64510–64660), also known as the Clean Power Plan. These guidelines prescribe how states must develop plans to reduce GHG emissions from existing fossil-fuel-fired electric generating units. The guidelines establish CO_2 emission performance rates representing the best system of emission reduction for two subcategories of existing fossil-fuel-fired electric generating units: (1) fossil-fuel-fired electric utility steam-generating units, and (2) stationary combustion turbines. Concurrently, the EPA published a final rule (effective October 23, 2015) establishing Standards of Performance for Greenhouse Gas Emissions from New, Modified, and Reconstructed Stationary Sources: Electric Utility Generating Units (80 FR 64661–65120). The rule prescribes CO_2 emission standards for newly constructed, modified, and reconstructed affected fossil-fuel-fired electric utility generating units. The U.S. Supreme Court stayed implementation of the Clean Power Plan pending resolution of several lawsuits. Additionally, in March 2017, President Trump directed the EPA Administrator to review the Clean Power Plan in order to determine whether it is consistent with current executive policies concerning GHG emissions, climate change and energy.

Council on Environmental Quality Guidance. On August 5, 2016, the Council on Environmental Quality (CEQ) released final guidance for federal agencies on considering the impacts of GHG emissions (CEQ 2016). This guidance supersedes the draft GHG and climate change guidance released by CEQ in 2010 and 2014. The final guidance applies to all proposed federal agency actions, including land and resource management actions. This guidance explains that agencies should consider both the potential effects of a proposed action on climate change, as indicated by its estimated GHG emissions, and the implications of climate change for the environmental effects of a proposed action. The guidance recommends that agencies quantify a proposed agency action's projected direct and indirect GHG emissions, taking into account available data and GHG quantification tools that are suitable for the proposed agency action. This guidance was withdrawn by the CEQ on April 5, 2017, as published in the *Federal Register* Volume 82, Number 64, Section 16576 (CEQ 2017).

3.2.2 State Regulations

The statewide GHG emissions regulatory framework is summarized below by category: state climate change targets, building energy, renewable energy and energy procurement, mobile sources, solid waste, water, and other state regulations and goals. The following text describes executive orders, legislation, regulations, and other plans and policies that would directly or indirectly reduce GHG emissions and/or address climate change issues.

State Climate Change Targets

Executive Order S-3-05. EO S-3-05 (June 2005) established the following statewide goals: GHG emissions should be reduced to 2000 levels by 2010, GHG emissions should be reduced to 1990 levels by 2020, and GHG emissions should be reduced to 80% below 1990 levels by 2050.

AB 32 and CARB's Climate Change Scoping Plan. In furtherance of the goals established in EO S-3-05, the legislature enacted AB 32, the California Global Warming Solutions Act of 2006. AB 32 requires California to reduce its GHG emissions to 1990 levels by 2020.

Under AB 32, CARB is responsible for and is recognized as having the expertise to carry out and develop the programs and requirements necessary to achieve the GHG emissions reduction mandate of AB 32. Under AB 32, CARB must adopt regulations requiring the reporting and verification of statewide GHG emissions from specified sources. This program is used to monitor and enforce compliance with established standards. CARB also is required to adopt rules and regulations to achieve the maximum technologically feasible and cost-effective GHG emission reductions. AB 32 relatedly authorized CARB to adopt market-based compliance mechanisms to meet the specified requirements. Finally, CARB is ultimately responsible for monitoring compliance and enforcing any rule, regulation, order, emission limitation, emission reduction measure, or market-based compliance mechanism adopted.

In 2007, CARB approved a limit on the statewide GHG emissions level for year 2020 consistent with the determined 1990 baseline (427 million MT (MMT) CO_2e). CARB's adoption of this limit is in accordance with California Health and Safety Code, Section 38550.

Further, in 2008, CARB adopted the *Climate Change Scoping Plan: A Framework for Change* (Scoping Plan) in accordance with California Health and Safety Code, Section 38561. The Scoping Plan establishes an overall framework for the measures that will be adopted to reduce California's GHG emissions for various emission sources/sectors to 1990 levels by 2020. The Scoping Plan evaluates opportunities for sector-specific reductions, integrates all CARB and Climate Action Team early actions and additional GHG reduction features by both entities, identifies additional measures to be pursued as regulations, and outlines the role of a cap-and-trade program. The key elements of the Scoping Plan include the following (CARB 2008):

1. Expanding and strengthening existing energy efficiency programs as well as building and appliance standards
2. Achieving a statewide renewable energy mix of 33%
3. Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system and caps sources contributing 85% of California's GHG emissions
4. Establishing targets for transportation-related GHG emissions for regions throughout California, and pursuing policies and incentives to achieve those targets

5. Adopting and implementing measures pursuant to existing state laws and policies, including California's clean car standards, goods movement measures, and the Low Carbon Fuel Standard (LCFS)
6. Creating targeted fees, including a public goods charge on water use, fees on high GWP gases, and a fee to fund the administrative costs of the State of California's long-term commitment to AB 32 implementation

In the Scoping Plan, CARB determined that achieving the 1990 emissions level in 2020 would require a reduction in GHG emissions of approximately 28.5% from the otherwise projected 2020 emissions level (i.e., those emissions that would occur in 2020, absent GHG-reducing laws and regulations (referred to as "Business-As-Usual" (BAU)). For purposes of calculating this percent reduction, CARB assumed that all new electricity generation would be supplied by natural gas plants, no further regulatory action would impact vehicle fuel efficiency, and building energy efficiency codes would be held at 2005 standards.

In the 2011 Final Supplement to the Scoping Plan's Functional Equivalent Document, CARB revised its estimates of the projected 2020 emissions level in light of the economic recession and the availability of updated information about GHG reduction regulations. Based on the new economic data, CARB determined that achieving the 1990 emissions level by 2020 would require a reduction in GHG emissions of 21.7% (down from 28.5%) from the BAU conditions. When the 2020 emissions level proposed projection also was updated to account for newly implemented regulatory measures, including Pavley I (model years 2009–2016) and the Renewable Portfolio Standard (RPS) (12% to 20%), CARB determined that achieving the 1990 emissions level in 2020 would require a reduction in GHG emissions of 16% (down from 28.5%) from the BAU conditions.

More recently, in 2014, CARB adopted the *First Update to the Climate Change Scoping Plan: Building on the Framework* (First Update). The stated purpose of the First Update is to "highlight California's success to date in reducing its GHG emissions and lay the foundation for establishing a broad framework for continued emission reductions beyond 2020, on the path to 80% below 1990 levels by 2050" (CARB 2014). The First Update found that California is on track to meet the 2020 emissions reduction mandate established by AB 32 and noted that California could reduce emissions further by 2030 to levels squarely in line with those needed to stay on track to reduce emissions to 80% below 1990 levels by 2050 if the state realizes the expected benefits of existing policy goals.

In conjunction with the First Update, CARB identified "six key focus areas comprising major components of the state's economy to evaluate and describe the larger transformative actions that will be needed to meet the state's more expansive emission reduction needs by 2050" (CARB

2014). Those six areas are (1) energy, (2) transportation (vehicles/equipment, sustainable communities, housing, fuels, and infrastructure), (3) agriculture, (4) water, (5) waste management, and (6) natural and working lands. The First Update identifies key recommended actions for each sector that will facilitate achievement of EO S-3-05's 2050 reduction goal.

Based on CARB's research efforts presented in the First Update, it has a "strong sense of the mix of technologies needed to reduce emissions through 2050" (CARB 2014). Those technologies include energy demand reduction through efficiency and activity changes; large-scale electrification of on-road vehicles, buildings, and industrial machinery; decarbonizing electricity and fuel supplies; and the rapid market penetration of efficient and clean energy technologies.

As part of the First Update, CARB recalculated the state's 1990 emissions level using more recent GWPs identified by the IPCC. Using the recalculated 1990 emissions level (431 MMT CO_2e) and the revised 2020 emissions level proposed projection identified in the 2011 Final Supplement, CARB determined that achieving the 1990 emissions level by 2020 would require a reduction in GHG emissions of approximately 15% (instead of 28.5% or 16%) from the BAU conditions.

On January 20, 2017, CARB released the *2017 Climate Change Scoping Plan Update* (Second Update) for public review and comment (CARB 2017d). This update proposes CARB's strategy for achieving the state's 2030 GHG target as established in Senate Bill (SB) 32 (discussed subsequently), including continuing the Cap-and-Trade Program through 2030, and includes a new approach to reduce GHGs from refineries by 20%. The Second Update incorporates approaches to cutting short-lived climate pollutants (SLCPs) under the *Short-Lived Climate Pollutant Reduction Strategy* (SLCP Reduction Strategy), a planning document that was adopted by CARB in March 2017, and acknowledges the need for reducing emissions in agriculture and highlights the work underway to ensure that California's natural and working lands increasingly sequester carbon. During development of the Second Update, CARB held a number of public workshops in the Natural and Working Lands, Agriculture, Energy and Transportation sectors to inform development of the 2030 Scoping Plan Update (CARB 2017d). When discussing project-level GHG emissions reduction actions and thresholds, the Second Update states achieving no net increase in GHG emissions is the correct overall objective, but it may not be appropriate or feasible for every development project. An inability to mitigate a proposed project's GHG emissions to zero does not necessarily imply a substantial contribution to the cumulatively significant environmental impact of climate change under CEQA. The Second Update was approved by CARB's Governing Board on December 14, 2017.

EO B-30-15. EO B-30-15 (April 2015) identified an interim GHG reduction target in support of targets previously identified under S-3-05 and AB 32. EO B-30-15 set an interim target goal of reducing statewide GHG emissions to 40% below 1990 levels by 2030 to keep California on its trajectory toward meeting or exceeding the long-term goal of reducing statewide GHG emissions to 80% below 1990 levels by 2050 as set forth in S-3-05. To facilitate achievement of this goal, EO B-30-15 calls for an update to CARB's Scoping Plan to express the 2030 target in terms of MMT CO_2e. The EO also calls for state agencies to continue to develop and implement GHG emission reduction programs in support of the reduction targets. Sector-specific agencies in transportation, energy, water, and forestry were required to prepare GHG reduction plans by September 2015, followed by a report on action taken in relation to these plans in June 2016. EO B-30-15 does not require local agencies to take any action to meet the new interim GHG reduction target.

SB 32 and AB 197. SB 32 and AB 197 (enacted in 2016) are companion bills that set a new statewide GHG reduction targets; make changes to CARB's membership, and increase legislative oversight of CARB's climate change-based activities; and expand dissemination of GHG and other air quality-related emissions data to enhance transparency and accountability. More specifically, SB 32 codified the 2030 emissions reduction goal of EO B-30-15 by requiring CARB to ensure that statewide GHG emissions are reduced to 40% below 1990 levels by 2030. AB 197 established the Joint Legislative Committee on Climate Change Policies, consisting of at least three members of the Senate and three members of the Assembly, in order to provide ongoing oversight over implementation of the state's climate policies. AB 197 also added two members of the legislature to CARB as nonvoting members; requires CARB to make available and update (at least annually via its website) emissions data for GHGs, criteria air pollutants, and TACs from reporting facilities; and, requires CARB to identify specific information for GHG emissions reduction measures when updating the scoping plan.

SB 605 and SB 1383. SB 605 (2014) requires CARB to complete a comprehensive strategy to reduce emissions of SLCPs in the state; and SB 1383 (2016) requires CARB to approve and implement that strategy by January 1, 2018. SB 1383 also establishes specific targets for the reduction of SLCPs (40% below 2013 levels by 2030 for methane and HFCs, and 50% below 2013 levels by 2030 for anthropogenic black carbon), and provides direction for reductions from dairy and livestock operations and landfills. Accordingly, and as previously mentioned, CARB adopted its SLCP Reduction Strategy in March 2017. The SLCP Reduction Strategy establishes a framework for the statewide reduction of emissions of black carbon, methane and fluorinated gases.

Building Energy

Title 24, Part 6. Title 24 of the California Code of Regulations was established in 1978 and serves to enhance and regulate California's building standards. While not initially promulgated to reduce GHG emissions, Part 6 of Title 24 specifically established Building Energy Efficiency Standards that are designed to ensure new and existing buildings in California achieve energy efficiency and preserve outdoor and indoor environmental quality. These energy efficiency standards are reviewed every few years by the Building Standards Commission and the California Energy Commission (CEC) (and revised if necessary) (California Public Resources Code, Section 25402[b][1]). The regulations receive input from members of industry, as well as the public, with the goal of "reducing of wasteful, uneconomic, inefficient, or unnecessary consumption of energy" (California Public Resources Code, Section 25402). These regulations are carefully scrutinized and analyzed for technological and economic feasibility (California Public Resources Code, Section 25402[d]) and cost effectiveness (California Public Resources Code, Sections 25402[b][2] and [b][3]). As a result, these standards save energy, increase electricity supply reliability, increase indoor comfort, avoid the need to construct new power plants, and help preserve the environment.

The current Title 24 standards are the 2016 Title 24 building energy efficiency standards, which became effective January 1, 2017. The updated standards will further reduce energy used and associated GHG emissions compared to previous standards, such as the 2013 Title 24 standards.

Title 24, Part 11. In addition to the CEC's efforts, in 2008, the California Building Standards Commission adopted the nation's first green building standards. The California Green Building Standards Code (Part 11 of Title 24) is commonly referred to as CALGreen, and establishes minimum mandatory standards as well as voluntary standards pertaining to the planning and design of sustainable site development, energy efficiency (in excess of the California Energy Code requirements), water conservation, material conservation, and interior air quality. The CALGreen standards took effect in January 2011 and instituted mandatory minimum environmental performance standards for all ground-up, new construction of commercial, low-rise residential and state-owned buildings and schools and hospitals. The CALGreen 2016 standards became effective January 1, 2017. The mandatory standards require the following (24 CCR Part 11):

- Mandatory reduction in indoor water use through compliance with specified flow rates for plumbing fixtures and fittings
- Mandatory reduction in outdoor water use through compliance with a local water efficient landscaping ordinance or the California Department of Water Resources' Model Water Efficient Landscape Ordinance
- 65% of construction and demolition waste must be diverted from landfills
- Mandatory inspections of energy systems to ensure optimal working efficiency
- Inclusion of electric vehicle charging stations or designated spaces capable of supporting future charging stations
- Low-pollutant emitting exterior and interior finish materials, such as paints, carpets, vinyl flooring, and particle boards

The CALGreen standards also include voluntary efficiency measures that are provided at two separate tiers and implemented at the discretion of local agencies and applicants. CALGreen's Tier 1 standards call for a 15% improvement in energy requirements, stricter water conservation, 65% diversion of construction and demolition waste, 10% recycled content in building materials, 20% permeable paving, 20% cement reduction, and cool/solar-reflective roofs. CALGreen's more rigorous Tier 2 standards call for a 30% improvement in energy requirements, stricter water conservation, 80% diversion of construction and demolition waste, 15% recycled content in building materials, 30% permeable paving, 25% cement reduction, and cool/solar-reflective roofs.

The California Public Utilities Commission (CPUC), CEC, and CARB also have a shared, established goal of achieving zero net energy performance for new construction in California. The key policy timelines include (1) all new residential construction in California will be zero net energy by 2020, and (2) all new commercial construction in California will be zero net energy by 2030.

Title 20. Title 20 of the California Code of Regulations requires manufacturers of appliances to meet state and federal standards for energy and water efficiency. Performance of appliances must be certified through the CEC to demonstrate compliance with standards. New appliances regulated under Title 20 include refrigerators, refrigerator-freezers, and freezers; room air conditioners and room air-conditioning heat pumps; central air conditioners; spot air conditioners; vented gas space heaters; gas pool heaters; plumbing fittings and plumbing fixtures; fluorescent lamp ballasts; lamps; emergency lighting; traffic signal modules; dishwaters; clothes washers and dryers; cooking products; electric motors; low voltage dry-type distribution transformers; power supplies; televisions and consumer audio and video equipment; and battery charger systems. Title 20 presents protocols for testing for each type of appliance covered under the regulations and appliances must meet the standards for energy performance, energy design, water performance, and water design. Title 20 contains the following three types of standards for appliances: federal and state standards for federally regulated appliances, state standards for federally regulated appliances, and state standards for non-federally regulated appliances.

SB 1. SB 1 (2006) established a $3 billion rebate program to support the goal of the state to install rooftop solar energy systems with a generation capacity of 3,000 megawatts (MW) through 2016. SB 1 added sections to the Public Resources Code, including Chapter 8.8 (California Solar Initiative), that require building proposed projects applying for ratepayer-funded incentives for photovoltaic systems to meet minimum energy efficiency levels and performance requirements. Section 25780 established that it is a goal of the state to establish a self-sufficient solar industry in which solar energy systems are a viable mainstream option for both homes and businesses within 10 years of adoption, and to place solar energy systems on 50% of new homes within 13 years of adoption. SB 1, also termed "GoSolarCalifornia," was previously titled "Million Solar Roofs."

AB 1470. This bill established the Solar Water Heating and Efficiency Act of 2007. The bill makes findings and declarations of the legislature relating to the promotion of solar water heating systems and other technologies that reduce natural gas demand. The bill defines several terms for purposes of the act. The bill requires the commission to evaluate the data available from a specified pilot program and, if it makes a specified determination, to design and implement a program of incentives for the installation of 200,000 solar water heating systems in homes and businesses throughout the state by 2017.

AB 1109. Enacted in 2007, AB 1109 required the CEC to adopt minimum energy efficiency standards for general purpose lighting, to reduce electricity consumption 50% for indoor residential lighting and 25% for indoor commercial lighting.

Mobile Sources

AB 1493. In a response to the transportation sector accounting for more than half of California's CO_2 emissions, AB 1493 was enacted in July 2002. AB 1493 required CARB to set GHG emission standards for passenger vehicles, light-duty trucks, and other vehicles determined by the state board to be vehicles that are primarily used for noncommercial personal transportation in the state. The bill required that CARB set GHG emission standards for motor vehicles manufactured in 2009 and all subsequent model years. CARB adopted the standards in September 2004. When fully phased in, the near-term (2009–2012) standards will result in a reduction of about 22% in GHG emissions compared to the emissions from the 2002 fleet, while the mid-term (2013–2016) standards will result in a reduction of about 30%.

EO S-1-07. Issued on January 18, 2007, EO S-1-07 sets a declining LCFS for GHG emissions measured in CO_2e grams per unit of fuel energy sold in California. The target of the LCFS is to reduce the carbon intensity of California passenger vehicle fuels by at least 10% by 2020. The carbon intensity measures the amount of GHG emissions in the lifecycle of a fuel, including extraction/feedstock production, processing, transportation, and final consumption, per unit of energy delivered. CARB adopted the implementing regulation in April 2009. The regulation is expected to increase the production of biofuels, including those from alternative sources, such as algae, wood, and agricultural waste.

SB 375. SB 375 (2008) addresses GHG emissions associated with the transportation sector through regional transportation and sustainability plans. SB 375 required CARB to adopt regional GHG reduction targets for the automobile and light-truck sector for 2020 and 2035. Regional metropolitan planning organization (MPOs) are then responsible for preparing an SCS within their RTP. The goal of the SCS is to establish a forecasted development pattern for the region that, after considering transportation measures and policies, will achieve, if feasible, the GHG reduction targets. If an SCS is unable to achieve the GHG reduction target, an MPO must prepare an Alternative Planning Strategy demonstrating how the GHG reduction target would be achieved through alternative development patterns, infrastructure, or additional transportation measures or policies.

Pursuant to Government Code, Section 65080(b)(2)(K), a SCS does not: (i) regulate the use of land; (ii) supersede the land use authority of cities and counties; or (iii) require that a city's or county's land use policies and regulations, including those in a general plan, be consistent with it. Nonetheless, SB 375 makes regional and local planning agencies responsible for developing those strategies as part of the federally required metropolitan transportation planning process and the state-mandated housing element process.

In September 2010, CARB adopted the first SB 375 targets for the regional MPOs. The targets for the MCAG are a 5% reduction in emissions per capita by 2020 and a 10% reduction by 2035. Achieving these goals through adoption of a SCS is the responsibility of the MPOs. MCAG completed a draft to their RTP/SCS in 2018. The plan quantified a 15% reduction by 2020 and a 25% reduction by 2035 (MCAG 2018).

Advanced Clean Cars Program. In January 2012, CARB approved the Advanced Clean Cars program, a new emissions-control program for model years 2015 through 2025. The program combines the control of smog- and soot-causing pollutants and GHG emissions into a single coordinated package. The package includes elements to reduce smog-forming pollution, reduce GHG emissions, promote clean cars, and provide the fuels for clean cars (CARB 2011). To improve air quality, CARB has implemented new emission standards to reduce smog-forming emissions beginning with 2015 model year vehicles. It is estimated that in 2025 cars will emit 75% less smog-forming pollution than the average new car sold today. To reduce GHG emissions, CARB, in conjunction with the EPA and the NHTSA, has adopted new GHG standards for model year 2017 to 2025 vehicles; the new standards are estimated to reduce GHG emissions by 34% in 2025. The Zero Emissions Vehicle (ZEV) Program will act as the focused technology of the Advanced Clean Cars Program by requiring manufacturers to produce increasing numbers of ZEVs and plug-in hybrid electric vehicles in the 2018 to 2025 model years. The Clean Fuels Outlet regulation will ensure that fuels such as electricity and hydrogen are available to meet the fueling needs of the new advanced technology vehicles as they come to the market.

EO B-16-12. EO B-16-12 (2012) directs state entities under the Governor's direction and control to support and facilitate development and distribution ZEVs. This EO also sets a long-term target of reaching 1.5 million zero-emission vehicles on California's roadways by 2025. On a statewide basis, EO B-16-12 also establishes a GHG emissions reduction target from the transportation sector equaling 80% less than 1990 levels by 2050. In furtherance of this EO, the Governor convened an Interagency Working Group on Zero-Emission Vehicles that has published multiple reports regarding the progress made on the penetration of ZEVs in the statewide vehicle fleet.

AB 1236. AB 1236 (2015) as enacted in California's Planning and Zoning Law, requires local land use jurisdictions to approve applications for the installation of electric vehicle charging stations, as defined, through the issuance of specified permits unless there is substantial evidence in the record that the proposed installation would have a specific, adverse impact upon the public health or safety, and there is no feasible method to satisfactorily mitigate or avoid the specific, adverse impact. The bill provides for appeal of that decision to the planning commission, as specified. The bill requires local land use jurisdictions with a population of 200,000 or more residents to adopt an ordinance, by September 30, 2016, that creates an expedited and streamlined permitting process for electric vehicle charging stations, as specified. The City's population does not exceed 200,000 so this statute does not apply. Prior to this statutory deadline, in August 2016, the County of San Diego's Board of Supervisors adopted Ordinance No. 10437 adding a section to its County Code related to the expedited processing of electric vehicle charging stations permits consistent with AB 1236.

SB 350. In 2015, SB 350—the Clean Energy and Pollution Reduction Act—was enacted into law. As one of its elements, SB 350 establishes a statewide policy for widespread electrification of the transportation sector, recognizing that such electrification is required for achievement of the state's 2030 and 2050 reduction targets (see Public Utilities Code, Section 740.12).

Renewable Energy and Energy Procurement

Senate Bill 1078. SB 1078 (2002) established the RPS program, which requires an annual increase in renewable generation by the utilities equivalent to at least 1% of sales, with an aggregate goal of 20% by 2017. This goal was subsequently accelerated, requiring utilities to obtain 20% of their power from renewable sources by 2010.

SB 1368. SB 1368 (2006) requires the CEC to develop and adopt regulations for GHG emission performance standards for the long-term procurement of electricity by local, publicly owned utilities. These standards must be consistent with the standards adopted by the CPUC. This effort will help protect energy customers from financial risks associated with investments in carbon-intensive generation by allowing new capital investments in power plants whose GHG emissions are as low as or lower than new combined-cycle natural gas plants by requiring imported electricity to meet GHG performance standards in California and by requiring that the standards be developed and adopted in a public process.

SB X1 2. SB X1 2 (2011) expanded the RPS by establishing that 20% of the total electricity sold to retail customers in California per year by December 31, 2013, and 33% by December 31, 2020, and in subsequent years be secured from qualifying renewable energy sources. Under the bill, a renewable electrical generation facility is one that uses biomass, solar thermal, photovoltaic, wind, geothermal, fuel cells using renewable fuels, small hydroelectric generation of 30 MW or less, digester gas, municipal solid waste conversion, landfill gas, ocean wave, ocean thermal, or tidal current, and that meets other specified requirements with respect to its location. In addition to the retail sellers previously covered by the RPS, SB X1 2 added local, publicly owned electric utilities to the RPS.

SB 350. SB 350 (2015) further expanded the RPS by establishing that 50% of the total electricity sold to retail customers in California per year by December 31, 2030, be secured from qualifying renewable energy sources. In addition, SB 350 includes the goal to double the energy efficiency savings in electricity and natural gas final end uses (e.g., heating, cooling, lighting, or class of energy uses on which an energy-efficiency program is focused) of retail customers through energy conservation and efficiency. The bill also requires the CPUC, in consultation with the CEC, to establish efficiency targets for electrical and gas corporations consistent with this goal.

SB 100. SB 100 (2018) increased the standards set forth in SB 350 establishing that 44% of the total electricity sold to retail customers in California per year by December 31, 2024, 52% by December 31, 2027, and 60% by December 31, 2030 be secured from qualifying renewable energy sources. SB 100 states that it is the policy of the State that eligible renewable energy resources and zero-carbon resources supply 100% of the retail sales of electricity to California. This bill requires that the achievement of 100% zero-carbon electricity resources do not increase the carbon emissions elsewhere in the western grid and that the achievement not be achieved through resource shuffling.

Water

EO B-29-15. In response to the ongoing drought in California, EO B-29-15 (April 2015) set a goal of achieving a statewide reduction in potable urban water usage of 25% relative to water use in 2013. The term of the EO extended through February 28, 2016, although many of the directives have since become permanent water-efficiency standards and requirements. The EO includes specific directives that set strict limits on water usage in the state. In response to EO B-29-15, the California Department of Water Resources has modified and adopted a revised version of the Model Water Efficient Landscape Ordinance that, among other changes, significantly increases the requirements for landscape water use efficiency and broadens its applicability to include new development proposed projects with smaller landscape areas.

Solid Waste

AB 939 and AB 341. In 1989, AB 939, known as the Integrated Waste Management Act (California Public Resources Code, Sections 40000 et seq.), was passed because of the increase in waste stream and the decrease in landfill capacity. The statute established the California Integrated Waste Management Board, which oversees a disposal reporting system. AB 939 mandated a reduction of waste being disposed where jurisdictions were required to meet diversion goals of all solid waste through source reduction, recycling, and composting activities of 25% by 1995 and 50% by the year 2000.

AB 341 (2011) amended the California Integrated Waste Management Act of 1989 to include a provision declaring that it is the policy goal of the state that not less than 75% of solid waste generated be source-reduced, recycled, or composted by the year 2020 and annually thereafter. In addition, AB 341 required the California Department of Resources Recycling and Recovery (CalRecycle) to develop strategies to achieve the state's policy goal. CalRecycle has conducted multiple workshops and published documents that identify priority strategies that CalRecycle believes would assist the state in reaching the 75% goal by 2020 (CalRecycle 2017).

Other State Regulations and Goals

EO S-13-08. EO Order S-13-08 (November 2008) is intended to hasten California's response to the impacts of global climate change, particularly sea-level rise. Therefore, the EO directs state agencies to take specified actions to assess and plan for such impacts. The final *2009 California Climate Adaptation Strategy* report was issued in December 2009 (CNRA 2009), and an update, *Safeguarding California: Reducing Climate Risk*, followed in July 2014 (CNRA 2014). To assess the state's vulnerability, the report summarizes key climate change impacts to the state for the following areas: agriculture, biodiversity and habitat, emergency management, energy, forestry, ocean and coastal ecosystems and resources, public health, transportation, and water. Issuance of the Safeguarding California: Implementation Action Plans followed in March 2016 (CNRA 2016). In January 2018, the CNRA released the Safeguarding California Plan: 2018 Update, which communicates current and needed actions that state government should take to build climate change resiliency (CNRA 2018).

2015 State of the State Address. In January 2015, Governor Brown in his inaugural address and annual report to the legislature established supplementary goals that would further reduce GHG emissions over the next 15 years. These goals include an increase in California's renewable energy portfolio from 33% to 50%, a reduction in vehicle petroleum use for cars and trucks by up to 50%, measures to double the efficiency of existing buildings, and decreasing emissions associated with heating fuels.

2016 State of the State Address. In his January 2016 address, Governor Brown established a statewide goal to bring per capita GHG emission down to two tons per person, which reflects the goal of the Global Climate Leadership Memorandum of Understanding (Under 2 MOU) to limit global warming to less than 2 degrees Celsius (°C) by 2050. The Under 2 MOU agreement pursues emission reductions of 80% to 95% below 1990 levels by 2050 and/or reach a per capita annual emissions goal of less than two metric tons by 2050. A total of 135 jurisdictions representing 32 countries and 6 continents, including California, have signed or endorsed the Under 2 MOU (Under 2 2017).

3.2.3 Local Regulations

3.2.3.1 San Joaquin Valley Air Pollution Control District

The SJVAPCD does not regulate GHG emissions directly through its permitting responsibilities for stationary sources. The SJVAPCD, however, can have an impact on GHGs from new and modified stationary sources when acting as a lead agency for CEQA. The SJVAPCD implements its GHG policies and reviews whether new or modified stationary sources will implement best performance standards (BPSs).

In 2009, the SJVAPCD developed an internal policy and guidance for local land use agencies to use in evaluating GHG impacts under CEQA. In the Final Staff Report – *Addressing GHG Emissions Impacts under the California Environmental Quality Act* (SJVAPCD 2009c), the SJVAPCD reviewed potential GHG significance thresholds and approaches suggested by or adopted by the following entities, ranging from quantification of a project's GHG impacts without a recommended significance threshold to a zero threshold to specific significance thresholds for different kinds of projects (e.g., residential, mixed use, industrial, plans).[12]

- CARB – "Preliminary Draft Staff Proposal: Recommended Approaches for Setting Interim Significance Thresholds for Greenhouse Gases under the California Environmental Quality Act"
- Office of Planning and Research – "Technical Advisory – CEQA and Climate Change: Addressing Climate Change Through California Environmental Quality Act (CEQA)

[12] These documents encompassed the primary approaches for establishing significance thresholds in the period prior to the March 18, 2010 effective date of revisions of the CEQA Guidelines in accordance with SB 97. Additional guidance regarding assessment of GHG impacts were provided in the revised CEQA Guidelines and accompanying *Final Statement of Reasons for Regulatory Action - Amendments to the State CEQA Guidelines Addressing Analysis and Mitigation of Greenhouse Gas Emissions Pursuant to SB97* (CNRA 2009). In addition, the California appellate courts and the Supreme Court have more recently considered CEQA cases and, in some cases, issued published decisions that provide additional direction regarding the appropriateness of certain GHG assessment methodologies and significance thresholds.

Review" and "*Preliminary Draft CEQA Guideline Amendments for Greenhouse Gas Emissions and Public Workshop Announcement*"

- California Air Pollution Control Officers Association (CAPCOA) – *CEQA & Climate Change: Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act*
- Association of Environmental Professionals – "Alternative Approaches to Analyzing Greenhouse Gas Emissions and Global Climate Change in CEQA Documents"
- South Coast Air Quality Management District – "Draft Guidance Document – *Interim CEQA GHG Significance Threshold*"
- Bay Area Air Quality Management District – Draft revisions to *California Environmental Quality Act Air Quality Guidelines*
- Sacramento Metropolitan Air Quality Management District – "*Addressing Climate Change in CEQA Documents*"

The following discussion summarizes the SJVAPCD's conclusions about various categories of GHG significance thresholds.

Zero Threshold – The SJVAPCD concluded that "Although a zero threshold is appealing in its simplicity; execution of a zero threshold would be difficult or impossible" (SJVAPCD 2009c). Furthermore, the SJVAPCD found that projects that could not reduce their emissions to zero would require preparation of an EIR and adoption of a statement of overriding consideration by the lead agency. Potentially, projects could choose to relocate to a region with a less stringent threshold, so-called "leakage" that would still result in GHG emissions outside the SJVAPCD. Finally, the SJVAPCD noted that CARB concluded that zero thresholds are not mandated because some level of GHG emissions is still consistent with climate stabilization and other regulatory programs will result in GHG reductions. For these reasons, the SJVAPCD did not support a zero threshold. Accordingly, a zero threshold was not selected as an appropriate GHG/climate change threshold for this assessment.

Non-Zero Quantitative Thresholds – As indicated previously, the SJVAPCD reviewed numerous quantitative thresholds adopted or proposed by other air districts and organizations, including "mass of GHG emissions generate per unit of activity, GHG emissions per capita per unit basis, and percent reduction compared to Business-as-Usual" (SJVAPCD 2009c). While a tiered approach was evaluated, with the final tier incorporating a quantitative threshold, the SJVAPCD concluded that "… without supporting scientific information, establishment of tier trigger levels could be argued to be arbitrary, and district staff does not believe the available science supports establishing a bright-line threshold, above which emissions are significant and below which they are not (SJVAPCD 2009c).

More specifically, the SJVAPCD concluded that inadequate evidence exists to support a specific quantitative level (e.g., a number of MT CO_2E per year that would be emitted due to a project) representing a significant impact. Specifically, the *Final Staff Report* states:

> District staff has reviewed the relevant scientific information and concludes that the existing science is inadequate to support quantification of the extent to which project specific GHG emissions would impact global climatic features such as average air temperature, average annual rainfall, or average annual snow pack. Thus, District staff concludes that it is not feasible to scientifically establish a numerical threshold that supports a determination that GHG emissions from a specific project, of any size, would or would have a significant impact on global climate change. In other words, the District was not able to determine a specific quantitative level of GHG emission increase, above which the project would have a significant impact on the environment, and below which would have an insignificant impact. District staff further concludes that impacts of project specific emissions on global climatic change are cumulative in nature, and the significance thereof should be examined in that context. This is readily understood when one considers that global climatic change is the result of the sum total of GHG emissions, both man made [sic] and natural that occurred in the past; that is occurring now; and will occur in the future (SJVAPCD 2009c).

Accordingly, a bright-line numerical threshold was not selected as an appropriate GHG / climate change threshold for this assessment.

Best Performance Standards **–** The SJVAPCD evaluated performance-based standards, which would state "in quantifiable terms the level and extent of the attribute necessary to reach a goal or objective." (SJVAPCD). The SJVAPCD considered a project achieving the performance-based standard or mitigating GHG emissions to an equivalent emission reduction level would be considered to have a less-than-significant cumulative impact on climate change. In conclusion, the SJVAPCD found that the state's GHG emission reduction target would be accomplished by achieving a 29% reduction from business as usual (BAU) and that achieving this reduction would be a "de facto" performance-based standard for GHG emission reductions.

On December 17, 2009, the SJVAPCD Governing Board adopted *Guidance for Valley Land-Use Agencies in Addressing GHG Emission Impacts for New Projects under CEQA* (SJVAPCD

2009b). The guidance recommends the following hierarchy for evaluating a project's impact with respect to its GHG emissions:

- Projects complying with an approved GHG emission reduction plan or GHG mitigation program, which avoids or substantially reduces GHG emissions within the geographic area in which the project is located would be determined to have a less than significant individual and cumulative impact for GHG emissions. Such plans or programs must be specified in law or approved by the lead agency with jurisdiction over the affected resource and supported by a CEQA compliant environmental review document adopted by the lead agency. Projects complying with an approved GHG emission reduction plan or GHG mitigation program would not be required to implement Best Performance Standards (BPS).
- Projects implementing BPS would not require quantification of project specific GHG emissions.[13] Consistent with the state CEQA Guidelines, such projects would be determined to have a less than significant individual and cumulative impact for GHG emissions.
- Projects not implementing BPS would require quantification of project specific GHG emissions and demonstration that project specific GHG emissions would be reduced or mitigated by at least 29%, compared to BAU, including GHG emission reductions achieved since the 2002–2004 baseline period. Projects achieving at least a 29% GHG emission reduction compared to BAU would be determined to have a less than significant individual and cumulative impact for GHG (SJVAPCD 2009b).
- For development projects, BPS would include project design elements, land use decisions, and technologies that reduce GHG emissions. While the SJVAPCD has adopted BPS for several types of stationary sources (e.g., boilers), it has not developed BPS for land development projects. Projects implementing any combination of BPS, and/or demonstrating a total 29% reduction in GHG emissions from BAU, would be determined to have a less than significant individual and cumulative impact on global climate change (SJVAPCD 2015b).

3.2.3.2 Merced County Association of Governments

SB 375 requires MPOs to prepare an SCS in their RTP. As discussed in Section 2.2.3.2, the MCAG developed the 2018 RTP/SCS as the region's strategy to fulfill the requirements of SB 375. The 2018 RTP/SCS establishes a development pattern for the region that, when integrated with the transportation network and other policies and measures, would reduce GHG emissions from transportation (excluding goods movement). Specifically, the 2018 RTP/SCS links the

[13] The guidance recommends, "Projects requiring preparation of an Environmental Impact Report for any other reason would require quantification of project specific GHG emissions." This assessment for the project does include quantification of the project's construction and operational GHG emissions.

goals of sustaining mobility with the goals of fostering economic development; enhancing the environment; reducing energy consumption; promoting transportation-friendly development patterns; and encouraging all residents affected by socioeconomic, geographic, and commercial limitations to be provided with fair access. The 2018 RTP/SCS does not require that local general plans, specific plans, or zoning be consistent with it but provide incentives for consistency for governments and developers.

3.3 Climate Change Conditions and Inventories

3.3.1 Sources of Greenhouse Gas Emissions

Per the U.S. Environmental Protection Agency's (EPA) Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2016 (EPA 2018), total U.S. GHG emissions were approximately 6,511.3 million metric tons (MMT) CO_2e in 2016. The primary GHG emitted by human activities in the United States was CO_2, which represented approximately 81.6% of total GHG emissions (5,310.9 MMT CO_2e). The largest source of CO_2, and of overall GHG emissions, was fossil-fuel combustion, which accounted for approximately 93.5% of CO_2 emissions in 2016 (4,966.0 MMT CO_2e). Relative to 1990, gross United States GHG emissions in 2016 are higher by 2.4%, down from a high of 15.7% above 1990 levels in 2007. GHG emissions decreased from 2015 to 2016 by 1.9% (126.8 MMT CO_2e), and, overall, net emissions in 2016 were 11.1% below 2005 levels (EPA 2018).

According to California's 2000–2016 GHG emissions inventory (2018 edition), California emitted 429.40 MMT CO_2e in 2016, including emissions resulting from out-of-state electrical generation (CARB 2018). The sources of GHG emissions in California include transportation, industrial uses, electric power production from both in-state and out-of-state sources, commercial and residential uses, agriculture, high GWP substances, and recycling and waste. The California GHG emissions source categories (as defined in CARB's 2008 Climate Change Scoping Plan: A Framework for Change (Scoping Plan) (CARB 2008)) and their relative contributions in 2016 are presented in Table 10.

Table 10
Greenhouse Gas Emissions Sources in California

Source Category	Annual GHG Emissions (MMT CO_2e)	Percent of Total[a]
Transportation	169.38	39%
Industrial uses[b]	89.61	21%
Electricity generation[c]	68.58	16%
Residential and commercial uses	39.36	9%

Table 10
Greenhouse Gas Emissions Sources in California

Source Category	Annual GHG Emissions (MMT CO_2e)	Percent of Total[a]
Agriculture	33.84	8%
High GWP substances	19.78	5%
Recycling and waste	8.81	2%
Totals	**429.40**	**100%**

Source: CARB 2018.
Notes: GHG = greenhouse gas; MMT CO_2e = million metric tons of carbon dioxide equivalent; GWP = global warming potential.
Emissions reflect 2016 California GHG inventory.
[a] Percentage of total has been rounded and total may not sum due to rounding.
[b] The Aliso Canyon natural gas leak event released 1.96 MMT CO_2e of unanticipated emissions in 2015 and 0.53 MMT CO_2e in 2016. These leak emissions will be fully mitigated according to legal settlement and are tracked separately from routine inventory emissions.
[c] Includes emissions associated with imported electricity, which account for 26.28 MMT CO_2e.

Total GHG emissions for Merced County in 2010 (the most recent year available) were estimated at approximately 3.65 MMT CO_2e within unincorporated areas and 6.04 MMT CO_2e within incorporated areas (Merced County 2012). The greatest contributor to Merced County's unincorporated and total GHG emissions was agriculture. Transportation emissions were the second greatest contributor for both unincorporated area and total GHG emissions in Merced County.

3.3.2 Potential Effects of Climate Change

Globally, climate change has the potential to affect numerous environmental resources through uncertain impacts related to future air temperatures and precipitation patterns. The 2014 *Intergovernmental Panel on Climate Change Synthesis Report* (IPCC 2014) indicated that warming of the climate system is unequivocal, and since the 1950s, many of the observed changes are unprecedented over decades to millennia. Signs that global climate change has occurred include warming of the atmosphere and ocean, diminished amounts of snow and ice, and rising sea levels (IPCC 2014).

In California, climate change impacts have the potential to affect sea-level rise, agriculture, snowpack and water supply, forestry, wildfire risk, public health, and electricity demand and supply (CCCC 2006). The primary effect of global climate change has been a 0.2°C rise in average global tropospheric temperature per decade, determined from meteorological measurements worldwide between 1990 and 2005. Scientific modeling predicts that continued emissions of GHGs at or above current rates would induce more extreme climate changes during the twenty-first century than were observed during the twentieth century. A warming of about 0.2°C (0.36°F) per decade is projected, and there are identifiable signs that global warming could be taking place.

Although climate change is driven by global atmospheric conditions, climate change impacts are felt locally. A scientific consensus confirms that climate change is already affecting California. The average temperatures in California have increased, leading to more extreme hot days and fewer cold nights. Shifts in the water cycle have been observed, with less winter precipitation falling as snow, and both snowmelt and rainwater running off earlier in the year. Sea levels have risen, and wildland fires are becoming more frequent and intense due to dry seasons that start earlier and end later (CAT 2010).

An increase in annual average temperature is a reasonably foreseeable effect of climate change. Observed changes over the last several decades across the western United States reveal clear signals of climate change. Statewide average temperatures increased by about 1.7°F from 1895 to 2011, and warming has been greatest in the Sierra Nevada (CCCC 2012). By 2050, California is projected to warm by approximately 2.7°F above 2000 averages, a threefold increase in the rate of warming over the last century. By 2100, average temperatures could increase by 4.1°F to 8.6°F, depending on emissions levels. Springtime warming—a critical influence on snowmelt—will be particularly pronounced. Summer temperatures will rise more than winter temperatures, and the increases will be greater in inland California, compared to the coast. Heat waves will be more frequent, hotter, and longer. There will be fewer extremely cold nights (CCCC 2012). A decline of Sierra Nevada snowpack, which accounts for approximately half of the surface water storage in California, by 30% to as much as 90% is predicted over the next 100 years (CAT 2006).

Model proposed projections for precipitation over California continue to show the Mediterranean pattern of wet winters and dry summers with seasonal, year-to-year, and decade-to-decade variability. For the first time, however, several of the improved climate models shift toward drier conditions by the mid-to-late twenty-first century in central, and most notably, Southern California. By the late century, all proposed projections show drying, and half of them suggest 30-year average precipitation will decline by more than 10% below the historical average (CCCC 2012).

A summary of current and future climate change impacts to resource areas in California, as discussed in the *Safeguarding California: Reducing Climate Risk* (CNRA 2014) is provided as follows.

Agriculture. Some of the specific challenges faced by the agricultural sector and farmers include more drastic and unpredictable precipitation and weather patterns; extreme weather events that range from severe flooding to extreme drought, to destructive storm events; significant shifts in water availably and water quality; changes in pollinator lifecycles; temperature fluctuations, including extreme heat stress and decreased chill hours; increased risks from invasive species and weeds, agricultural pests and plant diseases; and disruptions to the transportation and energy infrastructure supporting agricultural production.

Biodiversity and Habitat. Specific climate change challenges to biodiversity and habitat include species migration in response to climatic changes, range shift and novel combinations of species; pathogens, parasites and disease; invasive species; extinction risks; changes in the timing of seasonal life-cycle events; food web disruptions; threshold effects (i.e., a change in the ecosystem that results in a "tipping point" beyond which irreversible damage or loss has occurs).

Energy. Specific climate change challenges for the energy sector include temperature, fluctuating precipitation patterns, increasing extreme weather events and sea-level rise.

Forestry. The most significant climate change related risk to forests is accelerated risk of wildfire and more frequent and severe droughts. Droughts have resulted in more large-scale mortalities and combined with increasing temperatures have led to an overall increase in wildfire risks. Increased wildfire intensity subsequently increases public safety risks, property damage, fire suppression and emergency response costs, watershed and water quality impacts and vegetation conversions.

Ocean and Coastal Ecosystems and Resources. Sea-level rise, changing ocean conditions and other climate change stressors are likely to exacerbate long-standing challenges related to ocean and coastal ecosystems in addition to threatening people and infrastructure located along the California coastline and in coastal communities. Sea-level rise, in addition to more frequent and severe coastal storms and erosion, is threatening vital infrastructure such as roads, bridges, power plants, ports and airports, gasoline pipes, and emergency facilities, as well as negatively impacting the coastal recreational assets such as beaches and tidal wetlands.

Public Health. Climate change can impact public health through various environmental changes and is the largest threat to human health in the twenty-first century. Changes in precipitation patterns affect public health primarily through potential for altered water supplies, and extreme events such as heat, floods, droughts, and wildfires. Increased frequency, intensity and duration of extreme heat and heat waves are likely to increase the risk of mortality due to heat related illness as well as exacerbate existing chronic health conditions. Other extreme weather events are likely to negatively impact air quality and increase or intensify respiratory illness such as asthma and allergies.

Transportation. While the transportation industry is a source of GHG emissions it is also vulnerable to climate change risks. Increasing temperatures and extended periods of extreme heat threaten the integrity of the roadways and rail lines. High temperatures cause the road surfaces to expand which leads to increased pressure and pavement buckling. High temperatures can also cause rail breakages, which could lead to train derailment. Other forms of extreme weather events, such as extreme storm events, can negatively impact infrastructure, which can impair movement of peoples and goods, or potentially block evacuation routes and emergency access roads.

Increased wildfires, flooding, erosion risks, landslides, mudslides, and rockslides can all profoundly impact the transportation system and pose a serious risk to public safety.

Water. Climate change could seriously impact the timing, form, amount of precipitation, runoff patterns, and frequency and severity of precipitation events. Higher temperatures reduce the amount of snowpack and lead to earlier snowmelt, which can impact water supply availability, natural ecosystems and winter recreation. Water supply availability during the intense dry summer months is heavily dependent on the snowpack accumulated during the winter time. Increased risk of flooding has a variety of public health concerns including water quality, public safety, property damage, displacement and post-disaster mental health problems. Prolonged and intensified droughts can also negatively groundwater reserves and result in increased overdraft and subsidence. The higher risk of wildfires can lead to increased erosion, which can negatively impact watersheds and result in poor water quality.

In March 2016, the CNRA released *Safeguarding California: Implementation Action Plans*, a document that shows how California is acting to convert the recommendations contained in the 2014 *Safeguarding California* plan into action (CNRA 2016). Additionally, in May 2017, CNRA released the draft *Safeguarding California Plan: 2017 Update*, which is a survey of current programmatic responses for climate change and contains recommendations for further actions (CNRA 2017).

The CNRA released *Safeguarding California Plan: 2018 Update* in January 2018, which provides a roadmap for state agencies to protect communities, infrastructure, services, and the natural environment from climate change impacts. The 2018 Safeguarding California Plan includes 69 recommendations across 11 sectors and more than 1,000 ongoing actions and next steps developed by scientific and policy experts across 38 state agencies (CNRA 2018). As with previous state adaptation plans, the 2018 Update addresses the following: acceleration of warming across the state, more intense and frequent heat waves, greater riverine flows, accelerating sea level rise, more intense and frequent drought, more severe and frequent wildfires, more severe storms and extreme weather events, shrinking snowpack and less overall precipitation, and ocean acidification, hypoxia, and warming.

3.4 Significance Criteria and Methodology

3.4.1 Thresholds of Significance

The significance criteria used to evaluate the Project's GHG emissions impacts is based on the recommendations provided in Appendix G of the CEQA Guidelines. For the purposes of this

GHG emissions analysis, the Project would have a significant environmental impact if it would (14 CCR 15000 et seq.):

1. Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment?
2. Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs?

Global climate change is a cumulative impact; a proposed project participates in this potential impact through its incremental contribution combined with the cumulative increase of all other sources of GHGs. In addition, while GHG impacts are recognized exclusively as cumulative impacts (CAPCOA 2008), GHG emissions impacts must also be evaluated on a proposed project-level under CEQA.

In August 2008, the SJVAPCD adopted a Climate Change Action Plan (CCAP). The CCAP directed the Air Pollution Control Officer to develop guidance documents to assist land–use and other permitting agencies in addressing GHG emissions as part of the CEQA process. The SJVAPCD has adopted the guidance in *Guidance for Valley Land-Use Agencies in Addressing GHG Emission Impacts for New Projects Under CEQA* and the policy, *Addressing GHG Emission Impacts for Stationary Source Projects Under CEQA When Serving as the Lead Agency*. The guidance and policy rely on the use of performance based standards, otherwise known as Best Performance Standards (BPS) to assess significance of project specific GHG emissions on global climate change during the environmental review process. However, SJVAPCD's adopted BPS are specifically directed at reducing GHG emissions from stationary sources; therefore, the adopted BPS would not generally be applicable to the Project as the Project would not be a stationary source of emissions.

The SJVAPCD guidance does not limit a lead agency's authority in establishing its own process and guidance for determining significance of project related impacts on global climate change. Other air districts within the State of California have recently adopted recommended numerical CEQA significance thresholds for GHG emissions. The San Luis Obispo Air Pollution Control District (SLOAPCD) approved thresholds of significance for the evaluation of project-related increases of GHG emissions include both qualitative and quantitative threshold options, which include a bright-line threshold of 1,150 MT CO_2e per year. The Sacramento Metropolitan Air Quality Management District (SMAQMD) adopted a similar significance threshold of 1,100 MT CO_2e per year. Similarly, the Bay Area Air Quality Management District (BAAQMD) also recommends a numerical GHG threshold of 1,100 MT CO_2e per year. In absence of adopted GHG thresholds and for the purpose of analysis, a threshold of 1,100 MT CO_2e per year to evaluate whether the Project would generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment was applied for this analysis. Construction-generated GHG emissions were amortized based on an estimated 30-year project life and included in annual operational GHG emissions estimates.

3.4.2 Approach and Methodology

3.4.2.1 Construction

CalEEMod, Version 2016.3.2, was used to estimate potential Project-generated GHG emissions during construction. Construction of the Project would result in GHG emissions primarily associated with use of off-road construction equipment, on-road hauling and vendor (material delivery) trucks, and worker vehicles. All details for construction criteria air pollutants discussed in Section 2.4.2 are also applicable for the estimation of construction-related GHG emissions. As such, see Section 2.4.2 for a discussion of construction emissions calculation methodology and assumptions.

3.4.2.2 Operation

Emissions from the operational phase of the Project were estimated using CalEEMod and include energy, mobile source, and water GHG emissions. Additionally, GHG emissions associated with gas-insulated switchgear (SF_6 gas leakage) are included in this analysis as area sources. These sources are described below.

Energy Sources

Energy sources include emissions associated with Project electricity usage and on-site power generation. Estimated energy use for the proposed O&M building was estimated using CalEEMod. CalEEMod default energy intensity factors (CO_2, CH_4, and N_2O mass emissions per kilowatt-hour) for PG&E is based on the value for PG&E's energy mix in 2008. As explained in Section 3.2.2, SB X1 2 established a target of 33% from renewable energy sources for all electricity providers in California by 2020, and SB 350 calls for further development of renewable energy, with a target of 50% by 2030. The CO_2 emissions intensity factor for utility energy use in 2021 (first full year of Project operations) in CalEEMod was adjusted to account for implementation of 33% RPS by December 31, 2020, to reflect the increase in percentage of renewable energy in PG&E's energy portfolio.

Mobile Sources

All details for criteria air pollutants emissions estimates methodology discussed in Section 2.4.2 are also applicable for the estimation of operational mobile source GHG emissions. Mobile sources for the Project would primarily be motor vehicles (automobiles and light-duty trucks) traveling to and from the Project site. Motor vehicles may be fueled with gasoline, diesel, or alternative fuels. Based on applicant provided data, the proposed Project is anticipated to generate 16 round-trips per day by worker vehicles traveling to and from the operations and maintenance building. CalEEMod default data, including trip characteristics, variable start information, and emissions factors were conservatively used for the model inputs to estimate daily emissions from proposed vehicular sources. Workers were conservatively assumed to travel from Los Banos. Project-related traffic was assumed to include a mixture of vehicles in accordance with the model outputs for traffic. CalEEMod default emissions factors and vehicle fleet mix were conservatively used for the model inputs to estimate daily emissions from proposed vehicular sources.[14] Emission factors representing the vehicle mix and emissions for 2021 were used to estimate emissions associated with full build-out of the Project.

Solid Waste

The Project would generate minimal solid waste, and, therefore, result in limited CO_2e emissions associated with landfill off-gassing. CalEEMod default values for a commercial office building was used to estimate the solid waste generation and associated GHG emissions.

Water and Wastewater

The Project's water demand would be served by an on-site groundwater well, however, as a back-up option, water may be trucked to the site as a contingency option. To provide a conservative estimate, one water truck which would have a capacity of approximately 2,000 to 4,000 gallons of water was assumed to travel to and from the site once per week. All water use is assumed to be used indoors and be treated through and on-site septic system.

Stationary Sources

As discussed in 2.4.2.2, the Project would include a 100-kW emergency generator at the O&M Building. The generator was assumed to run for testing and maintenance approximately 30 minutes per day, or approximately 200 hours per year in accordance with the CARB ATCM for stationary sources (CARB 2011). The generator was assumed to be a 440 horsepower Tier 4 Final diesel engine and emission factors were taken from Appendix D of the CalEEMod User's Guide (CAPCOA 2017). Emissions were estimated based on a 33% average engine load.

[14] Motor vehicles may be fueled with gasoline, diesel, or alternative fuels. The default vehicle mix (vehicle class distribution including automobiles, trucks, buses, motorcycles) provided in CalEEMod 2016.3.2, which is based on CARB's Mobile Source Emissions Inventory model, EMFAC Version 2014, was applied.

Area Sources

GHG emissions would also be associated with fugitive emissions from equipment containing SF_6 gas installed at the proposed on-site substation. SF_6 has a GWP of 22,800 using CO_2 at a reference value of 1 (IPCC 2007). The only pieces of equipment within a substation that will have SF_6 gas would be the single 70 kV and the four 34.5 kV breakers. Based on specifications provided by the Applicant, it is estimated that the Project would have an estimated 68 pounds of SF_6 gas with a maximum annual leak rate of 0.5% stored within the Project site.

3.5 Impact Analysis

3.5.1 Would the Proposed Project Generate Greenhouse Gas Emissions, Either Directly or Indirectly, That May Have a Significant Impact on the Environment?

Construction Emissions

Construction of the Project would result in GHG emissions, which are primarily associated with use of off-road construction equipment, on-road vendor trucks, and worker vehicles.

CalEEMod was used to calculate the annual GHG emissions based on the construction scenario described in Section 2.4.2.1. Construction of the Project is anticipated to commence in October 2019 and would last approximately one year, ending in October 2020. On-site sources of GHG emissions include off-road equipment and off-site sources, including trucks and worker vehicles. Table 11 presents construction emissions including fuel emissions generated by blasting activities for the Project in 2019 and 2020 from on-site and off-site emission sources.

Table 11
Estimated Annual Construction Greenhouse Gas Emissions

Year	CO_2	CH_4	N_2O	CO_2e
	Metric Tons per Year			
2019	503.48	0.08	0.00	505.40
2020	1,319.56	0.20	0.00	1,325.19

Notes: CO_2 = carbon dioxide; CH_4 = methane; N_2O = nitrous oxide; CO_2e = carbon dioxide equivalent
GHG emissions from water use for dust suppression were modeled in the operational module within CalEEMod.
See Appendix A for complete results.

As shown in Table 11, GHG emissions during construction would generate approximately 505 MT CO_2e in 2019 and 1,325 MT CO_2e in 2020. As previously discussed, Project-generated construction emissions were amortized over 30 years which would be approximately 61 MT CO_2e

per year. Because there is no separate GHG threshold for construction, the evaluation of significance is discussed in the operational emissions analysis in the following text.

Operational Emissions

Operation of the Project would generate GHG emissions through motor vehicle trips to and from the Project site for routine inspection and maintenance, water truck deliveries, energy use (generation of electricity consumed by the Project), solid waste generation, and from the emergency generator. CalEEMod was used to calculate the annual GHG emissions based on the operational assumptions described in Section 3.4.2. GHG emissions associated with the SF_6-insulated breakers were calculated separately with a spreadsheet. Project-generated GHG emissions for the first full year of operations (year 2021) are summarized in Table 12. Details of the emission calculations are provided in Appendix A to this technical report.

Table 12
Estimated Annual Operational Greenhouse Gas Emissions

Year	CO_2	CH_4	N_2O	CO_2e
	Metric Tons per Year			
Area[a]	0.00	0.00	0.00	102.01
Energy	28.65	<0.01	<0.01	28.80
Mobile	91.61	0.00	0.00	91.83
Waste	0.19	0.01	0.00	0.47
Water	0.00	0.00	0.00	0.00
Stationary	16.5	<0.01	0.00	16.55
Total Project Annual Emissions	**136.95**	**0.01**	**<0.01**	**239.66**
Amortized Construction Emissions				61.02
Total Operational + Amortized Construction GHGs				**300.68**

Notes: CH_4 = methane; CO_2 = carbon dioxide; CO_2e = carbon dioxide equivalent; N_2O = nitrous oxide
Values may not sum exactly due to rounding. See Appendix A for complete results.
[a] Emissions from SF_6 leakage are considered an area source.

As shown in Table 12, estimated annual project-generated GHG emissions would be approximately 301 MT CO_2e per year as a result of Project operation. As shown, the total annual emissions would not exceed the GHG significance threshold of 1,100 MT CO_2e per year. As such, the Project's operational GHG emissions would be considered less than significant.

GHG Emissions Benefits

In keeping with the renewable energy target under the Scoping Plan, and as required by SB 350, the Project would provide a source of renewable energy to achieve the RPS of 50% by 2030.

Renewable energy, in turn, potentially offsets GHG emissions generated by fossil-fuel power plants. The latest published GHG emission factor for PG&E is 0.194 MT CO_2e/MWh (PG&E 2015). PG&E reported that 32.8% of its power mix was renewable in 2016. Therefore, the non-renewable GHG emission factor would be 0.269 MT CO_2e/MWh (see Appendix A for more details). Thus, based on net production of the existing 16.5 MW wind energy facility and the Project's nameplate generating capacity of up to approximately 100 MW, the Project would provide a potential reduction of 60,781 MT CO_2e per year if the renewable electricity generated by the Project were to be used instead of electricity generated by fossil-fuel sources or a total of 1,823,417 MT CO_2e over the 30-year Project lifetime. This reduction is not considered in the significance determination of the Project's GHG emissions, but is provided for disclosure purposes.

3.5.2 Would The Proposed Project Conflict With an Applicable Plan, Policy, or Regulation Adopted for the Purpose of Reducing The Emissions of Greenhouse Gases?

Under the SJVAPCD's CEQA thresholds for GHG, a project would not have a significant GHG impact if it is consistent with an applicable plan to reduce GHG emissions, and a CEQA-compliant analysis was completed for the GHG reduction plan. Although the state is not required to comply with local plans or policies, the MCAG's 2018 RTP/SCS is an applicable plan adopted for the purpose of reducing regional GHGs from the land use and transportation sectors in Merced County and was adopted after completion of a Programmatic EIR. The 2018 RTP/SCS was adopted and approved by CARB in August 2018. A project could result in a significant impact due to a conflict with an applicable plan, policy, or regulation if it would be inconsistent with the adopted MCAG 2018 RTP/SCS. Therefore, the Project could have a potential conflict with the RTP/SCS if it were to be found inconsistent based on a qualitative assessment of the Project's consistency with MCAG's SCS policies.

SB 375 requires MCAG to demonstrate in its SCS that it will reduce car and light truck GHG emissions 5% per capita by 2020, and 10% by 2035. The MCAG SCS has projected to exceed the goal by committing to a 15% reduction by 2020 and 25% reduction by 2035. The GHG emission goals in the MCAG 2018 RTP/SCS are based on demographic data trends and projections that include household, employment, and total population statistics. The MCAG 2018 RTP/SCS projects that the total employment in Merced County will be 82,810 in 2020 and 86,058 in 2025, or 3,248 additional jobs per year in that timeframe (MCAG 2018). The Project is anticipated to have up to eight full-time equivalent personnel consisting of operators and maintenance technicians starting in 2021. Therefore, the additional jobs estimated by the Project would be well within the annual growth projection for the MCAG 2018 RTP/SCS. Therefore, the Project would be consistent with the MCAG 2018 RTP/SCS and would not conflict with an applicable plan and the Project would have a less than significant impact.

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APPENDIX A

CalEEMod Output Files

CalEEMod Version: CalEEMod.2016.3.2

Date: 6/13/2019 9:45 AM

Gonzaga Ridge Wind Repowering Project

Merced County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Commercial	192.21	User Defined Unit	192.21	5,000.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	49
Climate Zone	4			**Operational Year**	2021
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	499.66	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Gonzaga Ridge Wind Repowering Project. Merced County. CO2 intensity to meet 33% RPS.

Land Use - Total disturbed area: 192.21 acres

Construction Phase - Construction phases and durations provided by applicant.

Off-road Equipment - Equipment based on information from applicant.

Off-road Equipment - Equipment based on information from applicant.

Off-road Equipment - No construction equipment assumed.

Off-road Equipment - Equipment based on information from applicant.

Off-road Equipment - Equipment based on information from applicant.

Off-road Equipment - Default equipment assumed for arch coatings.

Off-road Equipment - No construction equipment assumed.

Off-road Equipment - Equipment based on information from applicant.

Off-road Equipment - Equipment based on information from applicant.

Off-road Equipment - Equipment based on information from applicant.

Off-road Equipment - Equipment based on information from applicant.

Off-road Equipment - Equipment based on information from applicant.

Trips and VMT - Revised worker, vendor, and haul trips per phase.

On-road Fugitive Dust - Assumed 99 percent of roadways are paved.

Grading - Acres graded based on equipment fleet.

Energy Use - Updated energy use based on commercial office building defaults.

Solid Waste - Updated solid waste based on commercial office building.

Construction Off-road Equipment Mitigation - Fugitive dust controls to comply with SJVAPCD Reg VIII. Use of Tier 3 construction equipment.

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tblOnRoadDust	VendorPercentPave	100.00	99.00
tblOnRoadDust	VendorPercentPave	100.00	99.00
tblOnRoadDust	VendorPercentPave	100.00	99.00
tblOnRoadDust	VendorPercentPave	100.00	99.00
tblOnRoadDust	VendorPercentPave	100.00	99.00
tblOnRoadDust	VendorPercentPave	100.00	99.00
tblOnRoadDust	WorkerPercentPave	100.00	99.00
tblOnRoadDust	WorkerPercentPave	100.00	99.00
tblOnRoadDust	WorkerPercentPave	100.00	99.00
tblOnRoadDust	WorkerPercentPave	100.00	99.00
tblOnRoadDust	WorkerPercentPave	100.00	99.00
tblOnRoadDust	WorkerPercentPave	100.00	99.00

tblOnRoadDust	WorkerPercentPave	100.00	99.00
tblOnRoadDust	WorkerPercentPave	100.00	99.00
tblOnRoadDust	WorkerPercentPave	100.00	99.00
tblOnRoadDust	WorkerPercentPave	100.00	99.00
tblOnRoadDust	WorkerPercentPave	100.00	99.00
tblOnRoadDust	WorkerPercentPave	100.00	99.00
tblProjectCharacteristics	CO2IntensityFactor	641.35	499.66
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblSolidWaste	SolidWasteGenerationRate	0.00	0.93
tblTripsAndVMT	HaulingTripLength	20.00	40.00
tblTripsAndVMT	HaulingTripLength	20.00	25.00
tblTripsAndVMT	HaulingTripLength	20.00	25.00
tblTripsAndVMT	HaulingTripNumber	0.00	1,068.00
tblTripsAndVMT	HaulingTripNumber	0.00	3,744.00
tblTripsAndVMT	HaulingTripNumber	0.00	280.00
tblTripsAndVMT	VendorTripLength	6.60	25.00
tblTripsAndVMT	VendorTripLength	6.60	25.00
tblTripsAndVMT	VendorTripLength	6.60	25.00
tblTripsAndVMT	VendorTripLength	6.60	25.00
tblTripsAndVMT	VendorTripLength	6.60	25.00
tblTripsAndVMT	VendorTripLength	6.60	25.00
tblTripsAndVMT	VendorTripLength	6.60	28.00
tblTripsAndVMT	VendorTripLength	6.60	25.00
tblTripsAndVMT	VendorTripLength	6.60	25.00
tblTripsAndVMT	VendorTripLength	6.60	25.00
tblTripsAndVMT	VendorTripLength	6.60	25.00
tblTripsAndVMT	VendorTripLength	6.60	25.00
tblTripsAndVMT	VendorTripNumber	0.00	36.00
tblTripsAndVMT	VendorTripNumber	0.00	2.00
tblTripsAndVMT	VendorTripNumber	0.00	176.00
tblTripsAndVMT	VendorTripNumber	0.00	6.00

tblTripsAndVMT	VendorTripNumber	0.00	12.00
tblTripsAndVMT	VendorTripNumber	1.00	40.00
tblTripsAndVMT	VendorTripNumber	1.00	6.00
tblTripsAndVMT	VendorTripNumber	1.00	0.00
tblTripsAndVMT	WorkerTripNumber	25.00	80.00
tblTripsAndVMT	WorkerTripNumber	13.00	20.00
tblTripsAndVMT	WorkerTripNumber	0.00	10.00
tblTripsAndVMT	WorkerTripNumber	0.00	10.00
tblTripsAndVMT	WorkerTripNumber	35.00	46.00
tblTripsAndVMT	WorkerTripNumber	8.00	36.00
tblTripsAndVMT	WorkerTripNumber	28.00	90.00
tblTripsAndVMT	WorkerTripNumber	33.00	36.00
tblTripsAndVMT	WorkerTripNumber	10.00	24.00
tblTripsAndVMT	WorkerTripNumber	2.00	100.00
tblTripsAndVMT	WorkerTripNumber	2.00	30.00
tblTripsAndVMT	WorkerTripNumber	2.00	20.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	0.2496	2.9121	1.6947	5.4500e-003	2.7924	0.1066	2.8990	0.4915	0.0983	0.5898	0.0000	503.4765	503.4765	0.0770	0.0000	505.4014
2020	0.7021	7.5696	4.1298	0.0144	7.1150	0.2903	7.4053	1.0910	0.2678	1.3587	0.0000	1,319.5650	1,319.5650	0.1968	0.0000	1,324.4857
Maximum	**0.7021**	**7.5696**	**4.1298**	**0.0144**	**7.1150**	**0.2903**	**7.4053**	**1.0910**	**0.2678**	**1.3587**	**0.0000**	**1,319.5650**	**1,319.5650**	**0.1968**	**0.0000**	**1,324.4857**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	0.1191	2.0348	1.8844	5.4500e-003	1.6891	0.0618	1.7509	0.2768	0.0615	0.3383	0.0000	503.4763	503.4763	0.0770	0.0000	505.4011
2020	0.3432	5.1103	4.7103	0.0144	4.3774	0.1572	4.5346	0.6438	0.1564	0.8002	0.0000	1,319.5644	1,319.5644	0.1968	0.0000	1,324.4851
Maximum	**0.3432**	**5.1103**	**4.7103**	**0.0144**	**4.3774**	**0.1572**	**4.5346**	**0.6438**	**0.1564**	**0.8002**	**0.0000**	**1,319.5644**	**1,319.5644**	**0.1968**	**0.0000**	**1,324.4851**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**51.43**	**31.83**	**-13.22**	**0.00**	**38.77**	**44.83**	**39.00**	**41.83**	**40.49**	**41.57**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0232	2.0000e-005	1.7700e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	3.4300e-003	3.4300e-003	1.0000e-005	0.0000	3.6600e-003
Energy	5.4000e-004	4.9000e-003	4.1200e-003	3.0000e-005		3.7000e-004	3.7000e-004		3.7000e-004	3.7000e-004	0.0000	28.6465	28.6465	1.4600e-003	3.8000e-004	28.7955
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.1888	0.0000	0.1888	0.0112	0.0000	0.4677
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0237**	**4.9200e-003**	**5.8900e-003**	**3.0000e-005**	**0.0000**	**3.8000e-004**	**3.8000e-004**	**0.0000**	**3.8000e-004**	**3.8000e-004**	**0.1888**	**28.6499**	**28.8387**	**0.0126**	**3.8000e-004**	**29.2668**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0232	2.0000e-005	1.7700e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	3.4300e-003	3.4300e-003	1.0000e-005	0.0000	3.6600e-003
Energy	5.4000e-004	4.9000e-003	4.1200e-003	3.0000e-005		3.7000e-004	3.7000e-004		3.7000e-004	3.7000e-004	0.0000	28.6465	28.6465	1.4600e-003	3.8000e-004	28.7955
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.1888	0.0000	0.1888	0.0112	0.0000	0.4677
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0237**	**4.9200e-003**	**5.8900e-003**	**3.0000e-005**	**0.0000**	**3.8000e-004**	**3.8000e-004**	**0.0000**	**3.8000e-004**	**3.8000e-004**	**0.1888**	**28.6499**	**28.8387**	**0.0126**	**3.8000e-004**	**29.2668**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Turbine Decommissioning	Demolition	10/1/2019	1/31/2020	5	89	
2	Access Roads	Grading	10/15/2019	2/10/2020	5	85	
3	Substation	Grading	11/1/2019	4/2/2020	5	110	
4	Foundations	Grading	1/16/2020	3/25/2020	5	50	
5	Collection	Grading	2/1/2020	4/24/2020	5	60	
6	Transmission Line	Grading	3/16/2020	7/31/2020	5	100	
7	Turbine Install	Building Construction	3/16/2020	5/22/2020	5	50	
8	O&M Building	Building Construction	3/16/2020	7/24/2020	5	95	
9	Precommissioning/Commissioning	Building Construction	6/1/2020	8/15/2020	5	55	
10	Reclaimation	Grading	7/1/2020	8/25/2020	5	40	
11	O&M Building - Arch Coatings	Architectural Coating	7/25/2020	7/31/2020	5	5	
12	Final Testing/Close Out	Site Preparation	8/16/2020	10/1/2020	5	34	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 7,500; Non-Residential Outdoor: 2,500; Striped Parking Area: 0

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Turbine Decommissioning	Excavators	4	8.00	158	0.38
Turbine Decommissioning	Forklifts	2	8.00	89	0.20
Turbine Decommissioning	Skid Steer Loaders	2	4.00	65	0.37
Turbine Decommissioning	Tractors/Loaders/Backhoes	2	4.00	97	0.37
Access Roads	Graders	3	4.00	187	0.41
Access Roads	Rollers	3	4.00	80	0.38
Access Roads	Rubber Tired Dozers	5	4.00	247	0.40
Access Roads	Tractors/Loaders/Backhoes	3	4.00	97	0.37
Substation	Excavators	1	4.00	158	0.38
Substation	Forklifts	2	8.00	89	0.20
Foundations	Cranes	2	8.00	231	0.29
Foundations	Excavators	2	4.00	158	0.38
Foundations	Forklifts	2	8.00	89	0.20
Foundations	Other Construction Equipment	1	4.00	172	0.42
Foundations	Rollers	2	4.00	80	0.38
Foundations	Rubber Tired Dozers	2	4.00	247	0.40
Collection	Bore/Drill Rigs	1	6.00	221	0.50
Collection	Forklifts	10	8.00	89	0.20
Collection	Rubber Tired Dozers	1	4.00	247	0.40
Collection	Trenchers	1	4.00	78	0.50
Transmission Line	Cranes	2	8.00	231	0.29
Transmission Line	Other Construction Equipment	2	4.00	172	0.42
Turbine Install	Cranes	7	8.00	231	0.29
Turbine Install	Forklifts	8	8.00	89	0.20
O&M Building	Excavators	1	4.00	158	0.38
O&M Building	Forklifts	1	8.00	89	0.20
O&M Building	Rubber Tired Dozers	1	4.00	247	0.40
Precommissioning/Commissioning	Cranes	0	0.00	231	0.29

Reclaimation	Other Construction Equipment	1	4.00	172	0.42
Reclaimation	Rubber Tired Dozers	4	4.00	247	0.40
O&M Building - Arch Coatings	Air Compressors	1	6.00	78	0.48
Final Testing/Close Out	Rubber Tired Dozers	0	0.00	247	0.40

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Turbine Decommissioning	10	80.00	0.00	1,068.00	16.80	25.00	40.00	LD_Mix	HDT_Mix	HHDT
Access Roads	14	46.00	36.00	3,744.00	16.80	25.00	25.00	LD_Mix	HDT_Mix	HHDT
Substation	3	36.00	2.00	0.00	16.80	25.00	20.00	LD_Mix	HDT_Mix	HHDT
Foundations	11	90.00	176.00	280.00	16.80	28.00	25.00	LD_Mix	HDT_Mix	HHDT
Collection	13	36.00	6.00	0.00	16.80	25.00	20.00	LD_Mix	HDT_Mix	HHDT
Transmission Line	4	24.00	12.00	0.00	16.80	25.00	20.00	LD_Mix	HDT_Mix	HHDT
Turbine Install	15	100.00	40.00	0.00	16.80	25.00	20.00	LD_Mix	HDT_Mix	HHDT
O&M Building	3	30.00	6.00	0.00	16.80	25.00	20.00	LD_Mix	HDT_Mix	HHDT
Precommissioning/Commissioning	0	20.00	0.00	0.00	16.80	25.00	20.00	LD_Mix	HDT_Mix	HHDT
Reclaimation	5	20.00	0.00	0.00	16.80	25.00	20.00	LD_Mix	HDT_Mix	HHDT
O&M Building - Arch Coatings	1	10.00	0.00	0.00	16.80	25.00	20.00	LD_Mix	HDT_Mix	HHDT
Final Testing/Close Out	0	10.00	0.00	0.00	16.80	25.00	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Turbine Decommissioning - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0555	0.5626	0.6314	9.5000e-004		0.0312	0.0312		0.0287	0.0287	0.0000	85.5991	85.5991	0.0271	0.0000	86.2761
Total	**0.0555**	**0.5626**	**0.6314**	**9.5000e-004**		**0.0312**	**0.0312**		**0.0287**	**0.0287**	**0.0000**	**85.5991**	**85.5991**	**0.0271**	**0.0000**	**86.2761**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	6.0300e-003	0.1942	0.0304	5.9000e-004	0.2891	8.8000e-004	0.2899	0.0317	8.4000e-004	0.0326	0.0000	55.9725	55.9725	2.3500e-003	0.0000	56.0312
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0183	0.0144	0.1440	3.4000e-004	0.5976	2.6000e-004	0.5978	0.0650	2.4000e-004	0.0653	0.0000	30.4262	30.4262	1.0800e-003	0.0000	30.4533
Total	**0.0244**	**0.2086**	**0.1743**	**9.3000e-004**	**0.8866**	**1.1400e-003**	**0.8877**	**0.0967**	**1.0800e-003**	**0.0978**	**0.0000**	**86.3988**	**86.3988**	**3.4300e-003**	**0.0000**	**86.4845**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0235	0.4767	0.7229	9.5000e-004		0.0263	0.0263		0.0263	0.0263	0.0000	85.5990	85.5990	0.0271	0.0000	86.2760
Total	**0.0235**	**0.4767**	**0.7229**	**9.5000e-004**		**0.0263**	**0.0263**		**0.0263**	**0.0263**	**0.0000**	**85.5990**	**85.5990**	**0.0271**	**0.0000**	**86.2760**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	6.0300e-003	0.1942	0.0304	5.9000e-004	0.1835	8.8000e-004	0.1844	0.0212	8.4000e-004	0.0220	0.0000	55.9725	55.9725	2.3500e-003	0.0000	56.0312
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0183	0.0144	0.1440	3.4000e-004	0.3784	2.6000e-004	0.3787	0.0431	2.4000e-004	0.0433	0.0000	30.4262	30.4262	1.0800e-003	0.0000	30.4533
Total	**0.0244**	**0.2086**	**0.1743**	**9.3000e-004**	**0.5620**	**1.1400e-003**	**0.5631**	**0.0643**	**1.0800e-003**	**0.0653**	**0.0000**	**86.3988**	**86.3988**	**3.4300e-003**	**0.0000**	**86.4845**

3.2 Turbine Decommissioning - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0179	0.1773	0.2197	3.3000e-004		9.6600e-003	9.6600e-003		8.8900e-003	8.8900e-003	0.0000	29.1850	29.1850	9.4400e-003	0.0000	29.4210
Total	**0.0179**	**0.1773**	**0.2197**	**3.3000e-004**		**9.6600e-003**	**9.6600e-003**		**8.8900e-003**	**8.8900e-003**	**0.0000**	**29.1850**	**29.1850**	**9.4400e-003**	**0.0000**	**29.4210**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.9500e-003	0.0628	0.0101	2.0000e-004	0.2869	2.5000e-004	0.2871	0.0309	2.4000e-004	0.0312	0.0000	19.2720	19.2720	7.9000e-004	0.0000	19.2917
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.7900e-003	4.4000e-003	0.0445	1.1000e-004	0.2082	9.0000e-005	0.2083	0.0227	8.0000e-005	0.0227	0.0000	10.2775	10.2775	3.3000e-004	0.0000	10.2856
Total	**7.7400e-003**	**0.0672**	**0.0545**	**3.1000e-004**	**0.4951**	**3.4000e-004**	**0.4954**	**0.0536**	**3.2000e-004**	**0.0539**	**0.0000**	**29.5495**	**29.5495**	**1.1200e-003**	**0.0000**	**29.5774**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	8.1700e-003	0.1661	0.2519	3.3000e-004		9.1800e-003	9.1800e-003		9.1800e-003	9.1800e-003	0.0000	29.1850	29.1850	9.4400e-003	0.0000	29.4209
Total	**8.1700e-003**	**0.1661**	**0.2519**	**3.3000e-004**		**9.1800e-003**	**9.1800e-003**		**9.1800e-003**	**9.1800e-003**	**0.0000**	**29.1850**	**29.1850**	**9.4400e-003**	**0.0000**	**29.4209**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.9500e-003	0.0628	0.0101	2.0000e-004	0.1813	2.5000e-004	0.1816	0.0204	2.4000e-004	0.0206	0.0000	19.2720	19.2720	7.9000e-004	0.0000	19.2917
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.7900e-003	4.4000e-003	0.0445	1.1000e-004	0.1319	9.0000e-005	0.1320	0.0150	8.0000e-005	0.0151	0.0000	10.2775	10.2775	3.3000e-004	0.0000	10.2856
Total	**7.7400e-003**	**0.0672**	**0.0545**	**3.1000e-004**	**0.3132**	**3.4000e-004**	**0.3135**	**0.0354**	**3.2000e-004**	**0.0357**	**0.0000**	**29.5495**	**29.5495**	**1.1200e-003**	**0.0000**	**29.5774**

3.3 Access Roads - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.4482	0.0000	0.4482	0.2346	0.0000	0.2346	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1192	1.3138	0.5539	1.1200e-003		0.0628	0.0628		0.0578	0.0578	0.0000	100.3562	100.3562	0.0318	0.0000	101.1500
Total	**0.1192**	**1.3138**	**0.5539**	**1.1200e-003**	**0.4482**	**0.0628**	**0.5110**	**0.2346**	**0.0578**	**0.2924**	**0.0000**	**100.3562**	**100.3562**	**0.0318**	**0.0000**	**101.1500**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0128	0.4281	0.0642	1.2100e-003	0.6325	1.7400e-003	0.6343	0.0692	1.6700e-003	0.0709	0.0000	114.9018	114.9018	6.8800e-003	0.0000	115.0737
Vendor	0.0132	0.2854	0.0690	8.2000e-004	0.3437	3.2100e-003	0.3469	0.0386	3.0700e-003	0.0417	0.0000	78.2313	78.2313	3.4200e-003	0.0000	78.3167
Worker	8.9500e-003	7.0000e-003	0.0703	1.6000e-004	0.2915	1.2000e-004	0.2917	0.0317	1.1000e-004	0.0318	0.0000	14.8443	14.8443	5.3000e-004	0.0000	14.8575
Total	**0.0350**	**0.7205**	**0.2035**	**2.1900e-003**	**1.2678**	**5.0700e-003**	**1.2728**	**0.1395**	**4.8500e-003**	**0.1443**	**0.0000**	**207.9774**	**207.9774**	**0.0108**	**0.0000**	**208.2479**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.2017	0.0000	0.2017	0.1056	0.0000	0.1056	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0274	0.5493	0.6465	1.1200e-003		0.0252	0.0252		0.0252	0.0252	0.0000	100.3561	100.3561	0.0318	0.0000	101.1499
Total	**0.0274**	**0.5493**	**0.6465**	**1.1200e-003**	**0.2017**	**0.0252**	**0.2269**	**0.1056**	**0.0252**	**0.1307**	**0.0000**	**100.3561**	**100.3561**	**0.0318**	**0.0000**	**101.1499**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0128	0.4281	0.0642	1.2100e-003	0.4013	1.7400e-003	0.4031	0.0461	1.6700e-003	0.0477	0.0000	114.9018	114.9018	6.8800e-003	0.0000	115.0737
Vendor	0.0132	0.2854	0.0690	8.2000e-004	0.2192	3.2100e-003	0.2224	0.0261	3.0700e-003	0.0292	0.0000	78.2313	78.2313	3.4200e-003	0.0000	78.3167
Worker	8.9500e-003	7.0000e-003	0.0703	1.6000e-004	0.1846	1.2000e-004	0.1848	0.0210	1.1000e-004	0.0212	0.0000	14.8443	14.8443	5.3000e-004	0.0000	14.8575
Total	**0.0350**	**0.7205**	**0.2035**	**2.1900e-003**	**0.8052**	**5.0700e-003**	**0.8102**	**0.0932**	**4.8500e-003**	**0.0981**	**0.0000**	**207.9774**	**207.9774**	**0.0108**	**0.0000**	**208.2479**

3.3 Access Roads - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.2450	0.0000	0.2450	0.1229	0.0000	0.1229	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0586	0.6394	0.2800	5.8000e-004		0.0303	0.0303		0.0279	0.0279	0.0000	50.8368	50.8368	0.0164	0.0000	51.2478
Total	**0.0586**	**0.6394**	**0.2800**	**5.8000e-004**	**0.2450**	**0.0303**	**0.2753**	**0.1229**	**0.0279**	**0.1507**	**0.0000**	**50.8368**	**50.8368**	**0.0164**	**0.0000**	**51.2478**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	6.1500e-003	0.2067	0.0315	6.2000e-004	0.6293	7.5000e-004	0.6301	0.0680	7.2000e-004	0.0687	0.0000	58.7972	58.7972	3.4300e-003	0.0000	58.8830
Vendor	5.4500e-003	0.1305	0.0302	4.2000e-004	0.1780	1.1100e-003	0.1791	0.0200	1.0700e-003	0.0210	0.0000	40.1593	40.1593	1.6400e-003	0.0000	40.2004
Worker	4.2000e-003	3.1900e-003	0.0323	8.0000e-005	0.1510	6.0000e-005	0.1510	0.0164	6.0000e-005	0.0165	0.0000	7.4512	7.4512	2.4000e-004	0.0000	7.4571
Total	**0.0158**	**0.3403**	**0.0939**	**1.1200e-003**	**0.9583**	**1.9200e-003**	**0.9602**	**0.1044**	**1.8500e-003**	**0.1063**	**0.0000**	**106.4076**	**106.4076**	**5.3100e-003**	**0.0000**	**106.5404**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1102	0.0000	0.1102	0.0553	0.0000	0.0553	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0142	0.2845	0.3348	5.8000e-004		0.0130	0.0130		0.0130	0.0130	0.0000	50.8367	50.8367	0.0164	0.0000	51.2478
Total	**0.0142**	**0.2845**	**0.3348**	**5.8000e-004**	**0.1102**	**0.0130**	**0.1233**	**0.0553**	**0.0130**	**0.0683**	**0.0000**	**50.8367**	**50.8367**	**0.0164**	**0.0000**	**51.2478**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	6.1500e-003	0.2067	0.0315	6.2000e-004	0.3981	7.5000e-004	0.3989	0.0449	7.2000e-004	0.0456	0.0000	58.7972	58.7972	3.4300e-003	0.0000	58.8830
Vendor	5.4500e-003	0.1305	0.0302	4.2000e-004	0.1135	1.1100e-003	0.1146	0.0135	1.0700e-003	0.0146	0.0000	40.1593	40.1593	1.6400e-003	0.0000	40.2004
Worker	4.2000e-003	3.1900e-003	0.0323	8.0000e-005	0.0956	6.0000e-005	0.0957	0.0109	6.0000e-005	0.0110	0.0000	7.4512	7.4512	2.4000e-004	0.0000	7.4571
Total	**0.0158**	**0.3403**	**0.0939**	**1.1200e-003**	**0.6073**	**1.9200e-003**	**0.6092**	**0.0693**	**1.8500e-003**	**0.0712**	**0.0000**	**106.4076**	**106.4076**	**5.3100e-003**	**0.0000**	**106.5404**

3.4 Substation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	9.6800e-003	0.0903	0.0864	1.2000e-004		6.1500e-003	6.1500e-003		5.6600e-003	5.6600e-003	0.0000	10.8875	10.8875	3.4400e-003	0.0000	10.9736
Total	**9.6800e-003**	**0.0903**	**0.0864**	**1.2000e-004**	**0.0000**	**6.1500e-003**	**6.1500e-003**	**0.0000**	**5.6600e-003**	**5.6600e-003**	**0.0000**	**10.8875**	**10.8875**	**3.4400e-003**	**0.0000**	**10.9736**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.6000e-004	0.0122	2.9400e-003	4.0000e-005	0.0147	1.4000e-004	0.0148	1.6500e-003	1.3000e-004	1.7800e-003	0.0000	3.3373	3.3373	1.5000e-004	0.0000	3.3409
Worker	5.3800e-003	4.2100e-003	0.0422	1.0000e-004	0.1752	7.0000e-005	0.1753	0.0191	7.0000e-005	0.0191	0.0000	8.9204	8.9204	3.2000e-004	0.0000	8.9284
Total	**5.9400e-003**	**0.0164**	**0.0452**	**1.4000e-004**	**0.1899**	**2.1000e-004**	**0.1901**	**0.0207**	**2.0000e-004**	**0.0209**	**0.0000**	**12.2577**	**12.2577**	**4.7000e-004**	**0.0000**	**12.2692**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.9900e-003	0.0634	0.0921	1.2000e-004		3.8700e-003	3.8700e-003		3.8700e-003	3.8700e-003	0.0000	10.8875	10.8875	3.4400e-003	0.0000	10.9736
Total	**2.9900e-003**	**0.0634**	**0.0921**	**1.2000e-004**	**0.0000**	**3.8700e-003**	**3.8700e-003**	**0.0000**	**3.8700e-003**	**3.8700e-003**	**0.0000**	**10.8875**	**10.8875**	**3.4400e-003**	**0.0000**	**10.9736**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.6000e-004	0.0122	2.9400e-003	4.0000e-005	9.3500e-003	1.4000e-004	9.4900e-003	1.1100e-003	1.3000e-004	1.2500e-003	0.0000	3.3373	3.3373	1.5000e-004	0.0000	3.3409
Worker	5.3800e-003	4.2100e-003	0.0422	1.0000e-004	0.1110	7.0000e-005	0.1110	0.0126	7.0000e-005	0.0127	0.0000	8.9204	8.9204	3.2000e-004	0.0000	8.9284
Total	**5.9400e-003**	**0.0164**	**0.0452**	**1.4000e-004**	**0.1203**	**2.1000e-004**	**0.1205**	**0.0138**	**2.0000e-004**	**0.0140**	**0.0000**	**12.2577**	**12.2577**	**4.7000e-004**	**0.0000**	**12.2692**

3.4 Substation - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0138	0.1273	0.1338	1.9000e-004		8.4300e-003	8.4300e-003		7.7600e-003	7.7600e-003	0.0000	16.5970	16.5970	5.3700e-003	0.0000	16.7312
Total	**0.0138**	**0.1273**	**0.1338**	**1.9000e-004**	**0.0000**	**8.4300e-003**	**8.4300e-003**	**0.0000**	**7.7600e-003**	**7.7600e-003**	**0.0000**	**16.5970**	**16.5970**	**5.3700e-003**	**0.0000**	**16.7312**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	7.0000e-004	0.0167	3.8700e-003	5.0000e-005	0.0229	1.4000e-004	0.0230	2.5600e-003	1.4000e-004	2.7000e-003	0.0000	5.1545	5.1545	2.1000e-004	0.0000	5.1598
Worker	7.5900e-003	5.7600e-003	0.0583	1.5000e-004	0.2730	1.1000e-004	0.2731	0.0297	1.0000e-004	0.0298	0.0000	13.4724	13.4724	4.3000e-004	0.0000	13.4831
Total	**8.2900e-003**	**0.0225**	**0.0622**	**2.0000e-004**	**0.2958**	**2.5000e-004**	**0.2961**	**0.0323**	**2.4000e-004**	**0.0325**	**0.0000**	**18.6270**	**18.6270**	**6.4000e-004**	**0.0000**	**18.6430**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.6500e-003	0.0988	0.1435	1.9000e-004		6.0300e-003	6.0300e-003		6.0300e-003	6.0300e-003	0.0000	16.5970	16.5970	5.3700e-003	0.0000	16.7312
Total	**4.6500e-003**	**0.0988**	**0.1435**	**1.9000e-004**	**0.0000**	**6.0300e-003**	**6.0300e-003**	**0.0000**	**6.0300e-003**	**6.0300e-003**	**0.0000**	**16.5970**	**16.5970**	**5.3700e-003**	**0.0000**	**16.7312**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	7.0000e-004	0.0167	3.8700e-003	5.0000e-005	0.0146	1.4000e-004	0.0147	1.7400e-003	1.4000e-004	1.8700e-003	0.0000	5.1545	5.1545	2.1000e-004	0.0000	5.1598
Worker	7.5900e-003	5.7600e-003	0.0583	1.5000e-004	0.1729	1.1000e-004	0.1730	0.0197	1.0000e-004	0.0198	0.0000	13.4724	13.4724	4.3000e-004	0.0000	13.4831
Total	**8.2900e-003**	**0.0225**	**0.0622**	**2.0000e-004**	**0.1874**	**2.5000e-004**	**0.1877**	**0.0214**	**2.4000e-004**	**0.0217**	**0.0000**	**18.6270**	**18.6270**	**6.4000e-004**	**0.0000**	**18.6430**

3.5 Foundations - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1673	0.0000	0.1673	0.0846	0.0000	0.0846	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0744	0.7956	0.4486	8.5000e-004		0.0395	0.0395		0.0364	0.0364	0.0000	74.7196	74.7196	0.0242	0.0000	75.3237
Total	**0.0744**	**0.7956**	**0.4486**	**8.5000e-004**	**0.1673**	**0.0395**	**0.2068**	**0.0846**	**0.0364**	**0.1209**	**0.0000**	**74.7196**	**74.7196**	**0.0242**	**0.0000**	**75.3237**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.3500e-003	0.0453	6.9000e-003	1.4000e-004	0.0476	1.6000e-004	0.0477	5.2700e-003	1.6000e-004	5.4200e-003	0.0000	12.8884	12.8884	7.5000e-004	0.0000	12.9072
Vendor	0.0505	1.1953	0.2775	3.9600e-003	1.6803	0.0105	1.6908	0.1886	0.0100	0.1986	0.0000	375.5833	375.5833	0.0142	0.0000	375.9379
Worker	0.0142	0.0108	0.1088	2.8000e-004	0.5093	2.1000e-004	0.5095	0.0554	1.9000e-004	0.0556	0.0000	25.1351	25.1351	8.0000e-004	0.0000	25.1551
Total	**0.0660**	**1.2513**	**0.3932**	**4.3800e-003**	**2.2371**	**0.0109**	**2.2480**	**0.2493**	**0.0104**	**0.2597**	**0.0000**	**413.6068**	**413.6068**	**0.0157**	**0.0000**	**414.0002**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0753	0.0000	0.0753	0.0381	0.0000	0.0381	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0209	0.4162	0.5314	8.5000e-004		0.0194	0.0194		0.0194	0.0194	0.0000	74.7195	74.7195	0.0242	0.0000	75.3237
Total	**0.0209**	**0.4162**	**0.5314**	**8.5000e-004**	**0.0753**	**0.0194**	**0.0946**	**0.0381**	**0.0194**	**0.0574**	**0.0000**	**74.7195**	**74.7195**	**0.0242**	**0.0000**	**75.3237**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.3500e-003	0.0453	6.9000e-003	1.4000e-004	0.0303	1.6000e-004	0.0304	3.5400e-003	1.6000e-004	3.7000e-003	0.0000	12.8884	12.8884	7.5000e-004	0.0000	12.9072
Vendor	0.0505	1.1953	0.2775	3.9600e-003	1.0716	0.0105	1.0821	0.1277	0.0100	0.1378	0.0000	375.5833	375.5833	0.0142	0.0000	375.9379
Worker	0.0142	0.0108	0.1088	2.8000e-004	0.3225	2.1000e-004	0.3227	0.0367	1.9000e-004	0.0369	0.0000	25.1351	25.1351	8.0000e-004	0.0000	25.1551
Total	**0.0660**	**1.2513**	**0.3932**	**4.3800e-003**	**1.4244**	**0.0109**	**1.4353**	**0.1680**	**0.0104**	**0.1784**	**0.0000**	**413.6068**	**413.6068**	**0.0157**	**0.0000**	**414.0002**

3.6 Collection - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0903	0.0000	0.0903	0.0497	0.0000	0.0497	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0719	0.6954	0.5024	8.5000e-004		0.0439	0.0439		0.0404	0.0404	0.0000	74.5635	74.5635	0.0241	0.0000	75.1664
Total	**0.0719**	**0.6954**	**0.5024**	**8.5000e-004**	**0.0903**	**0.0439**	**0.1342**	**0.0497**	**0.0404**	**0.0900**	**0.0000**	**74.5635**	**74.5635**	**0.0241**	**0.0000**	**75.1664**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.8800e-003	0.0450	0.0104	1.5000e-004	0.0614	3.8000e-004	0.0618	6.8900e-003	3.7000e-004	7.2600e-003	0.0000	13.8480	13.8480	5.7000e-004	0.0000	13.8622
Worker	6.7900e-003	5.1600e-003	0.0522	1.3000e-004	0.2445	1.0000e-004	0.2446	0.0266	9.0000e-005	0.0267	0.0000	12.0649	12.0649	3.8000e-004	0.0000	12.0744
Total	**8.6700e-003**	**0.0501**	**0.0626**	**2.8000e-004**	**0.3058**	**4.8000e-004**	**0.3063**	**0.0335**	**4.6000e-004**	**0.0340**	**0.0000**	**25.9129**	**25.9129**	**9.5000e-004**	**0.0000**	**25.9366**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0407	0.0000	0.0407	0.0223	0.0000	0.0223	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0209	0.4487	0.5686	8.5000e-004		0.0262	0.0262		0.0262	0.0262	0.0000	74.5634	74.5634	0.0241	0.0000	75.1663
Total	**0.0209**	**0.4487**	**0.5686**	**8.5000e-004**	**0.0407**	**0.0262**	**0.0669**	**0.0223**	**0.0262**	**0.0486**	**0.0000**	**74.5634**	**74.5634**	**0.0241**	**0.0000**	**75.1663**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.8800e-003	0.0450	0.0104	1.5000e-004	0.0391	3.8000e-004	0.0395	4.6700e-003	3.7000e-004	5.0300e-003	0.0000	13.8480	13.8480	5.7000e-004	0.0000	13.8622
Worker	6.7900e-003	5.1600e-003	0.0522	1.3000e-004	0.1548	1.0000e-004	0.1549	0.0176	9.0000e-005	0.0177	0.0000	12.0649	12.0649	3.8000e-004	0.0000	12.0744
Total	**8.6700e-003**	**0.0501**	**0.0626**	**2.8000e-004**	**0.1940**	**4.8000e-004**	**0.1944**	**0.0223**	**4.6000e-004**	**0.0228**	**0.0000**	**25.9129**	**25.9129**	**9.5000e-004**	**0.0000**	**25.9366**

3.7 Transmission Line - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0700	0.8011	0.4176	8.9000e-004		0.0361	0.0361		0.0332	0.0332	0.0000	77.8538	77.8538	0.0252	0.0000	78.4833
Total	**0.0700**	**0.8011**	**0.4176**	**8.9000e-004**	**0.0000**	**0.0361**	**0.0361**	**0.0000**	**0.0332**	**0.0332**	**0.0000**	**77.8538**	**77.8538**	**0.0252**	**0.0000**	**78.4833**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	6.2600e-003	0.1499	0.0347	4.9000e-004	0.2046	1.2800e-003	0.2059	0.0230	1.2300e-003	0.0242	0.0000	46.1601	46.1601	1.8900e-003	0.0000	46.2073
Worker	7.5500e-003	5.7300e-003	0.0580	1.5000e-004	0.2716	1.1000e-004	0.2717	0.0296	1.0000e-004	0.0297	0.0000	13.4054	13.4054	4.3000e-004	0.0000	13.4161
Total	**0.0138**	**0.1557**	**0.0927**	**6.4000e-004**	**0.4762**	**1.3900e-003**	**0.4776**	**0.0525**	**1.3300e-003**	**0.0539**	**0.0000**	**59.5655**	**59.5655**	**2.3200e-003**	**0.0000**	**59.6234**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0218	0.4219	0.5429	8.9000e-004		0.0175	0.0175		0.0175	0.0175	0.0000	77.8538	77.8538	0.0252	0.0000	78.4832
Total	**0.0218**	**0.4219**	**0.5429**	**8.9000e-004**	**0.0000**	**0.0175**	**0.0175**	**0.0000**	**0.0175**	**0.0175**	**0.0000**	**77.8538**	**77.8538**	**0.0252**	**0.0000**	**78.4832**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	6.2600e-003	0.1499	0.0347	4.9000e-004	0.1305	1.2800e-003	0.1318	0.0156	1.2300e-003	0.0168	0.0000	46.1601	46.1601	1.8900e-003	0.0000	46.2073
Worker	7.5500e-003	5.7300e-003	0.0580	1.5000e-004	0.1720	1.1000e-004	0.1721	0.0196	1.0000e-004	0.0197	0.0000	13.4054	13.4054	4.3000e-004	0.0000	13.4161
Total	**0.0138**	**0.1557**	**0.0927**	**6.4000e-004**	**0.3025**	**1.3900e-003**	**0.3039**	**0.0351**	**1.3300e-003**	**0.0365**	**0.0000**	**59.5655**	**59.5655**	**2.3200e-003**	**0.0000**	**59.6234**

3.8 Turbine Install - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1082	1.2030	0.6062	1.3100e-003		0.0582	0.0582		0.0536	0.0536	0.0000	115.5702	115.5702	0.0374	0.0000	116.5047
Total	**0.1082**	**1.2030**	**0.6062**	**1.3100e-003**		**0.0582**	**0.0582**		**0.0536**	**0.0536**	**0.0000**	**115.5702**	**115.5702**	**0.0374**	**0.0000**	**116.5047**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0104	0.2499	0.0578	8.1000e-004	0.3410	2.1300e-003	0.3431	0.0383	2.0400e-003	0.0403	0.0000	76.9335	76.9335	3.1500e-003	0.0000	77.0122
Worker	0.0157	0.0119	0.1209	3.1000e-004	0.5659	2.3000e-004	0.5661	0.0616	2.1000e-004	0.0618	0.0000	27.9279	27.9279	8.9000e-004	0.0000	27.9501
Total	**0.0262**	**0.2618**	**0.1787**	**1.1200e-003**	**0.9068**	**2.3600e-003**	**0.9092**	**0.0998**	**2.2500e-003**	**0.1021**	**0.0000**	**104.8614**	**104.8614**	**4.0400e-003**	**0.0000**	**104.9623**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0324	0.6517	0.7699	1.3100e-003		0.0303	0.0303		0.0303	0.0303	0.0000	115.5701	115.5701	0.0374	0.0000	116.5045
Total	**0.0324**	**0.6517**	**0.7699**	**1.3100e-003**		**0.0303**	**0.0303**		**0.0303**	**0.0303**	**0.0000**	**115.5701**	**115.5701**	**0.0374**	**0.0000**	**116.5045**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0104	0.2499	0.0578	8.1000e-004	0.2175	2.1300e-003	0.2196	0.0259	2.0400e-003	0.0280	0.0000	76.9335	76.9335	3.1500e-003	0.0000	77.0122
Worker	0.0157	0.0119	0.1209	3.1000e-004	0.3584	2.3000e-004	0.3586	0.0408	2.1000e-004	0.0410	0.0000	27.9279	27.9279	8.9000e-004	0.0000	27.9501
Total	**0.0262**	**0.2618**	**0.1787**	**1.1200e-003**	**0.5758**	**2.3600e-003**	**0.5782**	**0.0667**	**2.2500e-003**	**0.0690**	**0.0000**	**104.8614**	**104.8614**	**4.0400e-003**	**0.0000**	**104.9623**

3.9 O&M Building - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0383	0.3881	0.2318	4.0000e-004		0.0206	0.0206		0.0189	0.0189	0.0000	34.9798	34.9798	0.0113	0.0000	35.2627
Total	**0.0383**	**0.3881**	**0.2318**	**4.0000e-004**		**0.0206**	**0.0206**		**0.0189**	**0.0189**	**0.0000**	**34.9798**	**34.9798**	**0.0113**	**0.0000**	**35.2627**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.9700e-003	0.0712	0.0165	2.3000e-004	0.0972	6.1000e-004	0.0978	0.0109	5.8000e-004	0.0115	0.0000	21.9260	21.9260	9.0000e-004	0.0000	21.9485
Worker	8.9600e-003	6.8100e-003	0.0689	1.8000e-004	0.3225	1.3000e-004	0.3227	0.0351	1.2000e-004	0.0352	0.0000	15.9189	15.9189	5.1000e-004	0.0000	15.9316
Total	**0.0119**	**0.0780**	**0.0854**	**4.1000e-004**	**0.4197**	**7.4000e-004**	**0.4205**	**0.0460**	**7.0000e-004**	**0.0467**	**0.0000**	**37.8450**	**37.8450**	**1.4100e-003**	**0.0000**	**37.8800**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	9.7700e-003	0.1952	0.2558	4.0000e-004		9.3200e-003	9.3200e-003		9.3200e-003	9.3200e-003	0.0000	34.9798	34.9798	0.0113	0.0000	35.2626
Total	**9.7700e-003**	**0.1952**	**0.2558**	**4.0000e-004**		**9.3200e-003**	**9.3200e-003**		**9.3200e-003**	**9.3200e-003**	**0.0000**	**34.9798**	**34.9798**	**0.0113**	**0.0000**	**35.2626**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.9700e-003	0.0712	0.0165	2.3000e-004	0.0620	6.1000e-004	0.0626	7.3900e-003	5.8000e-004	7.9700e-003	0.0000	21.9260	21.9260	9.0000e-004	0.0000	21.9485
Worker	8.9600e-003	6.8100e-003	0.0689	1.8000e-004	0.2043	1.3000e-004	0.2044	0.0233	1.2000e-004	0.0234	0.0000	15.9189	15.9189	5.1000e-004	0.0000	15.9316
Total	**0.0119**	**0.0780**	**0.0854**	**4.1000e-004**	**0.2663**	**7.4000e-004**	**0.2670**	**0.0307**	**7.0000e-004**	**0.0314**	**0.0000**	**37.8450**	**37.8450**	**1.4100e-003**	**0.0000**	**37.8800**

3.10 Precommissioning/Commissioning - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.4600e-003	2.6300e-003	0.0266	7.0000e-005	0.1245	5.0000e-005	0.1245	0.0136	5.0000e-005	0.0136	0.0000	6.1441	6.1441	2.0000e-004	0.0000	6.1490
Total	**3.4600e-003**	**2.6300e-003**	**0.0266**	**7.0000e-005**	**0.1245**	**5.0000e-005**	**0.1245**	**0.0136**	**5.0000e-005**	**0.0136**	**0.0000**	**6.1441**	**6.1441**	**2.0000e-004**	**0.0000**	**6.1490**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.4600e-003	2.6300e-003	0.0266	7.0000e-005	0.0788	5.0000e-005	0.0789	8.9800e-003	5.0000e-005	9.0300e-003	0.0000	6.1441	6.1441	2.0000e-004	0.0000	6.1490
Total	**3.4600e-003**	**2.6300e-003**	**0.0266**	**7.0000e-005**	**0.0788**	**5.0000e-005**	**0.0789**	**8.9800e-003**	**5.0000e-005**	**9.0300e-003**	**0.0000**	**6.1441**	**6.1441**	**2.0000e-004**	**0.0000**	**6.1490**

3.11 Reclaimation - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.2584	0.0000	0.2584	0.1343	0.0000	0.1343	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0481	0.5057	0.2065	4.0000e-004		0.0250	0.0250		0.0230	0.0230	0.0000	35.4544	35.4544	0.0115	0.0000	35.7410
Total	**0.0481**	**0.5057**	**0.2065**	**4.0000e-004**	**0.2584**	**0.0250**	**0.2833**	**0.1343**	**0.0230**	**0.1573**	**0.0000**	**35.4544**	**35.4544**	**0.0115**	**0.0000**	**35.7410**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.5200e-003	1.9100e-003	0.0193	5.0000e-005	0.0905	4.0000e-005	0.0906	9.8500e-003	3.0000e-005	9.8900e-003	0.0000	4.4685	4.4685	1.4000e-004	0.0000	4.4720
Total	**2.5200e-003**	**1.9100e-003**	**0.0193**	**5.0000e-005**	**0.0905**	**4.0000e-005**	**0.0906**	**9.8500e-003**	**3.0000e-005**	**9.8900e-003**	**0.0000**	**4.4685**	**4.4685**	**1.4000e-004**	**0.0000**	**4.4720**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1163	0.0000	0.1163	0.0604	0.0000	0.0604	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	9.8900e-003	0.1913	0.2284	4.0000e-004		7.5600e-003	7.5600e-003		7.5600e-003	7.5600e-003	0.0000	35.4543	35.4543	0.0115	0.0000	35.7410
Total	**9.8900e-003**	**0.1913**	**0.2284**	**4.0000e-004**	**0.1163**	**7.5600e-003**	**0.1238**	**0.0604**	**7.5600e-003**	**0.0680**	**0.0000**	**35.4543**	**35.4543**	**0.0115**	**0.0000**	**35.7410**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.5200e-003	1.9100e-003	0.0193	5.0000e-005	0.0573	4.0000e-005	0.0574	6.5300e-003	3.0000e-005	6.5700e-003	0.0000	4.4685	4.4685	1.4000e-004	0.0000	4.4720
Total	**2.5200e-003**	**1.9100e-003**	**0.0193**	**5.0000e-005**	**0.0573**	**4.0000e-005**	**0.0574**	**6.5300e-003**	**3.0000e-005**	**6.5700e-003**	**0.0000**	**4.4685**	**4.4685**	**1.4000e-004**	**0.0000**	**4.4720**

3.12 O&M Building - Arch Coatings - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0348					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.1000e-004	4.2100e-003	4.5800e-003	1.0000e-005		2.8000e-004	2.8000e-004		2.8000e-004	2.8000e-004	0.0000	0.6383	0.6383	5.0000e-005	0.0000	0.6396
Total	**0.0354**	**4.2100e-003**	**4.5800e-003**	**1.0000e-005**		**2.8000e-004**	**2.8000e-004**		**2.8000e-004**	**2.8000e-004**	**0.0000**	**0.6383**	**0.6383**	**5.0000e-005**	**0.0000**	**0.6396**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.6000e-004	1.2000e-004	1.2100e-003	0.0000	5.6600e-003	0.0000	5.6600e-003	6.2000e-004	0.0000	6.2000e-004	0.0000	0.2793	0.2793	1.0000e-005	0.0000	0.2795
Total	**1.6000e-004**	**1.2000e-004**	**1.2100e-003**	**0.0000**	**5.6600e-003**	**0.0000**	**5.6600e-003**	**6.2000e-004**	**0.0000**	**6.2000e-004**	**0.0000**	**0.2793**	**0.2793**	**1.0000e-005**	**0.0000**	**0.2795**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0348					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.5000e-004	3.3900e-003	4.5800e-003	1.0000e-005		2.4000e-004	2.4000e-004		2.4000e-004	2.4000e-004	0.0000	0.6383	0.6383	5.0000e-005	0.0000	0.6396
Total	**0.0349**	**3.3900e-003**	**4.5800e-003**	**1.0000e-005**		**2.4000e-004**	**2.4000e-004**		**2.4000e-004**	**2.4000e-004**	**0.0000**	**0.6383**	**0.6383**	**5.0000e-005**	**0.0000**	**0.6396**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.6000e-004	1.2000e-004	1.2100e-003	0.0000	3.5800e-003	0.0000	3.5900e-003	4.1000e-004	0.0000	4.1000e-004	0.0000	0.2793	0.2793	1.0000e-005	0.0000	0.2795
Total	**1.6000e-004**	**1.2000e-004**	**1.2100e-003**	**0.0000**	**3.5800e-003**	**0.0000**	**3.5900e-003**	**4.1000e-004**	**0.0000**	**4.1000e-004**	**0.0000**	**0.2793**	**0.2793**	**1.0000e-005**	**0.0000**	**0.2795**

3.13 Final Testing/Close Out - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0700e-003	8.1000e-004	8.2200e-003	2.0000e-005	0.0385	2.0000e-005	0.0385	4.1900e-003	1.0000e-005	4.2000e-003	0.0000	1.8991	1.8991	6.0000e-005	0.0000	1.9006
Total	**1.0700e-003**	**8.1000e-004**	**8.2200e-003**	**2.0000e-005**	**0.0385**	**2.0000e-005**	**0.0385**	**4.1900e-003**	**1.0000e-005**	**4.2000e-003**	**0.0000**	**1.8991**	**1.8991**	**6.0000e-005**	**0.0000**	**1.9006**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0700e-003	8.1000e-004	8.2200e-003	2.0000e-005	0.0244	2.0000e-005	0.0244	2.7800e-003	1.0000e-005	2.7900e-003	0.0000	1.8991	1.8991	6.0000e-005	0.0000	1.9006
Total	**1.0700e-003**	**8.1000e-004**	**8.2200e-003**	**2.0000e-005**	**0.0244**	**2.0000e-005**	**0.0244**	**2.7800e-003**	**1.0000e-005**	**2.7900e-003**	**0.0000**	**1.8991**	**1.8991**	**6.0000e-005**	**0.0000**	**1.9006**

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	23.3101	23.3101	1.3500e-003	2.8000e-004	23.4274
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	23.3101	23.3101	1.3500e-003	2.8000e-004	23.4274
NaturalGas Mitigated	5.4000e-004	4.9000e-003	4.1200e-003	3.0000e-005		3.7000e-004	3.7000e-004		3.7000e-004	3.7000e-004	0.0000	5.3364	5.3364	1.0000e-004	1.0000e-004	5.3681
NaturalGas Unmitigated	5.4000e-004	4.9000e-003	4.1200e-003	3.0000e-005		3.7000e-004	3.7000e-004		3.7000e-004	3.7000e-004	0.0000	5.3364	5.3364	1.0000e-004	1.0000e-004	5.3681

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
User Defined Commercial	100000	5.4000e-004	4.9000e-003	4.1200e-003	3.0000e-005		3.7000e-004	3.7000e-004		3.7000e-004	3.7000e-004	0.0000	5.3364	5.3364	1.0000e-004	1.0000e-004	5.3681
Total		**5.4000e-004**	**4.9000e-003**	**4.1200e-003**	**3.0000e-005**		**3.7000e-004**	**3.7000e-004**		**3.7000e-004**	**3.7000e-004**	**0.0000**	**5.3364**	**5.3364**	**1.0000e-004**	**1.0000e-004**	**5.3681**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
User Defined Commercial	100000	5.4000e-004	4.9000e-003	4.1200e-003	3.0000e-005		3.7000e-004	3.7000e-004		3.7000e-004	3.7000e-004	0.0000	5.3364	5.3364	1.0000e-004	1.0000e-004	5.3681
Total		**5.4000e-004**	**4.9000e-003**	**4.1200e-003**	**3.0000e-005**		**3.7000e-004**	**3.7000e-004**		**3.7000e-004**	**3.7000e-004**	**0.0000**	**5.3364**	**5.3364**	**1.0000e-004**	**1.0000e-004**	**5.3681**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
User Defined Commercial	102850	23.3101	1.3500e-003	2.8000e-004	23.4274
Total		**23.3101**	**1.3500e-003**	**2.8000e-004**	**23.4274**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
User Defined Commercial	102850	23.3101	1.3500e-003	2.8000e-004	23.4274
Total		**23.3101**	**1.3500e-003**	**2.8000e-004**	**23.4274**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0232	2.0000e-005	1.7700e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	3.4300e-003	3.4300e-003	1.0000e-005	0.0000	3.6600e-003
Unmitigated	0.0232	2.0000e-005	1.7700e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	3.4300e-003	3.4300e-003	1.0000e-005	0.0000	3.6600e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	3.4800e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0195					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.7000e-004	2.0000e-005	1.7700e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	3.4300e-003	3.4300e-003	1.0000e-005	0.0000	3.6600e-003
Total	**0.0232**	**2.0000e-005**	**1.7700e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**	**0.0000**	**3.4300e-003**	**3.4300e-003**	**1.0000e-005**	**0.0000**	**3.6600e-003**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	3.4800e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0195					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.7000e-004	2.0000e-005	1.7700e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	3.4300e-003	3.4300e-003	1.0000e-005	0.0000	3.6600e-003
Total	**0.0232**	**2.0000e-005**	**1.7700e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**	**0.0000**	**3.4300e-003**	**3.4300e-003**	**1.0000e-005**	**0.0000**	**3.6600e-003**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.1888	0.0112	0.0000	0.4677
Unmitigated	0.1888	0.0112	0.0000	0.4677

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
User Defined Commercial	0.93	0.1888	0.0112	0.0000	0.4677
Total		**0.1888**	**0.0112**	**0.0000**	**0.4677**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
User Defined Commercial	0.93	0.1888	0.0112	0.0000	0.4677
Total		**0.1888**	**0.0112**	**0.0000**	**0.4677**

CalEEMod Version: CalEEMod.2016.3.2

Date: 6/13/2019 9:48 AM

Gonzaga Ridge Wind Repowering Project

Merced County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Commercial	192.21	User Defined Unit	192.21	5,000.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	49
Climate Zone	4			**Operational Year**	2021
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	499.66	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Gonzaga Ridge Wind Repowering Project. Merced County. CO2 intensity to meet 33% RPS.

Land Use - Total disturbed area: 192.21 acres

Construction Phase - Construction phases and durations provided by applicant.

Off-road Equipment - Equipment based on information from applicant.

Off-road Equipment - Equipment based on information from applicant.

Off-road Equipment - No construction equipment assumed.

Off-road Equipment - Equipment based on information from applicant.

Off-road Equipment - Equipment based on information from applicant.

Off-road Equipment - Default equipment assumed for arch coatings.

Off-road Equipment - No construction equipment assumed.

Off-road Equipment - Equipment based on information from applicant.

Off-road Equipment - Equipment based on information from applicant.

Off-road Equipment - Equipment based on information from applicant.

Off-road Equipment - Equipment based on information from applicant.

Off-road Equipment - Equipment based on information from applicant.

Trips and VMT - Revised worker, vendor, and haul trips per phase.

On-road Fugitive Dust - Assumed 99 percent of roadways are paved.

Grading - Acres graded based on equipment fleet.

Energy Use - Updated energy use based on commercial office building defaults.

Solid Waste - Updated solid waste based on commercial office building.

Construction Off-road Equipment Mitigation - Fugitive dust controls to comply with SJVAPCD Reg VIII. Use of Tier 3 construction equipment.

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadMoistureContent	0	0.5
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	11.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	8.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	25.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	13.00
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tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3

tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
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tblConstructionPhase	NumDays	3,100.00	95.00
tblConstructionPhase	NumDays	3,100.00	55.00
tblConstructionPhase	NumDays	200.00	89.00
tblConstructionPhase	NumDays	310.00	40.00
tblConstructionPhase	NumDays	310.00	85.00
tblConstructionPhase	NumDays	310.00	110.00
tblConstructionPhase	NumDays	310.00	50.00
tblConstructionPhase	NumDays	310.00	60.00
tblConstructionPhase	NumDays	310.00	100.00
tblConstructionPhase	NumDays	120.00	34.00
tblEnergyUse	LightingElect	0.00	4.72
tblEnergyUse	NT24E	0.00	7.84
tblEnergyUse	T24E	0.00	8.01
tblEnergyUse	T24NG	0.00	20.00
tblGrading	AcresOfGrading	0.00	33.00
tblGrading	AcresOfGrading	63.75	50.25
tblGrading	AcresOfGrading	0.00	31.50
tblLandUse	LandUseSquareFeet	0.00	5,000.00
tblLandUse	LotAcreage	0.00	192.21
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	7.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	8.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	5.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
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tblOffRoadEquipment	PhaseName		Substation
tblOffRoadEquipment	PhaseName		Access Roads
tblOffRoadEquipment	PhaseName		Turbine Decommissioning
tblOffRoadEquipment	PhaseName		Turbine Decommissioning
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	7.00	0.00
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tblOffRoadEquipment	UsageHours	8.00	4.00
tblOffRoadEquipment	UsageHours	8.00	4.00
tblOffRoadEquipment	UsageHours	8.00	4.00
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tblOffRoadEquipment	UsageHours	8.00	4.00
tblOffRoadEquipment	UsageHours	8.00	4.00
tblOffRoadEquipment	UsageHours	8.00	0.00

tblOffRoadEquipment	UsageHours	8.00	4.00
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tblOnRoadDust	HaulingPercentPave	100.00	99.00
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tblOnRoadDust	HaulingPercentPave	100.00	99.00
tblOnRoadDust	HaulingPercentPave	100.00	99.00
tblOnRoadDust	HaulingPercentPave	100.00	99.00
tblOnRoadDust	HaulingPercentPave	100.00	99.00
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tblOnRoadDust	HaulingPercentPave	100.00	99.00
tblOnRoadDust	HaulingPercentPave	100.00	99.00
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tblOnRoadDust	VendorPercentPave	100.00	99.00
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tblOnRoadDust	VendorPercentPave	100.00	99.00
tblOnRoadDust	VendorPercentPave	100.00	99.00
tblOnRoadDust	VendorPercentPave	100.00	99.00
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tblOnRoadDust	WorkerPercentPave	100.00	99.00
tblOnRoadDust	WorkerPercentPave	100.00	99.00
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tblOnRoadDust	WorkerPercentPave	100.00	99.00
tblOnRoadDust	WorkerPercentPave	100.00	99.00

tblOnRoadDust	WorkerPercentPave	100.00	99.00
tblOnRoadDust	WorkerPercentPave	100.00	99.00
tblOnRoadDust	WorkerPercentPave	100.00	99.00
tblOnRoadDust	WorkerPercentPave	100.00	99.00
tblOnRoadDust	WorkerPercentPave	100.00	99.00
tblOnRoadDust	WorkerPercentPave	100.00	99.00
tblProjectCharacteristics	CO2IntensityFactor	641.35	499.66
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblSolidWaste	SolidWasteGenerationRate	0.00	0.93
tblTripsAndVMT	HaulingTripLength	20.00	40.00
tblTripsAndVMT	HaulingTripLength	20.00	25.00
tblTripsAndVMT	HaulingTripLength	20.00	25.00
tblTripsAndVMT	HaulingTripNumber	0.00	1,068.00
tblTripsAndVMT	HaulingTripNumber	0.00	3,744.00
tblTripsAndVMT	HaulingTripNumber	0.00	280.00
tblTripsAndVMT	VendorTripLength	6.60	25.00
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tblTripsAndVMT	VendorTripNumber	0.00	36.00
tblTripsAndVMT	VendorTripNumber	0.00	2.00
tblTripsAndVMT	VendorTripNumber	0.00	176.00
tblTripsAndVMT	VendorTripNumber	0.00	6.00

tblTripsAndVMT	VendorTripNumber	0.00	12.00
tblTripsAndVMT	VendorTripNumber	1.00	40.00
tblTripsAndVMT	VendorTripNumber	1.00	6.00
tblTripsAndVMT	VendorTripNumber	1.00	0.00
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tblTripsAndVMT	WorkerTripNumber	0.00	10.00
tblTripsAndVMT	WorkerTripNumber	35.00	46.00
tblTripsAndVMT	WorkerTripNumber	8.00	36.00
tblTripsAndVMT	WorkerTripNumber	28.00	90.00
tblTripsAndVMT	WorkerTripNumber	33.00	36.00
tblTripsAndVMT	WorkerTripNumber	10.00	24.00
tblTripsAndVMT	WorkerTripNumber	2.00	100.00
tblTripsAndVMT	WorkerTripNumber	2.00	30.00
tblTripsAndVMT	WorkerTripNumber	2.00	20.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

Year	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
2019	8.7590	99.9864	58.9276	0.1897	108.6231	3.7006	112.3237	18.4323	3.4122	21.8445	0.0000	19,325.5364	19,325.5364	2.8815	0.0000	19,397.5744
2020	31.4811	198.2606	111.3787	0.4120	260.4642	7.3726	265.8291	37.6255	6.8036	42.5824	0.0000	41,709.2265	41,709.2265	5.6095	0.0000	41,849.4633
Maximum	**31.4811**	**198.2606**	**111.3787**	**0.4120**	**260.4642**	**7.3726**	**265.8291**	**37.6255**	**6.8036**	**42.5824**	**0.0000**	**41,709.2265**	**41,709.2265**	**5.6095**	**0.0000**	**41,849.4633**

Mitigated Construction

Year	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
2019	4.1990	68.8283	65.2691	0.1897	65.8146	2.1010	67.9156	10.4252	2.0908	12.5160	0.0000	19,325.5364	19,325.5364	2.8815	0.0000	19,397.5744
2020	22.5913	139.9862	126.7427	0.4120	160.6419	4.1807	163.8961	22.4246	4.1538	25.6518	0.0000	41,709.2265	41,709.2265	5.6095	0.0000	41,849.4633
Maximum	**22.5913**	**139.9862**	**126.7427**	**0.4120**	**160.6419**	**4.1807**	**163.8961**	**22.4246**	**4.1538**	**25.6518**	**0.0000**	**41,709.2265**	**41,709.2265**	**5.6095**	**0.0000**	**41,849.4633**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**33.42**	**29.99**	**-12.75**	**0.00**	**38.64**	**43.27**	**38.70**	**41.40**	**38.87**	**40.76**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.1279	1.8000e-004	0.0197	0.0000		7.0000e-005	7.0000e-005		7.0000e-005	7.0000e-005		0.0421	0.0421	1.1000e-004		0.0449
Energy	2.9500e-003	0.0269	0.0226	1.6000e-004		2.0400e-003	2.0400e-003		2.0400e-003	2.0400e-003		32.2321	32.2321	6.2000e-004	5.9000e-004	32.4236
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.1308**	**0.0270**	**0.0423**	**1.6000e-004**	**0.0000**	**2.1100e-003**	**2.1100e-003**	**0.0000**	**2.1100e-003**	**2.1100e-003**		**32.2741**	**32.2741**	**7.3000e-004**	**5.9000e-004**	**32.4685**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.1279	1.8000e-004	0.0197	0.0000		7.0000e-005	7.0000e-005		7.0000e-005	7.0000e-005		0.0421	0.0421	1.1000e-004		0.0449
Energy	2.9500e-003	0.0269	0.0226	1.6000e-004		2.0400e-003	2.0400e-003		2.0400e-003	2.0400e-003		32.2321	32.2321	6.2000e-004	5.9000e-004	32.4236
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.1308**	**0.0270**	**0.0423**	**1.6000e-004**	**0.0000**	**2.1100e-003**	**2.1100e-003**	**0.0000**	**2.1100e-003**	**2.1100e-003**		**32.2741**	**32.2741**	**7.3000e-004**	**5.9000e-004**	**32.4685**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Turbine Decommissioning	Demolition	10/1/2019	1/31/2020	5	89	
2	Access Roads	Grading	10/15/2019	2/10/2020	5	85	
3	Substation	Grading	11/1/2019	4/2/2020	5	110	
4	Foundations	Grading	1/16/2020	3/25/2020	5	50	
5	Collection	Grading	2/1/2020	4/24/2020	5	60	
6	Transmission Line	Grading	3/16/2020	7/31/2020	5	100	
7	Turbine Install	Building Construction	3/16/2020	5/22/2020	5	50	
8	O&M Building	Building Construction	3/16/2020	7/24/2020	5	95	
9	Precommissioning/Commissioning	Building Construction	6/1/2020	8/15/2020	5	55	
10	Reclaimation	Grading	7/1/2020	8/25/2020	5	40	
11	O&M Building - Arch Coatings	Architectural Coating	7/25/2020	7/31/2020	5	5	
12	Final Testing/Close Out	Site Preparation	8/16/2020	10/1/2020	5	34	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 7,500; Non-Residential Outdoor: 2,500; Striped Parking Area: 0

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Turbine Decommissioning	Excavators	4	8.00	158	0.38
Turbine Decommissioning	Forklifts	2	8.00	89	0.20
Turbine Decommissioning	Skid Steer Loaders	2	4.00	65	0.37
Turbine Decommissioning	Tractors/Loaders/Backhoes	2	4.00	97	0.37
Access Roads	Graders	3	4.00	187	0.41
Access Roads	Rollers	3	4.00	80	0.38
Access Roads	Rubber Tired Dozers	5	4.00	247	0.40
Access Roads	Tractors/Loaders/Backhoes	3	4.00	97	0.37
Substation	Excavators	1	4.00	158	0.38
Substation	Forklifts	2	8.00	89	0.20
Foundations	Cranes	2	8.00	231	0.29
Foundations	Excavators	2	4.00	158	0.38
Foundations	Forklifts	2	8.00	89	0.20
Foundations	Other Construction Equipment	1	4.00	172	0.42
Foundations	Rollers	2	4.00	80	0.38
Foundations	Rubber Tired Dozers	2	4.00	247	0.40
Collection	Bore/Drill Rigs	1	6.00	221	0.50
Collection	Forklifts	10	8.00	89	0.20
Collection	Rubber Tired Dozers	1	4.00	247	0.40
Collection	Trenchers	1	4.00	78	0.50
Transmission Line	Cranes	2	8.00	231	0.29
Transmission Line	Other Construction Equipment	2	4.00	172	0.42
Turbine Install	Cranes	7	8.00	231	0.29
Turbine Install	Forklifts	8	8.00	89	0.20
O&M Building	Excavators	1	4.00	158	0.38
O&M Building	Forklifts	1	8.00	89	0.20
O&M Building	Rubber Tired Dozers	1	4.00	247	0.40
Precommissioning/Commissioning	Cranes	0	0.00	231	0.29

Reclaimation	Other Construction Equipment	1	4.00	172	0.42
Reclaimation	Rubber Tired Dozers	4	4.00	247	0.40
O&M Building - Arch Coatings	Air Compressors	1	6.00	78	0.48
Final Testing/Close Out	Rubber Tired Dozers	0	0.00	247	0.40

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Turbine Decommissioning	10	80.00	0.00	1,068.00	16.80	25.00	40.00	LD_Mix	HDT_Mix	HHDT
Access Roads	14	46.00	36.00	3,744.00	16.80	25.00	25.00	LD_Mix	HDT_Mix	HHDT
Substation	3	36.00	2.00	0.00	16.80	25.00	20.00	LD_Mix	HDT_Mix	HHDT
Foundations	11	90.00	176.00	280.00	16.80	28.00	25.00	LD_Mix	HDT_Mix	HHDT
Collection	13	36.00	6.00	0.00	16.80	25.00	20.00	LD_Mix	HDT_Mix	HHDT
Transmission Line	4	24.00	12.00	0.00	16.80	25.00	20.00	LD_Mix	HDT_Mix	HHDT
Turbine Install	15	100.00	40.00	0.00	16.80	25.00	20.00	LD_Mix	HDT_Mix	HHDT
O&M Building	3	30.00	6.00	0.00	16.80	25.00	20.00	LD_Mix	HDT_Mix	HHDT
Precommissioning/Commissioning	0	20.00	0.00	0.00	16.80	25.00	20.00	LD_Mix	HDT_Mix	HHDT
Reclaimation	5	20.00	0.00	0.00	16.80	25.00	20.00	LD_Mix	HDT_Mix	HHDT
O&M Building - Arch Coatings	1	10.00	0.00	0.00	16.80	25.00	20.00	LD_Mix	HDT_Mix	HHDT
Final Testing/Close Out	0	10.00	0.00	0.00	16.80	25.00	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Turbine Decommissioning - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.6802	17.0480	19.1341	0.0289		0.9463	0.9463		0.8706	0.8706		2,859.2977	2,859.2977	0.9047		2,881.9139
Total	**1.6802**	**17.0480**	**19.1341**	**0.0289**		**0.9463**	**0.9463**		**0.8706**	**0.8706**		**2,859.2977**	**2,859.2977**	**0.9047**		**2,881.9139**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.1814	5.6985	0.8953	0.0179	10.0527	0.0264	10.0791	1.0920	0.0253	1.1173		1,879.3703	1,879.3703	0.0748		1,881.2394
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.6133	0.4025	5.1114	0.0112	20.7923	7.7500e-003	20.8001	2.2425	7.1400e-003	2.2497		1,112.1029	1,112.1029	0.0404		1,113.1133
Total	**0.7947**	**6.1010**	**6.0067**	**0.0291**	**30.8450**	**0.0342**	**30.8791**	**3.3345**	**0.0324**	**3.3669**		**2,991.4732**	**2,991.4732**	**0.1152**		**2,994.3528**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.7105	14.4438	21.9067	0.0289		0.7979	0.7979		0.7979	0.7979	0.0000	2,859.2977	2,859.2977	0.9047		2,881.9139
Total	**0.7105**	**14.4438**	**21.9067**	**0.0289**		**0.7979**	**0.7979**		**0.7979**	**0.7979**	**0.0000**	**2,859.2977**	**2,859.2977**	**0.9047**		**2,881.9139**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.1814	5.6985	0.8953	0.0179	6.3590	0.0264	6.3854	0.7226	0.0253	0.7479		1,879.3703	1,879.3703	0.0748		1,881.2394
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.6133	0.4025	5.1114	0.0112	13.1228	7.7500e-003	13.1306	1.4756	7.1400e-003	1.4827		1,112.1029	1,112.1029	0.0404		1,113.1133
Total	**0.7947**	**6.1010**	**6.0067**	**0.0291**	**19.4819**	**0.0342**	**19.5160**	**2.1982**	**0.0324**	**2.2306**		**2,991.4732**	**2,991.4732**	**0.1152**		**2,994.3528**

3.2 Turbine Decommissioning - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5574	15.4131	19.1015	0.0289		0.8399	0.8399		0.7727	0.7727		2,797.472 6	2,797.472 6	0.9048		2,820.091 6
Total	**1.5574**	**15.4131**	**19.1015**	**0.0289**		**0.8399**	**0.8399**		**0.7727**	**0.7727**		**2,797.472 6**	**2,797.472 6**	**0.9048**		**2,820.091 6**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.1682	5.2904	0.8509	0.0177	28.6537	0.0220	28.6757	3.0635	0.0211	3.0846		1,856.925 4	1,856.925 4	0.0718		1,858.721 3
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.5556	0.3539	4.5430	0.0108	20.7923	7.4400e-003	20.7998	2.2425	6.8500e-003	2.2494		1,078.072 0	1,078.072 0	0.0351		1,078.948 7
Total	**0.7238**	**5.6443**	**5.3939**	**0.0285**	**49.4460**	**0.0295**	**49.4755**	**5.3061**	**0.0279**	**5.3340**		**2,934.997 4**	**2,934.997 4**	**0.1069**		**2,937.670 1**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.7105	14.4438	21.9067	0.0289		0.7979	0.7979		0.7979	0.7979	0.0000	2,797.4726	2,797.4726	0.9048		2,820.0916
Total	**0.7105**	**14.4438**	**21.9067**	**0.0289**		**0.7979**	**0.7979**		**0.7979**	**0.7979**	**0.0000**	**2,797.4726**	**2,797.4726**	**0.9048**		**2,820.0916**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.1682	5.2904	0.8509	0.0177	18.0546	0.0220	18.0766	2.0036	0.0211	2.0247		1,856.9254	1,856.9254	0.0718		1,858.7213
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.5556	0.3539	4.5430	0.0108	13.1228	7.4400e-003	13.1303	1.4756	6.8500e-003	1.4824		1,078.0720	1,078.0720	0.0351		1,078.9487
Total	**0.7238**	**5.6443**	**5.3939**	**0.0285**	**31.1774**	**0.0295**	**31.2069**	**3.4792**	**0.0279**	**3.5071**		**2,934.9974**	**2,934.9974**	**0.1069**		**2,937.6701**

3.3 Access Roads - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					15.6822	0.0000	15.6822	8.3433	0.0000	8.3433			0.0000			0.0000
Off-Road	4.2556	46.9228	19.7822	0.0399		2.2436	2.2436		2.0641	2.0641		3,950.8504	3,950.8504	1.2500		3,982.1005
Total	**4.2556**	**46.9228**	**19.7822**	**0.0399**	**15.6822**	**2.2436**	**17.9258**	**8.3433**	**2.0641**	**10.4074**		**3,950.8504**	**3,950.8504**	**1.2500**		**3,982.1005**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.4524	14.8926	2.1977	0.0435	25.9292	0.0619	25.9911	2.8092	0.0592	2.8684		4,559.0823	4,559.0823	0.2573		4,565.5142
Vendor	0.4711	9.8638	2.4136	0.0296	14.0729	0.1144	14.1872	1.5601	0.1094	1.6695		3,094.7911	3,094.7911	0.1292		3,098.0207
Worker	0.3526	0.2315	2.9391	6.4300e-003	11.9556	4.4600e-003	11.9600	1.2895	4.1100e-003	1.2936		639.4592	639.4592	0.0232		640.0402
Total	**1.2762**	**24.9879**	**7.5504**	**0.0795**	**51.9576**	**0.1807**	**52.1383**	**5.6587**	**0.1727**	**5.8314**		**8,293.3325**	**8,293.3325**	**0.4097**		**8,303.5750**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					7.0570	0.0000	7.0570	3.7545	0.0000	3.7545			0.0000			0.0000
Off-Road	0.9766	19.6177	23.0890	0.0399		0.8986	0.8986		0.8986	0.8986	0.0000	3,950.8504	3,950.8504	1.2500		3,982.1005
Total	**0.9766**	**19.6177**	**23.0890**	**0.0399**	**7.0570**	**0.8986**	**7.9555**	**3.7545**	**0.8986**	**4.6530**	**0.0000**	**3,950.8504**	**3,950.8504**	**1.2500**		**3,982.1005**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.4524	14.8926	2.1977	0.0435	16.3913	0.0619	16.4531	1.8554	0.0592	1.9146		4,559.0823	4,559.0823	0.2573		4,565.5142
Vendor	0.4711	9.8638	2.4136	0.0296	8.9371	0.1144	9.0514	1.0465	0.1094	1.1559		3,094.7911	3,094.7911	0.1292		3,098.0207
Worker	0.3526	0.2315	2.9391	6.4300e-003	7.5456	4.4600e-003	7.5501	0.8485	4.1100e-003	0.8526		639.4592	639.4592	0.0232		640.0402
Total	**1.2762**	**24.9879**	**7.5504**	**0.0795**	**32.8740**	**0.1807**	**33.0547**	**3.7503**	**0.1727**	**3.9231**		**8,293.3325**	**8,293.3325**	**0.4097**		**8,303.5750**

3.3 Access Roads - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					15.6822	0.0000	15.6822	8.3433	0.0000	8.3433			0.0000			0.0000
Off-Road	4.0389	44.0984	19.3103	0.0399		2.0895	2.0895		1.9223	1.9223		3,864.6867	3,864.6867	1.2499		3,895.9346
Total	**4.0389**	**44.0984**	**19.3103**	**0.0399**	**15.6822**	**2.0895**	**17.7716**	**8.3433**	**1.9223**	**10.2656**		**3,864.6867**	**3,864.6867**	**1.2499**		**3,895.9346**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.4191	13.8918	2.0817	0.0430	49.8493	0.0515	49.9008	5.3445	0.0493	5.3938		4,505.2302	4,505.2302	0.2477		4,511.4233
Vendor	0.3742	8.7178	2.0319	0.0293	14.0729	0.0766	14.1495	1.5601	0.0733	1.6334		3,067.8448	3,067.8448	0.1197		3,070.8360
Worker	0.3195	0.2035	2.6122	6.2300e-003	11.9556	4.2800e-003	11.9599	1.2895	3.9400e-003	1.2934		619.8914	619.8914	0.0202		620.3955
Total	**1.1127**	**22.8130**	**6.7258**	**0.0785**	**75.8778**	**0.1325**	**76.0102**	**8.1940**	**0.1266**	**8.3206**		**8,192.9663**	**8,192.9663**	**0.3876**		**8,202.6548**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					7.0570	0.0000	7.0570	3.7545	0.0000	3.7545			0.0000			0.0000
Off-Road	0.9766	19.6177	23.0890	0.0399		0.8986	0.8986		0.8986	0.8986	0.0000	3,864.6867	3,864.6867	1.2499		3,895.9346
Total	**0.9766**	**19.6177**	**23.0890**	**0.0399**	**7.0570**	**0.8986**	**7.9555**	**3.7545**	**0.8986**	**4.6530**	**0.0000**	**3,864.6867**	**3,864.6867**	**1.2499**		**3,895.9346**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.4191	13.8918	2.0817	0.0430	31.4312	0.0515	31.4828	3.5026	0.0493	3.5519		4,505.2302	4,505.2302	0.2477		4,511.4233
Vendor	0.3742	8.7178	2.0319	0.0293	8.9371	0.0766	9.0137	1.0465	0.0733	1.1198		3,067.8448	3,067.8448	0.1197		3,070.8360
Worker	0.3195	0.2035	2.6122	6.2300e-003	7.5456	4.2800e-003	7.5499	0.8485	3.9400e-003	0.8524		619.8914	619.8914	0.0202		620.3955
Total	**1.1127**	**22.8130**	**6.7258**	**0.0785**	**47.9139**	**0.1325**	**48.0464**	**5.3976**	**0.1266**	**5.5242**		**8,192.9663**	**8,192.9663**	**0.3876**		**8,202.6548**

3.4 Substation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.4503	4.1976	4.0200	5.6400e-003		0.2860	0.2860		0.2631	0.2631		558.2036	558.2036	0.1766		562.6188
Total	**0.4503**	**4.1976**	**4.0200**	**5.6400e-003**	**0.0000**	**0.2860**	**0.2860**	**0.0000**	**0.2631**	**0.2631**		**558.2036**	**558.2036**	**0.1766**		**562.6188**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0262	0.5480	0.1341	1.6400e-003	0.7818	6.3500e-003	0.7882	0.0867	6.0800e-003	0.0928		171.9328	171.9328	7.1800e-003		172.1123
Worker	0.2760	0.1811	2.3001	5.0300e-003	9.3565	3.4900e-003	9.3600	1.0091	3.2100e-003	1.0124		500.4463	500.4463	0.0182		500.9010
Total	**0.3022**	**0.7291**	**2.4342**	**6.6700e-003**	**10.1384**	**9.8400e-003**	**10.1482**	**1.0958**	**9.2900e-003**	**1.1051**		**672.3791**	**672.3791**	**0.0254**		**673.0133**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.1389	2.9487	4.2822	5.6400e-003		0.1799	0.1799		0.1799	0.1799	0.0000	558.2036	558.2036	0.1766		562.6188
Total	**0.1389**	**2.9487**	**4.2822**	**5.6400e-003**	**0.0000**	**0.1799**	**0.1799**	**0.0000**	**0.1799**	**0.1799**	**0.0000**	**558.2036**	**558.2036**	**0.1766**		**562.6188**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0262	0.5480	0.1341	1.6400e-003	0.4965	6.3500e-003	0.5029	0.0581	6.0800e-003	0.0642		171.9328	171.9328	7.1800e-003		172.1123
Worker	0.2760	0.1811	2.3001	5.0300e-003	5.9053	3.4900e-003	5.9088	0.6640	3.2100e-003	0.6672		500.4463	500.4463	0.0182		500.9010
Total	**0.3022**	**0.7291**	**2.4342**	**6.6700e-003**	**6.4018**	**9.8400e-003**	**6.4116**	**0.7222**	**9.2900e-003**	**0.7315**		**672.3791**	**672.3791**	**0.0254**		**673.0133**

3.4 Substation - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.4105	3.8013	3.9944	5.6400e-003		0.2518	0.2518		0.2316	0.2316		546.1209	546.1209	0.1766		550.5365
Total	**0.4105**	**3.8013**	**3.9944**	**5.6400e-003**	**0.0000**	**0.2518**	**0.2518**	**0.0000**	**0.2316**	**0.2316**		**546.1209**	**546.1209**	**0.1766**		**550.5365**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0208	0.4843	0.1129	1.6300e-003	0.7818	4.2600e-003	0.7861	0.0867	4.0700e-003	0.0907		170.4358	170.4358	6.6500e-003		170.6020
Worker	0.2500	0.1593	2.0443	4.8800e-003	9.3565	3.3500e-003	9.3599	1.0091	3.0800e-003	1.0122		485.1324	485.1324	0.0158		485.5269
Total	**0.2708**	**0.6436**	**2.1572**	**6.5100e-003**	**10.1384**	**7.6100e-003**	**10.1460**	**1.0958**	**7.1500e-003**	**1.1030**		**655.5682**	**655.5682**	**0.0224**		**656.1289**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.1389	2.9487	4.2822	5.6400e-003		0.1799	0.1799		0.1799	0.1799	0.0000	546.1209	546.1209	0.1766		550.5365
Total	**0.1389**	**2.9487**	**4.2822**	**5.6400e-003**	**0.0000**	**0.1799**	**0.1799**	**0.0000**	**0.1799**	**0.1799**	**0.0000**	**546.1209**	**546.1209**	**0.1766**		**550.5365**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0208	0.4843	0.1129	1.6300e-003	0.4965	4.2600e-003	0.5008	0.0581	4.0700e-003	0.0622		170.4358	170.4358	6.6500e-003		170.6020
Worker	0.2500	0.1593	2.0443	4.8800e-003	5.9053	3.3500e-003	5.9086	0.6640	3.0800e-003	0.6671		485.1324	485.1324	0.0158		485.5269
Total	**0.2708**	**0.6436**	**2.1572**	**6.5100e-003**	**6.4018**	**7.6100e-003**	**6.4094**	**0.7222**	**7.1500e-003**	**0.7293**		**655.5682**	**655.5682**	**0.0224**		**656.1289**

3.5 Foundations - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.6902	0.0000	6.6902	3.3824	0.0000	3.3824			0.0000			0.0000
Off-Road	2.9744	31.8236	17.9451	0.0340		1.5806	1.5806		1.4542	1.4542		3,294.5703	3,294.5703	1.0655		3,321.2086
Total	**2.9744**	**31.8236**	**17.9451**	**0.0340**	**6.6902**	**1.5806**	**8.2708**	**3.3824**	**1.4542**	**4.8365**		**3,294.5703**	**3,294.5703**	**1.0655**		**3,321.2086**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0533	1.7662	0.2647	5.4600e-003	2.1822	6.5500e-003	2.1887	0.2390	6.2700e-003	0.2453		572.7803	572.7803	0.0315		573.5677
Vendor	2.0147	46.2669	10.8757	0.1591	77.0562	0.4187	77.4749	8.5421	0.4005	8.9426		16,633.1221	16,633.1221	0.5999		16,648.1206
Worker	0.6251	0.3982	5.1109	0.0122	23.3914	8.3700e-003	23.3997	2.5229	7.7100e-003	2.5306		1,212.8310	1,212.8310	0.0395		1,213.8173
Total	**2.6931**	**48.4312**	**16.2512**	**0.1767**	**102.6297**	**0.4336**	**103.0633**	**11.3040**	**0.4145**	**11.7185**		**18,418.7334**	**18,418.7334**	**0.6709**		**18,435.5056**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					3.0106	0.0000	3.0106	1.5221	0.0000	1.5221			0.0000			0.0000
Off-Road	0.8359	16.6490	21.2564	0.0340		0.7747	0.7747		0.7747	0.7747	0.0000	3,294.5703	3,294.5703	1.0655		3,321.2086
Total	**0.8359**	**16.6490**	**21.2564**	**0.0340**	**3.0106**	**0.7747**	**3.7853**	**1.5221**	**0.7747**	**2.2968**	**0.0000**	**3,294.5703**	**3,294.5703**	**1.0655**		**3,321.2086**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0533	1.7662	0.2647	5.4600e-003	1.3832	6.5500e-003	1.3898	0.1591	6.2700e-003	0.1654		572.7803	572.7803	0.0315		573.5677
Vendor	2.0147	46.2669	10.8757	0.1591	48.9348	0.4187	49.3535	5.7300	0.4005	6.1305		16,633.1221	16,633.1221	0.5999		16,648.1206
Worker	0.6251	0.3982	5.1109	0.0122	14.7632	8.3700e-003	14.7716	1.6600	7.7100e-003	1.6677		1,212.8310	1,212.8310	0.0395		1,213.8173
Total	**2.6931**	**48.4312**	**16.2512**	**0.1767**	**65.0813**	**0.4336**	**65.5148**	**7.5492**	**0.4145**	**7.9636**		**18,418.7334**	**18,418.7334**	**0.6709**		**18,435.5056**

3.6 Collection - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					3.0110	0.0000	3.0110	1.6551	0.0000	1.6551			0.0000			0.0000
Off-Road	2.3979	23.1811	16.7472	0.0283		1.4624	1.4624		1.3454	1.3454		2,739.7408	2,739.7408	0.8861		2,761.8930
Total	**2.3979**	**23.1811**	**16.7472**	**0.0283**	**3.0110**	**1.4624**	**4.4734**	**1.6551**	**1.3454**	**3.0005**		**2,739.7408**	**2,739.7408**	**0.8861**		**2,761.8930**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0624	1.4530	0.3387	4.8900e-003	2.3455	0.0128	2.3583	0.2600	0.0122	0.2722		511.3075	511.3075	0.0199		511.8060
Worker	0.2500	0.1593	2.0443	4.8800e-003	9.3565	3.3500e-003	9.3599	1.0091	3.0800e-003	1.0122		485.1324	485.1324	0.0158		485.5269
Total	**0.3124**	**1.6122**	**2.3830**	**9.7700e-003**	**11.7020**	**0.0161**	**11.7181**	**1.2692**	**0.0153**	**1.2845**		**996.4399**	**996.4399**	**0.0357**		**997.3329**

Mitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Fugitive Dust					1.3550	0.0000	1.3550	0.7448	0.0000	0.7448			0.0000			0.0000
Off-Road	0.6980	14.9567	18.9539	0.0283		0.8741	0.8741		0.8741	0.8741	0.0000	2,739.7408	2,739.7408	0.8861		2,761.8930
Total	**0.6980**	**14.9567**	**18.9539**	**0.0283**	**1.3550**	**0.8741**	**2.2291**	**0.7448**	**0.8741**	**1.6189**	**0.0000**	**2,739.7408**	**2,739.7408**	**0.8861**		**2,761.8930**

Mitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0624	1.4530	0.3387	4.8900e-003	1.4895	0.0128	1.5023	0.1744	0.0122	0.1866		511.3075	511.3075	0.0199		511.8060
Worker	0.2500	0.1593	2.0443	4.8800e-003	5.9053	3.3500e-003	5.9086	0.6640	3.0800e-003	0.6671		485.1324	485.1324	0.0158		485.5269
Total	**0.3124**	**1.6122**	**2.3830**	**9.7700e-003**	**7.3948**	**0.0161**	**7.4109**	**0.8384**	**0.0153**	**0.8537**		**996.4399**	**996.4399**	**0.0357**		**997.3329**

3.7 Transmission Line - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	1.4008	16.0222	8.3528	0.0177		0.7210	0.7210		0.6633	0.6633		1,716.383 4	1,716.383 4	0.5551		1,730.261 2
Total	**1.4008**	**16.0222**	**8.3528**	**0.0177**	**0.0000**	**0.7210**	**0.7210**	**0.0000**	**0.6633**	**0.6633**		**1,716.383 4**	**1,716.383 4**	**0.5551**		**1,730.261 2**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1247	2.9059	0.6773	9.7800e-003	4.6910	0.0256	4.7165	0.5200	0.0244	0.5445		1,022.614 9	1,022.614 9	0.0399		1,023.612 0
Worker	0.1667	0.1062	1.3629	3.2500e-003	6.2377	2.2300e-003	6.2399	0.6728	2.0600e-003	0.6748		323.4216	323.4216	0.0105		323.6846
Total	**0.2914**	**3.0121**	**2.0402**	**0.0130**	**10.9287**	**0.0278**	**10.9564**	**1.1928**	**0.0265**	**1.2193**		**1,346.036 5**	**1,346.036 5**	**0.0504**		**1,347.296 6**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.4365	8.4381	10.8580	0.0177		0.3506	0.3506		0.3506	0.3506	0.0000	1,716.3834	1,716.3834	0.5551		1,730.2612
Total	**0.4365**	**8.4381**	**10.8580**	**0.0177**	**0.0000**	**0.3506**	**0.3506**	**0.0000**	**0.3506**	**0.3506**	**0.0000**	**1,716.3834**	**1,716.3834**	**0.5551**		**1,730.2612**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1247	2.9059	0.6773	9.7800e-003	2.9790	0.0256	3.0046	0.3488	0.0244	0.3733		1,022.6149	1,022.6149	0.0399		1,023.6120
Worker	0.1667	0.1062	1.3629	3.2500e-003	3.9369	2.2300e-003	3.9391	0.4427	2.0600e-003	0.4447		323.4216	323.4216	0.0105		323.6846
Total	**0.2914**	**3.0121**	**2.0402**	**0.0130**	**6.9159**	**0.0278**	**6.9437**	**0.7915**	**0.0265**	**0.8180**		**1,346.0365**	**1,346.0365**	**0.0504**		**1,347.2966**

3.8 Turbine Install - 2020

Unmitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Off-Road	4.3259	48.1207	24.2497	0.0526		2.3292	2.3292		2.1429	2.1429		5,095.7741	5,095.7741	1.6481		5,136.9760
Total	**4.3259**	**48.1207**	**24.2497**	**0.0526**		**2.3292**	**2.3292**		**2.1429**	**2.1429**		**5,095.7741**	**5,095.7741**	**1.6481**		**5,136.9760**

Unmitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4157	9.6864	2.2577	0.0326	15.6365	0.0852	15.7217	1.7334	0.0815	1.8149		3,408.7164	3,408.7164	0.1329		3,412.0400
Worker	0.6945	0.4424	5.6787	0.0135	25.9904	9.3000e-003	25.9997	2.8032	8.5700e-003	2.8117		1,347.5900	1,347.5900	0.0438		1,348.6859
Total	**1.1103**	**10.1288**	**7.9364**	**0.0461**	**41.6269**	**0.0945**	**41.7214**	**4.5366**	**0.0900**	**4.6266**		**4,756.3064**	**4,756.3064**	**0.1768**		**4,760.7260**

Mitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Off-Road	1.2938	26.0691	30.7959	0.0526		1.2100	1.2100		1.2100	1.2100	0.0000	5,095.7741	5,095.7741	1.6481		5,136.9760
Total	**1.2938**	**26.0691**	**30.7959**	**0.0526**		**1.2100**	**1.2100**		**1.2100**	**1.2100**	**0.0000**	**5,095.7741**	**5,095.7741**	**1.6481**		**5,136.9760**

Mitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4157	9.6864	2.2577	0.0326	9.9301	0.0852	10.0152	1.1628	0.0815	1.2443		3,408.7164	3,408.7164	0.1329		3,412.0400
Worker	0.6945	0.4424	5.6787	0.0135	16.4036	9.3000e-003	16.4129	1.8445	8.5700e-003	1.8531		1,347.5900	1,347.5900	0.0438		1,348.6859
Total	**1.1103**	**10.1288**	**7.9364**	**0.0461**	**26.3336**	**0.0945**	**26.4281**	**3.0073**	**0.0900**	**3.0973**		**4,756.3064**	**4,756.3064**	**0.1768**		**4,760.7260**

3.9 O&M Building - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.8063	8.1699	4.8800	8.3700e-003		0.4326	0.4326		0.3980	0.3980		811.7613	811.7613	0.2625		818.3248
Total	**0.8063**	**8.1699**	**4.8800**	**8.3700e-003**		**0.4326**	**0.4326**		**0.3980**	**0.3980**		**811.7613**	**811.7613**	**0.2625**		**818.3248**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0624	1.4530	0.3387	4.8900e-003	2.3455	0.0128	2.3583	0.2600	0.0122	0.2722		511.3075	511.3075	0.0199		511.8060
Worker	0.2084	0.1327	1.7036	4.0600e-003	7.7971	2.7900e-003	7.7999	0.8410	2.5700e-003	0.8435		404.2770	404.2770	0.0132		404.6058
Total	**0.2707**	**1.5857**	**2.0423**	**8.9500e-003**	**10.1426**	**0.0156**	**10.1582**	**1.1010**	**0.0148**	**1.1158**		**915.5845**	**915.5845**	**0.0331**		**916.4118**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.2058	4.1099	5.3859	8.3700e-003		0.1963	0.1963		0.1963	0.1963	0.0000	811.7613	811.7613	0.2625		818.3248
Total	**0.2058**	**4.1099**	**5.3859**	**8.3700e-003**		**0.1963**	**0.1963**		**0.1963**	**0.1963**	**0.0000**	**811.7613**	**811.7613**	**0.2625**		**818.3248**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0624	1.4530	0.3387	4.8900e-003	1.4895	0.0128	1.5023	0.1744	0.0122	0.1866		511.3075	511.3075	0.0199		511.8060
Worker	0.2084	0.1327	1.7036	4.0600e-003	4.9211	2.7900e-003	4.9239	0.5533	2.5700e-003	0.5559		404.2770	404.2770	0.0132		404.6058
Total	**0.2707**	**1.5857**	**2.0423**	**8.9500e-003**	**6.4106**	**0.0156**	**6.4261**	**0.7278**	**0.0148**	**0.7426**		**915.5845**	**915.5845**	**0.0331**		**916.4118**

3.10 Precommissioning/Commissioning - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1389	0.0885	1.1358	2.7100e-003	5.1981	1.8600e-003	5.1999	0.5606	1.7100e-003	0.5624		269.5180	269.5180	8.7700e-003		269.7372
Total	**0.1389**	**0.0885**	**1.1358**	**2.7100e-003**	**5.1981**	**1.8600e-003**	**5.1999**	**0.5606**	**1.7100e-003**	**0.5624**		**269.5180**	**269.5180**	**8.7700e-003**		**269.7372**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1389	0.0885	1.1358	2.7100e-003	3.2807	1.8600e-003	3.2826	0.3689	1.7100e-003	0.3706		269.5180	269.5180	8.7700e-003		269.7372
Total	**0.1389**	**0.0885**	**1.1358**	**2.7100e-003**	**3.2807**	**1.8600e-003**	**3.2826**	**0.3689**	**1.7100e-003**	**0.3706**		**269.5180**	**269.5180**	**8.7700e-003**		**269.7372**

3.11 Reclaimation - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					12.9191	0.0000	12.9191	6.7149	0.0000	6.7149			0.0000			0.0000
Off-Road	2.4060	25.2841	10.3243	0.0202		1.2482	1.2482		1.1483	1.1483		1,954.0871	1,954.0871	0.6320		1,969.8869
Total	**2.4060**	**25.2841**	**10.3243**	**0.0202**	**12.9191**	**1.2482**	**14.1673**	**6.7149**	**1.1483**	**7.8632**		**1,954.0871**	**1,954.0871**	**0.6320**		**1,969.8869**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1389	0.0885	1.1358	2.7100e-003	5.1981	1.8600e-003	5.1999	0.5606	1.7100e-003	0.5624		269.5180	269.5180	8.7700e-003		269.7372
Total	**0.1389**	**0.0885**	**1.1358**	**2.7100e-003**	**5.1981**	**1.8600e-003**	**5.1999**	**0.5606**	**1.7100e-003**	**0.5624**		**269.5180**	**269.5180**	**8.7700e-003**		**269.7372**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					5.8136	0.0000	5.8136	3.0217	0.0000	3.0217			0.0000			0.0000
Off-Road	0.4947	9.5633	11.4183	0.0202		0.3780	0.3780		0.3780	0.3780	0.0000	1,954.0871	1,954.0871	0.6320		1,969.8869
Total	**0.4947**	**9.5633**	**11.4183**	**0.0202**	**5.8136**	**0.3780**	**6.1916**	**3.0217**	**0.3780**	**3.3998**	**0.0000**	**1,954.0871**	**1,954.0871**	**0.6320**		**1,969.8869**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1389	0.0885	1.1358	2.7100e-003	3.2807	1.8600e-003	3.2826	0.3689	1.7100e-003	0.3706		269.5180	269.5180	8.7700e-003		269.7372
Total	**0.1389**	**0.0885**	**1.1358**	**2.7100e-003**	**3.2807**	**1.8600e-003**	**3.2826**	**0.3689**	**1.7100e-003**	**0.3706**		**269.5180**	**269.5180**	**8.7700e-003**		**269.7372**

3.12 O&M Building - Arch Coatings - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	13.9050					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109		281.4481	281.4481	0.0218		281.9928
Total	**14.1472**	**1.6838**	**1.8314**	**2.9700e-003**		**0.1109**	**0.1109**		**0.1109**	**0.1109**		**281.4481**	**281.4481**	**0.0218**		**281.9928**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0695	0.0442	0.5679	1.3500e-003	2.5990	9.3000e-004	2.6000	0.2803	8.6000e-004	0.2812		134.7590	134.7590	4.3800e-003		134.8686
Total	**0.0695**	**0.0442**	**0.5679**	**1.3500e-003**	**2.5990**	**9.3000e-004**	**2.6000**	**0.2803**	**8.6000e-004**	**0.2812**		**134.7590**	**134.7590**	**4.3800e-003**		**134.8686**

Mitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Archit. Coating	13.9050					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.0594	1.3570	1.8324	2.9700e-003		0.0951	0.0951		0.0951	0.0951	0.0000	281.4481	281.4481	0.0218		281.9928
Total	**13.9644**	**1.3570**	**1.8324**	**2.9700e-003**		**0.0951**	**0.0951**		**0.0951**	**0.0951**	**0.0000**	**281.4481**	**281.4481**	**0.0218**		**281.9928**

Mitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0695	0.0442	0.5679	1.3500e-003	1.6404	9.3000e-004	1.6413	0.1845	8.6000e-004	0.1853		134.7590	134.7590	4.3800e-003		134.8686
Total	**0.0695**	**0.0442**	**0.5679**	**1.3500e-003**	**1.6404**	**9.3000e-004**	**1.6413**	**0.1845**	**8.6000e-004**	**0.1853**		**134.7590**	**134.7590**	**4.3800e-003**		**134.8686**

3.13 Final Testing/Close Out - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0695	0.0442	0.5679	1.3500e-003	2.5990	9.3000e-004	2.6000	0.2803	8.6000e-004	0.2812		134.7590	134.7590	4.3800e-003		134.8686
Total	**0.0695**	**0.0442**	**0.5679**	**1.3500e-003**	**2.5990**	**9.3000e-004**	**2.6000**	**0.2803**	**8.6000e-004**	**0.2812**		**134.7590**	**134.7590**	**4.3800e-003**		**134.8686**

Mitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0695	0.0442	0.5679	1.3500e-003	1.6404	9.3000e-004	1.6413	0.1845	8.6000e-004	0.1853		134.7590	134.7590	4.3800e-003		134.8686
Total	**0.0695**	**0.0442**	**0.5679**	**1.3500e-003**	**1.6404**	**9.3000e-004**	**1.6413**	**0.1845**	**8.6000e-004**	**0.1853**		**134.7590**	**134.7590**	**4.3800e-003**		**134.8686**

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	2.9500e-003	0.0269	0.0226	1.6000e-004		2.0400e-003	2.0400e-003		2.0400e-003	2.0400e-003		32.2321	32.2321	6.2000e-004	5.9000e-004	32.4236
NaturalGas Unmitigated	2.9500e-003	0.0269	0.0226	1.6000e-004		2.0400e-003	2.0400e-003		2.0400e-003	2.0400e-003		32.2321	32.2321	6.2000e-004	5.9000e-004	32.4236

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
User Defined Commercial	273.973	2.9500e-003	0.0269	0.0226	1.6000e-004		2.0400e-003	2.0400e-003		2.0400e-003	2.0400e-003		32.2321	32.2321	6.2000e-004	5.9000e-004	32.4236
Total		**2.9500e-003**	**0.0269**	**0.0226**	**1.6000e-004**		**2.0400e-003**	**2.0400e-003**		**2.0400e-003**	**2.0400e-003**		**32.2321**	**32.2321**	**6.2000e-004**	**5.9000e-004**	**32.4236**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
User Defined Commercial	0.273973	2.9500e-003	0.0269	0.0226	1.6000e-004		2.0400e-003	2.0400e-003		2.0400e-003	2.0400e-003		32.2321	32.2321	6.2000e-004	5.9000e-004	32.4236
Total		**2.9500e-003**	**0.0269**	**0.0226**	**1.6000e-004**		**2.0400e-003**	**2.0400e-003**		**2.0400e-003**	**2.0400e-003**		**32.2321**	**32.2321**	**6.2000e-004**	**5.9000e-004**	**32.4236**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.1279	1.8000e-004	0.0197	0.0000		7.0000e-005	7.0000e-005		7.0000e-005	7.0000e-005		0.0421	0.0421	1.1000e-004		0.0449
Unmitigated	0.1279	1.8000e-004	0.0197	0.0000		7.0000e-005	7.0000e-005		7.0000e-005	7.0000e-005		0.0421	0.0421	1.1000e-004		0.0449

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0191					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.1070					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.8400e-003	1.8000e-004	0.0197	0.0000		7.0000e-005	7.0000e-005		7.0000e-005	7.0000e-005		0.0421	0.0421	1.1000e-004		0.0449
Total	**0.1279**	**1.8000e-004**	**0.0197**	**0.0000**		**7.0000e-005**	**7.0000e-005**		**7.0000e-005**	**7.0000e-005**		**0.0421**	**0.0421**	**1.1000e-004**		**0.0449**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0191					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.1070					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.8400e-003	1.8000e-004	0.0197	0.0000		7.0000e-005	7.0000e-005		7.0000e-005	7.0000e-005		0.0421	0.0421	1.1000e-004		0.0449
Total	**0.1279**	**1.8000e-004**	**0.0197**	**0.0000**		**7.0000e-005**	**7.0000e-005**		**7.0000e-005**	**7.0000e-005**		**0.0421**	**0.0421**	**1.1000e-004**		**0.0449**

CalEEMod Version: CalEEMod.2016.3.2

Date: 6/13/2019 9:50 AM

Gonzaga Ridge Wind Repowering Project
Merced County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Commercial	192.21	User Defined Unit	192.21	5,000.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	49
Climate Zone	4			**Operational Year**	2021
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	499.66	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Gonzaga Ridge Wind Repowering Project. Merced County. CO2 intensity to meet 33% RPS.

Land Use - Total disturbed area: 192.21 acres

Construction Phase - Construction phases and durations provided by applicant.

Off-road Equipment - Equipment based on information from applicant.

Off-road Equipment - Equipment based on information from applicant.

Off-road Equipment - No construction equipment assumed.

Off-road Equipment - Equipment based on information from applicant.

Off-road Equipment - Equipment based on information from applicant.

Off-road Equipment - Default equipment assumed for arch coatings.

Off-road Equipment - No construction equipment assumed.

Off-road Equipment - Equipment based on information from applicant.

Off-road Equipment - Equipment based on information from applicant.

Off-road Equipment - Equipment based on information from applicant.

Off-road Equipment - Equipment based on information from applicant.

Off-road Equipment - Equipment based on information from applicant.

Trips and VMT - Revised worker, vendor, and haul trips per phase.

On-road Fugitive Dust - Assumed 99 percent of roadways are paved.

Grading - Acres graded based on equipment fleet.

Energy Use - Updated energy use based on commercial office building defaults.

Solid Waste - Updated solid waste based on commercial office building.

Construction Off-road Equipment Mitigation - Fugitive dust controls to comply with SJVAPCD Reg VIII. Use of Tier 3 construction equipment.

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadMoistureContent	0	0.5
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	11.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	8.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	25.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	13.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3

tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
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tblConstructionPhase	NumDays	3,100.00	50.00
tblConstructionPhase	NumDays	3,100.00	95.00
tblConstructionPhase	NumDays	3,100.00	55.00
tblConstructionPhase	NumDays	200.00	89.00
tblConstructionPhase	NumDays	310.00	40.00
tblConstructionPhase	NumDays	310.00	85.00
tblConstructionPhase	NumDays	310.00	110.00
tblConstructionPhase	NumDays	310.00	50.00
tblConstructionPhase	NumDays	310.00	60.00
tblConstructionPhase	NumDays	310.00	100.00
tblConstructionPhase	NumDays	120.00	34.00
tblEnergyUse	LightingElect	0.00	4.72
tblEnergyUse	NT24E	0.00	7.84
tblEnergyUse	T24E	0.00	8.01
tblEnergyUse	T24NG	0.00	20.00
tblGrading	AcresOfGrading	0.00	33.00
tblGrading	AcresOfGrading	63.75	50.25
tblGrading	AcresOfGrading	0.00	31.50
tblLandUse	LandUseSquareFeet	0.00	5,000.00
tblLandUse	LotAcreage	0.00	192.21
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	7.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	8.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	5.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
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tblOffRoadEquipment	PhaseName		Substation
tblOffRoadEquipment	PhaseName		Access Roads
tblOffRoadEquipment	PhaseName		Turbine Decommissioning
tblOffRoadEquipment	PhaseName		Turbine Decommissioning
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	7.00	0.00
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tblOffRoadEquipment	UsageHours	8.00	4.00
tblOffRoadEquipment	UsageHours	8.00	4.00
tblOffRoadEquipment	UsageHours	8.00	4.00
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tblOffRoadEquipment	UsageHours	8.00	4.00
tblOffRoadEquipment	UsageHours	8.00	4.00
tblOffRoadEquipment	UsageHours	8.00	0.00

tblOffRoadEquipment	UsageHours	8.00	4.00
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tblOnRoadDust	HaulingPercentPave	100.00	99.00
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tblOnRoadDust	HaulingPercentPave	100.00	99.00
tblOnRoadDust	HaulingPercentPave	100.00	99.00
tblOnRoadDust	HaulingPercentPave	100.00	99.00
tblOnRoadDust	HaulingPercentPave	100.00	99.00
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tblOnRoadDust	HaulingPercentPave	100.00	99.00
tblOnRoadDust	HaulingPercentPave	100.00	99.00
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tblOnRoadDust	VendorPercentPave	100.00	99.00
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tblOnRoadDust	VendorPercentPave	100.00	99.00
tblOnRoadDust	VendorPercentPave	100.00	99.00
tblOnRoadDust	VendorPercentPave	100.00	99.00
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tblOnRoadDust	WorkerPercentPave	100.00	99.00
tblOnRoadDust	WorkerPercentPave	100.00	99.00
tblOnRoadDust	WorkerPercentPave	100.00	99.00
tblOnRoadDust	WorkerPercentPave	100.00	99.00
tblOnRoadDust	WorkerPercentPave	100.00	99.00

tblOnRoadDust	WorkerPercentPave	100.00	99.00
tblOnRoadDust	WorkerPercentPave	100.00	99.00
tblOnRoadDust	WorkerPercentPave	100.00	99.00
tblOnRoadDust	WorkerPercentPave	100.00	99.00
tblOnRoadDust	WorkerPercentPave	100.00	99.00
tblOnRoadDust	WorkerPercentPave	100.00	99.00
tblProjectCharacteristics	CO2IntensityFactor	641.35	499.66
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblSolidWaste	SolidWasteGenerationRate	0.00	0.93
tblTripsAndVMT	HaulingTripLength	20.00	40.00
tblTripsAndVMT	HaulingTripLength	20.00	25.00
tblTripsAndVMT	HaulingTripLength	20.00	25.00
tblTripsAndVMT	HaulingTripNumber	0.00	1,068.00
tblTripsAndVMT	HaulingTripNumber	0.00	3,744.00
tblTripsAndVMT	HaulingTripNumber	0.00	280.00
tblTripsAndVMT	VendorTripLength	6.60	25.00
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tblTripsAndVMT	VendorTripNumber	0.00	176.00
tblTripsAndVMT	VendorTripNumber	0.00	6.00

tblTripsAndVMT	VendorTripNumber	0.00	12.00
tblTripsAndVMT	VendorTripNumber	1.00	40.00
tblTripsAndVMT	VendorTripNumber	1.00	6.00
tblTripsAndVMT	VendorTripNumber	1.00	0.00
tblTripsAndVMT	WorkerTripNumber	25.00	80.00
tblTripsAndVMT	WorkerTripNumber	13.00	20.00
tblTripsAndVMT	WorkerTripNumber	0.00	10.00
tblTripsAndVMT	WorkerTripNumber	0.00	10.00
tblTripsAndVMT	WorkerTripNumber	35.00	46.00
tblTripsAndVMT	WorkerTripNumber	8.00	36.00
tblTripsAndVMT	WorkerTripNumber	28.00	90.00
tblTripsAndVMT	WorkerTripNumber	33.00	36.00
tblTripsAndVMT	WorkerTripNumber	10.00	24.00
tblTripsAndVMT	WorkerTripNumber	2.00	100.00
tblTripsAndVMT	WorkerTripNumber	2.00	30.00
tblTripsAndVMT	WorkerTripNumber	2.00	20.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	8.7624	101.3209	57.6477	0.1856	108.6231	3.7026	112.3258	18.4323	3.4142	21.8465	0.0000	18,916.6544	18,916.6544	2.9251	0.0000	18,989.7825
2020	31.4911	201.2899	109.0285	0.4045	260.4642	7.3761	265.8332	37.6255	6.8069	42.5864	0.0000	40,945.9540	40,945.9540	5.6783	0.0000	41,087.9116
Maximum	**31.4911**	**201.2899**	**109.0285**	**0.4045**	**260.4642**	**7.3761**	**265.8332**	**37.6255**	**6.8069**	**42.5864**	**0.0000**	**40,945.9540**	**40,945.9540**	**5.6783**	**0.0000**	**41,087.9116**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	4.2024	70.1628	63.9892	0.1856	65.8146	2.1031	67.9177	10.4252	2.0927	12.5179	0.0000	18,916.6544	18,916.6544	2.9251	0.0000	18,989.7825
2020	22.6014	143.0155	124.3926	0.4045	160.6419	4.1842	163.9003	22.4246	4.1572	25.6559	0.0000	40,945.9540	40,945.9540	5.6783	0.0000	41,087.9116
Maximum	**22.6014**	**143.0155**	**124.3926**	**0.4045**	**160.6419**	**4.1842**	**163.9003**	**22.4246**	**4.1572**	**25.6559**	**0.0000**	**40,945.9540**	**40,945.9540**	**5.6783**	**0.0000**	**41,087.9116**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**33.41**	**29.55**	**-13.02**	**0.00**	**38.64**	**43.25**	**38.70**	**41.40**	**38.85**	**40.75**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.1279	1.8000e-004	0.0197	0.0000		7.0000e-005	7.0000e-005		7.0000e-005	7.0000e-005		0.0421	0.0421	1.1000e-004		0.0449
Energy	2.9500e-003	0.0269	0.0226	1.6000e-004		2.0400e-003	2.0400e-003		2.0400e-003	2.0400e-003		32.2321	32.2321	6.2000e-004	5.9000e-004	32.4236
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.1308**	**0.0270**	**0.0423**	**1.6000e-004**	**0.0000**	**2.1100e-003**	**2.1100e-003**	**0.0000**	**2.1100e-003**	**2.1100e-003**		**32.2741**	**32.2741**	**7.3000e-004**	**5.9000e-004**	**32.4685**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.1279	1.8000e-004	0.0197	0.0000		7.0000e-005	7.0000e-005		7.0000e-005	7.0000e-005		0.0421	0.0421	1.1000e-004		0.0449
Energy	2.9500e-003	0.0269	0.0226	1.6000e-004		2.0400e-003	2.0400e-003		2.0400e-003	2.0400e-003		32.2321	32.2321	6.2000e-004	5.9000e-004	32.4236
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.1308**	**0.0270**	**0.0423**	**1.6000e-004**	**0.0000**	**2.1100e-003**	**2.1100e-003**	**0.0000**	**2.1100e-003**	**2.1100e-003**		**32.2741**	**32.2741**	**7.3000e-004**	**5.9000e-004**	**32.4685**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Turbine Decommissioning	Demolition	10/1/2019	1/31/2020	5	89	
2	Access Roads	Grading	10/15/2019	2/10/2020	5	85	
3	Substation	Grading	11/1/2019	4/2/2020	5	110	
4	Foundations	Grading	1/16/2020	3/25/2020	5	50	
5	Collection	Grading	2/1/2020	4/24/2020	5	60	
6	Transmission Line	Grading	3/16/2020	7/31/2020	5	100	
7	Turbine Install	Building Construction	3/16/2020	5/22/2020	5	50	
8	O&M Building	Building Construction	3/16/2020	7/24/2020	5	95	
9	Precommissioning/Commissioning	Building Construction	6/1/2020	8/15/2020	5	55	
10	Reclaimation	Grading	7/1/2020	8/25/2020	5	40	
11	O&M Building - Arch Coatings	Architectural Coating	7/25/2020	7/31/2020	5	5	
12	Final Testing/Close Out	Site Preparation	8/16/2020	10/1/2020	5	34	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 7,500; Non-Residential Outdoor: 2,500; Striped Parking Area: 0

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Turbine Decommissioning	Excavators	4	8.00	158	0.38
Turbine Decommissioning	Forklifts	2	8.00	89	0.20
Turbine Decommissioning	Skid Steer Loaders	2	4.00	65	0.37
Turbine Decommissioning	Tractors/Loaders/Backhoes	2	4.00	97	0.37
Access Roads	Graders	3	4.00	187	0.41
Access Roads	Rollers	3	4.00	80	0.38
Access Roads	Rubber Tired Dozers	5	4.00	247	0.40
Access Roads	Tractors/Loaders/Backhoes	3	4.00	97	0.37
Substation	Excavators	1	4.00	158	0.38
Substation	Forklifts	2	8.00	89	0.20
Foundations	Cranes	2	8.00	231	0.29
Foundations	Excavators	2	4.00	158	0.38
Foundations	Forklifts	2	8.00	89	0.20
Foundations	Other Construction Equipment	1	4.00	172	0.42
Foundations	Rollers	2	4.00	80	0.38
Foundations	Rubber Tired Dozers	2	4.00	247	0.40
Collection	Bore/Drill Rigs	1	6.00	221	0.50
Collection	Forklifts	10	8.00	89	0.20
Collection	Rubber Tired Dozers	1	4.00	247	0.40
Collection	Trenchers	1	4.00	78	0.50
Transmission Line	Cranes	2	8.00	231	0.29
Transmission Line	Other Construction Equipment	2	4.00	172	0.42
Turbine Install	Cranes	7	8.00	231	0.29
Turbine Install	Forklifts	8	8.00	89	0.20
O&M Building	Excavators	1	4.00	158	0.38
O&M Building	Forklifts	1	8.00	89	0.20
O&M Building	Rubber Tired Dozers	1	4.00	247	0.40
Precommissioning/Commissioning	Cranes	0	0.00	231	0.29

Reclaimation	Other Construction Equipment	1	4.00	172	0.42
Reclaimation	Rubber Tired Dozers	4	4.00	247	0.40
O&M Building - Arch Coatings	Air Compressors	1	6.00	78	0.48
Final Testing/Close Out	Rubber Tired Dozers	0	0.00	247	0.40

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Turbine Decommissioning	10	80.00	0.00	1,068.00	16.80	25.00	40.00	LD_Mix	HDT_Mix	HHDT
Access Roads	14	46.00	36.00	3,744.00	16.80	25.00	25.00	LD_Mix	HDT_Mix	HHDT
Substation	3	36.00	2.00	0.00	16.80	25.00	20.00	LD_Mix	HDT_Mix	HHDT
Foundations	11	90.00	176.00	280.00	16.80	28.00	25.00	LD_Mix	HDT_Mix	HHDT
Collection	13	36.00	6.00	0.00	16.80	25.00	20.00	LD_Mix	HDT_Mix	HHDT
Transmission Line	4	24.00	12.00	0.00	16.80	25.00	20.00	LD_Mix	HDT_Mix	HHDT
Turbine Install	15	100.00	40.00	0.00	16.80	25.00	20.00	LD_Mix	HDT_Mix	HHDT
O&M Building	3	30.00	6.00	0.00	16.80	25.00	20.00	LD_Mix	HDT_Mix	HHDT
Precommissioning/Commissioning	0	20.00	0.00	0.00	16.80	25.00	20.00	LD_Mix	HDT_Mix	HHDT
Reclaimation	5	20.00	0.00	0.00	16.80	25.00	20.00	LD_Mix	HDT_Mix	HHDT
O&M Building - Arch Coatings	1	10.00	0.00	0.00	16.80	25.00	20.00	LD_Mix	HDT_Mix	HHDT
Final Testing/Close Out	0	10.00	0.00	0.00	16.80	25.00	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Turbine Decommissioning - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.6802	17.0480	19.1341	0.0289		0.9463	0.9463		0.8706	0.8706		2,859.2977	2,859.2977	0.9047		2,881.9139
Total	**1.6802**	**17.0480**	**19.1341**	**0.0289**		**0.9463**	**0.9463**		**0.8706**	**0.8706**		**2,859.2977**	**2,859.2977**	**0.9047**		**2,881.9139**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.1849	5.9401	0.9559	0.0177	10.0527	0.0267	10.0794	1.0920	0.0255	1.1175		1,856.2786	1,856.2786	0.0835		1,858.3648
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.6026	0.4792	4.2677	9.8700e-003	20.7923	7.7500e-003	20.8001	2.2425	7.1400e-003	2.2497		982.0087	982.0087	0.0352		982.8891
Total	**0.7874**	**6.4193**	**5.2236**	**0.0276**	**30.8450**	**0.0345**	**30.8794**	**3.3345**	**0.0327**	**3.3672**		**2,838.2873**	**2,838.2873**	**0.1187**		**2,841.2538**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.7105	14.4438	21.9067	0.0289		0.7979	0.7979		0.7979	0.7979	0.0000	2,859.2977	2,859.2977	0.9047		2,881.9139
Total	**0.7105**	**14.4438**	**21.9067**	**0.0289**		**0.7979**	**0.7979**		**0.7979**	**0.7979**	**0.0000**	**2,859.2977**	**2,859.2977**	**0.9047**		**2,881.9139**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.1849	5.9401	0.9559	0.0177	6.3590	0.0267	6.3857	0.7226	0.0255	0.7482		1,856.2786	1,856.2786	0.0835		1,858.3648
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.6026	0.4792	4.2677	9.8700e-003	13.1228	7.7500e-003	13.1306	1.4756	7.1400e-003	1.4827		982.0087	982.0087	0.0352		982.8891
Total	**0.7874**	**6.4193**	**5.2236**	**0.0276**	**19.4819**	**0.0345**	**19.5163**	**2.1982**	**0.0327**	**2.2309**		**2,838.2873**	**2,838.2873**	**0.1187**		**2,841.2538**

3.2 Turbine Decommissioning - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5574	15.4131	19.1015	0.0289		0.8399	0.8399		0.7727	0.7727		2,797.4726	2,797.4726	0.9048		2,820.0916
Total	**1.5574**	**15.4131**	**19.1015**	**0.0289**		**0.8399**	**0.8399**		**0.7727**	**0.7727**		**2,797.4726**	**2,797.4726**	**0.9048**		**2,820.0916**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.1714	5.5109	0.9063	0.0175	28.6537	0.0223	28.6759	3.0635	0.0213	3.0848		1,833.9747	1,833.9747	0.0803		1,835.9821
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.5454	0.4209	3.7732	9.5600e-003	20.7923	7.4400e-003	20.7998	2.2425	6.8500e-003	2.2494		951.8096	951.8096	0.0304		952.5690
Total	**0.7168**	**5.9318**	**4.6795**	**0.0270**	**49.4460**	**0.0297**	**49.4757**	**5.3061**	**0.0281**	**5.3342**		**2,785.7844**	**2,785.7844**	**0.1107**		**2,788.5511**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.7105	14.4438	21.9067	0.0289		0.7979	0.7979		0.7979	0.7979	0.0000	2,797.4726	2,797.4726	0.9048		2,820.0916
Total	**0.7105**	**14.4438**	**21.9067**	**0.0289**		**0.7979**	**0.7979**		**0.7979**	**0.7979**	**0.0000**	**2,797.4726**	**2,797.4726**	**0.9048**		**2,820.0916**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.1714	5.5109	0.9063	0.0175	18.0546	0.0223	18.0768	2.0036	0.0213	2.0249		1,833.9747	1,833.9747	0.0803		1,835.9821
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.5454	0.4209	3.7732	9.5600e-003	13.1228	7.4400e-003	13.1303	1.4756	6.8500e-003	1.4824		951.8096	951.8096	0.0304		952.5690
Total	**0.7168**	**5.9318**	**4.6795**	**0.0270**	**31.1774**	**0.0297**	**31.2071**	**3.4792**	**0.0281**	**3.5073**		**2,785.7844**	**2,785.7844**	**0.1107**		**2,788.5511**

3.3 Access Roads - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					15.6822	0.0000	15.6822	8.3433	0.0000	8.3433			0.0000			0.0000
Off-Road	4.2556	46.9228	19.7822	0.0399		2.2436	2.2436		2.0641	2.0641		3,950.850 4	3,950.850 4	1.2500		3,982.100 5
Total	**4.2556**	**46.9228**	**19.7822**	**0.0399**	**15.6822**	**2.2436**	**17.9258**	**8.3433**	**2.0641**	**10.4074**		**3,950.850 4**	**3,950.850 4**	**1.2500**		**3,982.100 5**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.4654	15.3713	2.4310	0.0427	25.9292	0.0629	25.9921	2.8092	0.0602	2.8694		4,474.322 3	4,474.322 3	0.2892		4,481.552 8
Vendor	0.4793	10.2986	2.5413	0.0293	14.0729	0.1150	14.1879	1.5601	0.1100	1.6701		3,059.179 8	3,059.179 8	0.1420		3,062.729 7
Worker	0.3465	0.2755	2.4539	5.6800e-003	11.9556	4.4600e-003	11.9600	1.2895	4.1100e-003	1.2936		564.6550	564.6550	0.0203		565.1612
Total	**1.2912**	**25.9455**	**7.4262**	**0.0776**	**51.9576**	**0.1824**	**52.1401**	**5.6587**	**0.1744**	**5.8331**		**8,098.157 1**	**8,098.157 1**	**0.4515**		**8,109.443 7**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					7.0570	0.0000	7.0570	3.7545	0.0000	3.7545			0.0000			0.0000
Off-Road	0.9766	19.6177	23.0890	0.0399		0.8986	0.8986		0.8986	0.8986	0.0000	3,950.8504	3,950.8504	1.2500		3,982.1005
Total	**0.9766**	**19.6177**	**23.0890**	**0.0399**	**7.0570**	**0.8986**	**7.9555**	**3.7545**	**0.8986**	**4.6530**	**0.0000**	**3,950.8504**	**3,950.8504**	**1.2500**		**3,982.1005**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.4654	15.3713	2.4310	0.0427	16.3913	0.0629	16.4542	1.8554	0.0602	1.9156		4,474.3223	4,474.3223	0.2892		4,481.5528
Vendor	0.4793	10.2986	2.5413	0.0293	8.9371	0.1150	9.0521	1.0465	0.1100	1.1565		3,059.1798	3,059.1798	0.1420		3,062.7297
Worker	0.3465	0.2755	2.4539	5.6800e-003	7.5456	4.4600e-003	7.5501	0.8485	4.1100e-003	0.8526		564.6550	564.6550	0.0203		565.1612
Total	**1.2912**	**25.9455**	**7.4262**	**0.0776**	**32.8740**	**0.1824**	**33.0564**	**3.7503**	**0.1744**	**3.9247**		**8,098.1571**	**8,098.1571**	**0.4515**		**8,109.4437**

3.3 Access Roads - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					15.6822	0.0000	15.6822	8.3433	0.0000	8.3433			0.0000			0.0000
Off-Road	4.0389	44.0984	19.3103	0.0399		2.0895	2.0895		1.9223	1.9223		3,864.6867	3,864.6867	1.2499		3,895.9346
Total	**4.0389**	**44.0984**	**19.3103**	**0.0399**	**15.6822**	**2.0895**	**17.7716**	**8.3433**	**1.9223**	**10.2656**		**3,864.6867**	**3,864.6867**	**1.2499**		**3,895.9346**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.4310	14.3264	2.2957	0.0422	49.8493	0.0524	49.9017	5.3445	0.0501	5.3946		4,420.9878	4,420.9878	0.2788		4,427.9586
Vendor	0.3816	9.0813	2.1484	0.0290	14.0729	0.0772	14.1500	1.5601	0.0738	1.6339		3,032.4334	3,032.4334	0.1322		3,035.7386
Worker	0.3136	0.2420	2.1696	5.5000e-003	11.9556	4.2800e-003	11.9599	1.2895	3.9400e-003	1.2934		547.2905	547.2905	0.0175		547.7272
Total	**1.1262**	**23.6497**	**6.6136**	**0.0767**	**75.8778**	**0.1338**	**76.0115**	**8.1940**	**0.1278**	**8.3218**		**8,000.7117**	**8,000.7117**	**0.4285**		**8,011.4244**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					7.0570	0.0000	7.0570	3.7545	0.0000	3.7545			0.0000			0.0000
Off-Road	0.9766	19.6177	23.0890	0.0399		0.8986	0.8986		0.8986	0.8986	0.0000	3,864.6867	3,864.6867	1.2499		3,895.9346
Total	**0.9766**	**19.6177**	**23.0890**	**0.0399**	**7.0570**	**0.8986**	**7.9555**	**3.7545**	**0.8986**	**4.6530**	**0.0000**	**3,864.6867**	**3,864.6867**	**1.2499**		**3,895.9346**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.4310	14.3264	2.2957	0.0422	31.4312	0.0524	31.4836	3.5026	0.0501	3.5528		4,420.9878	4,420.9878	0.2788		4,427.9586
Vendor	0.3816	9.0813	2.1484	0.0290	8.9371	0.0772	9.0142	1.0465	0.0738	1.1203		3,032.4334	3,032.4334	0.1322		3,035.7386
Worker	0.3136	0.2420	2.1696	5.5000e-003	7.5456	4.2800e-003	7.5499	0.8485	3.9400e-003	0.8524		547.2905	547.2905	0.0175		547.7272
Total	**1.1262**	**23.6497**	**6.6136**	**0.0767**	**47.9139**	**0.1338**	**48.0477**	**5.3976**	**0.1278**	**5.5255**		**8,000.7117**	**8,000.7117**	**0.4285**		**8,011.4244**

3.4 Substation - 2019

Unmitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.4503	4.1976	4.0200	5.6400e-003		0.2860	0.2860		0.2631	0.2631		558.2036	558.2036	0.1766		562.6188
Total	**0.4503**	**4.1976**	**4.0200**	**5.6400e-003**	**0.0000**	**0.2860**	**0.2860**	**0.0000**	**0.2631**	**0.2631**		**558.2036**	**558.2036**	**0.1766**		**562.6188**

Unmitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0266	0.5722	0.1412	1.6300e-003	0.7818	6.3900e-003	0.7882	0.0867	6.1100e-003	0.0928		169.9544	169.9544	7.8900e-003		170.1517
Worker	0.2712	0.2156	1.9205	4.4400e-003	9.3565	3.4900e-003	9.3600	1.0091	3.2100e-003	1.0124		441.9039	441.9039	0.0159		442.3001
Total	**0.2978**	**0.7878**	**2.0617**	**6.0700e-003**	**10.1384**	**9.8800e-003**	**10.1483**	**1.0958**	**9.3200e-003**	**1.1051**		**611.8584**	**611.8584**	**0.0237**		**612.4517**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.1389	2.9487	4.2822	5.6400e-003		0.1799	0.1799		0.1799	0.1799	0.0000	558.2036	558.2036	0.1766		562.6188
Total	**0.1389**	**2.9487**	**4.2822**	**5.6400e-003**	**0.0000**	**0.1799**	**0.1799**	**0.0000**	**0.1799**	**0.1799**	**0.0000**	**558.2036**	**558.2036**	**0.1766**		**562.6188**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0266	0.5722	0.1412	1.6300e-003	0.4965	6.3900e-003	0.5029	0.0581	6.1100e-003	0.0643		169.9544	169.9544	7.8900e-003		170.1517
Worker	0.2712	0.2156	1.9205	4.4400e-003	5.9053	3.4900e-003	5.9088	0.6640	3.2100e-003	0.6672		441.9039	441.9039	0.0159		442.3001
Total	**0.2978**	**0.7878**	**2.0617**	**6.0700e-003**	**6.4018**	**9.8800e-003**	**6.4117**	**0.7222**	**9.3200e-003**	**0.7315**		**611.8584**	**611.8584**	**0.0237**		**612.4517**

3.4 Substation - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.4105	3.8013	3.9944	5.6400e-003		0.2518	0.2518		0.2316	0.2316		546.1209	546.1209	0.1766		550.5365
Total	**0.4105**	**3.8013**	**3.9944**	**5.6400e-003**	**0.0000**	**0.2518**	**0.2518**	**0.0000**	**0.2316**	**0.2316**		**546.1209**	**546.1209**	**0.1766**		**550.5365**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0212	0.5045	0.1194	1.6100e-003	0.7818	4.2900e-003	0.7861	0.0867	4.1000e-003	0.0908		168.4685	168.4685	7.3500e-003		168.6522
Worker	0.2454	0.1894	1.6979	4.3000e-003	9.3565	3.3500e-003	9.3599	1.0091	3.0800e-003	1.0122		428.3143	428.3143	0.0137		428.6560
Total	**0.2666**	**0.6939**	**1.8173**	**5.9100e-003**	**10.1384**	**7.6400e-003**	**10.1460**	**1.0958**	**7.1800e-003**	**1.1030**		**596.7829**	**596.7829**	**0.0210**		**597.3082**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.1389	2.9487	4.2822	5.6400e-003		0.1799	0.1799		0.1799	0.1799	0.0000	546.1209	546.1209	0.1766		550.5365
Total	**0.1389**	**2.9487**	**4.2822**	**5.6400e-003**	**0.0000**	**0.1799**	**0.1799**	**0.0000**	**0.1799**	**0.1799**	**0.0000**	**546.1209**	**546.1209**	**0.1766**		**550.5365**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0212	0.5045	0.1194	1.6100e-003	0.4965	4.2900e-003	0.5008	0.0581	4.1000e-003	0.0622		168.4685	168.4685	7.3500e-003		168.6522
Worker	0.2454	0.1894	1.6979	4.3000e-003	5.9053	3.3500e-003	5.9086	0.6640	3.0800e-003	0.6671		428.3143	428.3143	0.0137		428.6560
Total	**0.2666**	**0.6939**	**1.8173**	**5.9100e-003**	**6.4018**	**7.6400e-003**	**6.4094**	**0.7222**	**7.1800e-003**	**0.7293**		**596.7829**	**596.7829**	**0.0210**		**597.3082**

3.5 Foundations - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.6902	0.0000	6.6902	3.3824	0.0000	3.3824			0.0000			0.0000
Off-Road	2.9744	31.8236	17.9451	0.0340		1.5806	1.5806		1.4542	1.4542		3,294.5703	3,294.5703	1.0655		3,321.2086
Total	**2.9744**	**31.8236**	**17.9451**	**0.0340**	**6.6902**	**1.5806**	**8.2708**	**3.3824**	**1.4542**	**4.8365**		**3,294.5703**	**3,294.5703**	**1.0655**		**3,321.2086**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0548	1.8214	0.2919	5.3600e-003	2.1822	6.6600e-003	2.1888	0.2390	6.3700e-003	0.2454		562.0700	562.0700	0.0355		562.9563
Vendor	2.0514	48.3018	11.4219	0.1574	77.0562	0.4211	77.4774	8.5421	0.4029	8.9450		16,459.9998	16,459.9998	0.6609		16,476.5231
Worker	0.6136	0.4735	4.2448	0.0108	23.3914	8.3700e-003	23.3997	2.5229	7.7100e-003	2.5306		1,070.7859	1,070.7859	0.0342		1,071.6401
Total	**2.7198**	**50.5967**	**15.9585**	**0.1735**	**102.6297**	**0.4362**	**103.0659**	**11.3040**	**0.4169**	**11.7209**		**18,092.8557**	**18,092.8557**	**0.7306**		**18,111.1195**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					3.0106	0.0000	3.0106	1.5221	0.0000	1.5221			0.0000			0.0000
Off-Road	0.8359	16.6490	21.2564	0.0340		0.7747	0.7747		0.7747	0.7747	0.0000	3,294.5703	3,294.5703	1.0655		3,321.2086
Total	**0.8359**	**16.6490**	**21.2564**	**0.0340**	**3.0106**	**0.7747**	**3.7853**	**1.5221**	**0.7747**	**2.2968**	**0.0000**	**3,294.5703**	**3,294.5703**	**1.0655**		**3,321.2086**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0548	1.8214	0.2919	5.3600e-003	1.3832	6.6600e-003	1.3899	0.1591	6.3700e-003	0.1655		562.0700	562.0700	0.0355		562.9563
Vendor	2.0514	48.3018	11.4219	0.1574	48.9348	0.4211	49.3560	5.7300	0.4029	6.1328		16,459.9998	16,459.9998	0.6609		16,476.5231
Worker	0.6136	0.4735	4.2448	0.0108	14.7632	8.3700e-003	14.7716	1.6600	7.7100e-003	1.6677		1,070.7859	1,070.7859	0.0342		1,071.6401
Total	**2.7198**	**50.5967**	**15.9585**	**0.1735**	**65.0813**	**0.4362**	**65.5174**	**7.5492**	**0.4169**	**7.9661**		**18,092.8557**	**18,092.8557**	**0.7306**		**18,111.1195**

3.6 Collection - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					3.0110	0.0000	3.0110	1.6551	0.0000	1.6551			0.0000			0.0000
Off-Road	2.3979	23.1811	16.7472	0.0283		1.4624	1.4624		1.3454	1.3454		2,739.740 8	2,739.740 8	0.8861		2,761.893 0
Total	**2.3979**	**23.1811**	**16.7472**	**0.0283**	**3.0110**	**1.4624**	**4.4734**	**1.6551**	**1.3454**	**3.0005**		**2,739.740 8**	**2,739.740 8**	**0.8861**		**2,761.893 0**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0636	1.5135	0.3581	4.8300e-003	2.3455	0.0129	2.3583	0.2600	0.0123	0.2723		505.4056	505.4056	0.0220		505.9564
Worker	0.2454	0.1894	1.6979	4.3000e-003	9.3565	3.3500e-003	9.3599	1.0091	3.0800e-003	1.0122		428.3143	428.3143	0.0137		428.6560
Total	**0.3090**	**1.7029**	**2.0560**	**9.1300e-003**	**11.7020**	**0.0162**	**11.7182**	**1.2692**	**0.0154**	**1.2845**		**933.7199**	**933.7199**	**0.0357**		**934.6125**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					1.3550	0.0000	1.3550	0.7448	0.0000	0.7448			0.0000			0.0000
Off-Road	0.6980	14.9567	18.9539	0.0283		0.8741	0.8741		0.8741	0.8741	0.0000	2,739.740 8	2,739.740 8	0.8861		2,761.893 0
Total	**0.6980**	**14.9567**	**18.9539**	**0.0283**	**1.3550**	**0.8741**	**2.2291**	**0.7448**	**0.8741**	**1.6189**	**0.0000**	**2,739.740 8**	**2,739.740 8**	**0.8861**		**2,761.893 0**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0636	1.5135	0.3581	4.8300e-003	1.4895	0.0129	1.5024	0.1744	0.0123	0.1867		505.4056	505.4056	0.0220		505.9564
Worker	0.2454	0.1894	1.6979	4.3000e-003	5.9053	3.3500e-003	5.9086	0.6640	3.0800e-003	0.6671		428.3143	428.3143	0.0137		428.6560
Total	**0.3090**	**1.7029**	**2.0560**	**9.1300e-003**	**7.3948**	**0.0162**	**7.4110**	**0.8384**	**0.0154**	**0.8538**		**933.7199**	**933.7199**	**0.0357**		**934.6125**

3.7 Transmission Line - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	1.4008	16.0222	8.3528	0.0177		0.7210	0.7210		0.6633	0.6633		1,716.3834	1,716.3834	0.5551		1,730.2612
Total	**1.4008**	**16.0222**	**8.3528**	**0.0177**	**0.0000**	**0.7210**	**0.7210**	**0.0000**	**0.6633**	**0.6633**		**1,716.3834**	**1,716.3834**	**0.5551**		**1,730.2612**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1272	3.0271	0.7161	9.6700e-003	4.6910	0.0257	4.7167	0.5200	0.0246	0.5446		1,010.8111	1,010.8111	0.0441		1,011.9129
Worker	0.1636	0.1263	1.1320	2.8700e-003	6.2377	2.2300e-003	6.2399	0.6728	2.0600e-003	0.6748		285.5429	285.5429	9.1100e-003		285.7707
Total	**0.2908**	**3.1533**	**1.8481**	**0.0125**	**10.9287**	**0.0280**	**10.9566**	**1.1928**	**0.0267**	**1.2195**		**1,296.3540**	**1,296.3540**	**0.0532**		**1,297.6836**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.4365	8.4381	10.8580	0.0177		0.3506	0.3506		0.3506	0.3506	0.0000	1,716.383 4	1,716.383 4	0.5551		1,730.261 2
Total	**0.4365**	**8.4381**	**10.8580**	**0.0177**	**0.0000**	**0.3506**	**0.3506**	**0.0000**	**0.3506**	**0.3506**	**0.0000**	**1,716.383 4**	**1,716.383 4**	**0.5551**		**1,730.261 2**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1272	3.0271	0.7161	9.6700e-003	2.9790	0.0257	3.0047	0.3488	0.0246	0.3734		1,010.811 1	1,010.811 1	0.0441		1,011.912 9
Worker	0.1636	0.1263	1.1320	2.8700e-003	3.9369	2.2300e-003	3.9391	0.4427	2.0600e-003	0.4447		285.5429	285.5429	9.1100e-003		285.7707
Total	**0.2908**	**3.1533**	**1.8481**	**0.0125**	**6.9159**	**0.0280**	**6.9438**	**0.7915**	**0.0267**	**0.8182**		**1,296.354 0**	**1,296.354 0**	**0.0532**		**1,297.683 6**

3.8 Turbine Install - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	4.3259	48.1207	24.2497	0.0526		2.3292	2.3292		2.1429	2.1429		5,095.7741	5,095.7741	1.6481		5,136.9760
Total	**4.3259**	**48.1207**	**24.2497**	**0.0526**		**2.3292**	**2.3292**		**2.1429**	**2.1429**		**5,095.7741**	**5,095.7741**	**1.6481**		**5,136.9760**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4240	10.0903	2.3871	0.0322	15.6365	0.0857	15.7222	1.7334	0.0820	1.8154		3,369.3704	3,369.3704	0.1469		3,373.0429
Worker	0.6817	0.5261	4.7164	0.0120	25.9904	9.3000e-003	25.9997	2.8032	8.5700e-003	2.8117		1,189.7621	1,189.7621	0.0380		1,190.7112
Total	**1.1057**	**10.6164**	**7.1035**	**0.0442**	**41.6269**	**0.0950**	**41.7219**	**4.5366**	**0.0906**	**4.6272**		**4,559.1325**	**4,559.1325**	**0.1849**		**4,563.7541**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2938	26.0691	30.7959	0.0526		1.2100	1.2100		1.2100	1.2100	0.0000	5,095.7741	5,095.7741	1.6481		5,136.9760
Total	**1.2938**	**26.0691**	**30.7959**	**0.0526**		**1.2100**	**1.2100**		**1.2100**	**1.2100**	**0.0000**	**5,095.7741**	**5,095.7741**	**1.6481**		**5,136.9760**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4240	10.0903	2.3871	0.0322	9.9301	0.0857	10.0158	1.1628	0.0820	1.2448		3,369.3704	3,369.3704	0.1469		3,373.0429
Worker	0.6817	0.5261	4.7164	0.0120	16.4036	9.3000e-003	16.4129	1.8445	8.5700e-003	1.8531		1,189.7621	1,189.7621	0.0380		1,190.7112
Total	**1.1057**	**10.6164**	**7.1035**	**0.0442**	**26.3336**	**0.0950**	**26.4286**	**3.0073**	**0.0906**	**3.0978**		**4,559.1325**	**4,559.1325**	**0.1849**		**4,563.7541**

3.9 O&M Building - 2020

Unmitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Off-Road	0.8063	8.1699	4.8800	8.3700e-003		0.4326	0.4326		0.3980	0.3980		811.7613	811.7613	0.2625		818.3248
Total	**0.8063**	**8.1699**	**4.8800**	**8.3700e-003**		**0.4326**	**0.4326**		**0.3980**	**0.3980**		**811.7613**	**811.7613**	**0.2625**		**818.3248**

Unmitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0636	1.5135	0.3581	4.8300e-003	2.3455	0.0129	2.3583	0.2600	0.0123	0.2723		505.4056	505.4056	0.0220		505.9564
Worker	0.2045	0.1578	1.4149	3.5900e-003	7.7971	2.7900e-003	7.7999	0.8410	2.5700e-003	0.8435		356.9286	356.9286	0.0114		357.2134
Total	**0.2681**	**1.6714**	**1.7730**	**8.4200e-003**	**10.1426**	**0.0157**	**10.1583**	**1.1010**	**0.0149**	**1.1158**		**862.3342**	**862.3342**	**0.0334**		**863.1698**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.2058	4.1099	5.3859	8.3700e-003		0.1963	0.1963		0.1963	0.1963	0.0000	811.7613	811.7613	0.2625		818.3248
Total	**0.2058**	**4.1099**	**5.3859**	**8.3700e-003**		**0.1963**	**0.1963**		**0.1963**	**0.1963**	**0.0000**	**811.7613**	**811.7613**	**0.2625**		**818.3248**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0636	1.5135	0.3581	4.8300e-003	1.4895	0.0129	1.5024	0.1744	0.0123	0.1867		505.4056	505.4056	0.0220		505.9564
Worker	0.2045	0.1578	1.4149	3.5900e-003	4.9211	2.7900e-003	4.9239	0.5533	2.5700e-003	0.5559		356.9286	356.9286	0.0114		357.2134
Total	**0.2681**	**1.6714**	**1.7730**	**8.4200e-003**	**6.4106**	**0.0157**	**6.4262**	**0.7278**	**0.0149**	**0.7426**		**862.3342**	**862.3342**	**0.0334**		**863.1698**

3.10 Precommissioning/Commissioning - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1364	0.1052	0.9433	2.3900e-003	5.1981	1.8600e-003	5.1999	0.5606	1.7100e-003	0.5624		237.9524	237.9524	7.5900e-003		238.1422
Total	**0.1364**	**0.1052**	**0.9433**	**2.3900e-003**	**5.1981**	**1.8600e-003**	**5.1999**	**0.5606**	**1.7100e-003**	**0.5624**		**237.9524**	**237.9524**	**7.5900e-003**		**238.1422**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1364	0.1052	0.9433	2.3900e-003	3.2807	1.8600e-003	3.2826	0.3689	1.7100e-003	0.3706		237.9524	237.9524	7.5900e-003		238.1422
Total	**0.1364**	**0.1052**	**0.9433**	**2.3900e-003**	**3.2807**	**1.8600e-003**	**3.2826**	**0.3689**	**1.7100e-003**	**0.3706**		**237.9524**	**237.9524**	**7.5900e-003**		**238.1422**

3.11 Reclaimation - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					12.9191	0.0000	12.9191	6.7149	0.0000	6.7149			0.0000			0.0000
Off-Road	2.4060	25.2841	10.3243	0.0202		1.2482	1.2482		1.1483	1.1483		1,954.0871	1,954.0871	0.6320		1,969.8869
Total	**2.4060**	**25.2841**	**10.3243**	**0.0202**	**12.9191**	**1.2482**	**14.1673**	**6.7149**	**1.1483**	**7.8632**		**1,954.0871**	**1,954.0871**	**0.6320**		**1,969.8869**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1364	0.1052	0.9433	2.3900e-003	5.1981	1.8600e-003	5.1999	0.5606	1.7100e-003	0.5624		237.9524	237.9524	7.5900e-003		238.1422
Total	**0.1364**	**0.1052**	**0.9433**	**2.3900e-003**	**5.1981**	**1.8600e-003**	**5.1999**	**0.5606**	**1.7100e-003**	**0.5624**		**237.9524**	**237.9524**	**7.5900e-003**		**238.1422**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					5.8136	0.0000	5.8136	3.0217	0.0000	3.0217			0.0000			0.0000
Off-Road	0.4947	9.5633	11.4183	0.0202		0.3780	0.3780		0.3780	0.3780	0.0000	1,954.0871	1,954.0871	0.6320		1,969.8869
Total	**0.4947**	**9.5633**	**11.4183**	**0.0202**	**5.8136**	**0.3780**	**6.1916**	**3.0217**	**0.3780**	**3.3998**	**0.0000**	**1,954.0871**	**1,954.0871**	**0.6320**		**1,969.8869**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1364	0.1052	0.9433	2.3900e-003	3.2807	1.8600e-003	3.2826	0.3689	1.7100e-003	0.3706		237.9524	237.9524	7.5900e-003		238.1422
Total	**0.1364**	**0.1052**	**0.9433**	**2.3900e-003**	**3.2807**	**1.8600e-003**	**3.2826**	**0.3689**	**1.7100e-003**	**0.3706**		**237.9524**	**237.9524**	**7.5900e-003**		**238.1422**

3.12 O&M Building - Arch Coatings - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	13.9050					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109		281.4481	281.4481	0.0218		281.9928
Total	**14.1472**	**1.6838**	**1.8314**	**2.9700e-003**		**0.1109**	**0.1109**		**0.1109**	**0.1109**		**281.4481**	**281.4481**	**0.0218**		**281.9928**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0682	0.0526	0.4716	1.2000e-003	2.5990	9.3000e-004	2.6000	0.2803	8.6000e-004	0.2812		118.9762	118.9762	3.8000e-003		119.0711
Total	**0.0682**	**0.0526**	**0.4716**	**1.2000e-003**	**2.5990**	**9.3000e-004**	**2.6000**	**0.2803**	**8.6000e-004**	**0.2812**		**118.9762**	**118.9762**	**3.8000e-003**		**119.0711**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	13.9050					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.0594	1.3570	1.8324	2.9700e-003		0.0951	0.0951		0.0951	0.0951	0.0000	281.4481	281.4481	0.0218		281.9928
Total	**13.9644**	**1.3570**	**1.8324**	**2.9700e-003**		**0.0951**	**0.0951**		**0.0951**	**0.0951**	**0.0000**	**281.4481**	**281.4481**	**0.0218**		**281.9928**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0682	0.0526	0.4716	1.2000e-003	1.6404	9.3000e-004	1.6413	0.1845	8.6000e-004	0.1853		118.9762	118.9762	3.8000e-003		119.0711
Total	**0.0682**	**0.0526**	**0.4716**	**1.2000e-003**	**1.6404**	**9.3000e-004**	**1.6413**	**0.1845**	**8.6000e-004**	**0.1853**		**118.9762**	**118.9762**	**3.8000e-003**		**119.0711**

3.13 Final Testing/Close Out - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0682	0.0526	0.4716	1.2000e-003	2.5990	9.3000e-004	2.6000	0.2803	8.6000e-004	0.2812		118.9762	118.9762	3.8000e-003		119.0711
Total	**0.0682**	**0.0526**	**0.4716**	**1.2000e-003**	**2.5990**	**9.3000e-004**	**2.6000**	**0.2803**	**8.6000e-004**	**0.2812**		**118.9762**	**118.9762**	**3.8000e-003**		**119.0711**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0682	0.0526	0.4716	1.2000e-003	1.6404	9.3000e-004	1.6413	0.1845	8.6000e-004	0.1853		118.9762	118.9762	3.8000e-003		119.0711
Total	**0.0682**	**0.0526**	**0.4716**	**1.2000e-003**	**1.6404**	**9.3000e-004**	**1.6413**	**0.1845**	**8.6000e-004**	**0.1853**		**118.9762**	**118.9762**	**3.8000e-003**		**119.0711**

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	2.9500e-003	0.0269	0.0226	1.6000e-004		2.0400e-003	2.0400e-003		2.0400e-003	2.0400e-003		32.2321	32.2321	6.2000e-004	5.9000e-004	32.4236
NaturalGas Unmitigated	2.9500e-003	0.0269	0.0226	1.6000e-004		2.0400e-003	2.0400e-003		2.0400e-003	2.0400e-003		32.2321	32.2321	6.2000e-004	5.9000e-004	32.4236

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
User Defined Commercial	273.973	2.9500e-003	0.0269	0.0226	1.6000e-004		2.0400e-003	2.0400e-003		2.0400e-003	2.0400e-003		32.2321	32.2321	6.2000e-004	5.9000e-004	32.4236
Total		**2.9500e-003**	**0.0269**	**0.0226**	**1.6000e-004**		**2.0400e-003**	**2.0400e-003**		**2.0400e-003**	**2.0400e-003**		**32.2321**	**32.2321**	**6.2000e-004**	**5.9000e-004**	**32.4236**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
User Defined Commercial	0.273973	2.9500e-003	0.0269	0.0226	1.6000e-004		2.0400e-003	2.0400e-003		2.0400e-003	2.0400e-003		32.2321	32.2321	6.2000e-004	5.9000e-004	32.4236
Total		**2.9500e-003**	**0.0269**	**0.0226**	**1.6000e-004**		**2.0400e-003**	**2.0400e-003**		**2.0400e-003**	**2.0400e-003**		**32.2321**	**32.2321**	**6.2000e-004**	**5.9000e-004**	**32.4236**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.1279	1.8000e-004	0.0197	0.0000		7.0000e-005	7.0000e-005		7.0000e-005	7.0000e-005		0.0421	0.0421	1.1000e-004		0.0449
Unmitigated	0.1279	1.8000e-004	0.0197	0.0000		7.0000e-005	7.0000e-005		7.0000e-005	7.0000e-005		0.0421	0.0421	1.1000e-004		0.0449

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0191					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.1070					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.8400e-003	1.8000e-004	0.0197	0.0000		7.0000e-005	7.0000e-005		7.0000e-005	7.0000e-005		0.0421	0.0421	1.1000e-004		0.0449
Total	**0.1279**	**1.8000e-004**	**0.0197**	**0.0000**		**7.0000e-005**	**7.0000e-005**		**7.0000e-005**	**7.0000e-005**		**0.0421**	**0.0421**	**1.1000e-004**		**0.0449**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0191					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.1070					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.8400e-003	1.8000e-004	0.0197	0.0000		7.0000e-005	7.0000e-005		7.0000e-005	7.0000e-005		0.0421	0.0421	1.1000e-004		0.0449
Total	**0.1279**	**1.8000e-004**	**0.0197**	**0.0000**		**7.0000e-005**	**7.0000e-005**		**7.0000e-005**	**7.0000e-005**		**0.0421**	**0.0421**	**1.1000e-004**		**0.0449**

Gonzaga Ridge Wind Repowering Project
Blasting Emissions

Anticipated blasting activities is assumed to include the following:

Assumptions:

100	cubic yard/blast
1	blast/day
0.06	ton explosives/per 100 CY blast (maximum blast)
15.00	feet average depth

Project Phase Estimates:

40,000	total cubic yard/phase
40.0	total blasts
2.20	total ton explosives/phase
0.06	maximum ton explosives/day
2,667	total square feet blasted/phase
20	maxmimum square feet blasted/day

Emissions Calculations:

Pollutant	Source	Emission Factor	Units	Maximum Daily (lbs/day)	Annual (lbs/year)	Annual (ton/year)
ROG	1	N/A	lb/ton	—	—	—
NOx	1	17	lb/ton	0.94	37.40	0.02
CO	1	67	lb/ton	3.69	147.40	0.07
SOx	1	2	lb/ton	0.11	4.40	0.00
PM_{10}	2	—	lb/blast	0.00	1.00	0.00
$PM_{2.5}$	2	—	lb/blast	0.00	0.06	0.00

Source/Reference:
1. AP-42, Section 13.3, Table 13.3-1 for ANFO.
2. AP-42, Section 11.9, Table 11.9-1.
   $PM_{10} = 0.52 \times 0.000014 \times (A)^{1.5}$, where A is the horizontal area blasted.
   $PM_{2.5} = 0.03 \times 0.000014 \times (A)^{1.5}$, where A is the horizontal area blasted.

Notes:
lb = pounds

GHG Emissions Calculation Comparison:

Pollutant	Source	Emission Factor	Units	Maximum Daily (lbs/day)	Annual (lbs/year)	Annual (MT/year)
CO_2	1	10.35	kg/gallon	--	--	0.37
CO_2	2	0.1670	MT/MT	--	--	0.33

Source/Reference:
1. The Climate Registry. 2018 Emission Factors. Table 12.1 U.S. Default Factors for Calculating CO2 Emissions from Combustion of Fossil Fuel and Biomass.
2. Australian Government - Department of Heritage Australian Greenhouse Office. *AGO Factors and Methods Workbook.* December 2006

Conversion Values:

7.41	lbs/gallon fuel oil
6.00%	composition of fuel oil #2 in ANFO
10.35	kg CO2/gallon fuel oil #2
2000	lbs/ton
1000	kg/MT
1.102	tons/MT

Notes:
MT = metric tons
kg = kilograms
lb = pounds

Emergency Generator Emissions

ROC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	CO_2e
lb/day[a]									
0.02	0.08	0.70	0.0016	0.0026	0.0026	181.92	0.00	0.00	182.42
ton/year[b]						MT/year[b]			
0.00	0.01	0.07	0.00	0.00	0.00	16.50	0.0003	0.00	16.55

Notes:

a Assumes a maximum daily operations of 1 hour per day.

b Assumes 200 days of operation per year.

Emergency Generator Emission Factors

Type	Number	Engine Rating (hp)	Maximum Daily Operation (hr/day)	Load Factor	ROC[2] (g/bhp-hr)	NO_x[2] (g/bhp-hr)	CO[2] (g/bhp-hr)	SO_x[1] (g/bhp-hr)	PM_{10}[2] (g/bhp-hr)	$PM_{2.5}$[2] (g/bhp-hr)	CO_2[1] (g/bhp-hr)	CH_4[1] (g/bhp-hr)
Emergency Generator	1	440	1.00	0.33	0.06	0.26	2.20	0.01	0.01	0.01	568.30	0.01

Notes:

[1] Emission factors are taken from Table 3.4 from Appendix D of the CalEEMod User's Guide

[2] Emission factors are taken from Table 3.5 from Appendix D of the CalEEMod User's Guide

[3] N_2O emission factor based on ratio of N_2O to CH_4 in diesel fuel from The Climate Registry's 2017 Default Emission Factors.

Gonzaga Ridge Wind Repowering Project - Operational Mobile Source Emissions

Employee Trips - Off-Site Light Duty Vehicles (LDA, LDT1, LDT2)

	Units	ROG (VOC)	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$	CO_2	CO_2e	VMT	
Trips per Day	trips	16	16	16	16	16	16	16	–	Daily	269
Trips per Year	trips	4176	4176	4176	4176	4176	4176	4176	–	Annual	70,157
Distance Traveled	miles/trip	16.8	16.8	16.8	16.8	16.8	16.8	16.8	–		
Emission Factor	g/mi	0.06	3.35	5.51	0.01	0.03	0.14	1,271.63	–		
Daily Emissions	lb/day	**0.03**	**1.99**	**3.27**	**0.01**	**0.02**	**0.08**	753.56	754.31		
Annual Emissions	lb/year	8.61	518.53	852.68	1.77	5.24	22.16	196,679.22	196,875.90		
	tons/year	0.0000	0.0010	0.0016	0.0000	0.0000	0.0000	98.34	98.44		
	metric tons/year	0.00	0.00	0.00	0.00	0.00	0.00	**89.21**	**89.30**		

Water Delivery trips - Off-Site Heavy Duty Vehicles (HHD)

	Units	ROG (VOC)	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$	CO_2	CO_2e	VMT	
Trips per Day	trips	0.40	0.40	0.40	0.40	0.40	0.40	0.40	–	Daily	7
Trips per Year	trips	104	104	104	104	104	104	104	–	Annual	1,747
Distance Traveled	miles/trip	16.8	16.8	16.8	16.8	16.8	16.8	16.8	–		
Emission Factor	g/mi	0.17	2.88	12.71	0.02	0.01	0.02	1,373.10	–		
Daily Emissions	lb/day	**0.00**	**0.04**	**0.19**	**0.00**	**0.00**	**0.00**	20.26	21.34		
Annual Emissions	lb/year	0.65	11.09	48.97	0.07	0.04	0.07	5,288.99	5,569.31		
	tons/year	0.00	0.00	0.00	0.00	0.00	0.00	2.64	2.78		
	metric tons/year	0.00	0.00	0.00	0.00	0.00	0.00	**2.40**	**2.53**		

Daily Emissions

Total Mobile Emissions					
ROG (VOC)	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
0.04	2.03	3.27	0.01	0.02	0.09

Annual Emissions

Total Mobile Emissions							
ROG (VOC)	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$	CO_2	CO_2e
0.000018	0.001015	0.001727	0.000004	0.000010	0.000043	91.61	91.83

Trip Estimates	Daily Trips	Annual Trips	
Employee Trips - Off-Site Light Duty Vehicles (LDA, LDT1, LDT2)			
8 Full-time employee trips	16	4,176	
Water Delivery (HHD)			
1 Delivery per week	0.40	20.72	0.398467433

CO_2-to-CO_2 Equivalent Factors

	Source	Units	CO_2	CH_4	N_2O	CO_2/CO_2e
Global Warming Potential			1	25	298	
Diesel Trucks	1	g/mi	1,450.00	0.0051	0.0048	1.001
Passenger Vehicles	2	g/mi				1.053

Breaker (kV)	Number of Breakers	Pounds of SF6	MT of SF6	Leak Rate	Global Warming Potential	MT CO2 e
34.5	4	1,612.00	0.731	1%	23,900	87.38
70	1	270.00	0.122	1%	23,900	14.64
					Total	**102.01**

APPENDIX B
Cultural Report

CULTURAL RESOURCES INVENTORY REPORT
FOR THE GONZAGA RIDGE WIND REPOWERING PROJECT

Lead Agency:

California Department of Parks and Recreation Four Rivers District

Central Valley District - California State Parks
22708 Broadway
Columbia, CA 95310-9400

Prepared for

Gonzaga Ridge Wind Farm, LLC
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Prepared by

Adam Giacinto, MA, RPA, William Burns, MSc, RPA

Ryan Brady, MA, RPA, and Micah J. Hale, PhD, RPA

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October 2019

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Appendices

Figures

Tables

NATIONAL ARCHAEOLOGICAL DATA BASE INFORMATION

Authors:	Adam Giacinto, MA, RPA, William Burns, MSc, RPA, Ryan Brady, MA, RPA, and Micah J. Hale, PhD, RPA
Firm:	Dudek
Client/Project Proponent:	Gonzaga Ridge Wind Farm, LLC
Report Date:	October 2019
Report Title:	Cultural Resources Inventory Report for the Gonzaga Ridge Wind Repowering Project
Type of Study:	Cultural Resources Inventory
New Sites:	GZ-I-02, GZT-I-01, GZT-I-02, GZT-I-03 (isolates)
Updated Sites:	P-24-000142, P-24-001806, P-24-001820, P-24-001821, P-24-001822, P-24-001823, P-24-001824, P-24-001856, P-24-001988, P-24-002143, CA-24-002154, P-24-002164
U.S. Geological Survey Quad:	Pacheco Pass, CA; Mariposa Peak, CA; San Luis Dam, CA 7.5-Minute Quadrangles
Acreage:	Approximately 1,946 acres
Key Words:	Positive results; Merced County; Intensive pedestrian survey, GZ-I-02, GZT-I-01, GZT-I-02, GZT-I-03, P-24-000142, P-24-001806, P-24-001820, P-24-001821, P-24-001822, P-24-001823, P-24-001824, P-24-001856, P-24-001988, P-24-002143, San Luis Reservoir, Pacheco Pass, Mariposa Peak, San Luis Dam

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MANAGEMENT SUMMARY

The present report documents Phase I cultural resources Inventory efforts conducted by Dudek for the Gonzaga Ridge Wind Repowering Project (Project), located in the foothills of the Coastal Range of California, in western Merced County (County). The Project Area falls within Public Lands Survey System (PLSS) Township 10S, Range 7E, Sections 13-16, 21-28, 31 and 36; Township 10S, Range 8E, Sections 23-28, 32 and 36; Township 10S, Range 9E, Section 19; and Township 11S, Range 8E, Sections 3-6 of the Pacheco Pass, Mariposa Peak, and San Luis Dam U.S. Geological Survey (USGS) 7.5-minute topographic quadrangles. The Project is proposed by the Gonzaga Ridge Wind Farm, LLC (GRWF or Applicant). California Department of Parks and Recreation (CDPR) is the lead agency responsible for compliance with the California Environmental Quality Act (CEQA). The Applicant proposes to construct and operate the Project within Pacheco State Park (Park) to produce renewable energy and an approximately 14.8 mile transmission line route (New Transmission Line).

The Project Area, as represented by the limits of area with potential to be directly impacted as a result of Project activities, includes the following: the 1,630 acre wind turbine area (Project site) with proposed wind generation elements located within Pacheco State Park (Park) and an approximately 14.8 mile transmission line route (New Transmission Line). A total of 13 miles of this transmission line extends east of the Project site through Bureau of Reclamation (BOR or Reclamation) lands along the southern side of San Luis Reservoir to Los Banos Substation. A minimum 100 foot buffer (316 acre area) was applied to segments of the New Transmission Line to account for its anticipated rights-of-way (ROW). Recent design refinements have added access roads, two staging areas, and small additional areas to the Project site. Cultural survey is pending for access roads along the New Transmission Line and one proposed staging area at the Basalt Hill Quarry.

All cultural resource fieldwork and reporting for the Project has been conducted by qualified personnel meeting professional standards (including but not limited to the Secretary of the Interior's Professional Qualifications Standards). Two Native American Heritage Commission (NAHC) Sacred Lands File searches (submitted separately for the generation site and the transmission line routes on November 27, 2017 and May 7, 2018, respectively) were completed with the intent of identifying sacred sites that had potential to be impacted. NAHC records did not indicate the presence of Native American sacred sites within the Project site. The later of these searches, however, did indicate the presence of Native American sacred sites in the vicinity of the New Transmission Line. The Amah Mutsun Tribal Band responded to CDPR notification and, through consultation, requested Native American monitoring to occur in areas of the Project during construction. No specific resources of Native American significance were identified in areas that could be impacted by the Project.

Four Central California Information Center (CCaIC) records searches were conducted as Project designs were refined (completed on November 17, 2017, April 24, 2018, November 15, 2018, and January 28, 2019) of the Project site and New Transmission Line routes. A minimum records search buffer of a half-mile was applied from the Project Area components. These searches indicated that 10 cultural resources have been previously recorded within the Project Area. An intensive-level pedestrian survey of the

Project site and the New Transmission Line identified four newly discovered cultural isolates. Outreach with Native American representatives has not been completed by Dudek, however traditionally geographically affiliated tribes were contacted by CDPR pursuant to Assembly Bill 52 (AB 52).

A total of fourteen archaeological resources were identified through Inventory efforts (GZ-I-02, GZT-I-01, GZT-I-02, GZT-I-03, P-24-000142, P-24-001820, P-24-001821, P-24-001822, P-24-001823, P-24-001824, P-24-001856, P-24-001988, P-24-002143, and P-24-002164) within, or adjacent to, the Project Area. Four newly discovered prehistoric isolates (GZ-I-02, GZT-I-01, GZT-I-02, and GZT-I-03) were identified during survey, and are not considered eligible for listing in the NRHP/CRHR. Due to design refinements subsequent to the most recent survey, archaeological survey is pending for some access roads, staging areas, and small Project site expansions. One additional resource, P-24-002154, falls within one of these proposed staging areas along the New Transmission Line.

The Project, as currently designed, intersects the mapped locations of features associated with six previously recorded historic-era resources (P-24-001822, P-24-001856, P-24-001988, P-24-002143, P-24-002154 and P-24-002164). It appears that these resources, with the exception of P-24-002143, remain unevaluated for CRHR/NRHP listing. P-24-001822 consists of a 0.17 mile segment of a historic-era road, now called Dinosaur Lake Trail. This road segment is a primary access to this portion of the Park, and now consists of a 22 foot-wide graveled and improved road. P-24-001856 consists of the historic-era San Luis Gonzaga Rancho-Paula (Pacheco) Fatjo Ranch District (District). All portions of the Project site within the Park fall within the boundaries of this District. The proposed Project plans to utilize a number of dirt roads associated with these two previously recorded resources. The majority of these roads are already improved and being used to support maintenance of the existing wind facilities. However, approximately 3,000 feet of unimproved two-track dirt road in the northeastern portion of the Project site could be used for proposed access roads yet to be constructed. This road segment is not mapped on historical USGS maps prior to 1957 (available since 1920), and was likely primarily utilized for Fatjo family ranching activities during the mid-late 1900s. In addition, P-24-001988 and P-24-002164 are historic roads traversed by the proposed New Transmission Line route, with portions that may also be utilized for Project access.

With the understanding that historic-era roads may be subject to continued use or improvement by the Project as presently designed, Dudek completed appropriate locational, descriptive, and photographic documentation with the intent of capturing their data potential and significance-defining attributes. These road segments were subject to recordation meeting minimum California Office of Historic Preservation (OHP) Standards, using a Trimble GPS device, photographs, and other appropriate documentation required for preparation of DPR 523 series forms. While these road segments do lend to the broader integrity of location, setting, feeling and association of the larger San Luis Gonzaga Rancho-Paula (Pacheco) Fatjo Ranch District (P-24-001856) and construction of the San Luis Dam, this contribution remains appropriately conveyed through ongoing use as access roads. Road segments associated with P-24-001822 and P-24-001856 have already been recommended as contributors to the District and, as such, have not been re-evaluated. P-24-001988 and P-24-002164 are not recommended to be eligible for listing in the California Register of Historical Resources (CRHR) under Criteria 1,2,3, or 4, or the National Register of Historic Properties (NRHP) under Criteria A, B, C, or D. Regardless of access road significance pursuant to CEQA or the National Historic Preservation Act (NHPA), these routes represent existing routes and continued Project utilization and improvement would not represent an impact. P-24-002143 consists of an electrical transmission tower adjacent to Los Banos Substation and has been previously evaluated as not CRHR/NRHP eligible. It is yet unclear if this tower would be directly impacted as a result of the project, however, affects would be less than significant given this eligibility status.

P-24-002154 (Basalt Hill Quarry), which began operation in 1963 in order to provide construction material for local dam construction, remains unevaluated for CRHR/NRHP listing. The quarry has not yet been revisited by Dudek; archaeological surveys of the proposed staging area within this boundaries of the quarry area are pending. Based on review of existing photographs and description of P-24-002154, there are a number of existing roads and gravel terraces within the quarry. These would not likely require modification or be impacted through use for staging activities. While P-24-002154 remains unevaluated for CRHR/NRHP listing, use for Project activities as a staging area would not represent an effect to this resource.

An additional site, P-24-000142, consisting of a prehistoric midden site recorded in 1966, was not relocated during survey and is likely mismapped. This resources has either been inundated by the San Luis Reservoir or is located elsewhere, outside of the New Transmission Line ROW boundaries. Similarly, historical-era road P-24-002164, is shown on historical USGS maps as within the waters of the reservoir where the New Transmission Line is proposed to cross, and would not be affected by the Project.

The Project would not have a significant effect to cultural resources (No Historic Properties Affected). Intensive-level survey completed to date did not identify any newly recorded archaeological sites. Additional survey is planned for newly added access roads, staging areas, and minor expansions to the Project site. Additional significant resources are unlikely to be identified in these areas and, if observed, would be avoided by Project design. While a NAHC Sacred Lands File search did identify Native American sacred sites in the vicinity of the Project Area’s proposed New Transmission Line routes, no specific, geographically-defined Native American resources were identified through CDPR consultation with NAHC-listed representatives. It should be noted, however, that Amah Mutsun tribal representatives did indicate the area to be sensitive and requested Native American monitoring. While the Project proposes new areas for work, notably along the New Transmission Line alignment, the majority of ground-disturbing activities within the Project Area would occur in areas already modified by existing wind facilities. In consideration of information gathered through inventory efforts, the Project is considered relatively unlikely to encounter unanticipated cultural resources. The Project site, having been substantially modified for the previous wind project, is of less potential to support cultural resources than less disturbed areas along the New Transmission Line. It is recommended that a cultural resources management and treatment plan be prepared. This shall identify areas for required archaeological monitoring, monitoring strategies, methods for treatment of unanticipated cultural resources and human remains, and reporting requirements. It is further recommended that Worker Environmental Awareness

Program (WEAP) materials include information to be provided to construction personnel prior to initiation of project construction.

1.0 INTRODUCTION

The proposed Gonzaga Ridge Wind Repowering Project represents the "Project" for purposes of the present cultural resources inventory. The Project is proposed by Gonzaga Ridge Wind Farm, LLC. The CDPR is the lead reviewing agency for compliance with CEQA. The "Project site", represented by the 1,630 acre lease area currently developed with energy generation elements on Park lands and a New Transmission Line corridor located primarily on Reclamation land, includes the wind farm turbine area, proposed facilities, construction and staging areas, existing and proposed access roads, New Transmission Line routes and associated 200 foot ROW, and other project components. The "New Transmission Line" describes the 1.4 mile of transmission line intersecting the Project site on Park land, as well as the 13 miles of transmission line extending east through Reclamation land to Los Banos Substation. Recent design refinements have added access roads, two staging areas, and small additional areas to the Project site. Cultural survey is pending for access roads along the New Transmission Line and one proposed staging area at the Basalt Hill Quarry. Given CRPR's primary reviewing role on this Project, the term "Project Area" is used, which should be understood to have the same meaning as "Area of Potential Effect" (APE) in federal regulatory conditions, to be represented by the limits of the area with potential to be subject to direct or indirect disturbance as a result of Project activities.

GRWF retained Dudek to complete a cultural resources Inventory of the Project site. The present report documents the results of a NAHC Sacred Lands File searches, the CCaIC records searches, and 100 percent intensive pedestrian survey of the Project site (1,630 acres) and New Transmission Line ROW (316 acres outside of the Project site). All cultural resource fieldwork and reporting for the Project has been conducted by qualified personnel meeting the Secretary of the Interior's Professional Qualifications Standards. Work was completed in compliance with State Parks Archaeological Investigations Permit issued August 13, 2018 (Tracking No. 18-36) and Reclamation-issued Permission to Conduct Non-Collection Cultural Resources Investigation (18-SCAO-065).

1.1 Project Location and Setting

This cultural resources inventory report documents the cultural resources inventory conducted by Dudek for the Project, located in western Merced County (County) (Figure 1 and Figure 2). The Project site lies in the Pacheco Pass CA, Mariposa Peak CA, and San Luis Dam CA USGS 7.5-minute quadrangles, which fall on PLSS Township 10S, Range 7E, Sections 13-16, 21-28, 31 and 36; Township 10S, Range 8E, Sections 23-28, 32 and 36; Township 10S, Range 9E, Section 19; and Township 11S, Range 8E, Sections 3-6, Mount Diablo Base and Meridian. The Project site is located on the west side of the Central Valley in the foothills of the California Coast Ranges.

The Project site is located in the oak woodland savanna habitats of foothills of the Diablo Range, adjacent to San Joaquin Valley of California, in western Merced County (County). It is bordering the southern half of San Luis Reservoir. The western portion of State Route (SR 152) provides access to Interstate 5 (I-5), which is approximately 1 mile east of the Project site. State Route 33 (SR 33), and the unincorporated community of Santa Nella is located 2 miles northeast of San Luis Reservoir. Other nearby cities are Los Banos, approximately 6 miles east, and Gilroy, 38 miles to the west. Adjacent ranches include a small number of both permanent residences and periodically used dwellings

1.2 Document Overview and Key Personnel

The present report is divided into six chapters. Following the present section, a more detailed Project description and regulatory context is provided. Chapter 2 is an overview of the environmental and cultural context for the Project site. This is followed by Chapter 3, a summary of background information, including the CCaIC records search results, NAHC Sacred Lands File search results, and a review of geomorphic conditions for buried resource potential. Chapter 4 consists of a description of methods and the results of fieldwork. Chapter 5 provides a review of impacts, assessment of archaeological significance, and recommendations. The report closes with a list of references; Appendix A, CCaIC Records search; Appendix B, NAHC Sacred Lands File Search; and, Appendix C, DPR forms for updated and newly recorded resources.

Archaeological field crew included Sarah Lewis, Michelle Wilcox, and Jessica DeAlba. Gene Romanski, MA, acted as Crew Chief, completing and directing survey work of the Project Area. William Burns, MSc, RPA, acting as Field Director, led portions of in-field survey efforts throughout the Project Area, completed the records searches, assisted with coordination of investigations, and drafted portions of the present report. Adam Giacinto, MA, RPA acted as principal investigator and finalized the present report.

1.3 Project Description

GRWF has a long term (maximum 35 year) lease of approximately 1,630 acres with the State of California for construction and operation of the energy generation element of the Project. The Project would replace the existing 18.4 megawatt (MW) wind energy facility that was constructed starting in 1988 and has been operating since that time. Additional lands, outside of the Project site, would be used to construct and operate a New Transmission Line to convey the electricity generated by the Project to the Los Banos Substation, located between the San Luis Reservoir and the O'Neill Forebay.

This section provides an overview of each of the Project facilities and their related activities. These include:

- Decommissioning, removal and recycling of the existing turbines and associated infrastructure;
- Up to 40 turbines erected on tubular steel towers set on concrete foundations, with associated turbine pads, laydown areas, and pad mounted transformers;
- A 34.5-kilovolt (kV) overhead and underground electrical collector system linking each turbine to the next and to the on-site collector substation;

- An overhead and underground communication system (fiber optic cabling);
- One new on-site substation;
- New Transmission Line - An overhead, approximately 16-mile 70 kV transmission line (including portions located outside of Park boundaries) for connecting the Project to the Los Banos substation. This New Transmission Line would have up to approximately 120-foot tall power poles. The specific number and location of the poles has not yet been determined.
- Upgrades to the Los Banos Substation;
- Access roads, consisting of existing and new roads;
- A temporary, approximately 15 acre construction and equipment laydown area, batch plant, construction trailer area, and associated parking area;
- Up to three temporary, 2-acre laydown areas distributed throughout the Project Site;
- A temporary, approximately 10 acre construction and equipment laydown and staging area for the New Transmission Line;
- An O&M facility including an operations building and outdoor storage area;
- Permanent and temporary meteorological (MET) towers and wind measurement equipment;
- Storage sheds;
- Staging area for turbine component deliveries.

GRWF plans to decommission (remove) the existing wind turbines prior to, or simultaneous with starting construction on the Project. When the facility is decommissioned, the turbine components would be removed from the site, below grade infrastructure (e.g., cables, pipes, conduit or equipment) buried within two feet of the surface would be removed; infrastructure greater than two feet below grade would remain on-site, the concrete foundations would be demolished down at least one foot below grade, and the remaining materials would be reused or recycled, to the greatest degree possible. The remaining materials that are not recyclable would be removed from the site to be disposed of at an approved facility.

1.4 Regulatory Context

The Project as currently planned is subject to state and local regulatory conditions. CDPR will work cooperatively with the Reclamation to oversee federal regulatory compliance, and will provide state and local regulatory compliance.

1.4.1 Federal Regulations

The National Register of Historic Places (NRHP) is the United States' official list of districts, sites, buildings, structures, and objects worthy of preservation. Overseen by the National Park Service (NPS), under the U.S. Department of the Interior, the NRHP was authorized under the NHPA, as amended. Its listings encompass all National Historic Landmarks, as well as historic areas administered by NPS.

NRHP guidelines for the evaluation of historic significance were developed to be flexible and to recognize the accomplishments of all who have made significant contributions to the nation's history and heritage. Its criteria are designed to guide state and local governments, federal agencies, and others in evaluating potential entries in the NRHP. For a property to be listed in or determined eligible for listing, it must be demonstrated to possess integrity and to meet at least one of the following criteria:

The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and:

A. That are associated with events that have made a significant contribution to the broad patterns of our history; or

B. That are associated with the lives of persons significant in our past; or

C. That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

D. That have yielded, or may be likely to yield, information important in prehistory or history.

Integrity is defined in NRHP guidance, *How to Apply the National Register Criteria,* as "the ability of a property to convey its significance. To be listed in the NRHP, a property must not only be shown to be significant under the NRHP criteria, but it also must have integrity" (NPS 1990). NRHP guidance further asserts that properties be completed at least 50 years ago to be considered for eligibility. Properties completed fewer than 50 years before evaluation must be proven to be "exceptionally important" (criteria consideration G) to be considered for listing.

A historic property is defined as "any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the NRHP maintained by the Secretary of the Interior. This term includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the NRHP criteria" (36 CFR Sections 800.16(i)(1)).

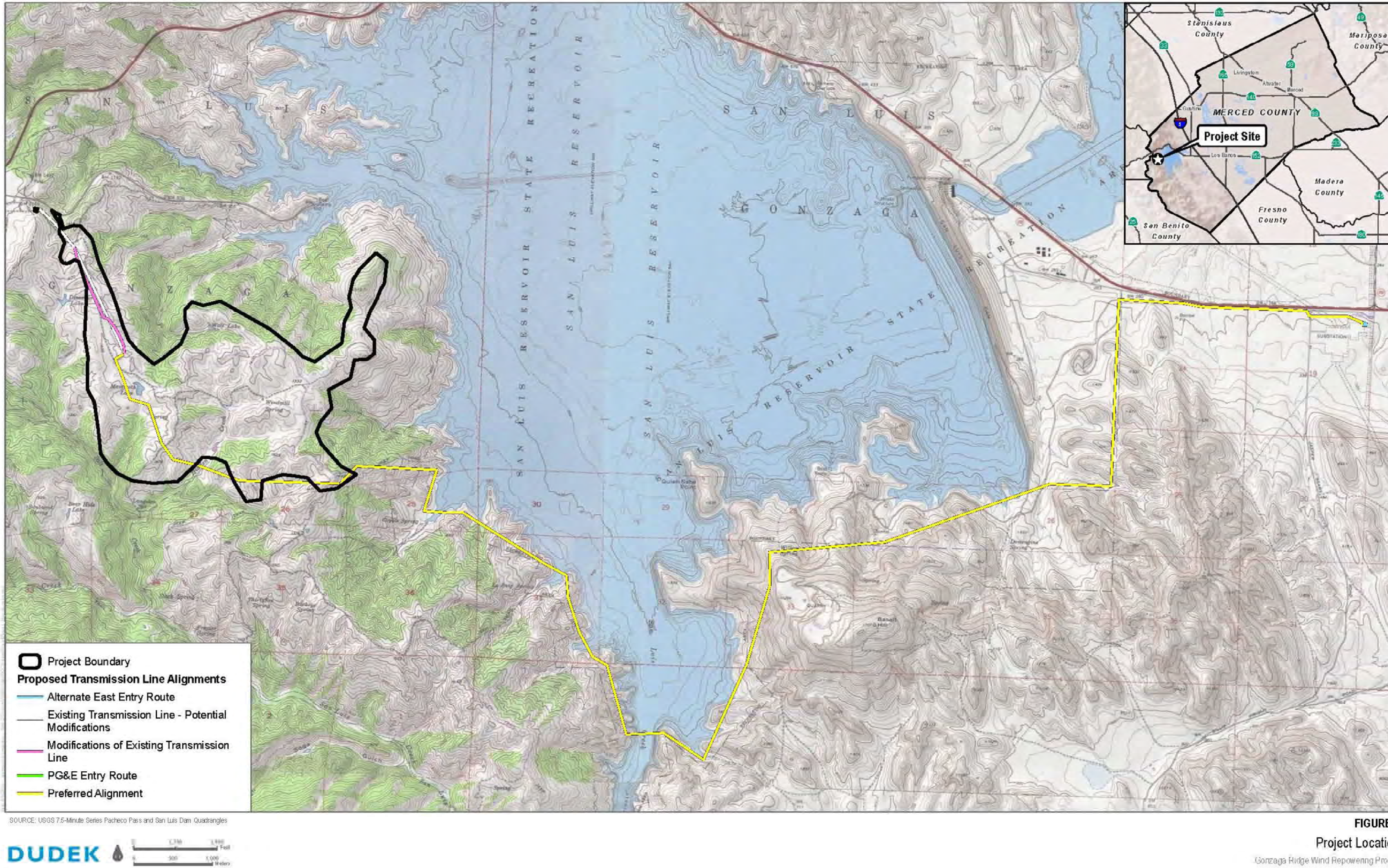

FIGURE 1

Project Location

Gonzaga Ridge Wind Repowering Project

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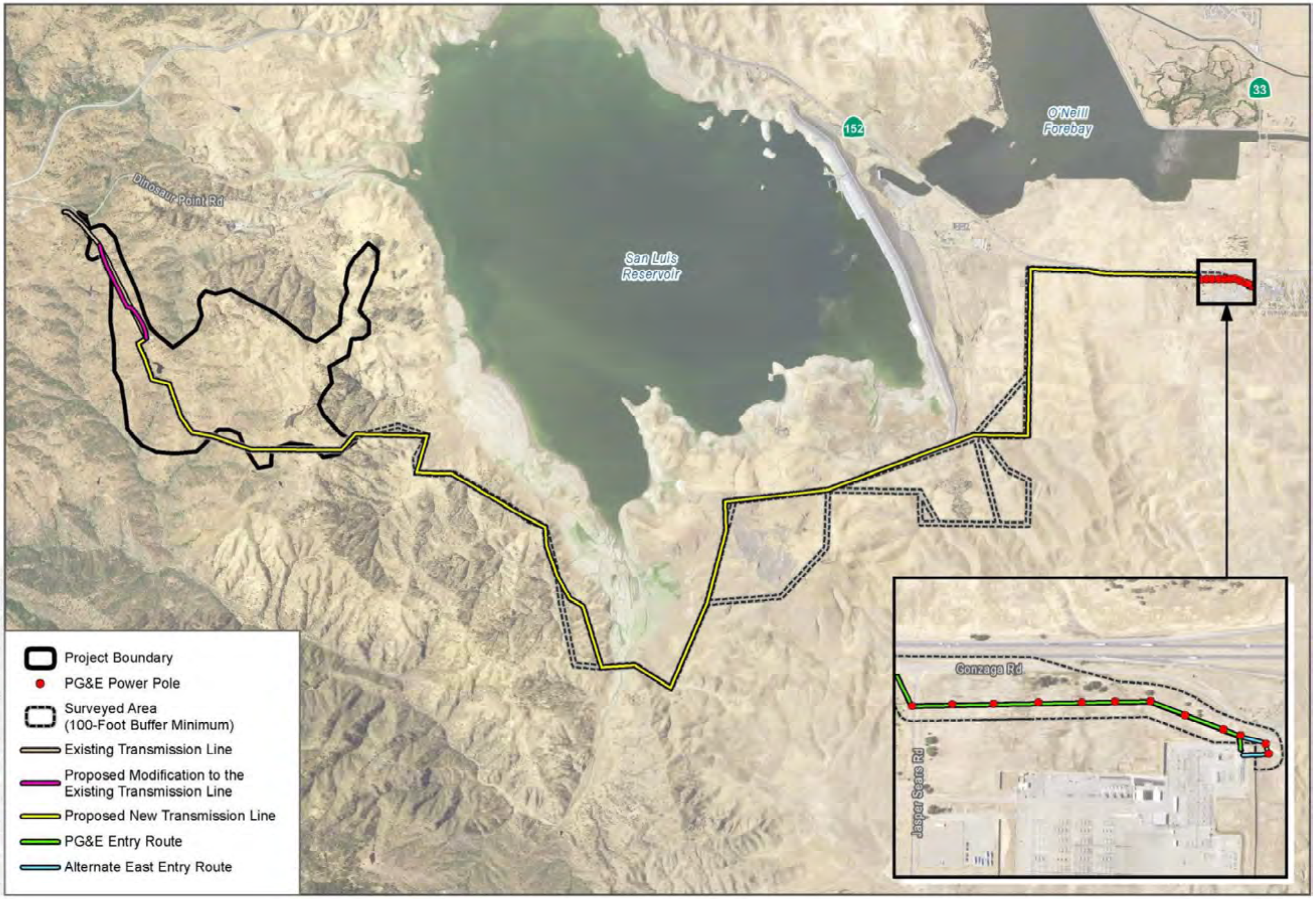

SOURCE: USDA 2016

DUDEK

0 3,000 6,000 Feet

0 900 1,800 Meters

FIGURE 2

Project Aerial

Gonzaga Ridge Wind Repowering Project

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Effects on historic properties under Section 106 of the NHPA are defined in the assessment of adverse effects in 36 CFR Sections 800.5(a)(1):

An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Consideration shall be given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property's eligibility for the National Register. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance or be cumulative.

Adverse effects on historic properties are clearly defined and include, but are not limited to:

(i) Physical destruction of or damage to all or part of the property;

(ii) Alteration of a property, including restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation and provision of handicapped access, that is not consistent with the Secretary's Standards for the Treatment of Historic Properties (36 CFR Part 68) and applicable guidelines;

(iii) Removal of the property from its historic location;

(iv) Change of the character of the property's use or of physical features within the property's setting that contributes to its historic significance;

(v) Introduction of visual, atmospheric or audible elements that diminish the integrity of the property's significant historic features;

(vi) Neglect of a property which causes its deterioration, except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance to an Indian tribe or Native Hawaiian organization; and

(vii) Transfer, lease, or sale of property out of Federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance (36 CFR 800.5 (2)).

To comply with Section 106, the criteria of adverse effect are applied to historic properties, if any exist in the Project Area of Potential Effect (APE), pursuant to 36 CFR Sections 800.5(a)(1). If no historic properties are identified in the APE, a finding of "no historic properties affected" will be made for the proposed Project. If there are historic properties in the APE, application of the criteria of adverse effect will result in Project-related findings of either "no adverse effect" or of "adverse effect," as described above. A finding of no adverse effect may be appropriate when the undertaking's effects do not meet the thresholds in criteria of adverse effect 36 CFR Sections 800.5(a)(1), in certain cases when the undertaking is modified to avoid or lessen effects, or if conditions were imposed to ensure review of rehabilitation plans for conformance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties* (codified in 36 CFR Part 68).

If adverse effects findings were expected to result from the proposed Project, mitigation would be required, as feasible, and resolution of those adverse effects by consultation may occur to avoid, minimize, or mitigate adverse effects on historic properties pursuant to 36 CFR Part 800.6(a).

1.4.2 State of California

California Register of Historical Resources

In California, the term "historical resource" includes "any object, building, structure, site, area, place, record, or manuscript which is historically or archaeologically significant, or is significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California" (California Public Resources Code, Section 5020.1[j]). In 1992, the California legislature established the California Register of Historical Resources (CRHR) "to be used by state and local agencies, private groups, and citizens to identify the state's historical resources and to indicate what properties are to be protected, to the extent prudent and feasible, from substantial adverse change" (California Public Resources Code, Section 5024.1(a)). The criteria for listing resources on the CRHR, enumerated in the following text, were developed to be in accordance with previously established criteria developed for listing in the NRHP. According to California Public Resources Code, Section 5024.1(c)(1–4), a resource is considered historically significant if it (i) retains "substantial integrity," and (ii) meets at least one of the following criteria:

1. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage

2. Is associated with the lives of persons important in our past

3. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values

4. Has yielded, or may be likely to yield, information important in prehistory or history

To understand the historic importance of a resource, sufficient time must have passed to obtain a scholarly perspective on the events or individuals associated with the resource. A resource less than 50 years old may be considered for listing in the CRHR if it can be demonstrated that sufficient time has passed to understand its historical importance (14 CCR 4852[d][2]).

The CRHR protects cultural resources by requiring evaluations of the significance of prehistoric and historic resources. The criteria for the CRHR are nearly identical to those for the NRHP, and properties listed or formally designated as eligible for listing in the NRHP are automatically listed in the CRHR, as are state landmarks and points of interest. The CRHR also includes properties designated under local ordinances or identified through local historical resource surveys.

California Environmental Quality Act

As described in the following text, the following CEQA statutes and CEQA Guidelines are of relevance to the analysis of archaeological, historic, and tribal cultural resources:

- California Public Resources Code, Section 21083.2(g), defines “unique archaeological resource.”
- California Public Resources Code, Section 21084.1, and CEQA Guidelines, Section 15064.5(a), define “historical resources.” In addition, CEQA Guidelines, Section 15064.5(b), defines the phrase “substantial adverse change in the significance of an historical resource.” It also defines the circumstances when a project would materially impair the significance of a historical resource.
- California Public Resources Code, Section 21074(a), defines “tribal cultural resources.”
- California Public Resources Code, Section 5097.98, and CEQA Guidelines, Section 15064.5(e), set forth standards and steps to be employed following the accidental discovery of human remains in any location other than a dedicated ceremony. The NAHC is to resolve disputes regarding the disposition of such remains. In addition, the Native American Historic Resource Protection Act makes it a misdemeanor, punishable by up to 1 year in jail, to deface or destroy a Native American historic or cultural site that is listed or may be eligible for listing in the CRHR.

California Health and Safety Code, Section 7050.5

California law protects Native American burials, skeletal remains, and associated grave goods, regardless of their antiquity, and provides for the sensitive treatment and disposition of those remains. California Health and Safety Code, Section 7050.5, requires that if human remains are discovered in any place other than a dedicated cemetery, no further disturbance or excavation of the site or nearby area reasonably suspected to contain human remains can occur until the County Coroner has examined the remains (California Health and Safety Code, Section 7050.5b). California Public Resources Code, Section 5097.98, also outlines the process to be followed in the event that remains are discovered. If the County Coroner determines or has reason to believe the remains are those of a Native American, the County Coroner must contact the California NAHC within 24 hours (California Health and Safety Code, Section 7050.5c). The NAHC will notify the most likely descendant. With the permission of the landowner, the most likely descendant may inspect the site of discovery. The inspection must be completed within 48 hours of notification of the most likely descendant by the NAHC. The most likely descendant may recommend means of treating or disposing of, with appropriate dignity, the human remains and items associated with Native Americans. California Public Resources Code, Sections 21083.2(b–c), and CEQA Guidelines, Section 15126.4, provide information regarding the mitigation framework for archaeological and historic resources, including examples of preservation-in-place mitigation measures. Preservation-in-place is the preferred manner of mitigating impacts to significant archaeological sites because it maintains the relationship between artifacts and the archaeological context and may also help avoid conflict with religious or cultural values of groups associated with the archaeological sites.

Under CEQA, a project may have a significant effect on the environment if it may cause “a substantial adverse change in the significance of an historical resource” (California Public Resources Code, Section 21084.1; 14 CCR 15064.5[b]). If a site is either listed or eligible for listing in the CRHR, included in a local register of historic resources, or identified as significant in a historical resources survey (meeting the requirements of California Public Resources Code, Section 5024.1[q]), it is a “historical resource” and is presumed to be historically or culturally significant for purposes of CEQA (California Public Resources Code, Section 21084.1; 14 CCR 15064.5[a]). The lead agency is not precluded from determining that a resource is a historical resource, even if it does not fall within this presumption (California Public Resources Code, Section 21084.1; 14 CCR 15064.5[a]).

A “substantial adverse change in the significance of an historical resource” reflecting a significant effect under CEQA means “physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired” (14 CCR 15064.5[b][1]; California Public Resources Code Section 5020.1[q]). In turn, the significance of a historical resource is materially impaired when a project does any of the following:

1. Demolishes or materially alters in an adverse manner those physical characteristics of an historical resource that convey its historical significance and that justify its inclusion in, or eligibility for, inclusion in the California Register; or

2. Demolishes or materially alters in an adverse manner those physical characteristics that account for its inclusion in a local register of historical resources pursuant to Section 5020.1(k) of the California Public Resources Code or its identification in an historical resources survey meeting the requirements of Section 5024.1(g) of the California Public Resources Code, unless the public agency reviewing the effects of the project establishes by a preponderance of evidence that the resource is not historically or culturally significant; or

3. Demolishes or materially alters in an adverse manner those physical characteristics of a historical resource that convey its historical significance and that justify its eligibility for inclusion in the California Register as determined by a lead agency for purposes of CEQA. (14 CCR 15064.5[b][2])

Pursuant to these sections, the CEQA inquiry begins with evaluating whether a project site contains any “historical resources,” then whether that project will cause a substantial adverse change in the significance of a historical resource such that the resource’s historical significance is materially impaired.

If it can be demonstrated that a project will cause damage to a unique archaeological resource, the lead agency may require reasonable efforts be made to permit any or all of these resources to be preserved in place or left in an undisturbed state. To the extent that they cannot be left undisturbed, mitigation measures are required (California Public Resources Code, Section 21083.2[a], [b], and [c]).

California Public Resources Code, Section 21083.2(g), defines a unique archaeological resource as an archaeological artifact, object, or site about which it can be clearly demonstrated that without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

1. Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information
2. Has a special and particular quality such as being the oldest of its type or the best available example of its type
3. Is directly associated with a scientifically recognized important prehistoric or historic event or person

Impacts to nonunique archaeological resources are generally not considered a significant environmental impact (California Public Resources Code, Section 21083.2(a); 14 CCR 15064.5[c][4]). However, if a nonunique archaeological resource qualifies as tribal cultural resource (California Public Resources Code, Sections 21074[c], 21083.2(h)), further consideration of significant impacts is required.

CEQA Guidelines, Section 15064.5, assigns special importance to human remains and specifies procedures to be used when Native American remains are discovered (14 CCR 15064.5). As described in the following text, these procedures are detailed in California Public Resources Code, Section 5097.98.

California State Assembly Bill 52

Assembly Bill (AB) 52 of 2014 amended California Public Resources Code, Section 5097.94, and added California Public Resources Code, Sections 21073, 21074, 21080.3.1, 21080.3.2, 21082.3, 21083.09, 21084.2, and 21084.3. AB 52 established that tribal cultural resources must be considered under CEQA and also provided for additional Native American consultation requirements for the lead agency. California Public Resources Code, Section 21074, defines tribal cultural resources as follows:

(a) “Tribal cultural resources” are either of the following:

(1) Sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe that are either of the following:

(A) Included or determined to be eligible for inclusion in the California Register of Historical Resources.

(B) Included in a local register of historical resources as defined in subdivision (k) of Section 5020.1.

(2) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Section 5024.1. In applying the criteria set forth in subdivision (c) of Section 5024.1 for the purposes of this paragraph, the lead agency shall consider the significance of the resource to a California Native American tribe.

(b) A cultural landscape that meets the criteria of subdivision (a) is a tribal cultural resource to the extent that the landscape is geographically defined in terms of the size and scope of the landscape.

(c) A historical resource described in Section 21084.1, a unique archaeological resource as defined in subdivision (g) of Section 21083.2, or a "nonunique archaeological resource" as defined in subdivision (h) of Section 21083.2 may also be a tribal cultural resource if it conforms with the criteria of subdivision (a).

AB 52 formalizes the lead agency–tribal consultation process, requiring the lead agency to initiate consultation with California Native American tribes located on the contact list maintained by the Native American Heritage Commission. This includes California Native American groups that are traditionally and culturally affiliated with the Project, including tribes that may not be federally recognized. Lead agencies are required to begin consultation prior to the release of a negative declaration, mitigated negative declaration, or environmental impact report (EIR).

Section 9 of AB 52 establishes that "a project with an effect that may cause a substantial adverse change in the significance of a tribal cultural resource is a project that may have a significant effect on the environment." Section 6 of AB 52 added Section 21080.3.2 to the California Public Resources Code, which states that parties may propose mitigation measures "capable of avoiding or substantially lessening potential significant impacts to a tribal cultural resource or alternatives that would avoid significant impacts to a tribal cultural resource." Further, if a California Native American tribe requests consultation regarding Project alternatives, mitigation measures, or significant effects to tribal cultural resources, the consultation shall include those topics (California Public Resources Code Section 21080.3.2[a]). The environmental document and the mitigation monitoring and reporting program (where applicable) shall include any mitigation measures that are adopted (California Public Resources Code Section 21082.3[a]).

Native American Human Remains

State law (California Public Resources Code, Section 5097 et seq.) addresses the disposition of Native American burials in archaeological sites and protects such remains from disturbance, vandalism, or inadvertent destruction; establishes procedures to be implemented if Native American skeletal remains are discovered during construction of a project; and established the NAHC.

In the event that Native American human remains or related cultural material are encountered, Section 15064.5(e) of the CEQA Guidelines (as incorporated from California Public Resources Code, Section 5097.98) and California Health and Safety Code, Section 7050.5, define the subsequent protocol. In the event of the accidental discovery or recognition of any human remains, excavation or other disturbances shall be suspended on the site or any nearby area reasonably suspected to overlie adjacent human remains or related material. Protocol requires that the County Coroner or County-approved Coroner represented be contacted in order to determine if the remains are of Native American origin. Should the coroner determine the remains to be Native American, the coroner must contact the NAHC within 24 hours. The most likely descendant may make recommendations to the landowner or the person responsible for the excavation work for means of treating, with appropriate dignity, the human remains and any associated grave goods as provided in California Public Resources Code, Section 5097.98 (14 CCR 15064.5(e)).

1.4.3 Local Regulations

The *Merced Vision 2030 General Plan* (Merced County 2013) was adopted in 2013 (amended in 2016) as a blueprint for growth and development in Merced County. This plan recognizes the rich archaeological and historic past of Merced County and understands that certain measures must be stated to ensure protection of these resources. This County General Plan applies California Public Resources Code Section 21083.2 and CEQA Section 15123.4(b) Guidelines for resource significance and cultural resources management in the County and proposes the following goal (Merced County 2013).

Goal RCR-2 Protect and preserve the cultural, archaeological, and historic resources of the County in order to maintain its unique character.

Pursuant of this goal, the *Merced Vision 2030 General Plan* provides the following policies aimed at preserving and protecting cultural resources (Merced County 2013):

Policy RCR-2.1 **Archaeological Site and Artifact Protection:** Require development projects that affect archaeological sites and artifacts to avoid disturbance or damage to these sites.

Policy RCR-2.2 **Historical Area Preservation:** Support the preservation of historical structures and areas, particularly those listed on the National Registrar of Historic Places and California Registrar of Historic Places.

Policy RCR-2.3 **Architectural Character Preservation:** Require that the original architectural character of significant State- and Federally-listed historic structures be maintained in compliance with preservation standards and regulations.

Policy RCR-2.4 **Parks and Open Space Historic Resource Preservation:** Require the preservation of historic resources located in parks and publicly-owned open space areas.

Policy RCR-2.5 **Human Remains Discovery:** Require that, in the event of the discovery of human remains on any project construction site, all work in the vicinity of the find will cease and the County Coroner and Native American Heritage Commission will be notified.

Policy RCR-2.6 **Historic Buildings and Areas:** Identify buildings and areas with special and recognized historic, architectural, or aesthetic value to be preserved and rehabilitated during the Community Plan update process. New development should respect architecturally and historically significant buildings and areas, and conform to the current Secretary of the Interior's Standards for the Treatment of Historic Properties and Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings, and incorporate adaptive reuse practices, where feasible, to preserve the County's historical heritage and rural character.

Policy RCR-2.7	**Historic Preservation:** Support the efforts of local preservation groups and community property owners to preserve or improve building facades and exteriors consistent with the historic and visual character of the specific building or area.
Policy RCR-2.8	**Historical Preservation Area/Site Designations:** Allow sites of historical and archaeological significance to be designated as historical preservation areas or sites during the Community Planning process or on individual sites in rural areas.
Policy RCR-2.9	**Historical and Cultural Resources Investigation, Assessment, and Mitigation Guidelines:** Establish and adopt mandatory guidelines for use during the environmental review processes for private and public projects to identify and protect historical, cultural, archaeological, and paleontological resources, and unique geological features.
Policy RCR-2.10	**Tribal Consultation:** Consult with Native American tribes regarding proposed development projects and land use policy changes consistent with Planning and Zoning Law at Government Code Section 65351, and the OPR Tribal Consultation Guidelines (2005).

2.0 PROJECT CONTEXT

2.1 Environmental Context

Average annual temperatures in the area range between 32 and 102 degrees Fahrenheit. The region is characterized by hot dry summers and wet winters with annual average precipitation of 6 to 10 inches, though may reach 20 inches in wetter years (Johnson, Dawson, and Haslam 1993, Munz 1970).

The land within this area has been farmed and grazed repeatedly, changing the character of the local vegetation. It is in an area that would be characterized naturally as Valley Grassland. The natural vegetation in the area would be bunch grasses such as needlegrass (*Stipa pulchra), S. cernua,* bluegrass *(Poa scabrella),* and poverty threeawn *(Aristida divaricate)*. Grazing and farming have replaced these species with annual species of *Bromus, Festuca,* and *Avena* (Munz 1970).

While the natural landscape of San Joaquin Valley has been modified drastically, native common mammals would have included mule deer (*Odocoileus* sp.), pronghorn (*Antilocapra* sp.), kit fox (*Vulpes macrotis)*, gray fox (*Urocyon cinereoargenteus*), mountain lion (*Puma concolor*) squirrel (*Sciurus* sp.), striped skunk (*Mephitis mephitis*), cottontail rabbit (*Sylvilagus* sp.), black-tailed jackrabbit (*Lepus californicus*), raccoon (*Procyon lotor*), among others. Birds include red-tailed hawk (*Buteo jamaicensis*), white tailed kite (*Elanus leucurus*), American Kestrel (*Falco sparverius),* burrowing owls (*Athene cunicularia)* California quail (*Callipepla californica*), wild turkey (*Meleagris gallopavo*), woodpecker (*Melanerpes*), owl (*Megascops*), turkey vulture (*Cathartes aura*), warbler, and others. Additional animals include a variety of reptiles and amphibians, as well as insects (Schoenherr 1992).

2.2 Cultural Context

2.2.1 Prehistoric Context

The archaeology and prehistory of the San Joaquin Valley are not well understood. In addition, much of the archaeological material from the valley area has not been found in context, having been scavenged from the surface and placed in private collections. Early and widespread agricultural use of the valley floor has destroyed much of the bottomland archaeology, and siltation has most likely buried many resources well below the surface sediments. On the valley floor, in the Tulare Lake vicinity, fluted projectile points were found at the Witt Site (Fenenga 1993; Riddell and Olsen 1969), suggesting possible Clovis occupation in the region earlier than 11,000 years ago, during the Pleistocene. Other evidence for Early Holocene occupation around valley lakes has been recovered from Buena Vista Lake (Fredrickson and Grossman 1977; Sutton 1997).

More than two decades ago, a general chronological framework was provided by Moratto (1984) that encompasses the southern San Joaquin Valley as well as the central and southern Sierra Nevada foothills. Since then, numerous additional studies have provided data to supplement and refine this framework (see below for examples). Building on this previous research, the following chronology contains four general time frames with associated periods, dates, and marker traits: Paleoindian (Paleoindian Period), Early Archaic (Early Period), Middle Archaic (Middle Period), and Late Archaic (Late Period). A description of each of these periods is presented below.

Paleoindian Period (ca. 12,000 to 9000 BP)

There is ample evidence of human habitation in the southern San Joaquin Valley dating to approximately 12,000 years ago, although this does not appear to be true in the central and southern Sierra Nevada. While few sites of Paleoindian age have been identified in the San Joaquin Valley, occupation is known to date to at least 11,000 years ago (e.g., Fenenga 1993; Fredrickson and Grossman 1977; Riddell and Olsen 1969; Siefkin 1999; Wallace 1991; Wallace and Riddell 1988). Most of the evidence for a Paleoindian presence in the valley has been limited to surface finds of fluted projectile points (see below), that are typically regarded by North American archaeologists as late Pleistocene early Holocene time markers.

As noted above, the evidence for a Paleoindian occupation in the San Joaquin Valley has been in the form of numerous fluted, concave base (Clovis or “Clovis-like”) projectile points, along with other artifacts presumed to be Paleoindian in age (e.g., “humpies” and crescents; see Fredrickson and Grossman 1977; Sampson 1991). Such artifacts have been collected from surface contexts in several locations, most notably from the southern shoreline of Tulare Lake southeast of Mendota. Unfortunately, most of these discoveries have been made by amateur collectors, many of whom were collecting illegally, so virtually no provenance has been provided for these artifacts. This has resulted in an enormous and irretrievable loss of data for understanding the Paleoindian Period in this region.

One of the most significant Paleoindian locations in this region is the Witt Site (CA-KIN-32) on the southwest shore of Tulare Lake, which contained fluted projectile points, scrapers, crescents, and Lake Mojave series points (Moratto 1984:81-82). The Witt Site, at an elevation of 192 feet, signifies a “major lake level for a considerable span of time” (Riddell and Olsen 1969:121). Subsequent archaeological investigations conducted by Fenenga (1993) in the early 1990s near the Witt Site resulted in the recovery of additional fluted projectile points, as well as later types, indicating sustained occupation of the Tulare Lake Basin dating from the Paleoindian Period to contact (also see Gardner et al. 1995; Jennings et al. 1994; Manifold et al. 1995; Tidmore et al. 1994), with the possible exception of a postulated hiatus during the Late Period (see below).

Early Period (ca. 9000 to 6000 BP)

Evidence for the Early Period in the San Joaquin Valley and the southern and central western slopes of the Sierra Nevada is meager. During this period, however, it is believed that human subsistence was based largely on the hunting of large game and fishing (Sutton 1997:12). Grinding implements, such as mortars, pestles, millingstones, and handstones, appear infrequently during this time in the archaeological record. Other types of artifacts in these assemblages include hand-molded baked clay net weights, Olivella and Haliotis shell beads and ornaments, charmstones, and stemmed projectile points. Bone artifacts are uncommon. Burials are typically fully extended, oriented to the west, and generally have associated artifacts (e.g., quartz crystals). Cremations are rare (Moratto 1984:181–182; Sutton 1997:12).

Two sites that are important for a better understanding of the Early Period on the western slopes of the Sierra Nevada are Skyrocket (CAL-629/930; Bieling et al. 1996; La Jeunesse and Pryor 1998) and Clarks Flat (CAL-342; Milliken et al. 1997; Peak and Crew 1990). The Skyrocket site contained eight components spanning the time between 9400 and 7000 BP, as evidenced by the radiocarbon dates and artifact assemblage (e.g., fluted, stemmed, and Pinto points). La Jeunesse et al. (2004) viewed the Skyrocket site as transitional from Paleoindian to Archaic times, and interestingly, contained some of the earliest evidence of mortar and pestle use in California. The Clarks Flat site produced the earliest radiocarbon date of the two sites at 9,570 ± 150 radiocarbon years before present (RCYBP; Milliken et al. 1997:22) and also contained stemmed points. Despite the evidence from these two sites, however, Delacorte (2001:14) observed that "both the structure and age of early Holocene occupation in the Sierra Nevada and adjacent portions of California have yet to be well defined."

Middle Period (ca. 6000 to 3000 BP)

After about 6,000 years ago, the climate became generally warmer, and there appears to have been fairly substantial use of upland and foothill environments in the central Sierra Nevada during the Middle Period. This time period is characterized by a more generalized subsistence pattern (Moratto 1984:183; Sutton 1997:12). While hunting, fowling, and fishing continue to be the focus of subsistence activities, an increased emphasis on seed processing (particularly acorns) is evident. Artifacts include Olivella and Haliotis beads and other ornaments, distinctive spindle-shaped charmstones, cobble mortars, chisel-ended pestles, and large projectile points (inferring use of the atlatl) (Moratto 1984:183; Sutton 1997:12). Bone tools, such as awls, fish spear tips, saws, and flakers may be evidence of generalized subsistence, but preservation bias (i.e., the lack of these perishable tools in earlier components) may have affected the archaeological record. Burials are tightly flexed and have few associated artifacts. At the same time, there is a slight increase in the number of cremations. Evidence of violent death appears in the burial assemblage, as indicated by disarticulated skeletons with embedded weapon points (Moratto 1984:183).

Wedel's (1941) excavations at Buena Vista Lake, considerably southeast of Mendota, represent the most comprehensive cultural studies in the southern San Joaquin Valley; Middle Period assemblages are the most significant components at the various sites he investigated. Interestingly, many of the artifacts are comparable to those found in the Delta and Santa Barbara Channel regions (Siefkin 1999:56; Wedel 1941:147–151), suggesting possible widespread interaction spheres. It is interesting to note that a human finger bone from KIN-80 on the southwestern shore of Tulare Lake was radiocarbon dated to 4,360 ± 70 RCYBP, representing the only radiocarbon date on human bone in the Tulare Lake Basin and providing additional direct evidence for occupation in the San Joaquin Valley during the Early Period (Gardner et al. 2005).

Late Period (ca. 3000 to 150 BP)

The Late Period has been postulated to represent the occupation of the ethnographic Yokuts (e.g., Kroeber 1925; Gayton 1948; Latta 1977; Spier 1978a, 1978b; Wallace 1978), although this presumption is based on assemblage composition and must be conditioned by the recognition that artifacts cannot be equated with culture. This is especially true since it is increasingly understood that the high diversity of identified tribes in California may have been a relatively late phenomenon associated with the development of an individualized currency economy (Bettinger 2015).

The Late Period is divided into four phases with associated marker traits: (1) the Early Late Period (3000 to 1500 BP, intensification of acorns, large corner-notched points (Elko series); (2) Late Period Phase 1 (1500 to 700 BP), introduction of bow and arrow, Rose Spring series arrow points, acorn-based economies, extensive trade; (3) Late Period Phase 2 (700 to 300 BP), large middens, Desert series arrow points (Desert Side-notched and Cottonwood types); and (4) Late Period Phase 3 (300 to 150 BP), ethnographic groups, historic trade goods.

During the Late Period in general, subsistence began to focus on the processing of acorns and other costly to process plant foods, with a proportionate decrease in the contribution of hunting, fowling, and fishing (Moratto 1984:183; Sutton 1997:12). Typical artifacts of this period include Olivella beads, Haliotis ornaments, stone beads and cylinders, clamshell disk beads, tubular smoking pipes of schist and steatite, arrow shaft straighteners, flat-bottomed mortars, cylindrical pestles, and small side-notched projectile points for use with the bow and arrow. Burials are often in flexed positions and cremation is more common than during the Middle Period (Moratto 1984:183).

The Late Period is the best represented time period in the San Joaquin Valley. In the adjacent Buena Vista Lake Basin, however, there appears to be a brief hiatus at approximately 2,000 BP, after which time there appears to have been greater activity around lakeshore sites (Hartzell 1992:304–305). Subsequent deteriorating environmental conditions may have resulted in diminished occupation (Hartzell 1992:312; also see Sutton 1997; but for alternative views, see Fenenga [1992] and Siefkin [1999]).

2.2.2 Ethnohistoric (post-AD 1750)

The history of Native American communities prior to the mid-1700s has largely been reconstructed through later mission-period and early ethnographic accounts. The first records of the Native American inhabitants of the region come predominantly from European merchants, missionaries, military personnel, and explorers. These brief, and generally peripheral, accounts were prepared with the intent of furthering respective colonial and economic aims and were combined with observations of the landscape. They were not intended to be unbiased accounts regarding the cultural structures and community practices of the newly encountered cultural groups. The establishment of the missions in the region brought more extensive documentation of Native American communities, though these groups did not become the focus of formal and in-depth ethnographic study until the early twentieth century. The principal intent of these researchers was to record the pre-contact, culturally specific practices, ideologies, and languages that had survived the destabilizing effects of missionization and colonialism. This research, often understood as "salvage ethnography," was driven by the understanding that traditional knowledge was being lost due to the impacts of modernization and cultural assimilation. Alfred Kroeber applied his "memory culture" approach (Lightfoot 2005: 32) by recording languages and oral histories within the region.

Based on ethnographic information, it is believed that at least 88 different languages were spoken from Baja California Sur to the southern Oregon state border at the time of Spanish contact (Johnson and Lorenz 2006). The distribution of recorded Native American languages has been dispersed as a geographic mosaic across California through six primary language families (Golla 2007).

Victor Golla has contended that one can interpret the amount of variability within specific language groups as being associated with the relative "time depth" of the speaking populations (Golla 2007). A large amount of variation within the language of a group represents a greater time depth then a group's language with less internal diversity. One method that he has employed is by drawing comparisons with historically documented changes in Germanic and Romantic language groups. Golla has observed that the "absolute chronology of the internal diversification within a language family" can be correlated with archaeological dates (2007). This type of interpretation is modeled on concepts of genetic drift and gene flows that are associated with migration and population isolation in the biological sciences.

The Project site falls on the boundary between Northern Valley Yokuts and Costanoan (Ohlone) populations documented during the ethnohistoric period. Costanoan and Yokuts are subgroups of the Penutian linguistic group spoken by populations that moved south from Oregon, displacing Hokan speaking groups (Golla 2011). Miwok, Yokuts, and Costanoan represent three subfamilies of this initial Penutian linguistic flow; of which Costanoan and Miwok are a distinct sub-branch ("Utian") from Yokuts (Golla 2007). Golla has interpreted the split between Miwok and Costanoan populations based on archaeological evidence and the amount of internal diversity within these language-speaking communities to reflect a time depth of approximately 4,500-4,000 years (Golla 2007). This is considered consistent with the archaeologically documented emergence of the Early Middle Horizon Windmiller Pattern (Moratto 1984) within the Bay Area, which generally dates 4,500 to 2,500 BP. This information suggests a migration of Utian populations from the Sacramento–San Joaquin River Delta (Delta) region occurred during this period, displacing Hokan speaking populations. The Yokuts time depth is more difficult to reconstruct, the level of internal variation between San Joaquin Valley speaking groups indicating that it formed as a shared language within the last 1,500 years. This suggests that speaking communities representing the pre-curser to Yokuts came from elsewhere, most likely further north in the Central Valley or the Great Basin (Golla 2007; Golla 2011).

Northern Valley Yokuts

Ethnohistoric inhabitants of the area now representing the Project site would have likely spoken *Noptinte*, a dialect of Northern Valley Yokuts that has been documented by records held at Mission San Juan Bautista to have been used by neophytes from the Los Banos area (Golla 2011). The Northern Valley Yokuts group inhabited the lower San Joaquin River watershed and its tributaries extending from Calaveras River in the north to approximately the large bend of the San Joaquin River eastward near Mendota. The lower San Joaquin River meanders through the territory making bends, sloughs, and marshes full of tule reeds as it meanders. Farther from the rivers and marshes, the valley floor would have been dry and sparely vegetated (Wallace 1978, Kroeber 1925).

Northern Valley Yokuts habitation areas were most commonly situated in proximity to rivers and major tributaries, more often on the east side of the river (Kroeber 1925). West of the river populations were much sparser and concentrated in the foothills on minor waterways. This focus on waterways can also be seen in their dietary resources which included various fish, waterfowl, antelope, elk, acorns, tule roots, and various seeds. The focus on fishing is seen in the material culture consisting of net sinkers and harpoons, likely used from rafts constructed from tule reed bundles (Wallace 1978).

Traditional villages were perched on top of low mounds on or near riverbanks. Northern Valley Yokuts dwellings were constructed of tule reed woven mats places over a pole frame oval or round structure. They were usually 25 to 40 feet in diameter and would belong to a single family (Wallace 1978). This is in contrast to the larger multi-family dwellings erected sometimes by the Southern Yokuts. In addition to dwellings, earth covered ceremonial sweat lodges were constructed. There was a high level of sedentism due to abundant riverine resources, though there were times of seasonal disbandment for harvesting wild plant resources such as acorns and seeds (Gayton 1948; Kroeber 1925).

The Northern Valley Yokuts saw sharp and devastating decline from disease and relocation to coastal missions nearly immediately after Spanish contact (Osbourne 1992). This only increased with the large influx of cattle ranching and Anglos Americans after the gold rush (Osbourne 1992, Cook 1976).

Costanoan (Ohlone)

The Ethnohistoric inhabitants immediately west of the Project area spoke a variety of Costanoan (Golla 2011). As an alternative to the term ”Costanoan”, which was popularized though use by Kroeber (1925), other researchers such as Merriam use “Ohlone” because it was the self-identifying term used by inhabitants of the region during interviews. Throughout this section “Costanoan” is used to reference the language community, while “Ohlone” is used to describe the people.

Due the effects of missionization, relatively little is known about the Ohlone ethnographically. The material culture of these people has largely been reconstructed from the archaeological record. Ohlone communities were generally organized into autonomous tribelets, with one or more permanent habitation areas near the coast or major drainages and a limited number of more peripheral semi-permanent villages situated near other important resources. As previously noted, these groups spoke different dialects of a broader mutually intelligible language. The population within each tribelet generally numbered 200 to 400 people, and was overseen by a headman and council of elders (Levy 1978). Permanent villages were established near the coast and river drainages, while temporary camps were located in prime resource collecting areas. The most common burial practice at the time of European contact was cremation.

The diet of tribes in the area included a large proportion of marine resources. Terrestrial vegetal food sources included acorn, nuts, seeds, greens and bulbs. Game included g deer, pronghorn, tule elk, rabbit, sea mammals and waterfowl. Ohlone people managed the seasonal seed production through controlled annual burning (Levy 1978:491). The house structure is poorly documented due to the influences of missionization, however has been described by Kroeber as a pole structure with a roof of brush or tule matting (Kroeber 1925: 468). Additional structures included sweathouses (which was visited daily), dance houses, and assembly houses. Lithic tools produced through imported obsidian and local cherts were manufactured. As acorn from coast live oak (*Quercus agrifolia*) and valley oak (*Quercus lobata*) was an important staple, groundstone handstones, pestles, portable mortars, and milling slabs were common. Bedrock milling was also common where bedrock was of sufficient quality. The Ohlone traded shell ornaments, animal furs, salt, shellfish, and other items with neighboring Miwok, Yokut and Patwin for bows and arrows, basketry materials, pigments, and feather blankets (Clay and Waechter 2009). Olivella and abalone shell beads was also used as currency.

2.2.3 The Historic Period

Spanish Period (1769–1822)

Spanish missionization of Alta California was initiated in San Diego (1769). A total of 21 missions were constructed by the Dominican and Franciscan orders between 1769 and 1823. Missions in the region included San Francisco de Asís (1776), Santa Clara de Asís (1776), San José de Guadalupe (1797 in Alameda County), San Rafael Arcángel (1817 in Marin County), and San Francisco Solano (1823 in Sonoma County; Grunsky 1989). The first Spaniards arrived in the San Joaquin Valley in 1772, led by don Pedro Fages (Johnson, Dawson, and Haslam 1993). In 1805, A Spanish expedition led by Gabriel Moraga traversed Pacheco Pass, directly northwest of the project area, which had been a Yokut trail previously (OHP 2018). A Spanish expedition from San Francisco named the vicinity of the project area San Luis Gonzaga after Saint Aloysius Gonzaga, a 16th century Italian aristocrat and Jesuit (Johnson, Dawson, and Haslam 1993; Autobee 2017).

Mexican Period (1822–1848)

Mexico's separation from the Spanish empire in 1821 and the secularization of the California missions in the 1830s caused further disruptions to Native American populations. Following the establishment of the Mexican republic, the government seized many of the lands belonging to Native Americans, providing them as parts of larger Land Grants to affluent Mexican citizens and rancheros. The 1833 Secularization Act passed by the Mexican Congress ordered half of all mission lands to be transferred to Native Americans, and the other half to remain in trust and managed by an appointed administrator. These orders were never implemented due to several factors that conspired to prevent Native Americans from regaining their patrimony. A Mexican land grant, Rancho San Luis Gonzaga, was issued in the vicinity to Juan Perez Pacheco and José Maria Mejía in 1843 (Hoffman 1862, Pierce 1981). This grant included more than 48,000 acres within present day Merced and Santa Clara Counties (San Jose Mercury News 1996). José Maria Mejía soon gave his portion of the land grant to Pacheco who became the sole owner (Pierce 1981). Juan Perez Pacheco saw construction of the area's first adobe building around 1844 and the ownership of the rancho stayed with Pacheco into the American Period, as expanded upon to follow.

American Period (Post 1848)

California was officially ceded to the United States in 1848, which led to the continued appropriation of Native American territory by ranchers, prospectors, and an increasing number of settlers. The economic drive to promote successful ranching activities within the Central Valley was of particular importance to the continued development, regional stabilization, and western growth of the United States Government authority. The Pacheco Pass saw increased traffic into the mid-19th century due to the 1849 Gold

Rush and the discovery of Gold in the Kern River in 1853 (California State Parks 2006). The increase in travelers through the pass cause an increase in banditry and in 1951 Juan Perez Pacheco moved his family away from the ranch to Monterey (California State Parks 2006). By the mid-19th Century, Euro-Americans miners, failed in the lodes to the east, began to move into the area to try their luck at agriculture, ranching, and to work as farm/ranch hands (Rolle 1998). From 1850, with the passage of California's Indian Act, until legislative reforms in the late 1880s, state laws provided little actual protections to Native American population throughout California who often worked on these local ranches and farms. This large influx of people into central California resulted in a large demand for meat and animal byproducts. In the earlier 1850s, entrepreneurs brought large herds of cattle, sheep, and hogs into the large grazing areas of Central Valley and the Sierra Foothills (California Department of Transportation 2007). Juan Perez Pacheco leased Rancho San Luis Gonzaga during this time to his son-in-law, Mariano Malarin, to begin a herding and ranching operation (Shumate 1977). Over the decade routes through Pacheco Pass become more formalized with the creation of a toll road in 1857 and the Butterfield Stage Lines established a regular route through the pass (Shumate 1977). Rancho San Luis Gonzaga became a stage station in the Butterfield Overland Mail stagecoach route which connected Saint Louis, Missouri to San Francisco (New York Times, 1858). The completion of the Transcontinetal Railroad in 1869 facilitated the shipping of animal products to markets east (California Department of Transportation 2007). While sheep in particular were brought in large herds to northern San Joaquin Valley, Los Banos (9 miles east of the Project site) became a destination for Basque immigrants who were predominantly cattlemen (California Department of Transportation 2007). Periods of drought led to conflicts with ranchers over grazing land on ranches rarely fenced in. The 'No-Fence Law' was passed in 1872, requiring stockmen to fence in their livestock herds to protect farmers' crops. As noted by Breschini et al. (1983), the passing of this law is a sign of the diminishing political clout of stockmen in the face of the raising economic dominance of grain farming.

While Americans slowly populated San Joaquin Valley into the latter half of the 19th Century, ranching continue to play an important economic role in the region around Rancho San Luis Gonzaga. In 1984, Paula Fatjo, owner of Rancho San Luis Gonzaga and Juan Perez Pacheco's descendant, moved into a new ranch headquarters north of the original rancho adobe (California State Parks 2006). The beginning of the 20th century brought the motorized water pump which would come to transform Central Valley into an agricultural center by tapping California's underground aquifer. The aquifer was tapped so heavily that by the 1930s the aquifer was dropping ten feet a year (Autobee 2017). This water demand was only increased into the 1940s, when World War II greatly increased national demand for cotton, flax, wheat, and vegetables. It was clear a new source of water would be needed in the near future. The majority of Rancho San Luis Gonzaga, was condemned by the State of California in 1962 to create San Luis Reservoir (San Jose Mercury-News 1996). Paula Fatjo, still in possession of Rancho San Luis Gonzaga, moved several structures of the old ranch complex to a new location near the summit of Pacheco Pass, including the 1844 adobe of which large portions collapsed during transit (California State Parks 2006). Construction of San Luis Dam was completed by 1968 and on May 31, 1969, the San Luis Reservoir filled for the first time (Autobee 2017). Years later, as part of a financial solution to tax disputes with Merced County, Paula Fatjo leased 5,000 acres of Rancho San Luis Gonzaga in a 25-year lease to support a wind energy conservation facility (California State Parks 2006). Paula Fatjo died on December 30, 1992, and left the remaining acreage of the Rancho San Luis Gonzaga to the California Parks System (San Jose Mercury-News 1996).

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3.0 BACKGROUND RESEARCH

3.1 CCaIC Records Search Results

Records searches of the main power generating body of the Project site, proposed New Transmission Line routes, and the surrounding 0.5-mile buffer were completed by CCaIC staff on November 17, 2017, April 24, 2018, November 15, 2018, and January 28, 2019 (Confidential Appendix A). Records searches included the CCaIC collection of mapped prehistoric, historical, and built-environment resources; California Department of Parks and Recreation Site Records; technical reports; archival resources; and ethnographic references. Additional consulted sources included the NRHP; California Inventory of Historical Resources/CRHR; and listed Office of Historic Preservation Archaeological Determinations of Eligibility, California Points of Historical Interest, Caltrans Bridge Surveys, historical maps, and California Historical Landmarks.

Previously Conducted Studies

Central California Information Center records indicate that forty-eight previous cultural resources technical investigations have been conducted within 0.5-mile of the Project Area (Table 1). Of these studies, twenty included portions of the Project Area.

Table 1
Previous Technical Studies

Report Number	Date	Title	Author
Reports within the Project Area			
ME-00581	1988	Negative Archaeological Survey Report 10 Mer 152 R11.8/12.8 Full Access Controlled Interchange at the Intersection of S.R. 152 and 33.	Adams, C. and J. Tordoff
ME-00603	1982	An Archaeological Reconnaissance of the Gonzaga Conservation Camp in Merced, California.	Foster, Dan
ME-00645	1990	A Cultural Resource Sensitivity Study of the Highway 152 Planning Area, 6333 Acres in Merced County, California.	Napton, L. K.
ME-03263	1998	RE: Cultural Resources Assessment, Pacific Bell Mobile Services Facility SF-720-03, Pacheco State Park, Merced County, California.	Price, B. A.
ME-05378	2004	Rancho San Louis Project, An Archaeological Reconnaissance.	Wren, D. G.
ME-05498	2004	Cultural Resources Inventory of Caltrans District 10 Rural Conventional Highways; Volume I: Summary of Methods and Findings	Leach-Palm, L., P. Mikkelsen, J. King, J. Hatch, and B. Larson
ME-05499	2004	Cultural Resources Inventory of Caltrans District 10 Rural Conventional Highways, Merced County, California: State Routes 33, 59, 140, and 152; Volume I - Report and Appendices.	Leach-Palm, L., J. King, J. Hatch, and B. Larson
ME-05500	2004	Cultural Resources Inventory of Caltrans District 10 Rural Conventional Highways; Volume II E: Merced County.	Leach-Palm, L., J. King, J. Hatch, and B. Larson
ME-05501	2004	Cultural Resources Inventory of Caltrans District 10 Rural Conventional Highways; Volume Ill: Geoarchaeological Study	Rosenthal, J. S. and J. Meyer
ME-05590	2004	Department of Parks and Recreation Archaeological Survey Report, ADA Retrofit, Basalt CG and DUA, Project No. 7988.	Wulzen, Warren
ME-05758	2003	Cultural Resources Inventory Report for Fly Yard 3, Construction Headquarters, and the Los Banos Substation Storage Area, Los Banos-Gates 500kV Transmission Line Project (Path 15), Fresno and Merced Counties, California.	Jones & Stokes

Report Number	Date	Title	Author
ME-05844	2005	Collocation Submission Packet, FCC Form 621, International Turbine Research, SJ-909-01.	Losee, C.
ME-05908	2005	New Tower ("NT") Submission Packet FCC Form 620: Cingular Basalt Hill Communications Site, SJ-910-01, Merced County, CA	Bonner, W.
ME-05926	2005	Cultural Resources Monitoring Report, Los Banos-Gates 500-kV Transmission Line Project (Path 15), Fresno and Merced Counties, CA	Maslonka & Associates
ME-06017	1996	Department of Parks and Recreation Fatjo-Archaeological Survey Report	Whatford, J. C.
ME-06474	2007	Archaeological Survey Report, 2007-08 Deferred Maintenance Program Projects, Sewage Lift Stations and Water Treatment Facilities, San Luis Reservoir State Recreation Area, Merced County, CA	Wulzen, W.
ME-06474	2014	Letter: NHPA Section 106 Consultation for a Fence Installation Project at San Luis Reservoir State Recreation Area, Merced County, CA (Project #14-SCA)-190 and 14-SCAO0214); project within ME-06474 survey area; no survey by Bureau of Reclamation; asking concurrence with SHPO no impact on historic properties	Leigh, Anastasia
ME-07007	2009	Geo-Exploration at Two Locations in the San Luis Reservoir State Recreation Area, San Luis Reservoir and O'Neil Forebay, Merced Co., CA (Tracking No. 08-SCAO-233.3). BUR090108A	Chotkowski, M. A.
ME-08185	2009	Archaeological Survey Report, Basalt Trail Accessibility Improvements, San Luis Reservoir State Recreation Area, Merced County, CA	Wulzen, W.
ME-08721	2017	Phase I Investigation for the Basalt Hill Communication Site Tower Modification project, Los Banos, Merced County, California	Noble, M. D.
Reports within the 0.5-Mile Search Area			
ME-00604	1984	An Archaeological Survey of the Pacheco Summit Conservation Camp in Merced and Santa Clara Counties, California.	Foster, D. G.
ME-00618	1984	Negative Archaeological Survey Report 10 Merced 152 10.8/12.2, 173600.	Littlefield, R.
ME-00657	1968	Paper Presented at the Southwestern Anthropological Association and Society for California Archaeology 1968 Annual Meetings, the Archaeology of the Greyson Site (4-Mer-94), Western Merced County, California.	Olsen, W. H.
ME-00666	1979	Archaeological Investigation of the Area of Geologic Test Excavations Near O'Neill Dam, Merced County, California.	Peak, A. S.
ME-00666	2014	Cultural Resources Compliance Division of Environmental Affairs, Cultural Resources Branch, San Luis Reservoir Recreation Areas Parking Control Access Gates, San Luis Creek Gate and Medeiros Gate. Review only, no survey already surveyed in ME-00666 (Medeiros) and ME-05777 (San Luis Creek); San Luis Dam 7.5'	Carper, M.
ME-00709	1987	Los Banos Grandes Offstream Storage Project: An Archaeological Reconnaissance.	Wren, P. G.
ME-01462	1969	Archaeology of the Grayson Site, Merced County, California. Department of Parks and Recreation Archaeological Research Section Archaeological Report No. 12	Olsen, W. H. and L. A. Payen
ME-01954	1993	An Inventory and Historical Significance Evaluation of CDF Fire Lookout Stations. CDF Archaeological Reports Number 12.	Thornton, M. V.
ME-04424	2001	Cultural Resource Investigations of the Proposed Los Banos Voltage Support Facility, Merced County, California.	Napton, L. K.
ME-04561	2001	Archaeological Inventory Survey: Proposed Dinosaur Point Cell Tower Site and Associated Access Road Corridor, in the Pacheco Pass, Merced County, California.	Jensen, P. M.
ME-05221	2003	Cultural Resource Inventory of the Path 15 Los Banos-Gates Transmission Line Construction Project, Merced and Fresno Counties, California.	Hector, S., M. Hale, and C. Wright
ME-05759	2004	Cultural Resource Inventory of An Off-Project Access Route in the 0-Mile of the Los Banos-Gates 500-kV Transmission Line Project (Path 15), Fresno and Merced Counties, California.	Jones & Stokes

Report Number	Date	Title	Author
ME-05777	2005	Department of Parks and Recreation Archaeological Survey Report: Accessibility Modifications--ACU; CEQA #6686, Project #8427, PCA #10628 (San Luis Reservoir State Recreation Area).	Wulzen, W.
ME-05777	2014	Cultural Resources Compliance Division of Environmental Affairs, Cultural Resources Branch, San Luis Reservoir Recreation Areas Parking Control Access Gates, San Luis Creek Gate and Medeiros Gate. Review only, no survey already surveyed in ME-00666 (Medeiros) and ME-05777 (San Luis Creek); San Luis Dam 7.5'	Carper, M.
ME-06535	2007	Archaeological Survey Report Basalt Campground Restroom 1 & 2, Project #8370	Wulzen, W.
ME-06667	2008	Cultural Resources Investigations of the Agua Fria Study Area, 3,187.72 Acres in Merced County, California	Napton, L. K.
ME-06984	2009	Geo-Exploration at Two Locations in the San Luis Reservoir State Recreation Area, San Luis Reservoir and O'Neil Forebay, Merced County, CA (Tracking No. 08-SCAO-233.2). BUR090108A	Chotkowski, M. A.
ME-07015	2008	Letter Report Re: National Historic Preservation Act, Section 106 Consultation for the Proposed Installation of Four Electronic Security Gates at San Luis Reservoir State Recreational Area, Merced County, California (Project No. 08-SCAO-306	Chotkowski, M.
ME-07269	2010	Gate Installation Project at San Louis Reservoir, Merced County, California (Project No. 09-SCAO-341)	Chotkowski, M. A.
ME-07405	2010	U.S. Dept. of the Interior, BUR, National Historic Preservation Act Section 106 Compliance for Kiosk Installation Project at San Luis Reservoir, Merced County, California (Tracking3 11-SCAO-015)	Chotkowski, M. A.
ME-07567	1934	Pacheco Pass Project Will Abolish 34 Curves, Widen Road, Reduce Grades. California Highways and Public Works, April 1934, pages 6-7	Pierce, R. E.
ME-07568	1963	Pacheco Pass Highway Relocation Includes 11,400,000-cubic-yard Fill. California Highways and Public Works, March-April, pages 45-49.	Kroeck, L. G.
ME-07569	1965	Pacheco Pass Route 152 Now Skirts San Luis Reservoir Site. California Highways and Public Works, July-August 1965, pages 2-7	Weaver, R. B. "Bud"
ME-07933	2010	Cultural Resources Inventory Report for the San Joaquin Valley Right-of-Way Maintenance Environmental Assessment Project	Siskin, B. et al.
ME-08283	2015	Historic Property Survey Report San Luis Solar Project Merced County, California	Johnston, S. and Brewer, C.
ME-08283	2015	Assessment of Historic Built Environment Resources, San Luis Solar Project, Merced County, CA	Brewer, C.
ME-08623	2016	Letter Report Re: Cultural Resources Records Search Results and Site Visit Results for T-Mobile West, LLC Candidate SC07132A (PG & E Los Banos Station) 16182 Jasper Sears Road, Los Banos, Merced County, California. [additional citation--Crawford, 2016--included]	Pearson, J. and K. Crawford
ME-08623	2016	Letter Report Re: Direct APE Historic Architectural Assessment for T-Mobile West, LLC Candidate SC07132A (PG & E Los Banos Station) 16182 Jasper Sears Road, Los Banos, Merced County, California.	Crawford, K.

Previously Identified Cultural Resources

Records at the Central California Information Center indicate that 11 cultural resources have been previously identified within the Project Area. In addition, 42 cultural resources have been identified within 0.5-mile the Project Area. (Table 2; Confidential Appendix A).

Table 2
Previously Recorded Cultural Resources

Primary Number	Period	Name	Type	NRHP/CRHR Status
Resources Within or Adjacent to the Project Area				
P-24-000142	Prehistoric	MER S-122	BEDROCK MILLING FEATURE; HABITATION DEBRIS; OTHER	7: Not Evaluated
P-24-001820	Prehistoric	FP-96-3	BEDROCK MILLING FEATURE	7: Not Evaluated
P-24-001821	Prehistoric, Historic	FP-96-4	OTHER; ROCK FEATURES	7: Not Evaluated
P-24-001822	Historic	Pacheco Pass Road	ROADS/TRAILS	7: Not Evaluated
P-24-001823	Historic	FP-96-6	WALLS/FENCES	7: Not Evaluated
P-24-001824	Historic	FP-96-7	FOUNDATIONS; WELLS/CISTERNS; OTHER	7: Not Evaluated
P-24-001856	Historic	Gonzaga-Pacheco-Fatjo Ranch	FARM/RANCH	7: Not Evaluated
P-24-001988	Historic	PL-SLLP-A-015	ROADS/TRAILS	7: Not Evaluated
P-24-002143	Historic	PG&E Lattice Tower; T-Mobile West LLC SC07132A (PG&E Los Banos Station)	ENGINEERING STRUCTURE	6Z: Ineligible
P-24-002154	Historic	PL-SLLPIP-16-01 Basalt Hill Quarry Rock Separation Plant	FOUNDATIONS; QUARRY	7: Not Evaluated
P-24-002164	Historic	PL-SLLPIP-16-13; Road	ROADS/TRAILS	7: Not Evaluated
Resources within the 0.5-Mile Surrounding Search Area				
P-24-000078	Historic	Basalt Hill Fire Lookout Station	GOVERNMENT BUILDING	7: Not Evaluated
P-24-000116	Prehistoric	MER S-120	LITHIC SCATTER; BEDROCK MILLING FEATURE; ROCK SHELTER; PETROGLYPHS	7: Not Evaluated
P-24-000127	Prehistoric, Historic	MER S-106	LITHIC SCATTER; HABITATION DEBRIS; OTHER	7: Not Evaluated
P-24-000129	Prehistoric	MER S-108	LITHIC SCATTER; OTHER	7: Not Evaluated
P-24-000130	Prehistoric	MER S-109	LITHIC SCATTER; BEDROCK MILLING FEATURE; HABITATION DEBRIS	7: Not Evaluated
P-24-000131	Prehistoric		LITHIC SCATTER; BEDROCK MILLING FEATURE; HABITATION DEBRIS; OTHER	7: Not Evaluated
P-24-000132	Prehistoric, Historic	6-25-65 #4	ROADS/TRAILS; LITHIC SCATTER; HABITATION DEBRIS; OTHER	7: Not Evaluated
P-24-000133	Prehistoric, Historic	6-25-65 #5	FOUNDATIONS; LITHIC SCATTER; BEDROCK MILLING FEATURE; HABITATION DEBRIS; OTHER	7: Not Evaluated
P-24-000143	Prehistoric, Historic	S-123	ROADS/TRAILS; LITHIC SCATTER; HABITATION DEBRIS	7: Not Evaluated
P-24-000182	Prehistoric, Historic	MER S-124	ROADS/TRAILS; LITHIC SCATTER; HABITATION DEBRIS	7: Not Evaluated
P-24-000183	Prehistoric, Historic	MER S-125	ROADS/TRAILS; HABITATION DEBRIS	7: Not Evaluated
P-24-000194	Prehistoric, Historic	MER S-94	ROADS/TRAILS; BEDROCK MILLING FEATURE; HABITATION DEBRIS; OTHER	7: Not Evaluated
P-24-000224	Prehistoric	MER S-134	BEDROCK MILLING FEATURE; HABITATION DEBRIS	ADOE 1D listed on the NRHP and the CRHR
P-24-000228	Prehistoric	MER S-138	HABITATION DEBRIS	7: Not Evaluated

Primary Number	Period	Name	Type	NRHP/CRHR Status
P-24-000229	Prehistoric		HABITATION DEBRIS	7: Not Evaluated
P-24-000489	Prehistoric	San Luis Gonzaga Archaeological District	OTHER	ADOE 1S listed on the NRHP and CRHR
P-24-000643	Historic	Pacheco Pass	ROADS/TRAILS	7: Not Evaluated
P-24-001805	Prehistoric	ISO-San Luis Dam-1	OTHER	7: Not Evaluated
P-24-001806	Prehistoric	Basalt CG BRM & Rock art site	BEDROCK MILLING FEATURE; PETROGLYPHS	7: Not Evaluated
P-24-001818	Historic	FP-96-1	WALLS/FENCES	7: Not Evaluated
P-24-001819	Prehistoric	FP-96-2	BEDROCK MILLING FEATURE	7: Not Evaluated
P-24-001828	Historic	FP-96-8 Point D	MONUMENT	7: Not Evaluated
P-24-001876	Historic	80131-01; Domengin Sheep Ranch	WELLS/CISTERNS; FARM/RANCH	7: Not Evaluated
P-24-001973	Historic	PL-SLLP-B-ISO-001	TRASH SCATTER	7: Not Evaluated
P-24-001979	Historic	PL-SLLP-A-013	ROADS/TRAILS	7: Not Evaluated
P-24-001980	Historic	PL-SLLP-A-019	TRASH SCATTER	7: Not Evaluated
P-24-001983	Historic	PL-SLLP-A-ISO-008	OTHER	7: Not Evaluated
P-24-001986	Historic	PL-SLLP-A-011	FOUNDATIONS; ROADS/TRAILS; MINES/QUARRIES; STANDING STRUCTURES; MINE STRUCTURE	7: Not Evaluated
P-24-001987	Historic	PL-SLLP-A-014	ROADS/TRAILS	7: Not Evaluated
P-24-001989	Historic	PL-SLLP-A-016	ROADS/TRAILS	7: Not Evaluated
P-24-001990	Prehistoric	PL-SLLP-A-ISO-010	OTHER/ISOLATE	7: Not Evaluated
P-24-001991	Prehistoric	PL-SLLP-A-ISO-011	OTHER/ISOLATE	7: Not Evaluated
P-24-002135	Historic	PL-SLLP-A-006; Earthen Dam 2	DAMS	7: Not Evaluated
P-24-002156	Historic	PL-SLLPIP-16-03; Ranch	RANCH COMPLEX	7: Not Evaluated
P-24-002157	Historic	PL-SLLPIP-16-05	FOUNDATIONS	7: Not Evaluated
P-24-002158	Historic	PL-SLLPIP-16-06; Road	ROADS/TRAILS	7: Not Evaluated
P-24-002159	Historic	PL-SLLPIP-16-07; Ditch	WATER CONVEYANCE	7: Not Evaluated
P-24-002163	Historic	PL-SLLPIP-16-12; Dam	DAMS	7: Not Evaluated
P-24-002165	Historic	PL-SLLPIP-16-14; 34 Survey Markers	OTHER	7: Not Evaluated
P-24-002166	Historic	PL-SLLPIP-ISO-16-01	OTHER/ISOLATE	7: Not Evaluated
P-24-002167	Historic	PL-SLLPIP-ISO-16-02	TRASH SCATTER	7: Not Evaluated
P-24-002168	Prehistoric	PL-SLLPIP-ISO-16-05	LITHIC SCATTER	7: Not Evaluated

Cultural Resources Within or Near the Project Area

Eleven cultural resources were identified within the Project Area during the CCaIC records search. P-24-001806 consists of a prehistoric bedrock milling site with petroglyphs. P-24-001820 consists of a prehistoric bedrock milling site containing a single boulder with two mortars. P-24-001821 consists of a stone cairn atop a single boulder likely used as a marker or survey monument and may be prehistoric or historic in nature. P-24-001822 consists of a segment of the historic Pacheco Pass Highway. P-24-001823 consists of a fence serving as the southern boundary of a state lands parcel which contains historic elements. P-24-001824 consists of the remnants of a historic windmill. P-24-001856 consists of the historic San Luis Gonzaga Rancho-Paula (Pacheco) Fatjo Ranch. P-24-001988 consists of an earthwork road of likely historic age. P-24-002143 consists of a steel lattice transmission tower of historic age, just north of the PG&E Entry Route transmission lines. P-24-002154, known as the Basalt Hill Quarry, was the primary source for the rock used in the construction of the San Luis Dam and began operation in 1963. P-24-002164 consists of a road of historic age, currently under the water of San Luis Reservoir. Additional details pertaining to these resources are provided in subsequent portions of the present report.

3.2 Native American Heritage Commission and Tribal Correspondence

Dudek requested an NAHC search of their Sacred Lands File on November 7, 2017, for the Project site and additional areas to the south. The NAHC responded on November 27, 2017, indicating the Sacred Lands File search did not identify any cultural resources within the records search area. Dudek requested a subsequent NAHC search of their Sacred Lands File on April 23, 2018, for the proposed New Transmission Line routes. The NAHC responded on May 7, 2018, indicating sacred sites were identified in the vicinity of the New Transmission Line and recommended contacting the Table Mountain Rancheria Native American Tribe for additional details. The NAHC additionally provided a list of Native American tribes culturally affiliated with the location of the entire Project area. All NAHC correspondence materials are included in Appendix B.

The Project is subject to compliance with AB 52 (California Public Resources Code, Section 21074), which requires consideration of impacts to “tribal cultural resources” as part of the CEQA process and requires the CEQA lead agency to notify any groups (who have requested notification) of the Project who are traditionally or culturally affiliated with the geographic area of the Project. Because AB 52 is a government-to-government process, all records of correspondence related to AB 52 notification and any subsequent consultation are on file with CDPR. Dudek understands that communication with two different tribal representatives has occurred to date, both occurring on November 11, 2019. Valentine Lopez, of the Amah Mutsun Tribal Band requested Native American monitors to be present for ground disturbing activities within 300 feet of waterways, caves, springs, and known archaeological sites. Robert Ledger, of the Dumna Wo-Wah Tribal Government indicated that he would speak with his tribal council, however to date has not followed up with CDPR staff.

3.3 Geomorphic Assessment and Buried Resource Potential

Potential for yet identified cultural resources in the Project vicinity was reviewed against geologic and topographic geographic information system data for the area and information from other nearby projects. The landforms in the area are composed of Cretaceous and Jurassic sandstones with smaller amounts of shale, chert, limestone, and conglomerate and Upper Cretaceous marine rocks (USGS 2018). These pre-Quaternary soils are expected for hills composed of volcanic, metamorphic, and sedimentary rocks of the Coast Ranges. Caltrans' Geoarchaeological Overview and Assessment of Caltrans Districts 6 and 9 (Meyer et al 2010) does not include the larger Project area, but similar landforms in proximity to the Project area were designated as Low/Very Low. In general and simplified, Meyer et al (2010) claim there is an inverse relationship between landform age and buried site potential. Landforms predating humans' arrival into North America could not contain archaeological deposits. The Cretaceous and Jurassic landforms located in the majority of the project area predate human mergence into North America by tens of millions of years, indicated a very low potential for buried archaeological deposits. The exception may be in slopes and drainages within the project area, where lenses of Holocene alluvium may have covered the much older landforms.

In addition to landform age, proximity to water and degree of landform slope have been shown be indicators of prehistoric site potential (Rosenthal et al 2003). The current Project area is naturally hilly and sloped being located in the foothills of the Diablo Range. However, this generalization should not be used in an area as large as the Project area since there are many benches and reasonably level valley floors within the Project area. The Project area is adjacent to San Luis Reservoir, which was flooded after San Luis Dam was completed in 1968. San Luis Reservoir is primarily filled by the California Aqueduct System, but also has a small natural stream, San Luis Creek, which feeds it. This creek would have been an attractive resource in prehistoric times. Based on review of this information, the Project Area has a potential to contain unanticipated buried cultural resources.

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4.0 METHODS AND RESULTS

4.1 Intensive Pedestrian Survey

4.1.1 Methods

Dudek archaeologists William Burns, Gene Romanski, Sarah Lewis, Michelle Wilcox, and Jennifer De Alba completed a pedestrian survey of the Project site from September 4, 2018, through September 21, 2018, December 3, 2018, through December 7, 2018, April 3, 2019, and May 3, 2019. William Burns, MSc, RPA acted as Field Director and assisted with field coordination for these efforts. Adam Giacinto, MA, RPA, acted as principal investigator, overseeing activities and reviewing findings. All fieldwork was performed using standard archaeological procedures and techniques that meet the Secretary of the Interior's standards and guidelines for cultural resources inventory and evaluation (48 FR 44720–44726). With the exception of the pending survey of recently added access roads, stating areas, and minor Project site expansions, the Project Area was subject to a 100% survey with transects spaced no more than 15 meters apart. Survey crew was equipped with a Global Positioning System (GPS) receiver with sub-meter accuracy. Field recording and photo documentation of features and the Project site was completed. A series of overview photographs was taken to document the current conditions. Location-specific photographs were taken using an Apple iPad equipped with 8-megapixel resolution and georeferenced PDF maps of the Project Area. Evidence for buried cultural deposits was opportunistically sought through inspection of natural or artificial erosion exposures and the spoils from rodent burrows. The Project Area was observed to be heavily grassed, allowing for approximately one-fifth of the ground to be directly observed in most areas. Areas considered to have a higher potential to support archaeological resources, such as near drainages and exposed bedrock, were given more intensive attention by slowing survey and tightening transects.

4.1.2 Survey Results

Eight of the previously recorded cultural resources were relocated and found to be in the same general condition as previously recorded. One cultural resource, P-24-000142, was not re-identified. As this resource was recorded in 1966 to a location mapped within San Luis Reservoir (constructed circa 1967), it is likely that the site was either mis-mapped and is located elsewhere outside of the Project site or that it is now underwater. Similarly, historical road P-24-002164 is mapped within San Luis Reservoir, and was not relocated. In addition, four newly discovered isolated cultural resource (GZ-I-02, GZT-I-01, GZT-I-02, and GZT-I-03) were identified during the survey (Confidential Figures 3a-c; Table 3). In order to meet minimum standards for recordation outlined by the CA Office of Historic Preservation (OHP), Dudek prepared CA Department of Parks and Recreation (DPR) 523 series site forms for these resources (Confidential Appendix C). Ground surface conditions were observed to be fairly undisturbed with the exception of several roads. Ground surface visibility was restricted due to tall grass, with approximately 20% directly observable during survey. A discussion of each resource follows Table 3.

Design refinements introduced subsequent to the cultural resources survey for this project have been introduced. These include limited modification of the Project site and New Transmission Line, additional access roads, and staging areas. These areas will be subject to archaeological survey at a future date, and the present report appropriately updated.

Table 3
Cultural Resources Identified and/or Updated During Survey

Resource ID	Resource Age	Resource Type	Proposed Project Component Proximity	Meters E (UTM NAD 1983)	Meters N (UTM NAD 1983)	Description
GZ-I-02	Prehistoric	Isolate	70 feet east of proposed road	660,150	4,101,175	One white cryptocrystalline interior lithic flake
GZT-I-01	Prehistoric	Isolate	Within transmission line alternate route. No present impact planned.	672,363	4,100,485	1 granitic handstone fragment
GZT-I-02	Prehistoric	Isolate	Within preferred transmission line route	672,368	4,100,508	1 granitic handstone fragment
GZT-I-03	Prehistoric	Isolate	Within transmission line alternate route. No present impact planned.	669,493	4,099,596	1 white quartzite flake
P-24-000142	Prehistoric	Habitation Site	Within preferred transmission line route. Not identified at location mapped during survey and appears likely to have been mismapped	666,519	4,104,514	Midden, FAR, debitage, portable mortar, handstone
P-24-001806	Prehistoric	Bedrock Milling, Petroglyphs	Within transmission line alternate route. No present impact planned.	672,355 138,590	4,099,422	Alleged bedrock milling/petroglyph site. Current survey relocated and determined previously identified features are natural
P-24-001820	Prehistoric	Bedrock Milling Feature	900 feet south of existing road	660,760 127,092	4,100,883	Bedrock milling site containing a single boulder with two mortars
P-24-001821	Historic	Rock Cairn	200 feet south of existing road	660,770	4,101,090	Stone cairn atop a single boulder
P-24-001822	Historic	Road	In existing improved access road	659,635 (at southern “Y” near Park entrance)	4,103,115 (at southern “Y” near Park entrance)	Segment of Pacheco Pass Road or other historic-era road
P-24-001823	Historic	Fence	45 feet south from proposed turbine	664,346 (east end) 656,348 (west end)	4,100,290 (east end) 4,098,666 (west end)	Fence serving as the southern boundary of a state lands parcel

Resource ID	Resource Age	Resource Type	Proposed Project Component Proximity	Meters E (UTM NAD 1983)	Meters N (UTM NAD 1983)	Description
P-24-001824	Historic	Windmill	630 feet north of proposed access road	662,315	4,101,160	Remnants of a historic windmill
P-24-001856	Historic	Historic District	Intersects existing and proposed roads	660,260 (northern) 664,515 (eastern) 656,350 (southern) 655,850 (western)	4,103,950 (northern) 4,101,860 (eastern) 4,098,665 (southern) 4,099,475 western)	Gonzaga-Pacheco-Fatjo Ranch. Historic- modern district, comprised of a number of ranching components, throughout the entirety of Pacheco State Park
P-24-001988	Historic	Road	Within preferred transmission line route	670,552	4,099,313	Earthwork road
P-24-002143	Historic	Transmission Tower	Within preferred PG&E Entry Route transmission line segment	675,629	4,102,912	Steel lattice electrical transmission tower
P-24-002154	Historic	Basalt Hill Quarry	Survey Pending – Recorded within staging area along south of preferred transmission line route	669,430	4,098,850	Quarry used during construction of San Luis Reservoir, started use in 1963.
P-24-002164	Historic	Road	Within preferred transmission line route. Not observed during survey. Likely inundated by San Luis Reservoir	665,270 (west end) 665,859 (east end)	4,095,493 (west end) 4,095,166 (east end)	Road, currently under San Luis Reservoir

GZ-I-02

GZ-I-02 is a newly discovered prehistoric isolate consisting of a single white cryptocrystalline interior flake, measuring 3.2 x 2 x 1.5 cm. The flake was discovered on the ground surface. No associated cultural constituents were observed, however less than one-half of the ground surface was visible through tall grasses. Light brown fine sandy silt was noted within and surrounding the site. There is little evidence for subsurface deposits in the area. This isolate was left on site, outside of a planned road segment, and will not be affected by the Project, as currently designed.

GZT-I-01

GZT-I-01 is a newly discovered prehistoric isolate consisting of a single granitic handstone fragment, measuring 17 x 14 x 12 cm. The fragment was discovered on the ground surface. No associated cultural constituents were observed, however less than one-half of the ground surface was visible through tall grasses. Light brown fine sandy silt was noted within and surrounding the site. There is little evidence for subsurface deposits in the area. This isolate was left on site. The location of this isolate falls outside of the presently New Transmission Line ROW, and would not be affected by the Project, as presently designed.

GZT-I-02

GZT-I-02 is a newly discovered prehistoric isolate consisting of a single granitic handstone fragment, measuring 9 x 7 x 6 cm. The fragment was discovered on the ground surface. No associated cultural constituents were observed, however less than one-half of the ground surface was visible through tall grasses. Light brown fine sandy silt was noted within and surrounding the site. There is little evidence for subsurface deposits in the area. This isolate was left in place. The location of this isolate falls outside of the New Transmission Line ROW but within 75 feet of a planned access road. It is unlikely that the isolate would not be affected by the Project as presently designed.

GZT-I-03

GZT-I-03 is a newly discovered prehistoric isolate consisting of a single white quartzite interior flake, measuring 4 x 2.5 x 0.5 cm. The flake was discovered on the ground surface. No associated cultural constituents were observed, however less than one-half of the ground surface was visible through tall grasses. Light brown fine sandy silt was noted within and surrounding the site. There is little evidence for subsurface deposits in the area. This isolate was left on site. The location of this isolate falls within or very near the New Transmission Line ROW. While it is possible that this resource wouldbe affected by the Project, it is not a CRHR/NRHP-eligible resource and would not represent a significant impact

P-24-000142

P-24-000142 was reported in 1966 to be a small habitation site with observed midden, groundstone, debitage, and fire-affected rock located on a southern terrace above a small seasonal creek. Dudek archaeologists thoroughly inspected the ground surface for evidence of this site within the proposed New Transmission Line ROW. No artifacts or midden-like soil was observed. Given that this resource was recorded prior to GPR technology, it is quite likely it was mis-mapped and is located outside of the New Transmission Line ROW. It is further possible, that P-24-000142 is located in an area that is now inundated by San Luis Reservoir (constructed in 1967). Regardless of its true location, this resource would not be impacted as a result of the Project.

P-24-001806

P-24-001806 was reported as a bedrock milling site with petroglyphs. The site was initially recorded in 2004 as several basalt boulders, one with a single milling feature and three other boulders with petroglyphs. The petroglyphs are described as deeply incised lines converging on a hole, another with incised lines near two cupules, and a third with pecked lines forming a rectangular design. It is located on the southern edge of the modern Basalt Campground. Dudek relocated the site during the site survey at its reported location. Upon inspection, the reported petroglyphs and the milling surface all appear to be natural wear on the stones with no cultural modification whatsoever. No other associated cultural constituents were observed, however less than one-fifth of the ground surface was visible through tall grasses. The resource is located near an alternative alignment that was subject to survey but is no longer likely to be used. P-24-001806 would not be affected by the Project, as currently designed.

P-24-001820

P-24-001820 consists of a bedrock milling site. The site was initially recorded by JC Whatford in 1996 as two shallow mortars on a highly weathered metamorphic boulder situated near an unnamed spring, on the west bank of a seasonal stream. Dudek relocated the site during recent surveys and expanded the site, which now measures 35 x 5 meters in size. Feature 1 was observed by Dudek to be in the same location as previously recorded by Whatford, and is situated approximately 40 meters up-slope from the recorded location on file with the CHRIS Information Center. No associated cultural constituents were observed, however less than one-fourth of the ground surface was visible through tall grasses. Dudek identified an additional feature (Feature 2) approximately 18 meters northwest of Feature 1. Feature 1 includes a single highly weathered mortar/basin, measuring 5.5 x 5.5 x 1 cm (length x width x depth) situated on a metamorphic boulder measuring 60 x 50 x 20 cm (length x width x height from soil). Light brown fine sandy silt was noted within and surrounding the site. The terrain in the area is relatively steep, and there is little evidence for subsurface deposits in the area. The site would not be affected by the Project, as currently designed.

P-24-001821

P-24-001821 consists of rock cairn resting on a large schist boulder, located 200 feet (60 meters) south of an earthen dam at Mammoth Lake. This feature was initially recorded by JC Whatford in 1996. It was revisited by Dudek during recent surveys, during which it was observed to be as previously recorded, however located 50 meters southeast of its location on file with the CHRIS Information Center. The cairn is composed of large cobbles and small boulders of a local metamorphic stone. The cairn stones are covered in thick lichen which indicates it to be of some age, though given its proximity to this manmade lake, it is very likely of historic origin. It is elliptical in shape, measuring 48 x 32 x 16 in (length x width x height). No other cultural features were observed in the vicinity. No associated cultural constituents were observed, however less than one-half of the surrounding ground surface was visible through tall grasses. Light brown fine sandy silt was noted within and surrounding the site. There is little evidence for subsurface deposits in the area. The resource would not be affected by the Project ,as currently designed.

P-24-001822

P-24-001822, consists of two segments of the historic Pacheco Pass Highway (Dinosaur Point Rd), as well as two sections of dirt road that split from Dinosaur Lake Trail 0.2 miles south of their intersection with Pacheco Pass Highway. The road segments in the vicinity of the northern limits of the Project site were initially recorded by JC Whatford in 1996. One of these segments, consisting of a 0.17 mile portion of Dinosaur Lake Trail. This segment (referred by Whatford as "Feature A") may have been part of a toll road constructed by Andrew B. Firebaugh (1856-1857) and/or part of the Butterfield Overland Mail Route. Dudek re-identified this segment during the recent surveys as a graded dirt-gravel road that measures approximately 22 feet in width. It was evident that this feature has been improved since its recordation in 1996. An additional segment recorded by Whatford on the other side of the drainage to the east, outside the Project site, was observed to also be present. This segment, measuring 15 feet in width, is in a state of disrepair and does not appear used. Feature A of P-24-001822 is an existing road used by the Park and for wind facility purposes. Use by the Project would not result in any changes to this road's present condition.

P-24-001823

P-24-001823 was initially recorded by JC Whatford in 1996 as a nearly four mile long fence oriented generally east-west along the southern side of P-24-001856 and Pacheco State Park Boundary. The fence was re-identified by Dudek during the recent surveys. It was noted to contain historic-era elements, including split redwood pickets and cross pieces and square cut nails, as well as more recent modifications such as modern barbed wire and steel T-posts. This feature is 45 feet outside of the nearest project component, and would not be affected by the Project as currently designed.

P-24-001824

P-24-001824 was initially recorded by JC Whatford in 1996 as the remnants of a windmill erected over a spring. Dudek re-identified this feature in the same condition, 85 feet (25 meters) east of the location on file with the CHRIS Information Center. The windmill blade itself has fallen and lies next to a redwood board fence and support structure that used to surround it. Components include a steel pipe connecting to a jack pump, steel and wooden rod, drive mechanism, six foot diameter windmill blade, wind vane, wooden support structure, wooden fence, water trough and small collapsed structure. The wind vane reads "PACIFIC PUMP AND SUP. CO. SAN FRANCISCO." No other associated cultural constituents were observed. This feature is more than 600 feet north of the nearest proposed Project component (access road) and wouldnot be affected by the Project, as currently designed.

P-24-001856

P-24-001856 was recorded Linda Dick Bissonnette in 2006 (rev 2007) as the Gonzaga-Pacheco-Fatjo Ranch (District). This ranch complex was observed to represent at least two periods of significance: the Historic Rancho Period (1843-1871) and the Modern Ranch Era (1962-1992). The historic Rancho San Luis Gonzaga was 48,821 acre land grant given to Juan Perez Pacheco in 1871, which remained in the family until the death of the last remaining member in 1996, Paula Fatjo, who left the remaining acreage of the Rancho San Luis Gonzaga to the California Parks System. Much of the ranch, including the initial location of the fortified Pacheco adobe constructed ca. 1843 at location of a named Native American village (*Lis-nay-yuk*), has since been inundated by San Luis Reservoir. Remaining cultural elements of the recorded District include the Paula Fatjo 1962 residence, gardens, barns, fences, corrals, windmills, small reservoirs, dirt roads, and the oak-grasslands landscape. All of these features, with the exception of ranch roads and open space, are located west (outside) of the Project site. The initial Pacheco adobe was partially destroyed during a failed attempt to relocate the structure in 1962. The remnants of the adobe are next to the Fatjo Residence, located approximately 0.95 mile west of the Project site. The Fatjo Residence has not been formally evaluated for CRHR/NRHP listing. The DPR form prepared for this district includes a number of linear road features, many of which continue to be used for wind facility and Park purposes. Dudek re-located these features and recorded a number of additional road segments throughout the Project site. Each of these features were confirmed to be present in historical imagery, available dating back to 1953 (NETR 2018). The majority of unimproved historic-era road segments within the central portion of the Project site would not be used for the Project; however, approximately 3,000 feet of two-track dirt road in the northeastern portion of the Project could be used for proposed access roads yet to be constructed. This road segment is not mapped on historical USGS maps prior to 1957 (available since 1920), and was likely primarily utilized for ranching activities in the mid-late 1900s. Road segments may be subject to improvement by the Project, as presently designed. As such, Dudek completed appropriate locational, descriptive, and photographic documentation of these historic-era road segments, focusing on those segments that appeared to have been subject to limited modern improvements. It is not anticipated that use or improvement of this road would represent an impact.

P-24-001988

P-24-001988, consists of a segment of a dirt work road initially identified in 2012. The road crosses the New Transmission Line and is a proposed Project access road. The road runs from the Basalt Quarry to the San Luis Dam and was likely built as part of the construction of the San Luis Dam. The portion of the road passing through the New Transmission Line ROW was cut into the side of several hills to accommodate the road. Dudek re-identified this segment during its recent surveys as a graded dirt-gravel road that measures approximately 20 to 25 feet in width. Use by the Project would not result in any changes to this road’s present condition.

P-24-002143

P-24-002143 was initially recorded in 2016 as a steel lattice transmission tower with concrete footings and stands 104 feet tall. It is maintained by Pacific Gas & Electric and is adjacent to the Los Banos Substation, used to service the Los Banos area. The tower was constructed in the 1960s and appears in good condition, though it is unclear what upgrades or maintenance the tower has undergone since its construction. The initial recordation of this site occurred in 2016, resulting in the finding that it was not eligible for CRHR/NRHP listing. Dudek re-identified this feature in the same condition and location as reported, and agrees with this eligibility finding. It is unclear if the Project as presently designed would affect this transmission tower, although it appears likely that the New Transmission Line segment leading to the Los Banos Substation would run very close to this feature.

P-24-002154

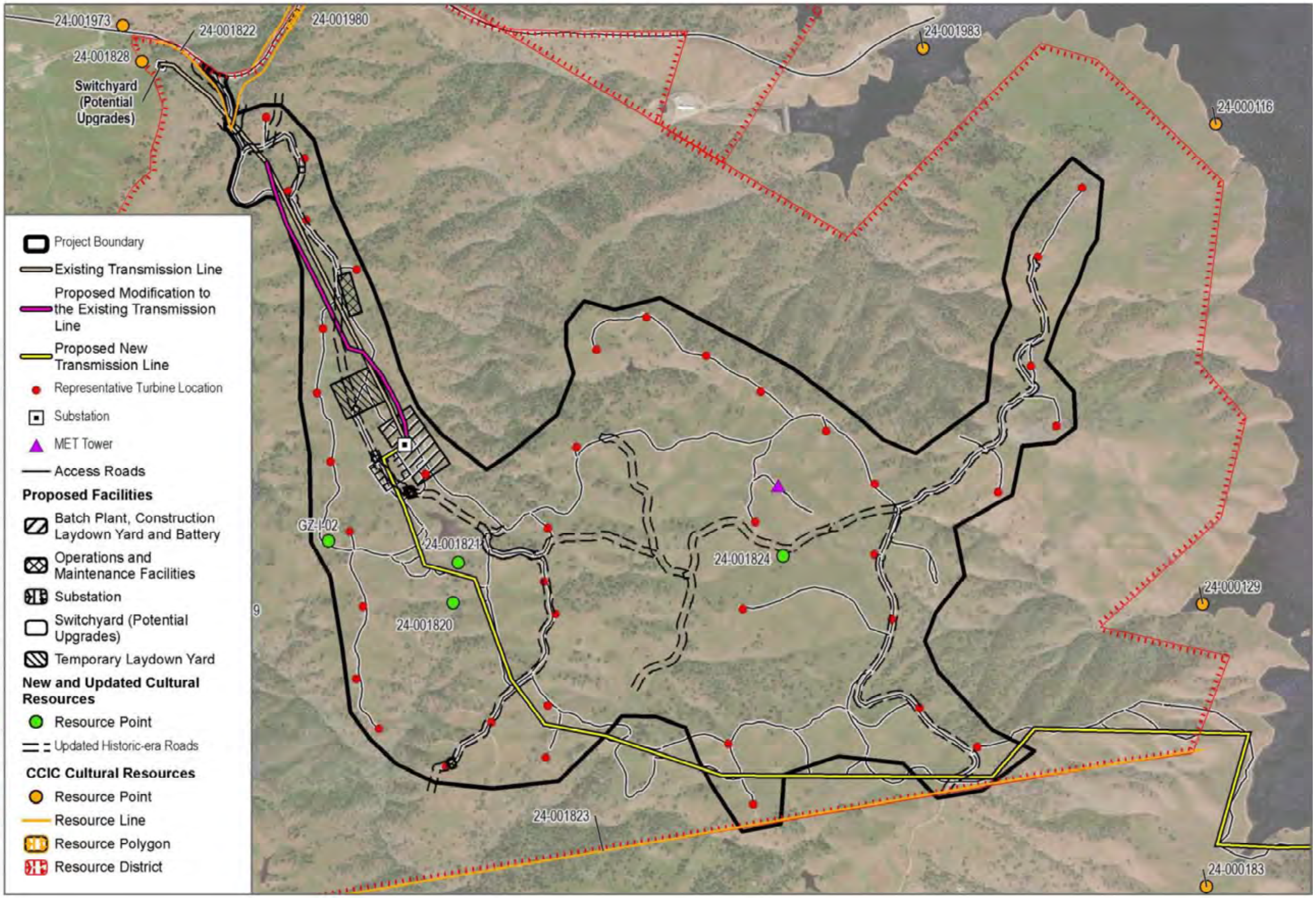
The Basalt Hill Quarry, which began operation in 1963 in order to provide construction material for the San Luis Dam. The quarry, which measures 3,900 x 2,550 feet, is divided into five terraces, and includes concrete equipment pads, a large gravity separator built into the hillside, and a triangular equipment pad. The DPR form for this resource provides the following interpretation:

> The Basalt Hill Quarry is associated directly with San Luis Unit construction (California Department of Water Resources 1974). The quarry should be considered a feature of the larger B.F. Sisk Dam and San Luis Reservoir system. The B.F. Sisk Dam has been previously recommended eligible under Criterion A as a contributing element of Central Valley and State Water Projects. If the Dam and Reservoir system is found eligible under A, then the quarry is a feature of that system and may be a contributing element as part of the evidence for typical construction methods for the 1960s elements of the CVP and SWP systems. The features present at the Basalt Hill Quarry are indicative or its use and provide indications of infrastructure placement. Most important, is Feature 3, a large (85 feet N/S by 75 feet E/W by ~80 feet tall) reinforced concrete construction, rock and aggregate size sorter/ separator built into the steep, north-facing slopes at the northern edge of the site. This feature was used to sort the large mined material from the quarry into various sizes for use in different locations and aspects of the dam construction. Material from the quarry was used for rock fill, rip-rap and bedding. The quarried material was pushed into the top of Feature 3 and was separated at the eight-inch size, with some materials crushed to manufacture bedding materials (DWR 1974:279). The smaller fraction was transported via a 3,200-foot long conveyor belt that led to the receiving feature at CA-MER-492H, where the material was picked up by trucks. The route for the conveyor line is clearly visible on aerial imagery for much of its route, only indistinct where they reach the resources…. Structurally, the quarry is not unusual or distinctive in engineering, architecture, or artistry on its own. Cedar Spring Dam and Silverwood Lake in southern CA also used a gravity separation plant when quarrying rock for construction in the 1960s (California Dept. of Water Resources 1974:328). The Basalt Hill Quarry could be a contributing element to engineering of Sisk Dam construction under Criterion C, but it was not the only source of materials used to build dam and embankment.

The quarry has not yet been revisited by Dudek; archaeological surveys of the planned staging area within this boundaries of the quarry area are pending. However, based on review of existing documentation, there are a number of existing roads and gravel terraces within the quarry. These would not likely require modification or be impacted through use for staging activities.

P-24-002164

P-24-002143 was initially recorded in 2016 as a historic road which extends south-southwest from the Pacheco Pass Road through what is now San Luis Reservoir. The road itself appears on topographic maps as early as the 1920s. The road intersects the proposed New Transmission Line route where it passes over San Luis Creek. The location of the road itself is only known from topographic maps as it is currently inundated by San Luis Reservoir (constructed in 1967). Because of this, the road could not be relocated or surveyed. The road would not be affected by the Project as presently designed.



SOURCE: USDA 2016; Scout Energy 2018; NWIC 2018

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CONFIDENTIAL

FIGURE 3A

Cultural Resources

Gonzaga Ridge Wind Repowering Project

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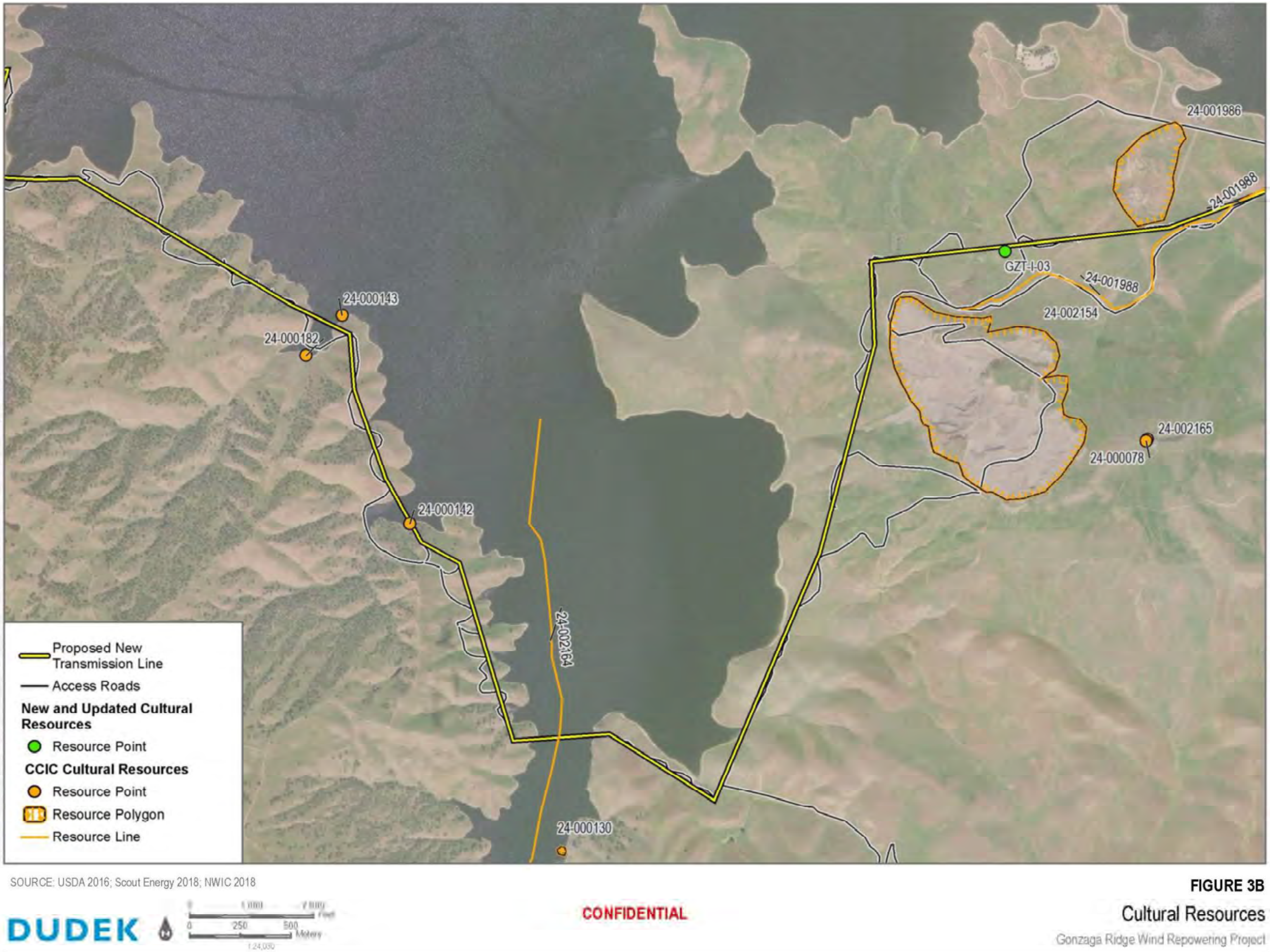
24-001986
24-001988
GZT-I-03
24-001988
24-002154
24-000143
24-000182
24-002165
24-000078
24-000142
24-002164
24-000130
Proposed New Transmission Line
Access Roads
New and Updated Cultural Resources
Resource Point
CCIC Cultural Resources
Resource Point
Resource Polygon
Resource Line
SOURCE: USDA 2016; Scout Energy 2018; NWIC 2018
DUDEK
CONFIDENTIAL
FIGURE 3B
Cultural Resources
Gonzaga Ridge Wind Repowering Project

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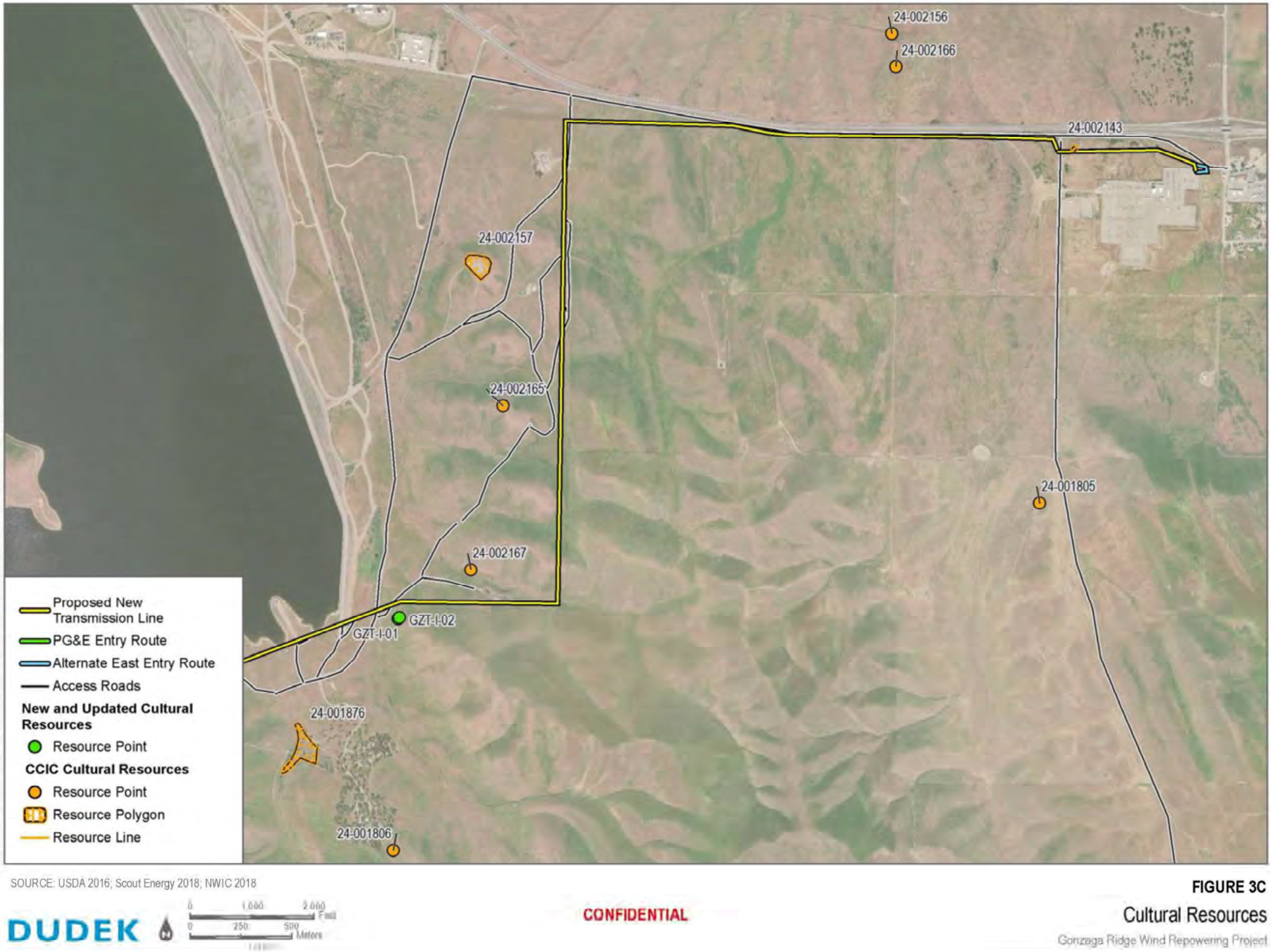
24-002156
24-002166
24-002143
24-002157
24-002165
24-001805
24-002167
GZT-I-02
GZT-I-01
24-001876
24-001806
Proposed New Transmission Line
PG&E Entry Route
Alternate East Entry Route
Access Roads
New and Updated Cultural Resources
Resource Point
CCIC Cultural Resources
Resource Point
Resource Polygon
Resource Line
SOURCE: USDA 2016; Scout Energy 2018; NWIC 2018
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CONFIDENTIAL
FIGURE 3C
Cultural Resources
Gonzaga Ridge Wind Repowering Project

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5.0 SUMMARY AND MANAGEMENT CONSIDERATIONS

Inventory efforts, including a CCaIC records search, intensive-level pedestrian survey, and NAHC SLF search, resulted in the identification of 14 archaeological resources within or adjacent to the Project Area (GZ-I-02, GZT-I-03, P-24-000142, P-24-001820, P-24-001821, P-24-001822, P-24-001823, P-24-001824, P-24-001856, P-24-001988, P-24-002143, P-24-002154, and P-24-002164). GZ-I-02 and GZT-I-03 are archaeological isolates and are not considered CRHR/NRHP-eligible or unique resources. Through consultation with CDPR staff, Valentine Lopez, of the Amah Mutsun Tribal Band indicated the area to be culturally sensitive and requested Native American monitors to be present for ground disturbing activities within 300 feet of waterways, caves, springs, and known archaeological sites.

Historical-era roads P-24-001822, P-24-001856, P-24-001988, P-24-002154, and P-24-002164 would be intersected, or otherwise used by the Project, and were previously unevaluated for CRHR/NRHP listing. P-24-001822 consists of a segment of the Pacheco Pass Highway or other historic-era road and remains unevaluated by Dudek. This road is a primary access to this portion of the Park, and now consists of a 22 foot-wide graveled and improved road. P-24-001856 consists of the historic-era San Luis Gonzaga Rancho-Paula (Pacheco) Fatjo Ranch District. All portions of the Project within the Park fall within the boundaries of this District. While many of these roads within this area would be considered a contributor to P-24-001856, most are already improved and being utilized to support maintenance of existing wind facilities. Dudek did, however, identify road segment proposed for use in the northeast portion of the Project site that remains a largely unmodified two-track roads. These road segments were subject to recordation meeting minimum California Office of Historic Preservation (OHP) Standards, using a Trimble GPS device, photographs, and other appropriate documentation required for preparation of DPR 523 series forms. Because P-24-001856 is already thoroughly documented, and CRHR/NRHP evaluation discussed, re-evaluation was not necessary in order to address continued Project use and improvements. In addition, the historic roads P-24-001988 and P-24-002164 intersect the proposed New Transmission Line route and segments will be used for Project access. These two roads, both of which are outside the P-24-001856 District boundary, have been evaluated for CRHR/NRHP listing within the present study, as detailed in the following section. P-24-002143, a PG&E Lattice tower and segment of transmission line, is adjacent to the Project transmission line, and was evaluated by K.A. Crawford in 2016 as ineligible for CRHR/NRHP-listing. P-24-000142, consisting of a prehistoric midden site, was not relocated during survey and is assumed to have been mismapped. P-24-001988, a historical road mapped on USGS maps, runs into San Luis Reservoir as it intersects the Project. P-24-002154, the Basalt Hill Quarry, intersects a proposed staging area that has not yet been surveyed. Based on review of existing documentation, use for staging would not likely impact the graded and graveled terraces

All remaining sites (P-24-001820, P-24-001821, P-24-001823, and P-24-001824), while falling within the larger power generation portion of the Project site, would be avoided by the Project as presently designed.

5.1 Review of Impacts

According to CEQA and NEPA, a project with an effect that may cause a substantial adverse change in the significance of an historical resource (historic property) is a project that may have a significant effect (adverse effect) on the environment and the cultural resource itself. A substantial adverse change in the significance of an historical resource would be constituted by physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of a historical resource would be materially impaired. Significance, under these management conditions, is to be interpreted in terms of the resource's eligibility for listing on the CRHR and/or NRHP. In order to best mitigate the effects of the Project on cultural resources, a reasonable, good faith effort must be applied to determining their archaeological character and eligibility for CRHR/NRHP listing.

As discussed above, the Project as currently designed has the potential to impact six historic-era resources (P-24-001822, P-24-001856, P-24-001988, P-24-002143, P-24-002154, and P-24-002164). P-24-001822 and identified roads within P-24-001856 consist of historic-era dirt roads in varying present states of improvement that fall within the larger San Luis Gonzaga Rancho-Paula (Pacheco) Fatjo Ranch District.. A DPR form prepared by Linda D. Bissonnette in 2006, indicates that dirt roads are considered contributing resources to the District. As continued use of these roads would not represent an effect, P-24-001822 and P-24-001856 are not re-evaluated here. Generally summarized for context relative to the pertinent significance criteria, these resources do have potential to be considered in association with District's broader themes of ranching in the region, which saw the initial period of ranching in California with Rancho San Luis Gonzaga, then the transition within the Central Valley to an economic focus on agriculture (Criterion 1/A). Mexican land grant, Rancho San Luis Gonzaga, was issued to Juan Perez Pacheco and José Maria Mejía in 1843 (Hoffman 1862, Pierce 1981). The most recent owner, Paula Fatjo, was a direct descendant of Pacheco (Criterion 2/B). The roads are not architectural (Criterion 3/C) and, beyond the attributes captured through recordation, do not have the potential to yield information locally, regionally, or nationally (Criterion 4/D). While these road segments do lend to the broader integrity of location, setting, feeling and association of the larger San Luis Gonzaga Rancho-Paula (Pacheco) Fatjo Ranch District, this contribution remains appropriately conveyed through ongoing use as access roads. Use of road Feature "A" of P-24-001822 (Dinosaur Lake Trail) and roads falling within the Project site that are associated with P-24-001856 would not have any impact on Criterion 1/A or Criterion 2/B values and, as such, continued use and/or improvements related to use for Project access would not be a significant (CCR Title 14, Section 4852(b)).

P-24-001988 and P-24-002164 are historic roads crossing the proposed New Transmission Line route and would be used for Project access. P-24-001988 is likely associated with the Basalt Hill Quarry (P-24-002154) which was established in 1963 as a source for San Luis Dam construction, as well as contributing material to B.F. Sisk Dam. In their 2016 DPR Form, Greenberg et al. observed that the larger B.F. Sisk Dam has been recommended NRHP eligible under Criterion A. The specific connection with P-24-001988 is tenuous. P-24-001988 and P-24-002164 seem to have no substantial connection to broader regional trends, particular events, people, or architectural resources. As such, of the four primary CRHR/NRHP criteria for making such eligibility recommendations, Criterion 4/D is most applicable. To be eligible for listing in the CRHR/NRHP, a site must have “yielded, or has the potential to yield, information important to the prehistory or history of the local area, California, or the nation” (Pub. Res. Code SS5024.1, Title 14 CCR, Section 4852). P-24-001822 and P-24-001856 are not substantially associated with any specific significant events locally, regionally, or nationally (Criterion 1/A); are not directly associated with the lives of any important people locally, regionally, or nationally (Criterion 2/B); do not contain architecture (Criterion 3/C); and, beyond the attributes captured through recordation, do not have the potential to yield information locally, regionally, or nationally (Criterion 4/D). Any data potential associated with historic-era roads intersecting the proposed Project has been exhausted through recordation and their continued use or improvement for Project purposes would not represent an impact. As such, P-24-001988 and P-24-002164 are not eligible for listing in the CRHR/NRHP, and impact/improvements related to use for Project access would not be a significant (CCR Title 14, Section 4852(b)).

P-24-002143 is an electrical transmission tower adjacent to the Los Banos Substation. The transmission line and towers were previously evaluated by K.A. Crawford in 2016, and found to be ineligible for CRHR/NRHP listing. Dudek agrees that the adjacent section or transmission line towers has no associated with any specific significant events locally, regionally, or nationally (Criterion 1/A); is not directly associated with the lives of any important people locally, regionally, or nationally (Criterion 2/B); does not embody a significant type of construction or the work of a master (Criterion 3/C); and, beyond the attributes captured through recordation, does not have the potential to yield information locally, regionally, or nationally (Criterion 4/D).

P-24-002154 (Basalt Hill Quarry), which began operation in 1963 in order to provide construction material for the San Luis Dam. The quarry also contributed material for construction of B.F. Sisk Dam. The quarry has not yet been revisited by Dudek, archaeological surveys of the planned staging area within this boundaries of the quarry area are pending. The quarry, which measures 3,900 x 2,550 feet, is divided into five terraces, and includes concrete equipment pads, a large gravity separator built into the hillside, and a triangular equipment pad. In their 2016 DPR Form, Greenberg et al. observed that the larger B.F. Sisk Dam has been recommended NRHP eligible under Criterion A. This interpretation could be extended such that the quarry could be considered a feature of the larger B.F. Sisk Dam and San Luis Reservoir system under Criterion A as a contributing element of Central Valley and State Water Projects. Greenberg et al. observed further observed that the Basalt Hill Quarry could be a contributing element to engineering of Sisk Dam construction under Criterion C, but that it was not the only source of materials used to build dam and embankment. Based on review of existing photographs and description of P-24-002154, there are a number of existing roads and gravel terraces within the quarry. These would not likely require modification or be impacted through use for staging activities. While P-24-002154 remains unevaluated for CRHR/NRHP listing, use for Project activities as a staging area would not represent an effect to this resource.

5.2 Recommendations

In consideration of information yielded through archaeological Inventory efforts, the Project will not impact/adversely affect any known cultural resources and is considered unlikely to encounter unanticipated cultural resources in most areas. The area has a long history of well-distributed agricultural and ranching, which is not likely to generate significant historical-era resources or features that were not observed during pedestrian survey. The potential for prehistoric resources is slightly higher, notably along drainages and nearer to the shoreline of San Luis Reservoir. While no known potentially significant prehistoric resources would be impacted as a result of the Project, Dudek is in agreement with Amah Mutsun Tribal Band recommendations for monitoring of initial ground disturbing activities within specific areas of the Project. Management provisions for unanticipated impacts to cultural resources and human remains during Project construction have been provided to follow.

5.2.1 Unanticipated Discovery of Archaeological Resources

In consideration of the fact that large portions of the Project fall within the San Luis Gonzaga Rancho-Paula (Pacheco) Fatjo Ranch District, it is recommended that prior to construction a qualified archaeologist, meeting the Secretary of the Interior's Professional Qualification Standards, review the final Project design to confirm no design refinements have occurred that may result in documented cultural resources. In addition, the topic of unanticipated cultural resources should be addressed with construction personnel prior to work. This may occur through inclusion of a cultural resources component within a Worker Environmental Awareness Program (WEAP) or other pre-construction training. Prior to construction, a cultural resources management and treatment plan should be prepared for the Project. This plan shall provide for archaeological and Native American monitoring in areas with potential to contain unanticipated cultural resources including, but not necessarily limited to, areas within 300 feet of major drainages, springs, prehistoric resources, and other features of potential importance to the Native American community. The plan will define areas required for monitoring, roles and responsibilities, resource definitions, and reporting requirements. This plan shall be reviewed and approved by CDPR and Reclamation staff prior to being considered final.

WEAP training materials and the cultural resources management and treatment plan should provide for unanticipated cultural resources in areas where monitoring is not required to occur as follows: all construction crew should be alerted to the potential to encounter sensitive archaeological material. In the event that archaeological resources (sites, features, or artifacts) are exposed during construction activities for the proposed project, all construction work occurring within 100 feet of the find shall immediately stop until a qualified archaeologist can evaluate the significance of the find and determine whether additional study is warranted. This work exclusion buffer may be adjusted by the qualified archaeologist in consultation with the lead agency. Prehistoric archaeological deposits may be indicated by the presence of discolored or dark soil, fire-affected material, the presence of imported shell, burned or complete bone, non-local lithic materials, or other characteristics observed to be atypical of the surrounding area. Common prehistoric artifacts may include modified or battered lithic materials; lithic or bone tools that appeared to have been used for chopping, drilling, or grinding; projectile points; fired clay ceramics or non-functional items; and other items. Historic-age deposits are often indicated by the presence of glass bottles and shards, ceramic material, building or domestic refuse, ferrous metal, or old features such as concrete foundations or privies. Depending upon the significance of the find under CEQA (14 CCR 15064.5(f); PRC Section 21082) and Section 106 of the NHPA, it may be appropriate that the archaeologist simply record the find and allow work to continue. Prior to any disturbing investigative techniques, the feasibility of resource avoidance should be considered. If the discovery proves significant, additional work, such testing, data recovery, or other alternatives may be warranted.

Following completion of construction, a monitoring report shall be prepared to document compliance with approved mitigation requirements. This report shall be reviewed by lead agency staff and, once final, submitted to a CHRIS information center.

5.2.2 Unanticipated Discovery of Human Remains

As previously noted, a cultural resources management and treatment plan would be prepared prior to construction. This plan would provide specific processes for the management of human remains. At a minimum, this plan shall include the following: in accordance with Section 7050.5 of the California Health and Safety Code, if human remains are found, the county coroner shall be immediately notified of the discovery. No further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent remains shall occur until the county coroner has determined, within 2 working days of notification of the discovery, the appropriate treatment and disposition of the human remains. If the county coroner determines that the remains are, or are believed to be, Native American, he or she shall notify the NAHC in Sacramento within 24 hours. In accordance with California Public Resources Code, Section 5097.98, the NAHC must immediately notify those persons it believes to be the most likely descendant from the deceased Native American. The most likely descendant shall complete his/her inspection within 48 hours of being granted access to the site. The designated Native American representative would then determine, in consultation with the property owner, the disposition of the human remains.

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APPENDIX A (Confidential)

Central California Information Center Records Search Information

APPENDIX B

Native American Heritage Commission Sacred Lands File Search

APPENDIX C (Confidential)

Map and DPR Forms for Newly Recorded and Previously Recorded Sites

APPENDIX C

Phase 1 ESA

APPENDIX D

Hydrology Report

HYDROLOGY AND WATER QUALITY TECHNICAL REPORT
for the
Gonzaga Ridge Wind Repowering Project
Merced County, California

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APPENDICES

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ACRONYMS AND ABBREVIATIONS

Acronym/Abbreviation	Definition
amsl	above mean sea level
Basin Plan	Water Quality Control Plan
BMP	best management practice
CEQA	California Environmental Quality Act
County	Merced County
DWR	Department of Water Resources
FIRM	Federal Emergency Management Agency
GIS	geographic information system
HA	hydrologic area
LID	Low Impact Development
NRCS	Natural Resources Conservation Service
O&M	operations and maintenance
project	Gonzaga Ridge Wind Repowering Project
study	Hydrology and Water Quality Technical Report
SWPPP	stormwater pollution prevention plan
USGS	U.S. Geological Survey
WinTR-55	WinTR-55 Watershed Hydrology
WQO	water quality objective

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1 INTRODUCTION

1.1 Scope and Purpose

This Hydrology and Water Quality Technical Report (study) was prepared for the Gonzaga Ridge Wind Repowering Project (Project) in support of the environmental review conducted for the Project in accordance with the California Environmental Quality Act (CEQA). The purpose of this study is to identify potential hydrology and water quality impacts from the Project and to recommend feasible and appropriate best management practices (BMPs) that can mitigate potential short- and long-term hydrology and water quality impacts. Specifically, the following hydrology and water quality components were evaluated in this study:

- A comparison of the existing versus proposed Project site peak runoff rates and volumes for the 2-, 5-, and 25-year 24-hour storm events using the U.S. Department of Agriculture Natural Resources Conservation Service (NRCS) WinTR-55 Watershed Hydrology (WinTR-55) methodology as recommended in the Merced County (County) Storm Drainage Design Manual (County of Merced 2016)
- An evaluation of the Project's impact on flood hazards using the Flood Insurance Rate Maps (FIRMs) and Special Flood Hazard Areas mapped by the Federal Emergency Management Agency, and a study conducted in the Central Valley by the U.S. Army Corps of Engineers (ACOE 2002)
- A synthesis and evaluation of water quality impacts using standards and criteria contained in the Water Quality Control Plan (Basin Plan) for the Central Valley Region (Central Valley RWQCB 2018), and the post-construction requirements of the statewide General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (SWRCB 2012)

Construction and post-construction hydrology and water quality criteria established for regulated projects in the County pursuant to stormwater ordinance (No. 1923) were used for determining potential Project impacts to the local and downstream water resources. In addition, the Project is evaluated in the context of water quality standards contained in the Basin Plan for the Central Valley Region (Central Valley RWQCB 2018). The tools used to evaluate existing conditions and anticipated project impacts are ArcGIS (to delineate contributing watershed conditions) and WinTR-55 (USDA 2009) (to develop runoff hydrographs for the 2-, 5-, and 25-year 24-hour rainfall events).

This study is based on Project plans and specifications that are not approved for construction purposes. As such, contractors shall refer to the final approved construction documents, which will be developed as the Project plans are finalized. Because preliminary construction plans were used for the hydrologic calculations, this study provides an estimate of the hydrologic conditions that are likely to exist at the Project location following construction completion (lease area portion of Pacheco State Park where the wind turbines and other facilities would be located). Lastly, analysis of the Project's generator tie-in or transmission line (gen-tie line) connecting to the San Luis Substation was not included in this study, because the required infrastructure is minimal and the accompanying access roads would be designed and maintained in a manner to minimize erosion/sedimentation to receiving water bodies (see Section 5).

1.2 Project Location

The Project is located in the southwest portion of unincorporated Merced County, in central California, as shown on Figure 1-1, Project Vicinity. The Project site is within Pacheco State Park. The Project site is located approximately 10 miles west of the community of Volta, approximately 17 miles northeast of the City of Hollister, approximately 18 miles west of the City of Los Banos, and less than 1 mile west of the San Luis Reservoir and the O'Neill Forebay. Other communities within the vicinity include Ingomar, Gustine, and Gilroy, which are roughly 14 miles northeast, 16 miles northeast, and 18 miles west of the Project site, respectively.

The Project is located on a ridge south of Pacheco Pass in the eastern foothills of the Diablo Range. The Project site is mountainous with ephemeral drainages that feed into the San Luis Reservoir to the east. This portion of Pacheco State Park is primarily undeveloped land with a large area that has been used for wind turbines since the mid-1980s and was historically used for grazing and dry agriculture. The Project site generally slopes from north to south with elevations ranging from approximately 1,520 feet above mean sea level (amsl) on the ridge in the center of the site, to approximately 1,020 feet amsl at the bottom of one of the ephemeral drainages in the southwest part of the site.

The Project site lies in the Pacheco Pass U.S. Geological Survey (USGS) 7.5-minute quadrangle, Section 32, Township 10 South, Range 7 East, Mount Diablo Base and Meridian. Figure 1-2, Project Site, depicts the Project boundaries.

1.3 Project Description and Activity

The Project consists of replacing the 16.5-megawatt (MW) wind energy facility with a wind energy facility with associated infrastructure necessary to generate up to 100 MW. The Project would remove approximately 160 wind turbines and replace them with up to 40 new turbines. The Project site includes approximately 1,630 acres of leased land and 600 acres of additional private lands for construction and operation of gen-tie or transmission lines connecting to the San Luis Substation (Figure 1-2). The Project would include approximately 100 acres for wind turbine and pad areas, 5 acres for the on-site collector substation, 24 acres of new access roads and 17 acres of improved existing access roads (unpaved, but compacted), up to 8.4 acres for meteorological towers, and a 5-acre operations and maintenance (O&M) yard, which includes a 5,000-square-foot building (with accompanying parking area). An underground and overhead electrical collector system would also be constructed. The overhead collector system would be up to five miles in length resulting in up to 3 acres of wind corridor, cleared of large vegetation, where it does not parallel access roads. The maximum pole height would be 90 feet. The underground collector system would be up to a 16 mile corridor, resulting in up to 9.7 acres where it does not parallel the road. An approximately 14-mile overhead 70 kilovolt gen-tie or transmission line would connect the Project's collector substation to the Los Banos Substation, which is owned and operated by Pacific Gas and Electric Company.

The turbine towers would be mounted on a permanent concrete foundation. The turbine models are still being considered; however, none would exceed 500 feet above ground level at the top of the blade. The base would be approximately 50–80 feet in diameter. A 30-foot by 50-foot gravel driveway would be placed around the base of the foundation.

Some grading would be necessary for the construction of the turbines and on-site access roads. Site topography and soil infiltration would be maintained through minimum-impact grading during the installation of the turbines, which includes minimizing grading and implementing only clearing/mowing where possible. New access roads would be designed to follow natural contours, avoiding hill cuts. Existing damaged or undersized culverts would be replaced with properly sized culverts, and BMPs would be implemented to ensure all site stormwater features (e.g., culverts and ditches) remain clear of debris and function properly (see Section 5).

Long-term operation of the Gonzaga Ridge Wind facility anticipates up to eight full-time employees during normal workday hours (i.e., 8:00 a.m.–5:00 p.m., Monday through Friday). Standard O&M activities would include evaluation of on-site storm management infrastructure (e.g., culverts and drainage ditches) and additional erosion control measures. Water and wastewater services would be provided by off-site entities, with portable toiletsprovided during construction activities with a septic system to provide wastewater services once the Project is operational.

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2 GEOGRAPHIC SETTING

This section describes the Project's local and regional geographic characteristics related to hydrology and water quality.

2.1 Surface Water Hydrology

Based on regional watersheds defined by the Central Valley Regional Water Quality Control Board, the Project site falls within the Grasslands Subarea, part of the Lower San Joaquin River Watershed. This subarea is bounded to the west by the Coastal Range and to the east by the Lower San Joaquin River between the Mendota Dam and the confluence of the Merced River (Central Valley RWQCB 2018). Watershed boundaries are further subdivided into hydrologic units, which are partitioned into hydrologic areas (HAs). The Project site is located within the Pacheco Pass HA.

The information presented in Table 2-1 was obtained from the 2004 California Interagency Watershed Map (Calwater 2004). The watersheds defined in this database are used as a way to identify beneficial uses and associated water quality objectives (WQOs) in the Central Valley Region Basin Plan (Central Valley RWQCB 2018). It should be noted that the HA identified herein contains a broad area with numerous subwatersheds, and is not the same (or as detailed) as watershed designations by the USGS Watershed Boundary Dataset or the project-specific (i.e., fine-scale) watersheds, which are described in Section 3.1.1.

Figure 2-1, Regional Hydrologic Setting, shows the location of the Project site with reference to the Pacheco Pass HA. A comparison of the Project site with respect to the acreage of the Pacheco Pass HA is presented in Table 2-1. The Project site consists of approximately 1.8% of the area encompassed by the Pacheco Pass HA.

Table 2-1
Project Contribution to Hydrologic Area

Hydrologic Area	Area (Acres)	Approximate Proposed Project Site Area (Acres)	Estimated Project Contribution (%)
Pacheco Pass (542.30)	89,530	1,630	1.82

Source: Calwater 2004.

Surface flows in the Project site are primarily ephemeral, present only in direct response to precipitation. There are a number of stock watering ponds throughout the site, two of which are perennial throughout the year (Mammoth Lake and Wolf Lake) (CSP 2006). The average annual rainfall totals for the weather stations located approximately 16 miles (California Irrigation Management Information System Station No. 126) west and 42 miles (City of Merced National

Weather Service Station) east of the Project site are 11.3 and 10.9 inches, respectively. At both stations, over 9 inches of rain falls between the months of October and March, typical for this region that is dependent on a winter precipitation regime. The remaining 6 months (April through September) receive on average less than 2 inches of rainfall, with the months between June and August being the driest.

The Project site is located approximately 0.5 miles east of the San Luis Reservoir. All of the Project site drains into San Luis Reservoir in one of two ways, either directly from the ephemeral channels on the northern and eastern edges of the site or by the ephemeral creeks through the center of the site to the intermittent Salt Creek south of the site. Salt Creek flows into San Luis Creek and then to San Luis Reservoir. San Luis Reservoir is primarily supplied by water from the San Joaquin Delta via the California Aqueduct and Delta-Mendota Canals. It is pumped into the reservoir from the O'Neill Forebay during the winter and spring. San Luis Reservoir discharges into the O'Neill Forebay, as well. Most of the water is utilized for the Central Valley Project and California State Water Project; however, the San Luis Wasteway and the Pacheco Pumping Station receive some of the water as well. The San Luis Wasteway discharges to Los Banos Creek, which discharges to Mud Slough and then the San Joaquin River.

The Pacheco Pumping station is located on the western end of San Luis Reservoir and delivers water to the Pacheco Conduit. The Pacheco Conduit carries the water west of the ridgeline to a bifurcation that splits that water between the Hollister Conduit and the Santa Clara Conduit. The Hollister Conduit extends to the Hollister Pumping Plant and then a second reach of the Hollister Conduit which then terminates at the San Justo Reservoir. The San Justo Reservoir is for off-stream water storage. The Santa Clara Conduit extends to the Santa Clara Pumping Plant, which pumps water through the Santa Clara Tunnel to the second reach of Santa Clara Conduit. From there, it is delivered to Coyote Pumping Plant at the base of Anderson Dam and Reservoir. The water from the plant is then discharged to Coyote Creek for recharge or sent to water treatment plants. Coyote Creek discharges to San Francisco Bay.

2.2 Floodplain

The entire Project site falls within Zone D of the Federal Emergency Management Agency FIRM panels 06047C0775G (FEMA 2008). Zone D is used to identify regions that have not been mapped. A separate floodplain analysis conducted by the U.S. Army Corps of Engineers for the Central Valley Region (ACOE 2002) also does not have the Project site mapped. The absence of mapping in this region does not preclude the possibility for flooding in the Project site, but the positioning of Project infrastructure along the ridges does.

2.3 Groundwater

A groundwater basin is defined by the California Department of Water Resources (DWR) as a hydrogeologic unit containing one large aquifer, or a series of stacked aquifers, with definitive lateral and horizontal boundaries (DWR 2003). A portion of the eastern development area of the Project site is located at the western end of the San Joaquin Valley – Delta–Mendota Sub-Basin (DWR Basin No. 5-22.07). As defined by DWR, this sub-basin covers an estimated 747,000 acres, and is bounded to the west by the Tertiary and older marine sediments of the Coast Ranges and on the north by the Stanislaus/San Joaquin County line. The sub-basin is bounded to the east by the San Joaquin River and the eastern boundary of Columbia Canal Company, the Chowchilla Bypass, and the eastern border of Farmer's Water District on the southern end. This sub-basin is bounded to the south by the northern end of the Westside Groundwater Basin, which corresponds with the Westlands Water District (DWR 2006). The groundwater in this sub-basin is provided in three zones: a freshwater zone confined in a lower section of the Tulare Formation; an upper confined, semi-confined, and unconfined zone in the upper zone of the Tulare formation; and a shallow unconfined zone. The general groundwater flow direction in this basin is north and east toward the San Joaquin River (DWR 2006).

The Project site itself sits above the Central Valley floor and has minimal connection to the San Joaquin Valley – Delta-Mendota Sub-Basin (which primarily consists of percolation from the San Luis Reservoir). Groundwater within the Project site has been identified within the fractured bedrock that feeds two springs (one approximately 850 feet south of Mammoth Lake, and one identified as the Windmill Spring on the USGS 7.5-minute quadrangle) and one active well that currently supports O&M activities for the existing wind energy operations (CSP 2006). One active well is located in the northwestern part of the Project site; however, there is no data from the well. One inactive well is also present at the northern point of the site. The DWR has multiple well completion records in the vicinity of the site; however, only one record had an identifiable location and depth to water. This well was located north of the Project site and approximately 0.5 miles west of San Luis Reservoir. The depth to water was recorded at 15 feet and the elevation of the well was approximately 620 feet amsl, and the recorded well discharge was estimated at 60 gallons per minute. For reference, the surface water elevation of San Luis Reservoir is around 550 feet amsl, and the lowest point within the Project site is around 1,020 feet amsl. Based on the available information, depth to groundwater within the site is anticipated to be greater than 100 feet below ground surface (particularly along the ridges where the turbine installations are proposed), and the hydraulic gradient is towards the east (towards San Luis Reservoir). What groundwater recharge may take place on the site would most likely occur where surface water makes contact with fractured bedrock or through channel transmission during periods of flow in the ephemeral channels.

2.4 Water Quality

Beneficial uses and WQOs, as defined in the Central Valley Regional Water Quality Control Board Basin Plan (Central Valley RWQCB 2018) and the San Francisco Bay Regional Water Quality Control Board Basin Plan (San Francisco Bay RWQCB 2017), have been designated for waters downstream of the Project site. The Basin Plan designates beneficial uses, establishes WQOs, and contains implementation programs and policies to preserve the beneficial uses for all waters identified in the plan (California Water Code, Sections 13240–13247). The Basin Plan provides quantitative and narrative criteria for a range of water quality constituents applicable to certain receiving water bodies and groundwater basins within the Central Valley Region and the San Francisco Bay Basin. Specific criteria are provided for the larger designated water bodies within the region, as well as general criteria or guidelines for surface and groundwater. In general, the narrative criteria require that degradation of water quality not occur due to increases in pollutant loads that will adversely affect the designated beneficial uses of a water body. The primary water body of concern for the Project is the San Luis Reservoir located approximately 0.5 miles east of the property boundary. Coyote Creek, which is part of the San Francisco Bay Basin, is included in this analysis because it receives water from the reservoir through the Pacheco Pumping Plant. The Delta Mendota Canal and the California Aqueduct receive the majority of water in the San Luis Wasteway. However, the San Luis Wasteway receives some water as a spillway, in the event of an emergency for safety and damage prevention.

The beneficial uses assigned to each water body in the Basin Plan are shown in Table 2-2 and are defined in the Basin Plan as follows:

- **Municipal and Domestic Supply (MUN) –** Beneficial uses of waters used for community, military, or individual water supply systems, including, but not limited to, drinking water supply.
- **Agricultural Supply (AGR) –** Beneficial uses of waters used for farming, horticulture, or ranching, including, but not limited to, irrigation, stock watering, and support of vegetation for range grazing.
- **Industrial Process Supply (PRO) –** Beneficial uses of waters used for industrial activities that depend primarily on water quality.
- **Industrial Service Supply (IND) –** Beneficial uses of waters used for industrial activities that do not depend primarily on water quality including, but not limited to, mining, cooling water supply, geothermal energy production, hydraulic conveyance, gravel washing, fire protection, or oil well re-pressurization.
- **Hydropower Generation (POW) –** Beneficial uses of water used for hydropower generation.

- **Contact Water Recreation (REC-1) –** Beneficial uses of waters used for recreational activities involving body contact with water where ingestion of water is reasonably possible. These uses include, but are not limited to, swimming, wading, water-skiing, skin and SCUBA diving, surfing, whitewater activities, fishing, and use of natural hot springs.
- **Non-Contact Water Recreation (REC-2) –** Beneficial uses of waters used for recreational activities involving proximity to water, but not normally involving body contact with water where ingestion of water is reasonably possible. These uses include, but are not limited to, picnicking, sunbathing, hiking, beachcombing, camping, boating, tidepool and marine life study, hunting, sightseeing, and aesthetic enjoyment in conjunction with the above activities.
- **Commercial and Sport Fishing (COMM) –** Uses of water for commercial or recreational collection of fish, shellfish, or other organisms, including, but not limited to, uses involving organisms intended for human consumption or bait purposes.
- **Warm Freshwater Habitat (WARM) –** Beneficial uses of waters that support warm water ecosystems, including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates.
- **Cold Freshwater Habitat (COLD) –** Beneficial uses of waters that support cold water ecosystems, including, but not limited to, preservation and enhancement of aquatic habitats, vegetation, fish, and wildlife, including invertebrates.
- **Migration of Aquatic Organisms (MIGR) –** Beneficial uses of water used for supporting habitats necessary for migration or other temporary activities by aquatic organisms such as anadromous fish.
- **Spawning, Reproduction, and/or Early Development (SPWN) –** Beneficial uses of water that support high-quality aquatic habitats suitable for reproduction and early development of fish.
- **Wildlife Habitat (WILD) –** Beneficial uses of waters that support wildlife habitat including, but not limited to, the preservation and enhancement of vegetation and prey species used by wildlife such as waterfowl.
- **Shellfish Harvesting (SHELL) –** Beneficial uses of water that supports habitats suitable for the collection of filter-feeding shellfish (e.g., clams, oysters, and mussels) for human consumption, commercial, or sports purposes.
- **Groundwater Recharge (GWR) –** Uses of water for natural or artificial recharge of groundwater for purposes of future extraction, maintenance of water quality, or halting saltwater intrusion into freshwater aquifers.

- **Navigation (NAV) –** Beneficial uses of water for shipping, travel, or other transportation by private, military, or commercial vessels.

Any water bodies identified in Section 2.1, but not in Table 2-2 have the designation MUN. The California Aqueduct and the groundwater basin share similar beneficial uses for municipal, agricultural, and industrial water supply. Recreation and wildlife habitat is a consistent beneficial use between the surface water bodies within the Project site. The San Luis Reservoir and the California Aqueduct provide industrial service supply and hydropower generation. The California Aqueduct is the only surface water that is not of beneficial use to warm freshwater habitat. Coyote Creek differs from the other water bodies in that it is not of beneficial use for municipal or agricultural use but provides many beneficial uses for habitats and ecosystem support.

In addition to beneficial uses, specific water bodies downstream from the Project site have also been included on a list of impaired water bodies according to the 2014/2016 Integrated Report (Clean Water Act Section 303(d) List/305(b) Report) published by the State Water Resources Control Board (SWRCB 2017). While the majority of water from San Luis Reservoir will be used for Central Valley Project and State Water Project, some of the water will be discharged through the San Luis Wasteway and the Pacheco Conduit; all potential receiving water bodies and their associated impairments are provided in Table 2-3.

Table 2-2
Beneficial Uses for Surface Water and Groundwater

Surface Water and Groundwater Body	Hydrologic Unit Basin Number	Beneficial Use															
		MUN	*AGR*	*PROC*	*IND*	*POW*	*REC-1*	*REC-2*	*COMM*	*WARM*	*COLD*	*MIGR*	*SPWN*	*WILD*	*SHELL*	*GWR*	*NAV*
Groundwater Basin																	
San Joaquin Valley – Delta-Mendota Groundwater Basin	5-22.07	●	●	●	●												
Surface Water Bodies																	
San Luis Reservoir	542.32	●	●		●	●	●	●		●				●			
O'Neill Reservoir	541.2	●	●				●	●		●				●			
California Aqueduct	541/543	●	●	●	●	●	●	●						●			
Delta–Mendota Canal	541/543	●	●				●	●		●				●			
Coyote Creek	205.3/205.4						●	●	●	●	●	●	●	●	●	●	

Source: Central Valley Region RWQCB 2018.
Notes: MUN = Municipal and Domestic Supply; AGR = Agricultural Supply; PROC = Industrial Process Supply; IND = Industrial Service Supply; POW = Hydropower Generation; REC-1 = Water-Contact Recreation; REC-2 = Noncontact Water Recreation; COMM = Commercial and Sport Fishing; WARM = Warm Freshwater Habitat; COLD = Cold Freshwater Habitat; MIGR = Migration of Aquatic Organisms; SPWN = Spawning, Reproduction, and/or Early Development; WILD = Wildlife Habitat; SHELL = Shellfish Harvesting; GWR = Groundwater Recharge; NAV = Navigation; HU = hydrologic unit; ● = existing beneficial uses; HA = hydrologic area.

Table 2-3
Clean Water Act Section 303(d) Water Bodies – 2014–2016 303(d) List of Water Quality Segments

Receiving Water Bodies	Listed 303(d) Pollutants	TMDL(s)
Pacheco Pass Basin		
Salt Creek	None	No TMDLs listed
San Luis Creek	None	No TMDLs listed
San Luis Reservoir	Mercury Total DDT PCBs Chlordane	TMDL still required for all
Los Banos Basin		
O'Neill Forebay	Mercury PCBs	TMDL still required for all
San Luis Wasteway	None	No TMDLs listed
Los Banos Creek	Oxygen Indicator Bacteria Toxicity Total Dissolved Solids	TMDL still required for all
Mud Slough, North (downstream of San Luis Drain)	Boron Electrical Conductivity Selenium Toxicity	San Joaquin River Selenium (March 28, 2002) TMDL still required for remainder
Coyote Creek and Guadalupe River Basin		
Coyote Creek	Diazinon Trash Toxicity	Diazinon – Being addressed by USEPA approved TMDL Trash – Being addressed by action other than a TMDL Toxicity - TMDL still required
San Joaquin and Sacramento Basin		
1. San Joaquin River (Mud Slough to Merced River) 2. San Joaquin River (Merced River to Tuolumne River) 3. San Joaquin River (Tuolumne River to Stanislaus River) 4. San Joaquin River (Stanislaus River to Delta Boundary) 5. Delta Waterways (Southern Portion) 6. Delta Waterways (Central Portion) 7. Delta Waterways (Western Portion) 8. Delta Waterways (Export Area) 9. Sacramento San Joaquin Delta 10. San Francisco Bay (Suisun Bay)	Boron[b] Chlorpyrifos[a] DDT[a] Diazinon[a] Exotic Species Group A Pesticides[a] Mercury[a] Pesticides[a] Sedimentation/Siltation[c] Selenium[b] Specific Conductivity[c] Unknown Toxicity Arsenic[b] Electrical Conductivity[c]	San Joaquin River Diazinon[a] and Chloropyrifos[a] (December 20, 2006) Lower San Joaquin River Salt and Boron[b] (February 8, 2007) Sacramento – San Joaquin Delta Estuary TMDL for Methylmercury[a] (October 20, 2011) Sacramento-San Joaquin Delta Waterways And Tributaries Diazinon[a] And Chlorpyrifos[a] TMDL (October 10, 2007) San Francisco Bay Mercury[a] TMDL (February 12, 2008) San Francisco Bay PCBs[a] TMDL (March 29, 2010)

Table 2-3
Clean Water Act Section 303(d) Water Bodies – 2014–2016 303(d) List of Water Quality Segments

Receiving Water Bodies	Listed 303(d) Pollutants	TMDL(s)
11. San Francisco Bay (Carquinez Strait) 12. San Francisco Bay (San Pablo Bay) 13. San Francisco Bay (Central) 14. San Francisco Bay (South)	Escherichia coli (E Coli) Temperature, water[c] DDE[a] Diuron[a] Toxaphene[a] Invasive and Invasive/Exotic Species Chlordane[a] Dieldrin[a] Dioxin Compounds[a] Furan Compounds[a] PCBs – Dioxin-like[a] PCBs[a] Nickel[b] Trash	Selenium[b] in North San Francisco Bay TMDL (August 23, 2016)

CWA = Clean Water Act; TMDL = total maximum daily load.
[a] Pollutants associated with pesticides, insecticides, herbicides.
[b] Pollutants associated with fertilizers.
[c] Basic water quality impairments associated with higher concentrations of salts and suspended solids.

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3 GONZAGA RIDGE WIND – HYDROLOGY

The Project site hydrology was assessed following protocols established in the County Storm Drainage Design Manual (County of Merced 2016). This methodology was used to characterize potential Project impacts to hydrology and water quality resources as they relate to surface waters (i.e., modifying natural drainage patterns, increasing flooding, accelerating erosion, and degrading water quality). Hydrology study methods are provided in detail in Section 3.1, followed by a comparison of results for the existing and post-Project conditions.

3.1 Hydrology Study – Methods

To estimate potential Project impacts related to surface flows, peak discharge from the 2-year, 5-year, and 25-year 24-hour rainfall events were calculated for the Project site using the WinTR-55 Watershed Hydrology model published by the NRCS,[1] as directed by the County's Storm Drainage Design Manual (County of Merced 2016). WinTR-55 is a single-event rainfall-runoff small watershed computer model with Microsoft Visual Basic Guided User Interface for calculating storm runoff volume, peak rate of discharge, and storage volumes for stormwater management structures. Minimum data requirements include Project location, storm intensity and distribution, land use, and stream geometry. Following the WinTR-55 User Guide (USDA 2009), the discharge rate for a given rainfall event is calculated using the curve number method from the NRCS. An additional analysis was conducted using the WinTR-55 model to determine whether the 85th percentile storm would produce runoff that may require stormwater retention and treatment Low Impact Development (LID) measures per County stormwater ordinance (No. 1923) standards.

While results derived from this analysis likely exaggerate the volume and peak discharge for rainfall events in this region,[2] this method is still an accurate tool for assessing Project impacts to hydrology relative to existing and post-Project conditions (e.g., percent increase/decrease in peak discharge). The data necessary for completing this analysis includes elevation, watershed area/shape and flow paths, soils, land use, and design storm rainfall hyetograph (i.e., a graph plotting rainfall depth over time). The development of the hydrology model components for each watershed is provided in Sections 3.1.1 through 3.1.4.

1 https://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/water/?cid=stelprdb1042901.
2 The unit hydrograph method does not include flow attenuation via transmission losses and/or evaporation, which are key components to the hydrology of this region.

3.1.1 Existing Topography

Topographic data were derived from a USGS 1/3 arc-second (10-meter) Digital Elevation Model (USGS 2017). The position of the Project site along a series of ridges within the Pacheco Pass region precludes surface flows from entering the site from adjacent areas. The highest point in the Project site, at approximately 1,520 feet amsl, falls along the main ridge within the center of the Project site. The lowest point of the Project site, at approximately 1,020 feet amsl, is located along an ephemeral drainage at the southwestern corner of the Project site. The typical range of slopes within this area fall between 5% and 30%. There is no general aspect within the Project site as the ridges trend both east–west and north–south, but all surface flows generated from the Project site ultimately end up in the San Luis Reservoir less than 1 mile east of the Project site boundary. The existing topography of the Project site and its surroundings is presented on Figure 3-1, Existing Conditions.

Project Watershed Delineation

The Project site was subdivided into individual watersheds using ArcHydro geographic information system (GIS) analyses on the 1/3 arc-second (10-meter) USGS Digital Elevation Model (USGS 2013) (Figure 3-1). Six individual watersheds were identified that collect runoff generated from the Project site boundary and discharge to the San Luis Reservoir at different points, outlined as follows.

Watershed – 1

A 324-acre watershed located at the northwestern corner of the study area contains 33 acres (2%) of the Project site. This watershed was delineated from a point approximately 0.5 miles upstream from the San Luis Reservoir, and approximately 0.6 miles downstream from the Project site boundary. Sections of Dinosaur Point Road and the entrance to the Project site are included in this watershed, but the watershed is primarily dominated by grasslands, mixed forest, and shrubs (Figure 3-1). Two turbines and additional access roads have been proposed in this watershed (Figure 3-2).

Watershed – 2

A 306-acre watershed located at the northeastern corner of the study area contains 33 acres (2%) of the Project site. This watershed boundary captures the east-facing slope along the Project's eastern ridge (which trends north/south) and lacks a singular drainage feature that captures all surface runoff; rather, three smaller drainages discharge directly into the San Luis Reservoir from this watershed. Three watersheds were delineated from where these smaller drainages discharge to the reservoir and were combined for this analysis. The watershed is undeveloped and consists of grasslands, mixed forest, and shrubs (Figure 3-1). Three turbines and additional access roads have been proposed in this watershed (Figure 3-2).

Watershed – 3

A 1,748-acre watershed located along the northern edge of the study area contains 393 acres (24%) of the Project site. This watershed was delineated from a point just downstream from where flows generated along the north-facing slope coalesce below Dinosaur Point (within a bay of the reservoir; Figure 3-1). There are 34 existing turbines and accompanying access roads within this watershed, which is dominated by grasslands, mixed forest, and shrubs. The Project proposes removing all of the existing turbines in this area and installing six new turbines and placing the O&M facilities along the eastern border of this watershed (Figure 3-2).

Watershed – 4

A 393-acre watershed located along the eastern edge of the study area contains 127 acres (8%) of the Project site. This watershed was delineated from where the main drainage in this basin discharges into the San Luis Reservoir (Figure 3-1). There are 22 existing turbines and accompanying access roads within this watershed, which is dominated by grasslands, mixed forest, and shrubs. The Project proposes replacing the existing turbines with three new turbines (Figure 3-2).

Watershed – 5

This 2,838-acre watershed comprises the majority of the Project site (1,031 acres – 63%), and is situated along its southern and western slopes of the study area, which drains into Salt Creek. This watershed was delineated from a point along Salt Creek above the confluence with San Luis Creek, approximately 4 miles upstream from where San Luis Creek discharges to San Luis Reservoir. The watershed is dominated by grasslands, mixed forest, and shrubs. Currently within this watershed there are 110 turbines, 3.6 miles of access roads, and the O&M facilities (including the site's substation; Figure 3-1). The Project proposes replacing the existing turbines with 26 new turbines, removing the existing O&M facilities, and establishing a new substation at the southeastern corner of the watershed (Figure 3-2).

Watershed – 6

An 878-acre watershed located at the southeastern corner of the study area contains 14 acres (<1%) of the Project site. This watershed captures a small section of surface flows generated from the Project site just south of Watershed 4 and is dominated by grasslands, mixed forest, and shrubs (Figure 3-1). The Project's preliminary plan does not include any modifications in this watershed (Figure 3-2).

3.1.2 Hydrologic Soil Groups and Land Cover

The two components required for developing a basin's curve number are the spatial distribution of the basin's soils and land cover. Given the amount of acreage of each land use/hydrologic soil group configuration, WinTR-55 calculates an arithmetically weighted curve number for each subwatershed.

Soils are classified by the U.S. Department of Agriculture NRCS (USDA 2017) into four Hydrologic Soil Groups based on the soil's runoff potential. The four Hydrologic Soil Groups are A, B, C, and D, where Group A generally has the smallest runoff potential and Group D the greatest. The Hydrologic Soil Groups are defined as follows:

- **Group A.** Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well-drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.
- **Group B.** Soils having a moderate infiltration rate when thoroughly wet. These consist primarily of moderately deep or deep, moderately well-drained, or well-drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.
- **Group C.** Soils having a slow infiltration rate when thoroughly wet. These consist mostly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.
- **Group D.** Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist largely of clays that have a high shrink–swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

Existing soils data for the project watersheds were downloaded from the NRCS Web Soil Survey online platform[3] for the Project area as a GIS shapefile.

The Project is anticipated to impact existing soils with the installation of the new turbines (anticipated 5-acre operational area around each turbine during installation), the proposed O&M facility and substation (8 acres), and the improvement of existing access roads (up to 7 miles) and grading of new ones (up to 10 miles). The extent and location of cut and fill activity within the Project site will not be determined until engineering for construction has been undertaken. For this

[3] https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm.

study, Project components identified in the preliminary site design (Figure 3-2) were used for estimating shifts between existing and post-Project soil hydrologic properties (Table 3-1).

Table 3-1
Soil Hydrologic Groups (Percentage)

Project Watershed	C Soil		D Soil	
	Existing	*Post-Project*	*Existing*	*Post-Project*
Watershed 1	42.5%	41.0%	57.5%	59.0%
Watershed 2	61.2%	56.4%	38.8%	43.6%
Watershed 3	48.9%	47.8%	51.1%	52.2%
Watershed 4	50.7%	50.7%	49.3%	49.3%
Watershed 5	26.9%	26.7%	73.1%	73.3%
Watershed 6	42.5%	42.5%	57.5%	57.5%

Source: USDA 2017.

The land uses for each Project watershed were characterized using the 2011 National Land Cover Database (NLCD 2011a) in ArcGIS. These land cover classifications were then converted to match the cover descriptions available in WinTR-55. National Land Cover Database land uses for the Project watersheds included Developed, Mixed Forest, Shrub/Scrub, Grassland/Herbaceous and Emergent Herbaceous Wetlands, Barren Land (Rock/Sand/Clay), and Open Water (Figures 3-1 and 3-2). These were reassigned to the WinTR-55 cover descriptions of gravel road, arid oak–aspen (good), arid sagebrush (good), arid herbaceous (good), and arid desert shrub (poor). Sections of open water were not included in the WinTR-55 watershed models.

The dominant land cover for all study area watersheds was the Grassland/Herbaceous cover, comprising anywhere between 46% and 79% of the entire watershed. The Mixed Forest land cover was the next most dominant (9%–33%), followed by Shrub/Scrub (11%–18%) and Developed (0%–8%). Emergent Wetland Herbaceous were only above 1% of the land cover in Watershed 2, and Barren Land was only identified in Watershed 3 (<1%). An additional National Land Cover Database database was used to identify percent impermeability throughout the study area (NLCD 2011b), which incorporates structures (e.g., rooftops) not captured in the prior National Land Cover Database database. Only Watersheds 1, 3, 4, and 5 appeared in this database within minimal impermeable surfaces (less than or equal to 0.3 acres).

Using GIS analysis, it was determined that the Project site lies over lands whose pre-Project condition land use may be described as grasslands (herbaceous) with sporadic stands of shrubs/trees. Due to the minimal infrastructure proposed in this area, the dominant land cover would remain the same after Project implementation. The largest anticipated impacts would be associated with the development of new access roads and the installation of impermeable structures, such as the O&M facilities and the new turbines. Zones of temporary impacts (construction related) around each proposed turbine (5 acres) are anticipated to return to natural grassland conditions, albeit with less permeable soil infiltration rates if previously identified as Group C soils. While the model assumes that a 5-acre area around proposed turbines with Group C soils would be compacted to Group D soils, through implementation of construction BMPs and minimal grading soil hydrologic properties could be maintained after construction.

Due to the extremely small alterations in land use and permeability by the Project in relation to the size of the affected subwatersheds, pre- and post-Project weighted curve numbers were calculated to be unchanged for all Project watersheds. Comparison of individual land cover acreage between pre- and post-Project conditions in the six Project watersheds are provided in Table 3-2.

3.1.3 Design Rainfall Event

Development of a design rainfall event for an individual basin incorporates information from isohyetal[4] maps, the basin area, and a rainfall distribution identifier specified in the County's Storm Drainage Design Manual (County of Merced 2016). Storm data in the form of 24-hour total rainfall depth in inches for varying rainfall return periods was identified at the centroid of the Project site using the National Oceanic and Atmospheric Administration Atlas 14 point precipitation frequency estimates from the Precipitation Frequency Data Server (see Appendix A to this study).[5] Rainfall depths and return periods for the Project location is listed in Table 3-3. This rainfall is distributed following a Type I distribution per the County's Design Manual.

4 A line drawn on a map connecting points having equal rainfall at a certain time or for a stated period.
5 https://hdsc.nws.noaa.gov/hdsc/pfds/.

Table 3-2
Land Cover Classifications and Weighted Curve Numbers

Project Watershed	Acres in Watershed 1				Acres in Watershed 2				Acres in Watershed 3				Acres in Watershed 4				Acres in Watershed 5				Acres in Watershed 6			
Soil Hydro Group	*C*		*D*		*C*		*D*		*C*		*D*		*C*		*D*		*C*		*D*		*C*		*D*	
Land Cover	*Pre*	*Post*	*Pre*	*Post*	*Pre*	*Post*	*Pre*	*Post*	*Pre*	*Post*	*Pre*	*Post*	*Pre*	*Post*	*Pre*	*Post*	*Pre*	*Post*	*Pre*	*Post*	*Pre*	*Post*	*Pre*	*Post*
Impermeable Areas (roof, parking lot)	0.31	0.42	0	0.12	0	0.35	0	0	0.09	0.57	0.05	0.19	0.04	0	0.04	0.31	0.10	0.12	0.20	2.73	0	0	0	0
Impermeable Areas (gravel roads)	12.70	13.75	13.00	14.65	0	1.72	0	0	2.78	2.78	54.00	63.63	1.23	1.23	10.32	10.69	0.35	0.35	62.00	74.56	3.83	3.83	35.22	35.22
Barren Land (rock/sand/clay)[1]	0	0	0	0	0	0	0	0	1.48	1.48	4.52	4.52	0	0	0	0	0	0	0	0	0	0	0	0
Grassland/Herbaceous[2]	30.60	25.29	151.70	155.56	139.88	123.16	108.09	122.74	159.88	139.85	645.78	655.55	56.24	56.28	170.96	170.33	245.03	240.02	1750.14	1740.04	86.75	86.75	410.84	410.84
Mixed Forest	51.00	51.00	9.12	9.12	23.33	23.33	2.73	2.73	497.82	497.82	74.88	74.88	87.68	87.68	6.26	6.26	375.25	375.25	107.50	107.50	182.16	182.16	27.10	27.10
Shrub	44.04	44.04	13.18	13.18	23.98	23.98	8.03	8.03	192.23	192.23	114.11	114.11	54.20	54.20	6.34	6.34	141.68	141.68	155.59	155.59	100.65	100.65	31.07	31.07
Open Water[3]	0		0		43.09		43.09		96.91		96.91		0.43		0.43		0.77		0.77		10.24		10.24	
Total Area (acres)[4]	**138.65**	**134.50**	**187.00**	**192.63**	**187.19**	**172.54**	**118.85**	**133.50**	**854.28**	**834.73**	**893.34**	**912.88**	**199.39**	**199.39**	**193.92**	**193.93**	**762.41**	**757.42**	**2075.43**	**2080.42**	**373.39**	**373.39**	**504.23**	**504.23**
Weighted Curve Number	**Pre = 70 Post = 70**				**Pre = 73 Post = 73**				**Pre = 64 Post = 64**				**Pre = 67 Post = 67**				**Pre = 73 Post = 74**				**Pre = 68 Post = 69**			

Notes: 1. Classified as Desert Shrub (poor condition) in TR-55 model; 2. Classified as Arid Herbaceous in TR-55 model (includes small areas of emergent herbaceous wetlands identified in Figures 3-1 and 3-2); 3. Open Water not included in TR-55 model; 4. Excludes Open Water areas.
Source: NLCD, 2011; USDA, 2017

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Table 3-3
National Oceanic and Atmospheric Administration Atlas 14
24-Hour Rainfall Depths and Return Periods

Gonzaga Ridge, Merced County, California				
Return period (years)	0.85*	2	5	25
Rainfall (inches)	0.57	1.95	2.51	3.69

Source: NOAA 2018.
Note:
* Rainfall depth for the 85th percentile storm was taken from the Stormwater Multiple Application and Report Tracking System Post-Construction Water Balance Calculator (Region – MERCED 2) (SWRCB 2018).

3.1.4 Time of Concentration

The remaining component required for developing the WinTR-55 model is "time of concentration." This is defined as the amount of time required for rainfall to flow from the most distant point of the subwatershed to the outlet. This time is calculated as the sum of the times of sheet flow, shallow concentrated flow, and channel flow as stormwater accumulates. Sheet flow and shallow concentrated flow are both calculated from three factors: flow length, frictional slope, and Manning's roughness coefficient. Sheet flow and concentrated flow lengths for the watersheds were assumed to be 100 feet and 800 feet, respectively. Below this point the conveyance of surface flows in the model are considered channel flow, which continues to the outlet of each subwatershed. Slopes were calculated using GIS and were averaged for the top 100-feet of contributing area for developing sheet flow slopes. Subsequent shallow concentrated flows and channel flow were identified along the longest flow path in each watershed using the elevation values provided in the USGS Digital Elevation Model. The surface coverage that determines Manning's coefficient was chosen from a drop-down list to be Dense Grass for sheet flow, and Unpaved for shallow concentrated flow. Equations used by the software for the calculation of travel times are available in Appendix B of the WinTR-55 Users Guide (USDA 2009).

Channel flow is calculated using Manning's equation, requiring inputs of length, slope, Manning's number, cross-sectional flow area, and wetted perimeter. Channel length and slope for each subwatershed were calculated using GIS. The Manning's number was estimated as that of a clean and winding main channel or mountain stream at 0.40 from Chow's empirical values (Chow 1959). Channel dimensions for the model were consistent in all subwatersheds, with a base of 10 feet and depth of 3 feet.

3.2 Hydrology Study – Results

Total 2-, 5-, and 25-year 24-hour rainfall event peak discharge values modeled at each watersheds' concentration point are provided in Table 3-4 in cubic feet per second. Due to the overall minimal changes to each watershed's existing land use, alongside the preservation of each watershed's surface hydrology, no change in peak-discharge was captured in the WinTR-55 modeling effort.

Table 3-4
Model Results – Peak and Total Discharge Comparisons

Watershed	Time of Concentration (hr)	Peak Discharge (cfs)	Total Volume (ac-ft)
2-Year Storm			
Watershed 1	0.245	7.48	2.86
Watershed 2	0.187	17.08	3.43
Watershed 3	0.503	15.83	10.22
Watershed 4	0.220	5.33	2.04
Watershed 5	0.478	101.84	50.63
Watershed 6	0.275	13.61	6.10
5-Year Storm			
Watershed 1	0.245	31.96	6.77
Watershed 2	0.187	56.98	7.24
Watershed 3	0.503	43.30	28.35
Watershed 4	0.220	21.33	5.63
Watershed 5	0.478	298.98	100.69
Watershed 6	0.275	53.56	15.59
25-Year Storm			
Watershed 1	0.245	128.65	17.34
Watershed 2	0.187	174.95	15.98
Watershed 3	0.503	239.13	89.21
Watershed 4	0.220	125.45	16.77
Watershed 5	0.478	952.31	226.58
Watershed 6	0.275	271.66	43.54

Notes: hr = hour; cfs = cubic feet per second; ac-ft = acre-feet.

The WinTR-55 model produced zero discharge for the 85th percentile storm for all six watersheds. Hydrographs for all six watersheds for the 25-year 24-hour event are provided in Figure 3-3. Hydrologic model inputs and results for all analyses of the 85% and the 2-, 5-, and 25-year 24-hour storm events are provided in Appendix B to this study.

4 CHARACTERIZATION OF PROJECT RUNOFF

This section provides a characterization of the Project runoff as it relates to water quality. Runoff generated within the Project site will initially travel overland as sheet flow into ephemeral drainages prior to discharging into the San Luis Reservoir and/or Salt Creek. While no beneficial uses have been established for the ephemeral drainages between the Project site and San Luis Reservoir, they have been established for the reservoir and the network of water bodies downstream from it (O'Neill Reservoir, California Aqueduct Delta–Mendota Canal, and Coyote Creek) (see Section 2.4). The San Luis Reservoir is the primary water body of concern for the Project largely due to the fact that it provides a buffer for settling out solids, and potential pollutants adsorbed to the solids, thus reducing the possibility for project related pollutants to reach downstream water bodies. The potential pollutants associated with the operation of the Project facilities are summarized in this section.

Potential Pollutants

The pollutant most likely to be generated by the Project would be increased sediment loading if surface flows were to concentrate along the access roads and accelerate erosion along non-vegetated surfaces. On-site grading should focus on minimizing soil compaction, allow for proper drainage of access roads, and maintain existing drainage patterns/topographic orientation to prevent the development of new drainage features.

During O&M of the Project facilities, small quantities of hazardous materials may be periodically or routinely transported, used, and disposed of. These materials would consist primarily of minor amounts of petroleum products (fuels and lubricating oils) to fuel and maintain vehicles and power construction equipment. Additional wastes may include waste paint, spent construction solvents, waste cleaners, waste oil, oily rags, waste batteries, spent welding materials, and herbicides (to be applied as-needed by licensed applicator). Workers would be trained to properly identify and handle all hazardous materials. Hazardous waste would be either recycled or disposed of at a permitted and licensed treatment and/or disposal facility. All hazardous waste shipped off site for recycling or disposal would be transported by a licensed and permitted hazardous waste hauler.

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5 PROJECT DESIGN CONSIDERATIONS

Stormwater discharge and WQOs outlined in the National Pollutant Discharge Elimination System General Permit No. CA2000004, as well as in the County's stormwater ordinance (No. 1923), were designed to ensure that regulated projects in this region comply with the Federal Clean Water Act. Stormwater and pollution control measures provided as follows (Table 5-1) are intended to meet Clean Water Act objectives during the long-term operation of the Project. The potential pollutants related to the Project's long-term operation (see Section 4) can be managed through site design, BMPs, and LID measures. The measures provided in Table 5-1 are referenced from the California Department of Transportation Treatment BMP Technology Report (Caltrans 2010), and are recommended based on the preliminary project plans. A separate sediment control plan or stormwater pollution prevention plan (SWPPP) would be required to cover project-related construction activities (National Pollutant Discharge Elimination System Order No. 2009-0009-DWQ). As part of the SWPPP, the Project should include post-Project stormwater management strategies. The recommended source control BMPs and LID measures provided in Table 5-1 can be incorporated into this stormwater management program and ensure the success of the Project through the Project's duration.

Table 5-1
Recommended Project Best Management Practices

Type of BMP	Design Concept	Description Applicable to the Proposed Project
Source Control BMPs	Good Housekeeping	**Site Maintenance:** Recurring site inspections will be established to identify potential maintenance needs. **Material Storage:** The collection or stockpiling of Project materials/debris will need to take place within a secure facility that eliminates the exposure and transport of potential pollutants. If hazardous materials are involved, this will require the implementation of a secondary containment system. Temporary or long-term stockpiling of large turbine material may require implementation of erosion control measures (e.g., straw waddles, sand-bag berms) to preclude the development of concentrated flows adjacent the material.
	Non-Toxic Roofing Materials	Building materials that do not require toxic materials for weatherproofing (e.g., tar) will be used where possible.
LID Measures	Native Trees/Shrubs	Native vegetation can be incorporated across the proposed Project site to reduce the hydrograph volume by increasing local evapotranspiration and can also reduce the peak hydrograph through rainfall interception.
	Minimization of Impervious Footprint	Maximize site design to reduce necessity for impermeable surface and increase space between impermeable structures.
	Construction Considerations	**Grading:** Soil compaction will be minimized (e.g., through the use of large treads, mow and roll grading), and the site will be graded to promote sheet flow/preclude concentrated flows and mimic existing topography. A combination of matting and seeding may also be implemented to maintain soil attributes (e.g., size class, porosity, infiltration rates, and mineral content) and preserve existing biota; this would further reduce the anticipated impacts of the Project on the site's soil hydrologic properties assumed in this study.

Table 5-1
Recommended Project Best Management Practices

Type of BMP	Design Concept	Description Applicable to the Proposed Project
	Access Roads	Access roads to turbines shall be planned, designed, and constructed in a manner that minimizes changes in runoff patterns and water quality impacts associated with erosion and/or poor drainage. Prior to construction, a qualified professional (e.g., Professional Geologist, Professional Engineer, or Certified Engineering Geologist reviewed and approved by California State Parks) shall review and/or modify access road plans as necessary to ensure they are constructed in a manner that minimizes changes in natural hydrology, incorporates appropriate and effective erosion control BMPs, and integrates requirements of the Project's SWPPP per the General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (State Water Resources Control Board Order No. 2009-0009-DWQ, as amended). Examples of design solutions could include, but are not limited to, the following: • Crowning road sections with gentle slopes to prevent standing water on the road • Outsloping roads at 3%–5% wherever possible • Where required for proper maneuvering and safety, insloping roads at 3%–5% into properly designed ditches • Installing rolling dips, ditch relief culverts, and/or water bars at intervals appropriate for the road grade and the soil erosivity • Minimizing the number of water crossings and maintaining crossings as close to a 90-degree angle as possible to the streambed • Constructing perennial and seasonal/ephemeral stream crossings so as not to change the cross-sectional area of the stream channel and so that adequate capacity exists to pass the County's design storm event • Constructing perennial and seasonal/ephemeral stream crossings with materials that will not degrade water quality (e.g., concrete, coarse rock, riprap, and/or gabions) Recommended resources for road design and maintenance is the University of California's Division of Agriculture and Natural Resources Rural Road Construction and Maintenance Guide (UCDANR 2007).

Source: Caltrans 2010.
Note: BMP = best management practice; LID = Low Impact Development.

6 PROJECT IMPACTS

This section presents the potential impacts associated with the Project, as referenced by the CEQA Guidelines (14 CCR 15000 et seq.). Where feasible, application of various construction and post-development techniques, BMPs, and other operational practices would ensure potential impacts would be less than significant.

6.1 California Environmental Quality Act Significance Criteria

Based on CEQA Guidelines, Section 15382, a "significant effect on the environment" includes any substantial, or potentially substantial, impact on all environmental resources by a project. This section lists significance criteria related to hydrology and water quality impact analysis from the CEQA Guidelines, Appendix G. A project's impacts on hydrology and water quality would be considered significant if the project would:

1. Violate any water quality standards or waste discharge requirements.
2. Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be 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 which would not support existing land uses or planned uses for which permits have been granted).
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 which would result in substantial erosion or siltation on or off site.
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 which would result in flooding on or off site.
5. Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff.
6. Otherwise substantially degrade water quality.
7. Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or FIRM or other flood hazard delineation map.
8. Place within a 100-year flood hazard area structures which would impede or redirect flood flows.
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.
10. Increase the risk of inundation by seiche, tsunami, or mudflow.

6.2 Impacts Analysis

For the purpose of the discussion of the following Project impacts, it is assumed that the BMPs listed in Section 5, Project Design Considerations, would be made a condition of Project approval. Therefore, these design considerations are considered elements of the Project rather than mitigation measures.

1. Would the project violate any water quality standards or waste discharge requirements?

Based on the characterization of water quality impairments, potential Project-related pollutant sources, comparison of existing versus post-Project runoff rates, and the implementation of stormwater BMPs identified in Section 5, the Project's impact on water quality standards and waste discharge requirements would be less than significant. Potential construction-related water quality impacts of the Project would be eliminated or substantially reduced by the requirements of the statewide General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (SWRCB 2013), which the applicant is required to comply with prior to construction.

2. Would the project substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be 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 which would not support existing land uses or planned uses for which permits have been granted)?

The Project proposes importing water for project construction activities and also for Project operation. Use of the existing well may be pursued for future uses, in coordination with California State Parks. Site infiltration characteristics would not change as a result of the Project; therefore, whatever exchange between surface water and groundwater within the Project site would be maintained. Impacts to groundwater resources and recharge as a result of the Project are less than significant.

3. Would the project 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 which would result in substantial erosion or siltation on or off site?

Through proper implementation of road design and maintenance (see Section 5), the Project's impacts to the existing drainage pattern (resulting in increased erosion or siltation) would be less than significant. The existing drainage pattern of the Project site would be maintained, as only minimal grading would be required for the proposed access roads and the pads for the wind turbines, the substation, and the O&M facilities. Access roads would be designed/graded to preserve the natural drainage patterns and would implement design measures that promote sheet flow and minimize the potential for concentrating flows and contributing sediment to downstream water bodies. Routine road maintenance protocol and scheduling would be incorporated into the long-term operation of the Project to ensure potential issues are dealt with promptly and effectively. The site design would incorporate the existing access roads to the maximum extent practicable, and any proposed repair or installation of culverts would be designed to convey the peak flow rate from the 25-year 24-hour rainfall event (which may require additional hydrology studies). Thus, impacts to altering the existing drainage pattern resulting in substantial erosion or siltation would be less than significant.

4. ***Would the project 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 which would result in flooding on or off site?***

The Project would not alter the course of a stream or river, and would not impact the peak discharge volumes for the 2-, 5-, and 25-year 24-hour storm event (see Section 3.2 and Appendix B); therefore, the Project would not substantially increase the rate or amount of surface runoff in a manner that would result in increased flooding on or off site, and the impact is less than significant.

5. ***Would the project create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff?***

The Project would maintain the existing peak discharge rates for the 2-, 5-, and 25-year storm events and would not produce substantial additional sources of pollutants in surface flows. The impact is less than significant.

6. ***Would the project otherwise substantially degrade water quality?***

Other than those addressed by stormwater BMPs identified in Section 5, there are no elements of the Project that would substantially degrade water quality. The impact is less than significant.

7. ***Would the project 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?***

The Project does not involve housing. There would be no impact with regard to this issue.

8. Would the project place within a 100-year flood hazard area structures which would impede or redirect flood flows?

The entire Project site falls within Zone D of the Federal Emergency Management Agency FIRM (FEMA 2008). Zone D is used to identify regions that have not been mapped. A separate floodplain analysis conducted by the U.S. Army Corps of Engineers for the Central Valley Region (ACOE 2002) also does not have the Project site mapped. However, the only potential structures proposed that could be within a 100-foot flood hazard area would be road crossings requiring culverts or bridges. The other Project buildings or facilities (i.e., wind turbines) would be located on higher areas within the Project site and are expected to be out of a flood hazard area. Should these crossings be required, and should a significant flood occur and result in their damage, it is not anticipated that flood flows would be impeded or redirected. Therefore, the impact of the Project with respect to impedance or redirection of flood flows would be less than significant.

9. Would the project 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?

The Project site does not include any existing housing and no permanent housing is proposed. During operation, the Project would employ eight people to oversee the facilities, but due to the location of the turbines and the O&M facility along higher points on the site there is minimal risk of exposing future employees to flooding. In addition, the dam at the San Luis Reservoir is located downstream of the Project site; therefore, the Project does not put people/structures in any greater risk as a result of flooding and/or flooding as a result of dam failure and there would be no impact.

10. Would the project increase the risk of inundation by seiche, tsunami, or mudflow?

The Project site is not located in a flood zone prone to seiches or tsunamis. While the Project is situated along the ridges above San Luis Reservoir, changes to existing land-cover are minimal and design measures will be implemented to reduce potential for erosional features to develop along the graded pads/access roads, thus not increasing risk of mudflows. There would be no impact associated with seiche, tsunami, or mudflows.

7 CONCLUSIONS

Based on this study, the proposed Project would have minimal impacts on hydrology and water quality within, and downstream from, the Project site. The primary findings of this study are summarized as follows:

- The proposed Project would have no impact on the peak discharge of the 2-, 5-, and 25-year 24-hour rainfall events.
- With the incorporation of a construction SWPPP (with accompanying post-project stormwater management strategy), site-grading Project design considerations, and good housekeeping, the proposed Project would not have a substantial impact with regard to water quality.
- Additional site design measures will need to be incorporated with the final site plan demonstrating that the Project will adequately manage access road grading and drainage crossings to maintain site hydrology and minimize the potential for erosion/sedimentation. Any stormwater features (e.g., culverts, detention basins) would need to be designed to meet the County's stormwater ordinance (No. 1923).

With the application of appropriate source control and LID BMPs, the proposed Project would not have substantial impacts on the hydrology and water quality resources within, or downstream of, the Project site.

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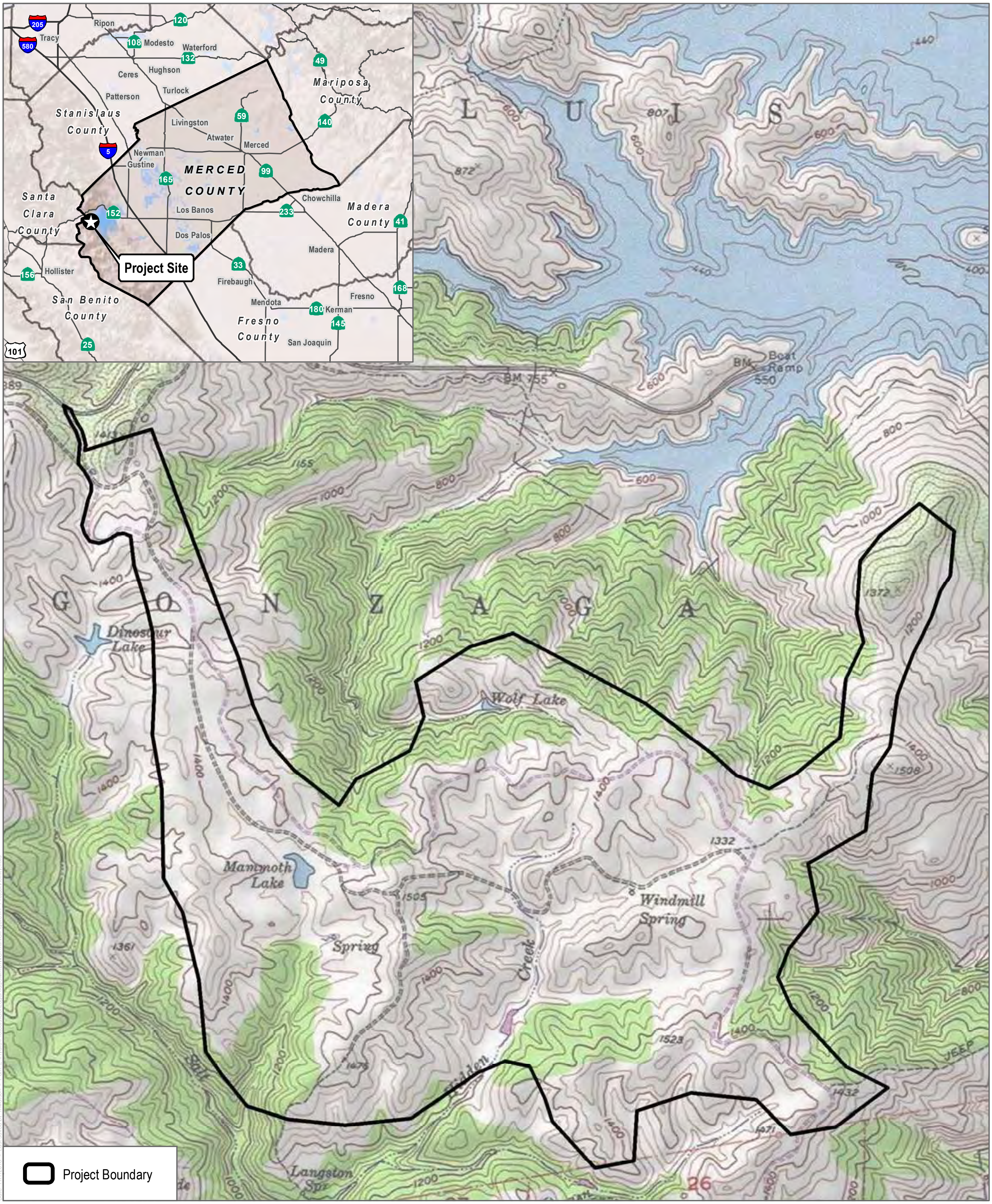

SOURCE: Scout Energy 2018, ESRI 2018

DUDEK

0 1,000 2,000 Feet

FIGURE 1-1

Project Location

Gonzaga Ridge Wind Farm Project Hydrology Technical Report

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SOURCE: Scout Energy 2018; Bing Maps 2018

DUDEK

0 0.5 1 Miles

FIGURE 1-2

Project Site

Gonzaga Ridge Wind Farm Project Hydrology Technical Report

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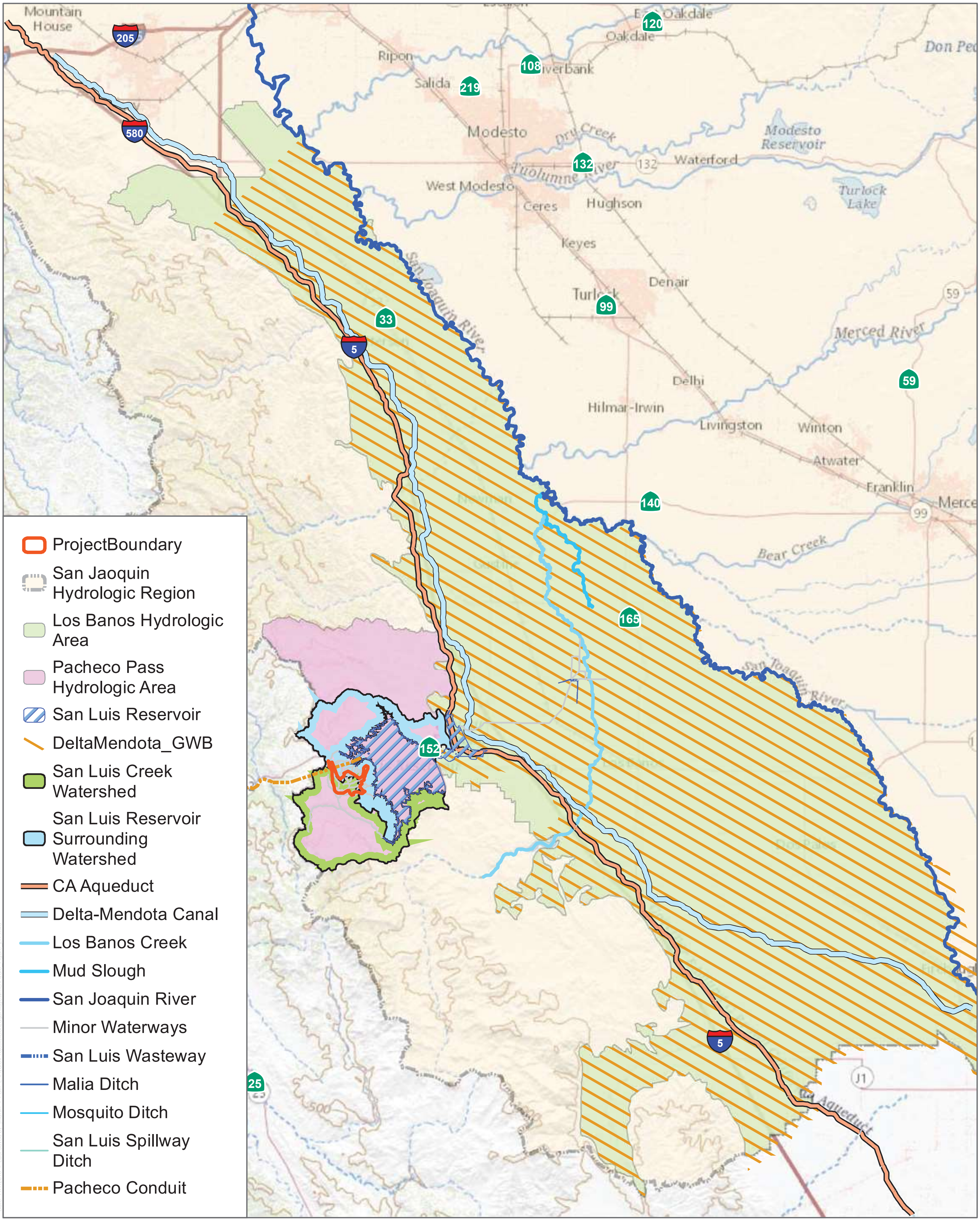

SOURCE: ESRI, USGS National Map, USGS NHD

DUDEK

FIGURE 2-1

Regional Hydrologic Setting

Gonzaga Ridge Wind Farm Project Hydrology Technical Report

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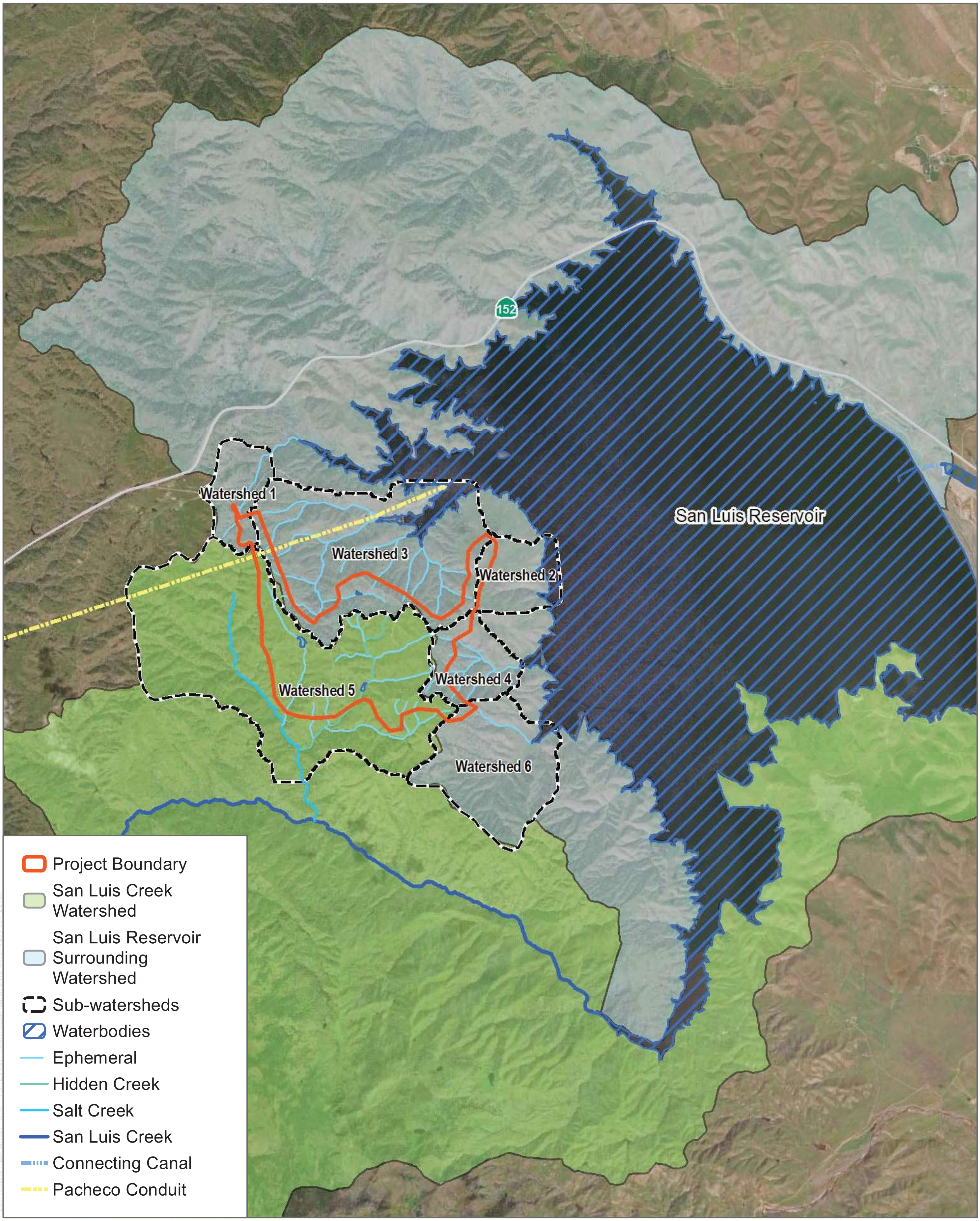

SOURCE: Bing, USGS NHD

DUDEK

0 1 2 Miles

FIGURE 2-2

Project Site - Hydrologic Setting

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SOURCE: USGS 2013; USDA 2017

DUDEK

FIGURE 3-1

Existing Conditions

Gonzaga Ridge Wind Repowering Project Hydrology Technical Report

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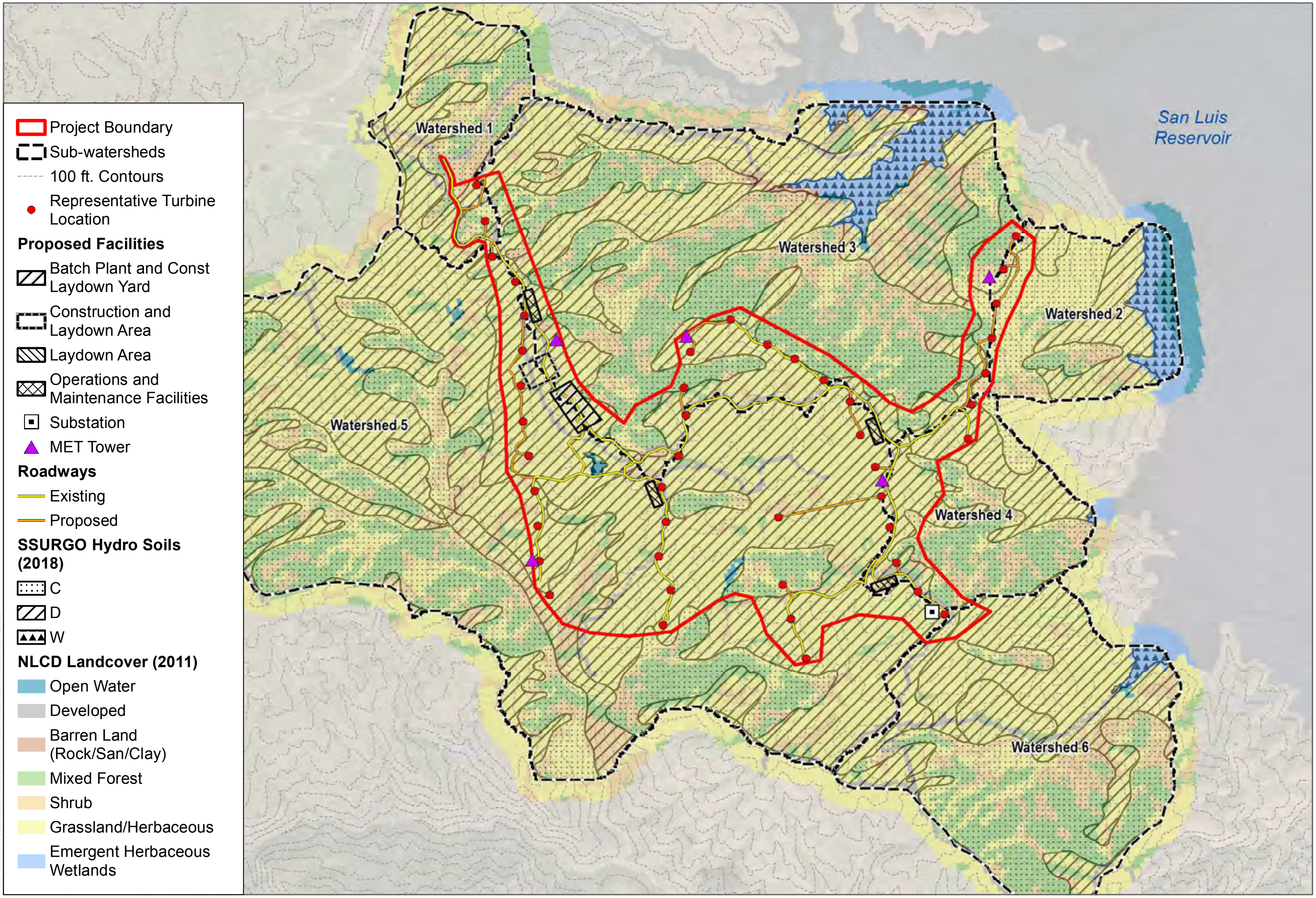

SOURCE: USGS 2013; USDA 2017

DUDEK

FIGURE 3-2

Post-Project Conditions

Gonzaga Ridge Wind Repowering Project Hydrology Technical Report

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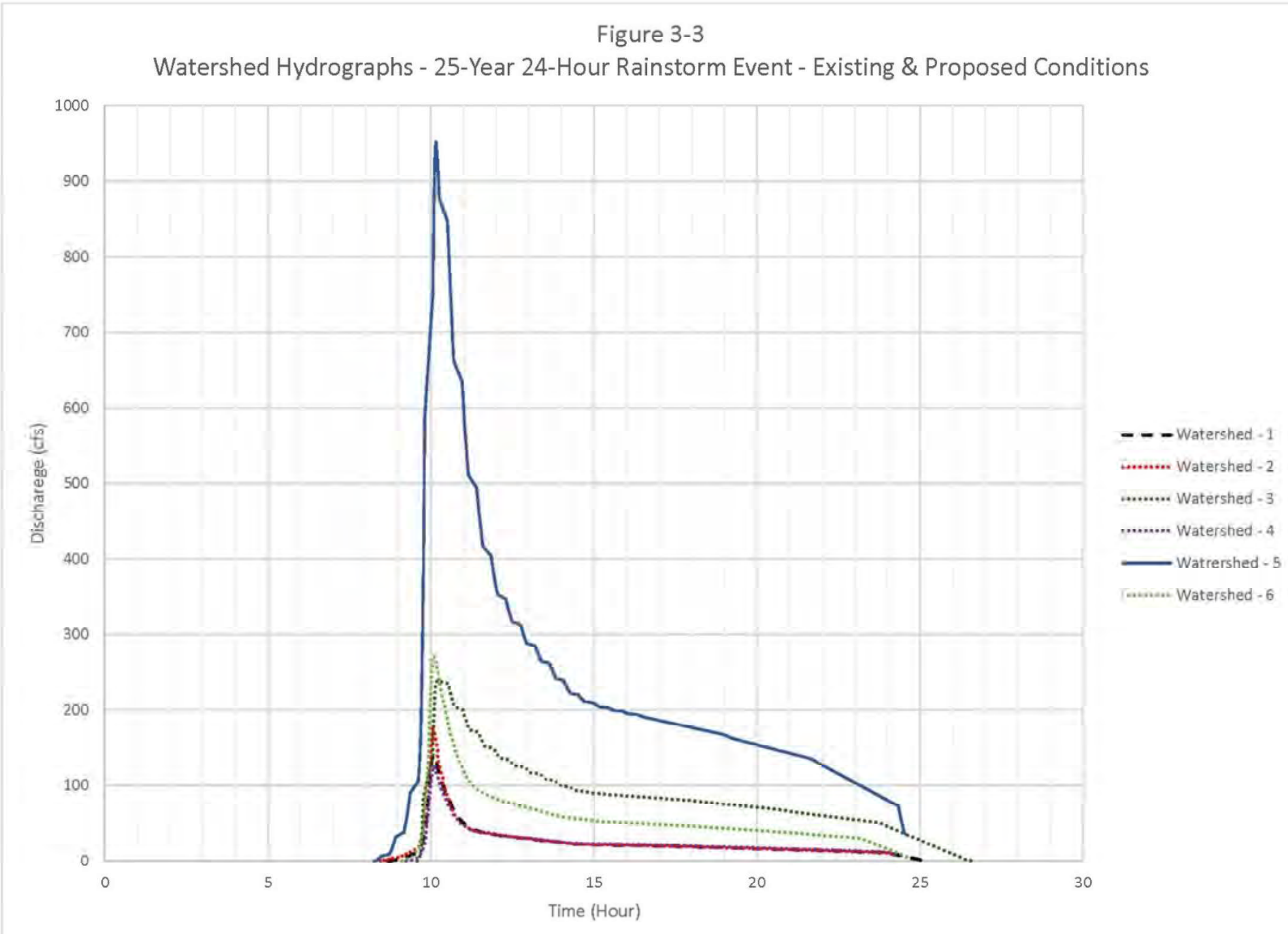
Figure 3-3
Watershed Hydrographs - 25-Year 24-Hour Rainstorm Event - Existing & Proposed Conditions
Discharege (cfs)
1000
900
800
700
600
500
400
300
200
100
0
0
5
10
15
20
25
30
Time (Hour)
Watershed - 1
Watershed - 2
Watershed - 3
Watershed - 4
Watrershed - 5
Watershed - 6

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APPENDIX A

Project Site Rainfall Depths/Frequencies
National Oceanic Atmospheric Administration
Atlas 14

NOAA Atlas 14, Volume 6, Version 2
Location name: Los Banos, California, USA*
Latitude: 37.0476°, Longitude: -121.1858°
Elevation: 1434.03 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**0.100** (0.087-0.116)	**0.134** (0.116-0.155)	**0.183** (0.159-0.213)	**0.227** (0.195-0.267)	**0.292** (0.241-0.359)	**0.348** (0.279-0.439)	**0.410** (0.319-0.533)	**0.480** (0.360-0.645)	**0.584** (0.417-0.826)	**0.674** (0.461-0.994)
10-min	**0.143** (0.125-0.166)	**0.192** (0.167-0.223)	**0.262** (0.227-0.306)	**0.325** (0.279-0.383)	**0.419** (0.345-0.515)	**0.499** (0.400-0.629)	**0.588** (0.457-0.764)	**0.687** (0.516-0.924)	**0.837** (0.597-1.18)	**0.966** (0.661-1.43)
15-min	**0.173** (0.151-0.201)	**0.232** (0.202-0.270)	**0.317** (0.275-0.370)	**0.393** (0.337-0.463)	**0.507** (0.417-0.622)	**0.604** (0.484-0.761)	**0.711** (0.553-0.923)	**0.831** (0.624-1.12)	**1.01** (0.722-1.43)	**1.17** (0.799-1.72)
30-min	**0.238** (0.207-0.275)	**0.318** (0.277-0.370)	**0.435** (0.377-0.507)	**0.539** (0.463-0.635)	**0.696** (0.572-0.854)	**0.828** (0.664-1.04)	**0.975** (0.758-1.27)	**1.14** (0.856-1.53)	**1.39** (0.991-1.97)	**1.60** (1.10-2.37)
60-min	**0.334** (0.291-0.388)	**0.448** (0.390-0.520)	**0.613** (0.531-0.714)	**0.759** (0.651-0.894)	**0.979** (0.805-1.20)	**1.17** (0.934-1.47)	**1.37** (1.07-1.78)	**1.61** (1.21-2.16)	**1.95** (1.40-2.77)	**2.26** (1.54-3.33)
2-hr	**0.518** (0.451-0.600)	**0.656** (0.571-0.762)	**0.859** (0.744-1.00)	**1.04** (0.894-1.23)	**1.32** (1.09-1.62)	**1.56** (1.25-1.97)	**1.83** (1.42-2.38)	**2.13** (1.60-2.87)	**2.60** (1.86-3.68)	**3.01** (2.06-4.44)
3-hr	**0.654** (0.570-0.758)	**0.815** (0.709-0.946)	**1.05** (0.911-1.22)	**1.26** (1.08-1.49)	**1.59** (1.31-1.95)	**1.87** (1.50-2.36)	**2.18** (1.70-2.84)	**2.54** (1.91-3.42)	**3.09** (2.21-4.37)	**3.57** (2.44-5.27)
6-hr	**0.895** (0.780-1.04)	**1.10** (0.956-1.28)	**1.40** (1.21-1.63)	**1.67** (1.43-1.96)	**2.07** (1.71-2.54)	**2.42** (1.94-3.05)	**2.81** (2.19-3.66)	**3.26** (2.45-4.38)	**3.94** (2.81-5.57)	**4.53** (3.10-6.69)
12-hr	**1.18** (1.03-1.37)	**1.47** (1.27-1.70)	**1.87** (1.62-2.18)	**2.23** (1.91-2.62)	**2.75** (2.27-3.38)	**3.20** (2.56-4.03)	**3.68** (2.86-4.78)	**4.22** (3.17-5.67)	**5.01** (3.58-7.10)	**5.69** (3.90-8.40)
24-hr	**1.54** (1.43-1.70)	**1.95** (1.80-2.15)	**2.51** (2.32-2.77)	**2.99** (2.75-3.33)	**3.69** (3.29-4.22)	**4.26** (3.73-4.96)	**4.86** (4.17-5.78)	**5.52** (4.62-6.72)	**6.46** (5.23-8.15)	**7.24** (5.68-9.41)
2-day	**1.94** (1.80-2.13)	**2.46** (2.28-2.71)	**3.17** (2.93-3.50)	**3.77** (3.46-4.19)	**4.62** (4.13-5.29)	**5.31** (4.66-6.19)	**6.04** (5.18-7.18)	**6.82** (5.71-8.30)	**7.93** (6.41-10.0)	**8.83** (6.93-11.5)
3-day	**2.16** (2.01-2.38)	**2.75** (2.55-3.03)	**3.54** (3.27-3.91)	**4.21** (3.86-4.68)	**5.15** (4.60-5.89)	**5.91** (5.18-6.88)	**6.70** (5.75-7.97)	**7.55** (6.32-9.19)	**8.74** (7.07-11.0)	**9.71** (7.62-12.6)
4-day	**2.36** (2.19-2.60)	**3.00** (2.78-3.31)	**3.86** (3.57-4.26)	**4.58** (4.21-5.10)	**5.60** (5.00-6.41)	**6.41** (5.62-7.47)	**7.26** (6.23-8.64)	**8.17** (6.84-9.94)	**9.44** (7.63-11.9)	**10.5** (8.21-13.6)
7-day	**2.85** (2.64-3.13)	**3.62** (3.36-3.99)	**4.66** (4.31-5.15)	**5.53** (5.07-6.15)	**6.73** (6.01-7.70)	**7.69** (6.74-8.95)	**8.69** (7.46-10.3)	**9.74** (8.16-11.9)	**11.2** (9.07-14.2)	**12.4** (9.75-16.1)
10-day	**3.17** (2.94-3.49)	**4.04** (3.74-4.45)	**5.19** (4.80-5.73)	**6.14** (5.64-6.83)	**7.46** (6.66-8.53)	**8.50** (7.45-9.90)	**9.58** (8.22-11.4)	**10.7** (8.98-13.0)	**12.3** (9.94-15.5)	**13.6** (10.7-17.6)
20-day	**4.03** (3.73-4.43)	**5.16** (4.78-5.68)	**6.61** (6.11-7.30)	**7.79** (7.15-8.66)	**9.37** (8.36-10.7)	**10.6** (9.27-12.3)	**11.8** (10.1-14.0)	**13.1** (11.0-15.9)	**14.8** (12.0-18.7)	**16.2** (12.7-21.1)
30-day	**4.81** (4.46-5.30)	**6.16** (5.71-6.79)	**7.87** (7.27-8.69)	**9.22** (8.46-10.3)	**11.0** (9.81-12.6)	**12.3** (10.8-14.4)	**13.7** (11.7-16.3)	**15.1** (12.6-18.3)	**16.9** (13.7-21.3)	**18.4** (14.4-23.9)
45-day	**5.94** (5.51-6.54)	**7.59** (7.03-8.37)	**9.64** (8.90-10.6)	**11.2** (10.3-12.5)	**13.3** (11.8-15.2)	**14.8** (12.9-17.2)	**16.2** (13.9-19.3)	**17.7** (14.9-21.6)	**19.7** (15.9-24.9)	**21.2** (16.7-27.6)
60-day	**7.01** (6.50-7.71)	**8.90** (8.24-9.81)	**11.2** (10.4-12.4)	**13.0** (11.9-14.4)	**15.2** (13.6-17.4)	**16.8** (14.7-19.6)	**18.4** (15.8-21.8)	**19.9** (16.7-24.3)	**22.0** (17.8-27.7)	**23.5** (18.4-30.5)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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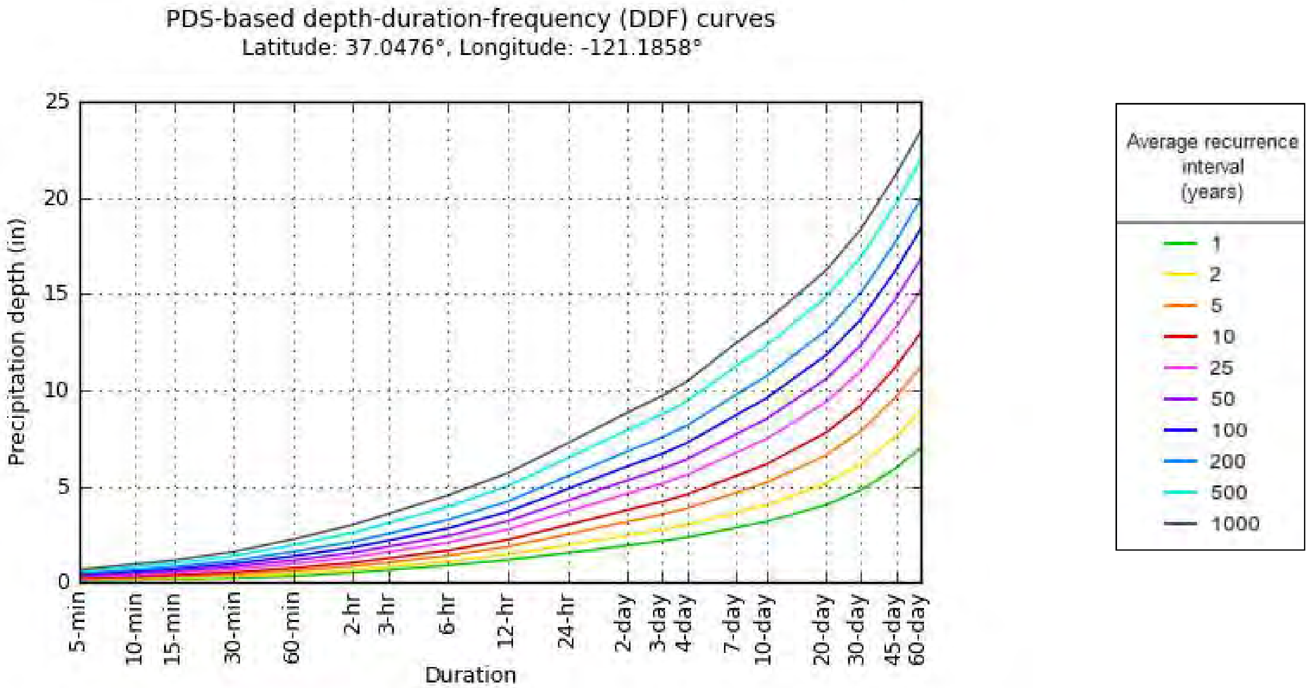
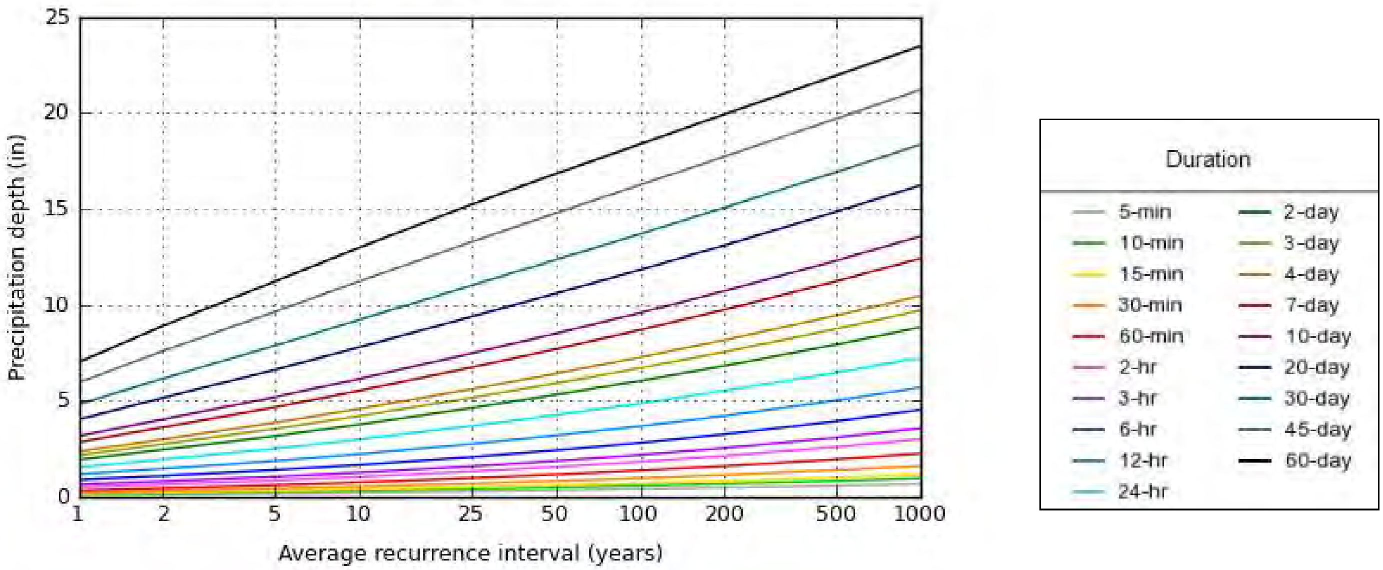
PF graphical





NOAA Atlas 14, Volume 6, Version 2 Created (GMT): Mon Oct 22 22:21:59 2018

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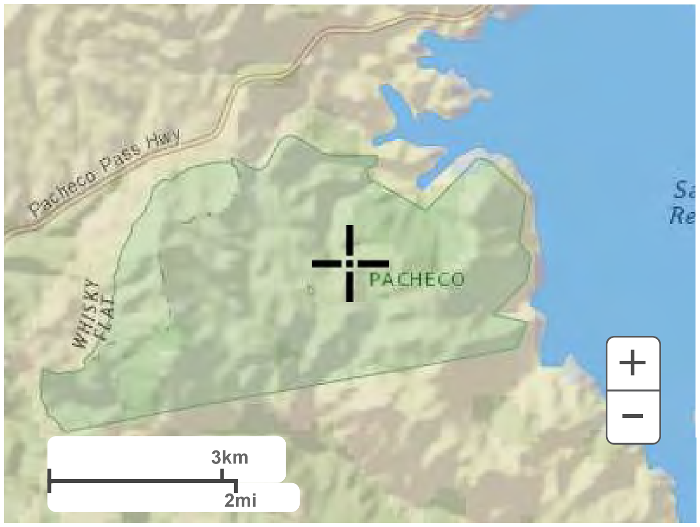
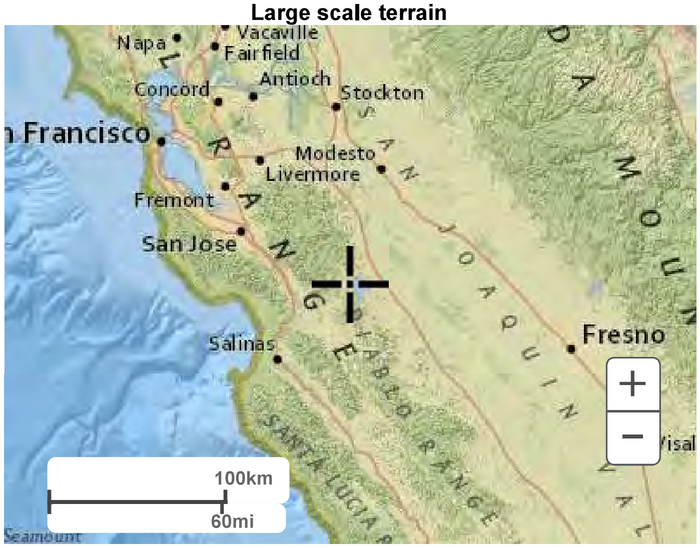
Maps & aerials

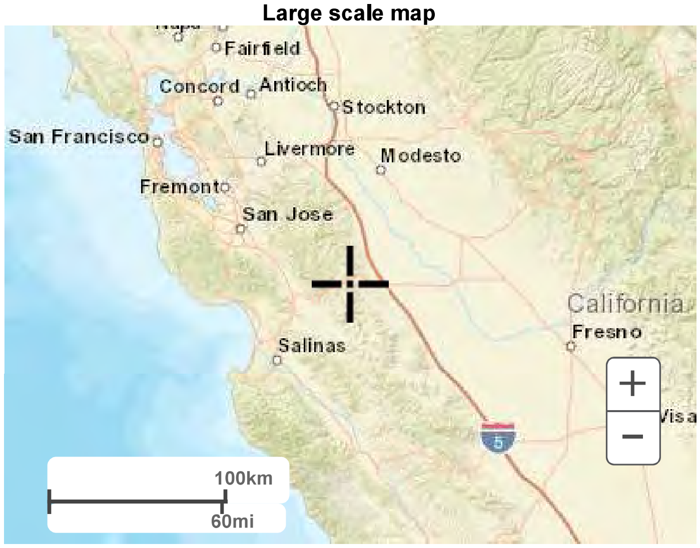
Small scale terrain



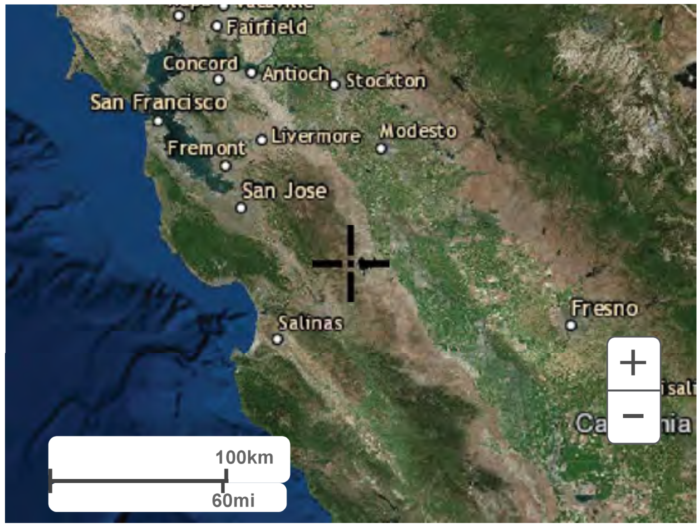
Large scale terrain



Large scale map



Large scale aerial



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US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer

APPENDIX B

WinTR-55 Hydrology Model Inputs and Results

WinTR-55 Current Data Description

--- Identification Data ---

User: JMartin
Date: 11/1/2018
Project: Gonzaga Ridge Wind
Units: English
SubTitle: Hydrology Study
Areal Units: Acres
State: California
County: Merced
Filename: P:\400.Hydrogeology\11295 - Gonzaga Ridge Hydro Study\WinTR Results\Watershed_1_Pre.w55

--- Sub-Area Data ---

Name	Description	Reach	Area(ac)	RCN	Tc
Basin_1	Watershed_1	Reach_1	326.38	76	.245

Total area: 326.38 (ac)

--- Storm Data --

Rainfall Depth by Rainfall Return Period

0.85-Yr (in)	1-Yr (in)	2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)
.57	1.18	1.95	2.51	2.99	3.69	4.26

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type I
Dimensionless Unit Hydrograph: delmarva

Gonzaga Ridge Wind
Hydrology Study
Merced County, California

Storm Data

Rainfall Depth by Rainfall Return Period

0.85-Yr (in)	1-Yr (in)	2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)
.57	1.18	1.95	2.51	2.99	3.69	4.26

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type I
Dimensionless Unit Hydrograph: delmarva

Gonzaga Ridge Wind
Hydrology Study
Merced County, California

Watershed Peak Table

Sub-Area or Reach Identifier	Peak Flow by Rainfall Return Period 0.85-Yr (cfs)	2-Yr (cfs)	5-Yr (cfs)	25-Yr (cfs)
SUBAREAS				
Basin_1	.00	30.17	75.19	198.18
REACHES				
Reach_1	.00	30.17	75.19	198.18
Down	.00	30.16	75.18	197.35
OUTLET	.00	30.16	75.18	197.35

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period			
	0.85-Yr (cfs) (hr)	2-Yr (cfs) (hr)	5-Yr (cfs) (hr)	25-Yr (cfs) (hr)
SUBAREAS				
Basin_1	.00	30.17	75.19	198.18
	n/a	10.11	10.08	10.09
REACHES				
Reach_1	.00	30.17	75.19	198.18
	n/a	10.11	10.08	10.09
Down	.00	30.16	75.18	197.35
	n/a	10.30	10.21	10.15
OUTLET	.00	30.16	75.18	197.35

Sub-Area Summary Table

Sub-Area Identifier	Drainage Area (ac)	Time of Concentration (hr)	Curve Number	Receiving Reach	Sub-Area Description
Basin_1	326.38	0.245	76	Reach_1	Watershed_1

Total Area: 326.38 (ac)

Reach Summary Table

Reach Identifier	Receiving Reach Identifier	Reach Length (ft)	Routing Method
Reach_1	Outlet	5464	CHANNEL

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
Basin_1							
SHEET	100	0.2100	0.240				0.119
SHALLOW	800	0.0800	0.050				0.049
CHANNEL	5464	0.1000	0.040	34.50	16.00	19.711	0.077
						Time of Concentration	.245

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use		Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
Basin_1	Paved parking lots, roofs, driveways		C	.305	98
	Gravel (w/ right-of-way)		C	12.703	89
	Gravel (w/ right-of-way)		D	13.745	91
	Herbaceous	(good)	C	30.595	74
	Herbaceous	(good)	D	151.699	85
	Oak - aspen	(good)	C	50.995	41
	Oak - aspen	(good)	D	9.122	48
	Desert shrub	(good)	C	44.038	79
	Desert shrub	(good)	D	13.182	84
	Total Area / Weighted Curve Number			326.38	76
				======	==

Reach Channel Rating Details

Reach Identifier	Reach Length (ft)	Reach Manning's n	Friction Slope (ft/ft)	Bottom Width (ft)	Side Slope
Reach_1	5464	0.048	0.1	10	2 :1

Reach Identifier	Stage (ft)	Flow (cfs)	End Area (sq ft)	Top Width (ft)	Friction Slope (ft/ft)
Reach_1	0.0	0.000	0	10	0.1
	0.5	31.595	5.5	12	
	1.0	103.687	12	14	
	2.0	355.677	28	18	
	5.0	2076.981	100	30	
	10.0	9131.492	300	50	
	20.0	45610.228	1000	90	

WinTR-55 Current Data Description

--- Identification Data ---

User:	JMartin	Date:	11/1/2018
Project:	Gonzaga Ridge Wind	Units:	English
SubTitle:	Hydrology Study	Areal Units:	Acres
State:	California		
County:	Merced		

Filename: P:\400.Hydrogeology\11295 - Gonzaga Ridge Hydro Study\WinTR Results\Watershed_2_Pre.w55

--- Sub-Area Data ---

Name	Description	Reach	Area(ac)	RCN	Tc
Basin_2	Watershed_2	Reach_2	306.02	73	.187

Total area: 306.02 (ac)

--- Storm Data --

Rainfall Depth by Rainfall Return Period

0.85-Yr (in)	1-Yr (in)	2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)
.57	1.18	1.95	2.51	2.99	3.69	4.26

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type I
Dimensionless Unit Hydrograph: delmarva

Gonzaga Ridge Wind
Hydrology Study
Merced County, California

Storm Data

Rainfall Depth by Rainfall Return Period

0.85-Yr (in)	1-Yr (in)	2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)
.57	1.18	1.95	2.51	2.99	3.69	4.26

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type I
Dimensionless Unit Hydrograph: delmarva

Gonzaga Ridge Wind
Hydrology Study
Merced County, California

Watershed Peak Table

Sub-Area or Reach Identifier	Peak Flow by Rainfall Return Period 0.85-Yr (cfs)	2-Yr (cfs)	5-Yr (cfs)	25-Yr (cfs)
SUBAREAS				
Basin_2	.00	17.08	56.98	174.95
REACHES				
Reach_2	.00	17.08	56.98	174.95
Down	.00	17.08	56.76	174.21
OUTLET	.00	17.08	56.76	174.21

Gonzaga Ridge Wind
Hydrology Study
Merced County, California

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period 0.85-Yr (cfs) (hr)	2-Yr (cfs) (hr)	5-Yr (cfs) (hr)	25-Yr (cfs) (hr)
SUBAREAS				
Basin_2	.00	17.08	56.98	174.95
	n/a	10.10	10.07	10.05
REACHES				
Reach_2	.00	17.08	56.98	174.95
	n/a	10.10	10.07	10.05
Down	.00	17.08	56.76	174.21
	n/a	10.20	10.15	10.09
OUTLET	.00	17.08	56.76	174.21

Sub-Area Summary Table

Sub-Area Identifier	Drainage Area (ac)	Time of Concentration (hr)	Curve Number	Receiving Reach	Sub-Area Description
Basin_2	306.02	0.187	73	Reach_2	Watershed_2

Total Area: 306.02 (ac)

Gonzaga Ridge Wind
Hydrology Study
Merced County, California

Reach Summary Table

Reach Identifier	Receiving Reach Identifier	Reach Length (ft)	Routing Method
Reach_2	Outlet	3672	CHANNEL

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
Basin_2							
SHEET	100	0.2100	0.240				0.119
SHALLOW	800	0.3400	0.050				0.024
SHALLOW	0		0.050				
CHANNEL	3672	0.1400	0.040	34.50	16.00	23.182	0.044
						Time of Concentration	.187

Gonzaga Ridge Wind
Hydrology Study
Merced County, California

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use		Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
Basin_2	Herbaceous	(good)	C	139.875	74
	Herbaceous	(good)	D	108.086	85
	Oak - aspen	(good)	C	23.328	41
	Oak - aspen	(good)	D	2.73	48
	Sagebrush (w/ grass understory)	(good)	C	23.977	47
	Sagebrush (w/ grass understory)	(good)	D	8.026	55
	Total Area / Weighted Curve Number			306.02	73
				======	==

Reach Channel Rating Details

Reach Identifier	Reach Length (ft)	Reach Manning's n	Friction Slope (ft/ft)	Bottom Width (ft)	Side Slope
Reach_2	3672	0.048	0.14	10	2 :1

Reach Identifier	Stage (ft)	Flow (cfs)	End Area (sq ft)	Top Width (ft)	Friction Slope (ft/ft)
Reach_2	0.0	0.000	0	10	0.14
	0.5	37.384	5.5	12	
	1.0	122.684	12	14	
	2.0	420.843	28	18	
	5.0	2457.517	100	30	
	10.0	10804.527	300	50	
	20.0	53966.750	1000	90	

WinTR-55 Current Data Description

--- Identification Data ---

User: JMartin
Project: Gonzaga Ridge Wind
SubTitle: Hydrology Study
State: California
County: Merced
Filename: P:\400.Hydrogeology\11295 - Gonzaga Ridge Hydro Study\WinTR Results\Watershed_3_Pre.w55

Date: 11/1/2018
Units: English
Areal Units: Acres

--- Sub-Area Data ---

Name	Description	Reach	Area(ac)	RCN	Tc
Basin_3	Watershed_3	Reach_3	1747.62	64	.503

Total area: 1747.62 (ac)

--- Storm Data --

Rainfall Depth by Rainfall Return Period

0.85-Yr (in)	1-Yr (in)	2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)
.57	1.18	1.95	2.51	2.99	3.69	4.26

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type I
Dimensionless Unit Hydrograph: delmarva

Gonzaga Ridge Wind
Hydrology Study
Merced County, California

Storm Data

Rainfall Depth by Rainfall Return Period

0.85-Yr (in)	1-Yr (in)	2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)
.57	1.18	1.95	2.51	2.99	3.69	4.26

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type I
Dimensionless Unit Hydrograph: delmarva

Gonzaga Ridge Wind
Hydrology Study
Merced County, California

Watershed Peak Table

Sub-Area or Reach Identifier	Peak Flow by Rainfall Return Period 0.85-Yr (cfs)	2-Yr (cfs)	5-Yr (cfs)	25-Yr (cfs)
SUBAREAS				
Basin_3	.00	15.83	43.30	239.13
REACHES				
Reach_3	.00	15.83	43.30	239.13
Down	.00	15.83	43.29	238.54
OUTLET	.00	15.83	43.29	238.54

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period 0.85-Yr (cfs) (hr)	2-Yr (cfs) (hr)	5-Yr (cfs) (hr)	25-Yr (cfs) (hr)
SUBAREAS				
Basin_3	.00	15.83	43.30	239.13
	n/a	18.15	12.03	10.38
REACHES				
Reach_3	.00	15.83	43.30	239.13
	n/a	18.15	12.03	10.38
Down	.00	15.83	43.29	238.54
	n/a	18.89	12.63	10.72
OUTLET	.00	15.83	43.29	238.54

Gonzaga Ridge Wind
Hydrology Study
Merced County, California

Sub-Area Summary Table

Sub-Area Identifier	Drainage Area (ac)	Time of Concentration (hr)	Curve Number	Receiving Reach	Sub-Area Description
Basin_3	1747.62	0.503	64	Reach_3	Watershed_3

Total Area: 1747.62 (ac)

Gonzaga Ridge Wind
Hydrology Study
Merced County, California

Reach Summary Table

Reach Identifier	Receiving Reach Identifier	Reach Length (ft)	Routing Method
Reach_3	Outlet	16112	CHANNEL

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
Basin_3							
SHEET	100	0.1700	0.240				0.129
SHALLOW	800	0.0700	0.050				0.052
CHANNEL	16112	0.0500	0.040	34.50	16.00	13.899	0.322
						Time of Concentration	.503

Gonzaga Ridge Wind
Hydrology Study
Merced County, California

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use		Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
Basin_3	Paved parking lots, roofs, driveways		C	.093	98
	Paved parking lots, roofs, driveways		D	.049	98
	Gravel (w/ right-of-way)		C	2.776	89
	Gravel (w/ right-of-way)		D	53.995	91
	Herbaceous	(good)	C	159.879	74
	Herbaceous	(good)	D	645.776	85
	Oak - aspen	(good)	C	497.822	41
	Oak - aspen	(good)	D	74.883	48
	Sagebrush (w/ grass understory)	(good)	C	192.232	47
	Sagebrush (w/ grass understory)	(good)	D	114.113	55
	Desert shrub	(poor)	C	1.482	85
	Desert shrub	(poor)	D	4.518	88
	Total Area / Weighted Curve Number			1747.62	64
				=======	==

Gonzaga Ridge Wind
Hydrology Study
Merced County, California

Reach Channel Rating Details

Reach Identifier	Reach Length (ft)	Reach Manning's n	Friction Slope (ft/ft)	Bottom Width (ft)	Side Slope
Reach_3	16112	0.048	0.05	10	2 :1

Reach Identifier	Stage (ft)	Flow (cfs)	End Area (sq ft)	Top Width (ft)	Friction Slope (ft/ft)
Reach_3	0.0	0.000	0	10	0.05
	0.5	22.341	5.5	12	
	1.0	73.318	12	14	
	2.0	251.502	28	18	
	5.0	1468.647	100	30	
	10.0	6456.940	300	50	
	20.0	32251.302	1000	90	

WinTR-55 Current Data Description

--- Identification Data ---

User:	JMartin	Date:	11/1/2018
Project:	Gonzaga Ridge Wind	Units:	English
SubTitle:	Hydrology Study	Areal Units:	Acres
State:	California		
County:	Merced		

Filename: P:\400.Hydrogeology\11295 - Gonzaga Ridge Hydro Study\WinTR Results\Watershed_4_Pre.w55

--- Sub-Area Data ---

Name	Description	Reach	Area(ac)	RCN	Tc
Basin_4	Watershed_4	Reach_4	393.31	67	.22

Total area: 393.31 (ac)

--- Storm Data --

Rainfall Depth by Rainfall Return Period

0.85-Yr (in)	1-Yr (in)	2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)
.57	1.18	1.95	2.51	2.99	3.69	4.26

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type I
Dimensionless Unit Hydrograph: delmarva

Gonzaga Ridge Wind
Hydrology Study
Merced County, California

Storm Data

Rainfall Depth by Rainfall Return Period

0.85-Yr (in)	1-Yr (in)	2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)
.57	1.18	1.95	2.51	2.99	3.69	4.26

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type I
Dimensionless Unit Hydrograph: delmarva

Gonzaga Ridge Wind
Hydrology Study
Merced County, California

Watershed Peak Table

Sub-Area or Reach Identifier	Peak Flow by Rainfall Return Period 0.85-Yr (cfs)	2-Yr (cfs)	5-Yr (cfs)	25-Yr (cfs)
SUBAREAS				
Basin_4	.00	5.33	21.33	125.45
REACHES				
Reach_4	.00	5.33	21.33	125.45
Down	.00	5.33	21.33	125.04
OUTLET	.00	5.33	21.33	125.04

JMartin

Gonzaga Ridge Wind
Hydrology Study
Merced County, California

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period 0.85-Yr (cfs) (hr)	2-Yr (cfs) (hr)	5-Yr (cfs) (hr)	25-Yr (cfs) (hr)
SUBAREAS				
Basin_4	.00	5.33	21.33	125.45
	n/a	12.80	10.16	10.09
REACHES				
Reach_4	.00	5.33	21.33	125.45
	n/a	12.80	10.16	10.09
Down	.00	5.33	21.33	125.04
	n/a	12.91	10.25	10.15
OUTLET	.00	5.33	21.33	125.04

JMartin

Gonzaga Ridge Wind
Hydrology Study
Merced County, California

Sub-Area Summary Table

Sub-Area Identifier	Drainage Area (ac)	Time of Concentration (hr)	Curve Number	Receiving Reach	Sub-Area Description
Basin_4	393.31	0.220	67	Reach_4	Watershed_4

Total Area: 393.31 (ac)

Gonzaga Ridge Wind
Hydrology Study
Merced County, California

Reach Summary Table

Reach Identifier	Receiving Reach Identifier	Reach Length (ft)	Routing Method
Reach_4	Outlet	5253	CHANNEL

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
Basin_4							
SHEET	100	0.2200	0.240				0.117
SHALLOW	800	0.1100	0.050				0.042
CHANNEL	5253	0.1500	0.040	34.50	16.00	23.921	0.061
						Time of Concentration	.22

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use		Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
Basin_4	Paved parking lots, roofs, driveways		C	.043	98
	Paved parking lots, roofs, driveways		D	.04	98
	Gravel (w/ right-of-way)		C	1.231	89
	Gravel (w/ right-of-way)		D	10.319	91
	Herbaceous	(good)	C	56.241	74
	Herbaceous	(good)	D	170.964	85
	Oak - aspen	(good)	C	87.675	41
	Oak - aspen	(good)	D	6.261	48
	Sagebrush (w/ grass understory)	(good)	C	54.196	47
	Sagebrush (w/ grass understory)	(good)	D	6.336	55
	Total Area / Weighted Curve Number			393.31	67
				======	==

Gonzaga Ridge Wind
Hydrology Study
Merced County, California

Reach Channel Rating Details

Reach Identifier	Reach Length (ft)	Reach Manning's n	Friction Slope (ft/ft)	Bottom Width (ft)	Side Slope
Reach_4	5253	0.04	0.15	10	2 :1

Reach Identifier	Stage (ft)	Flow (cfs)	End Area (sq ft)	Top Width (ft)	Friction Slope (ft/ft)
Reach_4	0.0	0.000	0	10	0.15
	0.5	46.435	5.5	12	
	1.0	152.388	12	14	
	2.0	522.736	28	18	
	5.0	3052.526	100	30	
	10.0	13420.498	300	50	
	20.0	67033.072	1000	90	

WinTR-55 Current Data Description

--- Identification Data ---

User: JMartin
Project: Gonzaga Ridge Wind
SubTitle: Hydrology Study
State: California
County: Merced
Filename: P:\400.Hydrogeology\11295 - Gonzaga Ridge Hydro Study\WinTR Results\Watershed_5_Pre.w55

Date: 11/1/2018
Units: English
Areal Units: Acres

--- Sub-Area Data ---

Name	Description	Reach	Area(ac)	RCN	Tc
Basin_5	Watershed_5	Reach_5	2837.84	73	.478

Total area: 2837.84 (ac)

--- Storm Data --

Rainfall Depth by Rainfall Return Period

0.85-Yr (in)	1-Yr (in)	2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)
.57	1.18	1.95	2.51	2.99	3.69	4.26

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type I
Dimensionless Unit Hydrograph: delmarva

Storm Data

Rainfall Depth by Rainfall Return Period

0.85-Yr (in)	1-Yr (in)	2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)
.57	1.18	1.95	2.51	2.99	3.69	4.26

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type I
Dimensionless Unit Hydrograph: delmarva

Gonzaga Ridge Wind
Hydrology Study
Merced County, California

Watershed Peak Table

Sub-Area or Reach Identifier	Peak Flow by Rainfall Return Period 0.85-Yr (cfs)	2-Yr (cfs)	5-Yr (cfs)	25-Yr (cfs)
SUBAREAS				
Basin_5	.00	101.84	298.98	952.31
REACHES				
Reach_5	.00	101.84	298.98	952.31
Down	.00	99.92	292.11	862.09
OUTLET	.00	99.92	292.11	862.09

Gonzaga Ridge Wind
Hydrology Study
Merced County, California

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period 0.85-Yr (cfs) (hr)	2-Yr (cfs) (hr)	5-Yr (cfs) (hr)	25-Yr (cfs) (hr)
SUBAREAS				
Basin_5	.00	101.84	298.98	952.31
	n/a	10.61	10.32	10.25
REACHES				
Reach_5	.00	101.84	298.98	952.31
	n/a	10.61	10.32	10.25
Down	.00	99.92	292.11	862.09
	n/a	49.23	39.13	30.58
OUTLET	.00	99.92	292.11	862.09

Gonzaga Ridge Wind
Hydrology Study
Merced County, California

Sub-Area Summary Table

Sub-Area Identifier	Drainage Area (ac)	Time of Concentration (hr)	Curve Number	Receiving Reach	Sub-Area Description
Basin_5	2837.84	0.478	73	Reach_5	Watershed_5

Total Area: 2837.84 (ac)

JMartin

Gonzaga Ridge Wind
Hydrology Study
Merced County, California

Reach Summary Table

Reach Identifier	Receiving Reach Identifier	Reach Length (ft)	Routing Method
Reach_5	Outlet	1637737	CHANNEL

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
Basin_5							
SHEET	100	0.2100	0.240				0.119
SHALLOW	800	0.1800	0.050				0.032
CHANNEL	16377	0.0500	0.040	34.50	16.00	13.912	0.327
						Time of Concentration	.478

JMartin

Gonzaga Ridge Wind
Hydrology Study
Merced County, California

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use		Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
Basin_5	Paved parking lots, roofs, driveways		C	.102	98
	Paved parking lots, roofs, driveways		D	.198	98
	Gravel (w/ right-of-way)		C	.345	89
	Gravel (w/ right-of-way)		D	61.99	91
	Herbaceous	(good)	C	245.034	74
	Herbaceous	(good)	D	1750.144	85
	Oak - aspen	(good)	C	375.25	41
	Oak - aspen	(good)	D	107.503	48
	Sagebrush (w/ grass understory)	(good)	C	141.68	47
	Sagebrush (w/ grass understory)	(good)	D	155.593	55
	Total Area / Weighted Curve Number			2837.84	73
				=======	==

Reach Channel Rating Details

Reach Identifier	Reach Length (ft)	Reach Manning's n	Friction Slope (ft/ft)	Bottom Width (ft)	Side Slope
Reach_5	1637737	0.04	0.05	10	2 :1

Reach Identifier	Stage (ft)	Flow (cfs)	End Area (sq ft)	Top Width (ft)	Friction Slope (ft/ft)
Reach_5	0.0	0.000	0	10	0.05
	0.5	26.809	5.5	12	
	1.0	87.981	12	14	
	2.0	301.802	28	18	
	5.0	1762.377	100	30	
	10.0	7748.328	300	50	
	20.0	38701.562	1000	90	

WinTR-55 Current Data Description

--- Identification Data ---

User:	JMartin	Date:	11/1/2018
Project:	Gonzaga Ridge Wind	Units:	English
SubTitle:	Hydrology Study	Areal Units:	Acres
State:	California		
County:	Merced		

Filename: P:\400.Hydrogeology\11295 - Gonzaga Ridge Hydro Study\WinTR Results\Watershed_6_Pre.w55

--- Sub-Area Data ---

Name	Description	Reach	Area(ac)	RCN	Tc
Basin_6	Watershed_6	Reach_6	877.62	68	.275

Total area: 877.62 (ac)

--- Storm Data --

Rainfall Depth by Rainfall Return Period

0.85-Yr (in)	1-Yr (in)	2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)
.57	1.18	1.95	2.51	2.99	3.69	4.26

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type I
Dimensionless Unit Hydrograph: delmarva

Storm Data

Rainfall Depth by Rainfall Return Period

0.85-Yr (in)	1-Yr (in)	2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)
.57	1.18	1.95	2.51	2.99	3.69	4.26

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type I
Dimensionless Unit Hydrograph: delmarva

Gonzaga Ridge Wind
Hydrology Study
Merced County, California

Watershed Peak Table

Sub-Area or Reach Identifier	Peak Flow by Rainfall Return Period 0.85-Yr (cfs)	2-Yr (cfs)	5-Yr (cfs)	25-Yr (cfs)
SUBAREAS				
Basin_6	.00	13.61	53.56	271.66
REACHES				
Reach_6	.00	13.61	53.56	271.66
Down	.00	13.61	53.56	270.56
OUTLET	.00	13.61	53.56	270.56

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period 0.85-Yr (cfs) (hr)	2-Yr (cfs) (hr)	5-Yr (cfs) (hr)	25-Yr (cfs) (hr)
SUBAREAS				
Basin_6	.00	13.61	53.56	271.66
	n/a	12.58	10.21	10.11
REACHES				
Reach_6	.00	13.61	53.56	271.66
	n/a	12.58	10.21	10.11
Down	.00	13.61	53.56	270.56
	n/a	12.80	10.39	10.22
OUTLET	.00	13.61	53.56	270.56

Gonzaga Ridge Wind
Hydrology Study
Merced County, California

Sub-Area Summary Table

Sub-Area Identifier	Drainage Area (ac)	Time of Concentration (hr)	Curve Number	Receiving Reach	Sub-Area Description
Basin_6	877.62	0.275	68	Reach_6	Watershed_6

Total Area: 877.62 (ac)

Gonzaga Ridge Wind
Hydrology Study
Merced County, California

Reach Summary Table

Reach Identifier	Receiving Reach Identifier	Reach Length (ft)	Routing Method
Reach_6	Outlet	8555	CHANNEL

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
Basin_6							
SHEET	100	0.2500	0.240				0.111
SHALLOW	800	0.1400	0.050				0.037
CHANNEL	8555	0.0900	0.040	34.50	16.00	18.712	0.127
						Time of Concentration	.275

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use		Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
Basin_6	Gravel (w/ right-of-way)		C	3.828	89
	Gravel (w/ right-of-way)		D	35.217	91
	Herbaceous	(good)	C	86.753	74
	Herbaceous	(good)	D	410.837	85
	Oak - aspen	(good)	C	182.162	41
	Oak - aspen	(good)	D	27.104	48
	Sagebrush (w/ grass understory)	(good)	C	100.654	47
	Sagebrush (w/ grass understory)	(good)	D	31.069	55
	Total Area / Weighted Curve Number			877.62	68
				======	==

Gonzaga Ridge Wind
Hydrology Study
Merced County, California

Reach Channel Rating Details

Reach Identifier	Reach Length (ft)	Reach Manning's n	Friction Slope (ft/ft)	Bottom Width (ft)	Side Slope
Reach_6	8555	0.04	0.09	10	2 :1

Reach Identifier	Stage (ft)	Flow (cfs)	End Area (sq ft)	Top Width (ft)	Friction Slope (ft/ft)
Reach_6	0.0	0.000	0	10	0.09
	0.5	35.969	5.5	12	
	1.0	118.039	12	14	
	2.0	404.910	28	18	
	5.0	2364.476	100	30	
	10.0	10395.473	300	50	
	20.0	51923.594	1000	90	

WinTR-55 Current Data Description

--- Identification Data ---

User:	JMartin	Date:	11/1/2018
Project:	Gonzaga Ridge Wind	Units:	English
SubTitle:	Hydrology Study	Areal Units:	Acres
State:	California		
County:	Merced		

Filename: P:\400.Hydrogeology\11295 - Gonzaga Ridge Hydro Study\WinTR Results\Watershed_1_Post.w55

--- Sub-Area Data ---

Name	Description	Reach	Area(ac)	RCN	Tc
B1_Post	B1_Post	Reach_1	326.38	71	.245

Total area: 326.38 (ac)

--- Storm Data --

Rainfall Depth by Rainfall Return Period

0.85-Yr (in)	1-Yr (in)	2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)
.57	1.18	1.95	2.51	2.99	3.69	4.26

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type I
Dimensionless Unit Hydrograph: delmarva

Storm Data

Rainfall Depth by Rainfall Return Period

0.85-Yr (in)	1-Yr (in)	2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)
.57	1.18	1.95	2.51	2.99	3.69	4.26

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type I
Dimensionless Unit Hydrograph: delmarva

Gonzaga Ridge Wind
Hydrology Study
Merced County, California

Watershed Peak Table

Sub-Area or Reach Identifier	Peak Flow by Rainfall Return Period 0.85-Yr (cfs)	2-Yr (cfs)	5-Yr (cfs)	25-Yr (cfs)
SUBAREAS				
B1_Post	.00	9.59	38.21	139.52
REACHES				
Reach_1	.00	9.59	38.21	139.52
Down	.00	9.58	38.07	139.15
OUTLET	.00	9.58	38.07	139.15

Gonzaga Ridge Wind
Hydrology Study
Merced County, California

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period 0.85-Yr (cfs) (hr)	2-Yr (cfs) (hr)	5-Yr (cfs) (hr)	25-Yr (cfs) (hr)
SUBAREAS				
B1_Post	.00	9.59	38.21	139.52
	n/a	10.46	10.11	10.07
REACHES				
Reach_1	.00	9.59	38.21	139.52
	n/a	10.46	10.11	10.07
Down	.00	9.58	38.07	139.15
	n/a	10.63	10.28	10.20
OUTLET	.00	9.58	38.07	139.15

Gonzaga Ridge Wind
Hydrology Study
Merced County, California

Sub-Area Summary Table

Sub-Area Identifier	Drainage Area (ac)	Time of Concentration (hr)	Curve Number	Receiving Reach	Sub-Area Description
B1_Post	326.38	0.245	71	Reach_1	B1_Post

Total Area: 326.38 (ac)

Gonzaga Ridge Wind
Hydrology Study
Merced County, California

Reach Summary Table

Reach Identifier	Receiving Reach Identifier	Reach Length (ft)	Routing Method
Reach_1	Outlet	5464	CHANNEL

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
B1_Post							
SHEET	100	0.2100	0.240				0.119
SHALLOW	800	0.0800	0.050				0.049
CHANNEL	5464	0.1000	0.040	34.50	16.00	19.711	0.077
						Time of Concentration	.245

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use		Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
B1_Post	Paved parking lots, roofs, driveways		C	.42	98
	Paved parking lots, roofs, driveways		D	.115	98
	Gravel (w/ right-of-way)		C	13.004	89
	Gravel (w/ right-of-way)		D	14.653	91
	Herbaceous	(good)	C	20.293	74
	Herbaceous	(good)	D	160.561	85
	Oak - aspen	(good)	C	50.995	41
	Oak - aspen	(good)	D	9.122	48
	Sagebrush (w/ grass understory)	(good)	C	44.038	47
	Sagebrush (w/ grass understory)	(good)	D	13.182	55
	Total Area / Weighted Curve Number			326.38	71
				======	==

Reach Channel Rating Details

Reach Identifier	Reach Length (ft)	Reach Manning's n	Friction Slope (ft/ft)	Bottom Width (ft)	Side Slope
Reach_1	5464	0.048	0.1	10	2 :1

Reach Identifier	Stage (ft)	Flow (cfs)	End Area (sq ft)	Top Width (ft)	Friction Slope (ft/ft)
Reach_1	0.0	0.000	0	10	0.1
	0.5	31.595	5.5	12	
	1.0	103.687	12	14	
	2.0	355.677	28	18	
	5.0	2076.981	100	30	
	10.0	9131.492	300	50	
	20.0	45610.228	1000	90	

WinTR-55 Current Data Description

--- Identification Data ---

User:	JMartin	Date:	11/1/2018
Project:	Gonzaga Ridge Wind	Units:	English
SubTitle:	Hydrology Study	Areal Units:	Acres
State:	California		
County:	Merced		

Filename: P:\400.Hydrogeology\11295 - Gonzaga Ridge Hydro Study\WinTR Results\Watershed_2_Post.w55

--- Sub-Area Data ---

Name	Description	Reach	Area(ac)	RCN	Tc
Basin_2	Watershed_2	Reach_2	306.02	73	.187

Total area: 306.02 (ac)

--- Storm Data --

Rainfall Depth by Rainfall Return Period

0.85-Yr (in)	1-Yr (in)	2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)
.57	1.18	1.95	2.51	2.99	3.69	4.26

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type I
Dimensionless Unit Hydrograph: delmarva

Storm Data

Rainfall Depth by Rainfall Return Period

0.85-Yr (in)	1-Yr (in)	2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)
.57	1.18	1.95	2.51	2.99	3.69	4.26

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type I
Dimensionless Unit Hydrograph: delmarva

Gonzaga Ridge Wind
Hydrology Study
Merced County, California

Watershed Peak Table

Sub-Area or Reach Identifier	Peak Flow by Rainfall Return Period 0.85-Yr (cfs)	2-Yr (cfs)	5-Yr (cfs)	25-Yr (cfs)
SUBAREAS				
Basin_2	.00	17.08	56.98	174.95
REACHES				
Reach_2	.00	17.08	56.98	174.95
Down	.00	17.08	56.76	174.21
OUTLET	.00	17.08	56.76	174.21

Gonzaga Ridge Wind
Hydrology Study
Merced County, California

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period 0.85-Yr (cfs) (hr)	2-Yr (cfs) (hr)	5-Yr (cfs) (hr)	25-Yr (cfs) (hr)
SUBAREAS				
Basin_2	.00	17.08	56.98	174.95
	n/a	10.10	10.07	10.05
REACHES				
Reach_2	.00	17.08	56.98	174.95
	n/a	10.10	10.07	10.05
Down	.00	17.08	56.76	174.21
	n/a	10.20	10.15	10.09
OUTLET	.00	17.08	56.76	174.21

Gonzaga Ridge Wind
Hydrology Study
Merced County, California

Sub-Area Summary Table

Sub-Area Identifier	Drainage Area (ac)	Time of Concentration (hr)	Curve Number	Receiving Reach	Sub-Area Description
Basin_2	306.02	0.187	73	Reach_2	Watershed_2

Total Area: 306.02 (ac)

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Gonzaga Ridge Wind
Hydrology Study
Merced County, California

Reach Summary Table

Reach Identifier	Receiving Reach Identifier	Reach Length (ft)	Routing Method
Reach_2	Outlet	3672	CHANNEL

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
Basin_2							
SHEET	100	0.2100	0.240				0.119
SHALLOW	800	0.3400	0.050				0.024
SHALLOW	0		0.050				
CHANNEL	3672	0.1400	0.040	34.50	16.00	23.182	0.044
						Time of Concentration	.187

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Gonzaga Ridge Wind
Hydrology Study
Merced County, California

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use		Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
Basin_2	Paved parking lots, roofs, driveways		C	.346	98
	Gravel (w/ right-of-way)		C	1.717	89
	Herbaceous	(good)	C	123.158	74
	Herbaceous	(good)	D	122.74	85
	Oak - aspen	(good)	C	23.328	41
	Oak - aspen	(good)	D	2.73	48
	Sagebrush (w/ grass understory)	(good)	C	23.976	47
	Sagebrush (w/ grass understory)	(good)	D	8.026	55
	Total Area / Weighted Curve Number			306.02	73
				======	==

Gonzaga Ridge Wind
Hydrology Study
Merced County, California

Reach Channel Rating Details

Reach Identifier	Reach Length (ft)	Reach Manning's n	Friction Slope (ft/ft)	Bottom Width (ft)	Side Slope
Reach_2	3672	0.048	0.14	10	2 :1

Reach Identifier	Stage (ft)	Flow (cfs)	End Area (sq ft)	Top Width (ft)	Friction Slope (ft/ft)
Reach_2	0.0	0.000	0	10	0.14
	0.5	37.384	5.5	12	
	1.0	122.684	12	14	
	2.0	420.843	28	18	
	5.0	2457.517	100	30	
	10.0	10804.527	300	50	
	20.0	53966.750	1000	90	

WinTR-55 Current Data Description

--- Identification Data ---

User: JMartin
Project: Gonzaga Ridge Wind
SubTitle: Hydrology Study
State: California
County: Merced
Filename: P:\400.Hydrogeology\11295 - Gonzaga Ridge Hydro Study\WinTR Results\Watershed_3_Post.w55

Date: 11/1/2018
Units: English
Areal Units: Acres

--- Sub-Area Data ---

Name	Description	Reach	Area(ac)	RCN	Tc
Basin_3	Watershed_3	Reach_3	1747.62	64	.503

Total area: 1747.62 (ac)

--- Storm Data --

Rainfall Depth by Rainfall Return Period

0.85-Yr (in)	1-Yr (in)	2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)
.57	1.18	1.95	2.51	2.99	3.69	4.26

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type I
Dimensionless Unit Hydrograph: delmarva

JMartin

Gonzaga Ridge Wind
Hydrology Study
Merced County, California

Storm Data

Rainfall Depth by Rainfall Return Period

0.85-Yr (in)	1-Yr (in)	2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)
.57	1.18	1.95	2.51	2.99	3.69	4.26

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type I
Dimensionless Unit Hydrograph: delmarva

JMartin

Gonzaga Ridge Wind
Hydrology Study
Merced County, California

Watershed Peak Table

Sub-Area or Reach Identifier	Peak Flow by Rainfall Return Period 0.85-Yr (cfs)	2-Yr (cfs)	5-Yr (cfs)	25-Yr (cfs)
SUBAREAS				
Basin_3	.00	15.83	43.30	239.13
REACHES				
Reach_3	.00	15.83	43.30	239.13
Down	.00	15.83	43.29	238.54
OUTLET	.00	15.83	43.29	238.54

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Gonzaga Ridge Wind
Hydrology Study
Merced County, California

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period 0.85-Yr (cfs) (hr)	2-Yr (cfs) (hr)	5-Yr (cfs) (hr)	25-Yr (cfs) (hr)
SUBAREAS				
Basin_3	.00	15.83	43.30	239.13
	n/a	18.15	12.03	10.38
REACHES				
Reach_3	.00	15.83	43.30	239.13
	n/a	18.15	12.03	10.38
Down	.00	15.83	43.29	238.54
	n/a	18.89	12.63	10.72
OUTLET	.00	15.83	43.29	238.54

Gonzaga Ridge Wind
Hydrology Study
Merced County, California

Sub-Area Summary Table

Sub-Area Identifier	Drainage Area (ac)	Time of Concentration (hr)	Curve Number	Receiving Reach	Sub-Area Description
Basin_3	1747.62	0.503	64	Reach_3	Watershed_3

Total Area: 1747.62 (ac)

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Gonzaga Ridge Wind
Hydrology Study
Merced County, California

Reach Summary Table

Reach Identifier	Receiving Reach Identifier	Reach Length (ft)	Routing Method
Reach_3	Outlet	16112	CHANNEL

Gonzaga Ridge Wind
Hydrology Study
Merced County, California

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
Basin_3							
SHEET	100	0.1700	0.240				0.129
SHALLOW	800	0.0700	0.050				0.052
CHANNEL	16112	0.0500	0.040	34.50	16.00	13.899	0.322
						Time of Concentration	.503

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use		Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
Basin_3	Paved parking lots, roofs, driveways		C	.568	98
	Paved parking lots, roofs, driveways		D	.187	98
	Gravel (w/ right-of-way)		C	2.776	89
	Gravel (w/ right-of-way)		D	63.63	91
	Herbaceous	(good)	C	129.852	74
	Herbaceous	(good)	D	665.553	85
	Oak - aspen	(good)	C	497.822	41
	Oak - aspen	(good)	D	74.883	48
	Sagebrush (w/ grass understory)	(good)	C	192.232	47
	Sagebrush (w/ grass understory)	(good)	D	114.113	55
	Desert shrub	(poor)	C	1.482	85
	Desert shrub	(poor)	D	4.518	88
	Total Area / Weighted Curve Number			1747.62	64
				=======	==

Reach Channel Rating Details

Reach Identifier	Reach Length (ft)	Reach Manning's n	Friction Slope (ft/ft)	Bottom Width (ft)	Side Slope
Reach_3	16112	0.048	0.05	10	2 :1

Reach Identifier	Stage (ft)	Flow (cfs)	End Area (sq ft)	Top Width (ft)	Friction Slope (ft/ft)
Reach_3	0.0	0.000	0	10	0.05
	0.5	22.341	5.5	12	
	1.0	73.318	12	14	
	2.0	251.502	28	18	
	5.0	1468.647	100	30	
	10.0	6456.940	300	50	
	20.0	32251.302	1000	90	

WinTR-55 Current Data Description

--- Identification Data ---

User: JMartin
Project: Gonzaga Ridge Wind
SubTitle: Hydrology Study
State: California
County: Merced
Filename: P:\400.Hydrogeology\11295 - Gonzaga Ridge Hydro Study\WinTR Results\Watershed_4_Post.w55

Date: 11/1/2018
Units: English
Areal Units: Acres

--- Sub-Area Data ---

Name	Description	Reach	Area(ac)	RCN	Tc
Basin_4_Po	Watershed_4_Post	Reach_4	393.31	67	.22

Total area: 393.31 (ac)

--- Storm Data --

Rainfall Depth by Rainfall Return Period

0.85-Yr (in)	1-Yr (in)	2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)
.57	1.18	1.95	2.51	2.99	3.69	4.26

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type I
Dimensionless Unit Hydrograph: delmarva

Storm Data

Rainfall Depth by Rainfall Return Period

0.85-Yr (in)	1-Yr (in)	2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)
.57	1.18	1.95	2.51	2.99	3.69	4.26

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type I
Dimensionless Unit Hydrograph: delmarva

JMartin

Gonzaga Ridge Wind
Hydrology Study
Merced County, California

Watershed Peak Table

Sub-Area or Reach Identifier	Peak Flow by Rainfall Return Period 0.85-Yr (cfs)	2-Yr (cfs)	5-Yr (cfs)	25-Yr (cfs)
SUBAREAS				
Basin_4_Po	.00	5.33	21.33	125.45
REACHES				
Reach_4	.00	5.33	21.33	125.45
Down	.00	5.33	21.33	125.04
OUTLET	.00	5.33	21.33	125.04

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period 0.85-Yr (cfs) (hr)	2-Yr (cfs) (hr)	5-Yr (cfs) (hr)	25-Yr (cfs) (hr)
SUBAREAS				
Basin_4_Po	.00	5.33	21.33	125.45
	n/a	12.80	10.16	10.09
REACHES				
Reach_4	.00	5.33	21.33	125.45
	n/a	12.80	10.16	10.09
Down	.00	5.33	21.33	125.04
	n/a	12.91	10.25	10.15
OUTLET	.00	5.33	21.33	125.04

JMartin

Gonzaga Ridge Wind
Hydrology Study
Merced County, California

Sub-Area Summary Table

Sub-Area Identifier	Drainage Area (ac)	Time of Concentration (hr)	Curve Number	Receiving Reach	Sub-Area Description
Basin_4_Po	393.31	0.220	67	Reach_4	Watershed_4_Post

Total Area: 393.31 (ac)

Gonzaga Ridge Wind
Hydrology Study
Merced County, California

Reach Summary Table

Reach Identifier	Receiving Reach Identifier	Reach Length (ft)	Routing Method
Reach_4	Outlet	5253	CHANNEL

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
Basin_4_Po							
SHEET	100	0.2200	0.240				0.117
SHALLOW	800	0.1100	0.050				0.042
CHANNEL	5253	0.1500	0.040	34.50	16.00	23.921	0.061
						Time of Concentration	.22

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use		Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
Basin_4_Po	Paved parking lots, roofs, driveways		D	.307	98
	Gravel (w/ right-of-way)		C	1.231	89
	Gravel (w/ right-of-way)		D	10.687	91
	Herbaceous	(good)	C	56.284	74
	Herbaceous	(good)	D	170.33	85
	Oak - aspen	(good)	C	87.675	41
	Oak - aspen	(good)	D	6.261	48
	Sagebrush (w/ grass understory)	(good)	C	54.196	47
	Sagebrush (w/ grass understory)	(good)	D	6.336	55
	Total Area / Weighted Curve Number			393.31	67
				======	==

Reach Channel Rating Details

Reach Identifier	Reach Length (ft)	Reach Manning's n	Friction Slope (ft/ft)	Bottom Width (ft)	Side Slope
Reach_4	5253	0.04	0.15	10	2 :1

Reach Identifier	Stage (ft)	Flow (cfs)	End Area (sq ft)	Top Width (ft)	Friction Slope (ft/ft)
Reach_4	0.0	0.000	0	10	0.15
	0.5	46.435	5.5	12	
	1.0	152.388	12	14	
	2.0	522.736	28	18	
	5.0	3052.526	100	30	
	10.0	13420.498	300	50	
	20.0	67033.072	1000	90	

WinTR-55 Current Data Description

--- Identification Data ---

User:	JMartin	Date:	11/1/2018
Project:	Gonzaga Ridge Wind	Units:	English
SubTitle:	Hydrology Study	Areal Units:	Acres
State:	California		
County:	Merced		

Filename: P:\400.Hydrogeology\11295 - Gonzaga Ridge Hydro Study\WinTR Results\Watershed_5_Post.w55

--- Sub-Area Data ---

Name	Description	Reach	Area(ac)	RCN	Tc
Basin_5	Watershed_5	Reach_5	2837.84	73	.478

Total area: 2837.84 (ac)

--- Storm Data --

Rainfall Depth by Rainfall Return Period

0.85-Yr (in)	1-Yr (in)	2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)
.57	1.18	1.95	2.51	2.99	3.69	4.26

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type I
Dimensionless Unit Hydrograph: delmarva

Gonzaga Ridge Wind
Hydrology Study
Merced County, California

Storm Data

Rainfall Depth by Rainfall Return Period

0.85-Yr (in)	1-Yr (in)	2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)
.57	1.18	1.95	2.51	2.99	3.69	4.26

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type I
Dimensionless Unit Hydrograph: delmarva

Gonzaga Ridge Wind
Hydrology Study
Merced County, California

Watershed Peak Table

Sub-Area or Reach Identifier	Peak Flow by Rainfall Return Period 0.85-Yr (cfs)	2-Yr (cfs)	5-Yr (cfs)	25-Yr (cfs)
SUBAREAS				
Basin_5	.00	101.84	298.98	952.31
REACHES				
Reach_5	.00	101.84	298.98	952.31
Down	.00	99.92	292.11	862.09
OUTLET	.00	99.92	292.11	862.09

JMartin

Gonzaga Ridge Wind
Hydrology Study
Merced County, California

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period 0.85-Yr (cfs) (hr)	2-Yr (cfs) (hr)	5-Yr (cfs) (hr)	25-Yr (cfs) (hr)
SUBAREAS				
Basin_5	.00	101.84	298.98	952.31
	n/a	10.61	10.32	10.25
REACHES				
Reach_5	.00	101.84	298.98	952.31
	n/a	10.61	10.32	10.25
Down	.00	99.92	292.11	862.09
	n/a	49.23	39.13	30.58
OUTLET	.00	99.92	292.11	862.09

Sub-Area Summary Table

Sub-Area Identifier	Drainage Area (ac)	Time of Concentration (hr)	Curve Number	Receiving Reach	Sub-Area Description
Basin_5	2837.84	0.478	73	Reach_5	Watershed_5

Total Area: 2837.84 (ac)

Gonzaga Ridge Wind
Hydrology Study
Merced County, California

Reach Summary Table

Reach Identifier	Receiving Reach Identifier	Reach Length (ft)	Routing Method
Reach_5	Outlet	1637737	CHANNEL

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
Basin_5							
SHEET	100	0.2100	0.240				0.119
SHALLOW	800	0.1800	0.050				0.032
CHANNEL	16377	0.0500	0.040	34.50	16.00	13.912	0.327
						Time of Concentration	.478

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use		Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
Basin_5	Paved parking lots, roofs, driveways		C	.115	98
	Paved parking lots, roofs, driveways		D	2.732	98
	Gravel (w/ right-of-way)		C	.345	89
	Gravel (w/ right-of-way)		D	74.564	91
	Herbaceous	(good)	C	240.021	74
	Herbaceous	(good)	D	1740.036	85
	Oak - aspen	(good)	C	375.25	41
	Oak - aspen	(good)	D	107.503	48
	Sagebrush (w/ grass understory)	(good)	C	141.68	47
	Sagebrush (w/ grass understory)	(good)	D	155.593	55
	Total Area / Weighted Curve Number			2837.84	73
				=======	==

Gonzaga Ridge Wind
Hydrology Study
Merced County, California

Reach Channel Rating Details

Reach Identifier	Reach Length (ft)	Reach Manning's n	Friction Slope (ft/ft)	Bottom Width (ft)	Side Slope
Reach_5	1637737	0.04	0.05	10	2 :1

Reach Identifier	Stage (ft)	Flow (cfs)	End Area (sq ft)	Top Width (ft)	Friction Slope (ft/ft)
Reach_5	0.0	0.000	0	10	0.05
	0.5	26.809	5.5	12	
	1.0	87.981	12	14	
	2.0	301.802	28	18	
	5.0	1762.377	100	30	
	10.0	7748.328	300	50	
	20.0	38701.562	1000	90	

WinTR-55 Current Data Description

--- Identification Data ---

User: JMartin
Date: 11/1/2018
Project: Gonzaga Ridge Wind
Units: English
SubTitle: Hydrology Study
Areal Units: Acres
State: California
County: Merced
Filename: P:\400.Hydrogeology\11295 - Gonzaga Ridge Hydro Study\WinTR Results\Watershed_6_Post.w55

--- Sub-Area Data ---

Name	Description	Reach	Area(ac)	RCN	Tc
Basin_6	Watershed_6	Reach_6	877.62	68	.275

Total area: 877.62 (ac)

--- Storm Data --

Rainfall Depth by Rainfall Return Period

0.85-Yr (in)	1-Yr (in)	2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)
.57	1.18	1.95	2.51	2.99	3.69	4.26

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type I
Dimensionless Unit Hydrograph: delmarva

Gonzaga Ridge Wind
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Merced County, California

Storm Data

Rainfall Depth by Rainfall Return Period

0.85-Yr (in)	1-Yr (in)	2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)
.57	1.18	1.95	2.51	2.99	3.69	4.26

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type I
Dimensionless Unit Hydrograph: delmarva

Gonzaga Ridge Wind
Hydrology Study
Merced County, California

Watershed Peak Table

Sub-Area or Reach Identifier	Peak Flow by Rainfall Return Period 0.85-Yr (cfs)	2-Yr (cfs)	5-Yr (cfs)	25-Yr (cfs)
SUBAREAS				
Basin_6	.00	13.61	53.56	271.66
REACHES				
Reach_6	.00	13.61	53.56	271.66
Down	.00	13.61	53.56	270.56
OUTLET	.00	13.61	53.56	270.56

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period 0.85-Yr (cfs) (hr)	2-Yr (cfs) (hr)	5-Yr (cfs) (hr)	25-Yr (cfs) (hr)
SUBAREAS				
Basin_6	.00	13.61	53.56	271.66
	n/a	12.58	10.21	10.11
REACHES				
Reach_6	.00	13.61	53.56	271.66
	n/a	12.58	10.21	10.11
Down	.00	13.61	53.56	270.56
	n/a	12.80	10.39	10.22
OUTLET	.00	13.61	53.56	270.56

Sub-Area Summary Table

Sub-Area Identifier	Drainage Area (ac)	Time of Concentration (hr)	Curve Number	Receiving Reach	Sub-Area Description
Basin_6	877.62	0.275	68	Reach_6	Watershed_6

Total Area: 877.62 (ac)

Gonzaga Ridge Wind
Hydrology Study
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Reach Summary Table

Reach Identifier	Receiving Reach Identifier	Reach Length (ft)	Routing Method
Reach_6	Outlet	8555	CHANNEL

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
Basin_6							
SHEET	100	0.2500	0.240				0.111
SHALLOW	800	0.1400	0.050				0.037
CHANNEL	8555	0.0900	0.040	34.50	16.00	18.712	0.127
						Time of Concentration	.275

Gonzaga Ridge Wind
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Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use		Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
Basin_6	Gravel (w/ right-of-way)		C	3.828	89
	Gravel (w/ right-of-way)		D	35.217	91
	Herbaceous	(good)	C	86.753	74
	Herbaceous	(good)	D	410.837	85
	Oak - aspen	(good)	C	182.162	41
	Oak - aspen	(good)	D	27.104	48
	Sagebrush (w/ grass understory)	(good)	C	100.654	47
	Sagebrush (w/ grass understory)	(good)	D	31.069	55
	Total Area / Weighted Curve Number			877.62	68
				======	==

Gonzaga Ridge Wind
Hydrology Study
Merced County, California

Reach Channel Rating Details

Reach Identifier	Reach Length (ft)	Reach Manning's n	Friction Slope (ft/ft)	Bottom Width (ft)	Side Slope
Reach_6	8555	0.04	0.09	10	2 :1

Reach Identifier	Stage (ft)	Flow (cfs)	End Area (sq ft)	Top Width (ft)	Friction Slope (ft/ft)
Reach_6	0.0	0.000	0	10	0.09
	0.5	35.969	5.5	12	
	1.0	118.039	12	14	
	2.0	404.910	28	18	
	5.0	2364.476	100	30	
	10.0	10395.473	300	50	
	20.0	51923.594	1000	90	

APPENDIX E

Noise

621 CHAPALA STREET
SANTA BARBARA, CALIFORNIA 93101
T 805.963.0651 F 805.963.2074

MEMORANDUM

To: Gonzaga Ridge Wind Farm, LLC
From: Jonathan V. Leech, Senior Environmental Acoustician
Subject: Noise Impact Study for the Gonzaga Ridge Wind Repowering Project
Date: June 4, 2019
Attachments: Figure 1, Modeling Receiver Locations
Figure 2, Noise Measurement Locations
Attachment A, Definitions
Attachment B, Measured Hourly L_{eq}
Attachment C, CadnaA Noise Modeling Input / Output
Attachment D, Construction Noise Modeling Input / Output

Dudek has completed an acoustical assessment for the proposed Gonzaga Ridge Wind Repowering Project (Project) located in Pacheco State Park (Park) in Merced County, California.

This memorandum summarizes State and local noise regulations and significance criteria related to noise, describes the ambient noise measurements conducted for the Project, and presents the noise methodology used to model and compare the noise levels produced from operation of the existing wind turbines prior to their decommissioning, against the noise levels from the Project turbines. The resulting modeled noise levels are summarized herein. In that the Project is located within a State Park, noise increases associated with the Project would primarily be subject to State standards. However, Project noise levels are also compared with local Merced County regulations to draw conclusions about the significance level of the impacts for proximate sensitive-receptors located adjacent to the State Park property on which the project is located. Construction and decommissioning noise and vibration impacts are also addressed.

FUNDAMENTALS OF NOISE AND VIBRATION

Sound pressure level alone is not a reliable indicator of loudness. The frequency, or pitch, of a sound also has a substantial effect on how humans will respond. To approximate the frequency response of the human ear, a series of sound level adjustments is usually applied to the sound measured by a sound level meter. The adjustments (referred to as a weighting network) are frequency-dependent.

The A-scale weighting network approximates the frequency response of the average young ear when listening to ordinary sounds. When people make judgments about the relative loudness or annoyance of a sound, their judgments correlate well with the A-scale sound levels of those sounds. Other weighting networks have been devised to address high noise levels or other special situations (e.g. C-scale), but these scales are rarely used in conjunction with most environmental noise. Noise levels are typically reported in terms of A-weighted sound levels. All sound levels discussed in this report are A-weighted decibels (dBA). Examples of typical noise levels for common indoor and outdoor activities are depicted in Table 1.

Table 1
Typical Sound Levels in the Environment and Industry

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
—	110	Rock band
Jet fly over at 300 meters (1,000 feet)	100	—
Gas lawn mower at 1 meter (3 feet)	90	—
Diesel truck at 15 meters (50 feet), at 80 kilometers per hour (50 miles per hour)	80	Food blender at 1 meter (3 feet); garbage disposal at 1 meter (3 feet)
Noisy urban area, daytime; gas lawn mower at 30 meters (100 feet)	70	Vacuum cleaner at 3 meters (10 feet)
Commercial area; heavy traffic at 90 meters (300 feet)	60	Normal speech at 1 meter (3 feet)
Quiet urban, daytime	50	Large business office; dishwasher next room
Quiet urban, nighttime	40	Theater; large conference room (background)
Quiet suburban, nighttime	30	Library
Quiet rural, nighttime	20	Bedroom at night; concert hall (background)
—	10	Broadcast/Recording studio
Lowest threshold of human hearing	0	Lowest threshold of human hearing

Source: Caltrans 1998.

The sound produced by mechanical equipment is sometimes reported as sound power or acoustic power. Similar to the light-intensity produced by a light bulb, sound power is the rate at which sound energy is emitted, and it is reported in watts. For a sound source, unlike sound pressure, sound power is neither room-dependent nor distance-dependent. Sound pressure varies with distance from the sound source, while sound power is a property of a sound source, equal to the total power emitted by that source in all directions.

Human Response to Changes in Noise Levels

"It is generally accepted that the average healthy ear … can barely perceive a noise level change of 3 dB" (Caltrans 2013). A change of 5 dBA is readily perceptible, and a change of 10 dBA is perceived as twice or half as loud. A doubling of sound energy results in a 3 dBA increase in sound, which means that a doubling of sound energy (e.g., doubling the average daily numbers of traffic on a road) would result in a barely perceptible change in sound level.

Additional units of measure have been developed to evaluate the long-term characteristics of sound. The equivalent sound level (L_{eq}) is also referred to as the time-average sound level. The 1-hour A-weighted equivalent sound level, L_{eq}(h), is the energy average of the A-weighted sound levels occurring during a 1-hour period.

People are generally more sensitive and annoyed by noise occurring during the evening and nighttime hours. Thus, another noise descriptor used in community noise assessments—the community noise equivalent level (CNEL)—was introduced. The CNEL scale represents a time-weighted, 24-hour average noise level based on the A-weighted sound level. The CNEL accounts for the increased noise sensitivity during the evening hours (7 p.m. to 10 p.m.) and nighttime hours (10 p.m. to 7 a.m.) by adding 5 dBA and 10 dBA, respectively, to the average sound levels occurring during the evening and nighttime hours.

Sound propagation (i.e., the passage of sound from a noise source to a receiver) is influenced by geometric spreading, ground absorption, atmospheric effects, and shielding by natural and/or built features. Sound levels attenuate (or diminish) at a rate of approximately 6 dBA per doubling of distance from an outdoor point source due to the geometric spreading of the sound waves. For sound point sources close to the ground, an additional attenuation of 1.5 dBA per doubling of distance applies for a "soft" site (when ground surfaces are covered with vegetation or loose soil), for a combined attenuation rate of 7.5 dBA per doubling of distance. Atmospheric conditions such as humidity, temperature, and wind gradients can also temporarily either increase or decrease sound levels. In general, the greater the distance the receiver is from the source, the greater the potential for variation in sound levels due to atmospheric effects. Additional sound attenuation can result from built features such as intervening walls and buildings, and by natural features such as hills and dense woods.

Groundborne Vibration Fundamentals

Groundborne vibration is a small, rapidly fluctuating motion transmitted through the ground. The strength of groundborne vibration attenuates rapidly over distance. Some soil types transmit vibration quite efficiently; other types (primarily sandy soils) do not. Several basic measurement units are commonly used to describe the intensity of ground vibration. The descriptors used by the Federal Transit Administration (FTA 2006) are peak particle velocity (PPV), in units of inches per second, and velocity decibel (VdB). The calculation to determine PPV at a given distance is as follows:

$$PPV_{distance} = PPV_{ref} * (25/D)^{1.5}$$

Where:

$PPV_{distance}$ = the peak particle velocity in inches per second of the equipment adjusted for distance

PPV_{ref} = the reference vibration level in inches per second at 25 feet

D = the distance from the equipment to the receiver

The response of humans, buildings, and sensitive equipment to vibration is described in this section in terms of the root-mean square velocity level in VdB units relative to 1 microinch per second. The average person can just barely perceive vibration velocity levels below 70 VdB (typically in the vertical direction). The calculation to determine the root-mean square at a given distance is as follows:

$$L_v(D) = L_v(25\text{ feet}) - 30*\log(D/25)$$

Where:

$L_v(D)$ = the vibration level at the receiver

$L_v(25\text{ feet})$ = the reference source vibration level

D = the distance from the vibration activity to the receiver

Typical background vibration levels are between 50 and 60 VdB, and the level for minor cosmetic damage to fragile buildings or blasting generally begins at 100 VdB.

PROJECT DESCRIPTION

The Project, is a repowering renewable wind energy generation development to be constructed and operated in Pacheco State Park (Park) in Merced County, California, by Gonzaga Ridge Wind Farm, LLC (GRWF). The Project would replace the existing wind energy facility that was constructed in 1988 with rights to transmit up to 18.4 megawatts (MWs) of electricity. The Project would consist of wind turbines and associated infrastructure, with a nameplate generating capacity[1] of up to approximately 100 MW on the approximately 1,630+ acre non-public portion of the Park site.[2] The Project would also utilize privately owned property for wind turbine and transmission line siting, as well as land owned by the Bureau of Reclamation (BOR) for transmission line siting.

The Park consists of 6,900 acres of former ranchland along State Route (SR) 152 known as Pacheco Pass, at the edge of the Diablo Range. The Park is located on SR-152, that connects two

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1 The nameplate generating capacity for a wind energy generation project is the sum of the total capacity rating of the turbines and should be considered a project's total potential generation output. A project's capacity factor refers to the percentage of the nameplate capacity actually generated over time.

2 A majority of the 1,630 acres is included within the non-public portion of the Park, with the exception of a small area located in the western portion that falls outside of the non-public boundary.

major north-south arteries—Interstate 5 (I-5), which is 16 miles to the east, and U.S. Highway 101 (US 101), which is approximately 30 miles to the west. The Park is generally equidistant between the cities of Gilroy and Los Banos and is an approximate 2-hour drive from San Francisco. The Park lies adjacent to the San Luis Reservoir State Recreation Area (SRA), which is under BOR ownership and managed by the California Department of Parks and Recreation (CDPR).

The Project would consist of the decommissioning and removal of the existing wind turbines and overhead energy collection system and the installation of up to 40 modern turbines, each having a generating capacity of up to 2.5 MW. The Project would also include ancillary facilities such as construction laydown areas, access roads, underground and overhead collector lines and associated equipment, an underground and overhead communications system, an operations and maintenance (O&M) facility, meteorological or MET tower(s), relocation of a communications tower, New 70 kV Transmission Line, relocation of existing transmission line poles, upgrades to the existing switchyard, upgrades to the Los Banos Substation, storage sheds, battery storage facility, and an electrical substation and associated substation components. The overhead New 70 kV Transmission Line would be up to approximately 16 miles long and would connect the existing Dinosaur Point Tap (existing switchyard) on the Project site to the Los Banos Substation.

In rocky areas, blasting may be necessary to loosen rock before excavation to install trenches and overhead transmission line poles. If blasting is necessary, a Blasting Plan would be prepared to identify the locations that are anticipated to require blasting. All applicable federal, state, and local regulations for blasting procedures would be identified in the Blasting Plan and would be followed. Explosives would only be used within specified times and at specified distances when the work is located within or nearby sensitive habitat areas.

Gonzaga is currently conducting a number of environmental studies to collect additional site condition information. Information gained from these studies, as well as wind resource studies and turbine performance tests would be used to further refine the Project layout and turbine locations.

REGULATORY SETTING

The Project site is located within unincorporated County of Merced and adjacent to Santa Clara County, but the Project lease area is also fully contained within Pacheco State Park. California State Parks has no adopted noise regulations for park operations or construction activities, but such standards have been adopted by Caltrans (another State agency), which are sometimes used as a reference for projects on State-owned lands. Likewise, most agencies have no adopted standards regarding vibration limits associated with construction; the U.S. Department of Transportation (DOT) Federal Transit Authority (FTA) has developed standards for regulating vibration levels from construction activities, which will be used in this analysis. Typically state projects are not subject to local policies and ordinances; however, since Merced County is a Responsible Agency under CEQA, compliance with

Merced County noise regulations are evaluated. In addition, because there are a few adjacent residences located in Santa Clara County, a review of applicable Santa Clara County noise regulations is also included to determine the potential significance of project noise levels at the location of adjacent residences in both Merced County and Santa Clara County.

U.S. Department of Transportation

The U.S. DOT, via the FTA adopted vibration standards to avoid damage to structures and prevent annoyance of residents from construction-related vibrations. For structural damage, a threshold of 90 vibration decibels (VdB) is identified for fragile buildings; the threshold is increased to 94 VdB for conventional structures (DOT 2006). With regard to annoyance of persons from vibration, a recommended threshold of 70 VdB is identified for human response within residential structures (DOT 2006).

California Department of Transportation

As indicated above, California State Parks has no adopted regulations governing park operations or construction activities. As guidance for determining the potential significance of Project noise impacts, standards adopted by Caltrans will be used. The Caltrans significance threshold for permanent noise increase is 12 dBA CNEL [L_{DN}] or more (Caltrans 2011). For temporary noise from construction, Caltrans Standard Specification Section 14-8.02 (Noise Control) requires that construction activity not exceed 86 dBA maximum sound level recorded during the measurement interval (Lmax) at 50 feet from job site activities between 9:00 p.m. to 6:00 a.m. and that internal combustion engines be equipped with manufacturer-recommended mufflers (Caltrans 2011).

Merced County General Plan Noise Standards

Though there is minimal residential development in the immediate areas where the wind turbines are located, the closest residences would be located in Merced County and Santa Clara County, as shown in Figure 1, Modeling Receiver Locations. Figure 1 also shows non-residential receivers in the area as well.

Although development located on State-controlled property is not generally subject to local general plans and zoning, noise generated by activities within the State Park would be subject to noise limits found in the County noise element, as determined at the property lines of residences located adjacent to the State Park. Land underlying the Project site and immediately adjacent to the Park boundaries is zoned Exclusive Agriculture (A-2) under Merced County Zoning; residences are an allowed use in the A-2 zone district. The Merced County General Plan contains Table HS-2, which includes outdoor median (L50) and maximum Non-Transportation Noise Standards. All classifications of residences in Table H-2 have exterior daytime median (L50) noise standards of 55 dBA. All classifications of residences in Table H-2 also have nighttime median

(L50) noise standard of 50 dBA. Playgrounds and parks have slightly higher noise standards of L50 of 65 dBA. The notes of this table state that when median (L50) noise level data is not available, average (L_{eq}) values may be substituted for the standards of this table provided the noise source operates for at least 30 minutes (County of Merced 2013).

County of Merced Noise Ordinances

Merced County Noise Ordinance. Chapter 10.60 of the County Code contains the Noise Ordinance. Table 1 of Chapter 10.60 contains noise level standards for residential and non-residential land uses. Specifically, the County Code sets a 65 dB Ldn standard for residential property, with standards applicable to nonresidential properties 5 dB higher. The County Code (Section 18.41.090) states that "no use shall create any disturbing ground vibration…beyond the boundaries of the site." With respect to Project generated noise levels, we interpret the ordinance to require noise from the Project not exceed 65 dB Ldn at any residential property line located in the County of Merced.

County of Santa Clara General Plan Noise Standards

The Santa Clara General Plan for Rural Unincorporated areas (Book B) includes a Noise section with guidelines. The Noise Compatibility Standards for Land Use has "Cautionary" noise levels for residences starting at 55 L_{dn}. With respect to Project generated noise levels, we interpret the ordinance to require noise from the Project not exceed 55 dB Ldn at any residential property line located in Santa Clara County.

County of Santa Clara Noise Ordinances

The Santa Clara Ordinance provides two tables that include noise criteria that could be applicable to the Project. From table B11-152, for one and two family residences a noise level of 45 dBA L_{eq} shall not be exceeded for more than 30 minutes in any hour during nighttime hours (10 p.m. to 7 a.m.). For daytime, the threshold is 55 dBA L_{eq}. Another table addresses noise limits for mobile and stationary equipment related to construction. For daytime (7 a.m. to 7 p.m.) mobile construction noise sources can produce up to 75 dBA at single and two family dwelling residential areas and 50 dBA at nighttime (7 p.m. to 7 a.m.). It is not expected that any major stationary equipment (used for a period of 10 days or more) would be required as part of Project construction (Santa Clara County 2003).

Vibration is mentioned in the noise ordinance, but no quantifiable levels are identified as thresholds. The regulation says that it shall be unlawful to create vibration above the threshold of perception for an individual at the closest property line.

The municipal code of Santa Clara County also includes an exception for "construction activities which occur during allowed hours, as otherwise specified in the Code" (Santa Clara County 2018).

THRESHOLDS OF SIGNIFICANCE

Appendix G Criteria

Consistent with Appendix G of the California Environmental Quality Act (CEQA) Guidelines (14 CCR 15000 et seq.), a significant impact would occur if development of the proposed project would do any of the following:

- Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.
- Generation of excessive groundborne vibration or groundborne noise levels.
- For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels.

Criteria Not Applicable to the Proposed Project

The Project is not located within an airport land use plan and is over 15 miles from the closest airports (Hollister Airport, San Martin Airport, Gustine Municipal Airport, and Los Banos Airport). Therefore, future employees would not be exposed to elevated noise levels from aircraft operations and airport noise impacts are not addressed further in the analysis.

Noise Significance Criteria Applicable to the Proposed Project

Based on policies in the Merced and Santa Clara County General Plans regarding community noise exposure limits for residences, Caltrans adopted standards for permanent noise increases and construction noise limits, and DOT standards for vibration, the proposed Project would have a significant impact on noise if it would result in:

- During construction activity, noise levels exceed 86 dBA maximum sound level recorded during the measurement interval (Lmax) at 50 feet from job site activities between 9:00 p.m. to 6:00 a.m. (Caltrans 2011).
- During construction, between the hours 7:00 a.m. and 7:00 p.m., construction noise levels greater than 75 dBA Leq at any vicinity residence within Santa Clara County (County of Santa Clara, 2003).

- During construction, the exposure of existing structures in the project vicinity to vibration levels exceeding 90 PPV, or exposure of residents to vibration levels of 70 VdB in residences where people normally sleep, for infrequent events (FTA 2006).
- During project operation, an increase of 12 dBA CNEL or more at noise sensitive receptors (Caltrans 2013).
- During project operation, generation of noise in excess of 65 dBA Ldn at the property line for any existing residential properties in the project vicinity which are located in Merced County (County of Merced 2013).
- During project operation, generation of noise in excess of 55 dBA Ldn at the property line for any existing residential properties in the project vicinity which are located in Santa Clara County (County of Santa Clara 2003).

METHODOLOGY

A site visit was conducted to measure existing ambient noise levels in the vicinity of the Project site. At the time of the site visit, none of the existing wind turbines were operating. Location data was provided for all existing on-site wind turbines, Figure 2 illustrates the locations of the existing wind turbines as well as the noise measurement locations. Because the wind turbines were not operating when the ambient noise measurements were taken, sound level modeling was conducted for the existing turbines on the Project site to establish baseline noise levels produced by the existing wind turbines.

A computer program called CadnaA (Computer Aided Noise Abatement) was used for the wind turbine noise analysis for both existing and new turbines. CadnaA is a computer-modeling program for calculation, presentation, assessment, and prediction of environmental noise. Wind turbine data for both the existing wind turbines and the proposed wind turbines on the Project site were input into the computer model, along with topographical data and site plan information. The outdoor noise propagation formulas follow the ISO 9613 (attenuation of sound during propagation outdoors) standard. Based on recent research for wind turbine modeling protocol (RSG 2016), a ground factor of 0.5 (G=0.5) and an addition of 2 dB to the raw noise modeling results was used. The modeling sound power levels for the proposed turbines are based on moderate to high wind speeds (10 miles per hour [mph] to 20 mph) during operation. These parameters were set in the CadnaA model.

For the baseline or "Existing" scenario, the CadnaA model was used to model the existing wind turbine noise from the Project site as point sources based on GIS data. A total of 166 wind turbines were included in the existing noise model. This GIS data included the locations of the existing and proposed turbines. The height of the existing turbines was assumed to be 80 feet (25 meters); for the proposed turbines, a height of 328 feet (100 meters) was assumed (based on the specification sheet provided by the client for wind turbine model GE 2.x-127). All existing turbines were assumed to have a sound power (L_W) of 100 dBA, based on previous wind turbine analyses for the repowering wind projects.

For the "Proposed" scenario, the existing turbines on the Project site were removed from the model and replaced with the proposed new wind turbines. The 40 proposed wind turbines were conservatively assumed to have an 80-meter hub height. In addition, they were conservatively modeled with a sound power level of 110 dBA based on the GE 2.x-127 specifications, which is the turbine with the maximum sound power level among a number of potential turbines under consideration for the Project. This sound power level corresponds to expected wind speeds from 10 mph to 20 mph for many of the potential turbine models.

Temporary noise and vibration impacts from construction equipment activities associated with the decommissioning of the existing turbines and construction of the new turbines were assessed using the Federal Highway Administration's (FHWA) Roadway Construction Noise Model (RCNM) (FHWA 2008). Although the model was developed by the FHWA, the RCNM is often used for non-roadway projects, because the same types of construction equipment used for roadway projects are also used for other project types. Input variables for the RCNM consist of the receiver/land use types, the equipment type and number of each (e.g., two graders, a loader, a tractor), the duty cycle for each piece of equipment (e.g., percentage of time the equipment is in operation versus idle, over the work day), and the distance between the construction activity and noise-sensitive receivers. No topographical or structural shielding was assumed in the construction noise modeling. This is a worst-case scenario, in that intervening topography and existing buildings could be located between the construction activity and closest receptors, thereby reducing the noise level at the receivers. The RCNM has default duty-cycle values for the various pieces of equipment, which were derived from an extensive study of typical construction activity patterns. Those default duty-cycle values were used for this noise analysis.

EXISTING CONDITIONS

Existing Ambient Noise Levels

Dudek visited the Project site on September 26 and September 28, 2018, to measure ambient sound levels in the Project vicinity. Figure 2, Noise Measurement Locations, shows the measurement locations in relation to the Project boundaries and existing turbines. None of the existing wind turbines were operating during the sound measurements. The following parameters were recorded during noise measurements:

1. Average wind speed: up to 15 mph
2. Wind direction: West

3. Temperature: lows of 53°F, about 81°F during short-term measurements
4. Relative humidity: 63%
5. General weather conditions: clear skies
6. Terrain (e.g., hills, level, ravines): rolling hills
7. Surrounding vegetation: small bushes and trees, mostly open rolling hills

Short-term (ST#) measurements were conducted with a calibrated Rion NL-62 sound level meter placed on a tripod with the microphone positioned approximately 5 feet above the ground. The meter was set with the slow time constant. The short-term measurements were 5 minutes long. Table 2 presents the results of the short-term noise measurements. Attachment A provides a definition of statistical levels; Attachment B includes field data sheets from the measurements.

Table 2
Existing Short-Term Sound Level Measurements

Measurement	Primary Observed Noise Sources	Time HH:MM	L_{eq} (dBA)
ST1	Wind	4.02 p.m. to 4:07 p.m.	27.4
ST2	Generator at Check In Booth	4.57 p.m. to 5:02 p.m.	45.8
ST3	Wind, Leaves, Distant Traffic	5:02 p.m.to 5:07 p.m.	40.9

Source: Data measured by Dudek in 2018.
L_{eq} = equivalent continuous sound level (time-average sound level)

The long-term measurements were completed using two SoftDB Model Piccolo sound level meters. The Piccolo sound level meters meet the ANSI standard for a Type 2 general-purpose sound level meter. The meters collected hourly measurements from the afternoon of September 26 to the afternoon of September 28, 2018. Those hourly equivalent levels (L_{eq}) were averaged together to produce the results presented in Table 3. Hourly L_{eq} data is plotted in Attachment B. Averages for the daytime and nighttime are presented as a reference of existing noise levels in the vicinity.

Table 3
Existing Long-Term Sound Level Measurements

Site	Location Description	(dBA)			
		Daytime Average Noise Levels 7a.m.–10p.m. L_{eq}	*Nighttime Average Noise Levels 10p.m.–7a.m. L_{eq}*	*L_{dn}*	*CNEL*
LT1 (pic7016)	On wood fence in northwest region of project site	50	47	54	55
LT2 (pic7003)	Northern project site off of dirt road	52	48	56	56

Source: Data measured by Dudek in 2018.

Both long-term monitors measured generally low noise levels (less than 40 dBA hourly L_{eq}) from the evening of September 26 to about 4 p.m. on September 27. From the afternoon of September 27 until the end of the measurements, higher sounds levels (up to about 65 dBA L_{eq}) were logged. It is likely that higher wind speeds during these hours contributed to the higher measured sound levels.

EXISTING CONDITIONS ANALYSIS

As detailed above, the CadnaA model was used to model the noise from the existing wind turbines from the Project site. Attachment C provides the CadnaA modeling inputs and outputs, Table 4 presents the calculated existing noise levels at modeled receiver locations. As shown, modeled noise levels from the existing turbines range from approximately 42 dB(A) L_{eq} at receiver M3 to 33 dB(A) at M3. Traffic noise from SR-152 was also included in the noise model. The traffic input data (e.g., average daily traffic trips, speed) was not varied between the existing and the proposed noise model.

Table 4
Existing Modeled Noise Level Results

Receiver ID	County	Location Description	Hourly L_{eq} dB(A)	L_{dn} (dBA)
M1	Santa Clara	Residence North Of Dinosaur Point Road	42	45
M2	Merced	Park Boat Launch Area	33	40
M3	Santa Clara	Structure South Dinosaur Point Road (Not a Residence)	43	46
M4	Santa Clara	Structure South Whiskey Flat Road (Not a Residence)	36	39
M5	Santa Clara	Residence West	34	37
M6	Santa Clara	Residence West 2	35	38
M7	Merced	Residence South	42	49
M8	Santa Clara	Residence West 3	41	44

Source: Data measured by Dudek in 2018.

PROJECT ANALYSIS

a) ***Would the project result in exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?***

Decommissioning and Construction

Less-Than-Significant Impact. Decommissioning and construction noise are temporary phenomena; it is assumed that construction activities beginning with the decommissioning of the existing wind turbines would last approximately 1 year. The activities associated with decommissioning of the existing turbines would be similar to construction of the new turbines in terms of the equipment used and activities conducted; thus, potential decommission noise impacts are addressed here along with possible construction noise impacts.

The Project site is located in a largely rural and undeveloped area with the closest sensitive receptor (residence) located approximately 1,604 feet south of the site boundary.

Construction noise levels would vary from hour to hour and day to day, depending on the equipment in use, the operations being performed, and the distance between the source and receptor. Construction equipment with substantially higher noise-generation characteristics (such as pile drivers, rock drills) would not be necessary, although jackhammers and/or excavators with hydraulic hammers may be necessary during existing turbine decommissioning.

Construction noise is difficult to quantify because of the many variables involved, including the specific equipment types, size of equipment used, percentage of time in use, condition of each piece of equipment, and number of pieces of equipment that will actually operate on site. The construction vehicle assemblage would include standard equipment such as cranes, excavators, man lifts, graders, rollers, dozers, trackers, and miscellaneous trucks.

The typical operating cycles for construction equipment involve one or two minutes of full power operation followed by 3 or 4 minutes at lower power settings. Noise from construction equipment generally exhibits point source acoustical characteristics. A point source sound is attenuated (is reduced) at a rate of 6 dB per doubling of distance from the source for “hard site” conditions and at 7.5 dB per doubling of distance for “soft site” conditions. A hard site is characterized by ground surface covered by pavement, or hard compacted soils; a soft site is characterized by ground covered with vegetation, or loose soil with a rough surface (such as tilled land). These rules apply to the propagation of sound waves with no obstacles between source and receivers, such as topography (ridges or berms) or structures.

The typical noise levels for various pieces of construction equipment at a distance of 50 feet are presented in Table 5. For example, measured backhoe maximum sound levels are 78 dBA at a distance of 50 feet.

Table 5
Typical Construction Equipment Noise Emission Levels and Usage Factors

Equipment Description	Impact Device?	Acoustical Use Factor (%)	Measured L_{max} @50ft (dBA)
Auger Drill Rig	No	20	84
Backhoe	No	40	78
Compressor (air)	No	40	78
Concrete Pump Truck	No	20	81
Crane	No	16	81
Dozer	No	40	82
Dump Truck	No	40	76
Excavator	No	40	81
Flat Bed Truck	No	40	74
Front End Loader	No	40	79
Generator	No	50	81
Generator (<25KVA, VMS signs)	No	50	73
Man Lift	No	20	75
Pickup Truck	No	40	75
Pneumatic Tools	No	50	85
Pumps	No	50	81
Roller	No	20	80
Sand Blasting (Single Nozzle)	No	20	96
Scraper	No	40	84
Tractor	No	40	78
Welder / Torch	No	40	74

Source: DOT FTA 2006.

Table 6 shows the calculated noise levels at nearby noise-sensitive receptors (i.e., residential properties) during decommissioning and construction phases for the Project, employing the RCNM software and based on construction equipment defaults found in the air quality model CalEEMod for a project of this size and scope. More details from the RCNM analysis can be found in Attachment D.

Table 6
Construction Noise Modeling Summary Results

Construction Phase	L_{eq} (dBA)	
	Nearest Receiver (2,376 feet)	*Possible Receiver (1,604 feet)*
Access Roads	55	59
Architectural Coating	40	44
Collection	53	56
Foundations	57	61
O&M Building	53	56
Reclamation	55	59
Substation	50	54
Transmission Line	51	55
Turbine Decommissioning	52	55
Turbine Install	45	49

Source: Data modeled by Dudek in 2018.

As shown in Table 6, turbine construction and decommissioning would not take place in close proximity to the nearest receiver (which is approximately 1,604 feet away), and therefore modeled noise levels at this closest receiver would range from approximately 44 to 61 dBA L_{eq}. Typical turbine decommissioning and construction-related noise levels are anticipated to range from approximately 40 to 57 dBA L_{eq} at other residential properties located over 2,300 feet from the northwest boundary of the Project site. The closest receiver (M1) is located in Santa Clara County, and the predicted construction noise levels would be well within the County limit of 75 dBA Leq during daytime hours.

Periodically throughout the construction workday, it is assumed temporary noise from turbine construction would be above the ambient noise level in the project vicinity. However, noise from construction activities would typically be below the ambient noise levels in the area. While construction activities would temporarily increase daytime noise levels, the expected increases would only be temporary and intermittent. Such increases would also be in compliance with the Santa Clara County daytime construction noise limits,

With respect to possible nighttime construction, the only construction equipment with measured Lmax greater than 86 dBA at 50 feet is a sandblaster. It is not anticipated that a sandblaster would be used for Project construction. Therefore, during nighttime construction, it is anticipated construction activities would comply with the Caltrans Standard Specification Section 14-8.02 (Noise Control) requiring construction activity not exceed 86 dBA Lmax at 50 feet from job site activities between 9:00 p.m. to 6:00 a.m. Consequently, short-term on-site construction noise is considered a less-than-significant impact.

In addition to the on-site construction noise, there would be intermittent truck deliveries occurring throughout the workday and occasionally overnight along SR 152 and on offsite access roads

(Dinosaur Point Road), delivering turbine components. The volume of construction related traffic trips would not be substantial compared to existing trip volumes along SR 152, which is the principal traffic noise source affecting existing residences to the northwest of the Park and Project site. This temporary off-site construction traffic noise would therefore not constitute a significant noise impact, though it may be intermittently audible at the nearest residences, located approximately 150 feet or more from the road.

Noise from blasting operations would be of a short duration and occur infrequently. While blasting noise may be audible at vicinity residences, the short duration of the event(s) fall within the allowed “temporarily elevated noise” that is mentioned in the County Code. Thus, noise impacts from potential blasting operations are considered less than significant. Vibration from blasting operations is evaluated in another section of this memorandum.

Overall, because construction and decommissioning would take place at substantial distances from existing residences, and due to the temporary and intermittent nature of the noise and the relatively low levels, noise levels from construction and decommissioning would not produce a significant impact.

Operation

Less-Than-Significant Impact. Table 7 shows the results from the wind turbine noise modeling during operations in terms of L_{dn}. Existing turbine noise levels as modeled (from Table 4) are compared with the proposed turbine noise levels as modeled, for comparison against the Caltrans significance thresholds for permanent noise increases. The modeled Project levels are also compared against Santa Clara and Merced County noise regulations, at the residences located adjacent to the Park boundaries within each of these counties.

As shown in Table 7, the increase in noise level resulting from Project operation at each of the existing residences would be 5 dBA Ldn or less. This increase is well below the Caltrans significance threshold of a 12 dBA CNEL (Ldn) increase.

Table 7
Wind Turbine Noise Modeling Results – Existing vs Proposed Turbines, L_{dn}

Receiver ID	County	Receiver Location / Description	L_{dn} (dBA)		65 / 55 dBA Ldn Exceeded?	Increase due to project (dB)
			Existing Turbines	*Proposed Turbines*		
M1	Santa Clara	Residence North Of Dinosaur Point Road	45	50	No	5
M2	Merced	Park Boat Launch Area	40	45	No	5
M3	Santa Clara	Structure South Dinosaur Point Road, Not Residence	46	47	No	1
M4	Santa Clara	Structure South Whiskey Flat Road (Not a Residence)	39	44	No	5
M5	Santa Clara	Residence West	37	37	No	0
M6	Santa Clara	Residence West 2	38	38	No	0
M7	Merced	Residence South	49	52	No	3
M8	Santa Clara	Residence West 3	44	45	No	1

Source: Data modeled by Dudek in 2018.

As also shown in Table 7, predicted noise levels produced by the proposed wind turbines would range from 52 dBA L_{dn} at receiver M7 to approximately 37 dBA L_{dn} at receiver M5. The Merced County Code 65 dB L_{dn} standard for residential property would not be exceeded at any of the modeled receiver locations within Merced County during Project operation. The Santa Clara "Cautionary" noise level of 55 L_{dn} would also not be exceeded at any of the modeled receivers located in Santa Clara County during operation. Consequently, on-site operational noise would result in a less-than-significant impact.

Noise sources associated with power transmission include occasional breaker operation in the switchyard, and corona noise and very low hum from the conductors. Breaker noise is considered impulsive in nature, lasting a very short duration and may occur only a very few times per year. Corona noise is characterized as a buzz or hum and is usually worse when the conductors are wet, such as in rain or fog.

The Electric Power Research Institute (EPRI) has conducted noise tests and studies and has published reference material on transmission line noise. EPRI states that noise produced by a conductor decreases at a rate of three decibels per doubling of distance from the source. The EPRI Transmission Line Reference Book indicates that the audible noise from a typical 230 kV line with two conductors per phase would likely be less than 40 dBA at a distance of 40 feet from the outside conductor at ground level. The Project includes a 70 kV transmission line, and the corona-related sound levels produced would therefore be lower than the 230 kV line. Since even a 40 dBA sound level associated with potential transmission line corona effects from a 230 kV line would comply with residential noise limits, the proposed 70 kV transmission line would have less-than-significant noise effects.

Based upon this analysis of transmission line operational noise levels, no significant noise impact would occur because the transmission line and switchyard are not proposed to be located near-noise-sensitive land uses and thus, these Project components would not create an adverse noise impact.

Therefore, the Project would not exceed applicable noise standards. Long-term operational impacts associated with the exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies would be less than significant.

b) Would the project result in exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?

Less-Than-Significant Impact. The Project is not anticipated to include equipment or activities capable of producing substantial long-term groundborne vibration or groundborne noise levels. The only ground vibration potential would be associated with the short-term decommissioning and construction phases of the Project.

Groundborne vibration from construction (and by extension, decommissioning) activities is typically attenuated over short distances. Blasting has the potential to produce high levels of groundborne vibration, but details of blasting locations are not available at this time. As described in the project description section, a Blasting Plan would be prepared if the need for blasting arises. The Blasting Plan should include consideration and analysis of potential groundbourne vibration based on the specific details in the plan.

Blasting for construction projects typically results in a Root Mean Square Amplitude (RMS) vibration velocity of about 100 VdB at 50 feet from the source (DOT 2005). As discussed above in the analysis of construction-related noise impacts, the shortest distance between an existing residence and the blasting activity was assumed to be not less than 1,604 feet. Given attenuation of vibration velocities with distance, the vibration level at the nearest existing residence would be about 46 VdB. This vibration level from blasting is less than typical background vibration levels and less than typical perceptible levels for people. Based on the expected blasting vibration level at the nearest residential receiver, the blasting impact is expected to be less than significant.

The heavier pieces of construction equipment used on site could include cranes, excavators, bulldozers, graders, loaded trucks, and rollers. Based on published vibration data, the anticipated construction equipment would generate a vibration level of approximately 94 VdB (reference of

1 micro-inch per second) at a distance of 25 feet from the source (DOT 2006). The closest existing residences are approximately 1,604 feet from the project boundary. At this distance and with the anticipated construction equipment, the RMS vibration levels at the closest residences would be less than 40 VdB. For access road improvements work, heavy equipment such as graders would be used, which would generate a maximum RMS vibration level of approximately 87 VdB (reference of 1 micro-inch per second) at a distance of 25 feet from the source (DOT 2006). At an average distance not less than 150 feet from access roads to existing residences, vibration levels from access road improvements would be approximately 65 VdB at existing residences. These levels would be less than the recommended threshold of 90 VdB for avoidance of structural damage and the threshold of 70 VdB for human response within residential structures (DOT 2006). Vibration from construction equipment would be less than significant at existing residences in the project vicinity.

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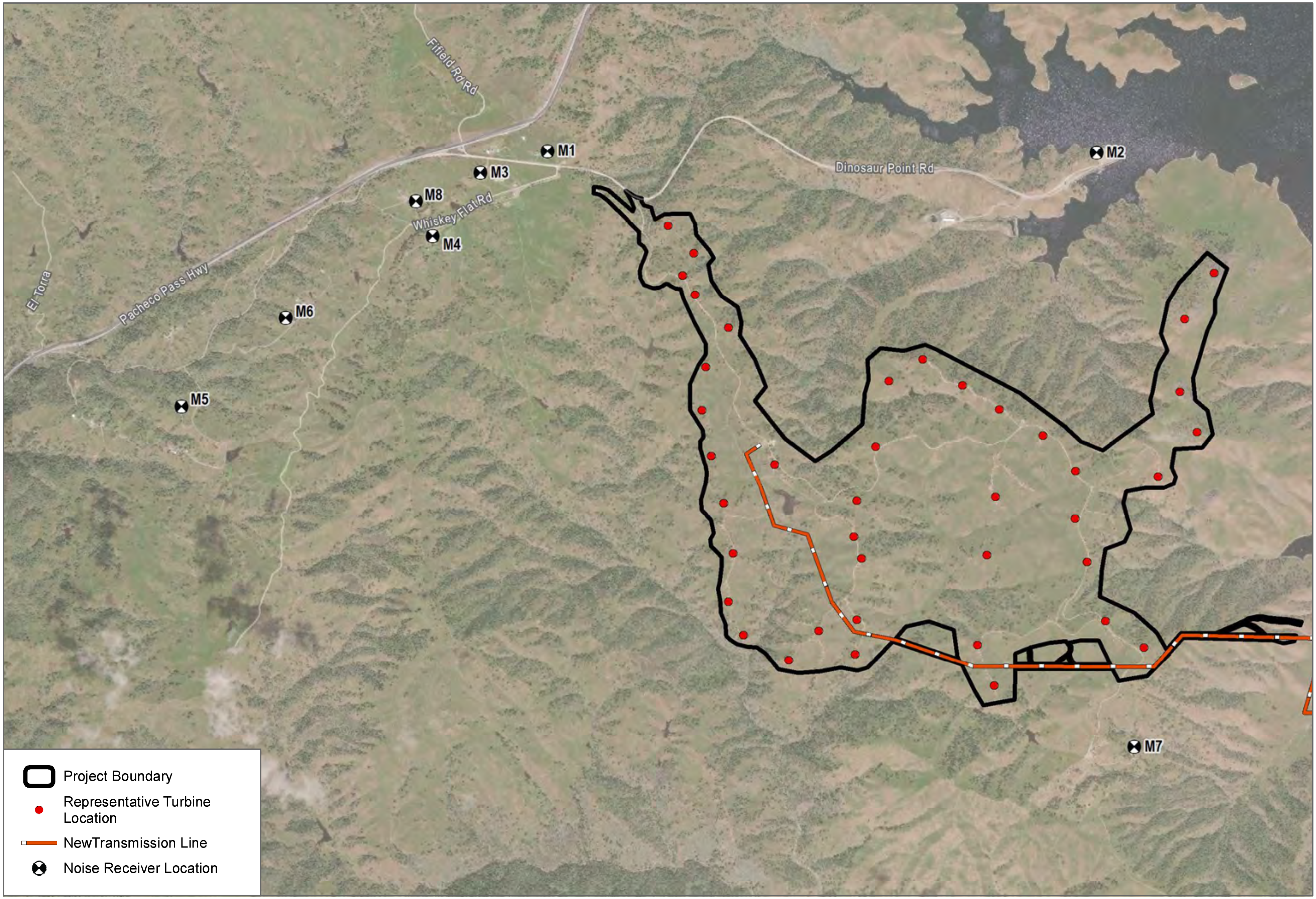


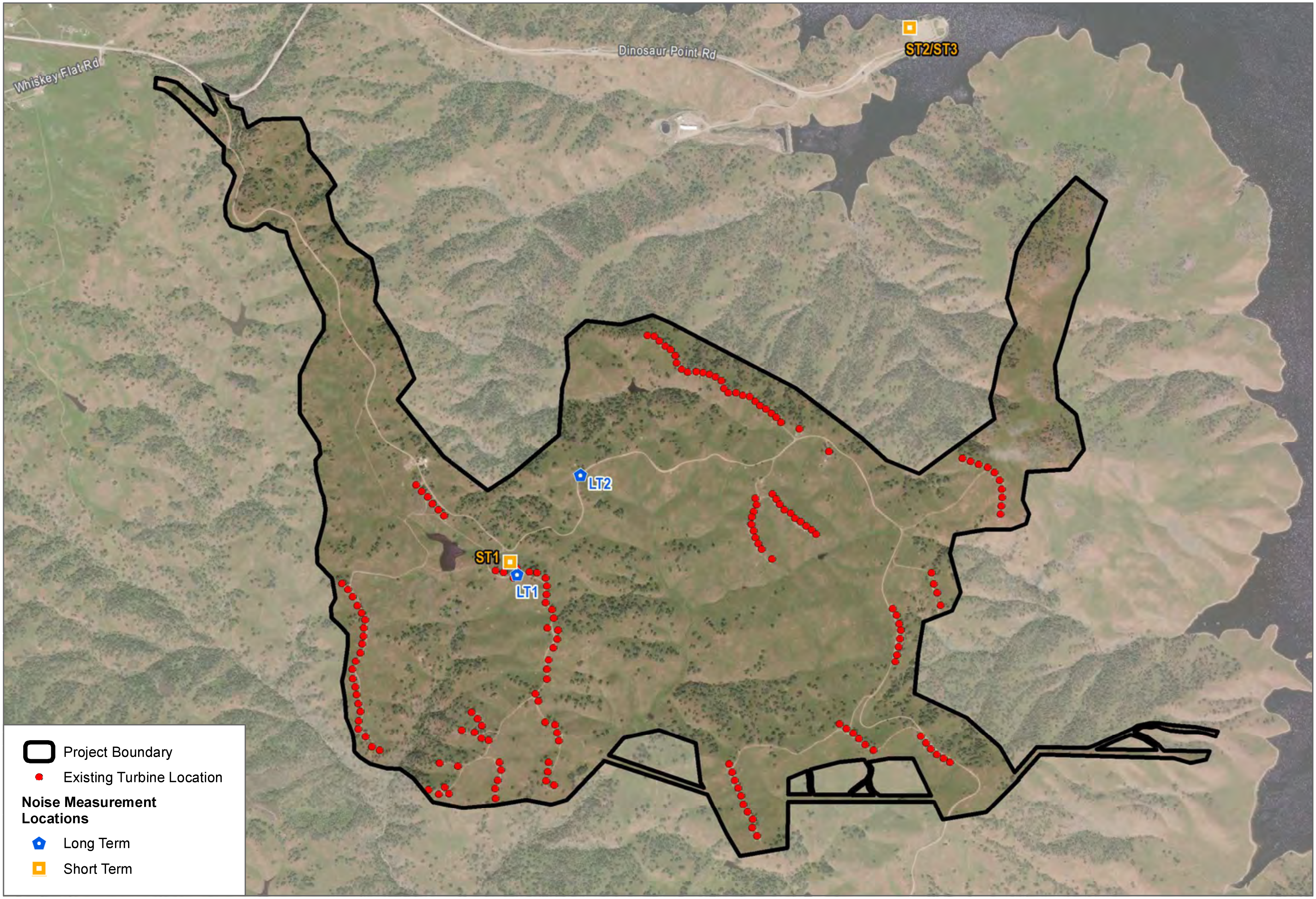
SOURCE: Bing Maps 2018, Scout Energy 2018

DUDEK

FIGURE 1

Modeling Receiver Locations

Gonzaga Ridge Wind Repowering Project



SOURCE: Bing Maps 2018, Scout Energy 2018

DUDEK

FIGURE 2

Noise Measurement Locations

Gonzaga Ridge Wind Repowering Project

ATTACHMENT A

Definitions

ATTACHMENT A
Definitions

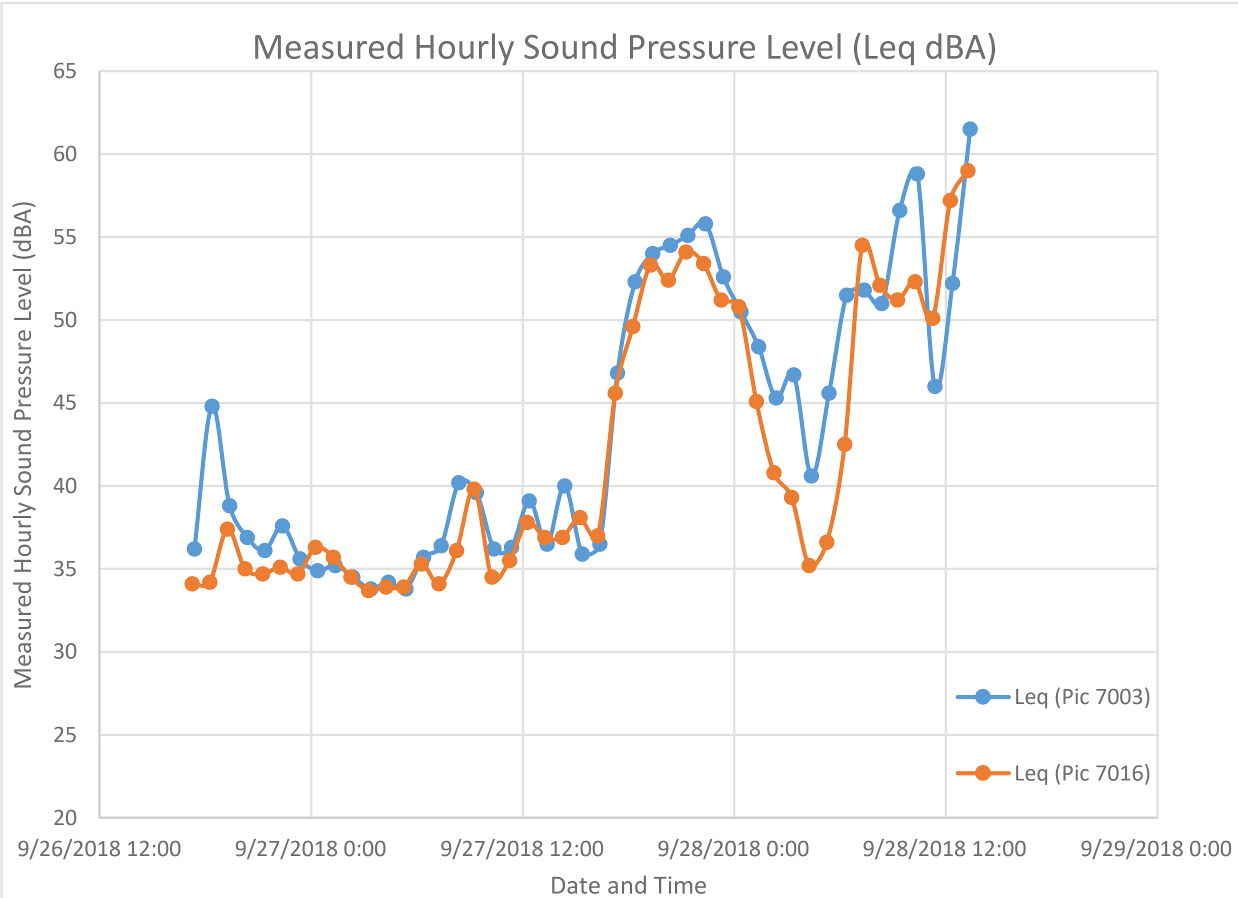
Term	Definition
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
A-Weighted Sound Level (dBA)	The sound pressure level in decibels as measured on a sound level meter using the A-weighted filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear.
Community Equivalent Sound Level (CNEL)	CNEL is the A-weighted equivalent continuous sound pressure level for a 24-hour period with a 10 dB adjustment added to sound levels occurring during the nighttime hours (10 p.m. to 7 a.m.) and 5 dB added to the sound during the evening hours (7 p.m. to 10 p.m.).
Day Night Level (DNL or L_{dn})	Similar to the CNEL, the DNL is the A-weighted equivalent continuous sound pressure level averaged over a 24-hour period. The only difference between the DNL and the CNEL is that the evening penalty of 5 dB (between 7 p.m. and 10 p.m.) is not included in this level.
Decibel (dB)	A unit for measuring sound pressure level, equal to 10 times the logarithm to the base 10 of the ratio of the measured sound pressure squared to a reference pressure, which is 20 micropascals.
L_{eq}	Energy equivalent level, which is the equivalent steady-state sound level that, in a stated period of time, contains the same acoustical energy as a time-varying sound during the same time period. An L_{eq} level is computed by summing the noise energy over the stated time period using mathematical integration.

Statistical Sound Level ($L_{\#\#}$)	A sound level metric describing the level exceeded for the percent of the time. For example, the L_{90} would be the sound level exceeded for 90% of the measurement time.

ATTACHMENT B

Field Data Sheets
and Measured Hourly L_{eq}

ATTACHMENT B
Measured Hourly L_{eq}



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CREATOR OF KERATA TECHNOLOGY

FIELD DATA REPORT

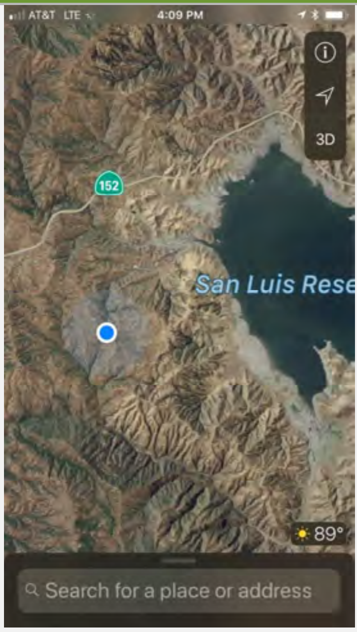
Field Noise Measurement Data

Record: 1105	
Project Name	*Gonzaga Wind*
Project #	*11295*
Observer(s)	*Christopher Barnobi*
Date	*2018-09-26*

Meteorological Conditions	
Upload NOAA Forecast	Image Not Found
Humidity % (R.H.)	*63*
Wind	*Moderate*
Wind Speed (MPH)	*15*
Wind Direction	*West*
Sky	*Partly Cloudy*

Instrument and Calibrator Information	
Instrument Name List	
Instrument Name	*(AUB) NL-62*
Instrument Name Lookup Key	*(AUB) NL-62*
Manufacturer	*Rion*
Model	*NL-62*
Serial Number	*350815*
Calibration Date	*5/17/2017*
Calibrator Name	*(SAC) Rion NC-74*
Calibrator Name Lookup Key	*(SAC) Rion NC-74*
Calibrator Manufacturer	*Rion*
Calibrator Model	*NC-74*
Calibrator Serial #	*34167529*
Pre-Test (dBA SPL)	*94*
Windscreen	*Yes*
Weighting?	*A-WTD*
Slow/Fast?	*Slow*
ANSI?	*No*

Monitoring	
Record #	*1*
Site ID	*ST1*
Site Location Lat/Long	*37.043786, -121.189897*
Begin (Time)	*16:00:00*
End (Time)	*16:05:00*
Leq	*27.4*
Other Lx (Specify Metric)	*L*
Primary Noise Source	*Wind, birds, bugs*
Other Noise Sources (Background)	*Birds, Distant Aircraft, Rustling Leaves*
Is the same instrument and calibrator being used as previously noted?	*Yes*
Are the meteorological conditions the same as previously noted?	*Yes*

Description / Photos	
Upload Google Maps Data	

Site Photos	
Photo	

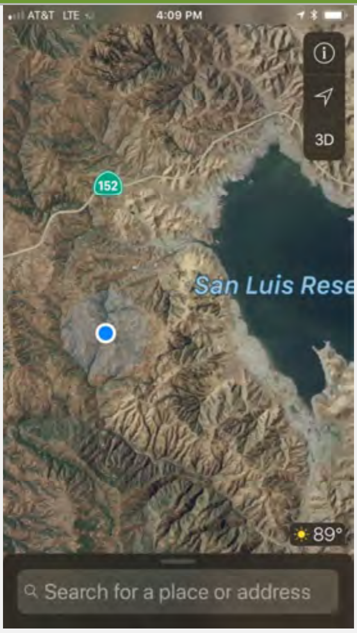
FIELD DATA REPORT

Monitoring

Record #	*2*
Site ID	*LT1*
Site Location Lat/Long	*37.043693, -121.189886*
Begin (Time)	*16:14:00*
Other Lx (Specify Metric)	*L*
Primary Noise Source	*Wind, birds, bugs*
Is the same instrument and calibrator being used as previously noted?	*Yes*
Are the meteorological conditions the same as previously noted?	*Yes*

Description / Photos

Upload Google Maps Data



Site Photos

FIELD DATA REPORT

Photo	

Monitoring	
Record #	*3*
Site ID	*LT2*
Site Location Lat/Long	*37.047547, -121.185007*
Begin (Time)	*16:23:00*
Other Lx (Specify Metric)	*L*
Primary Noise Source	*Traffic*
Other Noise Sources (Background)	*Birds, Distant Aircraft, Rustling Leaves*
Other Noise Sources Additional Description	
Is the same instrument and calibrator being used as previously noted?	*Yes*
Are the meteorological conditions the same as previously noted?	*Yes*

Description / Photos

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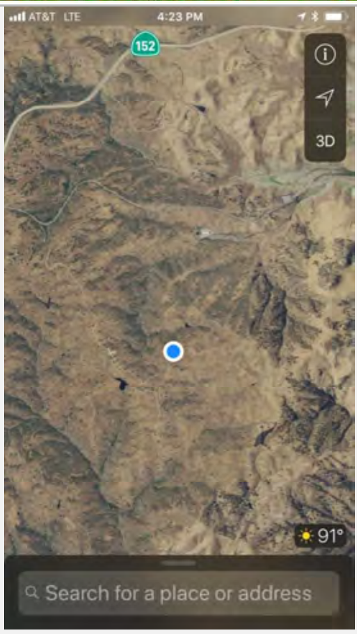
FIELD DATA REPORT

Upload Google Maps Data	

Site Photos

Photo	

DUDEK
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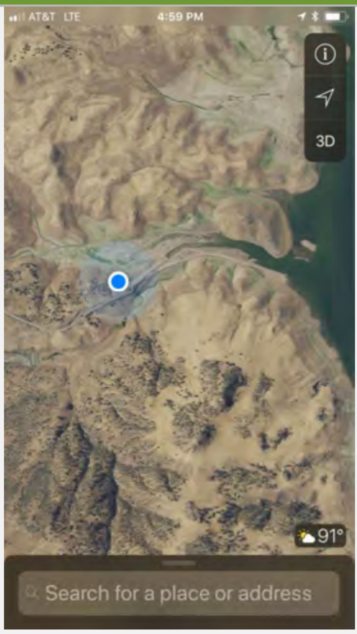
FIELD DATA REPORT

Monitoring

Record #	*4*
Site ID	*ST2*
Site Location Lat/Long	*37.066509, -121.167519*
Begin (Time)	*16:58:00*
End (Time)	*17:08:00*
Leq	*45.8*
Other Lx?	
Other Lx (Specify Metric)	*L*
Primary Noise Source	*Generator at parking lot attendant box*
Other Noise Sources (Background)	*Birds, Distant Aircraft, Distant Traffic, Rustling Leaves*
Other Noise Sources Additional Description	*Generator turned off at 5:01* *Measurement 0003 has no generator. 40.0. dBA Leq*
Is the same instrument and calibrator being used as previously noted?	*Yes*
Are the meteorological conditions the same as previously noted?	*Yes*

Description / Photos

Upload Google Maps Data



Site Photos

Photo	

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ATTACHMENT C

CadnaA Noise Modeling Input/Output
(Available Upon Request)

ATTACHMENT D

Construction Noise Modeling Input/Output

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 10/24/2018
Case Description: Gonzaga_Acess Roads

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Nearest Receiver 2376'	Residential	65	60	55

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Grader	No	40	85		2367	0
Grader	No	40	85		2367	0
Grader	No	40	85		2367	0
Roller	No	20		80	2367	0
Roller	No	20		80	2367	0
Roller	No	20		80	2367	0
Dozer	No	40		81.7	2367	0
Dozer	No	40		81.7	2367	0
Front End Loader	No	40		79.1	2367	0
Front End Loader	No	40		79.1	2367	0
Front End Loader	No	40		79.1	2367	0
Tractor	No	40	84		2367	0

Results

		Calculated (dBA)		Noise Limits (dBA)				
				Day		Evening		Night
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax
Grader		51.5	47.5	N/A	N/A	N/A	N/A	N/A
Grader		51.5	47.5	N/A	N/A	N/A	N/A	N/A
Grader		51.5	47.5	N/A	N/A	N/A	N/A	N/A
Roller		46.5	39.5	N/A	N/A	N/A	N/A	N/A
Roller		46.5	39.5	N/A	N/A	N/A	N/A	N/A
Roller		46.5	39.5	N/A	N/A	N/A	N/A	N/A
Dozer		48.2	44.2	N/A	N/A	N/A	N/A	N/A
Dozer		48.2	44.2	N/A	N/A	N/A	N/A	N/A
Front End Loader		45.6	41.6	N/A	N/A	N/A	N/A	N/A
Front End Loader		45.6	41.6	N/A	N/A	N/A	N/A	N/A
Front End Loader		45.6	41.6	N/A	N/A	N/A	N/A	N/A
Tractor		50.5	46.5	N/A	N/A	N/A	N/A	N/A
	Total	51.5	55.3	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Possible Receiver 1604'	Residential	65	60	55

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Grader	No	40	85		1604	0
Grader	No	40	85		1604	0
Grader	No	40	85		1604	0
Roller	No	20		80	1604	0
Roller	No	20		80	1604	0
Roller	No	20		80	1604	0
Dozer	No	40		81.7	1604	0
Dozer	No	40		81.7	1604	0
Front End Loader	No	40		79.1	1604	0
Front End Loader	No	40		79.1	1604	0
Front End Loader	No	40		79.1	1604	0
Tractor	No	40	84		1604	0

Results

		Calculated (dBA)		Noise Limits (dBA)				
				Day		Evening		Night
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax
Grader		54.9	50.9	N/A	N/A	N/A	N/A	N/A
Grader		54.9	50.9	N/A	N/A	N/A	N/A	N/A
Grader		54.9	50.9	N/A	N/A	N/A	N/A	N/A
Roller		49.9	42.9	N/A	N/A	N/A	N/A	N/A
Roller		49.9	42.9	N/A	N/A	N/A	N/A	N/A
Roller		49.9	42.9	N/A	N/A	N/A	N/A	N/A
Dozer		51.5	47.6	N/A	N/A	N/A	N/A	N/A
Dozer		51.5	47.6	N/A	N/A	N/A	N/A	N/A
Front End Loader		49	45	N/A	N/A	N/A	N/A	N/A
Front End Loader		49	45	N/A	N/A	N/A	N/A	N/A
Front End Loader		49	45	N/A	N/A	N/A	N/A	N/A
Tractor		53.9	49.9	N/A	N/A	N/A	N/A	N/A
	Total	54.9	58.7	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 10/24/2018
Case Description: Gonzaga_Architectural Coating

---- Receptor #1 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night

Nearest Receiver 2376'	Residential	65	60	55

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	2367	0

Results

		Calculated (dBA)		Noise Limits (dBA)				
				Day		Evening		Night
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax
Compressor (air)		44.2	40.2	N/A	N/A	N/A	N/A	N/A
	Total	44.2	40.2	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Possible Receiver 1604'	Residential	65	60	55

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	1604	0

Results

		Calculated (dBA)		Noise Limits (dBA)				
				Day		Evening		Night
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax
Compressor (air)		47.5	43.6	N/A	N/A	N/A	N/A	N/A
	Total	47.5	43.6	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 10/24/2018
Case Description: Gonzaga_Collection

---- Receptor #1 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Nearest Receiver 2376'	Residential	65	60	55

Equipment
Spec Actual Receptor Estimated

Description	Impact Device	Usage(%)	Lmax (dBA)	Lmax (dBA)	Distance (feet)	Shielding (dBA)
Excavator	No	40		80.7	2367	0
Excavator	No	40		80.7	2367	0
Excavator	No	40		80.7	2367	0
Man Lift	No	20		74.7	2367	0
Man Lift	No	20		74.7	2367	0
Man Lift	No	20		74.7	2367	0
Man Lift	No	20		74.7	2367	0
Man Lift	No	20		74.7	2367	0
Man Lift	No	20		74.7	2367	0
Man Lift	No	20		74.7	2367	0
Man Lift	No	20		74.7	2367	0
Man Lift	No	20		74.7	2367	0
Man Lift	No	20		74.7	2367	0
Front End Loader	No	40		79.1	2367	0
Front End Loader	No	40		79.1	2367	0
Front End Loader	No	40		79.1	2367	0
Tractor	No	40	84		2367	0

Results

		Calculated (dBA)		Noise Limits (dBA)				
				Day		Evening		Night
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax
Excavator		47.2	43.2	N/A	N/A	N/A	N/A	N/A
Excavator		47.2	43.2	N/A	N/A	N/A	N/A	N/A
Excavator		47.2	43.2	N/A	N/A	N/A	N/A	N/A
Man Lift		41.2	34.2	N/A	N/A	N/A	N/A	N/A
Man Lift		41.2	34.2	N/A	N/A	N/A	N/A	N/A
Man Lift		41.2	34.2	N/A	N/A	N/A	N/A	N/A
Man Lift		41.2	34.2	N/A	N/A	N/A	N/A	N/A
Man Lift		41.2	34.2	N/A	N/A	N/A	N/A	N/A
Man Lift		41.2	34.2	N/A	N/A	N/A	N/A	N/A
Man Lift		41.2	34.2	N/A	N/A	N/A	N/A	N/A
Man Lift		41.2	34.2	N/A	N/A	N/A	N/A	N/A
Man Lift		41.2	34.2	N/A	N/A	N/A	N/A	N/A
Man Lift		41.2	34.2	N/A	N/A	N/A	N/A	N/A
Front End Loader		45.6	41.6	N/A	N/A	N/A	N/A	N/A
Front End Loader		45.6	41.6	N/A	N/A	N/A	N/A	N/A
Front End Loader		45.6	41.6	N/A	N/A	N/A	N/A	N/A
Tractor		50.5	46.5	N/A	N/A	N/A	N/A	N/A
	Total	50.5	52.5	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night

Possible Receiver 1604'	Residential	65	60	55

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Excavator	No	40		80.7	1604	0
Excavator	No	40		80.7	1604	0
Excavator	No	40		80.7	1604	0
Man Lift	No	20		74.7	1604	0
Man Lift	No	20		74.7	1604	0
Man Lift	No	20		74.7	1604	0
Man Lift	No	20		74.7	1604	0
Man Lift	No	20		74.7	1604	0
Man Lift	No	20		74.7	1604	0
Man Lift	No	20		74.7	1604	0
Man Lift	No	20		74.7	1604	0
Man Lift	No	20		74.7	1604	0
Man Lift	No	20		74.7	1604	0
Front End Loader	No	40		79.1	1604	0
Front End Loader	No	40		79.1	1604	0
Front End Loader	No	40		79.1	1604	0
Tractor	No	40	84		1604	0

Results

		Calculated (dBA)		Noise Limits (dBA)				
				Day		Evening		Night
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax
Excavator		50.6	46.6	N/A	N/A	N/A	N/A	N/A
Excavator		50.6	46.6	N/A	N/A	N/A	N/A	N/A
Excavator		50.6	46.6	N/A	N/A	N/A	N/A	N/A
Man Lift		44.6	37.6	N/A	N/A	N/A	N/A	N/A
Man Lift		44.6	37.6	N/A	N/A	N/A	N/A	N/A
Man Lift		44.6	37.6	N/A	N/A	N/A	N/A	N/A
Man Lift		44.6	37.6	N/A	N/A	N/A	N/A	N/A
Man Lift		44.6	37.6	N/A	N/A	N/A	N/A	N/A
Man Lift		44.6	37.6	N/A	N/A	N/A	N/A	N/A
Man Lift		44.6	37.6	N/A	N/A	N/A	N/A	N/A
Man Lift		44.6	37.6	N/A	N/A	N/A	N/A	N/A
Man Lift		44.6	37.6	N/A	N/A	N/A	N/A	N/A
Man Lift		44.6	37.6	N/A	N/A	N/A	N/A	N/A
Front End Loader		49	45	N/A	N/A	N/A	N/A	N/A
Front End Loader		49	45	N/A	N/A	N/A	N/A	N/A
Front End Loader		49	45	N/A	N/A	N/A	N/A	N/A
Tractor		53.9	49.9	N/A	N/A	N/A	N/A	N/A
	Total	53.9	55.9	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 10/24/2018
Case Description: Gonzaga_Foundations

---- Receptor #1 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Nearest Receiver 2376'	Residential	65	60	55

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	2367	0
Crane	No	16		80.6	2367	0
Excavator	No	40		80.7	2367	0
Excavator	No	40		80.7	2367	0
Man Lift	No	20		74.7	2367	0
Man Lift	No	20		74.7	2367	0
Grader	No	40	85		2367	0
Grader	No	40	85		2367	0
Grader	No	40	85		2367	0
All Other Equipment > 5 HP	No	50	85		2367	0
All Other Equipment > 5 HP	No	50	85		2367	0
Roller	No	20		80	2367	0
Roller	No	20		80	2367	0
Roller	No	20		80	2367	0
Tractor	No	40	84		2367	0
Front End Loader	No	40		79.1	2367	0
Backhoe	No	40		77.6	2367	0
Tractor	No	40	84		2367	0
Front End Loader	No	40		79.1	2367	0

Results

	Calculated (dBA)		Noise Limits (dBA)				
			Day		Evening		Night
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax
Crane	47	39.1	N/A	N/A	N/A	N/A	N/A
Crane	47	39.1	N/A	N/A	N/A	N/A	N/A
Excavator	47.2	43.2	N/A	N/A	N/A	N/A	N/A
Excavator	47.2	43.2	N/A	N/A	N/A	N/A	N/A
Man Lift	41.2	34.2	N/A	N/A	N/A	N/A	N/A
Man Lift	41.2	34.2	N/A	N/A	N/A	N/A	N/A
Grader	51.5	47.5	N/A	N/A	N/A	N/A	N/A
Grader	51.5	47.5	N/A	N/A	N/A	N/A	N/A

Grader		51.5	47.5	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP		51.5	48.5	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP		51.5	48.5	N/A	N/A	N/A	N/A	N/A
Roller		46.5	39.5	N/A	N/A	N/A	N/A	N/A
Roller		46.5	39.5	N/A	N/A	N/A	N/A	N/A
Roller		46.5	39.5	N/A	N/A	N/A	N/A	N/A
Tractor		50.5	46.5	N/A	N/A	N/A	N/A	N/A
Front End Loader		45.6	41.6	N/A	N/A	N/A	N/A	N/A
Backhoe		44.1	40.1	N/A	N/A	N/A	N/A	N/A
Tractor		50.5	46.5	N/A	N/A	N/A	N/A	N/A
Front End Loader		45.6	41.6	N/A	N/A	N/A	N/A	N/A
	Total	51.5	57.2	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Possible Receiver 1604'	Residential	65	60	55

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	1604	0
Crane	No	16		80.6	1604	0
Excavator	No	40		80.7	1604	0
Excavator	No	40		80.7	1604	0
Man Lift	No	20		74.7	1604	0
Man Lift	No	20		74.7	1604	0
Grader	No	40	85		1604	0
Grader	No	40	85		1604	0
Grader	No	40	85		1604	0
All Other Equipment > 5 HP	No	50	85		1604	0
All Other Equipment > 5 HP	No	50	85		1604	0
Roller	No	20		80	1604	0
Roller	No	20		80	1604	0
Roller	No	20		80	1604	0
Tractor	No	40	84		1604	0
Front End Loader	No	40		79.1	1604	0
Backhoe	No	40		77.6	1604	0
Tractor	No	40	84		1604	0
Front End Loader	No	40		79.1	1604	0

Results

	Calculated (dBA)		Noise Limits (dBA)				
			Day		Evening		Night
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax

Crane		50.4	42.5	N/A	N/A	N/A	N/A	N/A
Crane		50.4	42.5	N/A	N/A	N/A	N/A	N/A
Excavator		50.6	46.6	N/A	N/A	N/A	N/A	N/A
Excavator		50.6	46.6	N/A	N/A	N/A	N/A	N/A
Man Lift		44.6	37.6	N/A	N/A	N/A	N/A	N/A
Man Lift		44.6	37.6	N/A	N/A	N/A	N/A	N/A
Grader		54.9	50.9	N/A	N/A	N/A	N/A	N/A
Grader		54.9	50.9	N/A	N/A	N/A	N/A	N/A
Grader		54.9	50.9	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP		54.9	51.9	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP		54.9	51.9	N/A	N/A	N/A	N/A	N/A
Roller		49.9	42.9	N/A	N/A	N/A	N/A	N/A
Roller		49.9	42.9	N/A	N/A	N/A	N/A	N/A
Roller		49.9	42.9	N/A	N/A	N/A	N/A	N/A
Tractor		53.9	49.9	N/A	N/A	N/A	N/A	N/A
Front End Loader		49	45	N/A	N/A	N/A	N/A	N/A
Backhoe		47.4	43.5	N/A	N/A	N/A	N/A	N/A
Tractor		53.9	49.9	N/A	N/A	N/A	N/A	N/A
Front End Loader		49	45	N/A	N/A	N/A	N/A	N/A
	Total	54.9	60.6	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 10/24/2018
Case Description: Gonzaga_O&M Building

---- Receptor #1 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Nearest Receiver 2376'	Residential	65	60	55

Description		Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Man Lift		No	20		74.7	2367	0
Man Lift		No	20		74.7	2367	0
Man Lift		No	20		74.7	2367	0
Man Lift		No	20		74.7	2367	0
Man Lift		No	20		74.7	2367	0
Man Lift		No	20		74.7	2367	0
Man Lift		No	20		74.7	2367	0
Man Lift		No	20		74.7	2367	0
Man Lift		No	20		74.7	2367	0
Man Lift		No	20		74.7	2367	0
Front End Loader		No	40		79.1	2367	0

Front End Loader	No	40		79.1	2367	0
Front End Loader	No	40		79.1	2367	0
Tractor	No	40	84		2367	0
Excavator	No	40		80.7	2367	0
Excavator	No	40		80.7	2367	0
Excavator	No	40		80.7	2367	0

				Results				
		Calculated (dBA)			Noise Limits (dBA)			
				Day		Evening		Night
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax
Man Lift		41.2	34.2	N/A	N/A	N/A	N/A	N/A
Man Lift		41.2	34.2	N/A	N/A	N/A	N/A	N/A
Man Lift		41.2	34.2	N/A	N/A	N/A	N/A	N/A
Man Lift		41.2	34.2	N/A	N/A	N/A	N/A	N/A
Man Lift		41.2	34.2	N/A	N/A	N/A	N/A	N/A
Man Lift		41.2	34.2	N/A	N/A	N/A	N/A	N/A
Man Lift		41.2	34.2	N/A	N/A	N/A	N/A	N/A
Man Lift		41.2	34.2	N/A	N/A	N/A	N/A	N/A
Man Lift		41.2	34.2	N/A	N/A	N/A	N/A	N/A
Man Lift		41.2	34.2	N/A	N/A	N/A	N/A	N/A
Front End Loader		45.6	41.6	N/A	N/A	N/A	N/A	N/A
Front End Loader		45.6	41.6	N/A	N/A	N/A	N/A	N/A
Front End Loader		45.6	41.6	N/A	N/A	N/A	N/A	N/A
Tractor		50.5	46.5	N/A	N/A	N/A	N/A	N/A
Excavator		47.2	43.2	N/A	N/A	N/A	N/A	N/A
Excavator		47.2	43.2	N/A	N/A	N/A	N/A	N/A
Excavator		47.2	43.2	N/A	N/A	N/A	N/A	N/A
	Total	50.5	52.5	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Possible Receiver 1604'	Residential	65	60	55

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Man Lift	No	20		74.7	1604	0
Man Lift	No	20		74.7	1604	0
Man Lift	No	20		74.7	1604	0
Man Lift	No	20		74.7	1604	0
Man Lift	No	20		74.7	1604	0
Man Lift	No	20		74.7	1604	0
Man Lift	No	20		74.7	1604	0

Man Lift	No	20		74.7	1604	0
Man Lift	No	20		74.7	1604	0
Man Lift	No	20		74.7	1604	0
Front End Loader	No	40		79.1	1604	0
Front End Loader	No	40		79.1	1604	0
Front End Loader	No	40		79.1	1604	0
Tractor	No	40	84		1604	0
Excavator	No	40		80.7	1604	0
Excavator	No	40		80.7	1604	0
Excavator	No	40		80.7	1604	0

Results

		Calculated (dBA)		Noise Limits (dBA)				
				Day		Evening		Night
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax
Man Lift		44.6	37.6	N/A	N/A	N/A	N/A	N/A
Man Lift		44.6	37.6	N/A	N/A	N/A	N/A	N/A
Man Lift		44.6	37.6	N/A	N/A	N/A	N/A	N/A
Man Lift		44.6	37.6	N/A	N/A	N/A	N/A	N/A
Man Lift		44.6	37.6	N/A	N/A	N/A	N/A	N/A
Man Lift		44.6	37.6	N/A	N/A	N/A	N/A	N/A
Man Lift		44.6	37.6	N/A	N/A	N/A	N/A	N/A
Man Lift		44.6	37.6	N/A	N/A	N/A	N/A	N/A
Man Lift		44.6	37.6	N/A	N/A	N/A	N/A	N/A
Man Lift		44.6	37.6	N/A	N/A	N/A	N/A	N/A
Front End Loader		49	45	N/A	N/A	N/A	N/A	N/A
Front End Loader		49	45	N/A	N/A	N/A	N/A	N/A
Front End Loader		49	45	N/A	N/A	N/A	N/A	N/A
Tractor		53.9	49.9	N/A	N/A	N/A	N/A	N/A
Excavator		50.6	46.6	N/A	N/A	N/A	N/A	N/A
Excavator		50.6	46.6	N/A	N/A	N/A	N/A	N/A
Excavator		50.6	46.6	N/A	N/A	N/A	N/A	N/A
	Total	53.9	55.9	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 10/24/2018
Case Description: Gonzaga_Reclaimation

---- Receptor #1 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Nearest Receiver 2376'	Residential	65	60	55

Equipment			
Spec	Actual	Receptor	Estimated

		Impact		Lmax	Lmax	Distance	Shielding
Description		Device	Usage(%)	(dBA)	(dBA)	(feet)	(dBA)
Grader		No	40	85		2367	0
Grader		No	40	85		2367	0
Grader		No	40	85		2367	0
Roller		No	20		80	2367	0
Roller		No	20		80	2367	0
Roller		No	20		80	2367	0
Dozer		No	40		81.7	2367	0
Dozer		No	40		81.7	2367	0
Front End Loader		No	40		79.1	2367	0
Front End Loader		No	40		79.1	2367	0
Front End Loader		No	40		79.1	2367	0
Tractor		No	40	84		2367	0

				Results				
		Calculated (dBA)			Noise Limits (dBA)			
				Day		Evening		Night
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax
Grader		51.5	47.5	N/A	N/A	N/A	N/A	N/A
Grader		51.5	47.5	N/A	N/A	N/A	N/A	N/A
Grader		51.5	47.5	N/A	N/A	N/A	N/A	N/A
Roller		46.5	39.5	N/A	N/A	N/A	N/A	N/A
Roller		46.5	39.5	N/A	N/A	N/A	N/A	N/A
Roller		46.5	39.5	N/A	N/A	N/A	N/A	N/A
Dozer		48.2	44.2	N/A	N/A	N/A	N/A	N/A
Dozer		48.2	44.2	N/A	N/A	N/A	N/A	N/A
Front End Loader		45.6	41.6	N/A	N/A	N/A	N/A	N/A
Front End Loader		45.6	41.6	N/A	N/A	N/A	N/A	N/A
Front End Loader		45.6	41.6	N/A	N/A	N/A	N/A	N/A
Tractor		50.5	46.5	N/A	N/A	N/A	N/A	N/A
	Total	51.5	55.3	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Possible Receiver 1604'	Residential	65	60	55

				Equipment			
				Spec	Actual	Receptor	Estimated
		Impact		Lmax	Lmax	Distance	Shielding
Description		Device	Usage(%)	(dBA)	(dBA)	(feet)	(dBA)
Grader		No	40	85		1604	0
Grader		No	40	85		1604	0
Grader		No	40	85		1604	0
Roller		No	20		80	1604	0

Roller	No	20		80	1604	0
Roller	No	20		80	1604	0
Dozer	No	40		81.7	1604	0
Dozer	No	40		81.7	1604	0
Front End Loader	No	40		79.1	1604	0
Front End Loader	No	40		79.1	1604	0
Front End Loader	No	40		79.1	1604	0
Tractor	No	40	84		1604	0

				Results				
		Calculated (dBA)			Noise Limits (dBA)			
				Day		Evening		Night
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax
Grader		54.9	50.9	N/A	N/A	N/A	N/A	N/A
Grader		54.9	50.9	N/A	N/A	N/A	N/A	N/A
Grader		54.9	50.9	N/A	N/A	N/A	N/A	N/A
Roller		49.9	42.9	N/A	N/A	N/A	N/A	N/A
Roller		49.9	42.9	N/A	N/A	N/A	N/A	N/A
Roller		49.9	42.9	N/A	N/A	N/A	N/A	N/A
Dozer		51.5	47.6	N/A	N/A	N/A	N/A	N/A
Dozer		51.5	47.6	N/A	N/A	N/A	N/A	N/A
Front End Loader		49	45	N/A	N/A	N/A	N/A	N/A
Front End Loader		49	45	N/A	N/A	N/A	N/A	N/A
Front End Loader		49	45	N/A	N/A	N/A	N/A	N/A
Tractor		53.9	49.9	N/A	N/A	N/A	N/A	N/A
	Total	54.9	58.7	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 10/24/2018
Case Description: Gonzaga_Substation

---- Receptor #1 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Nearest Receiver 2376'	Residential	65	60	55

			Equipment			
			Spec	Actual	Receptor	Estimated
	Impact		Lmax	Lmax	Distance	Shielding
Description	Device	Usage(%)	(dBA)	(dBA)	(feet)	(dBA)
Crane	No	16		80.6	2367	0
Crane	No	16		80.6	2367	0
Excavator	No	40		80.7	2367	0
Man Lift	No	20		74.7	2367	0
Man Lift	No	20		74.7	2367	0

Front End Loader		No	40		79.1	2367	0
Tractor		No	40	84		2367	0

Results

		Calculated (dBA)		Noise Limits (dBA)				
				Day		Evening		Night
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax
Crane		47	39.1	N/A	N/A	N/A	N/A	N/A
Crane		47	39.1	N/A	N/A	N/A	N/A	N/A
Excavator		47.2	43.2	N/A	N/A	N/A	N/A	N/A
Man Lift		41.2	34.2	N/A	N/A	N/A	N/A	N/A
Man Lift		41.2	34.2	N/A	N/A	N/A	N/A	N/A
Front End Loader		45.6	41.6	N/A	N/A	N/A	N/A	N/A
Tractor		50.5	46.5	N/A	N/A	N/A	N/A	N/A
	Total	50.5	50.1	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Possible Receiver 1604'	Residential	65	60	55

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	1604	0
Crane	No	16		80.6	1604	0
Excavator	No	40		80.7	1604	0
Man Lift	No	20		74.7	1604	0
Man Lift	No	20		74.7	1604	0
Front End Loader	No	40		79.1	1604	0
Tractor	No	40	84		1604	0

Results

		Calculated (dBA)		Noise Limits (dBA)				
				Day		Evening		Night
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax
Crane		50.4	42.5	N/A	N/A	N/A	N/A	N/A
Crane		50.4	42.5	N/A	N/A	N/A	N/A	N/A
Excavator		50.6	46.6	N/A	N/A	N/A	N/A	N/A
Man Lift		44.6	37.6	N/A	N/A	N/A	N/A	N/A
Man Lift		44.6	37.6	N/A	N/A	N/A	N/A	N/A
Front End Loader		49	45	N/A	N/A	N/A	N/A	N/A
Tractor		53.9	49.9	N/A	N/A	N/A	N/A	N/A
	Total	53.9	53.5	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 10/24/2018
Case Description: Gonzaga_Transmission Line

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Nearest Receiver 2376'	Residential	65	60	55

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	2367	0
Crane	No	16		80.6	2367	0
Excavator	No	40		80.7	2367	0
Excavator	No	40		80.7	2367	0
Man Lift	No	20		74.7	2367	0
Man Lift	No	20		74.7	2367	0
Front End Loader	No	40		79.1	2367	0
Front End Loader	No	40		79.1	2367	0
Tractor	No	40	84		2367	0

Results

Equipment		Calculated (dBA) *Lmax	Leq	Noise Limits (dBA) Day Lmax	Leq	Evening Lmax	Leq	Night Lmax
Crane		47	39.1	N/A	N/A	N/A	N/A	N/A
Crane		47	39.1	N/A	N/A	N/A	N/A	N/A
Excavator		47.2	43.2	N/A	N/A	N/A	N/A	N/A
Excavator		47.2	43.2	N/A	N/A	N/A	N/A	N/A
Man Lift		41.2	34.2	N/A	N/A	N/A	N/A	N/A
Man Lift		41.2	34.2	N/A	N/A	N/A	N/A	N/A
Front End Loader		45.6	41.6	N/A	N/A	N/A	N/A	N/A
Front End Loader		45.6	41.6	N/A	N/A	N/A	N/A	N/A
Tractor		50.5	46.5	N/A	N/A	N/A	N/A	N/A
	Total	50.5	51.4	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Possible Receiver 1604'	Residential	65	60	55

Equipment

Description	Impact Device	Usage(%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	1604	0
Crane	No	16		80.6	1604	0
Excavator	No	40		80.7	1604	0
Excavator	No	40		80.7	1604	0
Man Lift	No	20		74.7	1604	0
Man Lift	No	20		74.7	1604	0
Front End Loader	No	40		79.1	1604	0
Front End Loader	No	40		79.1	1604	0
Tractor	No	40	84		1604	0

Results

		Calculated (dBA)		Noise Limits (dBA)				
				Day		Evening		Night
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax
Crane		50.4	42.5	N/A	N/A	N/A	N/A	N/A
Crane		50.4	42.5	N/A	N/A	N/A	N/A	N/A
Excavator		50.6	46.6	N/A	N/A	N/A	N/A	N/A
Excavator		50.6	46.6	N/A	N/A	N/A	N/A	N/A
Man Lift		44.6	37.6	N/A	N/A	N/A	N/A	N/A
Man Lift		44.6	37.6	N/A	N/A	N/A	N/A	N/A
Front End Loader		49	45	N/A	N/A	N/A	N/A	N/A
Front End Loader		49	45	N/A	N/A	N/A	N/A	N/A
Tractor		53.9	49.9	N/A	N/A	N/A	N/A	N/A
	Total	53.9	54.8	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 10/24/2018
Case Description: Gonzaga_Turbine Decommisioning

---- Receptor #1 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Nearest Receiver 2376'	Residential	65	60	55

Equipment

Description	Impact Device	Usage(%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Excavator	No	40		80.7	2367	0
Excavator	No	40		80.7	2367	0
Man Lift	No	20		74.7	2367	0
Man Lift	No	20		74.7	2367	0

Description	Impact Device	Usage(%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Front End Loader	No	40		79.1	2367	0
Front End Loader	No	40		79.1	2367	0
Backhoe	No	40		77.6	2367	0
Tractor	No	40	84		2367	0
Front End Loader	No	40		79.1	2367	0
Backhoe	No	40		77.6	2367	0

Results

		Calculated (dBA)		Noise Limits (dBA)				
				Day		Evening		Night
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax
Excavator		47.2	43.2	N/A	N/A	N/A	N/A	N/A
Excavator		47.2	43.2	N/A	N/A	N/A	N/A	N/A
Man Lift		41.2	34.2	N/A	N/A	N/A	N/A	N/A
Man Lift		41.2	34.2	N/A	N/A	N/A	N/A	N/A
Front End Loader		45.6	41.6	N/A	N/A	N/A	N/A	N/A
Front End Loader		45.6	41.6	N/A	N/A	N/A	N/A	N/A
Backhoe		44.1	40.1	N/A	N/A	N/A	N/A	N/A
Tractor		50.5	46.5	N/A	N/A	N/A	N/A	N/A
Front End Loader		45.6	41.6	N/A	N/A	N/A	N/A	N/A
Backhoe		44.1	40.1	N/A	N/A	N/A	N/A	N/A
	Total	50.5	51.9	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Possible Receiver 1604'	Residential	65	60	55

Equipment

Description	Impact Device	Usage(%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Excavator	No	40		80.7	1604	0
Excavator	No	40		80.7	1604	0
Man Lift	No	20		74.7	1604	0
Man Lift	No	20		74.7	1604	0
Front End Loader	No	40		79.1	1604	0
Front End Loader	No	40		79.1	1604	0
Backhoe	No	40		77.6	1604	0
Tractor	No	40	84		1604	0
Front End Loader	No	40		79.1	1604	0
Backhoe	No	40		77.6	1604	0

Results

		Calculated (dBA)		Noise Limits (dBA)				
				Day		Evening		Night

Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax
Excavator		50.6	46.6	N/A	N/A	N/A	N/A	N/A
Excavator		50.6	46.6	N/A	N/A	N/A	N/A	N/A
Man Lift		44.6	37.6	N/A	N/A	N/A	N/A	N/A
Man Lift		44.6	37.6	N/A	N/A	N/A	N/A	N/A
Front End Loader		49	45	N/A	N/A	N/A	N/A	N/A
Front End Loader		49	45	N/A	N/A	N/A	N/A	N/A
Backhoe		47.4	43.5	N/A	N/A	N/A	N/A	N/A
Tractor		53.9	49.9	N/A	N/A	N/A	N/A	N/A
Front End Loader		49	45	N/A	N/A	N/A	N/A	N/A
Backhoe		47.4	43.5	N/A	N/A	N/A	N/A	N/A
	Total	53.9	55.3	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 10/24/2018

Case Description: Gonzaga_Turbine Install

---- Receptor #1 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Nearest Receiver 2376'	Residential	65	60	55

			Equipment			
			Spec	Actual	Receptor	Estimated
	Impact		Lmax	Lmax	Distance	Shielding
Description	Device	Usage(%)	(dBA)	(dBA)	(feet)	(dBA)
Crane	No	16		80.6	2367	0
Crane	No	16		80.6	2367	0
Crane	No	16		80.6	2367	0
Man Lift	No	20		74.7	2367	0
Man Lift	No	20		74.7	2367	0
Man Lift	No	20		74.7	2367	0
Man Lift	No	20		74.7	2367	0

Results

	Calculated (dBA)		Noise Limits (dBA)				
			Day		Evening		Night
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax
Crane	47	39.1	N/A	N/A	N/A	N/A	N/A
Crane	47	39.1	N/A	N/A	N/A	N/A	N/A
Crane	47	39.1	N/A	N/A	N/A	N/A	N/A
Man Lift	41.2	34.2	N/A	N/A	N/A	N/A	N/A
Man Lift	41.2	34.2	N/A	N/A	N/A	N/A	N/A
Man Lift	41.2	34.2	N/A	N/A	N/A	N/A	N/A
Man Lift	41.2	34.2	N/A	N/A	N/A	N/A	N/A

	Total	47	45.4	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Possible Receiver 1604'	Residential	65	60	55

			Equipment			
			Spec	Actual	Receptor	Estimated
	Impact		Lmax	Lmax	Distance	Shielding
Description	Device	Usage(%)	(dBA)	(dBA)	(feet)	(dBA)
Crane	No	16		80.6	1604	0
Crane	No	16		80.6	1604	0
Crane	No	16		80.6	1604	0
Man Lift	No	20		74.7	1604	0
Man Lift	No	20		74.7	1604	0
Man Lift	No	20		74.7	1604	0
Man Lift	No	20		74.7	1604	0

				Results				
		Calculated (dBA)			Noise Limits (dBA)			
				Day		Evening		Night
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax
Crane		50.4	42.5	N/A	N/A	N/A	N/A	N/A
Crane		50.4	42.5	N/A	N/A	N/A	N/A	N/A
Crane		50.4	42.5	N/A	N/A	N/A	N/A	N/A
Man Lift		44.6	37.6	N/A	N/A	N/A	N/A	N/A
Man Lift		44.6	37.6	N/A	N/A	N/A	N/A	N/A
Man Lift		44.6	37.6	N/A	N/A	N/A	N/A	N/A
Man Lift		44.6	37.6	N/A	N/A	N/A	N/A	N/A
	Total	50.4	48.8	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

APPENDIX C

Visual Resources Report

Visual Resources Report
for the
Gonzaga Ridge Wind Repowering Project

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Visual Resources Report for the Gonzaga Ridge Wind Repowering Project

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FIGURES

ACRONYMS AND ABBREVIATIONS

Acronym/Abbreviation	Definition
BOR	Bureau of Reclamation
Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
County	Merced County
Gonzaga or GRWF	Gonzaga Ridge Wind Farm, LLC
I-5	Interstate 5
kV	kilovolt
MW	megawatt
Park	Pacheco State Park
Project or proposed Project	Gonzaga Ridge Wind Repowering Project
SR	State Route
SRA	State Recreation Area

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Visual Resources Report for the Gonzaga Ridge Wind Repowering Project

1 INTRODUCTION

1.1 Purpose of the Visual Resources Report

The purpose of this visual resources report (report) is to assess the visual impacts of the Gonzaga Ridge Wind Repowering Project (proposed Project) and determine the significance of the impacts under the California Environmental Quality Act (CEQA). The report also proposes measures to avoid, minimize, or mitigate adverse visual impacts on existing views and the surrounding visual environment associated with replacement of the existing wind energy facility located within Pacheco State Park (Park), consisting of 162 wind turbines and associated facilities, with a new wind energy facility that could include up to 40, approximately 650-foot tall wind turbines, along with additional infrastructure located on lands outside of the Park boundaries.

1.2 Key Issues

Adverse effects typically associated with development include the loss of natural vegetation, removal of natural features with aesthetic value, modification of terrain (e.g., alteration of topography through grading), and/or the introduction of contrasting elements within the existing landscape setting. The loss or degradation of significant visual features or views and the introduction of project features that would significantly contrast with the existing visual character of an area or with the existing elements of form, line, color, or texture that may result in significant adverse visual effects. The effects and elements of the Project that could potentially result in significant visual quality impacts include the following:

- Introduction of up to forty (40) wind turbines (with a maximum blade tip height of approximately 650-feet tall each) on visually prominent terrain located within the viewshed of State Route-152 (SR-152), trails and peaks within the Park, the Romero Visitor Center within the San Luis Reservoir State Recreation Area (SRA), and the San Luis Reservoir recreational facilities.
- Introduction of a new, approximately 16-mile long, 70 kV transmission line (New Transmission Line) that would travel from the on-site collector substation to the existing Los Banos Substation, primarily along the southwest and southern extents of the San Luis Reservoir, spanning the SRA Portuguese Creek and Basalt Areas, prior to turning the north and then east and briefly paralleling SR-152.

- Contrasts in scale, mass, form, color, and movement between existing and proposed wind turbines and effects to scenic views available from the area including from SR-152 (an officially designated state scenic highway).
- Operation of modern, Federal Aviation Administration (FAA) obstruction lighting within an area currently developed with 162 existing wind turbines, a state park, scenic highway, and recreational facilities associated with the San Luis Reservoir SRA.

1.3 Principal Viewpoints to be Covered

Principal viewpoints to be covered in this analysis consist of off-site public viewing locations such as SR-152, Dinosaur Point Road, and the Park. Specifically, principal viewpoints used to assess the potential visual changes associated with the Project were established in coordination with State Parks and Recreation (CDPR) at the following locations:

- Pacheco State Park Day Use Area (parking lot);
- Dinosaur Point Road at entrance to Pacheco State Park;
- Dinosaur Point Road near San Luis Rey Reservoir boat launch (at Dinosaur Point);
- SR-152 at Cottonwood Bay Rock Bridge crossing;
- Romero Visitor Center (along eastern shoreline of San Luis Reservoir); and
- San Luis Reservoir SRA Basalt Area boat launch facilities.

2 PROJECT DESCRIPTION

The proposed Project is located west of the San Luis Reservoir and south of SR-152 in the foothills of the Diablo Range in western Merced County (see Figure 1, Project Location). In addition, the majority of Project components, including wind turbines, underground and overhead electrical collector system, on-site collector substation, new and expanded access roads, operations and maintenance (O&M) facility, and storage sheds are proposed in the easterly lease (LE) area of the Park that is currently closed to the public. This portion of the Park currently features 162 wind turbines that were installed between 1988 and 2002, five temporary meteorological evaluation towers (MET) used to gather information on meteorological and wind conditions on the site, a small switching station, and a trailer on-site that provides office space for the on-site maintenance personnel.

The Project, as currently proposed would consist of up to 40 wind turbines (three-bladed, horizontal-axis models that are approximately 650 feet tall) and associated infrastructure, with a nameplate generating capacity[1] of up to approximately 100 megawatts (MW) on the approximately 1,766-acre Project site.[2] A site plan of the Project is provided as Figure 2, Site Plan. The Project would also utilize privately owned property as well as land owned by the Bureau of Reclamation (BOR) for transmission line siting. New wind turbines installed on the Project site would generally be installed at or near the location of existing wind turbines, as shown on Figure 3, Existing and Proposed Turbine Locations. In addition to the removal of 162 existing wind turbines and five temporary MET towers, and installation of up to 40 new wind turbines (a representative wind turbine under consideration is illustrated on Figure 4, Representative Wind Turbine), the Project would include the following components:

- Up to 40 turbines erected on tubular steel towers set on concrete foundations, with associated turbine pads, laydown areas, and pad mounted transformers;
- A 34.5-kilovolt (kV) overhead and underground electrical collector system linking each turbine to the next and the on-site collector substation (Figure 5, Typical Overhead Electrical Pole Design, illustrates the form of poles that would support the overhead system);
- An overhead and underground communication system (fiber optic cabling);
- An O&M facility including an operations building and outdoor storage area (see Figure 6, O&M Building Illustrative);

1 The nameplate generating capacity for a wind energy generation project is the sum of the total capacity rating of the turbines and should be considered a project's total potential generation output. A project's capacity factor refers to the percentage of the nameplate capacity actually generated over time.

2 The ultimate number of turbines would not exceed 40, but if a larger MW turbine model is selected the total number of turbines required would be reduced to less than 30.

- On-site collector substation;
- A new overhead 70 kV New Transmission Line that would connect the on-site collector substation to the existing Los Banos Substation. The transmission line would be supported by steel poles up to 90 feet tall and would feature wire heights ranging from 20 to 30 feet above the ground unless special circumstances warrant different clearances (Figure 7, New Transmission Line, illustrates the location of the proposed alignment);
- Access roads, consisting of utilizing and upgrading existing roads and installing new roads;
- Up to three temporary and two permanent MET towers (approximately 400 feet tall each) and wind measurement equipment (see Figure 8, MET Tower Design). Only the two permanent MET towers are depicted on the site plan (Figure 2);
- Upgrades to the Los Banos Substation and existing switchyard;
- Battery storage facility; and
- Permanent storage sheds.

In addition, temporary facilities would be required during construction of the Project including equipment laydown areas, construction trailer area, and associated parking area, and staging area(s) for deliveries. The location of the temporary facilities is indicated on Figure 2.

The Project's collector substation and underground collection facility would be sized to accommodate the Project's total potential generation output. Upon completion, the Project would be monitored 24 hours a day, seven days a week through a supervisory control and data acquisition (SCADA) system. Primary access to the Project site would be provided via SR-152, Dinosaur Point Road, and Windmill Road within the Park.

2.1 Project Construction

2.1.1 Grading

Ground-disturbing activities including clearing and grubbing, topsoil stripping, grading, compaction, utility trenching, and placement of aggregate surfacing would occur during construction of the project. Grading activities would consist of the removal, storage, and/or disposal of earth, gravel, vegetation, organic matter, loose rock, and debris. Where possible, the top 4 to 6 inches of earth and vegetative material would be removed and stored for use as a base for revegetating temporarily disturbed areas elsewhere on the Project site. The cut and fill required for the Project would be balanced to the extent possible, to minimize the amount of materials that would need to be brought onto or removed from the site. Estimates of cut and fill cannot be determined until engineering for construction has been undertaken.

To the extent practicable, based on the Project's goal of minimizing ground disturbance and preventing erosion, graded areas would maintain the local surface drainage patterns. New Project access roads would be designed to follow natural contours and minimize side hill cuts to the extent possible and would include other BMPs such as ditches and culverts to capture and convey stormwater runoff. Additionally, with the exception of areas where permanent surface recontouring is required, disturbed areas would be restored to pre-existing grades and all disturbed areas where permanent gravel or aggregate is not required would be revegetated. These measures would reduce the potential for erosion and adverse effects on drainage patterns.

In rocky areas, blasting may be necessary to loosen rock before excavation. If blasting is necessary, a Blasting Plan would be prepared to identify the locations that are anticipated to require blasting. All applicable federal, state, and local regulations for blasting procedures would be identified in the Blasting Plan and would be followed. Explosives would only be used within specified times and at specified distances when the work is located within or nearby sensitive habitat areas.

2.1.2 Transportation of Turbine and New Transmission Line Components

Turbine components may be transported to the Project site by transport vehicles via the local highways and assembled on site. Each turbine would require multiple deliveries. The specifics of these deliveries would depend upon the final turbine model selected; however, Gonzaga anticipates that each turbine would require up to 10 separate loads, of equipment and materials to its pad, of which eight or nine would be oversized or super loads transporting turbine components. Site access may require minor modifications to the SR 152/Dinosaur Point Road intersection that may require a California Department of Transportation (Caltrans) encroachment permit. Towers are generally delivered in three, four, or five sections (depending on turbine selected). Each turbine blade, nacelle, rotor, and down-tower components (e.g., controllers, ladders and platforms, pad-mount transformers, pad-mounted transformer vaults, and turbine switchgear) would be delivered separately. Deliveries would be made using transport vehicles that conform to road weight limits; any variances would be incorporated into permits submitted to Caltrans.

Delivery of the New Transmission Line components would via semi-trucks and trailers to the temporary staging area or laydown area. Delivery trucks would not be as large as what is required for the turbine components and may not require either a Transportation or Encroachment Permit from Caltrans.

2.1.3 Construction Schedule and Workforce

Project construction period is expected to last approximately 12 months. This includes decommissioning the existing turbines and removing unnecessary facilities, which would occur prior to commencing work on installing the new turbines and other infrastructure. Construction would be completed during daylight hours, typically from 6 a.m. to 6 p.m., but may be earlier or later depending on daylight. There may be instances where those hours need to be extended earlier or later, such as during the delivery of super loads, and nighttime construction may occur to avoid traffic, adjust for high winds during daylight hours, and to facilitate schedule. The construction workforce is estimated to include up to 200 construction workers at any given time.

2.2 Land Use Designations and Zoning

As illustrated on Figure 2, proposed wind turbines would be located entirely on State Park lands and more specifically, within the Park. The Pacheco State Park General Plan establishes four management zones: Administration and Operations Zone (AO), Front Country Zone (FC), Backcountry (BC), and Lease Zone (LE). The Project site and existing wind turbines are located in the LE area that generally encompasses the eastern half of the Park.

Merced County does not have land use jurisdiction or discretionary permit authority over projects on state lands; however, Merced County applies land use and zoning designations to the land underlying the Project site within the Park. The Project site as illustrated on Figure 2 is located on lands designated as Foothill Pasture and zoned Exclusive Agriculture (A-2) by Merced County. The Foothill Pasture designation "provides for non-cultivated agricultural practices which typically require larger areas of land due to poor soil quality, limited water availability, and steeper slopes" (Merced County 2013). Within the County, this designation is applied to areas in the Sierra Nevada foothills and on the east and west sides of the County. The purpose of the Exclusive Agriculture (A-2) zone is to allow for "considerably expanded agricultural enterprises, due mainly to the requirement of larger size land parcels which are more economically suitable to support farming activities occurring in the area" (Chapter 18.02 of the Merced County Code).

Outside of the Project site boundary, the proposed 70 kV New Transmission Line would traverse Bureau of Reclamation (BOR), Merced County and private lands. The eastern extent of the transmission line paralleling Gonzaga Road would be located within site of the Villages of Laguna San Luis (an urban community subject to Merced County land use jurisdiction). The entirety of the New Transmission Line alignment would traverse the Foothill Pasture designation, passing to the north of Very Low Density Residential (VLDR), Low Density Residential (LD), and Open Space (OS) designations proposed south of SR-152 and east of Basalt Road within the urban community boundary. A land use designation is not applied to the existing Los Banos Substation however, lands to the south traversed by existing transmission lines are designated OS. Lands to the east of the substation are designated Regional Commercial (RC) and VLDR. These areas have direct access to SR-33 and SR-152 and support gas stations and a convenience shopping center with a large big-rig truck surface parking lot. A two-story motel (Motel 6 Santa Nella) and larger lot single-family residential neighborhood are also located within 1,200 feet of the Los Banos Substation.

Similarly, the entirety of the New Transmission Line corridor traverses the A-2 zoning designation (the existing Dinosaur Point tap switchyard [existing switchyard] is zoned A-2). South of SR-152 and east of Basalt Road, the transmission line passes just north of undeveloped lands zoned Agricultural-Residential (A-R) and Single-Family (R-1-5000). The commercial and residential areas adjacent to the substation are zoned General Commercial (C-2) and Agricultural Residential (A-R).

Figure 9, Merced County General Plan Land Use, and Figure 10, Merced County Zoning, depict the land use designations and zones applied to the project boundary, New Transmission Line corridor and properties in the surrounding area by Merced County.

2.3 Regulatory Framework

Federal

Federal Aviation Administration

FAA Advisory Circular 70/7460-1L (FAA 2018) states “any temporary or permanent structure, including all appurtenances, that exceeds an overall height of 200 feet above ground level (AGL) should be marked or lighted (FAA 2016). The tallest structure proposed on site (wind turbines measured from base to blade tip) would be over 200 feet and therefore, all or a portion of the proposed wind turbines would require the installation of obstruction lighting atop wind turbine hubs. Permanent MET towers greater than 200 feet AGL would also be installed on the Project site and would be subject to FAA jurisdiction. Preparation and submittal of an aeronautical study and review by FAA would determine whether structures will impair aviation safety.

According to the FAA, all structures that are above 499 feet AGL are designated an obstructions and must be evaluated by the FAA through an aeronautical study to determine the effects on navigable airspace.

Chapter 13 of FAA Advisory Circular 70/7460-1L is dedicated to marking and lighting wind turbine farms. Wind turbine farms are defined as wind turbine developments containing three or more turbines of heights over 200 feet aboveground level. Marking Standards are established in Section 13.4, Marking Standards. Per FAA recommend guidelines, wind turbines should be painted white or light grey because these specific colors have been “shown to be the most effective method for providing daytime conspicuity” (FAA 2018).

Section 13.5, Lighting Standards, contains the following general standards established for wind turbine farm lighting:

- In most cases, not all wind turbine units within a wind turbine farm need to be lighted. Obstruction lights should be placed along the perimeter of the wind turbine farm so that there are no unlit separations or gaps more than 1/2 statute mile (sm) (804 m). Wind turbines within a grid or cluster should not have an unlighted separation or gap of more than one sm (1.6 km) across the interior of a grid or cluster of turbines. (Nighttime wind turbine obstruction lighting should consist of the preferred FAA L-864 aviation red flashing, strobe, or pulsed obstruction lights. Studies have shown that red lights provide the most conspicuity to pilots.
- Daytime lighting of wind turbine farms is not required.
- Light fixtures should be placed as high as possible on the turbine nacelle, so they are visible by a pilot approaching from any direction.
- For linear turbine configurations, lights should be placed on each turbine positioned at each end of the line or string of turbines. Lights should also be placed along the line of turbines so that there is no more than a 1/2-sm (2,640-foot (805-m)) gap between the lighted turbines. In the event the gap between lights on the last segment of turbines is significantly short, it may be appropriate to move the lights on the turbine string back toward the starting point to present a well-balanced string of lights. High concentrations of lights shall be avoided.

The following standards established in Chapter 13.6, Wind Turbines Above 499 Feet, are applicable to wind turbines above 499 feet but below 699 feet:

- In addition to the lighting standards established in Chapter 13.5, the top of the turbine's nacelle should be equipped with a second L-864 flashing red light.
- The two obstruction lights should be arranged horizontally, positioned on opposite sides of the nacelle, visible to a pilot approaching from any direction, and flash simultaneously. This lighting configuration ensures the turbines in this size category are always lighted.
- In the event one of the two obstruction lights fails, no light failure notification is required; however, the light should be restored to service as soon as possible.
- All turbines within this size category should be illuminated, regardless of their location within a wind turbine farm, and should be configured to flash simultaneously with the other turbines in the same farm. This requirement ensures the pilots operating at 500 feet AGL have sufficient warning that a wind turbine obstruction may be within their flight path.

The following standard established in Chapter 13.8, Lighting of Wind Turbines During Construction Phase, are applicable to the project:

- To ensure proper conspicuity of turbines at night during construction, all turbines should be lighted with temporary lighting once they reach a height of 200 feet (61 m) or greater until the permanent lighting configuration is turned on. As the structure's height continues to increase, the temporary lighting should be relocated to the structure's uppermost height. The temporary lighting may be turned off for short periods if they interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An L-810 steady burning red light shall be used to light the structure during the construction phase, if the permanent L-864 flashing-red lights are not in place. If power is not available, turbines should be lighted with a self-contained, solar-powered, LED, steady-burning red light that meets the photometric requirements of an FAA L-810 lighting system. The lights should be positioned to ensure a pilot has an unobstructed view of at least one light at each level. Using a NOTAM (D) to justify not lighting the turbines until the entire project is completed is prohibited.

Chapter 14 describes the general standards associated with Aircraft Detection Lighting Systems (ADLS). These are sensor-based systems designed to detect aircraft as they approach an obstruction or group of obstructions. The systems activate the appropriate lights automatically until they are no longer needed.

State

California Scenic Highway System

Created by the California State Legislature in 1963, the California Scenic Highway Program includes highways designated by the California Department of Transportation (Caltrans) as scenic. There are two officially designated scenic highways in Merced County: SR-152 from the Merced/Santa Clara County site east to the I-5 junction (approximately 13.8 miles long) and I-5 from SR-33 north to the Merced/Stanislaus County site (approximately 14.9 miles long) (Caltrans 2018).

At its closest location, SR-152 is located approximately 1 mile north of the Project site within the Park. The Project site is located 9.7 miles west of the designated scenic segment of I-5 (the existing Los Banos Substation is located approximately 2.5 miles west of I-5).

Local

Pacheco State Park General Plan

Approved by the State Park and Recreation Commission in May 2016, the Pacheco State Park General Plan establishes four management zones: Administration and Operations Zone (AO), Front country Zone (FC), Backcountry (BC), and Lease Zone (LE). The Project site and existing wind turbines are located within the LE area that generally encompasses the eastern half of the Park. Per the General Plan, the LE area encompasses the current area of the Park that supports wind turbine development and "allows for this land use to continue with limited public access" (California State Parks 2006).

According to the Park General Plan, the Park contains a variety of aesthetic resources including wide and long, scenic vistas. Regarding existing resources and the availability of scenic views, the General Plan notes that the parks landscape is "predominantly undeveloped [and is] characterized by open grassland and oak woodlands." Further, due to its location atop the Diablo Range, prominent landforms provide "impressive vistas in all directions" (California State Parks 2006). Regarding existing wind turbines located on state parks lands, the General Plan acknowledges the visual contrasts and visibility of the features. Most notably, the General Plan states "the turbine towers are a physical intrusion into the natural setting" that "encroach on the uninterrupted landscape." Lastly, the General Plan notes that available dark skies at the state park and the limited amount of development in the immediate surrounding area make the Park a popular location for stargazing.

The General Plan also discloses the official scenic designation of SR-152 west of I-5 and the availability of scenic vistas from the highway. In regards to the state scenic designation, the General Plan notes that the State has established minimum standards for scenic corridor protection that include but are not limited to (1) regulation of land use and density of development; and (2) careful attention to design and appearance of structures and equipment.

The General Plan contains the following goals and guidelines related to Scenic/Aesthetic (RES-S) resources:

- **Goal RES-S1**: Preserve open scenic vistas on site through recognition of undeveloped ridgelines.
  - Guideline: Conduct a visual assessment for the placement of new structures and site features that need to be located in an identified viewshed.
  - Guideline: Where feasible, avoid placement of new structures or other obstructions at or near key vista points such as Spike's Peak.
- **Goal RES-S2**: Maintain large expanses of open space free of visual and physical interruptions.
  - Guideline: Minimize the development of new structures and reduce existing structures and other features that visually and physically fragment open space.

- **Goal RES-S3**: Ensure that new structures are architecturally compatible with the site's character and/or history as a former ranch.
  - Guideline: Identify the architectural components (style) and other contributing elements that define the site's character and use this information as a checklist for ensuring that new structures conform.
  - Guideline: Where feasible, ensure that the mass and scale of new structures are compatible with those of existing structures and do not dominate the surrounding landscape.
- **Goal RES-S5**: Prevent aesthetic and environmental damage from duration and intensity of lighting and fixtures.
- **Goal RES-S6**: Maintain and protect the dark nighttime sky for celestial viewing.

Merced County General Plan

According to the County General Plan, the rural and agricultural landscapes of Merced County comprise the primary scenic resources in the county. Regarding the availability of scenic views, the General Plan discloses that the county has many available scenic features including the Coastal and Sierra Nevada mountain ranges, and the Los Banos Creek, Merced, San Joaquin, and Bear Creek river corridors (Merced County 2013). The following goals and policies are applicable to scenic resources and the Project:

- Goal NR-4: Protect scenic resources and vistas.
- Policy NR-4.1: Scenic Resource Preservation. Promote the preservation of agricultural land, ranch land, and other open space areas as a means of protecting the County's scenic resources.
- Policy NR-4.5: Light Pollution Reduction. The County shall develop and implement a lighting ordinance to require good lighting practices, such as the use of specific light fixtures that reduce light pollution, minimize light impacts, and preserve views of the night sky. The ordinance shall contain standards to avoid light trespass, particularly from developed uses, to sensitive wildlife corridors and refuges.

Merced County Code

The following standard established in the Merced County Code are particularly applicable to visual resources and the Project:

- Section 18.41.060 Lighting. Exterior lighting shall be designed and maintained in a manner so that glare and reflections are contained within the boundaries of the parcel, and shall be hooded and directed downward and away from adjoining properties and public rights-of-way. The use of blinking, flashing or unusually high intensity or bright lights shall not be allowed. All lighting fixtures shall be appropriate to the use they are serving, in scale, intensity and height.

3 VISUAL ENVIRONMENT OF THE PROJECT

3.1 Project Setting

3.1.1 Project site, Surrounding Area and New Transmission Line Corridor

Project site

The Project site, which includes the portion of the Project within the LE area of the Park, is located west of the San Luis Reservoir and south of SR-152 and Dinosaur Point Road within an area of the Park not open to the public Figure 1, Project Location depicts the location of the Project site within the Park boundary. There are no buildings within this area with the exception of a trailer that provides office space for employees, a small shed that contains equipment and tools for O&M activities, and a small substation, also located onsite. Within this area there are 162 wind turbines ranging in size from 100 to 325-feet high (measured at the top of the turbine blade) and five temporary MET towers that are 197-feet tall. Only one existing turbine is currently required to include lights per FAA requirements. An existing transmission line, located in the northern portion of the Project site connects the existing wind farm to the Dinosaur Point Tap (existing switchyard) at which point the transmission infrastructure becomes owned and operated by Pacific Gas and Electric (PG&E). The Project is proposing to continue use of this transmission line and switchyard in addition to the New Transmission Line. A portion of an existing trail, Dinosaur Lake Trail, is located within the western portion of the Project site.

The approximately 1,766-acre Project site encompasses elevated ridgelines, hillsides, and high valley terrain to the northeast and east of Spikes Peak (elevation 1,927 feet above mean sea level (amsl)) and within the eastern half of the Park. Topography within the Project site includes steep slopes covered with grasses and hillsides with moderate to dense, clusters of oak trees. Lastly, drainages line the various valleys created by the local hill and valley terrain and water collects in a handful of small lakes including Wolf Lake and Mammoth Lake.

The Project site is primarily covered with grasslands, savanna, and oak woodland however, riparian and mesic herbaceous communities occur within and along drainages. In addition, non-native and weedy (ruderal) plant communities also occur near existing areas of disturbance (i.e., roads, an electrical substation and turbine research facility). Photographs A and B of Figure 11, Existing Conditions, illustrate the typical terrain and vegetation that occurs on the Project site.

The 162 existing wind turbines, installed between 1985 and 2002, are located atop ridgelines in linear strings or groupings that are accessible via a network of dirt roads that branch off from a primary access road (i.e., Windmill Road). The turbines are primarily supported by slightly conical steel tube towers that are approximately 80 feet high at the hub/nacelle however, several turbines are supported by unpainted lattice steel towers. In addition to these aged wind turbines, two taller wind turbines supported by white steel tube towers are installed to the southeast of Wolf Lake and west of the easternmost string of existing wind turbines in the project boundary. While existing wind turbines are obscured from view at the Park entrance and day use picnic and parking area, wind turbines are visible from segments of Dinosaur Point Road on the approach to the parking area and San Luis Reservoir SRA boating facilities at Dinosaur Point (see Photographs C and D of Figure 11).

As previously stated, existing wind turbines are installed in linear strings that are accessible via parallel (and narrow) dirt access roads. Short and straight spur roads branching from the string access road provide access to individual wind turbines. Also, most turbine strings are supported by a small, white rectangular “box” transformer that “steps up” the electricity produced by the wind turbine generator (located in the nacelle) to 34.5 kV. That electricity is then transmitted overhead and underground to a small electrical substation on a graveled 0.20-acre chain-link fenced site located approximately just under a half mile north of Mammoth Lake, within the Project site boundary. A 70 kV transmission line supported by thin wooden poles (approximately 50-70 feet high) deliver electricity produced by the wind turbine farm to an existing collector substation. A disturbed, primarily dirt storage yard for the existing wind farm is located immediately east of switchyard. Lastly, five steel lattice MET towers are temporarily installed on the Project site and are used to gather information on meteorological and wind conditions on the site. The thin line displayed by an existing MET tower on the Project site is illustrated in Photograph D on Figure 11.

Surrounding Area

The area immediately surrounding the Project site is primarily undeveloped and is comprised of generally similar vegetation and terrain. However, west of the Salt Creek drainage and adjacent canyon terrain (these features are located west of the Projectsite), tall ridgelines and locally prominent peaks including Spike’s Peak (approximately 1,927 feet amsl; located in the Park) and the shark-fin form of Pacheco Peak (approximately 2,770 feet amsl; located outside of the Park) are present and provide scenic viewing opportunities. The hill, valley, and canyon terrain within the Park and located west of the Project site is traversed by a network of fifteen (15) unimproved hiking and horseback trails (see Map 4, Existing Trails; California State Park 2006). Lastly, several rural residential structure are located within 3 miles of the Project site on hilly terrain west of the Park and south of SR-152 in Santa Clara County.

Lands to the south of the Project site are primarily undeveloped, but are traversed by a network of winding dirt roads. In addition, the hill and valley landscape supports limited remnants of previous ranchland operations. For example, a rectangular barn, pens/corrals, and a fenced property featuring a residence and several smaller accessory structures are present on sloping terrain to the south of the Project's southeastern boundary. Lands to the north of the Project site consist of similar terrain and vegetation. Limited development including three residences (primarily single-story) along Dinosaur Point Road, Santa Clara Valley Water District (SCVWD) facilities including a small electrical substation, and Park facilities (i.e., the existing Park and day use area, livestock corrals, park headquarters and ranch complex and storage shelters) are located north of the Project site and south of SR-152. The SCVWD facility and nearby reservoir boat launch and paved parking lot/picnic area within the San Luis Reservoir SRA (the SRA boundary generally follows the reservoir and O'Neill Forebay shorelines) are located on lower elevation terrain near and at the eastern terminus of Dinosaur Point Road. Similar terrain and vegetation lies to the north of SR-152 and encompasses the Upper Unit of the Cottonwood Creek Wildlife Area. Available recreational activities in the wildlife areas include wildlife viewing and hunting (CDFW 2018a, 2018b). The reservoir and surrounding terrain are visible in Photographs E, F, G and H on Figure 12, Existing Conditions.

New Transmission Line Corridor

The proposed up to approximately 16-mile New Transmission Line (or corridor) travels southeast from the new onsite project collector substation and through the Project site, along the western and southern shore of the San Luis Reservoir, through the SRA Basalt Area, and finally, parallels SR-152 and Gonzaga Road to the Los Banos Substation.

Within the Park boundary and from the new project collector substation (located adjacent to an existing collector substation), the proposed New Transmission Line corridor travels southeast across grassland covered and tree dotted hills towards the southeastern corner of the Park. Upon exiting the Park boundary, the corridor make an abrupt southerly and easterly turn and then proceeds to traverse the grassland covered and tree dotted terrain abutting the sinuous westerly shoreline of the reservoir. The corridor spans several dry inlets as it proceeds to the south towards the canyon-like landscape of the SRA Portuguese Creek area. Recreational boating and fishing are popular activities at the reservoir and limited hiking opportunities are available near the Portuguese Creek area and along the south shore's Lone Oak Trail (California State Parks 2017). In addition, scenic viewing opportunities to the west and south across the reservoir are available from the SRA's Romero Visitor Center, located along the eastern shoreline and directly accessible from SR-152. Photograph F of Figure 12 depicts a typical westerly view from the Romero Visitor Center.

Near the southern boundary of the SRA, the New Transmission Line corridor abruptly turns to the east, descends a slope, and spans the long, narrow inlet that defines the Portuguese Creek area. Crossing undulating, grassland-covered terrain to the south and southeast of the reservoir's Lone Oak Bay, the corridor runs west and north of quarried lands near Basalt Hill, a locally prominent landform and high point within the southern boundary of the SRA. An access road bisects the grassland covered and rock-strewn hill. In addition to tall lattice steel and tubular steel communications towers, several boxy and lightly colored communication facilities/structures and a forty-foot high fire lookout structure are present in this area. Northeast of Basalt Hill, the corridor turns to the northeast and spans the sole access road from SR-152 to the SRA's south shore Basalt Area (i.e., Basalt Road). This segment of the corridor traverses primarily undeveloped hills and is located within 0.5 mile of day use parking, picnic, and boat launch ramp facilities at Goosehead Point. Photograph G encompasses the boat launch facility at Goosehead Point. In addition to recreational activities, the boat launch area and the reservoir itself offer scenic viewing opportunities to the local hilly and mountainous terrain to the north, west, and southwest (see Photograph H of Figure 12). This particular segment of the corridor located south of the reservoir and near Basalt Road passes within approximately 250 feet of the SRA Basalt Area entrance (marked by a flag pole and small wooden kiosk/structure) and 0.4 mile of the shaded, 79-site Basalt Campground. Nestled among a dense cluster of mature oaks, the campground is situated in a short, narrow canyon located south of the SRA entrance gate.

East of the Basalt Road crossing, the corridor traverses low and rolling, grassland covered hills along a diagonal, northeastern heading and then parallels the SRA boundary to the north towards Los Banos CDF Road and SR-152. South of the state highway, the corridor spans Los Banos CDF Road and state property that supports a rectangular, single-story CAL FIRE facility. Mature trees, single-story accessory structures, paved parking areas, and a sand/dirt volleyball court are also present on the property. The remaining approximately 1.75-mile long segment of the corridor parallels SR-152, a four-lane state designated scenic highway. State highway motorists are provided unobstructed, foreground views to the proposed transmission line corridor and existing electrical infrastructure. For example, three high voltage transmission lines span the highway in a southeast-northwest direction near the proposed interconnection point to the 40-acre PG&E Los Banos Substation. The segment also parallels the northern boundary of the San Luis Reservoir Off-Highway Vehicle (OHV) Recreation Area, an approximately 155-acre area traversed by numerous dirt trails located immediate south of SR-152 and west of the Los Banos Substation. Regarding the substation, approximately four (4) transmission lines interconnect to the facility from the south and two transmission lines enter the substation from the west. The substation site contains numerous metallic bays and racks that display primarily straight vertical and horizontal forms and lines that display a consistent greyish tone. An approximately 8-foot high, beige concrete wall surrounds the substation site.

While state highway motorists are provided views to the eastern extent of the proposed New Transmission Line alignment and the Los Banos Substation, views to the hill and valley terrain of the Project site are not available generally from SR-33 west to the SRA's Romero Visitor Center. Along this segment, hilly terrain to the southeast and east of the reservoir, and the approximately 400 foot high, 3.5-mile long compacted earthen embankment that comprises San Luis Dam borders the southeastern corner of the reservoir and generally parallels the SR-152 alignment and obscures and blocks the higher elevation terrain of the Project site from view. North of the visitor center, the reservoir adjacent terrain has been modified (for reservoir and highway development) to a series of disconnected mounded landforms of varying height and width between which non-continuous views across the reservoir and towards the sloping hillsides and ridges of the Park (and Diablo Range) are available. As the highway spans Cotttonwood Bay and climbs west towards Pacheco Pass, views towards the oak and grassland covered terrain of the Project site and state park are available but regularly interrupted by mounded road cut terrain through which the highway is aligned. Approximately 33,500 vehicles travel daily on SR-152 between SR-33 to the east and the Santa Clara/Merced County line on the west (Caltrans 2018).

As stated in Section 2.3, Land Use Designations and Zoning, limited commercial and a 60-lot, relatively large lot single-family residential neighborhood are located to the east of the Los Banos Substation. These uses have direct access to SR-33 and SR-152. To the south and west of the single-family residential neighborhood are largely undeveloped and flat rangelands and a recreational vehicle (RV) campground. High voltage transmission lines traverse the relatively flat and otherwise undeveloped terrain to the north of SR-152. The southern shoreline of the O'Neill Forebay is located approximately 0.95-mile north of the Los Banos Substation.

3.2 Scenic Vistas, Highways, and Light and Glare

Scenic Vistas

The Project site encompasses elevated ridgelines, hillsides, and high valley terrain to the northeast and east of Spikes Peak (elevation 1,927 feet above mean sea level (amsl)). Topography within the Project site primarily consists of steeply sloped grass-covered and moderate to dense, clusters of oak trees on hillsides. While there are no officially designated scenic vistas in the Park (California State Parks 2006), the hilly terrain and numerous trails provide opportunities for scenic views and ensures the proliferation of scenic vistas. For example, long and occasionally broad scenic views stretching east to the San Joaquin Valley are available to trail-based recreationists on the Spikes Peak Trail and atop Spikes Peak (located approximately 1.2 miles west of the western Project boundary).

While not located atop ridgelines or other prominent terrain and somewhat limited in length by hilly terrain of the Park and Diablo Range, the Romero Visitor Center within San Luis Reservoir State Recreation Area (SRA) directly accessible from SR-152 provides an overlook from which scenic views to the characteristic vegetation and terrain of the local landscape and Diablo Range are available. The visitor center is approximately 3.9 miles from the easternmost portion of the Project site and includes an observation deck/patio that offers scenic views to the west and south across the reservoir.

Lastly, segments of SR-152 within the Project viewshed occasionally offer broad and scenic views of the Diablo Range and San Joaquin Valley to westbound and eastbound motorists.

While vantage points offering broad and long views to local terrain are available, any of the vistas available in the Project Area can be characterized as views of large public works projects superimposed on the natural environment. For example, easterly views from Spikes Peak encompass the Project site, which is currently developed with 162 wind turbines visible on the ridgetop. This area has remained undeveloped for public access since the Park's inclusion into the State Park system. From the Romero Visitor Center, man-made San Luis Reservoir is a prominent foreground feature in views and existing wind turbines on the Project site are also visible in west-oriented views. These features (i.e., San Luis Reservoir and existing wind turbines) are also visible from SR-152 where tall and mounded road cuts do not substantially block and limit the available views.

Scenic Highways

There are two officially designated scenic highways in Merced County: SR-152 from the Merced/Santa Clara County line east through the Project Area to the I-5 junction (approximately 13.8 miles long) and I-5 from SR-33 north to the Merced/Stanislaus County line (approximately 14.9 miles long) (Caltrans 2018). The portion of SR-152 farther to the west in Santa Clara County is considered an eligible State scenic highway.

At its closest location, SR-152 is located approximately one mile north of the Project boundary within the Park. The approximate daily volume of motorists on SR-152 is 33,500 vehicles (Caltrans 2018) and prevailing speed on the highway is approximately 65 miles per hour.

While state highway motorists are provided views to the eastern extent of the proposed New Transmission Line alignment and the Los Banos Substation, views to the hill and valley terrain of the Project site are not available generally from SR-33 west to the SRA's Romero Visitor Center. Along this segment, hilly terrain to the southeast and east of the reservoir, and the approximately 400-foot high, 3.5-mile long compacted earthen embankment that comprises San Luis Dam borders the southeastern corner of the reservoir and generally parallels SR-152 and obscures and blocks the higher elevation terrain of the Project site from view. North of the visitor center, the reservoir adjacent terrain has been modified (for reservoir and highway development) to a series of disconnected mounded landforms of varying height and width between which non-continuous views across the reservoir and towards the sloping hillsides and ridges of the Park (and Diablo Range) are available. As the highway spans Cottonwood Bay and climbs west towards Pacheco Pass, views towards the oak and grassland covered terrain of the Project site and Park are available, but regularly interrupted by mounded road cut terrain through which the highway is aligned.

The project boundary is located 9.7 miles west of the designated scenic segment of I-5 that is located west of the City of Los Banos. The existing Los Banos Substation is located approximately 2.5 miles west of I-5.

4 EXISTING VISUAL RESOURCES AND VIEWER RESPONSE

4.1 Visual Resources

Existing visual resources on the Project site and in the surrounding area are described above in Section 3, Visual Environment of the Project.

4.2 Viewer Groups, Exposure, and Sensitivity

Viewer response to changes in the visual landscape is based on a combination of factors:

- Individual viewers or groups affected by exposure to a Project (viewer groups)
- Viewer concern about noticeable changes to the view (viewer sensitivity)
- Frequency and duration of views (viewer exposure)
- Type of activity in which individuals are engaged when viewing the landscape (viewer awareness)

Viewer response is described below by viewer group.

Residents

Within the Project viewshed, several rural residences and ranchlands are concentrated to the west of the Project site and outside of the Park on unincorporated Santa Clara County lands. Located upslope of the Whiskey Flat area, there are a handful of homes south of SR-152, within 3 miles of the project boundary, and are accessed by an unsignalized paved road with direct access to the state highway. These residences are the closest residential receptors to the Project site and would be provided primarily obstructed views to the proposed wind turbines within the western string on the project boundary. However, viewing conditions to individual wind turbines from these private properties may be screened or partially obscured by trees installed on or near residential lots and nearby undeveloped slopes.

Additional clusters of residential development are located off SR-33, south of SR-152 and immediately east of the Los Banos Substation, and in the Santa Nella Village area. These pockets of development are located over 7.5 miles east of the Project site and provide distant and depending on specific location, obscured views to the proposed wind turbines within the project site.

Residents are provided static vantage points and depending on duration of occupancy, are typically exposed to long-term views of the surrounding area. Due to these factors, residential viewer groups are generally considered to have a high sensitivity and concern with particularly noticeable changes occurring in the visual environment. Residents are often concerned with potential effects to the quality of existing views available from their homes and due to the prevalence of undeveloped, oak and grassland covered terrain in the surrounding area, residents in the project viewshed are understood to value the existing quality of their private views. Under existing conditions, views to existing aged wind turbines are not available to private residences due to an intervening north-south trending ridgeline topped by Spike's Peak Trail that conceal the features.

Where available to residents, view exposure to the Project site and proposed wind turbines within the Project site would be long (permanent) and available from static vantage points. Views may be available from the interior of residential structures through east-facing windows or from outdoor areas such as east-facing patios and decks (if present). Awareness would be heightened if the Project were to be viewed from outdoor gathering areas that are typically conducive to longer duration focus on the surrounding landscape.

Recreationists

Recreational opportunities in the larger Project Area (includes both the Project site and New Transmission Line corridor) are described in Section 3.1.1, Project site, Surrounding Area and New Transmission Line Corridor, above. To summarize, recreationists in the Project viewshed include trail-users (i.e., hikers, mountain bikers and equestrian riders) on unimproved Park trails including the Dinosaur Lake and Spikes Peak trails, boating, fishing and other permitted water and shore-based recreational activities at the adjacent SRA (including O'Neill Forebay), and several sites at the SRA Basalt Family Campground. For purposes of this analysis, visitors to the Romero Visitor Center are considered recreationists. The volume of recreationists in the Project viewshed is considered moderate.

While the speed of boaters is variable, trail-based recreationists in the project viewshed move through the landscape at a slower, walking pace. Less hurried movement through the landscape provides time for reflection and focus on particularly interesting visual features. While some focus occurs, boaters and other water-based recreationist move at a higher speed than hikers and generally focus on the water and other features on the water while recreating. Despite the difference in sensitivity and awareness (trail-based recreationists typically have a higher sensitivity and awareness), recreationists are exposed to views of the landscape for a limited duration (i.e., while recreating or while experiencing views at the Romero Visitor Center).

Motorists

While the project viewshed encompasses segments of several local roads near Pacheco Pass, Basalt Road and others near the southeastern corner of the reservoir, the views of motorists on SR-152 and Dinosaur Point Road are the focus of this report. As previously stated, segments of the state designated scenic highway from the Romero Visitor Center west to Pacheco Pass are located in the Project viewshed. The character and quality of views to the Project site were previously described in Section 3.1.1, above, and the approximate daily volume of motorists on SR-152 is 33,500 vehicles. New wind turbines would be visible to highway motorists through viewing "windows" created by regular road cuts that abut the state highway on the west. Compared to the existing aged wind turbines on the project site, the scale of 650-foot tall wind turbines and the wider lines displayed by towers and blades would be bold and attract attention. Given the scenic highway designation and available views of scenic resources (reservoir and oak and grassland covered slopes and ridgelines), state highway motorists are considered moderate to highly sensitive to changes in visual quality. However, the visual awareness of motorists is considered moderate as the segment of the roadway is relatively narrow and winding which make particularly long, focused views off the highway corridor risky to all users of the highway corridor. Because vehicle passengers may experience longer duration views that extend off the highway corridor, the visual awareness of vehicle passengers is considered moderate high.

Nearly the entire segment of Dinosaur Point Road from SR-152 to Dinosaur Point boat launch facilities (approximately 3.3 miles) is included in the Project viewshed. The daily volume of vehicles on the road is unknown, but is assumed to be low (less than a 200) based on the number of available parking spaces (less than 100) and picnic spaces (4) at the boat launch facilities at Dinosaur Point. From SR-152 the road is aligned across slightly rolling grassland covered terrain that supports Park facilities and three rural residences, and primarily grassland. Near the gravel-dirt road that intersects the Dinosaur Lake Trail, the road descends and winds around hilly terrain that limit the extent of available views to the south and west. The road continues to descend the hilly terrain and then straddles a low ridge on the approach to the SRA boat launching facilities. Along this relatively straight segment of the road corridor, views to wind turbines in strings located closest to Wolf Lake are available atop ridgeline terrain to the south to eastbound and westbound motorists. The relatively short stretch of Dinosaur Point Road included in the Project viewshed makes for a relatively limited duration of mobile views to existing (and proposed) wind turbines. The winding alignment of the road and the narrow nature of available westerly views from the road reduces the awareness and sensitivity of Dinosaur Point Road motorists to a low to moderate low level.

5 VISUAL IMPACT ASSESSMENT

5.1 Methodology

5.1.1 Site Observations

Dudek staff conducted a photographic inventory of the site and surrounding area on September 21 and 23, 2018. The focus of the inventory was to obtain photographs of views looking towards the proposed wind turbine locations from public vantage points in the surrounding area. Winds were mild, and local conditions were sunny and clear. Digital photographs were taken with a location-services-enabled iPhone 8 to photodocument the characteristics of the Project site and surrounding area and to illustrate the quality of existing views. Photographs were taken from multiple locations along Dinosaur Point Road, SR-152, the Romero Visitor Center, and the SRA's Basalt Area.

5.1.2 Project Viewshed

The Project viewshed is primarily a factor of the elevated, hill and ridgeline terrain of the Project site and the vertical scale of proposed wind turbines. In addition, the local topography factors into the availability of potential views of proposed wind turbines as higher elevation terrain in the surrounding areas works to confine the Project viewshed and lower elevation terrain has the opposite effect. The topographic viewshed of the Project is presented on Figure 13, Topographic Viewshed and includes a 10-mile radius around the Project site. The topographic viewshed illustrates the approximate viewshed of the Project (i.e., the geographic area in which views of the Project would be potentially available) based solely on topography and the height of proposed wind turbines. Features that obstruct or block views to proposed wind turbines at specific vantage points including vegetation and structures are not considered in the topographic viewshed. In addition, visual quality and clarity of Project elements is not reflect in the topographic viewshed.

5.1.3 Key Views

In coordination with CDPR staff, key views were selected as representative vantage points in the landscape that offer sensitive receptors views to the Project site. Six key views were selected from which to evaluate the existing landscape and the Project. The locations of selected key views are shown in Figure 14, Key Views. The key views provide representative views from local and regional travel routes, and gathering spots in the Park and adjacent state recreation areas. The key views encompass a range of viewing distances and angles available to viewer groups in the project viewshed. More specifically, existing views towards the Project site from the State Park day use parking area (i.e., Key View 1), State Park entrance off Dinosaur Point Road (i.e., Key View 2), and Dinosaur Point Road near the SRA boat launch area (i.e., Key View 3) are depicted on Figures 15 through 17. As shown on Figures 15 and 16, existing wind turbines are not visible from lower-lying areas in the Park near the day use parking area. Existing views towards the Project site from SR-152 near the reservoir's Cottonwood Bay (i.e., Key View 4), the Romero Visitor Center (i.e., Key View 5), and the San Luis Reservoir SRA Basalt Area (i.e., along the southeastern shoreline) (i.e., Key View 6) are provided in Figures 18 through 20. Existing wind turbines on the Project site are visible in Figures 18 through 20.

As depicted on Figure 14, all key views are oriented towards the Project boundary and are intended to illustrate the anticipated visual change associated with prominent project components (i.e., proposed wind turbines). As discussed in Section 1.3 above, key views were selected in coordination with CDPR. While a specific key view was not selected to illustrate the anticipated visual change associated with the proposed transmission line, development of this feature is thoroughly evaluated in Section 5.3, Determination of Significance. It should be noted that due to location, views to the majority of the proposed transmission line alignment would offered to a limited number of recreationists and private residents. Where readily visible to larger number of public receptors (i.e., between the southern area of the San Luis Reservoir SRA and the existing Los Banos substation), the proposed transmission line would typically be viewed in the context of existing regional electrical transmission infrastructure that interconnects with the substation and run parallel and perpendicular to nearby SR-33.

5.1.4 Visual Simulations

Existing condition photographs were used as background images to which modeled components of the Project were added. Visual simulations were created to depict the anticipated visual change and characteristics associated with the development of the proposed Project. Using available topography maps or digital elevation maps, a 3D surface was created for the existing terrain and then imported into 3D Studio Max. This 3D surface was used to camera-match the background photos to the terrain model. 3D models were created for all proposed facilities that are visible from the selected key views. These 3D models were then merged into the 3D scene at their finished grade elevations. Lighting was added to the scene to match the time of day the photos were taken and to cast realistic shadows. Each view was rendered to a high-resolution image. The final product depicts a photorealistic before-and-after simulation. Upon completion of the visual simulations, the existing setting photographs were compared to the proposed Project conditions to outline the potential impacts of the proposed Project and determine the significance of anticipated visual change.

5.1.5 Visual Assessment

The environmental setting was developed through a review of aerial imagery available through Google Earth and applicable planning documents for on- and off-site lands in the Project vicinity, as well as an on-site survey. Dudek staff conducted a photographic inventory of the site and surrounding area on September 21 and 23, 2018. The focus of the inventory was to obtain photographs of views looking towards the proposed wind turbine locations from public vantage points in the surrounding area. Winds were mild, and local conditions were sunny and clear. Digital photographs were taken with a location-services-enabled iPhone 8 to photo document the characteristics of the Project site and surrounding area and to illustrate the quality of existing views. Photographs were taken from multiple locations along Dinosaur Point Road, SR-152, the Romero Visitor Center, and the SRA’s Basalt Area.

The visual analysis in this report evaluates the Project against CEQA Appendix G thresholds. To evaluate potential impacts, the most conservative turbine size has been chosen for each resource analysis. For the analysis of aesthetics, the largest possible machines were used in the development of visual simulations and impact analyses, which includes a maximum blade height of up to 650 feet. In addition to impacts to scenic vistas, state scenic highways and day and nighttime views, a detailed analysis of effects to existing visual character and quality of public views is provided in Section 5.2, Key View Assessment. Visual character is qualitatively defined by four primary components: form, line, color, and texture. Projects that create a high level of contrast with the existing visual character of a project setting are more likely to generate significant visual impacts due to visual incompatibility. Conversely, projects that create a low level of contrast with the existing visual character are less likely to generate significant visual impacts due to inherent visual compatibility. Project components are evaluated on this basis for impact analysis purposes.

For scenic vistas, public vantage points, such as roadways, public lookouts, trails, or recreational lands, from which views of the Project are likely to be available were initially identified through a review of aerial imagery, topographic maps, and the Project viewshed. Visibility to the Project site from select vantage points was verified during the photographic inventory. More remote scenic vista points such as Spike’s Peak Trail were not revisited during the photographic inventory however, the visibility of Project components was primarily through the use of aerial imagery, the Project site plan, and the proposed height of wind turbines. Height of proposed wind turbines, proximity of viewing locations (and receptors) to Project components, and complexity of the resulting view were the primary factors considered in determining whether the

Project would have a substantial adverse effect on a scenic vista. For purposes of this analysis, a "substantial adverse effect" would occur if the existing view would be substantially interrupted or obstructed by Project components.

State scenic highways were identified through review of the California Department of Transportation's Scenic Highway Program (http://www.dot.ca.gov/design/lap/livability/scenic-highways/index.html). Specifically, eligible and officially designated state scenic highways in Merced County and Santa Clara County near the Project site were identified. Viewing conditions from scenic highways to the Project site were assessed through review of the Goggle Earth street view application and for SR-152, photographs taken during the photographic inventory of the site. Factors considered in determining whether the Project would substantially damage scenic resources within a state scenic highway included existing visual quality and visual features present in views from scenic highways, visibility and scale of Project features and duration of available views to the Project site from designated scenic highways.

Lastly, the quality of existing day and night views as it pertains to glare and lighting conditions was assessed through a review of site aerial imagery and site photographs. Aerial imagery was reviewed to identify existing land uses and landscape features that may include components capable of generating glare during the day or lighting during evening and nighttime hours. Construction and operational sources of potential glare and nighttime lighting were evaluated in the context of existing day and night view quality. In addition to existing, view quality and lighting conditions, the volume, intensity and operational characteristics of proposed sources of glare and lighting were considered in determining whether Project-related glare and lighting would adversely affect day or nighttime views in the area.

5.2 Key View Assessment

5.2.1 Key View 1 – Pacheco State Park Day Parking Area

Existing Conditions

Key View 1 is located at the southeastern site of the graveled and relatively small Park day use parking area that is accessible via Dinosaur Point Road. In addition, the parking lot is located along the northern side of the Park and is approximately 0.25-mile south of SR-152. Key View 1 is situated at an elevation of 1,380 amsl and is located approximately 0.50-mile from the western project boundary.

A photograph illustrating the existing character of the Park landscape and quality of the existing view to the Project site is included on Figure 15, Key View 1 – Pacheco State Park Day Use Parking Area. The photograph was taken in the afternoon (i.e., 3:15 p.m.) by Dudek field staff during a site visit conducted on September 21, 2018. As shown on Figure 15, the view at Key View 1 looks to the southeast across relatively flat terrain covered with gold color, windswept grasslands. A dark and low, wooden structure surrounded by simple fencing constructed of metal and wood materials is visible to the south. In the foreground, grassland covered terrain gradually rises to the southeast and south to create rolling terrain and several soft ridgelines running perpendicular to the prominent and undulating hillside. Slopes and the strong ridgeline of the undulating hillside are dotted with tall, spreading and dark oak trees that along with the hilly terrain, add visual interest to the view. As the view primarily encompasses Park lands near the day use parking area, visible development at Key View 1 is limited to the dark, low structure, surrounding fencing and parallel dirt roads that traverse the topographical saddle located to the south. The terrain to the southeast effectively blocks views of the existing wind turbines on Park lands from viewer groups at Key View 1.

Proposed Conditions

Proposed conditions associated with implementation of the Project are depicted on Figure 15 (see Visual Simulation). As show in the visual simulation, the narrow extended blade tips of two proposed wind turbines would rise above the undulating ridgeline to the southeast and would be visible from the day use parking area. Nacelles and tall tubular towers associated with the three wind turbines would be obscured by the existing intervening hilly terrain that is nearly 200 feet higher in elevation than the ridgeline in the northwestern portion of the project boundary. While overall Project visibility would be limited at Key View 1, the long, rotating blade tips of two wind turbines would peak above the nearby undulating ridgeline. At Key View 1, the introduction of the tapering white lines of wind turbine blade tips would create noticeable but weak form, line and color contrast with existing vegetation and terrain. Specifically, the visible tips of two white blades would contrast with the tan and dark green tones displayed by existing savannah and oak woodland vegetation. The existing vividness or memorability of the landscape would be weakly affected by the introduction of wind turbine elements. The tips of two wind turbine blades would rise above local oak trees and hills but do due overall limited visibility, the resulting contrasts would be low.

5.2.2 Key View 2 – Dinosaur Point Road at Pacheco State Park entrance

Existing Conditions

Key View 2 is located on Dinosaur Point Road, approximately 0.55-mile east of SR-152 and at the entrance/driveway to the day use parking area. Key View 2 is located 0.20-mile northeast of Key View 1. Similar to Key View 1, the Key View 2 view is directed to the southeast, is situated at an elevation of approximately 1,380 feet amsl, and is located approximately 0.50-mile from the western project boundary.

A photograph illustrating the existing character of the Park landscape and quality of the existing view to the Project site is included on Figure 16, Key View 2 – Dinosaur Point Road at Pacheco State Park Entrance. The photograph was taken in the afternoon (i.e., 3:08 p.m.) by Dudek field staff during a site visit conducted on September 21, 2018. With the exception of several foreground elements, the existing visual character of the Park landscape at Key View 2 is similar to that described above in Section 5.2.1 for Key View 2. The presence of wood/metal and wire fencing in the immediate foreground of Key View 2 and an electrical distribution line supported by wood poles (approximately 40-50 feet high) that traverses the landscape in a general east-west alignment produces a slightly more complex visual pattern and varied scene when compared with the visible landscape at Key View 1. Still, the presence of fencing and a series of dark, slightly sagging electrical distribution lines supported by tall yet narrow poles is visually compatible with the otherwise undeveloped, grassland covered and oak tree dotted, hilly terrain. As shown on Figure 16, existing wind turbines on the Project site are not currently visible from Key View 2.

Proposed Conditions

A visual simulation of proposed conditions at Key View 2 is provided on Figure 16. Similar to the anticipated limited Project visibility at Key View 1, the majority of project components would be blocked by intervening terrain at Key View 2. An extended blade tip of a single wind turbine would be visible above the elevated rolling ridgeline and existing oak trees to the southeast. Resulting visual contrasts and project effects to existing visual quality would be less than that previously described for Key View 1 (see Section 5.2.1). The overall visibility of Project features would be limited, as the extended blade tip would be partially screened from view by existing terrain and vegetation. Due to the low viewing angle at Key View 2, the existing wood support poles in the landscape would display a greater scale than the wind turbine blade. Color contrast may attract some attention however, due to limited Project visibility and the presence of existing vertical features in the landscape, impacts to existing landscape vividness, intactness, and unity would be very low.

5.2.3 Key View 3 – Dinosaur Point Road near SR boat launch area

Existing Conditions

Located on Dinosaur Point Road approximately 0.20-mile west of the SRA boat launch and picnic facilities at Dinosaur Point, Key View 3 is situated approximately 0.70-mile north of the project boundary. The key view is situated at an approximate elevation of 600 feet amsl and is directed to the southeast.

Figure 17, Key View 3 – Dinosaur Point Road near SRA Boat Launch Area, provides an existing view from Dinosaur Point Road toward hills comprising the northeastern corner of the project boundary. The Key View 3 photograph was taken in the afternoon (i.e., 2:30 p.m.) by Dudek field staff during a site visit conducted on September 21, 2018. Directed to the southeast, the view looks across the aged asphalt-surface of Dinosaur Point Road in the immediate foreground to a narrow strip of disturbed lands that abruptly falls and comprises the visibly altered slopes of a reservoir bay system. The limits of grading creates a hard line on nearby northwest-facing slopes which, with the exception of exposed tan and grey soils near the bottom of the slope, are covered with tan/gold colored grasses and the dark green form of oaks and other trees. The density of oak tree coverage on the slopes varies, but tends to be concentrated along drainages. The hilly terrain forms a generally rolling ridgeline that at its high point is approximately 800 feet higher in elevation than Key View 3. Portions of eight existing wind turbines are visible above the ridgeline to the south and the darkly colored lines and hubs contrast with the rolling ridgeline. In addition, the tall (albeit faint) vertical line of a MET tower is visible atop the ridgeline to the southeast. The inclusion of visible vertical structures diminishes the intactness of the short and restricted view. Existing wind turbines and the MET tower contribute tall forms and straight, vertical lines to the otherwise rural and seemingly undeveloped landscape.

Proposed Conditions

A visual simulation of proposed Project conditions at Key View 3 is provided on Figure 17. While the short view available at Key View 3 would limit the visibility of the project, receptors would be provided clear, unobstructed views to the northeastern most string of wind turbines within the project boundary. As shown on Figure 17, existing aged wind turbines would be removed from the Project site and new, modern wind turbines would be installed. Compared to the relatively low, vertical lines displayed by existing visible wind turbines (see existing conditions photograph on Figure 17), new wind turbines would be taller and attract additional attention. In addition, proposed wind turbines would be located closer to receptors at Key View 3 than the existing wind turbines. As a result, the white color of turbine towers, nacelles, and blades would be more apparent. The whitish tones of new wind turbines would produce noticeable contrast with the dominant tans and greens of the existing landscape. Further, and due to the increased vertical scale of the new wind turbines, the visibility of the sky-lined structures would be enhanced. Lastly, the existing MET tower (197-feet tall) would be removed and a new tower (approximately 400-feet tall) would be installed at generally the same location. The new tower would display a taller vertical scale and slightly darker form than the existing tower. At KeyView 3, the introduction of the Project would be clearly visible.

5.2.4 Key View 4 – State Route 152 at Cottonwood Bay

Existing Conditions

Key View 4 is located off SR-152 and near the rock bridge that traverses the San Luis Reservoir's Cottonwood Bay area. The vantage point is situated just off the eastbound travel lanes of the state route and is approximately 2.3 miles from the Romero Visitor Center. The view is directed to the southwest and Key View is located at an elevation of approximately 565 feet amsl.

A photograph depicting the existing character of the San Luis Reservoir and surrounding area, and the quality of existing views from the state highway to prominent terrain in the Park, is provided on Figure 18, Key View 4 – State Route 152 at Cottonwood Bay. The Key View 4 photograph was taken in the afternoon (i.e., 12:20 p.m.) by Dudek field staff during a site visit conducted on September 23, 2018. The low horizontal form of SR-152 is visible in the western (i.e., "right") extent of the wide view, but the state route ultimately disappears behind the characteristic hilly terrain of the Diablo Range foothills. The focus of the view is the southwest, across the blue tones and flat form of the San Luis Reservoir, to east-facing, savannah, grassland, and oak woodland covered hills of the Diablo Range. The density of oak trees on local hills increases from west to southwest although trees are scarce on expanses of a pyramidal hill feature to the southwest. A slightly undulating ridgeline located approximately 4.5 miles away is marked by a series of low and indistinct vertical lines (i.e., existing wind turbines). Two existing wind turbines are noticeably taller than the majority and create a stronger and slightly darker line (than shorter wind turbines) in the landscape. Prominent, dark and rugged mountainous terrain rise to the southwest beyond the Park and the Project site.

Proposed Conditions

A visual simulation of proposed project conditions as experienced from Key View 4 is provided on Figure 18. With implementation of the Project, the subtle lines associated with existing ridgeline wind turbines would be replaced by the darker yet still faint vertical lines of modern wind turbines. As proposed, new wind turbines would be 2 to 4 times taller than existing wind turbines on Park lands (assuming existing wind turbines are between 150 and 300 feet high). The increased scale and darker line of the proposed wind turbines would be apparent at Key View 4 where clear views are provided to motorists. Approximately twenty-eight wind turbines displaying a distinct Y-massing would be silhouetted against the sky. Due to their proposed scale, characteristic massing, and prominent vertical form, proposed wind turbines would attract attention however, lines would be somewhat faint and color contrasts would be moderated by distance. In addition, two proposed wind turbines would be entirely "backscreened" by dark, mountainous terrain to the southwest and would be partially obscured. Overall, the resulting form, line, and color contrast associated with the introduction of new wind turbines would be visible but somewhat muted by distance.

5.2.5 Key View 5 – Romero Visitor Center

Existing Conditions

Key View 5 is located at the Romero Visitor Center observation deck/patio and is directed to the west across the San Luis Reservoir and towards the hilly terrain of the Park. The view is relatively wide and the vantage point (and visitor center) is located atop mounded terrain situated approximately 3.2 miles east of the reservoir's westerly shoreline. The Project site is located approximately 3.9 miles away. The approximate elevation of Key View 5 is 620 feet amsl.

Figure 19, Key View 5 – Romero Visitor Center, provides an existing view from the visitor center's observation deck/patio across the reservoir and towards hilly and mountainous terrain to the west. The Key View 5 photograph was taken in the afternoon (i.e., 12:40 p.m.) by Dudek field staff during a site visit conducted on September 23, 2018.The dark blue waters of the reservoir comprise much of the view available from the visitor center. However, the local hill and mountain terrain of the Diablo Range are also visible and provide a striking pattern of pyramidal to sloping forms, undulating to diagonal to flat lines, and tan and dark colors that juxtaposed against the flat form and dark blue tones of the reservoir waters. The faint lines of existing wind turbines within the Park are visible and two wind turbines are noticeably taller than the next to the other turbines. Still, the existing wind turbines are relatively distant and are generally submissive to natural landscape features in the viewshed.

Proposed Conditions

A visual simulation of proposed Project conditions as viewed from Key View 5 is provided on Figure 19. Similar scale, form, line, and color contrasts as described for Key View 4 would be experienced at Key View 5. In addition, at Key View 5, several wind turbines would be aligned with one another such that the lines of the wind turbine towers and blades would overlap. This overlap would darken and appear to widen project lines such that select new wind turbines would stand out from the others. At Key View 5, visual contrast in form, line, and color associated with the Project would be apparent, but moderated by the lines displayed by existing wind turbines on the Project site and distance.

5.2.6 Key View 6 – San Luis Reservoir SRA Basalt Area

Existing Conditions

Key View 6 is located near the boat launch, picnic and parking facilities in the SRA's Basalt Area (i.e., in the southeastern corner of the SRA).The key view is situated on a narrow landform that extends north from the Basalt Road area and into the San Luis Reservoir to form a small peninsula.

The vantage point is located approximately 0.35-mile north of Basalt Road, 1.3 miles northwest of the SRA entry gate and 2.4 miles southwest of SR-152. The approximate elevation of Key View 6 is 555 feet amsl.

Figure 20, Key View 6 – San Luis Reservoir SRA Basalt Area, provides an existing northwesterly view from the southern shoreline of the reservoir the characteristic hilly Diablo Range foothills in the surrounding area. The Key View 6 photograph was taken in the afternoon (i.e., 1:00 p.m.) by Dudek field staff during a site visit conducted on September 23, 2018. The Basalt Area boat launch ramp is visible in the foreground of Figure 20 along the rocky shoreline and with the exception of tan foreground grasses, the existing character of the surrounding landscape and quality of views towards the Park at Key View 6 are similar to Key Views 4 and 5. Please refer to Sections 5.2.4 and 5.2.5.

Proposed Conditions

A visual simulation of Project conditions as experienced from Key View 6 is provided on Figure 20. Similar scale, form, line, and color contrasts as described for Key View 5 would be experienced at Key View 5 (see Section 5.2.5, above). Visual contrast in form, line, and color associated with the Project would be apparent but somewhat muted by distance.

5.3 Determination of Significance

The criteria used to assess the significance of visual impacts from the Project are derived from Appendix G of the CEQA Guidelines. According to the guidelines, a project may result in a significant if it would:

a. Have a substantial adverse effect on a scenic vista?

b. Substantially damage scenic resources, including but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

c. In non-urbanized areas, substantially degrade the existing visual character or quality ofpublic views of the site and its surroundings? Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?

d. Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

5.3.1 Assessment

5.3.1.1 Would the project have a substantial adverse effect on a scenic vista?

The Project site is located west of the San Luis Reservoir and south of SR-152 atop the eastern foothills of the Diablo Range in western Merced County. While there are no officially designated scenic vistas in the Park, the hilly terrain and numerous trails in the Park provide opportunities for scenic views of the Park and surrounding area. For example, users of the Dinosaur Lake Trail which crosses Windmill Road and traverses (and abuts) the Project site, are provided foreground views of the characteristic grassland and oak covered terrain of the SRA. In addition, a water feature (Dinosaur Lake) is located adjacent to the trail alignment, at the base of converging slopes, and is a natural feature of interest. To the west of the Dinosaur Lake Trail, long and occasionally broad scenic views across the Park and extending to San Joaquin Valley are available to trail-based recreationists on the Spikes Peak Trail. Lastly, while somewhat limited in length by hilly terrain within the State Park and prominent mountain terrain of the Diablo Range, the Romero Visitor Center in the San Luis Reservoir SRA provides an overlook from which scenic views to the characteristic vegetation and terrain of the local landscape. Existing wind turbines and MET towers on the Project site are visible in views from the trails and visitor center.

For purposes of this analysis, the Dinosaur Lake Trail. Spikes Peak Trail and Romero Visitor Center are scenic vista/view locations from which impacts to existing views due to the Project are evaluated below.

Sections of the Dinosaur Lake trail are located within and outside of the Project site and the trail crosses Windmill Road. Views from the trail are typical short and consist of the grassland covered and oak tree dotted hilly terrain of the Park. Existing wind turbines are generally screened or obscured from view of trail-users along the majority of the Dinosaur Lake Trail alignment. However, at the southern end of the trail near the confluence with the Pig Pond Trail, existing wind turbines are visible to the south and the closest wind turbine is located within 500 feet of the trail. As such and in addition to oak and grassland covered hills, wind turbines contribute to the visual experience of trail users. Approximately nine new wind turbines are proposed to be located within 500 feet of the trail alignment and these features would be sited within 800 feet of one another in a rough north-south line that would generally parallel the trail. New wind turbines would be located within a foreground distance of the trail and would be a constant presence in the future experience of trail users. However, there would be a reduction of over 120 wind turbines from the Project site, which would reduce the number of features visible to trail users along the southern segment of the Dinosaur Lake Trail. In addition, as wind turbines are currently visible from the trail, the introduction of wind turbines along the northern and central segments of the trail would not substantially affect the overall experience of trail users within the Park. Lastly, new wind turbines would not substantially screen or obstruct the grassland and oak dotted terrain or occasional water features from view of trail users. As such, view impacts would be considered **less than significant**.

Spikes Peak is located approximately 1.2 miles west of the western project boundary. Existing wind turbines located in the eastern portion of the Park are occasionally visible in easterly views from ridgeline segments of the Spikes Peak Trail. The proposed new wind turbines would be the primary Project components visible from the Spikes Peak Trail. With the exception of the northwestern most string, the proposed wind turbines would be installed at or near locations currently occupied by existing wind turbines. In addition, implementation of the Project would entail the removal of approximately 162 existing wind turbines (between approximately 100 and 325 feet high) distributed across the Project site.

While existing wind turbines do not substantially block or obstruct scenic features from view, the removal of these features would minimize existing visual clutter and view interruption associated with the linear and clustered arrangement of numerous vertical structures. As proposed, the Project would install up to 40 new wind turbines that would be up to approximately 650 feet high as measured from base to extended blade tip. Although taller than the existing wind turbines, the new and modern wind turbines installed in individual strings would be spaced much further apart than the existing wind turbines currently located on site. In addition, new wind turbines would be painted white to match the color of existing wind turbine blades and modern tower segments on the Project site.

An overall reduced number of wind turbines and wider spacing between individual features would generally improve viewing conditions from the Spikes Peak Trail because views would include fewer man-made features such as wind turbines. There would be a reduction of over 120 wind turbines from the Project site, which would significantly reduce the number of features visible to trail users. Due to their scale, proposed wind turbines would attract attention from trail users. Specifically, proposed wind turbines would rise above existing vegetation/trees and terrain and these new features would be highly visible from most ridgeline vantage points. The ridgeline segment of the Spikes Peak Trail ranges in elevation from approximately 1,800 to 1,900 feet amsl. The westernmost turbine string on the Project site is located atop a low ridgeline that sits at approximately 1,400 feet amsl. Due to the variation in elevation between the trail and turbine locations, trail-based recreationists are located at a superior (i.e., higher) location in comparison to the Project. While the lower portions of proposed wind turbine towers would be below the normal line of sight of receptors, viewers would have to look "through" the upper portions (i.e., tower segments and blades) of new taller features in scenic easterly views towards the San Luis Reservoir and San Joaquin Valley.

The presence of 162 existing wind turbines, overhead collection poles and lines, and more distant transmission line structures in the landscape temper expectations for clear and uninterrupted views from the Spikes Peak Trail; therefore, the introduction of albeit larger scale but significantly fewer proposed wind turbines would not contribute to more of an interruption of easterly views. The proposed wind turbines would be setback over one mile from the ridgeline segments of the trail and Spikes Peak. Further, individual wind turbines would be spaced wider apart than existing wind turbines and as proposed, up to 40 new turbines would replace 162 existing wind turbines. Despite the setbacks of the proposed wind turbines to the trail and the wider spacing of individual wind turbines compared to the existing wind turbines, tall wind turbine components would be located in the sight line of easterly views from ridgeline portions of the trail. Similar to existing conditions, new overhead collection poles may be visible from portions of the trail and the linear disturbance (i.e., unvegetated lines or areas of disturbance in the landscape following trenching) resulting from installation of proposed underground lines may be detectable in the landscape. While existing overhead transmission lines and structures are present to the southeast of the San Luis Reservoir, the taller form and line, and longer blades of up to 40 new wind turbines on the Project site, while highly visible would not substantially change existing available long views from Spikes Peak towards the reservoir and San Joaquin Valley. As such, view impacts would be considered less **than significant**.

The San Luis Reservoir SRA Romero Visitor Center is located off SR-152 and along the reservoir's easterly shoreline. In addition, the visitor center is approximately 3.9 miles away from the easternmost portion of the project site and includes an observation deck/patio that offers scenic views to the west across the reservoir and to the hilly and mountain terrain of the Diablo Range. While the existing wind turbines are currently visible from the visitor center, the features display relatively low and faint lines in views and their apparent scale is diminished by distance (see Figure 19). With implementation of the Project, the introduction of up to 40 wind turbines would be noticeable in the western horizon by creating a bolder, more distinct silhouette on the Project site. However, substantial blockage of scenic features associated with the addition of up to 40 turbines would not occur, and visible interruption in the ridgeline of the western horizon would not result in a noticeably greater increase in view interruption as compared to existing conditions. Therefore, scenic view effects at the Romero Visitor Center would not be adverse and impacts would be considered **less than significant**.

The nearest segment of the proposed transmission line would be located greater than three miles from the San Luis Reservoir SRA Romero Visitor Center. As such, due to distance between the features and receptors, the proposed transmission line on the Project site (and near the San Luis Reservoir) would produce weak contrast and would not be clearly visible from the visitor center.

The Project would also remove five existing temporary MET towers and install three temporary and two permanent MET towers (approximately 400 feet tall each) on the Project site. The new MET towers would be installed across the 1,766-acre Project site. Despite the tall form displayed by new MET towers, these features would display a thin line. In addition, due to the thin profile of new MET towers and location of these features in relation to identified scenic vantage points, new MET towers would not substantially obstruct scenic features from view despite the larger size of the features relative to existing on site MET towers. Figure 3.1-14 provides a comparison of an existing and proposed MET tower on the Project site.. MET towers would be noticeable in the landscape including from park trails due to their tall scale. However, they would not be visually prominent and the generally thin form and line displayed by the features would not substantially obstruct or interrupt an existing view from a scenic vista. Lastly, the presence of existing tall features has affected existing opportunities for unimpeded views across the Project site from the identified on and off site scenic vantage points., scenic vista impacts associated with the removal of existing MET towers and installation of new MET towers would be **less than significant**.

5.3.1.2 Would the project substantially damage scenic resources, including but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

Within the Project site there are no historic buildings or rock outcroppings. However, as previously stated, oak woodland vegetation is a characteristic vegetation community on Park lands and mature oak trees regularly occur on the Project site.

As shown on Figure 13, the proposed Project viewshed encompasses segments of SR-152, an officially designated state scenic highway. The removal of 162 existing wind turbines and the installation of 40 noticeably taller new wind turbines (conservatively assumed up to 650-feet high to tip of the blade) would attract the attention of westbound SR-152 motorists. Similar to existing conditions, discontinuous views of proposed wind turbines would be available to motorists traveling at approximately 65 miles an hour on from approximately Romero Visitor Center in the San Luis Reservoir SRA to Pacheco Pass. Specifically, wind turbines would be visible between gaps in mounded road cuts and hills that occasionally line the eastern and northern shoreline of the reservoir and conceal the Project site from view of motorists. While the larger scale and distinct y-shaped massing of wind turbine towers and blades would change the existing visual quality of the landscape as viewed from SR-152, construction of the Project and installation of new wind turbines would require the removal of numerous trees. However, trees to be removed to accommodate Project roadways and the New Transmission Line are primarily located in the ravines and in other portions where views from the highway are limited. Where the removal of trees is unavoidable, the loss of individual trees would not be noticeable to motorists and other users of the state route in part, because it is over one mile from the site and motorists travelling at approximately 65 miles per hour would have a difficult time distinguishing this change. The majority of wind turbines would be setback from the closest ridgelines to the highway and the interior location of project components would largely conceal ground disturbances from view of highway users. As such, impacts associated with damage to scenic resources (specifically, trees) within SR-152 would be **less than significant**.

The Project site is located 9.7 miles west of the officially designated state scenic segment of I-5 as it travels west of the city of Los Banos. In addition, the proposed overhead New Transmission Line tie-in to the Los Banos Substation would be located approximately 2.5 miles west of I-5. Due to distance, proposed wind turbines on the Project site would be relatively indiscernible to passing motorists on I-5. The distant forms would be indefinite and as the Project site is located within the peripheral field of vision of motorists on the primarily north-south interstate, motorists would have only brief opportunities to focus on the hilly terrain of the Project site. Further, motorists are more likely to be attracted to the visually prominent mountain terrain of the Diablo Range (the Project site would be visually subordinate to the taller and darker mountains in views from I-5). Lastly, the interconnection of the proposed overhead New Transmission Line would not damage scenic resources within the I-5 corridor. New support poles (approximately 90-feet tall each) would be setback over 2.5 miles from the interstate and would not command the attention of interstate motorists. Further, new poles and transmission lines would be indistinct from the numerous existing transmission lines and taller lattice steel and tubular steel towers installed near the existing Los Banos Substation and nearby along the SR-33 corridor. Therefore, impacts associated with damage to scenic resources within I-5 would be **less than significant.**

5.3.1.3 In non-urbanized areas, would the project substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?

As the Project site is located in a non-urbanized area, the applicable significance threshold concerns the potential for substantial degradation of existing visual character or quality of public views of the site and its surroundings.

The Project site currently features 162 wind turbines installed atop ridgelines in linear strings or groupings that are accessible via a network of dirt roads that branch off from a primary access road (i.e., Windmill Road). The turbines are primarily supported by slightly conical steel tube towers that are approximately 80 feet high at the hub/nacelle however, several turbines are supported by unpainted lattice steel towers. When the extended blade tip from the top of the tower is included the total height of existing wind turbines range from approximately 150 to 325 feet tall. All existing wind turbines feature three-blade rotors.

Due to the location of the Project site and the inferior (i.e., low-angle) public vantage points provided to most receptors in the surrounding area, ground disturbance and other construction-related effects of the Project would be obscured from view. However, improvements to Windmill Road at the junction with Dinosaur Point Road would be visible to hikers on Dinosaur Lake Trail that crosses Windmill Road at the turnoff from Dinosaur Point Road. As part of the Project, CDPR is reviewing relocating Dinosaur Lake Trail to ensure an adequate buffer from proposed wind turbines is maintained and trail users are afforded a unique recreation experience. In addition to road improvements, the sequential installation of wind turbine towers and required cranes for their installation would be visible. As new sections are installed, turbine towers would rise from their ridgeline locations and introduce tall and straight vertical forms and lines to the landscape. The presence of cranes and other construction equipment and vehicles, and the progression of tall and visible Project components, would only be experienced on a temporary basis by local receptors, including hikers on Park trails (i.e., Dinosaur Lake and Spikes Peak trails) and motorists on SR-152. Once construction activities are complete, cranes (and other construction equipment and vehicles) would be removed and crane locations (and other areas of visible ground disturbance) would be restored back to its original state, or as close to its original state as possible, per terms of the lease. Given the limited duration of construction activities and the screening of non-wind turbine related components from view of most local receptors in the surrounding area, construction activities would not substantially degrade existing visual character or quality. Construction impacts would be **less than significant**.

Once operational, the visibility of Project components would vary with location. For example, the visibility of Project components at identified public gathering points in the central and northern portions of the Park would generally be limited with the exception of views from the Dinosaur Lake Trail. As noted above, CDPR is reviewing trail relocation to provide an adequate buffer from proposed wind turbines; however, it is anticipated new wind turbines would be visible from the relocated trail segment. Due to intervening terrain and trees, views to Project components (including wind turbines) from areas further to the west of the Project boundary would typically be screened or obscured. From these locations, views of the characteristic savannah, grassland, and oak woodland dotted hillside and valley terrain would continue to contribute to the State Park experience. At these locations, including the Park day use parking area and at the Park entrance off Dinosaur Point Road, Project components would be fully to partially screened from view and would have low/weak effects on existing visual quality. As such, implementation of the Project would produce overall weak visual contrast as experienced from the State Park day use parking area and the State Park entrance off Dinosaur Point Road. Photosimulations of the Project (specifically, new 650-foot tall wind turbines) as viewed from these locations (i.e., Key View 1 and Key View 2) are provided on Figures 15 and 16.

From elsewhere in the surrounding area, the new wind turbines would be clearly visible. For example, from low-angle vantage points to the north and west of the Project site including the San Luis Reservoir SRA (more specifically, at the Dinosaur Point boat launch and picnic area and Romero Visitor Center) and SR-152 at the Cottonwood Bay bridge, the new wind turbines would be tall and display a noticeable vertical form and line. Due to the scale and massing of the proposed wind turbines, the wind turbines would be visible atop ridgelines and against the sky. Near the Dinosaur Point Road SRA boat launch and picnic area (i.e., Key View 3), the closer proximity and taller scale of proposed wind turbines would create apparent and distinct forms and lines that would create a notable contrast compared to the existing older style wind turbines (see Figure 17). In addition and when viewed from a foreground viewing location, the white color of wind turbine towers, nacelles, and blades would produce a noticeable color contrast with the dominant tans and greens of the existing landscape. However, color contrasts would be moderated by distance such that beyond a foreground distance, the white color of turbines would be indistinct. Photosimulations of the Project as viewed from Dinosaur Point Road near the boat launch and picnic area (Key View 3), SR-152 at the Cottonwood Bay bridge (Key View 4), and the Romero Visitor Center (Key View 5) are presented on Figures 17, 18, and 19. An additional view of the Project from boat launch facilities in the Basalt Area of the SRA (Key View 6) is presented on Figure 20.

As shown in Figures 18 and 19, the existing 100 to 325-foot tall wind turbines are noticeable, but faint in views from SR-152 at the Cottonwood Bay bridge and the Romero Visitor Center The proposed wind turbines would also be noticeable from the highway and visitor center. Although the Project would remove all of the 162 older style wind turbines, the height of the new turbines would be somewhat more pronounced along the ridgeline locations as compared to existing conditions (see Figures 18 and 19). However, due to the distance the visibility of the new turbines would be somewhat muted. For example, the nearest wind turbines would be setback over approximately 3.5 miles from the bridge and visitor center, 4 miles from the boat launch area (see Key View 6, Figure 20), and 5.5 miles from the Basalt Campground. As shown in the Key View 6 visual simulation (see Figure 20), new wind turbines would be viewed from the SRA Basalt Area boat launch as a collection of visible yet faint lines on the western horizon. Although a slightly more distant location, views from this area would be similar to views from SR-152 and from the Romero Visitor Center. New wind turbines would be visible to the public; however, the addition of up to 40 new wind turbines would not substantially degrade the existing visual quality of public views of the Project site and surroundings. Therefore, impacts would be **less than significant**.

With the exception of the easternmost segment, the proposed New Transmission Line (and other components of the Project) would not be overly noticeable. These components would not create particularly strong/high visual contrast as viewed from public vantage points. The proposed O&M

facility would be located within the interior of the Project site and would be partially screened from public view from Park trails by existing terrain and vegetation. The new project collector substation would be situated in the western extent of the Project site and adjacent to the site of an existing collector substation. The facility would be visually submissive to taller wind turbines located nearby and would not be detectable to SR-152 motorists or receptors at the San Luis Rey Reservoir SRA. Off-site segments of the New Transmission Line would be visible from the Romero Visitor Center, other locations in the SRA, and from SR-152 near the Los Banos Substation. New Transmission Line support poles (approximately 120-feet tall) would be visible from the highway, but would be experienced in the context of existing high voltage transmission lines that parallel SR-152 to the north. The volume of existing transmission lines increases on the approach to the Los Banos Substation and therefore, due to the presence of similar features in views, the proposed New Transmission Line would create weak form and line contrasts. Impacts to existing visual character and quality associated with non-wind turbine project components would be **less than significant**.

Lastly, the removal of five existing MET towers and installation of three temporary and two permanent MET towers on the Project site would be noticeable to receptors. However, these features would not be visually prominent. The increased scale of MET towers (approximately 400 feet tall each) would be most apparent when viewed within a foreground viewing distance and from a low-angle position relative to the Project site. For example, at Dinosaur Point Road near the SRA boat launch and picnic facilities, a new MET tower would be located approximately 0.75 mile away atop the hilly terrain of the Project site (see Key View 3, Figure 17). The new MET tower would replace an existing MET tower and would be installed near the same site. While the new MET tower would be taller and display a more visible vertical line relative to the existing feature, the new MET tower would display a similar thin profile and would not degrade the character or quality of existing views. When viewed from more distant vantage points such as at westbound SR-152 at the Cottonwood Bay bridge, MET towers would display a thin line on the Project site ridgeline that may be overlooked by the casual observer. At Key View 4, the distant lines displayed by new MET towers would produce weak contrast such that the existing visual character of the site and surrounding area would not be degraded. In addition and when viewed in the context of new wind turbines new MET towers would be indistinct(see Figure 18). As such, impacts to existing visual character and quality associated with the operation of new MET towers would be **less than significant**.

5.3.1.4 Would the project create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

Lighting

Existing wind turbines and associated infrastructure on the Project site does not generate or produce a substantial amount of light. For example, FAA obstruction lighting is installed on one out of the 162 on site wind turbines and exterior lighting fixtures are installed on the office trailer. While existing sources of lighting along the western and southern shores of San Luis Reservoir are limited, the Los Banos Substation and nearby commercial and residential development at the SR-33 and SR-152 junction include sources of lighting along the eastern extent of the proposed New Transmission Line corridor.

Construction of the Project is anticipated to last approximately 12 months. Construction activities would occur during daylight hours but may involve extended hours, as needed, to complete certain activities and/or during emergencies. For the majority of the year, nighttime construction lighting would not be required. However, during emergencies, tasks requiring extended hours and during late fall and winter months, the lack of adequate natural lighting may dictate that portable lighting sources be used at specific construction sites.

The FAA requires obstruction lighting be installed on wind turbines over 200 feet tall from the base of the turbine to the top of the blade tip for aviation safety. During construction, the FAA lighting standard require turbines be lit with temporary lighting at a height of 200 feet until the permanent lighting is installed. As standard practice, the Project would install with temporary lighting consistent with FAA requirements. It is assumed that the use of night construction lighting during the 12-month construction period would be limited. Delivery of various turbine components may be required during nighttime hours and may require portable temporary lighting for short periods of time. However, for most non-emergency tasks, construction activities would be conducted during daylight hours. When required, portable construction night lighting would temporarily illuminate construction areas and would be focused onto the area of active construction. Unnecessary illumination of the nighttime sky from non-wind turbine lighting would be controlled to the extent feasible with the use of fully shielded and directed downward lighting. Due to the irregular need for night construction lighting and with shielded and downward directed lighting sources, short-term construction lighting impacts would be less than significant.

The FAA requires wind turbine projects to submit an application that provides details on the location and size of proposed turbines along with specific information in order to evaluate any potential impacts to the National Airspace System. This includes preparation and submittal of an aeronautical study and review by FAA to determine whether structures would impair aviation safety. Additionally, the FAA will evaluate a project to determine required lighting. Lights are required for turbines that exceed an overall height of 200 feet above ground level (FAA 2016). The tallest structure proposed on site (wind turbines measured from base to blade tip) would be over 200 feet and therefore, proposed wind turbines would require the installation of obstruction lighting atop wind turbine hubs. Light fixtures would be placed as high as possible on the turbine nacelle, so they are visible by a pilot approaching from any direction. Permanent MET towers greater than 200 feet AGL would also require lights. Consistent with FAA requirements, a lighting plan would be developed for the Project and submitted to FAA for approval.

Nighttime wind turbine obstruction lighting should consist of the preferred FAA L-864 aviation red flashing, strobe, or pulsed obstruction lights if approved by FAA. Studies have shown that red lights provide the most visibility to pilots. The FAA does not require daytime lighting of wind turbines. For linear turbine configurations, such as what the Project is proposing, the FAA suggests that lights should be placed on each turbine positioned at each end of the line or string of turbines and high concentrations of lights shall be avoided.

The introduction of obstruction lighting on approximately up to 80 percent of the turbines, or between 24 to 32 turbines, would add more light in an area that currently contains very limited amounts of visible light. The FAA L-864 lights are of medium intensity and are the same lights that are required on radio and television towers that exceed 350 feet in height. The Pacheco State Park General Plan (California State Parks 2006) acknowledges the presence of wind turbines in the LE portion of the Park. The General Plan also notes that due the limited amount of development in the immediate surrounding area, the Park is a popular location for stargazing. However, permitted year round day use of the park is limited to 8:00 a.m. to sunset and therefore, evening and nighttime use of the Park for activities including hiking and stargazing is currently unauthorized.

The red tint of obstruction lights installed on between 24 to 32 wind turbines on the Project site may be visible to nearby rural residences including four homes south of SR-152 and off Dinosaur Point Road. These homes are located within approximately one mile of Project site's western boundary. As depicted in Figure 15, Key View 1, the majority of wind turbines on the Project site would be blocked from view at the Park day use parking area. While not included in the Key View 1 photograph, the four nearby homes off Dinosaur Point Road are located at a similar or lower elevation than Key View 1. Therefore, overall project visibility from these homes is anticipated to be similar to that expected at Key View 1. As such, the four homes are not anticipated to be provided direct line of sight views to obstruction lighting installed atop wind turbine nacelles. Rather, the red tint of lights would be visible low on the horizon and would not substantially effect nighttime views available at the nearest residences.

In addition to residences, the lights on the wind turbines would be visible to SR-152 motorists and select areas within the SRA Basalt Campground. While the nearest new wind turbines would be located within one mile, the majority of the 40 proposed wind turbines would be setback 2 miles or more from the state route. The nearest wind turbines would be setback over approximately 5.5 miles from the Basalt Campground and 4 miles from the boat launch area. As previously stated, night lighting of wind turbines over 200 feet tall is a FAA requirement for increasing aircraft safety. The Project site currently contains limited nighttime lighting including FAA obstruction lighting on one existing wind turbine. Stationary and mobile sources of lighting occur outside of the Park boundary on private property, on the SR-152 corridor, near the reservoir dam and near the Los Banos Substation.

Due to the presence of existing lighting in the landscape, the operation medium-intensity lights synchronized to flash simultaneously atop 24 to 32 new wind turbines located between one and 5.5 miles from the nearest receptors would not substantially affect nighttime views. The lights would be visible from SR-152 but would not be a distraction to drivers due to distance and regularly impeded views to new wind turbines because of road cuts. Distance and the dense planting of mature trees that effectively block the availability of longer distance views would limit visibility of lights atop new wind turbines at the Basalt Campground sites. Therefore, obstruction lighting would not substantially affect nighttime views from SR-152 or the Basalt Campground. Impacts would be **less than significant**.

Following completion of construction, other new and familiar nighttime lighting sources would be introduced to the Project site. For example, exterior lights would be installed at the on-site project collector substation and O&M building. Newly installed lighting at the facility would be kept to the minimum intensity required to ensure adequate lighting for O&M staff to perform as-needed and/or emergency maintenance. The total amount of non-wind turbine related lighting operating on the Project site would be low and generally limited to the on-site collector substations and O&M facility. All non-wind turbine related lighting would be hooded, directed downward, and turned off when not required. Because new sources of nighttime lighting would be limited and facility lighting would be hooded, directed downwards, and turned off when not in use, facility lighting would not substantially affect nighttime views in the area. Impacts would be **less than significant**.

Glare

Consistent with FAA rules established in Advisory Circular 70/7460-1L: Obstruction Marking and Lighting, all turbine components (including towers, nacelles, and rotors) would be painted or finished using low-reflectivity, neutral white colors. Facilities, including the new project collector substation and O&M facility, would be partially screened from view of motorists and other local receptors by intervening terrain and oak woodland vegetation. Regarding the New Transmission

Line, the materials under consideration for support poles (i.e., steel) are displayed by electrical infrastructure in the existing landscape and are not highly reflective such that daytime views would be substantially impacted. Lastly, all outdoor non-wind turbine related lighting would be hooded, directed downward, and turned off when not required. Project components and operational facility lighting would not produce substantial glare that would adversely affect day or nighttime views in the area. Therefore, impacts would be **less than significant**.

Shadow Flicker

Shadow flicker refers to the alternative levels of lighting intensity produced when rotating blades cast shadows on nearby buildings and receptors. Shadow flicker may occur at sunrise or sunset where a wind turbine is installed near a residence or roadway. Proposed wind turbines would generally be setback from public roads outside of the Project site and from the nearest occupied residences. The nearest proposed wind turbine would be located approximately 675 feet south of Dinosaur Point Road and over 3,000 feet from residences located off Dinosaur Point Road and south of SR-152. While shadow flicker may be experienced by Dinosaur Point Road motorists as they navigate the noticeable curve in the road east of the Park entrance, the duration of received alternating lighting intensity would be brief (i.e., seconds) and exposure would be limited to sunrise and sunset hours. Further, atmospheric conditions effect the potential for shadow flicker as the presence of clouds and associated blocking of the sun tends to create faint/no shadows. In addition, blade angle relative to the receptor is an additional factor affecting shadow flicker. For example, if the plane of turbine blades is in a line between the receptor and the sun, the produced shadow should be thin and have a reduced impact compared to if the plane were perpendicular. The blade angle of the nearest turbines to Dinosaur Point Road may align perpendicular to the road however, proposed wind turbines would bet setback over 675 feet from Dinosaur Point Road, potential shadow flicker exposure would be brief and limited to sunrise and sunset hours. Thus, shadow flicker and associated impacts to daytime views would be **less than significant**.

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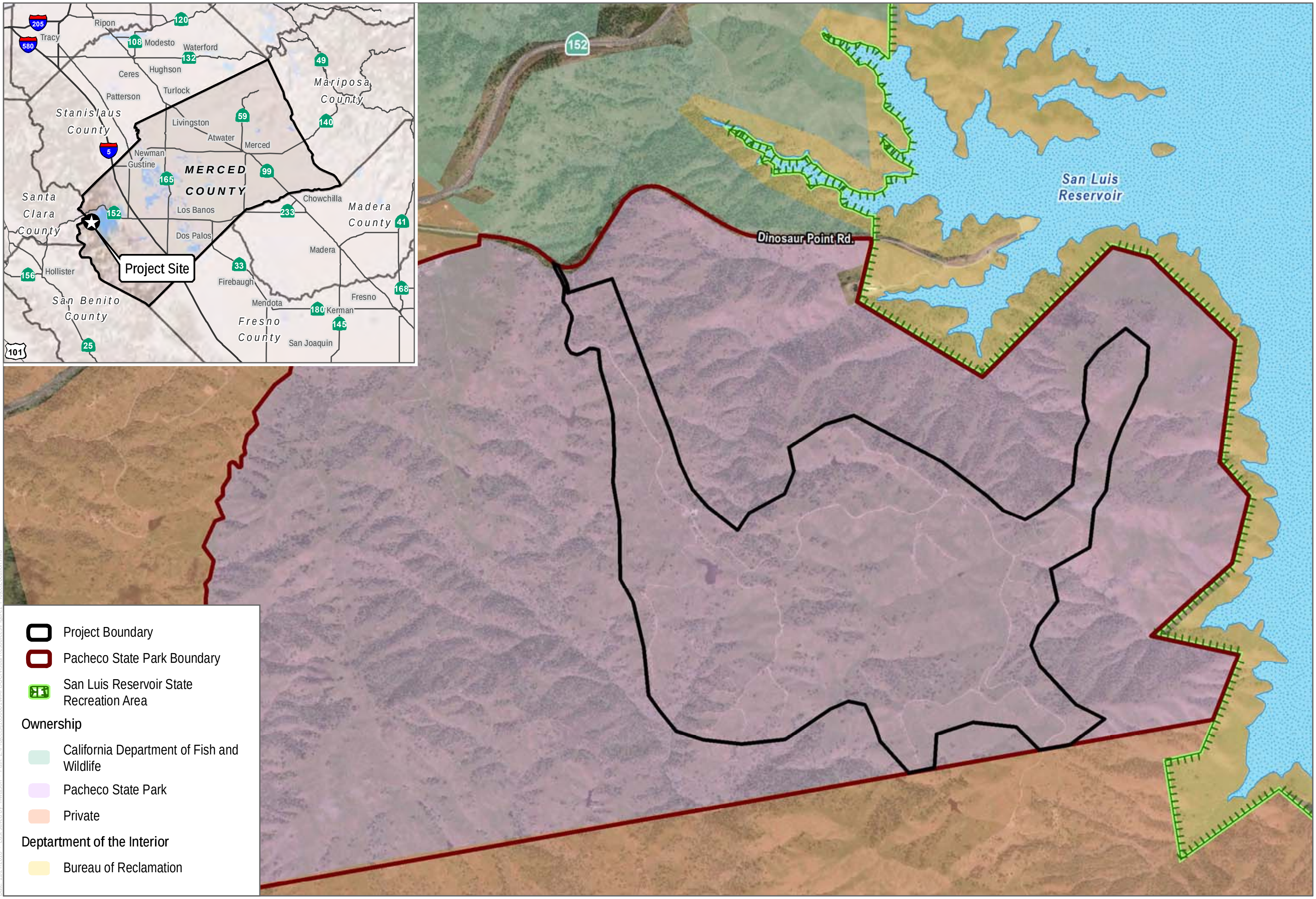

SOURCE: USDA 2016, Scout Energy 2018, Merced County 2018

DUDEK

0 1,500 3,000 Feet

FIGURE 1

Project Location

Gonzaga Ridge Wind Repowering Project

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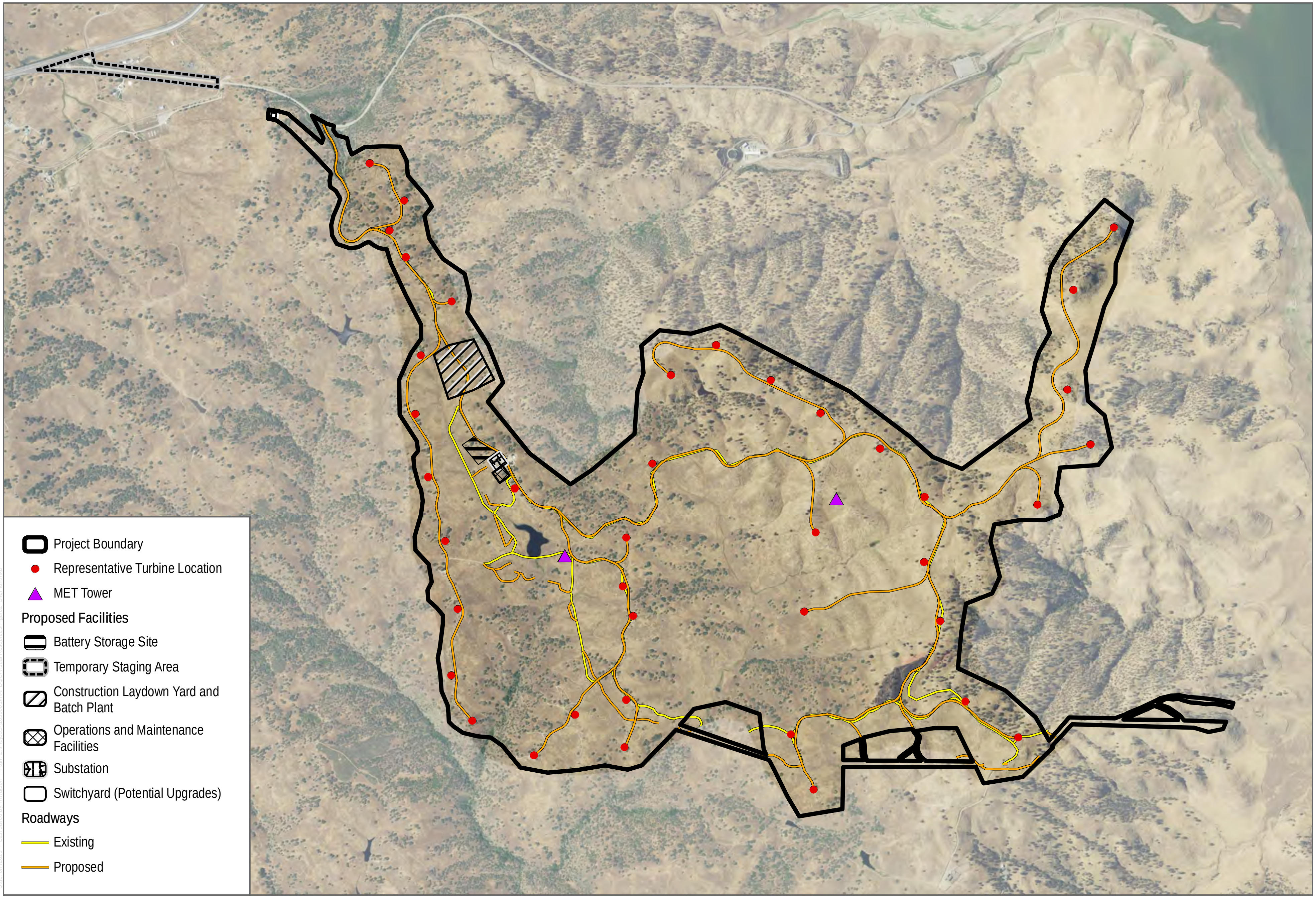

SOURCE: USDA 2016; Scout Energy 2019

DUDEK

FIGURE 2

Site Plan

Gonzaga Ridge Wind Repowering Project

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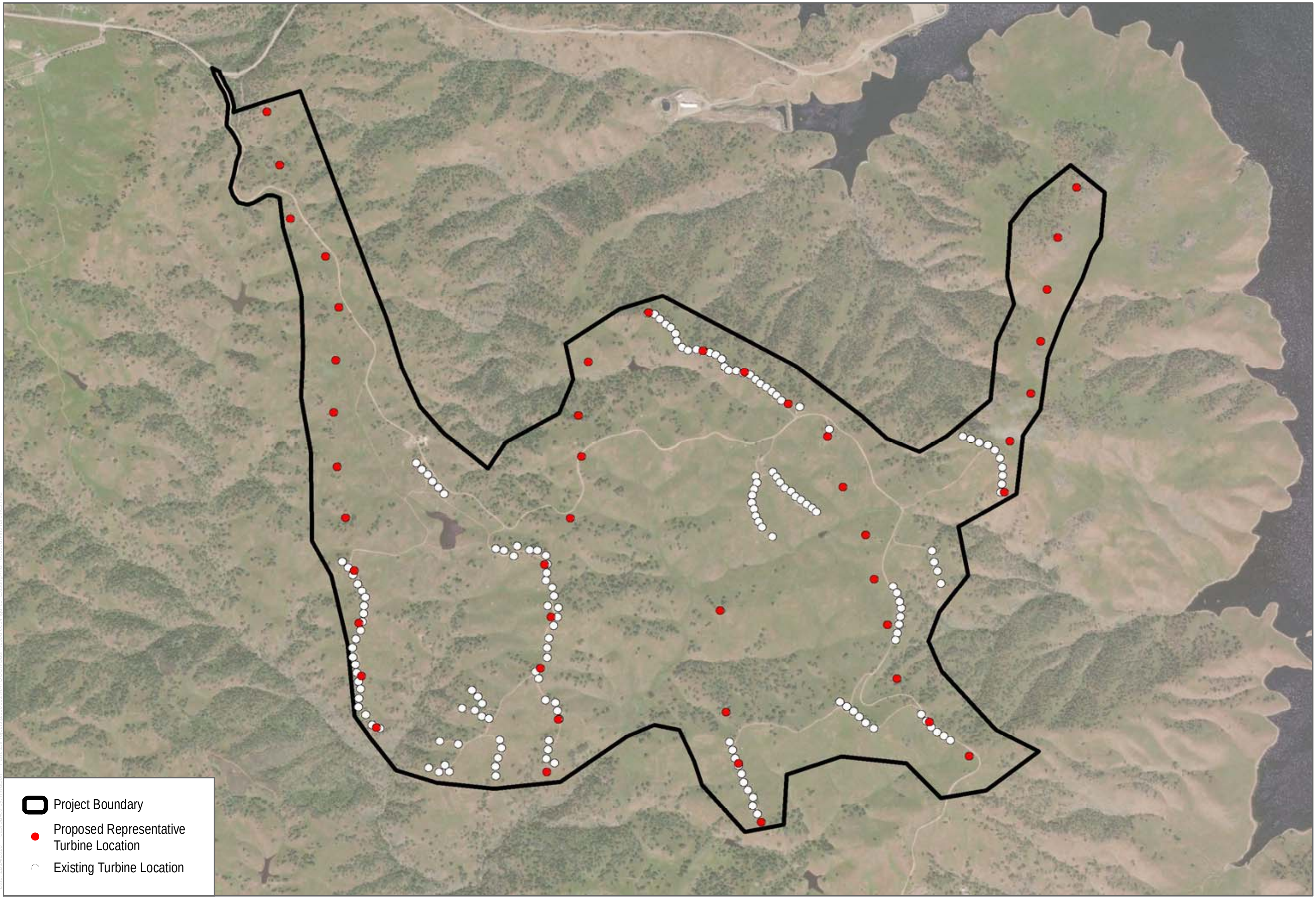

SOURCE: Scout Energy 2018, Bing Maps 2018

DUDEK

0 1,000 2,000 Feet

FIGURE 3

Existing and Proposed Wind Turbine Locations

Gonzaga Ridge Wind Repowering Project

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SOURCE: General Electric 2017

FIGURE 4

Representative Wind Turbine

Gonzaga Ridge Wind Repowering Project

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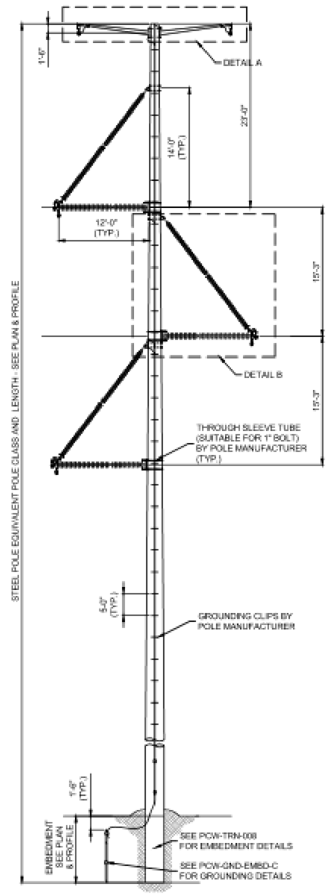
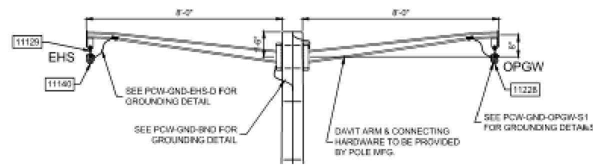
ITEM #	QTY	DESCRIPTION	MFG	MFG ITEM#	UNIT
10111	3	INSULATOR, 345KV, BRACED POST, GAIN BASE, 144.0" SECTION LENGTH, 324" LEAKAGE DISTANCE, W/CORONA RINGS, TURNBUCKLE, AND ANCHOR SHACKLE	MACLEAN	B35SF144T21168VB	Ea
11034	6	CLAMP, SUSPENSION, 345KV, AGS w/ PARROT-BILL END RODS, FOR 795 26/7 ACSR	PLP	AGS-5509	Ea
11129	7	Y-CLEVIS, EYE, 25K ULT, 13/16" EYE DIA, 1-1/16" EYE WIDTH, 3/4" PIN DIA	PLP	YC-5209	Ea
11140	1	CLAMP, SUSPENSION, ARMOR GRIP, SINGLE, FOR 3/8" EHS, W/ 26" LONG ARMOR RODS	PLP	AGS-7104S	Ea
11228	1	SUSPENSION CLAMP, SINGLE AGS, FOR OPGW DIA RANGE 0.512" TO 0.536", W/ Y-CLEVIS FOR CLAMP, INCL #4 COPPER GROUND WIRE	PLP	4300109GYC	Ea
13085	12	WASHER, ROUND, FLAT, 3" DIA, FOR 1" BOLTS, GALV, 1-1/16" HOLE	HUGHES	RW3-100	Ea
13122	12	NUT, LOCK, MF, SQUARE, FOR 1 IN BOLT	HUGHES	MF100	Ea
13131	12	WASHER, SQUARE, CURVED, FOR 1" BOLTS, 4" X 4" X 1/4", 1-1/16" DIA HOLE	HUGHES	CW100	Ea
13149	6	MACHINE BOLT, SQUARE HEAD, 1" X 20", w/ 1 NUT	HUGHES	B1020-6	Ea
13186	6	MACHINE BOLT, SQUARE HEAD, 1" X 28", w/ 1 NUT	HUGHES	B1028-6	Ea
20516	3	TEE, DEADEND, CURVED BASE, 60 KIP, 15/16" STEM HOLE, 1-1/16" MTG HOLES, 6" SPACING	HUGHES	2817R4.5-17-15	Ea
OTHER ASSEMBLIES					
	8	BOLT GROUNDING FOR 1" BOLTS, PCW-GND-BND		DWG PCW-TRN-006	
	1	OPGW TANGENT/ANGLE GROUNDING ON STEEL DAVIT ARM, PCW-GND-OPGW-D		DWG PCW-TRN-006	
	1	EHS TANGENT/ANGLE GROUNDING ON STEEL DAVIT ARM, PCW-GND-EHS-D		DWG PCW-TRN-006	
	1	DIRECT EMBEDDED CONCRETE POLE GROUNDING, PCW-GND-EMBD-C		DWG PCW-TRN-006	
	1	DIRECT EMBEDMENT DETAILS		DWG PCW-TRN-008	

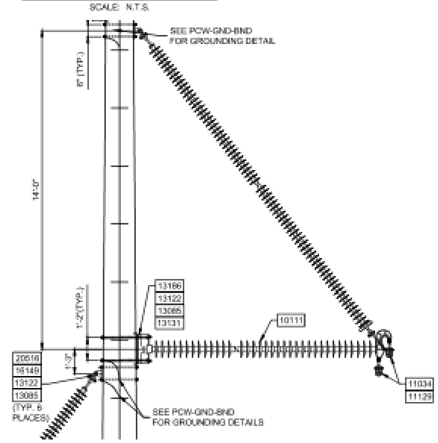
HT/CL	POLE EMBED (ft)	STR #'s	TOT QTY
115'/H6	17'-6"	40	1
120'/H6	18'-0"	8-10, 22, 23, 26, 27, 30, 31, 33, 39	11
125'/H6	18'-6"	3, 11, 14, 28, 32, 36-38, 41	9
130'/H6	19'-0"	24	1
135'/H6	19'-6"	35	1
110'/H7	17'-0"	12	1
120'/H7	18'-0"	4, 6, 13, 15, 17, 34	6
125'/H7	18'-6"	5, 7, 16, 18	4
130'/H7	19'-0"	25	1
125'/H8	18'-6"	19, 20	2



ELEVATION
SCALE: N.T.S.



DETAIL A: OPGW & EHS DETAIL
SCALE: N.T.S.



DETAIL B: CONDUCTOR DETAIL
SCALE: N.T.S.

SOURCE: Scout 2018

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FIGURE 5
Typical Overhead Electrical Pole Design
Gonzaga Ridge Wind Repowering Project

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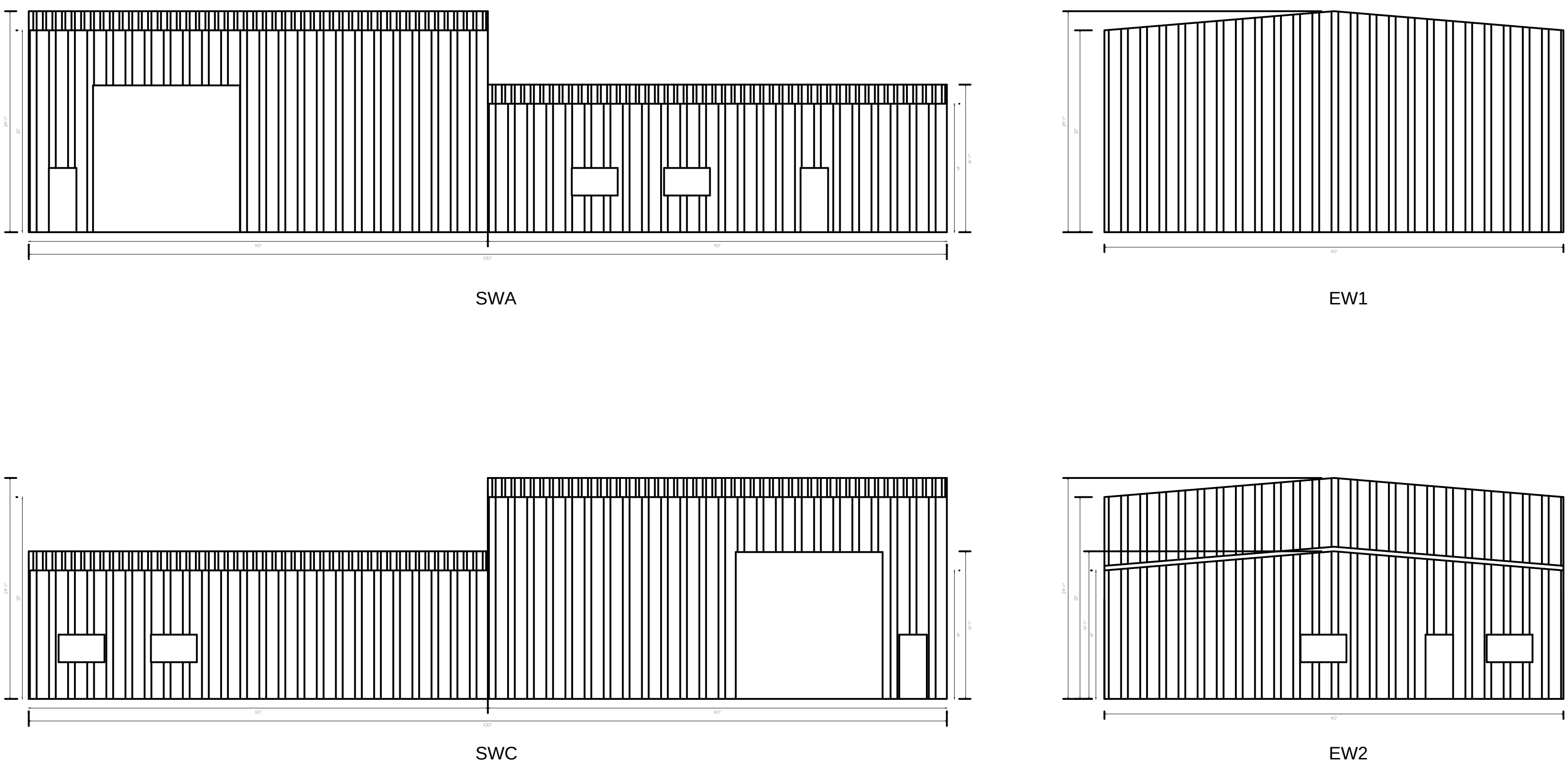

SOURCE: Scout Energy 2018

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FIGURE 6

O&M Building Illustrative

Gonzaga Ridge Wind Repowering Project

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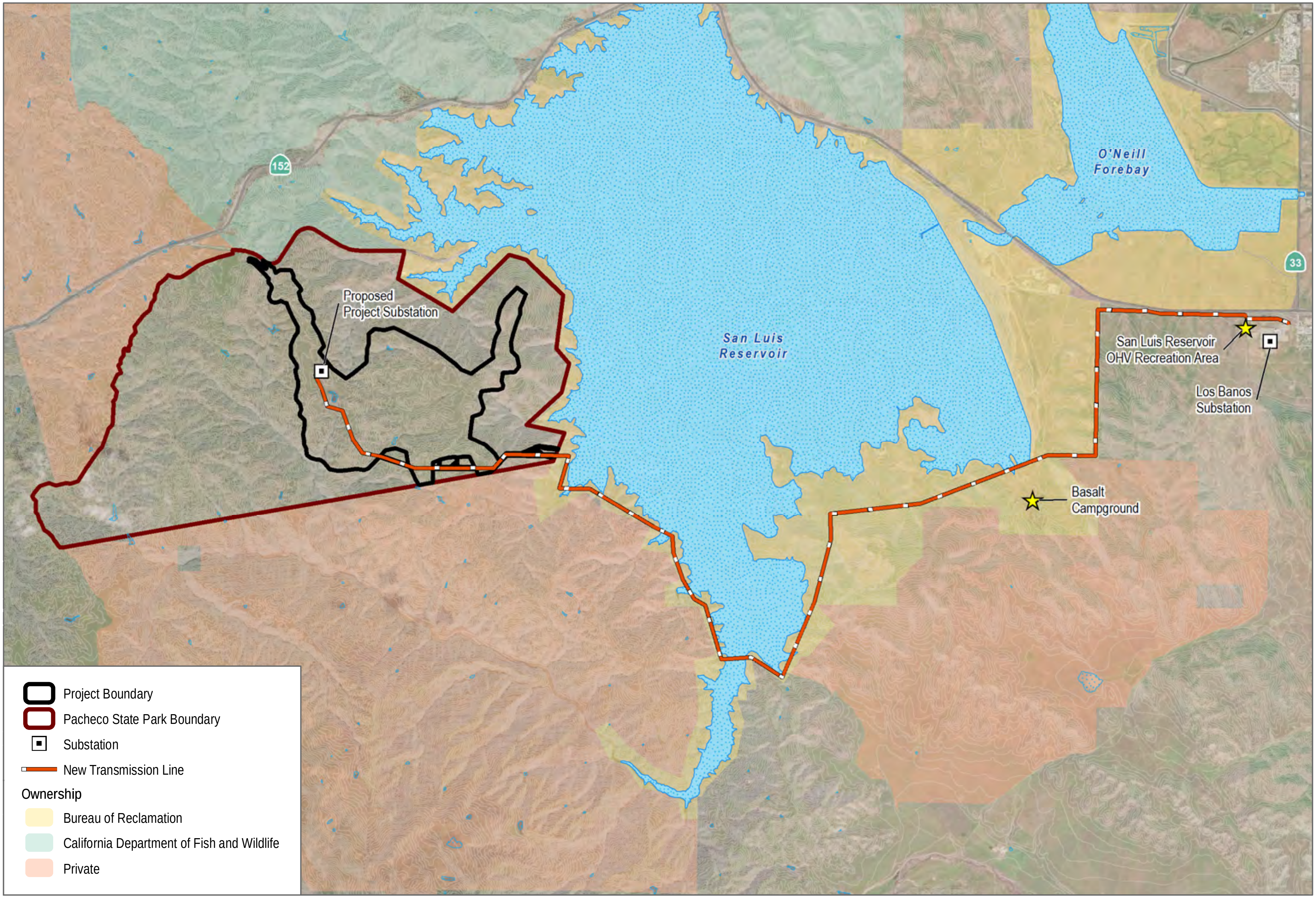

SOURCE: Bing Maps 2019; Scout Energy 2019

DUDEK

0 0.75 1.5 Miles

FIGURE 7

New Transmission Line

Gonzaga Ridge Wind Repowering Project

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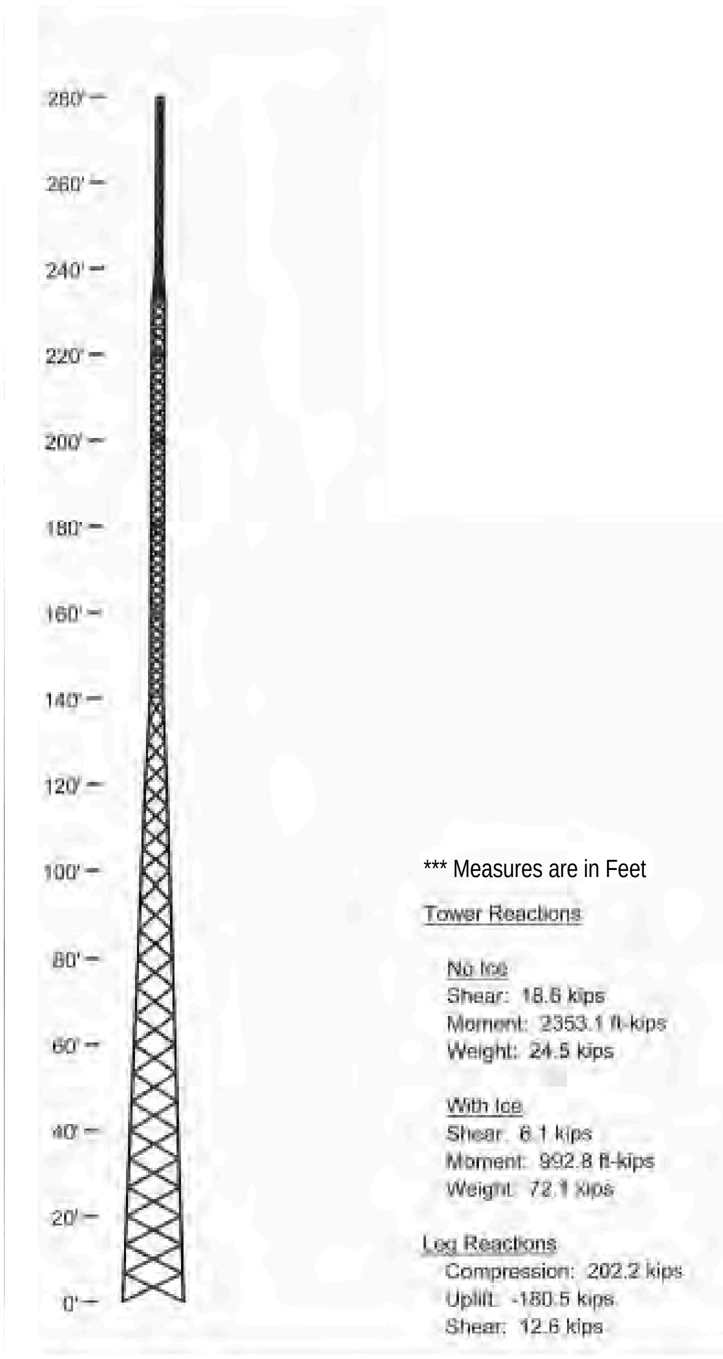

SOURCE: Scout Energy 2018

FIGURE 8

MET Tower Design

Gonzaga Ridge Wind Repowering Project

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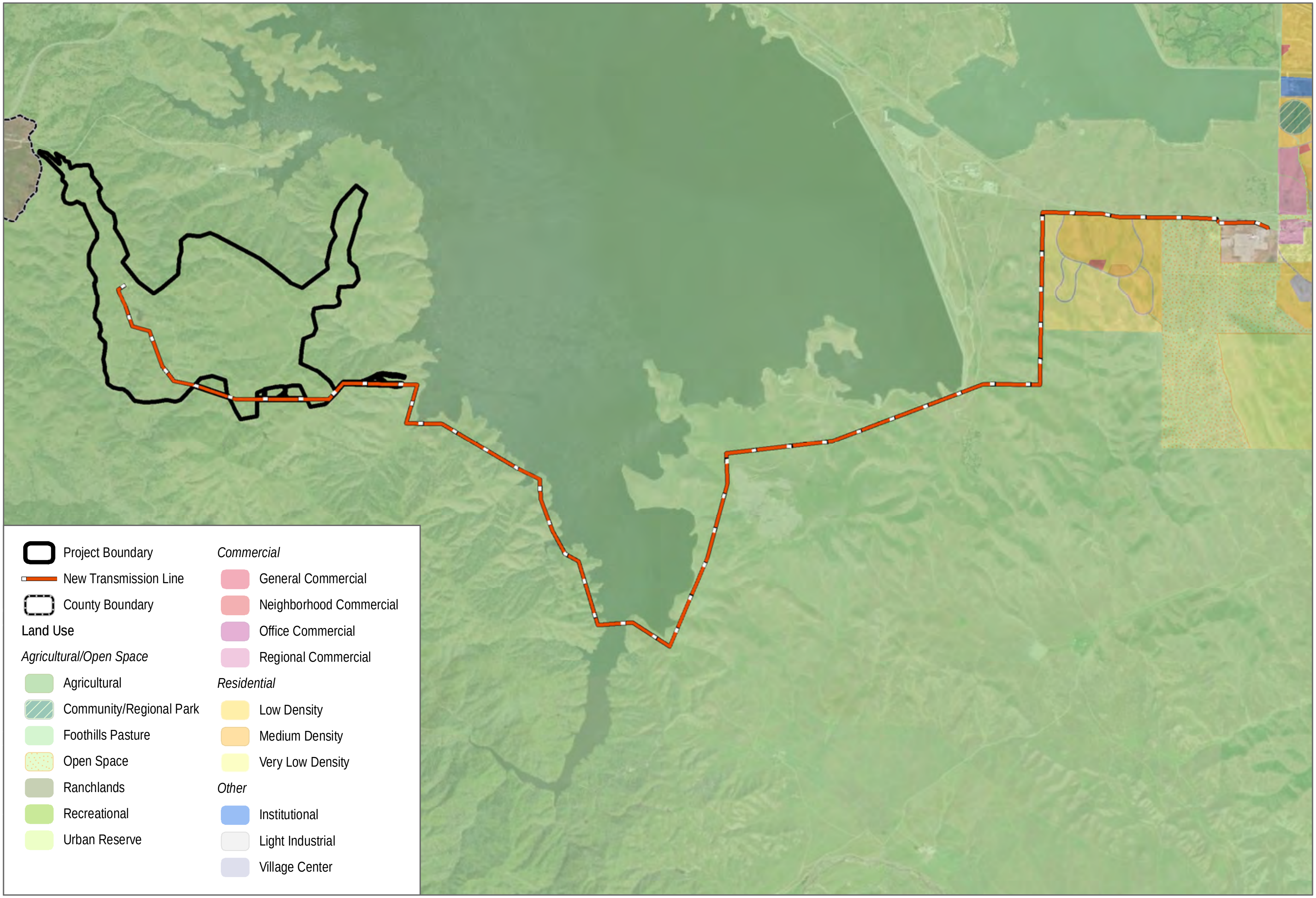

SOURCE: Merced County 2015; Scout Energy 2019; Bing Maps 2019

DUDEK

0 0.5 1 Miles

FIGURE 9

Merced County General Plan Land Use

Gonzaga Ridge Wind Repowering Project

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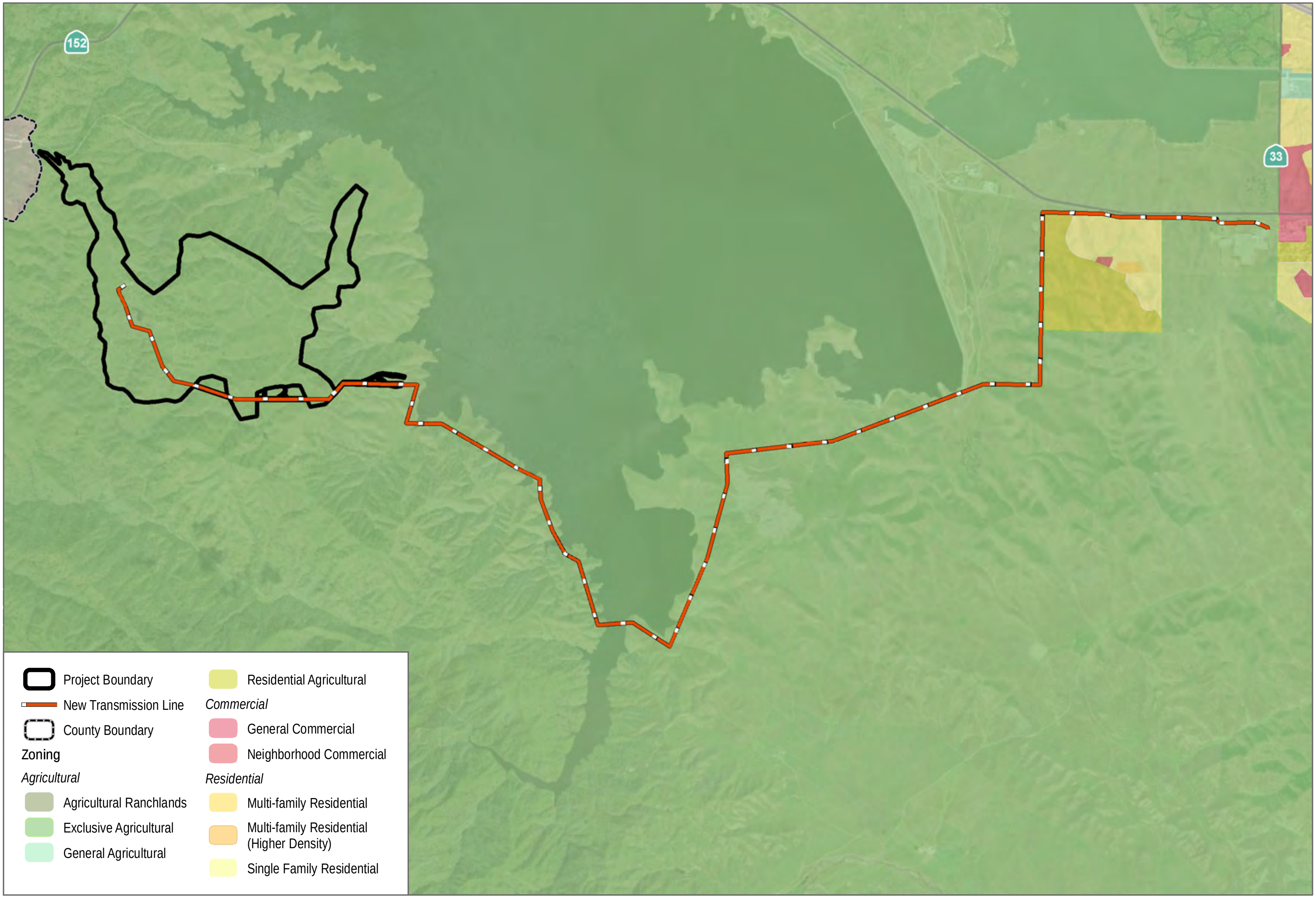

SOURCE: Merced County 2015; Scout Energy 2019; Bing Maps 2019

DUDEK

0 0.5 1 Miles

FIGURE 10

Merced County Zoning

Gonzaga Ridge Wind Repowering Project

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Photograph A: View southeast from Dinosaur Point Road at Pacheco SP entrance

Photograph B: View southeast from Pacheco SP day use area parking lot

Photograph C: View southeast from Dinosaur Point Road to oak woodland and grassland covered hilly terrain

Photograph D: View south from Dinosaur Point Road to oak woodland and grassland covered hilly terrain

DUDEK

FIGURE 11

Existing Conditions

Gonzaga Ridge Wind Repowering Project

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Photograph E: View west from Dinosaur Point Road towards San Luis Reservoir and Tunnel Island

Photograph F: View west from Romero Visitor Center across San Luis Reservoir towards terrain of the Diablo Range

Photograph G: View north from Goosehead Point boat launch facility

Photograph H: View northwest from Goosehead Point boat launch area towards hilly, oak and grassland covered terrain

DUDEK

FIGURE 12

Existing Conditions

Gonzaga Ridge Wind Repowering Project

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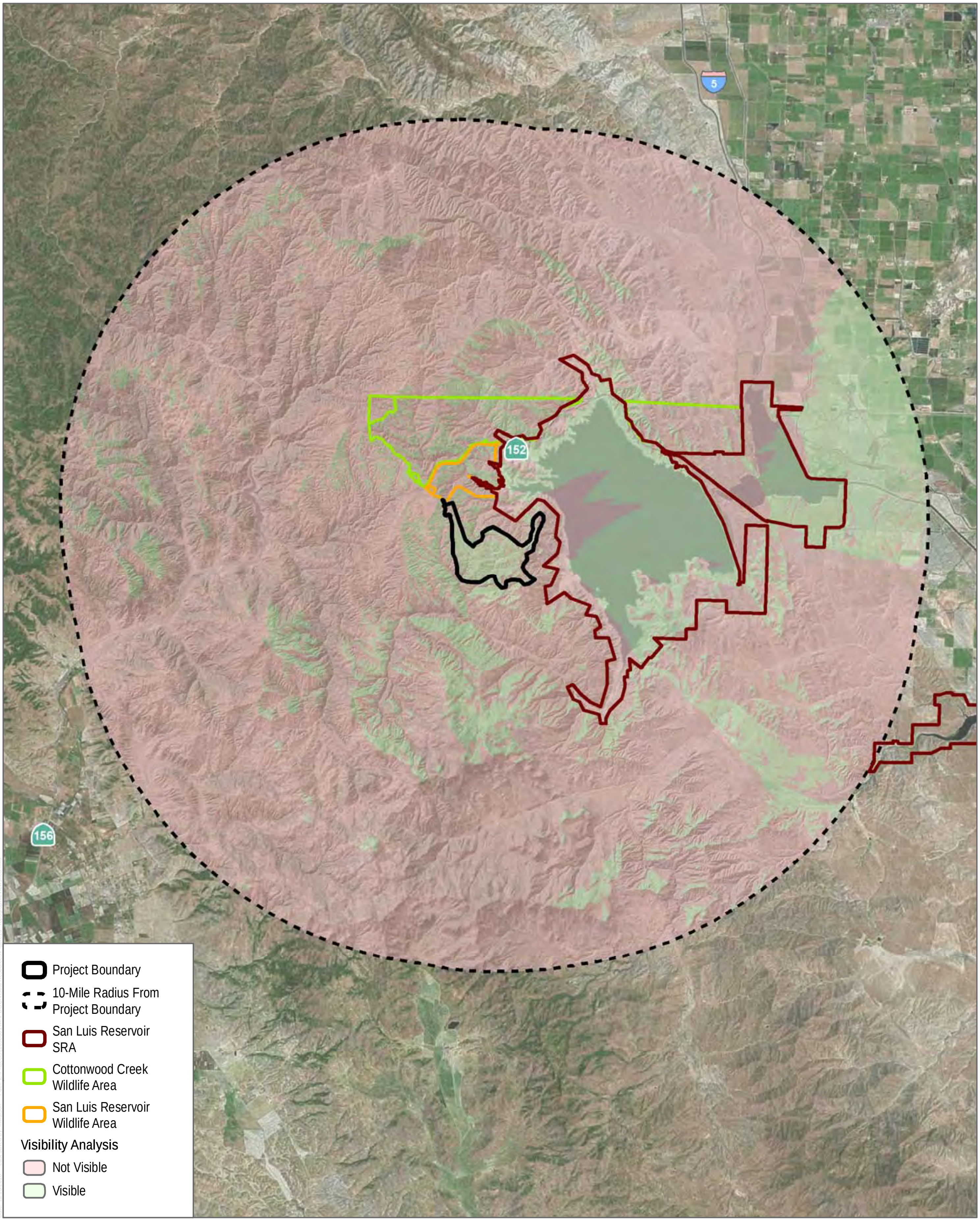

SOURCE: USGS 2018, Bing 2018

FIGURE 12

Topographic Viewshed

Gonzaga Ridge Wind Repowering Project

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0 1.5 3 Miles

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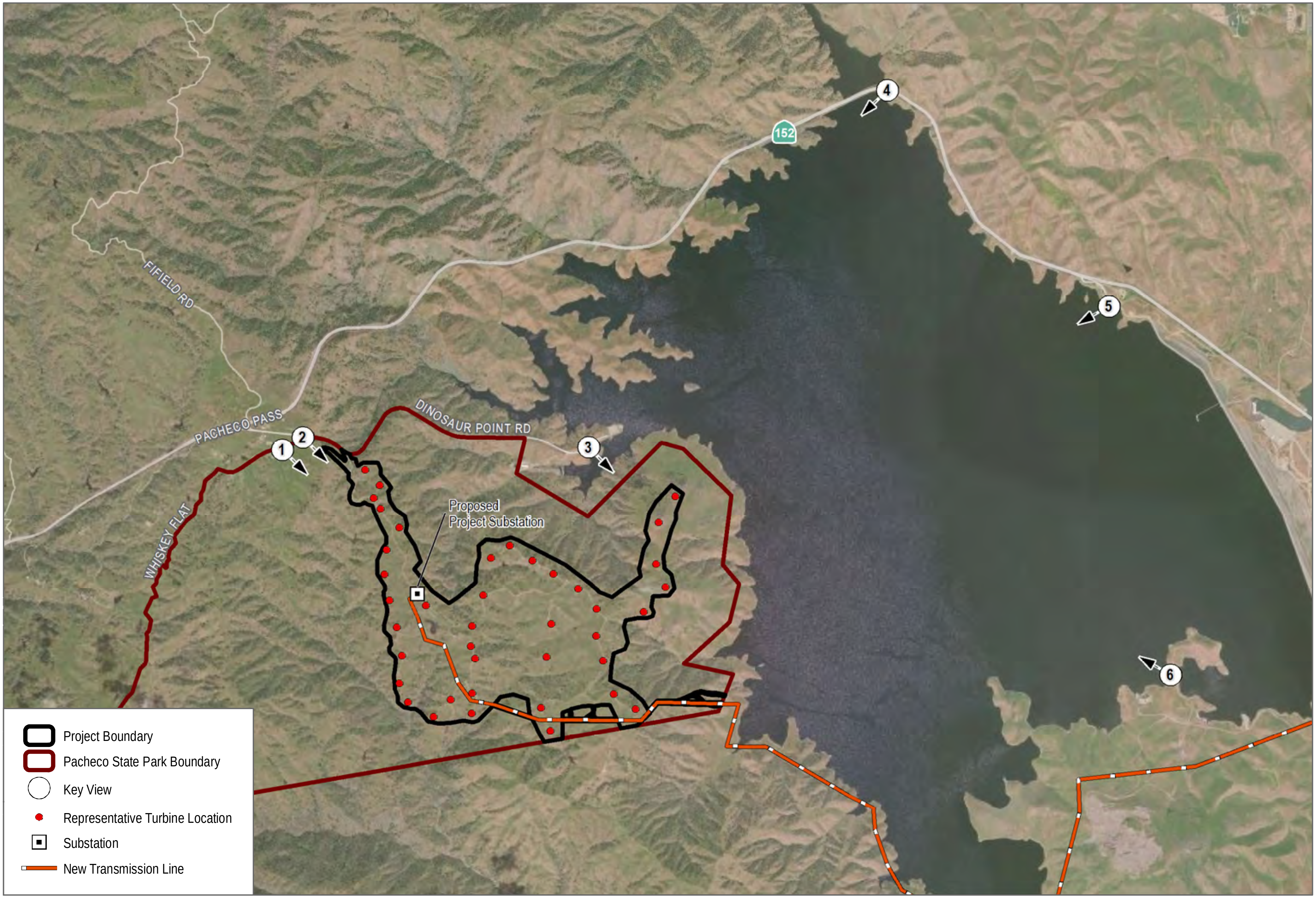

SOURCE: Bing Maps 2019; Scout Energy 2019

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0 0.5 1 Miles

FIGURE 14

Key Views

Gonzaga Ridge Wind Repowering Project

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Existing view southeast towards characteristic vegetation and terrain of Pacheco State Park

Visual Simulation: Proposed Conditions

FIGURE 15

Key View 1 - Pacheco State Park Day Use Parking Area

Gonzaga Ridge Wind Repowering Project

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Existing view southeast from Pacheco State Park entrance towards the project site

Visual Simulation: Proposed Conditions

FIGURE 16

Key View 2 - Dinosaur Point Road at Pacheco State Park Entrance

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Existing view southeast from Dinosaur Point Road towards characteristic terrain of Pacheco State Park

Visual Simulation: Proposed Conditions

FIGURE 17

Key View 3 - Dinosaur Point Road Near SRA Boat Launch Area

Gonzaga Ridge Wind Repowering Project

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Existing view west from State Route 152 across San Luis Reservoir towards Pacheco State Park

Visual Simulation: Proposed Conditions

FIGURE 18

Key View 4 - State Route 152 at Cottonwood Bay

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Existing view west from Romero Visitor Center towards project site (located 3.8 miles away)

Visual Simulation: Proposed Conditions

Path: Z:\Projects\j1050601\MAPDOC\Visual Resource

FIGURE 19

Key View 5 – Romero Visitor Center

Gonzaga Ridge Wind Repowering Project

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Existing view northwest from SRA Basalt Area boat launch facilities towards project site (located 4 miles away)

Visual Simulation: Proposed Conditions

FIGURE 20

Key View 6 - San Luis Reservoir SRA Basalt Area

Gonzaga Ridge Wind Repowering Project

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APPENDIX D

Biological Resources Technical Reports

APPENDIX D1

Botanical Report

DUDEK

853 LINCOLN WAY, SUITE #208
AUBURN, CALIFORNIA 95603
T 530.885.8232 F 530.885.8372

October 10, 2019

Matt Heck
Scout Clean Energy, LLC
2919 Valmont Road, Ste 209
Boulder, Colorado 80301

Subject: ***Botanical Survey Results for the Gonzaga Ridge Wind Repowering Project, Merced County, California***

Dear Mr. Heck:

This report documents the findings of a botanical survey conducted for the Gonzaga Ridge Wind Repowering Project (proposed project) near Santa Nella in Merced County, California (Figure 1, Regional Map and Figure 2, Site and Vicinity Map). The survey was conducted within the existing turbine generation site (study area) to determine whether the study area supports existing special-status plant species.

METHODOLOGY AND CONSTRAINTS

For the purposes of this analysis, the approximately 1,766-acre study area includes the planned limits of disturbance of all components associated with the regeneration site.

Background Research and Literature Review

Prior to conducting the site survey, a review of pertinent online and literature sources was performed. This review consisted of the following online databases and previous reports:

- The California Department of Fish and Wildlife's California Natural Diversity Database (CNDDB) focused on the Pacheco Pass, California, and surrounding U.S. Geological Survey topographic quadrangles (Mustang Peak, Crevison Peak, Howard Ranch, Pacheco Peak, San Luis Dam, Three Sisters, Mariposa Peak, and Los Banos Valley) (CDFW 2019).
- List of plants in the Pacheco Pass, California, and surrounding U.S. Geological Survey topographic quadrangles from the California Native Plant Society's Inventory of Rare and Endangered Plants of California (CNPS 2019).
- List of potential threatened, endangered, proposed, or candidate species in the project site region from the Sacramento Office of the U.S. Fish and Wildlife Service (USFWS 2019).

- Soils map and report for the survey area (USDA 2019).
- Consortium of California Herbaria specimen records (California Consortium of Herbaria (CCH) 2019).
- Appendix C: Pacheco State Park Vegetation Types. Pacheco State Park General Plan Environmental Impact Report (California State Parks 2006).

A list of special-status plant species was generated based on available data. The full list of potentially occurring special-status plant species is included in this report as Attachment A. An abbreviated list of target special-status species with moderate to high potential to occur was then produced based on available habitat, elevation, soils, geographic range, and past occurrence data. The abbreviated list is discussed further in Table 1 of the Survey Results section of this report. Plants with no to low potential to occur on site due to lack of suitable soils or habitat, or because the project site is outside their known elevation or geographic ranges, are not discussed further in this document.

Potential reference populations for special-status plant species were identified through an analysis of past records documented in the CNDDB (CDFW 2019) and the California Consortium of Herbaria online database (CCH 2019).

Survey

Dudek botanist Laura Burris and Dudek biologist Allie Sennett conducted a pedestrian survey of the project site on May 22 and 23, 2019. The survey followed recommended methodology described in the California Native Plant Society's Botanical Survey Guidelines (CNPS 2001), the California Department of Fish and Wildlife's Protocols for Surveying and Evaluating Impacts to Special-Status Native Plant Populations and Sensitive Natural Communities (CDFW 2018), and the U.S. Fish and Wildlife Service's Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed, Proposed and Candidate Plants (USFWS 2000).

The survey was floristic in nature and consisted of walking meandering transects in areas of suitable habitat. If special-status plant species encountered, they were recorded using a handheld GPS device. The timing of the survey was such that target species would be evident and identifiable. All botanical resources were identified to a level necessary to determine rarity and botanical nomenclature follows the Jepson Manual: Vascular Plants of California, Second Edition (Baldwin et al. 2012) and The Jepson Online Interchange Project (Jepson eFlora Project 2019). When appropriate for identification, specimens were collected for further study in a lab setting.

Constraints

Local reference populations for special-status species are primarily located on private land and were inaccessible. One potential reference population of spiny-sepaled button-celery was visited, but this species was not identified in the area when surveyed. Hall's bush-mallow was observed blooming along the south side of SR 152, less than 5 miles north to northeast of the project site. This population was not accessible due to limited road shoulders and areas for safe pedestrian travel. Dates of identification and collection of herbarium specimens coincide with the timing of the 2019 survey, as described above. The survey was conducted within a period when potentially occurring special-status species would be evident and identifiable.

REGULATORY DEFINITIONS AND FRAMEWORK

Special-Status Plant Species

For the purposes of this analysis, special-status plant species are defined as plants that are legally protected or that are otherwise considered sensitive by federal, state, or local resource conservation agencies. These species fall into one or more of the following categories:

- Listed by the federal government under the Federal Endangered Species Act of 1973 or the state of California under the California Endangered Species Act of 1970 as endangered, threatened, or rare;
- A candidate for federal or state listing as endangered or threatened;
- Species afforded protection under local or regional planning documents;
- Taxa considered to be "rare, threatened, or endangered in California" as defined by the California Department of Fish and Wildlife (CDFW) or assigned a California Rare Plant Rank (CRPR; CNPS 2019). The CDFW and CNPS system includes six rarity and endangerment ranks for categorizing plant species of concern, as follows:
    - CRPR 1A – Plants presumed to be extinct in California
    - CRPR 1B – Plants that are rare, threatened, or endangered in California and elsewhere
    - CRPR 2A – Plants presumed to be extinct in California, but more common elsewhere
    - CRPR 2B – Plants that are rare, threatened, or endangered in California, but more common elsewhere
    - CRPR 3 – Plants about which more information is needed (a review list)
    - CRPR 4 – Plants of limited distribution (a watch list)

Plants ranked as CRPR 1A, 1B, 2A, and 2B may qualify as endangered, rare, or threatened species within the definition of State California Environmental Quality (CEQA) Guidelines Section 15380. CDFW recommends that potential impacts to CRPR 1 and 2 species be evaluated in CEQA documents. In general, CRPR 3 and 4 species do not meet the definition of endangered, rare, or threatened pursuant to State CEQA Guidelines Section 15380, but these species may be evaluated on a case-by-case basis.

PROJECT SITE DESCRIPTION

Proposed Project

The proposed project would involve replacing 162 existing older model turbines and upgrading an existing wind energy facility with substantially fewer and more efficient wind turbines and associated facilities. The project would consist of up to 40 new wind turbines and associated infrastructure, as well as an approximately 16-mile 70 kV above-ground transmission line to the PG&E Los Banos Substation to the east (Figure 1). Because the exact location of transmission towers/pads, laydown/staging areas, and access roads associated with the proposed transmission line had not been finalized at the time of this survey effort, a focused survey along the proposed transmission line corridor was not conducted.

Soils

According to the U.S. Department of Agriculture (USDA) Soil Survey mapped the study area as being underlain by the following soil types: Millsholm Loam, Millsholm-Rock outcrop complex, Fifield-Gonzaga complex, Fifield-Millsholm complex, Quinto-Millsholm-Rock outcrop complex, Asolt very stony clay, and water (USDA 2018a) (See Table 1 and Figure 3). None of the soils within the study area have a hydric rating (USDA 2018a).

Table 1
Soil Substrate within the Study Area

Soil Substrate	Total Acreage
Loam	
Millsholm Loam, 30%-50% slopes	198.38
Millsholm Loam, 8%-15% slopes	229.64
Millsholm-Rock outcrop complex, 15%-30% slopes	934.26
Sandy Loam	
Fifield-Gonzaga complex, 30%-50% slopes	18.61
Fifield-Millsholm complex, 30%-50% slopes	237.98
Gravelly Sandy Loam	
Quinto-Millsholm-Rock outcrop complex, 40%-75% slopes	56.20

Table 1
Soil Substrate within the Study Area

Soil Substrate	Total Acreage
Very Stony Clay	
Asolt very stony clay, 15%-30% slopes	31.77
Asolt very stony clay, 30%-50% slopes	56.28
Water	
Water	3.27
Total	1,766.39

Vegetation Communities and Land Cover Types

The land cover within the project area consists of a combination of terrestrial non-vegetative land covers and natural vegetation communities, as well as aquatic land cover types. The vegetation communities and land covers have been adapted from the Manual of California Vegetation, Online Edition (CNPS 2018), the California Natural Community List (CDFW 2018), and the Pacheco State Park General Plan Environmental Impact Report (California State Parks 2006). The following vegetation communities and land cover types were documented on site: California sage brush scrub, holly leaf cherry chaparral, blue oak woodland and savannah, California buckeye groves, California sycamore woodland, purple needle grass grassland, California annual grassland, ruderal, developed, seasonal wetland swale, seasonal wetland, and channel (Figure 4, Vegetation Communities). These communities are discussed in more detail below.

California Sage Brush Scrub. Within the Study Area, California sage brush scrub forms an intermittent to dense shrub layer. The herbaceous layer is limited to openings and is poorly developed in established stands. Trees are occasionally present at lower levels of slopes. The on-site alliance is dominated by California sage brush and contains occasional coyote brush, deerweed, and California buckwheat (*Eriogonum fasciculatum*). The tree layer is emergent, open, occasional, and predominantly includes blue oak (*Quercus douglasii*). This vegetation community occurs on steeper slopes throughout the Study Area.

Holly Leaf Cherry Chaparral. Within the Study Area, holly leaf cherry chaparral forms an intermittent shrub layer dominated by holly leaf cherry. The community onsite is isolated and the herbaceous layer is generally poorly developed; a number of the holly leaf cherry shrubs were in poor health with a high degree of vegetation dieback. The soils associated with this community are loose and highly erodible. Trees are occasionally present and consist primarily of blue oak. This vegetation community is located in isolated north-facing portions of hillslopes in the northern portion of the Study Area. Holly leaf cherry chaparral is included as sensitive on the California Natural Community List (CDFW 2018).

Blue Oak Woodland. Blue oak woodland within the Study Area forms an open to intermittent tree layer with a sparse shrub layer. The herbaceous layer is consistent with adjacent California annual grasslands, as described in further detail, below. The on-site alliance is dominated by blue oak, with sporadic gray pine intermixed where this community occurs on higher elevation slopes. The blue oak woodlands are located primarily on hillslopes throughout the Study Area.

Blue Oak Savannah. Blue oak savannah within the Study Area contains only blue oak in the tree canopy and shrubs are largely absent. The understory consists of California annual grassland, as described below, with the addition of increased cover of non-native Italian thistle (*Carduus pycnocephalus*), barbed goat grass (*Aegelops triuncalis*), and wild carrot (*Daucus pusillus*). This vegetation community shows evidence of past and current cattle grazing and the thatch of previous years' grass growth is thick.

California Buckeye Grove. California buckeye grove forms an open to intermittent shrub layer within the Study Area. The herbaceous layer is limited to openings and is generally poorly developed in established stands. Trees are occasionally present. The on-site alliance is dominated by California buckeye with the occasional blue oak tree interspersed. The shrub layer includes California sagebrush and poison oak. The California buckeye grove onsite is limited to a north-facing slope in the northern portion of the Study Area. California buckeye grove is included as sensitive on the California Natural Community List (CDFW 2018).

California Sycamore Woodland. Within the Study Area, California sycamore woodland forms an open to intermittent tree layer dominated by California sycamore in association with coast live oak. The shrub layer is sparse and contains poison oak and California sagebrush. The herbaceous layer is grassy and contains similar species as those described in the California annual grassland, below. The California sycamore woodland is limited to a single, deeply incised stream channel in the southwestern portion of the Study Area. California sycamore woodland is included as sensitive on the California Natural Community List (CDFW 2018).

Purple Needlegrass. Within the Study Area, purple needlegrass forms an open grass canopy with approximately 15 percent absolute cover in association with other grasses such as wild oat (*Avena fatua*) and bromes (*Bromus* spp.). The shrub and tree layer is absent from this vegetation community. This vegetation community is located in isolated patch on a south-facing hillslope in the northern portion of the Study Area. Purple needle grass is included as sensitive on the California Natural Community List (CDFW 2018).

California Annual Grassland. California annual grassland in the Study Area is co-dominated by wild oat, ripgut brome (*Bromus diandrus*), and soft chess (*Bromus hordeaceus*). Additional grasses include barbed goat grass, purple needle grass, rattail fescue (*Festuca myuros*), and Italian ryegrass (*Festuca perennis*). Forbs present in this vegetation community include bluedicks, soaproot (*Chloragalum pomeridianum*), California poppy, and Italian thistle. The shrub and tree layer is absent from this vegetation community. This vegetation community is located throughout the Study Area.

Ruderal. Within the Study Area, ruderal areas include the sparsely vegetated upland areas that have been graded as a result of past roadway improvements, staging areas for wind farm activities, and barren areas associated with wind turbines. The soils are generally hard-packed and contain high concentrations of gravel. Vegetation cover is sparse in ruderal areas and dominated by introduced, non-native plant species such as redstemmed filaree (*Erodium cicutarium*), English plantain (*Plantago lanceolata*), common plantain (*P. major*), black mustard (*Brassica nigra*), rose clover (*Trifolium hirtum*), and yellow star-thistle (*Centaurea solstitialis*).

Developed. Developed areas are those that have been completely altered by anthropogenic or human activities and contain little to no vegetation. Within the Study Area, developed areas include buildings, un-vegetated parking areas and roadways, and wind turbine footings. Vegetation is largely absent from these areas.

Seasonal Wetland Swales. There are eight seasonal wetland swales in the Study Area. The eight swales are discernible from adjacent upland areas by a distinct change in vegetation. These features lack a defined bed and bank and only appear to be inundated seasonally. Seven of these swales occur in low areas at the saddle of hills, where they convey surface run-off from the surrounding uplands. The remaining swale meanders alongside a dirt access road prior to empting into a pond outside of the Study Area. The swales are dominated by hydrophytic species, such as Italian rye grass (*Festuca perennis*), foxtail barley (*Hordeum marinum*), Baltic rush (*Juncus balticus*), and rabbitsfoot grass (*Polypogon monspeliensis*). Surface water was only present in one of the swales during the May 2019 fieldwork.

Seasonal Wetland. There is one seasonal wetland (SW-1) that occurs adjacent to a dirt access road in the southern portion of the Study Area. The wetland is dominated by Baltic rush and Italian rye grass. No surface water was present in the wetland during the May 2019 fieldwork.

Intermittent Drainages. There are two intermittent drainages that flows north to south through the Study Area. These drainages convey pond overflow and/or surface run-off from the surrounding hillsides. There is no distinct riparian corridor associated with these drainages. Bank vegetation along the drainages includes rabbitsfoot grass, common monkeyflower (*Erythranthe guttata*), and common spikerush (*Eleocharis macrostachya*). Vegetation within the channels includes Baltic rush, American brooklime (*Veronica americana*), and watercress (*Nasturtium officinale*), as well as filamentous algae. Approximately 2 inches of flowing water was present in the two drainages during the May 2019 fieldwork.

Ephemeral Drainages. There are two ephemeral channels that, when inundated, flow roughly northwest through the southeast portion of the Study Area. The hydrology these channels are reliant on surface run-off/precipitation events. The banks of the channels support similar vegetation found in the California annual grassland and blue oak woodland communities discussed above.

Representative photographs of the project are included in Attachment B of this report.

SURVEY RESULTS

Special-Status Plants

Results of the CNDDB and CNPS searches identified nine special-status plant species as occurring or potentially occurring in the project region (refer to Attachment A). Of these, six were removed from consideration due to the lack of suitable habitat within or immediately adjacent to the project site, or because the project site is outside of the species' known range, and are therefore not addressed further in this report.

The remaining three plant species include spiny-sepaled button-celery (*Eryngium spinosepalum*) and shining navarretia (*Navarretia nigelliformis* ssp. *radians*), both identified by the CNPS as CRPR 1B.2 list species and both of which have moderate potential to occur within the project site, and one species, Hall's bush mallow (*Malacothamnus halli*), a CRPR 1B.2 list species that has been previously documented as occurring within the project site. These species are listed below in Table 2 and discussed in more detail below.

Table 2
Target Special-Status Species

Scientific Name	Common Name	Status *Federal/State/CRPR or Other*	Observed During 2019 Survey *(Yes/No)*
Eryngium spinosepalum	spiny-sepaled button-celery	None/None/1B.2	No
Malacothamnus hallii	Hall's bush-mallow	None/None/1B.2	No
Navarretia nigelliformis ssp. *radians*	shining navarretia	None/None/1B.2	No

Sources: CNPS 2019, CDFW 2019, USFWS 2019.
Notes: CRPR = California Rare Plant Rank.
CRPR:
1B = plants rare, threatened, or endangered in California and elsewhere
Threat Ranks:
.2 = moderately threatened in California (20%–80% of occurrences threatened/moderate degree and immediacy of threat)

All plant species observed within the project site were identified to the lowest taxonomic level necessary to determine rarity and are included in this report in Attachment 3.

Spiny-sepaled button-celery, Hall's bush-mallow, and shining navarretia were not identified in the survey area during the 2019 botanical survey. Species within the same genera (e.g. *Eryngium castrense*) were noted within the survey area and voucher specimens were collected to verify identification in a lab setting.

Spiny-sepaled button-celery (*Eryngium spinosepalum*). Spiny-sepaled button-celery is a dicot, California native perennial herb, and is distributed throughout central California (CNPS 2019). This species is found in valley and foothill grassland, and vernal pools. Spiny-sepaled button-celery's bloom period is between April and June. This species occurs at elevations between 260 and 3,200 feet.

This species has a moderate potential to occur within the project site. The seeps and mesic areas within the grassland present on site may provide potentially suitable habitat for this species. Spiny-sepaled button-celery was not identified in the study area during the May 2019 surveys.

Hall's bush mallow (*Malacothamnus halli*). Hall's bush mallow is a dicot, California native perennial evergreen shrub, and is distributed throughout the northern portion of the San Joaquin Valley (CNPS 2019). This species is found in chaparral and coastal scrub. The bloom period for Hall's bush mallow is between April and September, and sometimes October. Hall's bush mallow occurs at elevations between 30 and 2,495 feet.

This species is known to occur within the Park, along the SR-152 road cut; however, abundance and exact locations are not known due to lack of intensive surveys conducted within the Park (California State Parks 2006). The chaparral and scrub within the project site may provide potentially suitable habitat for this species. Hall's bush-mallow was not identified in the study area during the May 2019 surveys.

Shining navarretia (*Navarretia nigelliformis*). Shining navarretia is a dicot, California native annual herb, and is distributed throughout central California (CNPS 2019). This species is found in cismontane woodland, valley and foothill grassland, and edges of vernal pools. The bloom period for shining navarretia is between April and July. Shining navarretia occurs at elevations between 210 and 3,280 feet.

This species has a moderate potential to occur within the project site. The mesic areas within the woodland and grassland present on site may provide potentially suitable habitat for this species. Shining navarretia was not identified in the study area during the May 2019 surveys.

CONCLUSIONS AND RECOMMENDATIONS

A total of 122 species of native or naturalized plants, 75 native (61%) and 47 non-native (39%), was recorded on the site during the 2019 surveys (see Attachment C). As previously noted, Hall's bush-mallow has been historically documented on the project site, and spiny-sepaled button-celery and shining navarretia have a moderate potential to occur on the project site based on the presence of suitable habitat; however, none of these or any other special-status plant species, were observed during the onsite survey.

In accordance with CDFW plant survey guidance, if the project does not commence within 1 year, the botanical surveys should be repeated to verify the presence/absence of special-status plant species and to document any additional species that may have sprouted from the seedbank or may have been subsequently introduced in the project area. Many special-status plant species are annuals and thus may lie dormant in seedbanks or shift geographic location based on annual weather conditions.

If you have any questions or concerns regarding the content of this letter report, please contact me at 760.936.7969 or asennett@dudek.com.

Sincerely,

Allie Sennett, MS
Biologist
CDFW Voucher Plant Collection Permit No. 2081(a)-18-142-V

Attachments

Figures 1–4
A Special-Status Plant Species Potential to Occur within the Project Area
B Representative Site Photographs
C Plant Species Observed within the Project Area

cc: Keith Babcock, Dudek

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ATTACHMENT A

Special-Status Plant Species Potential to Occur within the Project Area

Attachment A
Special-Status Plant Species Potential to Occur within the Project Area

Scientific Name	Common Name	Status (Federal/State/CRPR)	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	Potential to Occur
Campanula exigua	chaparral harebell	None/None/1B.2	Chaparral (rocky, usually serpentinite)/annual herb/May–June/900–4,100	**Not expected to occur**. Although chaparral onsite may provide potentially suitable habitat for this species, the nearest documented occurrence for this species is located greater than 14 miles northwest of the project site (CNDDB Occ. No. 6; CDFW 2017).
Delphinium californicum ssp. *interius*	Hospital Canyon larkspur	None/None/1B.2	Chaparral (openings), Cismontane woodland (mesic), Coastal scrub/perennial herb/Apr–June/635–3,595	**Low potential to occur**. Although the chaparral, woodland, and scrub on site provide potentially suitable habitat; the nearest documented occurrence of this species is located approximately 7 miles north of the project site (CNDDB Occ. No. 3; CDFW 2017).
Eryngium spinosepalum	spiny-sepaled button-celery	None/None/1B.2	Valley and foothill grassland, Vernal pools/annual / perennial herb/Apr–June/260–3,200	**Moderate potential to occur**. Seeps and mesic areas in the grassland onsite may provide potentially suitable habitat for this species. The nearest documented occurrence of this species is located approximately 1 miles northeast of the project site (CNDDB Occ. No. 91; CDFW 2017).
Malacothamnus arcuatus	arcuate bush-mallow	None/None/1B.2	Chaparral, Cismontane woodland/perennial evergreen shrub/Apr–Sep/45–1,165	**Not expected to occur**. Although there is potentially suitable habitat for this species in the chaparral and woodland onsite, the nearest documented occurrence for this species is located more than 20 miles west of the project site (CNDDB Occ. No. 3; CDFW 2017).
Malacothamnus hallii	Hall's bush-mallow	None/None/1B.2	Chaparral, Coastal scrub/perennial evergreen shrub/(Apr)May–Sep(Oct)/30–2,495	**Present**. The chaparral and scrub onsite provide potentially suitable habitat for this species. This species was previously documented within the project site in 2009 (CNDDB Occ. No. 2; CDFW 2017).
Navarretia gowenii	Lime Ridge navarretia	None/None/1B.1	Chaparral/annual herb/May–June/590–1,000	**Not expected to occur**. Although chaparral onsite may provide potentially suitable habitat for this species, the nearest documented occurrence is located more than 8 miles north of the project site (CNDDB Occ. No. 1; CDFW 2017).
Navarretia nigelliformis ssp. *radians*	shining navarretia	None/None/1B.2	Cismontane woodland, Valley and foothill grassland, Vernal pools; Sometimes clay/annual herb/(Mar)Apr–July/210–3,280	**Moderate potential to occur**. Mesic areas in the woodland and grassland onsite provide potentially suitable habitat for this species. The nearest documented occurrence is located approximately 5 miles south of the project site (CNDDB Occ. No. 12; CDFW 2017).

Scientific Name	Common Name	Status (Federal/State/CRPR)	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	Potential to Occur
Puccinellia simplex	California alkali grass	None/None/1B.2	Chenopod scrub, Meadows and seeps, Valley and foothill grassland, Vernal pools; Alkaline, vernally mesic; sinks, flats, and lake margins/annual herb/Mar–May/5–3,050	Not expected to occur. Although the seeps and mesic areas in the grassland on site provide potentially suitable habitat, the nearest documented occurrence for this species is located approximately 10 miles southeast of the project site (CNDDB Occ. No. 30; CDFW 2017).
Streptanthus insignis ssp. *lyonii*	Arburua Ranch jewelflower	None/None/1B.2	Coastal scrub (sometimes serpentinite)/annual herb/Mar–May/750–2,805	Not expected to occur. Although the scrub onsite provides potentially suitable habitat for this species, the nearest documented occurrence is located approximately 8 miles south of the project site (CNDDB Occ. No. 10; CDFW 2017).

Notes:

Species database searches include data from the United States Geologic Survey (USGS) Pacheco Pass, California quadrangle and eight surrounding quadrangles (Mustang Peak, Crevison Peak, Howard Ranch, Pacheco Peak, San Luis Dam, Three Sisters, Mariposa Peak, and Los Banos Valley).

Status Legend:

California Native Plant Society Rare Plant Rank (CRPR)

CRPR 1A: Plants Presumed Extirpated in California and either Rare or Extinct Elsewhere
CRPR 1B: Plants Rare, Threatened, or Endangered in California and Elsewhere
CRPR 2A: Plants Presumed Extirpated in California, But More Common Elsewhere
CRPR 2B: Plants Rare, Threatened, or Endangered in California, But More Common Elsewhere
.1 Seriously threatened in California (over 80% of occurrences threatened / high degree and immediacy of threat)
.2 Moderately threatened in California (20-80% occurrences threatened / moderate degree and immediacy of threat)
.3 Not very threatened in California (<20% of occurrences threatened / low degree and immediacy of threat or no current threats known)"

Sources:

CDFW (California Department of Fish and Wildlife). 2017. California Natural Diversity Database (CNDDB). RareFind, Version 5. (Commercial Subscription). Sacramento, California: CDFW, Biogeographic Data Branch. http://www.dfg.ca.gov/biogeodata/ cnddb/mapsanddata.asp.

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ATTACHMENT B

Representative Site Photographs

Photo 1. View of California annual grassland and blue oak savannah. November 15, 2017.

Photo 2. View of a vegetated swale. November 15, 2017.

Photo 3. View of blue oak woodland, California annual grassland, and California sycamore woodland. November 15, 2017.

Photo 4. View of coastal sage scrub, and blue oak woodland, California annual grassland. November 15, 2017.

Photo 5. View of holly leaf cherry chaparral. November 15, 2017.

Photo 6. View of blue oak savannah. San Luis Reservoir is partially visible in the background. November 15, 2017.

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ATTACHMENT C

Plant Species Observed within the Project Area

EUDICOTS

VASCULAR SPECIES

ADOXACEAE—MUSKROOT FAMILY

Sambucus nigra—blue elderberry

ANACARDIACEAE—SUMAC OR CASHEW FAMILY

Toxicodendron diversilobum—poison oak

APIACEAE—CARROT FAMILY

Daucus pusillus—American wild carrot
Eryngium castrense—Great Valley eryngo
Lomatium utriculatum—common lomatium
Sanicula bipinnata—poison sanicle
Sanicula bipinnatifida—purple sanicle

APOCYNACEAE—DOGBANE FAMILY

Asclepias fascicularis—Mexican whorled milkweed

ASTERACEAE—SUNFLOWER FAMILY

Achillea millefolium—common yarrow
Achyrachaena mollis—blow wives
Artemisia californica—California sagebrush
Baccharis pilularis—coyote brush
* *Carduus pycnocephalus*—Italian plumeless thistle
* *Centaurea calcitrapa*—red star-thistle
* *Centaurea melitensis*—Maltese star-thistle
* *Centaurea solstitialis*—yellow star-thistle
Corethrogyne filaginifolia—sand-aster
Grindelia hirsutula—hairy gumweed
* *Grindelia squarrosa*—curlycup gumweed
Holocarpha heermannii—Heermann's tarweed
* *Lactuca serriola*—prickly lettuce
* *Leontodon saxatilis*—lesser hawkbit
* *Logfia gallica*—narrowleaf cottonrose
Madia gracilis—grassy tarweed
* *Senecio vulgaris*—old-man-in-the-Spring
* *Silybum marianum*—blessed milkthistle
* *Sonchus asper*—spiny sowthistle

BETULACEAE—BIRCH FAMILY

Alnus rhombifolia—white alder

BORAGINACEAE—BORAGE FAMILY

Amsinckia menziesii—Menzies' fiddleneck

Plagiobothrys nothofulvus—popcorn flower

BRASSICACEAE—MUSTARD FAMILY

* *Brassica nigra*—black mustard

* *Capsella bursa-pastoris*—shepherd's purse

Cardamine californica—milkmaids

Nasturtium officinale—watercress

CAPRIFOLIACEAE—HONEYSUCKLE FAMILY

Symphoricarpos mollis—creeping snowberry

CARYOPHYLLACEAE—PINK FAMILY

* *Spergularia rubra—red* sandspurry

CRASSULACEAE—STONECROP FAMILY

Crassula connata—sand pygmyweed

CUCURBITACEAE—GOURD FAMILY

Marah fabacea—California man-root

EUPHORBIACEAE—SPURGE FAMILY

Croton setiger—dove weed

FABACEAE—LEGUME FAMILY

Acmispon americanus—Spanish clover

Acmispon glaber—deer weed

Acmispon wrangelianus—Chilean bird's-foot trefoil

* *Lotus corniculatus*—bird's-foot trefoil

Lupinus bicolor—miniature lupine

Lupinus microcarpus—valley lupine

* *Medicago polymorpha*—burclover

* *Melilotus indicus*—annual yellow sweetclover

Trifolium bifidum—notchleaf clover

* *Trifolium hirtum*—rose clover

Trifolium willdenovii—tomcat clover

* *Vicia villosa*—winter vetch

FAGACEAE—OAK FAMILY

Quercus agrifolia—coast live oak

Quercus douglasii—blue oak

Quercus wislizeni—interior live oak

GERANIACEAE—GERANIUM FAMILY

* *Erodium cicutarium*—redstem stork's bill

* *Geranium dissectum*—cutleaf geranium

GROSSULARIACEAE—GOOSEBERRY FAMILY

Ribes californicum—hillside gooseberry

LAMIACEAE—MINT FAMILY

* *Marrubium vulgare*—horehound

Scutellaria siphocampyloides—grayleaf skullcap

Trichostema lanceolatum—vinegarweed

LYTHRACEAE—LOOSESTRIFE FAMILY

* *Lythrum hyssopifolia*—hyssop loosestrife

MONTIACEAE—MONTIA FAMILY

Calandrinia menziesii—red maids

Claytonia perfoliata—miner's lettuce

MYRSINACEAE—MYRSINE FAMILY

* *Lysimachia arvensis*—scarlet pimpernel

ONAGRACEAE—EVENING PRIMROSE FAMILY

Clarkia purpurea—winecup clarkia

Taraxia ovata—goldeneggs

PAPAVERACEAE—POPPY FAMILY

Eschscholzia californica—California poppy

PHRYMACEAE—LOPSEED FAMILY

Diplacus aurantiacus—bush monkeyflower

Erythranthe guttata—common monkey flower

PLANTAGINACEAE—PLANTAIN FAMILY

* *Plantago lanceolata*—narrowleaf plantain

* *Plantago major*—common plantain

Veronica americana—American speedwell

PLATANACEAE—PLANE TREE, SYCAMORE FAMILY

Platanus racemosa—California sycamore

POLEMONIACEAE—PHLOX FAMILY

Leptosiphon bicolor—true babystars

POLYGONACEAE—BUCKWHEAT FAMILY

Eriogonum fasciculatum—California buckwheat

Eriogonum nudum—naked buckwheat

* *Persicaria maculosa*—spotted ladysthumb

* *Polygonum aviculare*—prostrate knotweed

* *Rumex acetosella*—common sheep sorrel

* *Rumex crispus*—curly dock

* *Rumex pulcher*—fiddle dock

PRIMULACEAE—PRIMROSE FAMILY

Primula clevelandii—no common name

RANUNCULACEAE—BUTTERCUP FAMILY

Ranunculus aquatilis—white water crowfoot

Ranunculus californicus—California buttercup

ROSACEAE—ROSE FAMILY

Adenostoma fasciculatum—chamise

Cercocarpus betuloides—birch leaf mountain mahogany

Heteromeles arbutifolia—toyon

Prunus ilicifolia—holly leaf cherry

SAPINDACEAE—SOAPBERRY FAMILY

Aesculus californica—California buckeye

SCROPHULARIACEAE—FIGWORT FAMILY

Scrophularia californica—California figwort

SOLANACEAE—NIGHTSHADE FAMILY

Datura wrightii—sacred thorn-apple

Solanum umbelliferum—bluewitch nightshade

VERBENACEAE—VERVAIN FAMILY

Phyla nodiflora—turkey tangle fogfruit

VIOLACEAE—VIOLET FAMILY

Viola pedunculata—Johnny-jump-up

FERNS AND FERN ALLIES

VASCULAR SPECIES

PTERIDACEAE—BRAKE FAMILY

Pentagramma triangularis—goldback fern

GYMNOSPERMS AND GNETOPHYTES

VASCULAR SPECIES

PINACEAE—PINE FAMILY

Abies grandis—grand fir

Pinus radiata—Monterey pine

MONOCOTS

VASCULAR SPECIES

AGAVACEAE—AGAVE FAMILY

Chlorogalum pomeridianum—wavyleaf soap plant

CYPERACEAE—SEDGE FAMILY

Eleocharis macrostachya—pale spike rush

JUNCACEAE—RUSH FAMILY

Juncus balticus—no common name

Juncus bufonius—toad rush

LILIACEAE—LILY FAMILY

Calochortus superbus—yellow mariposa

Calochortus venustus—butterfly mariposa lily

POACEAE—GRASS FAMILY

* *Aira caryophyllea*—silver hairgrass

* *Avena barbata*—slender oat

* *Avena fatua*—wild oat

* *Bromus diandrus*—ripgut brome

* *Bromus hordeaceus*—soft brome

* *Bromus tectorum*—cheatgrass

* *Cynodon dactylon*—Bermudagrass

* *Digitaria sanguinalis*—hairy crabgrass
* *Elymus caput-medusae*—medusahead
* *Festuca myuros*—rat-tail fescue
* *Festuca perennis*—perennial rye grass
* *Gastridium phleoides*—nit grass
* *Hordeum marinum*—seaside barley
* *Hordeum murinum*—mouse barley
* *Poa annua*—annual bluegrass
* *Polypogon monspeliensis*—annual rabbitsfoot grass
Stipa pulchra—purple needlegrass

THEMIDACEAE—BRODIAEA FAMILY

Brodiaea elegans—harvest brodiaea
Dichelostemma capitatum—bluedicks

* signifies introduced (non-native) species

APPENDIX D2

Jurisdictional Delineation

PRELIMINARY JURISDICTIONAL DELINEATION OF WETLANDS AND WATERS OF THE UNITED STATES GONZAGA RIDGE WIND PROJECT MERCED COUNTY, CALIFORNIA

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Preliminary Jurisdictional Delineation of Wetlands and Waters of the United States Gonzaga Ridge Wind Repowering Project

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ACRONYMS AND ABBREVIATIONS

Acronym/Abbreviation	Definition
ACOE	U.S. Army Corps of Engineers
CDFW	California Department of Fish and Wildlife
CWA	Clean Water Act
OHWM	ordinary high water mark
Rapanos	*Rapanos v. United States* and *Carabell v. United States Army Corps of Engineers*
RWQCB	Regional Water Quality Control Board
SWANCC	*Solid Waste Agency of Northern Cook County v. United States Corps of Engineers*
TNW	traditional navigable waters

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Preliminary Jurisdictional Delineation of Wetlands and Waters of the United States Gonzaga Ridge Wind Repowering Project

1 INTRODUCTION

This report documents the results of a preliminary jurisdictional delineation of wetlands and other waters of the United States conducted for the Gonzaga Ridge Wind Repowering Project (Project) located in Pacheco State Park (Park), Merced County, California. The results of this delineation are preliminary until verified by the Sacramento District of the U.S. Army Corps of Engineers (ACOE). For the purpose of this study, the area in which the delineation was conducted (Study Area) includes all areas of potential ground disturbance within the generation area at the time of the delineation effort, including turbine footings, permanent and temporary access roads, staging and laydown areas, and other permanent infrastructure. Because the exact location of transmission towers/pads, laydown/staging areas, and access roads associated with the proposed New Transmission line (connecting the turbine generation area to the PG&E Los Banos Substation approximately 16 miles to the east) had not been finalized at the time of this delineation effort, a jurisdictional delineation of the New Transmission Line was not conducted.

1.1 Project Location

The project consists of approximately 1,766 acres of moderate to steeply sloped hills supporting relatively undisturbed (and some disturbed in association with the existing wind farm) natural plant communities and existing infrastructure, including dirt roads, buildings, 162 wind turbines, and several ponds. The Study Area is located in the western portion of Merced County, just southwest of the San Luis Reservoir (see Figure 1, Project Location and Figure 2, Project Site). The Study Area is located in Township 10S, Range 7E, and Sections 13, 14, 16, 21, 22, 23, 24, 25, 26, 27, and 28 of the "Pacheco Pass, CA" U.S. Geological Survey 7.5-minute quadrangle. The approximate center of the site corresponds to 37°2′39.54″ north latitude and 121°11′5.72″ west longitude.

1.2 Directions to the Study Area

From Sacramento, travel south on Interstate 5 for approximately 112 miles. Take exit 407 for State Route (SR) 33 toward Santa Nella/Gilroy and turn right onto Santa Nella Boulevard. After approximately 3 miles, turn right to merge onto SR 152 West and continue for 13.5 miles. Turn left onto Dinosaur Point Road, then right onto Windmill Road. The Study Area begins after the gate on Windmill Road.

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2 PROJECT DESCRIPTION

The proposed Project will replace 162 existing older model turbines and upgrade an existing wind energy facility with substantially fewer and more efficient wind turbines and associated facilities. The Project would consist of up to 40 new wind turbines and associated infrastructure within the Park, as well as land owned by the Bureau of Reclamation (BOR) for an approximately 16-mile 70 kV above-ground transmission line to a PG&E substation west of Los Banos. The area where the wind turbines would be located (generation area) is referred to as the Project Site while the combination of the turbine generation area and the transmission line corridor is hereafter referred to as the Project Area. As described in Section 1.1, the Study Area analyzed herein consists of all areas of potential ground disturbance at the time of the delineation effort, within the Project Site, including turbine footings, permanent and temporary access roads, staging and laydown areas, and other permanent infrastructure.

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3 REGULATORY BACKGROUND

3.1 Federal Statutes and Regulations – U.S. Army Corps of Engineers

Any person or public agency proposing to discharge dredged or fill material into waters of the United States, including jurisdictional wetlands, must obtain a permit from the ACOE.

As defined in Title 33 of the Code of Federal Regulations, Section 328.3, waters of the United States include all waters subject to interstate or foreign commerce, including tidal waters, interstate waters and wetlands, many intrastate waters, impoundments, tributaries, the territorial seas, and adjacent wetlands. Specifically, Section 328.3 of Title 33 of the Code of Federal Regulations defines waters of the United States as follows:

1. For purposes of the Clean Water Act, 33 USC 1251 et seq. and its implementing regulations, subject to the exclusions in paragraph (b) of this section, the term "waters of the United States" means:
    1. All waters which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
    2. All interstate waters, including interstate wetlands;
    3. The territorial seas;
    4. All impoundments of waters otherwise identified as waters of the United States under this section;
    5. All tributaries, as defined in paragraph (c)(3) of this section, of waters identified in paragraphs (a)(1) through (3) of this section;
    6. All waters adjacent to a water identified in paragraphs (a)(1) through (5) of this section, including wetlands, ponds, lakes, oxbows, impoundments, and similar waters.
2. The following are not "waters of the United States" even where they otherwise meet the terms of paragraphs (a)(4) through (8) of this section.
    1. Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of the Clean Water Act.
    2. Prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other Federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with EPA.

For non-tidal waters of the United States, the lateral limits of ACOE jurisdiction extend to the ordinary high water mark (OHWM) when no adjacent wetlands are present. As defined in the Code of Federal Regulations, Title 33, Section 328.3(e), the OHWM is "that line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas." If adjacent wetlands are present, the jurisdiction extends to the limit of wetlands.

Wetlands are "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (33 CFR 328.3). Wetlands are jurisdictional if they meet this definition and the definition of waters of the United States. The ACOE predominantly uses Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (ACOE 2008) methodology to determine the presence of wetlands. According to the manual (ACOE 2008), three criteria must be satisfied to classify an area as a wetland: (1) a predominance of plant life that is adapted to life in wet conditions (hydrophytic vegetation); (2) soils that saturate, flood, or pond long enough during the growing season to develop anaerobic conditions in the upper part (hydric soils); and (3) permanent or periodic inundation or soils saturation, at least seasonally (wetland hydrology). Further guidance for determining jurisdictional limits in ephemeral riverine systems in the Arid West is detailed in A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States (ACOE 2010).

In the last two decades, two major court cases have affected the jurisdictional reach of Section 404 of the Clean Water Act (CWA): (1) *Solid Waste Agency of Northern Cook County v. United States Corps of Engineers* (*SWANCC*) and (2) *Rapanos v. United States* and *Carabell v. United States Army Corps of Engineers* (*Rapanos*).

Solid Waste Agency of Northern Cook County v. United States Corps of Engineers

In 1986, in an attempt to clarify the reach of its jurisdiction, ACOE stated that Section 404(a) of the CWA extends to intrastate waters (51 FR 41217):

a. Which are or would be used as habitat by birds protected by Migratory Bird Treaties; or
b. Which are or would be used as habitat by other migratory birds which cross state lines; or
c. Which are or would be used as habitat for endangered species; or
d. Used to irrigate crops sold in interstate commerce.

In 2001, the U.S. Supreme Court, in its judgment on the *SWANCC* case, held that the Code of Federal Regulations, Title 33, Section 328.3(a)(3), as clarified and applied to the *SWANCC* site pursuant to the Migratory Bird Rule (51 FR 41217), exceeded the authority granted to ACOE under Section 404(a) of the CWA. Therefore, ACOE may not rely on the Migratory Bird Rule to establish a "significant nexus" to interstate or foreign commerce. In additional language, the U.S. Supreme Court majority opinion reasoned that these types of waters required some nexus to navigable waters. Although no formal guidance was issued by ACOE interpreting the extent to which the *SWANCC* decision would limit jurisdictional determinations, in practice, ACOE considers intrastate waters as waters of the United States where there is an appropriate connection to navigable water or other clear interstate commerce connection (*SWANCC v. ACOE* 2001).

Rapanos v. United States and Carabell v. United States Army Corps of Engineers

In 2006, the U.S. Supreme Court again issued an opinion on the extent ACOE had jurisdiction over certain waters under Section 404 of the CWA. The *Rapanos* consolidated decisions addressed the question of jurisdiction over attenuated tributaries to waters of the United States, as well as wetlands adjacent to those tributaries (*Rapanos v. United States* 2006).

ACOE and the U.S. Environmental Protection Agency issued guidance related to the *Rapanos* decision on June 5, 2007. The guidance identifies the waters the agencies (i.e., ACOE and the U.S. Environmental Protection Agency) will assert jurisdiction over categorically and on a case-by-case basis based on the reasoning of the *Rapanos* opinions. In summary, ACOE will continue to assert jurisdiction over the following:

- Traditional navigable waters (TNWs) and their adjacent wetlands.
- Non-navigable tributaries of TNWs that are relatively permanent (e.g., tributaries that typically flow year-round or have a continuous flow at least seasonally) and wetlands that directly abut such tributaries (e.g., not separated by uplands, berm, dike, or similar feature).

  Note: Relatively permanent waters do not include ephemeral tributaries, which flow only in response to precipitation, and intermittent streams, which do not typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months).
- Non-relatively permanent waters, if determined (on a fact-specific analysis) to have a significant nexus with a TNW—including non-navigable tributaries that do not typically flow year-round or have continuous flow at least seasonally, wetlands adjacent to such tributaries, and wetlands adjacent to but that do not directly abut such tributaries. Absent a significant nexus, jurisdiction is lacking.

A significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or an insubstantial effect on the chemical, physical, and/or biological integrity of a TNW. Principal considerations when evaluating significant nexus include volume, duration, and frequency of the flow of water in the tributary and the proximity of the tributary to a TNW, including hydrologic, ecologic, and other functions performed by the tributary and all of its adjacent wetlands. Certain ephemeral waters in the Arid West are distinguishable from the geographic features described previously, where such ephemeral waters are tributaries and have a significant nexus to downstream TNWs. For example, these ephemeral tributaries may serve as a transitional area between the upland environment and the TNW. These ephemeral tributaries may provide habitat for wildlife and aquatic organisms in downstream TNWs and support nutrient cycling, sediment retention and transport, pollutant trapping and filtration, and improvement of water quality.

Swales or erosional features (e.g., gullies and small washes characterized by low-volume, infrequent, or short-duration flow) are generally not considered waters of the United States because they are not tributaries or they do not have a significant nexus to downstream TNWs. In addition, ditches (including roadside ditches) excavated wholly in and draining only uplands, and that do not carry a relatively permanent flow of water, are generally not considered waters of the United States because they are not tributaries or they do not have a significant nexus to downstream TNWs. Even when not jurisdictional under Section 404 of the CWA, these features may still be jurisdictional at state or local levels, such as under Section 401 of the CWA, the Porter-Cologne Water Quality Control Act (Porter-Cologne Act), and Section 1602 of the California Fish and Game Code.

Prior to the *Rapanos* guidance, ACOE required its regional districts to request concurrence for only those jurisdictional determinations where the district was planning to assert jurisdiction over a non-navigable, intrastate, isolated water and/or wetland. The agencies now require that all determinations for non-navigable, intrastate, isolated waters be submitted for ACOE and U.S. Environmental Protection Agency review prior to the district making a final decision on the jurisdictional determination.

ACOE-Regulated Activities

Under Section 404 of the CWA, ACOE regulates activities that involve a discharge of dredged or fill material, including but not limited to grading, placing riprap for erosion control, pouring concrete, laying sod, and stockpiling excavated material into waters of the United States. Activities that generally do not involve a regulated discharge (if performed specifically in a manner to avoid discharges) include driving pilings, providing some drainage channel maintenance activities, and excavating without stockpiling.

3.2 State of California

California Department of Fish and Wildlife

Pursuant to Section 1602 of the California Fish and Game Code, the California Department of Fish and Wildlife (CDFW) regulates all diversions, obstructions, or changes to the natural flow or bed, channel, or bank of any river, stream, or lake that supports fish or wildlife.

In Title 14 of the California Code of Regulations, Section 1.72, CDFW defines a "stream" (including creeks and rivers) as "a body of water that flows at least periodically or intermittently through a bed or channel having banks and supports fish or other aquatic life. This includes watercourses having a surface or subsurface flow that supports or has supported riparian vegetation."

In Title 14 of the California Code of Regulations, Section 1.56, CDFW's definition of "lake" includes "natural lakes or man-made reservoirs." Diversion, obstruction, or change to the natural flow or bed, channel, or bank of any river, stream, or lake that supports fish or wildlife requires authorization from CDFW by entering into an agreement pursuant to Section 1602 of the Fish and Game Code.

California Regional Water Quality Control Board

Pursuant to Section 401 of the federal CWA, the Regional Water Quality Control Board (RWQCB) regulates discharging waste, or proposing to discharge waste, within any region that could affect a water of the state (California Water Code, Section 13260(a)), pursuant to provisions of the Porter-Cologne Act. "Waters of the state" are defined as "any surface water or groundwater, including saline waters, within the boundaries of the state" (California Water Code, Section 13050(e)). Before ACOE will issue a CWA Section 404 permit, applicants must receive a CWA Section 401 Water Quality Certification from the RWQCB. If a CWA Section 404 permit is not required for the project, the RWQCB may still require a permit (i.e., Waste Discharge Requirement) for impacts to waters of the state under the Porter-Cologne Act.

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4 METHODOLOGY

4.1 Literature Review

Prior to conducting fieldwork at the Study Area, Dudek biologists reviewed the following available resources:

- 1:200-scale aerial photograph (Google Earth 2019)
- Historic aerial photographs (Historicaerials.com 2019)
- U.S. Geological Survey 7.5-minute topographic quadrangle (USGS 2019)
- U.S. Department of Agriculture Natural Resources Conservation Services Web Soil Survey (USDA 2019a)
- National Wetland Inventory (USFWS 2019)

4.2 Jurisdictional Delineation

Potential wetlands or waters of the United States were delineated based on methodology described in the 1987 Corps of Engineers Wetlands Delineation Manual (ACOE 1987) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (ACOE 2008). Non-wetland waters of the United States are delineated based on the presence of an OHWM, as determined using the methodology in A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States (ACOE 2010). Dudek biologists collected photographic records that represent on-site habitats (Appendix A).

4.3 Flora

To the extent feasible due to the timing of the survey and the phenology of the plants, Dudek biologists identified all plant species encountered to the lowest taxonomic level needed to determine wetland plant indicator status. Those species that could not be immediately identified were brought into the laboratory for further investigation. Latin names follow the Jepson Interchange List of Currently Accepted Names of Native and Naturalized Plants of California (Jepson Flora Project 2019), and common names follow the U.S. Department of Agriculture Natural Resources Conservation Service PLANTS Database (USDA 2019b). Wetland plant indicator status for each plant was determined using the Arid West regional list of the National Wetland Plant List: 2016 (ACOE 2016). Appendix A shows representative site photographs, and Appendix B contains a complete list of plant species observed during the field surveys.

4.4 Field Assessment and Desktop Review

Dudek biologists Laura Burris and Allie Sennett conducted a jurisdictional delineation within the Study Area on May 22 and 23, 2019 to document current site conditions and to determine whether or not previously identified aquatic features would be considered a wetland or other waters of the United States. The focus of the delineation was in areas identified by the project applicant as being within or immediately adjacent to proposed limits of disturbance associated with the wind turbine project. Ms. Burris and Ms. Sennett took sample points in representative locations and when necessary to assess the potential for hydric soils, hydrophytic vegetation, and hydrology. Data at two stream transects were collected to assess channel hydrology and geomorphology. Sample point data sheets and channel transects are included in this report as Appendix C.

Approximately 136 acres was added to the Study Area after the May 2019 field surveys. Dudek biologists conducted a desktop review of aerial photographs and topographic maps to determine if potential wetlands or other water exist in the 136 acres based on an assessment of aerial signatures and topographic contours. Results of the sample points, channel transect analyses, and desktop review are presented in Section 6, Results of the Jurisdictional Delineation.

5 PHYSICAL CHARACTERISTICS

5.1 Land Uses

As previously stated, the Study Area is located within Pacheco State Park. The Park consists of 6,900 acres of former ranchland along SR 152 known as Pacheco Pass, at the edge of the Diablo Mountain Range. Grazing, hiking, mountain biking and horseback riding occur within the Park (California State Parks 2006).

The Park, and much of the privately-owned land surrounding the Park to the north, west, and south, is largely undeveloped and is characterized by rolling to steep topography dominated by grassland and oak savannah with various-sized patches of oak woodland and scrub vegetation interspersed with intermittent and perennial drainages and associated riparian vegetation. Much of the surrounding area outside the Park is used as grazing land by private ranches. The land between Pacheco State Park and the San Luis Reservoir State Recreation Area (SRA) to the east belongs to the BOR, is managed by the California Department of Parks and Recreation (CDPR).

5.2 Topography and Soils

The Study Area is located at the edge of the Diablo Mountain Range. Elevations within the Study Area vary from approximately 1,020 feet above mean sea level to 1,530 feet above mean sea level. Topography in the Study Area ranges from moderate to steeply sloped hills.

The U.S. Department of Agriculture (USDA) Soil Survey mapped the Project Area as being underlain by the following soil types: Millsholm Loam, Millsholm-Rock outcrop complex, Fifield-Gonzaga complex, Fifield-Millsholm complex, Quinto-Millsholm-Rock outcrop complex, Asolt very stony clay, and water (USDA 2019a). None of the soils within the Project site have a hydric rating (USDA 2018a).

5.3 Watershed and Hydrology

The Study Area occurs within the Panoche-San Luis Reservoir watershed, as part of the San Joaquin River Basin, and runoff from the Study Area flows into San Luis Reservoir through San Luis Creek (Figure 4, Hydrologic Setting; USGS 2019b). There are several unnamed National Hydrography Dataset (NHD) flow lines that run from the Study Area into the San Luis Reservoir (USGS 2019b). The three main tributaries within the Study Area include Hidden Creek and two unnamed ephemeral drainages, all of which have been modified to include ponds.

The National Wetlands Inventory identifies five waters of the United States, including Wolf Lake, Mammoth Lake, and three intermittent drainages, in the Study Area (Figure 4, Hydrologic Setting; USFWS 2019).

6 RESULTS OF THE JURISDICTIONAL DELINEATION

The land cover within the project area consists of a combination of terrestrial non-vegetative land covers and natural vegetation communities, as well as aquatic land cover types. The vegetation communities and land covers have been adapted from the Manual of California Vegetation, Online Edition (CNPS 2018), the California Natural Community List (CDFW 2018), and the Pacheco State Park General Plan Environmental Impact Report (California State Parks 2006). The following vegetation communities and land cover types were documented on site and are described in further detail in later sections: California sage brush scrub, holly leaf cherry chaparral, blue oak woodland and savannah, California buckeye groves, California sycamore woodland, purple needle grass grassland, California annual grassland, ruderal, developed, seasonal wetland swale, seasonal wetland, intermittent drainage, and ephemeral drainage.

6.1 Terrestrial Habitat Types

California Sage Brush Scrub. Within the Study Area, California sage brush scrub forms an intermittent to dense shrub layer. The herbaceous layer is limited to openings and is poorly developed in established stands. Trees are occasionally present at lower levels of slopes. The on-site alliance is dominated by California sage brush and contains occasional coyote brush, deerweed, and California buckwheat (*Eriogonum fasciculatum*). The tree layer is emergent, open, occasional, and predominantly includes blue oak (*Quercus douglasii*). This vegetation community occurs on steeper slopes throughout the Study Area.

Holly Leaf Cherry Chaparral. Within the Study Area, holly leaf cherry chaparral forms an intermittent shrub layer dominated by holly leaf cherry. The community onsite is isolated and the herbaceous layer is generally poorly developed; a number of the holly leaf cherry shrubs were in poor health with a high degree of vegetation dieback. The soils associated with this community are loose and highly erodible. Trees are occasionally present and consist primarily of blue oak. This vegetation community is located in isolated north-facing portions of hillslopes in the northern portion of the Study Area.

Blue Oak Woodland. Blue oak woodland within the Study Area forms an open to intermittent tree layer with a sparse shrub layer. The herbaceous layer is consistent with adjacent California annual grasslands, as described in further detail, below. The on-site alliance is dominated by blue oak, with sporadic gray pine intermixed where this community occurs on higher elevation slopes. The blue oak woodlands are located primarily on hillslopes throughout the Study Area.

Blue Oak Savannah. Blue oak savannah within the Study Area contains only blue oak in the tree canopy and shrubs are largely absent. The understory consists of California annual grassland, as described below, with the addition of increased cover of non-native Italian thistle (*Carduus pycnocephalus*), barbed goat grass (*Aegelops triuncalis*), and wild carrot (*Daucus pusillus*). This vegetation community shows evidence of past and current cattle grazing and the thatch of previous years' grass growth is thick.

California Buckeye Grove. California buckeye grove forms an open to intermittent shrub layer within the Study Area. The herbaceous layer is limited to openings and is generally poorly developed in established stands. Trees are occasionally present. The on-site alliance is dominated by California buckeye with the occasional blue oak tree interspersed. The shrub layer includes California sagebrush and poison oak. The California buckeye grove onsite is limited to a north-facing slope in the northern portion of the Study Area.

California Sycamore Woodland. Within the Study Area, California sycamore woodland forms an open to intermittent tree layer dominated by California sycamore in association with coast live oak. The shrub layer is sparse and contains poison oak and California sagebrush. The herbaceous layer is grassy and contains similar species as those described in the California annual grassland, below. The California sycamore woodland is limited to a single, deeply incised stream channel in the southwestern portion of the Study Area.

Purple Needle Grass. Within the Study Area, purple needle grass forms an open grass canopy with approximately 15 percent absolute cover in association with other grasses such as wild oat (*Avena fatua*) and bromes (*Bromus* spp.). The shrub and tree layer is absent from this vegetation community. This vegetation community is located in isolated patch on a south-facing hillslope in the northern portion of the Study Area.

California Annual Grassland. California annual grassland in the Study Area is co-dominated by wild oat, ripgut brome (*Bromus diandrus*), and soft chess (*Bromus hordeaceus*). Additional grasses include barbed goat grass, purple needle grass, rattail fescue (*Festuca myuros*), and Italian ryegrass (*Festuca perennis*). Forbs present in this vegetation community include bluedicks, soaproot (*Chloragalum pomeridianum*), California poppy, and Italian thistle. The shrub and tree layer is absent from this vegetation community. This vegetation community is located throughout the Study Area.

Ruderal. Within the Study Area, ruderal areas include the sparsely vegetated upland areas that have been graded as a result of past roadway improvements, staging areas for wind farm activities, and barren areas associated with wind turbines. The soils are generally hard-packed and contain high concentrations of gravel. Vegetation cover is sparse in ruderal areas and dominated by introduced, non-native plant species such as redstemmed filaree (*Erodium cicutarium*), English plantain (*Plantago lanceolata*), common plantain (*P. major*), black mustard (*Brassica nigra*), rose clover (*Trifolium hirtum*), and yellow star-thistle (*Centaurea solstitialis*).

Developed. Developed areas are those that have been completely altered by anthropogenic or human activities and contain little to no vegetation. Within the Study Area, developed areas include buildings, un-vegetated parking areas and roadways, and wind turbine footings. Vegetation is largely absent from these areas.

6.2 Aquatic Habitat Types

Wetlands

Seasonal Wetland Swales 1-8. There are eight seasonal wetland swales (SWS) in the Study Area (see Figures 4A, 4D, 4E, 4G, 4H, 4J, and 4K). These features lack a defined bed and bank and only appear to be inundated seasonally. Seven of these swales (SWS-1 and SWS-3 through SWS-8) occur in low areas at the saddle of hills, where they convey surface run-off from the surrounding uplands. The remaining swale (SWS-2) meanders alongside a dirt access road prior to empting into a pond outside of the Study Area.

The eight swales are discernible from adjacent upland areas by a distinct change in vegetation. The swales contain a dominance of hydrophytic species, such as Italian rye grass (*Festuca perennis*; FAC), foxtail barley (*Hordeum marinum*; FAC), Baltic rush (*Juncus balticus*; FACW), and rabbitsfoot grass (*Polypogon monspeliensis*; FACW). Hydric soils are present as indicated by redox dark surface (Hydric Soil Indicator F6), red parent material (Hydric Soil Indicator TF2), and a biotic crust (Hydric Soil Indicator B12). Wetland hydrology was confirmed by the presence of oxidized rhizospheres along living roots (Hydrology Indicator C3), saturation (Hydrology Indicator A3), and a high water table (Hydrology Indicator A2). Surface water was only present in SWS-2 during the May 2019 fieldwork.

Seasonal Wetland 1. There is one seasonal wetland (SW-1) in the Study Area (see Figure 4I). SW-1 collects and holds surface runoff long enough to create wetland hydrology, soils, and vegetation. SW-1 occurs adjacent to a dirt access road in the southern portion of the Study Area. SW-1 contains a dominance of Baltic rush and Italian rye grass. Hydric soils are present as indicated by redox dark surface (Hydric Soil Indicator F6), and wetland hydrology was confirmed by saturation (Hydrology Indicator A3). No surface water was present in the SW-1 during the May 2019 fieldwork.

Other Waters of the United States

Intermittent Drainage 1. There is one intermittent drainage (ID) that flows north to south through the southwestern portion of the Study Area (see Figure 4G). ID-1 originates from a pond outside of the Study Area and eventually flows into San Luis Reservoir to the east. ID-1 conveys overflow from the upstream pond, as well as surface run-off from the surrounding hillsides. There is no distinct riparian corridor associated with ID-1. Within the Study Area, herbaceous species such as, rabbitsfoot grass, common monkeyflower (*Erythranthe guttata*; OBL), and common spikerush (*Eleocharis macrostachya*; OBL), occur along the banks of ID-1. Vegetation in the channel itself includes Baltic rush, American brooklime (*Veronica americana*; OBL), and watercress (*Nasturtium officinale*; OBL), as well as filamentous algae. Approximately 2 inches of flowing water was present in ID-1 during the May 2019 fieldwork. Evidence of an OHWM includes a break in slope and change in vegetation cover and type.

Intermittent Drainage 2. There is one intermittent drainage (ID) that flows north to south through the southern portion of the Study Area (see Figure 4I). ID-2 originates approximately 0.5 mile upstream of the Study Area, at the convergence of two unnamed drainages. Similar to ID-1, ID-2 also conveys surface run-off from surrounding uplands and eventually flows into San Luis Reservoir to the east. Within the Study Area, ID-2 contains herbaceous species along its banks, including Baltic rush, rabbitsfoot grass, and seep monkeyflower, and white water crowfoot (*Ranunculus aquatilis*; OBL) and filamentous algae grow within the channel. There is no distinct riparian corridor associated with ID-2. Approximately 2 inches of flowing water was present in the southern segment of ID-2 during the May 2019 fieldwork. Evidence of an OHWM includes a break in slope and change in vegetation cover and type.

Ephemeral Drainage 1. There is one ephemeral channel (hereafter 'ED-1') that, when inundated, flows roughly northwest through the southeast portion of the Study Area (see Figure 4C). ED-1 originates in the Study Area near the top of a hill where it conveys surface run-off from adjacent uplands into San Luis Reservoir outside of the Study Area. The hydrology of ED-1 is reliant on surface run-off/precipitation events. The banks of ED-1 support similar vegetation found in the California annual grassland and blue oak woodland communities discussed above. Evidence of an OHWM includes a break in slope.

6.3 Results of Data Points

Results from nine representative data points and two transects document potentially jurisdictional wetlands and waters within the Study Area based on observable field indicators (Table 1). The data collected at each data point and transect are included in Appendix C, on the ACOE's Wetland Determination Data Forms or the OHWM Delineation Cover Sheet for the Arid West Region.

Table 1
Data Point and Transect Summary

Data Point or Transect [1]	Wetland Determination Field Indicators			Determination [2]	Jurisdiction
	Vegetation	*Hydric Soils*	*Hydrology*		
1a	✓	✓	✓	SWS-1	RWQCB
1b	None	None	None	Upland	None
2	None	✓	✓	Upland	None
3a	✓	✓	✓	SWS-2	RWQCB
3b	None	None	None	Upland	None
8a	✓	✓	✓	SWS-3	RWQCB
8b	None	None	None	Upland	None
9a	✓	✓	✓	SWS-4	RWQCB
9b	None	None	None	Upland	None
10a	✓	✓	✓	SWS-5	RWQCB
10b	None	None	None	Upland	None
11a	✓	✓	✓	SWS-6	RWQCB
11b	None	None	None	Upland	None
12a	✓	✓	✓	SW-1	RWQCB
12b	None	None	None	Upland	None
13a	✓	✓	✓	SWS-7	RWQCB
13b	None	None	None	Upland	None
14a	✓	✓	✓	SWS-8	RWQCB
14b	None	✓	✓	Upland	None
15	✓	None	None	Upland	None
16	✓	None	None	Upland	None
1	NA	NA	NA	ID-1	RWQCB, CDFW
2	NA	NA	NA	ID-2	RWQCB, CDFW
NA	NA	NA	NA	ED-1	CDFW

1 Data points 4a through 7b were recorded outside of the Study Area are not included in this table. Transect data was not recorded at ED-1.
2 SWS = seasonal wetland swale; SW = seasonal wetland; ID = intermittent drainage; ED = ephemeral drainage; RWQCB = Regional Water Quality Control Board; CDFW = California Department of Fish and Wildlife.

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7 CONCLUSIONS

Waters of the State

The Study Area supports 0.595 acres of wetlands and 391.83 linear feet of other waters that are anticipated to meet the criteria for jurisdictional waters of the States, based on the review presented herein. Specifically, SW-1 and SWS-1 through SWS-8 are potential waters of the State, under the jurisdiction of the RWQCB. ED-1 are potential waters of the State, but only under the jurisdiction of CDFW, and ID-1 and ID-2 are potential waters of the State under the joint jurisdiction of the RWQCB and CDFW. The criteria used to make these determinations include whether or not the feature contains surface water, a defined bed and bank, and/or could support riparian vegetation and wildlife.

Waters of the U.S.

Based on the review presented herein, there are no potential waters of the U.S. subject to ACOE jurisdiction in the Study Area (see below for discussion). These findings are preliminary until verified by the Sacramento District of the ACOE.

The Study Area does not support TNWs, interstate waters, or waters that support interstate commerce (33 CFR 328.3(a)(1–4)); therefore, potential ACOE jurisdiction was determined based on connectivity or adjacency to off-site waters of the United States (33 CFR 328.3(a)(5)). There are no wetlands in the Study Area neighboring or adjacent to a waters of the U.S. (33 CFR 328.3(a)(8)). SW-1 and SWS-1 through SWS-8 are located outside of 100-year floodplains and more than 1,500 feet from the OHWM of a waters of the U.S. defined by (a)(1) through (5) of 33 CFR 328.3, which includes waters with a significant nexus to TNWs, interstate waters, or waters that support interstate commerce (see below for details).

ID-1 and ID-2 convey water indirectly into San Luis Reservoir via a network of tributaries south of the Study Area. San Luis Reservoir, which is a component of the State Water Project, is considered a TNW. As such, ID-1 and ID-2 may be potential waters of the U.S., unless they are determined to lack a significant nexus to San Luis Reservoir. There are at least 6 to 7 river miles between ID-1 and ID-2 in the Study Area and San Luis Reservoir. Given the intermittent hydrology of ID-1 and ID-2, as well as the distance between these features and San Luis Reservoir, they are not likely to have a significant nexus to the reservoir (CFR 328.3 (c)(5)).

ED-1 flows episodically and is located approximately 1.25 river miles upstream of San Luis Reservoir. ED-1 is a non-relatively permanent water and therefore, not likely a waters of the U.S. subject to ACOE jurisdiction (ACOE and EPA 2019). In addition, ED-1 is likely a waters of the state regulated by CDFW; however, it lacks sufficient water and therefore, may not be regulated by the RWQCB.

Figure 5 depicts the spatial extent of wetland features within the Study Area, and Table 2 includes the total acreage of wetland features and other waters of the U.S. or State. An aquatic resources table in accordance with the ACOE format is provided in Appendix D.

Table 2
Wetlands and Waters in the Study Area

Feature	Cowardin Code	Potential Jurisdiction	Acres	Linear Feet
Wetlands				
SW-1	PEM	RWQCB	0.006	N/A
SWS-1	R6	RWQCB	0.064	N/A
SWS-2	R6	RWQCB	0.158	N/A
SWS-3	R6	RWQCB	0.127	N/A
SWS-4	R6	RWQCB	0.016	N/A
SWS-5	R6	RWQCB	0.056	N/A
SWS-6	R6	RWQCB	0.067	N/A
SWS-7	R6	RWQCB	0.010	N/A
SWS-8	R6	RWQCB	0.024	N/A
		Total	0.595	N/A
Other Waters				
ID-1	R4	RWQCB/CDFW	N/A	104.98
ID-2	R4	RWQCB/CDFW	N/A	140.25
ED-1	R6	CDFW	N/A	146.60
		Total	N/A	391.83

SW = seasonal wetland; PEM2 = Palustrine, emergent, non-persistent; SWS = seasonal wetland swale; RWQCB = Regional Water Quality Control Board; N/A = not applicable; CDFW = California Department of Fish and Wildlife; PD = perennial drainage; R5 = Riverine, perennial; ID = intermittent drainage; R4 = Riverine, Riverine, intermittent.

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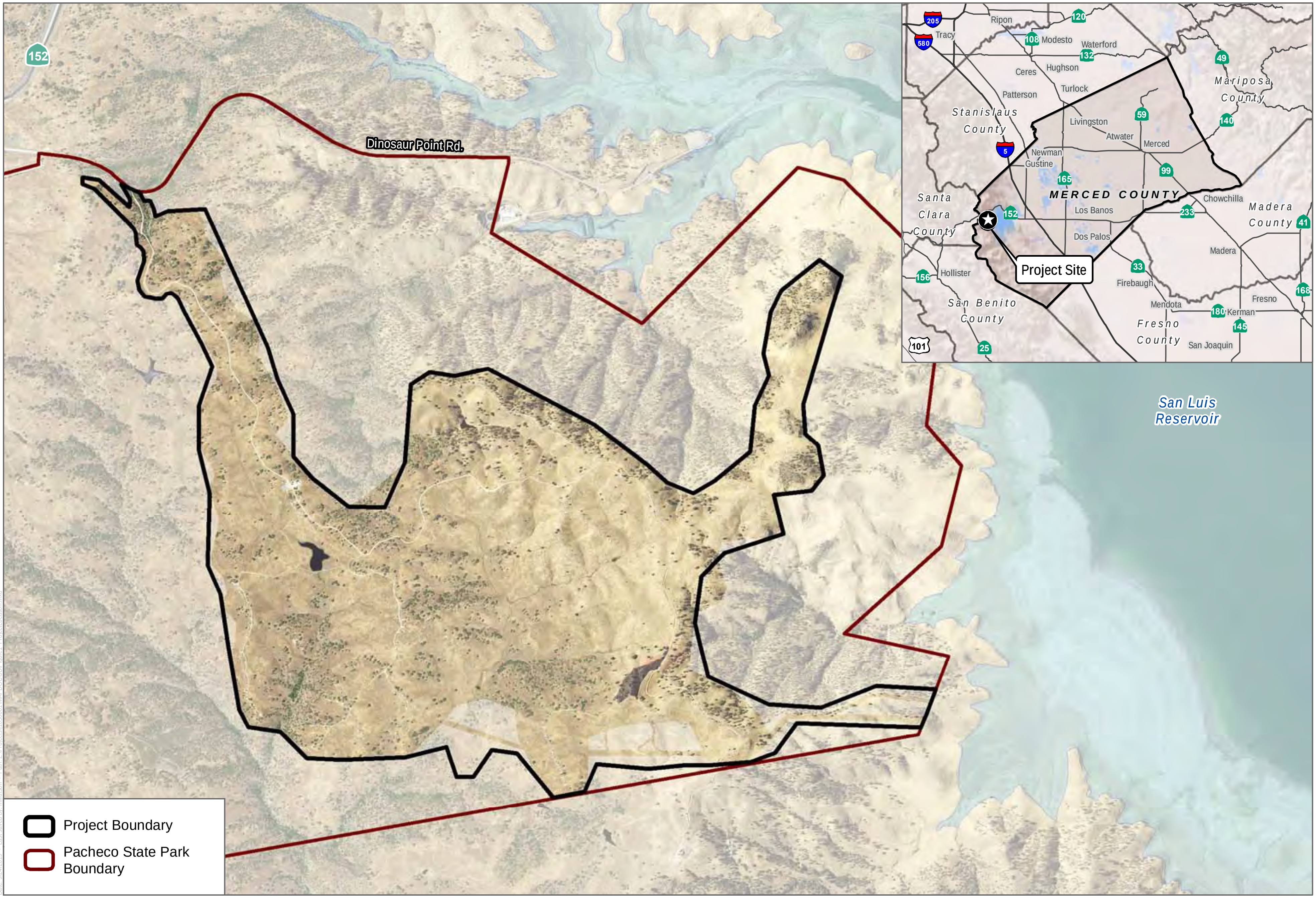

SOURCE: USDA 2016, Scout Energy 2018

DUDEK

FIGURE 1
Project Location
Gonzaga Ridge Wind Repowering Project

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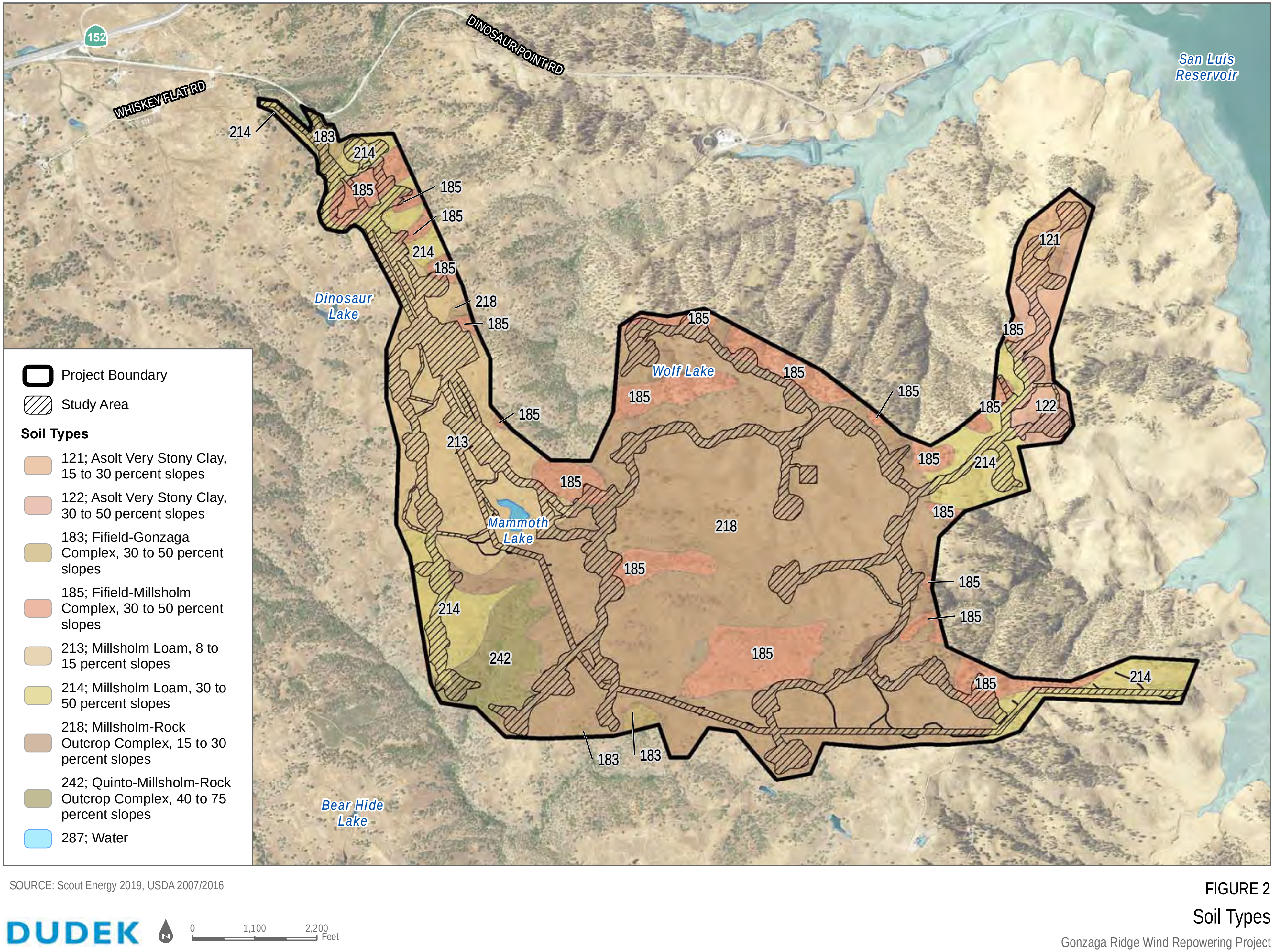

SOURCE: Scout Energy 2019, USDA 2007/2016

DUDEK

FIGURE 2

Soil Types

Gonzaga Ridge Wind Repowering Project

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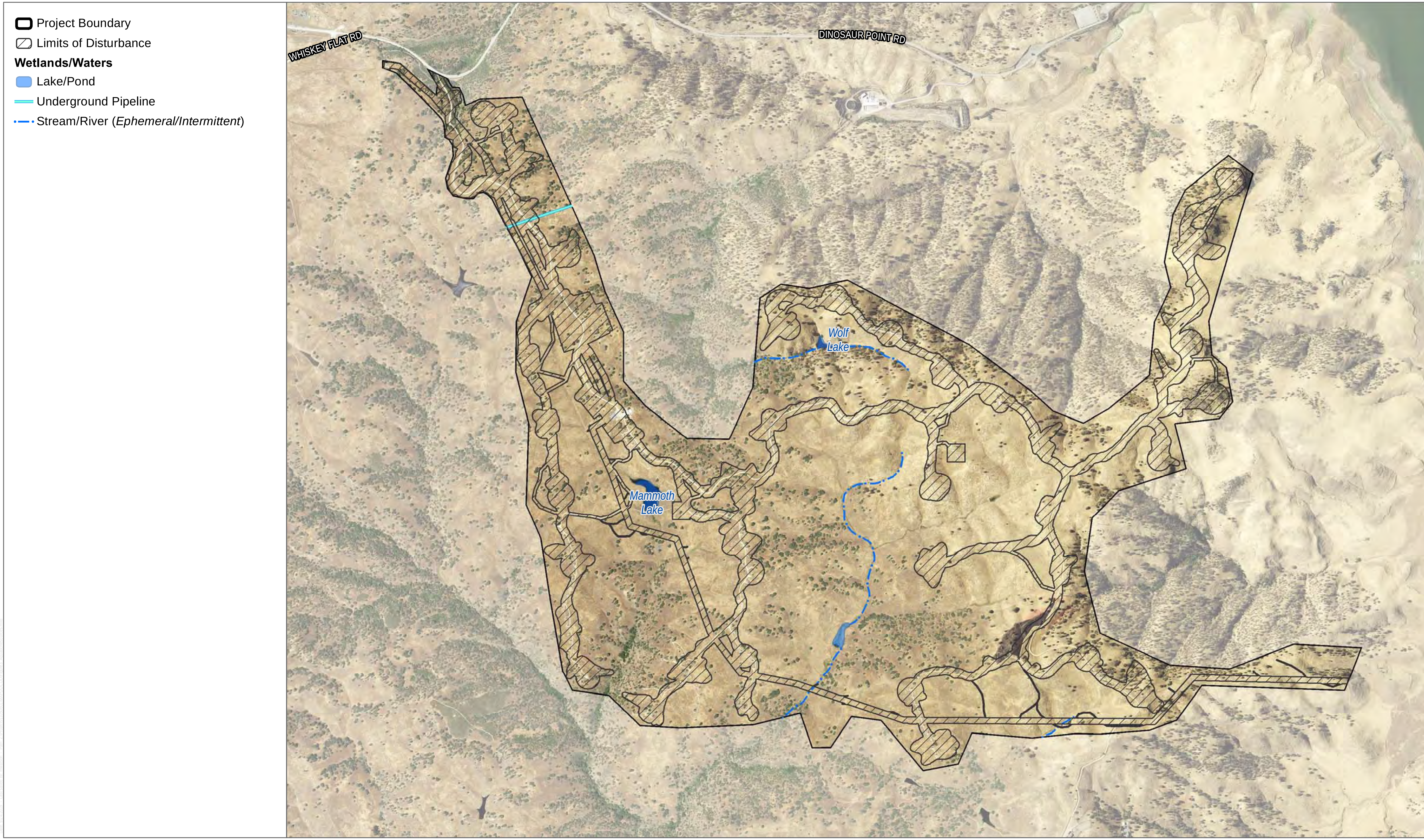

SOURCE: Scout Energy 2019, USFWS 2018, USGS 2018, USDA 2016

DUDEK

FIGURE 3

Existing Aquatic Resources

Gonzaga Ridge Wind Repowering Project

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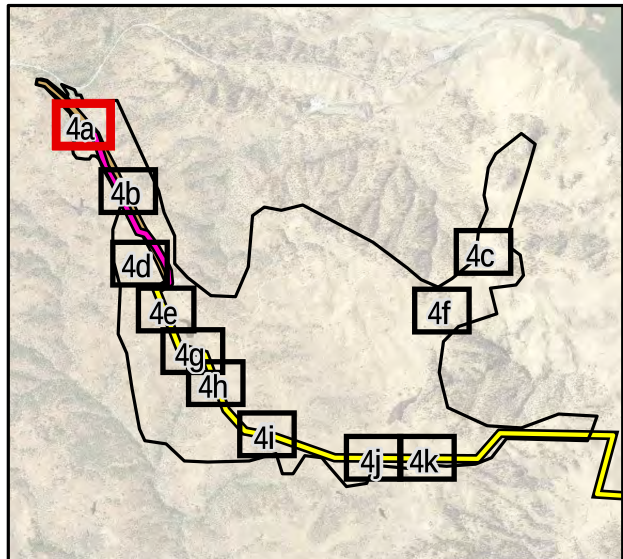


Project Boundary (*1630.22 acres*)
Limits of Disturbance (*450.67 acres*)
Existing Transmission Line
Proposed Modification to the Existing Transmission Line
Representative Turbine Location
Culvert

Data Point

Upland
Wetland

Jurisdictional Features

Seasonal Wetland Swale

** All areas of the project site delineated as wetlands or other waters of the U.S. are subject to verification by the ACOE.*

Coordinate System: NAD 1983 State Plane (Zone III)
Projection: Lambert Conformal Conic
Datum: North American 1983
Vertical Datum: NAVD 88, U.S. Feet
1 inch = 100 feet

Created on August 6th, 2019
Revised on (n/a)

Made in accordance with the
Updated Map and Drawing Standards for the South Pacific Division Regulatory Program,
as amended on February 10, 2016, by:
Jason Deters, Project Manager
Enforcement and Special Projects Unit
U.S. Army Corps of Engineers
South Pacific Division
Sacramento District, Regulatory Division
1325 J Street, Room 1350
Sacramento, California 95814-2922

SOURCE: NAIP 2016, Scout Energy 2019

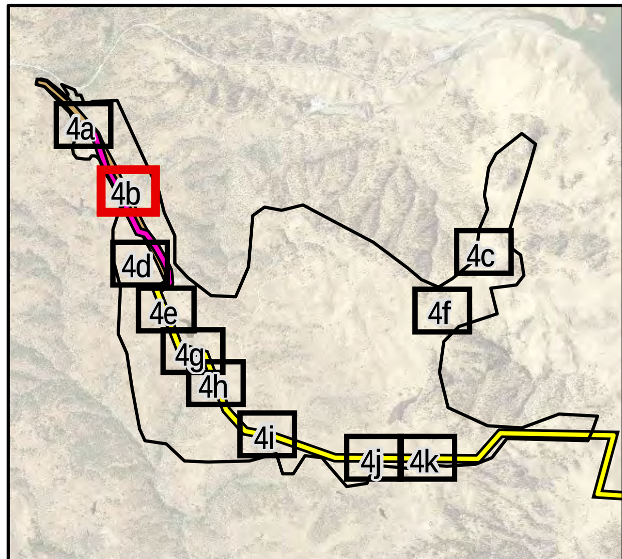
DUDEK

0 50 100 Feet

FIGURE 4A

Delineation of Wetlands and Waters of the U.S.

Gonzaga Ridge Wind Repowering Project



Project Boundary (*1630.22 acres*)

Limits of Disturbance (*450.67 acres*)

Existing Transmission Line

Proposed Modification to the Existing Transmission Line

Representative Turbine Location

Data Point

Upland

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SOURCE: NAIP 2016, Scout Energy 2019

DUDEK

0 50 100 Feet

FIGURE 4B

Delineation of Wetlands and Waters of the U.S.

Gonzaga Ridge Wind Repowering Project

Coordinate System: NAD 1983 State Plane (Zone III)
Projection: Lambert Conformal Conic
Datum: North American 1983
Vertical Datum: NAVD 88, U.S. Feet
1 inch = 100 feet

Created on August 6th, 2019
Revised on (n/a)

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Sacramento, California 95814-2922

SOURCE: NAIP 2016, Scout Energy 2019

DUDEK

0 50 100 Feet

FIGURE 4C

Delineation of Wetlands and Waters of the U.S.

Gonzaga Ridge Wind Repowering Project

Coordinate System: NAD 1983 State Plane (Zone III)
Projection: Lambert Conformal Conic
Datum: North American 1983
Vertical Datum: NAVD 88, U.S. Feet
1 inch = 100 feet

Created on August 6th, 2019
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Sacramento, California 95814-2922

SOURCE: NAIP 2016, Scout Energy 2019

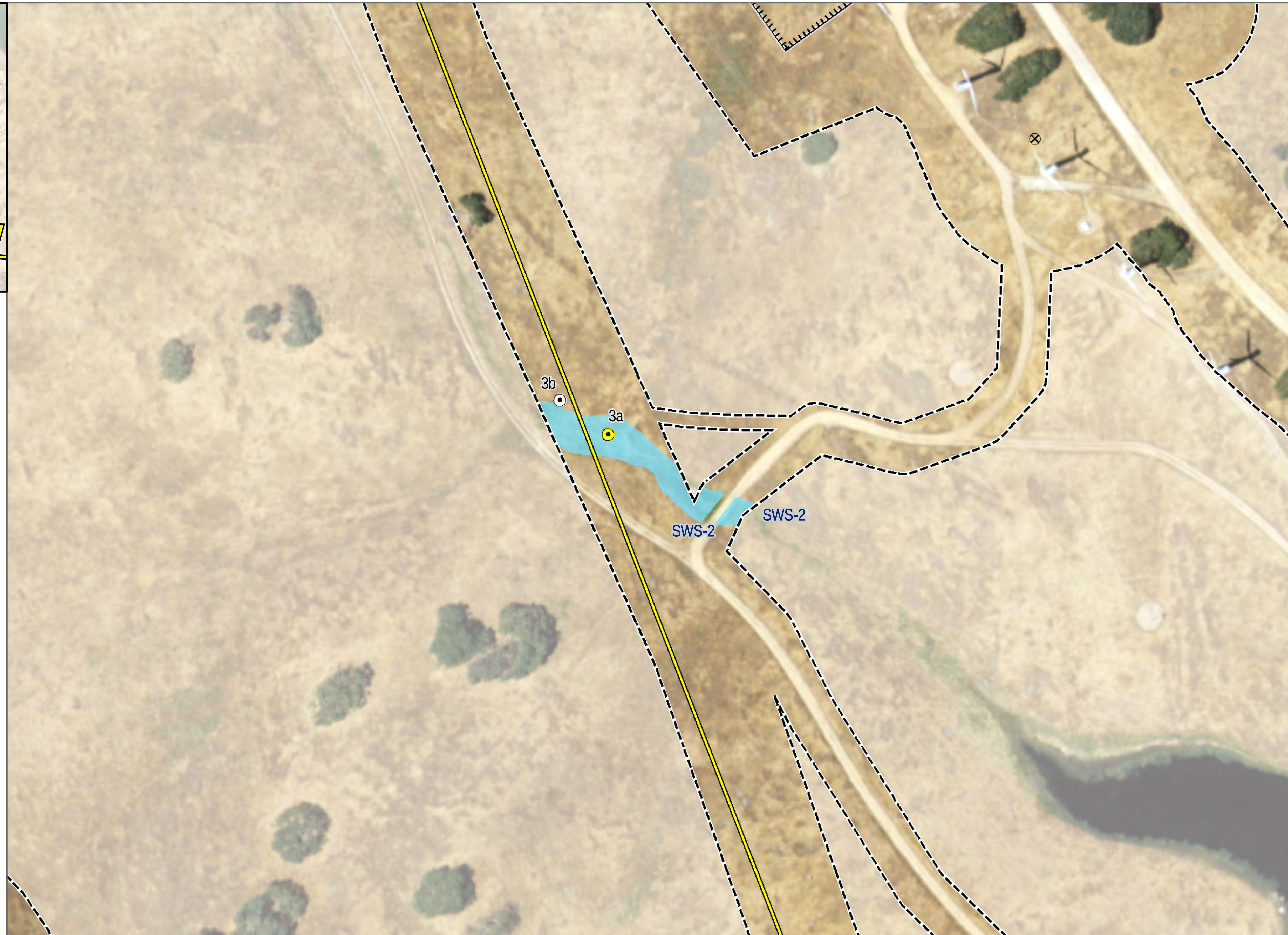
DUDEK

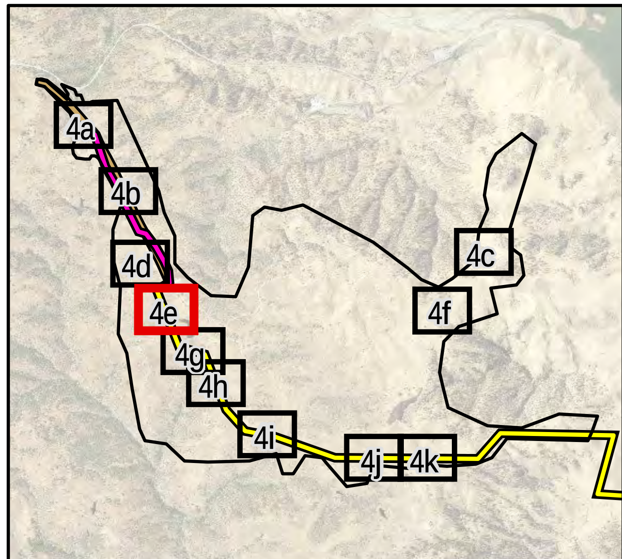
0 50 100 Feet

FIGURE 4D

Delineation of Wetlands and Waters of the U.S.

Gonzaga Ridge Wind Repowering Project





Project Boundary (*1630.22 acres*)
Limits of Disturbance (*450.67 acres*)
Proposed New Transmission Line
Representative Turbine Location

Proposed Facilities

Substation

Data Point

Upland
Wetland

Jurisdictional Features

Seasonal Wetland Swale

** All areas of the project site delineated as wetlands or other waters of the U.S. are subject to verification by the ACOE.*

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Projection: Lambert Conformal Conic
Datum: North American 1983
Vertical Datum: NAVD 88, U.S. Feet
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Sacramento, California 95814-2922

SOURCE: NAIP 2016, Scout Energy 2019

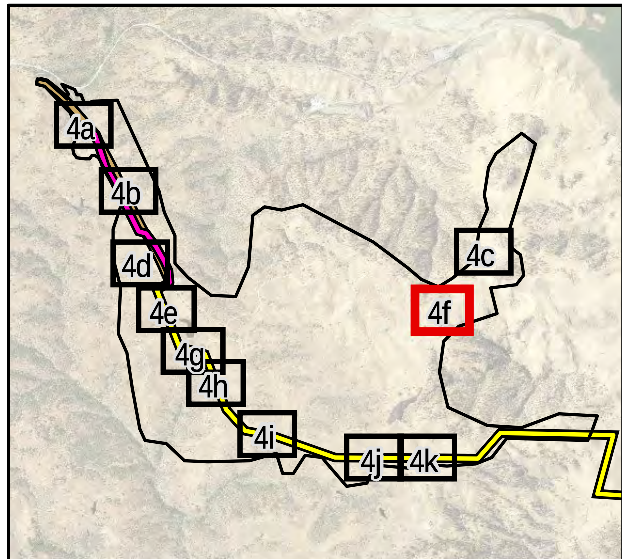
DUDEK

0 50 100 Feet

FIGURE 4E

Delineation of Wetlands and Waters of the U.S.

Gonzaga Ridge Wind Repowering Project



Project Boundary (*1630.22 acres*)
Limits of Disturbance (*450.67 acres*)

Data Point

Upland

** All areas of the project site delineated as wetlands or other waters of the U.S. are subject to verification by the ACOE.*

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Projection: Lambert Conformal Conic
Datum: North American 1983
Vertical Datum: NAVD 88, U.S. Feet
1 inch = 100 feet

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SOURCE: NAIP 2016, Scout Energy 2019

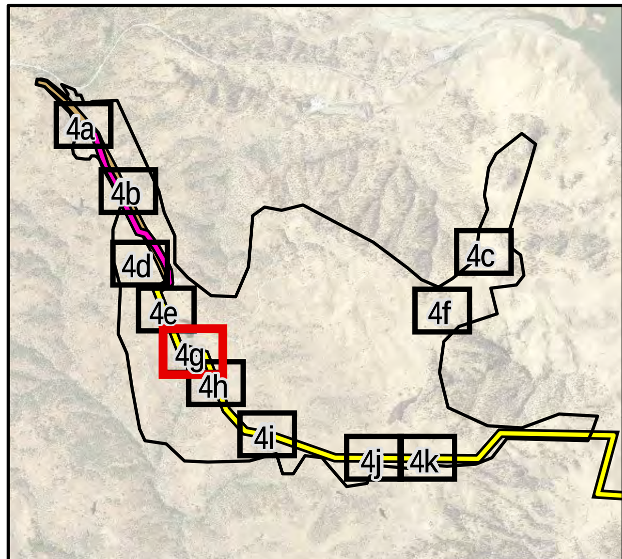
DUDEK

0 50 100 Feet

FIGURE 4F

Delineation of Wetlands and Waters of the U.S.

Gonzaga Ridge Wind Repowering Project



Project Boundary (*1630.22 acres*)
Limits of Disturbance (*450.67 acres*)
Transect
Proposed New Transmission Line

Data Point

Upland
Wetland

Jurisdictional Features

Intermittent Drainage
Seasonal Wetland Swale

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Coordinate System: NAD 1983 State Plane (Zone III)
Projection: Lambert Conformal Conic
Datum: North American 1983
Vertical Datum: NAVD 88, U.S. Feet
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Sacramento, California 95814-2922

SOURCE: NAIP 2016, Scout Energy 2019

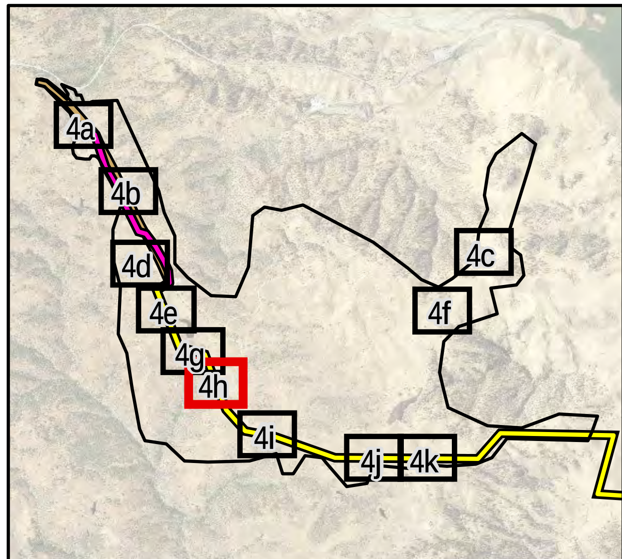
DUDEK

0 55 110 Feet

FIGURE 4G

Delineation of Wetlands and Waters of the U.S.

Gonzaga Ridge Wind Repowering Project



Project Boundary (*1630.22 acres*)
Limits of Disturbance (*450.67 acres*)
Proposed New Transmission Line

Data Point

Upland
Wetland

Jurisdictional Features

Seasonal Wetland Swale

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Projection: Lambert Conformal Conic
Datum: North American 1983
Vertical Datum: NAVD 88, U.S. Feet
1 inch = 100 feet

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SOURCE: NAIP 2016, Scout Energy 2019

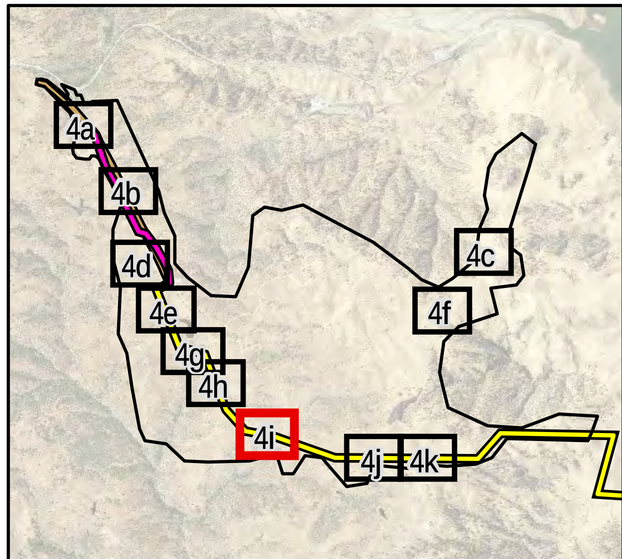
DUDEK

0 50 100 Feet

FIGURE 4H

Delineation of Wetlands and Waters of the U.S.

Gonzaga Ridge Wind Repowering Project



Project Boundary (*1630.22 acres*)
Limits of Disturbance (*450.67 acres*)
Transect
Proposed New Transmission Line

Data Point

Upland
Wetland

Jurisdictional Features

Intermittent Drainage
Seasonal Wetland

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Coordinate System: NAD 1983 State Plane (Zone III)
Projection: Lambert Conformal Conic
Datum: North American 1983
Vertical Datum: NAVD 88, U.S. Feet
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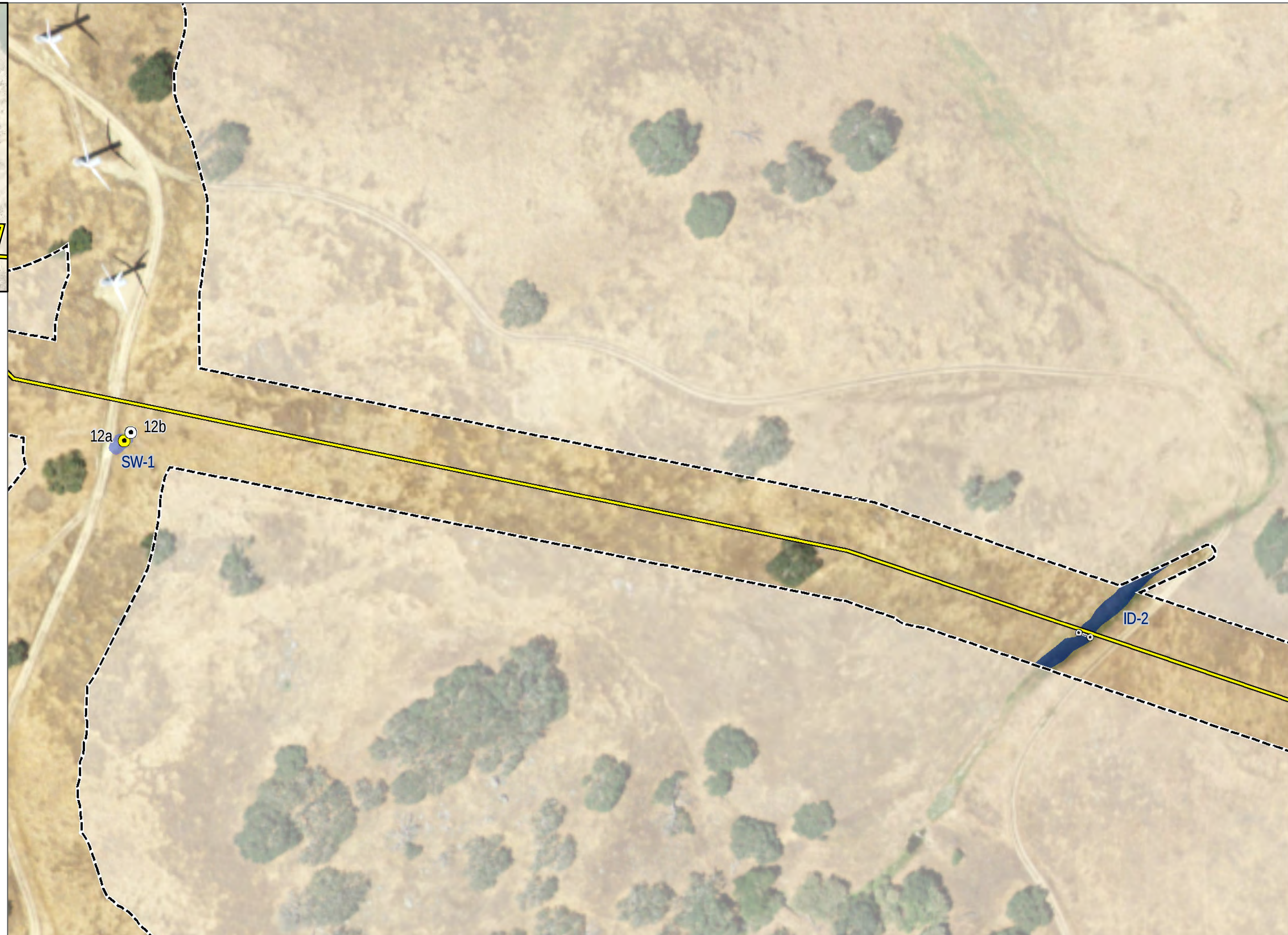


SOURCE: NAIP 2016, Scout Energy 2019

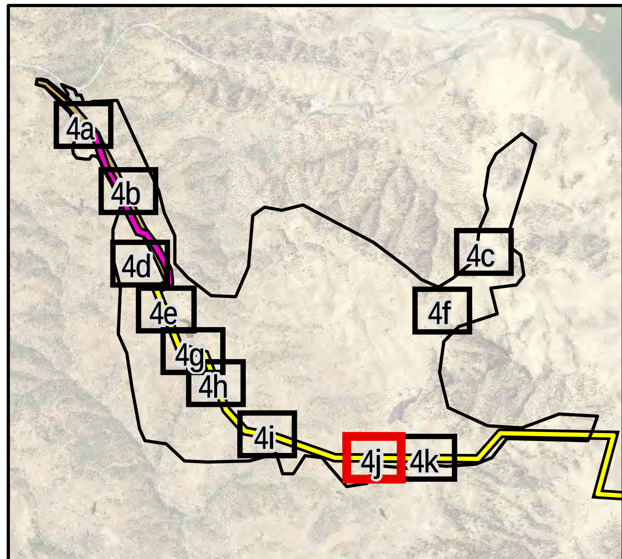
DUDEK

0 50 100 Feet

FIGURE 4I

Delineation of Wetlands and Waters of the U.S.

Gonzaga Ridge Wind Repowering Project



Project Boundary (*1630.22 acres*)

Limits of Disturbance (*450.67 acres*)

Proposed New Transmission Line

Representative Turbine Location

Data Point

Upland

Wetland

Jurisdictional Features

Seasonal Wetland Swale

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Datum: North American 1983
Vertical Datum: NAVD 88, U.S. Feet
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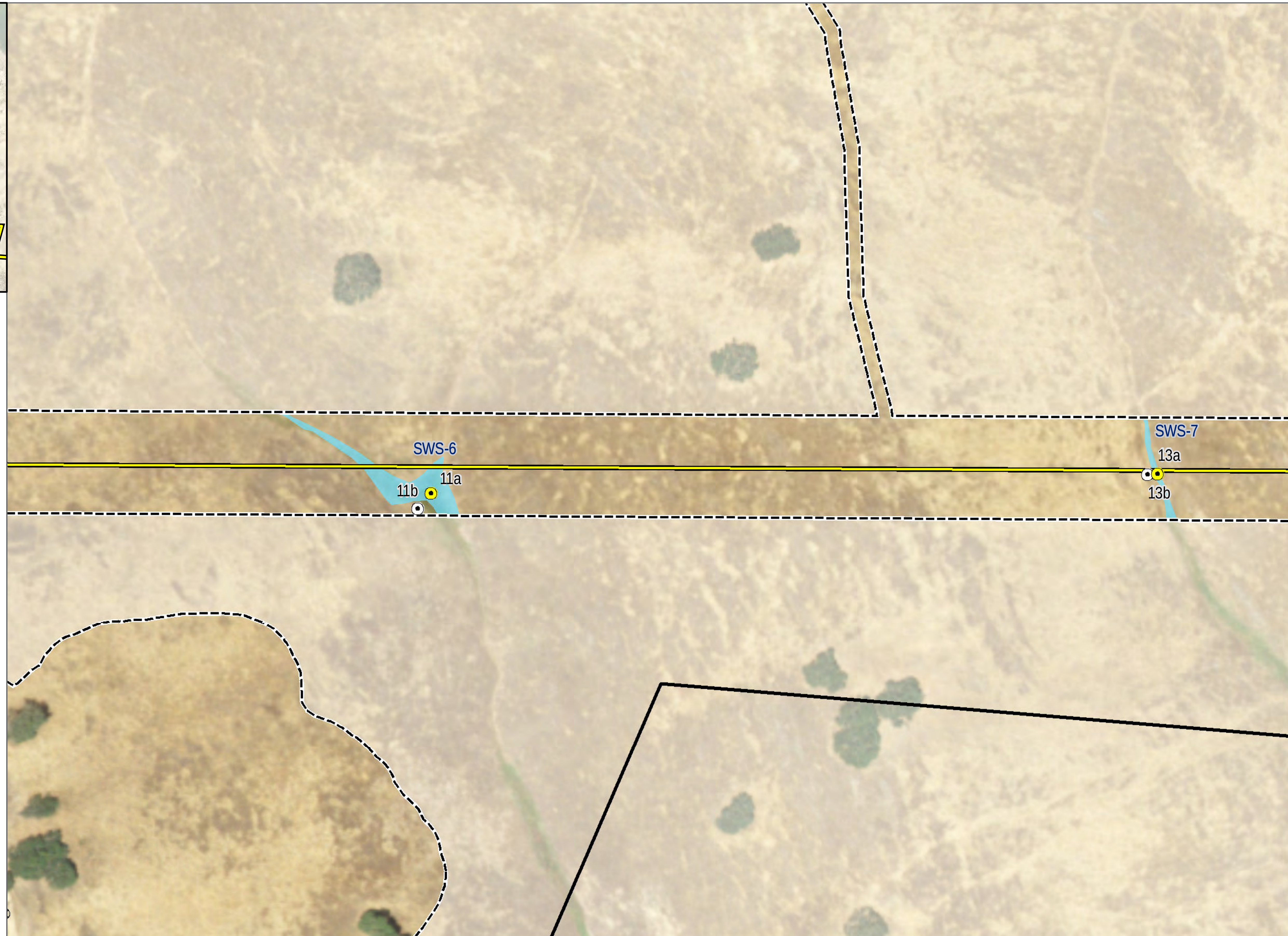


SOURCE: NAIP 2016, Scout Energy 2019

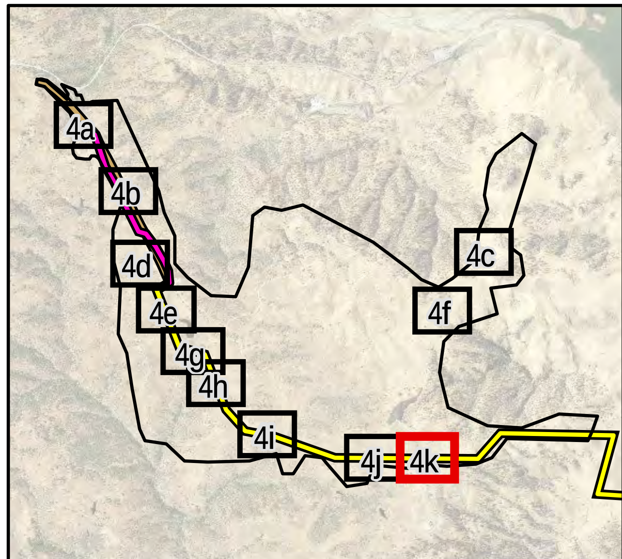
DUDEK

0 50 100 Feet

FIGURE 4J

Delineation of Wetlands and Waters of the U.S.

Gonzaga Ridge Wind Repowering Project



Project Boundary (*1630.22 acres*)
Limits of Disturbance (*450.67 acres*)
Proposed New Transmission Line

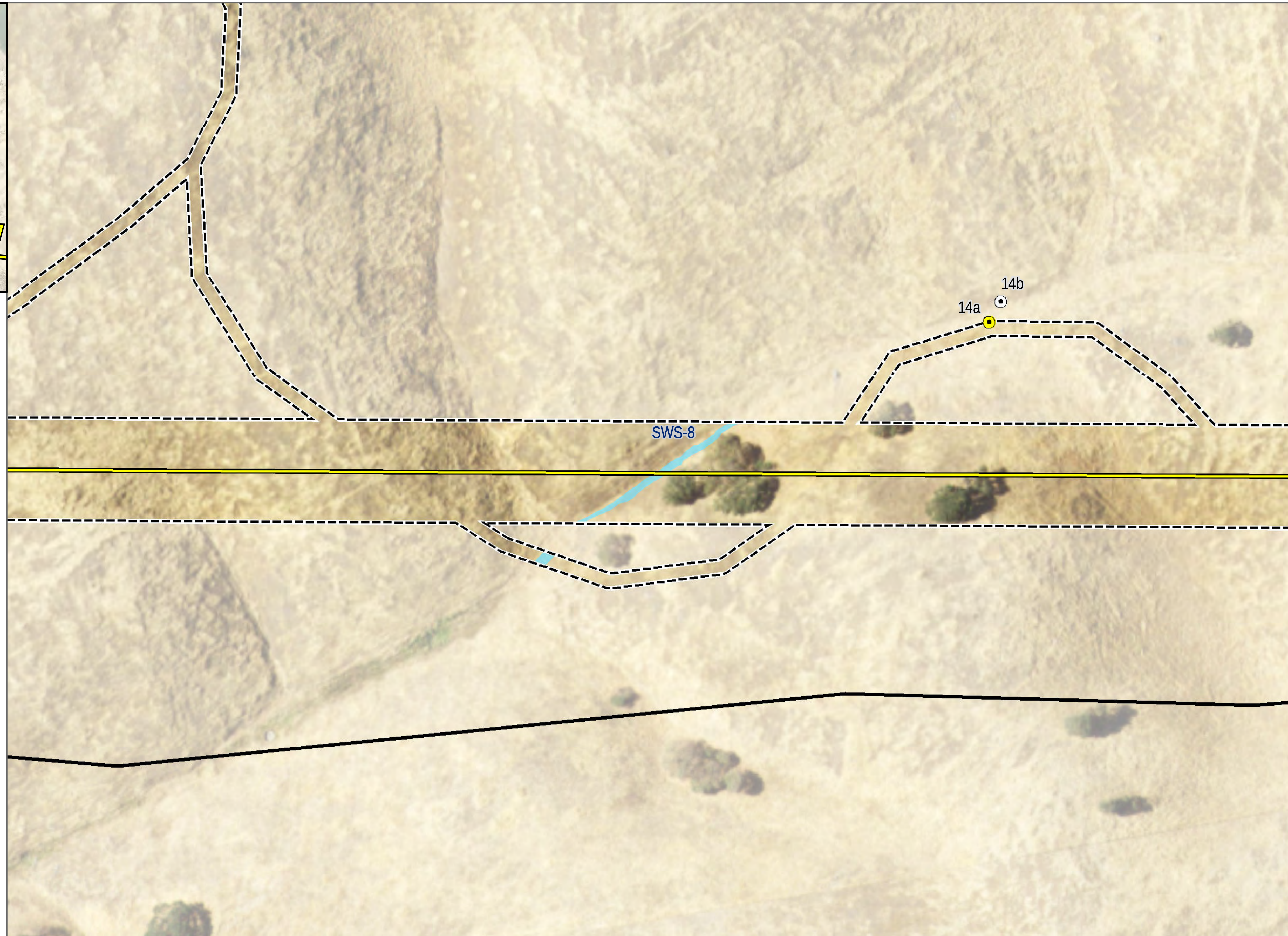
Data Point

Upland
Wetland

Jurisdictional Features

Seasonal Wetland Swale

** All areas of the project site delineated as wetlands or other waters of the U.S. are subject to verification by the ACOE.*



Coordinate System: NAD 1983 State Plane (Zone III)
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SOURCE: NAIP 2016, Scout Energy 2019

DUDEK

0 50 100 Feet

FIGURE 4K

Delineation of Wetlands and Waters of the U.S.

Gonzaga Ridge Wind Repowering Project

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APPENDIX A

Representative Site Photographs

Photo 1. View of SWS-1. Facing north. May 22, 2019.

Photo 2. View of SWS-3. Facing east. May 23, 2019.

Photo 3. View of ID-1. Facing northwest. May 23, 2019.

Photo 4. View of SWS-4. Facing southwest. May 23, 2019.

Photo 5. View of SW-1. Facing north. May 23, 2019.

Photo 6. View of ID-2. Facing northeast. May 23, 2019.

Photo 7. View of SWS-8. Facing southwest. May 23, 2019.

APPENDIX B
Plant Species Observed

EUDICOTS

VASCULAR SPECIES

ADOXACEAE—MUSKROOT FAMILY

Sambucus nigra—blue elderberry

ANACARDIACEAE—SUMAC OR CASHEW FAMILY

Toxicodendron diversilobum—poison oak

APIACEAE—CARROT FAMILY

Daucus pusillus—American wild carrot
Eryngium castrense—Great Valley eryngo
Lomatium utriculatum—common lomatium
Sanicula bipinnata—poison sanicle
Sanicula bipinnatifida—purple sanicle

APOCYNACEAE—DOGBANE FAMILY

Asclepias fascicularis—Mexican whorled milkweed

ASTERACEAE—SUNFLOWER FAMILY

Achillea millefolium—common yarrow
Achyrachaena mollis—blow wives
Artemisia californica—California sagebrush
Baccharis pilularis—coyote brush
* *Carduus pycnocephalus*—Italian plumeless thistle
* *Centaurea calcitrapa*—red star-thistle
* *Centaurea melitensis*—Maltese star-thistle
* *Centaurea solstitialis*—yellow star-thistle
Corethrogyne filaginifolia—sand-aster
Grindelia hirsutula—hairy gumweed
* *Grindelia squarrosa*—curlycup gumweed
Holocarpha heermannii—Heermann's tarweed
* *Lactuca serriola*—prickly lettuce
* *Leontodon saxatilis*—lesser hawkbit
* *Logfia gallica*—narrowleaf cottonrose
Madia gracilis—grassy tarweed
* *Senecio vulgaris*—old-man-in-the-Spring
* *Silybum marianum*—blessed milkthistle
* *Sonchus asper*—spiny sowthistle

BETULACEAE—BIRCH FAMILY

Alnus rhombifolia—white alder

BORAGINACEAE—BORAGE FAMILY

Amsinckia menziesii—Menzies' fiddleneck
Plagiobothrys nothofulvus—popcorn flower

BRASSICACEAE—MUSTARD FAMILY

* *Brassica nigra*—black mustard
* *Capsella bursa-pastoris*—shepherd's purse
Cardamine californica—milkmaids
Nasturtium officinale—watercress

CAPRIFOLIACEAE—HONEYSUCKLE FAMILY

Symphoricarpos mollis—creeping snowberry

CARYOPHYLLACEAE—PINK FAMILY

* *Spergularia rubra*—red sandspurry

CRASSULACEAE—STONECROP FAMILY

Crassula connata—sand pygmyweed

CUCURBITACEAE—GOURD FAMILY

Marah fabacea—California man-root

EUPHORBIACEAE—SPURGE FAMILY

Croton setiger—dove weed

FABACEAE—LEGUME FAMILY

Acmispon americanus—Spanish clover
Acmispon glaber—deer weed
Acmispon wrangelianus—Chilean bird's-foot trefoil
* *Lotus corniculatus*—bird's-foot trefoil
Lupinus bicolor—miniature lupine
Lupinus microcarpus—valley lupine
* *Medicago polymorpha*—burclover
* *Melilotus indicus*—annual yellow sweetclover
Trifolium bifidum—notchleaf clover
* *Trifolium hirtum*—rose clover
Trifolium willdenovii—tomcat clover
* *Vicia villosa*—winter vetch

FAGACEAE—OAK FAMILY

Quercus agrifolia—coast live oak
Quercus douglasii—blue oak
Quercus wislizeni—interior live oak

GERANIACEAE—GERANIUM FAMILY

* *Erodium cicutarium*—redstem stork's bill
* *Geranium dissectum*—cutleaf geranium

GROSSULARIACEAE—GOOSEBERRY FAMILY

Ribes californicum—hillside gooseberry

LAMIACEAE—MINT FAMILY

* *Marrubium vulgare*—horehound
Scutellaria siphocampyloides—grayleaf skullcap
Trichostema lanceolatum—vinegarweed

LYTHRACEAE—LOOSESTRIFE FAMILY

* *Lythrum hyssopifolia*—hyssop loosestrife

MONTIACEAE—MONTIA FAMILY

Calandrinia menziesii—red maids
Claytonia perfoliata—miner's lettuce

MYRSINACEAE—MYRSINE FAMILY

* *Lysimachia arvensis*—scarlet pimpernel

ONAGRACEAE—EVENING PRIMROSE FAMILY

Clarkia purpurea—winecup clarkia
Taraxia ovata—goldeneggs

PAPAVERACEAE—POPPY FAMILY

Eschscholzia californica—California poppy

PHRYMACEAE—LOPSEED FAMILY

Diplacus aurantiacus—bush monkeyflower
Erythranthe guttata—common monkey flower

PLANTAGINACEAE—PLANTAIN FAMILY

* *Plantago lanceolata*—narrowleaf plantain
* *Plantago major*—common plantain
Veronica americana—American speedwell

PLATANACEAE—PLANE TREE, SYCAMORE FAMILY

Platanus racemosa—California sycamore

POLEMONIACEAE—PHLOX FAMILY

Leptosiphon bicolor—true babystars

POLYGONACEAE—BUCKWHEAT FAMILY

Eriogonum fasciculatum—California buckwheat
Eriogonum nudum—naked buckwheat
* *Persicaria maculosa*—spotted ladysthumb
* *Polygonum aviculare*—prostrate knotweed
* *Rumex acetosella*—common sheep sorrel
* *Rumex crispus*—curly dock
* *Rumex pulcher*—fiddle dock

PRIMULACEAE—PRIMROSE FAMILY

Primula clevelandii—no common name

RANUNCULACEAE—BUTTERCUP FAMILY

Ranunculus aquatilis—white water crowfoot
Ranunculus californicus—California buttercup

ROSACEAE—ROSE FAMILY

Adenostoma fasciculatum—chamise
Cercocarpus betuloides—birch leaf mountain mahogany
Heteromeles arbutifolia—toyon
Prunus ilicifolia—holly leaf cherry

SAPINDACEAE—SOAPBERRY FAMILY

Aesculus californica—California buckeye

SCROPHULARIACEAE—FIGWORT FAMILY

Scrophularia californica—California figwort

SOLANACEAE—NIGHTSHADE FAMILY

Datura wrightii—sacred thorn-apple
Solanum umbelliferum—bluewitch nightshade

VERBENACEAE—VERVAIN FAMILY

Phyla nodiflora—turkey tangle fogfruit

VIOLACEAE—VIOLET FAMILY

Viola pedunculata—Johnny-jump-up

FERNS AND FERN ALLIES

VASCULAR SPECIES

PTERIDACEAE—BRAKE FAMILY

Pentagramma triangularis—goldback fern

GYMNOSPERMS AND GNETOPHYTES

VASCULAR SPECIES

PINACEAE—PINE FAMILY

Abies grandis—grand fir

Pinus radiata—Monterey pine

MONOCOTS

VASCULAR SPECIES

AGAVACEAE—AGAVE FAMILY

Chlorogalum pomeridianum—wavyleaf soap plant

CYPERACEAE—SEDGE FAMILY

Eleocharis macrostachya—pale spike rush

JUNCACEAE—RUSH FAMILY

Juncus balticus—no common name

Juncus bufonius—toad rush

LILIACEAE—LILY FAMILY

Calochortus superbus—yellow mariposa

Calochortus venustus—butterfly mariposa lily

POACEAE—GRASS FAMILY

* *Aira caryophyllea*—silver hairgrass

* *Avena barbata*—slender oat

* *Avena fatua*—wild oat

* *Bromus diandrus*—ripgut brome

* *Bromus hordeaceus*—soft brome

* *Bromus tectorum*—cheatgrass

* *Cynodon dactylon*—Bermudagrass

* *Digitaria sanguinalis*—hairy crabgrass

* *Elymus caput-medusae*—medusahead
* *Festuca myuros*—rat-tail fescue
* *Festuca perennis*—perennial rye grass
* *Gastridium phleoides*—nit grass
* *Hordeum marinum*—seaside barley
* *Hordeum murinum*—mouse barley
* *Poa annua*—annual bluegrass
* *Polypogon monspeliensis*—annual rabbitsfoot grass
Stipa pulchra—purple needlegrass

THEMIDACEAE—BRODIAEA FAMILY
Brodiaea elegans—harvest brodiaea
Dichelostemma capitatum—bluedicks

* denotes a non-native species

APPENDIX C

Data Sheets

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Gonzaga Ridge Wind City/County: Merced County Sampling Date: 5/22/19

Applicant/Owner: Scout Clean Energy, LLC State: CA Sampling Point: 1a

Investigator(s): A. Sennett, L. Burris Section, Township, Range: See Report

Landform (hillslope, terrace, etc.): Ravine Local relief (concave, convex, none): Concave Slope (%): 3

Subregion (LRR): Mediterranean Lat: 37.060001 Long: -121.203629 Datum: See Report

Soil Map Unit Name: See Report NWI classification: See Report

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No ___	**Is the Sampled Area within a Wetland?** Yes ___ No ___
Hydric Soil Present?	Yes ✓ No ___	
Wetland Hydrology Present?	Yes ✓ No ___	

Remarks:

Seasonal wetland (SWS-1) located near the gate entrance at the northwest extent of study area.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: ___)			
1. Festuca perennis	25	Y	FAC
2. Hordeum marinum	5	N	FAC
3.			
4.			
5.			
6.			
7.			
8.			
= Total Cover	30		
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 70 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ___	x 1 = ___
FACW species ___	x 2 = ___
FAC species ___	x 3 = ___
FACU species ___	x 4 = ___
UPL species ___	x 5 = ___
Column Totals: ___ (A)	___ (B)

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ___

Remarks:

SOIL

Sampling Point: 1a

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10 YR 4/3	100					Clay loam	Plant material present
8-12	10 YR 4/3	90	7.5 YR 4/4	10	C	M	Sandy loa	Some gravel

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ✓ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Gravel

Depth (inches): > 12

Hydric Soil Present? Yes ✓ No ______

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ✓ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ______ No ✓ Depth (inches): ______

Water Table Present? Yes ______ No ✓ Depth (inches): ______

Saturation Present? (includes capillary fringe) Yes ______ No ✓ Depth (inches): ______

Wetland Hydrology Present? Yes ✓ No ______

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Gonzaga Ridge Wind City/County: Merced County Sampling Date: May 22, 2019

Applicant/Owner: Scout Clean Energy, LLC State: CA Sampling Point: 1b

Investigator(s): L. Burris, A. Sennett Section, Township, Range: See Report

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): concave Slope (%): 1

Subregion (LRR): C Lat: 37.060050 Long: -121.203679 Datum: WGS84

Soil Map Unit Name: See Report NWI classification: See Report

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No ✓
Hydric Soil Present?	Yes ____	No ✓
Wetland Hydrology Present?	Yes ____	No ✓

Is the Sampled Area within a Wetland? **Yes** ____ **No** ✓

Remarks:

Upland point for SWS-1

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 2 ft x 2 ft)			
1. Avena barbata	35	Y	NL
2. Bromus hordeceus	30	Y	FACU
3. Bromus diandrus	10	N	NL
4. Festuca myuros	5	N	FACU
5. Festuca perennis	5	N	FAC
6.			
7.			
8.			
	85 = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 15 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ____ **No** ✓

Remarks:

Thatch present

SOIL

Sampling Point: 1b

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-10	7.5 YR 4/3	100					clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5) (**LRR C**)
___ 1 cm Muck (A9) (**LRR D**)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

___ 1 cm Muck (A9) (**LRR C**)
___ 2 cm Muck (A10) (**LRR B**)
___ Reduced Vertic (F18)
___ Red Parent Material (TF2)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: gravel/cobble

Depth (inches): > 10

Hydric Soil Present? Yes ______ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1) (**Nonriverine**)
___ Sediment Deposits (B2) (**Nonriverine**)
___ Drift Deposits (B3) (**Nonriverine**)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Salt Crust (B11)
___ Biotic Crust (B12)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

___ Water Marks (B1) (**Riverine**)
___ Sediment Deposits (B2) (**Riverine**)
___ Drift Deposits (B3) (**Riverine**)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ______ No ✓ Depth (inches): ____________
Water Table Present? Yes ______ No ✓ Depth (inches): ____________
Saturation Present? (includes capillary fringe) Yes ______ No ✓ Depth (inches): ____________

Wetland Hydrology Present? Yes ______ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Gonzaga Ridge Wind City/County: Merced County Sampling Date: 5/22/19

Applicant/Owner: Scout Clean Energy, LLC State: CA Sampling Point: 2

Investigator(s): A. Sennett, L. Burris Section, Township, Range: See Report

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 1

Subregion (LRR): Mediterranean Lat: 37.054787 Long: -121.199170 Datum: WGS4

Soil Map Unit Name: See Report NWI classification: See Report

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

	Yes	No
Hydrophytic Vegetation Present?		✓
Hydric Soil Present?	✓	
Wetland Hydrology Present?	✓	

Is the Sampled Area within a Wetland? Yes ___ No ✓

Remarks:

Potential swale between hillsides. Change in vegetation apparent.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: ___)			
1. Festuca perennis	35	Y	FAC
2. Avena barbata	5	N	NL
3. Bromus diandrus	2	N	NL
4. Hordeum marinum	2	N	FAC
5. Bromus hordeaceus	30	Y	FACU
6. Festuca myuros	10	N	FACU
7.			
8.			
= Total Cover	84		
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 16 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	0	x 1 = 0
FACW species	0	x 2 = 0
FAC species	37	x 3 = 111
FACU species	40	x 4 = 160
UPL species	7	x 5 = 35
Column Totals:	84 (A)	306 (B)

Prevalence Index = B/A = 3.6

Hydrophytic Vegetation Indicators:

- ___ Dominance Test is >50%
- ___ Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ___ No ✓

Remarks:

Thatch

SOIL

Sampling Point: 2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-10	7.5 YR 4/3	95	7.5 YR 4/6	5	C	M	Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ✓ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Gravel

Depth (inches): > 10

Hydric Soil Present? Yes ✓ No ______

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ✓ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ______ No ______ Depth (inches): ____________

Water Table Present? Yes ______ No ______ Depth (inches): ____________

Saturation Present? (includes capillary fringe) Yes ______ No ______ Depth (inches): ____________

Wetland Hydrology Present? Yes ✓ No ______

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Gonzaga Ridge Wind City/County: Merced County Sampling Date: 5/22/19

Applicant/Owner: Scout Clean Energy, LLC State: CA Sampling Point: 3a

Investigator(s): A. Sennett, L. Burris Section, Township, Range: See Report

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 0.5

Subregion (LRR): C Lat: 37.04531 Long: -121.195694 Datum: WGS84

Soil Map Unit Name: See Report NWI classification: See Report

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No ___	Is the Sampled Area within a Wetland? Yes ✓ No ___
Hydric Soil Present?	Yes ✓ No ___	
Wetland Hydrology Present?	Yes ✓ No ___	

Remarks:

Wetland swale (SWS-2) upstream of pond. Distinct change in veg from surrounding hills/uplands.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 2ft x 2ft)			
1. Juncus balticus	65	Y	FACW
2. Festuca perennis	25	Y	FAC
3. Rumex crispus	2	N	FAC
4. Hordeum marinum	5	N	FAC
5.			
6.			
7.			
8.			
	97 = Total Cover		
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 3 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ___

Remarks:

SOIL

Sampling Point: 3a

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-12	7.5 YR 3/1	98	7.5 YR 4/6	2	C	M	Clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Gravel / Cobble

Depth (inches): > 12

Hydric Soil Present? Yes ✓ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ✓ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No ✓	Depth (inches): ___
Water Table Present?	Yes ___	No ✓	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No ✓	Depth (inches): ___

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Surface water present at lower elevation (near access road).

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Gonzaga Ridge Wind City/County: Merced County Sampling Date: 5/22/19

Applicant/Owner: Scout Clean Energy, LLC State: CA Sampling Point: 8a

Investigator(s): A. Sennett, L. Burris Section, Township, Range: See Report

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 1

Subregion (LRR): C Lat: 37.042655 Long: -121.194229 Datum: WGS84

Soil Map Unit Name: See Report NWI classification: ______

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No ___	Is the Sampled Area within a Wetland? Yes ✓ No ___
Hydric Soil Present?	Yes ✓ No ___	
Wetland Hydrology Present?	Yes ✓ No ___	

Remarks:

Swale (SWS-3) located at base of hills; apparent change in vegetation compared to surrounding uplands

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: 2 ft x 2 ft)			
1. Juncus balticus	99	Y	FACW
2. Polypogon monspeliensis	1	N	FACW
3.			
4.			
5.			
6.			
7.			
8.			
= Total Cover	100		
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 0 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ___	x 1 = ___
FACW species ___	x 2 = ___
FAC species ___	x 3 = ___
FACU species ___	x 4 = ___
UPL species ___	x 5 = ___
Column Totals: ___ (A)	___ (B)

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%
___ Prevalence Index is ≤3.0[1]
___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ___

Remarks:

SOIL

Sampling Point: 8a

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-14	7.5 YR 3/1	96	7.5 YR 4/6	4	C	M	Clay/Silt	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: None

Depth (inches): ______

Hydric Soil Present? Yes ✓ No ______

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ______ No ✓ Depth (inches): ______

Water Table Present? Yes ✓ No ______ Depth (inches): 10

Saturation Present? (includes capillary fringe) Yes ✓ No ______ Depth (inches): 7

Wetland Hydrology Present? Yes ✓ No ______

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Gonzaga Ridge Wind City/County: Merced County Sampling Date: May 22, 2019

Applicant/Owner: Scout Clean Energy, LLC State: CA Sampling Point: 8b

Investigator(s): L. Burris, A. Sennett Section, Township, Range: See Report

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): concave Slope (%): 1

Subregion (LRR): C Lat: 37.042651 Long: -121.193959 Datum: WGS84

Soil Map Unit Name: See Report NWI classification: See Report

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

	Yes	No
Hydrophytic Vegetation Present?		✓
Hydric Soil Present?		✓
Wetland Hydrology Present?		✓

Is the Sampled Area within a Wetland? Yes ___ No ✓

Remarks:

Upland point for SWS-3

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: 2 ft x 2 ft)			
1. Avena barbata	35	Y	NL
2. Bromus hordeceus	30	Y	FACU
3. Bromus diandrus	10	N	NL
4. Festuca myuros	5	N	FACU
5. Festuca perennis	5	N	FAC
6.			
7.			
8.			
= Total Cover	85		
Woody Vine Stratum (Plot size:)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 15 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ___ No ✓

Remarks:

Thatch present

SOIL

Sampling Point: 8b

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-10	7.5 YR 4/3	100					clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5) (**LRR C**)
___ 1 cm Muck (A9) (**LRR D**)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

___ 1 cm Muck (A9) (**LRR C**)
___ 2 cm Muck (A10) (**LRR B**)
___ Reduced Vertic (F18)
___ Red Parent Material (TF2)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: gravel/cobble

Depth (inches): > 10

Hydric Soil Present? Yes ______ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1) (**Nonriverine**)
___ Sediment Deposits (B2) (**Nonriverine**)
___ Drift Deposits (B3) (**Nonriverine**)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Salt Crust (B11)
___ Biotic Crust (B12)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

___ Water Marks (B1) (**Riverine**)
___ Sediment Deposits (B2) (**Riverine**)
___ Drift Deposits (B3) (**Riverine**)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ______ No ✓ Depth (inches): ____________

Water Table Present? Yes ______ No ✓ Depth (inches): ____________

Saturation Present? (includes capillary fringe) Yes ______ No ✓ Depth (inches): ____________

Wetland Hydrology Present? Yes ______ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Gonzaga Ridge Wind City/County: Merced County Sampling Date: 5/22/19

Applicant/Owner: Scout Clean Energy, LLC State: CA Sampling Point: 9a

Investigator(s): A. Sennett, L. Burris Section, Township, Range: See Report

Landform (hillslope, terrace, etc.): ______ Local relief (concave, convex, none): concave Slope (%): 1

Subregion (LRR): Mediterranean Lat: 37.040896 Long: -121.190594 Datum: WGS84

Soil Map Unit Name: See Report NWI classification: See Report

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No ___	Is the Sampled Area within a Wetland? Yes ✓ No ___
Hydric Soil Present?	Yes ✓ No ___	
Wetland Hydrology Present?	Yes ✓ No ___	

Remarks:

Swale (SWS-4) at base of hills; apparent change in vegetation compared to surrounding uplands

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	___ = Total Cover		
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
	___ = Total Cover		
Herb Stratum (Plot size: 2 ft x 2 ft)			
1. Festuca perennis	25	Y	FAC
2. Juncus balticus	30	Y	FACW
3. Eleocharis macrostachya	10	N	NL
4. Medicago polymorpha	5	N	FACU
5.			
6.			
7.			
8.			
	80 = Total Cover		
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
	___ = Total Cover		

% Bare Ground in Herb Stratum 20 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	___	x 1 = ___
FACW species	___	x 2 = ___
FAC species	___	x 3 = ___
FACU species	___	x 4 = ___
UPL species	___	x 5 = ___
Column Totals:	___ (A)	___ (B)

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ___

Remarks:

SOIL

Sampling Point: 9a

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-6	10 YR 2/1	95	7.5 YR 5/6	5	C	M	Clay loam	Prominent redox
6-10	7.5 YR 3/1	70	7.5 YR 5/6	2.5	C	M	Clay silt	
6-10	7.5 YR 4/3	20	7.5 YR 5/6	2.5	C	M	Clay silt	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Cobble / Gravel

Depth (inches): > 6

Hydric Soil Present? Yes ✓ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): ___

Water Table Present? Yes ✓ No ___ Depth (inches): 6

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): 4

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Gonzaga Ridge Wind   City/County: Merced County   Sampling Date: May 22, 2019

Applicant/Owner: Scout Clean Energy, LLC   State: CA   Sampling Point: 9b

Investigator(s): L. Burris, A. Sennett   Section, Township, Range: See Report

Landform (hillslope, terrace, etc.): hillslope   Local relief (concave, convex, none): concave   Slope (%): 1

Subregion (LRR): C   Lat: 37.040824   Long: -121.190573   Datum: WGS84

Soil Map Unit Name: See Report   NWI classification: See Report

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed?   Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic?   (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___	No ✓
Hydric Soil Present?	Yes ___	No ✓
Wetland Hydrology Present?	Yes ___	No ✓

Is the Sampled Area within a Wetland? **Yes** ___ **No** ✓

Remarks:

Upland point for SWS-4

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	___ = Total Cover		
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
	___ = Total Cover		
Herb Stratum (Plot size: 2 ft x 2 ft)			
1. Avena barbata	35	Y	NL
2. Bromus hordeceus	30	Y	FACU
3. Bromus diandrus	10	N	NL
4. Festuca myuros	5	N	FACU
5. Festuca perennis	5	N	FAC
6.			
7.			
8.			
	85 = Total Cover		
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
	___ = Total Cover		

% Bare Ground in Herb Stratum 15   % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	___	x 1 = ___
FACW species	___	x 2 = ___
FAC species	___	x 3 = ___
FACU species	___	x 4 = ___
UPL species	___	x 5 = ___
Column Totals:	___ (A)	___ (B)

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:

- ___ Dominance Test is >50%
- ___ Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ___ **No** ✓

Remarks:

Thatch present

SOIL

Sampling Point: 9b

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-10	7.5 YR 4/3	100					clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5) (**LRR C**)
___ 1 cm Muck (A9) (**LRR D**)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

___ 1 cm Muck (A9) (**LRR C**)
___ 2 cm Muck (A10) (**LRR B**)
___ Reduced Vertic (F18)
___ Red Parent Material (TF2)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: gravel/cobble

Depth (inches): > 10

Hydric Soil Present? Yes ______ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1) (**Nonriverine**)
___ Sediment Deposits (B2) (**Nonriverine**)
___ Drift Deposits (B3) (**Nonriverine**)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Salt Crust (B11)
___ Biotic Crust (B12)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

___ Water Marks (B1) (**Riverine**)
___ Sediment Deposits (B2) (**Riverine**)
___ Drift Deposits (B3) (**Riverine**)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ______ No ✓ Depth (inches): ____________

Water Table Present? Yes ______ No ✓ Depth (inches): ____________

Saturation Present? (includes capillary fringe) Yes ______ No ✓ Depth (inches): ____________

Wetland Hydrology Present? Yes ______ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Gonzaga Ridge Wind City/County: Merced County Sampling Date: 5/22/19

Applicant/Owner: Scout Clean Energy, LLC State: CA Sampling Point: 10a

Investigator(s): A. Sennett, L. Burris Section, Township, Range: See Report

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): concave Slope (%): 1

Subregion (LRR): C Lat: 37.039158 Long: -121.190084 Datum: WGS84

Soil Map Unit Name: See Report NWI classification: See Report

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ____
Hydric Soil Present?	Yes ✓	No ____
Wetland Hydrology Present?	Yes ✓	No ____

Is the Sampled Area within a Wetland? **Yes** ✓ **No** ____

Remarks:

Swale (SWS-5) at base of hills; apparent change in vegetation compared to surrounding uplands

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: 2 ft x 2 ft)			
1. Festuca perennis	25	Y	FAC
2. Juncus balticus	30	Y	FACW
3. Eleocharis macrostachya	10	N	NL
4. Medicago polymorpha	5	N	FACU
5.			
6.			
7.			
8.			
= Total Cover	80		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 20 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

__ Prevalence Index is ≤3.0[1]

__ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ✓ **No** ____

Remarks:

SOIL

Sampling Point: 10a

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-6	10 YR 2/1	95	7.5 YR 5/6	5	C	M	Clay loam	Prominent redox
6-10	7.5 YR 3/1	70	7.5 YR 5/6	2.5	C	M	Clay silt	
6-10	7.5 YR 4/3	20	7.5 YR 5/6	2.5	C	M	Clay silt	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Cobble / Gravel

Depth (inches): > 6

Hydric Soil Present? Yes ✓ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): ___

Water Table Present? Yes ✓ No ___ Depth (inches): 6

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): 4

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Gonzaga Ridge Wind City/County: Merced County Sampling Date: May 23, 2019

Applicant/Owner: Scout Clean Energy, LLC State: CA Sampling Point: 10b

Investigator(s): L. Burris, A. Sennett Section, Township, Range: See Report

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): concave Slope (%): 1

Subregion (LRR): C Lat: 37.039040 Long: -121.190019 Datum: WGS84

Soil Map Unit Name: See Report NWI classification: See Report

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

	Yes	No
Hydrophytic Vegetation Present?		✓
Hydric Soil Present?		✓
Wetland Hydrology Present?		✓

Is the Sampled Area within a Wetland? Yes ___ No ✓

Remarks:

Upland point for SWS-5

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: 2 ft x 2 ft)			
1. Avena barbata	35	Y	NL
2. Bromus hordeceus	30	Y	FACU
3. Bromus diandrus	10	N	NL
4. Festuca myuros	5	N	FACU
5. Festuca perennis	5	N	FAC
6.			
7.			
8.			
= Total Cover	85		
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 15 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:

- ___ Dominance Test is >50%
- ___ Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ___ No ✓

Remarks:

Thatch present

SOIL

Sampling Point: 10b

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-10	7.5 YR 4/3	100					clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: gravel/cobble

Depth (inches): > 10

Hydric Soil Present? Yes ______ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ______ No ✓ Depth (inches): ____________

Water Table Present? Yes ______ No ✓ Depth (inches): ____________

Saturation Present? (includes capillary fringe) Yes ______ No ✓ Depth (inches): ____________

Wetland Hydrology Present? Yes ______ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Gonzaga Ridge Wind City/County: Merced County Sampling Date: 5/22/19

Applicant/Owner: Scout Clean Energy, LLC State: CA Sampling Point: 11a

Investigator(s): A. Sennett, L. Burris Section, Township, Range: See Report

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 0

Subregion (LRR): C Lat: 37.033120 Long: -121.174816 Datum: WGS84

Soil Map Unit Name: See Report NWI classification: See Report

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No ___	**Is the Sampled Area within a Wetland?** **Yes** ✓ **No** ___
Hydric Soil Present?	Yes ✓ No ___	
Wetland Hydrology Present?	Yes ✓ No ___	

Remarks:

Swale (SWS-6) at bottom of hillsides.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: 2 ft x 2 ft)			
1. Hordeum marinum	12	Y	FAC
2. Festuca perennis	10	Y	FAC
3. Bromus hordeaceus	2	N	FACU
4. Polygonum aviculare	1	N	FAC
5.			
6.			
7.			
8.			
= Total Cover	25		
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 60 % Cover of Biotic Crust 15

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	___	x 1 = ___
FACW species	___	x 2 = ___
FAC species	___	x 3 = ___
FACU species	___	x 4 = ___
UPL species	___	x 5 = ___
Column Totals:	___ (A)	___ (B)

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ✓ **No** ___

Remarks:

SOIL

Sampling Point: 11a

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-5	7.5 YR 4/2	95	7.5 YR 4/6	5	C	M	Clay loam	Prominent redox

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ✓ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Clay pan

Depth (inches): > 5

Hydric Soil Present? Yes ✓ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ✓ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ✓ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): ___

Water Table Present? Yes ___ No ✓ Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches): ___

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Gonzaga Ridge Wind City/County: Merced County Sampling Date: May 23, 2019

Applicant/Owner: Scout Clean Energy, LLC State: CA Sampling Point: 11b

Investigator(s): L. Burris, A. Sennett Section, Township, Range: See Report

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): concave Slope (%): 1

Subregion (LRR): C Lat: 37.033047 Long: -121.174861 Datum: WGS84

Soil Map Unit Name: See Report NWI classification: See Report

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

	Yes	No
Hydrophytic Vegetation Present?		✓
Hydric Soil Present?		✓
Wetland Hydrology Present?		✓

Is the Sampled Area within a Wetland? **Yes** ____ **No** ✓

Remarks:

Upland point for SWS-6

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: 2 ft x 2 ft)			
1. Avena barbata	35	Y	NL
2. Bromus hordeceus	30	Y	FACU
3. Bromus diandrus	10	N	NL
4. Festuca myuros	5	N	FACU
5. Festuca perennis	5	N	FAC
6.			
7.			
8.			
= Total Cover	85		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 15 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ___ Dominance Test is >50%
- ___ Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ____ **No** ✓

Remarks:

Thatch present

SOIL

Sampling Point: 11b

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-10	7.5 YR 4/3	100					clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5) (**LRR C**)
___ 1 cm Muck (A9) (**LRR D**)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

___ 1 cm Muck (A9) (**LRR C**)
___ 2 cm Muck (A10) (**LRR B**)
___ Reduced Vertic (F18)
___ Red Parent Material (TF2)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: gravel/cobble

Depth (inches): > 10

Hydric Soil Present? Yes ______ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1) (**Nonriverine**)
___ Sediment Deposits (B2) (**Nonriverine**)
___ Drift Deposits (B3) (**Nonriverine**)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Salt Crust (B11)
___ Biotic Crust (B12)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

___ Water Marks (B1) (**Riverine**)
___ Sediment Deposits (B2) (**Riverine**)
___ Drift Deposits (B3) (**Riverine**)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ______ No ✓ Depth (inches): ____________

Water Table Present? Yes ______ No ✓ Depth (inches): ____________

Saturation Present? (includes capillary fringe) Yes ______ No ✓ Depth (inches): ____________

Wetland Hydrology Present? Yes ______ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Gonzaga Ridge Wind City/County: Merced County Sampling Date: 5/22/19

Applicant/Owner: Scout Clean Energy, LLC State: CA Sampling Point: 12a

Investigator(s): A. Sennett, L. Burris Section, Township, Range: See Report

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): Concave Slope (%): 0

Subregion (LRR): C Lat: 37.035132 Long: -121.186728 Datum: WGS24

Soil Map Unit Name: See Report NWI classification: See Report

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

	Yes	No
Hydrophytic Vegetation Present?	✓	
Hydric Soil Present?	✓	
Wetland Hydrology Present?	✓	

Is the Sampled Area within a Wetland? Yes ✓ No ___

Remarks:

Depressional feature (SW-1) in/adjacent to access road.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: 2 ft x 2 ft)			
1. Hordeum marinum	50	Y	FAC
2. Festuca perennis	20	Y	FAC
3. Bromus hordeaceus	5	N	FACU
4. Eschscholzia californica	2	N	NL
5. Avena barbata	2	N	NL
6.			
7.			
8.			
= Total Cover	79		
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 21 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ___

Remarks:

High thatch cover.

SOIL

Sampling Point: 12a

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-6	7.5 YR 4/3	97	7.5 YR 4/6	3	C	PL	Silty clay	Distinct redox

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ✓ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: cobble/gravel

Depth (inches): > 6

Hydric Soil Present? Yes ✓ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ✓ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): ___

Water Table Present? Yes ___ No ✓ Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches): ___

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Gonzaga Ridge Wind City/County: Merced County Sampling Date: May 23, 2019

Applicant/Owner: Scout Clean Energy, LLC State: CA Sampling Point: 12b

Investigator(s): L. Burris, A. Sennett Section, Township, Range: See Report

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): concave Slope (%): 1

Subregion (LRR): C Lat: 37.035155 Long: -121.186706 Datum: WGS84

Soil Map Unit Name: See Report NWI classification: See Report

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___	No ✓
Hydric Soil Present?	Yes ___	No ✓
Wetland Hydrology Present?	Yes ___	No ✓

Is the Sampled Area within a Wetland? Yes ___ No ✓

Remarks:

Upland point for SW-1

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: 2 ft x 2 ft)			
1. Avena barbata	35	Y	NL
2. Bromus hordeceus	30	Y	FACU
3. Bromus diandrus	10	N	NL
4. Festuca myuros	5	N	FACU
5. Festuca perennis	5	N	FAC
6.			
7.			
8.			
= Total Cover	85		
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 15 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:

- ___ Dominance Test is >50%
- ___ Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ___ No ✓

Remarks:

Thatch present

SOIL

Sampling Point: 12b

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-10	7.5 YR 4/3	100					clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5) (**LRR C**)
___ 1 cm Muck (A9) (**LRR D**)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

___ 1 cm Muck (A9) (**LRR C**)
___ 2 cm Muck (A10) (**LRR B**)
___ Reduced Vertic (F18)
___ Red Parent Material (TF2)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: gravel/cobble

Depth (inches): > 10

Hydric Soil Present? Yes ______ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1) (**Nonriverine**)
___ Sediment Deposits (B2) (**Nonriverine**)
___ Drift Deposits (B3) (**Nonriverine**)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Salt Crust (B11)
___ Biotic Crust (B12)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

___ Water Marks (B1) (**Riverine**)
___ Sediment Deposits (B2) (**Riverine**)
___ Drift Deposits (B3) (**Riverine**)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ______ No ✓ Depth (inches): ____________
Water Table Present? Yes ______ No ✓ Depth (inches): ____________
Saturation Present? (includes capillary fringe) Yes ______ No ✓ Depth (inches): ____________

Wetland Hydrology Present? Yes ______ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Gonzaga Ridge Wind City/County: Merced County Sampling Date: 5/22/19

Applicant/Owner: Scout Clean Energy, LLC State: CA Sampling Point: 13a

Investigator(s): A. Sennett, L. Burris Section, Township, Range: See Report

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 0.5

Subregion (LRR): C Lat: 37.033189 Long: -121.172317 Datum: WSG84

Soil Map Unit Name: See Report NWI classification: See Report

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No ___	Is the Sampled Area within a Wetland? Yes ✓ No ___
Hydric Soil Present?	Yes ✓ No ___	
Wetland Hydrology Present?	Yes ✓ No ___	

Remarks:

Swale (SWS-7) at bottom of hillsides.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: 2 ft x 2 ft)			
1. Hordeum marinum	12	Y	FAC
2. Festuca perennis	10	Y	FAC
3. Bromus hordeaceus	2	N	FACU
4. Polygonum aviculare	1	N	FAC
5.			
6.			
7.			
8.			
= Total Cover	25		
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 60 % Cover of Biotic Crust 15

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ___	x 1 = ___
FACW species ___	x 2 = ___
FAC species ___	x 3 = ___
FACU species ___	x 4 = ___
UPL species ___	x 5 = ___
Column Totals: ___ (A)	___ (B)

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ___

Remarks:

SOIL

Sampling Point: 13a

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-5	7.5 YR 4/2	95	7.5 YR 4/6	5	C	M	Clay loam	Prominent redox

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ✓ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Clay pan

Depth (inches): > 5

Hydric Soil Present? Yes ✓ No ______

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ✓ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ✓ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ______ No ✓ Depth (inches): ____________

Water Table Present? Yes ______ No ✓ Depth (inches): ____________

Saturation Present? (includes capillary fringe) Yes ______ No ✓ Depth (inches): ____________

Wetland Hydrology Present? Yes ✓ No ______

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Gonzaga Ridge Wind City/County: Merced County Sampling Date: May 23, 2019

Applicant/Owner: Scout Clean Energy, LLC State: CA Sampling Point: 13b

Investigator(s): L. Burris, A. Sennett Section, Township, Range: See Report

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): concave Slope (%): 1

Subregion (LRR): C Lat: 37.033186 Long: -121.172353 Datum: WGS84

Soil Map Unit Name: See Report NWI classification: See Report

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

	Yes	No
Hydrophytic Vegetation Present?		✓
Hydric Soil Present?		✓
Wetland Hydrology Present?		✓

Is the Sampled Area within a Wetland? Yes ____ No ✓

Remarks:

Upland point for SWS-7

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: 2 ft x 2 ft)			
1. Avena barbata	35	Y	NL
2. Bromus hordeceus	30	Y	FACU
3. Bromus diandrus	10	N	NL
4. Festuca myuros	5	N	FACU
5. Festuca perennis	5	N	FAC
6.			
7.			
8.			
= Total Cover	85		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 15 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ___ Dominance Test is >50%
- ___ Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No ✓

Remarks:

Thatch present

SOIL

Sampling Point: 13b

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-10	7.5 YR 4/3	100					clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5) (**LRR C**)
___ 1 cm Muck (A9) (**LRR D**)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

___ 1 cm Muck (A9) (**LRR C**)
___ 2 cm Muck (A10) (**LRR B**)
___ Reduced Vertic (F18)
___ Red Parent Material (TF2)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: gravel/cobble

Depth (inches): > 10

Hydric Soil Present? Yes ______ No __✓__

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1) (**Nonriverine**)
___ Sediment Deposits (B2) (**Nonriverine**)
___ Drift Deposits (B3) (**Nonriverine**)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Salt Crust (B11)
___ Biotic Crust (B12)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

___ Water Marks (B1) (**Riverine**)
___ Sediment Deposits (B2) (**Riverine**)
___ Drift Deposits (B3) (**Riverine**)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ______ No __✓__ Depth (inches): ____________

Water Table Present? Yes ______ No __✓__ Depth (inches): ____________

Saturation Present? (includes capillary fringe) Yes ______ No __✓__ Depth (inches): ____________

Wetland Hydrology Present? Yes ______ No __✓__

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Gonzaga Ridge Wind City/County: Merced County Sampling Date: 5/22/19

Applicant/Owner: Scout Clean Energy, LLC State: CA Sampling Point: 14a

Investigator(s): A. Sennett, L. Burris Section, Township, Range: See Report

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 0.5

Subregion (LRR): C Lat: 37.033659 Long: -121.167492 Datum: WGS84

Soil Map Unit Name: See Report NWI classification: See Report

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No ___	Is the Sampled Area within a Wetland? Yes ✓ No ___
Hydric Soil Present?	Yes ✓ No ___	
Wetland Hydrology Present?	Yes ✓ No ___	

Remarks:

Swale (SWS-8) at bottom of hillsides.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: 2 ft x 2 ft)			
1. Hordeum marinum	12	Y	FAC
2. Festuca perennis	10	Y	FAC
3. Bromus hordeaceus	2	N	FACU
4. Polygonum aviculare	1	N	FAC
5.			
6.			
7.			
8.			
= Total Cover	25		
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 60 % Cover of Biotic Crust 15

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ___	x 1 = ___
FACW species ___	x 2 = ___
FAC species ___	x 3 = ___
FACU species ___	x 4 = ___
UPL species ___	x 5 = ___
Column Totals: ___ (A)	___ (B)

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:

- ✓ Dominance Test is >50%
- ___ Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ___

Remarks:

SOIL

Sampling Point: 14a

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-5	7.5 YR 4/2	95	7.5 YR 4/6	5	C	M	Clay loam	Prominent redox

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ✓ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Clay pan

Depth (inches): > 5

Hydric Soil Present? Yes ✓ No ______

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ✓ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ✓ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ______ No ✓ Depth (inches): ______

Water Table Present? Yes ______ No ✓ Depth (inches): ______

Saturation Present? (includes capillary fringe) Yes ______ No ✓ Depth (inches): ______

Wetland Hydrology Present? Yes ✓ No ______

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Gonzaga Ridge Wind City/County: Merced County Sampling Date: 5/23/19

Applicant/Owner: Scout Clean Energy, LLC State: CA Sampling Point: 14b

Investigator(s): A. Sennett, L. Burris Section, Township, Range: See Report

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): concave Slope (%): 0.5

Subregion (LRR): Mediterranean Lat: 37.033683 Long: -121.167504 Datum: WGS84

Soil Map Unit Name: See Report NWI classification: See Report

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___ No ✓	Is the Sampled Area within a Wetland? Yes ___ No ✓
Hydric Soil Present?	Yes ✓ No ___	
Wetland Hydrology Present?	Yes ✓ No ___	

Remarks:

upland point for SWS-8

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: 2 ft x 2 ft)			
1. Avena barbata	50	Y	NL
2. Festuca perennis	30	y	FAC
3. Bromus hordeaceus	5	N	FAC
4.			
5.			
6.			
7.			
8.			
= Total Cover	75		
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 25 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ___	x 1 = ___
FACW species ___	x 2 = ___
FAC species ___	x 3 = ___
FACU species ___	x 4 = ___
UPL species ___	x 5 = ___
Column Totals: ___ (A)	___ (B)

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ___ No ✓

Remarks:

SOIL

Sampling Point: 14b

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-8	7.5 YR 4/2	95	7.5 YR 4/6	5	C	M	Clay loam	Prominent redox

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ✓ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Gravel / Cobble

Depth (inches): > 8

Hydric Soil Present? Yes ✓ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ✓ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): ___

Water Table Present? Yes ___ No ✓ Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches): ___

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Gonzaga Ridge Wind City/County: Merced County Sampling Date: 5/22/19

Applicant/Owner: Scout Clean Energy, LLC State: CA Sampling Point: 15

Investigator(s): A. Sennett, L. Burris Section, Township, Range: See Report

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): concave Slope (%): 1

Subregion (LRR): C Lat: 37.045255 Long: -121.167277 Datum: WGS84

Soil Map Unit Name: See Report NWI classification: See Report

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

	Yes	No
Hydrophytic Vegetation Present?	✓	
Hydric Soil Present?		✓
Wetland Hydrology Present?		✓
Is the Sampled Area within a Wetland?		✓

Remarks:

Potential swale beginning near access road.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: 2 ft x 2 ft)			
1. Festuca perennis	55	Y	FAC
2. Hordeum marinum	10	N	FACU
3. Avena barbata	5	N	NL
4. Bromus hordeaceus	5	N	FACU
5.			
6.			
7.			
8.			
= Total Cover	75		
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 25 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ___

Remarks:

Layer of thatch present.

SOIL

Sampling Point: 15

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-6	10 YR 4/3	100					clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5) (**LRR C**)
___ 1 cm Muck (A9) (**LRR D**)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

___ 1 cm Muck (A9) (**LRR C**)
___ 2 cm Muck (A10) (**LRR B**)
___ Reduced Vertic (F18)
___ Red Parent Material (TF2)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Gravel / Cobble

Depth (inches): > 6

Hydric Soil Present? Yes ______ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1) (**Nonriverine**)
___ Sediment Deposits (B2) (**Nonriverine**)
___ Drift Deposits (B3) (**Nonriverine**)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Salt Crust (B11)
___ Biotic Crust (B12)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

___ Water Marks (B1) (**Riverine**)
___ Sediment Deposits (B2) (**Riverine**)
___ Drift Deposits (B3) (**Riverine**)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ______ No ✓ Depth (inches): ____________
Water Table Present? Yes ______ No ✓ Depth (inches): ____________
Saturation Present? (includes capillary fringe) Yes ______ No ✓ Depth (inches): ____________

Wetland Hydrology Present? Yes ______ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Gonzaga Ridge Wind City/County: Merced County Sampling Date: 5/23/19

Applicant/Owner: Scout Clean Energy, LLC State: CA Sampling Point: 16

Investigator(s): A. Sennett, L. Burris Section, Township, Range: See Report

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Flat Slope (%): 0

Subregion (LRR): C Lat: 37.049233 Long: -121.162566 Datum: WGS84

Soil Map Unit Name: See Report NWI classification: See Report

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ✓, Soil ✓, or Hydrology ✓ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

	Yes	No
Hydrophytic Vegetation Present?	✓	
Hydric Soil Present?		✓
Wetland Hydrology Present?		✓

Is the Sampled Area within a Wetland? Yes ___ No ✓

Remarks:

Two-track road on hillslope.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: 1m2)			
1. Festuca perennis	20	Y	FAC
2. Avena barbata	5	N	NL
3. Hordeum marinum	1	N	FAC
4.			
5.			
6.			
7.			
8.			
= Total Cover	26		
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 74 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ___

Remarks:

Disturbed by vehicle traffic- compacted and veg destruction.

SOIL

Sampling Point: 16

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-6	10 YR 3/2	100					Clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Gravel / Cobble

Depth (inches): > 6

Hydric Soil Present? Yes ______ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ______ No ✓ Depth (inches): ____________

Water Table Present? Yes ______ No ✓ Depth (inches): ____________

Saturation Present? (includes capillary fringe) Yes ______ No ✓ Depth (inches): ____________

Wetland Hydrology Present? Yes ______ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

* no GPS satellites

OHWM Delineation Cover Sheet

Project: Ganzaga **Date:** 5/23/19

Location: Merced County **Investigator(s):** AES + LAB

Project Description:

See report

Describe the river or stream's condition (disturbances, in-stream structures, etc.):

good condition - no in-stream structures, but may be disturbed by road-runoff.

Off-site Information

Remotely sensed image(s) acquired? ☐ **Yes** ☑ **No** [If yes, attach image(s) to datasheet(s) and indicate approx. locations of transects, OHWM, and any other features of interest on the image(s); describe below] Description:

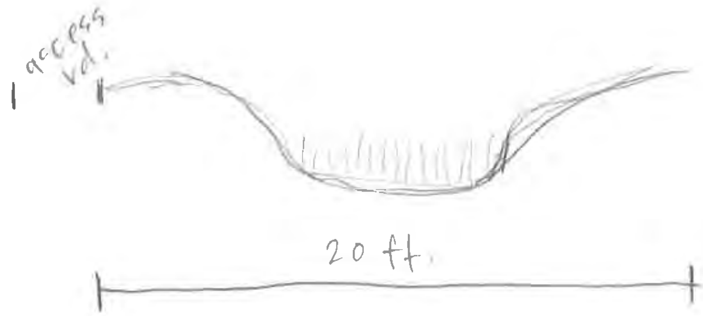
Hydrologic/hydraulic information acquired? ☐ **Yes** ☑ **No** [If yes, attach information to datasheet(s) and describe below.] Description:

List and describe any other supporting information received/acquired:

NA

Instructions: Complete one cover sheet and one or more datasheets for each project site. Each datasheet should capture the dominant characteristics of the OHWM along some length of a given stream. Complete enough datasheets to adequately document up- and/or downstream variability in OHWM indicators, stream conditions, etc. Transect locations can be marked on a recent aerial image or their GPS coordinates noted on the datasheet.

Transect (cross-section) drawing: (choose a location that is representative of the dominant stream characteristics over some distance; label the OHWM and other features of interest along the transect; include an estimate of transect length)



Break in Slope at OHWM: ☑ Sharp (> 60°) | ☐ Moderate (30–60°) | ☐ Gentle (< 30°) | ☐ None

Notes/Description:

Sediment Texture: Estimate percentages to describe the general sediment texture above and below the OHWM

	Clay/Silt <0.05mm	Sand 0.05 – 2mm	Gravel 2mm – 1cm	Cobbles 1 – 10cm	Boulders >10cm	Developed Soil Horizons (Y/N)
Above OHWM	100% clay loam	0	0	0	0	Y
Below OHWM	100% fines	0	0	0	0	N

Notes/Description:

Vegetation: Estimate absolute percent cover to describe general vegetation characteristics above and below the OHWM

	Tree (%)	Shrub (%)	Herb (%)	Bare (%)
Above OHWM	0	0	75	25
Below OHWM	0	0	25	75

Notes/Description:

margin - J. balticus
P. monspeliensis
Mimulus guttatus

E. macrostachya

below OHWM - R. aquatica
Filamentous algae

Other Evidence: List/describe any additional field evidence and/or lines of reasoning used to support your delineation

break in slope
change in vegetation
bed / bank

OHWM Delineation Cover Sheet

Project: Gaazaga **Date:** 5/23/19

Location: Merced county **Investigator(s):** AES + LAB

Project Description:

See report

Describe the river or stream's condition (disturbances, in-stream structures, etc.):

good - no obvious disturbances observed.

Off-site Information

Remotely sensed image(s) acquired? ☐ Yes ☑ No [If yes, attach image(s) to datasheet(s) and indicate approx. locations of transects, OHWM, and any other features of interest on the image(s); describe below] Description:

Hydrologic/hydraulic information acquired? ☐ Yes ☑ No [If yes, attach information to datasheet(s) and describe below.] Description:

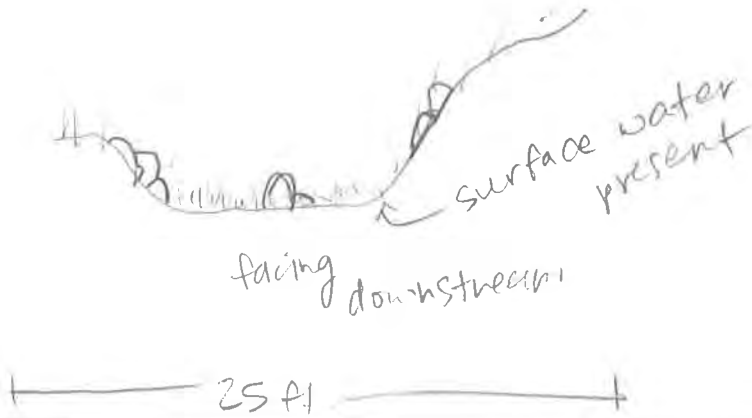
List and describe any other supporting information received/acquired:

NA

Instructions: Complete one cover sheet and one or more datasheets for each project site. Each datasheet should capture the dominant characteristics of the OHWM along some length of a given stream. Complete enough datasheets to adequately document up- and/or downstream variability in OHWM indicators, stream conditions, etc. Transect locations can be marked on a recent aerial image or their GPS coordinates noted on the datasheet.

Datasheet # 2	**OHWM Delineation Datasheet**	Page 4 of 4

Transect (cross-section) drawing: (choose a location that is representative of the dominant stream characteristics over some distance; label the OHWM and other features of interest along the transect; include an estimate of transect length)



Break in Slope at OHWM: ☐ Sharp (> 60°) | ☑ Moderate (30–60°) | ☐ Gentle (< 30°) | ☐ None

Notes/Description:

Sediment Texture: Estimate percentages to describe the general sediment texture above and below the OHWM

	Clay/Silt <0.05mm	Sand 0.05 – 2mm	Gravel 2mm – 1cm	Cobbles 1 – 10cm	Boulders >10cm	Developed Soil Horizons (Y/N)
Above OHWM	95	0	0	0	5	Y
Below OHWM	98	0	0	0	2	N

Notes/Description:

Vegetation: Estimate absolute percent cover to describe general vegetation characteristics above and below the OHWM

	Tree (%)	Shrub (%)	Herb (%)	Bare (%)
Above OHWM	0	0	65	35
Below OHWM	0	0	75	25

Notes/Description:
P. monspeliensis F. perennis
C. macrostachya
M. guttatus
J. balticus
Veronica americana
Nasturtium officinale
filamentous algae
Rumex pulcher

Other Evidence: List/describe any additional field evidence and/or lines of reasoning used to support your delineation

Break in slope
change in veg

APPENDIX D
Aquatic Resources Spreadsheet

Waters_Name	State	Cowardin_Code	HGM_Code	Meas_Type	Amount	Units	Waters_Type	Latitude	Longitude
SW-1	California	PEM		Area	0.006	Acre	ISOLATE	37.035132	-121.186728
SWS-1	California	R6		Area	0.064	Acre	ISOLATE	37.060001	-121.203629
SWS-2	California	R6		Area	0.158	Acre	ISOLATE	37.04531	-121.195694
SWS-3	California	R6		Area	0.127	Acre	ISOLATE	37.042655	-121.194229
SWS-4	California	R6		Area	0.016	Acre	ISOLATE	37.040896	-121.190594
SWS-5	California	R6		Area	0.056	Acre	ISOLATE	37.039158	-121.190084
SWS-6	California	R6		Area	0.067	Acre	ISOLATE	37.03312	-121.174816
SWS-7	California	R6		Area	0.01	Acre	ISOLATE	37.033189	-121.172317
SWS-8	California	R6		Area	0.024	Acre	ISOLATE	37.033659	-121.167492
ID-1	California	R4		Linear	104.98	Foot	RPW	37.04196800	-121.19217300
ID-2	California	R4		Linear	140.25	Foot	RPW	37.03460800	-121.18339900
ED-1	California	R6		Linear	146.60	Foot	NRPW	37.05036100	-121.16333400

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APPENDIX D3

Avian and Bat Technical Studies

AVIAN AND BAT STUDIES TECHNICAL REPORT: GONZAGA RIDGE WIND PROJECT, MERCED COUNTY, CALIFORNIA

Prepared for:

Scout Clean Energy, LLC
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Avian and Bat Studies Technical Report: Gonzaga Ridge Wind Project Merced County, California

1 INTRODUCTION

The proposed Gonzaga Ridge Wind Project (Project), located within Pacheco State Park in central California and described in more detail in the CEQA document, will replace 162 existing older model turbines and upgrade an existing wind energy facility with substantially fewer and more efficient wind turbines and associated facilities. The Project would consist of up to 40 new wind turbines and associated infrastructure within the Park, as well as land owned by the Bureau of Reclamation (BOR) for an approximately 16-mile 70 kV above-ground transmission line to a PG&E substation west of Los Banos. The area where the wind turbines would be located (generation area) and within which the technical studies described herein were conducted is referred to as the Project Site (Figure 1). Vegetation communities that characterize the Project Site are depicted in Figure 2. In support of the CEQA analysis of potential impacts on biological resources, several avian and bat biological technical studies and assessments were conducted on and adjacent to the Project Site. This report discusses the methods and results of these technical studies.

In particular, these studies included the following: avian point counts and surveys to identify species and determine overall use of the Project Site by small and large birds (including eagles), particularly in close proximity (800m) to turbines; point counts and surveys to determine golden eagle (*Aquila chrysaetos*) and bald eagle (*Haliaeetus leucocephalus*) use of the Project Site during spring and fall migration periods; aerial and ground-based surveys to determine the distribution of golden eagle territories within 10 miles of the Project Site; compilation and review of U.S. Fish and Wildlife Service (USFWS) data on radio-tagged California condors (*Gymnogyps californianus*) within close proximity to, or over, the Project Area; and passive acoustic bat surveys to determine species composition and activity levels within the Project Site.

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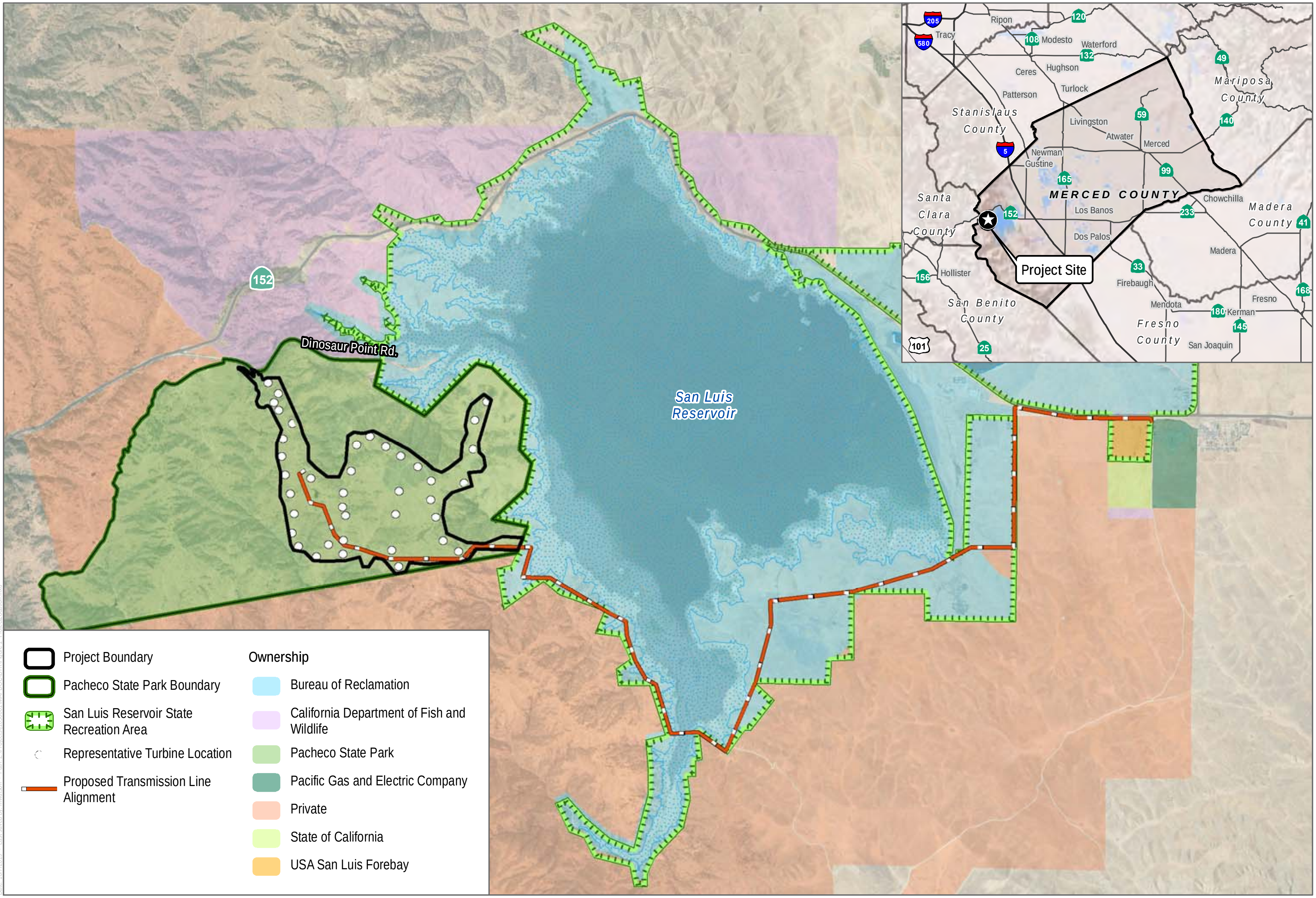

SOURCE: USDA 2016, Scout Energy 2018, Merced County 2018

DUDEK

FIGURE 1
Project Location

Biological Technical Report for the Gonzaga Ridge Wind Project

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2 AVIAN POINT COUNT STUDIES: SMALL AND LARGE BIRDS

2.1 Methods

To document bird use, behavior, and movement patterns, 30-minute counts were conducted by qualified biologists from nine fixed points within the Project Site (Ralph et al. 1993; Morrison 1998; CEC and CDFG 2007) (Figure 3). Surveys were conducted throughout the day, from one-half hour after sunrise to one hour before sunset, to capture avian species activity within varying daytime periods. Point counts were conducted weekly for 1 year beginning October 7, 2017, and ending October 3, 2018, and every other week during subsequent surveys from mid-October 2018 through September 2019. Observers rotated the starting survey location every week. A summary of personnel and site conditions associated with each survey is included in Appendix A.

During the first 10 minutes of the survey at each location, the biologist recorded occurrences and activities of small birds (less than 10 inches [25 centimeters] long) within 328 feet (100 meters) of the fixed observation point. During the entire 30 minutes, the biologist recorded occurrences and activities of medium to large birds (greater than 10 inches [25 centimeters] long) within 2,625 feet (800 meters) of the point (CEC and CDFG 2007). Therefore, data on raptor species, including eagles, were collected throughout the 30-minute point count within the 800-meter radius of each observation point. To the extent possible, the biologist collected data on raptors detected beyond the search radius as in optimal conditions an observer can identify larger raptors, such as eagles, up to 1 mile (1.6 kilometers) away. The nine point count stations were located primarily along ridgelines and at a density of 1 to 1.5 stations per square mile to afford maximum field of view for avian detections, to prevent overlap of the 800-meter point count radius at each station, to minimize repeat detections, and to maximize coverage across the wind turbine area.

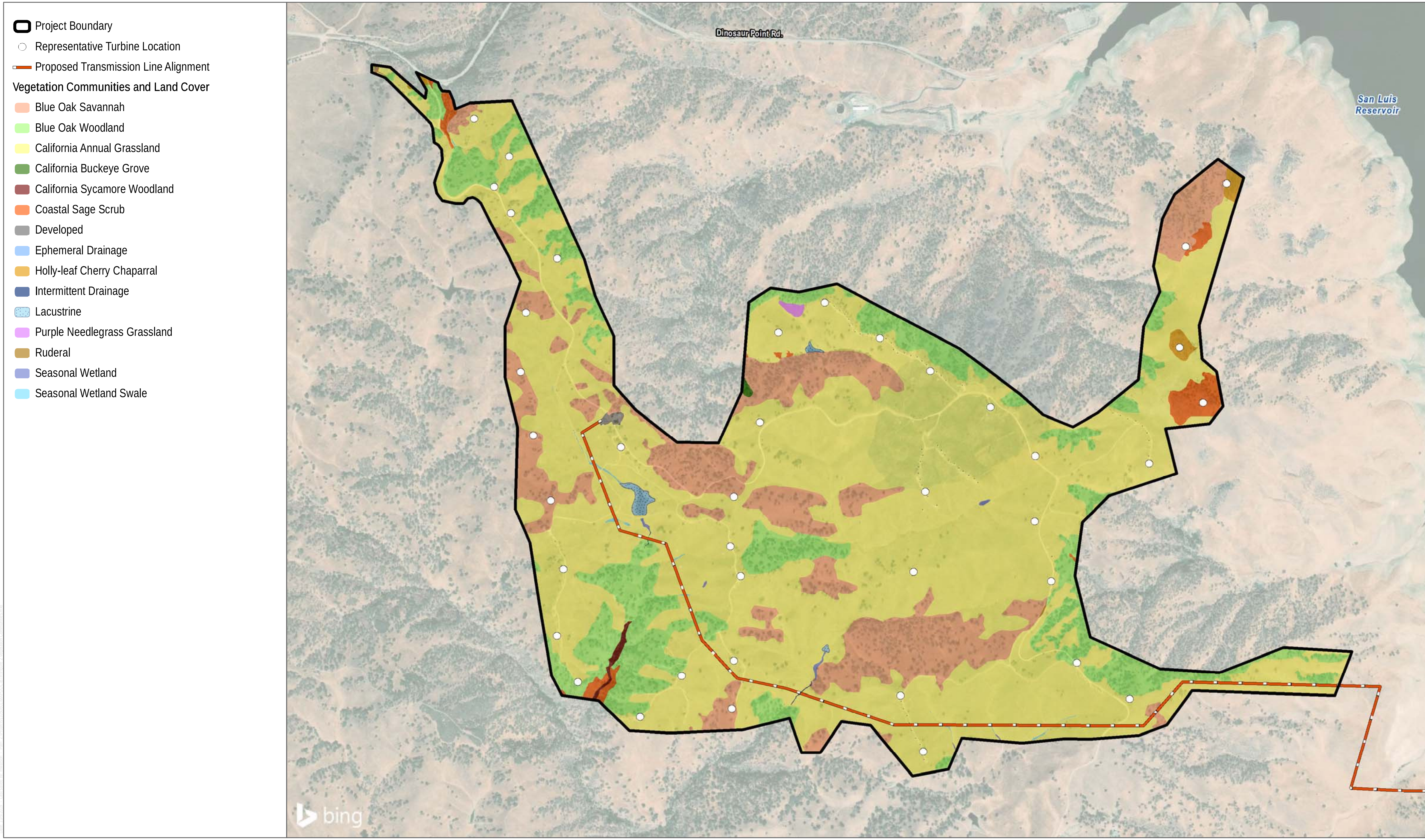
Data collected at each point count location included the following:

- Site location
- Observer name
- Survey period start and end times
- Weather (temperature, wind speed/direction, precipitation, percent cloud cover, visibility) at the start and end of each survey period
- Time and duration of observation (duration is rounded up to 1-minute increments; e.g., an eagle flying for about 15 seconds is 1 eagle minute, and another observed for about 1 minute10 seconds is 2 eagle minutes)
- Bird identification tag (for each individual or flock of birds observed at each location)

- Detection type (visual, aural)
- Species (American Ornithological Society four-letter code, including an unknown category)
- Number of individuals, sex, age class
- Location first observed (horizontal distance/bearing from observer)
- Activity/behavior (e.g., perching, soaring, flapping, circling, hunting, other)
- Flight height above ground (at location of bird) when first observed, and maximum and minimum heights throughout each observation
- Flight direction
- Flight paths for all raptors (delineated on a map)
- Notes (e.g., contour flying, following ridgeline, flying through a pass, flying over top of hills, location information on incidental bird sightings)

2.2 Results

This section discusses results of the general avian point count surveys with particular focus on numbers of each species observed, heights above the ground where birds were recorded, and detections within the turbine composite rotor swept zone (RSZ), or the area in space encompassed by spinning rotor blades at a given rotor diameter. Because data collected for the avian point counts (as well as for eagle studies) was recorded in terms of height above ground, the maximum and minimum height above the ground of the RSZ for the proposed turbines is referred to in this analysis as the rotor diameter above ground (RDAG). In addition, because of the dynamic nature of wind energy technology development, the actual make, model, size, and specifications of the turbines selected for the proposed Project will be determined closer to the start of construction. Therefore, a range of turbine types to capture the envelope of potential impacts representing the smallest and largest machines the Project will potentially use are considered in this analysis. The use of the smallest and largest turbine parameters provides an impact envelope that identifies all possible turbine heights, rotor diameters, and rotor swept areas that are used in the resource impact analyses. Therefore, the RDAG referred to below is a composite RDAG reflecting all turbine types that may be used.



SOURCE: USDA 2016

DUDEK

FIGURE 2

Vegetation Communities and Land Cover

Biological Technical Report for the Gonzaga Ridge Wind Project

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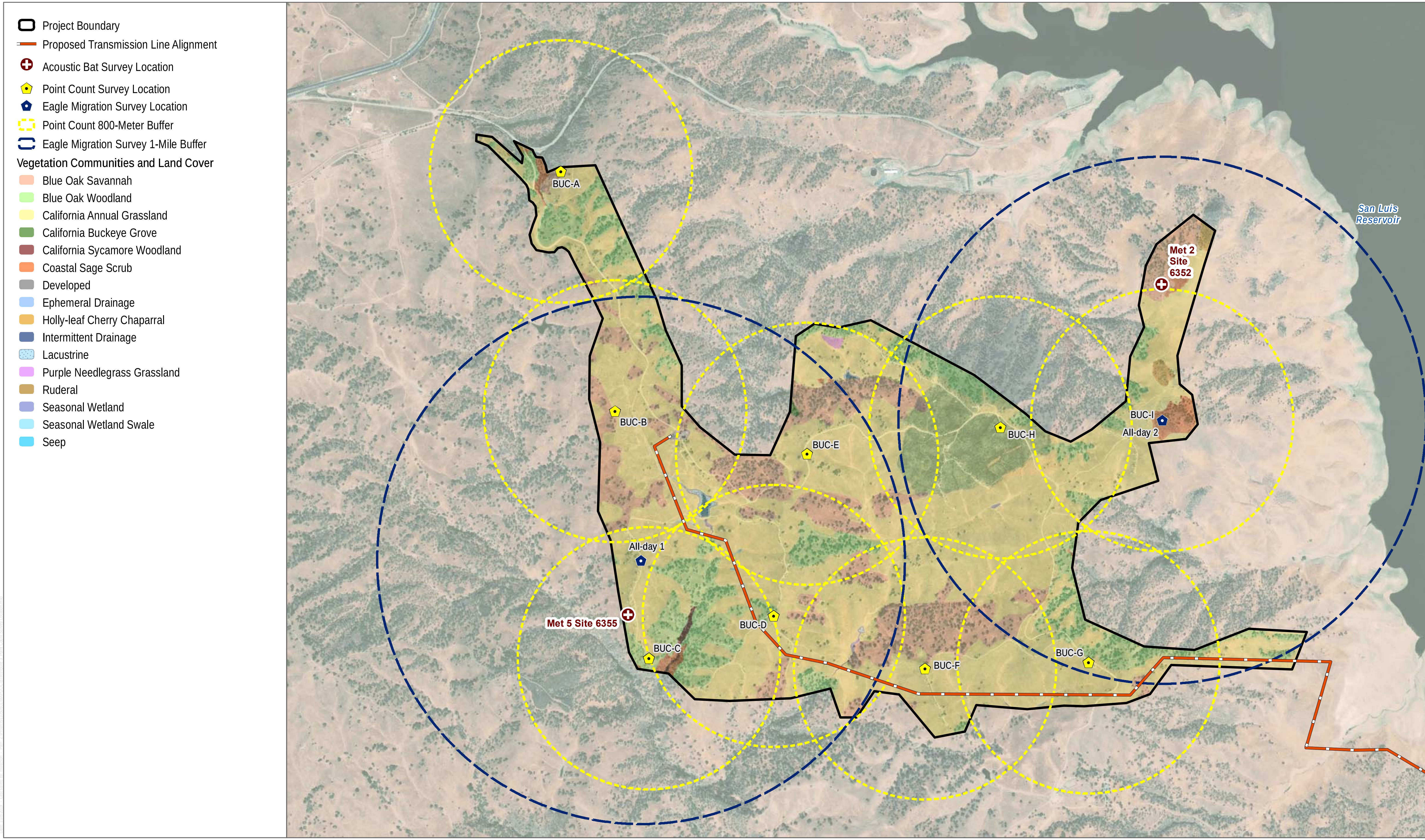

SOURCE: USDA 2016

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FIGURE 3

Point Count, Eagle Migration, and Acoustic Bat Survey Locations

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For the survey period beginning in October 2017 and ending in September 2019, a total of 693 point count surveys were conducted over 78 survey weeks within the Project Site (due to weather concerns, all 9 stations were not surveyed during several weeks). "Detections" refers to birds detected visually, aurally (by song or call), or both. However, while a number of birds were detected by call or song, only those visually detected were included in this analysis because height above ground data for birds only detected by sound obviously could not be calculated. A total of 1,103 detections representing 1,896 individual birds (and 54 species) were visually recorded during the survey period. The detections that were exclusively auditory were mostly passerines (songbirds) and other species, such as woodpeckers, that are relatively vocal and generally occur close to the ground. Table 1 provides height above ground information totals for all visual detections, including totals for all birds and totals for all raptors (including turkey vultures).

The maximum height for 35% of all visual detections (382 detections total) was below the RDAG of the turbine model closest to the ground (ground clearance of 29.5 feet); 50% (553 detections) occurred within the bottom 29% of the RDAG of most turbine models, 14% of observations were within the top 71% of the RDAG, and 1% was above the RDAG. Of all raptor detections, 12% (59 total) were detected below the RDAG, with an additional one percent observed entirely above the RDAG. Of those occurring at heights within the RDAG, most (63%, or 284 total) occurred solely within the lower 29% of the RDAG, including 43% that were never detected above the lower 60 ft (18m, or 11%) of the RDAG.

Table 1
Maximum and Minimum Flight Height for All Visual Detections

Height in Feet	All Bird Visual Detections (max height, % total)	All Bird Visual Detections (min height, % total)	Raptor Visual Detections (max height, % total)	Raptor Visual Detections (min height, % total)
0–20	382 (35)	547 (50)	59 (12)	119 (25)
30–90	401 (36)	352 (32)	185 (39)	206 (43)
100–190	152 (14)	114 (10)	108 (23)	84 (18)
200–290	94 (9)	54 (5)	70 (15)	41 (9)
300–390	39 (4)	21 (2)	27 (6)	18 (4)
400–490	15 (1)	6 (1)	15 (3)	6 (1)
500–590	10 (1)	2 (<1)	9 (2)	2 (<1)
>590	10 (1)	7 (1)	7 (1)	4 (1)
Total	1,103 (100)	1,103 (100)	480 (100)	480 (100)

Note: shaded cells are heights within the composite RDAG of the proposed "hypothetical" turbine.

Table 2 lists the 40 bird species observed in the RDAG, the total visual detections of each species within the RDAG per month, and the overall total bird visual detections in the RDAG for each month during the sampling period. Bird species in Table 2 are separated into two groups: non-raptors and raptors. Totals in the table may contain duplicate counts of individuals flying through the RDAG multiple times. Several birds not identified to species due to different factors (distance from observer, fog, rain, position of sun, etc.) are included in the total detections, as either unidentified raptor or unidentified non-raptor.

During the avian surveys, 714 visual detections involving 1,324 individuals that spent at least some portion of the observation period were recorded within the RDAG (Table 2). Raptors were the most common birds detected within the RDAG, accounting for 420 observations (58.8%) of the total detections made. The most abundant raptors detected visually in the RDAG were red-tailed hawk (*Buteo jamaicensis*) (35.7% of raptor detections), American kestrel (*Falco sparverius*) (25.7%), and turkey vulture (*Cathartes aura*) (21.2%), together accounting for 82.6% of all raptor detections within the RDAG. With respect to eagles, golden eagle accounted for 2.1% (9 total) and bald eagle accounted for 1.9% (8 total) of all raptor visual detections within the RDAG.

Non-raptor species, including those not identifiable to species, made up 41.2% of all bird visual detections in the RDAG during the 68 weeks of data collection. The species most frequently detected was common raven (*Corvus corax*), which accounted for 39.8% of all detections of non-raptors within the RDAG. California scrub-jay (*Aphelocoma californicus*), at 8.5%; western bluebird (*Sialia mexicana*), at 7.8%; and western meadowlark (*Sturnella neglecta*), at 7.5%, were the next most frequently detected. No other species exceeded 7%.

Table 2
Bird Species Detected Visually within the RDAG during Point Count Sampling Periods

Species	Oct 17	Nov 17	Dec 17	Jan 18	Feb 18	Mar 18	Apr 18	May 18	Jun 18	Jul 18	Aug 18	Sep 18	Oct 18*	Nov 18*	Dec 18*	Jan 19*	Feb 19*	Mar 19*	Apr 19*	May 19*	Jun 19*	Jul 19*	Aug 19*	Sep 19*	Total
Survey weeks	*4*	*5*	*4*	*5*	*4*	*4*	*4*	*5*	*4*	*4*	*5*	*4*	*3*	*2*	*2*	*2*	*2*	*2*	*3*	*2*	*2*	*2*	*2*	*2*	*58*
Non-Raptors																									
acorn woodpecker	2	1	1	3		1					1								1						10
American crow				7	1	1		1																	10
American white pelican							1																		1
ash-throated flycatcher			1						1																2
black phoebe			1																						1
Brewer's blackbird		2										2													4
California gull								1									1								2
California scrub-jay	12		5	3	1	4																			25
cliff swallow																				1					1
common raven	5	4	1	1	5	12	8	6	5	4	2	4	6	2	4	6	9	5	11	5	1	1	1	1	109
dark-eyed junco				1																					1
European starling			2																						2
house finch			1			3	5	1	1	3			1						1	3					19
house sparrow			1																						1
lark sparrow			3																						3
lesser goldfinch			1																						1
Lincoln's sparrow				1																					1
loggerhead shrike	1			2		2										1									6
mourning dove									1		1														2
northern mockingbird									1																1
oak titmouse		1	2	2																1					6
phainopepla				4																					4
red-winged blackbird							1	1											1						3
ruby-crowned kinglet				1																					1
Say's phoebe		1																						1	2
tree swallow			1	1		1	1	2	1	1									1						9
western bluebird	2	6	3	6	2	1														2				1	23
western kingbird							1																		1
western meadowlark	1		2	7	3	1	4	1											2	1					22
white-breasted nuthatch			2				1													1					4
yellow-billed magpie	1	1	3	1									1	1											8
gull sp.			1					1																	2
unidentified non-raptor			1	1		3		1			1														7
Subtotal Non-Raptor/Month	*24*	*16*	*32*	*41*	*12*	*29*	*22*	*15*	*10*	*8*	*5*	*6*	*8*	*3*	*4*	*7*	*10*	*5*	*17*	*14*	*1*	*1*	*1*	*3*	***294***

Table 2
Bird Species Detected Visually within the RDAG during Point Count Sampling Periods

Species	Oct 17	Nov 17	Dec 17	Jan 18	Feb 18	Mar 18	Apr 18	May 18	Jun 18	Jul 18	Aug 18	Sep 18	Oct 18*	Nov 18*	Dec 18*	Jan 19*	Feb 19*	Mar 19*	Apr 19*	May 19*	Jun 19*	Jul 19*	Aug 19*	Sep 19*	Total
Raptors																									
American kestrel	5	7	7	15	7	5	6	4	1	9	4	2	8	4	6	4			4	5	2		2	1	**108**
bald eagle	1						1	1				5													**8**
Cooper's hawk			3	4	3	1																			**11**
golden eagle		1			1		1			1			1	1	1				1	1					**9**
northern harrier	1		1				5		1	1	4				2	1	2								**18**
red-shouldered hawk				1																					**1**
red-tailed hawk	7	6	13	25	13	17	8	2	4	6	4	8	2	2	6	4	2	1	7	7	1		2	3	**150**
turkey vulture	4			2	7	10	11	5	5	5	4	7	1	1	2		2	1	6	3	3	3	3	4	**89**
white-tailed kite			1	1		1			1																**4**
unidentified soaring raptor			6	7	3	2	1	1	2																**22**
Subtotal Raptors/Month	*18*	*14*	*31*	*55*	*34*	*36*	*33*	*13*	*14*	*22*	*16*	*22*	*12*	*8*	*17*	*9*	*6*	*2*	*18*	*16*	*6*	*3*	*7*	*8*	***420***
Total/Month	**42**	**30**	**63**	**96**	**46**	**65**	**55**	28	**24**	**30**	21	**28**	20	**11**	**21**	**16**	**16**	**7**	**35**	**30**	**8**	**4**	**8**	**11**	**714**

Note: this table excludes auditory detections and individuals detected visually but not within the RDAG.
* – Surveys were conducted biweekly from mid-October 2018 through September 2019.

3 EAGLE STUDIES

3.1 Methods

Three different survey efforts gathered information on eagle use of the Project site and vicinity, and two of those efforts focused specifically on golden eagles and, to a lesser extent, bald eagles as described below.

3.1.1 Large Bird Point Counts

As described in detail in Section 2.1, during the entire 30 minutes of each avian count, an avian biologist counted all large birds, including golden eagles and bald eagles, within 800 meters (2,625 feet) during each of the point counts conducted at the nine fixed survey points on the Project Site (Figure 3). Methods, data collected, and timing of surveys are described in detail in Section 2.1 above.

3.1.2 Migration Counts

To obtain data on golden and bald eagle use of the Project Site and vicinity during the spring and fall migration periods, all-day eagle point counts were conducted at two locations shown on Figure 3. Surveying in one location for an entire day maximizes the potential for observations of golden eagles, thereby permitting detailed analysis of eagle use within the Project Site and immediate vicinity. During the all-day survey, biologists focused on detecting golden and bald eagles but included other raptor species as well.

All-day eagle point counts were conducted weekly between October 1 and November 30, 2017, between March 1 and April 30, 2018, and between October 15 and December 8, 2018, to collect data on potential use of the Project site and immediate vicinity by eagles during fall and spring migrations. These periods capture the center of the fall and spring raptor migration periods in California. The all-day eagle counts were conducted using methods established for raptor migration counts by the Hawk Migration Association of North America (HMANA 2012) as adapted to this particular region and the Project Site. Per recommendations from the USFWS, the counts were conducted between 8 a.m. and 4 p.m. for 3 days per week (not necessarily 3 consecutive days) for 8 weeks during each of the fall and spring periods. Two all-day count locations were established at opposite ends of the project site, with one on the east edge and one on the western edge (Figure 3). Each was at a prominent location atop a hill, providing expansive views of the surrounding area. The two locations were approximately 2.05 miles apart. From these locations, observers could identify and follow the activities of eagles up to a mile away, together covering approximately 6.3 square miles of the project and vicinity.

Weather conditions (temperature, wind speed and direction, cloud cover, precipitation, and visibility) were recorded on an hourly basis and recorded the following data for each golden eagle or other raptor observation:

- Species
- Number of individuals, sex, age class
- Time and duration of observation
- Detection type (visual or auditory)
- Location first observed (distance/direction from observer)
- Flight height where initially observed
- Maximum and minimum flight heights above the ground
- Flight direction
- Activity (such as perching, soaring, circling, flapping, hunting)
- Topographic flight path characterization (e.g., following ridgeline, through a pass, over tops of hills)
- Flight paths (delineated on a map)

3.1.3 Nest Territory Surveys

During the spring of 2018, qualified biologists conducted eagle territory/nest surveys, using several methodologies consistent with an ongoing multi-year U.S. Geological Survey (USGS) golden eagle study within the northern Diablo Range (Wiens et al. 2014). This study focused on detection of territorial golden eagle pairs within a sample of equal-sized, hexagonal study plots to investigate breeding success and occupancy for the territorial population of golden eagles in the northern Diablo Range, and how such occupancy data could be used to infer abundance of territorial pairs.

For the Gonzaga project, the survey area included the existing wind farm Project Site and all suitable golden eagle nesting habitat within 10 miles of the site (study area) as shown on Figure 4 (bald eagles were not include as the USGS study only addresses golden eagles). The 10-mile survey radius is based on requirements of the USFWS Eagle Conservation Plan Guidance for wind energy projects (USFWS 2013). While the USGS survey effort only included those hexagon plots selected by a random sampling protocol, the goal of this territory survey was to sample as many of the plots as possible. This included 100 percent of the plots within 2 miles of the Project Site since all plots were accessible. Ultimately, 75 percent of the 84 hexagon study plots within the 10-mile survey area was included in the surveys. This survey effort included both ground-based surveys as well as aerial surveys, as described below. Additional ground surveys were conducted in the spring of 2019 covering only the hexagon plots within 2 miles of the Project site.

3.1.3.1 Ground Surveys

As noted above, qualified biologists conducted ground-based surveys of accessible hexagons within 10 miles of the Project site, following USGS methods and using the grid system of hexagons established in the USGS study (Wiens et al. 2014). In this methodology, each hexagon is 5.35 square miles (1,385 hectares) which corresponds to the estimated mean size of core-use areas of territorial golden eagle pairs in the Diablo Range.

In areas that were publicly accessible or where access on private lands was obtained, biologists conducted ground surveys within those hexagons not previously surveyed by the USGS and that were partially or wholly included within the 10-mile radius study area. Hexagon study plots surveyed by the USGS (the USGS study area overlaps the Gonzaga study area) were not surveyed as USGS shared the multi-year data that they collected in these hexagons. Per direction of the USFWS, 100 percent of the hexagon plots within a 2-mile radius of the Project Site were surveyed (most are within public lands) by either Dudek or USGS. Study plots surveyed between 2 and 10 miles were determined based on habitat suitability and access (the majority of the study area is within private ownership). Because of the issues associated with access to private lands, an aerial survey conducted by helicopter was used to cover some areas within 2 to10 miles. Methods for this survey are discussed further below.

Observation points within each accessible hexagon plot were established prior to the field surveys based on aerial imagery and topographic maps. Observation points (typically 2-4 per study plot) were generally located on ridges and hilltops in order to provide the maximum coverage of the study plot. During the surveys, the raptor biologist spent from 1 to 4 hours at each of the pre-selected observation points. Surveys were conducted between one hour after sunrise and one hour before sunset to maximize detectability of perching and soaring golden eagles. Surveys were not conducted during extreme weather conditions.

Pursuant to the USGS study methodology, qualified biologists conducted surveys in three of four identified survey periods within the nesting season: the courtship period (January 1–February 28), the incubation period (March 1–April 30), the nestling period (May 1–June 15), and the fledgling period (June 15–July 31). A site was determined to be occupied if two golden eagles were observed in territorial display or courtship behavior within the study plot, or if golden eagles are detected engaging in behavior indicating that nesting has occurred (carrying sticks, food provisioning, etc.). Although the focus of the study was not to detect nests, information on nest status of any nest that was detected was also recorded.

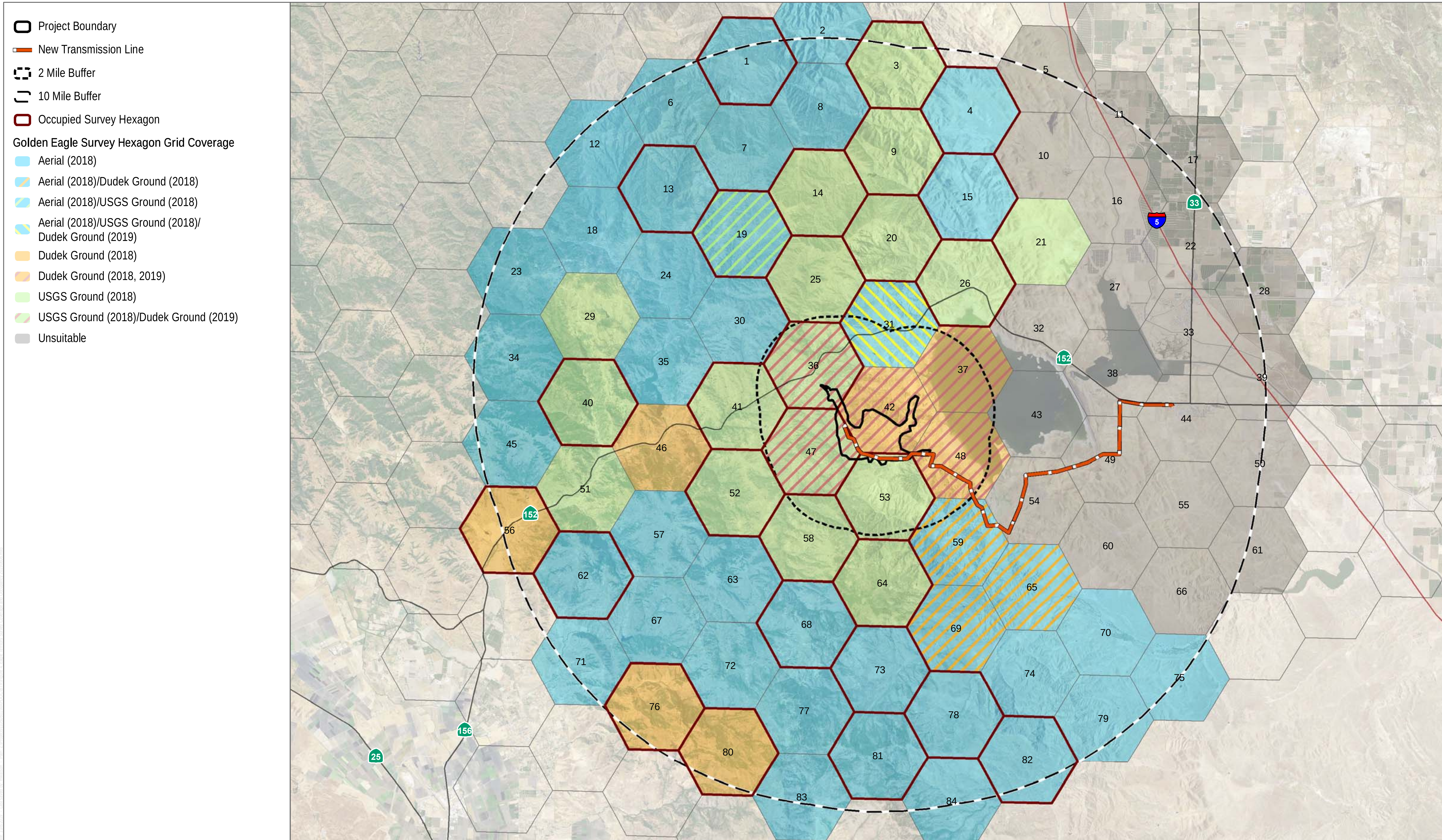
Observers searched for evidence of occupancy by territorial pairs (as determined by specific breeding/nesting behaviors exhibited by a pair of eagles), scanning from the observation points using binoculars and a spotting scope. Observations were recorded in electronic forms using a data collecting application for iPhones and iPads. The data forms were tailored to prompt the user to enter the same information collecting using the standard hard copy form used in the USGS study.

While the study focused on occupancy by golden eagle pairs, observations of any active nests or territorial behavior by pairs of bald eagles, particularly in the study cells that included the San Luis Reservoir, were also recorded. The observers also noted the presence of other raptor species, but did not record their locations. Ground surveys conducted in 2019 in hexagon survey plots within 2 miles of the Project site followed the same methods as the 2018 surveys, except that surveys were conducted within only the first two periods of the protocol (January 1–February 28 and March 1–April 30).

3.1.3.2 Aerial Surveys

Because of the issues associated with access to private lands, an independent raptor biologist qualified by CDFW to conduct aerial surveys for eagles and eagle nests, BioResource Consultants (BRC), was contracted to conduct helicopter surveys. The surveys were conducted during the second survey period (March 1 to April 30) of selected study cells between 2 and 10 miles from the site. Prior to conducting the field surveys, to locate historical nesting locations, BRC reviewed several past reports on golden eagle nesting surveys in the region, as well as published and unpublished databases.

Aerial surveys were conducted on March 6 and 7, 2018, by the BRC team in a Robinson R-66 Raven helicopter. The purpose of this survey was to identify which, if any, of the identified hexagon study plots supported nesting territories and/or individual nests of golden eagles. The survey was conducted according to established golden eagle survey protocol guidelines for aerial surveys (Pagel et al, 2010). The helicopter flew directly to the hexagon framework, where the observers searched for signs of active nesting or territorial behavior by golden eagles. The effort was initiated with the expectation that the survey team would spend 12 to 15 minutes of survey time in each hexagon, and would fly the survey hexagons in a systematic sequence. Since the vegetation density varied highly from area to area, the survey team spent the most survey time in oak woodland/savannah areas and much less time in areas of dense vegetation dominated by tall trees. Observers spent only a limited time surveying in the easternmost areas, which were essentially treeless and void of suitable nesting cliffs.



SOURCE: USDA 2016

DUDEK

0 6,500 13,000 Feet

FIGURE 4

Eagle Cumulative Territory Survey Coverage and Occupancy Results

Biological Technical Report for the Gonzaga Ridge Wind Project

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3.2 Results

This section presents results of bird surveys as they relate to eagles, by survey type. While the main focus of the surveys was to document the use of the Project Site and vicinity by golden eagles, observations of bald eagles are noted as well.

3.2.1 Large Bird Counts

As noted in Section 2.2, a total of 693 avian point counts were conducted over 78 survey weeks, through September 2019 within the Project Site. During these counts, a total of 20,790 total observation minutes were tallied. Over this entire time, biologists observed individual golden eagles on nine occasions, comprising a total of approximately 25 minutes of golden eagle observations (0.12%) out of the total observation minutes for the surveys (Table 3).

During the weekly counts, golden eagles were detected on four different occasions: a juvenile at point count station BUC-G (see Figure 3) on November 27, 2017; an adult at Station BUC-G on February 9, 2018; and individuals of undetermined age at Station BUC-G on April 3, 2018 and Station BUC-F on July 5, 2018. During the biweekly surveys from mid-October 2018 through September 2019, golden eagles were detected on five additional occasions, including an individual of undetermined age at Station BUC-F on October 29, 2018; an adult detected at Station BUC-G on November 27, 2018; one of undetermined age at Station BUC-H on December 27, 2018; an adult at Station BUC-C on April 4, 2019; and an adult again at Station BUC-C on May 13, 2019. Eight of the nine golden eagles were detected within the southern part of the site; however, the detections demonstrated no temporal pattern, instead occurring at different times of the year. All nine were visual detections involving flying individuals that briefly passed through the elevation range of the RDAG at some point during the observation.

Biologists detected bald eagles 8 times during weekly large bird counts through early October 2018, for a total of 15 detected minutes (0.10%) out of the 15,420 total observation minutes conducted; no bald eagles were detected during the biweekly counts conducted from mid-October 2018 through September 2019. Over the two years of surveys, bald eagles were detected 0.07 percent of the 20,790 total observation minutes. Five of the eight detections occurred during a two-week period in September 2018, including two different bald eagles, an adult and a juvenile or subadult, detected during the same survey period, from station D, on September 18, 2018. A juvenile detected 40 minutes later from Station BUC-E could have been the same individual. Nine days later, on September 27, 2018, an adult was near Station BUC-E, and a juvenile was detected from Station BUC-G. Previous detections were more widely spaced geographically and over time: a juvenile at Station BUC-A on October 26, 2017; a juvenile at Station BUC-C on April 24, 2018; and an adult at Station BUC-H on May 15, 2018. All bald eagles were detected visually in flight; all eight were recorded briefly passing through the potential RDAG at some point during the observations.

Table 3
Summary of Eagle Detections during Large Bird Point Counts

Species	Surveys	Survey Minutes	Detections	Detection Minutes	Percent of Total Observation Minutes
Golden Eagle	693	20,790	9	25	0.12
Bald Eagle	693	20,790	8	15	0.07

3.2.2 Migration Counts

During the spring and fall migration counts, a total of 48 golden eagles were detected, totaling 175 golden eagle detection minutes out of the total 71,700 survey minutes (0.24%) (Table 4). Of these detections, 12 were from Station BUC-B in the western part of the site and 36 were from Station BUC-I in the northeastern part of the site. During the fall 2017, golden eagles were detected on 9 occasions, including 7 times from Station BUC-I and twice from Station BUC-B. Two of these, on October 5 and October 25, 2017, were detections of two adults from Station BUC-I. Eight of the nine detections involved adults, and the ninth involved an individual of undetermined age. The detections were relatively evenly split between October (5) and November (4). During the spring 2018, golden eagles were detected on 26 occasions, the majority detected during the migration counts to date. Of these, 19 were detected from Station BUC-I and 7 from station BUC-B. Nearly half (12) were during a 9-day period in the latter half of April (April 17-25), including six from Station BUC-I on April 18, one of which involved four golden eagles of different ages detected at the same time. Spring detections more often involved subadults or juveniles (at least 8 of the 27 observations). In the fall 2018, golden eagles were detected 13 times, including 10 times at Station BUC-I and 3 times at Station BUC-B. All detections have involved individual birds. Of the 13 detections, 9 involved adults, 3 involved subadults or juveniles, and one was of undetermined age. Of the 13 detections, 10 occurred in October, and 11 occurred during the first 18 days (October 15 to November 1) of the 55-day period during which fall 2018 surveys were conducted.

All golden eagles were detected visually in flight behavior of some type. Of the 48 detections, 42 (88%) involved individuals flying at least partly at heights within the RDAG. These 42 individuals were observed for a combined total of 160 minutes (0.22%), out of the 71,700 total survey minutes. Table 5 provides height above ground information totals for all visual detections of golden eagles and bald eagles. In general, golden eagles were detected at a variety of heights above ground, showing relatively little pattern. The highest number for maximum height above ground was for golden eagles flying above the RDAG (38%), although only 10% of the total spent the entire time detected above the RDAG. While 29 of the 48 golden eagles (60%) spent time in the lower 29% of the RDAG or below the RDAG, only 1 individual (2%) was observed entirely below the RDAG (Table 5).

Biologists detected bald eagles on 24 occasions during surveys (Table 3). Nearly all (20 of 24) of these detections were from station BUC-I, which overlooks San Luis Reservoir to the east. Most of the detections of bald eagles (17 of 24) came in the fall 2017, including 7 from Station BUC-I on October 14, 2018, alone. The remaining detections included two (adult, juvenile) on March 27, 2018; an adult on April 5, 2018; single adults in the fall 2018, on October 16, October 30, and November 7; and a juvenile/subadult on November 8, 2018. Nine of the detections were of adults, and 15 were of juveniles or subadults. Most detections (21 of 24) involved individuals flying for at least part of the time at altitudes within the RDAG, although 10 spent time well above the RDAG, at altitudes 1,200 feet and higher (Table 5). The total detection time for 21 individuals flying within the RDAG was 82 minutes (0.11%), out of the total survey time of 71,700 minutes. Similarly to golden eagle, relatively little pattern is evident in maximum and minimum heights recorded for bald eagle (Table 5).

Table 4
Summary of Eagle Migration Count Survey Data by Month

	Surveys	Survey Minutes	Golden Eagle Detections	Golden Eagle Individuals Detected	Adult	Juvenile/ Subadult	Unknown	Detection Minutes	Bald Eagle Detections	Bald Eagle Individuals Detected	Adult	Juvenile/ Subadult
October 2017	25	12,000	5	7	6	0	1	30	16	18	4	14
November 2017	29	13,620	4	4	4	0	0	10	1	1	1	0
March 2018	24	11,520	9	9	6	3	0	41	2	2	1	1
April 2018	24	11,520	17	21	11	7	3	45	1	1	1	0
October 2018	17	8,160	10	10	8	1	1	42	2	2	2	0
November 2018	25	12,000	3	3	1	2	0	7	2	2	1	1
December 2018	6	2,880	0	0	0	0	0	0	0	0	0	0
Total	150	71,700	48	54	36	13	5	175	24	26	10	16

Table 5
Maximum and Minimum Flight Height for Eagle Visual Detections during Migration Count

Height in feet	Golden Eagle Detections (max height, % total)	Golden Eagle Detections (min height, % total)	Bald Eagle Detections (max height, % total)	Bald Eagle Detections (min height, % total)
0-20	1 (2)	8 (17)	0 (0)	1 (4)
30-90	4 (8)	10 (21)	3 (13)	4 (17)
100-190	5 (10)	11 (23)	2 (8)	4 (17)
200-290	9 (19)	9 (19)	2 (8)	4 (17)
300-390	4 (8)	2 (4)	1 (4)	4 (17)
400-490	2 (4)	3 (6)	3 (13)	0 (0)
500-590	5 (10)	0 (0)	2 (8)	4 (17)
>590	18 (38)	5 (10)	11 (46)	3 (13)
Total	48 (100)	48 (100)	24 (100)	24 (100)

Note: shaded cells are heights within the RDAG of the proposed “hypothetical” turbine.

3.2.3 Nest Territory Surveys

In 2018, biologists completed ground coverage (full coverage during three of four survey periods) of Hexagon 42, the main survey area within the Project Site, and of Hexagons 37 and 48, which fall within 2.0 miles of the Project site, confirming occupancy of territorial golden eagles only in Hexagon 48. Dudek was able to provide only partial coverage (one of four survey periods) of Hexagon 53, because of property access issues, although biologists contributed additional, incidental observations for this survey area during surveys of Hexagon 48. In 2019, Dudek provided coverage in the first two survey periods for all accessible hexagons within 2.0 miles of the site, which included Hexagons 42 and 47 (each of which covers parts of the Project Site), as well as Hexagons 31, 36, 37, and 48. Surveys confirmed occupancy of hexagon 47 in both years, and additional territories were confirmed near the boundary of 42 and 36 and near the boundary of 48 and 53. The former was active only in 2019, and the center of observed activity was considered to be within Hexagon 42. However, because of uncertainty of the location of a nest, Hexagon 42 is not shown as occupied on Figure 4. The latter territory was active in both 2018 and 2019, although in 2019 the pair occupying this survey area was considered not to be nesting. The center of observed activity for this pair is considered to be in Hexagon 53 (Figure 4). Note that USGS also confirmed a territory incidentally in Hexagon 53 in 2018. Within between 2.0 and 10.0 miles of the Project site, occupancy of golden eagle pairs was confirmed in three additional hexagons (56, 76, and 80), and was incidentally confirmed in Hexagon 41. Two full surveys of Hexagon 46 were completed; no eagle pairs were detected. Some level of coverage of four additional hexagons (59, 64, 65, 69) was achieved, but property access issues limited the coverage in terms of time spent during each survey period and the number of survey periods visited. However, USGS confirmed occupancy in Hexagon 64. In addition, BRC covered these hexagons during the 2018 aerial survey and did not detect territorial golden eagles (BRC 2018).

In 2018, USGS provided ground coverage of 21 hexagons, including four that fell at least partly within the 2.0-mile buffer of the Project site. Of these 21 hexagons, seven were not the subject of focused surveys, but USGS confirmed presence incidentally during focused surveys of other hexagons. BRC provided aerial coverage of 40 hexagons (including all hexagons where ground coverage was less than complete). In all, Dudek, USGS, and BRC provided coverage of all 63 hexagons that were considered to include suitable nesting habitat. Suitable nesting habitat was absent in 21 hexagons within the 10-mile study area.

The cumulative survey effort of USGS and Dudek ground surveys and BRC aerial surveys confirmed golden eagle territorial occupancy in 28 of the 84 hexagons within 10 miles of the Project Site (Figure 4). Although an individual eagle was recorded within the main Project Site hexagon (42) in 2018, no indication of territorial occupancy was observed or recorded that year. However, the next year, Dudek observed three adult golden eagles within this survey area on February 20, 2019, including one carrying a stick, presumably for nesting material. One of the three adults was observed flying over the Project, but this adult appeared to be passing through the area. A single adult was observed perching within the area on April 4, 2019; another adult was observed flying over the area on the same day. However, no territorial behavior from a pair of eagles was observed during either the 2018 or 2019 surveys or hexagon 42 and nest searches within the hexagon were negative. The only observation over the Project Site during the 2019 surveys involved the bird passing through the area on February 20. The stick carry and perching occurred north of the Project Site, closer to Dinosaur Point Road. Hexagon 47, which slightly overlaps the Project Site, was occupied in both 2018 and 2019. But eagle activity was centered well away from the Project Site, in the far western part of the survey area, around Spikes Peak, near the Santa Clara County line.

In an additional 14 hexagons, observers recorded at least one golden eagle, but did not confirm territorial occupancy according to the criteria described in Section 3.1.3 (Figure 4). Most of these observations involved individual golden eagles perching or flying in an area where no nest was detected and no pairs of eagles were observed. During aerial surveys, BRC observed 10 nests (including active and "old" nests) in 9 hexagons between 2.0 to 10.0 miles from the Project Site (BRC 2018). Of these nests, six had either incubating birds or a pair nearby. These active nests were in 5 different survey hexagons: 15, 68, 73, 78 and 82 (two nests). The "old" nests were in hexagons 45, 68 (two old nests in addition to the active nest mentioned above), and 77.

The territory surveys also resulted in detections of individual bald eagles in several of the survey hexagons (Table 6). Four individual bald eagles, including three subadults and one adult in Hexagon 48, were detected less than 2.0 miles from the Project Site and along the shore of San Luis Reservoir, on April 24, 2018. A subadult bald eagle was also observed here on February 18, 2019. Other bald eagles detections, all from 2018, were greater than 2.0 miles from the Project Site. Two were near the southernmost point of San Luis Reservoir, on May 9, 2018, in Hexagon 59. An adult and a subadult were near Pacheco Lake and within Hexagon 56, approximately 5.0 miles west of the Project Site, on March 27, 2018. And an adult was observed near a suitable nest structure in a western sycamore (*Platanus racemosa*) near Pacheco Creek, approximately 7.5 miles south southwest of the Project Site, in Hexagon 56, also on March 27, 2018. BRC reported a bald eagle in Hexagon 8 during aerial surveys, approximately 8.0 miles north of the Project Site.

**Table 6
Summary of Territory Survey Golden Eagle Data**

Total Survey Hexagons	Suitable Habitat	Aerial Coverage	Ground Coverage	Occupied	Eagles Detected (Hexagons)
84	63	41	27	28	44

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4 ACOUSTIC BAT SURVEYS

4.1 Methods

Qualified biologists conducted passive acoustic bat surveys to determine general bat presence, activity levels, and species composition in proposed turbine areas to ultimately determine potential collision risk of the repowered turbines on special-status bat species, the data of which may later be compared to post-construction data to determine bat displacement impacts.

Biologists utilized Anabat II zero-crossing ultrasonic detectors and compact flash drive (CF)-zero crossings analysis interface module (ZCAIM) storage units. Two units were programmed to record bat calls each day from one half-hour before sunset to one half-hour after sunrise each day of the study. Monitoring units were installed on an existing MET tower location in 2018 (see Figure 3). The MET tower included two monitoring units dressed with microphones within the wind-swept zone, and one nearer ground level. The MET tower was chosen based on topography and vegetative communities and therefore potentially a high probability for detections.

Microphones were kept in water-resistant casings attached to a microphone cable that extended to the ground where the detectors were placed in waterproof storage boxes. Microphones for the MET tower detectors have been deployed near the ground at approximately 5 feet (1.5 meters) and at a higher elevation approximately 131 feet (40 meters) of the individual tower height. The microphone enclosures were fitted with sound reflector plates positioned at 45° below horizontal so that the angle of the call reception is pointed upward at 45°. Pre-amp drivers were installed with each microphone enclosure to prevent signal loss due to cable length. Detectors and ZCAIM units were powered by a 12-volt battery that were recharged daily by a 10-watt solar panel attached to the MET tower. Each Anabat acoustic detector was set to a sensitivity level of six to reduce interference from other sources of ultrasonic noise. A division ratio of 16 was used for the study.

Monitoring was conducted February through October 2018, covering peak activity season for bats (i.e., March through October). Passive survey data was downloaded from all monitoring units on a weekly basis throughout the sampling periods to ensure that the equipment was operating correctly and to download data from the compact flash drive (CF) cards onto an external hard drive.

Limitations to data collection was the result of various hurdles witnessed throughout the survey period. Mechanical errors resulted in the loss or lack of data collection. Several units exhibited low or no battery power due to solar panels not working properly. On several occasions, solar panels were observed to have no power from wiring problems associated with the connection and high winds requiring monitoring units to rely on battery power lasting no more than a few days. On different occasions, the unit itself died of unknown causes, often requiring repairs or replacement. The availability for new unit exchanges during the repair/replacement of existing monitoring equipment was limited; therefore, one unit working in the lower tower elevations was changed out and used for the microphones placed at a higher tower elevation to continue to monitor bats within the rotary sweep zone of the proposed turbines.

The deployment schedule for each passive acoustic unit is presented in Table 7. The total number of detector nights (312) excluding nights where the equipment did not function properly.

Table 7
Schedule of Anabat Deployment

Towers	Staff	Dates of Deployment	Total No. Detector Nights**
Met Tower 5			
High	MJ/PL	02/15/2018-10/18/2018	230
Low	MJ/PL	02/15/2018-10/18/2018	82

Notes:
Biologist's initials: Paul Lemons (PL); Michelle Jordan (MJ)
** Total number of detector nights excludes nights where equipment failed

After completion of the passive surveys, the acoustic data were sent to a bat expert, Dr. Michael O'Farrell, for data analysis, interpretation, and species identification. Dr. O'Farrell differentiated species-level identifications using the methods of O'Farrell et al. (1999) based on frequency characteristics, call shape, and comparison with a comprehensive library of vocal signatures developed by O'Farrell and his colleagues. Thus, species richness (number of species verified as present) was obtained for each location. An Index of Abundance (IA), or the magnitude of each species contribution to spatial use, was obtained using the sum of 1-minute time increments for which a species was detected as present, divided by the number of nights of sampling (Miller 2001).

4.2 Results

Over 10,000 files with bat calls were recorded during the survey period from February through October 2018. Data collected from passive acoustic bat surveys was reviewed and determined that bat species were present within the Project site. The passive acoustic bat survey results were also used to evaluate the level of bat activity at each survey station. Eleven bat species were identified within the Project site using the Anabat passive surveys, including three California species of Special Concern: pallid bat (*Antrozous pallidus*), western red bat (*Lasiurus blossevillii*), and western mastiff bat (*Eumops perotis*). The eight additional species detected include: big brown bat (*Eptesicus fuscus*), silver-haired bat (*Lasionycteris noctivagans*), hoary bat (*Lasiurus cinereus*), western small-footed myotis (*Myotis ciliolabrum*), little brown bat (*Myotis lucifugus*), Yuma myotis (*Myotis yumanensis*), canyon bat (*Parastrellus hesperus*), and Brazilian free-tailed bat (*Tadarida brasiliensis*).

Table 8, Bat Survey Results by Location in Minutes of Detection, provides the special-status designation for each species detected, and displays the number of minutes of bat activity for each passive survey location and species richness across all survey locations. Exact numbers of individuals cannot be determined because the difference between single vocalization files made by different individuals or multiple vocalization files made by the same individual can't be distinguished. Instead, the sum of 1-minute time increments for which a species was detected as present is used to calculate Index of Abundance (IA), an IA or magnitude of each species contribution to spatial use (Miller 2001) (Table 9). Although bat species were detected via acoustic methods within the project boundaries it is difficult to confirm that the bat species roost on site based on this survey. The bat species may have been passing over the Project site.

Table 8
Bat Survey Results by Location in Minutes of Detection

Species		Survey Location (minutes recorded)		Total Minutes Recorded
Species Name	*Status[1]*	*MET 5 (High)*	*MET 5 (Low)*	
Pallid Bat (*Antrozous pallidus*)	SSC/WBWG:H	—	2	2
Big Brown Bat (*Eptesicus fuscus*)	None	—	6	6
Western Mastiff Bat (*Eumops perotis*)	SSC/WBWG:H	3	4	7
Western Red Bat (*Lasiurus blossevillii*)	SSC/WBWG:H	—	4	4
Hoary bat (*Lasiurus cinereus*)	WGWB: M	36	8	44
Silver-haired Bat (*Lasionycteris noctivagans*)	WGWB: M	—	3	3
Western Small-footed Myotis (*Myotis ciliolabrum*)	WGWB: M	—	1	1
Little Brown Myotis (*Myotis lucifugus*)	WGWB: M	—	3	3
Yuma Myotis (*Myotis yumanensis*)	WBWG: LM	5	117	122
Canyon Bat (*Parastrellus hesperus*)	None	3	8	11
Brazilian Free-tailed Bat (*Tadarida brasiliensis*)	None	645	144	789
	Total	692	300	992

[1] Status Notes:
SSC: California Species of Special Concern
WBWG: Western Bat Working Group
H: High
M: Medium
LM: Low-Medium

Table 9, Index of Species Abundance (IA) in Minutes of Detection, displays the IA by species across all recording locations and all sampling nights. The IA number is the number of minutes the species was observed, divided by the total number of sampling nights, and then multiplied by 100. This allows for a comparison of number of individuals (i.e. abundance) between species.

Table 9
Index of Species Abundance (IA) in Minutes of Detection

Species	IA (minutes recorded)	
Species Name	*MET 5 (High)*	*MET 5 (Low)*
Pallid Bat (*Antrozous pallidus*)	—	3
Big Brown Bat (*Eptesicus fuscus*)	—	8
Western Mastiff Bat (*Eumops perotis*)	1	5
Western Red Bat (*Lasiurus blossevillii*)	—	5
Hoary bat (*Lasiurus cinereus*)	16	10
Silver-haired Bat (*Lasionycteris noctivagans*)	—	4
Western Small-footed Myotis (*Myotis ciliolabrum*)	—	1
Little Brown Myotis (*Myotis lucifugus*)	—	4
Yuma Myotis (*Myotis yumanensis*)	2	150
Canyon Bat (*Parastrellus hesperus*)	1	10
Brazilian Free-tailed Bat (*Tadarida brasiliensis*)	288	185
Total	308	385

In minutes of detection, MET 5 low was the most active at 385 minutes, whereas MET 5 high was the least active at 308 minutes. Overall, the relative species abundance across all recording locations in minutes of detection indicated that the Brazilian free-tailed bat was the most abundant at 473 minutes, and the western small-footed bat was the least abundant at 1 minute (Table 9). Only Yuma myotis and Brazilian free-tailed bat have relative high abundance with IA at or above 150 minutes.

All three California Species of Special Concern had low relative abundance in the Project site. Pallid bat and western red bat were not recorded at MET 5 high, but were both recorded at MET 5 low with 3 and 5 minutes respectively. Western mastiff bat was recorded for 1 minute at MET 5 high, and 5 minutes at MET 5 low.

As previously stated, a total of 308 minutes of activity was recorded at MET 5 high which is set up within the RDAG. Passive monitoring resulted in the detection of five bat species. Of these five species, one special-status species, western mastiff bat, was detected in the RDAG, comprising approximately 0.32% of the total minutes present in the RDAG.

5 CALIFORNIA CONDOR ASSESSMENT

5.1 Methods

To identify and characterize potential California condor use of the Project site and/or surrounding region, Dudek biologists compiled and reviewed the USFWS/USGS database that depicts, on KMZ-based maps, the daily flight paths of condors outfitted with GPS/GSM radio transmitters. The northern California breeding population of condors is centered in Pinnacles National Park approximately 50 miles southwest of the Project site. Approximately 85% of the free-flying condors in the California population are outfitted with radio transmitters. Historical data from January 2017 through to March 31, 2019, was reviewed and evaluated and any condors (and their flight paths) flying within 10 miles of the Project site were mapped. In addition, any anecdotal observations of condors during any of the biological surveys described above were also compiled and mapped.

5.2 Results

Based on a review of USFWS/USGS GPS telemetry data (representing individual condor flights) from January 2017 through March 2019, eleven individual condors flew within 10 miles of the Project Site. Of these, nine flew within 5 miles of the site of which only one flew over the site (Figure 5). In 2017, a total of 2,596,871 condor location “points” (location information, including speed and elevation, provided by solar-powered GPS transmitters generally every 1-5 minutes during daylight hours) were recorded by the 55 condors wearing GPS transmitters. Of these points, 214 (.008% of all condor location points), representing four individual condors, were recorded within 0-5 miles from the Project site and 489 location points (.018%), representing the same four condors, were recorded from 5-10 miles of the site. In 2018, a total of 2,101,768 condor location points were recorded, with 295 location points (.014%), representing six individual condors, occurring within 0-5 miles and 2,467 location points (.117%), representing the same six condors and two other additional condors, occurring from 5-10 miles of the site. In the first quarter of 2019, a total of 780,559 condor location points were recorded, with 44 location points (.006%), representing one individual condor, occurring within 0-5 miles and 351 location points (.045%), representing the same condor, occurring from 5-10 miles of the site.

No individuals landed or perched on the Project site or within five miles of the Project site during any of the data collection periods. Between 5 and 10 miles of the site, two individuals perched briefly during August 2017 and two individuals perched during June 2018.

Of note, all condors documented within 5 miles and 5-10 miles of the Project site in 2017, 2018, and the first quarter of 2019, occurred at relatively high altitudes above the ground. In 2017, four condors flew at an average altitude of 2,953 feet (900 meters) above ground within 5 miles of the site, and the same four condors flew at an average altitude of 3,413 feet (1,040 meters) above ground between 5 and 10 miles of the site. In 2018, the average altitude within 5 miles and between 5 and 10 miles was 4,939 feet (1,505 meters) and 3,027 feet (922 meters), respectively. In the first quarter of 2019, the average altitude within 5 miles and between 5-10 miles was 2,366 feet (721 meters) and 2,320 feet (707 meters), respectively. These high altitude overflights likely reflect the relative lack of large animal carcasses (the preferred source of food for condors) within the Project site and surrounding area. The prohibition on hunting (a typical source of animal carcasses within the range of the condor in California) within the Project site and State Park likely contributes to this lack of a food source. In addition, the Park and surrounding region is not historically known as a frequent foraging area for California condors.

Table 10 below presents the average flight altitude of each of the condors that flew within 10 miles of the site, time spent within the 5- and 10-mile buffers, and the percent that the records of each of these condors within the buffers represented with respect to all condor records in 2017, 2018, and in the first quarter of 2019 in northern California.

Table 10
Summary of California Condor Occurrences within 5 and 10 Miles of the Project Site

California Condor ID	Average Altitude (Feet)		Number and Percent of Location Point Records[1]	
	5-Mile Buffer[2]	*5-10 Mile Buffer[3]*	*5-Mile Buffer[2] Number (Percent)*	*5-10 Mile Buffer[3] Number (Percent)*
2017 Occurrences				
564	3,208	3,182	50 (<0.01%)	184 (0.01%)
706	2,644	3,205	38 (<0.01%)	76 (<0.01%)
716	2,716	3,330	49 (<0.01%)	128 (<0.01%)
758	3,245	3,937	77 (<0.01%)	100 (<0.01%)
Total	—	—	214 (<0.01%)	488 (0.02%)
Average	2,953	3,413	—	—
2018 Occurrences				
678	5,981	4,990	10 (<0.01%)	24 (<0.01%)
697	3,028	3,107	54 (<0.01%)	595 (0.03%)
716	—	3,258	—	473 (0.02%)
726	3,255	1,811	89 (<0.01%)	564 (0.03%)
745	3,507	2,457	86 (<0.01%)	510 (0.02%)
823	10,541	5,354	2 (<0.01%)	18 (<0.01%)
828	3,320	2,303	54 (<0.01%)	266 (0.01%)
840	—	936	—	11 (<0.01%)
Total	—	—	295 (0.01%)	2,461 (0.12%)
Average	4,939	3,027	—	—

Table 10
Summary of California Condor Occurrences within 5 and 10 Miles of the Project Site

California Condor ID	Average Altitude (Feet)		Number and Percent of Location Point Records[1]	
	5-Mile Buffer[2]	*5-10 Mile Buffer[3]*	*5-Mile Buffer[2] Number (Percent)*	*5-10 Mile Buffer[3] Number (Percent)*
2019 First Quarter Occurrences				
828	2,366	2,320	44 (<0.01%)	351 (<0.05%)
Total (all data)	—	—	553 (<.01%)	3,300 (<.01%)
Average (all data)	3,983	3,092	—	—

Notes:
1 Percent of Records is based on the number of USGS location point records for each individual California condor divided by the total location point records of all California condors for that year.
2 The 5-mile buffer is defined as all California condor point record locations occurring between 0 and 5 miles from the Project site.
3 The 10-mile buffer is defined as all California condor point record locations occurring between 5 and 10 miles from the Project site.

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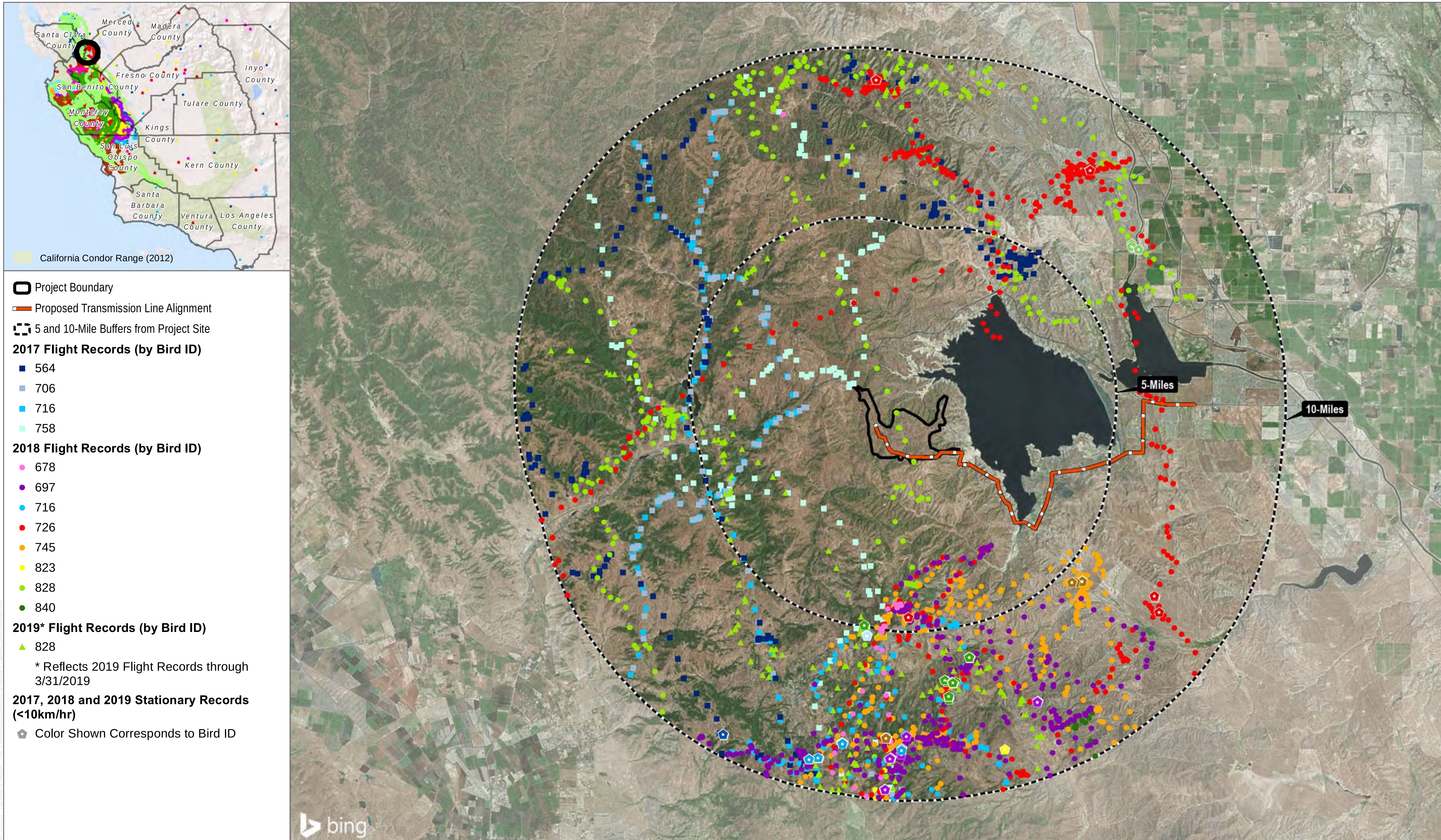

SOURCE: USFWS 2018

DUDEK

0 7,000 14,000 Feet

FIGURE 5

California Condor Assessment

Biological Technical Report for the Gonzaga Ridge Wind Project

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APPENDIX A

Avian Surveys: Personnel and Site Conditions

Appendix A
Avian Surveys: Personnel and Site Conditions

Table 1
Summary of 30-Minute Avian Counts: Personnel and Conditions

Date	Time	Survey Type	Personnel	Site Conditions
10/7/2017	0815- 1558	30-minute avian	Ben Delancey	54-88 °F; 0% cloud cover; 0-3 mph winds
10/9/2017	0920-1615	30-minute avian	Amy Anderson	55-82 °F; 0-10% cloud cover; 3-10 mph winds
10/18/2017	0813-1624	30-minute avian	Ben Delancey	54-82 °F; 10-30% cloud cover; 0-4 mph winds
10/26/2017	0815-1550	30-minute avian	Any Anderson	53-88 °F; 0% cloud cover; 2-8 mph winds
11/3/2017	0810-1655	30-minute avian	Jesse Ridenour	54-67 °F; 50-90% cloud cover; 0-7 mph winds
11/8/2017	0816- 1616	30-minute avian	Ben Delancey	49-63 °F; 80-90% cloud cover; 0-12 mph winds
11/16/2017	0730- 1400	30-minute avian	John Spranza	56-58 °F; 90-100% cloud cover; 0-15 mph winds, light rain
11/22/2017	0737-1514	30-minute avian	Jesse Ridenour	55-72 °F; 0-60% cloud cover; 0-7 mph winds
11/27/2017	0819-1612	30-minute avian	Ben Delancey	46-55 °F; 10-50% cloud cover; 0-12 mph winds
12/5/2017	0924-1551	30-minute avian	Michelle Leis	48-60 °F; 0% cloud cover; 0-18 mph winds
12/14/2017	0809-1650	30-minute avian	Michelle Leis	49-63 °F; 0% cloud cover; 0-10 mph winds
12/21/2017	0746-1444	30-minute avian	Michelle Leis	37-50 °F; 0% cloud cover; 0-10 mph winds
12/28/2017	0752-1417	30-minute avian	Michelle Leis	36-56 °F; 0-30% cloud cover; 0-10 mph winds
1/4/2018	0750-1417	30-minute avian	Michelle Leis	45-66 °F; 10-%60 cloud cover; 0-10 mph winds
1/11/2018	0751-1423	30-minute avian	Michelle Leis	50-55 °F; 10-100% cloud cover; 0-5 mph winds
1/16/2018	0750-1413	30-minute avian	Michelle Leis	51-57 °F; 30-100% cloud cover; 0-10 mph winds
1/23/2018	0747-1418	30-minute avian	Michelle Leis	42-50 °F; 100% cloud cover; 0-10 mph winds
1/30/2018	0745-1403	30-minute avian	Michelle Leis	43-64 °F; 0-20% cloud cover; 0-10 mph winds
2/9/2018	0818- 1658	30-minute avian	Ben Delancey	50-78 °F; 0-50% cloud cover; 0-4 mph winds
2/15/2018	0906-0939	30-minute avian	Nick Jakubek	42-43 °F; 0% cloud cover; 5-10 mph winds
2/16/2018	1010-1445	30-minute avian	Nick Jakubek	54-61 °F; 0% cloud cover; 3-10 mph winds
2/23/2018	0750-1421	30-minute avian	Michelle Leis	35-48 °F; 0% cloud cover; 0-15 mph winds
2/27/2018	0723-1425	30-minute avian	Michelle Leis	38-49 °F; 0-30% cloud cover; 0-10 mph winds
3/8/2018	0728-1402	30-minute avian	Michelle Leis	53-66 °F; 0-20% cloud cover; 0-5 mph winds
3/14/2018	0752-1440	30-minute avian	Michelle Leis	45-51 °F; 60-100% cloud cover; 0-15 mph winds
3/23/2018	0756-1522	30-minute avian	Michelle Leis	38-55 °F; 0-10% cloud cover; 0-15 mph winds
3/29/2018	0740-1403	30-minute avian	Michelle Leis	57-74 °F; 0-10% cloud cover; 0-10 mph winds
4/3/2018	0758-1419	30-minute avian	Michelle Leis	51-72 °F; 0-100% cloud cover; 0-5 mph winds
4/10/2018	0737-1449	30-minute avian	Michelle Leis	56-72 °F; 40-70% cloud cover; 5-15 mph winds
4/17/2018	0822-1507	30-minute avian	Michelle Leis	44-58 °F; 0-50% cloud cover; 0-10 mph winds
4/24/2018	0712-1423	30-minute avian	Michelle Leis	61-78 °F; 0-10% cloud cover; 0-15 mph winds
5/1/2018	0719-1409	30-minute avian	Michelle Leis	47-64 °F; 0-100% cloud cover; 5-15 mph winds
5/9/2018	0707-1329	30-minute avian	Michelle Leis	55-74 °F; 0-10% cloud cover; 10-15 mph winds
5/15/2018	0715-1346	30-minute avian	Michelle Leis	50-63 °F; 10-90% cloud cover; 5-15 mph winds
5/22/2018	0650-1300	30-minute avian	Michelle Leis	51-63 °F; 10-100% cloud cover; 10-20 mph winds
5/30/2018	0720-1337	30-minute avian	Michelle Leis	47-57 °F; 20-100% cloud cover; 20-40 mph winds
6/6/2018	0710-1341	30-minute avian	Michelle Leis	47-62 °F; 10-70% cloud cover; 15-30 mph winds
6/12/2018	0706-1436	30-minute avian	Michelle Leis	72-91 °F; 0% cloud cover; 0-5 mph winds
6/19/2018	0707-0859	30-minute avian	Michelle Leis	64-70 °F; 0-10% cloud cover; 5-15 mph winds

Table 1
Summary of 30-Minute Avian Counts: Personnel and Conditions

Date	Time	Survey Type	Personnel	Site Conditions
6/27/2018	0712-1445	30-minute avian	Michelle Leis	52-71 °F; 0-30% cloud cover; 5-30 mph winds
7/5/2018	0717-1359	30-minute avian	Michelle Leis	55-86 °F; 0% cloud cover; 0-10 mph winds
7/11/2018	0713-1322	30-minute avian	Michelle Leis	67-87 °F; 0% cloud cover; 10-15 mph winds
7/17/2018	0718-1310	30-minute avian	Michelle Leis	76-94 °F; 0% cloud cover; 0-15 mph winds
7/25/2018	0723-1331	30-minute avian	Michelle Leis	77-91 °F; 10-20% cloud cover; 5-20 mph winds
8/1/2018	0715-1328	30-minute avian	Michelle Leis	75-87 °F; 0-10% cloud cover; 10-20 mph winds
8/6/2018	0710-1325	30-minute avian	Michelle Leis	69-91 °F; 0-40% cloud cover; 0-20 mph winds
8/15/2018	0716-1326	30-minute avian	Michelle Leis	56-81 °F; 0-50% cloud cover; 10-25 mph winds
8/23/2018	0707-1310	30-minute avian	Michelle Leis	54-71 °F; 0-60% cloud cover; 10-20 mph winds
8/28/2018	0717-1343	30-minute avian	Michelle Leis	52-68 °F; 0-100% cloud cover; 15-25 mph winds
9/6/2018	0729-1333	30-minute avian	Michelle Leis	64-87 °F; 0% cloud cover; 0-20 mph winds
9/12/2018	0730-1342	30-minute avian	Michelle Leis	57-71 °F; 0-30% cloud cover; 10-25 mph winds
9/18/2018	0854-1410	30-minute avian	Pedro Garcia	52-73 °F; 0% cloud cover; 1-15 mph winds
9/27/2018	0906-1435	30-minute avian	Pedro Garcia	70-87 °F; 30-50% cloud cover; 0-6 mph winds
10/3/2018	0740-1338	30-minute avian	Michelle Leis	63-71 °F; 40-100% cloud cover; 0-15 mph winds
10/18/2018	0759-1416	30-minute avian	Michelle Leis	63-74 °F; 0% cloud cover; 0-10 mph winds
10/29/2018	0756-1416	30-minute avian	Michelle Leis	54-68 °F; 30-80% cloud cover; 0-15 mph winds
11/14/2018	0726-1344	30-minute avian	Michelle Leis	56-61 °F; 0% cloud cover; 0-15 mph winds
11/27/2018	0743-1355	30-minute avian	Michelle Leis	53-55 °F; 70-100% cloud cover; 5-20 mph winds
12/12/2018	0740-1355	30-minute avian	Michelle Leis	45-51 °F; 20-100% cloud cover; 0-15 mph winds
12/27/2018	0855-1450	30-minute avian	Michelle Leis	46-52 °F; 0-10% cloud cover; 10-20 mph winds
1/9/2019	0752-1355	30-minute avian	Michelle Leis	52-55 °F; 80-100% cloud cover; 0-5 mph winds
1/22/2019	0807-1404	30-minute avian	Michelle Leis	45-50 °F; 20-50% cloud cover; 0-15 mph winds
2/5/2019	0736-1408	30-minute avian	Michelle Leis	34-43 °F; 30-70% cloud cover; 10-25 mph winds
2/19/2019	0732-1358	30-minute avian	Michelle Leis	37-47 °F; 0-10% cloud cover; 0-15 mph winds
3/5/2019	0726-1254	30-minute avian	Michelle Leis	47-50 °F; 100% cloud cover, rain; 0-15 mph winds
3/19/2019	0750-1343	30-minute avian	Michelle Leis	57-65 °F; 50-100% cloud cover; 0-15 mph winds
4/4/2019	0744-1356	30-minute avian	Michelle Leis	49-57 °F; 70-100% cloud cover; 0-15 mph winds
4/17/2019	0707-1329	30-minute avian	Michelle Leis	50-65 °F; 0-10% cloud cover; 0-15 mph winds
4/30/2019	0817-1417	30-minute avian	Pedro Garcia	57-69 °F; 10-90% cloud cover; 4-32 mph winds
5/13/2019	0851-1500	30-minute avian	Pedro Garcia	69-83 °F; 10-50% cloud cover; 2-22 mph winds
5/28/2019	0846-1435	30-minute avian	Pedro Garcia	61-81 °F; 10-80% cloud cover; 0-14 mph winds
6/11/2019	0731-1307	30-minute avian	Michelle Leis	73-101 °F; 0-40% cloud cover; 0-5 mph winds
6/27/2019	0703-1252	30-minute avian	Michelle Leis	52-78 °F; 0-30% cloud cover; 0-10 mph winds
7/10/2019	0703-1246	30-minute avian	Michelle Leis	59-86 °F; 0-10% cloud cover; 5-10 mph winds
7/26/2019	0725-1300	30-minute avian	Michelle Leis	69-90 °F; 0-20% cloud cover; 0-10 mph winds
8/7/2019	0702-1248	30-minute avian	Michelle Leis	63-85 °F; 0-20% cloud cover; 5-15 mph winds
8/19/2019	0714-1255	30-minute avian	Michelle Leis	54-80 °F; 0-90% cloud cover; 10-15 mph winds
9/4/2019	0737-1309	30-minute avian	Michelle Leis	73-93 °F; 0-20% cloud cover; 0-5 mph winds
9/18/2019	0741-1359	30-minute avian	Michelle Leis	55-77 °F; 0-90% cloud cover; 0-10 mph winds

Notes:
mph – miles per hour

Table 2
Summary of All-Day Eagle Migration Counts: Personnel and Conditions

Date	Time	Site 1	Site 2	Personnel	Site Conditions
10/2/2017	0900-1700	X		Ben Delancey	64-77 °F; 0% cloud cover; 0-7 mph winds; clear
10/3/2017	0800-1600	X		Ben Delancey	48-74 °F; 0-10% cloud cover; 0-10 mph winds; clear
10/4/2017	0800-1600	X		Ben Delancey	54-81 °F; 0-20% cloud cover; 0-6 mph winds; clear
10/5/2017	0800-1600		X	Ben Delancey	56-82 °F; 0% cloud cover; 0-3 mph winds; clear
10/6/2017	0800-1600		X	Ben Delancey	54-80 °F; 0% cloud cover; 0-3 mph winds; clear
10/7/2017	0800-1600		X	Amy Anderson	53-84 °F; 0% cloud cover; 0-8 mph winds; clear
10/9/2017	0800-1600	X		Jesse Ridenour	63-742 °F; 0% cloud cover; 0-10 mph winds; clear
10/10/2017	0800-1600	X		Jesse Ridenour	66-85 °F; 0-50% cloud cover; 0-8 mph winds; clear
10/11/2017	0800-1600	X		Jesse Ridenour	54-72 °F; 0-10% cloud cover; 0-11 mph winds; clear
10/12/2017	0800-1600		X	Jesse Ridenour	51-73 °F; 0% cloud cover; 0-8 mph winds; clear
10/13/2017	0800-1600		X	Jesse Ridenour	57-77 °F; 0% cloud cover; 0-7 mph winds; clear
10/14/2017	0800-1600		X	Jesse Ridenour	54-70 °F; 0% cloud cover; 0-9 mph winds; clear
10/16/2017	0800-1600	X		Ben Delancey	54-70 °F; 0-30% cloud cover; 0-9 mph winds; clear
10/17/2017	0800-1600		X	Ben Delancey	55-81 °F; 20-100% cloud cover; 0-1 mph winds; clear
10/17/2017	0800-1600	X		Jesse Ridenour	68-81 °F; 30-90% cloud cover; 1-9 mph winds; clear to hazy
10/18/2017	0800-1600	X		Jesse Ridenour	63-77 °F; 0-10% cloud cover; 2-6.3 mph winds; clear to hazy
10/19/2017	0800-1600	X		Jesse Ridenour	59-72 °F; 10-30% cloud cover; 5-24 mph winds; clear
10/20/2017	0800-1600		X	Jesse Ridenour	50-63 °F; 30-70% cloud cover; 0-18 mph winds; clear
10/24/2017	0800-1600	X		Jesse Ridenour	66-80 °F; 0% cloud cover; 2-10 mph winds; clear
10/24/1017	0800-1600		X	Amy Anderson	55-86 °F; 0-10% cloud cover; -7 mph winds; clear
10/25/2017	0800-1600	X		Jesse Ridenour	64-84 °F; 0% cloud cover; 1-8 mph winds; clear
10/25/2018	0800-1600		X	Amy Anderson	49-88 °F; 0% cloud cover; 0-8 mph winds; clear
10/26/2017	0800-1600	X		Jesse Ridenour	66-83 °F; 0% cloud cover; 3-10 mph winds; clear
10/27/2017	0800-1600		X	Jesse Ridenour	68-81 °F; 0% cloud cover; 1-8 mph winds; clear
10/31/2017	0800-1600		X	Jesse Ridenour	55-68 °F; 0-100% cloud cover; 1-11 mph winds; clear
11/1/2017	0800-1600	X		Ronald Clark	43-67 °F; 0-0% cloud cover; 0-7 mph winds; clear
11/1/2017	0800-1600		X	Jesse Ridenour	53-66 °F; 0-0% cloud cover; 2-9 mph winds; clear to hazy
11/2/2017	0800-1600	X		Ronald Clark	50-60 °F; 0-100% cloud cover; 0-10 mph winds; clear to hazy
11/2/2017	0800-1600		X	Jesse Ridenour	55-66 °F; 90-100% cloud cover; 1-12 mph winds; clear
11/3/2017	0800-1600	X		Ronald Clark	52-64 °F; 40-100% cloud cover; 0-7 mph winds; clear to hazy
11/6/2017	0800-1600		X	Ben Delancey	44-60 °F; 10-30% cloud cover; 1-4 mph winds; clear
11/7/2017	0800-1600		X	Ben Delancey	46-61 °F; 0-10% cloud cover; 0-4 mph winds; clear

Table 2
Summary of All-Day Eagle Migration Counts: Personnel and Conditions

Date	Time	Site 1	Site 2	Personnel	Site Conditions
11/8/2017	0800-1600	X		Ronald Clark	50-59 °F; 60-100% cloud cover; 0-10 mph winds; hazy
11/9/2017	0800-1600		X	Ronald Clark	57-61 °F; 50-100% cloud cover; 0-15 mph winds; clear to foggy, light rain
11/10/2017	0800-1600	X		Ronald Clark	49-62 °F; 10-70% cloud cover; 3-25 mph winds; clear
11/11/2017	0800-1600	X		Ronald Clark	50-63 °F; 0-40% cloud cover; 0-5 mph winds; clear
11/14/2017	0800-1600	X		Russell Sweet	56-60 °F; 10-50% cloud cover; 3-9 mph winds; clear
11/15/2017	0800-1600	X		John Spranza	51-63 °F; 60-90% cloud cover; 0-8 mph winds; clear
11/16/2017	0800-1400*	X		Russell Sweet	62-68.1 °F; 90-100% cloud cover; 6-22 mph winds; poor visibility with heavy rain
11/16/2017	0800-1300*		X	Ronald Clark	57-61 °F; 30-100% cloud cover; 4-18 mph winds; clear to hazy with sometime heavy rain
11/17/2017	0800-1600		X	Ronald Clark	49-61 °F; 0% cloud cover; 0-15 mph winds; clear
11/18/2017	0800-1600		X	Ronald Clark	44-62 °F; 0% cloud cover; 0-3 mph winds; clear
11/20/2017	0800-1600		X	Jesse Ridenour	44-58 °F; 0-50% cloud cover; 0-10 mph winds
11/20/2017	0800-1600	X		Ronald Clark	54-63 °F; 30-100% cloud cover; 0-12 mph winds; clear to hazy
11/21/2017	0800-1600		X	Jesse Ridenour	54-75 °F; 30-60% cloud cover; 1-3 mph winds; clear to hazy
11/21/2017	0800-1600	X		Ronald Clark	53-63 °F; 10-100% cloud cover; 0-5 mph winds; clear to hazy
11/22/2017	0800-1600	X		Ronald Clark	54-63 °F; 0-50% cloud cover; 0-7 mph winds; hazy
11/23/2017	0800-1600		X	Ronald Clark	54-69 °F; 0-30% cloud cover; 0-7 mph winds; hazy
11/28/2017	0800-1600		X	Ben Delancey	44-60 °F; 0-30% cloud cover; 0-3 mph winds; clear
11/28/2017	0800-1600	X		Nick Jakubek	44-54 °F; 0-20% cloud cover; 0-3 mph winds; clear
11/29/2017	0800-1600		X	Ben Delancey	44-62 °F; 0-10% cloud cover; 0-10 mph winds; clear to hazy
11/29/2017	0800-1600	X		Nick Jakubek	46-57 °F; 0% cloud cover; 1-10 mph winds; clear
11/30/2017	0800-1600		X	Ben Delancey	41-66 °F; 0-30% cloud cover; 0-4 mph winds; clear to hazy
11/30/2017	0800-1600	X		Nick Jakubek	46-59 °F; 0-20% cloud cover; 1-5 mph winds; clear
3/6/2018	0800-1600	X		Ben Delancey	44-68 °F; 20-70% cloud cover; 2-14 mph winds; clear
3/7/2018	0800-1600	X		Ben Delancey	53-66 °F; 10-80% cloud cover; 0-20 mph winds; clear
3/7/2018	0800-1600		X	Ryan Lefler	50-73 °F; 0-100% cloud cover; 0-12 mph winds; clear
3/8/2018	0800-1600		X	Ben Delancey	55-74 °F; 10-40% cloud cover; 0-3 mph winds; clear
3/9/2018	0800-1600		X	Ryan Lefler	56-72 °F; 40-50% cloud cover; 1-25 mph winds; clear
3/9/2018	0800-1600	X		Ben Delancey	55-69 °F; 10-90% cloud cover; 3-12 mph winds; clear to foggy
3/12/2018	0800-1600		X	J. Brandon Vidrio	55-69 °F; 0-90% cloud cover; 0-8 mph winds; clear
3/13/2018	0800-1600	X		J. Brandon Vidrio	48-58 °F; 90-100% cloud cover; 6-35 mph winds; hazy to foggy

Table 2
Summary of All-Day Eagle Migration Counts: Personnel and Conditions

Date	Time	Site 1	Site 2	Personnel	Site Conditions
3/14/2018	0800-1600	X		J. Brandon Vidrio	45-48 °F; 50-100% cloud cover; 10-30 mph winds; clear to hazy
3/15/2018	0800-1600	X		J. Brandon Vidrio	37-50 °F; 10-90% cloud cover; 15-35 mph winds; clear
3/15/2018	0800-1600		X	Ryan Lefler	43-55 °F; 10-100% cloud cover; 10-35 mph winds; clear to hazy
3/16/2018	0800-1600		X	Ryan Lefler	47-54 °F; 60-100% cloud cover; 5-60 mph winds; clear to foggy
3/19/2018	0800-1600	X		J. Brandon Vidrio	41-58 °F; 0-70% cloud cover; 2-15 mph winds; clear to hazy
3/19/2018	0800-1600		X	Ryan Lefler	46-61 °F; 20-30% cloud cover; 0-10 mph winds; clear to hazy
3/20/2018	0800-1600	X		J. Brandon Vidrio	48-53 °F; 100% cloud cover; 0-15 mph winds; clear to foggy
3/20/2018	0800-1600		X	Michelle Leis	49-52 °F; 100% cloud cover; 0-10 mph winds; clear to hazy
3/21/2018	0815-1615	X		J. Brandon Vidrio	50-61 °F; 100-100% cloud cover; 0-5 mph winds; clear to foggy
3/22/2018	0800-1600		X	Ryan Lefler	56-60 °F; 70-100% cloud cover; 8-40 mph winds; clear to foggy
3/26/2018	0800-1600	X		J. Brandon Vidrio	38-60 °F; 0-10% cloud cover; 1-15 mph winds; clear
3/26/2018	0800-1600		X	Ben Delancey	43-65 °F; 0-10% cloud cover; 1-6 mph winds; clear
3/27/2018	0800-1600	X		J. Brandon Vidrio	52-62 °F; 0-20% cloud cover; 1-11 mph winds; clear
3/27/2018	0800-1600		X	Ben Delancey	47-70 °F; 0-10% cloud cover; 0-3 mph winds; clear
3/28/2018	0800-1600	X		J. Brandon Vidrio	59-66 °F; 0-0% cloud cover; 1-12 mph winds; clear
3/29/2018	0815-1615		X	J. Brandon Vidrio	62-71 °F; 10-40% cloud cover; 2-11 mph winds; clear
4/2/2018	0800-1600		X	J. Brandon Vidrio	47-65 °F; 0-70% cloud cover; 5-16 mph winds; clear
4/3/2018	0815-1615		X	J. Brandon Vidrio	56-72 °F; 0-0% cloud cover; 0-14 mph winds; clear to hazy
4/4/2018	0800-1600	X		J. Brandon Vidrio	57-67 °F; 40-90% cloud cover; 6-12 mph winds; clear
4/5/2018	0800-1600		X	Ryan Lefler	55-72 °F; 60-100% cloud cover; 0-18 mph winds; clear
4/5/2018	0800-1600	X		J. Brandon Vidrio	52-65 °F; 50-100% cloud cover; 3-13 mph winds; clear
4/6/2018	0800-1600		X	Ryan Lefler	50-65 °F; 100-100% cloud cover; 0-2 mph winds; foggy
4/9/2018	0800-1600	X		Ben Delancey	58-70 °F; 10-100% cloud cover; 2-8 mph winds; clear
4/9/2018	0800-1600		X	Ryan Lefler	56-71 °F; 10-40% cloud cover; 0-7 mph winds; clear to hazy
4/10/2018	0800-1600	X		Ben Delancey	59-75 °F; 50-100% cloud cover; 4-17 mph winds; clear
4/11/2018	0800-1600	X		Ben Delancey	51-73 °F; 20-100% cloud cover; 3-33 mph winds; clear

Table 2
Summary of All-Day Eagle Migration Counts: Personnel and Conditions

Date	Time	Site 1	Site 2	Personnel	Site Conditions
4/11/2018	0800-1600		X	Ryan Lefler	53-64 ^{o}F; 40-80% cloud cover; 0-30 mph winds; clear
4/12/2018	0800-1600		X	Ryan Lefler	49-57 ^{o}F; 0-50% cloud cover; 0-12 mph winds; clear
4/17/2018	0800-1600	X		Chris Frey	48-61 ^{o}F; 0-40% cloud cover; 1-7 mph winds; clear
4/18/2018	0800-1600		X	Chris Frey	43-63 ^{o}F; 50-100% cloud cover; 0-15 mph winds; clear
4/19/2018	0800-1600		X	Chris Frey	48-65 ^{o}F; 0-20% cloud cover; 11-18 mph winds; clear
4/19/2018	0800-1600	X		Ryan Lefler	48-63 ^{o}F; 0-30% cloud cover; 10-27 mph winds; clear
4/20/2018	0800-1600	X		Chris Frey	52-74 ^{o}F; 0% cloud cover; 0-11 mph winds; clear
4/20/2018	0800-1600		X	Ryan Lefler	54-73 ^{o}F; 0% cloud cover; 0-15 mph winds; clear
4/23/2018	0800-1600		X	Chris Frey	0-82 ^{o}F; 0-20% cloud cover; 0-14 mph winds; clear
4/24/2018	0800-1600	X		Chris Frey	59-79 ^{o}F; 0-20% cloud cover; 2-14 mph winds; clear
4/25/2018	0800-1600		X	Chris Frey	54-69 ^{o}F; 0-10% cloud cover; 1-18 mph winds; clear
4/26/2018	0800-1600		X	Chris Frey	47-72 ^{o}F; 0-10% cloud cover; 8-17 mph winds; clear to foggy
4/26/2018	0800-1600	X		Ryan Lefler	53-71 ^{o}F; 0-40% cloud cover; 7-24 mph winds; clear
4/27/2018	0800-1600	X		Ryan Lefler	52-67 ^{o}F; 0-10% cloud cover; 6-15 mph winds; clear
10/15/2018	0800-1600	X		Chris Frey	51-80 ^{o}F; 0% cloud cover; 2-7 mph winds; clear
10/16/2018	0800-1600	X		Chris Frey	57-78 ^{o}F; 0% cloud cover; 2-9 mph winds; clear
10/17/2018	0800-1600	X		Michelle Leis	63-78 ^{o}F; 0% cloud cover; 0-10 mph winds; clear
10/17/2018	0800-1600		X	Chris Frey	51-81 ^{o}F; 0% cloud cover; 0-5 mph winds; clear
10/18/2018	0800-1600		X	Chris Frey	51-81 ^{o}F; 0-10% cloud cover; 0-5 mph winds; clear
10/19/2018	0800-1600		X	Pedro Garcia	66-78 ^{o}F; 0% cloud cover; 0-2 mph winds; clear
10/22/2018	0801-1601	X		J. Brandon Vidrio	60-76 ^{o}F; 0-40% cloud cover; 2-12 mph winds; clear to hazy
10/23/2018	0801-1601	X		J. Brandon Vidrio	47-70 ^{o}F; 10-80% cloud cover; 2-21 mph winds; hazy to foggy
10/24/2018	0804-1604	X		J. Brandon Vidrio	58-71 ^{o}F; 10-40% cloud cover; 0-9 mph winds; hazy
10/25/2018	0802-1602		X	J. Brandon Vidrio	63-73 ^{o}F; 0-10% cloud cover; 3-14 mph winds; hazy
10/26/2018	0809-1609		X	J. Brandon Vidrio	67-76 ^{o}F; 0-40% cloud cover; 3-11 mph winds; hazy
10/27/2018	0807-1607		X	J. Brandon Vidrio	68-80 ^{o}F; 20-30% cloud cover; 2-10 mph winds; clear to hazy
10/29/2018	0801-1601	X		J. Brandon Vidrio	54-67 ^{o}F; 30-90% cloud cover; 2-17 mph winds; clear
10/30/2018	0805-1605	X		J. Brandon Vidrio	53-71 ^{o}F; 0-10% cloud cover; 4-14 mph winds; clear
10/30/2018	0800-1600		X	Pedro Garcia	53-71 ^{o}F; 0-10% cloud cover; 0-7 mph winds; clear
10/31/3018	0802-1602	X		J. Brandon Vidrio	59-67 ^{o}F; 10-30% cloud cover; 0-11 mph winds; clear to hazy
10/31/2018	0800-1600		X	Pedro Garcia	59-67 ^{o}F; 10-80% cloud cover; 0-4 mph winds; clear
11/1/2018	0814-1614		X	J. Brandon Vidrio	62-71 ^{o}F; 30-80% cloud cover; 2-16 mph winds; clear to hazy
11/5/2018	0800-1600	X		J. Brandon Vidrio	65-75 ^{o}F; 0% cloud cover; 2-15 mph winds; clear
11/6/2018	0800-1600	X		J. Brandon Vidrio	61-67 ^{o}F; 0% cloud cover; 2-10 mph winds; clear

Table 2
Summary of All-Day Eagle Migration Counts: Personnel and Conditions

Date	Time	Site 1	Site 2	Personnel	Site Conditions
11/7/2018	0800-1600		X	J. Brandon Vidrio	64-68 ^{o}F; 0% cloud cover; 5-10 mph winds; clear to hazy
11/7/2018	0800-1600		X	Pedro Garcia	64-68 ^{o}F; 0% cloud cover; 0-4 mph winds; clear
11/8/2018	0800-1600		X	J. Brandon Vidrio	56-63 ^{o}F; 0% cloud cover; 2-23 mph winds; clear to hazy
11/9/2018	0800-1600	X		J. Brandon Vidrio	58-63 ^{o}F; 0% cloud cover; 3-10 mph winds; hazy (smoke)
11/12/2018	0800-1600	X		J. Brandon Vidrio	54-60 ^{o}F; 0% cloud cover; 3-10 mph winds; hazy (smoke)
11/12/2018	0800-1600		X	Chris Frey	43-74 ^{o}F; 0% cloud cover; 0-3 mph winds; hazy (smoke)
11/13/2018	0800-1600	X		J. Brandon Vidrio	55-61 ^{o}F; 30-80% cloud cover; 2-9 mph winds; clear (smoke)
11/13/2018	0800-1600		X	Chris Frey	42-67 ^{o}F; 10-60% cloud cover; 0-3 mph winds; hazy (smoke)
11/14/2018	0800-1600	X		J. Brandon Vidrio	57-61 ^{o}F; 0-40% cloud cover; 2-13 mph winds; hazy (smoke)
11/14/2018	0800-1600		X	Chris Frey	46-74 ^{o}F; 0% cloud cover; 1-4 mph winds; hazy (smoke)
11/19/2018	0800-1600	X		Chris Frey	41-64 ^{o}F; 10-40% cloud cover; 2-6 mph winds; hazy (smoke)
11/19/2018	0800-1600		X	Pedro Garcia	50-58 ^{o}F; 70-100% cloud cover; 0-1 mph winds; hazy (smoke)
11/20/2018	0800-1600	X		Pedro Garcia	55-62 ^{o}F; 0-40% cloud cover; 0-6 mph winds; hazy (smoke)
11/20/2018	0800-1600		X	Chris Frey	43-69 ^{o}F; 0-20% cloud cover; 0-3 mph winds; hazy (smoke)
11/21/2018	0800-1600	X		Chris Frey	53-68 ^{o}F; 60-100% cloud cover; 1-9 mph winds; clear; intermittent rain
11/21/2018	0800-1600		X	Pedro Garcia	55-58 ^{o}F; 80-100% cloud cover; 0-6 mph winds; clear; some light rain
11/26/2018	0800-1600		X	Chris Frey	48-69 ^{o}F; 10-80% cloud cover; 0-4 mph winds; clear
11/27/2018	0800-1600	X		Chris Frey	50-62 ^{o}F; 80-100% cloud cover; 1-12 mph winds; hazy
11/27/2018	0800-1600		X	Pedro Garcia	50-62 ^{o}F; 100% cloud cover; 1-20 mph winds; clear
11/28/2018	0800-1600	X		Chris Frey	55-59 ^{o}F; 100% cloud cover; 1-9 mph winds; clear to foggy; light rain
11/28/2018	0800-1600		X	Pedro Garcia	53-54 ^{o}F; 100% cloud cover; 2-15 mph winds; clear to hazy
11/29/2018	0800-1600	X		Chris Frey	56-58 ^{o}F; 50-100% cloud cover; 3-12 mph winds; clear to foggy; rain
12/3/2018	0800-1600		X	Chris Frey	43-59 ^{o}F; 10-100% cloud cover; 0-4 mph winds; clear; drizzle

Table 2
Summary of All-Day Eagle Migration Counts: Personnel and Conditions

Date	Time	Site 1	Site 2	Personnel	Site Conditions
12/4/2018	0800-1600		X	Chris Frey	49-56 ^{o}F; 100% cloud cover; 0-3 mph winds; foggy
12/5/2018	0800-1600	X		Chris Frey	53-60 ^{o}F; 90-100% cloud cover; 0-4 mph winds; clear to foggy
12/6/2018	0800-1600	X		Chris Frey	49-61 ^{o}F; 30-90% cloud cover; 1-4 mph winds; clear to foggy
12/7/2018	0800-1600		X	Chris Frey	44-64 ^{o}F; 0-100% cloud cover; 1-3 mph winds; clear
12/8/2018	0800-1600	X		Chris Frey	43-57 ^{o}F; 20-50% cloud cover; 1-6 mph winds; foggy

Notes:
mph – miles per hour
* – survey ended earlier due to severe weather

Table 3
Summary of Eagle Territory Surveys: Personnel and Conditions

Date	Time	Hours Completed	HexID	Personnel	Weather/Wind
2/21/2018	0754-1635	8.0	42	Dave Compton	Clear and sunny, low winds
2/22/2018	0740-1235	4.0	48	Dave Compton	Partly cloudy and dry, high winds
2/22/2018	0800-1600	6.3	53	Randall McInvale	Partly cloudy and dry, high winds
2/22/2018	1341-1441	1.0*	37	Dave Compton	Partly cloudy and dry, high winds
3/15/2018	1350-1735	3.18†	80	Dave Compton	Partly cloudy and dry, moderate winds
3/16/2018	1145-1615	4.33	76	Dave Compton	Rain, moderate winds
3/16/2018	1620-1731	1.0†	80	Dave Compton	Partly cloudy and dry, low winds
3/26/2018	1411-1703	2.0†	56	Dave Compton	Partly cloudy and dry, moderate winds
3/27/2018	0837-1051	2.2†	56	Dave Compton	Clear and sunny, low winds
3/27/2018	1100-1632	4.0	46	Dave Compton	Partly cloudy and dry, low winds
4/23/2018	0810-1314	4.0	42	Dave Compton	Partly cloudy and dry, low winds
4/23/2018	1441-1604	1.0*	37	Dave Compton	Partly cloudy and dry, moderate winds
4/24/2018	0910-1340	4.0	48	Dave Compton	Partly cloudy and dry, moderate winds
5/8/2018	1427-1649	2.0†	42	Dave Compton	Partly cloudy and dry, high winds
5/9/2018	0726-0852	1.25**	65	Dave Compton	Clear and sunny, low winds
5/9/2018	0852-1212	2.25**	59	Dave Compton	Clear and sunny, moderate winds
5/9/2018	1222-1339	1.0**	64	Dave Compton	Clear and sunny, moderate winds
5/9/2018	1600-1801	2.0†	42	Dave Compton	Clear and sunny, high winds
5/9/2018	1510-1515	incidental detection	55	Dave Compton	Clear and sunny, moderate winds
6/8/2018	0916-1418	4.6	48	Russell Sweet	Clear and sunny, high winds
7/9/2018	1516-1941	4.0	76	Dave Compton	Partly cloudy and dry, moderate winds
7/10/2018	0750-1234	4.0	46	Dave Compton	Clear and sunny, low winds
7/10/2018	1022-110	incidental detection	41	Dave Compton	Clear and sunny, moderate winds
7/24/2018	0907-1101	1.6**	64	Dave Compton	Clear and sunny, low winds
7/24/2018	1107-1313	1.8**	69	Dave Compton	Clear and sunny, moderate winds
7/24/2018	1315-1500	1.5**	59	Dave Compton	Clear and sunny, moderate winds

Table 3
Summary of Eagle Territory Surveys: Personnel and Conditions

Date	Time	Hours Completed	HexID	Personnel	Weather/Wind
2/18/2019	1250-1713	4.0	48	Dave Compton	Clear and sunny, moderate winds
2/18/2019	1334-1701	incidental detection	53	Dave Compton	Clear and sunny, moderate winds
2/19/2019	0742-1152	3.02†	36	Dave Compton	Clear and sunny, moderate winds
2/19/2019	1155-1621	4.0	31	Dave Compton	Clear and sunny, moderate winds
2/20/2019	0750-1347	5.02	42	Dave Compton	Partly cloudy and dry, moderate winds
2/20/2019	1404-1533	1.02†	36	Dave Compton	Partly cloudy and dry, moderate winds
2/25/2019	1534-1639	1.0*	37	Dave Compton	Partly cloudy and dry, moderate winds
2/26/2019	0845-1140	2.0††	47	Dave Compton	Partly cloudy and dry, moderate winds
2/26/2019	1246-1350	1.0*	37	Dave Compton	Partly cloudy and dry, moderate winds
4/3/2019	1441-1621	1.5*	37	Dave Compton	Partly cloudy and dry, low winds
4/3/2019	0818-1250	4.0	48	Dave Compton	Partly cloudy and dry, moderate winds
4/3/2019	1009-1237	incidental detection	53	Dave Compton	Partly cloudy and dry, moderate winds
4/4/2019	0815-1317	4.35	42	Dave Compton	Partly cloudy and dry, moderate winds
4/17/2019	1405-1855	4.0	36	Dave Compton	Clear and sunny, moderate winds
4/18/2019	0854-1325	4.02	31	Dave Compton	Clear and sunny, low winds

Notes:
* – >90% of hexagon is open water, and upland areas include no golden eagle nesting habitat; † – 4.0 survey hours completed over two days; ** – limited time available to access private property area; †† - Occupancy confirmed in less than 4.0 hours.

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APPENDIX E

Transportation Technical Memorandum

1630 SAN PABLO AVENUE, SUITE 300
OAKLAND, CALIFORNIA 94612
T 510.601.2500 F 510.601.2501

TECHNICAL MEMORANDUM

To:	Gonzaga Wind Farm, LLC
From:	Dennis Pascua, Transportation Services Manager Mladen Popovic, Transportation Planner
Subject:	Gonzaga Ridge Wind Repowering Project Traffic Impact Assessment
Date:	November 7, 2018
Attachment(s):	Figures 1 – 9 Raw Traffic Counts LOS Worksheets

Introduction

The following technical memorandum provides an assessment of the construction trip generation and circulation for the Gonzaga Wind Repowering project (proposed Project) located near the San Luis Reservoir State Recreation Area adjacent to Pacheco State Park. The Project site is located within unincorporated Merced County (County), and the two study intersections are located on State Highway 152 (SR-152), which are under the jurisdiction of Caltrans. This traffic impact analysis (TIA) has been prepared per the Caltrans *Guide for the Preparation of Traffic Impact Studies* (December 2002). The purpose of this analysis is to evaluate the existing conditions of the study area, to analyze temporary construction impacts, and to analyze the permanent operations associated with the Project.

Project Description

The Project includes the construction of up to 40 wind turbines and associated infrastructure, with a capacity to produce up to approximately 100 megawatts (MW) of wind energy. The Project also includes the decommissioning of 166 existing wind turbines and equipment, creation of temporary access roads, an on-site collector substation, storage sheds, and other ancillary support systems.

The Project site is located within Merced County in the eastern portion of Pacheco State Park, and is bordered by the Upper Cottonwood Creek Wildlife Area to the north along with SR-152, the San Luis Reservoir and the San Luis Reservoir State Recreation area to the east, Pacheco Sate Park and unincorporated Santa Clara County to the west, and private lands and land under the jurisdiction of the Bureau of Reclamation to the south. The City of Los Banos is located approximately 20 miles to the east, while the City of Gilroy is located approximately 18 miles to the west.

Regional access to the Project site is provided by SR-152, which has connections to Interstate 5 (I-5) to/from the east, and US Route 101 (US-101) to/from the west. Access to the site is primarily provided by Dinosaur Point Road – Fifield Road/SR-152 (full access) and by Old Pacheco Pass Road/SR-152 (right turn in/out only). From these two roadways, a series of roads provide access to the interior of Pacheco State Park where the wind turbines will be erected. Figure 1 displays the Project site location and study area.

Study Area

The study area is comprised of the following two intersections that would be potentially impacted by traffic generated by the peak construction phase as well as the permanent operations of the proposed Project:

1. SR-152/Dinosaur Point Road – Fifield Road
2. SR-152/Old Pacheco Pass Road

Analysis Scenarios

This TIA includes a description of existing conditions in the site vicinity, including the existing roadway system, existing weekday AM and PM peak hour traffic volumes, and existing traffic operations. The existing conditions are representative of year 2018.

Existing plus Project (Peak Construction) conditions includes analysis of the Project's peak construction phase traffic added to the existing weekday daily, AM and PM peak hour traffic volumes. Project traffic is comprised of construction-related traffic from construction workers, vendor trucks, haul trucks, and oversized load trucks. Project traffic was distributed and assigned to the segments and intersections in the study area and analyzed under Existing plus Project (Peak Construction) conditions.

Existing plus Project (Permanent Operations) conditions includes analysis of the Project's permanent operational traffic added to the existing weekday daily, AM and PM peak hour traffic volumes. Project traffic is comprised of daily employees. Project traffic was distributed and assigned to the segments and intersections in the study area and analyzed under Existing plus Project (Permanent Operations) conditions.

Methodology and Significance Criteria

Level of service (LOS) is commonly used as a qualitative description of segment or intersection operations and is based on the capacity and the volume of traffic using the segment or the intersection.

The HCM analysis methodology describes the operation of an intersection using a range of LOS from LOS A (free-flow conditions) to LOS F (severely congested conditions), based on the corresponding control delay experienced per vehicle for unsignalized intersections. At the Caltrans study area intersections, the LOS was calculated using the HCM 2010 methodology. The Synchro 10 LOS software was used to determine intersection LOS for all study scenarios. Synchro is consistent with the HCM 2010 methodology (Transportation Research Board 2010). Table 1 shows the LOS for unsignalized and signalized intersections under the HCM methodology (delay).

Table 1: Levels of Service for Intersections using HCM Methodology

Level of Service	Unsignalized Intersections Control Delay (in seconds)	Signalized Intersections Control Delay (in seconds)
A	< 10.0	< 10.0
B	> 10.0 to < 15.0	> 10.0 to < 20.0
C	> 15.0 to < 25.0	> 20.0 to < 35.0
D	> 25.0 to < 35.0	> 35.0 to < 55.0
E	> 35.0 to < 50.0	> 55.0 to < 80.0
F	> 50.0	> 80.0

Source: HCM 2010.

Per Caltrans, the level of service for operating State highway facilities is based upon measures of effectiveness (MOEs). These MOEs describe the measures best suited for analyzing State highway facilities (i.e., freeway segments, signalized intersections, on- or off-ramps, etc.). Caltrans endeavors to maintain a target LOS at the transition between LOS C and LOS D on State highway facilities; however, Caltrans acknowledges that this may not always be feasible and if an existing State highway facility is operating at less than the appropriate target LOS, the existing MOE should be maintained.

Existing Conditions

Transportation Network

The following streets are located within the study area. Brief descriptions of each street are given below.

State Route 152 is a generally a four-lane, divided freeway that runs east-west within the study area, connecting to I-5 and the communities of Merced County in the east, to the communities of Santa Clara County in the west. While the freeway is divided with a landscape median, a turn pocket along Dinosaur Point Road – Fifield Road allows for left-turning movements and U-turns.

Dinosaur Point Road – Fifield Road is a two-lane, undivided road that runs north-south, and east-wind within the study area. Dinosaur Point Road connects to the interior of Pacheco State Park and provides a public parking lot and boating area for the San Luis Reservoir, while Fifield Road connects to the Upper Cottonwood Creek Wildlife Area.

Old Pacheco Pass Road is a two-lane, undivided road that runs east-west within the study area. Old Pacheco Pass Road is unpaved and serves as a connection to Dinosaur Point Road. The road provides a wide shoulder for SR-152.

Traffic Volumes

Existing peak hour counts with axle-classification at the study intersections were conducted in September 2018 during a typical non-holiday week. Due to the large amount of truck traffic existing along SR-152, existing volumes were adjusted to include a "heavy vehicle percentage" factor within Synchro. Use of the heavy vehicle percentage factor within Synchro more accurately estimates the operation of an intersection that is being evaluated with the HCM methodology. Raw traffic count worksheets are provided in Attachment B. Existing weekday AM and PM peak hour volumes are summarized on Figure 2.

Intersection Operations

An intersection LOS analysis was prepared for the existing conditions using HCM 2010 methodology via the Synchro LOS software as discussed previously. Table 2 shows the results of the existing conditions LOS analysis.

Table 2: Existing Weekday Peak Hour Intersection LOS

Intersection	Control[1]	AM Peak		PM Peak	
		Delay (in sec)	LOS	Delay (in sec)	LOS
1. SR-152/Dinosaur Point Road – Fifield Road	2-way stop	**35.6**	**E**	24.4	C
2. SR-152/Old Pacheco Pass Road	1-way stop	0.0	A	0.0	A

Notes: Delay – Delay reported as Control Delay and expressed in seconds
LOS – Level of Service
[1] Two-Way Stop Control reported as worst movement. Analyzed using Highway Capacity Manual (HCM 2010) methodology.
BOLD value indicates unsatisfactory LOS

As shown in the table, all of the study area intersections are currently operating at LOS C or better under existing conditions during both peak hours, with the exception of the intersection of SR-152/Dinosaur Point Road – Fifield Road which operates at LOS E (35.6 seconds) in the AM peak hour. Due to HCM methodology for stop controlled intersections, the worst movement of an intersection is reported. In this case, the northbound left consisting of 4 vehicles is the resulting delay. All other movements are LOS C or better.

Peak Construction Traffic Analysis

This section documents the trip generation, distribution and assignment of construction-related traffic associated with the proposed Project.

Trip Generation

Trip generation estimates for the construction phase of the Project were calculated based on the peak phase of construction and delivery of wind turbine equipment. Construction traffic includes the number of workers, and the amount of delivery and on-site truck traffic that would be generated to and from the site during a 24-hour period (daily), and the AM and PM peak commute hours. It is assumed construction activities would occur during the daylight hours of 6:00 a.m. to 6:00 p.m., for approximately 12 hours over the weekdays (Monday through Friday), with some possible work over the weekend. The peak construction phase will occur in late spring, and since construction is contingent upon daylight hours, shifts will be shortened for other phases occurring during winter.

For the purposes of this analysis, approximately 200 workers and 8 vendor trucks would access the site during the AM and PM peak hours. The length of the wind turbine components necessitates oversized haul trucks that are longer than average and contain more axles, and as a result, would require coordination with Caltrans for encroachment permits (for oversized vehicles traveling on State highways). Coordination with the California Highway Patrol (CHP) may also be necessary to ensure oversized haul trucks have safe access to/from the site. Due to the irregular size and safety requirements associated with hauling these materials, it is assumed the specialized oversized haul trucks would not deliver equipment during the AM or PM peak hours. The following list provides the type and quantity of each type of specialized haul truck destined to the Project site during one day of peak construction:

- Hub Truck: 2 trucks per day
- Nose Cone Truck: 1 truck per day
- Down Tower Assembly Truck: 1 truck per day
- Tower Tube Truck: 6 trucks per day
- Nacelle Truck – 2 trucks per day
- Generator Truck – 2 trucks per day
- Blade Truck – 6 trucks per day

Vendor truck traffic to and from the site would be evenly distributed over the 12 hour workday. Although construction worker shifts are scheduled to start before the AM peak hour, a conservative analysis assuming that 10% of construction workers would arrive or depart the Project site within the AM peak hour (after 7:00 a.m.), was analyzed.

The calculation of Project trip generation estimates are shown in Table 3. Passenger car equivalent (PCE) factors were used to account for the Project's truck traffic and provide a more realistic measurement in terms of the impact of Project-related truck traffic.

Table 3: Project Trip Generation (Peak Construction)

Vehicle Type	Daily Quantity		Daily Trips	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total
TRIP GENERATION[1]									
Workers	200	workers	400	20	0	20	0	20	20
Vendor Trucks	8	trucks	16	1	1	2	1	1	2
Hub Trucks	2	trucks	4	0	0	0	0	0	0
Nose Cone Trucks	1	trucks	2	0	0	0	0	0	0
Down Tower Assembly Trucks	1	trucks	2	0	0	0	0	0	0
Tower Tube Trucks	6	trucks	12	0	0	0	0	0	0
Nacelle Trucks	2	trucks	4	0	0	0	0	0	0
Generator Trucks	2	trucks	4	0	0	0	0	0	0
Blade Trucks	6	trucks	12	0	0	0	0	0	0
		Total	**456**	**21**	**1**	**22**	**1**	**21**	**22**
TRIP GENERATION W/ PCE[2]									
Workers (1.0 PCE)	200	workers	400	20	0	20	0	20	20
Vendor Trucks (2.0 PCE)	8	trucks	32	2	2	4	2	2	4
Hub Trucks (3.0 PCE)	2	trucks	12	0	0	0	0	0	0
Nose Cone Trucks (3.0 PCE)	1	trucks	6	0	0	0	0	0	0
Down Tower Assembly (3.0 PCE)	1	trucks	6	0	0	0	0	0	0

Vehicle Type	Daily Quantity		Daily Trips	AM Peak Hour			PM Peak Hour		
				In	Out	Total	In	Out	Total
Tower Tube Trucks (4.5 PCE)	6	trucks	54	0	0	0	0	0	0
Nacelle Trucks (4.5 PCE)	2	trucks	18	0	0	0	0	0	0
Generator Trucks (4.5 PCE)	2	trucks	18	0	0	0	0	0	0
Blade Trucks (6.0 PCE)	6	trucks	72	0	0	0	0	0	0
	Total (w/ PCE)		**618**	**22**	**2**	**24**	**2**	**22**	**24**

Notes:
[1] Trip Generation based on construction estimates provided by Scout Clean Energy.
[2] Passenger Car Equivalent (PCE) factors utilized to conservatively estimate truck traffic generated in comparison to standard vehicles. Specific PCE was derived from the length of each truck.

Source: Scout Clean Energy

As shown in Table 3, the peak construction phase of the proposed Project would generate 456 daily trips, 22 AM peak hour trips (21 inbound and 1 outbound), and 22 PM peak hour trips (1 inbound and 21 outbound). With the application of PCE factors to truck trips, the Project would generate 618 PCE daily trips, and 24 PCE trips during the AM peak hour (22 inbound and 2 outbound) and 24 PCE trips during the PM peak hour (2 inbound and 22 outbound). It should also be noted that due to the irregular size and safety requirements associated with hauling these materials, the specialized oversized haul trucks would not deliver equipment during the AM or PM peak hours.

Trip Distribution and Assignment

Project trips were distributed to the study area intersections and segments using the regional location of the Project site, logical commute routes for workers, and available truck routes for Project-related trucks.

It is assumed all of construction-related Project truck traffic would originate from I-5 to the east, and enter the Project site via SR-152 westbound, and exit via SR-152 eastbound. Trucks would utilize I-5 as a major regional connector. Construction workers are assumed to be drawn from the east (Central Valley), as temporary worker housing costs are estimated to be cheaper than in the west (Bay Area). Therefore, construction workers have been analyzed as arriving via SR-152 westbound and departing via SR-152 eastbound.

The resulting Project trip distribution percentages and assignments are shown in Figures 3, 4, 5 and 6 for passenger cars, vendor trucks, haul trucks, and total Project (peak construction) traffic, respectively.

Existing plus Project (Peak Construction)

Traffic Volumes

Existing traffic volumes were collected in September 2018 and were previously shown in Figure 2. As shown under the existing conditions analysis, the traffic volumes in the study area are relatively low, and as such, no new significant growth is anticipated in the short term horizon. Therefore, Project impacts were calculated for the Existing plus Project (Peak Construction) condition.

The Project trip assignments shown in Figure 6 for construction-related Project traffic (workers and vendor trucks), were added to the existing traffic volumes shown in Figure 2 to derive the Existing plus Project (Peak Construction) traffic volumes. Figure 7 illustrates the Existing plus Project (Peak Construction) traffic volumes that were used to evaluate Existing plus Project (Peak Construction) traffic conditions.

Intersection Operations

An intersection operations analysis was conducted for the study area to evaluate the Existing plus Project (Peak Construction) weekday AM and PM peak hour conditions. Intersection operations were calculated using the LOS methodology described previously. The following presents the results of the Existing plus Project (Peak Construction) analysis.

Table 5 shows the results of the Existing plus Project (Peak Construction) LOS analysis and provides a comparison to the existing (without Project) conditions for the weekday peak hours using HCM methodology for unsignalized intersections and Caltrans intersections. Detailed LOS worksheets are provided in Attachment C.

Based on the appropriate significance criteria, most of the study area intersections are forecast to continue to operate at LOS C or better with the addition of construction-related Project traffic from the proposed Project, with the exception of the intersection of SR-152/Dinosaur Point Road – Fifield Road which continues to operate at LOS E (38.4) in the AM peak hour, and degrades to operate at LOS D (26.7) in the PM peak hour.

Based on the significance criteria provided by Caltrans, since LOS E is maintained with the addition of peak construction traffic, there is no significant impact in the AM peak hour. Due to degradation from LOS C to LOS D in the PM peak hour, a Construction Traffic Management Plan would be required to mitigate the temporary impact of the proposed Project. The construction-related impact in the PM peak hour is a result of one vendor truck performing a westbound left turn to access the site via Dinosaur Point Road. This movement constitutes a small and temporary increase, however due to the HCM 2010 methodology requirements for two-way stop control analysis, must be evaluated as the worst movement even though the total intersection delay is 0.3 seconds per vehicle (LOS A).

The Construction Traffic Management Plan may include such details such as construction worker carpooling, dedicated flag men, restriction of work hours to limit egress and ingress during peak hours, and dedicated flag men to facilitate safe movement of vehicles. Additionally, coordination with Caltrans would be required in order to secure the necessary encroachment and trip permits necessary for specialized haul trucks. CHP may also be notified in order to facilitate slowing freeway traffic to ensure safe access for motorists.

Permanent Operations Traffic Analysis

This section documents the trip generation, distribution and assignment of traffic associated with the permanent operations of the proposed Project.

Trip Generation

Trip generation estimates were calculated based upon the estimated number of full-time employees. It is assumed employees would work between the hours of 8:00 a.m. to 5:00 p.m., for approximately 9 hours over the weekdays (Monday through Friday). Approximately 8 employees would arrive to the site during the AM and PM peak hours.

The calculation of Project trip generation estimates are shown in Table 4.

Table 4: Project Trip Generation (Permanent Operations)

Vehicle Type	Daily Quantity	Daily Trips	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total
TRIP GENERATION[1]								
Employees	8 employees	16	8	0	8	0	8	8
	Total	16	8	0	8	0	8	8

Notes:
[1] Trip Generation based on permanent operations estimates provided by Scout Clean Energy

Source: Gonzaga Wind Farm, LLC

As shown in Table 4, permanent operations of the proposed Project would generate 16 daily trips, 8 AM peak hour trips (8 inbound and 0 outbound), and 8 PM peak hour trips (0 inbound and 8 outbound).

Trip Distribution and Assignment

Project trips were distributed to the study area intersections and segments using the regional location of the Project site and logical commute routes for employees.

Employees are assumed to be drawn from areas to the east (Central Valley) and west (Bay Area). Therefore, employees have been analyzed as arriving and departing from both SR-152 westbound and SR-152 eastbound, with an equal distribution.

The resulting Project trip distribution percentage and assignment for the permanent operations of the proposed Project is shown in Figure 8.

Existing plus Project (Permanent Operations)

Traffic Volumes

Existing traffic volumes were collected in September 2018 and were previously shown in Figure 2. As shown under the existing conditions analysis, the traffic volumes in the study area are relatively low, and as such, no new significant growth is anticipated in the short term horizon. Therefore, Project impacts were calculated for the Existing plus Project (Permanent Operations) condition.

The Project trip assignments shown in Figure 8 for permanent operations traffic (full-time employees), were added to the existing traffic volumes shown in Figure 2 to derive the Existing plus Project (Permanent Operations) traffic volumes. Figure 9 illustrates the Existing plus Project (Permanent Operations) traffic volumes that were used to evaluate Existing plus Project (Permanent Operations) traffic conditions.

Intersection Operations

An intersection operations analysis was conducted for the study area to evaluate the Existing plus Project (Permanent Operations) weekday AM and PM peak hour conditions. Intersection operations were calculated using the LOS methodology described previously. The following presents the results of the Existing plus Project (Permanent Operations) analysis.

Table 6 shows the results of the Existing plus Project (Permanent Operations) LOS analysis and provides a comparison to the existing (without Project) conditions for the weekday peak hours using HCM methodology for unsignalized intersections and Caltrans intersections. Detailed LOS worksheets are provided in Attachment C.

Based on the appropriate significance criteria, most of the study area intersections are forecast to continue to operate at LOS C or better with the addition of permanent operations traffic from the proposed Project, with the exception of the intersection of SR-152/Dinosaur Point Road – Fifield Road which continues to operate at LOS E (35.8) in the AM peak hour, and degrades from LOS C (24.4) to operate at LOS F (>300) in the PM peak hour.

Based on the appropriate significance criteria, since LOS E is maintained with the addition of permanent operations traffic there is no significant impact in the AM peak hour. The PM peak hour degrades from LOS C to LOS F, due to the assumption that approximately 50% of employees would go to/from the westbound direction towards the Bay Area, resulting in 4 northbound left turns to proceed westbound along SR-152 from Dinosaur Point Road. This movement constitutes a small proportion of the total intersection volume (less than 0.2%), would not meet the Caltrans signal warrant criteria (due to minor approaches being substantially less than the 100 required), and is an assumption based upon an equal distribution between east and west residing employees. However, due to the HCM 2010 methodology requirements for two-way stop control analysis, this must be evaluated as the worst movement even though the total intersection delay is 0.7 seconds per vehicle (LOS A).

Oversized Haul Truck Circulation Analysis

[TO BE PROVIDED]

Conclusions and Recommendations

Based on the results of the traffic analysis, the following summarizes the traffic impacts of the proposed Project. General findings include:

- Peak construction phase of the proposed Project would generate 136 daily trips, 6 AM peak hour trips (5 inbound and 1 outbound), and 42 PM peak hour trips (1 inbound and 41 outbound). With the application of PCE factors to truck trips, the proposed Project would generate 298 PCE daily trips, and 8 PCE trips during the AM peak hour (6 inbound and 2 outbound) and 44 PCE trips during the PM peak hour (2 inbound and 44 outbound).
- Permanent operations of the proposed Project would generate 16 daily trips, 8 AM peak hour trips (8 inbound and 0 outbound), and 8 PM peak hour trips (0 inbound and 8 outbound).
- Peak Construction Analysis:
    - All of the study area intersections currently operate at LOS C or better under existing conditions during both the peak hours, except for:
        - SR-152/Dinosaur Point Road – Fifield Road (operates at LOS E in the AM peak hour)
    - All of the study area intersections will continue to operate at LOS C or better under Existing Plus Project conditions during both the peak hours, except for:
        - SR-152/Dinosaur Point Road – Fifield Road (continues to operate at LOS E in the AM peak hour, and degrades to LOS D in the PM peak hour)
        - The impact in the PM peak hour is a result of one vendor truck performing a westbound left turn to access the site via Dinosaur Point Road.
    - Project impacts would be further minimized based on the application of a Construction Traffic Management Plan which would reduce temporary impacts resulting from the construction-related traffic. These details may include:
        - Construction worker carpooling, dedicated flag men, restriction of work hours to limit egress and ingress during peak hours, and dedicated flag men to facilitate safe movement of vehicles.
        - Additionally, coordination with Caltrans will be required in order to secure the necessary encroachment and trip permits necessary for specialized haul trucks.
        - CHP may also be notified in order to facilitate slowing freeway traffic to ensure safe access for motorists.
- Permanent Operations Analysis:
    - All of the study area intersections currently operate at LOS C or better under existing conditions during both the peak hours, except for:
        - SR-152/Dinosaur Point Road – Fifield Road (operates at LOS E in the AM peak hour)
    - All of the study area intersections will continue to operate at LOS C or better under Existing Plus Project conditions during both the peak hours, except for:
        - SR-152/Dinosaur Point Road – Fifield Road (continues to operate at LOS E in the AM peak hour, and degrades to LOS F in the PM peak hour)
    - The PM peak hour degrades from LOS C to LOS F, due to the assumption that approximately 50% of employees would go to/from the westbound direction towards the Bay Area, resulting in 4 northbound left turns to proceed westbound along SR-152 from Dinosaur Point Road. This movement constitutes a small proportion of the total intersection volume (less than 0.2%), would not meet signal warrant criteria (due to minor approaches being substantially less than the 100

required), and is an assumption based upon an equal distribution between east and west residing employees.

Table 5: Existing Plus Project (Peak Construction) Peak Hour Intersection LOS

		Existing				Existing plus Project (Peak Construction)				Change		Significant Change in LOS or Delay	
		AM Peak		PM Peak		AM Peak		PM Peak					
Intersection	Control[1]	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	AM	PM	AM	PM
1. SR-152/Dinosaur Point Rd – Fifield Rd	2-way stop	**35.6**	**E**	24.4	C	**38.4**	**E**	**26.7**	**D**	2.8	**2.3**	no	**yes**
2. SR-152/Old Pacheco Pass Road	1-way stop	0.0	A	0.0	A	0.0	A	0.0	A	0.0	0.0	no	no

Notes: Delay – Delay reported as Control Delay and expressed in seconds
LOS – Level of Service
[1] Two-Way Stop Control reported as worst movement. Analyzed using Highway Capacity Manual (HCM 2010) methodology.
BOLD value indicates unsatisfactory LOS

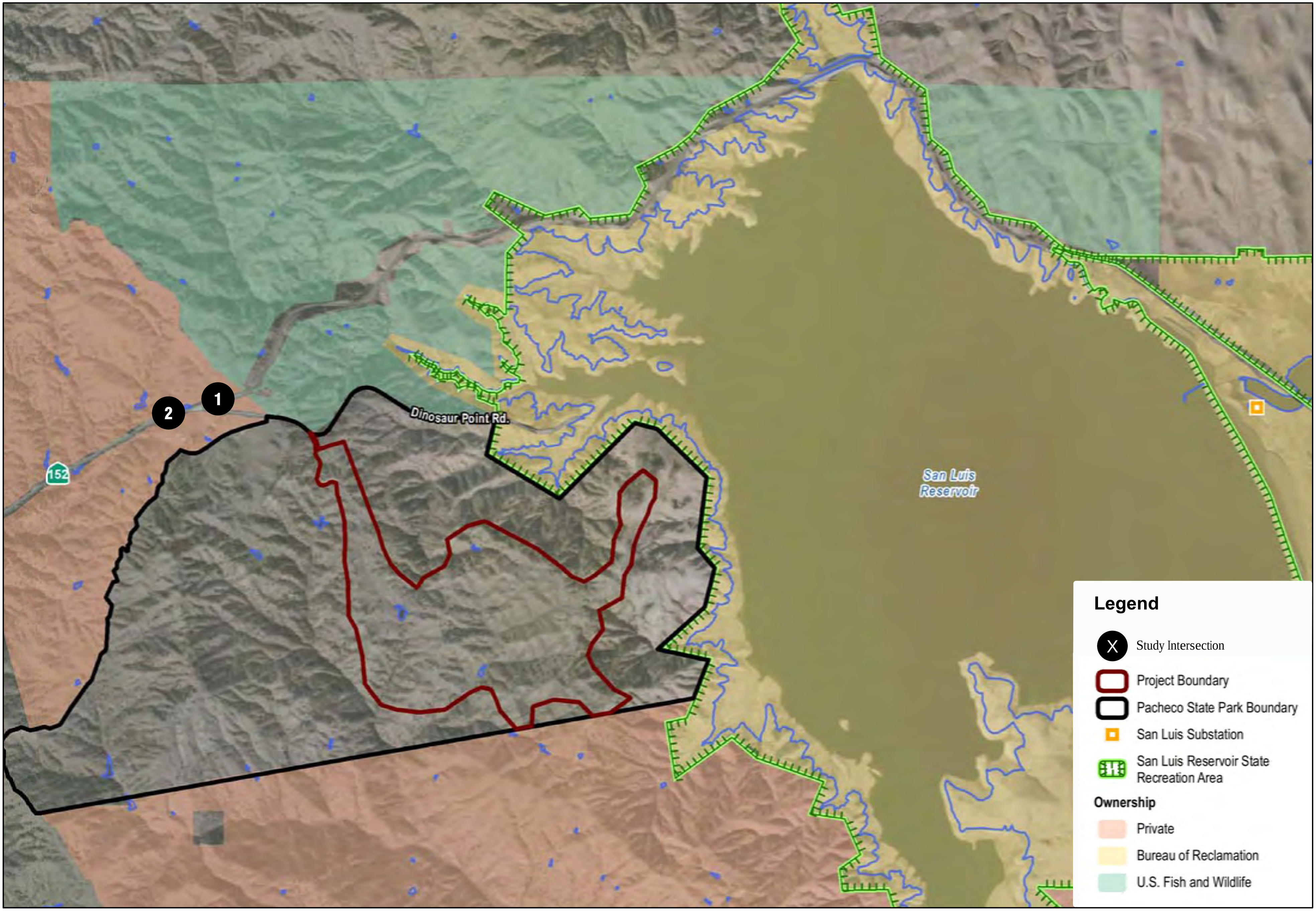
Table 6: Existing Plus Project (Permanent Operations) Peak Hour Intersection LOS

		Existing				Existing plus Project (Permanent Operations)				Change		Significant Change in LOS or Delay	
		AM Peak		PM Peak		AM Peak		PM Peak					
Intersection	Control[1]	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	AM	PM	AM	PM
1. SR-152/Dinosaur Point Rd – Fifield Rd	2-way stop	**35.6**	**E**	24.4	C	**35.8**	**E**	**>300**	**F**	0.2	**>300**	no	**yes**
2. SR-152/Old Pacheco Pass Road	1-way stop	0.0	A	0.0	A	0.0	A	0.0	A	0.0	0.0	no	no

Notes: Delay – Delay reported as Control Delay and expressed in seconds
LOS – Level of Service
1 Two-Way Stop Control reported as worst movement. Analyzed using Highway Capacity Manual (HCM 2010) methodology.
BOLD value indicates unsatisfactory LOS

Attachment A

Figures 1 – 9



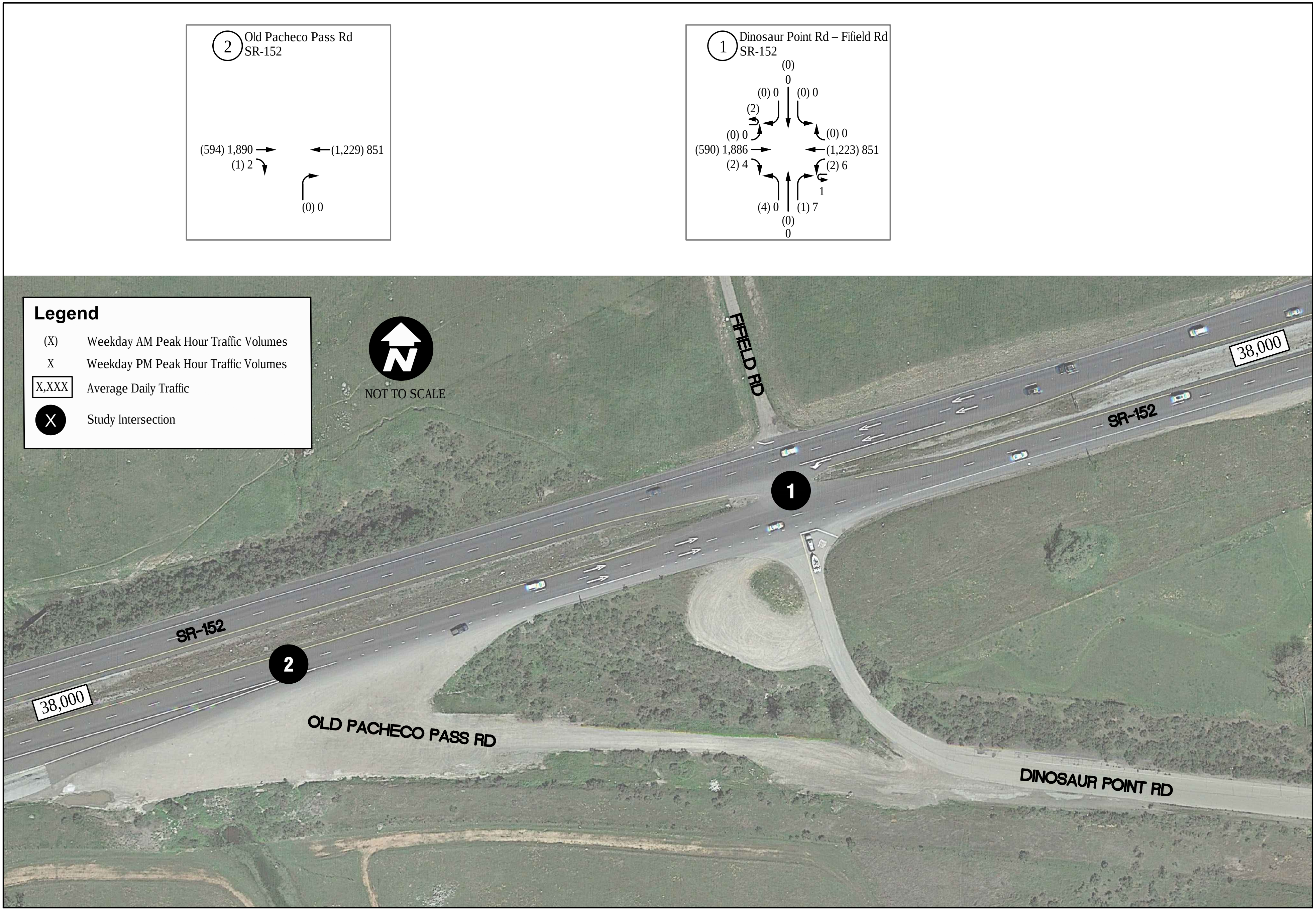
Source: Merced County 2018, Bing Maps 2018

FIGURE 1

Project Site Location and Study Area

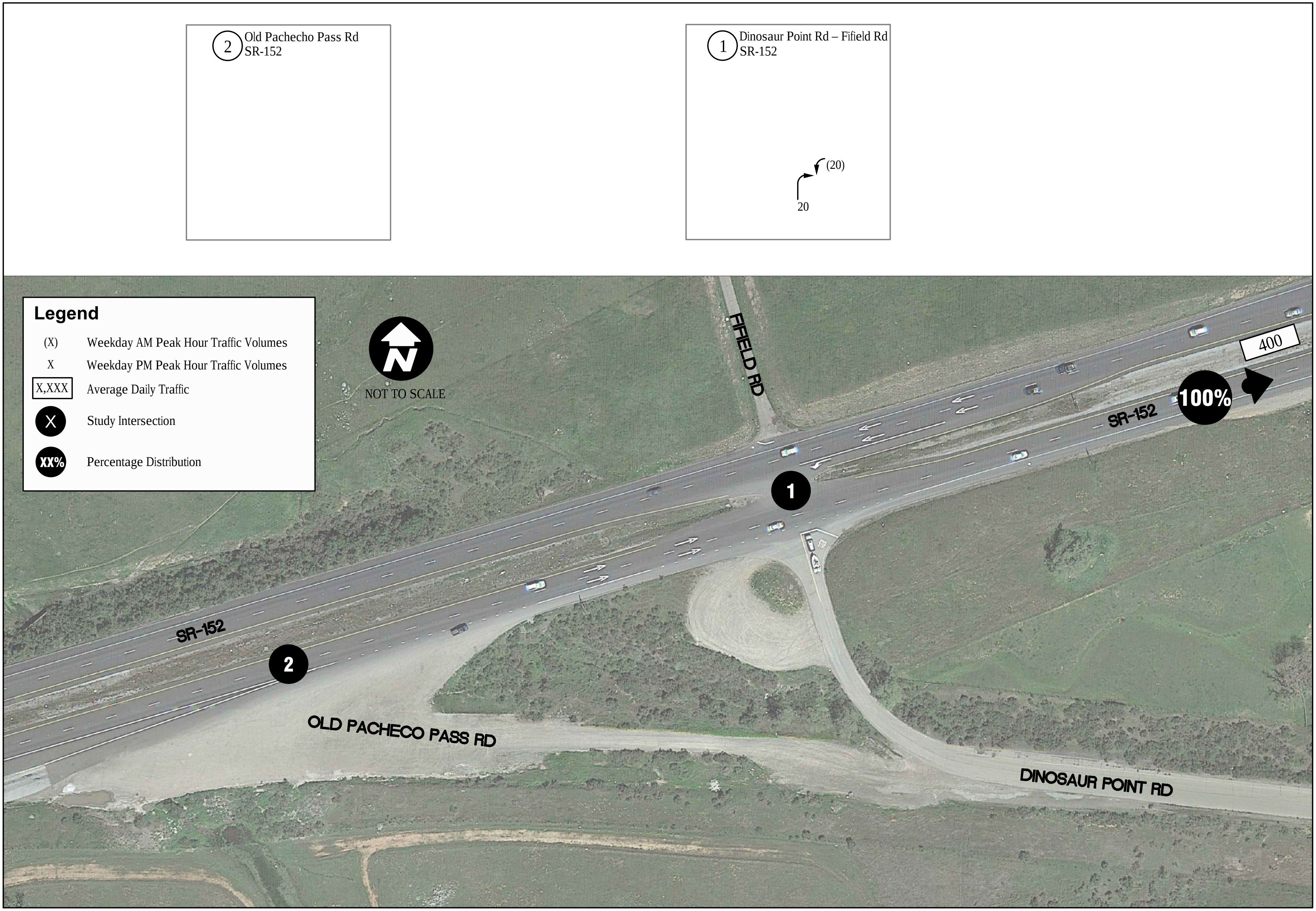
Gonzaga Ridge Wind Repowering Project

DUDEK



Source: Google Maps, 03/2018

FIGURE 2
Existing AM, PM and Daily Traffic Volumes
Gonzaga Ridge Wind Repowering Project

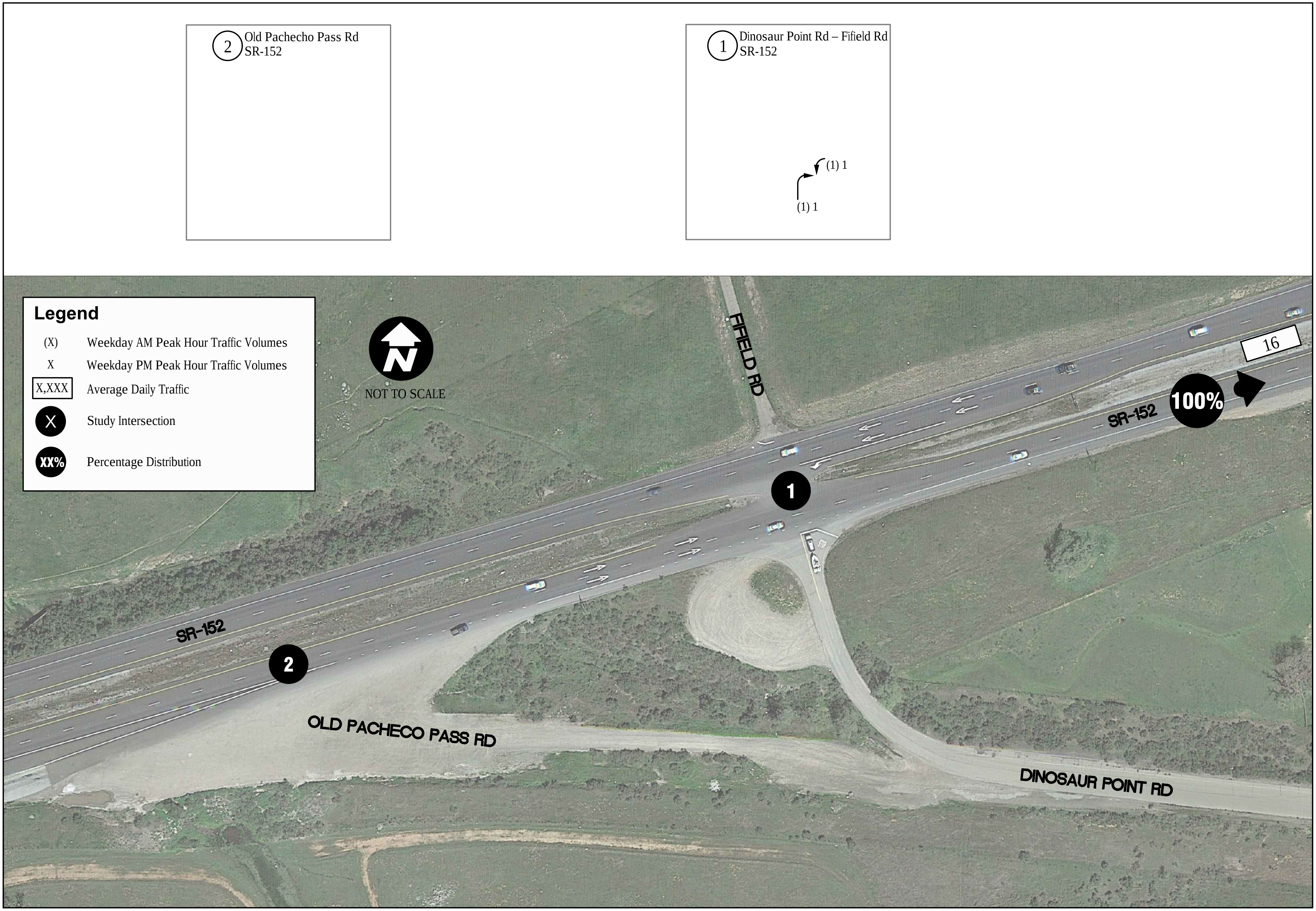


Source: Google Maps, 03/2018

FIGURE 3

Project Trip Distribution and Assignment – Passenger Cars (Peak Construction)

Gonzaga Ridge Wind Repowering Project



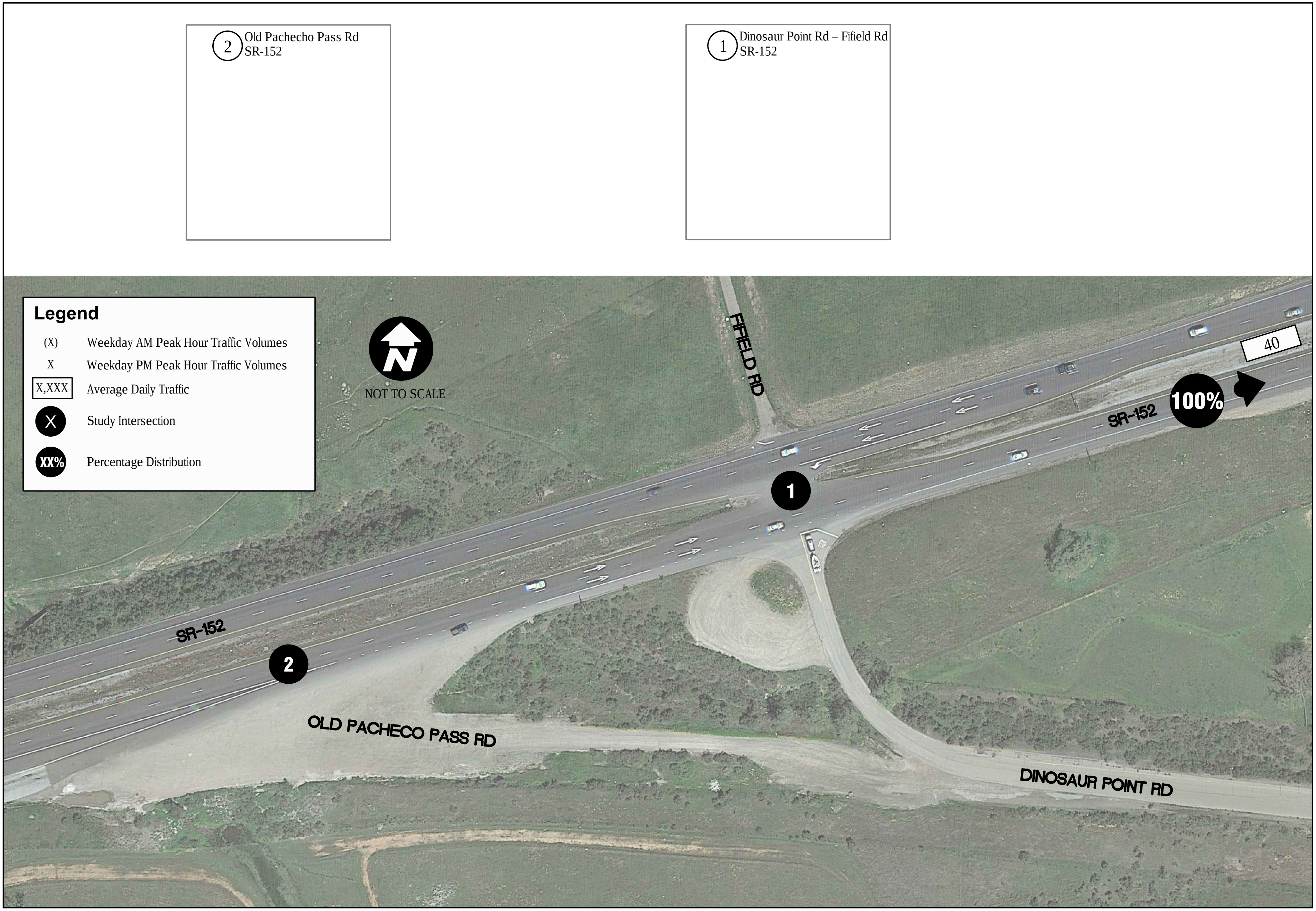
Source: Google Maps, 03/2018

FIGURE 4

Project Trip Distribution and Assignment – Vendor Trucks (Peak Construction)

Gonzaga Ridge Wind Repowering Project

DUDEK



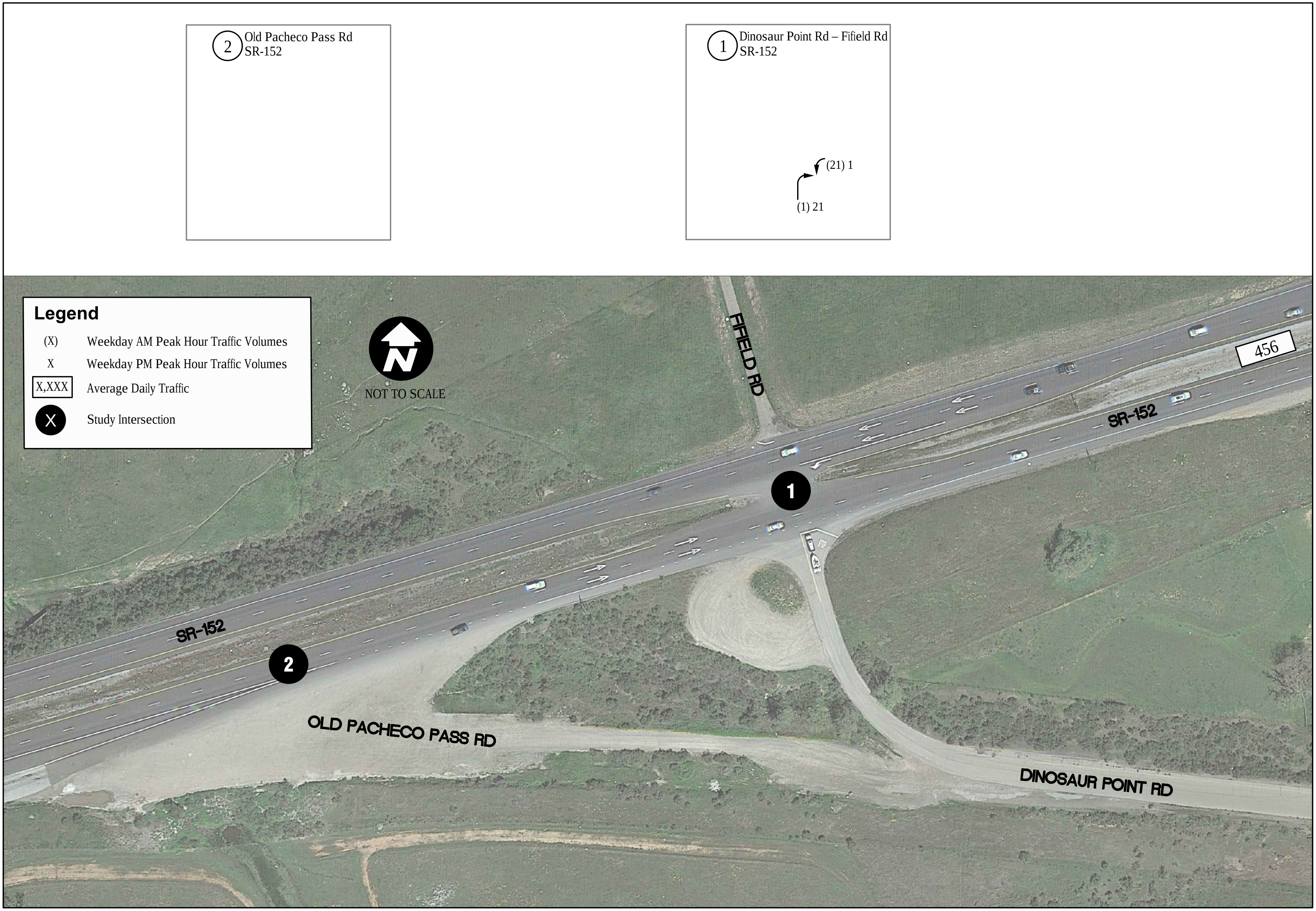
Source: Google Maps, 03/2018

FIGURE 5

Project Trip Distribution and Assignment – Haul Trucks (Peak Construction)

Gonzaga Ridge Wind Repowering Project

DUDEK

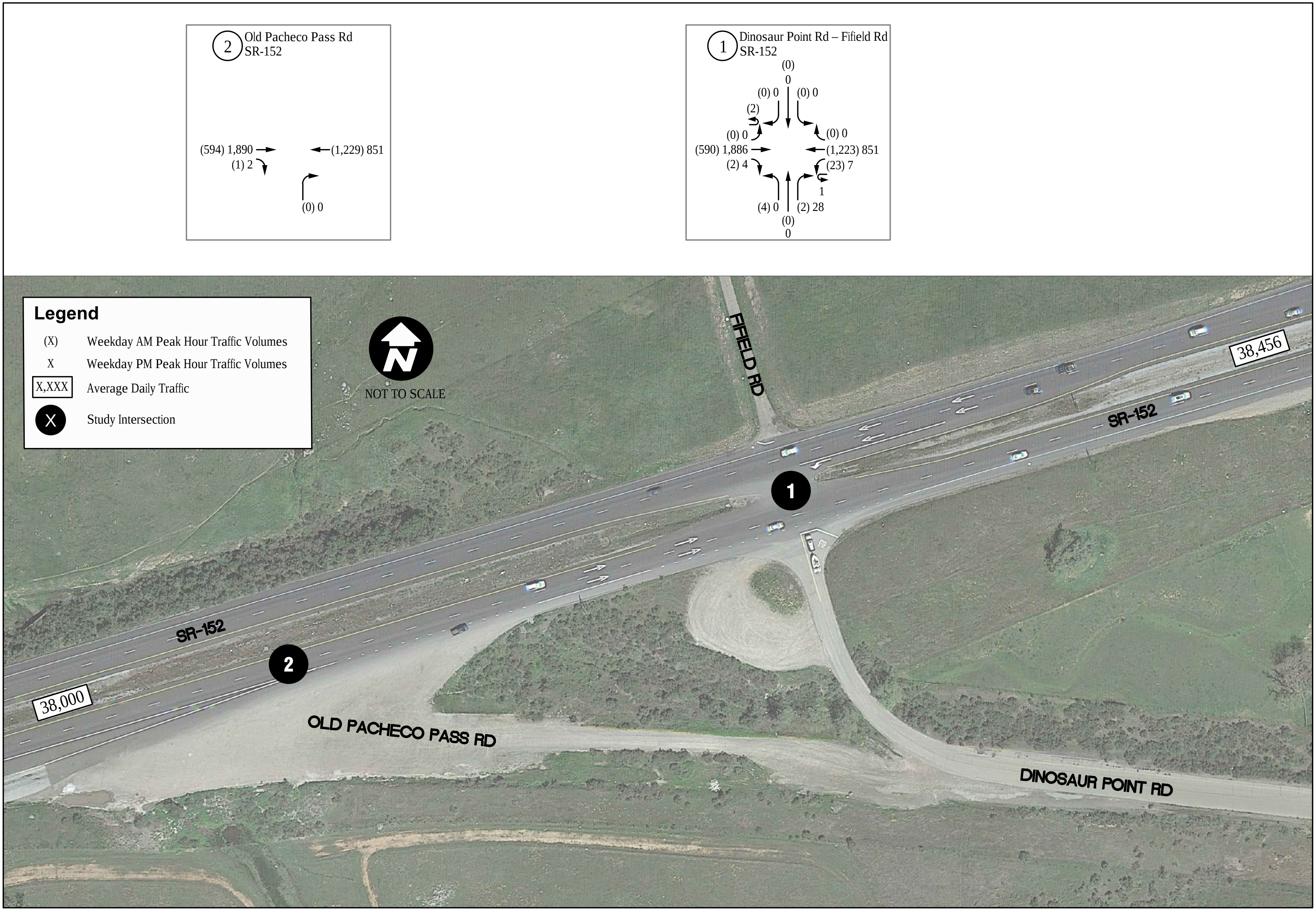


Source: Google Maps, 03/2018

FIGURE 6

Total Project Trip Assignment (Peak Construction)

Gonzaga Ridge Wind Repowering Project



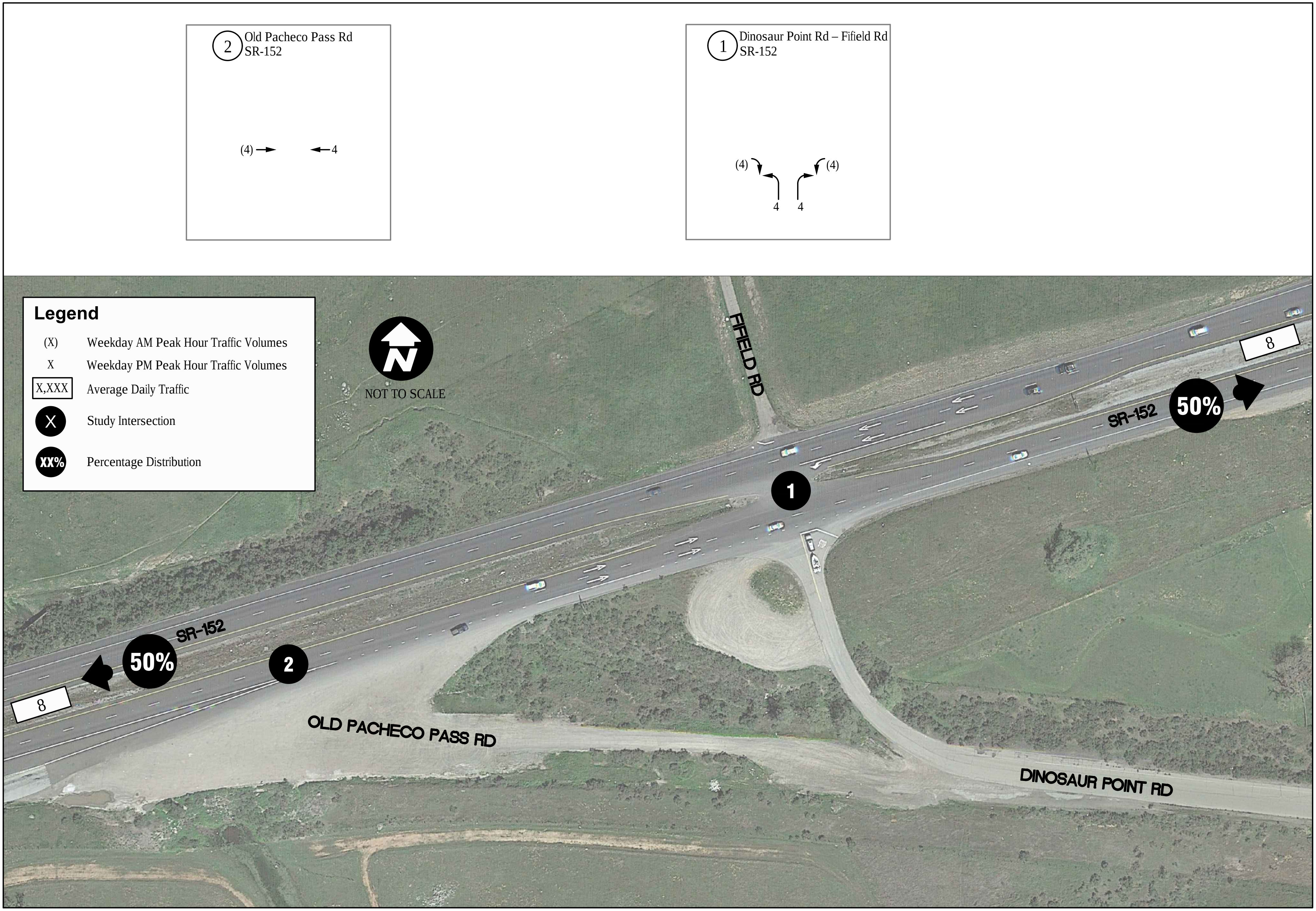
Source: Google Maps, 03/2018

FIGURE 7

Existing Plus Project AM, PM and Daily Traffic Volumes (Peak Construction)

Gonzaga Ridge Wind Repowering Project

DUDEK



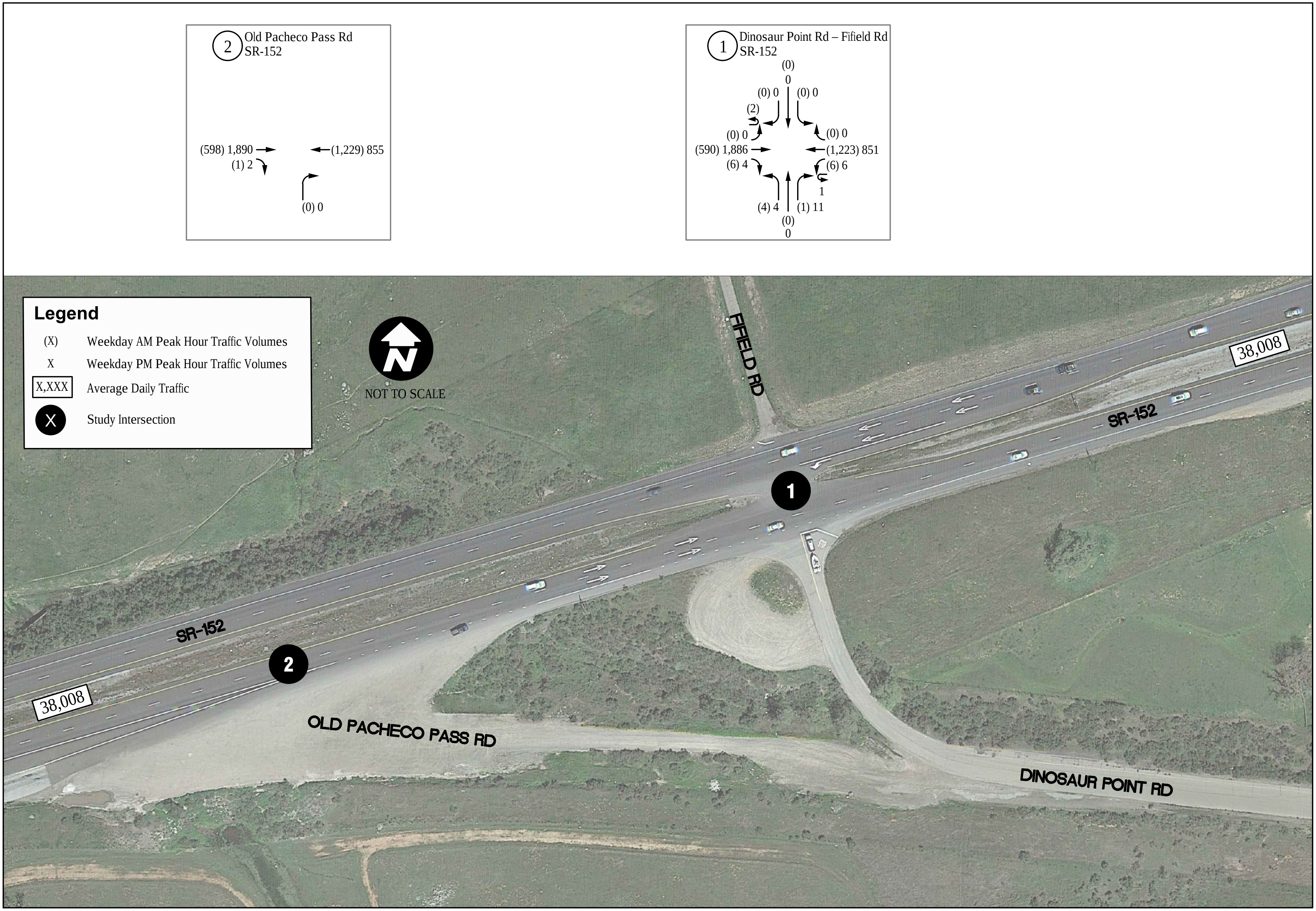
Source: Google Maps, 03/2018

FIGURE 8

Total Project Trip Distribution & Assignment (Permanent Operations)

Gonzaga Ridge Wind Repowering Project

DUDEK



Source: Google Maps, 03/2018

FIGURE 9

Existing Plus Project AM, PM and Daily Traffic Volumes (Permanent Operations)

Gonzaga Ridge Wind Repowering Project

Attachment B

Raw Traffic Counts

National Data & Surveying Services

Intersection Turning Movement Count

Location: Dinosaur Point Rd&Fifield Rd & SR-152
City: Hollister
Control: 2-Way Stop (NB/SB)

Project ID: 18-8464
Date: 9/19/2018

Total

NS/EW Streets:	Fifield Road/Dinosaur Point Rd				Fifield Road/Dinosaur Point Rd				SR-152				SR-152				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0.5	0.5	0	0	1	0	0	0	3	0	0	1	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	3	0	0	0	0	0	0	0	0	147	2	1	0	330	0	0	483
7:15 AM	1	0	0	0	0	0	0	0	0	136	0	1	0	324	0	0	462
7:30 AM	0	0	1	0	0	0	0	0	0	153	0	0	0	291	0	0	445
7:45 AM	0	0	0	0	0	0	0	0	0	154	0	0	2	277	0	0	433
8:00 AM	0	0	1	0	0	0	0	0	0	125	1	0	0	266	0	0	393
8:15 AM	1	0	0	0	0	0	0	0	0	139	0	0	0	257	0	0	397
8:30 AM	0	0	1	0	0	0	0	0	0	145	0	0	0	291	0	0	437
8:45 AM	0	0	0	0	0	0	0	0	0	157	0	0	0	275	0	0	432
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	5	0	3	0	0	0	0	0	0	1156	3	2	2	2311	0	0	3482
APPROACH %'s :	62.50%	0.00%	37.50%	0.00%					0.00%	99.57%	0.26%	0.17%	0.09%	99.91%	0.00%	0.00%	
PEAK HR :	07:00 AM - 08:00 AM																TOTAL
PEAK HR VOL :	4	0	1	0	0	0	0	0	0	590	2	2	2	1222	0	0	1823
PEAK HR FACTOR :	0.333	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.958	0.250	0.500	0.250	0.926	0.000	0.000	0.944
	0.417								0.964				0.927				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0.5	0.5	0	0	1	0	0	0	3	0	0	1	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	0	0	0	0	0	0	0	0	513	1	0	3	200	0	0	717
4:15 PM	0	0	4	0	0	0	0	0	0	432	0	0	1	232	0	0	669
4:30 PM	0	0	0	0	0	0	0	0	0	536	0	0	1	215	0	1	753
4:45 PM	0	0	3	0	0	0	0	0	0	405	3	0	1	204	0	0	616
5:00 PM	0	0	2	0	0	0	0	0	0	481	0	0	0	190	0	0	673
5:15 PM	0	0	1	0	0	0	0	0	0	433	1	0	0	195	0	0	630
5:30 PM	0	0	0	0	0	0	0	0	0	457	3	0	1	196	0	0	657
5:45 PM	0	0	2	0	0	0	0	0	0	398	0	0	1	182	0	0	583
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	12	0	0	0	0	0	0	3655	8	0	8	1614	0	1	5298
APPROACH %'s :	0.00%	0.00%	100.00%	0.00%					0.00%	99.78%	0.22%	0.00%	0.49%	99.45%	0.00%	0.06%	
PEAK HR :	04:00 PM - 05:00 PM																TOTAL
PEAK HR VOL :	0	0	7	0	0	0	0	0	0	1886	4	0	6	851	0	1	2755
PEAK HR FACTOR :	0.000	0.000	0.438	0.000	0.000	0.000	0.000	0.000	0.000	0.880	0.333	0.000	0.500	0.917	0.000	0.250	0.915
	0.438								0.882				0.921				

National Data & Surveying Services

Intersection Turning Movement Count

Location: Dinosaur Point Rd&Fifield Rd & SR-152
City: Hollister
Control: 2-Way Stop (NB/SB)

Project ID: 18-8464
Date: 9/19/2018

Passenger Vehicles

NS/EW Streets:	Fifield Road/Dinosaur Point Rd				Fifield Road/Dinosaur Point Rd				SR-152				SR-152				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0.5	0.5	0	0	1	0	0	0	3	0	0	1	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	3	0	0	0	0	0	0	0	0	124	2	1	0	269	0	0	399
7:15 AM	1	0	0	0	0	0	0	0	0	118	0	1	0	279	0	0	399
7:30 AM	0	0	1	0	0	0	0	0	0	130	0	0	0	252	0	0	383
7:45 AM	0	0	0	0	0	0	0	0	0	122	0	0	2	236	0	0	360
8:00 AM	0	0	1	0	0	0	0	0	0	97	1	0	0	218	0	0	317
8:15 AM	1	0	0	0	0	0	0	0	0	87	0	0	0	216	0	0	304
8:30 AM	0	0	1	0	0	0	0	0	0	106	0	0	0	240	0	0	347
8:45 AM	0	0	0	0	0	0	0	0	0	110	0	0	0	228	0	0	338
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	5	0	3	0	0	0	0	0	0	894	3	2	2	1938	0	0	2847
APPROACH %'s :	62.50%	0.00%	37.50%	0.00%					0.00%	99.44%	0.33%	0.22%	0.10%	99.90%	0.00%	0.00%	
PEAK HR :	07:00 AM - 08:00 AM																TOTAL
PEAK HR VOL :	4	0	1	0	0	0	0	0	0	494	2	2	2	1036	0	0	1541
PEAK HR FACTOR :	0.333	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.950	0.250	0.500	0.250	0.928	0.000	0.000	0.966
	0.417								0.958				0.930				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0.5	0.5	0	0	1	0	0	0	3	0	0	1	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	0	0	0	0	0	0	0	0	468	1	0	3	174	0	0	646
4:15 PM	0	0	4	0	0	0	0	0	0	384	0	0	1	194	0	0	583
4:30 PM	0	0	0	0	0	0	0	0	0	488	0	0	1	172	0	1	662
4:45 PM	0	0	3	0	0	0	0	0	0	360	3	0	1	163	0	0	530
5:00 PM	0	0	2	0	0	0	0	0	0	433	0	0	0	156	0	0	591
5:15 PM	0	0	1	0	0	0	0	0	0	397	1	0	0	159	0	0	558
5:30 PM	0	0	0	0	0	0	0	0	0	413	3	0	1	149	0	0	566
5:45 PM	0	0	2	0	0	0	0	0	0	361	0	0	1	150	0	0	514
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	12	0	0	0	0	0	0	3304	8	0	8	1317	0	1	4650
APPROACH %'s :	0.00%	0.00%	100.00%	0.00%					0.00%	99.76%	0.24%	0.00%	0.60%	99.32%	0.00%	0.08%	
PEAK HR :	04:00 PM - 05:00 PM																TOTAL
PEAK HR VOL :	0	0	7	0	0	0	0	0	0	1700	4	0	6	703	0	1	2421
PEAK HR FACTOR :	0.00	0.000	0.438	0.000	0.000	0.000	0.000	0.000	0.000	0.871	0.333	0.000	0.500	0.906	0.000	0.250	0.914
	0.438								0.873				0.910				

National Data & Surveying Services

Intersection Turning Movement Count

Location: Dinosaur Point Rd&Fifield Rd & SR-152
City: Hollister
Control: 2-Way Stop (NB/SB)

Project ID: 18-8464
Date: 9/19/2018

Light Trucks

NS/EW Streets:	Fifield Road/Dinosaur Point Rd				Fifield Road/Dinosaur Point Rd				SR-152				SR-152				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0.5	0.5	0	0	1	0	0	0	3	0	0	1	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	7
7:15 AM	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0	0	4
7:30 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	8	0	0	9
7:45 AM	0	0	0	0	0	0	0	0	0	3	0	0	0	6	0	0	9
8:00 AM	0	0	0	0	0	0	0	0	0	3	0	0	0	5	0	0	8
8:15 AM	0	0	0	0	0	0	0	0	0	8	0	0	0	8	0	0	16
8:30 AM	0	0	0	0	0	0	0	0	0	5	0	0	0	8	0	0	13
8:45 AM	0	0	0	0	0	0	0	0	0	5	0	0	0	4	0	0	9
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0	27	0	0	0	48	0	0	75
APPROACH %'s :									0.00%	100.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	
PEAK HR :	07:00 AM - 08:00 AM																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	6	0	0	0	23	0	0	29
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.500	0.000	0.000	0.000	0.719	0.000	0.000	0.806
									0.500				0.719				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0.5	0.5	0	0	1	0	0	0	3	0	0	1	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	0	0	0	0	0	0	0	0	5	0	0	0	4	0	0	9
4:15 PM	0	0	0	0	0	0	0	0	0	8	0	0	0	6	0	0	14
4:30 PM	0	0	0	0	0	0	0	0	0	9	0	0	0	6	0	0	15
4:45 PM	0	0	0	0	0	0	0	0	0	6	0	0	0	5	0	0	11
5:00 PM	0	0	0	0	0	0	0	0	0	9	0	0	0	4	0	0	13
5:15 PM	0	0	0	0	0	0	0	0	0	6	0	0	0	6	0	0	12
5:30 PM	0	0	0	0	0	0	0	0	0	4	0	0	0	8	0	0	12
5:45 PM	0	0	0	0	0	0	0	0	0	8	0	0	0	3	0	0	11
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0	55	0	0	0	42	0	0	97
APPROACH %'s :									0.00%	100.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	
PEAK HR :	04:00 PM - 05:00 PM																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	28	0	0	0	21	0	0	49
PEAK HR FACTOR :	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.778	0.000	0.000	0.000	0.875	0.000	0.000	0.817
									0.778				0.875				

National Data & Surveying Services

Intersection Turning Movement Count

Location: Dinosaur Point Rd&Fifield Rd & SR-152
City: Hollister
Control: 2-Way Stop (NB/SB)

Project ID: 18-8464
Date: 9/19/2018

Medium Trucks

NS/EW Streets:	Fifield Road/Dinosaur Point Rd				Fifield Road/Dinosaur Point Rd				SR-152				SR-152				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0.5	0.5	0	0	1	0	0	0	3	0	0	1	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
7:45 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
8:45 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	2
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0	6	0	0	0	2	0	0	8
APPROACH %'s :									0.00%	100.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	
PEAK HR :	07:00 AM - 08:00 AM																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	3	0	0	0	1	0	0	4
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.375	0.000	0.000	0.000	0.250	0.000	0.000	0.500
									0.375				0.250				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0.5	0.5	0	0	1	0	0	0	3	0	0	1	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0	0	4
4:45 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0	6	0	0	0	3	0	0	9
APPROACH %'s :									0.00%	100.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	
PEAK HR :	04:00 PM - 05:00 PM																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	5	0	0	0	2	0	0	7
PEAK HR FACTOR :	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.625	0.000	0.000	0.000	0.250	0.000	0.000	0.438
									0.625				0.250				

National Data & Surveying Services

Intersection Turning Movement Count

Location: Dinosaur Point Rd&Fifield Rd & SR-152
City: Hollister
Control: 2-Way Stop (NB/SB)

Project ID: 18-8464
Date: 9/19/2018

Heavy Trucks

NS/EW Streets:	Fifield Road/Dinosaur Point Rd				Fifield Road/Dinosaur Point Rd				SR-152				SR-152				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0.5	0.5	0	0	1	0	0	0	3	0	0	1	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	0	0	0	0	0	0	0	0	23	0	0	0	53	0	0	76
7:15 AM	0	0	0	0	0	0	0	0	0	16	0	0	0	43	0	0	59
7:30 AM	0	0	0	0	0	0	0	0	0	20	0	0	0	31	0	0	51
7:45 AM	0	0	0	0	0	0	0	0	0	28	0	0	0	35	0	0	63
8:00 AM	0	0	0	0	0	0	0	0	0	25	0	0	0	43	0	0	68
8:15 AM	0	0	0	0	0	0	0	0	0	44	0	0	0	33	0	0	77
8:30 AM	0	0	0	0	0	0	0	0	0	32	0	0	0	43	0	0	75
8:45 AM	0	0	0	0	0	0	0	0	0	41	0	0	0	42	0	0	83
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0	229	0	0	0	323	0	0	552
APPROACH %'s :									0.00%	100.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	
PEAK HR :	07:00 AM - 08:00 AM																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	87	0	0	0	162	0	0	249
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.777	0.000	0.000	0.000	0.764	0.000	0.000	0.819
									0.777				0.764				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0.5	0.5	0	0	1	0	0	0	3	0	0	1	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	0	0	0	0	0	0	0	0	38	0	0	0	22	0	0	60
4:15 PM	0	0	0	0	0	0	0	0	0	40	0	0	0	32	0	0	72
4:30 PM	0	0	0	0	0	0	0	0	0	37	0	0	0	35	0	0	72
4:45 PM	0	0	0	0	0	0	0	0	0	38	0	0	0	36	0	0	74
5:00 PM	0	0	0	0	0	0	0	0	0	39	0	0	0	29	0	0	68
5:15 PM	0	0	0	0	0	0	0	0	0	30	0	0	0	30	0	0	60
5:30 PM	0	0	0	0	0	0	0	0	0	40	0	0	0	39	0	0	79
5:45 PM	0	0	0	0	0	0	0	0	0	28	0	0	0	29	0	0	57
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0	290	0	0	0	252	0	0	542
APPROACH %'s :									0.00%	100.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	
PEAK HR :	04:00 PM - 05:00 PM																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	153	0	0	0	125	0	0	278
PEAK HR FACTOR :	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.956	0.000	0.000	0.000	0.868	0.000	0.000	0.939
									0.956				0.868				

National Data & Surveying Services

Intersection Turning Movement Count

Location: Dinosaur Point Rd&Fifield Rd & SR-152
City: Hollister
Control: 2-Way Stop (NB/SB)

Project ID: 18-8464
Date: 9/19/2018

Totals PCE

NS/EW Streets:	Fifield Road/Dinosaur Point Rd				Fifield Road/Dinosaur Point Rd				SR-152				SR-152				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	3	0	0	0	0	0	0	0	0	193	2	1	0	441	0	0	640
7:15 AM	1	0	0	0	0	0	0	0	0	169	0	1	0	411	0	0	582
7:30 AM	0	0	1	0	0	0	0	0	0	196	0	0	0	357	0	0	554
7:45 AM	0	0	0	0	0	0	0	0	0	213	0	0	2	350	0	0	565
8:00 AM	0	0	1	0	0	0	0	0	0	177	1	0	0	355	0	0	534
8:15 AM	1	0	0	0	0	0	0	0	0	231	0	0	0	327	0	0	559
8:30 AM	0	0	1	0	0	0	0	0	0	214	0	0	0	381	0	0	596
8:45 AM	0	0	0	0	0	0	0	0	0	243	0	0	0	362	0	0	605
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	5	0	3	0	0	0	0	0	0	1636	3	2	2	2984	0	0	4635
APPROACH %'s :	62.50%	0.00%	37.50%	0.00%					0.00%	99.70%	0.18%	0.12%	0.07%	99.93%	0.00%	0.00%	
PEAK HR :	07:00 AM - 08:00 AM																TOTAL
PEAK HR VOL :	4	0	1	0	0	0	0	0	0	771	2	2	2	1559	0	0	2341
PEAK HR FACTOR :	0.333	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.905	0.250	0.500	0.250	0.884	0.000	0.000	0.914
	0.417								0.910				0.885				

	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
PM	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	0	0	0	0	0	0	0	0	594	1	0	3	246	0	0	844
4:15 PM	0	0	4	0	0	0	0	0	0	516	0	0	1	299	0	0	820
4:30 PM	0	0	0	0	0	0	0	0	0	617	0	0	1	290	0	1	909
4:45 PM	0	0	3	0	0	0	0	0	0	485	3	0	1	279	0	0	771
5:00 PM	0	0	2	0	0	0	0	0	0	564	0	0	0	251	0	0	817
5:15 PM	0	0	1	0	0	0	0	0	0	496	1	0	0	258	0	0	756
5:30 PM	0	0	0	0	0	0	0	0	0	539	3	0	1	278	0	0	821
5:45 PM	0	0	2	0	0	0	0	0	0	459	0	0	1	242	0	0	704
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	12	0	0	0	0	0	0	4270	8	0	8	2143	0	1	6442
APPROACH %'s :	0.00%	0.00%	100.00%	0.00%					0.00%	99.81%	0.19%	0.00%	0.37%	99.58%	0.00%	0.05%	
PEAK HR :	04:00 PM - 05:00 PM																TOTAL
PEAK HR VOL :	0	0	7	0	0	0	0	0	0	2212	4	0	6	1114	0	1	3344
PEAK HR FACTOR :	0.00	0.000	0.438	0.000	0.000	0.000	0.000	0.000	0.000	0.896	0.333	0.000	0.500	0.931	0.000	0.250	0.920
	0.438								0.898				0.934				

National Data & Surveying Services

Intersection Turning Movement Count

Location: Dinosaur Point Rd&Fifield Rd & SR-152
City: Hollister
Control: 2-Way Stop (NB/SB)

Project ID: 18-8464
Date: 9/19/2018

Passenger Vehicles PCE

NS/EW Streets:	Fifield Road/Dinosaur Point Rd				Fifield Road/Dinosaur Point Rd				SR-152				SR-152				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	3	0	0	0	0	0	0	0	0	124	2	1	0	269	0	0	399
7:15 AM	1	0	0	0	0	0	0	0	0	118	0	1	0	279	0	0	399
7:30 AM	0	0	1	0	0	0	0	0	0	130	0	0	0	252	0	0	383
7:45 AM	0	0	0	0	0	0	0	0	0	122	0	0	2	236	0	0	360
8:00 AM	0	0	1	0	0	0	0	0	0	97	1	0	0	218	0	0	317
8:15 AM	1	0	0	0	0	0	0	0	0	87	0	0	0	216	0	0	304
8:30 AM	0	0	1	0	0	0	0	0	0	106	0	0	0	240	0	0	347
8:45 AM	0	0	0	0	0	0	0	0	0	110	0	0	0	228	0	0	338
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	5	0	3	0	0	0	0	0	0	894	3	2	2	1938	0	0	2847
APPROACH %'s :	62.50%	0.00%	37.50%	0.00%					0.00%	99.44%	0.33%	0.22%	0.10%	99.90%	0.00%	0.00%	
PEAK HR :	07:00 AM - 08:00 AM																TOTAL
PEAK HR VOL :	4	0	1	0	0	0	0	0	0	494	2	2	2	1036	0	0	1541
PEAK HR FACTOR :	0.333	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.950	0.250	0.500	0.250	0.928	0.000	0.000	0.966
	0.417								0.958				0.930				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	0	0	0	0	0	0	0	0	468	1	0	3	174	0	0	646
4:15 PM	0	0	4	0	0	0	0	0	0	384	0	0	1	194	0	0	583
4:30 PM	0	0	0	0	0	0	0	0	0	488	0	0	1	172	0	1	662
4:45 PM	0	0	3	0	0	0	0	0	0	360	3	0	1	163	0	0	530
5:00 PM	0	0	2	0	0	0	0	0	0	433	0	0	0	156	0	0	591
5:15 PM	0	0	1	0	0	0	0	0	0	397	1	0	0	159	0	0	558
5:30 PM	0	0	0	0	0	0	0	0	0	413	3	0	1	149	0	0	566
5:45 PM	0	0	2	0	0	0	0	0	0	361	0	0	1	150	0	0	514
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	12	0	0	0	0	0	0	3304	8	0	8	1317	0	1	4650
APPROACH %'s :	0.00%	0.00%	100.00%	0.00%					0.00%	99.76%	0.24%	0.00%	0.60%	99.32%	0.00%	0.08%	
PEAK HR :	04:00 PM - 05:00 PM																TOTAL
PEAK HR VOL :	0	0	7	0	0	0	0	0	0	1700	4	0	6	703	0	1	2421
PEAK HR FACTOR :	0.00	0.000	0.438	0.000	0.000	0.000	0.000	0.000	0.000	0.871	0.333	0.000	0.500	0.906	0.000	0.250	0.914
	0.438								0.873				0.910				

National Data & Surveying Services

Intersection Turning Movement Count

Location: Dinosaur Point Rd&Fifield Rd & SR-152
City: Hollister
Control: 2-Way Stop (NB/SB)

Project ID: 18-8464
Date: 9/19/2018

Light Trucks PCE

NS/EW Streets:	Fifield Road/Dinosaur Point Rd				Fifield Road/Dinosaur Point Rd				SR-152				SR-152				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	11	0	0	11
7:15 AM	0	0	0	0	0	0	0	0	0	3	0	0	0	3	0	0	6
7:30 AM	0	0	0	0	0	0	0	0	0	2	0	0	0	12	0	0	14
7:45 AM	0	0	0	0	0	0	0	0	0	5	0	0	0	9	0	0	14
8:00 AM	0	0	0	0	0	0	0	0	0	5	0	0	0	8	0	0	13
8:15 AM	0	0	0	0	0	0	0	0	0	12	0	0	0	12	0	0	24
8:30 AM	0	0	0	0	0	0	0	0	0	8	0	0	0	12	0	0	20
8:45 AM	0	0	0	0	0	0	0	0	0	8	0	0	0	6	0	0	14
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0	43	0	0	0	73	0	0	116
APPROACH %'s :									0.00%	100.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	
PEAK HR :	07:00 AM - 08:00 AM																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	10	0	0	0	35	0	0	45
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.500	0.000	0.000	0.000	0.729	0.000	0.000	0.804
									0.500				0.729				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	0	0	0	0	0	0	0	0	8	0	0	0	6	0	0	14
4:15 PM	0	0	0	0	0	0	0	0	0	12	0	0	0	9	0	0	21
4:30 PM	0	0	0	0	0	0	0	0	0	14	0	0	0	9	0	0	23
4:45 PM	0	0	0	0	0	0	0	0	0	9	0	0	0	8	0	0	17
5:00 PM	0	0	0	0	0	0	0	0	0	14	0	0	0	6	0	0	20
5:15 PM	0	0	0	0	0	0	0	0	0	9	0	0	0	9	0	0	18
5:30 PM	0	0	0	0	0	0	0	0	0	6	0	0	0	12	0	0	18
5:45 PM	0	0	0	0	0	0	0	0	0	12	0	0	0	5	0	0	17
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0	84	0	0	0	64	0	0	148
APPROACH %'s :									0.00%	100.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	
PEAK HR :	04:00 PM - 05:00 PM																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	43	0	0	0	32	0	0	75
PEAK HR FACTOR :	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.768	0.000	0.000	0.000	0.889	0.000	0.000	0.815
									0.768				0.889				

National Data & Surveying Services

Intersection Turning Movement Count

Location: Dinosaur Point Rd&Fifield Rd & SR-152
City: Hollister
Control: 2-Way Stop (NB/SB)

Project ID: 18-8464
Date: 9/19/2018

Medium Trucks PCE

NS/EW Streets:	Fifield Road/Dinosaur Point Rd				Fifield Road/Dinosaur Point Rd				SR-152				SR-152				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	4
7:45 AM	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	4
8:45 AM	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0	0	4
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0	12	0	0	0	4	0	0	16
APPROACH %'s :									0.00%	100.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	
PEAK HR :	07:00 AM - 08:00 AM																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	6	0	0	0	2	0	0	8
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.375	0.000	0.000	0.000	0.250	0.000	0.000	0.500
									0.375				0.250				

	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
PM	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	4
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	4	0	0	0	4	0	0	8
4:45 PM	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0	12	0	0	0	6	0	0	18
APPROACH %'s :									0.00%	100.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	
PEAK HR :	04:00 PM - 05:00 PM																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	10	0	0	0	4	0	0	14
PEAK HR FACTOR :	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.625	0.000	0.000	0.000	0.250	0.000	0.000	0.438
									0.625				0.250				

National Data & Surveying Services

Intersection Turning Movement Count

Location: Dinosaur Point Rd&Fifield Rd & SR-152
City: Hollister
Control: 2-Way Stop (NB/SB)

Project ID: 18-8464
Date: 9/19/2018

Heavy Trucks PCE

NS/EW Streets:	Fifield Road/Dinosaur Point Rd				Fifield Road/Dinosaur Point Rd				SR-152				SR-152				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	0	0	0	0	0	0	0	0	69	0	0	0	159	0	0	228
7:15 AM	0	0	0	0	0	0	0	0	0	48	0	0	0	129	0	0	177
7:30 AM	0	0	0	0	0	0	0	0	0	60	0	0	0	93	0	0	153
7:45 AM	0	0	0	0	0	0	0	0	0	84	0	0	0	105	0	0	189
8:00 AM	0	0	0	0	0	0	0	0	0	75	0	0	0	129	0	0	204
8:15 AM	0	0	0	0	0	0	0	0	0	132	0	0	0	99	0	0	231
8:30 AM	0	0	0	0	0	0	0	0	0	96	0	0	0	129	0	0	225
8:45 AM	0	0	0	0	0	0	0	0	0	123	0	0	0	126	0	0	249
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0	687	0	0	0	969	0	0	1656
APPROACH %'s :									0.00%	100.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	
PEAK HR :	07:00 AM - 08:00 AM																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	261	0	0	0	486	0	0	747
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.777	0.000	0.000	0.000	0.764	0.000	0.000	0.819
									0.777				0.764				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	0	0	0	0	0	0	0	0	114	0	0	0	66	0	0	180
4:15 PM	0	0	0	0	0	0	0	0	0	120	0	0	0	96	0	0	216
4:30 PM	0	0	0	0	0	0	0	0	0	111	0	0	0	105	0	0	216
4:45 PM	0	0	0	0	0	0	0	0	0	114	0	0	0	108	0	0	222
5:00 PM	0	0	0	0	0	0	0	0	0	117	0	0	0	87	0	0	204
5:15 PM	0	0	0	0	0	0	0	0	0	90	0	0	0	90	0	0	180
5:30 PM	0	0	0	0	0	0	0	0	0	120	0	0	0	117	0	0	237
5:45 PM	0	0	0	0	0	0	0	0	0	84	0	0	0	87	0	0	171
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0	870	0	0	0	756	0	0	1626
APPROACH %'s :									0.00%	100.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	
PEAK HR :	04:00 PM - 05:00 PM																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	459	0	0	0	375	0	0	834
PEAK HR FACTOR :	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.956	0.000	0.000	0.000	0.868	0.000	0.000	0.939
									0.956				0.868				

Prepared by National Data & Surveying Services

Dinosaur Point Rd&Fifield Rd & SR-152

Peak Hour Turning Movement Count

ID: 18-8464
City: Hollister

Day: Wednesday
Date: 09/19/2018

PEAK HOURS		COUNT PERIODS
AM	07:00 AM - 08:00 AM	07:00 AM - 09:00 AM
NOON	NONE	NONE
PM	04:00 PM - 05:00 PM	04:00 PM - 06:00 PM

Fifield Road/Dinosaur Point Rd — SOUTHBOUND

	Right	Thru	Left	U-Turn	Exiting
AM	0	0	0	0	0
NOON	0	0	0	0	0
PM	0	0	0	0	0
	0	1	0	0	

SR-152 — EASTBOUND

	AM	NOON	PM	
Exiting	1228	0	851	
U-Turn	2	0	0	0
Left	0	0	0	0
Thru	590	0	1886	3
Right	2	0	4	0

SR-152 — WESTBOUND

		PM	NOON	AM
U-Turn	0	0	0	0
Thru	2	851	0	1222
Left	1	6	0	2
Right	0	1	0	0
Exiting		1894	0	591

CONTROL

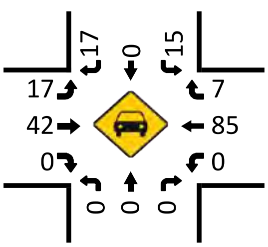
2-Way Stop (NB/SB)

	AM	NOON	PM
TEV	1823	0	2755
PHF	0.94		0.91

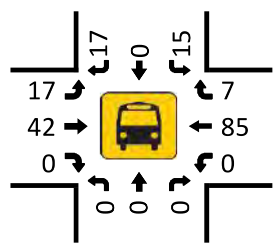
Fifield Road/Dinosaur Point Rd — NORTHBOUND

	Exiting	U-Turn	Left	Thru	Right
		0	0	0.5	0.5
PM	10	0	0	0	7
NOON	0	0	0	0	0
AM	4	0	4	0	1

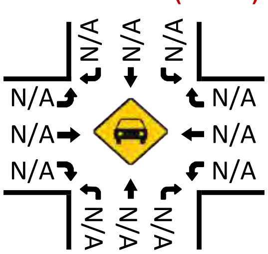
Total Vehicles (AM)



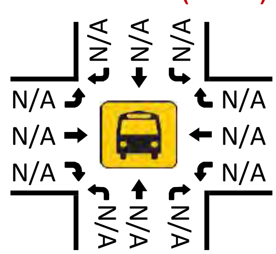
Total Vehicles (AM)



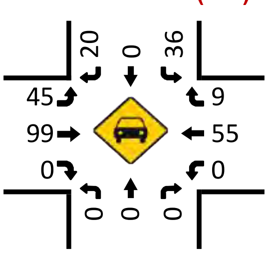
Total Vehicles (NOON)



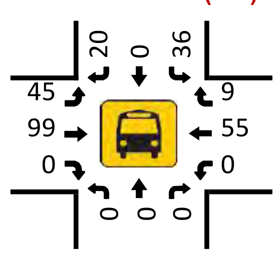
Total Vehicles (NOON)



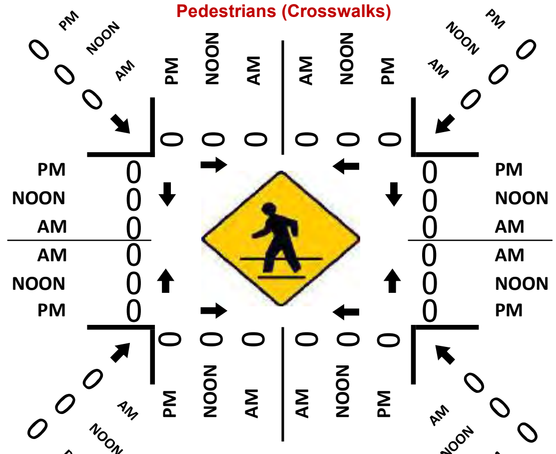
Total Vehicles (PM)



Total Vehicles (PM)



Pedestrians (Crosswalks)



National Data & Surveying Services

Intersection Turning Movement Count

Location: Old Pacheco Pass Rd & SR-152
City: Hollister
Control: No Control

Project ID: 18-8464
Date: 9/19/2018

Total

NS/EW Streets:	Old Pacheco Pass Rd				Old Pacheco Pass Rd				SR-152				SR-152				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	0	0	0	0	2	0	0	0	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	0	0	0	0	0	0	0	0	153	0	0	0	338	0	0	491
7:15 AM	0	0	0	0	0	0	0	0	0	133	0	0	0	319	0	0	452
7:30 AM	0	0	0	0	0	0	0	0	0	156	1	0	0	285	0	0	442
7:45 AM	0	0	0	0	0	0	0	0	0	148	0	0	0	287	0	0	435
8:00 AM	0	0	0	0	0	0	0	0	0	130	0	0	0	258	0	0	388
8:15 AM	0	0	0	0	0	0	0	0	0	137	0	0	0	257	0	0	394
8:30 AM	0	0	0	0	0	0	0	0	0	148	0	0	0	292	0	0	440
8:45 AM	0	0	0	0	0	0	0	0	0	154	0	0	0	276	0	0	430
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0	1159	1	0	0	2312	0	0	3472
APPROACH %'s :									0.00%	99.91%	0.09%	0.00%	0.00%	100.00%	0.00%	0.00%	
PEAK HR :	07:00 AM - 08:00 AM																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	590	1	0	0	1229	0	0	1820
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.946	0.250	0.000	0.000	0.909	0.000	0.000	0.927
									0.941				0.909				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	0	0	0	0	2	0	0	0	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	0	0	0	0	0	0	0	0	508	0	0	0	198	0	0	706
4:15 PM	0	0	0	0	0	0	0	0	0	433	1	0	0	233	0	0	667
4:30 PM	0	0	0	0	0	0	0	0	0	533	0	0	0	215	0	0	748
4:45 PM	0	0	0	0	0	0	0	0	0	417	1	0	0	209	0	0	627
5:00 PM	0	0	0	0	0	0	0	0	0	484	1	0	0	188	0	0	673
5:15 PM	0	0	0	0	0	0	0	0	0	434	1	0	0	191	0	0	626
5:30 PM	0	0	2	0	0	0	0	0	0	457	2	0	0	191	0	0	652
5:45 PM	0	0	0	0	0	0	0	0	0	399	2	0	0	179	0	0	580
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	2	0	0	0	0	0	0	3665	8	0	0	1604	0	0	5279
APPROACH %'s :	0.00%	0.00%	100.00%	0.00%					0.00%	99.78%	0.22%	0.00%	0.00%	100.00%	0.00%	0.00%	
PEAK HR :	04:00 PM - 05:00 PM																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	1891	2	0	0	855	0	0	2748
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.887	0.500	0.000	0.000	0.917	0.000	0.000	0.918
									0.888				0.917				

National Data & Surveying Services

Intersection Turning Movement Count

Location: Old Pacheco Pass Rd & SR-152
City: Hollister
Control: No Control

Project ID: 18-8464
Date: 9/19/2018

Passenger Vehicles

NS/EW Streets:	Old Pacheco Pass Rd				Old Pacheco Pass Rd				SR-152				SR-152				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	0	0	0	0	2	0	0	0	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	0	0	0	0	0	0	0	0	132	0	0	0	274	0	0	406
7:15 AM	0	0	0	0	0	0	0	0	0	114	0	0	0	276	0	0	390
7:30 AM	0	0	0	0	0	0	0	0	0	131	1	0	0	250	0	0	382
7:45 AM	0	0	0	0	0	0	0	0	0	116	0	0	0	243	0	0	359
8:00 AM	0	0	0	0	0	0	0	0	0	101	0	0	0	212	0	0	313
8:15 AM	0	0	0	0	0	0	0	0	0	87	0	0	0	216	0	0	303
8:30 AM	0	0	0	0	0	0	0	0	0	109	0	0	0	240	0	0	349
8:45 AM	0	0	0	0	0	0	0	0	0	107	0	0	0	228	0	0	335
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0	897	1	0	0	1939	0	0	2837
APPROACH %'s :									0.00%	99.89%	0.11%	0.00%	0.00%	100.00%	0.00%	0.00%	
PEAK HR :	07:00 AM - 08:00 AM																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	493	1	0	0	1043	0	0	1537
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.934	0.250	0.000	0.000	0.945	0.000	0.000	0.946
									0.936				0.945				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	0	0	0	0	2	0	0	0	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	0	0	0	0	0	0	0	0	466	0	0	0	171	0	0	637
4:15 PM	0	0	0	0	0	0	0	0	0	385	1	0	0	194	0	0	580
4:30 PM	0	0	0	0	0	0	0	0	0	484	0	0	0	171	0	0	655
4:45 PM	0	0	0	0	0	0	0	0	0	371	1	0	0	168	0	0	540
5:00 PM	0	0	0	0	0	0	0	0	0	436	1	0	0	155	0	0	592
5:15 PM	0	0	0	0	0	0	0	0	0	398	1	0	0	156	0	0	555
5:30 PM	0	0	2	0	0	0	0	0	0	413	2	0	0	146	0	0	563
5:45 PM	0	0	0	0	0	0	0	0	0	362	2	0	0	146	0	0	510
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	2	0	0	0	0	0	0	3315	8	0	0	1307	0	0	4632
APPROACH %'s :	0.00%	0.00%	100.00%	0.00%					0.00%	99.76%	0.24%	0.00%	0.00%	100.00%	0.00%	0.00%	
PEAK HR :	04:00 PM - 05:00 PM																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	1706	2	0	0	704	0	0	2412
PEAK HR FACTOR :	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.881	0.500	0.000	0.000	0.907	0.000	0.000	0.921
									0.882				0.907				

National Data & Surveying Services

Intersection Turning Movement Count

Location: Old Pacheco Pass Rd & SR-152
City: Hollister
Control: No Control

Project ID: 18-8464
Date: 9/19/2018

Light Trucks

NS/EW Streets:	Old Pacheco Pass Rd				Old Pacheco Pass Rd				SR-152				SR-152				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	0	0	0	0	2	0	0	0	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	9	0	0	9
7:15 AM	0	0	0	0	0	0	0	0	0	2	0	0	0	3	0	0	5
7:30 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	6	0	0	7
7:45 AM	0	0	0	0	0	0	0	0	0	4	0	0	0	8	0	0	12
8:00 AM	0	0	0	0	0	0	0	0	0	4	0	0	0	4	0	0	8
8:15 AM	0	0	0	0	0	0	0	0	0	7	0	0	0	5	0	0	12
8:30 AM	0	0	0	0	0	0	0	0	0	5	0	0	0	10	0	0	15
8:45 AM	0	0	0	0	0	0	0	0	0	4	0	0	0	3	0	0	7
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0	27	0	0	0	48	0	0	75
APPROACH %'s :									0.00%	100.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	
PEAK HR :	07:00 AM - 08:00 AM																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	7	0	0	0	26	0	0	33
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.438	0.000	0.000	0.000	0.722	0.000	0.000	0.688
									0.438				0.722				

	Old Pacheco Pass Rd				Old Pacheco Pass Rd				SR-152				SR-152				
PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	0	0	0	0	2	0	0	0	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	0	0	0	0	0	0	0	0	5	0	0	0	5	0	0	10
4:15 PM	0	0	0	0	0	0	0	0	0	8	0	0	0	5	0	0	13
4:30 PM	0	0	0	0	0	0	0	0	0	10	0	0	0	8	0	0	18
4:45 PM	0	0	0	0	0	0	0	0	0	6	0	0	0	4	0	0	10
5:00 PM	0	0	0	0	0	0	0	0	0	10	0	0	0	5	0	0	15
5:15 PM	0	0	0	0	0	0	0	0	0	5	0	0	0	5	0	0	10
5:30 PM	0	0	0	0	0	0	0	0	0	5	0	0	0	7	0	0	12
5:45 PM	0	0	0	0	0	0	0	0	0	6	0	0	0	3	0	0	9
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0	55	0	0	0	42	0	0	97
APPROACH %'s :									0.00%	100.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	
PEAK HR :	04:00 PM - 05:00 PM																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	29	0	0	0	22	0	0	51
PEAK HR FACTOR :	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.725	0.000	0.000	0.000	0.688	0.000	0.000	0.708
									0.725				0.688				

National Data & Surveying Services

Intersection Turning Movement Count

Location: Old Pacheco Pass Rd & SR-152
City: Hollister
Control: No Control

Project ID: 18-8464
Date: 9/19/2018

Medium Trucks

NS/EW Streets:	Old Pacheco Pass Rd				Old Pacheco Pass Rd				SR-152				SR-152				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	0	0	0	0	2	0	0	0	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
7:45 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
8:45 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	2
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0	6	0	0	0	2	0	0	8
APPROACH %'s :									0.00%	100.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	
PEAK HR :	07:00 AM - 08:00 AM																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	3	0	0	0	1	0	0	4
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.375	0.000	0.000	0.000	0.250	0.000	0.000	0.500
									0.375				0.250				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	0	0	0	0	2	0	0	0	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0	0	3
4:45 PM	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	3
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	2
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0	6	0	0	0	3	0	0	9
APPROACH %'s :									0.00%	100.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	
PEAK HR :	04:00 PM - 05:00 PM																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	5	0	0	0	2	0	0	7
PEAK HR FACTOR :	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.417	0.000	0.000	0.000	0.250	0.000	0.000	0.583
									0.417				0.250				

National Data & Surveying Services

Intersection Turning Movement Count

Location: Old Pacheco Pass Rd & SR-152
City: Hollister
Control: No Control

Project ID: 18-8464
Date: 9/19/2018

Heavy Trucks

NS/EW Streets:	Old Pacheco Pass Rd				Old Pacheco Pass Rd				SR-152				SR-152				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	0	0	0	0	2	0	0	0	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	0	0	0	0	0	0	0	0	21	0	0	0	54	0	0	75
7:15 AM	0	0	0	0	0	0	0	0	0	17	0	0	0	40	0	0	57
7:30 AM	0	0	0	0	0	0	0	0	0	22	0	0	0	29	0	0	51
7:45 AM	0	0	0	0	0	0	0	0	0	27	0	0	0	36	0	0	63
8:00 AM	0	0	0	0	0	0	0	0	0	25	0	0	0	42	0	0	67
8:15 AM	0	0	0	0	0	0	0	0	0	43	0	0	0	36	0	0	79
8:30 AM	0	0	0	0	0	0	0	0	0	32	0	0	0	42	0	0	74
8:45 AM	0	0	0	0	0	0	0	0	0	42	0	0	0	44	0	0	86
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0	229	0	0	0	323	0	0	552
APPROACH %'s :									0.00%	100.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	
PEAK HR :	07:00 AM - 08:00 AM																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	87	0	0	0	159	0	0	246
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.806	0.000	0.000	0.000	0.736	0.000	0.000	0.820
									0.806				0.736				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	0	0	0	0	2	0	0	0	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	0	0	0	0	0	0	0	0	36	0	0	0	22	0	0	58
4:15 PM	0	0	0	0	0	0	0	0	0	40	0	0	0	34	0	0	74
4:30 PM	0	0	0	0	0	0	0	0	0	38	0	0	0	34	0	0	72
4:45 PM	0	0	0	0	0	0	0	0	0	37	0	0	0	37	0	0	74
5:00 PM	0	0	0	0	0	0	0	0	0	38	0	0	0	28	0	0	66
5:15 PM	0	0	0	0	0	0	0	0	0	30	0	0	0	29	0	0	59
5:30 PM	0	0	0	0	0	0	0	0	0	39	0	0	0	38	0	0	77
5:45 PM	0	0	0	0	0	0	0	0	0	31	0	0	0	30	0	0	61
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0	289	0	0	0	252	0	0	541
APPROACH %'s :									0.00%	100.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	
PEAK HR :	04:00 PM - 05:00 PM																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	151	0	0	0	127	0	0	278
PEAK HR FACTOR :	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.944	0.000	0.000	0.000	0.858	0.000	0.000	0.939
									0.944				0.858				

National Data & Surveying Services

Intersection Turning Movement Count

Location: Old Pacheco Pass Rd & SR-152
City: Hollister
Control: No Control

Project ID: 18-8464
Date: 9/19/2018

Totals PCE

NS/EW Streets:	Old Pacheco Pass Rd				Old Pacheco Pass Rd				SR-152				SR-152				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	0	0	0	0	0	0	0	0	195	0	0	0	452	0	0	647
7:15 AM	0	0	0	0	0	0	0	0	0	168	0	0	0	401	0	0	569
7:30 AM	0	0	0	0	0	0	0	0	0	203	1	0	0	346	0	0	550
7:45 AM	0	0	0	0	0	0	0	0	0	205	0	0	0	363	0	0	568
8:00 AM	0	0	0	0	0	0	0	0	0	182	0	0	0	344	0	0	526
8:15 AM	0	0	0	0	0	0	0	0	0	227	0	0	0	332	0	0	559
8:30 AM	0	0	0	0	0	0	0	0	0	217	0	0	0	381	0	0	598
8:45 AM	0	0	0	0	0	0	0	0	0	241	0	0	0	367	0	0	608
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0	1638	1	0	0	2986	0	0	4625
APPROACH %'s :									0.00%	99.94%	0.06%	0.00%	0.00%	100.00%	0.00%	0.00%	
PEAK HR :	07:00 AM - 08:00 AM																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	771	1	0	0	1562	0	0	2334
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.940	0.250	0.000	0.000	0.864	0.000	0.000	0.902
									0.941				0.864				

	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
PM	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	0	0	0	0	0	0	0	0	584	0	0	0	245	0	0	829
4:15 PM	0	0	0	0	0	0	0	0	0	517	1	0	0	304	0	0	822
4:30 PM	0	0	0	0	0	0	0	0	0	615	0	0	0	289	0	0	904
4:45 PM	0	0	0	0	0	0	0	0	0	497	1	0	0	285	0	0	783
5:00 PM	0	0	0	0	0	0	0	0	0	565	1	0	0	247	0	0	813
5:15 PM	0	0	0	0	0	0	0	0	0	498	1	0	0	253	0	0	752
5:30 PM	0	0	2	0	0	0	0	0	0	538	2	0	0	271	0	0	813
5:45 PM	0	0	0	0	0	0	0	0	0	464	2	0	0	241	0	0	707
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	2	0	0	0	0	0	0	4278	8	0	0	2135	0	0	6423
APPROACH %'s :	0.00%	0.00%	100.00%	0.00%					0.00%	99.81%	0.19%	0.00%	0.00%	100.00%	0.00%	0.00%	
PEAK HR :	04:00 PM - 05:00 PM																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	2213	2	0	0	1123	0	0	3338
PEAK HR FACTOR :	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.900	0.500	0.000	0.000	0.924	0.000	0.000	0.923
									0.900				0.924				

National Data & Surveying Services

Intersection Turning Movement Count

Location: Old Pacheco Pass Rd & SR-152
City: Hollister
Control: No Control

Project ID: 18-8464
Date: 9/19/2018

Passenger Vehicles PCE

NS/EW Streets:	Old Pacheco Pass Rd				Old Pacheco Pass Rd				SR-152				SR-152				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	0	0	0	0	0	0	0	0	132	0	0	0	274	0	0	406
7:15 AM	0	0	0	0	0	0	0	0	0	114	0	0	0	276	0	0	390
7:30 AM	0	0	0	0	0	0	0	0	0	131	1	0	0	250	0	0	382
7:45 AM	0	0	0	0	0	0	0	0	0	116	0	0	0	243	0	0	359
8:00 AM	0	0	0	0	0	0	0	0	0	101	0	0	0	212	0	0	313
8:15 AM	0	0	0	0	0	0	0	0	0	87	0	0	0	216	0	0	303
8:30 AM	0	0	0	0	0	0	0	0	0	109	0	0	0	240	0	0	349
8:45 AM	0	0	0	0	0	0	0	0	0	107	0	0	0	228	0	0	335
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0	897	1	0	0	1939	0	0	2837
APPROACH %'s :									0.00%	99.89%	0.11%	0.00%	0.00%	100.00%	0.00%	0.00%	
PEAK HR :	07:00 AM - 08:00 AM																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	493	1	0	0	1043	0	0	1537
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.934	0.250	0.000	0.000	0.945	0.000	0.000	0.946
									0.936				0.945				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	0	0	0	0	0	0	0	0	466	0	0	0	171	0	0	637
4:15 PM	0	0	0	0	0	0	0	0	0	385	1	0	0	194	0	0	580
4:30 PM	0	0	0	0	0	0	0	0	0	484	0	0	0	171	0	0	655
4:45 PM	0	0	0	0	0	0	0	0	0	371	1	0	0	168	0	0	540
5:00 PM	0	0	0	0	0	0	0	0	0	436	1	0	0	155	0	0	592
5:15 PM	0	0	0	0	0	0	0	0	0	398	1	0	0	156	0	0	555
5:30 PM	0	0	2	0	0	0	0	0	0	413	2	0	0	146	0	0	563
5:45 PM	0	0	0	0	0	0	0	0	0	362	2	0	0	146	0	0	510
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	2	0	0	0	0	0	0	3315	8	0	0	1307	0	0	4632
APPROACH %'s :	0.00%	0.00%	100.00%	0.00%					0.00%	99.76%	0.24%	0.00%	0.00%	100.00%	0.00%	0.00%	
PEAK HR :	04:00 PM - 05:00 PM																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	1706	2	0	0	704	0	0	2412
PEAK HR FACTOR :	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.881	0.500	0.000	0.000	0.907	0.000	0.000	0.921
									0.882				0.907				

National Data & Surveying Services

Intersection Turning Movement Count

Location: Old Pacheco Pass Rd & SR-152
City: Hollister
Control: No Control

Project ID: 18-8464
Date: 9/19/2018

Light Trucks PCE

NS/EW Streets:	Old Pacheco Pass Rd				Old Pacheco Pass Rd				SR-152				SR-152				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	14	0	0	14
7:15 AM	0	0	0	0	0	0	0	0	0	3	0	0	0	5	0	0	8
7:30 AM	0	0	0	0	0	0	0	0	0	2	0	0	0	9	0	0	11
7:45 AM	0	0	0	0	0	0	0	0	0	6	0	0	0	12	0	0	18
8:00 AM	0	0	0	0	0	0	0	0	0	6	0	0	0	6	0	0	12
8:15 AM	0	0	0	0	0	0	0	0	0	11	0	0	0	8	0	0	19
8:30 AM	0	0	0	0	0	0	0	0	0	8	0	0	0	15	0	0	23
8:45 AM	0	0	0	0	0	0	0	0	0	6	0	0	0	5	0	0	11
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0	42	0	0	0	74	0	0	116
APPROACH %'s :									0.00%	100.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	
PEAK HR :	07:00 AM - 08:00 AM																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	11	0	0	0	40	0	0	51
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.458	0.000	0.000	0.000	0.714	0.000	0.000	0.708
									0.458				0.714				

	Old Pacheco Pass Rd				Old Pacheco Pass Rd				SR-152				SR-152				
PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	0	0	0	0	0	0	0	0	8	0	0	0	8	0	0	16
4:15 PM	0	0	0	0	0	0	0	0	0	12	0	0	0	8	0	0	20
4:30 PM	0	0	0	0	0	0	0	0	0	15	0	0	0	12	0	0	27
4:45 PM	0	0	0	0	0	0	0	0	0	9	0	0	0	6	0	0	15
5:00 PM	0	0	0	0	0	0	0	0	0	15	0	0	0	8	0	0	23
5:15 PM	0	0	0	0	0	0	0	0	0	8	0	0	0	8	0	0	16
5:30 PM	0	0	0	0	0	0	0	0	0	8	0	0	0	11	0	0	19
5:45 PM	0	0	0	0	0	0	0	0	0	9	0	0	0	5	0	0	14
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0	84	0	0	0	66	0	0	150
APPROACH %'s :									0.00%	100.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	
PEAK HR :	04:00 PM - 05:00 PM																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	44	0	0	0	34	0	0	78
PEAK HR FACTOR :	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.733	0.000	0.000	0.000	0.708	0.000	0.000	0.722
									0.733				0.708				

National Data & Surveying Services

Intersection Turning Movement Count

Location: Old Pacheco Pass Rd & SR-152
City: Hollister
Control: No Control

Project ID: 18-8464
Date: 9/19/2018

Medium Trucks PCE

NS/EW Streets:	Old Pacheco Pass Rd				Old Pacheco Pass Rd				SR-152				SR-152				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	4
7:45 AM	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	4
8:45 AM	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0	0	4
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0	12	0	0	0	4	0	0	16
APPROACH %'s :									0.00%	100.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	
PEAK HR :	07:00 AM - 08:00 AM																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	6	0	0	0	2	0	0	8
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.375	0.000	0.000	0.000	0.250	0.000	0.000	0.500
									0.375				0.250				

	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
PM	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	2	0	0	0	4	0	0	6
4:45 PM	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	6
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0	0	4
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0	12	0	0	0	6	0	0	18
APPROACH %'s :									0.00%	100.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	
PEAK HR :	04:00 PM - 05:00 PM																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	10	0	0	0	4	0	0	14
PEAK HR FACTOR :	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.417	0.000	0.000	0.000	0.250	0.000	0.000	0.583
									0.417				0.250				

National Data & Surveying Services

Intersection Turning Movement Count

Location: Old Pacheco Pass Rd & SR-152
City: Hollister
Control: No Control

Project ID: 18-8464
Date: 9/19/2018

Heavy Trucks PCE

NS/EW Streets:	Old Pacheco Pass Rd				Old Pacheco Pass Rd				SR-152				SR-152				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	0	0	0	0	0	0	0	0	63	0	0	0	162	0	0	225
7:15 AM	0	0	0	0	0	0	0	0	0	51	0	0	0	120	0	0	171
7:30 AM	0	0	0	0	0	0	0	0	0	66	0	0	0	87	0	0	153
7:45 AM	0	0	0	0	0	0	0	0	0	81	0	0	0	108	0	0	189
8:00 AM	0	0	0	0	0	0	0	0	0	75	0	0	0	126	0	0	201
8:15 AM	0	0	0	0	0	0	0	0	0	129	0	0	0	108	0	0	237
8:30 AM	0	0	0	0	0	0	0	0	0	96	0	0	0	126	0	0	222
8:45 AM	0	0	0	0	0	0	0	0	0	126	0	0	0	132	0	0	258
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0	687	0	0	0	969	0	0	1656
APPROACH %'s :									0.00%	100.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	
PEAK HR :	07:00 AM - 08:00 AM																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	261	0	0	0	477	0	0	738
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.806	0.000	0.000	0.000	0.736	0.000	0.000	0.820
									0.806				0.736				

	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
PM	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	0	0	0	0	0	0	0	0	108	0	0	0	66	0	0	174
4:15 PM	0	0	0	0	0	0	0	0	0	120	0	0	0	102	0	0	222
4:30 PM	0	0	0	0	0	0	0	0	0	114	0	0	0	102	0	0	216
4:45 PM	0	0	0	0	0	0	0	0	0	111	0	0	0	111	0	0	222
5:00 PM	0	0	0	0	0	0	0	0	0	114	0	0	0	84	0	0	198
5:15 PM	0	0	0	0	0	0	0	0	0	90	0	0	0	87	0	0	177
5:30 PM	0	0	0	0	0	0	0	0	0	117	0	0	0	114	0	0	231
5:45 PM	0	0	0	0	0	0	0	0	0	93	0	0	0	90	0	0	183
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0	867	0	0	0	756	0	0	1623
APPROACH %'s :									0.00%	100.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	
PEAK HR :	04:00 PM - 05:00 PM																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	453	0	0	0	381	0	0	834
PEAK HR FACTOR :	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.944	0.000	0.000	0.000	0.858	0.000	0.000	0.939
									0.944				0.858				

Prepared by National Data & Surveying Services

Old Pacheco Pass Rd & SR-152

Peak Hour Turning Movement Count

ID: 18-8464
City: Hollister

Day: Wednesday
Date: 09/19/2018

PEAK HOURS		COUNT PERIODS
AM	07:00 AM - 08:00 AM	07:00 AM - 09:00 AM
NOON	NONE	NONE
PM	04:00 PM - 05:00 PM	04:00 PM - 06:00 PM

Old Pacheco Pass Rd – SOUTHBOUND

AM	0	0	0	0	0
NOON	0	0	0	0	0
PM	0	0	0	0	0
	0	0	0	0	

SR-152 – EASTBOUND

AM	NOON	PM	
1229	0	855	
0	0	0	0
0	0	0	0
590	0	1891	2
1	0	2	0

SR-152 – WESTBOUND

	PM	NOON	AM
0	0	0	0
2	855	0	1229
0	0	0	0
0	0	0	0
	1891	0	590

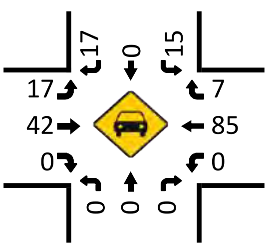
Old Pacheco Pass Rd – NORTHBOUND

		0	0	1	0
PM	2	0	0	0	0
NOON	0	0	0	0	0
AM	1	0	0	0	0

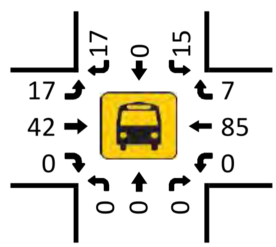
CONTROL: No Control

	AM	NOON	PM
TEV	1820	0	2748
PHF	0.93		0.92

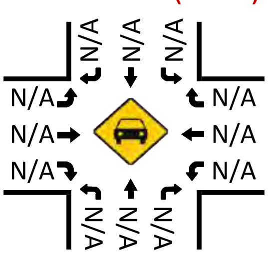
Total Vehicles (AM)



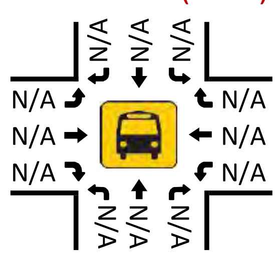
Total Vehicles (AM)



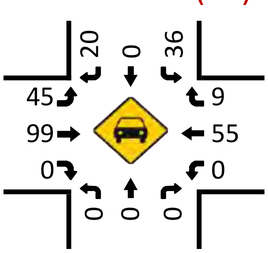
Total Vehicles (NOON)



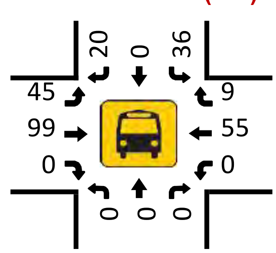
Total Vehicles (NOON)



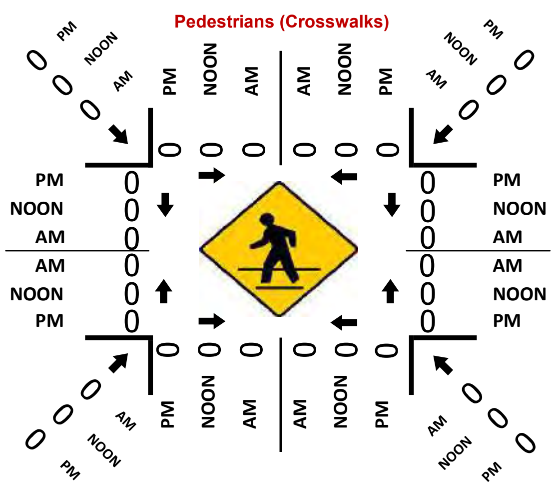
Total Vehicles (PM)



Total Vehicles (PM)



Pedestrians (Crosswalks)



Attachment C

LOS Worksheets

Intersection	
Int Delay, s/veh	0.1

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations													
Traffic Vol, veh/h	2	0	590	2	2	1223	0	4	0	1	0	0	0
Future Vol, veh/h	2	0	590	2	2	1223	0	4	0	1	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	100	-	130	250	-	-	-	-	25	-	-	-
Veh in Median Storage, #	-	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	0	0	16	0	0	15	0	0	0	0	0	0	0
Mvmt Flow	2	0	628	2	2	1301	0	4	0	1	0	0	0

Major/Minor	Major1				Major2			Minor1			Minor2		
Conflicting Flow All	1301	1301	0	0	630	0	0	1287	1937	314	1623	1939	651
Stage 1	-	-	-	-	-	-	-	632	632	-	1305	1305	-
Stage 2	-	-	-	-	-	-	-	655	1305	-	318	634	-
Critical Hdwy	6.4	4.1	-	-	4.1	-	-	7.5	6.5	6.9	7.5	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.5	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	216	539	-	-	962	-	-	123	66	688	70	66	416
Stage 1	-	-	-	-	-	-	-	440	477	-	172	232	-
Stage 2	-	-	-	-	-	-	-	426	232	-	673	476	-
Platoon blocked, %			-	-		-	-						
Mov Cap-1 Maneuver	216	216	-	-	962	-	-	122	65	688	69	65	416
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	122	65	-	69	65	-
Stage 1	-	-	-	-	-	-	-	436	473	-	170	232	-
Stage 2	-	-	-	-	-	-	-	425	232	-	666	472	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0	30.5	0
HCM LOS			D	A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	122	688	216	-	-	962	-	-	-
HCM Lane V/C Ratio	0.035	0.002	0.01	-	-	0.002	-	-	-
HCM Control Delay (s)	35.6	10.2	21.8	-	-	8.8	-	-	0
HCM Lane LOS	E	B	C	-	-	A	-	-	A
HCM 95th %tile Q(veh)	0.1	0	0	-	-	0	-	-	-

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	594	1	0	1229	0	0
Future Vol, veh/h	594	1	0	1229	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	1000	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	16	0	0	15	0	0
Mvmt Flow	639	1	0	1322	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	320
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.3
Pot Cap-1 Maneuver	-	-	0	-	0	682
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	682
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-
HCM Control Delay (s)	0	-	-	-
HCM Lane LOS	A	-	-	-
HCM 95th %tile Q(veh)	-	-	-	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations													
Traffic Vol, veh/h	0	1886	4	1	6	851	0	0	0	7	0	0	0
Future Vol, veh/h	0	1886	4	1	6	851	0	0	0	7	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	-	None	-	-	None	-	-	None
Storage Length	100	-	130	-	250	-	-	-	-	25	-	-	-
Veh in Median Storage, #	-	0	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	10	0	0	0	17	0	0	0	0	0	0	0
Mvmt Flow	0	2050	4	1	7	925	0	0	0	8	0	0	0

Major/Minor	Major1			Major2				Minor1			Minor2		
Conflicting Flow All	925	0	0	2050	2054	0	0	2529	2991	1025	1966	2995	463
Stage 1	-	-	-	-	-	-	-	2050	2050	-	941	941	-
Stage 2	-	-	-	-	-	-	-	479	941	-	1025	2054	-
Critical Hdwy	4.1	-	-	6.4	4.1	-	-	7.5	6.5	6.9	7.5	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.5	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	747	-	-	71	277	-	-	14	14	236	38	14	551
Stage 1	-	-	-	-	-	-	-	59	100	-	287	345	-
Stage 2	-	-	-	-	-	-	-	542	345	-	255	99	-
Platoon blocked, %		-	-			-	-						
Mov Cap-1 Maneuver	747	-	-	194	194	-	-	14	13	236	36	13	551
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	14	13	-	36	13	-
Stage 1	-	-	-	-	-	-	-	59	100	-	287	331	-
Stage 2	-	-	-	-	-	-	-	520	331	-	247	99	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.2	20.8	0
HCM LOS			C	A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	236	747	-	-	194	-	-	-
HCM Lane V/C Ratio	-	0.032	-	-	-	0.039	-	-	-
HCM Control Delay (s)	0	20.8	0	-	-	24.4	-	-	0
HCM Lane LOS	A	C	A	-	-	C	-	-	A
HCM 95th %tile Q(veh)	-	0.1	0	-	-	0.1	-	-	-

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1890	2	0	851	0	0
Future Vol, veh/h	1890	2	0	851	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	1000	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	10	0	0	18	0	0
Mvmt Flow	2054	2	0	925	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	1027
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.3
Pot Cap-1 Maneuver	-	-	0	-	0	235
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	235
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB		WB		NB
HCM Control Delay, s	0		0		0
HCM LOS					A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-
HCM Control Delay (s)	0	-	-	-
HCM Lane LOS	A	-	-	-
HCM 95th %tile Q(veh)	-	-	-	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations													
Traffic Vol, veh/h	2	0	590	2	23	1223	0	4	0	2	0	0	0
Future Vol, veh/h	2	0	590	2	23	1223	0	4	0	2	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	100	-	130	250	-	-	-	-	25	-	-	-
Veh in Median Storage, #	-	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	0	0	16	0	4	15	0	0	0	50	0	0	0
Mvmt Flow	2	0	628	2	24	1301	0	4	0	2	0	0	0

Major/Minor	Major1				Major2			Minor1			Minor2		
Conflicting Flow All	1301	1301	0	0	630	0	0	1331	1981	314	1667	1983	651
Stage 1	-	-	-	-	-	-	-	632	632	-	1349	1349	-
Stage 2	-	-	-	-	-	-	-	699	1349	-	318	634	-
Critical Hdwy	6.4	4.1	-	-	4.18	-	-	7.5	6.5	7.9	7.5	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.5	2.2	-	-	2.24	-	-	3.5	4	3.8	3.5	4	3.3
Pot Cap-1 Maneuver	216	539	-	-	935	-	-	115	62	559	64	62	416
Stage 1	-	-	-	-	-	-	-	440	477	-	162	221	-
Stage 2	-	-	-	-	-	-	-	401	221	-	673	476	-
Platoon blocked, %			-	-		-	-						
Mov Cap-1 Maneuver	216	216	-	-	935	-	-	112	60	559	62	60	416
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	112	60	-	62	60	-
Stage 1	-	-	-	-	-	-	-	436	473	-	161	215	-
Stage 2	-	-	-	-	-	-	-	391	215	-	664	472	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.2	29.4	0
HCM LOS			D	A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	112	559	216	-	-	935	-	-	-
HCM Lane V/C Ratio	0.038	0.004	0.01	-	-	0.026	-	-	-
HCM Control Delay (s)	38.4	11.5	21.8	-	-	9	-	-	0
HCM Lane LOS	E	B	C	-	-	A	-	-	A
HCM 95th %tile Q(veh)	0.1	0	0	-	-	0.1	-	-	-

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	594	1	0	1229	0	0
Future Vol, veh/h	594	1	0	1229	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	1000	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	16	0	0	15	0	0
Mvmt Flow	639	1	0	1322	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	320
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.3
Pot Cap-1 Maneuver	-	-	0	-	0	682
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	682
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-
HCM Control Delay (s)	0	-	-	-
HCM Lane LOS	A	-	-	-
HCM 95th %tile Q(veh)	-	-	-	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations													
Traffic Vol, veh/h	0	1886	4	1	7	851	0	0	0	28	0	0	0
Future Vol, veh/h	0	1886	4	1	7	851	0	0	0	28	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	-	None	-	-	None	-	-	None
Storage Length	100	-	130	-	250	-	-	-	-	25	-	-	-
Veh in Median Storage, #	-	0	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	10	0	0	12	17	0	0	0	3	0	0	0
Mvmt Flow	0	2050	4	1	8	925	0	0	0	30	0	0	0

Major/Minor	Major1				Major2			Minor1			Minor2		
Conflicting Flow All	925	0	0	2050	2054	0	0	2531	2993	1025	1968	2997	463
Stage 1	-	-	-	-	-	-	-	2050	2050	-	943	943	-
Stage 2	-	-	-	-	-	-	-	481	943	-	1025	2054	-
Critical Hdwy	4.1	-	-	6.4	4.34	-	-	7.5	6.5	6.96	7.5	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.5	2.32	-	-	3.5	4	3.33	3.5	4	3.3
Pot Cap-1 Maneuver	747	-	-	71	235	-	-	14	14	231	38	14	551
Stage 1	-	-	-	-	-	-	-	59	100	-	286	344	-
Stage 2	-	-	-	-	-	-	-	540	344	-	255	99	-
Platoon blocked, %		-	-			-	-						
Mov Cap-1 Maneuver	747	-	-	174	174	-	-	13	13	231	32	13	551
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	13	13	-	32	13	-
Stage 1	-	-	-	-	-	-	-	59	100	-	286	326	-
Stage 2	-	-	-	-	-	-	-	512	326	-	221	99	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.2	22.9	0
HCM LOS			C	A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	231	747	-	-	174	-	-	-
HCM Lane V/C Ratio	-	0.132	-	-	-	0.05	-	-	-
HCM Control Delay (s)	0	22.9	0	-	-	26.7	-	-	0
HCM Lane LOS	A	C	A	-	-	D	-	-	A
HCM 95th %tile Q(veh)	-	0.4	0	-	-	0.2	-	-	-

Intersection						
Int Delay, s/veh	0					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1890	2	0	851	0	0
Future Vol, veh/h	1890	2	0	851	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	1000	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	10	0	0	17	0	0
Mvmt Flow	2054	2	0	925	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	1027
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.3
Pot Cap-1 Maneuver	-	-	0	-	0	235
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	235
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-
HCM Control Delay (s)	0	-	-	-
HCM Lane LOS	A	-	-	-
HCM 95th %tile Q(veh)	-	-	-	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations													
Traffic Vol, veh/h	2	0	590	6	6	1223	0	4	0	1	0	0	0
Future Vol, veh/h	2	0	590	6	6	1223	0	4	0	1	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	100	-	130	250	-	-	-	-	25	-	-	-
Veh in Median Storage, #	-	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	0	0	16	0	0	15	0	0	0	0	0	0	0
Mvmt Flow	2	0	628	6	6	1301	0	4	0	1	0	0	0

Major/Minor	Major1				Major2			Minor1			Minor2		
Conflicting Flow All	1301	1301	0	0	634	0	0	1295	1945	314	1631	1951	651
Stage 1	-	-	-	-	-	-	-	632	632	-	1313	1313	-
Stage 2	-	-	-	-	-	-	-	663	1313	-	318	638	-
Critical Hdwy	6.4	4.1	-	-	4.1	-	-	7.5	6.5	6.9	7.5	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.5	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	216	539	-	-	959	-	-	122	66	688	69	65	416
Stage 1	-	-	-	-	-	-	-	440	477	-	170	230	-
Stage 2	-	-	-	-	-	-	-	422	230	-	673	474	-
Platoon blocked, %			-	-		-	-						
Mov Cap-1 Maneuver	216	216	-	-	959	-	-	121	65	688	68	64	416
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	121	65	-	68	64	-
Stage 1	-	-	-	-	-	-	-	436	473	-	168	229	-
Stage 2	-	-	-	-	-	-	-	419	229	-	666	470	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0	30.7	0
HCM LOS			D	A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	121	688	216	-	-	959	-	-	-
HCM Lane V/C Ratio	0.035	0.002	0.01	-	-	0.007	-	-	-
HCM Control Delay (s)	35.8	10.2	21.8	-	-	8.8	-	-	0
HCM Lane LOS	E	B	C	-	-	A	-	-	A
HCM 95th %tile Q(veh)	0.1	0	0	-	-	0	-	-	-

Intersection						
Int Delay, s/veh	0					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↱		↑↑		↱
Traffic Vol, veh/h	598	1	0	1229	0	0
Future Vol, veh/h	598	1	0	1229	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	1000	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	16	0	0	15	0	0
Mvmt Flow	643	1	0	1322	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	322
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.3
Pot Cap-1 Maneuver	-	-	0	-	0	680
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	680
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-
HCM Control Delay (s)	0	-	-	-
HCM Lane LOS	A	-	-	-
HCM 95th %tile Q(veh)	-	-	-	-

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations													
Traffic Vol, veh/h	0	1886	4	1	6	851	0	4	0	11	0	0	0
Future Vol, veh/h	0	1886	4	1	6	851	0	4	0	11	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	-	None	-	-	None	-	-	None
Storage Length	100	-	130	-	250	-	-	-	-	25	-	-	-
Veh in Median Storage, #	-	0	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	10	0	0	0	17	0	0	0	0	0	0	0
Mvmt Flow	0	2050	4	1	7	925	0	4	0	12	0	0	0

Major/Minor	Major1			Major2				Minor1			Minor2		
Conflicting Flow All	925	0	0	2050	2054	0	0	2529	2991	1025	1966	2995	463
Stage 1	-	-	-	-	-	-	-	2050	2050	-	941	941	-
Stage 2	-	-	-	-	-	-	-	479	941	-	1025	2054	-
Critical Hdwy	4.1	-	-	6.4	4.1	-	-	7.5	6.5	6.9	7.5	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.5	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	747	-	-	71	277	-	-	14	14	236	38	14	551
Stage 1	-	-	-	-	-	-	-	59	100	-	287	345	-
Stage 2	-	-	-	-	-	-	-	542	345	-	255	99	-
Platoon blocked, %		-	-			-	-						
Mov Cap-1 Maneuver	747	-	-	192	192	-	-	14	13	236	35	13	551
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	14	13	-	35	13	-
Stage 1	-	-	-	-	-	-	-	59	100	-	287	331	-
Stage 2	-	-	-	-	-	-	-	519	331	-	242	99	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.2	109.3	0
HCM LOS			F	A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	14	236	747	-	-	192	-	-	-
HCM Lane V/C Ratio	0.311	0.051	-	-	-	0.04	-	-	-
HCM Control Delay (s)	$ 352	21.1	0	-	-	24.5	-	-	0
HCM Lane LOS	F	C	A	-	-	C	-	-	A
HCM 95th %tile Q(veh)	0.8	0.2	0	-	-	0.1	-	-	-

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1890	2	0	855	0	0
Future Vol, veh/h	1890	2	0	855	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	1000	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	10	0	0	17	0	0
Mvmt Flow	2054	2	0	929	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	1027
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.3
Pot Cap-1 Maneuver	-	-	0	-	0	235
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	235
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-
HCM Control Delay (s)	0	-	-	-
HCM Lane LOS	A	-	-	-
HCM 95th %tile Q(veh)	-	-	-	-